

F.3225
WAG9x and WAP7x

WAG9 CCU Troubleshooting Guide

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Revision history

Version	Date	Sections changed	Reason for change
-	2021-09-30	All	First Issue Layout Concept (Release WAG9_Upgrade)
01	2023-03-29	All	New FCs added after restructure.
02	2023-06-01	All	Complete inclusion according to customer
03	2023-07-22	Annex IV	Correction done
04	2024-05-20	All	New FCs & Node chart Added

Unresolved issues

No.	Topic	Chapter	To be resolved by	no late than

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1 Introduction

1.1 General information about this document

- This Trouble Shooting Guide (TSG) is for maintenance personnel, who are trained in the general handling of the locomotive, traction equipment and locomotive control equipment.
- The trouble shooting personnel should already be familiar with the specific safety measures required on these locomotives due to the presence of the various high- voltage capacitors. For a detailed description the personnel has to refer to the safety precautions for the locomotive it is working on!
- This trouble shooting guide provides information about the diagnostic messages (fault codes) in the Central Control Units diagnostic memory.

In order to understand the TSG, the user must be familiar with the documents listed below in section 0.2.

Section **Error! Reference source not found.** contains an overview, how to read the trouble shooting guide.

In addition to each individual diagnostic code in section 4, there is also a description of the possible causes and corrective measures.

1.2 Other applicable documents

Reference	Document	Version	Date
[SyArs]	System architecture WAG9_WAP7_7MW SAP : A6Z00042973571		
[IO_assign]	Revised-Lion-Assignment_EN2_2		
[WAG9_9K]	WAG9_9K_UPGRADE SCHEMATIC_A2		
[WAG9-6K]	WAG9_6K_SCHEMATIC_A2		
[WAG9-6K-ACU1]	A5E42173743E_AE_ver005_Circuit Diagram ACU1		
[WAG9-6K-ACU2]	WAG9 6K ACU2		
[WAG9-6K-TCU]	20190206_A5E42173718B_AB_Circuit_diagram		
[WAG9-9K-TCU]	20190106_1_WAG9 9K		

1.3 Safety instructions and notes

All safety instructions in the maintenance manuals of the relevant components must be observed when performing tasks described in this document, safety precautions are not explicitly stated in this document.

As general, at least the following five safety regulations have to be considered:

- Disconnect mains!
- Prevent reconnection!
- Test for absence of harmful voltages!
- Ground and short circuits!
- Cover or close of nearby live parts!

When performing troubleshooting on the vehicle, the relevant sections of the running maintenance manual for the affected component/system and especially their Safety Summary must be observed.

Also following must be considered:

- Even if a converter container has been switched off for a prolonged period of time, residual charge can pose enough of a danger to cause serious personal injury.
- Personnel will be exposed to the same risks when working on the traction components connected to the converter container and their supply lines (e.g. pantograph, main circuit breaker, and all connecting lines).
- It can take more than one hour for the capacitors to discharge. Therefore, even after a long wait time has elapsed, personnel have to make sure that the capacitors are actually discharged and de-energized.
- Capacitors which are not short-circuited appropriately will continue to absorb power even when disconnected. Accordingly, when capacitors are replaced, their connectors must be short-circuited appropriately (and this shorting must, of course, be reversed once the new capacitors have been installed and connected).
- If the converter container has to be opened for the purpose of accessing the TCU, the same safety regulations shall apply as when working on the converter.
- When wiring interfaces to external destinations "on the fly", extreme caution must always be taken when laying cables so that there is always sufficient safety clearance between them and live parts.
- Connectors must be attached as appropriate for their design (snapped or screwed into place).
- Personnel are required to comply with all safety information in this document, as well as that appearing on devices and vehicles.
- Only manufacturer's original spare parts or parts recommended by the manufacturer are to be used.
- All maintenance operations or repairs must comply with the necessary maintenance intervals and repair and replacement guidelines.

DANGER

Only tools and auxiliaries to be used that are approved for carrying out work on and in the converter container. This requirement applies to all cables temporarily or permanently connected to the DSP. Connecting cables between the DSP and the PC or measuring devices must meet specific requirements; therefore, only tools approved by Siemens may be used.

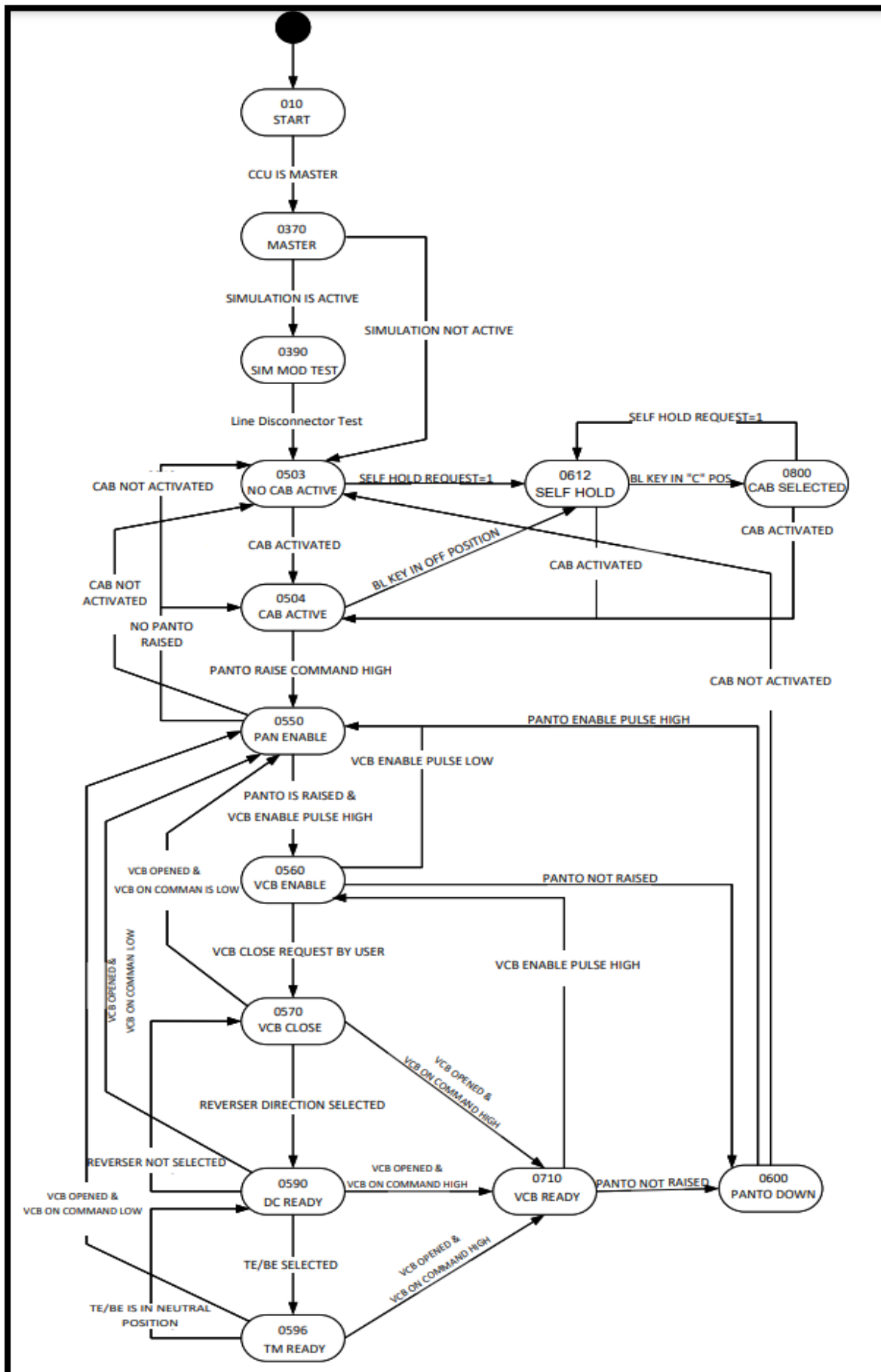
Noncompliance with warning notices and failure to take safety precautions can lead to fatal injuries and serious material damage.

1.4 List of abbreviations

Abbreviation	Meaning
4QC	Four-quadrant chopper
AC	Alternating Current
AI	Analog input
AO	Analog output
Approx.	Approximately
ATC	Automatic Train Control
Aux.	Auxiliary
BC	Brake Cylinder
BCU	Brake Control Unit
BP	Break Pipe
BRAM	Battery buffered random access memory (RAM) of the SIBAS 32 control Units
BUR	Auxiliary converter control
CAN	Controller Area Network
CB	Circuit Breaker
CCU	Central Control Unit
Circ.	Circuit
CPU	Central Processing Unit
Ctrl	Control
DC	Diagnostic Code also called „Diagnostic Message“ or “Fault Code”
DI	Digital input
Diag.	Diagnostic
DO	Digital output
DSP	Digital Signal Processor
e.g.	for example
GND	Ground
HEP	Head end power
HW	Hardware
I/O	Input/Output
ICU	Inverter control unit
IN	Signal Input
LED	Light Emitting Diode
LION	External Input/output=I/O
MCB	Main circuit breaker
MR	Main Reservoir
MVB	Multifunction Vehicle Bus
No.	Number
NSDB	Node Supervisor database
OUT	Signal Output
Panto	Pantograph
Pos.	Position
PR	Program
PWI	Pulse Width Inverter
RDA	Remote Data Access
RS232	Standard for serial computer interfaces with $\pm 12V$ signals (V.24)
SIBAS 32	Siemens Bahn Automatisierungs System – Siemens automation system for railway applications
Sig	Signal

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SW	Software
TC	Traction converter
TCC	Traction converter cubical
TCN	Train Communication Network
TCU	Traction Control Unit
TSG	Trouble shooting guide
VCB	Vacuum circuit breaker
VCU	Vehicle control unit
WTB	Wired train bus



2 Applicable software versions

This document applicable for the diagnostics structure integrated with below software:

Part.	Software Version
MCU-CCU	
Operating System	2.05, 10/May/2020
Hardware module	70.01, 10/May/2020
ETH2-Firmware	3.10 04/DEC/2020
Communication Drivers	17.0, 29/Aug/2019
NSDB	2.78 08/May/2023
Program	2.01, 08/May/2023
Parameter	0.213, 08/May/2023
MCU-CCU	
Program	1.2.1 – 9K & 1.1.6 – 6K 08/May/2023
NSDB	2.66 20/Oct/2021

3 How to use the trouble shooting guide

This document assumes, that service personnel has retrieved the necessary information from the CCU diagnostic memory and is analyzing it either:

- offline via Sibas Diagnosis Viewer or
- online via SIBAS-Monitor

The list of all possible CCU diagnostic codes can be found in section **Error! Reference source not found.** Typical reactions of the control system, which are repeatedly used, are defined in section 3.4.1.

Further information about the desired behavior and the functionalities of each system can be found in:

- Related System Architecture Specifications [SyArs] of each system included in the technical documentation.
- Technical documentation, WAG9 Schematic [WAG9_9K].

Strategy:

If more than one Diagnostic message is triggered, start working on the messages that are related to faults or the status of:

- Circuit Breakers
- Contactors / Relays
- I/O-Stations

Solving these diagnostic messages could lead to dissolve further messages.

3.1 Using Circuit diagrams

The circuit diagrams are included in the technical documentation, section “WAG9 Schematic [WAG9_9K]”. Each electrical device on the loco and also each electrical Input/output of any Lütze I/O module can be found in that circuit diagrams.

To find an electrical device its “Device Designation” has to be used. Device Designations are used within the schematics in section 4 of this TSG.

A Device Designation is based on the standard 6k nomenclature and not on the SIEMENS standards. Few examples have been stated below:

CCU1: 127.1/1

Auxiliary Compressor: 48.1

Battery: 111

This Device Designations can be used with the normal Search function of a PDF viewer software. See also technical documentation, section WAG9 Schematic [WAG9_9K]

To find a specific electrical Input or Output signal on a Lütze module, it is also possible to use the search function of the PDF viewer software. Refer WAG9 IO assignment [IO_assign] for the IO nomenclature e.g.:

- E111_03	Binary Input
- A113_03	Binary Output
- EA112_00	Analogue Input
- AA115_01	Analogue Output

3.2 How to check the status of I/Os

Status of each Lütze contact can be checked easily via Service screen TOD. In menu “Service” / “I/O signals” all inputs and outputs are listed.

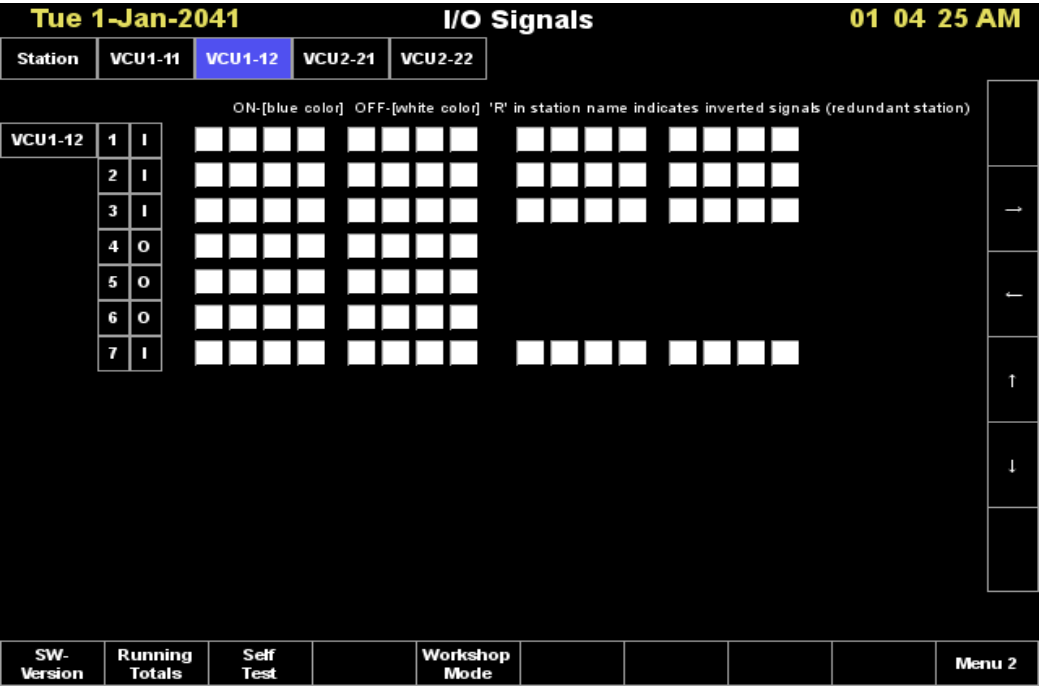


Figure 1 Example, overview I/O 12



Figure 2 Example, detailed view IO E121

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Also, each Lütze contact can be checked via Sibas Monitor. Therefore, Sibas Monitor has to be started and connected to CCU. Then the command “**Applic. Connect.**” has to be used.

Examples:

To check binary input E111_00

Applic. -> Connect. -> EXT11_20.O00

To check binary output A116_00:

Applic. -> Connect. -> PACKA116.I00

To check analogue input EA213_00:

Applic. -> Connect. -> E213_00.OUT

To check analogue output AA217_00:

Applic. -> Connect -> SA217_00.IN

4 Overview

4.1 Locomotive Overview

The purpose of this section is to provide several schematic diagrams to make the TSG easier to understand. The following schematics and charts are included.

- WAG 9 Technical Data
- Locomotive control system overview
- Ethernet configuration
- MVB configuration
- Overview VCU
- Overview I/O Stations

WAG9 Technical Data

Axle arrangement		Co-Co
Gear ratio		1:5.133
Gauge		1676 mm
Wheel diameter	New	1092 mm
	Half worn	1054 mm
	Worn	1016 mm
Maximum permitted difference of wheel Diameters within one bogie		8 mm
Maximum permitted difference of wheel diameters between bogies		25 mm
Sharpest negotiable curve radius		174 m
Total weight (without ballast)		123 t
Catenary voltage	Nominal	25 kV
	Minimum	19 kV
	Maximum	27.5 kV
Frequency		50 Hz +/- 8%
Static power supply to auxiliary circuits		
	Voltage	415 V +/- 10%
	Frequency	0 ... 50 Hz
	Battery voltage	110 VDC
Regenerative brake	Maximum braking force	260 kN
Automatic train brake	Maximum braking force Coefficient of adhesion 35%	242 kN
Parking brake	Maximum braking force	37 kN
Continuous rating on wheel rim between 80 and 120 km/h		4500 kW
Traction force on wheel rim between 0 and 50 km/h		
	maximum	460 kN

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	continuous	325 kN
Maximum speed	with half worn wheels	100 km/h
	at constant speed	100 km/
Maximum ambient temperatures	in the sun	75 °C
	In the shade	55 °C
Minimum ambient temperature		0 °C

Table 1 : Technical Data

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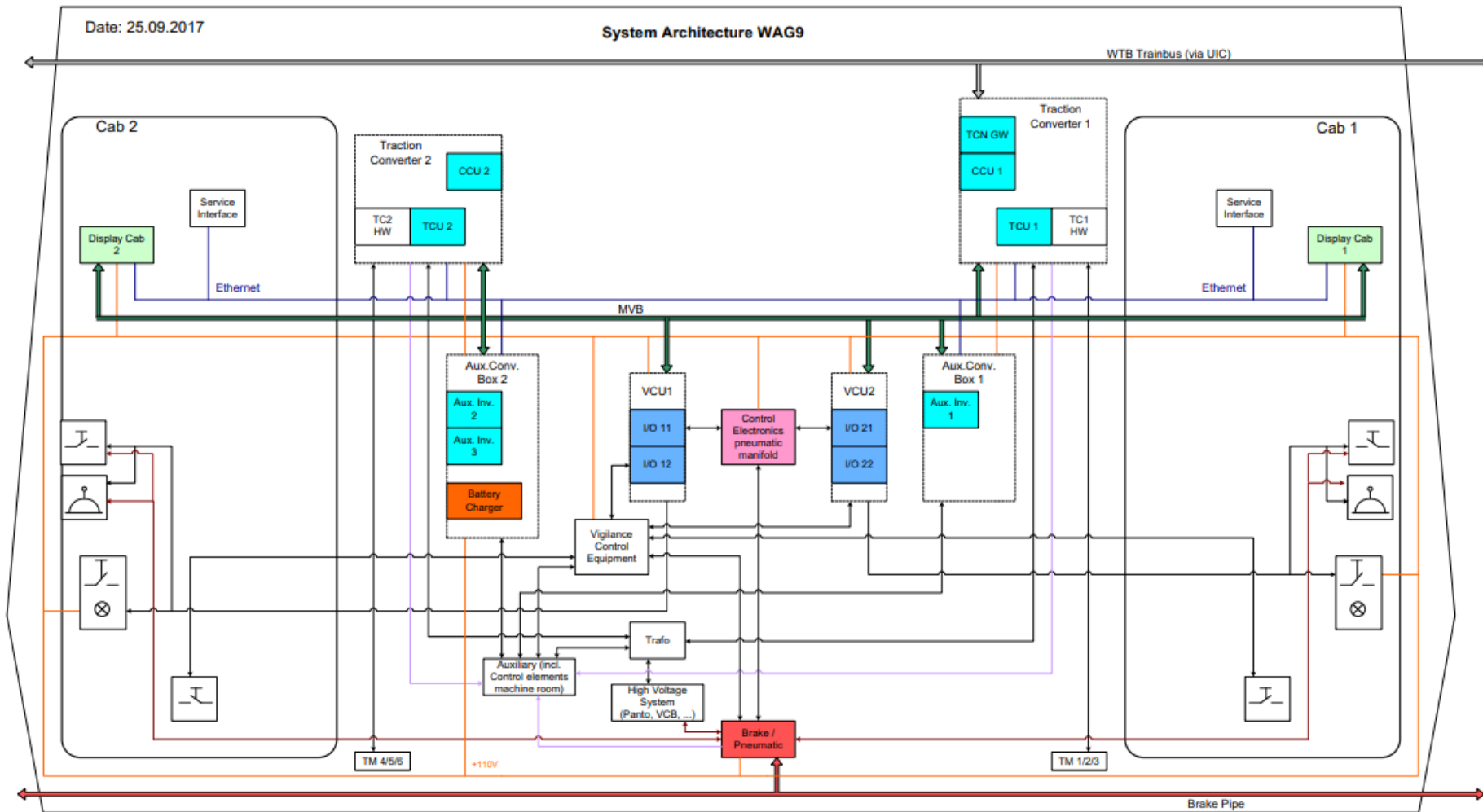


Figure 3 Locomotive control system overview of WAG9

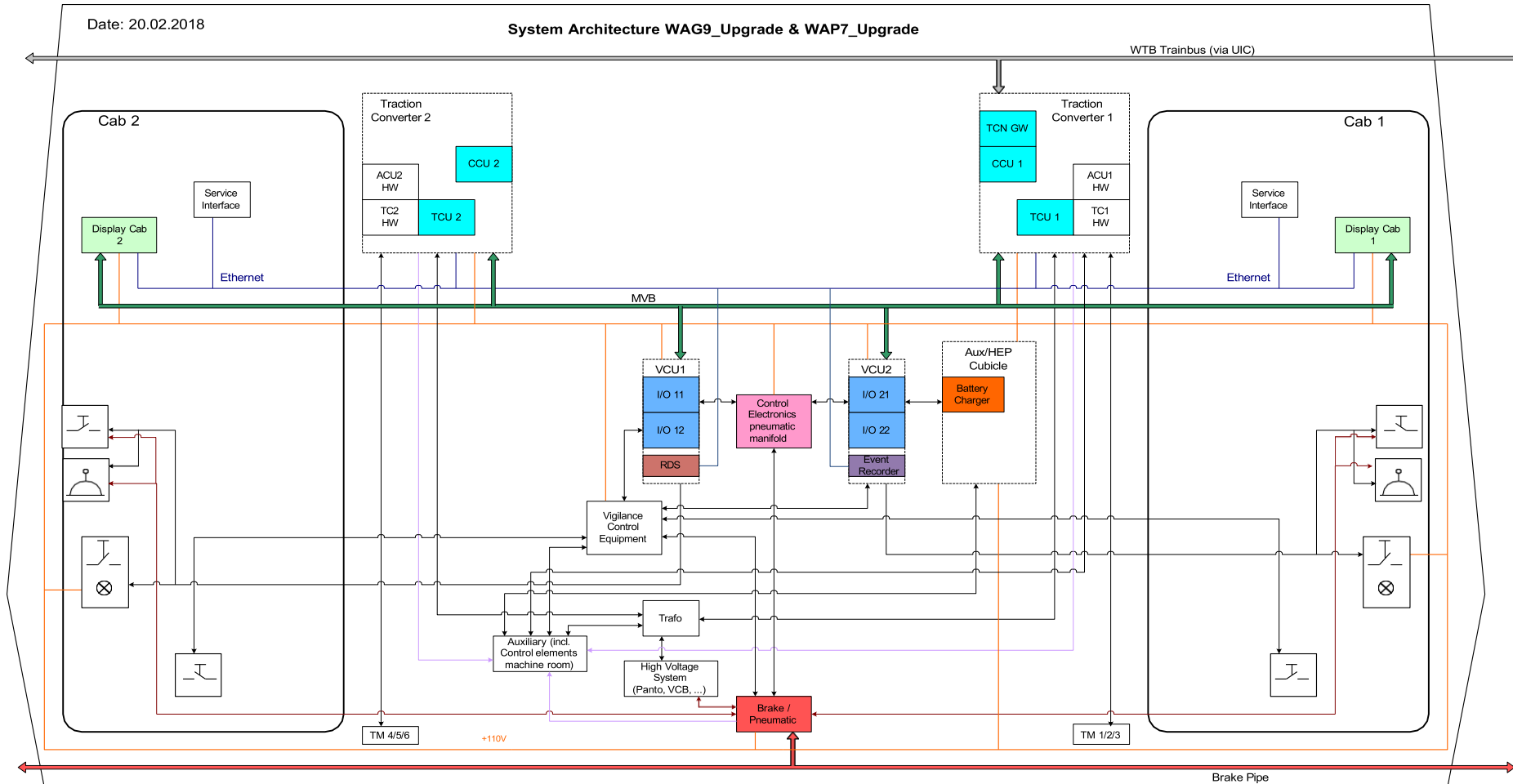


Figure 4 Locomotive control system overview of WAG9HH

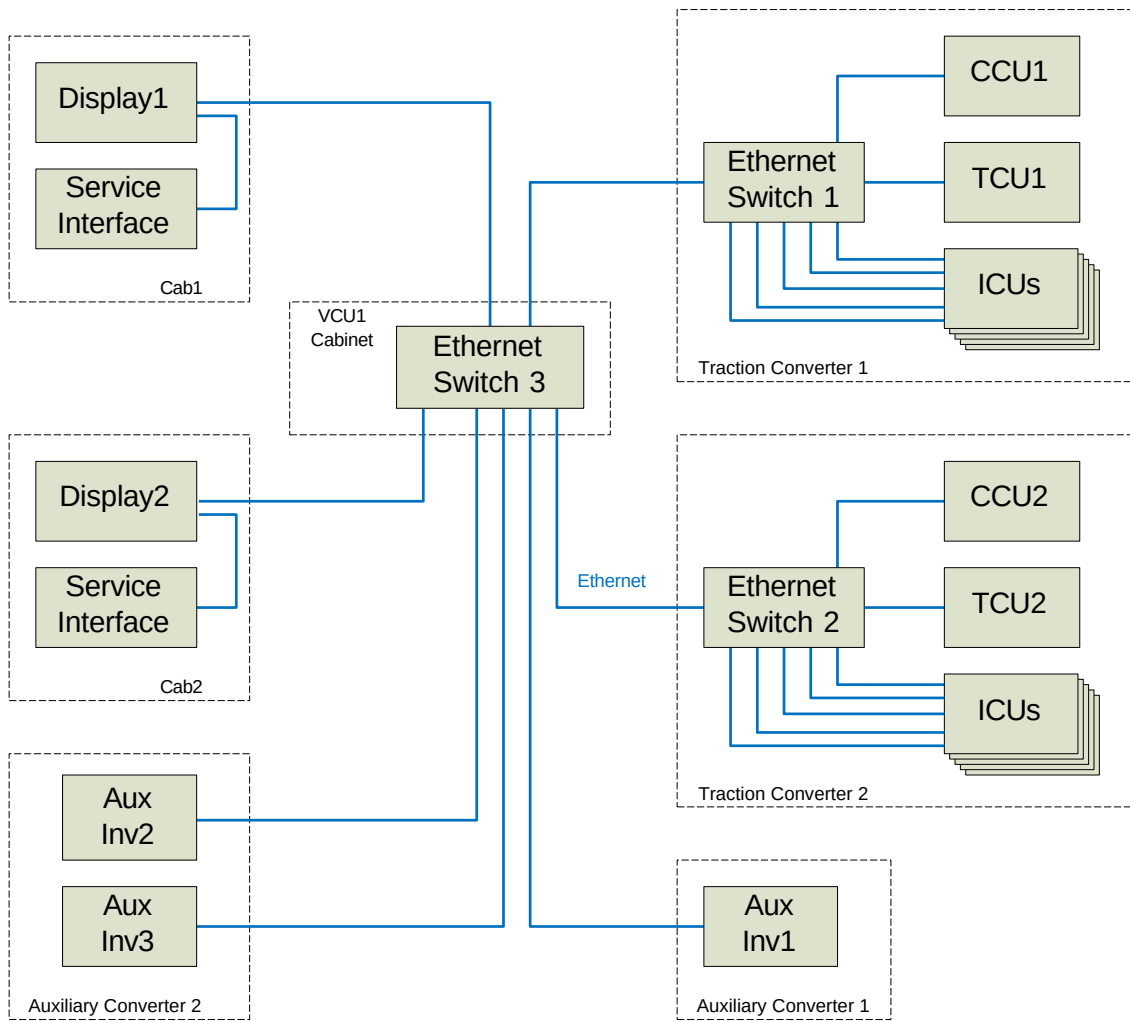


Figure 5 Ethernet architecture and configuration.

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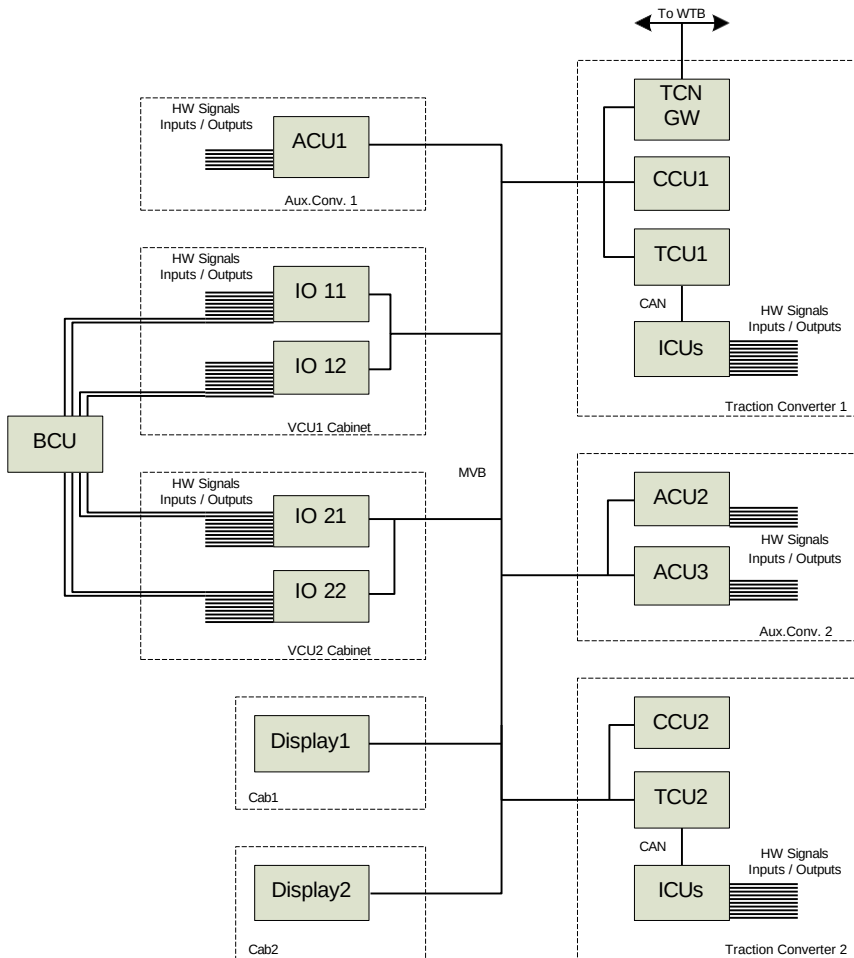


Figure 6 MVB architecture and configuration

4.1.1 VCU Layout

The CCU/VCU is responsible for the following functions:

- It processes all commands from operator (throttle handle, switches, etc.) or train bus.
- It controls and monitors on/off devices on the locomotive (contactors, relays, magnet relays and CBs).
- Process inputs and outputs hardwired signals via external I/O modules (KLIP/LION).
- It communicates with other units via the available interfaces.
- MVB master function can also handle by MCU2.

VCU	Device	Location
VCU1	CCU1	Traction Converter 1
	TCN-GW	Traction Converter 1
	IO11	VCU1 box
	IO12	VCU1 box
VCU2	CCU2	Traction Converter 2
	IO21	VCU2 box
	IO22	VCU2 box

Table 2 VCU Layout

4.1.2 Sibas32C and CCU Disposition

This chapter describes the components of Sibas32 rack.

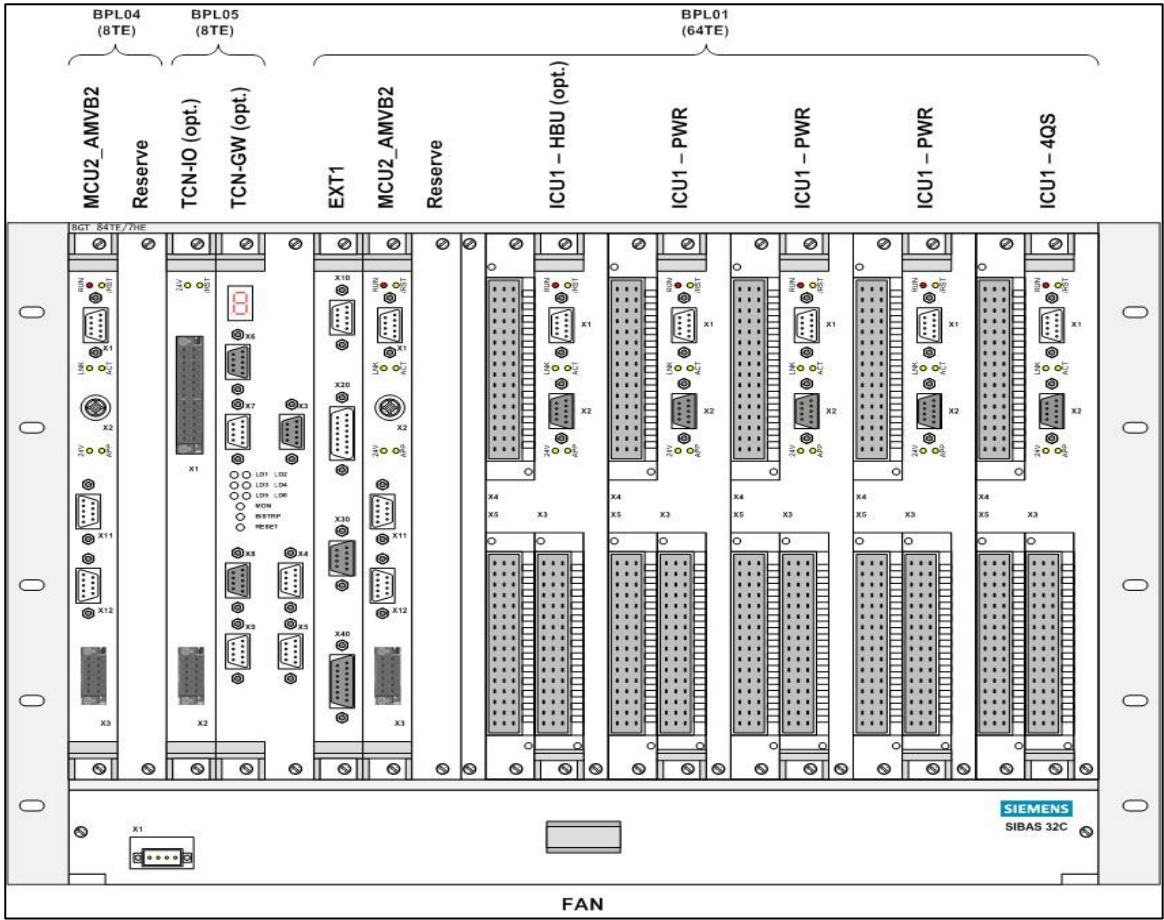


Table 3 Disposition of CCU and TCU

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Control Unit	Backplane	Module
CCU	BPL04	MCU2
		Spare, for future use
WTB	BPL05	TCN-IO(only with CCU1)
		TCN-GW (Only with CCU1)
TCU	BPL01	Extender-EXT 1
		MCU2
		Communication Interface(Optional)
		5 ICUs

Table 4 Sibas32 Rack Layout

A detailed description of each module will be given in the technical documentation.

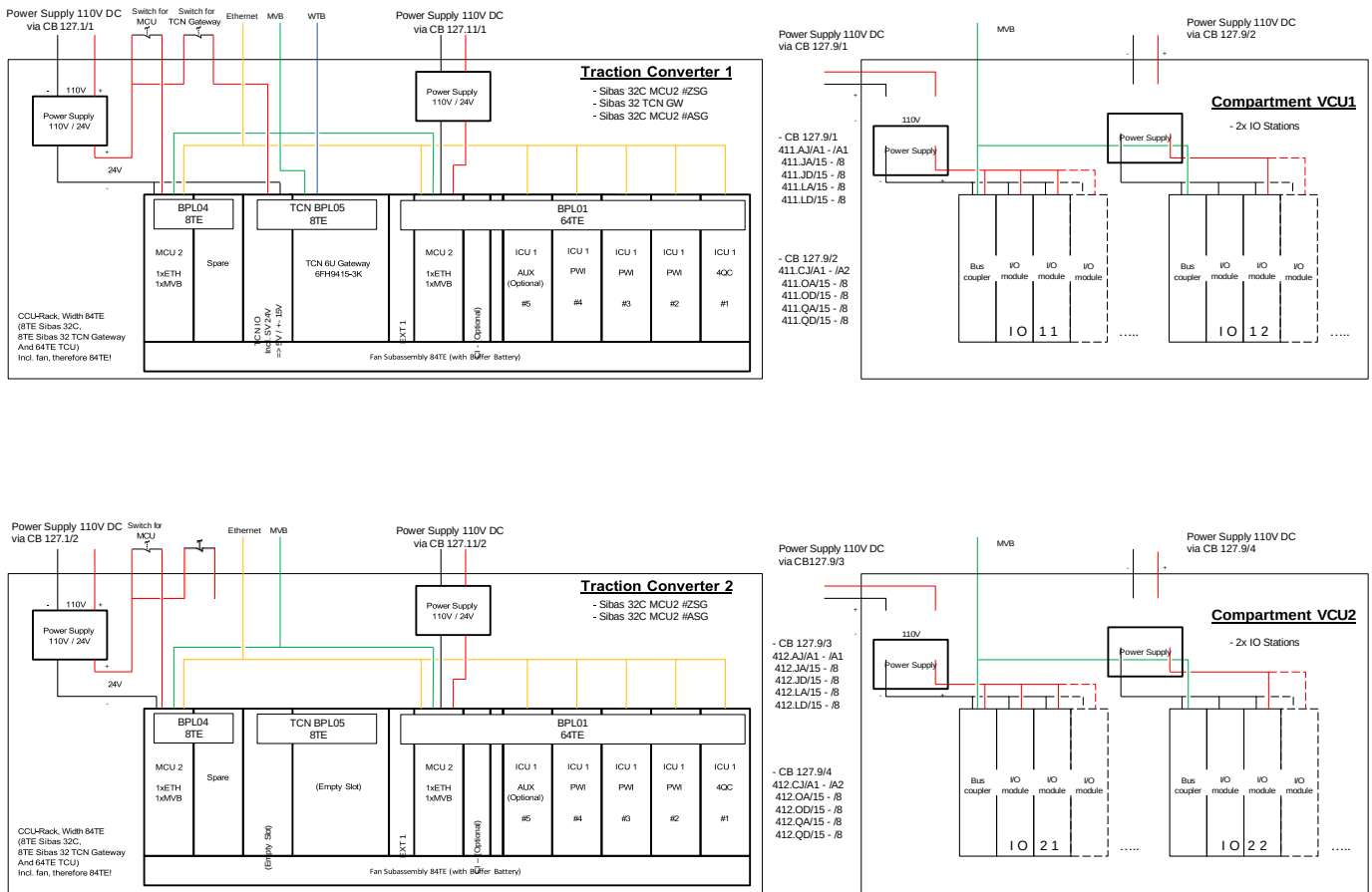


Figure 7 VCU architecture

4.1.3 IO Station

The four IO stations provide digital and analogue inputs and outputs for the CCUs. In each VCU box there are two IO stations installed (see Figure 8). Communication between IOs and CCUs is realized via MVB

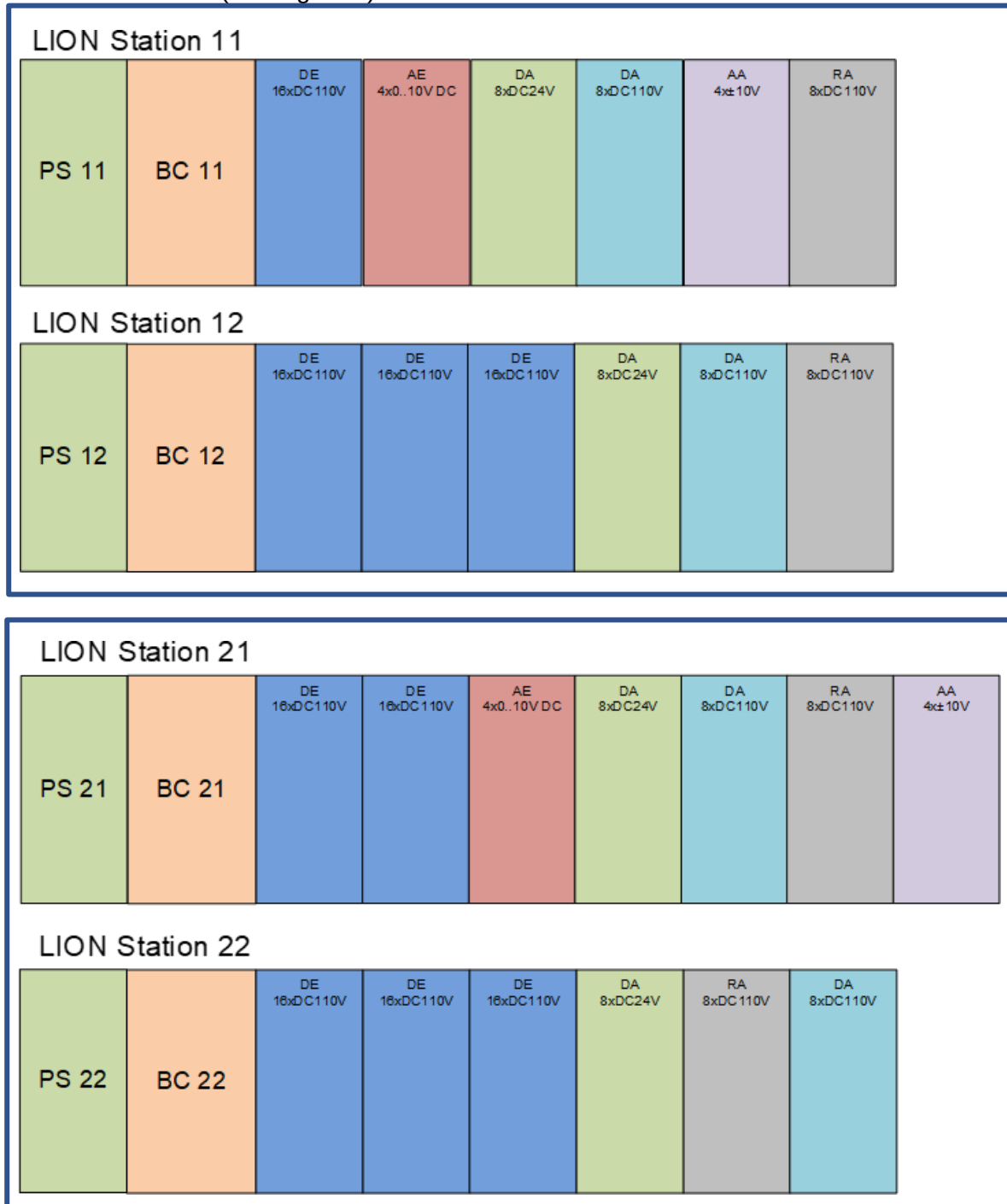


Figure 8 Lutze Disposition



Figure 9 Leroy Disposition

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4.2 Overview - Locomotive

The SIBAS 32 control units (CCU, TCU and ICU) and other subsystems with diagnostic capabilities (e.g. BCU, I/O, DDU) communicate via the MVB bus and via Ethernet. Connected to the Ethernet network are the DDUs, the SIBAS control units (CCU, TCU and ICU), the Diagnostic Server (RDS) and other subsystems (if applicable).

Subsystems, which have no direct connection to the MVB, are linked to the MVB via gateways or transmit their diagnostic events via Ethernet.

Subsystems with diagnostic capabilities provide full diagnostic functionality for themselves considering all available conditions and the status of the vehicle.

All diagnostic events which are generated by the diagnostic system are signaled to the central Diagnostic Server of the vehicle (RDS).

4.3 Structure of Diagnosis

The diagnosis is structured hierarchically explained from the subsystem up to the Diagnostic Server.

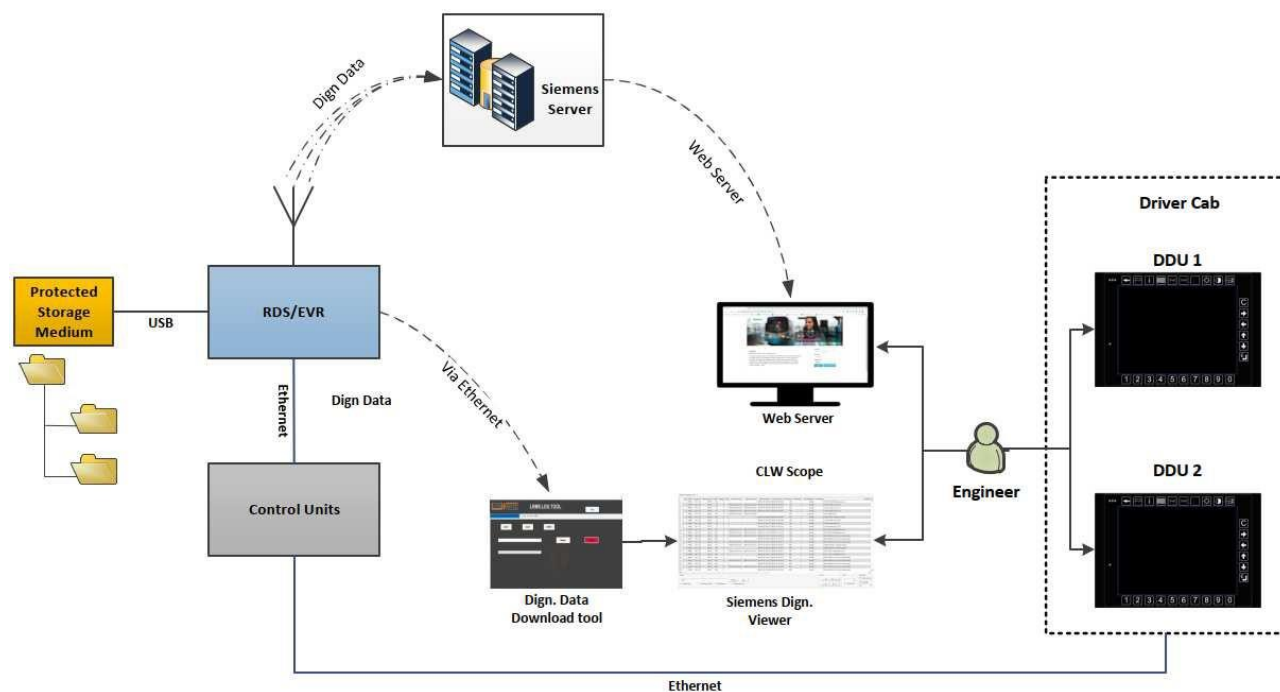


Figure 10 Structure of the diagnostic system

4.3.1 Subsystem Diagnosis

The target audiences for collected diagnostic data are firstly the locomotive pilots and secondly the maintenance personnel.

Messages for the engineers at the DDUs (Crew messages)

Messages for the locomotive pilots (so-called "Crew messages") are controlled by the central diagnostic system. The objective of the crew messages is to maximize vehicle availability. Therefore, the messages include information regarding current malfunctions and possible actions and measures for rectifying or bypassing these malfunctions.

Messages for maintenance (Diagnosis Messages)

The objective of the messages for maintenance is to maximize vehicle availability and minimize the time necessary for troubleshooting, service actions and maintenance. When a maintenance relevant event occurs, the CCU decides what type of message must be created. All diagnostics messages are forwarded to the Diagnostic Server (RDS) which serves as central diagnosis data storage.

4.3.2 Subsystems and Central Diagnostic System of the Vehicle

The central diagnostic system of the locomotive (located at the CCU) handles and controls the following types of diagnostic events for itself and connected subsystems:

- Crew messages
- Diagnosis messages

Crew messages are displayed at the DDU. In general, a set and cleared crew message is also logged as an additional protocol message (see below).

The messages are grouped into the following severity classes:

Severity class	Description	Example
A	A major fault leading to a total failure of the locomotive	Failure on the truck brake
B	A fault leading to a limitation of the locomotive performance	Reduction of available tractive effort
C	A minor fault not affecting tractive power of the locomotive; still relevant for the crew on the locomotive but immediate action of the crew is not required	Circuit breaker tripped

Table 5 Severity of Fault



The DDU shows all currently present crew messages. This list is selected by pressing the hard key.

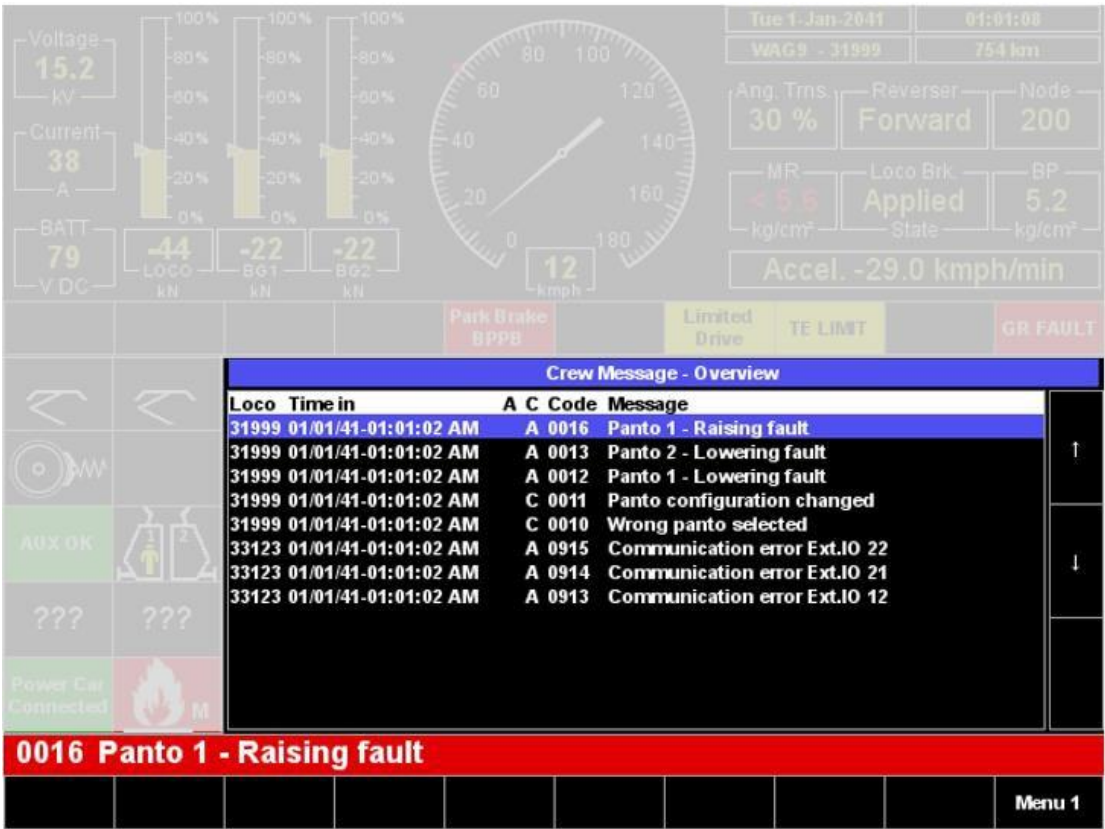


Figure 11 Crew message overview page

This sub screen page shows detailed information about a crew message. This page is selected by

pressing the

i

 hard key.

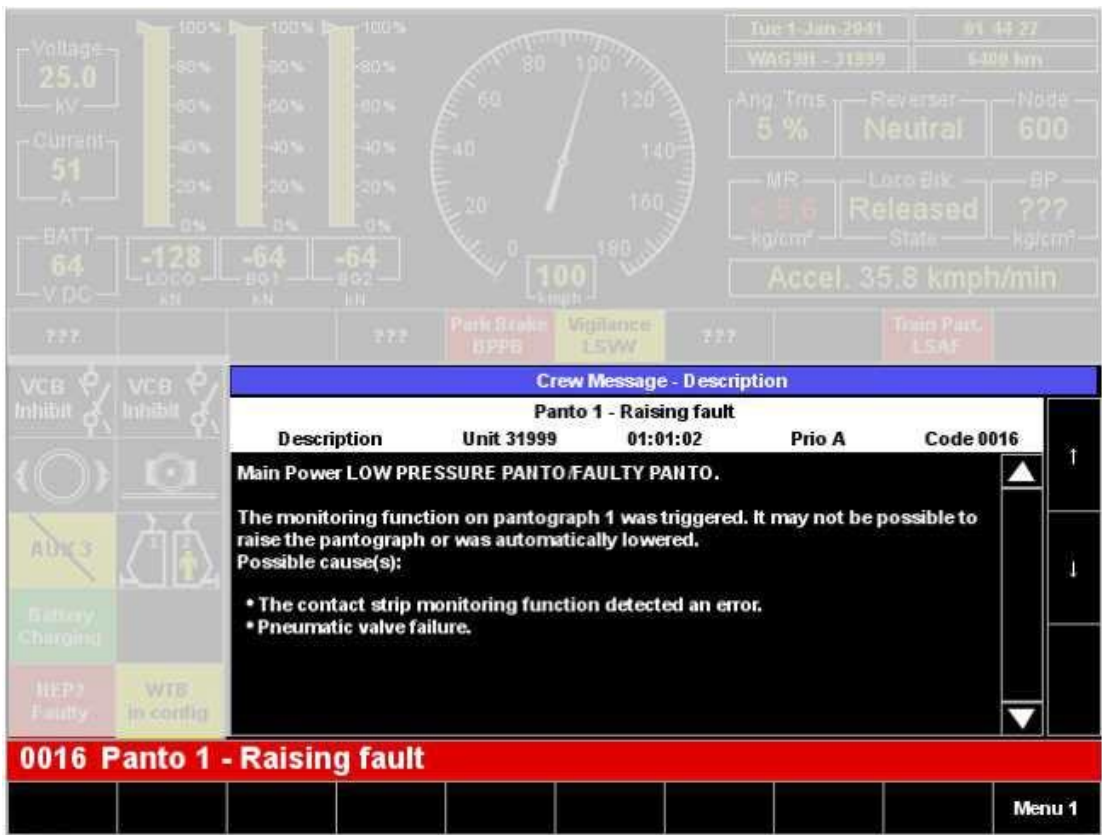


Figure 12 Crew message overview page.

Troubleshooting tips can be viewed from the same page by pressing the hard keys

V=0

 or

V>0

 in the same page as above.

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Diagnosis messages are stored in the SIBAS control units' internal non-volatile memory with a complete record of related data, such as a time stamp, information about type and duration of the malfunction and a data package with important signals at the time of occurrence.

As described above, all diagnosis messages are additionally transferred to the Diagnostic Server for further processing and transfer to the wayside. With this approach, it is not necessary to connect directly to the SIBAS control unit to readout the internal memory if the communication with the Diagnostic Server runs properly. However, the possibility to connect directly to the SIBAS control unit still exists.

Access to diagnosis messages can be achieved by the following possibilities, listed in order of the most convenient way to gain access:

1. Direct connection to the SIBAS32 control unit
2. Downloaded via the log download tool of the Diagnostic Server (RDS)
3. Visualize through DDU
4. In the wayside user interface.

Possibility 1, via Sibas Monitor:

Therefore, Sibas Monitor has to be started and connected to CCU.

Via menu "Events" / "Statistics_D", the list of triggered Diagnostic messages can be displayed. Each code that was active when the list was called is marked with an asterisk "*".

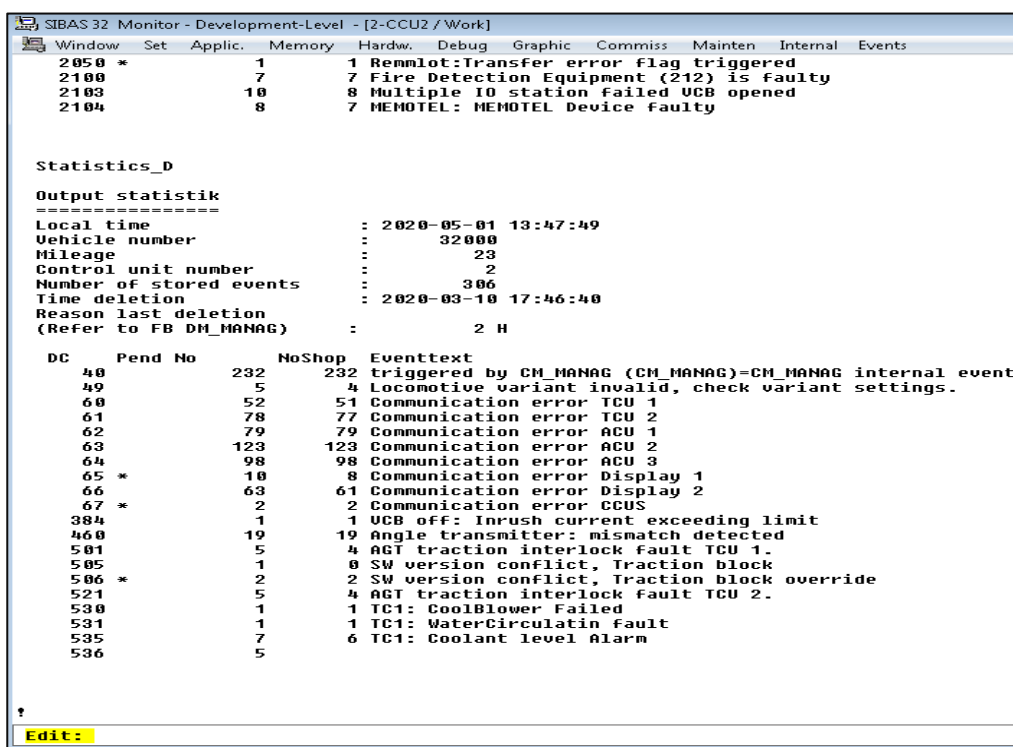


Figure 13 List of triggered in Diagnostic messages

Procedure for data download can be found at [Annexure-I](#)

Possibility 2, via Diagnostics server (RDS):

The diagnostics of each control units can be downloaded via “Log download tool” of diagnostics server(RDS).



Figure 14 Log download tool for RDS

Procedure for data download and visualization can be found at [Annexure-II](#)

Possibility 3, via DDU:

The diagnosis messages can be viewed on the DDUs.

Menu2 → Service → Shop Diagnosis

Tue 1-Jan-2041		Fault Archive				01:01:10		
Time in	Gone-Time	Code	Count	Device	Fault description			
03/03/23-12:24:46 PM	-	4460	1	CCU1	CM: Auxiliary 1 is cutout			
03/03/23-12:24:44 PM	-	62	1	CCU1	Communication error ACU 1			
03/03/23-12:19:22 PM	-	2610	1	CCU1	CB Cooling unit 1 is off.			
03/03/23-12:17:03 PM	-	2611	1	CCU1	CB Cooling unit 2 is off.			
03/03/23-12:12:52 PM	-	2610	1	CCU1	CB Cooling unit 1 is off.			
03/03/23-12:12:00 PM	-	2610	1	CCU1	CB Cooling unit 1 is off.			
03/03/23-12:07:52 PM	-	2610	1	CCU1	CB Cooling unit 1 is off.			
03/03/23-11:56:15 AM	-	2610	1	CCU1	CB Cooling unit 1 is off.			
03/03/23-11:53:10 AM	-	4165	1	CCU1	CM: Alarm Chain pulling			
03/03/23-11:53:08 AM	-	4364	1	CCU1	CM: Power reduction is active			
03/03/23-11:52:29 AM	-	1947	1	CCU1	Main transformer: Oil circuit 1 pressure fault			
03/03/23-11:45:27 AM	-	431	1	CCU1	MCE_ON Triggered			
03/03/23-11:45:16 AM	-	10	1	CCU1	Logging SW-Versions and operating hours			
03/03/23-11:45:12 AM	-	4161	1	CCU1	CM: Brake control isolated			
03/03/23-11:45:11 AM	-	67	1	CCU1	Communication error CCUS			
03/03/23-11:44:26 AM	-	432	1	CCU1	MCE_OFF Triggered			
03/03/23-11:44:25 AM	-	2321	1	CCU1	Reserved			
03/03/23-11:44:24 AM	-	2321	1	CCU1	Reserved			
CM: Auxiliary 1 is cutout								
Event Overview for Device CCUM successfully read.					line 1 of 595			
Fetch CCUM						Sort by Code		Menu 1

Figure 15 Crew message overview page.

4.4 Definitions

Cab activated:

The reverser in the active cab is in position Neutral, Forward or Reverse and no other cab in the train was already activated.

4.4.1 Typical reactions of the control unit (CCU/TCU)

“Monitor-only” operation mode:

A mode of the SIBAS CPU units (mounting position C019 in CCU/TCU) in which the cyclical processing of the application software is stopped. The control unit is brought to a safe state, all outputs controlled by this control unit are opened. Only software functions for communication with the Service-PC are still active.

That operation mode is visualized by a blank 7-segment-display on the CPU unit. Also, the red LED directly below the 7-segment-display is not illuminated.

Once the reason is cleared the control unit can be put back into “Normal” operation mode via the Service-PC or a hardware reset (battery off/on or reset button on SIBAS front panel).

5 Trouble shooting Guide

5.1 List of crew message

The list of pop-up and actions are illustrated in [Annexure-III](#)

5.2 Cross reference from crew messages to diagnostic messages

The list of pop-up and actions are illustrated in [Annexure-IV](#)

5.3 Structure of the troubleshooting guide

Description of the structure of the troubleshooting instructions relating to the fault code.

- **Fault code number**
- **Fault text**
- **Applicable variants**
- **Sub-system**
- **Condition**
 - If the FC can only be entered under certain conditions, for example while booting up, during voltage retention, while braking, etc.
- **Criteria**
 - What is the cause for the fault code?
- **Device name (Device name) of the components concerned.**
 - List of the components concerned. However, the list is only meant as an initial step. There is no complete list of all possible components involved.
- **Troubleshooting**
 - Steps to take for troubleshooting, specifically for the particular fault code.
- **Reaction**
 - Protective reaction
- **Related messages**
 - Are there any messages that often occur at the same time or that might help in troubleshooting?

5.4 Diagnostic messages

5.4.1 CCU Fault Code 003

Fault Text:

PMEM: error read buffer (not empty)

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- Internal service memory read error or unavailable.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- The internal buffer returned with read error.
- Check and load the application software.
- Contact siemens maintenance personnel.

Reaction:

- Read write lock activated to service memory.
- CCU may be not functional.

Related messages:

-

5.4.2 CCU Fault Code 004

Fault Text:

PMEM: error write buffer

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

SYSTEM

Condition:

-

Criteria:

- Write buffer is initialized.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Replace buffer.

Reaction:

- Fault code triggered.

Related messages:

-

5.4.3 CCU Fault Code 005

Fault Text:

PMEM: error user data length (read buffer)

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

SYSTEM

Condition:

-

Criteria:

- Buffers are not empty.
- Service buffer initialization ok.
- Buffer length and size are not equal.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Replace buffer.

Reaction:

- Fault code triggered

Related messages:

-

5.4.4 CCU Fault Code 006

Fault Text:**PMEM: error checksum (read buffer)**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

SYSTEM

Condition:

-

Criteria:

- Buffers are not empty.
- Service buffers initialization ok.
- CRC checksum not valid or CRC length and buffer length not equal.

Components concerned:

Component	Device name
CCU	-A100-C003

Reaction:

- Fault code triggered

Troubleshooting:

- Replace Buffer or check CRC and its length.

Related messages:

-

5.4.5 CCU Fault Code 007

Fault Text:

PMEM: error user data length (write buffer)

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

SYSTEM

Condition:

-

Criteria:

- Service buffers initialization not ok.
- User data length and buffer size do not matches.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Replace Buffer.

Reaction:

- Fault code triggered

Related messages:

-

5.4.6 CCU Fault Code 008

Fault Text:

PMEM: error checksum (write buffer)

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

SYSTEM

Condition:

-

Criteria:

- Service buffers initialization not ok.
- CRC checksum not valid or CRC length and buffer length not equal.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Replace Buffer.

Reaction:

- Fault code triggered

Related messages:

-

5.4.7 CCU Fault Code 009

Fault Text:

PMEM: service buffer initialization not ok

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H/P7/P5, WAG9 H 7MW, WAP7 Upgrade

Sub-system:

SYSTEM

Condition:

-

Criteria:

- Initialization of Read buffer or write buffer or service buffer is not ok.

Components concerned:

Component	Device name
CCU	-A100-C003

Reaction:

- Fault code triggered

Troubleshooting:

- Replace Buffer.

Related messages:

-

Fault Text:

Logging SW-Versions and operating hours

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- Message logs to records the Energy consumption, Operating hours and switching cycles of subsystems and components.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- This message only for information, no action required.

Reaction:

-

Related messages:

-

5.4.9 CCU Fault Code 030

Fault Text:

System: Invalid device HW ID

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- The CCU has invalid hardware configuration.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Check for the front connector at CCU-X1.
- Check the proper coding in X1 plug. Coding can be monitored via signal "\$01HWDID".
- If problem persists replace CCU(-C003).

Reaction:

- CCU may not functional.

Related messages:

-

5.4.10 CCU Fault Code 031

Fault Text:

System: Background manager failure

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- The CCU application background services manager returned with error.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Check/load the application software.
- Contact siemens personnel for internal error resolution.

Reaction:

- CCU may not functional.

Related messages:

-

5.4.11 CCU Fault Code 032

Fault Text:

System: Background manager failure

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- The CCU application background services manager returned with error.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Check/load the application software.
- Contact siemens personnel for internal error resolution.

Reaction:

- CCU may not functional.

Related messages:

-

5.4.12 CCU Fault Code 033

Fault Text:

System: Standard memory error

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- The CCU standard memory check returns error.
- General memory management not configured.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Check/load the application software.
- Contact siemens personnel for internal error resolution.

Reaction:

- CCU may not functional.

Related messages:

-

Fault Text:**System: Fast memory error**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- The CCU fast memory check returns error.
- General memory management not configured.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Check/load the application software.
- Contact siemens personnel for internal error resolution.

Reaction:

- CCU may not functional.

Related messages:

-

Fault Text:

triggered by CM_MANAG (CM_MANAG)=CM_MANAG internal event

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- The CCU CM ring memory overflow or memory is not configured properly.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Check/load the application software.
- Contact siemens personnel for internal error resolution.

Reaction:

- CCU may not functional.

Related messages:

-

5.4.15 CCU Fault Code 041

Fault Text:

Triggered by TM_MANAG (TM_MANAG)=TM_MANAG internal event

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- The CCU TM ring memory overflow or memory is not configured properly.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Check/load the application software.
- Contact siemens personnel for internal error resolution.

Reaction:

- CCU may not functional.

Related messages:

-

Fault Text:**Locomotive variant invalid, check variant settings.**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

System

Condition:

- MVB communication with I/O 12 is ok.

Criteria:

- Hardware variant and software variant are equal.
- Hardware variant changed from IO station 12(E123_12, E123_13, E123_14, E123_15).

Components concerned:

Component	Device name
I/O station 12	E122

Troubleshooting:

- Check connection of pins in IO station 12(E123_12, E123_13, E123_14, E123_15).
- Set correct variant.

Set the loco variant from SIBAS monitor tool COMM.--> Variant

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:

Communication error TCU 1

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

MVB

Condition:

- Receiving port error

Components concerned:

Component	Device name
CCU-MCU	-A100-C003
TCU1-MCU	-A100-C051

Troubleshooting:

- Check / reload NSDB in CCU and TCU1.
- Check further codes regarding MVB communication triggered.
- Check any codes triggered in TCU1 regarding MVB communication or internal components:
- Exchange CPU module.

Reaction:

- Fault code triggered.

Related messages:

-

Fault Text:

Communication error TCU 2

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

MVB

Condition:

- Receiving port error

Components concerned:

Component	Device name
CCU-MCU	-A100-C003
TCU1-MCU	-A100-C051

Troubleshooting:

- Check / reload NSDB in CCU and TCU1.
- Check further codes regarding MVB communication triggered.
- Check any codes triggered in TCU1 regarding MVB communication or internal components:
- Exchange CPU module.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:

Communication error ACU 1

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Sub-system:

MVB

Condition:

-

Criteria:

- Loco variant is other than WAG9HH or WAP7HH
- ACU1 communication is not ok. (MVB communication port (receiving) error)

Components concerned:

Component	Device name
AUX1-M1300	-A1
CCU-MCU	-A100-C003

Troubleshooting:

- Check the AUX1-M1300 is powered on. Check the 110V Power Supply (X040), Refer Diagram [WAG9-6K-ACU1] page 3.
- Check the MVB wiring between CCU1-X12 and AUX1-M1300-X90, Refer Diagram [WAG9-6K-ACU1] page 3 and [WAG9-6K-TCU] page 31
- Check for the correct NSDB in CCU and AUX1-M1300.
- If problem persists, check for the AUX1 data download for specific fault.

Reaction:

- AUX1 may be isolated.
- AUX1 load will be shifted to AUX2.

Related messages:

0650

Fault Text:**Communication error ACU 2**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Sub-system:

MVB

Condition:

-

Criteria:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX 2 communication is not ok. (MVB communication (receiving) port error)

Components concerned:

Component	Device name
AUX2-M1300	-A1
CCU-MCU	-A100-C003

Troubleshooting:

- Check the AUX2-M1300 is powered on. Check the 110V Power Supply (X040), Refer Diagram [WAG9-6K-ACU2] page 3.
- Check the MVB wiring between CCU-X12 and AUX2-M1300-X90, Refer Diagram [WAG9-6K-ACU2] page 3 and [WAG9-6K-TCU] page 31
- Check for the correct NSDB in CCU and AUX2-M1300.
- If problem persists, check for the AUX2 data download for specific fault.

Reaction:

- AUX2 may be isolated.
- AUX2 load will be shifted to AUX3.

Related messages:

-

Fault Text:**Communication error ACU 3**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Sub-system:

MVB

Condition:

-

Criteria:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX 3 communication is not ok. (MVB communication (receiving) port error)

Components concerned:

Component	Device name
AUX3-M1300	-A2
CCU-MCU	-A100-C003

Troubleshooting:

- Check the AUX3-M1300 is powered on. Check the 110V Power Supply (X040), Refer Diagram [WAG9-6K-ACU2] page 3.
- Check the MVB wiring between CCU-X12 and AUX3-M1300-X90, Refer Diagram [WAG9-6K-ACU2] page 3 and [WAG9-6K-TCU] page 31
- Check for the correct NSDB in CCU and AUX3-M1300.
- If problem persists, check for the AUX2 data download for specific fault.

Reaction:

- AUX2 may be isolated.
- AUX2 load will be shifted to AUX2.

Related messages:

-

Fault Text:

Communication error Display 1

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

MVB

Condition:

-

Criteria:

- Communication with display is not ok.

Components concerned:

Component	Device name
Display	435/1

Troubleshooting:

- If connection to the display is OK:
 - o Repair/replace display.
- If connection to the display is NOT OK:
 - o Repair connections of display.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:

Communication error Display 2

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H/P7/P5, WAG9 H 7MW, WAP7 Upgrade

Sub-system:

MVB

Condition:

-

Criteria:

- Communication with display is not ok.

Components concerned:

Component	Device name
Display	435/2

Troubleshooting:

- If connection to the display is OK:
 - o Repair/replace display.
- If connection to the display is NOT OK:
 - o Repair connections of display.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:

Communication error CCUS

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H/P7/P5, WAG9 H 7MW, WAP7 Upgrade

Sub-system:

MVB

Condition:

-

Criteria:

- MVB communication port error.

Components concerned:

Component	Device name
CCU-MCU	-A100-C003

Reaction:

- Fault code triggered

Troubleshooting:

- Check / reload NSDB in CCU1 and CCU2.
- Check the coding connector of both master and slave CCU.
- Check for other codes regarding MVB communication triggered in CCU Slave or Master:
- Exchange CPU module.

Related messages:

-

Fault Text:

Datashot: Debug

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- This code is for the data sort triggering through Sibas32 Monitor.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- This event triggers when user select Events➔Datashot.

Reaction:

-

Related messages:

-

Fault Text:

Datashot: Protocol other

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- This code is for the data sort triggering through Sibas32 Monitor.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- This event log protocol memory when user select Events→Datashot.

Reaction:

-

Related messages:

-

Fault Text:

Datashot: Protocol pulse

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SYSTEM

Condition:

-

Criteria:

- This code is for the cyclic data sort triggering through Sibas32 Monitor.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- This event log when user select P_menu → Datashot Interval.
- This is for internal debugging.

Reaction:

-

Related messages:

-

Fault test:**Panto 1: Raising fault (no pressure feedback)**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- CB I/O station signals (127.9) is on.
- Pantograph not cut out by cock
- Panto 1 Pressure should be ok.

Criteria:

- Panto-1 was not lifted within 15s after EP coil was energized.

Components concerned:

Component	Device Name
Front Pantograph	1/1
Pressure Switch	130.4/1
I/O-Station 22 module 2	E222_00
I/O-Station 22 module 5	A225_1
I/O-Station 21 module 2	E212_08
Panto-1 EP Valve	130/1

Troubleshooting:

- Try to lift front pantograph by ZPT (129/1 or 129/2) and check whether the pantograph is up or not.
- If it is up and lowered again then Check operation of pressure switch 130.4/1 Refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace pressure switch.
- If pantograph didn't go up Check associated wiring to IO module A225_1 and check the EP Valve 130/1. Refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace EP Valve.
- Check auxiliary air reservoir pressure for pantograph.

Reaction:

- Fault code triggered.
- VCB disabled.
- All pantographs of vehicle lowered.
- Lifting pantographs inhibited.

Related messages:

-

Fault test:**Panto 2: Raising fault (no pressure feedback)**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- CB I/O station signals (127.9) is on.
- Pantograph not cut out by cock
- Panto 2 pressure should be ok

Criteria:

- Panto-2 was not lifted within 15s after EP coil was energized.

Components concerned:

Component	Device Name
Front Pantograph	1/1
Pressure Switch	130.4/2
I/O-Station 21 module 1	E211_05
I/O-Station 22 module 2	E222_12
I/O-Station 21 module 6	A216_1
Panto-2 EP Valve	130/2

Troubleshooting:

- Try to lift front pantograph by ZPT (129/1 or 129/2) and check whether the pantograph is up or not.
- If it is up and lowered again then Check operation of pressure switch 130.4/2 refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace pressure switch.
- If pantograph didn't go up Check associated wiring to IO module A216_1 and check the EP valve 130/2. Refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace EP Valve.
- Check auxiliary air reservoir pressure for pantograph.

Reaction:

- Fault code triggered.
- VCB disabled.
- All pantographs of vehicle lowered.
- Lifting pantographs inhibited.

Related messages:

-

Fault test:**Panto 1: Lowering fault (error in active pressure feedback)**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- CB I/O station signals (127.9) is on.
- Pantograph not cut out by cock
- Panto 1 Pressure should be ok.

Criteria:

- Panto-1 was not lowered within 15s after EP valve was deenergized.

Components concerned:

Component	Device Name
Front Pantograph	1/1
Pressure Switch	130.4/1
I/O-Station 22 module 2	E222_00
I/O-Station 22 module 5	A225_1
I/O-Station 21 module 2	E212_08
Panto-1 EP Valve	130/1

Troubleshooting:

- Try to lower front pantograph by ZPT (129/1 or 129/2) and check whether the pantograph is lowered or not.
- If it is lowered then Check operation of pressure switch 130.4/1 refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace pressure switch.
- if it is not lowered check the operation of Panto 1 EP Valve 130/1 and check associated wiring module A225_1 refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace EP Valve.
- Check auxiliary air supply for pantograph.

Reaction:

- Fault code triggered.
- VCB disabled.
- All pantographs of vehicle lowered.
- Lifting pantographs inhibited.

Related messages:

-

Fault test:**Panto 2: Lowering fault (error in active pressure feedback)**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- CB I/O station signals (127.9) is on.
- Pantograph not cut out by cock
- Panto 2 Pressure should be ok.

Criteria:

- Panto-2 was not lowered within 15s after EP valve was deenergized.

Components concerned:

Component	Device Name
Front Pantograph	1/1
Pressure Switch	130.4/2
I/O-Station 21 module 1	E211_05
I/O-Station 22 module 2	E222_12
I/O-Station 21 module 6	A216_1
Panto-2 EP Valve	130/2

Troubleshooting:

- Try to lower front pantograph by ZPT (129/1 or 129/2) and check whether the pantograph is lowered or not.
- If it is lowered then Check operation of pressure switch 130.4/2 refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace pressure switch.
- if it is not lowered check the operation of Panto 1 EP Valve 130/2 and check associated wiring module A216_1 refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace EP Valve.
- Check auxiliary air supply for pantograph.

Reaction:

- Fault code triggered.
- VCB disabled.
- All pantographs of vehicle lowered.
- Lifting pantographs inhibited.

Related messages:

-

Fault Text:**Wrong Panto selected**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- one Panto is up.

Criteria:

- The pantograph selection switch is not in AUTO position.
- If the current pantograph is selected due to damage to the other pantograph, the driver must observe the operational speed limits.

Components concerned:

Component	Device name
Pantograph	1/1 & 1/2

Troubleshooting:

- IF both pantographs are in order: place the pantograph selection switch in the AUTO position.
- Operational rules and restrictions must be considered.

Reaction:

-

Related messages:

0010

Fault Text:

Panto configuration changed.

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- Locomotive working in Multiple Unit

Criteria:

- Change of pantograph position either in Master Loco or Slave Loco

Components concerned:

Component	Device name
Pantograph	1/1 & 1/2

Troubleshooting:

- Command the pantograph down and up again.

Reaction:

-

Related messages:

0011

Fault test:**Panto 1: Sudden pressure loss**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- CB I/O station signals (127.9) is on.
- Pantograph not cut out by cock.
- Panto 1 Pressure should not be ok.

Criteria:

- Panto-1 lowered without command automatically as Pressure switch is not ok.

Components concerned:

Component	Device Name
Front Pantograph	1/1
Pressure Switch	130.4/1
I/O-Station 22 module 2	E222_00
I/O-Station 22 module 5	A225_1
Panto-1 EP Valve	130/1

Troubleshooting:

- Check auxiliary air supply for pantograph.
- Check operation of pressure switch 130.4/1 Refer drawing [WAG9_6K] 05A, Sheet-1. If necessary, replace pressure switch.
- Check the operation of Panto 1 EP Valve 130/1 and check associated wiring module A225_1 refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace EP Valve.

Reaction:

- Fault code triggered.
- VCB disabled.
- All pantographs of vehicle lowered.
- Lifting pantographs inhibited.

Related messages:

-

Fault test:**Panto 2: Sudden pressure loss**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- CB I/O station signals (127.9) is on.
- Pantograph not cut out by cock.
- Panto 2 Pressure should not be ok.

Criteria:

- Panto-2 lowered without command automatically as Pressure switch is not ok.

Components concerned:

Component	Device Name
Front Pantograph	1/1
Pressure Switch	130.4/2
I/O-Station 21 module 1	E211_05
I/O-Station 22 module 5	A216_1
Panto-2 EP Valve	130/2

Troubleshooting:

- Check auxiliary air supply for pantograph.
- Check operation of pressure switch 130.4/2 Refer drawing (WAG9_6K) 05A Sheet-1. If necessary, replace pressure switch.
- Check the operation of Panto 2 EP Valve 130/2 and check associated wiring module A216_1 refer drawing [WAG9_6k] 05A Sheet-1. If necessary, replace EP Valve.

Reaction:

- Fault code triggered.
- VCB disabled.
- All pantographs of vehicle lowered.
- Lifting pantographs inhibited.

Related messages:

-

5.4.36 CCU Fault Code 280Fault Text:**VCB: Switch-on acknowledgement fault**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- VCB is ON
- Any of the TCU is ON and communicating with CCU.
- Locomotive in Traction enabled/ traction disabled/ Traction mode/Braking mode /coasting.
- Locomotive running/ standstill.
- Multi traction enabled/ disabled.
- Both TCUs are Enabled/ Single TCU is Enabled.

Criteria:

- The fault gets triggered and VCB gets off.
- The fault gets triggers, when CCU commands VCB_ON, but fails to receive the feedback from VCB.
- DI channel E111_04 or E112_09 are redundant channels

Components concerned:

Component	Device name
IO station 11 Module 1 & 2	E111 & E112
VCB	5

Troubleshooting:

- Check the VCB's NO and NC contacts properly and ensure the intactness. If possible, check the operational condition of auxiliary contact by operating it in Lab.
- Check the wiring from VCB's "NO" Auxiliary contacts to DI channel E111_04 or E112_09, VCU. Refer drawing [WAG9_6k] Ref.No 05C, Page 03.
- Check the wiring from VCB's "NC" Auxiliary contacts to TCUs -K78 contactor and TCU internal wiring from TCUs -K78 NO contact to PWR_4QC modules. (Refer drawing [WAG9_6k] 05C, Sheet 03 & [WAG9-6K-TCU] Page 35).
- Check for 110V supply shorting that could have triggered coil of -K78 contactor.

- Check Digital Input channel (E111_04 and E122_09) (If both are problematic, as these are redundant).
- VCB's "NO" Auxiliary contacts and it's wiring from VCB connector to DI channel E111_04 and E112_09, Refer drawing [WAG9_6k] Ref.No 05C, Page 03.
- VCB's "NC" Auxiliary contacts and it's wiring from VCB connector to TCU1 and TCU2 Refer drawing [WAG9_6k] 05C, Sheet 03 & [WAG9-6K-TCU] Page 35).
- Error in Digital Input channel E111_04 and E112_09, If both are problematic, as these are redundant.
- If still problem persists, check the downloads from TCU for further troubleshooting.

Reaction:

- VCB Inhibit

Related messages:

0282

Fault Text:**VCB: Switch-off acknowledgement fault**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB.

Condition:

- VCB is OFF
- Any of the TCU is ON and communicating with CCU.
- Locomotive running/ standstill.
- Multi traction enabled/ disabled.
- Both TCUs are Enabled/ Single TCU is Enabled.

Criteria:

- The fault gets triggered when CCU receiving VCB_ON feedback from TCU even though CCU command is OFF.
- Malfunction of VCB_NC auxiliary contact.
- Wiring defective from VCB_NC auxiliary contact to contactor -K78 in TCUs.
- Wiring defect from NO auxiliary contact of -K78 to ICU_4QC.

Components concerned:

Component	Device name
VCB	5

Troubleshooting:

- Check the VCB's NC contacts properly and ensure the intactness. If possible, check the operational condition of auxiliary contact by operating it in Lab.
- Check the wiring from VCB's "NC" Auxiliary contacts to TCUs -K78 contactor and TCU internal wiring from TCUs -K78 NO contact to PWR_4QC modules.
- Check for availability of 110V DC supply at common point of VCB's_NC contact. (From XK48A_pin 28 to pin no. 9 of VCB for TCU1 and XK57_A pin 28 to no. 23 of VCB for TCU2)

Reaction:

- VCB Inhabit.

Related messages:

-

Fault Text:**VCB: loss of ON feedback**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB.

Condition:

- VCB is ON
- Any of the TCU is ON and communicating with CCU.
- Locomotive in Traction enabled/ traction disabled/ Traction mode/Braking mode /coasting.
- Locomotive running/ standstill.
- Multi traction enabled/ disabled.
- Both TCUs are Enabled/ Single TCU is Enabled.

Criteria:

- The fault gets triggered and VCB gets off.
- This is associate fault of Fault code 280; the fault code triggers between transition from VCB_ON to VCB_OFF due to loss of ON (through VCU DI feedback) or OFF (through TCU) feedback for more than 700ms (0.7s).
- Digital input channels E111_04 or E112_09 are redundant channels

Components concerned:

Component	Device name
IO station 11 Module 1 & 2 VCB	E111 & E112 5

Troubleshooting:

- Check the wiring from VCB's "NO" Auxiliary contacts to DI channel E111_04 and E112_09, VCU. Refer drawing [WAG9_6k] Ref.No 05C, Page 03.
- Check the wiring from VCB's "NC" Auxiliary contacts to TCUs -K78 contactor and TCU internal wiring from TCUs -K78 NO contact to PWR_4QC modules. (Refer drawing [WAG9_6k] 05C, Sheet 03 & [WAG9-6K-TCU] Page 35).
- Check for 110V supply shorting that could have triggered coil of -K78 contactor.
- Check Digital Input channel (E111_04 and E122_09) (If both are problematic, as these are redundant).

- VCB's "NO" Auxiliary contacts and it's wiring from VCB connector to DI channel E111_04 and E112_09, Refer drawing [WAG9_6k] Ref.No 05C, Page 03.
- VCB's "NC" Auxiliary contacts and it's wiring from VCB connector to TCU1 and TCU2 Refer drawing [WAG9_6k] 05C, Sheet 03 & [WAG9-6K-TCU] Page 35).
- Error in Digital Input channel E111_04 and E112_09, If both are problematic, as these are redundant.
- If still problem persists, check the downloads from TCU for further troubleshooting.

Reaction:

-VCB Inhabit.

Related messages:

0281

Fault Text:

VCB: Current detected with open VCB

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- CB VCB (127.12) is on.
- CB I/O station signals (127.9) is on.
- MVB communication with I/Os 11/12 is ok.
- VCB I current fault is not disabled and BRAM is not reset.

Criteria:

CCU detects status VCB off, while at least one TCU detects a line current > 50A.

Components concerned:

Component	Device name
VCB	5
Line Current Transducers	6.2/1,6.2/2
I/O station 11	A116
I/O-Station 12	A126
ICU 4QC	A100-C159 (AIN12)

Troubleshooting:

- Use sibas monitor to check the following signals CCU
Sig1: \$260068 TCU1_ACPrimaryCurrent
Sig2: \$260368 TCU2_ACPrimaryCurrent
- Check the wiring from VCB to associated inputs A116_3/A126_3 refer drawing [WAG9-6K] 05B sheet 2.
- Check the wiring of current sensor-1(6.2/1), from 6.2A/1 to 415.AA/1 refer drawing [WAG9-6K], 12B sheet 2.
- Check the wiring of current sensor-1, from 415.AA/1 to A100-C159(AIN12) of ICU 4QC Refer drawing [WAG9-6K-TCU] sheet A5E42173718B
- Check the wiring of current sensor-2(6.2/2), from 6.2A/2 to 415.AA/2 refer drawing [WAG9-6K], 12F sheet 6.
- Check the wiring of current sensor-2, from 415.AA/2 to A100-C159(AIN12) of ICU 4QC Refer drawing [WAG9-6K-TCU], sheet A5E42173718B
- Replace the line current transducer 6.2/1 & 6.2/2 or Contact Siemens maintenance personnel and replace AIN12 (A100-C159) in ICU 4QC.

Reaction:

- VCB switched off
- Pantograph lowered.
- Fault code triggered.

Related messages:

-

Fault Text:**VCB: TCU requested help from CCU to open the VCB**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

-

Criteria:

- CCU received open the VCB request from TCU

Components concerned:

Component	Device name
VCB	5
ICU-4QC	A100-C159
ICU PWMI A	A100-C139
ICU PWMI B	A100-C119

Troubleshooting:

- TCU called CCU for help to open VCB. For further Troubleshooting readout Diagnostic memory of concern TCU.
- Check the TCC cards (A100-C159, A100-C139, A100-C119), refer schematic [WAG9-6K-TCU] sheet 22
- Contact Siemens maintenance personnel and replace concern TCC cards.

Reaction:

- VCB switched off
- Fault code triggered

Related messages:

-

5.4.41 CCU Fault Code 320

Fault Text:

HEP: HEP_CB1_Tripped.

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAP7HH

Subsystem:

HEP

Condition:

Criteria:

-

Components concerned:

Component	Device name

Troubleshooting:

-

Reaction:

-.

Related messages:

570

Fault Text:

HEP: HEP_CB2_Tripped.

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAP7HH

Subsystem:

HEP

Condition:

.

Criteria:

-

Components concerned:

Component	Device name

Troubleshooting:

-

Reaction:

-

Related messages:

2714

Fault Text:

HEP: ZCT Feeder1 Earth fault

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAP7HH

Subsystem:

HEP

Condition:

.

Criteria:

-

Components concerned:

Component	Device name

Troubleshooting:

-

Reaction:

-

Related messages:

-

Fault Text:

HEP: ZCT Feeder2 Earth fault

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAP7HH

Subsystem:

HEP

Condition:

.

Criteria:

-

Components concerned:

Component	Device name

Troubleshooting:

-

Reaction:

-

Related messages:

-

Fault Text:

HEP:Sine filter Cap1 fault

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAP7HH

Subsystem:

HEP

Condition:

.

Criteria:

-

Components concerned:

Component	Device name

Troubleshooting:

-

Reaction:

-

Related messages:

-

Fault Text:

HEP:Sine filter Cap2 fault

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAP7HH

Subsystem:

HEP

Condition:

.

Criteria:

-

Components concerned:

Component	Device name

Troubleshooting:

-

Reaction:

-

Related messages:

-

Fault Text:

HEP Converter 1 Faulty.

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAP7HH

Subsystem:

HEP

Condition:

.

Criteria:

-

Components concerned:

Component	Device name

Troubleshooting:

-

Reaction:

-

Related messages:

-

Fault Text:

HEP Converter 2 Faulty.

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAP7HH

Subsystem:

HEP

Condition:

.

Criteria:

-

Components concerned:

Component	Device name

Troubleshooting:

-

Reaction:

-

Related messages:

-

Fault Text:**HEP:VCB Inhibit-Overcurrent detected HLC**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAP7HH

Subsystem:

HEP

Condition:

- Communication to TCU1 and TCU2 ok.

Criteria:

- Over current (750 A) detected from TCU1/TCU2

Components concerned:

Component	Device name

Troubleshooting:

- Check the TCU log for related fault.
- Check the connections and load connected to HEP transformer circuit.

Reaction:

-

Related messages:

-

Fault Text:**Water Closet occupied, Traction inhibit.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- Water Closet Occupied

Criteria:

- Water closet door closed feedback to E123_15
- Locomotive Direction applied (Reverse or Forward)

Components concerned:

Component	Device name
IO station 12 Module 3	E123

Troubleshooting:

- Check water closet door feedback at E123_15.
- Check water closed wiring.

Reaction:

- Traction Blocked.

Related messages:

0550

Fault test:**VCB off: Catenary overvoltage**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Communication with TCU is ok.

Criteria:

- AC line voltage detected by TCU is greater than 31KV
- Catenary voltage is not more than 33kV.

Components concerned:

Component	Device Name
VCB	5
TCU1	415/1
TCU2	415/2
PT Module	224.1/1, 224.1/2
ICU 4QC	A100-C159

Troubleshooting:

- Check PT module 224.1/1 and 224.1/2 Refer drawing [WAG9_6k] 12A Sheet-1. If required replace the PT module.
- Check the wiring from x13 to AIN 10-11 of ICU 4QC A100-C159, refer the drawing [WAG9_6K_TCU] sheet 18.
- Check for OHE if there are any issues on the field.

Reaction:

- VCB switched off
- Fault code triggered

Related messages:

-

Fault test:**VCB locked: Catenary thermal protection.**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- VCB is ON.
- MVB communication with IO station 11 & 12 is ok.

Criteria:

- AC line voltage detected by TCU is greater than 29KV

Components concerned:

Component	Device Name
VCB	5
TCU1	415/1
TCU2	415/2
PT Module	224.1/1, 224.1/2
ICU 4QC	A100-C159

Troubleshooting:

- Check PT module 224.1/1 and 224.1/2 Refer drawing [WAG9_6k] 12A Sheet-1. If required replace the PT module.
- Check the wiring from x13 to AIN 10-11 of ICU 4QC A100-C159, refer the drawing [WAG9_6K_TCC] sheet 18.
- Check for OHE if there are any issues on the field.

Reaction:

- VCB is opened.
- VCB is locked for.
- Fault code triggered.

Related messages:

-

Fault test:**VCB off: Catenary undervoltage**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Atleast one panto is raised.
- VCB is ON.
- Communication with TCU is ok.
- Minimum catenary voltage (0.5KV) should be detected.

Criteria:

- AC line voltage detected by TCU is less than 16KV

Components concerned:

Component	Device Name
VCB	5
TCU1	415/1
TCU2	415/2
PT Module	224.1/1, 224.1/2
ICU 4QC	A100-C159

Troubleshooting:

- Check PT module 224.1/1 and 224.1/2 Refer drawing [WAG9_6k] 12A Sheet-1. If required replace the PT module.
- Check the wiring from x13 to AIN 10-11 of ICU 4QC A100-C159, refer the drawing [WAG9_6K_TCU] sheet 18.
- Check for OHE if there are any issues on the field.

Reaction:

- VCB is switched off.
- Fault code triggered.

Related messages:

-

Fault test:**VCB off: Line voltage 5th harmonic too high**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Atleast one panto is raised.
- VCB is ON.
- Communication with TCU is ok.

Criteria:

- Ac line harmonic voltage detected by TCU is greater than 9.2kV for more than 60 sec.

Components concerned:

Component	Device Name
VCB	5
TCU1	415/1
TCU2	415/2
PT Module	224.1/1, 224.1/2
Harmonic Filter resistor	8.3
Harmonic Filter capacitor	8.4

Troubleshooting:

- Check the faults if any logged related to AC line voltage in TCU.
- Check PT module 224.1/1 and 224.1/2 Refer drawing [WAG9_6k] 12A Sheet-1. If required replace the PT module.
- Check the associated wiring to harmonic filter 8.3 & 8.4, Refer drawing [WAG9-6K] 1A sheet 8. If necessary replace the harmonic filter or contact Siemens engineer.

Reaction:

- VCB is opened.
- Fault code triggered.

Related messages:

-

Fault test:**VCB off: Voltage instantaneous value too high**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Atleast one panto is raised.
- VCB is ON.
- Communication with TCU is ok.
- Minimum catenary voltage (0.5KV) should be detected.

Criteria:

- Ac line harmonic voltage detected by TCU is greater than 9.2kV.

Components concerned:

Component	Device Name
VCB	5
TCU1	415/1
TCU2	415/2
PT Module	224.1/1, 224.1/2
ICU 4QC	A100-C159

Troubleshooting:

- Check PT module 224.1/1 and 224.1/2 Refer drawing [WAG9_6k] 12A, Sheet-1. If required replace the PT module.
- Check the faults if any logged related to AC line voltage in TCU.
- Check the wiring from x13 to AIN 10-11 of ICU 4QC A100-C159, refer the drawing [WAG9_6K_TCU] sheet 18.

Reaction:

- VCB is switched off.
- Fault code triggered.

Related messages:

-

Fault Text:**TCU1-> No catenary voltage detected**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

VCB

Condition:

- TCU1 is available
- Minimum one panto is raised
- Either TCU1 or TCU2 catenary voltage is available
- No phase break section
- CCU is master
- Valid AC line voltage

Criteria:

- TCU1 catenary voltage is < 0.5kV

Components concerned:

Component	Device name
PT Module	224.1/1
ICU 4QC	A100-C159

Troubleshooting:

- Check the wiring between 224.1/1 to XK42B in TCC1, Refer drawing [WAG9_6k] sheet 12A.
- Check the wiring between XK42B in TCC1 to ICU 4QC, Refer drawing [WAG9-6K-TCU] sheet 18.
- Check the MVB communication status between TCC1 & CCU.

Reaction:

- VCB inhibit
- Fault code triggered

Related messages:

-

Fault Text:-**Variance between TCU 1 and TCU 2: Catenary voltage detection.**Priority Type:-

3(1=A , 2=B, 3=C, 0=Info)

Applicable Variants:-

WAG9H / WAP7H / WAP5H / WAP7HH

Subsystem:-

Traction

Condition:

-Communication with at least one TCU is OK.

Criteria:-

- Maximum difference between AC line voltage detected by TCU1 and TCU2 is greater than 1 kV

Components concerned:-

Component	Device name
PT Module	224.1/1, 224.1/2
ICU 4QC1 & 2	A100-C159

Troubleshooting:-

- Check trafo primary voltage T3 connection (WAG9-6K-TCU sheet no.18)
- Check the wiring between 224.1/1 to XK42B in TCC1, Refer drawing [WAG9_6k] sheet 12A.
- Check the wiring between XK42B in TCC1 to ICU 4QC, Refer drawing [WAG9-6K-TCU] sheet 18.
- Check the wiring between 224.1/1 to XK42B in TCC2, Refer drawing [WAG9_6k] sheet 12A.
- Check the wiring between XK42B in TCC2 to ICU 4QC, Refer drawing [WAG9-6K-TCU] sheet 18.

Reaction:-

- Fault code triggered.

Related message:-

-

Fault Text:**Variance between TCU 1 and TCU 2: Catenary frequency detection.**Priority Type:

3(1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAP7HH

Subsystem:

Traction

Condition:

-Communication with at least one TCU is OK.

Criteria:

-Maximum difference between AC frequency detected by TCU1 and TCU2 is greater than 5 Hz

Components concerned:-

Component	Device name
PT Module	224.1/1, 224.1/2
ICU 4QC1 & 2	A100-C159

Troubleshooting:-

- Check trafo primary voltage T3 connection (WAG9-6K-TCU sheet no.18)
- Check the wiring between 224.1/1 to XK42B in TCC1, Refer drawing [WAG9_6k] sheet 12A.
- Check the wiring between XK42B in TCC1 to ICU 4QC, Refer drawing [WAG9-6K-TCU] sheet 18.
- Check the wiring between 224.1/1 to XK42B in TCC2, Refer drawing [WAG9_6k] sheet 12A.
- Check the wiring between XK42B in TCC2 to ICU 4QC, Refer drawing [WAG9-6K-TCU] sheet 18.

Reaction:

- Fault code triggered.

Related message:

-

Fault Text:**No catenary voltage detected.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- TCU-2 Communication OK.
- Panto raised

Criteria:

- No catenary voltage detected after 15 sec of any one panto raise.
- No feedback to T3 [Intermediate vtg transducer] Voltage transducer of TCU-2.
- Analog Input Card [-A100] C159 not reading catenary voltage.

Components concerned:

Component	Device name
Voltage Transducer TCC2	T3
ICU 4QC	-A100-C159

Troubleshooting:

- Check wiring of T3 [Intermediate vtg transducer] Voltage transducer of TCU-2, Refer drawing [WAG9-6K-TCU] sheet 18. Replace if faulty.
- Replace ICU 4QC card -C159, Refer drawing [WAG9-6K-TCU] sheet 18.

Reaction:

- VCB Inhabited

Related messages:

2802

Fault Text:**VCB locked: Current monitoring triggered twice**Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Communication to TCU1 and TCU2 ok.

Criteria:

- Input current has exceeded the maximum value twice which could be dangerous and may lead to another faults and damage of any components hence VCB is locked, and this message will be triggered.

Components concerned:

Component	Device name
Voltage Transducer TCC2	T3
ICU 4QC	-A100-C159

Troubleshooting:

- Check for any abnormalities.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered and VCB locked.
- Pantograph locked.

Related messages:

-

Fault Text:**VCB off: Catenary overcurrent**Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Current monitoring not disabled.
- Communication with IO Module E123_07 is ok.
- Communication with at least one TCU is ok.

Criteria:

- AC overcurrent is detected in either TCU1 or TCU2.
- High primary current is detected by Maximum current relay (78).
- AC line current detected by any TCU is greater than below limit.

Loco Variant	Current Limit
WAG9/WAG9H	308A
WAP7	367A
WAP5	278A
WAG9H	395A
WAP 7HH	450A

Components concerned:

Component	Device name
IO station 12	E123
Maximum Current Relay	78
Primary Current Sensor	6.2/1, 6.2/2
ICU 4QC	-A100

Troubleshooting:

- Check any short circuits.
- Check Primary current Sensors(6.2/1) and its wiring from sensor(6.2/1) to 415.AA/1; Refer drawing [WAG9_9K] or [WAG9_6K] 12B sheet no 2.
- Check Primary current Sensors(6.2/2) and its wiring from sensor(6.2/2) to 415.AA/2; Refer drawing [WAG9_9K] or [WAG9_6K] 12F sheet no 6.
- Check the wiring between +C159 of ICU 4QC -A100 and 415.AA/1 for TCC1 and 415.AA/2 for TCC2; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 18.
- Check Maximum Current Relay(78).
- Check the wiring between IO Station 12 E123_07, Maximum Current relay(78) and MCB 218; Refer drawing [WAG9_9K] or [WAG9_6K] 05C sheet no 3.

- Replace Maximum Current Relay(78).
- Replace Traction T/F Primary Current Sensor-1(6.2/1) or Traction T/F Primary Current Sensor-2 (6.2/2) based on problem if necessary.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered and VCB off.

Related messages:

-

Fault Text:**Variance between TCU 1 and TCU 2: Catenary current detection CB off**Priority Type:

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Communication with TCU is ok.

Criteria:

- Maximum difference between AC line current detected by TCU1 and TCU2 is greater than 40A.

Components concerned:

Component	Device name
Traction T/F Primary Current Sensor-1	6.2/1
Traction T/F Primary Current Sensor-2	6.2/2
ICU 4QC	-A100

Troubleshooting:

- Check Traction T/F Primary Current Sensor-1(6.2/1) and Traction T/F Primary Current Sensor-2 (6.2/2).
- Check the wiring between Sensor(6.2/1) and 415.AA/1; Refer drawing [WAG9_9K] or [WAG9_6K] 12B sheet no 2.
- Check the wiring between Sensor(6.2/1) and 415.AA/1; Refer drawing [WAG9_9K] or [WAG9_6K] 12F sheet no 6.
- Check the wiring between +C159 of ICU 4QC -A100 and 415.AA/1 for TCC1 and 415.AA/2 for TCC2; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 18.
- Replace Traction T/F Primary Current Sensor-1(6.2/1) or Traction T/F Primary Current Sensor-2 (6.2/2) based on problem if necessary.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

-

Fault Text:**VCB off: Inrush current exceeding limit**Priority Type:

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Communication with TCU is ok.
- VCB Closed.
- Current monitoring not disabled.

Criteria:

- Transformer no load inrush current is too high after VCB ON.

Components concerned:

Component	Device name
Transformer	7
Traction T/F Primary Current Sensor-1	6.2/1
Traction T/F Primary Current Sensor-2	6.2/2
ICU 4QC	-A100

Troubleshooting:

- Check for any short circuits in Main transformer.
- Check Traction T/F Primary Current Sensor-1(6.2/1) and Traction T/F Primary Current Sensor-2 (6.2/2).
- Check the wiring between Sensor(6.2/1) and 415.AA/1; Refer drawing [WAG9_9K] or [WAG9_6K] 12B sheet no 2.
- Check the wiring between Sensor(6.2/1) and 415.AA/2; Refer drawing [WAG9_9K] or [WAG9_6K] 12F sheet no 6.
- Check the wiring between +C159 of ICU 4QC -A100 and 415.AA/1 for TCC1 and 415.AA/2 for TCC2; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 18.
- Replace Traction T/F Primary Current Sensor-1(6.2/1) or Traction T/F Primary Current Sensor-2 (6.2/2) based on problem if necessary.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.
- VCB off and Pantograph lock.

Related messages:

-

Fault Text:**VCB loop test: conditions missing**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

-

Criteria:

- TCU pin test is already in progress.
- VCB test not released due to missing conditions which are
 - At least one TCU communication Ok
 - IO station 11 OR 12 are ok.
 - VCB CB 127.12 is not tripped.
 - VCB is OFF

Components concerned:

Component	Device name
VCB	127.12

Troubleshooting:

- Check the following conditions for the VCB loop test:
- Cab activated, BL key in D position.
- Pantograph lowered
- VCB opened
- Reverser in center
- Throttle in idle
- Loco speed is zero

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**VCB loop test: conditions missing.**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- Communication with master CCU is ok.
- Communication with IO station 11 and 12 is ok.

Criteria:

- The VCB loop TCU1 4QC is not released.
- The VCB loop TCU1 one of the PWR module is not released.
- The VCB loop TCU2 4QC is not released.
- The VCB loop TCU2 one of the PWR module is not released.
- EXT_IO pin 11 open error
- EXT_IO pin 12 open error

Components concerned:

Component	Device name
VCB	127.12

Troubleshooting:

- Check IO station CB is ON and communication is OK
- Check LED status of Input module pins E111_15 and E123_00.
- If feedback available check wiring of VCB loop from 78.D- TCC1-TCC2-E111_15 and E123_00 (see circ. Diagram 05B) and start VCB loop test again.
- If fault still exists change following modules and check if fault triggered again.

Exchange TCU1 4QC ICU.

Exchange TCU1 PWI-C ICU.

Exchange TCU2 4QC ICU.

Exchange TCU2 PWI-C ICU.

Reaction:

- Fault code triggered.
- VCB inhibited.

Related messages:

-

Fault Text:**VCB loop: TCU 1 is switched off but VCB loop is opened**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Communication with master CCU is ok.
- CB 127.12 is ON.
- One cab occupied.
- Emergency stop is not activated.
- Communication with IO E123_07 is ok.
- Communication with TCU is ok.

Criteria:

- TCU1 not available.
- Feedback loop Voltage before and after TCU1 is not equal.

Components concerned:

Component	Device name
VCB CB	127.12
TCU1	415/1
IO station 12	E123

Troubleshooting:

- _Check if cab is occupied
- Check TCU1 is ON and communication is OK
- Check IO E123_07

Reaction:

- Fault code triggered.

Related messages:

-

Fault Text:**VCB loop: TCU 1 is switched off but VCB loop is opened**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Communication with master CCU is ok.
- One cab occupied.
- Emergency stop is not activated.
- Communication with either TCU 1 or TCU 2 is ok
- CB I/O station signals (127.9/2) is on
- MVB communication with I/O 12 is ok

Criteria:

- CB 127.12 is off
- Primary AC current is high.

Components concerned:

Component	Device name
VCB CB	127.12
IO station 12	E123

Troubleshooting:

- Close circuit breaker 127.12 . Still message not gone check AUX contacts of 127.12
- If CB trips again isolate connections to 127.12 Check circuits connected to CB contacts for short circuits (see circ. Diagram 04C.03 05A_04,05C.1,05H.2).

Reaction:

- Fault code triggered
- MCB off
- All pantographs of vehicle lowered
- Lifting pantographs inhibited

Related messages:

-

Fault Text:**CB 127.12 is tripped.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Communication with master CCU is ok.
- CB 127.12 is ON.
- One cab occupied.
- Emergency stop is not activated.
- Communication with IO E123_07 is ok.
- Communication with TCU is ok.

Criteria:

- TCU1 not available.
- Feedback loop Voltage before and after TCU1 is not equal.

Components concerned:

Component	Device name
VCB CB	127.12
TCU1	415/1
IO station 12	E123

Troubleshooting:

- Check if cab is occupied
- Check TCU1 is ON and communication is OK
- Check IO E123_07

Reaction:

- Fault code triggered.

Related messages:

-

5.4.69 CCU Fault Code 424

Fault Text:

VCB Loop not Released by TCU1

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPOWER

Condition:

- Communication with master CCU is ok.
- Communication with IO station 11 and 12 is ok.
- TCC Is not isolated.

Criteria:

- BL key in drive position.
- VCB loop is not cleared by 4QC & PWR-A & PWR-B

Components concerned:

Component	Device name
TCC1	415/1

Troubleshooting:

- Reset CB 127.11/1 & Check the status of fault.
- Check the diag data of TC1 for further action.
- Run the VCB loop test.
- Refer drawing [WAG9-6K-TCU] Page No-22 & [WAG9-6K] Ref No-09C

Reaction:

- Fault code triggered.

Related messages:

-

5.4.70 CCU Fault Code 425

Fault Text:

VCB loop not released by TCU-2

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPOWER

Condition:

- Communication with master CCU is ok.
- Communication with IO station 11 and 12 is ok.
- TCC Is not isolated.

Criteria:

- BL key in drive position.
- VCB loop is not cleared by 4QC & PWR-A & PWR-B

Components concerned:

Component	Device name
TCC2	415/2

Troubleshooting:

- Reset CB 127.11/2 & check the status of fault.
- Run the VCB loop test.
- Check the diag data of TC2 for further action.
- Refer drawing [WAG9-6K-TCU] Page No-22 & [WAG9-6K] Ref No-09C

Reaction:

- Fault code triggered.

Related messages:

-

5.4.71 CCU Fault Code 426

Fault Text:

VCB: Feedback not Valid

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPOWER

Condition:

- Communication with master CCU is ok.
- Communication with IO station 11 and 12 is ok.
- VCB feedback not valid from CCU & TCU

Criteria:

- BL key in drive position.
- Feedback validity from CCU & TCU

Components concerned:

Component	Device name
IO Station	E116/E126
TCU	415/1, 415/2

Troubleshooting:

- Reset CB's 127.11/1 & 127.11/2 of TCC from SB Panel & check the status of fault.
- Perform the VCU reset & Check the status of fault.
- Check the Respective IO Cards for any abnormality.
- Refer drawing [WAG9-6K] Ref No-05C
- Check the logs of CCU & TCU for further action.

Reaction:

- Fault code triggered

Related messages:

-

5.4.72 CCU Fault Code 427

Fault Text:

VCB loop: VCB Loop open after TCU-2

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPOWER

Condition:

- Communication with master CCU is ok.
- Communication with IO station 11 and 12 is ok.
- VCB Loop Opened by TCU1 & Feedback missing of VCB.

Criteria:

- BL key in drive position.
- No feedback from safety relay.

Components concerned:

Component	Device name
Safety relay control electronics	126.6

Troubleshooting:

Reset CB's 127.11/1 & 127.11/2 of TCC from SB Panel & check the status of fault.
Check the event log of CCU & TCU for further action.

Reaction:

- Fault code triggered

Related messages:

-

5.4.73 CCU Fault Code 428

Fault Text:

VCB: Temporary loss of VCB feedback

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPOWER

Condition:

Communication between CCU and I/O station 11 and 12 is ok.

Criteria:

- BL key in drive position.
- No feedback from safety relay.

Components concerned:

Component	Device name
Safety relay control electronics	126.6

Troubleshooting:

- Check the status of VCB in normal condition by CCU and TCU
- Check for any loose connections in K78 relay in TCC and IO E111_04 and E122_09
- Check the diagnostic log of CCU and TCU for further action.

-
-
-
-

Reaction:

- Fault code triggered

Related messages:

-

5.4.74 CCU Fault Code 430

Fault Text:

Safety Relay Control Electronics On 126.6 Failed.

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication between CCU and I/O station 11 and 12 is ok.

Criteria:

- BL key in drive position.
- No feedback from safety relay.

Components concerned:

Component	Device name
Safety relay control electronics	126.6

Troubleshooting:

- Check/repair wiring to Safety relay 126.6, E111_06 and E122_11:
125/1.2 to 126.6.A1
125/2.2 to 126.6.A1
125/1.1 to 126.7/1.2
125/2.1 to 126.7/1.2
126.6.87 to 127.9/1
126.6.88 to E111_06 & E122_11 (411.LA/11)
- If message still not gone Check relay 126.6
If necessary replace it by a trouble-free spare part.
- Message still not gone Check digital input module E111 and E122
If necessary replace modules by a trouble-free spare part.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:

MCE_ON Triggered

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

- Power of control unit is switched on.

Components concerned:

Component	Device name
CCU	A100-C003

Troubleshooting:

- This event is only for information.

Reaction:

-

Related messages:

-

Fault Text:**MCE_OFF Triggered**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

- Safe off ok from TCUs and Loco in standstill

Criteria:

- Self hold mode active for 10 mins (BL-key "off" and WTB-M "off").
- Low Battery Voltage (< 82 VDC) for 10 mins.
- BL-Key in "D" and Pantos lowered for 10 mins.
- Cooling mode selected by driver.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- This event is only for information.

Reaction:

- Control electronics switches off after 1min after this message.

Related messages:

3900

Fault Text:**TC1 or TC2 Pre_charge or DC Link Cont. not ready. Please recycle CB.**Priority Type

3 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU-1 & 2 Communication OK.

Criteria:

- Not in SIMULATION mode.
- Line Disconnecter in open condition.
- Pre charging contactor in open condition.
- Stop Simulation mode if loco in simulation mode.

Components concerned:

Component	Device name
Pre-Charging contactor	-K4/1 , -K4/2
DC Link Contactor	Q1.1, Q1.2

Troubleshooting:

- Pre-Charging contactor not ready for operation K4/2. Refer drawing [WAG9_6k] sheet 24B Page 02.
 - a) Stuck off: Fault message with traction interlock, one re-start attempt shall be allowed, this is taken care by VCU. Refer Drawing [WAG9-6K-TCU] sheet 34.
 - b) Stuck on: VCB off, shut-down, Fault message, traction interlock. Refer Drawing [WAG9-6K-TCU] sheet 34.
- DC Link Contactor not ready for Operation Q1/2. Refer drawing [WAG9_6k] sheet 24B Page 02.
 - a) Stuck off: Fault message, with protective shutdown; One renewed restart attempt allowed. Isolate defective converter. Refer Drawing [WAG9-6K-TCU] sheet 23.
 - b) Stuck on: Fault message with trip VCB, shutdown, Isolation of the subsystem main power. Refer Drawing [WAG9-6K-TCU] sheet 23.

Reaction:
VCB / Traction Interlock

Related messages:
-

Status: released TRIPATH_ASH 26.07.2023
DCC: ADC045 Obj.Desgn. Prod: TS_RGC07

Fault Text:

TE without demand Bogie 1.

Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

Tractive effort above 2kN without demand

Criteria:

- Tractive effort above 2kN without angle transmitter application.
- Incorrect pulses detected from Traction converter1.

Components concerned:

Component	Device name
Traction converter1	415/1
Current sensor TM1	-U3,-U4
Current sensor TM2	-U5,-U6
Current sensor TM3	-U7,-U8

Troubleshooting:

- Check the TCU1 download for any related message.
- Check/replace TM output current sensor, if faulty.

Reaction:

-

Related messages:

-

Fault Text:

TE without demand Bogie 2.

Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

Tractive effort above 2kN without demand

Criteria:

- Tractive effort above 2kN without angle transmitter application.
- Incorrect pulses detected from Traction converter2.

Components concerned:

Component	Device name
Traction converter2	415/2
Current sensor TM4	-U3,-U4
Current sensor TM5	-U5,-U6
Current sensor TM6	-U7,-U8

Troubleshooting:

- Check the TCU2 download for any related message.
- Check/replace TM output current sensor, if faulty.

Reaction:

-

Related messages:

-

Fault Text:**Angle transmitter: mismatch detected.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Cab is active.

Criteria:

- Mismatch between angle transmitter and throttle auxiliary contactor values either Cab.
- Angle transmitter faulty.

Components concerned:

Component	Device name
Angle transmitter	150.1/1

Troubleshooting:

- Check wiring(and change if wiring is not okay) between IO module E112 : CB station11& 127.9/1 & E121 :CB station12 & 127.9/2, E112_00.
- Angle transmitter E111_00, E121_12,E121_02,E121_10,E121_11 to throttle auxiliary contacts.
- If the wiring is ok Check and exchange Angle transmitter (150.1/1) see circ. Diagram 08C).

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**Cab Angle transmitter: Value implausible.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

- Cab 1 is active
 - Angle transmitter cab 1 is valid
 - Cab 2 is active
 - Angle transmitter cab 2 is valid
- Criteria:
- CB I/O station signals (127.9/1) is On.
 - Angle transistor cab 1 is implausible.
 - CB I/O station signals (127.9/3) is On
 - Angle transistor cab 2 is implausible

Components concerned:

Component	Device name
Angle transmitter	150.1/1
Angle transmitter	150.1/2

Troubleshooting:

- Check(change if wiring is not okay) wiring to IO module pin EA112.00.EA213.00 and IO station CB 127.9/1,CB 127.9/3 and to the angle transmitter (see circ. Diagram 08C)
- If the wiring is ok Check and exchange Angle transmitter (150.1/1) and (150.1/2)see circ. Diagram 08C).

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**TCC1 Cutout requested by TCU1 MCU.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU1 Communication OK.

Criteria:

- Failure related to TCU1 triggered in TCU1-MCU.
- TCU1 Power Supply faulty

Components concerned:

Component	Device name
TCU1-MCU	-A100-C051
Power supply	A96

Troubleshooting:

- Check TCU1-MCU failure log for further faults if problem remain for corrective action.
- Check Power MCU Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.29.
- Check DC-DC Converter A96, Refer Drawing [WAG9-6K-TCU] Sheet No.17.
- Replace MCU card C051[A100]

Reaction:

TCU1 Traction not possible.

Related messages:

-

Fault Text:**TCC1 Cutout requested by ICU 4QC.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- TCU1 Communication OK.

Criteria:

- Failure related to 4QC logged in ICU-4QC.
- 4QC Power Supply faulty

Components concerned:

Component	Device name
TCU1-ICU-4QC	-A100-C159
Power supply	A91
4QC1	-A1,-A2

Troubleshooting:

- Check ICU 4QC download for further faults if problem remain for corrective action.
- Check Power 4QC Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.18.
- Check DC-DC Converter A91, Refer Drawing [WAG9-6K-TCU] Sheet No.15.
- Replace ICU 4QC card C159[A100]

Reaction:

- TCU1 Traction not possible.

Related messages:

-

Fault Text:**TCC1 Cutout requested by ICU PWR A.**Priority Type

3 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU1 Communication OK.

Criteria:

- Failure related to PWR-A logged in TCU1-ICU-PWRA.
- PWR-A Power Supply unit.

Components concerned:

Component	Device name
TCU1-ICU-PWRA	-A100-C139
Power supply	- A91
PWR-A	-A3

Troubleshooting:

- Check ICU PWR-A downloads for further faults if problem remain for corrective action.
- Check Power PWR-A Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.19.
- Check DC-DC Converter A92, Refer Drawing [WAG9-6K-TCU] Sheet No.15.
- Replace ICU PWR-A card C139[A100].

Reaction:

- TCU1 Traction not possible.

Related messages:

-

Fault Text:**TCC1 Cutout requested by ICU PWR B.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU1 Communication OK.

Criteria:

- Failure related to PWR-B logged in TCU1-ICU-PWR-B.
- PWR-B Power Supply unit.

Components concerned:

Component	Device name
TCU1-PWR-B	-A100-C119
Power supply	-A93
PWR-B	-A4

Troubleshooting:

- Check PWR ICU-B downloads for further faults if problem remain for corrective action.
- Check Power PWR-B Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.20.
- Check DC-DC Converter A93, Refer Drawing [WAG9-6K-TCU] Sheet No.16.
- Replace PWR ICU-B card C119[A100].

Reaction:

- TCU1 Traction not possible.

Related messages:

-

Fault Text:**TCC1 Cutout requested by ICU PWR C.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU1 Communication OK.

Criteria:

- Failure related to PWR-C logged in TCU1-ICU-PWR-C.
- PWR-C Power Supply unit.

Components concerned:

Component	Device name
TCU1-PWR-C	-A100-099
Power supply	-A94
PWR-C	-A5

Troubleshooting:

- Check PWR ICU-C downloads for further faults if problem remain for corrective action.
- Check Power PWR-C Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.21.
- Check DC-DC Converter A94, Refer Drawing [WAG9-6K-TCU] Sheet No.16.
- Replace PWR ICU-C card C119[A100].

Reaction:

- TCU1 Traction not possible.

Related messages:

-

Fault Text:**TCC1 Cutout requested by ICU AUX1.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- TCU1 Communication OK.

Criteria:

- ICU-AUX-1 card defective in TCU-1.
- ICU-AUX-1 Power Supply unit.

Components concerned:

Component	Device name
TCU1-ICU-AUX1	-A100-079
Power supply	-A97
PWR-AUX1	-A6

Troubleshooting:

- Check ICU-AUX1 downloads for further faults if problem remain for corrective action.
- Check Power ICU-AUX1 Power Supply 24V on X-3, Refer Drawing [WAG9-9K-TCU] Sheet No.14.2.
- Check DC-DC Converter A97, Refer Drawing [WAG9-9K-TCU] Sheet No.16.1.
- Replace ICU-AUX1 card C079[A100].

Reaction:

- TCU1 Traction not possible.

Related messages:

-

Fault Text:**AUX1 inverter Cutout requested by TCU1 MCU.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU1 Communication OK.

Criteria:

AUX1 is cut out by MCU of TCU-1

Components concerned:

Component	Device name
TCU1-MCU	-A100-051
TCU1-ICU-AUX1	-A100-079
PWR-AUX1	-A6

Troubleshooting:

- Check MCU download for further faults if problem remain for corrective action.
- Replace TCU1-MCU card C051[A100]

Reaction:

- AUX1 cutout

Related messages:

-

Fault Text:**AUX1 inverter Cutout requested by ICU AUX.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- TCU1 Communication OK.

Criteria:

- AUX1 cutout by TCU1-ICU-AUX1.
- ICU-AUX1 Power Supply unit.

Components concerned:

Component	Device name
TCU1-ICU-AUX1	-A100-079
PWR-AUX1	-A6
Power Supply	A97

Troubleshooting:

- Check Power ICU-AUX-1 Power Supply 24V on X-3, Refer Drawing [WAG9-9K-TCU] Sheet No.14.2.
- Check DC-DC Converter A94, Refer Drawing [WAG9-9K-TCU] Sheet No.16.1.
- Replace ICU-AUX-1 card C079[A100].
- Check ICU-AUX-1 downloads for further faults if problem remain for corrective action.

Reaction:

- AUX1 cutout

Related messages:

-

Fault Text:**TCC2 Cutout requested by TCU2 MCU.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU2 Communication OK.

Criteria:

- Failure related to TCU2 triggered in TCU2-MCU.
- TCU2 Power Supply faulty

Components concerned:

Component	Device name
TCU2-MCU	-A100-C051
Power supply	A96

Troubleshooting:

- Check TCU2-MCU failure log for further faults if problem remain for corrective action.
- Check Power MCU Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.29.
- Check DC-DC Converter A96, Refer Drawing [WAG9-6K-TCU] Sheet No.17.
- Replace MCU card C051[A100]

Reaction:

TCU2 Traction not possible.

Related messages:

-

Fault Text:**TCC2 Cutout requested by ICU 4QC.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- TCU2 Communication OK.

Criteria:

- Failure related to 4QC logged in TCU2-ICU-4QC.
- 4QC Power Supply faulty

Components concerned:

Component	Device name
TCU2-ICU-4QC	-A100-C159
Power supply	A91
4QC2	-A1,-A2

Troubleshooting:

- Check TCU2 ICU 4QC download for further faults if problem remain for corrective action.
- Check Power 4QC Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.18.
- Check DC-DC Converter A91, Refer Drawing [WAG9-6K-TCU] Sheet No.15.
- Replace ICU 4QC card C159[A100]

Reaction:

- TCU2 Traction not possible.

Related messages:

-

Fault Text:**AGT traction release fault TCU 1**Priority Type:

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Communication with TCU1 ok.
- AGT1 TCU1 & AGT1 TCU2 Traction release.

Criteria:

- Traction locked by any of below when Traction release by AGT TCU1 and AGT TCU2.
 - AGT PWM1 1A
 - AGT PWM1 1B
 - AGT PWM1 1C
 - AGT TCU1
- AGT1 and AGT2 self-test is not active.
- No traction interlock on train and locomotive.
- Actual torque status input from TCU1 should be Zero.
- TE/BE demand is not zero.
- Emergency brake is not applied.
- Emergency stop button is not activated.

Components concerned:

Component	Device name
TCU1	415/1
Inverter PWI 1A	A3-PWMI A/TCC-1
Inverter PWI 1B	A4-PWMI B/TCC-1
Inverter PWI 1C	A5-PWMI C/TCC-1

Troubleshooting:

- Check the faults if any logged related to Control Electronics, Emergency brake and Emergency Switch in CCU data.
- Check the TCU1 diagnostics data for any faults related to PWM Inverter.
- If there is a fault refer troubleshooting for concerned fault.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Concerned PWM Inverter in TCU1 is disabled.
- Fault code triggered.

Related messages:

-

Fault Text:**AGT traction interlock fault TCU 1**Priority Type:

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Communication with TCU1 ok.
- No Traction release for AGT1 TCU1/AGT2 TCU2 and traction not locked for any one of the below.
 - AGT1 PWM1 1A
 - AGT1 PWM1 1B
 - AGT1 PWM1 1C

Criteria:

- Actual torque status input from TCU1 is not 0.
- AGT1 or AGT2 self-test is active.
- TE/BE demand is zero (or between 0kN – 1kN).
- Emergency brake applied.
- Emergency stop button is activated.
- Traction interlock on train or locomotive.
- Emergency stop button activated.

Components concerned:

Component	Device name
TCU1	415/1
Inverter PWI 1A	A3-PWMI A/TCC-1
Inverter PWI 1B	A4-PWMI B/TCC-1
Inverter PWI 1C	A5-PWMI C/TCC-1

Troubleshooting:

- Check the faults if any logged related to Control Electronics, Emergency brake and Emergency Switch in CCU data.
- Check the TCU1 diagnostics data for any faults related to PWM Inverter.
- If there is a fault refer troubleshooting for concerned fault.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- VCB Open.
- Fault code triggered.

Related messages:

0519

Fault Text:**SW version conflict, Traction block**Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Workshop mode not active.

Criteria:

- If there is a software version conflict with set value and actual software version.

Components concerned:

Component	Device name

Troubleshooting:

- Check software version of below, it should be latest one.
 - Display Software
 - CCU software
 - CCU NSDB version
 - LION software
 - TCU software
 - TCN software
 - Aux software
 - Battery charger software
- if problem persists, contact siemens personnel for loading latest software.

Reaction:

- Fault code triggered.
- Traction lock active.

Related messages:

-

Fault Text:**SW version conflict, Traction block override**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Workshop mode active.

Criteria:

- Software version conflict override by workshop mode activation.

Components concerned:

Component	Device name

Troubleshooting:

- Check software version of below, it should be latest one.
 - Display Software
 - CCU software
 - CCU NSDB version
 - LION software
 - TCU software
 - TCN software
 - Aux software
 - Battery charger software
- if problem persists, contact siemens personnel for loading latest software.

Reaction:

- Fault code triggered.
- Software version conflict overridden.

Related messages:

-

Fault Text:**TCC2 Cutout requested by ICU PWR A.**Priority Type

3 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU2 Communication OK.

Criteria:

- Failure related to PWR-A logged in TCU2-ICU-PWRA.
- PWR-A Power Supply unit.

Components concerned:

Component	Device name
TCU2-ICU-4QC	-A100-C139
Power supply	- A91
PWR-A	-A3

Troubleshooting:

- Check TCU2 ICU-PWR-A downloads for further faults if problem remain for corrective action.
- Check Power PWR-A Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.19.
- Check DC-DC Converter A92, Refer Drawing [WAG9-6K-TCU] Sheet No.15.
- Replace ICU PWR-A card C139[A100].

Reaction:

- TCU2 Traction not possible.

Related messages:

-

Fault Text:**TCC2 Cutout requested by ICU PWR B.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU2 Communication OK.

Criteria:

- Failure related to PWR-B logged in TCU2-ICU-PWR-B.
- PWR-B Power Supply unit.

Components concerned:

Component	Device name
TCU1-PWR-B	-A100-C119
Power supply	-A93
PWR-B	-A4

Troubleshooting:

- Check TCU2 ICU-PWR-B downloads for further faults if problem remain for corrective action.
- Check Power PWR-B Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.20.
- Check DC-DC Converter A93, Refer Drawing [WAG9-6K-TCU] Sheet No.16.
- Replace PWR ICU-B card C119[A100].

Reaction:

- TCU2 Traction not possible.

Related messages:

-

Fault Text:**TCC2 Cutout requested by ICU PWR C.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU2 Communication OK.

Criteria:

- Failure related to PWR-C logged in TCU2-ICU-PWR-C.
- PWR-C Power Supply unit.

Components concerned:

Component	Device name
TCU2-PWR-C	-A100-C099
Power supply	-A94
PWR-C	-A5

Troubleshooting:

- Check TCU2 ICU-PWR-C downloads for further faults if problem remain for corrective action.
- Check Power PWR-C Power Supply 24V on X-3, Refer Drawing [WAG9-6K-TCU] Sheet No.21.
- Check DC-DC Converter A94, Refer Drawing [WAG9-6K-TCU] Sheet No.16.
- Replace TCU2 ICU- PWR-C card C099[A100].

Reaction:

- TCU2 Traction not possible.

Related messages:

-

Fault Text:**TCC2 Cutout requested by ICU AUX2.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- TCU2 Communication OK.

Criteria:

- Fault in TCU2-ICU-AUX2 requested TCC2 cutout.
- ICU-AUX2 Power Supply unit.

Components concerned:

Component	Device name
TCU2-ICU-AUX2	-A100-079
Power supply	-A97
PWR-AUX2	-A6

Troubleshooting:

- Check TCU2 ICU-PWR-AUX2 downloads for further faults if problem remain for corrective action.
- Check Power ICU-AUX1 Power Supply 24V on X-3, Refer Drawing [WAG9-9K-TCU] Sheet No.14.2.
- Check DC-DC Converter A97, Refer Drawing [WAG9-9K-TCU] Sheet No.16.1.
- Replace TCU2 ICU-PWR-AUX2 card C079[A100].

Reaction:

- TCU2 Traction not possible.

Related messages:

-

Fault Text:**AUX2 inverter Cutout requested by TCU2 MCU.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU-2 Communication OK.

Criteria:

AUX2 is cutout by MCU of TCU-2

Components concerned:

Component	Device name
TCU2-MCU	-A100-051
TCU2-ICU-AUX2	-A100-079
PWR-AUX2	-A6

Troubleshooting:

- Check MCU download for further faults if problem remain for corrective action.
- Replace TCU2-MCU card C051[A100]

Reaction:

- AUX2 cutout

Related messages:

-

Fault Text:**AUX2 Inverter cutout requested by AUX2 ICU.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- TCU2 Communication OK.

Criteria:

- AUX2 cutout by TCU2-ICU-AUX2.
- ICU-AUX2 Power Supply unit.

Components concerned:

Component	Device name
TCU2-ICU-AUX2	-A100-079
PWR-AUX2	-A6
Power Supply	A97

Troubleshooting:

- Check Power ICU-AUX-2 Power Supply 24V on X-3, Refer Drawing [WAG9-9K-TCU] Sheet No.14.2.
- Check DC-DC Converter A94, Refer Drawing [WAG9-9K-TCU] Sheet No.16.1.
- Replace ICU-AUX-2 card C079[A100].
- Check ICU-AUX-2 downloads for further faults if problem remain for corrective action.

Reaction:

- AUX2 cutout

Related messages:

-

Fault Text:**Please switch off Circuit Breaker TCU1 (127.11/1).**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU1 Communication OK

Criteria:

- TCU1 communication error.
- DC-link not discharged to minimum.
- Self-Hold mode request from TCU1.

Components concerned:

Component	Device name
DC-Link discharge contactor	-K7
TCU1-MCU	-A100-051

Troubleshooting:

- Check TCU1-MCU data log for further faults if problem remain for corrective action.
- Check DC-Link discharge contactor, Refer Drawing [WAG9-6K-TCU] Sheet No.22 & 34.
- Check DC-Link discharge resistor R7, Refer Drawing [WAG9-6K-TCU] Sheet No.04.
- Check TCU1 Communication, Refer Drawing [WAG9-6K-TCU] Sheet No.36.

Reaction:

TCU1 Cutout.

Related messages:

-

Fault Text:**Please switch off Circuit Breaker TCU2 (127.11/2).**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU2 Communication OK

Criteria:

- TCU2 communication error.
- DC-link not discharged to minimum.
- Self-Hold mode request from TCU2.

Components concerned:

Component	Device name
DC-Link discharge contactor	-K7
TCU2-MCU	-A100-051

Troubleshooting:

- Check TCU2-MCU data log for further faults if problem remain for corrective action.
- Check DC-Link discharge contactor, Refer Drawing [WAG9-6K-TCU] Sheet No.22 & 34.
- Check DC-Link discharge resistor R7, Refer Drawing [WAG9-6K-TCU] Sheet No.04.
- Check TCU2 Communication, Refer Drawing [WAG9-6K-TCU] Sheet No.36.

Reaction:

TCU2 Cutout.

Related messages:

-

Fault Text:**TCU 1 fault Self OFF req**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

-

Criteria:

- TCU1 send self-off request to CCU, because of internal faults.

Components concerned:

Component	Device name
TCU1	415/1

Troubleshooting:

- Try to activate TCU1 to readout diagnostic memory.
- If it is not possible to activate it permanently to read out the data, remove CPU module from TCU1 and plug in other TCU to access diagnostic for loading latest software.
- Check Diagnostic memory of TCU1 for entries regarding:
 - Wrong SW loaded on CPU /4QC / PWI / HEP.
 - TC switch gear.
 - HEP switch gear

Reaction:

- Fault code triggered.
- TCU1 is off
- Main Inverter 1 off
- MCB off
- MCB inhibited
- Fault code triggered

Related messages:

-

Fault Text:**TCU 2 fault Self OFF req**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

-

Criteria:

- TCU1 send self-off request to CCU, because of internal faults.

Components concerned:

Component	Device name
TCU2	415/2

Troubleshooting:

- Try to activate TCU2 to readout diagnostic memory.
- If it is not possible to activate it permanently to read out the data, remove CPU module from TCU2 and plug in other TCU to access diagnostic for loading latest software.
- Check Diagnostic memory of TCU2 for entries regarding:
 - Wrong SW loaded on CPU /4QC / PWI / HEP.
 - TC switch gear.
 - HEP switch gear

Reaction:

- Fault code triggered.
- TCU2 is off
- Main Inverter 2 off
- MCB off
- MCB inhibited
- Fault code triggered

Related messages:

-

Fault Text:**AGT traction release fault TCU 2**Priority Type:

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Communication with TCU2 ok.
- AGT1 TCU1 & AGT1 TCU2 Traction release.

Criteria:

- Traction locked by any of below when Traction release by AGT TCU1 and AGT TCU2.
 - AGT PWMI 2A
 - AGT PWMI 2B
 - AGT PWMI 2C
 - AGT TCU2
- AGT1 and AGT2 self-test is not active.
- No traction interlock on train and locomotive.
- Actual torque status input from TCU2 should be 0
- TE/BE demand is not zero.
- Emergency brake is not applied.
- Emergency stop button is not activated.

Components concerned:

Component	Device name
TCU1	415/2
Inverter PWI 1A	A3-PWMI A/TCC-2
Inverter PWI 1B	A4-PWMI B/TCC-2
Inverter PWI 1C	A5-PWMI C/TCC-2

Troubleshooting:

- Check the faults if any logged related to Control Electronics, Emergency brake and Emergency Switch in CCU data.
- Check the TCU2 diagnostics data for any faults related to PWM Inverter.
- If there is a fault refer troubleshooting for concerned fault.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Concerned PWM Inverter in TCU2 is disabled.
- Fault code triggered.

Related messages:

-

Fault Text:**AGT traction interlock fault TCU 2**Priority Type:

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Communication with TCU2 ok.
- No Traction release for AGT1 TCU1/AGT2 TCU2 and traction not locked for any one of the below.
 - AGT2 PWM1 1A
 - AGT2 PWM1 1B
 - AGT2 PWM1 1C

Criteria:

- Actual torque status input from TCU1 is not 0.
- AGT1 or AGT2 self-test is active.
- TE/BE demand is zero (or between 0kN – 1kN).
- Emergency brake applied is applied.
- Emergency stop button is activated.
- Traction interlock on train or locomotive.
- Emergency stop button activated.

Components concerned:

Component	Device name
TCU2	415/2
Inverter PWI 2A	A3-PWMI A/TCC-2
Inverter PWI 2B	A4-PWMI B/TCC-2
Inverter PWI 2C	A5-PWMI C/TCC-2

Troubleshooting:

- Check the faults if any logged related to Control Electronics, Emergency brake and Emergency Switch in CCU data.
- Check the TCU2 diagnostics data for any faults related to PWM Inverter.
- If there is a fault refer troubleshooting for concerned fault.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- VCB Open.
- Fault code triggered.

Related messages:

0519

Fault Text:**SDTv2 error in TCU1 MVB ports.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- VCB ON

Criteria:

- TCU1 communication error.
- MVB Communication failure

Components concerned:

Component	Device name
CCU-MCU	-A100-003
TCU1-MCU	-A100-051

Troubleshooting:

- Check TCU1 Communication, Refer Drawing [WAG9-6K-TCU] 9G Sheet No.7.
- Check/replace CCU-MCU(-A100-003).
- Check/replace TCU1-MCU(-A100-051)

Reaction:

- TCU1 Cutout

Related messages:

-

Fault Text:**SDTv2 error in TCU2 MVB ports.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- VCB ON

Criteria:

- TCU2 communication error.
- MVB Communication failure

Components concerned:

Component	Device name
CCU-MCU	-A100-003
TCU2-MCU	-A100-051

Troubleshooting:

- Check TCU2 Communication, Refer Drawing [WAG9-6K-TCU] 9G Sheet No.7.
- Check/replace CCU-MCU(-A100-003).
- Check/replace TCU2-MCU(-A100-051)

Reaction:

- TCU2 Cutout

Related messages:

-

Fault Text:

VCB off, Traction Interface.

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU-1 & 2 Communication OK

Criteria:

- VCB open by TCU-1 or TCU-2
- Low Coolant Level
- Isolation switch Earth Fault in DC-Link
- TCU cut out request.
- TCU Self Off request

Components concerned:

Component	Device name
TCU1	415/1
TCU2	415/2

Troubleshooting:

- Check coolant pressure on DDU if found low, check coolant level and top up coolant.
- Check earth switch not in ON condition, Refer Drawing [WAG9-6K-TCU] Sheet No.07.
- Check downloads of TCUs for further analysis.

Reaction:

-

Related messages:

-

Fault Text:**Regenerative brake failure.**Priority Type

3 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Locomotive running above 10 kmph.
- Locomotive in Regenerative braking.

Criteria:

- Braking effort not available even demanded above 1%.
- Braking effort not increasing [-10kN]
- Angle transmitter of Driving cab

Components concerned:

Component	Device name
Angle Transmitter	150.1/1 , 150.1/2
TCU1	415/1
TCU2	415/2

Troubleshooting:

- Check angle transmitter % is increasing in braking position.
- Check TCU downloads for further faults related to motors, voltage, and current transducers if no Braking effort is increasing [-10kN].

Reaction:

- Regenerative braking not possible

Related messages

-

Fault Text:**TCU 1 Isolated**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Rotary switch for TCU1 Should be in NORMAL position.
- Circuit Breaker 127.11/1 should be ON condition.

Criteria:

- A200 Digital input card faulty.
- Rotary cut out switch wiring or selected in position-1

Components concerned:

Component	Device name
TCU	415/1
A200	DIO Card
Rotary cut out switch	154 [BOGIE CUT OUT]

Troubleshooting:

- Check wiring of Bogie cut out rotary switch[154] in HB Panel.
- Check voltage at -A200 [Digital Input card] pin no 14. If no voltage check wiring from 127.11/1.
- If voltage available and still the message appears replace A200 [Digital Input card],Refer drawing [WAG9-6K-TCU] Sheet no.23.

Reaction:

- TCU1 isolation

Related messages:

0361

Fault Text:**TCU 2 Isolated**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Rotary switch for TCU2 Should be in NORMAL position.
- Circuit Breaker 127.11/2 should be ON condition.

Criteria:

- A200 Digital input card faulty.
- Rotary cut out switch wiring or selected in position-2

Components concerned:

Component	Device name
TCU	415/2
A200	DIO Card
Rotary cut out switch	154 [BOGIE CUT OUT]

Troubleshooting:

- Check wiring of Bogie cut out rotary switch[154] in HB Panel.
- Check voltage at -A200 [Digital Input card] pin no 14. If no voltage check wiring from 127.11/2.
- If voltage available and still the message appears replace A200 [Digital Input card],Refer drawing [WAG9-6K-TCU] Sheet no.23.

Reaction:

TCU2 isolation

Related messages:

0362

Fault Text:**Power reduction is active**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

Transformer oil temperature exceeds specified limit (84 degC for WAG9HH and 105 degC for WAG9H)

Criteria:

- Power reduction active due to transformer oil temperature.
- Power reduction active due any sub system.
- A400 TP12 analog card faulty

Components concerned:

Component	Device name
TCU 1 or 2	415/1 or 415/2
Transformer oil temp sensor	210.5/1 & 210.5/2
A400	TP12

Troubleshooting:

- Check Transformer oil temperature sensor wiring, Refer drawing [WAG9-6K] 12I sheet no.9.
- Check -A400[TP12] analog in put card of TCU, Refer drawing [WAG9-6K-TCU] Sheet No 25 from Trafo Oil Temp sensor 1, Refer drawing [WAG9-6K-TCU] Sheet No 26 from Trafo Oil Temp sensor 2
- Check related sub system temperature values in related message 3450. Take appropriate action to related subsystem.

Reaction:

- Tractive power reduction.

Related messages:

3450

Fault Text:**TCU Master conflict**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- CCU should be configured to Master.
- TCU 1 should be configured to Master.
- TCU 1 Should be available.
- TCU 2 Should be available.
- TCU 2 should be configured to Master.

Criteria:

- TCU master assignment encountered conflict.

Components concerned:

Component	Device name
TCU CB	127.11/1 & 127.11/2
C051	A100

Troubleshooting:

- Check downloaded Software in CCU, TCU1 and TCU2.
- Check the coding connector of TCU1 and TCU2, Refer drawing [WAG9-6K-TCU] Sheet No 32.
- Check the failure of MCU of TCU1 & 2 and replace if any failure in device, Refer drawing [WAG9-6K-TCU] Sheet No 29.

Reaction:

- Traction Lock

Related messages:

0366

Fault Text:**TC1: Water Circulation fault**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- Atleast one aux converter is running and supplying to the loads.
- CB monitoring1 ok.
- CB to oil pump1 converter ok
- IO station 12 or module E122 is ok.

Criteria:

- CB of TC1 water pump is opened.
- No signal from E122_02.

Components concerned:

Component	Device name
CB oil pump1 converter	63.1/1
CB monitoring1	127.1/1
IO station 12	E122

Troubleshooting:

- Close circuit breaker 63.1/1
- If Message still not gone , check operations of 59.1/1 AUX contacts. Check/repair wiring between IO module E122_02 ad 63.1/1.
- If CB 63.1/1 trips again check circuits connected to CB contacts for short circuits(Diagram 05G).
- If CB is tripping again replace circuit breaker 63.1/1.

Reaction:

- Fault code triggered
- TC1 water pump is inoperative
- TC1 cooling failed

Related messages:

-

Fault Text:**TC1: Coolant Pressure High**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- At least one aux converter is running.
- TCU1 MVB communication is ok.

Criteria:

- pressure sensor of traction converter 1 is broken
- coolant pressure of traction converter 1 is too high and has to be adjusted

Components concerned:

Component	Device name
Traction converter 1	415/1

Troubleshooting:

- Check/repair pressure sensor
- Check/repair wiring from 218 to 127.2/1(72V DC)(see circ. Diagram 05G)
- If message is still there Check/repair wiring from Clip E122_02:411.QA/3 to 63.1/1.24 63.1/1.23 to 127.2/1 (see circ. Diagram 05G)

Reaction:

- Fault code triggered
- VCB opened
- Locomotive not operational

Related messages:

-

Fault Text:**TC1: Coolant Pressure Low**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- At least one aux converter is running.
- TCU1 MVB communication is ok.

Criteria:

- pressure sensor of traction converter 1 is broken
- coolant pressure of traction converter 1 is low and has to be adjusted

Components concerned:

Component	Device name
Traction converter 1	415/1

Troubleshooting:

- Check/repair pressure sensor
- Check/repair wiring from 218 to 127.2/1(72V DC)(see circ. Diagram 05G)
- If message is still there Check/repair wiring from Clip E122_02:411.QA/3 to 63.1/1.24
63.1/1.23 to 127.2/1
(see circ. Diagram 05G)

Reaction:

- Fault code triggered
- VCB opened
- Locomotive not operational

Related messages:

-

Fault Text:**TC1: Coolant level Warning**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- CCU master

Criteria:

- coolant level drops to the considerably lower level.(Loco needs to be taken to the shed for maintenance)

Components concerned:

Component	Device name

Troubleshooting:

- Diagnostic message for info

Reaction:

- Fault code triggered
- TC1 cutout request is initiated

Related messages:

-

Fault Text:**TC1: Coolant level Alarm**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- CCU master

Criteria:

- coolant level drops to the considerably lower level. (Loco needs to be taken to the shed for maintenance)

Components concerned:

Component	Device name

Troubleshooting:

- Check coolant level at(Coolant expansion tank). If tank is not empty check/repair tank sensor contact and CCU
- If the coolant expansion tank is empty check the cooling water pipe for leakage inside and outside of the convertor 1 .
- If there is any leakage check/repair cooling water pipe
- Refill cooling water by using the coolant expansion tank
- Unground the high voltage circuit and close the MCB

Reaction:

- Fault code triggered
- VCB locked.
- Locomotive not operational.
- TC1 cut out request is initiated

Related messages:

-

Fault Text:**TC1: Temp sensor Faulty**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- Communication to atleast on TCU is ok.

Criteria:

- Traction converter 1 temperature sensor is faulty.

Components concerned:

Component	Device name
Traction Converter 1	

Troubleshooting:

- Check traction converter 1 temperature sensor.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**TC2: Water Circulation fault**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- At least one aux converter is running and supplying to the loads.
- ACU communication ok.
- AUX2, AUX3 o/p frequency greater than 48 HZ.
- IO station 22 or module E223 is ok.

Criteria:

- CB of TC1 water pump is opened.
- TC water pump powered.

Components concerned:

Component	Device name
CB oil pump1 converter	63.1/2
CB monitoring2	127.1/2
IO station 22	E223

Troubleshooting:

- Close circuit breaker 63.1/2
- If Message still not gone , check operations of 63.1/2 AUX contacts. Check/repair wiring between IO module E223_09 and 63.1/2.
- If CB 63.1/2 trips again check circuits connected to CB contacts for short circuits(Diagram 05G).
- If CB is tripping again replace circuit breaker 63.1/2.

Reaction:

- Fault code triggered
- TC1 water pump is inoperative
- TC1 cooling failed

Related messages:

-

Fault Text:**TC2: Coolant Pressure High**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- At least one aux converter is running.
- TCU2 MVB communication is ok.

Criteria:

- pressure sensor of traction converter 2 is broken
- coolant pressure of traction converter 2 is too high and has to be adjusted

Components concerned:

Component	Device name
Traction converter 2	415/2

Troubleshooting:

- Check/repair pressure sensor
- Check/repair wiring from 218 to 127.2/2(72V DC)(see circ. Diagram 05G)
- If message is still there Check/repair wiring from Clip E223_09: 412.LA/10 to 63.1/2 63.1/2 to 127.2/2 (see circ. Diagram 05G)

Reaction:

- Fault code triggered
- VCB opened
- Locomotive not operational

Related messages:

-

Fault Text:**TC1: Coolant Pressure Low**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- At least one aux converter is running.
- TCU2 MVB communication is ok.

Criteria:

- pressure sensor of traction converter 2 is faulty
- coolant pressure of traction converter 2 is low.

Components concerned:

Component	Device name
Traction converter 2	415/2

Troubleshooting:

- Check/repair pressure sensor
- Check/repair wiring from 218 to 127.2/2(72V DC)(see circ. Diagram 05G)
- If message is still there Check/repair wiring from Clip E223_09:412.LA/10 to 63.1/2
63.1/2 to 127.2/2
(see circ. Diagram 05G)

Reaction:

- Fault code triggered
- VCB opened
- Locomotive not operational

Related messages:

-

Fault Text:**TC2: Coolant level Warning**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- CCU master

Criteria:

- coolant level drops to the considerably lower level

Components concerned:

Component	Device name
Traction Converter unit 2	415/2

Troubleshooting:

- Diagnostic message for info

Reaction:

- Fault code triggered
- TC2 cutout request is initiated

Related messages:

-

Fault Text:**TC1: Coolant level Alarm**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- CCU master

Criteria:

- coolant level drops to the considerably lower level.

Components concerned:

Component	Device name
Traction Converter unit 2	415/2

Troubleshooting:

- Check coolant level at(Coolant expansion tank). If tank is not empty check/repair tank sensor contact and CCU
- If the coolant expansion tank is empty check the cooling water pipe for leakage inside and outside of the convertor 2 .
- If there is any leakage check/repair cooling water pipe
- Refill cooling water by using the coolant expansion tank
- Unground the high voltage circuit and close the MCB

Reaction:

- Fault code triggered
- VCB locked.
- Locomotive not operational.
- TC2 cut out request is initiated

Related messages:

-

Fault Text:**TC2: Temp sensor Faulty**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- Communication to at least one TCU is ok.

Criteria:

- Traction converter 2 temperature sensor is faulty.

Components concerned:

Component	Device name
Traction Converter 2	415/2

Troubleshooting:

- Check traction converter 2 temperature sensor.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**TCC1 Capacitor Pressure High, Capacitor faulty.**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

Communication to TCU1 is OK

Criteria:

- TCC1 Capacitor pressure is high, Capacitor faulty.
- TCC1 Capacitor pressure switch faulty.

Components concerned:

Component	Device name
Capacitors	C30, C31, C32, C33, C1, C2, C3, C4

Troubleshooting:

- Check the wiring and continuity between connectors 23.2 and 47.6 Refer drawing [WAG9_6k-TCC] AD sheet 35.
- Check the wiring between K77 to A200 X2 connector Pin No.4, 6 Refer drawing [WAG9_6k-TCC] AD sheet 23.
- Check the TCC1 Capacitor healthiness. If faulty replace capacitor.

Reaction:

- TCU1 converter Isolation.

Related messages:

0330

Fault Text:**TCC2 Capacitor Pressure High, Capacitor faulty.**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

Communication to TCU2 is OK

Criteria:

- TCC2 Capacitor pressure is high, Capacitor faulty.
- TCC2 Capacitor pressure switch faulty.
- A200 faulty or feedback missing at Pin no.6 at X-2 connector.

Components concerned:

Component	Device name
Capacitors	C30, C31, C32, C33, C1, C2, C3, C4
DIO Card	-A200

Troubleshooting:

- Check the wiring and continuity between connectors 23.2 and 47.6 Refer drawing [WAG9_6k-TCC] AD sheet 35
- Check the wiring between K77 to A200 X2 connector Pin No.4, 6 Refer drawing [WAG9_6k-TCC] AD sheet 23.
- Check the TCC2 Capacitor healthiness. If faulty replace capacitor.
- Replace -A200 if fault.

Reaction:

- TCU2 converter Isolation.

Related messages:

-

Fault Text:**Switch-on fault primary coupling contactor -Q01/Q02/Q03**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- CB I/O signals (127.9) is on.
- PWIAUX1 or PWIAux2 is ready to operate.
- Aux contactor test is not active.

Criteria:

- Command to close the contactor Q01 is given, but feedback signal is not available at I/O module E117_00, E127_00

Components concerned:

Component	Device name
Contactor	Q01
IO station 11	E117,A114
IO station 12	E127,A125

Troubleshooting :

- Check whether Output module pins A114_04 and A125_04 LEDs are on and command to close Q01 is given.
- Check wiring from output module A114 and A125 to its CB 127.9/1 and 127.9/2 respectively. Refer drawing [WAG9_9K] 04E sheet 4
- Check/Replace Output module A114 and/or A125
- Check wiring from I/O input E117_00 and E127_00 to Contactor Q01 (21-24) & (11-14) contacts. Refer drawing [WAG9_9K] 05M sheet 13
- Check/Replace module E117_00 and E127_00
- Check/replace contactor Q01

Reaction:

- TCC1 & TCC2 will not be synchronized.

Related messages:

-

0.1.2 CCU Fault Code 551

Fault Text:

Switch-off fault primary coupling contactor -Q01/Q02/Q03

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Traction

Condition:

- CB I/O signals (127.9) is on.
- PWIAUX1 or PWIAux2 is ready to operate.
- Aux contactor test is not active.

Criteria:

- Command to open the contactor Q01 is given, but ON feedback signal is still available at I/O module E117_00, E127_00

Components concerned:

Component	Device name
Contactor	Q01
IO station 11	E117,A114
IO station 12	E127,A125

Troubleshooting :

- Check whether Output module pins A114_04 and A125_04 LEDs are off and command to close Q01 is not given.
- Check wiring from output module A114 and A125 to its CB 127.9/1 and 127.9/2 respectively.
Refer drawing [WAG9_9K] 04E sheet 4
- Check/Replace Output module A114 and/or A125
- Check wiring from I/O input E117_00 and E127_00 to Contactor Q01 (21-24) & (11-14) contacts.
Refer drawing [WAG9_9K] 05M sheet 13
- Check/replace module E117_00 and E127_00
- Check/replace contactor Q01

Reaction:

-

Related messages:

-

Fault Text:-**Switch-on fault AUX contactor -K01**Priority Type:-

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:-

WAG9HH / WAP7HH

Subsystem:-

AUX

Condition:-

Communication to IO station 11 and 12 ok.

Criteria:-

- The command for contactor -K01 is high from A114_05/A125_05 but no feedback available at input channel E117_01 & E127_01.
- A114_05 and A125_05 are redundant channels.
- E117_01 and E127_01 are redundant channels.

Components concerned:-

Component	Device name
IO station 11 module 4	A114_05
IO station 12 module 5	A125_05
IO station 11 module 7	E117_01
IO station 12 module 7	E127_01
Contactor	-K01
Circuit Breaker	127.9/1,127.9/2, 127.22/2 & 127.22/3

Troubleshooting:-

- Check Output module pins A114_05 and A125_05. Check whether Led of these output pins are on and command to close K01 is given, Refer drawing [WAG9_9K] 05R sheet 17. If ok then replace DO-Card.
- Check wiring from CB 127.9/1 & 127.9/2 .
- Check wiring from CB 127.22/2&127.22/3, Refer drawing [WAG9_9K_ACU], sheet-1.
- Check input module E117_01 and E127_01, check respective LEDs of input pins whether feedback is available or not. Refer drawing [WAG9_9K] 05R sheet 17 if led is off check wiring/IO module.
- Check wiring of Auxiliary contactor K01, Refer drawing [WAG9_9K] 05M sheet 13. If wiring is ok, check/repair contactor.
- Check wiring of Main contactor K01, Refer drawing [WAG9_9K] 05M sheet 13. If wiring is ok, check/repair contactor.

Reaction:-

- Aux1 will isolate.

Related messages:-

-

Fault Text:-**Switch-off fault AUX contactor -K01**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants

WAG9HH / WAP7HH

Subsystem:-

Aux

Condition:-

Communication to IO station 11 and 12 ok.

Criteria:-

- The command for contactor -K01 is low at A114_05/A125_05 but feedback available at input channel E117_01 & E127_01.
- A114_05 and A125_05 are redundant channels.
- E117_01 and E127_01 are redundant channels.

Components concerned:

Component	Device name
IO station 11 module 4	A114_05
IO station 12 module 5	A125_05
IO station 11 module 7	E117_01
IO station 12 module 7	E127_01
Contactor	-K01
Circuit Breaker	127.9/1,127.9/2, 127.22/2 & 127.22/3

Troubleshooting:

- Check Output module pins A114_05 and A125_05. Check whether Led of these output pins are off and command to close K01 is not given. Refer Drawing [WAG9_9K] 05R, sheet-17, if not replace DO-Card.
- Check wiring from CB 127.9/1 & 127.9/2 Refer Drawing [9000HP_VCU1] 04E sheet-4.
- Check wiring from CB 127.22/2&127.22/3 .Refer Drawing [WAG9_9K_ACU1] sheet-1.
- Check input module E117_01 and E127_01, check respective LEDs of input pins whether feedback is available or not. Refer Drawing [WAG9_9K]05R sheet no-17. if led is on check wiring/IO module..
- Check wiring of Auxiliary contactor K01. Refer Drawing [WAG9_9K]05M Sheet -13. If wiring is ok, check/repair contactor..
- Check wiring of Main contactor K01. Refer Drawing [WAG9_9K] 05M, sheet –13. If wiring is ok, check/repair contactor.

Reaction:

- Fault code Triggered

Related messages:

-

Fault Text:-**Switch-on fault AUX contactor -K02**Priority Type:-

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:-

WAG9HH / WAP7HH

Subsystem:-

Aux

Condition:-

Communication to IO station 11 and 12 ok.

Criteria:-

- The command for contactor -K01 is high from A114_06/A125_06 but no feedback available at input channel E117_02 & E127_02.
- A114_06 and A125_06 are redundant channels.
- E117_02 and E127_02 are redundant channels.

Components concerned:-

Component	Device name
IO station 11 module 4	A114_06
IO station 12 module 5	A125_06
IO station 11 module 7	E117_02
IO station 12 module 7	E127_02
Contactor	K02
Circuit Breaker	127.9/1,127.9/2, 127.22/2 & 127.22/3

Troubleshooting:-

- Check Output module pins A114_06 and A125_06. Check whether Led of these output pins are on and command to close K02 is given. Refer Drawing [WAG9_9K] 05S sheet-18. If not replace DO-Card.
- Check wiring from CB 127.9/1 & 127.9/2. Refer Drawing [9000HP_VCU1] 04E sheet-4.
- Check wiring from CB 127.22/2&127.22/3. Refer Drawing [WAG9_9K_ACU] sheet-1.
- Check input module E117_02 and E127_02, check respective LEDs of input pins whether feedback is available or not. Refer Drawing [WAG9_9K] ,05S sheet-18, if led is off check wiring/IO module..
- Check wiring of Auxiliary contactor K02. Refer Drawing [WAG9_9K] ,05M sheet-13, If wiring is ok, check/repair contactor..
- Check wiring of Main contactor K02. Refer Drawing [WAG9_9K] ,05M sheet -13, If wiring is ok, check/repair contactor.

Reaction

- Aux2 isolated

Related messages:

-

Fault Text:-**Switch-off fault AUX contactor -K02**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

Aux

Condition:

Communication with IO Station 11 & 12 ok.

Criteria:

- The command for contactor -K02 is low at A114_06/A125_06 but feedback available at input channel E117_02 & E127_02.
- A114_06 and A125_06 are redundant channels.
- E117_02 and E127_02 are redundant channels.

Components concerned:

Component	Device name
IO station 11 module 4	A114_06
IO station 12 module 5	A125_06
IO station 11 module 7	E117_02
IO station 12 module 7	E127_02
Contactor	K02
Circuit Breaker	127.9/1,127.9/2, 127.22/2 & 127.22/3

Troubleshooting:

- Check Output module pins A114_06 and A125_06. Check whether Led of these output pins are off and command to close K02 is not given. Refer Drawing [WAG9_9K] ,05S sheet no-18, if not replace DO-Card.
- Check wiring from CB 127.9/1 & 127.9/2. Refer Drawing [9000HP_VCU1] 04E sheet-4 .
- Check wiring from CB 127.22/2&127.22/3. Refer Drawing [WAG9_9K_ACU] sheet-1.
- Check input module E117_03 and E127_03, check respective LEDs of input pins whether feedback is available or not. Refer Drawing [WAG9_9K] ,05S sheet-18. if led is on check wiring/IO module..
- Check wiring of Auxiliary contactor K02. Refer Drawing 4[WAG9_9K] ,05M sheet no-13 .If wiring is ok, check/repair contactor..
- Check wiring of Main contactor K02. refer Drawing [WAG9_9K] ,05M sheet no-13. If wiring is ok, check/repair contactor.

Reaction:

- Fault code triggered.

Related messages:

0577

Fault Text:

Switch-on fault secondary coupling contactor -K03

Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

Aux

Condition:

Communication with IO station11 & 12 ok.

Criteria:

- The command for contactor -K03 is high from A114_07/A125_07 but no feedback available at input channel E117_03 & E127_03.
- A114_07 and A125_07 are redundant channels.
- E117_03 and E127_03 are redundant channels.

Components concerned:

Component	Device name
IO station 11 module 4	A114_07
IO station 12 module 5	A125_07
IO station 11 module 7	E117_03
IO station 12 module 7	E127_03
Contactor	K03
Circuit Breaker	127.9/1,127.9/2, 127.22/2 & 127.22/3

Troubleshooting:

- Check Output module pins A114_06 and A125_06. Check whether Led of these output pins are on and command to close K03 is given. Refer Drawing [WAG9_9K] ,05S sheet-18. if not replace DO-Card.
- Check wiring from CB 127.9/1 & 127.9/2. Refer Drawing [9000HP_VCU1], 04E sheet4.
- Check wiring from CB 127.22/2&127.22/3. Refer Drawing [WAG9_9K_ACU] ,sheet-1.
- Check input module E117_02 and E127_02, check respective LEDs of input pins whether feedback is available or not. Refer Drawing [WAG9_9K] ,05S sheet-18. if led is off, check wiring/IO module..
- Check wiring of Auxiliary contactor K03. Refer Drawing [WAG9_9K] ,05M sheet no-13. If wiring is ok, check/repair contactor..
- Check wiring of Main contactor K03. Refer Drawing [WAG9_9K] ,05M ,sheet no-13, If wiring is ok, check/repair contactor.

Reaction:

- fault code triggered.

Related messages:

-

Fault Text:-

Switch-off fault secondary coupling contactor -K03

Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

Aux

Condition:

Communication to IO-Station 11 & 12 ok.

Criteria:

- The command for contactor -K03 is at A114_07/A125_07 but feedback available at input channel E117_03 & E127_03.
- A114_07 and A125_07 are redundant channels.
- E117_03 and E127_03 are redundant channels.

Components concerned:

Component	Device name
IO station 11 module 4	A114_07
IO station 12 module 5	A125_07
IO station 11 module 7	E117_03
IO station 12 module 7	E127_03
Contactor	K03
Circuit Breaker	127.9/1,127.9/2, 127.22/2 & 127.22/3

Troubleshooting:

- Check Output module pins A114_07 and A125_07. Check whether Led of these output pins are off and command to close K03 is not given. (WAG9_9K ,sheet no-18 and Ref.no.05S) if not replace DO-Card.
- Check wiring from CB 127.9/1 & 127.9/2 (WAG9_9K _VCU1 sheet4/ref.04E).
- Check wiring from CB 127.22/2&127.22/3 (WAG9_9K _ACU sheet-1).
- Check input module E117_02 and E127_02, check respective LEDs of input pins whether feedback is available or not. (WAG9_9K ,sheet no-18 and Ref.no.05S) if led is on, check wiring/IO module.
- Check wiring of Auxiliary contactor K03 (WAG9_9K ,sheet no-13 and Ref.no.05M). If wiring is ok, check/repair contactor..
- Check wiring of Main contactor K03 (WAG9_9K ,sheet no-13 and Ref.no.05M). If wiring is ok, check/repair contactor.

Reaction:

- Fault code triggered.

Related messages:

0561

Fault Text:**TC1 DC link isolation sw. at earthed position**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- communication between CCU and TCU1 is OK

Criteria:

- TC1 DC link isolation switch at earthed position

Components concerned:

Component	Device name
TCU1	415/1

Troubleshooting:

- check the position of the TC1 DC link isolation switch, drawing [WAG9_6k-TCU] AD sheet 04.
- check the wiring between the A100 X3 connector pin 7 to 29.3, Refer drawing [WAG9_6k-TCU] AD sheet 33

Reaction:

- TC1 isolation

Related messages:

0267

Fault Text:**TC 1 is cutout**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

-

Criteria:

- TC1 communication error.
- CB 110V power supply is tripped
- TCU 4QC [C159]
- TC1 cutout request from ICU

Components concerned:

Component	Device name
CB power supply of TCU1	127.11/1
C159	A100

Troubleshooting:

- Check the TCU-1 communication Refer drawing [WAG9-6K-TCU] sheet number 36
- Check TCU1 110V power supply CB tripped 127.11/1.
- Check the wiring between 04C.15 to Control electronics contactor +1 of 218 SB-1, Refer drawing [WAG9_9k] 4D sheet 03.
- Check the wiring between Control electronics contactor -2 of 218 SB-1 to TCU1 electronics converter 1 of contactor1 127.11/1, Refer drawing [WAG9_9k] 4D sheet 03.
- Check the wiring between TCU1 electronics converter 1 of Contactor 2 127.11/1 to 05E.01, Refer drawing [WAG9_9k] 4D sheet 03.
- Check TCU 1 downloads for further faults

Reaction:

- TC1 isolation

Related messages:

0268

Fault Text:**TC1 manual cut-in not possible**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Communication between CCU and TCU 1 is OK

Criteria:

- TC 1 communication error.
- Locomotive not in standstill.
- TC 1 is not cut out from the Display
- TC 1 is not available

Components concerned:

Component	Device name
TCU1	415/1

Troubleshooting:

- Check the TCU-1 communication Refer drawing [WAG9-6K-TCU] sheet number 36
- Check TC1 downloads for any faults related to TCU cut out.

Reaction:

- TC1 isolation

Related messages:

0272

Fault Text:**TC2 DC link isolation sw. at earthed position**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Subsystem:

TRACTION

Condition:

- communication between CCU and TCU2 is OK

Criteria:

- TC2 DC link isolation switch at earthed position

Components concerned:

Component	Device name
TCU2	415/2

Troubleshooting:

- check the position of the TC2 DC link isolation switch, drawing [WAG9_6k-TCU] AD sheet 04.
- check the wiring between the A100 X3 connector pin 7 to 29.3, Refer drawing [WAG9_6k-TCU] AD sheet 33

Reaction:

- TC1 isolation

Related messages:

0314

Fault Text:**TC 2 is cutout**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

-

Criteria:

- TC2 communication error.
- CB 110V TCU -2 power supply is tripped
- TCU 4QC [C159]
- TC2 cutout request from ICU

Components concerned:

Component	Device name
CB power supply of TCU2	127.11/2
C159	A100

Troubleshooting:

- Check the TCU-2 communication Refer drawing [WAG9-6K-TCU] sheet number 36
- Check TCU2 110V power supply CB tripped 127.11/2.
- Check the wiring between 04C.15 to Control electronics contactor +1 of 218 SB-1, Refer drawing [WAG9_9k] 4D sheet 03.
- Check the wiring between Control electronics contactor -2 of 218 SB-1 to TCU2 electronics converter 2 of contactor1 127.11/2, Refer drawing [WAG9_9k] 4D sheet 03.
- Check the wiring between TCU2 electronics converter 2 of Contactor2 127.11/2 to 05E.09, Refer drawing [WAG9_9k] 4D sheet 03.
- Check TCU 2 downloads for further faults

Reaction:

- TC2 isolation

Related messages:

0315

Fault Text:**TC2 manual cut-in not possible**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- Communication between CCU and TCU 2 is OK

Criteria:

- TC 2 communication error.
- Locomotive not in standstill.
- TC 2 is not cut out from the Display
- TC 2 is not available

Components concerned:

Component	Device name
TCU2	415/2

Troubleshooting:

- Check the TCU-2 communication Refer drawing [WAG9-6K-TCU] sheet number 36
- Check TC2 downloads for any faults related to TCU cut out.

Reaction:

- TC2 isolation

Related messages:

0320

Fault Text:-**415/110 Circuit fuse open.**Priority Type:-

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:-

WAG9H / WAP7H / WAP5H

Subsystem:

Aux

Condition:

Communication to Input Station is ok.

Fuse is ok

Criteria:

- Fuse supply feedback at E122_00 is not ok
- Fuse not ok.

Components concerned:

Component	Device name
IO station 12 module 2	E122_00
Aux Fuse	41

Troubleshooting:

- Check led status of IO module E122_00 .
- Check fuse 41 and wiring between 127.2/1,fuse and E122_00. (WAG9_6K sheet 05F sheet no.6)
- Replace the fuse

Reaction:

- Aux isolated

Related messages :

-

Fault Text:**AUX1: Permanent fault**Priority Type:

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

AUX

Condition:

Auxiliary Cabinet component status ok

Criteria:

- Auxiliary internal component/control feedback to ICU failure.

Component	Device name
Inverter module	A6
Current Transducer	-U9 & -U10

Troubleshooting:

- AUX1 is cut out because of a permanent failure. The diagnostic code is for information only. The cause of the total failure is diagnosed in other diagnostic codes.
- Check CCU and TCU diagnostic storage for the cause of the total failure. Follow instructions of that code(s).
- Check input and output power connection of aux Invertor. Refer Drawing [WAG9-9K-TCU]sheet 7.
- Check CT and voltage sensor connection .Refer Drawing [WAG9-9K-TCU] sheet 21.1.
- Check Aux invertor logic connector . Refer Drawing [WAG9-9K-TCU] sheet 13.

Reaction:

- Fault Code triggered
- AUX1 is cut out

Related messages:

-

Fault Text:**AUX2: Permanent fault**Priority Type:

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

Auxiliary Cabinet component status ok

Criteria:

Auxiliary internal component/control Feedback to ICU failure.

Component	Device name
Inverter module	A6
Current Transducer	-U9 & -U10

Troubleshooting:

- AUX2 is cut out because of a permanent failure. The diagnostic code is for information only. The cause of the total failure is diagnosed in other diagnostic codes.
- Check CCU and TCU diagnostic storage for the cause of the total failure. Follow instructions of that code(s).

Reaction:

- Fault code triggered
- AUX2 is cut out

Related messages:

-

Fault Text:-

AUX1: Temporary error

Priority Type :-

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants :-

WAG9HH / WAP7HH

Subsystem:-

AUX

Condition :-

TCU PWI AUX ok

Criteria :-

-AUX2 is in redundancy mode. The fault code is for information only. The cause of the redundancy mode is diagnosed in other fault codes.

Components concerned :-

Component	Device name
Inverter module	A6
Current Transducer	-U9 & -U10

Troubleshooting :-

- AUX1 is in redundancy mode. The diagnostic code is for information only. The cause of the redundancy mode is diagnosed in other diagnostic codes.
- Check CCU and TCU diagnostic storage for the cause of the redundancy mode. Follow instructions of that code(s).

Reaction:

- AUX1 is in redundancy mode.

Related Messages:

-

Fault Text :-

AUX2: Temporary error

Priority Type :-

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants :-

WAG9HH / WAP7HH

Subsystem:-

AUX

Condition:-

TCU PWI AUX

Criteria:-

- AUX1 is in redundancy mode. The fault code is for information only. The cause of the redundancy mode is diagnosed in other fault codes.

Components concerned:-

Component	Device name
Inverter module	-A6
Current Transducer	-U9 & -U10

Troubleshooting:-

- AUX2 is in redundancy mode. The diagnostic code is for information only. The cause of the redundancy mode is diagnosed in other diagnostic codes.
- Check CCU and TCU diagnostic storage for the cause of the redundancy mode. Follow instructions of that code(s).

Reaction :-

- AUX2 is in redundancy mode.

Related message:

-

Fault Text:**AUX1: Load shedding Load reduction**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:-

WAG9HH / WAP7HH

Subsystem:

AUX

Condition:

- AUX1 is on/Active.
- AUX should not be in redundant mode with 1 transformer active.

Criteria:

- Aux1 output failure.

Components concerned:

Component	Device name
Inverter module	-A6
Current Transducer	-U9 & -U10

Troubleshooting:

- Aux1 load shedding or load reduction request is generated when there is some issue with inverter of AUX converter-1 e.g. IGBT junction temperature high or AUX is not delivering required output to the load. The only possible immediate short-term remedy is a reduction in power or disconnection. In the longer term, it is necessary to investigate whether the cooling system is functioning correctly. Refer Drawing [WAG9-6k-ACU1] Sheet no.2 & 8.

Reaction:

- Aux isolated

Related messages:

-

Fault Text:**AUX2: Load shedding Load reduction**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants :

WAG9HH / WAP7HH

Subsystem:

AUX

Condition:

- AUX2 is On/Active.
- AUX should not be in redundant mode with 1 transformer active.

Criteria:-

- Aux2 output failure.

Components concerned:

Component	Device name
Inverter module	-A6
Current Transducer	-U9 & -U10

Troubleshooting:

- Aux2 load shedding or load reduction request is generated when there is some issue with inverter of AUX converter 2 eg. IGBT junction temperature high or AUX is not delivering required output to the load. The only possible immediate short-term remedy is a reduction in power or disconnection. In the longer term, it is necessary to investigate whether the cooling system is functioning correctly. Refer Drawing [WAG9-6k ACU2] sheet no.9 &15.

Reaction:

Aux isolated

Related messages:

-

Fault Text:**Current / voltage limitation AUX1 is active.**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Aux

Condition:

Communication to Aux is ok.

Criteria:

- AUX1 detects an overload or short circuit at its output for minimum of 4s.
- The AUX1 limits the output current, by lowering of the output voltage with constant frequency.

Components concerned:

Component	Device name
Inverter module	-A6
Current Transducer	-U9 & -U10

Troubleshooting:-

- Check output terminals of Aux Inverter [WAG9-9K] 01G sheet 7.
- Check Load Connected to the Aux.

Reaction:

-

Related message:

-

Fault Text:-**Current / voltage limitation AUX2 is active.**Priority Type :-

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:-

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:-

Aux

Condition:-

Communication to Aux is ok

Criteria:

- AUX2 detects an overload or short circuit at its output for minimum of 4s.
- The AUX2 limits the output current, by lowering of the output voltage with constant frequency.

Components concerned:

Component	Device name
Inverter module	-A6
Current Transducer	-U9 & -U10

Troubleshooting:-

- Check output terminals of Aux Inverter [WAG9-9K] 01G sheet 7.
- Check Load Connected to the Aux.

Reaction:

-

Related message:

-

Fault Text:-**AUX1 degrouped due to current/voltage limitation**Priority Type :-

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:-

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:-

Aux

Condition:-

Communication to Aux is ok

Criteria:-

- The AUX1 output over current or over voltage detected.

Components concerned:-

Component	Device name
Inverter module	-A6
Current Transducer	-U9 & -U10

Troubleshooting:-

- The TCU1 or the CCU (loop from CCU to TCU an TCU to CCU) has generated a cut out request because of a protective reaction or a detected fault.
- The fault or protective reaction is stored in a separate diagnostic entry in TCU or CCU storage.
- Issues can be for example C-filter fault, detected ground fault, permanent fault of AUX, frequency/voltage/current limitation.

Reaction:-

Aux1 cutout

Related messages:-

-

Fault Text:-

AUX2 degrouped due to current/voltage limitation.

Priority Type:-

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:-

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:-

Aux

Condition:-

Communication to Aux is ok

Criteria:-

- The AUX2 output over current or over voltage detected.

Components concerned:-

Component	Device name
Inverter module	-A6
Current Transducer	-U9 & -U10

Troubleshooting:-

-The TCU2 or the CCU (loop from CCU to TCU an TCU to CCU) has generated a cut out request because of a protective reaction or a detected fault.
-The fault or protective reaction is stored in a separate diagnostic entry in TCU or CCU storage.
- Issues can be for example C-filter fault, detected ground fault, permanent fault of AUX, frequency/voltage/current limitation.

Reaction:-

- Aux-2 cutout

Related messages:

-

Fault Text:**VCB off due to Auxiliary inverter**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

- TCU1/TCU2 communication ok.
- AUX communication ok.

Criteria:

- AUX1/AUX2 isolated
- Aux transformer1/ Aux transformer 2 faulty.
- Aux filter capacitor failure
- AUX current limiting active.

Components concerned:

Component	Device name
Auxiliary	-A6
Auxiliary Disconnecter	- Q61
Auxiliary Transformer	-T01,T02
Aux	

Troubleshooting:

- Check AUX1 diagnostics for related fault.
- Check disconnecter of AUX1 and AUX2.
- Check the load connected to AUX1. Check for short circuit if current limiting is active.
- Check if both AUX TCU1 and AUX TCU2 both are on.
- Check auxiliary transformer winding for short circuit.
- Check Filter capacitors on the secondary side of aux transformer.

Reaction:

- AUX will restart, if fault persists will get isolate.

Related messages:

-

Fault Text:**Aux1 Degrouped due to faulty filter capacitor (BRAM)**Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

Aux

Condition:

Communication to TCU1 is ok

Criteria:

- The AUX1 supervises with the help of the voltage transducers the ripple of the output value. If the ripple is too high, a fault of the filter capacitors is detected.

Components concerned:

Component	Device name
Filter Capacitor	C11,C12,C13

Troubleshooting:

- Fault is triggered in BRAM and this fault will remain locked until BRAM is resetted using SIBAS monitor tool.
- Check Filter capacitor connections refer Drawing [WAG9-9K] 1J sheet 9. check condition of capacitor if found damaged replace.

Reaction:

- Fault code triggered.
- Aux1 cutout

Related message:

-

Fault Text:**Aux2 Degrouped due to faulty filter capacitor (BRAM)**Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

Aux

Condition:

Communication to TCU1 is ok

Criteria:

- The AUX2 supervises with the help of the voltage transducers the ripple of the output value. If the ripple is to high, a fault of the filter capacitors is detected.

Components concerned:

Component	Device name
Filter Capacitor	C14,C15,C16

Troubleshooting:

- Fault is triggered in BRAM and this fault will remain locked until BRAM is resetted using SIBAS monitor tool.
- Check Filter capacitor connections refer Drawing [WAG9-9K] 1J sheet 9.check condition of capacitor if found damaged replace.

Reaction:

- Fault code triggered.
- Aux2 cutout

Related message:

-

Fault Text:**Ground fault detected AUX1.**Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

Aux

Condition:

Communication to TCU1 is ok.

Criteria:

- The AUX1 detects an internal grounding fault/isolation fault inside the cubicle.

Components concerned:

Component	Device name
Auxiliary	-A6
Auxiliary Disconnecter	- Q61
Auxiliary Transformer	-T01,T02

Troubleshooting:

- Check the missing earth strap.
- Check loose or missing Shielding of cable.

Reaction:

Aux1 cutout

Related message:

-

Fault Text:-**Ground fault detected AUX2.**Priority Type:-

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:-

WAG9HH / WAP7HH

Subsystem:-

Aux

Condition:-

- Communication to TCU2 is ok.

Criteria:

- The AUX2 detects an internal grounding fault/isolation fault inside the cubicle.

Components concerned:

Component	Device name
Auxiliary	-A6
Auxiliary Disconnecter	- Q61
Auxiliary Transformer	-T01,T02

Troubleshooting:

- Check the missing earth strap.
- Check loose or missing Shielding of cable.

Reaction:

Aux2 cutout

Related message:

-

5.4.159 CCU Fault Code 610

Fault Text:

Switch-off fault AUX disconnecter 1

Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

AUX

Condition:

- TCU1 is Active and Communication ok.
- Fault in Aux converter, Aux disconnection initiated by TCU1.
- Loco variant is other than WAG9H / WAP7H / WAP5H.

Criteria:

- In case of any fault in AUX Inverter module, isolation from DC link is initiated by switching off disconnector, Fault would trigger if disconnector stuck or feedback missing.

Components concerned:

Component	Device name
Aux Disconnector DIDO	Q61 -A300

Troubleshooting:

- Check the disconnector(Q61) and its related wiring from Q61 to DIDO_H2 of -A300; Refer Drawing [WAG9-9K-TCU] Page 14.1 and 14.2.
- Contact Siemens maintenance personnel for replacing Aux Disconnector or DIDO (-A300), if problem persists.

Reaction:

- Fault code triggered.

Related messages:

-

5.4.160 CCU Fault Code 613

Fault Text:

Switch-off fault AUX disconnecter 2

Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

- TCU2 communication ok.

Criteria:

- Disconnecting contactor of Q61 might got stuck or has wiring issue.

Components concerned:

Component	Device name
Aux Disconnecter 2	- Q61

Troubleshooting:

- Check disconnecter 2 (Q61) of Aux refer [WAG9-9K-TCU] page 14.2.
- In case of AUX modules isolation from DC link due to any fault there is fault in disconnecter. Disconnecting contactor might get stuck or not receiving signal so check that contactor refer [WAG9-9K-TCU] page 14.2.

Reaction:

- AUX2 transformer cut-out request generated.
- AUX2 inverter fault code triggered.
- VCB off

Related messages:

0601

-

5.4.161 CCU Fault Code 621

Fault Text:

Failure voltage transformer AUX1 detected

Priority Type:

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

AUX

Condition:

- TCU1 is Active and Communication ok.
- Simulation mode not activated.
- No fault reset from BRAM.
- Loco variant is other than WAG9H / WAP7H / WAP5H.

Criteria:

- The signal from voltage transformer or the voltage value of Aux1 detected by TCU1 is not valid or CB F03 is off.

Components concerned:

Component	Device name
Aux Voltage Sensors (TCC2)	-U36.1 & -U36.2
Circuit Breaker	-CB F03
ICU PWMI AUX	-A100

Troubleshooting:

- Check CB F03, it should be ON and no tripping.
 - Check the voltage sensors -U36.1 & -U36.2 of TCC1 and its related wiring from -X4 to the sensors; Refer Drawing [WAG9-9K-TCU] Page 5.
 - Check the wiring from sensors (-U36.1& -U36.2) to +C079 of ICU PWMI AUX(-A100); Refer Drawing [WAG9-9K-TCU] Page 21.1.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

-

5.4.162 CCU Fault Code 622

Fault Text:

Failure voltage transformer AUX2 detected

Priority Type:

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

AUX

Condition:

- TCU2 is Active and Communication ok.
- Simulation mode not activated.
- No fault reset from BRAM.
- Loco variant is other than WAG9H / WAP7H / WAP5H.

Criteria:

- The signal from voltage transformer or the voltage value of Aux2 detected by TCU2 is not valid or CB F04 is off.

Components concerned:

Component	Device name
Aux Voltage Sensors (TCC2)	-U36.1 & -U36.2
Circuit Breaker	-CB F04
ICU PWMI AUX	-A100

Troubleshooting:

- Check CB F03, it should be ON and no tripping.
- Check the voltage sensors -U36.1 & -U36.2 of TCC2 and its related wiring from -X4 to the sensors; Refer Drawing [WAG9-9K-TCU] Page 5.
- Check the wiring from sensors (-U36.1 & -U36.2) to +C079 of ICU PWMI AUX(-A100); Refer Drawing [WAG9-9K-TCU] Page 21.1.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

-

5.4.163 CCU Fault Code 627

Fault Text:

AUX1 Filter capacitor monitoring is not active

Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

- AUX1 is ready for activation.
- AUX1 on command is given and there is no AUX1 related fault.
- K01 is ON.

Criteria:

- Aux1 filter capacitor monitoring disabled by TCU1.

Components concerned:

Component	Device name
Aux filter capacitors	- C11, C12, C13
Voltage sensor	-U36.1, U36.2

Troubleshooting:

- Check CCU and TCU diagnostic storage, if any other reason can be found (e.g. other fault of the AUX or of an other component like voltage transducers etc.).
- Check complete wiring of the filter capacitors C11, C12, C13, refer drawing [WAG9_9K] 01J sheet 9
- Check the voltage transducers U36.1,U36.2, refer drawing [WAG9_9K] 01L page11.
- Check auxiliary transformers connections visually.
- If wiring is correct then check all connections of voltage sensors in the TCC and execute voltage sensor test. Refer TCC operating manual [WAG9/WAP7 TCC 9K-A5E43779407W Operating Instructions]
- Replace filter capacitors C11, C12, C13.

Reaction:

-

Related messages:

-

5.4.164 CCU Fault Code 628

Fault Text:

AUX2 Filter capacitor monitoring is not active

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

- AUX2 is ready for activation.
- AUX2 on command is given and there is no AUX1 related fault.
- K01 is ON.

Criteria:

- Aux2 filter capacitor monitoring disabled by TCU2.

Components concerned:

Component	Device name
Aux filter capacitors	- C14,C15,C16
Voltage sensor	-U36.1, U36.2

Troubleshooting:

- Check CCU and TCU diagnostic storage, if any other reason can be found (e.g. other fault of the AUX or of an other component like voltage transducers etc.)
- Check complete wiring of the filter capacitors C14,C15,C16 including the voltage transducers, refer drawing [WAG9_9K] 01J sheet 9Check the voltage transducers U36.1,U36.2, refer drawing [WAG9_9K] 01L page11.
- Check auxiliary transformers connection visually.
- If wiring is correct then check all connections of voltage sensors in the TCC and execute voltage sensor test. Refer TCC operating manual [WAG9/WAP7 TCC 9K-A5E43779407W Operating Instructions]
- Replace filter capacitors C14, C15, C16.

Reaction:

-

Related messages:

-

5.4.165 CCU Fault Code 631

Fault Text:

ACU 1: Overcurrent detected

Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

- Communication with ACU1 is ok.
- Loco variant is other than WAG9HH / WAP7HH.

Criteria:

- Aux1 output current is more than 600A for 100ms.
- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.

Components concerned:

Component	Device name
Aux Converter	1050.1
Current Sensors (ACU1)	-U4, -U5
M2000	-A3

Troubleshooting:

- Check the current sensors (-U4, -U5) & its wiring from sensor to X341 of -A3; Refer Drawing [WAG9-6K-ACU] Page 2 & 4.
- Check for any short circuits in output of ACU1 and connected loads.
- Check for any short circuits in Oil cooling Blowers(59/1 & 59/2).
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

-

5.4.166 CCU Fault Code 632

Fault Text:

ACU 2: Overcurrent detected

Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

- Communication with ACU2 is ok.
- Loco variant is other than WAG9HH / WAP7HH.

Criteria:

- AUX2 output current is more than 600A for 100ms.
- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.

Components concerned:

Component	Device name
Aux Converter	1050.2
Current Sensors (ACU2)	-U4, -U5
M2000	-A3

Troubleshooting:

- Check the current sensors (-U4, -U5) & its wiring from sensor to X341 of -A3; Refer Drawing [WAG9-6K-ACU2] Page 2 & 4.
- Check for any short circuits in output of ACU2 and connected loads.
- Check for any short circuits in Traction motor Blowers(53/1 & 53/2), Oil Pump transformers(62/1 & 62/2), Oil Pump converters(63/1 & 63/2).
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

-

5.4.167 CCU Fault Code 633

Fault Text:

ACU 3: Overcurrent detected

Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

- Communication with ACU3 is ok.
- Loco variant is other than WAG9HH / WAP7HH.

Criteria:

- AUX3 output current is more than 600A for 100ms.
- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.

Components concerned:

Component	Device name
Aux Converter	1050.2
Output CT (AUX3)	-U11, -U12
-M2000	-A4

Troubleshooting:

- Check the current sensors (-U11, -U12) & its wiring from sensor to X341 of -A4; Refer Drawing [WAG9-6K-ACU2] Page 9 & 11.
- Check for any short circuits in output of ACU2 and connected loads.
- Check for any short circuits in Scavange Blowers(55/1 & 55/2), Compressor(47/1 & 47/2), Battery Charger(-G5).
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

-

5.4.168 CCU Fault Code 634

Fault Text:

ACU Overcurrent detected-VCB Locked

Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7

Sub-system:

Auxiliary

Condition:

- ACU1/ACU2/ACU3 communication ok.

Criteria:

- AUX1/AUX2/AUX3 output current is more than or equal to 600A.

Components concerned:

Component	Device name
Aux current sensor AUX	- U4,U5 -1050.1, 1050.2

Troubleshooting:

- Check for other fault codes FC_0631,FC_0632,FC_0633. If any of this fault code if triggered follow its troubleshooting steps to check repair/replace wiring for short circuit between AUX and its loads.
- Check current sensor U4 and U5 refer, Refer drawing [WAG9-6K] 02C sheet 3,02E sheet 5,02G sheet 7.
- Check repair/replace battery charger circuit for any short circuit refer [WAG9-6K] pages 04A, 04B.

Reaction:

- VCB will be locked.

Related messages:

0631, 0632, 0633

-

5.4.169 CCU Fault Code 635

Fault Text:

Earth fault in AUX Circuit.

Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- IO station 21 communication ok.

Criteria:

- Earth fault detected via earth fault monitoring relay 89.2 on E212_07

Components concerned:

Component	Device name
IO station 21	- E212_07
Earth fault relay AUX	- 89.2

Troubleshooting:

- Check repair/replace wiring between IO module E212_07 to relay contact 89.2. Relay contact 89.2 to CB 127.2/2 refer [WAG9_9K], 04D.8.
- Other reasons could be
 - missing earth strap
 - not full/complete missing mounting of the shield of a cable
 - humidity (e.g. contact of shielding with the wire).
 - connections not tightened enough
 - serious fault of one of the components of the AUX (one of the components scorched)
- Check repair/replace IO modules E212_07.
- Check repair/replace earth fault relay 89.2.

Reaction:

- Earth detected indicated on display.

Related messages:

5.4.170 CCU Fault Code 640

Fault Text:

TM1 is isolated.

Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication with TCU1 is ok.
- Simulation mode not active.
- Master controller not at zero position.

Criteria:

TM1 will be isolated with any of below faults.

- TM1 Temperature sensor or speed sensors are Faulty.
- TM1 Current Sensors Faulty.
- Cut out request for isolation of TM1 from display.
- Excessive change in value of detected speed.

- Components concerned:

Component	Device name
Traction Motor - 1	20/1
Speed Sensor	93.2/1
Temperature Sensors	98/1 & 98/2
Current Sensors	-U3 & -U4
ICU PWM1 A	-A100-C139
TP12	-A400
Inverter -1 (PWM1 A/TCC-1)	-A3

Troubleshooting:

- Check for any damages or short circuits of Traction motor – 1(20/1) and its wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 01D sheet no 4.
- Check the sensors of Traction motor(20/1) and related wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 12D sheet no 4.
- Check the wiring between +C139 of ICU PWMI A (-A100) and TCC1 415.HA/1 (-X7.1), TCC1 415.HA/2 (-X7.2) for any speed sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 27.
- Check the wiring between TP12 of -A400 and TCC1 415.DA/1 (-X4) for any temperature sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 25.
- Check the wiring between +C139 ICU PWMI A (-A100) and current sensors (-U3, -U4) for any current sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 19.
- Check the Inverter – 1(-A3 PWMI A/TCC-1) for any abnormalities.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered and TM1 isolates.

Related messages:

-

5.4.171 CCU Fault Code 641

Fault Text:

TM2 is isolated.

Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication with TCU1 is ok.
- Simulation mode not active.
- Master controller not at zero position.

Criteria:

- TM1 will be isolated with any of below faults.
 - TM2 Temperature sensor or speed sensors are Faulty.
 - TM2 Current Sensors Faulty.
 - Cut out request for isolation of TM2 from display.
 - Excessive change in value of detected speed.
- Components concerned:

Component	Device name
Traction Motor - 2	20/2
Speed Sensor	93.2/2
Temperature Sensors	98/3 & 98/4
Current Sensors	-U5 & -U6
ICU PWMI B	-A100
TP12	-A400
Inverter – 2(PWMI B/TCC-1)	-A4

Troubleshooting:

- Check for any damages or short circuits in Traction motor – 2(20/2) and its wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 01D sheet no 4.
- Check the sensors of Traction motor(20/2) and related wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 12D sheet no 4.
- Check the wiring between +C119 of ICU PWMI B (-A100) and TCC1 415.HC/1 (-X8.1), TCC1 415.HC/2(-X8.2) for any speed sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 27.
- Check the wiring between TP12 of -A400 and TCC1 415.DC/1 (-X5) for any temperature sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 25.
- Check the wiring between +C119 of ICU PWMI B (-A100) and current sensors (-U5, -U6) for any current sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 20.
- Check the Inverter – 2(-A4 PWMI B/TCC-1) for any abnormalities.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered and TM2 isolates.

Related messages:

-

Fault Text:**TM3 is isolated.**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication with TCU1 is ok.
- Simulation mode not active.
- Master controller not at zero position.

Criteria:

- TM1 will be isolated with any of below faults.
 - TM3 Temperature sensor or speed sensors are Faulty.
 - TM3 Current Sensors Faulty.
 - TC3 Traction interlock.
 - Cut out request for isolation of TM3 from display.
 - Excessive change in value of detected speed.

- Components concerned:

Component	Device name
Traction Motor - 3	20/3
Speed Sensor	93.2/3
Temperature Sensors	98/5 & 98/6
Current Sensors	-U7 & -U8
ICU PWMI C	-A100
TP12	-A400
Inverter – 3 (PWMI C/TCC-1)	-A5

Troubleshooting:

- Check for any damages or short circuits in Traction motor – 3(20/3) and its wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 01D sheet no 4.
- Check the sensors of Traction motor(20/3) and related wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 12D sheet no 4.
- Check the wiring between +C099 of ICU PWMI C (-A100) and TCC1 415.HE/1 (-X9.1), TCC1 415.HE/2 (-X9.2) for speed sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 27.
- Check the wiring between TP12 of -A400 and TCC1 415.DE/1 (-X6) for temperature sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 26.
- Check the wiring between +C099 ICU PWMI B (-A100) and current sensors (-U7, -U8) for any current sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 21.
- Check the Inverter – 3(-A5 PWI C/TCC-1) for any abnormalities.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered and TM3 isolates.

Related messages:

-

Fault Text:**TM4 is isolated.**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication with TCU2 is ok.
- Simulation mode not active.
- Master controller not at zero position.

Criteria:

- TM4 will be isolated with any of below faults.
 - TM4 Temperature sensor or speed sensors are Faulty.
 - TM4 Current Sensors Faulty.
 - TC4 Traction interlock.
 - Cut out request for isolation of TM4 from display.
 - Excessive change in value of detected speed.

Components concerned:

Component	Device name
Traction Motor - 4	20/4
Speed Sensor	93.2/4
Temperature Sensors	98/7 & 98/8
Current Sensors	-U7 & -U8
ICU PWMI C	-A100
-A400	TP12
Inverter – 6 (PWMI C/TCC-2)	-A5

Troubleshooting:

- Check for any damages or short circuits if any in Traction motor – 4(20/4) and its wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 01G sheet no 7.
- Check the sensors of Traction motor(20/3) and related wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 12H sheet no 8.
- Check the wiring between +C099 of ICU PWMI C (-A100) and TCC2 415.HE/3 (-9.1), TCC2 415.HE/4 for any speed sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 27.
- Check the wiring between TP12 of -A400 and TCC2 415.DA/2 (-X4) for any temperature sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 25.
- Check the wiring between +C099 ICU PWMI B (-A100) and current sensors (-U7, -U8) for any current sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 21.
- Check/Replace Inverter – 6(-A5 PWMI C/TCC-2).
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered and TM4 isolates.

Related messages:

-

5.4.174 CCU Fault Code 644

Fault Text:

TM5 is isolated.

Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication with TCU2 is ok.
- Simulation mode not active.
- Master controller not at zero position.

Criteria:

- TM5 will be isolated with any of below faults.
 - TM5 Temperature sensor or speed sensors are Faulty.
 - TM5 Current Sensors Faulty.
 - TC5 Traction interlock.
 - Cut out request for isolation of TM5 from display.
 - Excessive change in value of detected speed.

Components concerned:

Component	Device name
Traction Motor - 5	20/5
Speed Sensor	93.2/5
Temperature Sensors	98/9 & 98/10
Current Sensors	-U5 & -U6
ICU PWMI B	-A100
-A400	TP12
Inverter – 5 (PWMI B/TCC-2)	-A4

Troubleshooting:

- Check for any damages or short circuits if any in Traction motor – 5(20/5) and its wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 01G sheet no 7.
- Check the sensors of Traction motor(20/3) and related wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 12H sheet no 8.
- Check the wiring between +C119 of ICU PWMI B (-A100) and TCC2 415.HC/3 (-X8.1), TCC2 415.HC/4 (-X8.2) for any speed sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 27.
- Check the wiring between TP12 of -A400 and TCC2 415.DC/2 (-X5) for temperature sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 25.
- Check the wiring between +C119 ICU PWMI B (-A100) and current sensors (-U5, -U6) for any current sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 20.
- Check the Inverter – 5(-A4 PWMI B/TCC-2) for any abnormalities.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered and TM5 isolates.

Related messages:

-

5.4.175 CCU Fault Code 645

Fault Text:

TM6 is isolated.

Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication with TCU2 is ok.
- Simulation mode not active.
- Master controller not at zero position.

Criteria:

- TM6 will be isolated with any of below faults.
 - TM6 Temperature sensor or speed sensors are Faulty.
 - TM6 Current Sensors Faulty.
 - TC6 Traction interlock.
 - Cut out request for isolation of TM6 from display.
 - Excessive change in value of detected speed.

- Components concerned:

Component	Device name
Traction Motor - 6	20/6
Speed Sensor	93.2/6
Temperature Sensors	98/11 & 98/12
Current Sensors	-U3 & -U4
ICU PWMI A	-A100
TP12	-A400
Inverter – 4(PWMI A/TCC-2)	-A3

Troubleshooting:

- Check for any damages or short circuits if any in Traction motor – 6(20/6); Refer drawing [WAG9_9K] or [WAG9_6K] 01G sheet no 7.
- Check the sensors of Traction motor(20/3) and related wiring; Refer drawing [WAG9_9K] or [WAG9_6K] 12H sheet no 8.
- Check the wiring between +C139 of ICU PWI -A100 and TCC2 415.HA/3 (-X7.1), TCC2 415.HA/4 (-X7.2) for any speed sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 27.
- Check the wiring between TP12 of -A400 and TCC2 415.DE/2 (-X6) for any temperature sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 26.
- Check the wiring between +C139 of ICU PWMI A (-A100) and current sensors (-U3, -U4) for any current sensor faulty; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 19
- Check the Inverter – 4(-A3 PWMI A/TCC-2) for any abnormalities.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered and TM6 isolates.

Related messages:

-

5.4.176 CCU Fault Code 650

Fault Text:

AUX 1 Isolated/Cutout

Priority Type:

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

- VCB closed.
- Loco variant is other than WAG9HH / WAP7HH.

Criteria:

- AUX1 will be isolated/Cutout in any of the following cases.
 - ACU1 communication error.
 - AUX1 overload or output over current.
 - AUX1 Contactor (52/5) close error.
 - AUX1 Switch On/Off fault.
 - ACU1 Inverter Heat sink over temperature.
 - No Close error with AUX1 Contactor (52/5).
 - AUX1 is locked.
 - Output voltage of AUX1 not available within 40 seconds from ACU1 ON request.
- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.

Components concerned:

Component	Device name
Aux Converter	1050.1

Troubleshooting:

- Check the faults if any logged related to AUX1 in CCU data.
- Check the AUX1 diagnostics data for related faults.
- If there is a fault refer troubleshooting for concerned fault.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.
- The entire load of AUX1 will switch over to remaining two auxiliary converters using switchover contactors.
- Contactors 52/1, 52/3, 52/4, 52.4/1, 52.5/2 will remain ON
- All loads will run at 50 Hz.

Related messages:

5.4.177 CCU Fault Code 651

Fault Text:

AUX 2 Isolated/Cutout

Priority Type:

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

- VCB closed.
- Loco variant is other than WAG9HH / WAP7HH.

Criteria:

- AUX2 will be isolated/Cutout in any of the following cases.
 - ACU2 communication error.
 - AUX2 overload or output over current.
 - AUX2 Contactor (52/4) open error.
 - AUX2 Switch On/Off fault.
 - ACU2 Inverter Heat sink over temperature.
 - No error with AUX2 Contactor (52/1).
 - AUX2 is locked.
 - Output voltage of AUX2 not available within 40 seconds from ACU2 ON request.
- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.

Components concerned:

Component	Device name
Aux Converter	1050.2

Troubleshooting:

- Check the faults if any logged related to AUX2 in CCU data.
- Check the AUX2 diagnostics data for related faults.
- If there is a fault refer troubleshooting for concerned fault.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.
- The entire load of AUX2 will switch over to remaining two auxiliary converters using switchover contactors.
- Contactors 52/3, 52/4, 52/5, 52.4/1, 52.5/2 will remain ON
- All loads will run at 50 Hz.

Related messages:

5.4.178 CCU Fault Code 652

Fault Text:

AUX 3 Isolated/Cutout

Priority Type:

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

- VCB closed.
- Loco variant is other than WAG9HH / WAP7HH.

Criteria:

- AUX3 will be isolated/Cutout in any of the following cases.
 - ACU3 communication error.
 - AUX3 overload or output over current.
 - No error in AUX2 Contactor (52/2).
 - No error in AUX3 Contactor (52/3).
 - AUX3 Contactor (52/1) open error.
 - AUX3 Switch On/Off fault.
 - ACU3 Inverter Heat sink over temperature.
 - No Close error with AUX3Contactor (52/5).
 - AUX3 is locked.
 - Output voltage of AUX3 not available within 40 seconds from ACU3 ON request.

Components concerned:

Component	Device name
Aux Converter	1050.2

Troubleshooting:

- Check the faults if any logged related to AUX3 in CCU data.
- Check the AUX3 diagnostics data for related faults.
- If there is a fault refer troubleshooting for concerned fault.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.
- The entire load of AUX3 will switch over to remaining two auxiliary converters using switchover contactors.
- Contactors 52/2, 52/4, 52/5, 52.4/1, 52.5/2 will remain ON
- All loads will run at 50 Hz.

Related messages:

5.4.179 CCU Fault Code 664

Fault Text:

Auxiliary 1 M1300 /Rectifier Temperature error

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- Auxiliary 1 Temperature error

Criteria:

- AUX1 controller M1300 Internal Temperature sensor error (Bit4).
- AUX1 Rectifier Fault detection Temperature sensor (Bit7).

Components concerned:

Component	Device name
AUX1	-426/1
MVB	-

Troubleshooting:

- Check the environment "ACU1 Isolation Status" bits for rectifier & Master Temperature sensor error reason.
- Check the environment "ACU 1 Reset status" (Bit 28) for ACU1 Inverter Temperature sensor error

10584: \$ACU1ISO [] (ACU1 Isolation Status): 0000 0000 0000 0000	
Bit	Reason
4	ACU1 master Temperature sensor error
7	ACU1 rectifier Fault detection temperature sensor

10588: \$ACU1RES [] (ACU1 Reset Status): 0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
28	ACU1 Inverter Temperature sensor error

- Check/repair the Rectifier's temperature using SIBAS tool. If abnormal temp, check sensor wiring, see page [WAG9-6K] page 02
- Check/repair the inverter temperature using SIBAS tool. If abnormal temp, check sensor wiring, see page [WAG9-6K] page 03
- Replace M1300 and check if fault cleared.
- Check AUX1 diagnostics for related fault.

Reaction:

- Fault code triggered
- AUX1 will isolate

Related messages:

-

5.4.180 CCU Fault Code 665

Fault Text

Auxiliary 1 Communication error

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX1 communication is not ok.

Criteria:

- AUX1 controller M1300 has internal fault (Bit1).
- AUX1 controller M1300 has MVB timeout(Bit2).
- AUX1 controller M1300 has CAN bus fault(Bit3).

Components concerned:

Component	Device name
AUX1-M1300	-426/1
MVB	-

Troubleshooting:

- Check the environment "ACU1 Isolation Status" bits for exact reason.

10584: \$ACU1ISO [] (ACU1 Isolation Status) :	
0000 0000 0000 0000	
Bit	Reason
1	ACU1 master Connector code M1300
2	ACU1 master CAN1-Bus fault
3	ACU1 master MVB Timeout

- Check CB 127.22/1 and wiring connection between CB and ACU. If necessary replace the CB or wiring. See diag [WAG9-6K] page 05L,9D
- Check MVB and CAN wiring to AUX1 M1300 module. See diag [WAG9-6K] page 09s
- Check AUX1 diagnostics for related fault.

Reaction:

- Fault code triggered
- AUX1 will isolate

Related messages:

5.4.181 CCU Fault Code 666

Fault Text:

Auxiliary 1 master or inverter Voltage sensor fault / voltage difference.

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX1 communication is ok and not isolated.

Criteria:

AUX1 output voltage has voltage difference between transducers(Bit18). check the environment "ACU1 Isolate Status" bit 09.

10584: \$ACU1ISO [] (ACU1 Isolation Status) :	
0000 0000 0000 0000	
Bit	Reason
9	ACU1 Inverter U in difference

- AUX1 output voltage RMS has over/under voltage. check the environment "ACU1 Reset Status" bit 14.

10588: \$ACU1RES [] (ACU1 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
14	ACU1 Inverter U in rms max,min

Components concerned:

Component	Device name
AUX1-M2000	-A3
AUX1-Voltage transducers	-U6,U7
Auxiliary Load	

Troubleshooting:

- Check/repair power supply and wiring connections between Diode card A5 to M2000-X040. See diag [WAG9-6K-ACU] page 04.B2,16.E5
- Check/repair the load connected to AUX1.
- Check/repair the voltage transducer U6,U7 to M2000-X341 See diag [WAG9-6K-ACU] page 02.C6,04.E6
- Check AUX1 diagnostics for the related fault

Reaction:

- Fault code triggered
- AUX1 will restart, if fault persists will get isolate.

Related messages:

-

5.4.182 CCU Fault Code 667

Fault Text:

Auxiliary 1 M1300 Power supply faulty / Internal error.

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX1 communication is ok and not isolated.

Criteria:

- AUX1 controller M1300 has powersupply fault(Bit1).
- AUX1 controller M1300 has internal error(Bit2).
- AUX1 controller M1300 has unknown error(Bit0).

Components concerned:

Component	Device name
AUX1-M1300	-426/1
	-426/2

Troubleshooting:

- Check the environment "ACU1 Reset Status" bits for exact reason.

10588: \$ACU1RES [] (ACU1 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
0	ACU1 master Unknown Error
1	ACU1 master Power supply unit fault
2	ACU1 master Internal error

- Check/repair CB 127.22/1 and wiring connections between CB and AUX. If necessary replace the CB or wiring. See diag [WAG9-6K] page 05I,9D
- Check/repair the power supply to AUX1-M1300
- Check AUX1 diagnostics for Internal/Unkown faults

Reaction:

- Fault code triggered
- AUX1 will restart, if fault persists will get isolate

Related messages:

5.4.183 CCU Fault Code 668

Fault Text:

Auxiliary 1 Rectifier input voltage min/max detected

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX1 Temperature error

Criteria:

- AUX1 controller Input Voltage Low (Bit5).
- AUX1 controller Input Voltage High (Bit4).

Components concerned:

Component	Device name
AUX1	-426/1
MVB	-

Troubleshooting:

- Check the enviroment "ACU 1 Reset status" for any other error

10588: \$ACU1RES [] (ACU1 Reset Status): 0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
4	ACU1 rectifier U in Max rms
5	ACU1 rectifier U in Min rms

- Check downloads for Rectifier input voltage.
- Check U1 transduce power supply (U1+U1- wiring) and feed cable U1M to M1300. See diag [WAG9-6K] Page 1& 3. Fix wiring to module and check or replace U1 transducer.
- Check Input Voltage using SIBCOS tool and replace M1300
- Check AUX1 diagnostics for related faults

Reaction:

- Fault code triggered
- AUX1 will isolate

Related messages:

-

5.4.184 CCU Fault Code 669

Fault Text:

Auxiliary 1 DC-Link voltage min/max detected

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX1 communication ok and not isolated

Criteria:

- AUX1 rectifier output DCL has over voltage(Bit7).
- AUX1 rectifier output DCL has under voltage(Bit8).

Components concerned:

Component	Device name
AUX1-M1300	-A1
AUX1-Voltage transducers	-U3
Auxiliary Load	-

Troubleshooting:

- Check the environment "ACU1 Reset Status" bits for exact reason.

10588: \$ACU1RES [] (ACU1 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
7	ACU1 rectifier U DC-Link min
8	ACU1 rectifier U DC-Link Max rms

- Check/repair power supply and wiring connections between Diode card A5 to M1300-X040. See diag [WAG9-6K-ACU] page 03.B2,9.A7
- Check/repair the load connected to AUX1
- Check/repair the voltage transducers U3 and wiring between o/p voltage transducer-U3 to M1300-X251. See diag [WAG9-6K-ACU] page 01.E8,03.F3
- Check AUX1 diagnostics for related faults

Reaction:

- Fault code triggered
- AUX1 will restart, if faults persists will get isolate.

Related messages:

Fault Text:

Auxiliary 1 Inverter output voltage min/max detected

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX1 communication ok and not isolated

Criteria:

- AUX1 output voltage RMS has over voltage(Bit16).
- AUX1 output voltage RMS has under voltage(Bit17).
- AUX1 output voltage RMS has voltage difference between transducers(Bit18).

Components concerned:

Component	Device name
AUX1-M2000	-A3
AUX1-Voltage transducers	-U6,U7
Auxiliary Load	-

Troubleshooting:

- Check the environment "ACU1 Reset Status" bits for exact reason.

10588: \$ACU1RES [] (ACU1 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
16	ACU1 Inverter U out (rms) max L1/L2,L2/L3,L3/L1
17	ACU1 Inverter U out (rms) min L1/L2,L2/L3,L3/L1
18	ACU1 Inverter U out difference

- Check/repair power supply and wiring connections between Diode card A5 to M2000-X040.See diag [WAG9-6K-ACU] page 04.B2,16.E5
- Check/repair the load connected to AUX1
- Check/repair the voltage transducers U6,U7 and wiring between o/p voltage transducer-U6,U7 to M2000-X341. See diag [WAG9-6K-ACU] page 02.C6,04.E6
- Check AUX1 diagnostics for related faults

Reaction:

- Fault code triggered
- AUX1 will restart, if faults persists will get isolate

Related messages:

-

5.4.186 CCU Fault Code 671

Fault Text:

Auxiliary 1 Load short circuit / overload / Sine filter error detected

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- Auxiliary 1 Lods short circuit /overload / Sine filter error detected.

Criteria:

- AUX1 Check for any Short Circuit in input short circuit (Bit26).
- AUX1 Check for any short circuit in out put L1/L2/L3 (Bit20).
- AUX1 Check for any short circuit in Sign Filter Choke (Bit22).
- AUX1 Check for any Phase Imbalance (Bit23).

Components concerned:

Component	Device name
AUX1	-426/1
MVB	-

Troubleshooting:

- Check the environment "ACU 1 Reset status" for any other error's

10588: \$ACU1RES [] (ACU1 Reset Status): 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
20	ACU1 Inverter I out (rms) IL1,IL2,IL3
21	ACU1 Inverter I out total
22	ACU1 Inverter Sine filter error
23	ACU1 Inverter Phase failure
24	ACU1 Inverter Control electronic fault
25	ACU1 Inverter Earth fault DC-link
26	ACU1 Inverter Short circuit

- Check/repair any phase failure.
- Check if there is any erratic value of phase current and voltage using SIBMON tool.
- Check/repair output current transducers and wiring to the module or replace M1300
- Check for short circuit in wiring and replace inverter Assembly or sign filter which ever is faulty.
- Check AUX1 diagnostics for related faults

Reaction:

- Fault code triggered
- AUX1 will isolate

Related messages:

5.4.187 CCU Fault Code 672

Fault Text

Auxiliary 2 M1300 /Rectifier Temperature error

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- Auxiliary 2 Temperature error

Criteria:

- AUX2 controller M1300 Internal Temperature sensor error (Bit4).
- AUX2 Rectifier Fault detection Temperature sensor (Bit7).

Components concerned:

Component	Device name
AUX2	-426/2
MVB	-

Troubleshooting:

- Check the environment "ACU2 Isolation Status" bits for rectifier & Master Temperature sensor error reason.
- Check the environment "ACU 2 Reset status" (Bit 28) for ACU1 Inverter Temperature sensor error

10585: \$ACU2ISO [] (ACU2 Isolation Status) :	
0000 0000 0000 0000	
Bit	Reason
4	ACU2 master Temperature sensor error
7	ACU2 rectifier Fault detection temperature sensor

10589: \$ACU2RES [] (ACU2 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
28	ACU2 Inverter Temperature sensor error

- Check/repair the Rectifier's temperature using SIBAS tool. If abnormal temp,check sensor wiring,see pag [WAG9-6K] page 02
- Check the inverter temperature using SIBAS tool. If abnormal temp,check/repair sensor wiring,see pag [WAG9-6K] page 03

SIEMENS

- Replace M1300 and check if fault cleared.
- Check AUX2 diagnostics for related fault.

Reaction:

- Fault code triggered
- AUX2 will isolate

Related messages:

-

5.4.188 CCU Fault Code 673

Fault Text:

Auxiliary 2 Communication Error

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX2 communication is not ok

Criteria:

- AUX2 controller M1300 has internal fault (Bit1).
- AUX2 controller M1300 has MVB timeout(Bit2).
- AUX2 controller M1300 has CAN bus fault(Bit3).

Components concerned:

Component	Device name
AUX2-M1300	-426/2
MVB	-

Troubleshooting:

- Check the environment "ACU2 Isolation Status" bits for exact reason.

10585: \$ACU2ISO [] (ACU2 Isolation Status) :	
0000 0000 0000 0000	
Bit	Reason
0	ACU2 master Locked
1	ACU2 master Connector code M1300
2	ACU2 master CAN1-Bus fault
3	ACU2 master MVB Timeout

- Check/repair CB 127.22/2 and wiring connection between CB and ACU.See diag [WAG9-6K] page 05I,9E
- Check/repair MVB and CAN wiring to AUX2 M1300 module See diag [WAG9-6K] page 09G
- Check AUX2 diagnostics for related faults

Reaction:

- Fault code triggered
- AUX2 will isolate

Related messages:

0063

5.4.189 CCU Fault Code 674

Fault Text:

Auxiliary 2 master or inverter voltage sensor fault/ voltage difference.

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX2 communication ok and not isolated.

Criteria:

- AUX2 output voltage has voltage difference between transducers(Bit18).

Components concerned:

Component	Device name
AUX2-M2000	-A3
AUX2-Voltage transducers	-U6,U7
Auxiliary load	-

Troubleshooting:

- check the environment “ACU2 Isolate Status” bit 09.

10585: \$ACU2ISO [] (ACU2 Isolation Status) :	
0000 0000 0000 0000	
Bit	Reason
9	ACU2 Inverter U in difference

- AUX2 output voltage RMS has over/under voltage. check the environment “ACU2 Reset Status” bit 14.

10589: \$ACU2RES [] (ACU2 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
14	ACU2 Inverter U in rms max,min

- Check/repair power supply and wiring connection between Diode card A5 to M2000-X040 .See diag [WAG9-6K-ACU2] page 04.B2,16.E5
- Check/repair load connected to AUX2.
- Check/repair the voltage transducer U6,U7 and wiring between o/p voltage transducer U6,U7 to M2000-X341 see diag [WAG9-6K-ACU2] page 02.C6,04.E6
- Check AUX2 diagnostics for related faults.

Reaction:

- Fault code triggered
- AUX2 will restart, if fault persists will get isolate

Related messages:

-

Fault Text:

Auxiliary 2 M1300 Power supply faulty/internal error

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX2 communication ok and not isolated.

Criteria:

- AUX2 controller M1300 has powersupply fault(Bit1).
- AUX2 controller M1300 has internal error(Bit2).
- AUX2 controller M1300 has unknown error(Bit0).

Components concerned:

Component	Device name
AUX2-M1300	-426/2
-	-

Troubleshooting:

- Check the environment "ACU2 Reset Status" bits for exact reason.

10589: \$ACU2RES [] (ACU2 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
0	ACU2 master Unknown Error
1	ACU2 master Power supply unit fault
2	ACU2 master Internal error

- Check/repair CB 127.22/2 and wiring connections between CB and AUX. If necessary replace the CB or wiring. See diag [WAG9-6K] page 05I,9E
- Check/repair power supply to AUX2 M1300
- Check AUX2 diagnostics for the internal/Unkown faults.

Reaction:

- Fault code triggered
- AUX2 will restart, if fault persists will get isolate

Related messages:

-

5.4.191 CCU Fault Code 676

Fault Text:

Auxiliary 2 Rectifier input voltage min/max detected

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX2 Temperature error

Criteria:

- AUX2 controller Input Voltage Low (Bit5).
- AUX2 controller Input Voltage High (Bit4).
- Check the environment "ACU 2 Reset status" for any other error

10589: \$ACU2RES [] (ACU2 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
4	ACU2 rectifier U in Max rms
5	ACU2 rectifier U in Min rms

Components concerned:

Component	Device name
AUX2	-426/2
MVB	-

Troubleshooting:

- Check downloads for Rectifier input voltage.
- Check U1 transduce power supply (U1+U1- wiring) and feed cable U1M to M1300. See diag [WAG9-6K] Page 1& 3. Fix wiring to module and check or replace U1 transducer.
- Check Input Voltage using SIBCOS tool and replace M1300
- Check AUX2 diagnostics for related faults

Reaction:

- Fault code triggered
- AUX2 will isolate

Related messages:

-

Fault Text:

Auxiliary 2 DC-Link Voltage min/max detected

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX2 communication ok and not isolated.

Criteria:

- AUX2 rectifier output DCL has over voltage(Bit7)
- AUX2 rectifier output DCL has under voltage(Bit8).
- Check the environment "ACU2 Reset Status" bits for exact reason.

10589: \$ACU2RES [] (ACU2 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
7	ACU2 rectifier U DC-Link min
8	ACU2 rectifier U DC-Link Max rms

Components concerned:

Component	Device name
AUX2-M1300	-A1
AUX2-Voltage transducers	-U3
Auxiliary Load	-

Troubleshooting:

- Check/repair and wiring connections between Diode card A5 to M1300-X040. See diag [WAG9-6K-ACU2] page 04.B2,16.A7
- Check/repair load connected to AUX2.
- Check/repair voltage transducer U3 and wiring between o/p voltage transducer U3 to M1300-X251 see diag [WAG9-6K-ACU2] page 01.E8,03.F3
- Check AUX2 diagnostics for the internal/Unknown faults.

Reaction:

- Fault code triggered
- AUX2 will restart, if fault persists will get isolate

Related messages:

-

Fault Text:

Auxiliary 2 Inverter Output Voltage min/max detected

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX2 communication ok and not isolated.

Criteria:

- AUX2 output voltage RMS has over voltage(Bit16).
- AUX2 output voltage RMS has under voltage(Bit17).
- AUX2 output voltage RMS has voltage difference between transducers(Bit18).
- Check the environment "ACU2 Reset Status" bits for exact reason.

10589: \$ACU2RES [] (ACU2 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
16	ACU2 Inverter U out (rms) max L1/L2,L2/L3,L3/L1
17	ACU2 Inverter U out (rms) min L1/L2,L2/L3,L3/L1
18	ACU2 Inverter U out difference

Components concerned:

Component	Device name
AUX2-M2000	-A3
AUX2-Voltage transducers	-U6,U7
Auxiliary Load	-

Troubleshooting:

- Check/repair and wiring connections between Diode card A5 to M2000-X040.See diag [WAG9-6K-ACU2] page 04.B2,16.E5
- Check/repair load connected to AUX2.
- Check/repair voltage transducer U6,U7 and wiring between o/p voltage transducer U6,U7 to M2000-X341 see diag [WAG9-6K-ACU2] page 02.C6,04.E6
- Check AUX2 diagnostics for related faults.

Reaction:

- Fault code triggered
- AUX2 will restart, if fault persists will get isolate

Related messages:

-

Fault Text:

Auxiliary 2 Load short circuit / overload / Sine filter error detected

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- Auxiliary 2 Lods short circuit /overload / Sine filter error detected.

Criteria:

- AUX2 Check for any Short Circuit in input short circuit (Bit26).
- AUX2 Check for any short circuit in out put L1/L2/L3 (Bit20).
- AUX2 Check for any short circuit in Sign Filter Choke (Bit22).
- AUX2 Check for any Phase Imbalance (Bit23).
- Check the environment "ACU 2 Reset status" for any other error's

10589: \$ACU2RES [] (ACU2 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
20	ACU2 Inverter I out (rms) IL1,IL2,IL3
22	ACU2 Inverter Sine filter error
23	ACU2 Inverter Phase failure

Components concerned:

Component	Device name
AUX1	-426/2
MVB	-

Troubleshooting:

- Check/repair any phase failure.
- Check if there is any erratic value of phase current and voltage using SIBMON tool.
- Check/repair output current transducers and wiring to the module or replace M1300
- Check for short circuit in wiring and replace inverter Assembly or sign filter which ever is faulty.
- Check AUX2 diagnostics for related faults

Reaction:

- Fault code triggered
- AUX2 will isolate

Related messages:

-

5.4.195 CCU Fault Code 680

Fault Text:

Auxiliary 3 M1300 Power supply faulty/internal error

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX3 communication ok and not isolated.

Criteria:

- AUX3 controller M1300 has power supply fault(Bit1).
- AUX3 controller M1300 has internal error(Bit2).
- AUX3 controller M1300 has unknown error(Bit0).
- Check the environment "ACU3 Reset Status" bits for exact reason.

10590: \$ACU3RES [] (ACU3 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
0	ACU3 master Unknown Error
1	ACU3 master Power supply unit fault
2	ACU3 master Internal error

Components concerned:

Component	Device name
AUX3-M1300	-426/3
-	-

Troubleshooting:

- Check/repair CB 127.22/3 and wiring connections between CB and AUX. If necessary replace the CB or wiring. See diag [WAG9-6K] page 05K,9E
- Check/repair power supply to AUX3 M1300
- Check AUX3 diagnostics for the internal/Unknown faults.

Reaction:

- Fault code triggered
- AUX3 will restart, if fault persists will get isolate

Related messages:

-

Fault Text:

Auxiliary 3 Communication Error

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX3 communication is not ok

Criteria:

- AUX3 controller M1300 has internal fault (Bit1).
- AUX3 controller M1300 has MVB timeout(Bit2).
- AUX3 controller M1300 has CAN bus fault(Bit3).
- Check the environment "ACU3 Isolation Status" bits for exact reason.

10586: \$ACU3ISO [] (ACU3 Isolation Status) :	
0000 0000 0000 0000	
Bit	Reason
0	ACU3 master Locked
1	ACU3 master Connector code M1300
2	ACU3 master CAN1-Bus fault
3	ACU3 master MVB Timeout

Components concerned:

Component	Device name
AUX3-M1300	-426/3
MVB	-

Troubleshooting:

- Check/repair CB 127.22/3 and wiring connections between CB and AUX. If necessary replace the CB or wiring. See diag [WAG9-6K] page 05k,9E
- Check/repair MVB and CAN wiring to AUX3 M1300 module. See diag [WAG9-6K] page 09 G
- Check AUX3 diagnostics for related faults.

Reaction:

- Fault code triggered
- AUX3 will isolate

Related messages:

0064

Fault Text:

Auxiliary 3 master or inverter voltage sensor fault/voltage difference.

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX3 communication is not ok

Criteria:

AUX3 output voltage has voltage difference between transducers(Bit18). check the environment "ACU3 Isolate Status" bit 09.

10586: \$ACU3ISO [] (ACU3 Isolation Status) :	
0000 0000 0000 0000	
Bit	Reason
9	ACU3 Inverter U in difference

- AUX2 output voltage RMS has over/under voltage. check the environment "ACU2 Reset Status" bit 14.

10590: \$ACU3RES [] (ACU3 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
14	ACU3 Inverter U in rms max,min

Components concerned:

Component	Device name
AUX3-M2000	-A4
AUX3-Voltage transducers	-U6,U7
Auxiliary Load	-

Troubleshooting:

- Check/repair power supply and wiring connections between Diode card A5 to M2000-X040. See diag [WAG9-6K-ACU2] page 11.B2, 16.E5
- Check/repair load connected to AUX3
- Check/repair the voltage transducer U6,U7 to M2000-X341. See diag [WAG9-6K-ACU2] page 09.C6, 11.E6
- Check AUX3 diagnostics for the related faults

Reaction:

- Fault code triggered
- AUX3 will restart, if faults persists will get isolate

Related messages:

-

Fault Text:

Auxiliary 3 M1300 Power supply faulty/internal error

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX3 communication ok and not isolated

Criteria:

- AUX3 controller M1300 has power supply fault(Bit1).
- AUX3 controller M1300 has internal error(Bit2).
- AUX3 controller M1300 has unknown error(Bit0).
- Check the environment "ACU3 Reset Status" bits for exact reason.

10590: \$ACU3RES [] (ACU3 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
0	ACU3 master Unknown Error
1	ACU3 master Power supply unit fault
2	ACU3 master Internal error

Components concerned:

Component	Device name
AUX3-M1300	-426/3

Troubleshooting:

- Check/repair CB 127.22/3 and wiring connections between CB and AUX. If necessary replace CB or wiring . See diag [WAG9-6K] page 05K,9E
- Check and repair power supply to AUX3-M1300
- Check AUX3 diagnostics for the related faults

Reaction:

- Fault code triggered
- AUX3 will restart, if faults persists will get isolate

Related messages:

-

Fault Text:

Auxiliary 3 Rectifier input voltage min/max detected

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX3 Temperature error

Criteria:

- AUX3 controller Input Voltage Low (Bit5).
- AUX3 controller Input Voltage High (Bit4).
- Check the environment "ACU 3 Reset status" for any other error

10590: \$ACU3RES [] (ACU3 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
4	ACU3 rectifier U in Max rms
5	ACU3 rectifier U in Min rms

Components concerned:

Component	Device name
AUX3	-426/3
MVB	-

Troubleshooting:

- Check downloads for Rectifier input voltage.
- Check U1 transduce power supply (U1+U1- wiring) and feed cable U1M to M1300. See diag [WAG9-6K] Page 1& 3. Fix wiring to module and check or replace U1 transducer.
- Check Input Voltage using SIBCOS tool and replace M1300
- Check AUX3 diagnostics for related faults

Reaction:

- Fault code triggered
- AUX3 will isolate

Related messages

-

Fault Text:

Auxiliary 3 DC-Link voltage min/max detected

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX3 communication ok and not isolated

Criteria:

- AUX3 rectifier output DCL has over voltage(Bit7).
- AUX3 rectifier output DCL has under voltage(Bit8).
- Check the environment "ACU3 Reset Status" bits for exact reason.

10590: \$ACU3RES [] (ACU3 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
7	ACU3 rectifier U DC-Link min
8	ACU3 rectifier U DC-Link Max rms

Components concerned:

Component	Device name
AUX3-M1300	-A2
AUX3-Voltage transducers	-U10
Auxiliary Load	-

Troubleshooting:

- Check/repair power supply and wiring connections between Diode card A7 to M1300-X040. See diag [WAG9-6K-ACU2] page 10.B2, 16.C7
- Check/repair load connected to AUX3
- Check/repair the voltage transducer U10 and wiring between o/p voltage transducer U10 to M1300-X251 See diag [WAG9-6K-ACU2] page 08.E8,10.F3
- Check AUX3 diagnostics for the related faults

Reaction:

- Fault code triggered
- AUX3 will restart, if faults persists will get isolate

Related messages:

-

Fault Text:

Auxiliary 3 Inverter output voltage min/max detected

Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- AUX3 communication ok and not isolated

Criteria:

- AUX3 output voltage RMS has over voltage(Bit16).
- AUX3 output voltage RMS has under voltage(Bit17).
- AUX3 output voltage RMS has voltage difference between transducers(Bit18).
- Check the environment "ACU3 Reset Status" bits for exact reason.

10590: \$ACU3RES [] (ACU3 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
16	ACU3 Inverter U out (rms) max L1/L2,L2/L3,L3/L1
17	ACU3 Inverter U out (rms) min L1/L2,L2/L3,L3/L1
18	ACU3 Inverter U out difference

Components concerned:

Component	Device name
AUX3-M2000	-A4
AUX3-Voltage transducers	-U6,U7
Auxiliary Load	-

Troubleshooting:

- Check/repair power supply and wiring connections between Diode card A5 to M2000-X040. See diag [WAG9-6K-ACU3] page 11.B2, 16.E5
- Check/repair load connected to AUX3
- Check/repair the voltage transducer U6,U7 and wiring between o/p voltage transducer U6,U7 to M2000-X341 See diag [WAG9-6K-ACU3] page 09.C6,11.E6
- Check AUX3 diagnostics for the related faults

Reaction:

- Fault code triggered
- AUX3 will restart,if faults persists will get isolate

Related messages:

Fault Text:

Auxiliary 3 Load short circuit / overload / Sine filter error detected

Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9

Sub-system:

AUX

Condition:

- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.
- Auxiliary 2 Lods short circuit /overload / Sine filter error detected.

Criteria:

- AUX3 Check for any Short Circuit in input short circuit (Bit26).
- AUX3 Check for any short circuit in out put L1/L2/L3 (Bit20).
- AUX3 Check for any short circuit in Sign Filter Choke (Bit22).
- AUX3 Check for any Phase Imbalance (Bit23).
- Check the environment "ACU 3 Reset status" for any other error's

10590: \$ACU3RES [] (ACU3 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
20	ACU3 Inverter I out (rms) IL1,IL2,IL3
22	ACU3 Inverter Sine filter error
23	ACU3 Inverter Phase failure
26	ACU3 Inverter Short circuit

Components concerned:

Component	Device name
AUX3	-426/3
MVB	-

Troubleshooting:

- Check/repair any phase failure.
- Check if there is any erratic value of phase current and voltage using SIBMON tool.
- Check/repair output current transducers and wiring to the module or replace M1300
- Check for short circuit in wiring and replace inverter Assembly or sign filter which ever is faulty.
- Check AUX2 diagnostics for related faults

Reaction:

- Fault code triggered
- AUX2 will isolate

Related messages:

Fault Text:

Auxiliary 1 DC-Link current min / max detected.

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7

Sub-system:

Auxiliary

Condition:

- CCU is master.
- AUX1 communication ok.

Criteria:

- Aux1 DC-Link current crossed min/max limit.

Components concerned:

Component	Device name
Aux1 current transducer	- U2
AUX1	-1050.1
Auxiliary Loads	-

Troubleshooting:

- AUX1 rectifier output DCL has max current(Bit24).
- Check the environment "ACU1 Reset Status" bits for exact reason.

10588: \$ACU1RES [] (ACU1 Reset Status): 0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
24	ACU1 Rectifier DC link Current Maximum rms

- Check and repair/replace wiring connections between rectifier and G1-AUX1 terminal 3 to U2 DC link current transducer to DC link chock (L1) X1:3 refer [WAG9-6K] page 02B.
- Check the wiring between DC link current transducer (U2) to AUX1-M1300-X251, refer drawing [WAG9-6K-ACU1] sheet 1 and sheet 3.
- Check loads connected to AUX1 Scavenge Blower, Oil cooling unit blower refer [WAG9-6K] page 02Z.
- Check AUX1 diagnostics for other fault codes.

Reaction:

- AUX1 will restart, if fault persists will get isolate

Related messages:

-

Fault Text:

Auxiliary 2 DC-Link current min / max detected.

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7

Sub-system:

Auxiliary

Condition:

- CCU is master.
- AUX2 communication ok.

Criteria:

- Aux2 DC-Link current crossed min/max limit.

Components concerned:

Component	Device name
AUX2 current transducer	- U2
AUX2	-1050.2
Auxiliary Loads	-

Troubleshooting:

- AUX2 rectifier output DCL has max current(Bit24).
- Check the environment "ACU2 Reset Status" bits for exact reason.

10589: \$ACU2RES [] (ACU2 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
24	ACU2 Rectifier DC link Current Maximum rms

- Check and repair/replace wiring connections between rectifier and G1-AUX2 3 to U2 DC link current transducer to DC link chock (L1) X1:3 refer [WAG9-6K] page 02D.
- Check the wiring between DC link current transducer (U2) to AUX2-M1300-X251, refer drawing [WAG9-6K-ACU2] sheet 1 and sheet 3.
- Check loads connected to AUX2 Traction motor blower1 and 2 refer [WAG9-6K] page 02Z.
- Check AUX2 diagnostics for other fault codes.

Reaction:

AUX2 will restart, if fault persists will get isolate

Related messages:

-

Fault Text:

Auxiliary 3 DC-Link current min / max detected.

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7

Sub-system:

Auxiliary

Condition:

- CCU is master.
- ACU3 communication ok.

Criteria:

- Aux3 DC-Link current crossed min/max limit.

Components concerned:

Component	Device name
AUX3 current transducer	- U9
AUX3	-1050.2
Auxiliary Loads	-

Troubleshooting:

- AUX3 rectifier output DCL has max current(Bit24).
- Check the environment "ACU3 Reset Status" bits for exact reason.

10590: \$ACU3RES [] (ACU3 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
24	ACU3 Rectifier DC link Current Maximum rms

- Check and repair/replace wiring connections between rectifier and G1-AUX3 3 to U9 DC link current transducer to DC link chock (L1) X1:3 refer [WAG9-6K] page 02F.
- Check the wiring between DC link current transducer (U9) to AUX3-M1300-X251, refer drawing [WAG9-6K-ACU2] sheet 8 and sheet 10.
- Check loads connected to AUX3 Main compressor unit, Converter pump, Oil pump transformer refer [WAG9-6K] page 2z.
- Check AUX3 diagnostics for other fault codes.

Reaction:

- AUX3 will restart, if fault persists will get isolate

Related messages:

-

Fault Text:**AUX 1 input fuse opened.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

- AUX1 communication is ok.

Criteria:

- Fuse opened might be because of short circuit, overload, ground fault.

Components concerned:

Component	Device name
Auxiliary1 Fuse	- F1

Troubleshooting:

- Check repair/replace Auxiliary fuse F1.
- If fuse is ok check repair/replace wiring between input voltage transducer U1 and Fuse F1. Fuse F1 and Rectifier module G1-AUX1 refer [WAG9-6K] page 02B.
- Check the environment "ACU1 Reset Status" bits for exact reason.

10588: \$ACU1RES [] (ACU1 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
13	ACU1_Input fuse open

- Check AUX1 diagnostics for other fault codes and follow troubleshooting steps for those fault codes.

Reaction:

-

Related messages:

-

Fault Text:**AUX 2 input fuse opened.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

AUX2 communication ok.

Criteria:

- Fuse opened might be because of short circuit, overload, ground fault.

Components concerned:

Component	Device name
Auxiliary2 Fuse	- F1

Troubleshooting:

- Check repair/replace Auxiliary fuse F1.
- If fuse is ok check repair/replace wiring between input voltage transducer U1 and Fuse F1. Fuse F1 and Rectifier module G1-AUX2 refer [WAG9-6K] page 02D.
- Check the environment "ACU2 Reset Status" bits for exact reason.

10589: \$ACU2RES [] (ACU2 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
13	ACU2_Input fuse open

- Check AUX2 diagnostics for other fault codes and follow troubleshooting steps for those fault codes.

Reaction:

-

Related messages:

-

Fault Text:**AUX 3 input fuse opened.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

- AUX3 communication ok.

Criteria:

- Fuse opened might be because of short circuit, overload, ground fault.

Components concerned:

Component	Device name
Auxiliary Fuse	- F1

Troubleshooting:

- Check repair/replace Auxiliary fuse F1.
- If fuse is ok check repair/replace wiring between input voltage transducer U1 and Fuse F1. Fuse F1 and Rectifier module G1-AUX3 refer [WAG9-6K] page 02F.
- Check the environment "ACU3 Reset Status" bits for exact reason.

10590: \$ACU3RES [] (ACU3 Reset Status) :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
13	ACU3_Input fuse open

- Check AUX3 diagnostics for other fault codes and follow troubleshooting steps for those fault codes.

Reaction:

-

Related messages:

-

Fault Text:**ACU1: detected Aux cont 52/4 dropout error**Priority Type

3 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9/WAG9 H 7MW/ WAP7 Upgrade

Sub-system:

AUX

Condition:

- Contactor 52/4 on command is not given by CCU to ACU1 still feedback is available in Aux1 from contactor 52/4 for 1s or longer. That means contactor is still closed.

Criteria:

- Aux1 contactor 52/4 On command is not given.
- AUX Contactor test active
- VCB off.
- CB Aux Contactor ON
- ACU1 to CCU master MVB communication is OK.
- AUX3_Contactor 52/3 test has quit.

Components concerned:

Component	Device name
-Auxiliary contactor ACU1	-52/4

Troubleshooting:

- Check CB 127.22/1 and 218. Switch on again.
- Check contactor 52.3/4. If contactor open, check/repair contactor 52.4. Check/repair/replace wiring between contactor 52/4_A & 52.3 /4_+1. 52/4_A1 to (52/1_72 & 52/5_61). (52/1_71 & 52/5_62) to CB 127.22/1 Connection between contactor 52/4_54 to 50.X2_9 Aux1 and 52/4_53 to 50.X2_11 Aux1
- If contactor not open, check wiring between contactor 52.3/4_A1 to 50.X2_11 AUX1 52.3/4_A2 to 50.X2_10 AUX1
- Replace faulty contactor

Reaction:

- Fault code triggered

Related messages:

0701

Fault Text:

ACU1: detected Aux cont 52/4 pickup error

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB AUX Contactor ON
- ACU1 to CCU master MVB communication is OK.

Criteria:

- Contactor 52/4 ON command is given by AUX1 M1300. But the feedback is not available at AUX-1 M1300.
- Contactor 52/4 is driven by auxiliary contactor 52.3/4.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/4
AUX-1 M1300	-A1
Auxiliary Contactor	-K52.3/4

Troubleshooting:

- Check wiring from AUX-1 CB 127.22/1 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from AUX-1 CB 127.22/1 to Auxiliary Main Contactor 52/4_A1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxiliary Main Contactor 52/4_A2 to Auxiliary Contactor 52.3/4_+1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxiliary Contactor K52.3/4A coil contact A2 to AUX-1 M1300 X083_7. Refer Drawing [WAG9_6K-ACU1] Page 6.
- Check the wiring from AUX-1 M1300 X083_8 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU1] Page 6 & 9.
- Check wiring from Auxiliary Contactor K52.3/4A coil contact A1 to Diode card -A5_X2.1. Refer Drawing [WAG9_6K-ACU1] Page 6 & 9.
- Check wiring from Auxiliary Contactor -K52.3/4A_14 to AUX-1 M1300 50.X2_10. Refer Drawing [WAG9_6K-ACU1] Page 7.
- Check wiring from Auxiliary Contactor -K52.3/4A_13 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU1] Pages 6, 7 & 9.
- Check wiring from Contactor -K100_A1 to AUX-1 M1300 50.X2_9. Refer Drawing [WAG9_6K-ACU1] Page 7.
- Check wiring from Contactor -K100_A2 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU1] Pages 7, 6 & 9.

- Replace faulty Auxiliary Main contactor 52/4.
- Replace faulty Auxiliary contactor 52.3/4.
- Replace Aux-1 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**ACU1: detected Aux cont 52/5 dropout error**Priority Type

3 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON
- AUX1 to CCU master MVB communication is OK.

Criteria:

- Contactor 52/5 ON command is not given by AUX1 M1300 but still feedback is available at AUX1 M1300.
- Contactor 52/5 is driven by auxiliary contactor 52.3/5.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/5
AUX-1 M1300	-A1
Auxiliary Contactor	-K52.3/5

Troubleshooting:

- Check wiring from AUX-1 CB 127.22/1 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from AUX-1 CB 127.22/1 to Auxiliary Main Contactor 52/5_A1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxiliary Main Contactor 52/5_A2 to Auxiliary Contactor 52.3/5_+1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxiliary Contactor K52.3/5A coil contact A2 to AUX-1 M1300 X083_5. Refer Drawing [WAG9_6K-ACU1] Page 6.
- Check the wiring from AUX-1 M1300 X083_6 to Diode Card -A5_X2.2. Refer Drawing [WAG9_6K-ACU1] Page 6 & 9.
- Check wiring from Auxiliary Contactor K52.3/5A coil contact A1 to Diode card -A5_X2.1. Refer Drawing [WAG9_6K-ACU1] Page 6 & 9.
- Check wiring from Auxiliary Contactor K52.3/5A_13 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU1] Page 7, 6 & 9.
- Check wiring from Auxiliary Contactor K52.3/5_14 to AUX-1 M1300 50.X2_7. Refer Drawing [WAG9_6K-ACU1] Page 7.
- Check wiring from Contactor -K101_A1 to AUX-1 M1300 50.X2_8. Refer Drawing [WAG9_6K-ACU1] Page 7.
- Check wiring from Contactor -K101_A2 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU1] Pages 7,6 & 9.
- Replace faulty Auxiliary Main contactor 52/5.

- Replace faulty Auxiliary contactor 52.3/5.
- Replace Aux-1 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**ACU1: detected Aux cont 52/5 pickup error**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON.
- ACU1 to CCU master MVB communication is OK.

Criteria:

- Contactor 52/5 ON command is given by AUX1 M1300 but still the feedback is not available in AUX1 M1300.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/5
AUX-1 M1300	-A1
Auxiliary Contactor	-K52.3/5

Troubleshooting:

- Check wiring from AUX-1 CB 127.22/1 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from AUX-1 CB 127.22/1 to Auxiliary Main Contactor 52/5_A1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxiliary Main Contactor 52/5_A2 to Auxiliary Contactor 52.3/5_+1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxiliary Contactor K52.3/5A coil contact A2 to AUX-1 M1300 X083_5. Refer Drawing [WAG9_6K-ACU1] Page 6.
- Check the wiring from AUX-1 M1300 X083_6 to Diode Card -A5_X2.2. Refer Drawing [WAG9_6K-ACU1] Page 6 & 9.
- Check wiring from Auxiliary Contactor K52.3/5A coil contact A1 to Diode card -A5_X2.1. Refer Drawing [WAG9_6K-ACU1] Page 6 & 9.
- Check wiring from Auxiliary Contactor K52.3/5A_13 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU1] Page 7, 6 & 9.
- Check wiring from Auxiliary Contactor K52.3/5_14 to AUX-1 M1300 50.X2_7. Refer Drawing [WAG9_6K-ACU1] Page 7.
- Check wiring from Contactor -K101_A1 to AUX-1 M1300 50.X2_8. Refer Drawing [WAG9_6K-ACU1] Page 7.
- Check wiring from Contactor -K101_A2 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU1] Pages 7,6 & 9.
- Replace faulty Auxiliary Main contactor 52/5.
- Replace faulty Auxiliary contactor 52.3/5.

- Replace Aux-1 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**ACU2: detected Aux cont 52/1 dropout error**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON
- ACU2 to CCU master MVB communication is OK..

Criteria:

- Contactor 52/1 ON command is not given by AUX2 M1300 but still feedback is available in AUX2 M1300.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/1
AUX-2 M1300	-A1
Auxiliary Contactor	-K52.3/1

Troubleshooting:

- Check wiring from AUX-2 CB 127.22/2 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5l.
- Check wiring from AUX-2 CB 127.22/2 to Auxiliary Main Contactor 52/1_A1. Refer Drawing [WAG9_6K] Page 5l.
- Check wiring from Auxiliary Main Contactor 52/1_A2 to Auxiliary Contactor 52.3/1_+1. Refer Drawing [WAG9_6K] Page 5l.
- Check wiring from Auxiliary Contactor K52.3/1 coil contact A2 to AUX-2 M1300 X083_1. Refer Drawing [WAG9_6K-ACU2] Page 6.
- Check the wiring from AUX-2 M1300 X083_2 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxiliary Contactor K52.3/1 coil contact A1 to Diode card -A5_X2.1. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxiliary Contactor K52.3/1_14 to AUX-2 M1300 50.X3_26. Refer Drawing [WAG9_6K-ACU2] Page 7.
- Check wiring from Auxiliary Contactor K52.3/1_13 to AUX-2 M1300 50.X3_32. Refer Drawing [WAG9_6K-ACU2] Page 7.
- Replace faulty Auxiliary Main contactor 52/1.
- Replace faulty Auxiliary contactor 52.3/1.
- Replace Aux-2 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**ACU2: detected Aux cont 52/1 pickup error**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON
- ACU2 to CCU master MVB communication is OK..

Criteria:

- Contactor 52/1 ON command is given by AUX2 M1300 but still feedback is not available in AUX2 M1300.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/1
AUX-2 M1300	-A1
Auxillary Contactor	-K52.3/1

Troubleshooting:

Check wiring from AUX-2 CB 127.22/2 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5l.

- Check wiring from AUX-2 CB 127.22/2 to Auxillary Main Contactor 52/1_A1. Refer Drawing [WAG9_6K] Page 5l.

- Check wiring from Auxillary Main Contactor 52/1_A2 to Auxillary Contactor 52.3/1_+1. Refer Drawing [WAG9_6K] Page 5l.

- Check wiring from Auxillary Contactor K52.3/1 coil contact A2 to AUX-2 M1300 X083_1. Refer Drawing [WAG9_6K-ACU2] Page 6.

- Check the wiring from AUX-2 M1300 X083_2 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.

- Check wiring from Auxillary Contactor K52.3/1 coil contact A1 to Diode card -A5_X2.1. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.

- Check wiring from Auxillary Contactor K52.3/1_14 to AUX-2 M1300 50.X3_26. Refer Drawing [WAG9_6K-ACU2] Page 7.

- Check wiring from Auxillary Contactor K52.3/1_13 to AUX-2 M1300 50.X3_32. Refer Drawing [WAG9_6K-ACU2] Page 7.

- Replace faulty Auxillary Main contactor 52/1.

- Replace faulty Auxillary contactor 52.3/1.

- Replace Aux-2 M1300 if faulty

- Reaction:

Fault code triggered

Related messages:

-

5.4.215 CCU Fault Code 706

Fault Text:

ACU2: detected Aux cont 52/2 dropout error

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON
- ACU2 to CCU master MVB communication is OK..

Criteria:

- Contactor 52/2 ON command is not given by AUX2 M1300 but still feedback is available in AUX2 M1300.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/2
AUX-2 M1300	-A1
Auxillary Contactor	-K52.3/2

Troubleshooting:

- Check wiring from AUX-2 CB 127.22/2 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5l.
- Check wiring from AUX-2 CB 127.22/2 to Auxillary Main Contactor 52/2_A1. Refer Drawing [WAG9_6K] Page 5l.
- Check wiring from Auxillary Main Contactor 52/1_A2 to Auxillary Contactor 52.3/2_+1. Refer Drawing [WAG9_6K] Page 5l.
- Check wiring from Auxillary Contactor K52.3/2_A2 to AUX-2 M1300 X083_3. Refer Drawing [WAG9_6K-ACU2] Page 6.
- Check the wiring from AUX-2 M1300 X083_4 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxillary Contactor K52.3/2_A1 to Diode card -A5_X2.1. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxillary Contactor K52.3/2_14 to AUX-2 M1300 50.X3_29. Refer Drawing [WAG9_6K-ACU2] Page 7.
- Check wiring from Auxillary Contactor K52.3/2_13 to AUX-2 M1300 50.X3_5. Refer Drawing [WAG9_6K-ACU2] Page 7.
- Replace faulty Auxillary Main contactor 52/2.
- Replace faulty Auxillary contactor 52.3/2.
- Replace Aux-2 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

Fault Text:**ACU2: detected Aux cont 52/2 pickup error**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON
- ACU2 to CCU master MVB communication is OK..

Criteria:

- Contactor 52/2 ON command is given by AUX2 M1300 but still feedback is not available in AUX2 M1300.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/2
AUX-2 M1300	-A1
Auxillary Contactor	-K52.3/2

Troubleshooting:

- Check wiring from AUX-2 CB 127.22/2 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5l.
- Check wiring from AUX-2 CB 127.22/2 to Auxillary Main Contactor 52/2_A1. Refer Drawing [WAG9_6K] Page 5l.
- Check wiring from Auxillary Main Contactor 52/1_A2 to Auxillary Contactor 52.3/2_+1. Refer Drawing [WAG9_6K] Page 5l.
- Check wiring from Auxillary Contactor K52.3/2_A2 to AUX-2 M1300 X083_3. Refer Drawing [WAG9_6K-ACU2] Page 6.
- Check the wiring from AUX-2 M1300 X083_4 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxillary Contactor K52.3/2_A1 to Diode card -A5_X2.1. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxillary Contactor K52.3/2_14 to AUX-2 M1300 50.X3_29. Refer Drawing [WAG9_6K-ACU2] Page 7.
- Check wiring from Auxillary Contactor K52.3/2_13 to AUX-2 M1300 50.X3_5. Refer Drawing [WAG9_6K-ACU2] Page 7.
- Replace faulty Auxillary Main contactor 52/2.
- Replace faulty Auxillary contactor 52.3/2.
- Replace Aux-2 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**ACU2: detected Aux cont 52/4 dropout error**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON
- ACU2 to CCU master MVB communication is OK..

Criteria:

- Contactor 52/4 ON command is not given by AUX2 M1300 but still feedback is available in AUX2 M1300.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/4
AUX-2 M1300	-A1
Auxillary Contactor	-K52.3/4

Troubleshooting:

- Check wiring from AUX-2 CB 127.22/2 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from AUX-2 CB 127.22/2 to Auxillary Main Contactor 52/4_A1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxillary Main Contactor 52/4_A2 to Auxillary Contactor 52.3/4_+1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxillary Contactor K52.3/4A coil contact A2 to AUX-2 M1300 X083_7. Refer Drawing [WAG9_6K-ACU2] Page 6.
- Check the wiring from AUX-2 M1300 X083_8 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxillary Contactor K52.3/4A coil contact A1 to Diode card -A5_X2.1. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxillary Contactor -K52.3/4A_14 to AUX-2 M1300 50.X3_31. Refer Drawing [WAG9_6K-ACU2] Pages 7.
- Check wiring from Auxillary Contactor -K52.3/4A_13 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Pages 7, 6 & 16.
- Check wiring from Contactor -K100_A1 to AUX-2 M1300 50.X3_21. Refer Drawing [WAG9_6K-ACU2] Pages 7.
- Check wiring from Contactor -K100_A2 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Pages 7, 6 & 16.
- Replace faulty Auxillary Main contactor 52/4.
- Replace faulty Auxillary contactor 52.3/4.

- Replace Aux-2 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

-

5.4.218 CCU Fault Code 709

Fault Text:

ACU2: detected Aux cont 52/4 pickup error

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON
- ACU2 to CCU master MVB communication is OK..

Criteria:

- Contactor 52/4 ON command is given by AUX2 M1300 but still feedback is not available in AUX2 M1300.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/4
AUX-2 M1300	-A2
Auxillary Contactor	-K52.3/4

Troubleshooting:

- Check wiring from AUX-2 CB 127.22/2 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from AUX-2 CB 127.22/2 to Auxillary Main Contactor 52/4_A1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxillary Main Contactor 52/4_A2 to Auxillary Contactor 52.3/4_+1. Refer Drawing [WAG9_6K] Page 5L.
- Check wiring from Auxillary Contactor K52.3/4A coil contact A2 to AUX-2 M1300 X083_7. Refer Drawing [WAG9_6K-ACU2] Page 6.
- Check the wiring from AUX-2 M1300 X083_8 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxillary Contactor K52.3/4A coil contact A1 to Diode card -A5_X2.1. Refer Drawing [WAG9_6K-ACU2] Page 6 & 16.
- Check wiring from Auxillary Contactor -K52.3/4A_14 to AUX-2 M1300 50.X3_31. Refer Drawing [WAG9_6K-ACU2] Pages 7.
- Check wiring from Auxillary Contactor -K52.3/4A_13 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Pages 7, 6 & 16.
- Check wiring from Contactor -K100_A1 to AUX-2 M1300 50.X3_21. Refer Drawing [WAG9_6K-ACU2] Pages 7.
- Check wiring from Contactor -K100_A2 to Diode card -A5_X2.2. Refer Drawing [WAG9_6K-ACU2] Pages 7, 6 & 16.

- Replace faulty Auxillary Main contactor 52/4.
- Replace faulty Auxillary contactor 52.3/4.
- Replace Aux-2 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**ACU3: detected Aux cont 52/3 dropout error**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON
- ACU3 to CCU master MVB communication is OK..

Criteria:

- Contactor 52/3 ON command is not given by AUX3 M1300 but still feedback is available in AUX3 M1300.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/3
AUX-3 M1300	-A2
Auxillary Contactor	-K52.3/3

Troubleshooting:

- Check wiring from AUX-3 CB 127.22/3 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5K.
- Check wiring from AUX-3 CB 127.22/3 to Auxillary Main Contactor 52/3_A1. Refer Drawing [WAG9_6K] Page 5K.
- Check wiring from Auxillary Main Contactor 52/3_A2 to Auxillary Contactor 52.3/3_+1. Refer Drawing [WAG9_6K] Page 5K.
- Check wiring from Auxillary Contactor K52.3/3 coil contact A2 to AUX-3 M1300 X083_5. Refer Drawing [WAG9_6K-ACU2] Page 13.
- Check the wiring from AUX-3 M1300 X083_6 to Diode card -A7_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 13 & 16.
- Check wiring from Auxillary Contactor K52.3/3 coil contact A1 to Diode card -A7_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 13 & 16.
- Check wiring from Auxillary Contactor -K52.3/3_14 to AUX-3 M1300 50.X3_11. Refer Drawing [WAG9_6K-ACU2] Pages 7.
- Check wiring from Auxillary Contactor -K52.3/3_13 to AUX-3 M1300 50.X3_9. Refer Drawing [WAG9_6K-ACU2] Pages 7.
- Replace faulty Auxillary Main contactor 52/3.
- Replace faulty Auxillary contactor 52.3/3.
- Replace Aux-3 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

-

5.4.220 CCU Fault Code 711

Fault Text:

ACU3: detected Aux cont 52/3 pickup error

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- CB Aux Contactor ON
- ACU3 to CCU master MVB communication is OK..

Criteria:

- Contactor 52/3 ON command is given by AUX3 M1300 but still feedback is not available in AUX3 M1300.

Components concerned:

Component	Device name
Auxiliary Main contactor	-52/3
AUX-3 M1300	-A2
Auxillary Contactor	-K52.3/3

Troubleshooting:

- Check wiring from AUX-3 CB 127.22/3 to 218 Control Electronics Contactor. Refer Drawing [WAG9_6K] Page 5K.
- Check wiring from AUX-3 CB 127.22/3 to Auxillary Main Contactor 52/3_A1. Refer Drawing [WAG9_6K] Page 5K.
- Check wiring from Auxillary Main Contactor 52/3_A2 to Auxillary Contactor 52.3/3_+1. Refer Drawing [WAG9_6K] Page 5K.
- Check wiring from Auxillary Contactor K52.3/3 coil contact A2 to AUX-3 M1300 X083_5. Refer Drawing [WAG9_6K-ACU2] Page 13.
- Check the wiring from AUX-3 M1300 X083_6 to Diode card -A7_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 13 & 16.
- Check wiring from Auxillary Contactor K52.3/3 coil contact A1 to Diode card -A7_X2.2. Refer Drawing [WAG9_6K-ACU2] Page 13 & 16.
- Check wiring from Auxillary Contactor -K52.3/3_14 to AUX-3 M1300 50.X3_11. Refer Drawing [WAG9_6K-ACU2] Pages 7.
- Check wiring from Auxillary Contactor -K52.3/3_13 to AUX-3 M1300 50.X3_9. Refer Drawing [WAG9_6K-ACU2] Pages 7.
- Replace faulty Auxillary Main contactor 52/3.
- Replace faulty Auxillary contactor 52.3/3.
- Replace Aux-3 M1300 if faulty.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**AUX winding overcurrent, VCB off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

- Communication with TCU1 and TCU2 is ok

Criteria:

- AUX1/AUX22 aux winding current is more than 400A.

Components concerned:

Component	Device name
Auxiliary Current sensor	-U9,U10

Troubleshooting:

- Check repair/replace current sensor -U9,U10.
- If sensor is ok check auxiliary winding for short circuit refer [WAG9-9K-TCU] sheet 7.
- Check devices connected to Aux winding for short circuit. Check earth fault detection circuit, input filter,Aux converter, for short circuit refer [WAG9-9K] 1Q page 15.
- Check Auxiliary Loads for short circuit refer [WAG9-9K] 1Q page 15.
- Check Aux diagnostics for other faults.

Reaction:

- VCB off

Related messages:

-

Fault Text:**Two or more AUX isolated**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7

Sub-system:

Auxiliary

Condition:

- VCB is on.

Criteria:

- Two AUX isolated.

Components concerned:

Component	Device name
AUX	- 1050.1, 1050.2
Auxiliary contactors	- 52/1,52/2,52/3,52/4,52/5

Troubleshooting:

- Check the failure related to Auxiliary in CCU data. Follow troubleshooting steps of logged fault.
- Check Aux diagnostics (0650,0651,0652) for other faults.

Reaction:

- VCB inhibited.

Related messages:

0650,0651,0652

Fault Text:**Earth fault AUX2 consumers**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9/WAG9 H 7MW/ WAP7 Upgrade

Sub-system:

AUX

Condition:

-CB F01 off

-No feedback signal from CB F01 available at digital input E117_04 and E127_04

Criteria:

MVB communication with IO is ok

Components concerned:

Component	Device name
CB	F01
IO station 11	E117
IO station 12	E127
AUX Cubical	1050.2

Troubleshooting:

-Close circuit breaker F01, check if CB trips, If yes Isolate connections to F01.

-CB does not trip but message not gone, check operation of F01 auxiliary contacts (pin 21/22)

-Check/ repair wiring to clip E117 & E127: F01.21 to 1050.2_X5.11 1050.2_X5 to 411.RA/5

411.RA/5 to E117_04 & E127_04 F01.22 to PST02

-Check circuits connected to CB contacts for short circuits

-Replace circuit breaker FO1

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**Earth fault AUX1 consumers**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 H / WAP7 /WAG9/WAG9 H 7MW/ WAP7 Upgrade

Sub-system:

AUX

Condition:

-CB F02 off

-No feedback signal from CB F01 available at digital input E117_05 and E127_05

Criteria:

MVB communication with IO is ok

Components concerned:

Component	Device name
CB	F02
IO station 11	E117
IO station 12	E127
AUX Cubical	1050.2

Troubleshooting:

-Close circuit breaker F02, check if CB trips, If yes Isolate connections to F02.

-CB does not trip but message not gone, check operation of F02 auxiliary contacts (pin 21/22)

-Check/ repair wiring to clip E117 & E127: F01.21 to 1050.2_X5.12 1050.2_X5 to 411.RA/6 411.RA/6 to E117_05 & E127_05 F02.22 to PST02

-Check circuits connected to CB contacts for short circuits

-Replace circuit breaker F02

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**VCB locked: AUX2 overload -> cutout TCU1 and bogie 1 consumers**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

- TCU communication is ok.

Criteria:

- AUX1 transformer cutout.
- TCU1 is off.
- CBs for AUX1 load are off.

Components concerned:

Component	Device name
AUX	- 1050.1
Auxiliary transformer	- T01
Auxiliary feeder contactor	- K01
IO11 module 7	E117
IO12 module 7	E127

Troubleshooting:

- Check the failure related to Auxiliary in CCU data. Follow troubleshooting steps of logged fault.
- Check repair/replace contactor K01. Check Digital input E117_01 and E127_01 channels for fault. Also check E122_02, E122_03, E122_04, E122_06, E122_07.
- If contactor and IO channels are ok check repair/replace wiring PST01 110V A4 to K01.14 to K01.13 to K01.44, K01.43 to AK01.14, AK01.13 to X5.6, X5.6 to 411.RA/2, refer [WAG9_9K] page 05M. 411.RA/2 to E117_01 and E127_01 refer [WAG9-9K] page 05R.
- Check Aux1 output filter.
- Check Aux1 transformer winding for short circuit.
- Check Aux diagnostics for other faults.

Reaction:

- AUX2 cutout

Related messages:

-

Fault Text:**VCB locked: AUX1 overload -> cutout TCU2 and bogie 2 consumers**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Sub-system:

Auxiliary

Condition:

- TCU communication is ok.

Criteria:

- AUX2 transformer cutout.
- TCU2 is off.
- CBs for AUX2 load are off.

Components concerned:

Component	Device name
AUX	- 1050.2
Auxiliary transformer	- T02
Auxiliary feeder contactor	- K02
IO11 module 7	E117
IO12 module 7	E127
IO22 module 3	E223
IO22 module 2	E222

Troubleshooting:

- Check the failure related to Auxiliary in CCU data. Follow troubleshooting steps of logged fault.
- Check repair/replace contactor K02. Check Digital input E117_02 and E127_02 channels for fault. Also check E223_09, E212_06, E223_04, E223_06, E223_07.
- If contactor and IO channels are ok check repair/replace wiring PST01 110V A5 to K02.14 to K02.13 to K02.44, K02.43 to AK02.14, AK02.13 to X5.8, X5.8 to 411.RA/3, refer [WAG9_9K] page 05M. 411.RA/3 to E117_02 and E127_02 refer [WAG9_9K] page 05S.
- Check Aux2 output filter.
- Check Aux2 transformer winding for short circuit.
- Check Aux diagnostics for other faults.

Reaction:

- AUX1 cutout

Related messages:

-

Fault Text:**Contact. 8.2 stuck Open**Priority Type:

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- VCU self-test is pass and locomotive is operating/ready for operating in normal mode (2 bogie operation).
- Traction Converter 1 & 2 are healthy and available.
- MR Pressure is more than 8 bar.
- HF Test not active.

Criteria:

- Triggering signal from TCU is given to HF contactor 8.2 but no feedback from contactor received in TCU.

Components concerned:

Component	Device name
HF Contactor TCU DIDO_H1	8.2 -A200

Troubleshooting:

- Check the Contactor Filter adaptation (8.2).
- Check the wiring between Contactor Filter adaption (8.2) and XK42A, XK57A; Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and Contactor Filter adaption (8.2); Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and CB 218 ; Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring from -X15 Pin 18 to DIDO_H1 (-A200) Pin 8 of -X4; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Check the wiring from -X15 Pin 21 to DIDO_H1 (-A200) Pin 3 of -X4; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Replace the Contactor Filter adaptation (8.2).
- Contact Siemens maintenance personnel, if problem persists.

Reaction:

- VCB open

Related messages:

0880, 0879.

Fault Text:**Contact. 8.2 stuck Closed**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- VCU self-test is pass.
- HF Test is active.
- Either Traction Converter 1 or Traction Converter 2 not available.
- MR pressure less than 5.6 bar.

Criteria:

- Reset signal from TCU is given to contactor 8.2 but no feedback from contactor 8.2 is available in TCU DI.

Components concerned:

Component	Device name
HF Contactor	8.2
TCU DIDO_H1	-A200

Troubleshooting:

- Check the Contactor Filter adaptation (8.2).
- Check the wiring between Contactor Filter adaption (8.2) and XK42A, XK57A; Refer drawing [WAG9_9K] or [WAG9_6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and Contactor Filter adaption (8.2); Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and CB 218 ; Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring from -X15 Pin 21 to DIDO_H1 (-A200) Pin 3 of -X4; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Replace the Contactor Filter adaptation (8.2).
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- VCB open

Related messages:

0880, 0879.

Fault Text:**Harmonic filter: Contact 8.1 Stuck Opened**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- Communication with TCU1 and TCU2 ok.
- HF test is active.
- VCB is closed.
- HF contactor 8.41 is opened.
- No error in HF Contactor 8.2.

Criteria:

- Triggering signal from TCU is given to HF contactor 8.1 but no feedback from contactor received in TCU1 or TCU2.

Components concerned:

Component	Device name
HF Contactor	8.1
TCU DIDO_H1	-A200

Troubleshooting:

- Check the HF contactor 8.1.
- Check the wiring between HF Filter contactor (8.1) and XK42A, XK57A; Refer drawing [WAG9_9K] or [WAG9_6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and HF Filter contactor (8.1); Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and CB 218 ; Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring from -X15 Pin 17 to DIDO_H1 (-A200) Pin 7 of -X4; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Check the wiring from -X15 Pin 20 to DIDO_H1 (-A200) Pin 2 of -X4; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Replace the HF contactor 8.1.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- VCB open

Related messages:

0880, 0879.

Fault Text:**Harmonic filter: Contact 8.1 stuck Closed**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- HF test is active.
- VCB is opened.
- HF contactor 8.1 is not triggered.
- Contactor 8.2 stuck closed.
- Contactor 8.41 is triggered.
- VCB Trip due to HF Inrush over current.
- VCB Trip due to HF Over current.

Criteria:

- Reset signal from TCU is given to HF contactor 8.1 but no feedback from contactor received in TCU1 or TCU2.

Components concerned:

Component	Device name
HF Contactor	8.1
TCU DIDO_H1	-A200

Troubleshooting:

- Check the HF Filter Contactor 8.1.
- Check the wiring between HF Filter contactor (8.1) and XK42A, XK57A; Refer drawing [WAG9_9K] or [WAG9_6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and HF Filter contactor (8.2); Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and CB 218; Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring from -X15 Pin 20 to DIDO_H1 (-A200) Pin 2 of -X4; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Replace the HF Filter Contactor 8.1.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

0880, 0879.

Fault Text:**Harmonic filter: Contact 8.41 Stuck Open**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- HF test is active.
- HF contactor 8.41 is triggered.
- HF contactor 8.1 is opened and no error in its feedback.
- VCB is opened.
- MR pressure should be more than 5.6 bar.

Criteria:

- Triggering signal from TCU is given to HF contactor 8.41 but no feedback from contactor received in TCU1 or TCU2.

Components concerned:

Component	Device name
HF Contactor	8.41
TCU DIDO_H1	-A200

Troubleshooting:

- Check the HF contactor 8.41.
- Check the wiring between HF Filter contactor (8.41) and XK42A, XK57A; Refer drawing [WAG9_9K] or [WAG9_6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and HF Filter contactor (8.41); Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and CB 218; Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring from -X15 Pin 19 to DIDO_H1 (-A200) Pin 9 of -X4; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Check the wiring from -X15 Pin 22 to DIDO_H1 (-A200) Pin 4 of -X4; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Replace the HF contactor 8.41.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

0880, 0879.

Fault Text:**Harmonic filter: Contact 8.41 Stuck Closed**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- HF test is active.
- HF contactor 8.1 is opened or error in its feedback.
- VCB closed.
- MR pressure not above 5.6 bar.

Criteria:

- Reset signal from TCU is given to HF contactor 8.41 but no feedback from contactor received in TCU1 or TCU2.

Components concerned:

Component	Device name
HF Contactor	8.41
TCU DIDO_H1	-A200

Troubleshooting:

- Check the HF contactor 8.41.
- Check the wiring between HF Filter contactor (8.41) and XK42A, XK57A; Refer drawing [WAG9_9K] or [WAG9_6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and HF Filter contactor (8.41); Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring between CB 127.2/1 and CB 218; Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
- Check the wiring between -X15 Pin 22 and DIDO_H1 (-A200) Pin 4 of -X4; Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Replace the HF Contactor 8.41.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- VCB open

Related messages:

0880, 0879.

Fault Text:**Harmonic filter: Inrush current to high, VCB off**Priority Type

1(1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- Communication with any one TCU(s) OK.
- AC HF inrush Current is out of limits.
- HF Contactor 8.1 triggered.

Criteria:

- AC harmonic inrush current detected by TCU 1 or TCU 2 is greater than 600A.

Components concerned:

Component	Device name
Harmonic Filter Current Sensor (TCU1)	8.5/1
Harmonic Filter Current Sensor (TCU2)	8.5/2
ICU PWMI A	(-A100)

Troubleshooting:

- Check the Harmonic Filter Current Sensor (8.5/1) and related wiring from HF Current sensor 8.5/1 to 415.AE/1, if the fault is in TCU1; Refer drawing [WAG9_9K] or [WAG9_6K] 12B sheet no 2.
- Check the Harmonic Filter Current Sensor (8.5/2) and related wiring from HF Current sensor 8.5/1 to 415.AE/2, if the fault is in TCU2; Refer drawing [WAG9_9K] or [WAG9_6K] 12F sheet no 6.
- Check the wiring between 415.AE/1 or 415.AE/2 and +C139 of ICU PWMI A (-A100); Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 19.
- Check for any short circuits in power scheme.
- Replace the sensor (8.5/1, 8.5/2).
- If problem persists, Contact Siemens maintenance personnel for replacing ICU PWMI A (-A100).

Reaction:

- VCB open.

Related messages:

- 0567, 0573, 0879, 0880.

Fault Text:**Harmonic filter: Over current detected, VCB off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- Communication with any one TCU(s) OK.
- AC HF Current is out of limits.
- HF Contactor 8.1 triggered.

Criteria:

- AC harmonic current detected by TCU 1 or TCU 2 is greater than 400A.

Components concerned:

Component	Device name
Harmonic Filter Current Sensor (TCU1)	8.5/1
Harmonic Filter Current Sensor (TCU2)	8.5/2
ICU PWMI A	-A100

Troubleshooting:

- Check the Harmonic Filter Current Sensor (8.5/1) and related wiring from HF Current sensor 8.5/1 to 415.AE/1 if the fault is in TCU1; Refer drawing [WAG9_9K] or [WAG9_6K] 12B sheet no 2.
- Check/replace Harmonic Filter Current Sensor (8.5/2) and related wiring from HF Current sensor 8.5/1 to 415.AE/2 if the fault is in TCU2; Refer drawing [WAG9_9K] or [WAG9_6K] 12F sheet no 6.
- Check the wiring between 415.AE/1 or 415.AE/2 and +C139 of ICU PWMI A (-A100); Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 19.
- Check for any short circuits in power scheme.
- Replace the sensor (8.5/1, 8.5/2).
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- VCB open.

Related messages:

0568, 0570, 0573.

Fault Text:**Harmonic filter: Harmonic filter test failed**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- Communication with any one TCU(s) OK.
- Cab 1 or Cab 2 is active.
- No error with HF Contactor 8.1 or 8.2 or 8.41.

Criteria:

- During Harmonic Filter contactor test, one of the contactors 8.41, 8.1 and 8.2 has open/close error with in time period from 300ms to 2000ms after close/open command.

Components concerned:

Component	Device name
HF Contactor	8.1
HF Contactor	8.2
HF Contactor	8.41
TCU DIDO_H1	-A200

Troubleshooting:

- Check HF Contactor 8.1 or 8.2 or 8.41 and related wiring based on faulty contactor.
 - Refer drawing [WAG9_9K] or [WAG9-6K] 05H sheet no 8.
 - Refer Drawing [WAG9-9K-TCU] or [WAG9-6K-TCU] Page 23.
- Replace faulty contactor.
- If problem persists, Contact Siemens maintenance personnel for replacing faulty contactor.

Reaction:

- Fault code triggered.

Related messages:

- 0870, 0871, 0872, 0873, 0874, 0875.

Fault Text:**Harmonic Filter fault -> VCB open**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- communication between CCU and TCU is OK

Criteria:

- VCB may tripped due below faults
 - HF inrush High
 - HF overcurrent
 - HF fault
 - HF current in simulation test.

Components concerned:

Component	Device name
TCU2	415/2

Troubleshooting:

- Check the below faults along with the 0879
Faults codes: 0876, 0877,0880 and 0877 in simulation mode.
- Check the above activated fault code for trouble shooting

Reaction:

VCB trip

Related messages:

0876, 0877,0880

Fault Text:**Harmonic filter Isolated, Speed limit 40kmph**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- Panto is raised

Criteria:

- HF contactor 8.2 is stuck
- HF contactor 8.1 is stuck open and node 596.
- HF contactor 8.41 is stuck closed

Components concerned:

Component	Device name
Filter contactor	8.1
Filter contactor	8.2
Filter contactor	8.41

Troubleshooting:

- check the filter contactor 8.1 wiring from 127.2/1 to XK42A pin 20 for TCU1, Refer drawing [WAG9-9K] 05H sheet 8
- check the filter contactor 8.1 wiring from 127.2/1 to XK57A pin 20 for TCU2, Refer drawing [WAG9-9K] 05H sheet 8
- check the filter contactor 8.2 wiring from 127.2/1 to XK42A pin 21 for TCU1, Refer drawing [WAG9-9K] 05H sheet 8
- check the filter contactor 8.2 wiring from 127.2/1 to XK57A pin 21 for TCU2, Refer drawing [WAG9-9K] 05H sheet 8.
- check the filter contactor 8.41 wiring from 127.2/1 to XK42A pin 22 for TCU1, Refer drawing [WAG9-9K] 05H sheet 8
- check the filter contactor 8.41 wiring from 127.2/1 to XK57A pin 22 for TCU2, Refer drawing [WAG9-9K] 05H sheet 8

Reaction:

- VCB open

Related messages:

0561,0563,0565

0.1.1 CCU Fault Code 910

Fault Text:-

Battery charger: Fault detected.

Priority Type:-

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAP7HH

Subsystem:-

Batt.

Condition:-

- Aux1 & Aux2 is ok and running. (6K locomotive).
- Aux1 & Aux2 is ok and K03 is on (9k locomotive)

Criteria:-

- Output of Battery charge is not available.

Components concerned:-

Component	Device name
Battery charger	-G5

Troubleshooting:-

For 6K locomotive

- Check Battery Charger output MCB110. [WAG9-6K] 09F sheet 6 and 04B sheet 2.
- Check Battery Charger input MCB(Q1)100. [WAG9-6K] 05G sheet 7 and 04A sheet 1
- Check input and output wiring of battery charger. [WAG9-6K-ACU2] sheet 14.

For 9K locomotive

- Check Battery Charger output MCB110. [WAG9-9K] 09F sheet 6 & 04B sheet 1.
- Check Battery Charger input MCB(F05)100. [WAG9-9K] 05G sheet 7 & 04A sheet 1.
- Check, if the battery charger has an issue in real, or if the I/O signal does have a fault.
- the fault must be within the I/O signal. Check/repair wiring From 411.RA/11 to E117_10 and E127_10. If necessary replace module.
- Check input and output wiring of battery charger. [WAG9-9K] 05L sheet 12.

Reaction:

- Fault code triggered.

Related message:-

-

Fault Text:**Battery Charger Overcurrent.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

Battery

Condition:

- IO station 11 and 12 communication is ok.

Criteria:

- Battery charger indicating overcurrent.
- Battery Charger locked.

Components concerned:

Component	Device name
Battery Charger	-A012
IO station 11 module 7	E117
IO station 12 module 7	E127

Troubleshooting:

- Check battery charger.
- Check repair/replace wiring from A012.6 to X5.21 to 411.RA/12 to E117_11 and E127_11 refer [WAG9_9K] page 05Q, 05L.
- If there is some problem with battery charger check battery charger diagnostic memory and for any internal fault follow the customer documentation for check and troubleshooting. If not resolved replace battery charger.
- Check load connected to battery charger for short circuit.

Reaction:

-

Related messages:

-

Fault Text:**Battery Overcurrent.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

Battery

Condition:

- IO station 11 and 12 communication is ok.

Criteria:

- Battery charger diagnostic Bit1 (E117_12/E127_12) is set indicating battery

overcurrent. Components concerned:

Component	Device name
Battery	-111
IO station 11 module 7	E117
IO station 12 module 7	E127

Troubleshooting:

- Check the battery.
- If IO modules has problem replace the module or check repair/replace wiring from A012.7 to X5.22 to 411.RA/13 to E117_12 and E127_12 refer [WAG9_9K] page 05Q, 05L.
- Check load connected to battery for short circuit.
- Check fan M01 and M02 wiring for short circuit refer [WAG9_9K] 05L.

Reaction:

- Battery Charger locked.

Related messages:

-

Fault Text:**DC Overvoltage**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

Battery

Condition:

- IO station 11 and 12 communication is ok.

Criteria:

- Battery charger diagnostic Bit0 and Bit1 (E117_11/E127_11) and (E117_12/E127_12) are set indicating DC overvoltage.

Components concerned:

Component	Device name
Battery charger	-A012
IO station 11 module 7	E117
IO station 12 module 7	E127

Troubleshooting:

- Check the battery charger.
- If IO modules has problem replace the module or check repair/replace wiring from A012.6 to X5.21 to 411.RA/12 to E117_11 and E127_11 refer [WAG9_9K] page 05Q, 05L.
check repair/replace wiring from A012.7 to X5.22 to 411.RA/13 to E117_12 and E127_12 refer [WAG9_9K] page 05Q, 05L.
- If there is some problem with battery charger check battery charger diagnostic memory and for any internal fault follow the customer documentation for check and troubleshooting. If not resolved replace battery charger.
- Check load connected to battery charger for failure.

Reaction:

- Battery Charger locked.

Related messages:

-

Fault Text:**Battery charger input AC Overvoltage .**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

Battery

Condition:

- IO station 11 and 12 communication is ok.

Criteria:

- Battery charger diagnostic Bit2 (E117_13/E127_13) are set indicating input AC

overvoltage. Components concerned:

Component	Device name
Battery charger	-A012
IO station 11 module 7	E117
IO station 12 module 7	E127

Troubleshooting:

- Check the battery charger .
- If IO modules has problem replace the module or check repair/replace wiring from A012.8 to X5.23 to 411.RA/14 to E117_13 and E127_13 refer [WAG9_9K] page 05Q, 05L.
- If there is some problem with battery charger check battery charger diagnostic memory and for any internal fault follow the customer documentation for check and troubleshooting. If not resolved replace battery charger.
- Check load connected to battery charger for failure.

Reaction:

- Battery Charger locked.

Related messages:

-

Fault Text:**Battery Charger AC input Undervoltage.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

Battery

Condition:

- IO station 11 and 12 communication is ok.

Criteria:

- Battery charger diagnostic Bit0 and Bit2 (E117_11/E127_11) and (E117_13/E127_13) are set indicating input AC under voltage.

Components concerned:

Component	Device name
Battery charger	-A012
IO station 11 module 7	E117
IO station 12 module 7	E127

Troubleshooting:

- Check the battery charger .
- If IO modules has problem replace the module or check repair/replace wiring from A012.6 to X5.21 to 411.RA/12 to E117_11 and E127_11 refer [WAG9_9K] page 05Q, 05L. Check repair/replace wiring from A012.8 to X5.23 to 411.RA/14 to E117_13 and E127_13 refer [WAG9_9K] page 05Q, 05L.
- If there is some problem with battery charger check battery charger diagnostic memory and for any internal fault follow the customer documentation for check and troubleshooting. If not resolved replace battery charger.
- Check load connected to battery charger for failure.

Reaction:

- Battery Charger locked.

Related messages:

-

Fault Text:**Battery Charger controller overtemperature.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

Battery

Condition:

- IO station 11 and 12 communication is ok.

Criteria:

- Battery charger diagnostic Bit1 and Bit2 (E117_12/E127_12) and (E117_13/E127_13) are set indicating input AC under voltage.

Components concerned:

Component	Device name
Battery charger	-A012
IO station 11 module 7	E117
IO station 12 module 7	E127

Troubleshooting:

- Check the battery charger .
- If IO modules has problem replace the module or check repair/replace wiring from A012.7 to X5.22 to 411.RA/13 to E117_12 and E127_12 refer [WAG9_9K] page 05Q, 05L. Check repair/replace wiring from A012.8 to X5.23 to 411.RA/14 to E117_13 and E127_13 refer [WAG9_9K] page 05Q, 05L.
- If there is some problem with battery charger check battery charger diagnostic memory and for any internal fault follow the customer documentation for check and troubleshooting. If not resolved replace battery charger.
- Check load connected to battery charger for failure.

Reaction:

-

Related messages:

-

Fault Text:**Battery Charger input overcurrent**Priority Type

3(1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

BATT

Condition:

- Communication to IO station 11 & IO12 is ok.
- Battery Charger is ok.

Criteria:

-
- Battery charger overcurrent detected.

Components concerned:

Component	Device name
Battery charger	-A012
IO station 11 Module 7	-E117
IO station 12 Module 7	-E127

Troubleshooting:

- Check the wiring between AUX. CUBICLE to VCU-1, Refer drawing [WAG9_9K] sheet 16.
- Check the input circuit of battery charger.
- Check Battery Charger and replace if faulty.

Reaction:

- Battery charger switch off.

Related messages:

0543

Fault Text:**Battery Charging Current Low.**Priority Type

2(1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

BATT

Condition:

- Communication to IO station 11 & IO12 is ok.
- Battery Charger is ok.

Criteria:

- Battery charger current low detected

Components concerned:

Component	Device name
Battery charger	-A012
IO station 11 Module 7	-E117
IO station 12 Module 7	-E127

Troubleshooting:

- Check the wiring between AUX. CUBICLE to VCU-1, Refer drawing [WAG9_9K] sheet 16.
- Check the input circuit of battery charger.
- Check Battery Charger and replace if faulty.

Reaction:

- Battery charger switch off.

Related messages:

0544

Fault Text:**Battery Charger heat sink temperature high.**Priority Type

2(1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

BATT

Condition:

- Communication to IO station 11 & IO12 is ok.
- Battery Charger is ok.

Criteria:

- Battery Charger heatsink temperature high detected.

Components concerned:

Component	Device name
Battery charger	-A012
IO station 11 Module 7	-E117
IO station 12 Module 7	-E127

Troubleshooting:

- Check the cooling air supply to battery charger.
- Check Battery Charger and replace if faulty.

Reaction:

- Battery charger switch off.

Related messages:

0545

Fault Text:**BATT < 82 Vdc, Self OFF timer start**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

BATT

Condition:

- Communication to IO station 12 is ok (for 9K locomotive)
- AUX2 & AUX3 communication ok (for 6K locomotive)

Criteria:

- Battery voltage <86V

Components concerned:

Component	Device name
IO station 12 Module 1	-E121
AUX2-M1300	-A1
AUX3-M1300	-A2

Troubleshooting:

- Check the communication with AUX2 & AUX3.
- Check communication with E112 IO card
- Check 411.EC connection, Refer drawing [WAG9_9K] sheet 28A, page1.

Reaction:

- Self timer initiated, locomotive will shutdown in 5 mins.

Related messages:

0522

Fault Text:**Battery Charger diagnosis triggered**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

BATT

Condition:

- VCB is ON
- Battery charger available
- loco variant 6k
- simulation mode not activated
- Communication with AUX2 & AUX3 healthy

Criteria:

- AUC2 has triggered fault
- ACU3 has triggered fault.

Components concerned:

Component	Device name
Battery charger	-A012

Troubleshooting:

- Check the communication with AUX2 & AUX3
- Check AUX2 / AUX3 logs for further diagnostics.

Reaction:

-

Related messages:

0376

Fault test:**CDS: Speed invalid**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Speed

Condition:

-

Criteria:

- Speed sensor system is completely failed. All speed sensors failed.
- Actual speed by TM is beyond tolerance limit.

Components concerned:

Component	Device Name
TCU1	415/1
TCU2	415/2
Speed Sensor	93.2/1,93.2/2,93.2/3,93.2/4,93.2/5,93.2/6

Troubleshooting:

- It is not possible, that all these six speed sensors do have a fault at the same time.
- Check the faults if any logged related to Speed sensors.
- Check the associated wiring to each speed sensors 93.2/1, 93.2/2, 93.2/3, 93.2/4, 93.2/5, 93.2/6. Refer the drawing [WAG9-6K] 12D sheet 4.
- If the problem still persists contact SIEMENS engineer.

Reaction:

- Fault code triggered.

Related messages:

-

Fault Text:**Limited speed value displayed**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

Traction

Condition:

- Difference in Speed sensor values

Criteria:

- Difference in traction motor speed sensors between TM1-6

Components concerned:

Component	Device name
Speed sensors	93.2/1,93.2/2,93.2/3,93.2/4,93.2/5,93.2/6
Traction motors	20/1,20/2,20/3,20/4,20/5,20/6

Troubleshooting:

- Check TM speed sensor speed value in DDU and see which TM sensor is showing the deviation.

Reaction:

-

Related messages:

-

5.4.251 CCU Fault Code 934Fault test:**CDS: Milage invalid**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Speed

Condition:

- No new value entered by user

Criteria:

- The mileages from all the controls need to be synchronized.

Components concerned:

Component	Device Name
TCU1	415/1
TCU2	415/2
CCU	-A100-C003
Battery/ Fan module	-A100-J000

Troubleshooting:

- Ensure that communication with TCU is ok, then restart the CCU's.
- Restart both the TCU's and reenter the mileage.
- Check battery in control units of CCU and TCU replace if necessary. Refer the drawing [WAG9_6K_TCU] sheet 45.

Reaction:

- Fault code triggered.

Related messages:

-

Fault test:**CDS: Reference axle diameter out of range**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Speed

Condition:

- System run ok.

Criteria:

- The input wheel diameter is out of the limits (Wheel diameter ranges from 1015.98mm to 1097.2 mm)

Components concerned:

Component	Device Name
CCU	-A100-C003

Troubleshooting:

- Enter Input wheel diameter of the reference axle with SIBAS-Monitor.
- If the error still persists, Reload actual CCU software in the CCU with SIBAS Monitor. If required replace the CCU module.

Reaction:

- Fault code triggered.

Related messages:

-

Fault test:

CDS: Stored value for reference axle diameter out of range

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Speed

Condition:

- System runs ok.

Criteria:

- There is a difference for the two memory locations for the diameter of the reference axle inside the CCU control.

Components concerned:

Component	Device Name
CCU	-A100-C003

Troubleshooting:

- Enter Input wheel diameter of the reference axle with SIBAS-Monitor.
- If the error still persists, Reload actual CCU software in the CCU with SIBAS Monitor. If required replace the CCU module.

Reaction:

- Fault code triggered.

Related messages:

-

Fault Text:**CDS: Speed sensor axel 1 failure**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

-

Criteria:

-Actual speed of TM1 in Kmph is valid but raw speed value given by speed sensor 93.2/1 of TM1 is not valid.

Components concerned:

Component	Device name
Speed sensor	93.2/1
ICU PWMI A	C139

Troubleshooting :

- Check/replace speed sensor 93.2/1
- Check the wiring from speed sensor connector 92.2A/1 to TCU1 connector 415.HA/1
Refer drawing [WAG9_9K] 12D sheet 4
- Check the wiring from speed sensor connector 93.2B/1 to TCU1 connector 415.HA/2
Refer drawing [WAG9_9K] 12D sheet 4
- Check the wiring from TCU1 connector X7.1 to C139 connector X3 inside of TCU1
[WAG9-9K-TCU] sheet 27
- Check the wiring from TCU1 connector X7.2 to C139 connector X3 inside of TCU1
[WAG9-9K-TCU] sheet 27
- If problem doesn't resolved replace ICU PWMI A card of TCU1

Reaction:

- traction inhibited until speed sensor is isolated

Related messages:

-

Fault Text**CDS: Speed sensor axel 2 failure**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

-

Criteria:

-Actual speed of TM2 in Kmph is valid but raw speed value given by speed sensor 93.2/2 of TM2 is not valid.

Components concerned:

Component	Device name
Speed sensor	93.2/2
ICU PWMI B	C119

Troubleshooting :

- Check/replace speed sensor 93.2/2
- Check the wiring from speed sensor connector 92.2A/2 to TCU1 connector 415.HC/1
Refer drawing [WAG9_9K] 12D sheet 4
- Check the wiring from speed sensor connector 93.2B/2 to TCU1 connector 415.HC/2
Refer drawing [WAG9_9K] 12D sheet 4
- Check the wiring from TCU1 connector X8.1 to C119 connector X3 inside of TCU1
[WAG9-9K-TCU] sheet 27
- Check the wiring from TCU1 connector X8.2 to C119 connector X3 inside of TCU1
[WAG9-9K-TCU] sheet 27
- If problem doesn't resolved ,replace ICU PWMI B card of TCU1

Reaction:

- traction inhibited until speed sensor is isolated

Related messages:

-

Fault Text:**CDS: Speed sensor axel 3 failure**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

-

Criteria:

-Actual speed of TM3 in Kmph is valid but raw speed value given by speed sensor 93.2/3 of TM3 is not valid.

Components concerned:

Component	Device name
Speed sensor	93.2/3
ICU PWMI C	C099

Troubleshooting:

- Check/replace speed sensor 93.2/3
- Check the wiring from speed sensor connector 92.2A/3 to TCU1 connector 415.HE/1
Refer drawing [WAG9_9K] 12D sheet 4
- Check the wiring from speed sensor connector 93.2B/3 to TCU1 connector 415.HE/2
Refer drawing [WAG9_9K] 12D sheet 4
- Check the wiring from TCU1 connector X9.1 to C099 connector X3 inside of TCU1
[WAG9-9K-TCU] sheet 27
- Check the wiring from TCU1 connector X9.2 to C099 connector X3 inside of TCU1
[WAG9-9K-TCU] sheet 27
- If problem doesn't resolved ,replace ICU PWMI C card of TCU1

Reaction:

- traction inhibited until speed sensor is isolated

Related messages:

-

Fault Text

CDS: Speed sensor axel 4 failurePriority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

-

Criteria:

-Actual speed of TM4 in Kmph is valid but raw speed value given by speed sensor 93.2/4 of TM4 is not valid.

Components concerned:

Component	Device name
Speed sensor	93.2/4
ICU PWMI C	C099

Troubleshooting :

- Check/replace speed sensor 93.2/4
- Check the wiring from speed sensor connector 92.2A/4 to TCU2 connector 415.HE/3
Refer drawing [WAG9_9K] 12H sheet 8
- Check the wiring from speed sensor connector 93.2B/4 to TCU2 connector 415.HE/4
Refer drawing [WAG9_9K] 12H sheet 8
- Check the wiring from TCU2 connector X9.1 to C099 connector X3 inside of TCU2
[WAG9-9K-TCU] sheet 27
- Check the wiring from TCU2 connector X9.2 to C099 connector X3 inside of TCU2
[WAG9-9K-TCU] sheet 27
- If problem doesn't resolved ,replace ICU PWMI C card of TCU2

Reaction:

- traction inhibited until speed sensor is isolated

Related messages:

-

Fault Text:**CDS: Speed sensor axel 5 failure**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

-

Criteria:

-Actual speed of TM5 in Kmph is valid but raw speed value given by speed sensor 93.2/5 of TM5 is not valid

Components concerned:

Component	Device name
Speed sensor	93.2/5
ICU PWMI B	C119

Troubleshooting :

- Check/repair speed sensor 93.2/5
- Check the wiring from speed sensor connector 92.2A/5 to TCU2 connector 415.HC/3
Refer drawing [WAG9_9K] 12H sheet 8
- Check the wiring from speed sensor connector 93.2B/5 to TCU2 connector 415.HC/4
Refer drawing [WAG9_9K] 12H sheet 8
- Check the wiring from TCU2 connector X8.1 to C119 connector X3 inside of TCU2
[WAG9-9K-TCU] sheet 27
- Check the wiring from TCU2 connector X8.2 to C119 connector X3 inside of TCU2
[WAG9-9K-TCU] sheet 27
- If problem doesn't resolved ,replace ICU PWMI B card of TCU2

Reaction:

- traction inhibited until speed sensor is isolated

Related messages:

-

Fault Text:**CDS: Speed sensor axel 6 failure**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

-

Criteria:

-Actual speed of TM6 in Kmph is valid but raw speed value given by speed sensor 93.2/6 of TM6 is not valid

Components concerned:

Component	Device name
Speed sensor	93.2/6
ICU PWMI A	C139

Troubleshooting :

- Check/repair speed sensor 93.2/6
- Check the wiring from speed sensor connector 92.2A/6 to TCU2 connector 415.HA/3
Refer drawing [WAG9_9K] 12H sheet 8
- Check the wiring from speed sensor connector 93.2B/6 to TCU2 connector 415.HA/4
Refer drawing [WAG9_9K] 12H sheet 8
- Check the wiring from TCU2 connector X7.1 to C139 connector X3 inside of TCU2
[WAG9-9K-TCU] sheet 27
- Check the wiring from TCU2 connector X7.2 to C139 connector X3 inside of TCU2
[WAG9-9K-TCU] sheet 27
- If problem doesn't resolved ,replace ICU PWMI A card of TCU2

Reaction:

- traction inhibited until speed sensor is isolated

Related messages:

-

Fault Text:**Speed sensor locked**Priority Type

0 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

TMC

Condition:

- Communication with TCU1 and TCU2 is ok

Criteria:

- One/more speed sensors detected lock.

Components concerned:

Component	Device name
Speed sensors	93.2/1,93.2/2,93.2/3,93.2/4,93.2/5,93.2/6
Traction motors	20/1,20/2,20/3,20/4,20/5,20/6

Troubleshooting:

- Check the speed sensor feedback from DDU, replace speed sensor if faulty.
- If speed sensor is locked, then unlock the speed sensor from the maintenance menu.
- Check the value of speed sensor during testing or via signal for all the motors for reference.
- Check the concerned SUB-D for any loose connection for the TCC having the motor.
- Check for any grease or gap in the speed sensor mounting assembly.
- Check/fix slipping/broken pinion and run the locomotive.
- Check and tear wheel to same size.

Reaction:

-

Related messages:0951
0952
0953
0954
0955
0956

5.4.261 CCU Fault Code 980

Fault Text:

REMMLOT Transfer error

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H/WAP7/WAP5/WAG9H/7MW/WAP7 Upgrade

Sub-system:

RDS

Condition:

-

Criteria:

- Size of HTTP request send buffer is not valid.
- Maximum payload receive buffer/ HTTP reply receive buffer size is not valid.
- TCP/IP send buffer is not logged in or registered.
- TCP/IP receive buffer is not logged in or registered.
- TCP/IP send and receive buffer ID is not same.
- HTTP receive buffer clear failed.
- HTTP request is not successfully generated.
- IP socket is not opened successfully.
- TCP connect error.
- HTTP header not ok.
- HTTP body not ok.
- IP close error

Components concerned:

Component	Device name
REMMLOT	EU1

Reaction:

- Fault code triggered.

Troubleshooting:

- Check the ethernet connection between ethernet switch to REMMLOT. (Refer drg. [WAG9-9K] page 14)
- Check/Replace the REMMLOT

Related messages:

-

5.4.262 CCU Fault Code 981

Fault Text:

REMMLOT Communication Error

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H/WAP7/WAP5/WAG9H/7MW/WAP7 Upgrade

Sub-system:

RDS

Condition:

-

Criteria:

- Size of HTTP request send buffer is not valid.
- Maximum payload receive buffer/ HTTP reply receive buffer size is not valid.
- TCP/IP send buffer is not logged in or registered.
- TCP/IP receive buffer is not logged in or registered.
- TCP/IP send and receive buffer ID is not same.
- HTTP receive buffer clear failed.
- HTTP request is not successfully generated.
- IP socket is not opened successfully.
- TCP connect error.
- HTTP header not ok.
- HTTP body not ok.
- IP close error

Components concerned:

Component	Device name
REMMLOT	EU1

Reaction:

- Fault code triggered.

Troubleshooting:

- Reset Power supply of REMMLOT & Check the LED Status.
- Check the ethernet connection between ethernet switch to REMMLOT. (Refer drg. [WAG9-9K] page 14).

Related messages:

5.4.263 CCU Fault Code 982

Fault Text:

REMMLOT External Memory not available

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H/WAP7/WAP5/WAG9H/7MW/WAP7 Upgrade

Sub-system:

RDS

Condition:

-

Criteria:

- In REMMLOT Device USB LED not glow.

Components concerned:

Component	Device name
REMMLOT	EU1

Reaction:

- Fault code triggered.

Troubleshooting:

- Connect the REMMLOT by IP address 10.0.1.50.
- Remove & Reinsert Turg Memory & Check LED of USB detection on REMMLOT Device.
- If not ok, Then remove turg memory & Check with Service laptop.
- If Issue In turg memory Replace with new one or Change the REMMLOT Device.

Related messages:

5.4.264 CCU Fault Code 984

Fault Text:

REMMLOT external memory 100% filled

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H/WAP7/WAP5/WAG9H/7MW/WAP7 Upgrade

Sub-system:

RDS

Condition:

-

Criteria:

- Turg Memory is Full

Components concerned:

Component	Device name
REMMLOT	EU1

Reaction:

- Fault code triggered.

Troubleshooting:

- Take the Logs & Stored in Service Laptop & Erased the Turg Memory Data.

Related messages:

5.4.265 CCU Fault Code 1001

Fault Text:

Emergency exhaust cock closed no traction.

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Communication to IO station 22 is ok

Criteria:

- Pneumatic Brake Control should be ON.
- Feedback to DI card E222_06 [LEmgBKOut] missing.
- DI Card Failure.

Components concerned:

Component	Device name
IO station 22 Module 2	E222

Troubleshooting:

- Check input power supply to Pneumatic brake control power supply unit.
- Check DI card E222_06 [LEmgBKOut] feedback at Pin I7.
- Check Emergency exhaust isolating cock position 237.3, Refer drawing [WAG9_6k] sheet 06A Page 01.
- Replace if Digital input card E222 card, if faulty.

Reaction:

- Traction Blocked.

Related messages:

-

Fault Text:**Brake Pipe Pressure Switch Signal is not valid.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Brake

Condition:

- Brake pipe pressure is less than 2.5 bar and Pressure switch emergency brake not active.
- OR Brake pipe pressure is greater than 4.7 bar and pressure switch emergency brake is active.

Criteria:

- Analog brake pipe pressure value doesn't fit to the BP pressure switch.

Components concerned:

Component	Device name CCU1
IO station 21 Module 2	E212
IO station 21 Module 3	EA213
IO station 22 module 2	E222
Pressure transducer auto brake pipe	269
Emergency brake pressure switch	269.1

Troubleshooting:

- Check CB control circuit 126 & Pneumatic panel CB 127.7
- Check wiring between AI Module EA213_01 to autobrake pressure transducer 269. Refer drawing [WAG9_9K] 06H sheet 08.
- Check wiring between E212_10 to emergency brake pressure switch 269.1 & between E222_07 to emergency brake pressure switch 269.1.Refer drawing [WAG9_9K] 06A sheet 01.
- Check/replace Module EA213.
- Check/replace pressure transducer 269

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**MR-Pressure Switch Signals are not valid**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Brake

Condition:

-

- Module E212_02 & E222_09 are redundant channels.

-Module E212_03 & E222_14 are redundant channels.

Criteria:

- One of MR pressure switch 1 and MR pressure switch 2 should show more than 8 bar and MR pressure switch 3 shows less than 5.6 bar

Components concerned:

Component	Device name CCU1
IO station 22 Module 2	E222
IO station 21 Module 2	E212
Pressure switch main compressor 1	172.2
Pressure switch main compressor 2	172.3
Pressure switch low main compressor 3	269.4

Troubleshooting:

-Check control circuit CB 126 & Pneumatic panel CB 127.7

-Check wiring between CB 127.7 to pressure switches 172.2,172.3 & 269.4. Refer drawing [WAG9_9K] 06E sheet 05

-Check wiring from pressure switches 172.2 to E222_11. Refer drawing [WAG9_9K] 06E sheet 05

-Check wiring from pressure switches 172.3 to E212_02 & from 172.3 to E222_09. Refer drawing [WAG9_9K] 06E sheet 05

-Check wiring from pressure switches 269.4 to E212_03 & from 269.4 to E222_14. Refer drawing [WAG9_9K] 06E sheet 05

-Check/replace Pressure switches 172.2,172.3 & 269.4

-Check/replace Modules E222 and/or E212

Reaction:

-Fault code triggered

Related messages:

-

Fault Text:**Low main reservoir pressure.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:BRAKECondition:

Communication to IO station 22 is ok

Criteria:

- MR Pressure is < 5.6 bar detected by E212_03 and E222_14.
- If CB 127.7 is OFF
- E212_03 and E222_14 are redundant channels.

Components concerned:

Component	Device name
IO station 21 Module 3	E212
IO station 22 Module 2	E222

Troubleshooting:

- Check Pneumatic panel power supply 127.7, Refer drawing [WAG9_6k] 06E sheet 05.
- Check DI cards E212_03 [MPPrSwLowMR] or E222_14 [MPPrSwLowMR] any one feedback should be high. Refer drawing [WAG9_6k] 06E sheet 05.
- Check the leakage in air pipe or main reservoir.
- Check Main Compressor running status.

Reaction:

- Traction Block.

Related messages:

-

Fault Text:**Parking Brake Releasing Failed**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Brake

Condition:

- Parking brake release button was pressed and loco is switched on.
- Park brake pressure is greater than 3.5 bar.

Criteria:

- Park brake release command is given, and park brake release magnet valve is closed for more than 30 seconds.
- Park brake is not released in own loco.

Components concerned:

Component	Device name
EP valve	270.4
IO station 21	A215
IO station 22	E222
Pressure switch	P3.5(269.3)

Troubleshooting:

- Check/repair parking brake release EP valve (270.4_06 B01)
- Check Wiring between EP valve 270.4 and DO (A215_06,A226_04) module and repair it.
- Check pressure feedback from pressure switch P3.5 (269.3_06B11). Check pressure switch is ok or not and repair it
- Check/repair wiring from pressure switch to DI (E212_14, E222_01) module
- Contact Siemens maintenance personnel.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**Parking Brake Application failed**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Brake

Condition:

- Parking brake apply button was pressed and loco is switched on.
- Park brake pressure is less than 3.5 bar

Criteria:

- Park brake apply command is given, and park brake apply magnet valve is opened for more than 30 seconds.
- Park brake is not applied in own loco.

Components concerned:

Component	Device name
EP valve	270.3
IO station 21	A215
IO station 22	E222
Pressure switch	P3.5(269.3)

Troubleshooting:

- Check/repair parking brake release EP valve (270.3_06 B02)
- Check Wiring between EP valve 270.3 and DO (A215_07,A226_05) module and repair it.
- Check pressure feedback from pressure switch P3.5 (269.3_06B11). Check pressure switch is ok or not and repair it
- Check/repair wiring from pressure switch to DI (E212_14, E222_01) module
- Contact Siemens maintenance personnel.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**Traction with parking brakes not allowed.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

Communication to IO station 22 is ok

Criteria:

- Parking brake applied.
- E211_02 or E221_15[redundant channels], feedback high.

Components concerned:

Component	Device name
IO station 21 Module 1	E211
IO station 22 Module 1	E221

Troubleshooting:

- Check parking brake push button(BPPB) and release if pressed.
- Check the wiring of E211_02 or E221_15.

Reaction:

- Traction Block.

Related messages:

-

Fault Text:**Brake Pipe Cut Out**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Communication to IO station 21 or 22 is ok

Criteria:

- Pneumatic Brake Control should be ON.
- Feedback to DI card E211_05 [LCockBkCon] or E222_02 [LCockBkCon] are faulty [redundant channels].

Components concerned:

Component	Device name
IO station 21 Module 1	E211
IO station 22 Module 2	E222
BP Isolation Cock	293.2

Troubleshooting:

- Check input power supply to Pneumatic brake control power supply unit.
- Check DI card E211_05 [LCockBkCon] or E222_02 [LCockBkCon] any one card feedback should be high, Refer drawing [WAG9_6k] 06A sheet 01.
- BP Isolating Cock should be in closed position 293.2, Refer drawing [WAG9_6k] 06A sheet 01.

Reaction:

- Traction Blocked.

Related messages:

-

Fault Text:**Fault in Brake Electronics**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Brake

Condition:

- MCB 126 should be in on condition

Criteria:

- BCU healthy feedback from brake electronics is not available at digital input E123_01 and E222_05
- E123_01 and E222_05 are the redundant channels.

Components concerned:

Component	Device name
IO station 12 Module 3	E123
IO station 22 Module 2	E222
Brake Pneumatic	260

Troubleshooting :

- Check / replace IO module E123_01 and E222_05.
- Check Wiring between DI E123_01 and E222_05 and BCU 260. Refer drawing [WAG9_9K] 2J sheet 08
- Check//Replace BCU 260.

Reaction:

- BCU will not be available

Related messages:

-

Fault Text:**Activation of Banking not possible in Running Loco.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Locomotive is running

Criteria:

- Banking mode activation requested through ZBAN switch [LSwBankOp] while Locomotive is running

Components concerned:

Component	Device name
ZBAN	153/1 153/2

Troubleshooting:

- Stop the locomotive and switch-on ZBAN for banking operation.

Reaction:

- Banking mode operation not possible.

Related messages:

-

Fault Text:**Deactivation of Banking not possible with VCB closed.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Locomotive is running
- Locomotive is in banking mode
- VCB Closed.

Criteria:

- Banking mode deactive command through ZBAN switch [LSwBankOp] while locomotive is not standstill.

Components concerned:

Component	Device name
ZBAN	153/1 153/2

Troubleshooting:

- Stop the locomotive and open VCB to disable ZBAN operation, Refer drawing [WAG9_6k] 06F sheet 06.

Reaction:

- Banking mode cannot be disabled.

Related messages:

-

Fault Text:

Alarm Chain pulling.

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- External Emergency Brake Active [VCD, EmBrk Overspeed and Emg Stop]
- Emergency Brake Active.

Criteria:

- Brake Pipe air flow is high, may due to
 - Alarm chain is pulled on a coach.
 - Train is parted.
 - Too much air flows out of the brake pipe on the train.

Components concerned:

Component	Device name
ZBAN	153/1 153/2

Troubleshooting:

- Reset external emergency Brake

Reaction:

Traction not possible

Related messages:

-

Fault Text:**Air brake emergency activated.**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Pneumatic Brake Control should be ON.
- Communication to IO station 21 or 22 is ok

Criteria:

- Emergency brake pressure switch feedback active at E212_10/222_07 (MprSwEmgBk)
- E212_10 and E222_07 are redundant

channels. Components concerned:

Component	Device name
IO station 21 Module 2	E212
IO station 22 Module 2	E222
Emergency brake pressure switch	269.1

Troubleshooting:

- Check for emergency brake applied.
- Check/replace the Emergency brake pressure switch(269.1)
- Check/replace DI card channels E212_10/222_07 any one card feedback should be high, Refer drawing [WAG9_6k] 06A sheet 01.

Reaction:

- Traction Blocked.

Related messages:

Fault Text:

Traction with applied auto brakes not allowed.

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Emergency brake not active.
- Angle Transmitter in Traction Position
- Locomotive speed above 10 Kmph

Criteria:

- Auto brake applied on loco while traction demand from angle transmitter.

Components concerned:

Component	Device name

Troubleshooting:

- Move angle transmitter to zero position then apply auto brake.

Reaction:

- Traction not available.

Related messages:

-

Fault Text:**Traction with applied independent brakes not allowed.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Communication to IO station 21 and 22 is ok
- Pneumatic Brake Control should be ON.
- Locomotive speed above 10 Kmph

Criteria:

- Loco brake applied while locomotive in traction.

Components concerned:

Component	Device name
IO station 21 Module 1	E211
IO station 22 Module 2	E222
SA9 Pressure Switch	269.2

Troubleshooting:

- Check DI card E211_07 [MPPrSwLocoB] or E222_03 [MPPrSwLocoB] any one card feedback should be high, Refer drawing [WAG9_6k] 06A sheet 01.
- Check/Replace SA9 Pressure Switch should be in closed position 293.2, Refer drawing [WAG9_6k] 06A sheet 01.

Reaction:

- Traction Blocked.

Related messages:

-

Fault Text:**Traction with applied pneumatic brakes not allowed.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Communication to IO station 21 and 22 is ok
- Pneumatic Brake Control should be ON.
- Locomotive speed above 10 Kmph.

Criteria:

- Pneumatic Brake not released while locomotive is in traction.

Components concerned:

Component	Device name
IO station 21 Module 1	E211
IO station 21 Module 2	E212
IO station 22 Module 2	E222
IO station 22 Module 3	E223
BC Pressure Switch BG1	269.6/1
BC Pressure Switch BG2	269.6/2

Troubleshooting:

- Ensure Pneumatic brake is fully released condition while locomotive is running.

If problem still persists:

- Check/replace BC Pressure Switch Bogie1 (269.6/1).
- Check/replace BC Pressure Switch Bogie2 (269.6/2).
- Check DI card E212_12/223_13 (MPrSwBkCy1), Refer drawing [WAG9_6k] 06A sheet 01.
- Check DI card E211_06/222_10 (MprSwBkCy2), Refer drawing [WAG9_6k] 06A sheet 01.

Reaction:

-

Related messages:

-

Fault Text:**CSC: EB not sufficient!**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

Traction

Condition:

- Constant speed mode activation.
- Locomotive speed is more than 1km/h in CSC mode.
- Acceleration is more than 0.2m/s².

Criteria:

- Not sufficient regenerative braking during constant speed mode.

Components concerned:

Component	Device name
TCU-1	415/1
TCU-2	415/2

Troubleshooting:

- Check which bogie regenerative braking is poor in DDU while in CSC mode.
- Check downloads of related TCUs for further analysis.

Reaction:

- Poor Regenerative braking.

Related messages:

-

Fault Text:**Shunting Mode: EB not sufficient! Manual brake required!**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

Traction

Condition:

- Shunting Mode Activated.
- Locomotive speed is more than 1km/h in shunting mode.
- Acceleration is more than 0.2m/s².

Criteria:

- Not sufficient regenerative braking during constant speed mode.

Components concerned:

Component	Device name
TCU-1	415/1
TCU-2	415/2

Troubleshooting:

- Check which bogie regenerative braking is poor in DDU while in CSC mode.
- Check downloads of related TCUs for further analysis.

Reaction:

- Limited Regenerative braking.

Related messages:

-

Fault Text:**Shunting mode activated**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- Cab is active.
- Reverser position center.
- Master controller in 0 position.
- Locomotive is standstill.
- Command to activate shunting mode is given.
- Loco is leading.

Criteria:

- Command is given to activate the shunting mode.

Components concerned:

Component	Device name

Troubleshooting:

- This is only for information.

Reaction:

- Locomotive will run on speed upto 15kmph.

Related messages:

-

Fault Text:

Ext IO 11: AS Module defective

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CB 127.9/1 is ON

Criteria:

Ext IO 11 AS module may have:

- General status faulty
- Error on L_Bus
- NSDB Error
- Component Error
- Sink Port Error
- Watchdog Error

Components concerned:

Component	Device name
CB	127.9/1
Bus coupler 11	411

Troubleshooting:

- Read out CCU diagnostic memory.
- Analyze diagnostic environment of diagnostic entry. The parameter "Ext IO 11 Status " in the environment for exact error.

10748: Ext IO 11 Status :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
4	General Status Error
5	Shift Register Error
6	NSDB Error
7	Component Error
8	Sink Port Error
9	Watchdog Error

- Switch I/O station 11 (Use CB I/O station 11, 127.9/1)

- Check/reload correct NSDB to bus coupler or I/O station 11
- Check correctness of L-Bus connector and front connectors and switch I/O station 11 again.
- Check hardware of I/O module
- Ensure all Line Bus cables are plugged correctly.
- Check/replace Bus module of I/O station 11. Refer drawing [WAG9-6K] 9A sheet no.1

Reaction:

- VCB switched off
- Fault code triggered

Related messages:

-

Fault Text:**Ext.IO 11: One/More Module defective.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

MVB Communication between CCU and I/O station 11 is Ok

Criteria:

- Slot status error for failed module in IO station 11 is set

Components concerned:

Component	Device name
I/O station 11	411

Troubleshooting:

- Check "Ext IO 11 Status " in the environment for exact slot error.

10748: Ext IO 11 Status: 0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
10	Slot status 1
11	Slot status 3
12	Slot status 4
13	Slot status 5
14	Slot status 6
15	Slot status 7
16	Slot status 2

- If any of the above Bits 10 to 16 is high then that particular Slot module is faulty.
- Replace the faulty module.

Reaction:

- Fault code triggered
- The failed slot in IO station 11 is inoperative.
- If the critical signals available at failed slot are redundant then they are automatically taken over by the CCU software. Therefore, creating no reduction in loco functionality.

Related messages:

-

Fault Text:

Ext.IO 12: AS Module defective

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CB 127.9/2 is ON

Criteria:

Ext IO 12 AS module may have:

- General status faulty
- Error on L_Bus
- NSDB Error
- Component Error
- Sink Port Error
- Watchdog Error

Components concerned:

Component	Device name
CB	127.9/2
Bus coupler 12	411

Troubleshooting:

- Read out CCU diagnostic memory.
- Analyze diagnostic environment of diagnostic entry. The parameter "Ext IO 12 Status " in the environment for exact error.
- Check "Ext IO 12 Status " in the environment for exact error.

10761: Ext IO 12 Status :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
3	General status error
4	Shift register error
5	NSDB Error
6	Component Error
7	Sink Port Error
8	Watchdog Error

- Switch I/O station 12 (Use CB I/O station 12, 127.9/2)
- Check/reload correct NSDB to bus coupler or I/O station 12
- Check correctness of L-Bus connector and front connectors and switch I/O station 12 again.
- Check hardware of I/O module
- Ensure all Line Bus cables are plugged correctly.
- Check/replace Bus module of I/O station 12. Refer drawing [WAG9-6K] 9A sheet no.1

Reaction:

- VCB switched off
- Fault code triggered

Related messages:

-

Fault Text:**Ext.IO 12: One/More Module defective.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

MVB Communication between CCU and I/O station 12 is Ok

Criteria:

- Slot status error for failed module in IO station 12 is set

Components concerned:

Component	Device name
I/O station 12	411

Troubleshooting:

- Check "Ext IO 12 Status " in the environment for exact slot error.

10761: Ext IO 12 Status: 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
9	Slot status 1 DI12
10	Slot status 2 DI13
11	Slot status 3 DI14
12	Slot status 4 DI15
13	Slot status 5 DI16
14	Slot status 6 DI17
15	Slot status 7 DI18

- If any of the above Bits 9 to 15 is high then that particular Slot module is faulty.
- Replace the faulty module.

Reaction:

- Fault code triggered
- The failed slot in IO station 12 is inoperative.
- If the critical signals available at failed slot are redundant then they are automatically taken over by the CCU software. Therefore, creating no reduction in loco functionality.

Related messages:

-

Fault Text:

Ext.IO 21: AS Module defective

Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CB 127.9/3 is ON

Criteria:

Ext IO 21 AS module may have:

- General status faulty
- Error on L_Bus
- NSDB Error
- Component Error
- Sink Port Error
- Watchdog Error

Components concerned:

Component	Device name
CB	127.9/3
Bus coupler 21	412

Troubleshooting:

- Read out CCU diagnostic memory.
- Analyze diagnostic environment of diagnostic entry. The parameter "Ext IO 21 Status " in the environment for exact error.

10772: Ext IO 21 Status :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
3	General Status Error
4	Shift Register Error
5	NSDB Error
6	Component Error
7	Sink Port Error
8	Watchdog Error

- Switch I/O station 21 (Use CB I/O station 21, 127.9/3) .

- Check/reload correct NSDB to bus coupler or I/O station 21.
- Check correctness of L-Bus connector and front connectors and switch I/O station 21 again.
- Check hardware of I/O module.
- Ensure all Line Bus cables are plugged correctly.
- Check/replace Bus module of I/O station 21. Refer drawing [WAG9-6K] 9B sheet no.2

Reaction:

- VCB switched off
- Fault code triggered

Related messages:

-

Fault Text:

Ext.IO 21: One/More Module defective.

Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

MVB Communication between CCU and I/O station 21 is Ok

Criteria:

- Slot status error for failed module in IO station 21 is set

Components concerned:

Component	Device name
I/O Station 21	412

Troubleshooting:

- Check "Ext IO 21 Status " in the environment for exact slot error.

10772: Ext IO 21 Status: 0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
9	Slot status 1
10	Slot status 2
11	Slot status 3
12	Slot status 4
13	Slot status 5
14	Slot status 6
15	Slot status 7

- If any of the above Bits 9 to 15 is high then that particular Slot module is faulty.
- Replace the faulty module.

Reaction:

- Fault code triggered
- The failed slot in IO station 21 is inoperative.
- If the critical signals available at failed slot are redundant then they are automatically taken over by the CCU software. Therefore, creating no reduction in loco functionality.

Related messages:

-

Fault Text:

Ext.IO 22: AS Module defective

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CB 127.9/4 is ON

Criteria:

Ext IO 22 AS module may have:

- General status faulty
- Error on L_Bus
- NSDB Error
- Component Error
- Sink Port Error
- Watchdog Error

Components concerned:

Component	Device name
CB	127.9/4
Bus coupler 22	412

Troubleshooting:

- Read out CCU diagnostic memory.
- Analyze diagnostic environment of diagnostic entry. The parameter "Ext IO 22 Status " in the environment for exact error.

10787: Ext IO 22 Status :	
0000 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
3	General Status Error
4	Shift Register Error
5	NSDB Error
6	Component Error
7	Sink Port Error
8	Watchdog Error

- Switch I/O station 22 (Use CB I/O station 22, 127.9/4) .
- Check/reload correct NSDB to bus coupler or I/O station 22.
- Check correctness of L-Bus connector and front connectors and switch I/O station 22 again.
- Check hardware of I/O module.
- Ensure all Line-Bus cables are plugged correctly.
- Check/replace Bus module of I/O station 22. Refer drawing [WAG9-6K] 9B sheet no.2

Reaction:

- VCB switched off
- Fault code triggered

Related messages:

-

Fault Text:**Ext.IO 22: One/More Module defective.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- MVB Communication between CCU and I/O station 22 is Ok

Criteria:

- Slot status error for failed module in IO station 22 is set

Components concerned:

Component	Device name
I/O station 22	412

Troubleshooting:

- Check "Ext IO 22 Status " in the environment for exact slot error.

10787: Ext IO 22 Status: 0000 0000 0000 0000 0000 0000 0000	
Bit	Reason
9	Slot status 1 DI12
10	Slot status 2 DI13
11	Slot status 3 DI14
12	Slot status 4
13	Slot status 5
14	Slot status 6
15	Slot status 7

- If any of the above Bits 9 to 15 is high then that particular Slot module is faulty.
- Replace the faulty module.

Reaction:

- Fault code triggered
- The failed slot in IO station 22 is inoperative.
- If the critical signals available at failed slot are redundant then they are automatically taken over by the CCU software. Therefore, creating no reduction in loco functionality.

Related messages:

-

Fault Text:

E112: Hardware error status

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- MVB Communication between CCU and IO Station11 is Ok

Criteria:

- IO module E112 reports a hardware error.

Issues can be:

- General status faulty
- Error on L_Bus
- NSDB Error
- Component Error
- Sink Port Error
- Watchdog Error

Components concerned:

Component	Device name
IO Station 11 Module 2	E112

Troubleshooting:

- Check "E112_00HwEr Status " in the environment for exact slot error.

10751: ENV08_1.OUT [] (E112_00HwEr Status): 0000 0000 0000 0000	
Bit	Reason
0	E112_00 Hardware Error
1	E112_01 Hardware Error
2	E112_02 Hardware Error
3	E112_03 Hardware Error

- If any of the above Bits 0 to 3 is/are high then the IO Station 11 Module 2 is faulty.
- Replace the faulty module 2 in IO Station 11.
- Check L_Bus cables are plugged correctly. Repress the plugs of the L_Bus Cables accurately.
- Check if there is any damage on the L_Bus cable, the shielding should not be damaged in anyway.
- Check the wiring of I/O module (Inputs, Outputs, Power supply).
- Check if all the plugs of I/O module are fitted correctly.
- Check the shielding of the MVB Cable, shielding of other cables and the grounding.

Reaction:

- Fault code triggered
- The failed Module 2 in IO station 11 is inoperative.
- If the critical signals available at failed Module 2 in IO station 11 are redundant then they are automatically taken over by the CCU software. Therefore, creating no reduction in loco functionality

Related messages:

-

Fault Text:**Ext.IO 11: E113 Short circuit detected.**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

MVB Communication between CCU and I/O station 11 is Ok

Criteria:

- short circuit detected in module 3 of IO station 11.

Components concerned:

Component	Device name
I/O station 11 module 3	A113

Troubleshooting:

- Check the environment ("A113 SC detection") bits for exact reason.

10752: \$020036 [] (A113 SC detection): 0000 0000 0000 0000	
Bit	Reason
0	Short circuit A113_00
1	Short circuit A113_01
2	Short circuit A113_02
3	Short circuit A113_03
4	Short circuit A113_04
5	Short circuit A113_05
6	Short circuit A113_06
7	Short circuit A113_07

- If any of the above Bits 0 to 7 is high then that particular Slot module is short circuited.
- Check for the load connected to the short circuited module.
- Check the connectors on the module. (X10 and X20)
- Replace the faulty module.

Reaction:

- Fault code triggered
- Module 3 of station 11 detected a short circuit.
- Module 3 of station 11 is inoperative

Related messages:

-

Fault Text:**Ext.IO 11: E114 Short circuit detected.**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7 / WAP5 / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

MVB Communication between CCU and I/O station 11 is Ok

Criteria:

- short circuit detected in module 4 of IO station 11.

Components concerned:

Component	Device name
I/O station 11 module 4	A114

Troubleshooting:

- Check the environment ("A114 SC detection") bits for exact reason.

10754: \$020037 [] (E114 SC detection): 0000 0000	
Bit	Reason
0	Short circuit A114_00
1	Short circuit A114_01
2	Short circuit A114_02
3	Short circuit A114_03
4	Short circuit A114_04
5	Short circuit A114_05
6	Short circuit A114_06
7	Short circuit A114_07

- If any of the above Bits 0 to 7 is high then that particular Slot module is short circuited.
- Check for the load connected to the short circuited module.
- Check the connectors on the module. (X10 and X20)
- Replace the faulty module.

Reaction:

- Fault code triggered
- Module 4 of station 11 detected a short circuit.
- Module 4 of station 11 is inoperative

Related messages:

-

Fault Text:

Ext.IO 12: A124 Short circuit detected

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

-MVB Communication between CCU and I/O station 12 is Ok

Criteria:

- short circuit detected in module 4 of IO station 12.

Components concerned:

Component	Device name
IO station 12	A124

Troubleshooting :

-Switch off CB I/O station 12 127.9/2,check correctness of serial Bus connector and front connectors on module 4 and switch on CB again.
-Check the environment for particular short circuit status of I/O station 12 module 4 output A124.

- Check the environment ("A124 SC detection") bits for exact reason.

10766: \$020075 [] (A124 SC detection)		: 0000 0000
Bit	Reason	
0	Short circuit A124_00	
1	Short circuit A124_01	
2	Short circuit A124_02	
3	Short circuit A124_03	
4	Short circuit A124_04	
5	Short circuit A124_05	
6	Short circuit A124_06	
7	Short circuit A124_07	

- Check circuits connected to I/O station 12 module 4 contact 411.LG/17(Pin Q1) for short circuit.
Refer drawing [WAG9_9K] 07E sheet 5
-Check/replace module 4 (A124) on I/O station 12.

Reaction:

- module 4 of station 12 detected a short circuit.
- Module 4 on I/O station 12 is inoperative.
- Fault code triggered

Related messages:

-

Fault Text:

Ext.IO 12: A125 Short circuit detected

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

-MVB Communication between CCU and I/O station 12 is Ok

Criteria:

- short circuit detected in module 5 of IO station 12.

Components concerned:

Component	Device name
IO station 12	A125

Troubleshooting :

-Switch off CB I/O station 12 127.9/2,check correctness of serial Bus connector and front connectors on module 5 and switch on CB again.

-Check the environment for particular short circuit status of I/O station 12 module 5 output A125.

-Check the environment ("A125 SC detection") bits for exact reason.

10768: \$020076 [] (A125 SC detection)		: 0000 0000
Bit	Reason	
0	Short circuit A125_00	
1	Short circuit A125_01	
2	Short circuit A125_02	
3	Short circuit A125_03	
4	Short circuit A125_04	
5	Short circuit A125_05	
6	Short circuit A125_06	
7	Short circuit A125_07	

- Check circuits connected to I/O station 12 module 5 contact 411.OJ/09(Pin Q1) for short circuit.

Refer drawing [WAG9_9K] 06E sheet 5

-Check/replace module 5 (A125) on I/O station 12.

Reaction:

- module 5 of station 12 detected a short circuit.
- Module 5 on I/O station 12 is inoperative.
- Fault code triggered

Related messages:

-

Fault Text:**E213: Hardware error status**Priority Type:

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- MVB Communication between CCU and I/O station 21 is ok.

Criteria:

- IO module (-E213) reports a hardware error.

Issues can be:

- General status faulty
- Error on L_Bus
- NSDB Error
- Component Error
- Sink Port Error
- Watchdog Error

Components concerned:

Component	Device name
IO Module	-E213

Troubleshooting:

- Read out CCU diagnostic memory and analyze diagnostic environment of entry. The error word shows which issues had led to the diagnostic entry.

10775: ENV08_50.OUT [] (E213_00HwEr Status): 0000 0000	
Bit	Reason
0	E213_00 Hardware Error
1	E213_01 Hardware Error
2	E213_02 Hardware Error
3	E213_03 Hardware Error

- Check L_bus cables, they should be plugged perfectly.
- Check shielding of MVB cable and L_bus Cables.
- Replace IO Module -E213.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

Fault Text:

E214: Short circuit status

Priority Type:

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- MVB Communication between CCU and I/O station 21 is ok.

Criteria:

- Short circuit detected in module 4 of IO station 21.

Components concerned:

Component	Device name
IO Module	-A214

Troubleshooting:

- Check the correctness serial bus connectors and fron fascia connectors connected on -A214.
- Read out CCU diagnostic memory and analyze diagnostic environment of entry. The error word shows which issues had led to the diagnostic entry.

10776: \$020104 □ E214 SC detection : 0000 0000		
Bit	Reason	
0	Short circuit A214_00	
1	Short circuit A214_01	
2	Short circuit A214_02	
3	Short circuit A214_03	
4	Short circuit A214_04	
5	Short circuit A214_05	
6	Short circuit A214_06	
7	Short circuit A214_07	

- Check circuits connected to IO module -A214 for any short circuit.
- Check circuits connected to I/O station 21 module 4 contact (Pin Q1, 412.JG/18) for short circuit.
- Replace IO module -A214.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

-

Fault Text:**E215: Short circuit status**Priority Type:

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- MVB Communication between CCU and I/O station 21 is ok.

Criteria:

- Short circuit detected in module 5 of IO station 21.

Components concerned:

Component	Device name
IO Module	-A215

Troubleshooting:

- Check the correctness serial bus connectors and fron fascia connectors connected on -A215.
- Read out CCU diagnostic memory and analyze diagnostic environment of entry. The error word shows which issues had led to the diagnostic entry.

10778: \$020105 □ E215 SC detection : 0000 0000	
Bit	Reason
0	Short circuit A215_00
1	Short circuit A215_01
2	Short circuit A215_02
3	Short circuit A215_03
4	Short circuit A215_04
5	Short circuit A215_05
6	Short circuit A215_06
7	Short circuit A215_07

- Check circuits connected to IO module -A215 for any short circuit.
- Check circuits connected to I/O station 21 module 5 contact (Pin Q1, 412.JJ/12) for short circuit.
- Replace IO module -A215.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered.

Related messages:

-

Fault Text:

Ext.IO 22: A224 Short circuit detected

Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

-MVB Communication between CCU and I/O station 22 is Ok

Criteria:

- short circuit detected in module 4 of IO station 22.

Components concerned:

Component	Device name
IO station 22	A224

Troubleshooting :

-Switch off CB I/O station 22 127.9/4,check correctness of serial Bus connector and front connectors on module 4 and switch on CB again.
-Check the environment for particular short circuit status of I/O station 22 module 4 output A224.

-Check the environment ("A224 SC detection") bits for exact reason.

10791: \$020153 [] (A224 SC detection)		: 0000 0000
Bit	Reason	
0	Short circuit A224_00	
1	Short circuit A224_01	
2	Short circuit A224_02	
3	Short circuit A224_03	
4	Short circuit A224_04	
5	Short circuit A224_05	
6	Short circuit A224_06	
7	Short circuit A224_07	

- Check circuits connected to I/O station 22 module 4 contact 412.JJ/13(Pin Q1) for short circuit.
Refer drawing [WAG9_9K] 07E sheet 5
-Check/replace module 4 (A224) on I/O station 22.

Reaction:

- module 4 of station 22 detected a short circuit.
- Module 4 on I/O station 22 is inoperative.
- Fault code triggered

Related messages:

-

Fault Text:

Ext.IO 22: A226 Short circuit detected

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

-MVB Communication between CCU and I/O station 22 is Ok

Criteria:

- short circuit detected in module 6 of IO station 22.

Components concerned:

Component	Device name
IO station 22	A226

Troubleshooting :

-Switch off CB I/O station 22 127.9/4,check correctness of serial Bus connector and front connectors on module 6 and switch on CB again.
-Check the environment for particular short circuit status of I/O station 22 module 6 output A226.

-Check the environment ("A226 SC detection") bits for exact reason.

10794: \$020154 [] (A224 SC detection)		: 0000 0000
Bit	Reason	
0	Short circuit A226_00	
1	Short circuit A226_01	
2	Short circuit A226_02	
3	Short circuit A226_03	
4	Short circuit A226_04	
5	Short circuit A226_05	
6	Short circuit A226_06	
7	Short circuit A226_07	

- Check circuits connected to I/O station 22 module 6 contact 412.QG/14(Pin Q1) for short circuit.

Refer drawing [WAG9_9K] 06D sheet 4

-Check/replace module 6 (A226) on I/O station 22.

Reaction:

- module 6 of station 22 detected a short circuit.
- Module 6 on I/O station 22 is inoperative.
- Fault code triggered

Related messages:

-

Fault Text:**BRIO 11 J1 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- MS LED Status in BRIO should be flashing Green and NS Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to BRIO11 (VCU1) J1 Connector have internal hardware error.
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU1, IO Station 11	BRIO 11

Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "BRIO1_J1.I00" and hit Enter.
- List of input value status from I00 to I27 shall be appear on monitor menu.
- Please note down Inputs having value 1, Channel having value 1 is error.
- Input values I00 to I19 assigned for Digital Input channel 1 to 20 and Input values I20 to I27 assigned for Digital Output channel 1 to 8 respectively.
- Find out the affected channel location in BRIO J1 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J1 Harting connector:

- Remove the J1 Connector from BRIO 11 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback (Single wire), for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire, for DI channel and IN/Out wire for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the BRIO 11 module and Send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for Short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**BRIO 11 J2 connector channel hardware error.**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- MS Led in BRIO should be flashing Green and NS Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to BRIO11 (VCU1) J2 Connector have internal hardware error.
- connected load (for DO, AO) or Feedback wire (for DI, AI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU1, IO Station 11	BRIO 11

Troubleshooting:**Step 1:** To identify the channel/channels, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "BRIO1_J2.I00" and hit Enter.
- List of input value status from I00 to I24 shall be appear on monitor.
- Please note down the inputs having value 1. Channel having value 1 is error.
- Input values I00 to I11 assigned to Digital Input channels 21 to 32, Input values I12 to I19 assigned to Digital Output channels 9 to 16, Input values I20 to I23 assigned for Analog Input channels 1 to 4 and Input value I24 assigned for Analog Output channel 1 respectively.
- Find out the affected channel location in BRIO J2 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J2 Harting connector:

- Remove the J2 Connector from BRIO 11 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot after. If DI, only remove the feedback (Single wire), for DO remove both the IN and Out wires and for AI and AO remove both reference and Signal wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and again check for the fault code.
- If fault code is no longer there, then please check the feedback wire (for DI channel), IN/Out wire for DO and Signal and reference wire for AI AO channels for any kind of short circuit, Grounding, Overvoltage.
- If the fault is persisting after removal of wire from affected channel and battery recycle, then change the BRIO 11 module and send affected module to Siemens service center.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 12 J1 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM 12 (VCU1) J1 Connector have internal hardware error.
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU1, IO Station 12	RIOM 12

Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM1_J1.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I15 assigned for Digital Input channel 1 to 16 and Input values I16 to I23 assigned for Digital Output channel 1 to 8 respectively.
- Find out the affected channel location in RIOM J1 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J1 Harting connector:

- Remove the J1 Connector from RIOM 12 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback (Single wire), for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire, for DI channel and IN/Out wire for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 12 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 12 J2 connector channel hardware error.**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON for more than 3 min.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM 12 (VCU1) J2 Connector have internal hardware error.
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU1, IO Station 12	RIOM 12

Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM1_J2.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I15 assigned for Digital Input channel 17 to 32 and Input values I16 to I23 assigned for Digital Output channel 9 to 16 respectively.
- Find out the affected channel location in RIOM J2 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J2s Harting connector:

- Remove the J2 Connector from RIOM 12 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback (Single wire), for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire, for DI channel and IN/Out wire for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 12 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 12 J3 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM 12 (VCU1) J3 Connector have internal hardware error.
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU1, IO Station 12	RIOM 12

5.4.306.1.1.1 Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM1_J3.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I15 assigned for Digital Input channel 33 to 48 and Input values I16 to I23 assigned for Digital Output channel 17 to 24 respectively.
- Find out the affected channel location in RIOM J3 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J3 Harting connector:

- Remove the J3 Connector from RIOM 12 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback wire only, for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire for DI channel and IN/Out wires for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 12 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 12 J4 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to **RIOM 12 (VCU1) J4 Connector** have internal hardware error.
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU1, IO Station 12	RIOM 12

5.4.307.1.1.1 Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM1_J4.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I15 assigned for Digital Input channel 49 to 64 and Input values I16 to I23 assigned for Digital Output channel 25 to 32 respectively.
- Find out the affected channel location in RIOM J4 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J4 Harting connector:

- Remove the J4 Connector from RIOM 12 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback wire only, for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire for DI channel and IN/Out wires for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 12 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 12 J0 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON for more than 3 min.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM 12 (VCU1) J0 Connector have internal hardware error.
- connected load for AO or Feedback wire for AI have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU1, IO Station 12	RIOM 12

Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM1_J0.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I03 assigned for Analog Input channel 1 to 4 and Input values I04 to I05 assigned for Analog Output channel 1 and 2 respectively.
- Find out the affected channel location in RIOM J0 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J0 Harting connector:

- Remove the J0 Connector from RIOM 12 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, remove both Signal wire and reference wire for affected AI and AO channels.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code. Remove and secure it properly.
- If fault code is no longer there, then please check the removed wire any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 12 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**BRIO 21 J1 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are.
- MS Led in BRIO should be flashing Green and NS Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to BRIO21 (VCU2) J1 Connector have internal hardware error
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU2, IO Station 21	BRIO 21

Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "BRIO2_J1.I00" and hit Enter.
- List of input value status from I00 to I27 shall be appear on monitor menu.
- Please note down Inputs having value 1, Channel having value 1 is error.
- Input values I00 to I19 assigned for Digital Input channel 1 to 20 and Input values I20 to I27 assigned for Digital Output channel 1 to 8 respectively.
- Find out the affected channel location in BRIO J1 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J1 Harting connector:

- Remove the J1 Connector from BRIO 21 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback (Single wire), for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire, for DI channel and IN/Out wire for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the BRIO 21 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for Short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**BRIO 21 J2 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON for more than 3 min.
- Communication between CCU and IO stations are OK.
- MS Led in BRIO should be flashing Green and NS Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to BRIO21 (VCU2) J2 Connector have internal hardware error.
- connected load (for DO, AO) or Feedback wire (for DI, AI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU2, IO Station 21	BRIO 21

Troubleshooting:**Step 1:** To identify the channel/channels, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "BRIO2_J2.I00" and hit Enter.
- List of input value status from I00 to I24 shall be appear on monitor.
- Please note down the inputs having value 1. Channel having value 1 is error.
- Input values I00 to I11 assigned to Digital Input channels 21 to 32, Input values I12 to I19 assigned to Digital Output channels 9 to 16, Input values I20 to I23 assigned for Analog Input channels 1 to 4 and Input value I24 assigned for Analog Output channel 1 respectively.
- Find out the affected channel location in BRIO J2 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J2 Harting connector:

- Remove the J2 Connector from BRIO 21 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot after. If DI, only remove the feedback (Single wire), for DO remove both the IN and Out wires and for AI and AO remove both reference and Signal wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and again check for the fault code.
- If fault code is no longer there, then please check the feedback wire (for DI channel), IN/Out wire for DO and Signal and reference wire for AI AO channels for any kind of short circuit, Grounding, Overvoltage.
- If the fault is persisting after removal of wire from affected channel and battery recycle, then change the BRIO 21 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 22 J1 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM 22 (VCU2) J1 Connector have internal hardware error.
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU2, IO Station 22	RIOM 22

Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM2_J1.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I15 assigned for Digital Input channel 1 to 16 and Input values I16 to I23 assigned for Digital Output channel 1 to 8 respectively.
- Find out the affected channel location in RIOM J1 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J1 Harting connector:

- Remove the J1 Connector from RIOM 22 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback (Single wire), for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire, for DI channel and IN/Out wire for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 22 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 22 J2 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM 22 (VCU2) J2 Connector have internal hardware error.
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU2, IO Station 22	RIOM 22

Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM2_J2.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I15 assigned for Digital Input channel 17 to 32 and Input values I16 to I23 assigned for Digital Output channel 9 to 16 respectively.
- Find out the affected channel location in RIOM J2 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J2 Harting connector:

- Remove the J2 Connector from RIOM 22 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback (Single wire), for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire, for DI channel and IN/Out wire for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 22 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 22 J3 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM 22 (VCU2) J3 Connector have internal hardware error.
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU2, IO Station 22	RIOM 22

Troubleshooting:**Step 1:** To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM2_J3.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I15 assigned for Digital Input channel 33 to 48 and Input values I16 to I23 assigned for Digital Output channel 17 to 24 respectively.
- Find out the affected channel location in RIOM J3 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J3 Harting connector:

- Remove the J3 Connector from RIOM 22 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback wire only, for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire for DI channel and IN/Out wires for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 22 module and send affected module to Siemens service center.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 22 J4 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

IO Station 22, VCU 2, RIOM module. (For Locomotive installed with Leroy make IO station)

Condition:

- CCU and control electronics turned ON for more than 3 min.
- Communication between CCU and IO stations are.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM 22 (VCU2) J4 Connector have internal hardware error.
- connected load (for DO) or Feedback wire (for DI) have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU2, IO Station 22	RIOM 22

Troubleshooting:

Step 1: To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM2_J4.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I15 assigned for Digital Input channel 49 to 64 and Input values I16 to I23 assigned for Digital Output channel 25 to 32 respectively.
- Find out the affected channel location in RIOM J4 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J4 Harting connector:

- Remove the J4 Connector from RIOM 22 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, for DI remove the feedback wire only, for DO remove the IN and Out both the wires. Remove the wires and secure it.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code.
- If fault code is no longer there, then please check the feedback wire for DI channel and IN/Out wires for DO channel for any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 22 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 22 J0 connector channel hardware error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

IO Station 22, VCU 2, RIOM module. (For Locomotive installed with Leroy make IO station)

Condition:

- CCU and control electronics turned ON for more than 3 min.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM 22 (VCU2) J0 Connector have internal hardware error.
- connected load for AO or Feedback wire for AI have some problem or grounded / short circuited/Overloaded/Overvoltage.

Components concerned:

Component	Device name
VCU2, IO Station 22	RIOM 22

Troubleshooting:

Step 1: To identify the channel, Connect CCU master through Sibas monitor,

- Select the below command from Sibas monitor menu:
Application -> View, put signal name "RIOM2_J0.I00" and hit Enter.
- List of input value status from I00 to I23 shall be appear on monitor menu.
- Please note inputs having value 1, Inputs having value 1 is error.
- Input values I00 to I03 assigned for Analog Input channel 1 to 4 and Input values I04 to I05 assigned for Analog Output channel 1 and 2 respectively.
- Find out the affected channel location in RIOM J0 Harting Connector referring to the below connector description:

Step2: After identification of the channel and slot in J0 Harting connector:

- Remove the J0 Connector from RIOM 22 module and remove the connector cover through proper tool.
- Remove the wire from affected channel slot, remove both Signal wire and reference wire for affected AI and AO channels.
- Recycle the Battery supply (recycle power supply of control electronics) and check again for the fault code. Remove and secure it properly.
- If fault code is no longer there, then please check the removed wire any kind of short circuit, Grounding, Overvoltage and clear it.
- If the fault is persisting after removal of wire from affected channel and after battery recycle, then change the RIOM 22 module and send affected module to Siemens service centre.

Note: Before replacing the affected module by new module, do check the affected channel wiring properly for short circuit, Grounding, Intermittent shorting etc.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**BRIO 11 Sink Port Error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- MS Led in BRIO should be flashing Green and NS Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to BRIO11 (VCU1) unable to receive the updated data from CCU for 500ms.
- Problem in MVB cable connected across DB9 connector **J100 and J101**

Components concerned:

Component	Device name
VCU1, IO Station 11	BRIO 11

Troubleshooting:

- Shutdown the Locomotive and turnoff the control electronics supply.
- Remove the MVB connector from DB9, J100 and J101 Connector.
- Do the continuity test of the MVB connected between the modules and CCU.

- Please check for the other MVB related fault code if it there in system. Not only for BRIO11 module, but also for other components, like TCU, DDU, Aux, etc.

Step1: If no other MVB related fault code w.r.t to other component.

- Check the continuity from one side of the connector Line A with the other side of Line A and one side Line B with other side of Line B.
- Please check and confirm about the MVB cable shielding. It should be shield in every connector.
- If possible, please check the communication strength between CCU and BRIO through the MVB analyser.
- Ensure about intact of DB9 network connector.
- Ensure about MVB end connector, it should be properly shielded and connector is intact.
- Please check for loaded binary file In CCU and BRIO11, if possible, reload the proper binary file once again in CCU and BRIO11.
- If the problem still persisting, Change the BRIO11 with new module and send the faulty one to Siemens service station.

Step 2: If yes, there is other MVB related fault code triggered w.r.t to another component.

- Check the MVB network throughout properly, ensure about cable continuity, shielding, connector intact, end connector, follow 6K TCU schematic and Loco schematic for cabling trace.
- Check the relevant TSG for other further troubleshooting.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 12 Sink Port Error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON.
- Communication between CCU and IO stations are OK.
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should constantly Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM12 (VCU1) unable to receive the updated data from CCU for 500ms.
- Problem in MVB cable connected across DB9 connector J100 and J101 .

Components concerned:

Component	Device name
VCU1, IO Station 12	RIOM 12

Troubleshooting:

- Shutdown the Locomotive and turnoff the control electronics supply.
- Remove the MVB connector from DB9, J100 and J101 Connector.
- Do the continuity test of the MVB connected between the modules and CCU.

- Please check for the other MVB related fault code if it there in system. Not only for RIOM12 module, but also for other components, like TCU, DDU, Aux, etc.

Step1: If no other MVB related fault code w.r.t to other component.

- Check the continuity from one side of the connector Line A with the other side of Line A and one side Line B with other side of Line B.
- Please check and confirm about the MVB cable shielding. It should be shield in every connector.
- If possible, please check the communication strength between CCU and BRIO through the MVB analyser.
- Ensure about intact of DB9 network connector.
- Ensure about MVB end connector, it should be properly shielded and connector is intact.
- Please check for loaded binary file In CCU and RIOM12, if possible, reload the proper binary file once again in CCU and RIOM12.
- If the problem still persisting, replace the RIOM12 with new module and send the faulty one to Siemens service station.

Step1: If yes, there is other MVB related fault code triggered w.r.t to another component.

- Check the MVB network throughout properly, ensure about cable continuity, shielding, connector intact, end connector, follow 6K TCU schematic and Loco schematic for cabling trace.
- Check the relevant TSG for other further troubleshooting.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**BRIO 21 Sink Port Error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON for more than 3 min.
- Communication between CCU and IO stations are OK (Can be verified through the DDU, IO screen, IO stations shouldn't be blurred).
- MS Led in BRIO should be flashing Green and NS Led should be constant Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to BRIO21 (VCU2) unable to receive the updated data from CCU for 500ms.
- Problem in MVB cable connected across DB9 connector J100 and J101

Components concerned:

Component	Device name
VCU2, IO Station 21	BRIO 21

Troubleshooting:

- Shutdown the Locomotive and turnoff the control electronics supply.
- Remove the MVB connector from DB9, J100 and J101 Connector.
- Do the continuity test of the MVB connected between the modules and CCU.

- Please check for the other MVB related fault code if it there in system. Not only for BRIO21 module, but also for other components, like TCU, DDU, Aux, etc.

Step1: If no other MVB related fault code w.r.t to other component.

- Check the continuity from one side of the connector Line A with the other side of Line A and one side Line B with other side of Line B.
- Please check and confirm about the MVB cable shielding. It should be shield in every connector.
- If possible, please check the communication strength between CCU and BRIO through the MVB analyser.
- Ensure about intact of DB9 network connector.
- Ensure about MVB end connector, it should be properly shielded and connector is intact.
- Please check for loaded binary file In CCU and BRIO21, if possible, reload the proper binary file once again in CCU and BRIO21.
- If the problem still persisting, Change the BRIO21 with new module and send the faulty one to Siemens service station.

Step1: If yes, there is other MVB related fault code triggered w.r.t to another component.

- Check the MVB network throughout properly, ensure about cable continuity, shielding, connector intact, end connector, follow 6K TCU schematic and Loco schematic for cabling trace.
- Check the relevant TSG for other further troubleshooting.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**RIOM 22 Sink Port Error.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCU

Condition:

- CCU and control electronics turned ON for more than 3 min.
- Communication between CCU and IO stations are OK (Can be verified through the DDU, IO screen, IO stations shouldn't be blurred).
- Run Led in RIOM should be flashing green in around every 2 sec, Fail Led should OFF and IO Led should constantly Green.

Criteria:

- The message gets triggered if any channel/Channels assigned to RIOM22 (VCU2) unable to receive the updated data from CCU for 500ms.
- Problem in MVB cable connected across DB9 connector **J100 and J101**

Components concerned:

Component	Device name
VCU2, IO Station 22	RIOM 22

5.4.319.1.1.1 Troubleshooting:

- Shutdown the Locomotive and turnoff the control electronics supply.
- Remove the MVB connector from DB9, J100 and J101 Connector.
- Do the continuity test of the MVB connected between the modules and CCU.

- Please check for the other MVB related fault code if it there in system. Not only for **RIOM22 module**, but also for other components, like TCU, DDU, Aux, etc.

Step1: If no other MVB related fault code w.r.t to other component.

- Check the continuity from one side of the connector Line A with the other side of Line A and one side Line B with other side of Line B.
- Please check and confirm about the MVB cable shielding. It should be shield in every connector.
- If possible, please check the communication strength between CCU and BRIO through the MVB analyser.
- Ensure about intact of DB9 network connector.
- Ensure about MVB end connector, it should be properly shielded and connector is intact.
- Please check for loaded binary file In CCU and RIOM22, if possible, reload the proper binary file once again in CCU and RIOM22.
- If the problem still persisting, replace the RIOM22 with new module and send the faulty one to Siemens service station.

Step2: If yes, there is other MVB related fault code triggered w.r.t to another component.

- Check the MVB network throughout properly, ensure about cable continuity, shielding, connector intact, end connector, follow 6K TCU schematic and Loco schematic for cabling trace.
- Check the relevant TSG for other further troubleshooting.

Reaction:

- Functionality shall impaired of affected channel.

Related messages:

-

Fault Text:**Main transformer: all PT100s defective**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- Communication to at least one TCU OK.

Criteria:

- Temperature sensors of main transformer are faulty.

Components concerned:

Component	Device name
Transformer temperature Oil sensors	210.5/1, 210.5/2
Traction converter (TP12 - A400)	T00, T06

Troubleshooting:

- Check the main transformer (7) temperature sensors *TFP OIL temperature sensors* (210.5/1 & 210.5/2)
- Check the wiring from TFP OIL temperature sensors, [WAG9-6K]
 - TCU1: from 210.5/1 to 415.DI/1 of TCC1 [ref no. 12E sheet 5]
 - TCU2: from 210.5/2 to 415.DI/2 of TCC2 [ref no. 12I sheet 9]
- Check the wiring in TCC1, refer schematic [WAG9-6K-TCU]
 - TCU1: from 415.DI/1(X11) to T00 of TP12-A400 [refer A5E42173718B sheet 25]
 - TCU2: from 415.DI/2 to T06 of TP12-A400 [refer A5E42173718B sheet 26]
- Replace Oil sensors(210.5/1,210.5/2) or Contact Siemens maintenance personnel to replace TP12-A400(T00 & T06)

Reaction:

- Fault code triggered
- VCB OFF

Related messages:

-

5.4.321 CCU Fault Code 1941,

Fault Text:

Main transformer: Oil circuit 1 overtemperature, VCB off

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU1 is ON.

Criteria:

- VCB off because of transformer overtemperature.
- Overtemperature limit:
- for WAG9H / WAP7H / WAP5H: 84 degC
- for WAG9HH / WAP7HH: 110 degC

Components concerned:

Component	Device name
TFP OIL Temperature Sensor	210.5/1
Traction Converter (TP12 - A400)	T00
Circuit breaker oil pump transformer	62.1/1, 62.1/2
Transformer Oil pump	62/1, 62/2
Circuit breaker to oil cooling unit	59.1
Oil Pump contactor	52.5/1, 52.5/2

Troubleshooting:

- Check the main transformer (7) temperature sensors *TFP OIL temperature sensor* (210.5/1)
- Check the main transformer oil pump(62.1) operation and cooling unit(59.1) for any abnormality. Refer schematic [WAG9-6K]
- Check the oil level of the transformer and maintain sufficient oil level of the main transformer.
- Replace transformer Oil temperature sensor (210.5/1) or respective defective component of oil oil pump, oil cooling circuit and Contact Siemens maintenance personnel to replace TP12 A400(T00)

Reaction:

- Fault code triggered
- VCB OFF.

Related messages:

-

Fault Text:**Main transformer: Oil circuit 2 overtemperature, VCB off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU2 is ON.

Criteria:

- VCB off because of transformer overtemperature.
- Overtemperature limit:
 - for WAG9H / WAP7H / WAP5H: 84 degC
 - for WAG9HH / WAP7HH: 110 degC

Components concerned:

Component	Device name
TFP OIL Température Sensor	210.5/2
Traction Converter (TP12 - A400)	T06
Circuit breaker oil pump transformer	62.1/1, 62.1/2
Transformer Oil pump	62/1, 62/2
Circuit breaker to oil cooling unit	59.1
Oil Pump contactor	52.5/1, 52.5/2

Troubleshooting:

- Check the main transformer (7) temperature sensors *TFP OIL temperature sensor* (210.5/2)
- Check the main transformer oil pump(62.1) operation and cooling unit(59.1) for any abnormality.
- Check the oil level of the transformer and maintain sufficient oil level of the main transformer.
- Replace transformer Oil temperature sensor (210.5/1) or respective defective component of oil oil pump,oil cooling circuit and Contact Siemens maintenance personnel to replace TP12 A400(T06)

Reaction:

- Fault code triggered
- VCB OFF

Related messages:

-

0.1.2 CCU Fault Code 1943,

Fault Text:

Main transformer: Oil circuit 1 overtemperature, power limitation

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU1 is ON.

Criteria:

- Power reduction because of transformer overtemperature..

Components concerned:

Component	Device name
TFP OIL Temperature Sensor	210.5/1
Traction Converter (TP12 - A400)	T00
Circuit breaker oil pump transformer	62.1/1, 62.1/2
Transformer Oil pump	62/1, 62/2
Circuit breaker to oil cooling unit	59.1
Oil Pump contactor	52.5/1, 52.5/2

Troubleshooting:

- Check the main transformer (7) temperature sensors *TFP OIL temperature sensor* (210.5/1)
- Check the main transformer oil pump(62.1) operation and cooling unit(59.1) for any abnormality.
- Check the oil level of the transformer and maintain sufficient oil level of the main transformer.
- Replace transformer Oil temperature sensor (210.5/1) or respective defective component of oil oil pump,oil cooling circuit and Contact Siemens maintenance personnel to replace TP12 A400(T00)

Reaction:

- Fault code triggered
- VCB OFF

Related messages:

-

Fault Text:**Main transformer: Oil circuit 2 overtemperature, power limitation**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU2 is ON.

Criteria:

- Power reduction because of transformer overtemperature.

Components concerned:

Component	Device name
TFP OIL Temperature Sensor	210.5/2
Traction Converter (TP12 - A400)	T06
Circuit breaker oil pump transformer	62.1/1, 62.1/2
Transformer Oil pump	62/1, 62/2
Circuit breaker to oil cooling unit	59.1
Oil Pump contactor	52.5/1, 52.5/2

Troubleshooting:

- Check the main transformer (7) temperature sensors *TFP OIL temperature sensor* (210.5/2)
- Check the main transformer oil pump(62.1) operation and cooling unit(59.1) for any abnormality.
- Check the oil level of the transformer and maintain sufficient oil level of the main transformer.
- Replace transformer Oil temperature sensor (210.5/1) or respective defective component of oil oil pump,oil cooling circuit and Contact Siemens maintenance personnel to replace TP12 A400(T06)

Reaction:

- Fault code triggered
- VCB OFF

Related messages:

-

Fault Text:**Main transformer: Oil circuit 1 invalid pressure**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU1 is ON.
- TCU1 CB 127.11/1 is ok.
- Oil pump1 not supplied by auxiliary.

Criteria:

- Pressure measured by pressure sensor 213.5/1 is either greater than 0.5 bar or less than 0.4 bar for more than 200 ms.

Components concerned:

Component	Device name
ICU 4QC	A100 - C159
Transformer temperature sensors	213.5/1,213.5/2
TFP Oil Pressure sensor amplifier	214/1

Troubleshooting:

- Check the main transformer *OIL pressure sensors* (213.5/1, 213.5/2) & amplifier (214/1)
- Check the wiring from TFP Oil pressure sensor, from 213.5/1, 213.5/2 to 214/1 and from 214.C/1 to 415.AI/1, refer schematic [WAG9-6K], 12E sheet no.5
- Check the wiring in TCC1, refer schematic [WAG9-6K-TCU], A5E42173718B sheet no.18
- TCU1: from 415.AI/1(X12) to AIN09 of ICU 4QC-A400
- Replace Oil pressure sensors (213.5/1,213.5/2) and pressure sensor amplifier 214/1
- Contact Siemens maintenance personnel to replace AIN09 of ICU 4QC-A400

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**Main transformer: Oil circuit 2 invalid pressure**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU2 is ON.
- TCU2 CB 127.11/2 is ok.
- Oil pump1 not supplied by auxiliary

Criteria:

- Pressure measured by pressure sensors 213.5/3 and 213.5/4 is either greater than 0.5 bar or less than 0.4 bar for more than 200 ms.

Components concerned:

Component	Device name
ICU 4QC	A100 - C159
Transformer temperature sensor	213.5/3,213.5/4
TFP Oil Pressure sensor amplifier	214/2

Troubleshooting:

- Check/replace the main transformer *OIL pressure sensors* (213.5/3, 213.5/4)
- Check/replace the pressure sensor amplifier (214/2)
- Check the wiring from TFP Oil pressure sensor, from 213.5/3,213.5/4 to 214/2 and from 214.C/1 to 415.AI/2, refer schematic [WAG9-6K], 12I sheet no.9
- Check the wiring in TCC1, refer schematic [WAG9-6K-TCU], A5E42173718B sheet no.18
TCU2: from 415.AI/2(X12) to AIN09 of ICU 4QC-A400
- Contact Siemens maintenance personnel to replace AIN09 of ICU 4QC of A100-C159

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**Main transformer: Oil circuit 1 pressure fault**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU1 is ON.
- TCU1 CB 127.11/1 is ok.
- Oil pump1 supplied.

Criteria:

- Pressure measured by pressure sensor 213.5/1 and 213.5/2 is either greater than 2.5 bar or less than 0.75 bar
- For upgrade Loco, the lower limit varies between 0.35 to 0.75 bar depending upon the transformer temperature.

Components concerned:

Component	Device name
ICU 4QC	A100 - C159
Transformer oil pressure sensors	213.5/1,213.5/2
TFP Oil Pressure sensor amplifier	214/1
Circuit breaker oil pump transformer	62.1/1, 62.1/2
Contact oil pumps	52.5/1, 52.5/2
Oil pump transformers	62/1,62/2

Troubleshooting:

- Check/refill oil level of the transformer.
- Check/ replace the main transformer (7) pressure sensors (213.5/1, 213.5/2)
- Check/ replace the Oil Pressure sensor amplifier(214/1)
- Check the main transformer oil pump(62.1) operation and cooling unit(59.1) for any abnormality.
- Replace respective defective component of oil pump and oil cooling circuit.
- Contact Siemens maintenance personnel to replace AIN09 of ICU 4QC of A100-C159

Reaction:

- Transformer pressure low or high may not allowed to close the VCB

Related messages:

-

5.4.327 CCU Fault Code 1948,Fault Text:**Main transformer: Oil circuit 2 pressure fault**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU2 is ON.
- TCU2 CB 127.11/2 is ok.
- Oil pump2 supplied.

Criteria:

- Pressure measured by pressure sensor 213.5/3 and 213.5/4 is either greater than 2.5 bar or less than 0.75 bar.
- For upgrade Loco, the lower limit varies between 0.35 to 0.75 bar depending upon the transformer temperature.

Components concerned:

Component	Device name
ICU 4QC	A100 - C159
Transformer oil pressure sensors	213.5/3,213.5/4
TFP Oil Pressure sensor amplifier	214/2.
Circuit breaker oil pump transformer	62.1/1, 62.1/2
Contact oil pumps	52.5/1, 52.5/2
Oil pump transformers	62/1,62/2

Troubleshooting:

- Check/refill oil level of the transformer.
- Check/ replace the main transformer (7) pressure sensors (213.5/1, 213.5/2)
- Check/ replace the Oil Pressure sensor amplifier(214/1)
- Check the main transformer oil pumps(62) operation and cooling unit(59.1) for any abnormality.
- Replace respective defective component of oil pump and oil cooling circuit.
- Contact Siemens maintenance personnel to replace AIN09 of ICU 4QC of A100-C159

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**Main transformer: Oil circuit 1 Temperature Variance**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU1 is ON

Criteria:

- Difference between oil temperature measured by both sensors is more than 10 degree.

Components concerned:

Component	Device name
Transformer temperature Oil sensors	210.5/1
Traction converter 1 (TP12 - A400)	T00

Troubleshooting:

- Check the main transformer (7) temperature sensors *TFP OIL temperature sensor* (210.5/1)
- Check the wiring from TFP OIL temperature sensors, refer schematic [WAG9-6K]
TCU1: from 210.5/1 to 415.DI/1 of TCC1
- Check the wiring in TCC1, refer schematic [WAG9-6K-TCU]
TCU1: from 415.DI/1(X11) to T00 of TP12-A400
- Replace Oil sensors(210.5/1) or Contact Siemens maintenance personnel to replace TP12-A400(T00)

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**Main transformer: Oil circuit 2 Temperature Variance**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

- TCU2 is ON

Criteria:

- Difference between oil temperature measured by both sensors is more than 10 degree.

Components concerned:

Component	Device name
Transformer temperature Oil sensor	210.5/2
Traction converter 2 (TP12 - A400)	T06

Troubleshooting:

- Check/replace the main transformer (7) oil *temperature sensor* (210.5/2)
- Check the wiring from TFP OIL temperature sensors, refer schematic [WAG9-6K]
TCU2: from 210.5/2 to 415.DI/2 of TCC2
- Check the wiring in TCC2, refer schematic [WAG9-6K-TCU]
TCU2: from 415.DI/2 to T06 of TP12-A400
- Contact Siemens maintenance personnel to replace TP12-A400(T06)

Reaction:

- Fault code triggered

Related messages:

5.4.330 CCU Fault Code 1951

Fault Text:

VCB off; CB pump open/Oil pressure fault

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

Communication to TCU1 and TCU2 is OK

Criteria:

- CB of oil pump 1 and oil pump 2 has tripped/missing feedback from E122_00.
- oil pressure sensors are faulty.
- A100 ICU 4QS card faulty [4QC]

Components concerned:

Component	Device name
Trafo oil pump pressure sensor	213.5/1 & 213.5/2
Oil Pump	62/1 and 62/2
IO station 12 Module 2	E122
A100 ICU 4QC	C159

Troubleshooting:

- Check the oil pump CBs tripped
- Check the wiring between 127.2/1 to oil pump 1 contactor 23 of 62.1/1, Refer drawing WAG9_9k] 5G sheet 07.
- Check the wiring between oil pump 1 contactor 23 of 62.1/1 24 to E122_06 Refer drawing [WAG9_9k] 5G sheet 07.
- Check the wiring between 127.2/1 to oil pump 1 contactor 23 of 62.1/2, Refer drawing [WAG9_9k] 5G sheet 07.
- Check the wiring between oil pump 1 contactor 23 of 62.1/2 24 to E122_06 Refer drawing [WAG9_9k] 5G sheet 07.
- Check the oil pumps 62/1 and 62/2
- Check ICU 4QC [C159] wiring at X-12 if find ok replace 4QC card Refer drawing [WAG9-6K-TCU] Sheet No 18.

Reaction:

- Inhibit the VCB

Related messages:

0101

5.4.331 CCU Fault Code 1952

Fault Text:

Trafo oil temp sensor 1 faulty

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

Communication to TCU1 and TCU2 is OK

Criteria:

- Trafo oil temperature sensor 1 is faulty
- A400[TP12] analog input missing.

Components concerned:

Component	Device name
Trafo oil temperature sensor	210.5/1
Analog Input Card	-A400

Troubleshooting:

- Check -A400[TP12] analog input card of TCU, Refer drawing [WAG9-6K-TCU] Sheet No 25
- Check connection between Trafo oil temperature sensor1 (210.5/1) and TCU 415.DI/1

Reaction:

-

Related messages:

0107

5.4.332 CCU Fault Code 1953

Fault Text:

Trafo oil temp sensor 2 faulty

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

Communication to TCU1 and TCU2 is OK

Criteria:

- Trafo oil temperature sensor 2 is faulty
- A400[TP12] analog input missing.

Components concerned:

Component	Device name
Trafo oil temperature sensor	210.5/2
Analog Input card	A400

Troubleshooting:

- Check -A400[TP12] analog input card of TCU, Refer drawing [WAG9-6K-TCU] Sheet No 26.
- Check connection between Trafo oil temperature sensor2 (210.5/2) and TCU 415.DI/2

Reaction:

-

Related messages:

0108

Fault Text:**TM1 Temperature sensor faulty of not valid. TM1 Isolated.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication to TCU1 is ok

Criteria:

- The filtered temperature input lies outside given range or not valid.
- The temperature varies from other TM temperature.
- The temperature changes more then a defined rate.

Components concerned:

Component	Device name
TCU	415/1
TM1 Temp. sensor	98/1,98/2

Troubleshooting:

- Check the wiring between 98.A/1 to 415.DA/1, Refer drawing [WAG9_6k] 12D sheet 4.
- Check the wiring between 415.DA/1 or X4 to A400-X1(T01), Refer drawing [WAG9_6k_TCC] A5E42173718B sheet 25.
- Check/Change the temperature sensor-98/1,98/2 of Traction motor 1.
- Contact Siemens maintenance personnel and replace TP12/-A400(T01) in TCC1.

Reaction:

- TM1 will isolate

Related messages:

-

Fault Text:**TM2 Temperature sensor faulty of not valid. TM2 Isolated.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication to TCU1 is ok

Criteria:

- The filtered temperature input lies outside given range or not valid.
- The temperature varies from other TM temperature.
- The temperature changes more then a defined rate.

Components concerned:

Component	Device name
TCU	415/1
TM2 Temp. sensor	98/3,98/4

Troubleshooting:

- Check the wiring between 98.A/2 to 415.DC/1, Refer drawing [WAG9_6k] 12D sheet 4.
- Check the wiring between 415.DC/1 or X4 to A400-X1(T02), Refer drawing [WAG9_6k_TCC] A5E42173718B sheet 25.
- Check/Change the temperature sensor-98/3,98/4 of Traction motor 2.
- Contact Siemens maintenance personnel and replace TP12/-A400(T02) in TCC1.

Reaction:

- TM2 will isolate

Related messages:

-

Fault Text:**TM3 Temperature sensor faulty of not valid. TM3 Isolated.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication to TCU1 is ok

Criteria:

- The filtered temperature input lies outside given range or not valid.
- The temperature varies from other TM temperature.
- The temperature changes more then a defined rate.

Components concerned:

Component	Device name
TCU	415/1
TM3 Temp. sensor	98/5,98/6

Troubleshooting:

- Check the wiring between 98.A/3 to 415.DE/1, Refer drawing [WAG9_6k] 12D sheet 4.
- Check the wiring between 415.DC/1 or X5 to A400-X2(T04), Refer drawing [WAG9_6k_TCC] A5E42173718B sheet 25.
- Check/Change the temperature sensor-98/5,98/6 of Traction motor 3.
- Contact Siemens maintenance personnel and replace TP12/-A400(T04) in TCC1.

Reaction:

- TM3 will isolate

Related messages:

-

Fault Text:**TM4 Temperature sensor faulty of not valid. TM4 Isolated.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication to TCU2 is ok

Criteria:

- The filtered temperature input lies outside given range or not valid.
- The temperature varies from other TM temperature.
- The temperature changes more then a defined rate.

Components concerned:

Component	Device name
TCU	415/2
TM4 Temp. sensor	98/7,98/8

Troubleshooting:

- Check the wiring between 98.A/4 to 415.DA/2, Refer drawing [WAG9_6k] 12H sheet 8.
- Check the wiring between 415.DC/2 or X5 to A400-X2(T05), Refer drawing [WAG9_6k_TCC] A5E42173718B sheet 25
- Check/Change the temperature sensor-98/7,98/8 of Traction motor 4.
- Contact Siemens maintenance personnel and replace TP12/-A400(T05) in TCC1.

Reaction:

- TM4 will isolate

Related messages:

-

Fault Text:**TM5 Temperature sensor faulty of not valid. TM5 Isolated.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication to TCU2 is ok

Criteria:

- The filtered temperature input lies outside given range or not valid.
- The temperature varies from other TM temperature.
- The temperature changes more then a defined rate.

Components concerned:

Component	Device name
TCU	415/2
TM5 Temp. sensor	98/9,98/10

Troubleshooting:

- Check the wiring between 98.A/5 to 415.DC/2, Refer drawing [WAG9_6k] 12H sheet 8.
- Check the wiring between 415.DE/2 or X6 to A400-X3(T07), Refer drawing [WAG9_6k_TCC] A5E42173718B sheet 26.
- Check/Change the temperature sensor-98/9,98/10 of Traction motor 5.
- Contact Siemens maintenance personnel and replace TP12/-A400(T07) in TCC2.

Reaction:

- TM5 will isolate

Related messages:

-

Fault Text:**TM6 Temperature sensor faulty of not valid. TM6 Isolated.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Communication to TCU2 is ok

Criteria:

- The filtered temperature input lies outside given range or not valid.
- The temperature varies from other TM temperature.
- The temperature changes more then a defined rate.

Components concerned:

Component	Device name
TCU	415/2
TM6 Temp. sensor	98/11,98/12

Troubleshooting:

- Check the wiring between 98.A/6 to 415.DE/2, Refer drawing [WAG9_6k] 12H sheet 8.
- Check the wiring between 415.DE/2 - X6 to A400-X3(T08), Refer drawing [WAG9_6k_TCC] A5E42173718B sheet 26
- Check/Change the temperature sensor-98/11,98/12 of Traction motor 6.
- Contact Siemens maintenance personnel and replace TP12/-A400(T08) in TCC2.

Reaction:

- TM6 will isolate

Related messages:

-

Fault Text:**WTB Gateway: MVB communication error**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

WTB

Condition:

-

Criteria:

- MVB communication error with WTB gateway.

Components concerned:

Component	Device name
CCU-MCU	-A100-C003
WTB Gateway	-A100-C159
TCN IO	-A100-C019

Troubleshooting:

- Check the WTB gateway card is powered on.
- If not powered check the wiring , refer drawing [WAG9-6K-TCU] or [WAG9-9K-TCU] sheet 50.
- Check the MVB communication cable connection from WTB Gateway to CCU-MCU, refer drawing [WAG9-6K-TCU] or [WAG9-9K-TCU] sheet 31 and 38.
- Check/update the application software and NSDB for CCU-MCU and WTB Gateway.
- Contact siemens personnel and replace the WTB Gateway card or TCN IO card.

Reaction:

- WTB train bus communication may not possible.

Related messages:

2021,2022

Fault test:

WTB Gateway: Hardware failure

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

WTB

Condition:

- MVB communication with gateway is not ok.
- Cab should be active

Criteria:

- Gateway asleep or faulty.

Components concerned:

Component	Device Name
CCU-MCU	-A100-C003
WTB Gateway	-A100-C159
TCN IO	-A100-C019

Troubleshooting:

- Check the faults if any logged related to gateway communication.
- Check TCN Gateway module located in TC1 from both master and slave loco. Restart the gateway once again.
- Check MVB connections of all the devices, Refer the drawing [WAG9_6K_TCU] sheet 31 and 38. If necessary replace the cables/ modules or contact SIEMENS engineer.

Reaction:

- Fault code triggered.
- WTB train communication may not possible.

Related messages:

2020, 2022

Fault test:**WTB Gateway: WTB communication error**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

WTB

Condition:

- Connection to master loco/ slave loco is lost.
- WTB communication not established.

Criteria:

- Loco shouldn't be in stand still condition.

Components concerned:

Component	Device Name
TCN GW	A100-C027

Troubleshooting:

- Check the faults if any logged related to gateway communication.
- Check TCN Gateway module located in TC1 from both master and slave loco. Restart the gateway once again.
- Check whether WTB connections between master and slave locomotives. Refer the drawing [WAG9_6K_TCU] sheet 31 and 38. If necessary replace the cables/ modules or contact SIEMENS engineer.

Reaction:

- Fault code triggered.

Related messages:

2020, 2021

Fault Text:**Number of WTB nodes changed**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

WTB

Condition:

- MVB communication to WTB gateway is ok.
- WTB train bus communication is ok.

Criteria:

- WTB Master/Slave node number not maintained same to demanded node.

Components concerned:

Component	Device name
CCU-MCU	-A100-C003
WTB Gateway	-A100-C159
TCN IO	-A100-C019

Troubleshooting:

- Check/update the application software and NSDB for WTB Gateway.
- Check the diagnostics of Master/Slave locomotive.

Reaction:

- WTB train bus communication may not possible.

Related messages:

2021

Fault Text:**WTB master conflict**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

WTB

Condition:

- MVB communication to WTB gateway is ok.

Criteria:

- WTB train bus unable to detect one master or detected multiple

master. Components concerned:

Component	Device name
CCU-MCU	-A100-C003
WTB Gateway	-A100-C159

Troubleshooting:

- Check/update the application software and NSDB for WTB Gateway.
- Check the WTB configuration of other Master/Slave locomotive .
- Contact siemens personnel and replace the WTB Gateway card.

Reaction:

- WTB train bus communication may not possible.

Related messages:

2021,2022

Fault Text:**Fire Detection Equipment (212) is faulty**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Safety

Condition:

- MCB 218 should be in on condition

Criteria:

- Fire Detection Equipment healthy feedback is not available at digital input
E222_04

Components concerned:

Component	Device name
IO station 22 Module 2	E222
Fire Detection Equipment	212
CB	127.9/3

Troubleshooting :

- Check/replace IO module E222.
- Check/replace CB 127.9/3
- Check Wiring between DI E222_04 and Fire detection equipment 212(23/10). Refer drawing [WAG9-6K] 11B sheet 02.
- Check wiring between CB 127.9/3 to Fire detection equipment 212(23/10).Refer drawing [WAG9-6K] 11B sheet 02.
- Check/replace Fire Detection equipment 212.

Reaction:

-Fire Detection equipment will not be available

Related messages:

-

Fault Text:**Fire detection: Smoke detected in locomotive machine room**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Safety

Condition:

- Fire detection device is healthy.
- IO module E212 is ok

Criteria:

- Input feedback is available at DI E212_09 from Sensor 2 of Fire Detection equipment.

Components concerned:

Component	Device name
IO station 21 module 2	E212
Fire Detection Equipment	212

Troubleshooting :

- Stop the Locomotive first & physically check that the warning is not false and truly there is smoke or fire in machine room.
- Acknowledge Fault or reset the alarm. Check/replace smoke detection sensors.
- Check wiring between CB 127.9/3 to Fire detection equipment 212(5/4).Refer drawing [WAG9-6K] 11B sheet 02.
- Check Wiring between DI E212_09 and Fire detection equipment 212(5/4). Refer drawing [WAG9-6K] 11B sheet 02
- Check/replace Fire Detection equipment 212.

Reaction:

- Fault code triggered
- Start Run interlock is initiated.

Related messages:

-

Fault Text:**Fire detection: Fire detected in locomotive machine room**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Safety

Condition:

- Fire detection device is healthy.
- IO module E222, E212 is ok.
- CAB1 or CAB2 is active.
- Locomotive is not in trailing mode

Criteria:

-Smoke or fire is detected by sensors and thus smoke warning or fire alarm input is given to the digital inputs E212_09, E222_13 respectively.

Components concerned:

Component	Device name
IO station 21 Module 2	E212
IO station 22 Module 2	E222
Fire Detection Equipment	212

Troubleshooting :

- Stop the Locomotive first & physically check that the warning is not false and truly there is smoke or fire in machine room.
- Shutdown the Locomotive, inspect the machine room & take necessary action. If required use fire extinguisher.
- Check/replace smoke and/or fire detection sensors.
- Check wiring between CB 127.9/3 to Fire detection equipment 212(5/4).Refer drawing [WAG9-6K] 11B sheet 02.
- Check wiring between CB 127.9/4 to Fire detection equipment 212(8/7).Refer drawing [WAG9-6K] 11B sheet 02.
- Check Wiring between DI E212_09 and Fire detection equipment 212(5/4). Refer drawing [WAG9-6K] 11B sheet 02
- Check Wiring between DI E222_13 and Fire detection equipment 212(8/7). Refer drawing [WAG9-6K] 11B sheet 02

Reaction:

- Fault code triggered
- Start Run interlock is initiated.

Related messages:

Fault Text:**Multiple IO station failed VCB opened**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

VCB

Condition:

- Limited drive mode is requested

Criteria:

- one IO station or more than one IO station is completely faulty.
- VCB is ON

Components concerned:

Component	Device name
VCB CB	127.12
IO station 11	11
IO station 12	12
IO station 21	21
IO station 22	22
Display	435/1,435/2

Troubleshooting:

- Check CB 127.9/1,127.9/2,127.9/3,127.9/4 of each IO station.
- Check correctness of serial Bus connector and front connectors
- Check each IO Module in each IO station manually. Check status LEDs of every module.
- code still triggered Exchange faulty module

Reaction:

- Fault code triggered.
- VCB is open

Related messages:

-

Fault Text:**Fire detection: Fire detected in slave locomotive**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Safety

Condition:

- Fire detection device is healthy.
- CAB1 or CAB2 is active.

Criteria:

- Smoke or fire is detected by sensors and thus smoke warning or fire alarm triggered

Components concerned:

Component	Device name
IO station 11	A113
IO station 12	A124
IO station 21	A214
IO station 22	A224
Fire detection equipment	212 in slave loco
Buzzer	238/1,238/2

Troubleshooting :

- Stop the Locomotive first & physically check that the warning is not false and truly there is smoke or fire in slave locomotive.
- if there is smoke/fire, Shutdown the Locomotive, inspect & take necessary action. If required use fire extinguisher.
- Check wiring from A113_04 & A124_02 to buzzer 238/1
Check wiring from A113_05 & A124_03 to buzzer 238/1
Check wiring from A224_02 & A214_04 to buzzer 238/2
Check wiring from A224_03 & A214_05 to buzzer 238/2
Refer drawing [WAG9_9K] 11B sheet 2
- Check/replace smoke and/or fire detection sensors.

Reaction:

- Fault code triggered
- VCB gets opened in slave loco only

Related messages:

Fault Text:**MEMOTEL: MEMOTEL Device faulty**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

Safety

Condition:

- CB 218 should be in ON condition

Criteria:

MEMOTEL equipment healthy feedback is not available at digital input E211_13.

Components concerned:

Component	Device name
IO station 21 module 1	E211
CB MEMOTEL Speedometer	127.92
Speedometer and indicator	94.2
Pulse generator	94.1

Troubleshooting :

- Check/replace CB MEMOTEL Speedometer 127.92
- Check wiring between CB 127.92 to Speedometer 94.2.Refer drawing [WAG9_9K] 10A sheet 01.
- Check Wiring between DI E211_13 and speedometer 94.2.Refer drawing [WAG9_9K] 10A sheet 01.
- Check voltage at pin 25 & 9 of speedometer 94.2. Refer drawing [WAG9_9K] 10A sheet 01.
- Check/replace IO Module E211

Reaction:

- Speed measurement will not be available

Related messages:

-

Fault Text:**TCU1 Earth fault detected**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- communication between CCU and TCU1 is OK

Criteria:

- TCU1 Earth fault detected in power circuit.
- Earth Leakage detector sensor faulty.

Components concerned:

Component	Device name
TCU1	415/1
Earth Leakage sensor	-U31.2,C75 & R41
4QC	C159

Troubleshooting:

- Check the TCU1 downloads for further analysis related to power circuit ground.
- Check Earth leakage sensor components for any faulty and replace the same, Refer drawing [WAG9-6K-TCU] sheet no.4
- Check ICU 4QC [C159] wiring at X-4 if find ok replace 4QC card Refer drawing [WAG9-6K-TCU] Sheet No 18.
- A100 ICU 4QS card faulty [4QC]

Reaction:

- TCU1 isolation

Related messages:

-

Fault Text:**TCU2 Earth fault detected**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

- communication between CCU and TCU1 is OK

Criteria:

- TCU2 Earth fault detected in power circuit.
- Earth Leakage detector sensor faulty.

Components concerned:

Component	Device name
TCU2	415/2
Earth Leakage sensor	-U31.2,C75 & R41
4QC	C159

Troubleshooting:

- Check the TCU2 downloads for further analysis related to power circuit ground.
- Check Earth leakage sensor components for any faulty and replace the same, Refer drawing [WAG9-6K-TCU] sheet no.4
- Check ICU 4QC [C159] wiring at X-4 if find ok replace 4QC card Refer drawing [WAG9-6K-TCU] Sheet No 18.
- A100 ICU 4QS card faulty [4QC]

Reaction:

- TCU2 isolation

Related messages:

-

Fault Text:**Emergency Push button pressed from Cab 1.**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SAFETY

Condition:

- Communication IO 11 & 12 are OK.
- Cab1 active.

Criteria:

- Emergency stop switch(244/1) is Pressed.
- Emergency stop available at Digital input card of IO11 E111_07[LEmgStop] and IO12 E121_00 [LEmgStop] [redundant channels].
- E111_07 and E121_00 are redundant channels.

Components concerned:

Component	Device name
IO station 11 Module 1	E111
IO station 12 Module 1	E121
Emergency Switch	244/1

Troubleshooting:

- Release the Emergency push button at Panel-A If message still persists
- Ensure wiring between 126.7/1 to 244/1, Refer drawing [WAG9_6k] 06B sheet 02.
- Check Emergency push button and replace if defective.
- Check E111_07[LEmgStop] or E121_00 [LEmgStop] both are not faulty Refer drawing [WAG9_6k] 06B sheet 02.

Reaction:

- Pantograph and VCB will be off.

Related messages:

-

Fault Text:**Emergency Push button pressed from Cab 2**Priority Type

1 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SAFETY

Condition:

- Communication IO 21 & 22 are OK
- Cab 2 active

Criteria:

- Emergency stop switch1 (244/2) is Pressed.
- Emergency stop available at Digital input card of IO 21 E212_00 [LEmgStop] and IO 22 E221_01 [LEmgStop] [redundant channels].
- E212_00 and E221_01 are redundant channels.

Components concerned:

Component	Device name
IO station 21 Module 2	E212
IO station 22 Module 1	E221
Emergency Switch 2	244/2

Troubleshooting:

- Release the Emergency push button at Panel-A. If message still persists
- Ensure wiring between 126.7/2 to 244/2, Refer drawing [WAG9_6k] 06B sheet 02.
- Check Emergency push button and replace if defective.
- Check E212_00[LEmgStop] and E221_01 [LEmgStop] both are not faulty Refer drawing [WAG9_6k] sheet 06B Page 02.

Reaction:

- Pantograph and VCB will be off.

Related messages:

-

Fault Text:**Emergency stop activated.**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

SAFETY

Condition:

- Communication IO 11 & 12 are OK
- Communication IO 21 & 22 are OK
- WTB communication if ok (if operating)
- DPWCS communication if ok (if operating)

Criteria:

- Emergency stop switch(244/1 or 244/2) is Pressed.
- Emergency stop command through WTB master/slave.
- Emergency stop command through DPWCS master/slave.

Components concerned:

Component	Device name
IO station 21 Module 2	E111
IO station 22 Module 1	E121
Emergency Switch cab1	244/1
IO station 11 Module 1	E212
IO station 12 Module 1	E221
Emergency Switch cab2	244/2

Troubleshooting:

- Release the Emergency push button (244/1 or 244/2) at Panel-A
- Check for any Emergency push button (244/1 or 244/2) activated from WTB master/slave loco
- Check for any Emergency push button (244/1 or 244/2) activated from DPWCS master/slave loco
- If message still persists check the trouble shooting for code 2311 or 2322.

Reaction:

- Pantograph and VCB will be off.

Related messages:

-

Fault Text:**Tractive Effort limitation(ZTEL) activated**Priority Type:

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

VCU

Condition:

- Master controller in zero position.
- Either Cab 1 or Cab 2 Active and Healthy.
- ZTEL SW ON from active cab.
- Tractive Effort limit request from master or slave locomotive.
- Tractive Effort limit request from DPWCS.
- No bogie is isolated.
- Loco variant is other than WAG9 H 7MW, WAP7 Upgrade.

Criteria:

- For limiting the tractive effort ZTEL SW will be turned ON.

Components concerned:

Component	Device name
ZTEL SW Cab 1	151.1/1
ZTEL SW Cab 2	151.1/2
IO Station VCU1	-E121
IO Station VCU1	-E221

Troubleshooting:

- This is an Information message for Tractive effort limit active, if TE limit not working then check/replace wiring between ZTEL SW (151.1/1) and E121_01 PIN _I2 for Cab 1; Refer drawing [WAG9_9K] or [WAG9_6K] 08E sheet no 5.
- check/replace wiring between ZTEL SW (151.1/2) and E221_01 PIN _I2 for Cab 2; Refer drawing [WAG9_9K] or [WAG9_6K] 08F sheet no 6.
- Contact Siemens maintenance personnel if problem persists.

Reaction:

- Fault code triggered and Tractive Effort limit active.

Related messages:

-

Fault Text:**Locomotive in Banking operation**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- Cab is active.
- Locomotive is in standstill.

Criteria:

- Command is given to activate the banking mode from CAB1/CAB2 ZBAN switch.

Components concerned:

Component	Device name
ZBAN	153/1,153/2

Troubleshooting:

- This is only for information.

Reaction:

- Autobrake will not work in banker loco. But emergency braking can be done.
- Loco will be continue with banking mode.
- If ZBAN not activated intentionally check the wiring from CB 126.7/1 ro ZABN switch and ZBAN to E121_04, refer schematic [WAG9_9K] or [WAG9_6K] 06F sheet no 6.

Related messages:

-

5.4.357 CCU Fault Code 2360

Fault Text:

TCU1 switched OFF via CB (127.11/1)

Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU1 is not enabled.

Criteria:

- TCU1 110V power supply CB has tripped/missing feedback from 09C.04.
- Switched OFF TCU1 110V supply CB (127.11/1) manually

Components concerned:

Component	Device name
TCU1 110V supply CB	127.11/1

Troubleshooting:

- Check TCU1 110V power supply CB tripped 127.11/1.
- Check the wiring between 04C.15 to Control electronics contactor +1 of 218 SB-1, Refer drawing [WAG9_9k] 4D sheet 03.
- Check the wiring between Control electronics contactor -2 of 218 SB-1 to TCU1 electronics converter 1 of contactor1 127.11/1, Refer drawing [WAG9_9k] 4D sheet 03.
- Check the wiring between TCU1 electronics converter 1 of Contactor 2 127.11/1 to 05E.01, Refer drawing [WAG9_9k] 4D sheet 03.

Reaction:

TCU1 isolation

Related messages:

0353

Fault Tex:**TCU2 switched OFF via CB (127.11/2)**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TRACTION

Condition:

TCU2 is not enabled.

Criteria:

- TCU2 110V power supply CB has tripped/missing feedback from 09C.04.
- Switched OFF TCU2 110V supply CB (127.11/1) manually

Components concerned:

Component	Device name
TCU2 110V supply CB	127.11/2

Troubleshooting:

- Check TCU2 110V power supply CB tripped 127.11/2.
- Check the wiring between 04C.15 to Control electronics contactor +1 of 218 SB-1, Refer drawing [WAG9_9k] 4D sheet 03.- Check the wiring between Control electronics contactor -2 of 218 SB-1 to TCU2 electronics converter 2 of contactor1 127.11/2, Refer drawing [WAG9_9k] 4D sheet 03.
- Check the wiring between TCU2 electronics converter 2 of Contactor2 127.11/2 to 05E.09, Refer drawing [WAG9_9k] 4D sheet 03.

Reaction:

TCU2 isolation

Related messages:

0354

Fault Text:**Both Cabs are Active**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- IO station 11, 12, 21, 22 communication ok.

Criteria:

- BL key from both cab is into position D.
- CAB1 and CAB2 active status from DPWCS.

Components concerned:

Component	Device name
IO station 11 module 1	E111
IO station 12 module 1	E121
IO station 21 module 1	E211_00
IO station 22 module 3	E223_00
BL Key1	-125/1
BL Key1	-125/2

Troubleshooting:

- Check the BL key position in both cab and activate only one cab.
- Check the feedback at IO stations E111_01/121_15 for Cab1 BL key input, Refer drawing [WAG9_6K] 8A sheet 1.
- Check the feedback at IO stations E211_00/223_00 for Cab1 BL key input, Refer drawing [WAG9_6K] 8A sheet 1.

Reaction:

-

Related messages:

-

Fault Text:**Direction changed while in movement**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- IO station 11, 12, 21, 22 communication ok.
- Cab is active.
- Actual speed is greater than or equal to 2 kmph.
- Simulation mode is not active.

Criteria:

- Direction is changed from reverser of active cab from leading or trailing loco while locomotive speed is equal or more than 2 kmph.

Components concerned:

Component	Device name
IO station 11 module 1	E111
IO station 12 module 1	E121
IO station 21 module 1	E211
IO station 22 module 1	E221
Reverser1	-140/1
Reverser2	-140/2

Troubleshooting:

- Check for any movement of reverser, only set reverser direction in standstill.
- Check the cab1 reverser forward feedback at IO stations E111_12/E121_06, Refer drawing [WAG9_6K] 8C sheet 6.
- Check the cab1 reverser reverse feedback at IO stations E111_11/E121_09, Refer drawing [WAG9_6K] 8C sheet 6.
- Check the cab2 reverser forward feedback at IO stations E211_11/E221_11, Refer drawing [WAG9_6K] 8D sheet 6.
- Check the cab2 reverser reverse feedback at IO stations E211_09/E221_08, Refer drawing [WAG9_6K] 8D sheet 6.
- Replace the master controller.

Reaction:

- Driver is informed with priority2 message on display.

Related messages:

Fault Text:**Direction Conflict - Multiple direction inputs selected**Priority Type

0 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- IO station 11, 12, 21, 22 communication ok.

Criteria:

- Multiple direction that is forward as well as reverse direction command is high from active cab or from DPWCS loco consists.

Components concerned:

Component	Device name
IO station 11 module 1	E111
IO station 12 module 1	E121
IO station 21 module 1	E211
IO station 22 module 1	E221
Reverser1	-140/1
Reverser2	-140/2

Troubleshooting:

- Check for any movement of reverser, only set reverser direction in standstill.
- Check the cab1 reverser forward feedback at IO stations E111_12/E121_06, Refer drawing [WAG9_6K] 8C sheet 6.
- Check the cab1 reverser reverse feedback at IO stations E111_11/E121_09, Refer drawing [WAG9_6K] 8C sheet 6.
- Check the cab2 reverser forward feedback at IO stations E211_11/E221_11, Refer drawing [WAG9_6K] 8D sheet 6.
- Check the cab2 reverser reverse feedback at IO stations E211_09/E221_08, Refer drawing [WAG9_6K] 8D sheet 6.
- Replace the master controller.

Reaction:

-

Related messages:

-

Fault Text:**CB Traction motor blower 1 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 12 is ok

Criteria:

- The circuit breaker TM blower 1 has tripped/missing feedback at E122_03 (MMCBloTM1)
- Overcurrent traction motor blower 1

Components concerned:

Component	Device name
MCB TMB-1	53.1/1
Traction motor blower 1	53/1
IO station 12 Module 2	E122

Troubleshooting:

- Check the MCB of TM1 blower(53.1/1) for any tripping.
- Check the Traction Motor blower 1 (53/1) for any abnormality/failure, Refer drawing [WAG9_6k] sheet 02H page 8.
- Check the wiring between 127.2/1 to MCB TM1 blower(53.1/1) auxiliary contact 23, Refer drawing [WAG9_6k] sheet 5F page 06.
- Check the wiring between MCB TM1 blower(53.1/1) auxiliary contact 24 to E122_03 Refer drawing [WAG9_6k] sheet 5F page 06.

Reaction:

- No effect on normal operation. If traction motor temperature increases then bogie 1 might be isolated.

Related messages:

0838

Fault Text:**CB Traction motor blower 2 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 21 is ok

Criteria:

- The circuit breaker TM blower 2 has tripped/missing feedback at E212_06 (MMCBloTM2)
- Overcurrent traction motor blower 2

Components concerned:

Component	Device name
MCB TMB-2	53.1/2
Traction motor blower 2	53/2
IO station 21 Module 2	E212

Troubleshooting:

- Check the MCB of TM2 blower(53.1/2) for any tripping.
- Check the Traction Motor blower 2 (53/2) for any abnormality/failure, Refer drawing [WAG9_6k] 02H sheet 8.
- Check the wiring between 127.2/2 to MCB TM2 blower(53.1/2) auxiliary contact 23, Refer drawing [WAG9_6k] 5F sheet 06.
- Check the wiring between MCB TM2 blower(53.1/2) auxiliary contact 24 to E212_06 Refer drawing [WAG9_6k] 5F sheet 06.

Reaction:

- No effect on normal operation. If traction motor temperature increases then bogie 1 might be isolated.

Related messages:

0839

Fault Text:**CB TM scavenge blower 1 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 12 is ok

Criteria:

- The circuit breaker TM scavenge blower 1 has tripped/missing feedback at E122_07 (MMCBTScBlo1)
- Overcurrent in TM scavenge blower 1

Components concerned:

Component	Device name
MCB TM scavenge blower 1	55.1/1
TM scavenge blower 1	55/1
IO station 12 Module 2	E122

Troubleshooting:

- Check the MCB of TM scavenge blower 1 (55.1/1) for any tripping.
- Check the TM scavenge blower 1(55/1) for any abnormality/failure, Refer drawing [WAG9_6k] 02H sheet 8.
- Check the wiring between 127.2/1 to MCB TM scavenge blower 1 (55.1/1) auxiliary contact 23, Refer drawing [WAG9_6k] 5F sheet 06.
- Check the wiring between MCB TM scavenge blower 1 (55.1/1) auxiliary contact 24 to E122_07 Refer drawing [WAG9_6k] 5F sheet 06.

Reaction:

- TM scavenge blower 1 may not operational

Related messages:

-

Fault Text:**CB TM scavenge blower 2 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 22 is ok

Criteria:

- The circuit breaker TM scavenge blower 2 has tripped/missing feedback at E223_07 (MMCBTScBlo2)
- Overcurrent in TM scavenge blower 2

Components concerned:

Component	Device name
MCB TM scavenge blower 2	55.1/2
TM scavenge blower 2	55/2
IO station 22 Module 3	E223

Troubleshooting:

- Check the MCB of TM scavenge blower 2 (55.1/2) for any tripping.
- Check the TM scavenge blower 2(55/2) for any abnormality/failure, Refer drawing [WAG9_6k] 02H sheet 8.
- Check the wiring between 127.2/2 to MCB TM scavenge blower 2 (55.1/2) auxiliary contact 23, Refer drawing [WAG9_6k] 5F sheet 06.
- Check the wiring between MCB TM scavenge blower 2 (55.1/1) auxiliary contact 24 to E223_07 Refer drawing [WAG9_6k] 5F sheet 06.

Reaction:

- TM scavenge blower 2 may not operational

Related messages:

-

Fault Text:**CB MR scavenge blower 1 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 12 is ok

Criteria:

- The circuit breaker MR scavenge blower 1 has tripped/missing feedback at E122_05 (MMCBMScBlo1)
- Overcurrent in TM scavenge blower 1

Components concerned:

Component	Device name
MCB MR scavenge blower 1	56.1/1
MR scavenge blower 1	56/1
IO station 12 Module 2	E122

Troubleshooting:

- Check the MCB of MR scavenge blower 1 (56.1/1) for any tripping.
- Check the MR scavenge blower 1(56/1) for any abnormality/failure, Refer drawing [WAG9_6k] 03A sheet 1.
- Check the wiring between 127.2/1 to MCB MR scavenge blower 1 (56.1/1) auxiliary contact 23, Refer drawing [WAG9_6k] 5F sheet 06.
- Check the wiring between MCB MR scavenge blower 1 (56.1/1) auxiliary contact 24 to E122_05 Refer drawing [WAG9_6k] 5F sheet 06.

Reaction:

- MR scavenge blower 1 may not operational

Related messages:

-

Fault Text:**CB MR scavenge blower 2 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 22 is ok

Criteria:

- The circuit breaker MR scavenge blower 2 has tripped/missing feedback at E223_05 (MMCBMScBlo2)
- Overcurrent in TM scavenge blower 2

Components concerned:

Component	Device name
MCB MR scavenge blower 2	56.1/2
MR scavenge blower 2	56/2
IO station 22 Module 3	E223

Troubleshooting:

- Check the MCB of MR scavenge blower 2 (56.1/2) for any tripping.
- Check the MR scavenge blower 2 (56/2) for any abnormality/failure, Refer drawing [WAG9_6k] 03A sheet 1.
- Check the wiring between 127.2/2 to MCB MR scavenge blower 2 (56.1/2) auxiliary contact 23, Refer drawing [WAG9_6k] 5F sheet 06.
- Check the wiring between MCB MR scavenge blower 2 (56.1/2) auxiliary contact 24 to E223_05 Refer drawing [WAG9_6k] 5F sheet 06.

Reaction:

- MR scavenge blower 2 may not operational

Related messages:

-

Fault Text:**CB MR blower 1 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 12 is ok

Criteria:

- The circuit breaker MR blower 1 has tripped/missing feedback at E122_01 (MMCBloMR1)
- Overcurrent in Machine room blower 1

Components concerned:

Component	Device name
MCB MR blower 1	54.1/1
Machine room blower 1	54/1
IO station 12 Module 2	E122

Troubleshooting:

- Check the MCB of MR blower 1 (54.1/1) for any tripping.
- Check the Machine room blower 1(54/1) for any abnormality/failure, Refer drawing [WAG9_6k] 03A sheet 1.
- Check the wiring between 127.2/1 to MCB MR blower 1 (54.1/1) auxiliary contact 23, Refer drawing [WAG9_6k] 5F sheet 06.
- Check the wiring between MCB MR blower 1 (54.1/1) auxiliary contact 24 to E122_01 Refer drawing [WAG9_6k] 5F sheet 06.

Reaction:

- MR blower 1 may not operational

Related messages:

-

Fault Text:**CB MR blower 2 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 22 is ok

Criteria:

- The circuit breaker MR blower 2 has tripped/missing feedback at E223_08 (MMCBloMR2)
- Overcurrent in Machine room blower 2

Components concerned:

Component	Device name
MCB MR blower 2	54.1/2
Machine room blower 2	54/2
IO station 22 Module 3	E223

Troubleshooting:

- Check the MCB of MR blower 2 (54.1/2) for any tripping.
- Check the Machine room blower 2(54/2) for any abnormality/failure, Refer drawing [WAG9_6k] 03A sheet 1.
- Check the wiring between 127.2/2 to MCB MR blower 2 (54.1/2) auxiliary contact 23, Refer drawing [WAG9_6k] 5F sheet 06.
- Check the wiring between MCB MR blower 2 (54.1/2) auxiliary contact 24 to E223_08 Refer drawing [WAG9_6k] 5F sheet 06.

Reaction:

- MR blower 2 may not operational

Related messages:

-

Fault Text:**CB Main compressor 1 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 12 is ok

Criteria:

- The circuit breaker Main compressor 1 has tripped/missing feedback at E123_02 (MMCBCompr1)
- Overcurrent in Main compressor 1

Components concerned:

Component	Device name
MCB Main compressor 1	47.1/1
Main compressor 1	47/1
IO station 12 Module 3	E123

Troubleshooting:

- Check the MCB of Main compressor 1(47.1/1) for any tripping.
- Check the Main compressor 1(47/1) for any abnormality/failure, Refer drawing [WAG9_6k] 02I sheet 9.
- Check the wiring between 127.2/1 to MCB Main compressor 1(47.1/1) auxiliary contact 23, Refer drawing [WAG9_6k] 5F sheet 06.
- Check the wiring between MCB Main compressor 1(47.1/1) auxiliary contact 24 to E123_02 Refer drawing [WAG9_6k] 5F sheet 06.

Reaction:

- Main compressor 1 may not operational

Related messages:

-

Fault Text:**CB Main compressor 2 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 22 is ok

Criteria:

- The circuit breaker Main compressor 2 has tripped/missing feedback at E221_00 (MMCBCompr2)
- Overcurrent in Main compressor 2

Components concerned:

Component	Device name
MCB Main compressor 2	47.1/2
Main compressor 2	47/2
IO station 22 Module 1	E221

Troubleshooting:

- Check the MCB of Main compressor 2(47.1/2) for any tripping.
- Check the Main compressor 2 (47/2) for any abnormality/failure, Refer drawing [WAG9_6k] 02I sheet 9.
- Check the wiring between 127.2/2 to MCB Main compressor 2(47.1/2) auxiliary contact 23, Refer drawing [WAG9_6k] 5F sheet 06.
- Check the wiring between MCB Main compressor 2 (47.1/2) auxiliary contact 24 to E221_00 Refer drawing [WAG9_6k] 5F sheet 06.

Reaction:

- Main compressor 2 may not operational.

Related messages:

-

Fault Text:**CB Cooling unit 1 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 12 is ok

Criteria:

- The circuit breaker Oil cooling blower 1 has tripped/missing feedback at E122_04 (MMCBBlOCT1)
- Overcurrent in Oil cooling blower 1.

Components concerned:

Component	Device name
MCB Cooling unit 1	59.1/1
Cooling unit 1	59/1
IO station 12 Module 2	E122

Troubleshooting:

- Check the MCB of Oil cooling blower 1(59.1/1) for any tripping.
- Check the Oil cooling blower 1(59/1) for any abnormality/failure, Refer drawing [WAG9_6k] 02H sheet 8.
- Check the wiring between 127.2/1 to MCB Oil cooling blower 1(59.1/1) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB Oil cooling blower 1(59.1/1) auxiliary contact 24 to E122_04 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- Oil cooling blower 1 may not operational

Related messages:

-

Fault Text:**CB Cooling unit 2 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 22 is ok.

Criteria:

- The circuit breaker Oil cooling blower 2 has tripped/missing feedback at E223_04 (MMCBBlOCT2)
- Overcurrent in Oil cooling blower 2.

Components concerned:

Component	Device name
MCB Cooling unit 2	59.1/2
Cooling unit 2	59/2
IO station 22 Module 3	E223

Troubleshooting:

- Check the MCB of Oil cooling blower 2 (59.1/2) for any tripping.
- Check the Oil cooling blower 2 (59/2) for any abnormality/failure, Refer drawing [WAG9_6k] 02H sheet 8.
- Check the wiring between 127.2/2 to MCB Oil cooling blower 2(59.1/2) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB Oil cooling blower 2 (59.1/2) auxiliary contact 24 to E223_04 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- Oil cooling blower 2 may not operational

Related messages:

-

Fault Text:**CB Oil pump Trafo 1 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 12 is ok

Criteria:

- The circuit breaker Transformer oil pump 1 has tripped/missing feedback at E122_06 (MMCBPumpT1)
- Overcurrent in Transformer oil pump 1.

Components concerned:

Component	Device name
MCB Transformer oil pump 1	62.1/1
Transformer oil pump 1	62/1
IO station 12 Module 2	E122

Troubleshooting:

- Check the MCB of Transformer oil pump 1 (62.1/1) for any tripping.
- Check the Transformer oil pump 1 (62/1) for any abnormality/failure, Refer drawing [WAG9_6k] 02I sheet 9.
- Check the wiring between 127.2/1 to MCB Transformer oil pump 1 (62.1/1) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB Transformer oil pump 1 (62.1/1) auxiliary contact 24 to E122_06 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- Transformer oil pump 1 (62/1) may not operational

Related messages:

-

Fault Text:**CB Oil pump Trafo 2 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 22 is ok

Criteria:

- The circuit breaker Transformer oil pump 2 has tripped/missing feedback at E223_06 (MMCBPumpT2)
- Overcurrent in Transformer oil pump 2.

Components concerned:

Component	Device name
MCB Transformer oil pump 2	62.1/2
Transformer oil pump 2	62/2
IO station 22 Module 3	E223

Troubleshooting:

- Check the MCB of Transformer oil pump 2 (62.1/2) for any tripping.
- Check the Transformer oil pump 2 (62/2) for any abnormality/failure, Refer drawing [WAG9_6k] 02I sheet 9.
- Check the wiring between 127.2/2 to MCB Transformer oil pump 2 (62.1/2) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB Transformer oil pump 2 (62.1/2) auxiliary contact 24 to E122_06 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- Transformer oil pump 2 (62/2) may not operational

Related messages:

-

Fault Text:**CB Coolant pump 1 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 12 is ok

Criteria:

- The circuit breaker converter 1 coolant pump has tripped/missing feedback at E122_02 (MMCBPumpC1)
- Overcurrent in converter 1 coolant pump.

Components concerned:

Component	Device name
MCB Converter1 coolant pump	63.1/1
Converter1 coolant pump	63/1
IO station 12 Module 2	E122

Troubleshooting:

- Check the MCB of Converter1 coolant pump (63.1/1) for any tripping.
- Check the Converter1 coolant pump (63/1) for any abnormality/failure, Refer drawing [WAG9_6k] 02I sheet 9.
- Check the wiring between 127.2/1 to MCB Converter1 coolant pump (63.1/1) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB Converter1 coolant pump (63.1/1) auxiliary contact 24 to E122_02 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- Converter1 coolant pump (63/1) may not operational.
- No effect on normal operation. If converter coolant temperature increases then bogie 1 might be isolated.

Related messages:

0531

Fault Text:**CB Coolant pump 2 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 22 is ok.

Criteria:

- The circuit breaker converter 2 coolant pump has tripped/missing feedback at E223_09 (MMCBPumpC2)
- Overcurrent in converter 2 coolant pump.

Components concerned:

Component	Device name
MCB Converter2 coolant pump	63.1/2
Converter2 coolant pump	63/2
IO station 22 Module 3	E223

Troubleshooting:

- Check the MCB of Converter2 coolant pump (63.1/2) for any tripping.
- Check the Converter2 coolant pump (63/2) for any abnormality/failure, Refer drawing [WAG9_6k] 02I sheet 9.
- Check the wiring between 127.2/2 to MCB Converter2 coolant pump (63.1/2) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB Converter2 coolant pump (63.1/2) auxiliary contact 24 to E223_09 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- Converter2 coolant pump (63/3) may not operational.
- No effect on normal operation. If converter coolant temperature increases then bogie 2 might be isolated.

Related messages:

0538

Fault Text:**CB 127.9/1 Ext.IO 11 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 12 is ok.

Criteria:

- The circuit breaker EXT.IO 11 has tripped/missing feedback at E122_15 (CB 127.9 /1)

Components concerned:

Component	Device name
MCB EXT.IO 11	127.9 /1
IO station 12 Module 2	E122

Troubleshooting:

- Check the MCB of EXT.IO 11 (CB 127.9 /1) for any tripping.
- Check the +ve supply at MCB EXT.IO 11 (CB 127.9 /1) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB EXT.IO 11 (CB 127.9 /1) auxiliary contact 24 to E122_15 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- VCU1 IO stations may inoperative.

Related messages:

-

Fault Text:**CB 127.9/2 Ext.IO 12 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 is ok.

Criteria:

- The circuit breaker EXT.IO 12 has tripped/missing feedback at E113_08 (CB 127.9 /2)

Components concerned:

Component	Device name
MCB EXT.IO 12	127.9 /2
IO station 11 Module 3	E122

Troubleshooting:

- Check the MCB of EXT.IO 12 (CB 127.9 /2) for any tripping.
- Check the +ve supply at MCB EXT.IO 12 (CB 127.9 /2) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB EXT.IO 12 (CB 127.9 /2) auxiliary contact 24 to E113_08 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- VCU1 IO stations may inoperative.

Related messages:

-

Fault Text:**CB 127.9/3 Ext.IO 21 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 21 is ok.

Criteria:

- The circuit breaker EXT.IO 21 has tripped/missing feedback at E223_12 (CB 127.9 /3)

Components concerned:

Component	Device name
MCB EXT.IO 21	127.9 /3
IO station 22 Module 3	E223

Troubleshooting:

- Check the MCB of EXT.IO 21 (CB 127.9/3) for any tripping.
- Check the +ve supply at MCB EXT.IO 21 (CB 127.9/3) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB EXT.IO 21 (CB 127.9/3) auxiliary contact 24 to E223_12 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- VCU2 IO stations may inoperative.

Related messages:

-

Fault Text:**CB 127.9/4 Ext.IO 22 is off.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 22 is ok.

Criteria:

- The circuit breaker EXT.IO 22 has tripped/missing feedback at E211_03 (CB 127.9 /4)

Components concerned:

Component	Device name
MCB EXT.IO 22	127.9 /4
IO station 21 Module 1	E211

Troubleshooting:

- Check the MCB of EXT.IO 22 (CB 127.9/4) for any tripping.
- Check the +ve supply at MCB EXT.IO 22 (CB 127.9/4) auxiliary contact 23, Refer drawing [WAG9_6k] 5G sheet 07.
- Check the wiring between MCB EXT.IO 22 (CB 127.9/4) auxiliary contact 24 to E211_03 Refer drawing [WAG9_6k] 5G sheet 07.

Reaction:

- VCU2 IO stations may inoperative.

Related messages:

-

Fault Text:**CB F01 TCU 1 voltage sensor off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker TCU 1 voltage sensor has tripped/missing feedback at E117_06/127_06 (-F03).
- E117_06 and 127_06 are the redundant

channels. Components concerned:

Component	Device name
MCB TCU 1 voltage sensor	-F03
IO station 11 Module 7	E117
IO station 21 Module 7	E217

Troubleshooting:

- Check the MCB of TCU 1 voltage sensor (-F03) for any tripping or wiring failure, Refer drawing [WAG9_9k] IJ sheet 9.
- Check the +ve supply at MCB TCU 1 voltage sensor (-F03) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB TCU 1 voltage sensor (-F03) auxiliary contact 21 to E117_06/127_06(redundant) Refer drawing [WAG9_9k] 5P sheet 18.

Reaction:

- AUX1 output voltage can not be detected.
- AUX1 may be inoperatable

Related messages:

-

Fault Text:**CB F01 TCU 2 voltage sensor off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker TCU 1 voltage sensor has tripped/missing feedback at E117_07/127_07 (-F04)
- E117_07 are 127_07 are the redundant

channels. Components concerned:

Component	Device name
MCB TCU 2 voltage sensor	-F04
IO station 11 Module 7	E117
IO station 21 Module 7	E217

Troubleshooting:

- Check the MCB of TCU 2 voltage sensor (-F04) for any tripping or wiring failure, Refer drawing [WAG9_9k] IJ sheet 9.
- Check the +ve supply at MCB TCU 2 voltage sensor (-F04) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB TCU 2 voltage sensor (-F04) auxiliary contact 21 to E117_07/127_07(redundant) Refer drawing [WAG9_9k] 5P sheet 18.

Reaction:

- AUX2 output voltage can not be detected.
- AUX2 may be inoperatable

Related messages:

-

Fault Text:**CB Auxiliary transformer earth off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker AUX transformer earth 1 monitoring has tripped/missing feedback at E117_04/127_04 (-F01)
- E117_04 and 127_04 are the redundant

channels. Components concerned:

Component	Device name
MCB AUX transformer earth 1 monitoring	-F01
IO station 11 Module 4	E117
IO station 12 Module 4	E127

Troubleshooting:

- Check the MCB of AUX transformer earth 1 monitoring (-F01) for any tripping or wiring failure, Refer drawing [WAG9_9k] IK sheet 10.
- Check the +ve supply at MCB AUX transformer earth 1 monitoring (-F01) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB AUX transformer earth 1 monitoring (-F01) auxiliary contact 21 to E117_04/127_04 (redundant) Refer drawing [WAG9_9k] 5P sheet 15.

Reaction:

-

Related messages:

-

Fault Text:**CB Auxiliary transformer blower off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker AUX transformer earth 2 monitoring has tripped/missing feedback at E117_05/127_05. (-F02)
- E117_05 and 127_05 are the redundant

channels. Components concerned:

Component	Device name
MCB AUX transformer earth 1 monitoring	-F02
IO station 11 Module 4	E114
IO station 12 Module 4	E124

Troubleshooting:

- Check the MCB of AUX transformer earth 2 monitoring (-F02) for any tripping or wiring failure, Refer drawing [WAG9_9k] IK sheet 10.
- Check the +ve supply at MCB AUX transformer earth 2 monitoring (-F02) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB AUX transformer earth 2 monitoring (-F02) auxiliary contact 21 to E117_05/127_05 (redundant) Refer drawing [WAG9_9k] 5P sheet 15.

Reaction:

-

Related messages:

-

Fault Text:**CB Battery charger is off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker Battery charger monitoring has tripped/missing feedback at E117_08/127_08 (-F05)
- E117_08 and 127_08 are the redundant

channels. Components concerned:

Component	Device name
MCB Battery charger	-F05
IO station 11 Module 7	E117
IO station 12 Module 7	E127

Troubleshooting:

- Check the MCB Battery charger(-F05) for any tripping or wiring failure, Refer drawing [WAG9_9k] IK sheet 10.
- Check the +ve supply at MCB Battery charger(-F05) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB Battery charger(-F05) auxiliary contact 21 to E117_08/127_08 (redundant) Refer drawing [WAG9_9k] 5P sheet 15.

Reaction:

Battery charger may not operational.

Related messages:

-

Fault Text:**CB Single phase transformer is off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker Battery charger monitoring has tripped/missing feedback at E117_09/127_09 (-F06)
- E117_09 and E127_09 are the redundant

channels. Components concerned:

Component	Device name
AUX Trafo CB	-F06
IO station 11 Module 7	E117
IO station 12 Module 7	E127

Troubleshooting:

- Check the MCB AUX Trafo CB (-F06) for any tripping or wiring failure, Refer drawing [WAG9_9k] IL sheet 11.
- Check the +ve supply at MCB AUX Trafo CB (-F06) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 18.
- Check the wiring between MCB AUX Trafo CB (-F06) auxiliary contact 21 to E117_09/127_09 (redundant) Refer drawing [WAG9_9k] 5P sheet 15.

Reaction:

Cab fan and heater may not operational.

Related messages:

-

Fault Text:**CB Auxiliary transformer 1 earth fault is off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker AUX transformer earth 1 monitoring has tripped/missing feedback at E117_04/127_04 (-F01)
- E117_04 and 127_04 are the redundant

channels. Components concerned:

Component	Device name
MCB AUX transformer earth 1 monitoring	-F01
IO station 11 Module 4	E117
IO station 12 Module 4	E127

Troubleshooting:

- Check the MCB of AUX transformer earth 1 monitoring (-F01) for any tripping or wiring failure, Refer drawing [WAG9_9k] IK sheet 10.
- Check the +ve supply at MCB AUX transformer earth 1 monitoring (-F01) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB AUX transformer earth 1 monitoring (-F01) auxiliary contact 21 to E117_04/127_04 (redundant) Refer drawing [WAG9_9k] 5P sheet 15.

Reaction:

-

Related messages:

-

Fault Text:**CB Auxiliary transformer 2 earth fault is off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker AUX transformer earth 2 monitoring has tripped/missing feedback at E117_05/127_05. (-F02)
- E117_05 and 127_05 are the redundant

channels. Components concerned:

Component	Device name
MCB AUX transformer earth 1 monitoring	-F02
IO station 11 Module 4	E114
IO station 12 Module 4	E124

Troubleshooting:

- Check the MCB of AUX transformer earth 2 monitoring (-F02) for any tripping or wiring failure, Refer drawing [WAG9_9k] IK sheet 10.
- Check the +ve supply at MCB AUX transformer earth 2 monitoring (-F02) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB AUX transformer earth 2 monitoring (-F02) auxiliary contact 21 to E117_05/127_05 (redundant) Refer drawing [WAG9_9k] 5P sheet 15.

Reaction:

-

Related messages:

-

Fault Text:**CB Voltage sensor for TCC1 is off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker TCU 1 voltage sensor has tripped/missing feedback at E117_06/127_06 (-F03).
- E117_06 and 127_06 are the redundant

channels. Components concerned:

Component	Device name
MCB TCU 1 voltage sensor	-F03
IO station 11 Module 7	E117
IO station 21 Module 7	E217

Troubleshooting:

- Check the MCB of TCU 1 voltage sensor (-F03) for any tripping or wiring failure, Refer drawing [WAG9_9k] IJ sheet 9.
- Check the +ve supply at MCB TCU 1 voltage sensor (-F03) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB TCU 1 voltage sensor (-F03) auxiliary contact 21 to E117_06/127_06(redundant) Refer drawing [WAG9_9k] 5P sheet 18.

Reaction:

- AUX1 output voltage can not be detected.
- AUX1 may be inoperatable

Related messages:

-

Fault Text:**CB Voltage sensor for TCC2 is off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker TCU 1 voltage sensor has tripped/missing feedback at E117_07/127_07 (-F04)
- E117_07 are 127_07 are the redundant

channels. Components concerned:

Component	Device name
MCB TCU 2 voltage sensor	-F04
IO station 11 Module 7	E117
IO station 21 Module 7	E217

Troubleshooting:

- Check the MCB of TCU 2 voltage sensor (-F04) for any tripping or wiring failure, Refer drawing [WAG9_9k] IJ sheet 9.
- Check the +ve supply at MCB TCU 2 voltage sensor (-F04) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB TCU 2 voltage sensor (-F04) auxiliary contact 21 to E117_07/127_07(redundant) Refer drawing [WAG9_9k] 5P sheet 18.

Reaction:

- AUX2 output voltage can not be detected.
- AUX2 may be inoperatable

Related messages:

-

Fault Text:**CB Battery charger is off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker Battery charger monitoring has tripped/missing feedback at E117_08/127_08 (-F05)
- E117_08 and 127_08 are the redundant

channels. Components concerned:

Component	Device name
MCB Battery charger	-F05
IO station 11 Module 47	E117
IO station 12 Module 47	E127

Troubleshooting:

- Check the MCB Battery charger(-F05) for any tripping or wiring failure, Refer drawing [WAG9_9k] IK sheet 10.
- Check the +ve supply at MCB Battery charger(-F05) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 10.
- Check the wiring between MCB Battery charger(-F05) auxiliary contact 21 to E117_08/127_08 (redundant) Refer drawing [WAG9_9k] 5P sheet 15.

Reaction:

Battery charger may not operational.

Related messages:

-

Fault Text:**CB Single phase transformer is off**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

Communication to IO station 11 / IO station 12 is ok.

Criteria:

- The circuit breaker AUX Trafo has tripped/missing feedback at E117_09/127_09 (-F06)
- E117_09 and E127_09 are the redundant

channels. Components concerned:

Component	Device name
AUX Trafo CB	F06
IO station 11 Module 7	E117
IO station 12 Module 7	E127

Troubleshooting:

- Check the AUX Trafo CB (-F06) for any tripping or wiring failure, Refer drawing [WAG9_9k] IL sheet 11.
- Check the +ve supply at AUX Trafo CB (-F06) auxiliary contact 22, Refer drawing [WAG9_9k] 5J sheet 18.
- Check the wiring between AUX Trafo CB (-F06) auxiliary contact 21 to E117_09/127_09 (redundant) Refer drawing [WAG9_9k] 5P sheet 15.

Reaction:

Cab fan and heater may not operational.

Related messages:

-

Fault Text:**CB 100 Battery charger input is off**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

MONITORING

Condition:

Communication to AUX2/AUX3 is ok.

Criteria:

- The circuit breaker Battery charger monitoring has tripped/missing feedback at AUX2-M1300-X080.5/ AUX3-M1300-X080.5
- The detection of feedback depends on the which AUX is active and feeding the battery charger.

Components concerned:

Component	Device name
CB Battery charger input	100/Q1
AUX2-M1300	-A1
AUX3-M1300	-A2
BCH Rectifier Module	-G6

Troubleshooting:

- Check the MCB CB Battery charger input (100/Q1) for any tripping or wiring failure, Refer drawing [WAG9-6K-ACU2] sheet 9.
- If still tripping persists Check the BCH Rectifier Module (-G6) for any shorting or wiring failure, Refer drawing [WAG9-6K-ACU2] sheet 14.
- Check the +24V supply at MCB CB Battery charger input (100/Q1) auxiliary contact 33, Refer drawing [WAG9-6K-ACU2] sheet 5.
- Check the wiring between MCB CB Battery charger input (100/Q1) auxiliary contact 34 to AUX2-M1300-X080.5, Refer drawing [WAG9-6K-ACU2] sheet 5.
- Check the +24V supply at MCB CB Battery charger input (100/Q1) auxiliary contact 13, Refer drawing [WAG9-6K-ACU2] sheet 12.
- Check the wiring between MCB CB Battery charger input (100/Q1) auxiliary contact 14 to AUX3-M1300-X080.5, Refer drawing [WAG9-6K-ACU2] sheet 12.

Reaction:

Cab fan and heater may not operational.

Related messages:

Fault Text:**Wheel Slipping.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Difference in Speed sensor value between two axels.
- Wheel diameter mismatch

Criteria:

- Wheel slip detected by traction control unit
- TM Speed sensors speed mismatch
- Wheel diameter mismatch

Components concerned:

Component	Device name
TM Speed Sensors Bogie1	93.2/1,93.2/2,93.3/3
TM Speed Sensors Bogie2	93.2/4,93.2/5,93.3/6
Wheel Diameter	

Troubleshooting:

- Check if there is actual wheel slipping, check slipping/broken pinion.
- Check the speed value of TM speed sensors in DDU replace speed sensor if faulty.
- Tear wheel diameter to same size and enter correct diameter value through Sibas monitor.

Reaction:

-

Related messages:

-

Fault Text:**Locomotive is creeping.**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

TMC

Condition:

- Loco speed is below a <11km/h and high tractive effort demanded.

Criteria:

- Tractive effort insufficient
- Train too heavy
- Banking loco missing

Components concerned:

Component	Device name

Troubleshooting:

-

Reaction:

-

Related messages:

-

Fault Text:**Sanding Activated**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- Direction selected.
- Actual loco speed > 20 Kmph

Criteria:

Any one condition:

- Either TCU1 or TCU2 sanding request
- Manual sanding request

Components concerned:

Component	Device name

Troubleshooting:

- This is only for information.

Reaction:

- Sanding activated.

Related messages:

0629

Fault Text:**VCD Emergency Brakes Active.**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Communication to IO 21 and 22 is OK.

Criteria:

- Emergency brake application by vigilance control (237)
- Feedback of Digital Emergency brake application not available at input card E212_13 [MEmgBkVig] and E223_03 [MEmgBkVig].

Components concerned:

Component	Device name
Vigilance control unit	237
IO station 21 Module 2	E212
IO station 22 Module 3	E223

Troubleshooting:

- Release the emergency brake application.

If problem persists:

- Check/replace Digital input card E212_13 [MEmgBkVig] and E223_03 [MEmgBkVig] if faulty.
- Check wiring of vigilance control(237), Refer drawing [WAG9_6k] 11A sheet 01

Reaction:

- Traction inhibited.

Related messages:

-

Fault Text:**Overspeed 105%.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Condition:

- Communication to IO 21 is OK.

Criteria:

- Speed of loco more then 105% of the maximum permitted speed.
- Feedback from memotel (MSpeed105%) to Digital input card E211_10 [MSpeed105%] is faulty.

Components concerned:

Component	Device name
Memotel	94.2
IO station 21 Module 1	E211

Troubleshooting:

- Reduce the speed.

If problem persists:

- Replace MEMOTEL device(94.2).
- Check wiring of Overspeed 105% from memotel to Digital input card E211_10, Refer drawing [WAG9_6k] 10A sheet 01
- Check/replace Digital input card E211_10 [MSpeed105%].

Reaction:

- Speed increase may cause emergency brake.

Related messages:

2706

Fault Text:**Overspeed 110%.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Condition:

- Communication to IO 21 is OK.

Criteria:

- Speed of loco more then 110% of the maximum permitted speed.
- Feedback from memotel (MSpeed110%) to Digital input card E211_12 [MSpeed110%] is faulty.

Components concerned:

Component	Device name
Memotel	94.2
IO station 21 Module 1	E211

Troubleshooting:

- Reduce the speed.

If problem persists:

- Replace MEMOTEL device(94.2).
- Check wiring of Overspeed 110% from memotel to Digital input card E211_12, Refer drawing [WAG9_6k] 10A sheet 01
- Check/replace Digital input card E211_12 (MSpeed110%).

Reaction:

- Speed increase may cause emergency brake.

Related messages:

2705

Fault Text:**Limited Drive mode activated**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- Loco in standstill position
- IO module 11 communication error
- IO module 12 communication error
- IO module 21 communication error
- IO module 22 communication error

Criteria:

Faulty any/all IO stations

- IO module 11
- IO module 12
- IO module 21
- IO module 22

Components concerned:

Component	Device name
IO Stations	11,12,21 or 21
Circuit breaker	127.1/1 & 127.2/2

Troubleshooting:

- Check VCU Circuit breaker 127.1/1 for VCU-1 and 127.1/2 for VCU-2t, Refer [WAG9_6K] 4D sheet no.4
- Check 24V power supply at IO Station power supply Unit of 11,12,21 or 22.

Reaction:

- Limited locomotive drive activated.

Related messages:

0629

Fault Text:**BATT < 86 V Tr. Interlock**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

BATT

Condition:

- ACU 3 Communication OK.

Criteria:

- Battery voltage <86V
- EA112_02 [Batt Volt] Card faulty [9k Locomotive]

Components concerned:

Component	Device name
IO station 11 Module 2	-EA112
Communication	-E112, ACU2, ACU3

Troubleshooting:

- Check the EA112_02 [Batt Volt] Card replace if faulty, Refer drawing [WAG9-9K-TCU] 05Q sheet no.16
- Check the communication with ACU2 and ACU3.

Reaction:

- Traction interlock

Related messages:

0521

Fault Text:

Deactivate limited drive mode (Redundancy mode)

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- Limited drive mode activated

Criteria:

-

Components concerned:

Component	Device name

Troubleshooting:

- The normal mode driving can be possible, deactivate the limited driving mode.

Reaction:

-

Related messages:

-

Fault Text:**Harmonic Filter Earth Fault**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

MAINPWR

Condition:

- Communication with IO module 12 is ok

Criteria:

- Earth fault feedback of harmonic circuit high at E122_10 [MEFRFilter]
- E/F Relay Harmonic Filter 89.6

Components concerned:

Component	Device name
IO Station 12 Module 2	E122
E/F Relay	89.6

Troubleshooting:

- Check IO Module 122_10 [MEFRFilter] replace if faulty, Refer drawing [WAG9_6K] 05G sheet no.7.
- Check the E/F Earth Fault relay 89.6, Refer drawing [WAG9_6K] 05G sheet no.7.

Reaction:

-

Related messages:

0759

Fault Text:**DC circuit earth fault**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- IO station 12 communication ok.

Criteria:

- Earth fault detected via earth fault monitoring relay 89.7 at E122_13.

Components concerned:

Component	Device name
IO station 12	E122
Earth fault relay	-89.7

Troubleshooting:

- Switch check the 110V DC circuit for any earth leakage.
- Check repair/replace wiring between IO module E122_13 to relay contact 89.7. Relay contact 89.7 to CB 127.2/1 refer [WAG9_9] page 05G, 04D.8. Wiring between coil 89.7 to resistor voltage divider network to contactor 126 of control circuit for short circuit refer [WAG9_9K] page 04C.
- Check repair/replace IO modules E122_13.
- Check repair/replace earth fault relay 89.7.

Reaction:

- Earth detected indicated on display.

Related messages:

-

Fault Text:**1ph. Load earth fault**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

AUX

Condition:

- Communication with IO module 12 is ok

Criteria:

- Earth fault in single phase circuit high at E122_08 [MEFR415/110]
- E/F Relay 415/110V 89.5

Components concerned:

Component	Device name
IO Station 12 Module 2	-E122
E/F Relay	89.5

Troubleshooting:

- Check IO Module 122_08 [MEFR415/110] replace if faulty, Refer drawing [WAG9_6K] 05G sheet no.7.
- Check the E/F Earth Fault relay 89.6, Refer drawing [WAG9_6K] 05G sheet no.7.

Reaction:

-

Related messages:

-

Fault Text:**TC1 cutout req. Manual**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- IO station 12 communication ok.
- Display communication ok.
- Loco is standstill.

Criteria:

- TC1 cut out is requested by driver via display or by rotary switch 154.

Components concerned:

Component	Device name
IO station 12	E123
Display	- 435
Bogie cut out switch	- 154

Troubleshooting:

- Check the reason for manual bogie cutout(any failure in TC1).
- Check/replace Bogie cut out switch(154).
- Check/replace IO station 12 module 3(E123_10).

Reaction:

- Traction converter1 cutout.

Related messages:

Fault Text:**TC2 cutout req. Manual**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- IO station 12 communication ok.
- Display communication ok.
- Loco is standstill.

Criteria:

- TC2 cut out is requested by driver via display or by switch(154).

Components concerned:

Component	Device name
IO station 12	- E123_11
Display	- 435
Bogie cut out switch	- 154

Troubleshooting:

- Check the reason for manual bogie cutout(any failure in TC2).
- Check/replace Bogie cut out switch(154).
- Check/replace IO station 12 module 3(E123_11).

Reaction:

- Traction converter2 cutout.

Related messages:

-

Fault Text:**Vigilance manually cutout.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

BRAKE

Condition:

- Vigilance Cut-out Switch 237.1 is ON

Criteria:

- Vigilance isolating switch (Vigilance Cut-out Switch 237.1) provided on SB1 panel is in cutout position. This will make vigilance control device isolated.

Components concerned:

Component	Device name
Vigilance cutout switch	237.1
IO station 12 Module 3	E123

Troubleshooting:

- Switch on the vigilance cutout switch.

If problem persists:

- Replace Vigilance Cut-out Switch (237.1).

- Check wiring of Vigilance Cut-out Switch (237.1) to Digital input card E123_09, Refer drawing [WAG9_6k] 11A sheet 02.

- Check/replace Digital input card E123.

Reaction:

- Vigilance function will not functional.

Related messages:

-

Fault Text:**Harmonic Filter Current Deviation**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

MAINPWR

Condition:

- Communication with TCU(s) is ok

Criteria:

- Difference between TCU1 & TCU2 AC HF current is >40A
- A100 [C139] Analog input card faulty.
- Harmonic Filter Current Transducer faulty [8.5/1 or 8.5/2]

Components concerned:

Component	Device name
TCU1 & TCU2	415/1 & 415/2
-C139	-A100
Current transducer	8.5/1 or 8.5/2

Troubleshooting:

- Check the communication with TCU1 & TCU2.
- Check Harmonic filter current transducer-1 [8.5/1], Refer drawing [WAG9_6K] 12E sheet no.5
- Check Harmonic filter current transducer-2 [8.5/2], Refer drawing [WAG9_6K] 12F sheet no.6
- Check -A100[C139] X-4 connector and replace if card faulty.

Reaction:

-

Related messages:

0571

Fault Text:**Loco Variant changed, Traction locked. Reset of both VCUs required.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- IO station 12 communication ok.
- Hardware variant and software variant identical.

Criteria:

- Variant set through Sibas Monitor, which required CCU reset.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- Reset CCU and check variant set.

Reaction:

-

Related messages:

Fault Text:

No Angle Transmitter Mismatch detected, but Failure Mode activated by driver.

Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H / WAP7 / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- IO station 12 communication ok.
- Communication to Display is ok.
- No angle transmitter mismatch detected.

Criteria:

- Failure activated by driver by switch or from display.

Components concerned:

Component	Device name
CCU	-A100-C003

Troubleshooting:

- This is only for information.

Reaction:

- Angle Transmitter smooth regulation is not possible.
- TE/BE demand follows aux contact of the master controller position (0, 1/3TE , 2/3TE , TE Max).

Related messages:

-

Fault Text:**Dangerous overvoltage detected (U > 33 kV)**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

MAINPWR

Condition:

- Communication with TCU1 and 2 is ok
- Panto raised.

Criteria:

- Catenary voltage detected TCU1 & TCU2 crossed the dangerous limit 33kV.

Components concerned:

Component	Device name
TCU1	415/1
TCU2	415/2
PT Module	224.1/1, 224.1/2
ICU 4QC	A100-C159

Troubleshooting:

- Check PT module 224.1/1 and 224.1/2 Refer drawing [WAG9_6k] 12A, Sheet-1. If required replace the PT module.
- Check the faults if any logged related to AC line voltage in TCU.
- Check the wiring from x13 to AIN 10-11 of ICU 4QC A100-C159, refer the drawing [WAG9_6K_TCU] sheet 18.

Reaction:

- Pantograph Down

Related messages:

-

Fault Text:**No catenary voltage detected ($U < 0,5 \text{ kV}$)**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

MAINPWR

Condition:

- Communication with TCU1 and 2 is ok
- Panto raised.

Criteria:

- Either TCU1 or TCU2 no catenary voltage detect

Components concerned:

Component	Device name
TCU1	415/1
TCU2	415/2
PT Module	224.1/1, 224.1/2
ICU 4QC	A100-C159

Troubleshooting:

- Check PT module 224.1/1 and 224.1/2 Refer drawing [WAG9_6k] 12A, Sheet-1. If required replace the PT module.
- Check the faults if any logged related to AC line voltage in TCU.
- Check the wiring from x13 to AIN 10-11 of ICU 4QC A100-C159, refer the drawing [WAG9_6K_TCU] sheet 18.

Reaction:

- Fault code triggered
- Pantograph Down

Related messages:

-

Fault Text:**VCB loop test: test mode TCU 1 could not be set**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

Communication to TCU1 is ok.

Criteria:

- The VCB loop test requested from TCU1 but the TCU1 ICU unable to perform the test

Components concerned:

Component	Device name
TCU-MCU	-A100-C051
ICU 4QC	-A100-C159
ICU PWRA	-A100-C139
ICU PWRB	-A100-C119

Troubleshooting:

- Check the TCU1 download for related log.
- Check the front connector (-X3) on the ICU cards , refer drawing [WAG9-6K-TCU] or [WAG9-9K-TCU] sheet 22.
- Check the VCB loop from MCR (78) to VCB (5) through TCU1 cards, refer drawing [WAG9_6k] 5B sheet 2.
- Contact siemens personnel and replace the concerned cards.

Reaction:

- VCB loop test unsuccessful.
- VCB may not close

Related messages:

-

Fault Text:**VCB loop test: test mode TCU 2 could not be set**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MAINPWR

Condition:

Communication to TCU2 is ok.

Criteria:

- The VCB loop test requested from TCU2 but the TCU2 ICUs unable to perform the test

Components concerned:

Component	Device name
TCU-MCU	-A100-C051
ICU 4QC	-A100-C159
ICU PWRA	-A100-C139
ICU PWRB	-A100-C119

Troubleshooting:

- Check the TCU2 download for related log.
- Check the front connector (-X3) on the TCU2 ICU cards , refer drawing [WAG9-6K-TCU] or [WAG9-9K-TCU] sheet 22.
- Check the VCB loop from MCR (78) to VCB (5) through TCU2 cards, refer drawing [WAG9_6k] 5B sheet 2.
- Contact siemens personnel and replace the concerned cards.

Reaction:

- VCB loop test unsuccessful.
- VCB may not close

Related messages:

-

Fault Text:**Line voltage 5. harmonic too high - condition 2**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

MAINPWR

Condition:

- Minimum one panto is raised
- CCU is master

Criteria:

- AC harmonic voltage from Either TCU1 & TCU2 >7100V

Components concerned:

Component	Device name
TCU1	415/1
TCU2	415/2
PT Module	224.1/1, 224.1/2
ICU 4QC	A100-C159

Troubleshooting:

- Check PT module 224.1/1 and 224.1/2 Refer drawing [WAG9_6k] 12A, Sheet-1. If required replace the PT module.
- Check the faults if any logged related to AC line voltage in TCU.
- Check the wiring from x13 to AIN 10-11 of ICU 4QC A100-C159, refer the drawing [WAG9_6K_TCU] sheet 18.
- Check/repair harmonic filter related fault.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**Line voltage 5. harmonic too high - condition 1**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

MAINPWR

Condition:

- Minimum one panto is raised
- CCU is master

Criteria:

- AC harmonic voltage from Either TCU1 & TCU2 is >3500V
- AC harmonic voltage from Either TCU1 & TCU2 >7100V

Components concerned:

Component	Device name
TCU1	415/1
TCU2	415/2
PT Module	224.1/1, 224.1/2
ICU 4QC	A100-C159

Troubleshooting:

- Check PT module 224.1/1 and 224.1/2 Refer drawing [WAG9_6k] 12A, Sheet-1. If required replace the PT module.
- Check the faults if any logged related to AC line voltage in TCU.
- Check the wiring from x13 to AIN 10-11 of ICU 4QC A100-C159, refer the drawing [WAG9_6K_TCU] sheet 18.
- Check/repair harmonic filter related fault.

Reaction:

- Fault code triggered

Related messages:

-

Fault Text:**AUX inverter redundancy mode active**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

- TCU1 & TCU2 communication ok
- One AUX is cutout

Criteria:

- One of the AUX failed requested redundancy mode.

Components concerned:

Component	Device name
PWMI/AUX	-A6
AUX Trafo	7

Troubleshooting:

- Check the data for failure related to any AUX.
- Check the failure related to AUX switchgear -K01,K02,-Q01
- Check the TCU download.

Reaction:

- VCB off
- AUX redundancy mode will active.

Related messages:

571,572,573,574,496,497,511,512

Fault Text:**AUX inverter: 1 transformer cutout**Priority Type

3 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

- TCU1 & TCU2 communication ok
- One AUX is cutout

Criteria:

- One of the AUX failed requested redundancy mode.
- Only one transformer active for the AUX load.

Components concerned:

Component	Device name
PWMI/AUX	-A6
AUX Trafo	7

Troubleshooting:

- Check the data for failure related to any AUX.
- Check the TCU download.

Reaction:

- VCB off
- AUX redundancy mode will active.
- Contactor Q01 will be on operation.

Related messages:

571,572,573,574,496,497,511,512

Fault Text:**ACU1 master Temp OOR Controller**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

- AUX1 communication ok

Criteria:

- AUX1-M1300 module temperature above 75 degC.

Components concerned:

Component	Device name
AUX1-M1300	-A1
Cooling fans	-M1,-M2

Troubleshooting:

- Check the temperature of AUX1 in the data environment.
- Check the DC fans operation, Refer drawing [WAG9-6K-ACU1] sheet 12.
- AUX1 cubicle: Check the adicuate airflow into the AUX cubicle.
- Replace the AUX1-M1300 module (-A1) .

Reaction:

- Further increase of temperature may cutout AUX1.

Related messages:

-

Fault Text:**ACU1 rectifier Temp OOR Heatsink**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

AUX1 communication Ok.

Criteria:

- ACU-1 Rectifier temperature is more than 80 deg C
- ACU-1 Rectifier temperature sensor faulty.
- A-1 M-1300 faulty.
- Rectifier assembly may be faulty.

Components concerned:

Component	Device name
Rectifier	-G1
M1300	-A1

Troubleshooting:

- Check Connection of -A1 M1300 at X151 connector, Refer drawing [WAG9-6K-ACU1] Sheet No3.
- Check Temperature value using SIBMON application if it is showing abnormal value replace -A1 M1300 card.
- Check rectifier assembly and replace if faulty.

Reaction:

-

Related messages:

-

Fault Text:**ACU1 Inverter Temp OOR Controller**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

- AUX1 communication Ok.

Criteria:

- ACU-1 Inverter controller temperature is more than 85 deg C
- A-3 M-2000 faulty.
- Power Supply to -A3 M2000 may be faulty.

Components concerned:

Component	Device name
Inverter Controller	-G2
M2000	-A3

Troubleshooting:

- Check Power supply Connection at -A3 X040 of M2000 connector, Refer drawing [WAG9-6K-ACU1]
Sheet No.4
- Check Temperature value using SIBMON application if it is showing abnormal value replace -A3 M2000 card
- Check ACU-1 fault diagnostics for further analysis.

Reaction:

-

Related messages:

-

Fault Text:**ACU1 Inverter Temp OOR Heatsink**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

AUX1 communication Ok.

Criteria:

- ACU-1 Inverter Heat Sink temperature is more than 90 deg C
- A-3 M-2000 faulty.
- Power Supply to -A3 M2000 may be faulty

Components concerned:

Component	Device name
Inverter Controller	-G2
M2000	-A3

Troubleshooting:

- Check Power supply Connection at -A3 X040 of M2000 connector, Refer drawing [WAG9-6K-ACU1]
Sheet No.4
- Check Temperature value using SIBMON application if it is showing abnormal value replace -A3 M2000 card
- Check Inverter Assembly replace if faulty.
- Check ACU-1 fault diagnostics for further analysis.

Reaction:

-

Related messages:

-

Fault Text:**ACU2 master Temp OOR Controller**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

- AUX2 communication ok

Criteria:

- AUX2-M1300 module temperature above 75 degC.

Components concerned:

Component	Device name
AUX2-M1300	-A1
Cooling fans	-M1,-M2

Troubleshooting:

- Check the temperature of AUX2 in the data environment.
- Check the DC fans operation, Refer drawing [WAG9-6K-ACU2] sheet 15.
- AUX2 cubicle: Check the adicuate airflow into the AUX cubicle.
- Replace the AUX2-M1300 module (-A1) .

Reaction:

- Further increase of temperature may cutout AUX2.

Related messages:

-

Fault Text:**ACU2 rectifier Temp OOR Heatsink**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

AUX2 communication Ok.

Criteria:

- ACU-2 Rectifier temperature is more than 80 deg C
- ACU-2 Rectifier temperature sensor faulty.
- A-1 M-1300 faulty.
- Rectifier assembly may be faulty.

Components concerned:

Component	Device name
Rectifier	-G1
M1300	-A1

Troubleshooting:

- Check Connection of -A1 M1300 at X151 connector, Refer drawing [WAG9-6K-ACU1] Sheet No3.
- Check Temperature value using SIBMON application if it is showing abnormal value replace -A1 M1300 card
- Check rectifier assembly and replace if faulty.

Reaction:

-

Related messages:

-

Fault Text:**ACU2 Inverter Temp OOR Controller**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

AUX2 communication Ok.

Criteria:

- ACU-2 Inverter controller temperature is more than 85 deg C
- A-3 M-2000 faulty.
- Power Supply to -A3 M2000 may be faulty.

Components concerned:

Component	Device name
Inverter Controller	-G2
M2000	-A3

Troubleshooting:

- Check Power supply Connection at -A3 X040 of M2000 connector, Refer drawing [WAG9-6K-ACU2]
Sheet No.4
- Check Temperature value using SIBMON application if it is showing abnormal value replace -A3 M2000 card
- Check ACU-2 fault diagnostics for further analysis.

Reaction:

-

Related messages:

-

Fault Text:**ACU2 Inverter Temp OOR Heatsink**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

AUX2 communication Ok.

Criteria:

- ACU-2 Inverter Heat Sink temperature is more than 90 deg C
- A-3 M-2000 faulty.
- Power Supply to -A3 M2000 may be faulty

Components concerned:

Component	Device name
Inverter Controller	-G2
M2000	-A3

Troubleshooting:

- Check Power supply Connection at -A3 X040 of M2000 connector, Refer drawing [WAG9-6K-ACU2]
Sheet No.4
- Check Temperature value using SIBMON application if it is showing abnormal value replace -A3 M2000 card
- Check Inverter Assembly replace if faulty.
- Check ACU-2 fault diagnostics for further analysis.

Reaction:

-

Related messages:

-

Fault Text:**ACU3 master Temp OOR Controller**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H

Subsystem:

AUX

Condition:

- AUX3 communication ok

Criteria:

- AUX3-M1300 module temperature above 75 degC.

Components concerned:

Component	Device name
AUX3-M1300	-A2
Cooling fans	-M1,-M2

Troubleshooting:

- Check the temperature of AUX3 in the data environment.
- Check the DC fans operation, Refer drawing [WAG9-6K-ACU2] sheet 15.
- AUX2 cubicle: Check the adicuate airflow into the AUX cubicle.
- Replace the AUX3-M1300 module (-A2) .

Reaction:

- Further increase of temperature may cutout AUX3.

Related messages:

-

Fault Text:**ACU3 rectifier Temp OOR Heatsink**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

AUX3 communication Ok.

Criteria:

- ACU-3 Rectifier temperature is more than 80 deg C
- ACU-3 Rectifier temperature sensor faulty.
- A-1 M-1300 faulty.
- Rectifier assembly may be faulty.

Components concerned:

Component	Device name
Rectifier	-G1
M1300	-A1

Troubleshooting:

- Check Connection of -A1 M1300 at X151 connector, Refer drawing [WAG9-6K-ACU2] Sheet No3.
- Check Temperature value using SIBMON application if it is showing abnormal value replace -A1 M1300 card
- Check rectifier assembly and replace if faulty.

Reaction:

-

Related messages:

-

Fault Text:**ACU3 Inverter Temp OOR Controller**Priority Type

2 (1=A, 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

AUX3 communication Ok.

Criteria:

- ACU-3 Inverter controller temperature is more than 85 deg C
- A-3 M-2000 faulty.
- Power Supply to -A3 M2000 may be faulty.

Components concerned:

Component	Device name
Inverter Controller	-G2
M2000	-A3

Troubleshooting:

- Check Power supply Connection at -A3 X040 of M2000 connector, Refer drawing [WAG9-6K-ACU2]
Sheet No.4
- Check Temperature value using SIBMON application if it is showing abnormal value replace -A3 M2000 card
- Check ACU-3 fault diagnostics for further analysis.

Reaction:

-

Related messages:

-

Fault Text:**ACU3 Inverter Temp OOR Heatsink**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H

Sub-system:

AUX

Condition:

- AUX3 communication Ok.

Criteria:

- ACU-3 Inverter Heat Sink temperature is more than 90 deg C
- A-3 M-2000 faulty.
- Power Supply to -A3 M2000 may be faulty

Components concerned:

Component	Device name
Inverter Controller	-G2
M2000	-A3

Troubleshooting:

- Check Power supply Connection at -A3 X040 of M2000 connector, Refer drawing [WAG9-6K-ACU2]
Sheet No.4
- Check Temperature value using SIBMON application if it is showing abnormal value replace -A3 M2000 card
- Check Inverter Assembly replace if faulty.
- Check ACU-3 fault diagnostics for further analysis.

Reaction:

-

Related messages:

-

Fault Text:

Failure mode activated from display by driver

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9 / WAG9H

Sub-system:

VCU

Condition:

- Display communication is ok.

Criteria:

- Driver selected failure mode from display.

Components concerned:

Component	Device name

Troubleshooting:

- This is only for information.

Reaction:

- The angle transmitter digital feedback will be considered.

Related messages:

-

Fault Text:**Component overtemperature detected: logging temperature values every 300s.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

Any of below temperature exceed level limit:

- CCU1/CCU2 temperature above 70 degC.
- TCU1/TCU2 temperature above 70 degC.
- AUX1/AUX2/AUX3 controller temperature above 70 degC.
- AUX1/AUX2/AUX3 heatsink temperature above 85 degC.
- Battery charger controller temperature above 70 degC.
- Battery charger heatsink controller temperature above 90 degC.
- ExtIO11/ ExtIO12/ ExtIO21/ ExtIO22 temperature above 70 degC.

Components concerned:

Component	Device name
CCU1/CCU2	-A100-C003
TCU1/TCU2	-A100-C051
AUX1-M1300	-A1
AUX2-M1300	-A1
AUX3-M1300	-A2
Battery charger	-G5
VCU1	411
VCU2	412

Troubleshooting:

- Check the temperature of the individual controller on display/in the data environment.
- CCU1/CCU2 or TCU1/TCU2 : check for the adequate cooling in side the TCC and check the fan unit in the Sibas rack -J000, Refer drawing [WAG9-6K-TCU] or [WAG9-9K-TCU] sheet 37.
- AUX1 : Check the DC fans operation, Refer drawing [WAG9-6K-ACU1] sheet 8.
- AUX2/AUX3 : check the DC fans operation, Refer drawing [WAG9-6K-ACU1] sheet 15.
- AUX cubicle: Check the adequate airflow into the AUX cubicle.
- VCU1/VCU2: Check the wiring/operation of DC fans inside VCU1 and VCU2 , Refer drawing [WAG9-6K] 09A sheet 1 and 09B sheet 2.

Reaction:

- Further increase of temperature can isolate the concerned subsystem.

Related messages:

3451, 3452, 3453, 3454, 3455, 3456, 3460, 3461, 3465, 3466, 3467, 3468

Fault Text:**CCU 1 temperature has exceeded the temperature limit for reaction 2.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

CCU1 temperature above 75 degC.

Components concerned:

Component	Device name
CCU1 (TCC1)	-A100-C003
Sibas Fan unit	-A100-J000

Troubleshooting:

- Check the temperature of CCU1 on display/in the data environment.
- Check for the adicuate cooling in side the TCC1 and check the fan unit in the Sibas rack -J000, Refer drawing [WAG9-6K-TCU] or [WAG9-9K-TCU] sheet 37.

Reaction:

- Further increase of temperature can switch off the CCU1
- CCU2 will act as redundant master.

Related messages:

3450

Fault Text:**CCU 2 temperature has exceeded the temperature limit for reaction 2.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

CCU2 temperature above 75 degC.

Components concerned:

Component	Device name
CCU2 (TCC2)	-A100-C003
Sibas Fan unit	-A100-J000

Troubleshooting:

- Check the temperature of CCU2 on display.
- Check for the adicuate cooling in side the TCC2 and check the fan unit in the Sibas rack -J000, Refer drawing [WAG9-6K-TCU] or [WAG9-9K-TCU] sheet 37.

Reaction:

- Further increase of temperature can switch off the CCU2
- CCU1 will act as redundant master.

Related messages:

3450

Fault Text:**TCU 1 temperature has exceeded the temperature limit for reaction 2.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

TCU1 temperature above 75 degC.

Components concerned:

Component	Device name
TCU-MCU (TCC1)	-A100-C051
Sibas Fan unit	-A100-J000

Troubleshooting:

- Check the temperature of TCU1 on display/in the data environment.
- Check for the adicuate cooling in side the TCC1 and check the fan unit in the Sibas rack -J000, Refer drawing [WAG9-6K-TCU] or [WAG9-9K-TCU] sheet 37.

Reaction:

- Further increase of temperature may isolate TCU1.

Related messages:

3450

Fault Text:**TCU 2 temperature has exceeded the temperature limit for reaction 2.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

TCU2 temperature above 75 degC.

Components concerned:

Component	Device name
TCU-MCU (TCC2)	-A100-C051
Sibas Fan unit	-A100-J000

Troubleshooting:

- Check the temperature of TCU2 on display/in the data environment.
- Check for the adicuate cooling in side the TCC2 and check the fan unit in the Sibas rack -J000, Refer drawing [WAG9-6K-TCU] or [WAG9-9K-TCU] sheet 37.

Reaction:

- Further increase of temperature may isolate TCU2.

Related messages:

3450

Fault Text:**Display 1 temperature has exceeded the limit for reaction 2.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

Display1 temperature above 75 degC.

Components concerned:

Component	Device name
Display1	435/1

Troubleshooting:

- Check the temperature of Display1 on Display2/in the data environment.
- Check for the adicuate cooling near Display1.

Reaction:

- Further increase of temperature may switch off Display 1 permanently. It is not switched on again until it has been cooled down by disconnecting and reconnecting power supply.

Related messages:

3450

Fault Text:**Display 2 temperature has exceeded the limit for reaction 2.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

Display2 temperature above 75 degC.

Components concerned:

Component	Device name
Display2	435/2

Troubleshooting:

- Check the temperature of Display2 on Display1/in the data environment.
- Check for the adicuate cooling near Display2.

Reaction:

- Further increase of temperature may switch off Display 2 permanently. It is not switched on again until it has been cooled down by disconnecting and reconnecting power supply.

Related messages:

3450

Fault Text:

Battery charger control module temperature (via ACU2) has exceeded the limit for reaction 2.

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

Battery charger control module temperature above 75 degC.

Components concerned:

Component	Device name
Battery charger control module	-G5
Cooling fans	-M1,-M2

Troubleshooting:

- Check the temperature of Battery charger in the data environment.
- Check the DC fans operation, Refer drawing [WAG9-6K-ACU2] sheet 15.
- AUX2 cubicle: Check the adequate airflow into the AUX cubicle.
- Replace the battery charger control module (-G5) .

Reaction:

- Further increase of temperature may switch off Battery charger controller permanently.
- Battery charging may not possible.

Related messages:

3450

Fault Text:

Battery charger control module temperature (via ACU3) has exceeded the limit for reaction 2.

Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

Battery charger control module temperature above 75 degC.

Components concerned:

Component	Device name
Battery charger control module	-G5
Cooling fans	-M1,-M2

Troubleshooting:

- Check the temperature of Battery charger in the data environment.
- Check the DC fans operation, Refer drawing [WAG9-6K-ACU2] sheet 15.
- AUX2 cubicle: Check the adequate airflow into the AUX cubicle.
- Replace the battery charger control module (-G5) .

Reaction:

- Further increase of temperature may switch off Battery charger controller permanently.
- Battery charging may not possible.

Related messages:

3450

Fault Text:**ExtIO 11 temperature has exceeded the limit for reaction 1.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

VCU1 IO station 11 bus coupler temperature above 70 degC.

Components concerned:

Component	Device name
VCU1 IO station 11 bus coupler	411
Cooling fans	-

Troubleshooting:

- Check the wiring/operation of DC fans inside VCU1, Refer drawing [WAG9-6K] 09A sheet 1.

Reaction:

- Further increase of temperature may make the VCU1 IO station 11 bus coupler in safe mode.
- IO station 11 may not available for operation.

Related messages:

3450

Fault Text:**ExtIO 12 temperature has exceeded the limit for reaction 1.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

VCU1 IO station 12 bus coupler temperature above 70 degC.

Components concerned:

Component	Device name
VCU1 IO station 12 bus coupler	411
Cooling fans	-

Troubleshooting:

- Check the wiring/operation of DC fans inside VCU1, Refer drawing [WAG9-6K] 09A sheet 1.

Reaction:

- Further increase of temperature may make the VCU1 IO station 12 bus coupler in safe mode.
- IO station 12 may not available for operation.

Related messages:

3450

Fault Text:**ExtIO 21 temperature has exceeded the limit for reaction 1.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

VCU2 IO station 21 bus coupler temperature above 70 degC.

Components concerned:

Component	Device name
VCU2 IO station 21 bus coupler	412
Cooling fans	-

Troubleshooting:

- Check the wiring/operation of DC fans inside VCU2, Refer drawing [WAG9-6K] 09B sheet 2.

Reaction:

- Further increase of temperature may make the VCU2 IO station 21 bus coupler in safe mode.
- IO station 21 may not available for operation.

Related messages:

3450

Fault Text:**ExtIO 22 temperature has exceeded the limit for reaction 1.**Priority Type

2 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Subsystem:

MONITORING

Condition:

-

Criteria:

VCU2 IO station 22 bus coupler temperature above 70 degC.

Components concerned:

Component	Device name
VCU2 IO station 22 bus coupler	412
Cooling fans	-

Troubleshooting:

- Check the wiring/operation of DC fans inside VCU2, Refer drawing [WAG9-6K] 09B sheet 2.

Reaction:

- Further increase of temperature may make the VCU2 IO station 22 bus coupler in safe mode.
- IO station 22 may not available for operation.

Related messages:

3450

Fault Text:**Switch Off Announcement active**Priority Type

1 (1=A , 2=B, 3=C, 0=Info)

Applicable Variants:

WAG9H / WAP7H / WAP5H / WAG9HH / WAP7HH

Sub-system:

VCU

Condition:

- Loco in standstill
- Panto lowered.

Criteria:

- Cab is not active for 10 mins.
- BL key moved from D to C pos.

Components concerned:

Component	Device name
IO station 11 module2	-E112

Troubleshooting:

- This is only for information.

Reaction:

- Loco will shutdown

Related messages:

-

6 Annextures – I

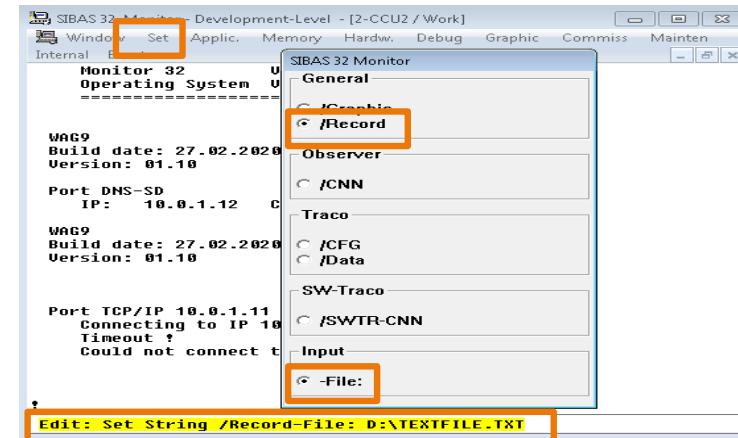
Status: released TRIPATH_ASH 26.07.2023
DCC: ADC045 Obj.Desgn. Prod: TS_RGC07

SIBAS Monitor Tool – Data Record



1.1.1 How to Record data into text file

1. Set- string
2. Check, selection should be on record and file as shown in fig.
3. Type location where you want to save this text file.
4. Enter



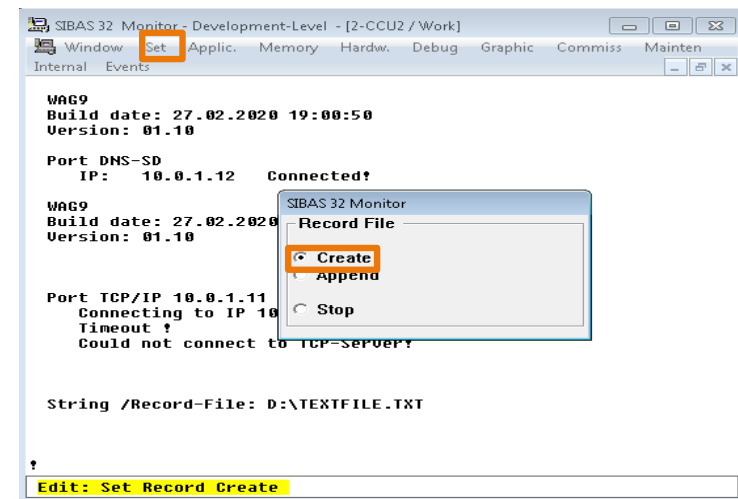
5. Set- Record (create/append)

6. Enter

Then all data and parameters you are opening after this will get recorded in text file

And after recording desired data you can stop recording

7. Set-Record-stop-enter



SIBAS Monitor Tool – Statistics_D

Diagnostic Data

1. Event -> Statistics_D -> Enter

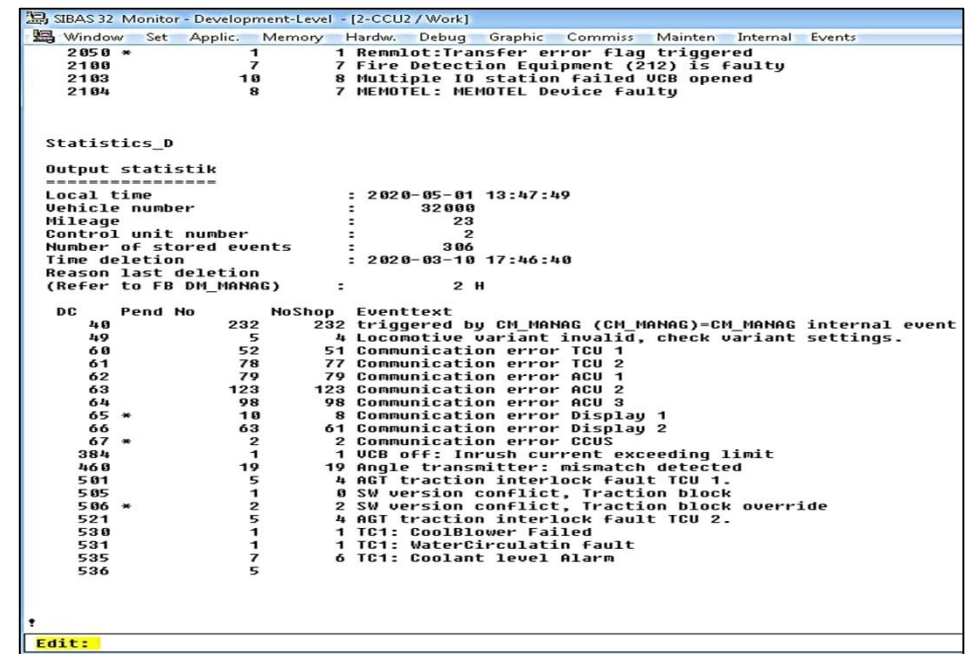
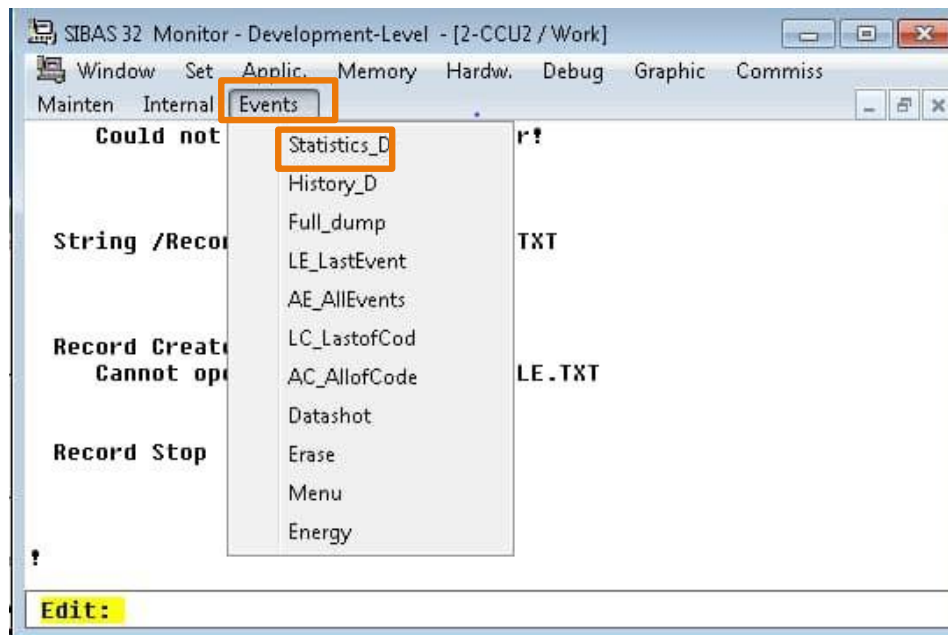


Figure 16 Downloading of Statistic Data

SIBAS Monitor Tool - History_D



Diagnostic Data

Event -> History_D -> Enter

SIBAS 32 Monitor - Development-Level - [2-CC02 / work]

Window

Set

Applic.

Memory

Hardw.

Debug

Graphic

Commiss

Mainten

Internal

Events

2020-04-17

23:14:26.5

12005

0

1950

Main transformer: Oil circuit 2 invalid temperature

2020-04-17

23:14:26.4

12004

I

61

Communication error TCU 2

2020-04-17

16:01:01.0

12002

I

1950

Main transformer: Oil circuit 2 invalid temperature

History_D

Output history

=====

Local time

:

2020-05-01

13:49:53

Vehicle number

:

32000

Mileage

:

23

Control unit number

:

2

Number of stored events

:

306

Time deletion

:

2020-03-10

17:46:40

Reason last deletion

:

(Refer to FB DM_MANAG)

:

2

H

Date

Time

DSNr

I/O

DC

Eventtext

2020-05-01

02:46:42.0

12225

I

1950

Main transformer: Oil circuit 2 invalid temperature

2020-05-01

02:46:34.7

12224

0

61

Communication error TCU 2

2020-05-01

02:46:33.8

12222

0

1950

Main transformer: Oil circuit 2 invalid temperature

2020-05-01

02:46:33.7

12221

I

61

Communication error TCU 2

2020-04-30

14:25:58.4

12219

I

1950

Main transformer: Oil circuit 2 invalid temperature

2020-04-30

14:25:54.4

12218

0

628

AUX2 Filter capacitor monitoring is not active

2020-04-30

14:25:54.4

12217

0

627

AUX1 Filter capacitor monitoring is not active

2020-04-30

14:25:51.1

12214

0

61

Communication error TCU 2

2020-04-30

14:25:50.2

12212

0

1950

Main transformer: Oil circuit 2 invalid temperature

2020-04-30

14:25:50.1

12210

I

61

Communication error TCU 2

2020-04-29

11:36:42.9

12198

I

628

AUX2 Filter capacitor monitoring is not active

2020-04-29

11:36:42.9

12197

I

627

AUX1 Filter capacitor monitoring is not active

2020-04-28

02:04:19.4

12175

I

1950

Main transformer: Oil circuit 2 invalid temperature

2020-04-28

02:04:15.6

12174

0

628

AUX2 Filter capacitor monitoring is not active

2020-04-28

02:04:15.6

12173

0

627

AUX1 Filter capacitor monitoring is not active

2020-04-28

02:04:12.1

12170

0

61

Communication error TCU 2

2020-04-28

02:04:11.2

12168

0

1950

Main transformer: Oil circuit 2 invalid temperature

2020-04-28

02:04:11.1

12166

I

61

Communication error TCU 2

2020-04-22

11:18:06.2

12102

I

628

AUX2 Filter capacitor monitoring is not active

2020-04-22

11:18:06.2

12101

I

627

AUX1 Filter capacitor monitoring is not active

2020-04-21

19:21:30.0

12065

I

1950

Main transformer: Oil circuit 2 invalid temperature

2020-04-21

19:21:26.1

12064

0

628

AUX2 Filter capacitor monitoring is not active

2020-04-21

19:21:26.0

12062

0

627

AUX1 Filter capacitor monitoring is not active

2020-04-21

19:21:22.7

12060

0

61

Communication error TCU 2

?

Edit:

Figure 17 Downloading of History Data

SIBAS Monitor Tool - Full Dump

Diagnostic Data

2. Event -> Full Dump -> Enter

```

SIBAS 32 Monitor - Development-Level - [2-CCU2 / Work]
Window Set Applic. Memory Hardw. Debug Graphic Commiss Mainten Internal Events

Full_dump
Local time           : 2020-05-01 13:51:42
Vehicle number       : 32000
Mileage              : 23
Control unit number  : 2
Number of stored events : 306
Time deletion        : 2020-03-10 17:46:40
Reason last deletion (Refer to FB_DM_MANAG) : 2 H

DC   Pend No   NoShop Eventtext
10   24        20  Logging SW-Versions and operating hours
40   232       232 triggered by CM_MANAG (CM_MANAG)=CM_MANAG internal event
41   382       380 triggered by TM_MANAG (TM_MANAG)=TM_MANAG internal event
49   5         4  Locomotive variant invalid, check variant settings.
60   52        51 Communication error TCU 1
61   78        77 Communication error TCU 2
62   79        79 Communication error ACU 1
63   123       123 Communication error ACU 2
64   98        98 Communication error ACU 3
65   10        8  Communication error Display 1
66   63        61 Communication error Display 2
67   2         2  Communication error CCUS
384  1         1  UCB off: Inrush current exceeding limit
399  9         8  Energy meter: Energy measurements stopped
460  19        19 Angle transmitter: mismatch detected
501  5         4  AGT traction interlock fault TCU 1.
505  1         0  SW version conflict, Traction block
506  2         2  SW version conflict, Traction block override
521  5         4  AGT traction interlock fault TCU 2.
530  1         1  TC1: CoolBlower Failed
531  1         1  TC1: WaterCirculatin fault
535  7         6  TC1: Coolant level Alarm
536  5         4  TC1: Temp sensor Faulty
537  1         1  TC2: CoolBlower Failed
538  1         1  TC2: WaterCirculatin fault
543  5         4  TC2: Temp sensor Faulty
570  10        10 Reserved for AUX_INT
600  1         1  total failure AUX inverters
621  1         1  Failure voltage transformer AUX1 detected (BRAM)

?
Edit:
    
```

Figure 18 Downloading of Full Dump Data

7 Annextures – II

Status: released TRIPATH_ASH 26.07.2023
DCC: ADC045 Obj.Desgn. Prod: TS_RGC07

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F.3225

IN-WAG9-IGBT-drive components

WAG9 - Extraction procedure diagnostic data

Extraction and Viewer

Owner: 33	Responsible unit: RC-IN MO SER RS1	Doc. kind: Concept		Reference designation: -TS_SCB&AEC025		Siemens Mobility GmbH	
Prepared:	Ashok Tripathy	WAG9 - Reading diagnostic data		Doc.-state: checkout			
Checked:	---						
Approved:	xxxxxxx	File name: Reading_diagnostic_data_Remmlot.docx		Index: D	Date: 2023-07-22	Lang.: EN	Pages: 1/23
Customer: Ident-No.:		Date:	Approved:	Issue:		Date:	

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0 Introduction

0.1 Document Data

Project	Doors version
WAG9	

0.2 Referenced documents

Reference	Title	Source	Document number	Version

0.3 List of changes

Version	Author	Reason
A	Ashok	Created

0.4 Open items

Section	Responsible	Description	Due date

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1 Field of Application

During operation of the vehicles, diagnostic messages are recorded in memories of the various control units.

During operation, the diagnostic messages can be read out of the control units via http and sent as a file to the land side.

This document describes the structure of a file for transmitting diagnostic messages, Diagnosis Server functionality and Event Recorder functionality.

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2 Terms and Abbreviations

The following terms and abbreviations will be used in this document:

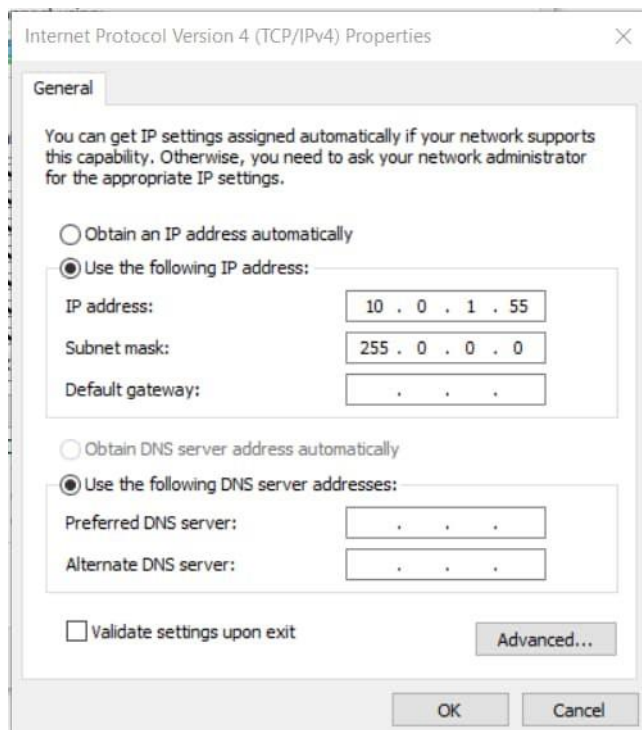
Term	Explanation

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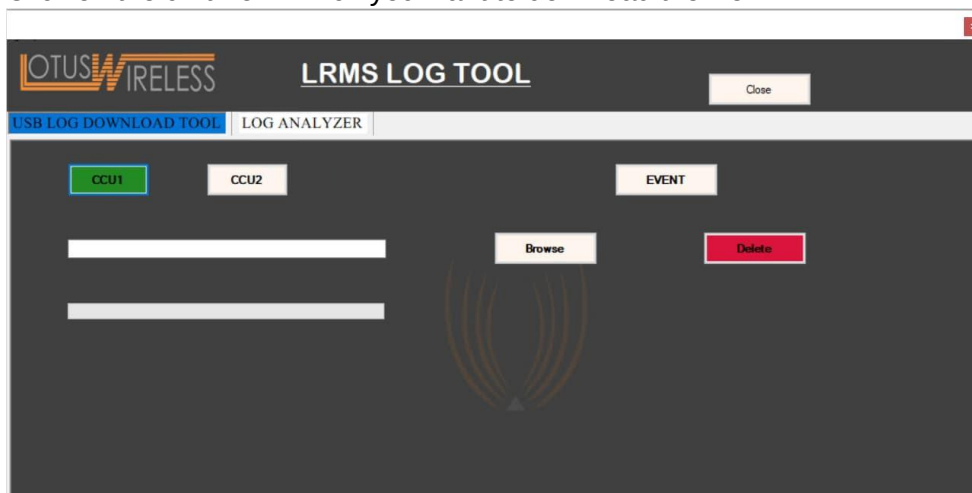
3 USB EXPERT LOG DOWNLOAD:

3.1 Download

- I. Set IP address of the Laptop to “10.0.1.55” or in the same range.

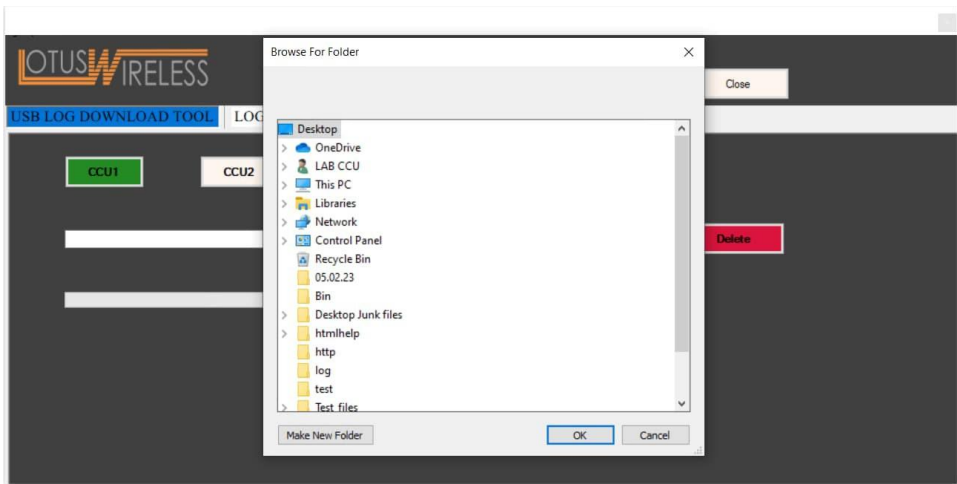


- II. Ping from laptop to LRMS device through CMD prompt with **ping -t 10.0.1.50**. check for response from LRMS.
- III. Open USB LOG DOWNLOAD application.
- IV. Click on the unit from which you want to download the file.



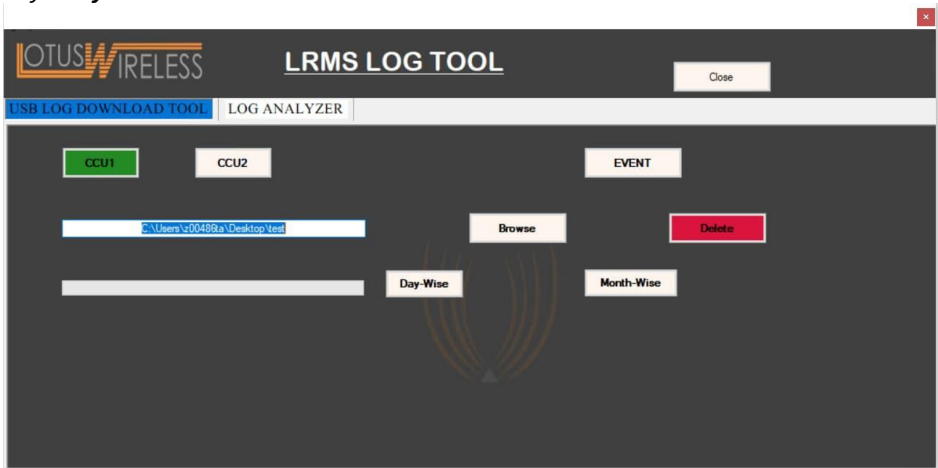
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V. Click on **Browse** and select the destination folder.

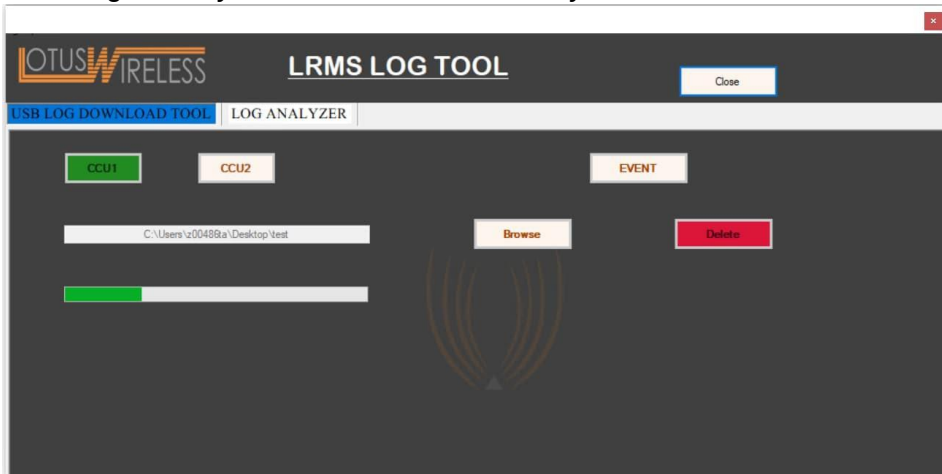


VI. click on **Download** button. It will show 2 options **Day-wise** and **Month-wise**.

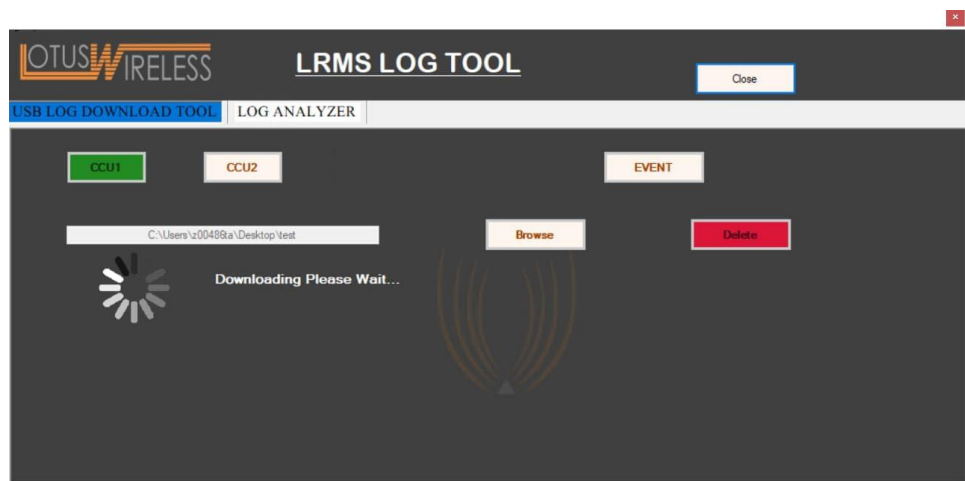
*Note: The day **Day-wise** and **Month-wise** will only appear for CCU and TCU section for EVENT it always **Day-wise***



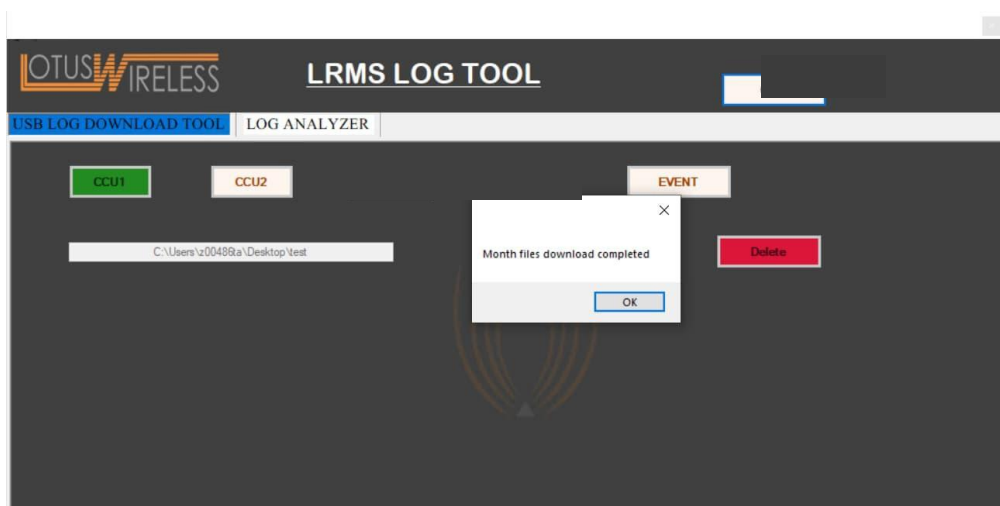
VII. Selecting the Day-wise will download the day wise data into PC.



VIII. Selecting the Month-wise will download the day wise data into PC.

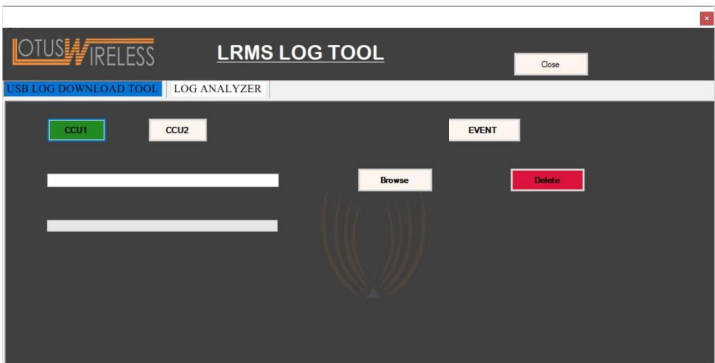


IX. Files will be downloaded to the Destination folder.

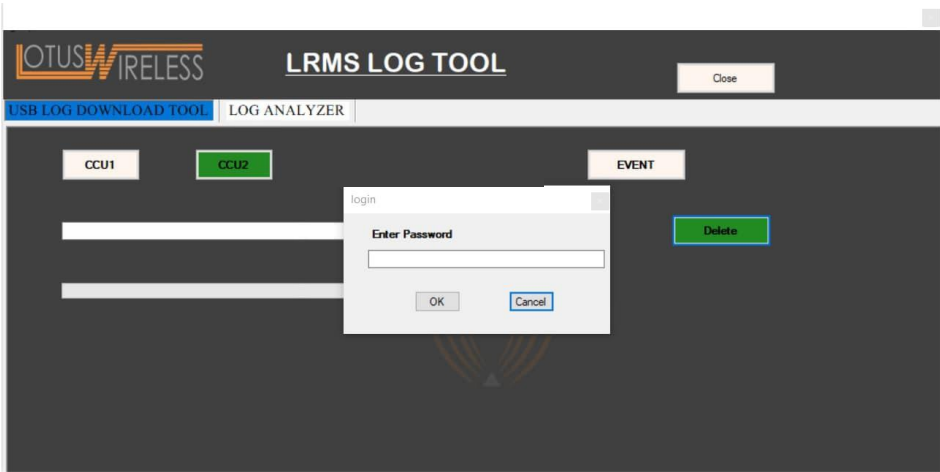


3.2 Delete

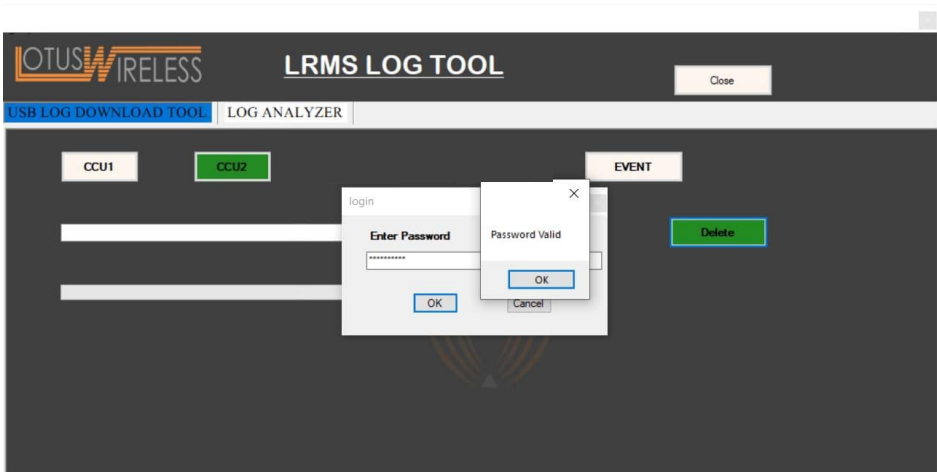
- I. Click on the unit from which you want to delete the file.



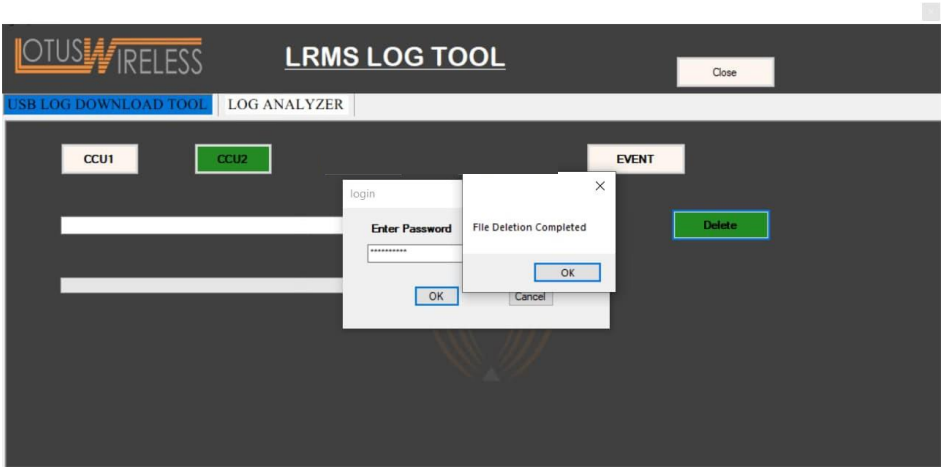
- II. Selecting **Delete** tab will pop-up the password screen.



- III. Enter the password and select **OK** (Password- **Siemens123**).



- IV. On successful authentication it will delete all the data of selected control unit except current day data.

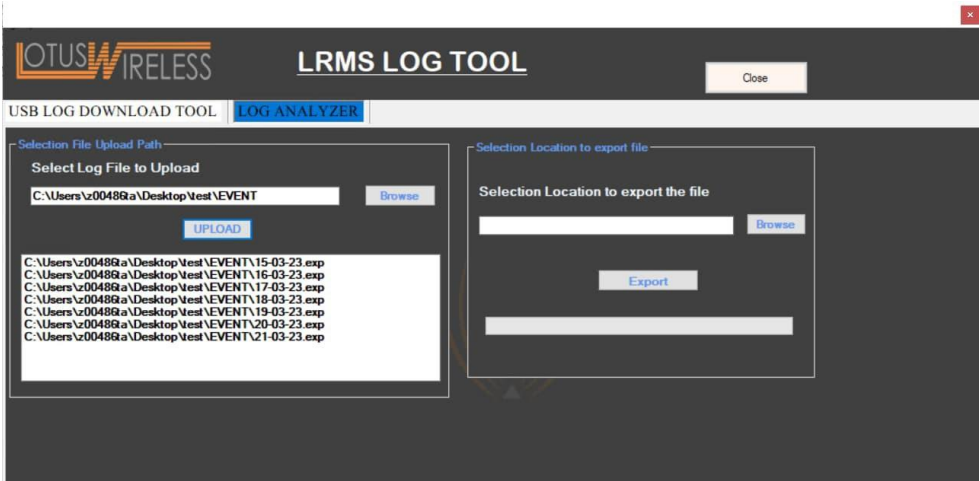


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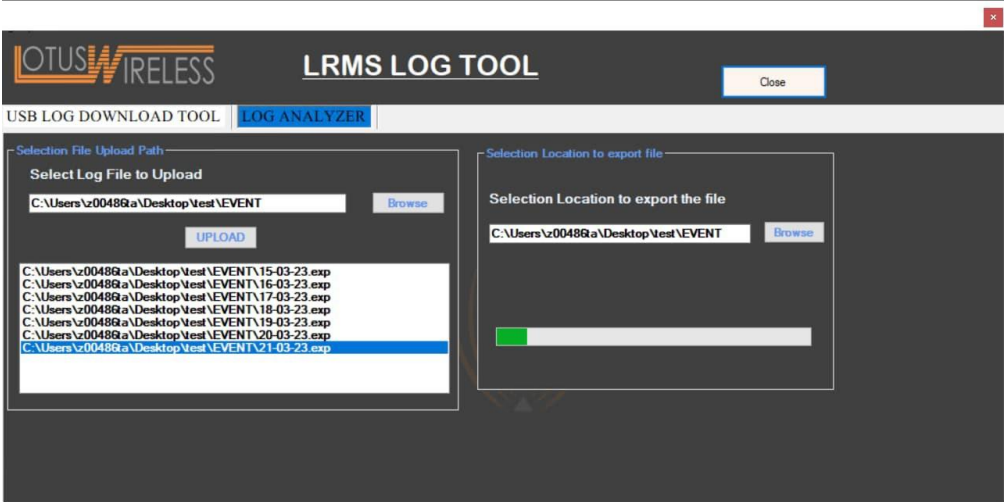
3.3 LOG ANALYSER

This feature will convert the EVENT data into readable format. This only applicable to all files downloaded in **EVENT** folder.

- 1. Select the **LOG ANALYSER** tab and clicking the **Browse** and the **Upload** will upload all the files from EVENT folder.



- 2. Select the file to convert then select the **Browse** option for path selection.



- 3. Selecting **Export** will convert into readable CSV file.

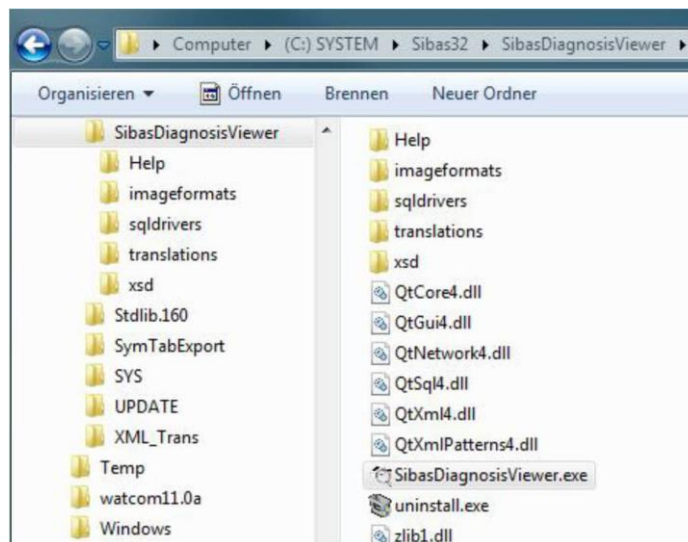
4 EXPERT DATA VIEWER

Expert data can be viewed through 2 tools:

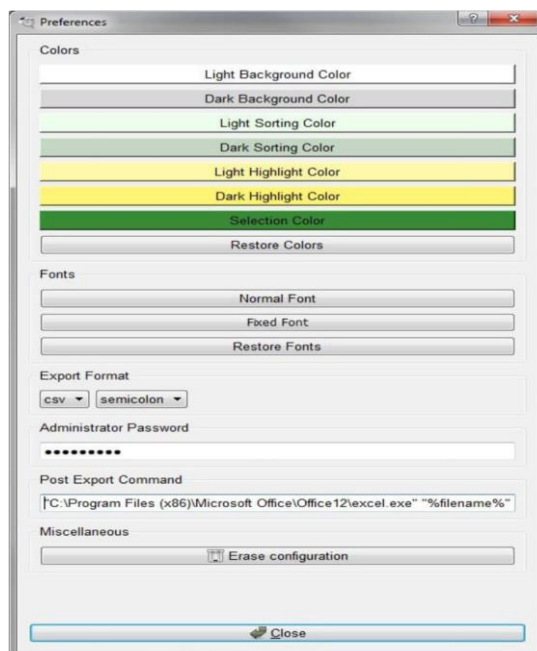
- i. Sibas Diagnostics Viewer
- ii. Sibas Target Monitor

4.1 Sibas Diagnosis Viewer:

- I. Execute the file "SibasDiagnosisViewer.exe" within the installation directory, to start the Sibas Diagnosis Viewer.

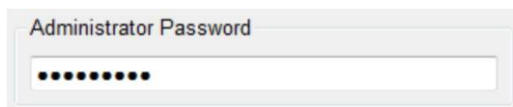


- II. Select the command *Edit | Preferences* ([Ctrl]+[N]) to adjust preferences according to colors, fonts, export data settings and Troubleshooting Guide settings.

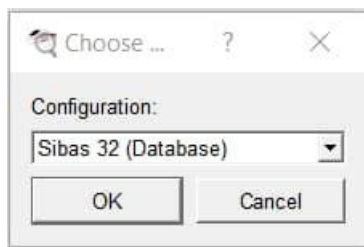


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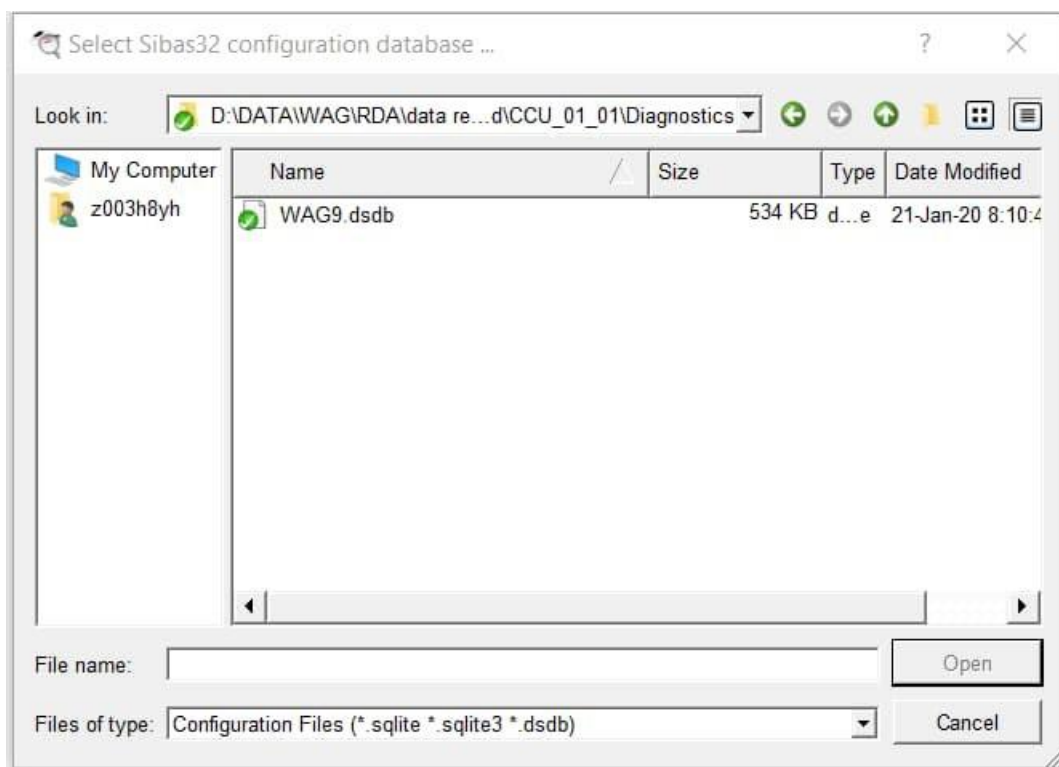
- III. Enter **Administrator Password** - The password by default is empty. It is necessary, to show Siemens internal Data. If the correct password was typed, all views will be updated immediately. After restart of the application the Password will be remembered.



- IV. Select *File | Configuration* or press **[CTRL]+[T]** to select the desired configuration directory or database.

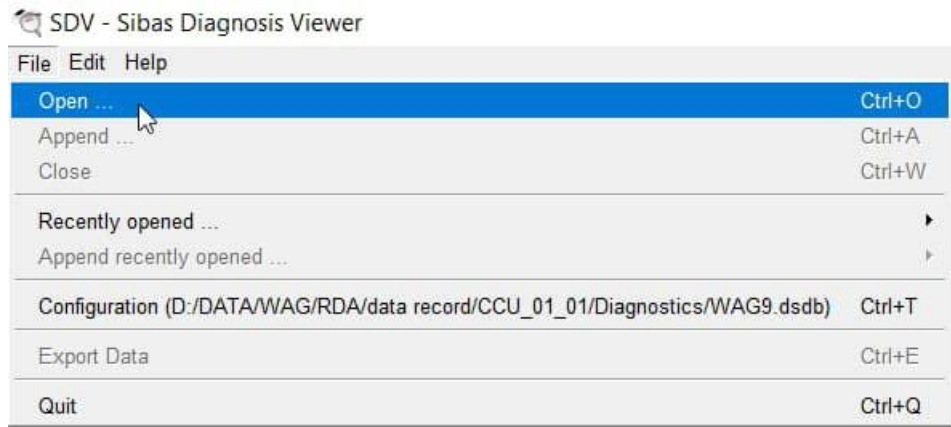


- V. Select **Sibas 32(Database)** from drop down list and then OK.
- VI. Select diagnostic data base file for the project (Ex: WAG9.dsdb) then select Open.

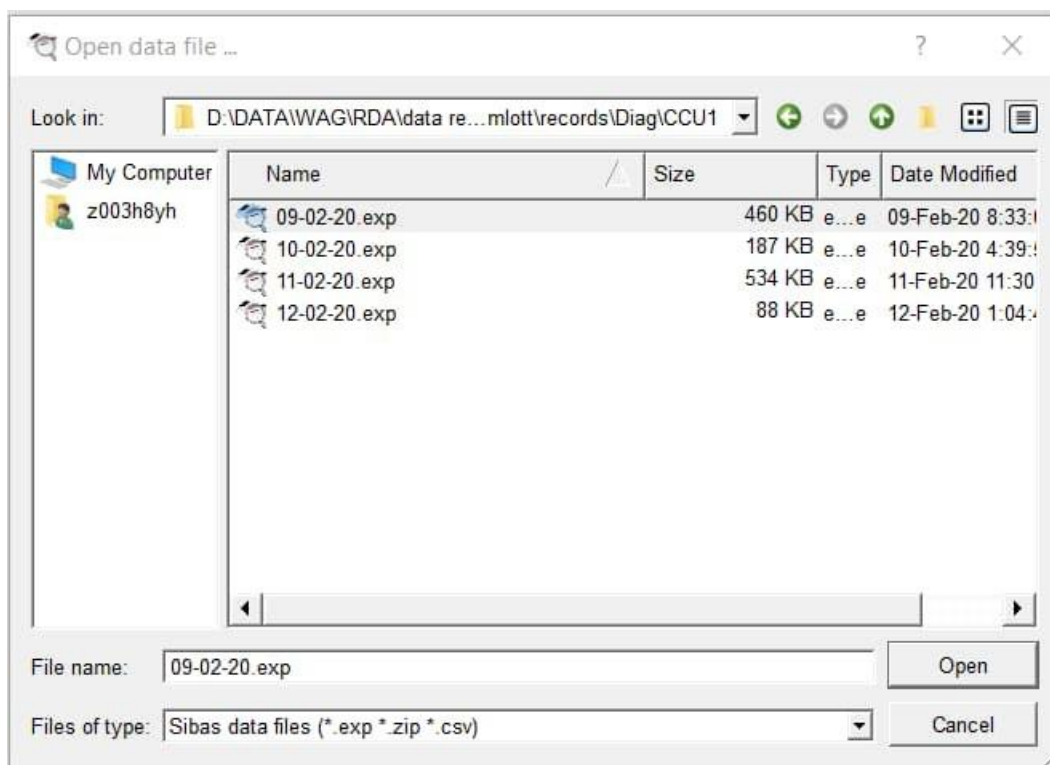


Reference designation: -TS_SCB&AEC025	WAG9 - Reading diagnostic data	Index:	Date: 2023-07-22	Lang.: EN	Pages: 13/23

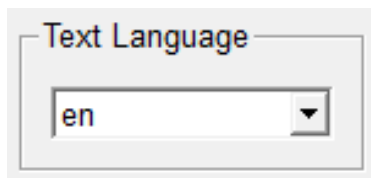
- VII. Use the command *File | Open* to open the file(s) you want to show with the SibasDiagnosis Viewer.



- VIII. Select the downloaded expert file.

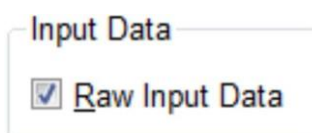


- IX. The Language of the displayed event texts can be adjusted by selecting the desired Language from the pull-down menu *Text Language*



- X. The Sibas Diagnosis Viewer (checkbox *Raw Input Data* is not selected) does not display the dataset of the occurrence of the message any longer as soon as the message is gone.

By selecting the check-box *Raw Input Data*, the data set of the occurrence will be displayed as well.



- XI. Double click or left mouse click on “*Event environment*” opens the event environment view. The requirement is, the correct configuration data is loaded.

Header | Environment

	name	value		description	name	value	unit
1	Type	3		1	\$43A3V00 [km/h] CDS: v-Act	\$43A3V00	1.59 km/h
2	CarNo	90002		2	\$43MC001 [km] MC: last known mileage	\$43MC001	71 km
3	Component	CCU 1 [1]		3	\$9921F10 [kN] env: TE/BE act loco	DIAG_ENV:ENV0_003.OUT	0.00 kN
4	SubComponent	DM [1]		4	\$2801006 [bar] Brake Pipe pressure Disp	DIAG_ENV:ENV0_004.OUT	0.36 bar
5	MemVersionNu...	0		5	\$2805001 [] Emergency Brake active	\$2805001	true
6	MemReleaseNu...	1		6	\$2804006 [] Pneu brake applied BG1	\$2804006	false
7	SwVersionNum...	1		7	\$2804007 [] Pneu brake applied BG2	\$2804007	false
8	SwReleaseNu...	1		8	\$0901000 [] Vehicle occupied	\$0901000	true
9	CodeID	1439		9	\$0901001 [] Cab 1 active	\$0901001	false

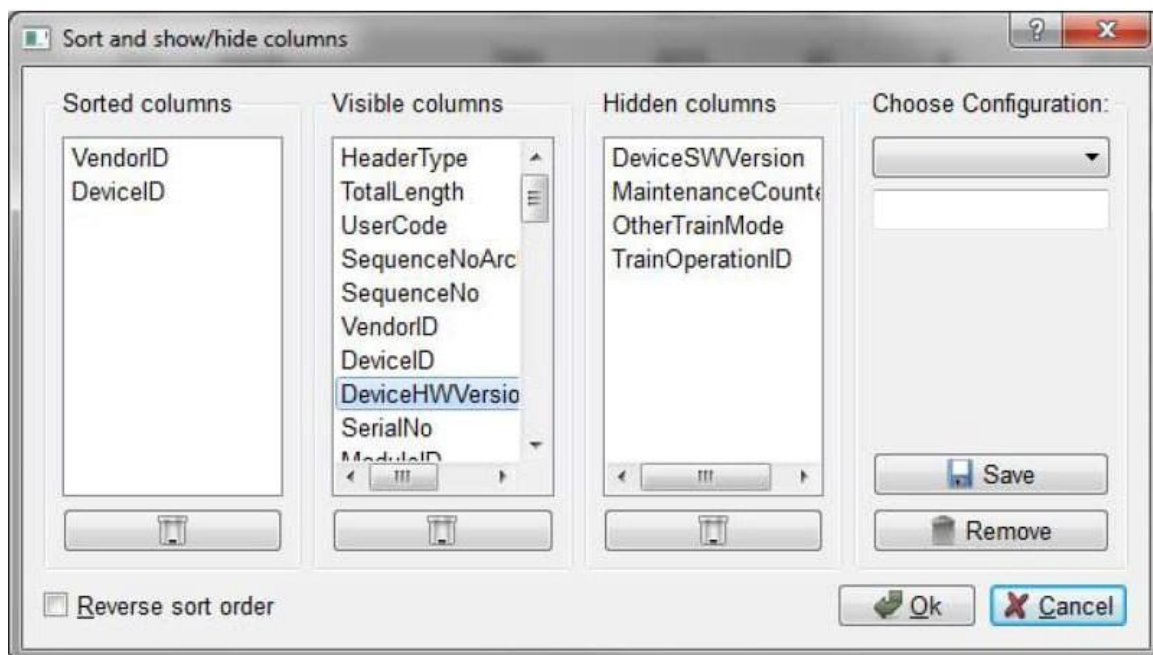
- XII. Manage columns

Left mouse click on Manage columns ... opens a window which visualizes the design of the active view. Mark one signal and drag it from the column **VISIBLE COLUMNS** to the column **HIDDEN COLUMNS** if you want to hide this signal. Mark one signal and drag it from the column **HIDDEN COLUMNS** to the column **VISIBLE COLUMNS** to visualize the signal. The position, where the signal is to be dropped, is shown by a line. The order of the data sets is done according to the order of the signals within the column **SORTED COLUMNS**.

Press the recycler button below one column to delete the complete choice of the column above the button.

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Column configurations can be saved by typing a name in the EDIT BOX and press the save button. To load a configuration, choose it in the DROP-DOWN- BOX. A chosen configuration can be removed by pressing the remove button.



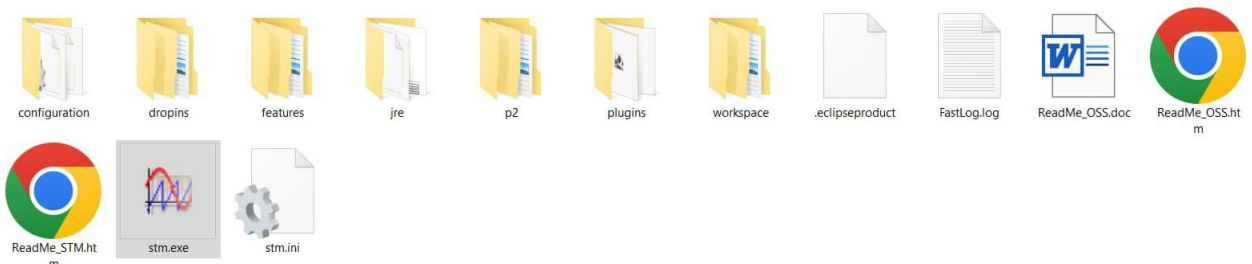
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4.2 Sibas Target Monitor

I. Unzip the folder , there will be 2 directory Downloads and STM Tool.

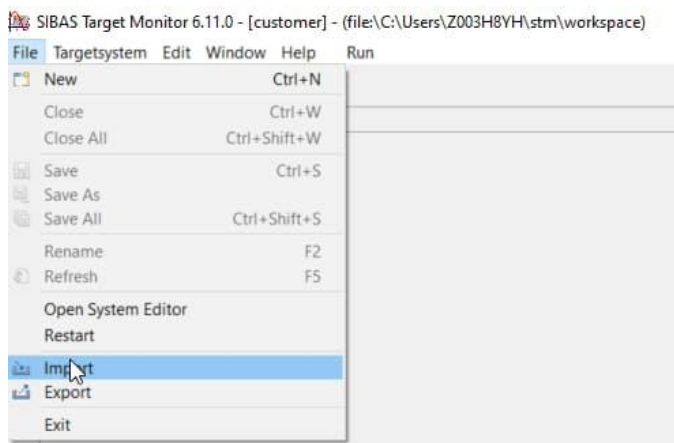
 Downloads	25-May-23 18:14	File folder
 STM Tool	25-May-23 18:18	File folder

II. 2. Go to STM tools and open the stm.exe

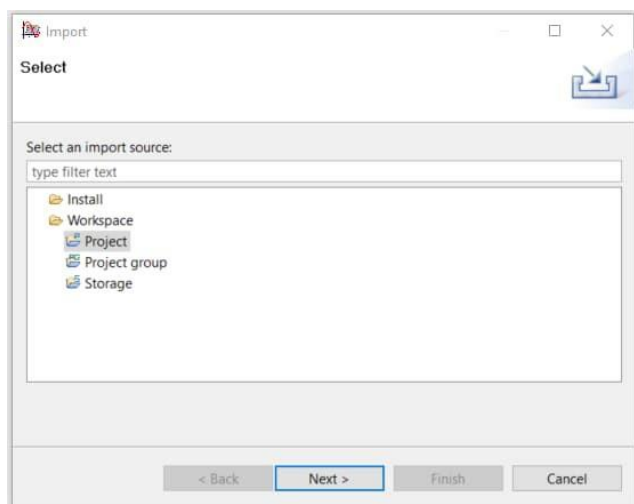


III. One time configuration to be done. Follow process below.

a) Select **File** → **Import**

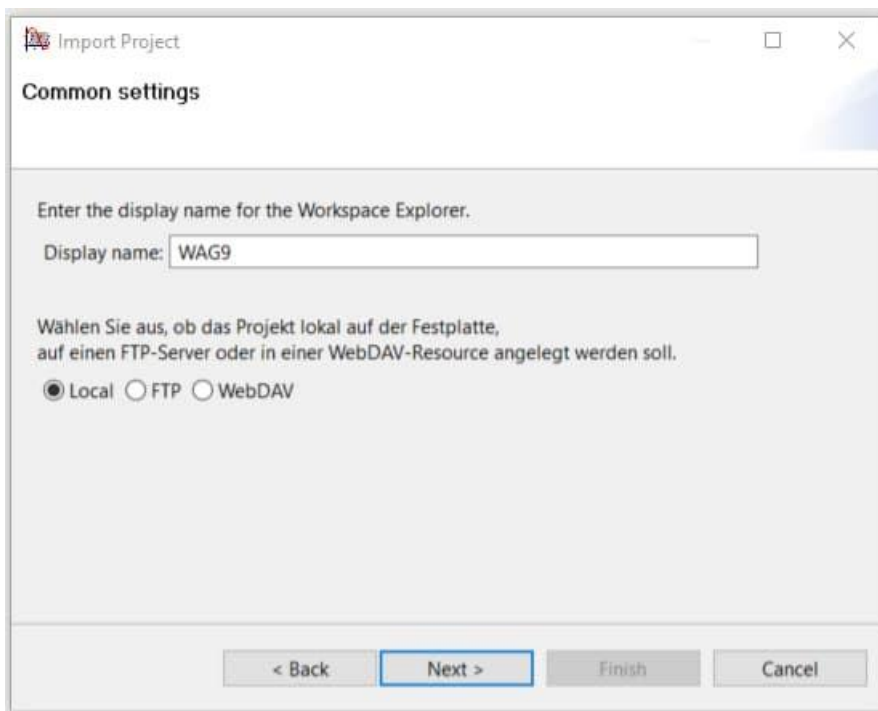


b) Select **Project** then **Next**.



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c) Provide the project name as **WAG9** then select **Next**.



Import Project

Common settings

Enter the display name for the Workspace Explorer.

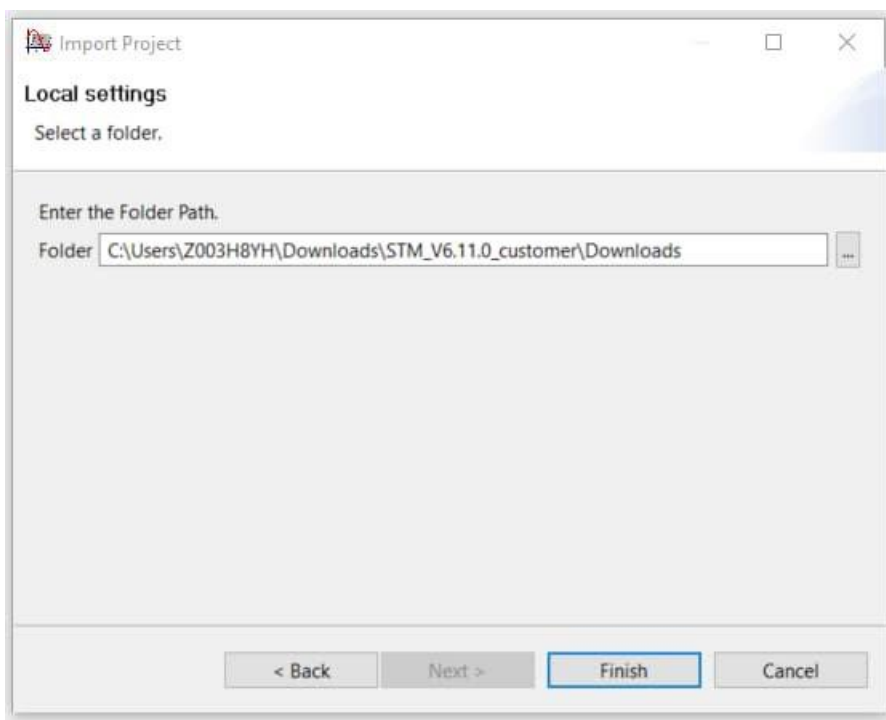
Display name:

Wählen Sie aus, ob das Projekt lokal auf der Festplatte, auf einen FTP-Server oder in einer WebDAV-Ressource angelegt werden soll.

☒ Local ☐ FTP ☐ WebDAV

< Back Next > Finish Cancel

d) Input directory of Downloads (mentioned in step 1) then select **Finish**.



Import Project

Local settings

Select a folder.

Enter the Folder Path.

Folder

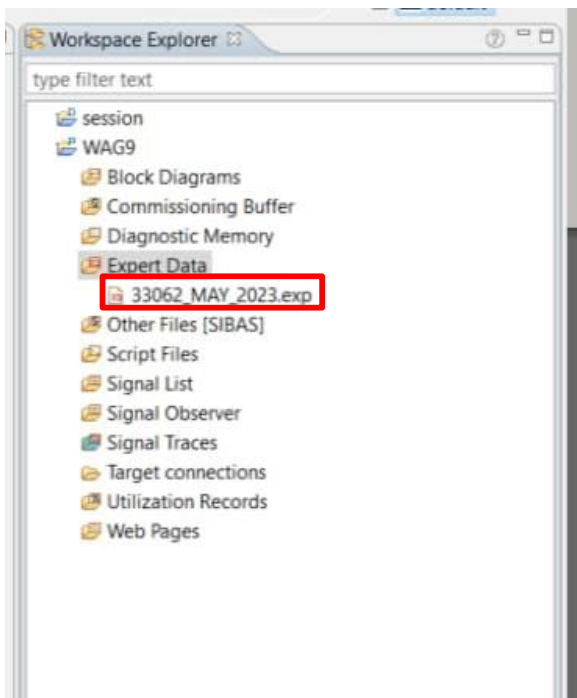
< Back Next > Finish Cancel

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IV. Place the downloaded .exp file into the downloads folder.

Name	Date modified	Type	Size
 33062_MAY_2023.exp	14-May-23 11:46	EXP File	1,272 KB
 WAG9.dsdb	02-May-23 09:57	DSDB File	549 KB

V. Go to the right window click on **Export data** and select the downloaded .exp file.

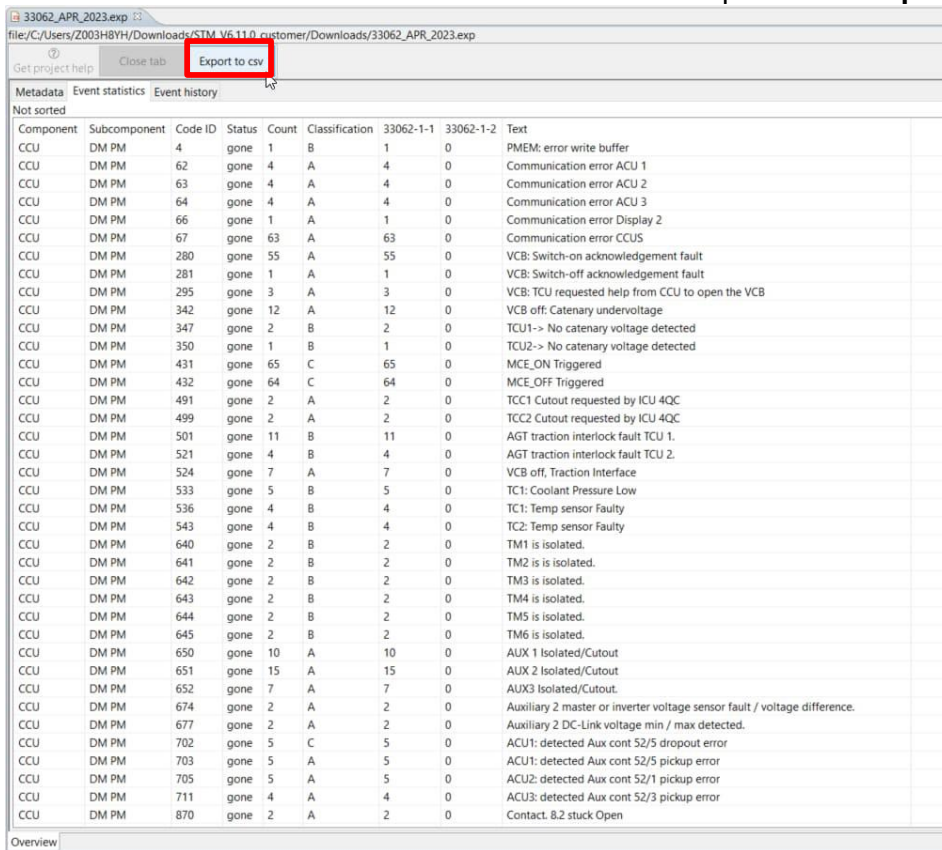


VI. It will open the data in readable format. Select **Event Statistics**.

33062_APR_2023.exp	
file://C:/Users/Z003H8YH/Downloads/STM_V6.11.0_customer/Downloads/33062_APR_2023.exp	
Get project help Close tab Export to csv	
Metadata	Event statistics Event history
Project	WAG9 (WAG9)
Car number	33062
Component	CCU 1 (1)
Subcomponents	DM (1), PM (2)
Version	0.1[Main development branch (trunk)](2.1[Main development branch (trunk)])
Begin (UTC)	
End (UTC)	2023-04-30T23:13:08+0000
Total number of records	7064
- Number of version data hunks	1
- Number of global data hunks	1
- Number of events	7062
Source	C:/Users/Z003H8YH/Downloads/STM_V6.11.0_customer/Downloads/33062_APR_2023.exp
Metadata source	C:/Users/Z003H8YH/Downloads/STM_V6.11.0_customer/Downloads/WAG9.dsdb

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VII. It will show the Event statistics with count. To export select **Export to CSV**.



33062_APR_2023.exp

file/C:/Users/2003H8VH/Downloads/STM_V6.11.0_customer/Downloads/33062_APR_2023.exp

Get project help Close tab **Export to csv**

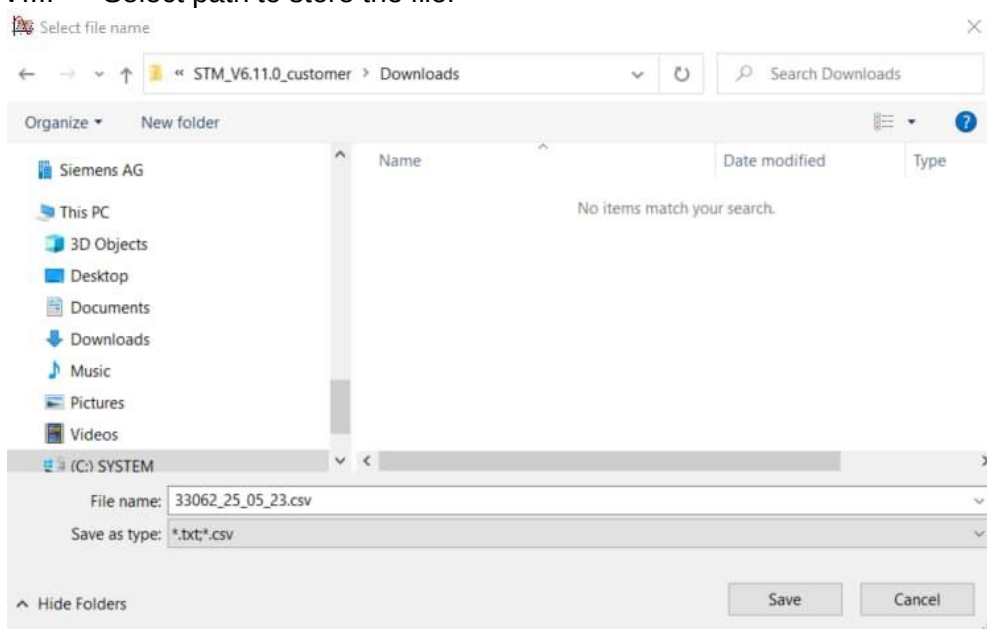
Metadata Event statistics Event history

Not sorted

Component	Subcomponent	Code ID	Status	Count	Classification	33062-1-1	33062-1-2	Text
CCU	DM PM	4	gone	1	B	1	0	PMEM: error write buffer
CCU	DM PM	62	gone	4	A	4	0	Communication error ACU 1
CCU	DM PM	63	gone	4	A	4	0	Communication error ACU 2
CCU	DM PM	64	gone	4	A	4	0	Communication error ACU 3
CCU	DM PM	66	gone	1	A	1	0	Communication error Display 2
CCU	DM PM	67	gone	63	A	63	0	Communication error CCUS
CCU	DM PM	280	gone	55	A	55	0	VCB: Switch-on acknowledgement fault
CCU	DM PM	281	gone	1	A	1	0	VCB: Switch-off acknowledgement fault
CCU	DM PM	295	gone	3	A	3	0	VCB: TCU requested help from CCU to open the VCB
CCU	DM PM	342	gone	12	A	12	0	VCB off: Catenary undervoltage
CCU	DM PM	347	gone	2	B	2	0	TCU1-> No catenary voltage detected
CCU	DM PM	350	gone	1	B	1	0	TCU2-> No catenary voltage detected
CCU	DM PM	431	gone	65	C	65	0	MCE_ON Triggered
CCU	DM PM	432	gone	64	C	64	0	MCE_OFF Triggered
CCU	DM PM	491	gone	2	A	2	0	TCC1 Cutout requested by ICU 4QC
CCU	DM PM	499	gone	2	A	2	0	TCC2 Cutout requested by ICU 4QC
CCU	DM PM	501	gone	11	B	11	0	AGT traction interlock fault TCU 1.
CCU	DM PM	521	gone	4	B	4	0	AGT traction interlock fault TCU 2.
CCU	DM PM	524	gone	7	A	7	0	VCB off, Traction Interface
CCU	DM PM	533	gone	5	B	5	0	TC1: Coolant Pressure Low
CCU	DM PM	536	gone	4	B	4	0	TC1: Temp sensor Faulty
CCU	DM PM	543	gone	4	B	4	0	TC2: Temp sensor Faulty
CCU	DM PM	640	gone	2	B	2	0	TM1 is isolated.
CCU	DM PM	641	gone	2	B	2	0	TM2 is isolated.
CCU	DM PM	642	gone	2	B	2	0	TM3 is isolated.
CCU	DM PM	643	gone	2	B	2	0	TM4 is isolated.
CCU	DM PM	644	gone	2	B	2	0	TM5 is isolated.
CCU	DM PM	645	gone	2	B	2	0	TM6 is isolated.
CCU	DM PM	650	gone	10	A	10	0	AUX 1 Isolated/Cutout
CCU	DM PM	651	gone	15	A	15	0	AUX 2 Isolated/Cutout
CCU	DM PM	652	gone	7	A	7	0	AUX3 Isolated/Cutout.
CCU	DM PM	674	gone	2	A	2	0	Auxiliary 2 master or inverter voltage sensor fault / voltage difference.
CCU	DM PM	677	gone	2	A	2	0	Auxiliary 2 DC-Link voltage min / max detected.
CCU	DM PM	702	gone	5	C	5	0	ACU1: detected Aux cont 52/5 dropout error
CCU	DM PM	703	gone	5	A	5	0	ACU1: detected Aux cont 52/5 pickup error
CCU	DM PM	705	gone	5	A	5	0	ACU2: detected Aux cont 52/1 pickup error
CCU	DM PM	711	gone	4	A	4	0	ACU3: detected Aux cont 52/3 pickup error
CCU	DM PM	870	gone	2	A	2	0	Contact: 8.2 stuck Open

Overview

VIII. Select path to store the file.

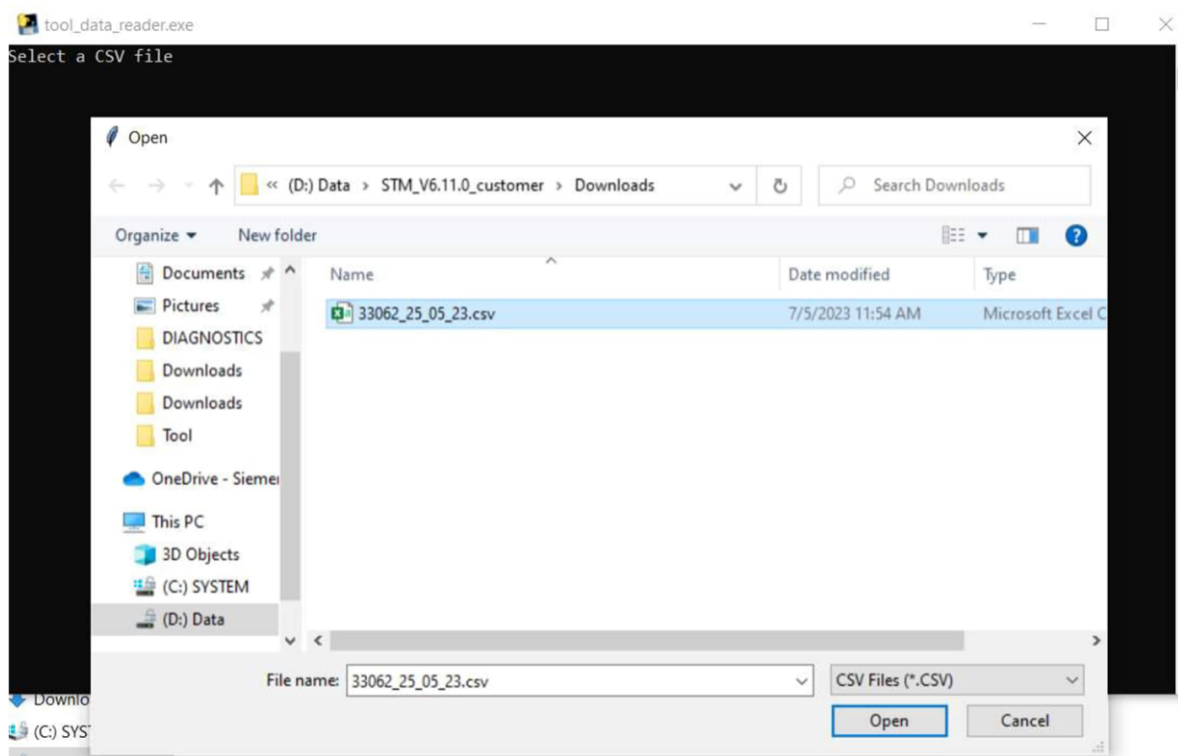


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- V. Run the tool_data_recorder.exe file in the original unzipped folder of the STM, the tool_data_recorder folder should be available in the following path:

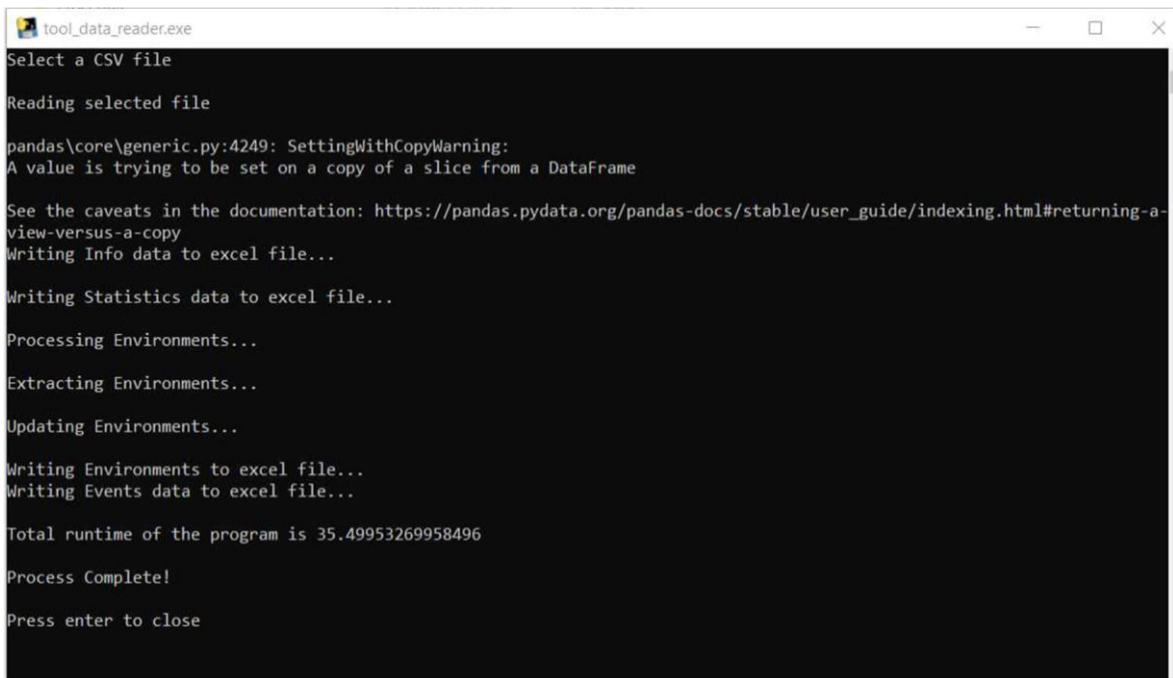
Name	Date modified	Type	Size
Downloads	7/5/2023 11:53 AM	File folder	
Procedure	5/25/2023 7:07 PM	File folder	
STM Tool	7/5/2023 11:51 AM	File folder	
tool_data_reader	7/4/2023 1:17 PM	File folder	
tool_data_reader.exe	6/29/2023 3:17 PM	Shortcut	1 KB

A command prompt opens automatically and opens a dialog box to select a CSV file. Please import the CSV file from step 8 here and click on 'Open':



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- VI. The exe processes the CSV file and processes it. Once the processing is completed, you will be able to see the process completed message as follows:



```

tool_data_reader.exe
Select a CSV file
Reading selected file
pandas\core\generic.py:4249: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame
See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
Writing Info data to excel file...
Writing Statistics data to excel file...
Processing Environments...
Extracting Environments...
Updating Environments...
Writing Environments to excel file...
Writing Events data to excel file...
Total runtime of the program is 35.49953269958496
Process Complete!
Press enter to close
  
```

- VII. The final exported file would be created inside the downloads folder:

Name	Date modified	Type	Size
 33062_25_05_23_EXPORT.xlsx	7/5/2023 12:31 PM	Microsoft Excel W...	457 KB
 39235_APR_2023.exp	6/20/2023 11:52 AM	EXP File	6,523 KB
 WAG9.dsdb	5/2/2023 9:57 AM	DSDB File	549 KB

- VIII. Example of the output file is as follows:

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AutoSave 33062_25_05_23_EXPORT.xlsx Search Burman, Kasturi (PC-IN SMO RS EN 5)

File Home Insert Page Layout Formulas Data Review View Automate Help

Clipboard Font Alignment Sensitivity Number Styles Cells Editing Analysis

A1 Car number

C1 - Restricted C0 - Unrestricted C1 - Restricted C2 - Confidential C3 - Strictly Confidential

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Car number	Component	Component	Code ID	Event Count	Count	Status	Occurred	Gone	Mode	Text	Classification	Link to Environment			
2	0	CCU 2 (2)	DM (1)	67	3	1	gone	2009-06-14 06:10:50	2009-06-14 06:16:26	normal	Communic A		ENVIRONMENT B2091			
3	0	CCU 2 (2)	DM (1)	2100	4	1	gone	2009-06-14 06:10:50	2023-03-28 16:12:55	normal	Fire Detect: B		ENVIRONMENT B2148			
4	0	CCU 2 (2)	DM (1)	2600	5	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB Tractio B		ENVIRONMENT B19680			
5	0	CCU 2 (2)	DM (1)	2602	6	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB TM sca B		ENVIRONMENT B13827			
6	0	CCU 2 (2)	DM (1)	2604	7	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB MR sca B		ENVIRONMENT B13858			
7	0	CCU 2 (2)	DM (1)	2606	8	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB MR blo B		ENVIRONMENT B13156			
8	0	CCU 2 (2)	DM (1)	2608	9	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB Main c B		ENVIRONMENT B14529			
9	0	CCU 2 (2)	DM (1)	2610	10	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB Cooling B		ENVIRONMENT B12512			
10	0	CCU 2 (2)	DM (1)	2612	11	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB Oil pump B		ENVIRONMENT B12543			
11	0	CCU 2 (2)	DM (1)	2614	12	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB Coolan B		ENVIRONMENT B12574			
12	0	CCU 2 (2)	DM (1)	2616	13	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB 127.9/1 B		ENVIRONMENT B2219			
13	0	CCU 2 (2)	DM (1)	2617	14	1	gone	2009-06-14 06:10:50	2023-02-15 15:27:30	normal	CB 127.9/2 B		ENVIRONMENT B2250			
14	0	CCU 2 (2)	DM (1)	4166	15	1	active	2009-06-14 06:10:50			normal	CM: Air br A	ENVIRONMENT B2281			
15	0	CCU 2 (2)	DM (1)	4361	16	1	gone	2009-06-14 06:10:50	2009-06-14 06:10:54	normal	CM: TCU 1 B		ENVIRONMENT B2338			
16	0	CCU 2 (2)	DM (1)	4362	17	1	gone	2009-06-14 06:10:50	2009-06-14 06:10:54	normal	CM: TCU 2 B		ENVIRONMENT B2395			
17	0	CCU 2 (2)	DM (1)	4355	18	1	gone	2009-06-14 06:10:51	2009-06-14 06:10:54	normal	CM: Pleasu B		ENVIRONMENT B2452			
18	0	CCU 2 (2)	DM (1)	4356	19	1	gone	2009-06-14 06:10:51	2009-06-14 06:10:54	normal	CM: Pleasu B		ENVIRONMENT B2509			
19	0	CCU 2 (2)	DM (1)	430	25	1	gone	2009-06-14 06:19:13	2023-02-15 15:27:30	normal	Safety Rel A		ENVIRONMENT B12605			
20	0	CCU 2 (2)	DM (1)	432	26	1	gone	2009-06-14 06:20:43	2023-02-15 15:27:30	normal	MCE OFF C		ENVIRONMENT B2566			
21	39235	CCU 2 (2)	DM (1)	67	30	2	gone	2023-02-15 15:27:30	2023-03-28 16:13:29	normal	Communic A		ENVIRONMENT B2580			
22	39235	CCU 2 (2)	DM (1)	875	31	1	gone	2023-02-15 15:27:30	2023-03-28 16:12:55	normal	Harmonic A		ENVIRONMENT B2637			
23	39235	CCU 2 (2)	DM (1)	4107	44	1	gone	2023-02-15 15:27:30	2023-03-28 16:13:14	normal	CM: Trafo C		ENVIRONMENT B2738			
24	39235	CCU 2 (2)	DM (1)	4268	45	1	gone	2023-02-15 15:27:30	2023-03-28 16:12:58	normal	CM: TC 1 i B		ENVIRONMENT B2795			
25	39235	CCU 2 (2)	DM (1)	4353	46	1	gone	2023-02-15 15:27:30	2023-03-28 16:12:58	normal	CM: TCU1 C		ENVIRONMENT B2852			

INFO HITLIST ENVIRONMENT **EVENTS**

Reference designation: -TS_SCB&AEC025	WAG9 - Reading diagnostic data	Index:	Date: 2023-07-22	Lang.: EN	Pages: 23/23

8 Annextures – III

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Restricted	Trouble shooting guide WAG9x and WAP7x CCU	Doc.-state: WAG9-9K-EN2-GL-01	Index: -	Date:2023-07-26	Language: DE	Pages: 544/546

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POP-UP	POP-UP TEXT	INFORMATION	ACTION
0001	F0100P0 MAIN POWER ISOLATED; VCB inhibited	F0100P0 MAIN POWER ISOLATED; VCB inhibited. Loco is dead.	• Switch OFF the Electronics and Switch it ON once again. • Try to resume traction. if not successful, then-Ask for relief loco within 20 minutes.
0004	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO Check Isolating Cock Check Aux. Reservoir Pressure	• Ensure that IG-38 Blue key is inserted and keep horizontal on Pn.Panel. • Check that auxiliary compressor is working or not. • If not working, tap gently on Pressure switch No. 26 on pneumatic panel. • Check that pressure is available in Aux. Reservoir and more than 5.2 Kg/cm2 on the gauge provided on pneumatic panel. • If not, then Switch OFF the Electronics and Switch it ON once again. • Check Panto isolating cocks on pneumatic panel. • Try to raise pantograph. • If not successful, try to raise other pantograph by changing the position of Panto selector switch (85) on pneumatic panel. • Pressure in Pan circuit is monitored by a pressure switch (130.4/1 & 130.4/2). • After giving Panto raising command, if pressure switch not picked up within 35 sec, then VCB will be disabled. • In case VCB is closed then it will open with delay of 2 seconds, if above pressure switch not picked up. • Try by changing the cab/ changing Panto selector switch no. 84 on pneumatic panel.
0005	F0104P1 CATENARY VOLTAGE OUT OF LIMIT	F0104P1 CATENARY VOLTAGE OUT OF LIMIT Watch Catenary Voltmeter Close VCB When Voltage is OK	• Bring throttle to '0' position. Check 2 Amps. Fuse at SB-1, if it is blown off change it with the spare fuse. • Check for OHE voltage getting restore, then close the VCB and resume traction. • If 2 Amps fuse is not blown, wait for Catenary voltage to rise above 17.5 KV but less than 29.5 KV. After OHE voltage get restored, then re-close the VCB and resume traction. • Switch OFF the Electronics and Switch it ON once again. • Try to resume traction, if not succeed, then-Try by changing Panto. • Try by changing cab. • Try by isolating Traction converter 1 or Traction converter-2 one by one.
0006	F0104P2 LOW FREQUENCY CATENARY VOLTAGE	F0104P2 LOW FREQUENCY CATENARY VOLTAGE Wait for 1 minute and set TE/BE again.	• Coast to clear block section. • Inform TLC at scheduled stop and record in the logbook. • Keep trying for traction and resume normal operation.
0007	F0105P2 CATENARY FREQUENCY IS HIGH	F0105P2 CATENARY FREQUENCY IS HIGH Bring throttle to zero	• Coast to clear block section. • Inform TLC at scheduled stop and record in the logbook. • Keep trying for traction and resume normal operation.
0008	F0108P1 PRIMARY OVER CURRENT	F0108P1 PRIMARY OVER CURRENT Check over current relay flag Try to close VCB again	• Don't close DJ until you check the loco. • Coast to clear block section. Bringing the loco to dead stop. • Check over current relay-78 flag in SB-1 panel. • Inspect the Machine Room for any oil spillage. • Check the oil level in both the expansion tanks of transformer in Machine room located near Oil • Cooling Unit and the expansion tanks of both converters. It should be in between the Max. & Min. Mark. If there is any abnormality like splashing of oil inside the machine room or Transformer, shut down the loco. Ask for relief loco within 20 minutes. • If flag found dropped, but there is no abnormality of oil splashing, oil level is in between max & min in all the four gauges, press BLDJ to close VCB after resetting the relay target. Inform TLC and record in the logbook. • If not successful after making one attempt as given in step 6 then VCB will inhibited ask for relief loco without loosing time.

0010	Wrong Panto selected	The pantograph selection switch is not in AUTO position. If the current pantograph is selected due to damage to the other pantograph, the driver has to observe the operational speed limits.	If both pantographs are in order: • Check the panto selector switch (HTP-129.1) position in machine room. • place the pantograph selection switch in the AUTO position. • Try by MCE ON/OFF once.
0011	Panto configuration changed	The pantograph configuration was actuated because the multiple traction operation. The new pantograph selection will take effect after lowering the pantograph.	• Check the position of panto selector switch . • Command the pantograph down and up again through ZPT.
0012	Panto 1 - Lowering fault	Main Power LOW PRESSURE PANTO/FAULTY PANTO. The monitoring function on pantograph 1 was triggered. The pantograph is possibly raised / it may not be possible to lower the pantograph.	• Press Emergency off button for lowering panto. • IF not successful : Isolate Pantograph-1 from Panto earthing switch • Change the position of Panto selector Switch to Panto-2 by “129.1” Switch from Pneumatic Panel
0013	Panto 2 - Lowering fault	Main Power LOW PRESSURE PANTO/FAULTY PANTO. The monitoring function on pantograph 2 was triggered. The pantograph is possibly raised / it may not be possible to lower the pantograph.	• Press Emergency off button for lowering panto. • IF not successful : Isolate Pantograph-2 from Panto earthing switch • Change the position of Panto selector Switch to Panto-1 by “129.1” Switch from Pneumatic Panel
0016	Panto 1 - Raising fault	Main Power LOW PRESSURE PANTO/FAULTY PANTO. The monitoring function on pantograph 1 was triggered. It may not be possible to raise the pantograph or was automatically lowered. Possible cause(s): * The contact strip monitoring function detected an error. * Pneumatic valve failure.	• Check the emergency stop button position: Should be release. • Ensure that Blue key is inserted and keep horizontal on Pneumatic panel. • Check that auxiliary compressor working or not. • If not working, tap gently on pressure switch(130.4/1) on pneumatic panel • If not Successful : Try by MCE ON/OFF once. • Check panto isolating cocks on pneumatic panel. • Try to raise panto . If not, try by changing cab and Panto selector switch.
0017	Panto 2 - Raising fault	Main Power LOW PRESSURE PANTO/FAULTY PANTO. The monitoring function on pantograph 2 was triggered. It may not be possible to raise the pantograph or was automatically lowered. Possible cause(s): * The contact strip monitoring function detected an error. * Pneumatic valve failure.	• Check the emergency stop button position : Should be release. • Ensure that Blue key is inserted and keep horizontal on Pneumatic panel. • Check that auxiliary compressor working or not. • If not working, tap gently on pressure switch(130.4/2) on pneumatic panel • If not Successful : Try by MCE ON/OFF once. • Check panto isolating cocks on pneumatic panel. • Try to raise Panto . If not, try by changing cab and Panto selector switch.
0020	Panto 1 pressure loss	Main Power LOW PRESSURE PANTO/FAULTY PANTO. Pantograph 1 was lowered automatically because of a sudden drop in pressure. Possible cause(s): * Contact strip malfunction	• Raise the Panto and visually verified leakage sound near Panto Control unit. • While raising Panto verified the Auxiliary compressor working or not. • If not recycle the electronics & check. • If not Change the cab & switch position change to Panto-2
0021	Panto 2 pressure loss	Main Power LOW PRESSURE PANTO/FAULTY PANTO. Pantograph 2 was lowered automatically because of a sudden drop in pressure. Possible cause(s): * Contact strip malfunction	• Raise the Panto and visually verified leakage sound near Panto Control unit. • While raising panto verified the Auxiliary compressor working or not. • If not Try by MCE ON/OFF once & check. • If not Change the cab & switch position change to Panto-1

0023	VCB control loop test failed - VCB locked	There is a fault in the VCB loop control function.	- Start component test at display page "function tests", If not successful: recycle control electronics - Start component test at display page "function tests" again ,If still not successful: - Report to TLC and record in the logbook
0024	abort VCB loop test: conditions missing	Test process of the VCB loop was aborted. One or more conditions are missing.	- Start component test at display page "function tests", If not successful: recycle control electronics - Start component test at display page "function tests" again ,If still not successful: - Report to TLC and record in the logbook
0025	Catenary overvoltage > 33 kV - panto down	Main Power CATENARY VOLTAGE OUT OF LIMIT Catenary overvoltage detected. The VCB is switched off and the pantograph lowered.	- Bring throttle to neutral position. - Lower the Panto and recycle the electronics. - Raise the panto and check voltage in Display. - If still overvoltage : Change the Panto/Cab. - If still overvoltage : Report to TLC and record in the logbook
0026	No catenary voltage detected	Main Power CATENARY VOLTAGE OUT OF LIMIT No catenary voltage detected. VCB is locked. Possible cause(s): * No catenary voltage Unstable grid	- Bring throttle to neutral position. - Lower the Panto and Recycle the electronics. - Raise the panto and check voltage in Display/U Meter. - If still No voltage : Change the Panto Selection / Cab - If still no voltage: Inform the traffic control.
0027	One TCU is in test mode.	* One TCU in test mode, VCB off	- Cancel component test at display page "function tests" If not successful: Recycle locomotive - Cancel component test at display page "function tests" - If still not successful: Report to TLC and record in the logbook
0028	VCB loop test fail	VCB contacts failed. VCB closing may not be possible. Reasons could be: * TCU 1 4QC contact failed. * TCU1 one of the PWR contacts failed. * TCU 2 4QC contact failed. * TCU2 one of the PWR contacts failed. * EXTIO 11 contact failed. * EXTIO 12 contact failed	- Start component test at display page "function tests", If not successful: recycle control electronics - Start component test at display page "function tests" again ,If still not successful: - Report to TLC and record in the logbook
0029	VCB loop test: test mode TCU could not be set	VCB loop test: test mode TCU could not be set. Reasons could be: * There is failure in VCB control circuit * TCU1/2 has monitoring error	- Try by MCE ON/OFF once: - Try by raising panto and Closing VCB. If not successful: - Check with one by one with TCU isolate condition. If not successful: - Report to TLC and record in the logbook
0030	VCB loop failure by TCU 1	MAIN POWER ISOLATED. TCU 1 is switched off but one or more by-pass pins of the TCU 1 in the VCB loop is open.	- Try by MCE ON/OFF once: - Try by raising panto and Closing VCB. If not successful: - Check with TCU-1 Isolate condition. If not successful: - Unrecoverable fault - Report to TLC and record in the logbook

0031	VCB loop failure by TCU 2	MAIN POWER ISOLATED. TCU 2 is switched off but one or more by-pass pins of the TCU 1 in the VCB loop is open.	• Try by MCE ON/OFF once: • Try by raising panto and Closing VCB. If not successful: • Check with TCU-2 Isolate condition. If not successful: • Unrecoverable fault - Report to TLC and record in the logbook
0032	CB for VCB loop is tripped (127.12)	The Circuit Breaker Panto/VCB Control (127.12) tripped or was triggered. The VCB is automatically switched off and the pantograph lowered.	• Reset Circuit Breaker Panto/VCB Control (127.12) • Raise pantograph • Switch-on VCB If not successful: • Report to TLC and record in the logbook
0048	F0102P1 VCB STUCK IN OFF POSITION	F0102P1 VCB STUCK IN OFF POSITION Try to close VCB again	• On pneumatic Panel, Make Sure the VCB Cock is Open position. • Try to close VCB by closing BLDJ switch. • If not successful: MCE OFF/ON & again try to close VCB by raising the Panto. Work further after getting success. • If Not Successful : Try to Change Panto/Cab
0049	F0101P1 VCB STUCK IN ON POSITION	F0101P1 VCB STUCK IN ON POSITION. Loco will be shut down.	• MCE OFF/ON And make Sure LSDJ is glow. • If Not Successful : Report to TLC and record in the logbook
0050	VCB Loop open by TCU1 or TCU2	VCB Loop Opened by TCU1 or TCU2, Check for the VCB wiring.	• Recycle the electronics and check by closing VCB. If not successful : • Isolate TCU1 or TCU2 individual and check by closing VCB. If not successful : • Unrecoverable fault - report to TLC and record in the logbook.
0051	VCB open by TCU	VCB opened by TCU.	• Recycle the electronics and check by closing VCB. If not successful : • Isolate TCU and check by closing VCB. If not successful : • Unrecoverable fault - report to TLC and record in the logbook.
0052	VCB Loop opened by TCU1 -> VCB off	VCB loop opened by TCU1. Could be protection by TCU1	• Recycle the electronics and check by closing VCB. If not successful : • Isolate TCU-1 and check by closing VCB. If not successful : • Unrecoverable fault - report to TLC and record in the logbook.
0053	VCB Loop opened by TCU2 -> VCB off	VCB loop opened by TCU2. Could be protection by TCU2	• Recycle the electronics and check by closing VCB. If not successful : • Isolate TCU-2 and check by closing VCB. If not successful : • Unrecoverable fault - report to TLC and record in the logbook.
0054	VCB: Current detected with open VCB	Current Detected in VCB open condition and is permanently locked. No operation possible.	• Recycle the electronics and check by closing VCB. If not successful: • Report to TLC and record in the logbook.
0055	VCB Feedback not valid -> VCB off	Please check TCU related interface connectors, check respective digital IO signals at IO stations.	• Recycle control electronics. If not successful: • Try by Changing Panto/Cab. • If not successful : Report to TLC and record in the logbook.
0056	One TCU is off, VCB Loop is open	Please check VCB related wirings, Please check for the TCU downloads.	• Check TCU status on DDU If TCU power off/Isolate : • Normalize TCU. • Try by using VCB switch through BLDJ. If not successful : • Report to TLC and record in the logbook. • Continue operation with one TCU.

0057	VCB OFF without reason	VCB OFF without reason, not known to VCU control	• Switch on VCB through BLDJ If not successful: • Try by MCE ON/OFF once If still not successful: • Unrecoverable fault - Report to TLC and record in the logbook.
0058	TCU requested to open the VCB from CCU	TCU requested help from CCU to open the VCB	• Check in Driver screen of TCU isolation. • If all TCU is in normal condition : • Try by MCE ON/OFF once If still not successful: • Unrecoverable fault - Report to TLC and record in the logbook.
0059	VCB disabled for 2 minutes, exceeded maximum operation limit.	VCB disabled temporarily, more than 6 operations per minute encountered. * Wait for 2 min. & Close VCB again	• VCB disabled temporarily More than 6 operations per minute encountered. Wait for 2 min. • Close VCB again If not successful: • Recycle the electronics & try by raising panto and closing VCB. • Continue service
0060	Bring throttle to Neutral position to enable traction.	Traction Blocked: VCB Closed while Throttle in Traction or Braking position. Bring throttle in to Neutral position and apply again to get traction.	• Bring throttle in to neutral position and apply again to get traction. • Check the effort in TE meter in DDU. If not successful : • Try by changing the Cab
0067	HEP Converter 1 Faulty.	HEP Converter 1 Faulty. Please check Auxiliary module 1 data pack for Auxiliary failure.	• Check the circuit breaker Status of HEP in Panel. • If found Tripped, Closed and checked. If not successful : • Continue service with HEP converter-2
0068	HEP Converter 2 faulty.	HEP Converter 2 Faulty. Please check Auxiliary module 1 data pack for Auxiliary failure.	• Check the circuit breaker Status of HEP in Panel. • If found Tripped, Closed and checked. If not successful : • Continue service with HEP converter-1
0069	F0503P1 Earth Fault In Hotel Load Circuit.	F0503P1 Earth Fault In Hotel Load Circuit. Hotel load will be isolated	• Bring throttle in neutral position. • Maintain MR pressure 6.4 bar. • Try to switch on HEP. If not success: • Load switch to another feeder. • Continue service with another feeder.
0070	HEP1 Converter CB Tripped.	CB of HEP Converter 1 power supply tripped.	• Bring throttle in neutral position. • Check circuit breaker status of HEP1 converter in HEP panel. • Close the circuit breaker, If tripped and continue service. If not successful: • Continue Service with HEP2 converter.
0071	HEP 2 Converter CB Tripped.	CB of HEP Converter 2 power supply tripped.	• Bring throttle in neutral position. • Check circuit breaker status of HEP2 converter in HEP panel. • Close the circuit breaker, If tripped and continue service. If not successful: • Continue Service with HEP1 converter.
0072	HEP Capacitor fault, HEP/Auxiliary Load Isolated.	HEP capacitor pressure switch feedback missing. Respective load isolated.	• Please check HEP capacitor pressure switch related wiring. If all ok, Inform shed for investigation • on HEP sine filter capacitor.

0073	HEP Feeder2 (Right feeder) Earth fault. Feeder contactor drooped.	Reserve HEP Feeder2 (Right feeder) Earth fault. Feeder contactor drooped.	• Bring throttle in neutral position. • Maintain pressure 6.4bar. • Try to switch on HEP. If not success: • Load switch to HEP feeder 1. • Continue service with feeder 1.
0074	HLC input contactor close	HLC1/HLC2 input contactor closed or open after giving ON command	• Wait if parking brake applies within the next minute. IF PARKING BRAKE IS APPLIED: • No measures are required. • Notify dispatcher. IF PARKING BRAKE DOES NOT APPLY: • Manually actuate the apply side of the parking brake impulse valve on the brake rack.
0075	F0502P2 Hotel Load Contactor Stuck ON.	F0502P2 Hotel Load Contactor Stuck ON. For un/coupling hotel load trip VCB	• Check in HEP screen for particular feeder contactor open error. • Make OFF and Enable of Converter enable switch and check. if the problem is persisting: • Try by MCE ON/OFF once. • Report to TLC and record in the logbook.
0076	HLC inhibit: HLC Overcurrent.	Overcurrent detected in HLC1/HLC2 more than once, Inhibit HLC switch ON.	• Try by MCE ON/OFF once. If not successful : • Report to TLC and record in the logbook.
0077	Overcurrent detected in HLC1	Overcurrent detected in HLC1. HLC1 is isolated.	• Try by MCE ON/OFF once. If not successful : • Continue service with HLC2.
0078	Overcurrent detected in HLC2	Overcurrent detected in HLC2. HLC2 is isolated.	• Try by MCE ON/OFF once. If not successful: • Continue service with HLC1.
0080	Catenary input detection difference TCU1 and TCU2	At least one of the following measured values is invalid: * Catenary voltage * Catenary current * Catenary Frequency	• No corrective action needed while operating
0081	Catenary voltage not stable - VCB lock for 1 min	Main Power CATENARY VOLTAGE OUT OF LIMIT. Possible cause(s): * Very high harmonics in the line voltage. The line voltage instantaneous value is extremely high.	• Wait 1 min • Switch on VCB If not successful: Try by MCE ON/OFF once. • Report to TLC and record in the logbook.
0083	Catenary overvoltage - VCB off	Main Power CATENARY VOLTAGE OUT OF LIMIT The catenary voltage detection reported that the line voltage exceeded the acceptable limit. The VCB got switched off automatically. NOTE: * The VCB is inhibited until the voltage gets back to the permitted range.	• Check catenary voltage in DDU and in U Meter. • Try by MCE ON/OFF once. If not successful: • Check by changing Panto selection (129.1) in Pneumatic Panel. • Check by individual TCU selection. • Report to TLC and record in the logbook.
0085	Catenary undervoltage - VCB off	Main Power CATENARY VOLTAGE OUT OF LIMIT. The catenary voltage detection reported that the line voltage fell below the acceptable limit. The VCB got switched off automatically. NOTE: * The VCB is inhibited until the voltage gets back to the permitted range	• Check catenary voltage in DDU and in driver desk meter • Try by MCE ON/OFF once. If not successful • Check by changing Panto selection(129.1) in Pneumatic Panel n. • Check by individual TCU selection. • Report to TLC and record in the logbook.

0086	Continued catenary overvoltage - VCB lock for 2min	Main Power CATENARY VOLTAGE OUT OF LIMIT. During the last hour the catenary voltage exceeded the acceptable limit values too often and for too long. The VCB was switched-off and is locked for 2 min in order to allow the transformer to cool down.	Wait out 2 min cooling period • Close VCB and Continue service If not successful: • Report to TLC and record in the logbook.
0087	Continued catenary overvoltage - VCB lock for 60 sec	During the last hour the catenary voltage exceeded the acceptable limit values too often and for too long. The VCB was switched-off and is locked for 60 sec in order to allow the transformer to cool down.	• Wait out 60 sec cooling period • Close VCB and continue service If not successful : • Report to TLC and record in the logbook.
0088	Line voltage 5th harmonic too high limit-1	Possible cause(s): * Very high harmonics in the line voltage(>3500 V). * The line voltage instantaneous value is extremely high.	• Press BLDJ to close VCB If the message persists : • Try by MCE ON/OFF once.. • Raise panto, close VCB and resume Traction. If not successful : • Report to TLC and record in the logbook.
0089	Line voltage 5th harmonic too high limit-2	Possible cause(s): * Very high harmonics in the line voltage(>7100 V). * The line voltage instantaneous value is extremely high.	• Press BLDJ to close VCB If the message persists : • Try by MCE ON/OFF once.. • Raise panto, close VCB and resume Traction. If not successful : • Report to TLC and record in the logbook.
0090	Catenary overcurrent current - VCB off	The catenary current monitoring function was triggered. The VCB was switched off.	• Do not close VCB before checking the loco. Especially check OCR 78) and all oil points in the machine room. If fire seen, take action as per F1501P1(0757). • IF there is no fire, clear the block section while coasting and park the Loco. Ack the fault by BPFA Push button. • Check the OCR-78 Relay in SB-1 Panel, if no abnormality • Isolate Bogie one by One via the display & Monitor the OHE Current on DDU. • If Not Successful : MCE OFF/ON & Continue Service. • If Not Successful : Inform to TCL & Record in the Logbook
0091	No-load current monit. - VCB off	The no-load current monitoring function was triggered. The VCB was switched off automatically.	• Isolate bogie one by one via the display & monitor the OHE current on DDU. • If not success : • Recycle the electronics and Continue Service. If still not success : • Report to TLC and record in the logbook.
0093	TCU1 Voltage sensor value not valid	Value received from TCU1 Voltage sensor not valid. Please check the TCU1 Voltage sensor	• Recycle control electronics. • Raise Panto & Close VCB, If issue still Same : • Report to TLC and record in the logbook.
0094	TCU2 Voltage sensor value not valid	Value received from TCU2 Voltage sensor not valid. Please check the TCU2 Voltage sensor	• Recycle control electronics. • Raise Panto & Close VCB, If issue still Same : • Report to TLC and record in the logbook.
0095	F0101P2 OVER TEMPERATURE CONTROL ELECTRONICS	F0101P2 OVER TEMPERATURE CONTROL ELECTRONIC Turn off the loco. Setup cooling mode.	• Check MCBs in HB / SB, if found tripped, reset once. • Try to clear section. Advise station regarding inability for 10-15 minutes. Switch OFF the control Electronics. • Put BL Key in position 'C' raise pantograph with ZPT, close VCB both Machine Room Blowers will start working. • The loco is now, in cooling mode and Electronics is being cooled wait till LSCE extinguished. • After LSCE extinguished, open DJ, lower panto.

			Put BL Key to 'D' position. Raise panto, close VCB and resume traction.
0096	F0902P2 Battery system BATTERY CHARGER MCB OFF	F0902P2 Battery system BATTERY CHARGER MCB OFF Try to close the MCB	- Check MCB 110 in SB2 and 100 in Auxiliary Box 2 or in HB2. If tripped, reset it once. - Clear the block section. - Reset MCB 100 in HB2 panel and work further. - If MCB-100 is tripping repeatedly, then isolate ACI3 and try to work with CHBA on ACI2. If still message persist, then inform TLC and ask for relief loco. Loco can work till battery voltage drops to 86 V. - Record in Logbook that driver could not Troubleshoot because it is not possible for the driver to reset the battery charger input MCB (100) which is located inside Auxiliary Converter box-2. (In case of unmodified locos)
0097	F1101P2 Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1	F1101P2 Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1 Traction power may get reduced, if temperature exceed.	- Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. - Check MCB's in Auxiliary cubicle HB1. If any MCB found tripped then reset it once after opening VCB. If any MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. - If MCB (59.1/1 or 62.1/1 or 63.1/1 or 53.1/1) getting tripped after resetting it once as given in step 2 above, then driver should not try to reset these MCBs. - Inform TLC and record in loco logbook. Resume traction with bogie 1 in isolated condition if automatically isolated. - In case of any other MCB excluding MCB given in step 4 above is getting tripped after resetting once, then continue normal operation as long as possible and inform TLC.
0098	F1201P2 Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2	F1201P2 Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2 Traction power may get reduced if temperature exceed.	- Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. - Check MCB's in Auxiliary cubicle HB2. If any MCB found tripped then reset it once after opening VCB. If any MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB.
0099	F1102P2 Auxiliaries HB1 EARTH FAULT 415/110V CIRCUIT	F1102P2 Auxiliaries HB1 EARTH FAULT 415/110V CIRCUIT Normal operation can continue	- Resume normal traction. - Inform TLC and record in loco logbook.
0101	Transformer oil pumps CB dropped	Both transformer oil pump circuit breakers have tripped or feedback missing at VCU.	- Reset CB(62.1/1 & 62.1/2) of Transformer Oil Pump - Press BLDJ to close the VCB IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - Report to TLC and record in the logbook
0102	Transformer oil pressure - VCB off	The Transformer oil pressure below the acceptable limit values. The VCB was switched off. Possible cause(s): * Transformer oil pumps are not working or blockage. * Feedback missing at VCU.	- Check the status of the transformer oil pump CB(62.1/1 & 62.1/2, 63.1/1 & 63.1/2.) reset the CB if found tripped - Press BLDJ to close the VCB, IF not successful - Check the functioning/leakage of the transformer oil Pump. - If one of the Pump does not work, isolate concerned TC, If working normal resume traction. - If Not successful : Report to TLC and record in the logbook

0103	Trafo both temp reading not valid - VCB Open	The Transformer temperature readings are invalid. VCB will remain open until the transformer temperature readings become valid again.	- Recycle CB Circuit Breaker TCU1 (127.11/1) - Recycle CB Circuit Breaker TCU2 (127.11/2) IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - Report to TLC and record in the logbook
0104	Transformer oil pressure - power limitation	Main Power TRANSFORMER OIL PRESSURE NOT OK The Transformer has insufficient oil pressure. Power limitation will remain active until the transformer oil pressure recovers. Possible cause(s): * Blockage in the transformer oil loop Defective transformer oil pump	- Check the oil pump relates circuit CB's(62.1/1 & 62.1/2, 63.1/1,63.1/2 & 59.1), if found tripped reset the CB's. - Press BLDJ to close the VCB, IF not successful - Check the functioning/leakage of the transformer oil Pump. - If one of the Pump does not work, isolate concerned TC, If working normal resume traction. - If Not successful : Report to TLC and record in the logbook
0105	Transformer overtemperature - VCB locked	Main Power TRANSFORMER OIL TEMPERATURE exceeds limit. The transformer has exceeded it's maximum allowed temperature. The VCB will be locked until the temperature recovers to an acceptable level. Possible cause(s): * Defective oil pumps * Defective cooling unit	- Check for the status of the transformer oil pump CB (63.1/1,63.1/2,62.1/1 & 62.1/2) and reset the CB if tripped - Press BLDJ to close the VCB - Resume normal traction IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - Report to TLC and record in the logbook
0106	Transformer oil pressure - VCB locked	The transformer oil pressure dropped below it's minimum allowed pressure to many times. The VCB will be permanently locked.	- Check for the status of the transformer oil pump CB (63.1/1,63.1/2,62.1/1 & 62.1/2) and reset the CB if tripped - Press BLDJ to close the VCB, IF not successful - Check the functioning/leakage of the transformer oil Pump. - If one of the Pump does not work, isolate concerned TC, If working normal resume traction. - If Not successful : Report to TLC and record in the logbook
0107	Trafo oil temp sensor 1 faulty	Transformer oil temp sensor 1 reported faulty. The value from the transformer oil temp sensor 1 may be invalid.	- No action required and Continue service IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - Report to TLC and record in the logbook
0108	Trafo oil temp sensor 2 faulty	Transformer oil temp sensor 2 reported faulty. The value from the transformer oil temp sensor 2 may be invalid.	- No action required and Continue service IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - Report to TLC and record in the logbook
0109	Transformer Oil circuit in TCU 1 or 2 invalid temperature	Main Power TRANSFORMER OIL TEMPERATURE invalid Invalid temperature of main transformer oil from TCU-1 or TCU-2 Possible cause(s): * Check temperature sensor * Check Oil level * Check Oil Pressure	- Try by MCE ON/OFF once - Raise pantograph and close VCB, ensure that oil pumps are running - Resume traction .IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0110	Main transformer: Oil circuit 1 invalid pressure	The transformer oil circuit 1 has pressure feedback invalid. The invalid pressure may open the VCB.	- Reset the circuit breaker oil pump 1 (62.1/1), if found tripped - Report to TLC and record in the logbook
0111	Main transformer: Oil circuit 2 invalid pressure	The transformer oil circuit 2 has pressure feedback invalid. The invalid pressure may open the VCB.	- Reset the circuit breaker oil pump 2 (62.1/2), if found tripped - Report to TLC and record in the logbook

0117	F0105P1 TRANSFORMER OIL TEMPERATURE OR PRESSURE NOT OK	F0105P1 TRANSFORMER OIL TEMPERATURE OR PRESSURE NOT OK TE/BE reduction or VCB trips Try to close VCB if open	• Bring throttle to '0' position. • Try to clear the block section by coasting. • Check manually if Transformer oil pumps are working by touching the pumps outlets and inlet pipes in the under frame. Check if MCB 62.1/1 and HB1& 62.1/2 in HB2 Cubicle. If found tripped open VCB and reset MCB once. • If MCB not working then Switch OFF and ON Electronics. • Keep loco in idle mode for 10 minutes. • Check the oil level in both the expansion tanks of transformer in Machine room located near Oil Cooling Unit. It should be in between the Max & Min Mark. • Driver should check the working of Oil cooler blower unit located in machine room; If it is not working then ensure that MCB 59.1/1 (in HB-1 Cubicle) & 59.1/2 (in HB-2 Cubicle) should not be in tripped condition. If found tripped, then open VCB & reset MCB only once. If OCBs are not working, then- Switch OFF and ON Electronics. • Keep loco in idle mode for 10 minutes. • If driver noticed that OCB impeller and its casing got physically damaged, then driver should immediately isolate. • Concerned OCB by opening MCB 59.1/1 OR 59.1/2 Concerned traction converter pump by opening coolant pumps MCB 63.1/1 OR 63.1/2 and Concerned transformer oil pumps by opening MCB 62.1/1 OR 62.1/2. • Driver should operate above MCB after opening VCB and switching OFF control electronics. • Then driver should isolate concerned Bogie-by-Bogie isolating switch (154) located in SB-1 cubicle. • Switch ON control electronics raise Panto & close VCB. Work the train with one bogie in service after making conversation with TLC. Try to resume traction. • If the same message repeats, bring throttle to 0. Switch OFF the Electronics and Switch it ON once again. Raise Panto and close VCB and resume traction. • If not successful within 20 minutes, ask for relief loco.
0118	F0102P2 TRANSFORMER OIL PRESSURE NOT OK	F0102P2 TRANSFORMER OIL PRESSURE NOT OK Any oil pump circuit not working TE/BE will be reduced	• Coast to clear block section. • Check manually that oil pumps are working or not by touching the pumps outlets and inlet pipes in the under frame. • Check MCB 62.1/1 in HB1 & 62.1/2 in HB2 panels. If found tripped, open VCB and reset MCB once.
0146	BP pressure switch input not valid	The input value from the pressure switch may be invalid.	BP pressure switch input not valid: • Check for the operation of A9 handle between minimum service to full service position whether BP Pressure is Dropping or not. • Check for loose connection of pressure switch 269.1 on pneumatic panel. • Report to TLC and record in the logbook

0148	F1002P1 Brake System LOW PRESSURE MAIN RESERVOIR	F1002P1 Brake System LOW PRESSURE MAIN RESERVOIR No traction allowed till pressure reaches 6.4 kg/cm ²	- Bring TE/BE throttle to '0' position. - Wait until a MR pressure of 6.4 Kg/cm² reached. - Check whether compressor works or not. Check the MCB of compressors 47.1/1 in HB1 & 47.1/2 in HB2 panels. If found tripped, open VCB and reset the MCB once. - Check leakage from Air dryer. If leakage persists, then isolate Air dryer by isolating D in cock & by putting D out to normal position provided in under frame. - Check leakage from Auto drain valve provided under the main reservoir 1 & 2 or air leakage from CP delivery pipe. - Check train for heavy leakage in pneumatic system. - If there is no leakage and MCBs of both the Compressors are in closed condition, even then compressor are not working and MR is not being maintained, Switch OFF the Electronics and Switch it ON once again. - Raise Panto, close VCB and resume Traction if loco get normal. IF NOT SUCCESSFUL: - Unrecoverable fault - Report to TLC and record in the logbook - Ask relief loco
0149	MR pressure switch input not valid	Brake System LOW PRESSURE MAIN RESERVOIR The input value from the pressure switch may be invalid.	- Switch OFF the Electronics and Switch it ON once again. Raise panto, close VCB and resume Traction if loco get normal. IF NOT SUCCESSFUL: - Unrecoverable fault - Report to TLC and record in the logbook - Ask relief loco
0150	F1009P1 Brake System TRACTION NOT ALLOWED WITH APPLIED BRAKE	F1009P1 Brake System TRACTION NOT ALLOWED WITH APPLIED BRAKE Release loco brake Bring TE/BE Throttle to 0	- This fault messages is generated when BC pressure is over 0.65 Kg/cm², throttle is not at position and speed is over 10 KMPH. - Bring TE/BE throttle to '0' position. Release Loco Brakes with SA9.
0151	F1004P1 Brake System WORKING WRONG CONFIGURATION BRAKE SYSTEM	F1004P1 Brake System WORKING WRONG CONFIGURATION BRAKE SYSTEM Check isolating coc brake control Wrong coc position, to reset open VCB	- Bring TE/BE throttle to '0' position. - Check isolating Cock No. 70 (E70 Brake Pipe isolating cock) provided on pneumatic panel. If found close then open cock No. 70. Close VCB. - Also check ZBAN switch. It should be OFF, if not, put it at OFF position. - Resume Normal Traction.
0156	Parking brake application at speeds above 5km/h not allowed	Parking Brake Application Command is ignored due to not allowed Parking Brake Application at speeds greater than 5km/h.	- Bring TE/BE Throttle to '0' position. - Release parking brake with illuminated Red Push Button BPPB. In case parking brakes get released, then parking brake gauge will show pressure of 6 Kg/cm² and BPPB will extinguish. - If parking brake is not getting released, then inspect the Latch Solenoid valve (30) on pneumatic panel. If it is found permanently latched in applied condition, then release it. - Press releasing knob and lock in that condition if necessary. - If still parking brakes not released, check for any sign of air leakage from parking brake cylinder hosepipe. If there is leakage, then arrest the leakage. - After releasing parking brakes, resume normal traction.

0157	F1006P1 Brake System TRACTION WITH PARKING BRAKES NOT ALLOWED	F1006P1 Brake System TRACTION WITH PARKING BRAKES NOT ALLOWED Release parking brakes Bring TE/BE Throttle to 0	• Bring TE/BE Throttle to '0' position. • Release parking brake with illuminated Red Push Button BPPB. In case parking brakes get released, then parking brake gauge will show pressure of 6 Kg/cm² and BPPB will extinguish. • If parking brake is not getting released, then inspect the Latch Solenoid valve (30) on pneumatic panel. If it is found permanently latched in applied condition, then release it. • Press releasing knob and lock in that condition if necessary. • If still parking brakes not released, check for any sign of air leakage from parking brake cylinder hosepipe. If there is leakage, then arrest the leakage. • After releasing parking brakes, resume normal traction.
0158	Parking brake release failed	Parking brake release failed. NOTE: The parking brake does not release in the required amount of time after the parking brake push button is pressed.	• Wait if parking brake release within the next minute. • IF PARKING BRAKE IS RELEASED: • No measures are required • Report to TLC and record in the logbook IF PARKING BRAKE IS NOT RELEASED: • Manually set the parking brake impulse valve to "release" position on the brake rack. Perform a roll-by test. • Check locomotive is secured against moving when all parking brakes are released. • Manually release all parking brake cylinders, Perform a roll-by test. • Operational rules and restrictions must be taken into account. • NOTE: If the parking brake is manually released, it is inoperative. • Secure parked locomotive against moving with suitable measures.
0159	Parking brake apply failed	Parking brake application failed. NOTE: The parking brake does not apply in the required amount of time after the parking brake push button is pressed.	• Wait if parking brake applies within the next minute. • IF PARKING BRAKE IS APPLIED: • No measures are required • Report to TLC and record in the logbook IF PARKING BRAKE DOES NOT APPLY: • Manually actuate the apply side of the parking brake impulse valve on the brake rack. • When parked, suitable measures (apply parking brake, chock block, coupled with secured locomotive) must prevent the locomotive from rolling
0160	F1001P2 Brake System LOCO IS IN BANKING MODE	F1001P2 Brake System LOCO IS IN BANKING MODE Loco brake controller isolated Emergency brakes can be applied	• This message is expected when loco is in banking mode (ZBAN is ON and Cock 70 is isolated). If not in Banking mode follow the procedure given below: • Bring TE/BE throttle to '0'. • Check position of ZBAN switch. If ON, then switch it OFF. • It could be due to maloperation of ZBAN microswitch. Operate ZBAN switch 2-3 times vigorously, it will normalize if stuck up. • Close VCB and resume normal traction. • If not successful, try to work from rear cab after switching ON/ OFF MCE.

0161	Brake Pipe Cut Out	* Loco brake controller isolated. * Emergency brakes can be applied. NOTE:Trail use only	- Bring TE/BE throttle to '0' position. - Check isolating Cock No. 70 (E70 Brake Pipe isolating cock) provided on pneumatic panel. If found close then open cock No. 70. Close VCB. - Also check ZBAN switch. It should be OFF, if not, put it at OFF position. - Resume Normal Traction.
0162	F1001P1 Brake System FAULT IN BRAKE ELECTRONICS	F1001P1 Brake System FAULT IN BRAKE ELECTRONICS Emergency brake applied No traction allowed	- Check MCB No. 127.7. If found tripped, reset 127.7 once. - Recycle Control electronics. Raise panto, close VCB and resume Traction, if loco get normal. - If the message repeated bring TE/BE throttle to '0' position. - With CCB equipped locomotive, use the instructions* to make PTDC mode of CCB active to clear the line. - If not successful , ask for relief loco.
0163	Activation of Banking not possible in Running Loco.	Activation of Banking only possible, while Loco is not standstill.	To activate banking: - Bring Loco Standstill - Check position of ZBAN switch. If ON, Then Open the VCB by BLDJ and Turn off ZBAN & Once Again Switch ON ZBAN Switch - IF NOT SUCCESSFUL: Unrecoverable fault - Report to TLC and record in the logbook
0164	Deactivation of Banking not possible with VCB closed	Deactivation of Banking only possible, while Loco is not standstill and VCB closed.	To deactivate banking mode: - Bring Loco Standstill - Open VCB with BLDJ - Check position of ZBAN switch. If ON, then switch it OFF. IF NOT SUCCESSFUL: - Unrecoverable fault - Report to TLC and record in the logbook
0165	F1002P2 Brake System ALARM CHAIN PULLING	F1002P2 Brake System ALARM CHAIN PULLING Check train	- Bring the train to a halt at convenient place immediately. - Check the affected coach, find out the reason of ACP, reset the ACP and work the train accordingly. - Check MCB 128.1 in SB2 Panel, if found tripped, reset the MCB once. - If the MCB trips again, resume normal operation air dryer in isolated condition.
0166	Air brake emergency activated	Brake System EMG. EXHAUST COCK CLOSED, NO TRACTION Air brake emergency activated	- Bring TE/BE Throttle to '0' position. - Apply A-9 to emergency to avoid depletion of MR through BP. - Move A9 Handle to run. After resetting Penalty Brake, BP will be charged to 5 Kg/cm². - If the penalty brakes remains applied even after the above, Switch OFF the Electronics and Switch it ON once again. Raise panto, close VCB and resume normal traction. - IF NOT SUCCESSFUL: - Unrecoverable fault - Report to TLC and record in the logbook
0171	F1005P1 Brake System TRACTION WITH AUTO BRAKE NOT ALLOWED	F1005P1 Brake System TRACTION WITH AUTO BRAKE NOT ALLOWED Release parking brakes Bring TE/BE Throttle to 0	- Release Auto Air Brake. Check BP, it should be 5 Kg/cm². - Bring TE/BE Throttle to '0' position. - Resume normal traction. - If not successful, try from other cab. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook

0172	Traction with applied independent brakes not allowed	Brake System TRACTION NOT ALLOWED WITH APPLIED BRAKE The independent loco brake is not released. This Message will come when BC Pressure is not 0.65 kg/cm² and the throttle is not at "0" and speed is more than 10 kmph	• Verify that independent loco brake work properly. • Release independent loco brakes. • Bring TE/BE throttle to zero. • Resume normal traction. • If not successful, try from other cab. IF NOT SUCCESSFUL: • Switch off pilot supply for the direct brake isolating valve of the affected cab. • Report to TLC and record in the logbook
0173	Traction with applied pneumatic brakes not allowed	Brake System TRACTION NOT ALLOWED WITH APPLIED BRAKE The pneumatic brake of at minimum one bogie is not released.	• Release independent loco brakes. • Activate manual assimilation and wait until process is finished. • Perform a leak-tightness test for the auto air brake. • Verify that auto air brake works properly. • Verify that independent loco brake works properly. • IF PNEUMATIC BRAKE CONTINUES NOT TO RELEASE ON ONE BOGIE: • Cut-off pneumatic brake of the affected bogie by brake cylinder isolation cock. • Perform a new brake calculation. • IF BRAKES DO NOT RELEASE ON BOTH BOGIES: • Report to TLC and record in the logbook
0201	F1008P1 Brake System EMERGENCY STOP, SHUTDOWN ON THE LOCO	F1008P1 Brake System EMERGENCY STOP, SHUTDOWN ON THE LOCO To release, reset emergency stop push button Bring TE/BE Throttle to 0	• Bring TE/BE throttle to '0' position. • Reset Emergency Stop push Button by rotating it in the direction of Arrow marked on it. It will come out a little bit. • Press BPFA. • Raise Pantograph. • Close VCB through BLDJ. • Resume Normal Traction after charging BP and MR. • If not successful, try from other cab.
0206	F1010P1 Brake System EMG. EXHAUST COCK CLOSED, NO TRACTION.	F1010P1 Brake System EMG. EXHAUST COCK CLOSED, NO TRACTION . For traction open the cock Bring TE/BE Throttle to 0	• Verify the position of emergency exhaust cock on brake rack. • IF THE CUT OUT COCK IS IN FAULT POSITION FOR SERVICE: • Set the emergency exhaust cock to normal service position. • Bring TE/BE throttle to "0" position. • IF THE CUT OUT COCK IS IN FAULT POSITION BECAUSE OF A FAULT: • Take note of active alerted fault messages
0256	F1007P1 Brake System REGENERATIVE BRAKE FAILURE	F1007P1 Brake System REGENERATIVE BRAKE FAILURE Pneumatic loco brake applied.	• Bring TE/BE Throttle to '0' position, loco brakes will be released. • Control the train through A-9. Press PVEF, till BC-1/BC-2 gauge pressure reaches '0' Kg/cm² • No electrical Brake power available; braking can be done with A9/SA9 only. • Resume Normal Traction • Inform TLC and record in the Logbook.
0257	Traction Motor 1 is isolated	MOTOR1-BOGIE1 ISOLATED Traction motor 1 is not operational	• Try by MCE ON/OFF once • Resume normal traction IF NOT SUCCEESFUL: • Continue service with TM1 isolated condition • Report to TLC and record in the logbook

0258	Traction Motor 2 is isolated	MOTOR2-BOGIE1 ISOLATED Traction motor 2 is not operational	• Try by MCE ON/OFF once • Resume normal traction IF NOT SUCCEESFUL: • Continue service with TM2 isolated condition • Report to TLC and record in the logbook
0259	Traction Motor 3 is isolated	MOTOR3-BOGIE1 ISOLATED Traction motor 3 is not operational	• Try by MCE ON/OFF once • Resume normal traction IF NOT SUCCEESFUL: • Continue service with TM3 isolated condition • Report to TLC and record in the logbook
0260	F0200P0 BOGIE1 ISOLATEDO	F0200P0 BOGIE1 ISOLATED Only half traction and electrical braking power available.	• If bogie-1 is isolated by Driver through (154) switch or DDU then only acknowledge the • isolation message by pressing BPFA. • Switch OFF the Electronics and Switch it ON once again. Raise the panto and close • VCB and resume traction. • If the same message repeats resume normal operation with half traction/braking power. • Inform TLC and record in the logbook.
0262	TC1 water pressure fault-High/Low	Traction Bogie 1 CONVERTER 1 COOLANT PRESSURE NOT OK The water circulation pressure for traction container 1 is out of bounds. Traction container 1 is automatically cut out. Possible cause(s): * Circuit Breaker Oil Pump Converter 63.1/1 is off Blockage in the cooling loop.	• AUX-2 to be kept isolated and try to close VCB. • If problem disappear, work with AUX-2 isolated. • If problem persist, BG-I will get automatically isolated. • Check coolant level in converter expansion tank. • If MCB 63.1/1 getting trip again after resetting it once then do not try to reset the MCB again. BG-1 will get automatically isolated. Work with half traction. • Driver should also inspect the traction converter No.1 coolant pipeline for any sign of damage causing coolant leakage and inspect the oil cooler blower-1 casing for any sign of damage due to failure of its impeller. In this case it may lead to damage of converter radiator causing coolant leakage. Then driver should open VCB, lower panto & switch off control electronics. Open MCB 59.1/1, 63.1/1 (all located in HB-1 cubicle). Isolate bogie-1 by putting rotating switch 154 at position-1. • Energise the loco and work the train with one bogie in service. Inform • TLC and record in loco logbook.
0263	TC 1 coolant level low (Warning)	The coolant level for traction container 1 has dropped below the warning level. There may be a leak in the traction container 1 coolant loop. If the coolant level drops further, the locomotive will become unoperational.	• Check coolant level in converter expansion tank, located at the converter cubicle. • Inspect the traction converter No.1 coolant pipeline for any sign of damage causing coolant leakage • Inspect the oil cooler blower-1 casing for any sign of damage due to failure of its impeller. In this case it may lead to damage of converter radiator causing coolant leakage. Then driver should open VCB, lower panto & switch off control electronics. Open MCB 59.1/1, 63.1/1 (all located in HB-1 cubicle). Isolate bogie-1 by putting rotating switch 154 at position-1. • Energise the loco and work the train with one bogie in service. Inform • TLC and record in loco logbook.

0264	TC1 coolant level low (Alarm) - Leakage	The coolant level for traction container 1 has dropped below the alarm level. There may be a leak in the traction container 1 coolant loop. The locomotive is now unoperational.	• Check coolant level in converter expansion tank, located at the converter cubicle. • Inspect the traction converter No.1 coolant pipeline for any sign of damage causing coolant leakage • Inspect the oil cooler blower-1 casing for any sign of damage due to failure of its impeller. In this case it may lead to damage of converter radiator causing coolant leakage. Then driver should open VCB, lower panto & switch off control electronics. Open MCB 59.1/1, 63.1/1 (all located in HB-1 cubicle). Isolate bogie-1 by putting rotating switch 154 at position-1. • Energise the loco and work the train with one bogie in service. Inform • TLC and record in loco logbook.
0265	TC1 \ BG1 is isolated.	Traction Bogie 1 DISTURBANCE IN CONVERTER1 Traction container 1 and bogie 1 is not available for operation.	• If bogie-1 is isolated by Driver through (154) switch or DDU then only acknowledge the isolation message by pressing BPFA. • Switch OFF the Electronics and Switch it ON once again. Raise the panto and close. • VCB and resume traction. • If the same message repeats resume normal operation with half traction/braking power. • Inform TLC and record in the logbook.
0266	TC1 inside air temperature sensor faulty	The inside air temperature sensor for traction container 1 is faulty. Locomotive operation can be continued.	• Switch OFF the Electronics and Switch it ON once again. Raise the panto and close • VCB and resume traction. • Inform TLC and record in the logbook.
0267	TC1 DC link isolation sw. at earthed position	The traction container 1 isolation switch is in the earthed position.	• Earthing switch to placed in the OFF position IF NOT SUCCESSFUL: • Recycle locomotive IF STILL NO SUCCESS: • Report to TLC and record in the logbook
0268	TC 1 is cutout	Traction Bogie 1 DISTURBANCE IN CONVERTER1 Traction container 1 is cutout, therefore bogie 1 is not operational.	• If bogie-1 is isolated by Driver through (154) switch or DDU then only acknowledge the isolation message by pressing BPFA. • Switch OFF the Electronics and Switch it ON once again. Raise the panto and close • VCB and resume traction. • If the same message repeats resume normal operation with half traction/braking power. • Inform TLC and record in the logbook.
0269	F1104P2 Auxiliaries HB1 OVERLOAD ON OCB-1	F1104P2 Auxiliaries HB1 OVERLOAD ON OCB-1 Isolate OCB	• Check manually that oil-cooling blower unit-1 is working by checking the air coming. • out of the radiator in the underframe. • Check MCB 59.1/1 in HB1 panel. If found tripped, open VCB and reset MCB. • Driver should also inspect the oil cooler blower motor-1 impeller and casing for any sign of damage. If found damaged, then driver should open VCB, lower panto and switch off control electronics. • Open MCB 59.1/1, open MCB 52.1/1 & MCB 63.1/1 (all located in HB1 cubicle). Then isolate bogie-1 by bogie isolating switch 154 (located in SB- 1) cubicle. • Energies the loco and work the train with one bogie in service. Under such condition, • LSFI will glow permanently. Inform to TLC and record in Loco logbook.

0270	TC1 water pressure fault	The water circulation pressure for traction container 1 is out of bounds. Traction container 1 is automatically cut out. Possible cause(s): * Circuit Breaker Oil Pump Converter 63.1/1 is off - Blockage in the cooling loop	• AUX-2 to be kept isolated and try to close VCB. • If problem disappear, work with AUX-2 isolated. • If problem persist, BG-1 will get automatically isolated. • Check coolant level in converter expansion tank. • If MCB 63.1/1 getting trip again after resetting it once then do not try to reset the MCB again. BG-I will get automatically isolated. Work with half traction. • Driver should also inspect the traction converter No.1 coolant pipeline for any sign of damage causing coolant leakage and inspect the oil cooler blower-1 casing for any sign of damage due to failure of its impeller. • Open VCB, lower panto & switch off control electronics. Open MCB 59.1/1, 63.1/1 (all located in HB-1 cubicle). Isolate bogie-1 by putting rotating switch 154 at position-1. • Energise the loco and work the train with one bogie in service. Inform • TLC and record in loco logbook.
0271	F0604P1 BOGIE1 VENTILATION AUX-1 DISTURBED	F0604P1 BOGIE1 VENTILATION AUX-1 DISTURBED Press acknowledge to reconfigure to ACI2	• Check manually whether traction motor blower-1 is working or not, by checking air suction at TM Louver. • Check MCB 53.1/1 in HB1 panel. If found tripped, open VCB and reset MCB once. • IF NOT SUCCESSFUL: Continue service with TC 1 cut out • Report to TLC and record in the logbook
0272	TC1 manual cut-in not possible	It is not possible the manually cut in traction container 1. Possible cause(s): * Locomotive is not at standstill * TCU 1 is not switched ON via Circuit Breaker TCU1 127.11/1 * Traction converter is permanently cut due to other subsystem failures.	• Check MCB 127.11/1. IF there is a trip Turn off the MCE and Reset MCB, Turn ON MCE & Start normal operation • IF NOT SUCCESSFUL: Check crew messages for other faults that can lead to traction container cut out. • IF STILL NO SUCCESS: Continue service with TC 1 cut out • Report to TLC and record in the logbook
0273	F0206P1 CONVERTER 1 COOLANT PRESSURE NOT OK	F0206P1 CONVERTER 1 COOLANT PRESSURE NOT OK Check coolant level Try to close the VCB again.	• AUX-2 to be kept isolated and try to close VCB. • If problem disappear, work with AUX-2 isolated. • If problem persist, BG-I will get automatically isolated. • Check coolant level in converter expansion tank. • If MCB 63.1/1 getting trip again after resetting it once then do not try to reset the MCB again. BG-I will get automatically isolated. Work with half traction. • Driver should also inspect the traction converter No.1 coolant pipeline for any sign of damage causing coolant leakage and inspect the oil cooler blower-1 casing for any sign of damage due to failure of its impeller. In this case it may lead to damage of converter radiator causing coolant leakage and lead to fault message "Converter No.1 coolant pressure low". Then driver should open VCB, lower panto & switch off control electronics. Open MCB 59.1/1, 63.1/1 (all located in HB-1 cubicle). Isolate bogie-1 by putting rotating switch 154 at position-1. • Energise the loco and work the train with one bogie in service. Under such condition LSFI will glow permanently if driver isolated the bogie-1 as described above. Inform TLC and record in loco logbook.

0274	TC1 isolated manually through rotary switch or DDU screen.	TC1 isolated manually through Rotary switch or DDU CutOut screen. Please check the Rotary switch or DDU CutOut screen.	- Check the status of TCU-1 on the DDU screen and ensure that switch 154 is normal. If LP has isolated Bogie-1 by operating switch 154 due to any fault then acknowledge the fault by BPFA only. - If Bogie-1 has not been isolated by LP by operating switch 154, then turn off MCE and turn it on and close VCB by raising panto. Act normally. - If the same message comes again then work with half TE/BE. - Notify TLC and enter in logbook.
0275	TC2 isolated manually through Rotary switch or DDU screen.	TC2 isolated manually through Rotary switch or DDU CutOut screen. Please check the Rotary switch or DDU CutOut screen.	- Check the status of TCU-2 on the DDU screen and ensure that switch 154 is normal. If LP has isolated Bogie-2 by operating switch 154 due to any fault then acknowledge the fault by BPFA only. - If Bogie-2 has not been isolated by LP by operating switch 154, then turn off MCE and turn it on and close VCB by raising panto. Act normally. - If the same message comes again then work with half TE/BE. - Notify TLC and enter in logbook.
0276	F0204P2 TRACTION BOGIE-1 FAULTY MOTOR TEMPERATURE SENSORS	Normal operation can continue To be checked during maintenance.	Resume normal operation. Inform TLC and record in the logbook.
0280	Tractive effort without demand at bogie 1	Traction interest set, because tractive effort was detected on bogie 1 without demand.	- Reset traction interlock with master controller in zero position, resume traction. - IF NOT SUCCESSFUL: - Cut out bogie 1 via the display & Continue service. - Report to TLC and record in the logbook
0281	TM1 Temperature sensor faulty or not valid. TM1 Isolated.	TM1 Temperature sensor faulty or not valid. TM1 Isolated.	- Check manually whether traction motor blower-1 is working or not, by checking air suction at TM Louver. Check MCB 53.1/1 in HB1 panel. If found tripped, open VCB and reset MCB once. IF NOT SUCCESSFUL: - Continue service with TM1 isolated. - Report to TLC and record in the logbook.
0282	TM2 Temperature sensor faulty or not valid. TM2 Isolated.	TM2 Temperature sensor faulty or not valid. TM2 Isolated.	- Check manually whether traction motor blower-1 is working or not, by checking air suction at TM Louver. Check MCB 53.1/1 in HB1 panel. If found tripped, open VCB and reset MCB once. IF NOT SUCCESSFUL: - Continue service with TM2 isolated. - Report to TLC and record in the logbook.
0283	TM3 Temperature sensor faulty or not valid. TM3 Isolated.	TM3 Temperature sensor faulty or not valid. TM3 Isolated.	- Check manually whether traction motor blower-1 is working or not, by checking air suction at TM Louver. Check MCB 53.1/1 in HB1 panel. If found tripped, open VCB and reset MCB once. IF NOT SUCCESSFUL: - Continue service with TM3 isolated. - Report to TLC and record in the logbook.
0284	TM4 Temperature sensor faulty or not valid. TM4 Isolated.	TM4 Temperature sensor faulty or not valid. TM4 Isolated.	- Check manually whether traction motor blower-2 is working or not, by checking air suction at TM Louver. Check MCB 53.1/2 in HB-2 panel. If found tripped, open VCB and reset MCB once. IF NOT SUCCESSFUL: - Continue service with TM4 isolated. - Report to TLC and record in the logbook.
0285	TM5 Temperature sensor faulty or not valid. TM5 Isolated.	TM5 Temperature sensor faulty or not valid. TM5 Isolated.	Check manually whether traction motor blower-2 is working or not, by checking air suction at TM Louver. Check MCB 53.1/2 in HB-2 panel. If found tripped, open VCB and reset MCB once. IF NOT SUCCESSFUL:

			- Continue service with TM5 isolated. - Report to TLC and record in the logbook.
0286	TM6 Temperature sensor faulty or not valid. TM6 Isolated.	TM6 Temperature sensor faulty or not valid. TM6 Isolated.	- Check manually whether traction motor blower-2 is working or not, by checking air suction at TM Louver. Check MCB 53.1/2 in HB-2 panel. If found tripped, open VCB and reset MCB once. - IF NOT SUCCESSFUL: - Continue service with TM6 isolated. - Report to TLC and record in the logbook.
0288	F0401P2 Harmonic filter CONTACTOR 8.1 STUCK ON	F0401P2 Harmonic filter FILTER CONTACTOR 8.1 STUCK ON If VCB opens it will not close again	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. - If VCB not closing ask for relief loco.
0290	F0201P2 Traction Bogie 1 EARTH FAULT IN CONVERTER1	F0201P2 Traction Bogie 1 EARTH FAULT IN CONVERTER1 Normal operation can continue To be checked during maintenance	- Reset the CB 127.1/1 & 127.11/1 & Continue Service. - If still not successful: Recycle the locomotive. - Report to TLC and record in the logbook
0305	Traction Motor 4 is isolated.	MOTOR1-BOGIE2 ISOLATED Traction motor 4 is not operational	- Try by MCE ON/OFF once - Resume normal traction - IF NOT SUCCEESFUL: Continue service with TM4 isolated condition - Report to TLC and record in the logbook
0306	Traction Motor TM5 is isolated.	MOTOR2-BOGIE2 ISOLATED Traction motor 5 is not operational	- Try by MCE ON/OFF once - Resume normal traction - IF NOT SUCCEESFUL: Continue service with TM5 isolated condition - Report to TLC and record in the logbook
0307	Traction Motor 6 is isolated.	MOTOR3-BOGIE2 ISOLATED Traction motor 6 is not operational	- Try by MCE ON/OFF once - Resume normal traction - IF NOT SUCCEESFUL: Continue service with TM6 isolated condition - Report to TLC and record in the logbook
0308	F0300P0 BOGIE 2 ISOLATED	F0300P0 Traction bogie 2 BOGIE 2 ISOLATED Only half traction and braking power available	- If bogie-2 is isolated by Driver through (154) switch or DDU then only acknowledge the - isolation message by pressing BPFA. - Switch OFF the Electronics and Switch it ON once again. Raise the panto and close - VCB and resume traction. - If the same message repeats resume normal operation with half traction/braking power. - Inform TLC and record in the logbook.

0309	F0306P1 Traction Bogie 2 CONVERTER 2 COOLANT PRESSURE NOT OK	F0306P1 Traction Bogie 2 CONVERTER 2 COOLANT PRESSURE NOT OK Check oil level Try to close the VCB again	• AUX-2 to be kept isolated and try to close VCB. If problem disappear, work with AUX-2 isolated • If problem persist, BG-2 will get automatically isolated • Check coolant level in converter expansion tank. • If MCB 63.1/2 getting tripped again after resetting it once then do not try to reset the MCB again. BG-2 will get automatically isolated. Work with half traction. • Driver should also inspect the traction converter No.2 coolant pipeline for any sign of damage causing coolant leakage and inspect the coolant cooler blower casing-2 for any sign of damage due to failure of its impeller. In this case it may lead to damage of converter radiator causing coolant leakage and lead to fault message "Converter No.2 coolant pressure low". Then driver should open VCB, lower panto & switch off control electronics. Open MCB 59.1/2, 63.1/2 (all located in HB-2 cubicle). Isolate bogie-2 by putting rotating switch 154. • Energize the loco and work the train with one bogie in service. • Under such condition LSFI will permanently glow if driver isolated the bogie-2 as described in last 2 steps above. Inform TLC and record in loco logbook.
0310	TC 2 coolant level low (Warning)	The coolant level for traction Converter 2 has dropped below the warning level. There may be a leak in the traction Converter 2 coolant loop. If the coolant level drops further, the locomotive will become unoperational.	• Check coolant level in converter expansion tank, located at the converter cubicle. • Inspect the traction converter No.2 coolant pipeline for any sign of damage causing coolant leakage • Inspect the oil cooler blower-2 casing for any sign of damage due to failure of its impeller. In this case it may lead to damage of converter radiator causing coolant leakage. Then driver should open VCB, lower panto & switch off control electronics. Open MCB 59.1/2, 63.1/2 (all located in HB-2 cubicle). Isolate bogie-2 by putting rotating switch 154 at position-II. • Energise the loco and work the train with one bogie in service. Inform • TLC and record in loco logbook.
0311	TC2 coolant level low (Alarm) - Leakage	The coolant level for traction Converter 2 has dropped below the alarm level. There may be a leak in the traction Converter 2 coolant loop. The locomotive is now unoperational.	• Check coolant level in converter expansion tank, located at the converter cubicle. • Inspect the traction converter No.2 coolant pipeline for any sign of damage causing coolant leakage. • Inspect the oil cooler blower-2 casing for any sign of damage due to failure of its impeller. In this case it may lead to damage of converter radiator causing coolant leakage. Then driver should open VCB, lower panto & switch off control electronics. Open MCB 59.1/2, 63.1/2 (all located in HB-2 cubicle). Isolate bogie-2 by putting rotating switch 154 at position-II. • Energise the loco and work the train with one bogie in service. • InformTLC and record in loco logbook.
0312	TC2 \ BG2 is isolated.	Traction Converter 2 and bogie 2 is not available for operation.	• If bogie-2 is isolated by Driver through (154) switch or DDU then only acknowledge the isolation message by pressing BPFA. • Switch OFF the Electronics and Switch it ON once again. Raise the panto & close VCB • VCB and resume traction. • If the same message repeats resume normal operation with half traction/braking power.

			• Inform TLC and record in the logbook.
0313	TC2 inside air temperature sensor faulty	The inside air temperature sensor for traction Converter 2 is faulty.	• Switch OFF the Electronics and Switch it ON once again. Raise the panto and close • VCB and resume traction. • Inform TLC and record in the logbook.
0314	TC2 DC link isolation sw. at earthed position	The traction Converter 2 isolation switch is in the earthed position.	• Earthing switch to placed in the OFF position IF NOT SUCCESSFUL: • Recycle locomotive IF STILL NO SUCCESS: • Report to TLC and record in the logbook
0315	TC 2 is cutout	Traction Converter 2 is cutout, therefore bogie 2 is not operational.	• If bogie-1 is isolated by Driver through (154) switch or DDU then only acknowledge the isolation message by pressing BPFA. • Switch OFF the Electronics and Switch it ON once again. Raise the panto and close VCB and resume traction. • If the same message repeats resume normal operation with half traction/braking power. • Inform TLC and record in the logbook.
0316	TC2 water pressure fault-High/Low	Traction Bogie 2 CONVERTER 2 COOLANT PRESSURE NOT OK. The water circulation pressure for traction Converter 2 is out of bounds. Traction Converter 2 is automatically cut out. Possible cause(s): Circuit Breaker Oil Pump Converter 63.1/2 is off Blockage in the cooling loop	• AUX-2 to be kept isolated and try to close VCB. • If problem disappear, work with AUX-2 isolated. • If problem persist, BG-2 will get automatically isolated. • Check coolant level in converter expansion tank. • If MCB 63.1/2 getting trip again after resetting it once then do not try to reset the MCB again. BG-1 will get automatically isolated. Work with half traction. • Driver should also inspect the traction converter No.2 coolant pipeline for any sign of damage causing coolant leakage and inspect the oil cooler blower-2 casing for any sign of damage due to failure of its impeller. • Open VCB, lower panto & switch off control electronics. Open MCB 59.1/2, 63.1/2 (all located in HB-2 cubicle). Isolate bogie-2 by putting rotating switch 154 at position-II. • Energise the loco and work the train with one bogie in service. • Inform TLC and record in loco logbook.
0317	F1203P2 Auxiliaries HB2 OVERLOAD ON OCB-2	F1203P2 Auxiliaries HB2 OVERLOAD ON OCB-2 Isolate OCB	• Check manually that oil-cooling blower unit-1 is working by checking the air coming out of the radiator in the underframe. • Check MCB 59.1/2 in HB2 panel. If found tripped, open VCB and reset MCB • Driver should also inspect the oil cooler blower motor-2 impeller and casing for any sign of damage. If found damaged, then driver should open VCB, lower panto and switch off control electronics. • Open MCB 59.1/2, open MCB 52.1/2 & MCB 63.1/2 (all located in HB2 cubicle). Then isolate bogie-2 by bogie isolating switch 154 (located in SB- 1) cubicle. • Energise the loco and work the train with one bogie in service. Under such condition, • LSF1 will glow permanently. Inform to TLC and record in Loco logbook.

0318	TC2 water pressure fault	The water circulation pressure for traction Converter 2 is out of bounds. Traction Converter 1 is automatically cut out. Possible cause(s): * Circuit Breaker Oil Pump Converter 63.1/2 is off * Blockage in the cooling loop	• AUX-2 to be kept isolated and try to close VCB. • If problem disappear, work with AUX-2 isolated. • If problem persist, BG-2 will get automatically isolated. • Check coolant level in converter expansion tank. • If MCB 63.1/2 getting trip again after resetting it once then do not try to reset the MCB again. BG-I will get automatically isolated. Work with half traction. • Driver should also inspect the traction converter No.2 coolant pipeline for any sign of damage causing coolant leakage and inspect the oil cooler blower-2 casing for any sign of damage due to failure of its impeller. • Open VCB, lower panto & switch off control electronics. Open MCB 59.1/2, 63.1/2 (all located in HB-2 cubicle). Isolate bogie-2 by putting rotating switch 154 at position-II. • Energise the loco and work the train with one bogie in service. Inform TLC and record in loco logbook.
0319	F0704P1 BOGIE2 VENTILATION AUX-2 DISTURBED	F0704P1 BOGIE2 VENTILATION AUX-2 DISTURBED Press acknowledge to reconfigure to ACI1	• Switch OFF the electronics and Switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated, resume normal operation with AUX-2 isolated. • Inform TLC and record in the logbook.
0320	TC2 manual cut-in not possible	It is not possible the manually cut in traction Converter 1. Possible cause(s): * TCU 2 is not switched ON via Circuit Breaker TCU2 127.11/2 * Traction converter is permanently cut due to other subsystem failures.	• Switch on TCU 2 via Circuit Breaker TCU2 127.11/1 IF NOT SUCCESSFUL: • Check crew messages for other faults that can lead to traction container cut out. • IF STILL NO SUCCESS: Continue service with TC 2 cut out • Report to TLC and record in the logbook
0322	F0304P2 Traction Bogie 2 FAULTY MOTOR TEMERATURE SENSOR	F0304P2 Traction Bogie 2 FAULTY MOTOR TEMERATURE SENSOR * Normal operation can continue * To be checked during maintenance	• Resume normal operation. • Inform TLC and record in the logbook.
0328	Tractive effort without demand at bogie 2	Traction interset, because tractive effort was detected on bogie 2 without demand.	• Reset traction interlock with master controller in zero position If not successful: • Cut out bogie 2 via the display & Continue service
0330	F0206P2 TCC1 DC LINK CAPACITORS PRESSURE NOT OK	F0206P2 Traction bogie 1 DC LINK CAPACITORS PRESSURE NOT OK Normal operation can continue To be checked during maintenance	• Recycle Circuit breaker 127.11/1 (TCU_ELECTRONICS CONVERTER 1). If not successful: • Continue service with TCC2 • Report to TLC & record in logbook
0331	F0306P2 TCC2 DC LINK CAPACITORS PRESSURE NOT OK	F0306P2 DC LINK CAPACITORS PRESSURE NOT OK Normal operation can continue To be checked during maintenance.	• Recycle Circuit breaker 127.11/2 (TCU_ELECTRONICS CONVERTER 2). • If not successful : Continue service with TCC1 & Clear the section & report to TLC
0338	F0301P2 Traction Bogie 2 EARTH FAULT IN CONVERTER 2	F0301P2 Traction Bogie 2 EARTH FAULT IN CONVERTER 2 Normal operation can continue To be checked during maintenance	• Bring throttle to neutral position. • Recycle Circuit breaker 127.11/2 (TCU_ELECTRONICS CONVERTER 2). • If not successful : Continue service with TCC1 & Clear the section & report to TLC
0353	TCU1 switched OFF via CB (127.11/1)	TCU1 switched OFF via CB (127.11/1)	• Check for any TC1 related message. • Check the CB status 127.11/1(TCU_Electronics Converter 1) in TCU Panel. • If CB is off condition, Switch ON 127.11/1 from TCU Panel. Continue Service
0354	TCU2 switched OFF via CB (127.11/2)	TCU2 switched OFF via CB (127.11/2)	• Check for any TC2 related message. • Check the CB status 127.11/2(TCU_Electronics Converter 1) in TCU Panel. • If CB is off condition, Switch ON 127.11/2 from TCU Panel. Continue Service

0355	Please switch off Circuit Breaker TCU1 (127.11/1)	TCU 1 isolation is required. Further Locomotive operation is possible only after Circuit Breaker TCU1 (127.11/1) was switched off.	• There could be serious fault in TC1 • Switch off Circuit Breaker TCU1 (127.11/1) and try to close the VCB. • Continue Service. • If still not successful: Report to TLC and record in the logbook
0356	Please switch off Circuit Breaker TCU2 (127.11/2)	TCU 2 isolation is required. Further Locomotive operation is possible only after Circuit Breaker TCU2 (127.11/2) was switched off.	• Switch off Circuit Breaker TCU2 (127.11/2) and try to close the VCB. • If successful: Continue Service. • If still not successful: Recycle the locomotive. • If still not successful: Report to TLC and record in the logbook
0357	F0106P1 FILTER ON/OFF CONTACTOR STUCK ON	F0106P1 FILTER ON/OFF CONTACTOR STUCK ON VCB will not close again	• If VCB opens, it will not close again. Bring Throttle to 0. • Switch OFF the Electronics and Switch it ON once again. • Raise panto and close VCB and resume Traction if loco get normal. • Harmonic filter get isolated automatically. Driver can work at 40 KMPH.
0361	TCU 1 Isolated	Traction Bogie 1 DISTURBANCE IN CONVERTER1. TCU 1 is not available for operation. Further operation is not possible until TCU 1 has been isolated.	• Check for any TC1 related message. • Recycle Circuit Breaker TCU1 (127.11/1) and try to Normalize TCU 1. • If successful, Continue Service. • If still not successful: Try by MCE ON/OFF once. • Report to TLC and record in the logbook
0362	TCU 2 Isolated	Traction Bogie 2 DISTURBANCE IN CONVERTER2 TCU 2 is not available for operation. Further operation is not possible until TCU 2 has been isolated.	• Check for any TC2 related message. • Recycle Circuit Breaker TCU1 (127.11/2) and try to Normalize TCU 2. • If successful: Continue Service. • If still not successful: Try by MCE ON/OFF once. • If still not successful: Report to TLC and record in the logbook
0363	Reduce the TE demand – Excess load on gear system	The gear system is overloaded, please reduce traction demand. If traction demand is not reduced, the gear system may be damaged.	• Check for traction motor and bogie for any damage. • Check by isolating each TC. If still not successful: • Continue service with reduced TE
0364	Power reduction is active	Power reduction is active. Possible cause(s): * Transformer protection active * Overtemperature in locomotive control system	• Check for the transformer temperature or other related messages. • Check for any control system over temperature related messages. • Try by MCE ON/OFF once and continue service. If not successful: • Report to TLC and record in the logbook
0365	Both Bogies / TCs are isolated.	Both bogies are not available for operation.	• Check for ant TC related messages. • Recycle the locomotive : Check bogie/TC status in TOD. • If both are operational, continue service. • If still issue : Report to TLC and ask for relief locomotive.
0366	TCU Master conflict	TCU master assignment encountered conflict.	• Reset Circuit Breaker TCU1 (127.11/1) and TCU2 (127.11/2) If not successful: • Continue service with one bogie. • Report to TLC and record in the logbook
0368	Traction release fault (AGT)	At least one TCU reports a fault in the traction release (AGT).	• Try by MCE ON/OFF once. • IF FAULT IS STILL ACTIVE AND ONE BOGIE IS AVAILABLE: • Cut off the faulty bogie at the display and continue travel. • IF BOTH BOGIES ARE FAULTY: Report to TLC and record in the logbook

0369	415/110 Circuit fuse open.	No feedback from Fuse Auxiliaries 415V/110V	• Replace the fuse and continue service. • Report to TLC and record in the log book.
0370	Aux 1 M1300 power supply faulty or Internal error. AUX 1 isolated.	Aux 1 M1300 power supply faulty or Internal error, Aux 1 Isolated. * Aux 1 is cutout. * The auxiliary loads are shifted to Aux 2 & Aux 3.	• Check MCB No. 127.22/1 in SB-1. If found tripped, reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated. • Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0371	AUX 1 rectifier input voltage not in range, AUX1isolated	AUX 1 rectifier input voltage not in range, AUX1 isolated. * Rectifier Input voltage too low or too high. Aux 1 is cutout. The auxiliary loads are shifted to Aux 2 & Aux 3.	• Check MCB No. 127.22/1 in SB-1. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated. • Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0372	AUX 1 DC-Link voltage not in range or DC-Link earthed, AUX 1 isolated.	AUX 1 DC-Link voltage not in range, AUX 1 isolated. * Auxiliary 1 is cutout. The auxiliary loads are shifted to Aux 2 & Aux 3. AUX 1 DC-Link voltage too low or too high.	• Check MCB No. 127.22/1 in SB-1. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated. • Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0373	AUX 1 output voltage not in range, AUX 1 isolated.	AUX 1 output voltage not in range, AUX 1 isolated, * AUX 1 is isolated. The auxiliary loads are shifted to Aux 2 & Aux 3 * AUX 1 output voltage too low or too high.	• Check MCB No. 127.22/1 in SB-1. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated. • Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0374	AUX 1 master or rectifier temperature sensor Faulty, AUX1 Isolated.	Aux 1 Temperature faulty: * M1300 Temperature Faulty. * Rectifier Temperature Sensor Faulty. * AUX 1 Inverter temperature sensor faulty * Auxiliary 1 is cutout. The auxiliary loads are shifted to Aux 2 & Aux 3.	• Check MCB No. 127.22/1 in SB-1. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated. • Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0375	AUX 1 Communication Error, AUX1 Isolated.	Aux 1 Internal Communication Error due to below: * ACU1 master code Connector M1300. * ACU1 master CAN1-Bus fault. * ACU3 master MVB Hardware error. * The auxiliary loads are shifted to Aux 2 & Aux 3.	• Check MCB No. 127.22/1 in SB-1. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated.

			• Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0376	Battery charger diagnosis triggered	The battery charger has reported an internal diagnostics error. No further action is required.	• Switch OFF the Electronics and Switch it ON once again. Raise panto and close VCB. • If the Fault still persists, acknowledge the fault and inform TLC that battery is not being charged. • Loco can work till battery voltage drops to 86 V.
0377	AUX 1 Inverter input voltage sensor Faulty or Invalid, AUX1 Isolated.	AUX 1 Inverter input voltage sensor Faulty or Invalid for below mentioned components: * AUX 1 Inverter input or output voltage difference. * AUX 1 Inverter voltage sensors faulty	• Check MCB No. 127.22/1 in SB-1. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and • resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated. • Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0379	AUX1 Overcurrent detected	Aux-converter1 FAULT IN AUXILIARY CONVERTER 1 Auxiliary converter 1 has detected an over current.	• Press BLDJ to close VCB. • If fault persists Try by MCE ON/OFF once • Check by isolating AUX-1 through 127.22/1 in SB-1. • If fault gone, continue service with the AUX in redundancy mode. • Repetitive fault could Lock VCB IF NOT SUCCESSFUL: • Report to TLC and record in the logbook
0380	AUX2 Overcurrent detected	Aux-converter 2 FAULT IN AUXILIARY CONVERTER 2 Auxiliary converter 2 has detected an over current.	• Press BLDJ to close VCB. • If fault persists Try by MCE ON/OFF once • Check by isolating AUX-2 through 127.22/2 in SB-2. • If fault gone, continue service with the AUX in redundancy mode. • Repetitive fault could lock VCB IF NOT SUCCESSFUL: • Report to TLC and record in the logbook
0381	AUX 3 Overcurrent detected	Aux-converter 3 FAULT IN AUXILIARY CONVERTER 3 Auxiliary converter 3 has detected an over current.	• Press BLDJ to close VCB. • If fault persists Try by MCE ON/OFF once • Check by isolating AUX-3 through 127.22/3 in SB-2. • If fault gone, continue service with the AUX in redundancy mode. • Repetitive fault could lock VCB IF NOT SUCCESSFUL: • Report to TLC and record in the logbook
0382	AUX overcurrent VCB locked.	Main Power MAIN POWER ISOLATED VCB locked due to AUX overcurrent	• Try by MCE ON/OFF once • Press BLDJ to close VCB IF NOT SUCCESSFUL: • Report to TLC and record in the logbook
0383	AUX 1 Load overload or short circuited, AUX 1isolated.	AUX 1 Load overload or short circuited, AUX 1 isolated: * Auxiliary 1 is cutout. The auxiliary loads are shifted to Aux 2 & Aux 3 * AUX 1 output overloaded or short circuited. * AUX 1 output sine filter error or phase error.	• Check MCB No. 127.22/1 in SB-1. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated.

			• Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0384	Aux 2 M1300 power supply faulty or Internal error. AUX 2 Isolated	Aux 2 M1300 power supply faulty or Internal error, Aux 2 Isolated. * Aux 2 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 3.	• Check MCB No. 127.22/2 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-2 isolated. • Energize the loco and work the train with AUX-2 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0385	AUX 2 Master or Rectifier Temperature sensor Faulty, AUX2 Isolated.	Aux 2 Temperature faulty: * Master Temperature Faulty. * Rectifier Temperature Sensor Faulty * Auxiliary 2 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 3.	• Check MCB No. 127.22/2 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-2 isolated. • Energize the loco and work the train with AUX-2 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0386	AUX 2 Communication Error, AUX2 Isolated.	Aux 2 Internal Communication Error due to below: * ACU2 master code Connector M1300. * ACU2 master CAN1-Bus fault. * ACU2 master MVB Hardware error * The auxiliary loads are shifted to Aux 1 & Aux 3.	• Check MCB No. 127.22/2 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-2 isolated. • Energize the loco and work the train with AUX-2 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0387	AUX 2 Inverter input voltage sensor Faulty or Invalid, AUX2 Isolated.	AUX 2 Inverter voltage sensor Faulty or Invalid for below mentioned components: * AUX 2 Inverter input or output voltage difference. * AUX 2 Inverter voltage sensors	• Check MCB No. 127.22/2 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-2 isolated. • Energize the loco and work the train with AUX-2 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook..
0388	AUX 2 rectifier input voltage not in range, AUX 2 isolated.	AUX 2 rectifier input voltage not in range, AUX 2 isolated. * Rectifier Input voltage too low or too high. * Aux 2 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 3.	• Check MCB No. 127.22/2 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-2 isolated. • Energize the loco and work the train with AUX-2 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0389	Aux 3 M1300 power supply faulty or Internal error. AUX 3 isolated.	Aux 3 M1300 power supply faulty or Internal error, Aux 3 Isolated. * Aux 3 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 2.	• Check MCB No. 127.22/3 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-3 isolated.

			• Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0390	AUX 3 Master or Rectifier Temperature Faulty, AUX3 Isolated.	Aux 3 Temperature faulty: * Master Temperature sensor Faulty. * Rectifier Temperature Sensor Faulty. Auxiliary 3 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 2.	• Check MCB No. 127.22/3 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-3 isolated. • Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0391	AUX 3 Communication Error, AUX3 Isolated.	Aux 3 Internal Communication Error due to below: * ACU 3 master code Connector M1300. * ACU 3 master CAN1-Bus fault. * ACU 3 master MVB Hardware error. * The auxiliary loads are shifted to Aux 1 & Aux 2	• Check MCB No. 127.22/3 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-3 isolated. • Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0392	AUX 3 Inverter input voltage sensor Faulty or Invalid, AUX 3 Isolated.	AUX 3 Inverter voltage sensor Faulty or Invalid for below mentioned components: * AUX 3 Inverter input or output voltage difference. AUX 3 Inverter voltage sensors faulty.	• Check MCB No. 127.22/3 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-3 isolated. • Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0393	AUX 3 rectifier input voltage not in range, AUX 3 isolate	AUX 3 rectifier input voltage not in range, AUX 3 isolated. * Rectifier Input voltage too low or too high. Aux 3 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 2.	• Check MCB No. 127.22/3 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-3 isolated. • Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0394	AUX 2 DC-Link voltage not in range or DC-Link earthed,	AUX 2 DC-Link voltage not in range, AUX 2 isolated. * Aux 2 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 3. * AUX 2 DC-Link voltage too low or too high.	• Check MCB No. 127.22/2 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated. • Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0395	AUX 2 output voltage not in range, AUX 2 isolated.	AUX 2 output voltage not in range, AUX 2 isolated, * AUX 2 is isolated. The auxiliary loads are shifted to Aux 1 & Aux 3 * AUX 2 output voltage too low or too high.	• Check MCB No. 127.22/2 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-2 isolated.

			• Energize the loco and work the train with AUX-2 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0396	AUX 2 Load overload or short circuited, AUX 2 isolated.	AUX 2 Load overload or short circuited, AUX 2 isolated: * Aux 2 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 3 * AUX 2 output overloaded or short circuited. * AUX 2 output sine filter error or phase error.	• Check MCB No. 127.22/2 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-2 isolated. • Energize the loco and work the train with AUX-2 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0397	AUX 3 DC-Link voltage not in range or DC-Link earthed,	AUX 3 DC-Link voltage not in range, AUX 3 isolated. * Auxiliary 3 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 2. * AUX 1 DC-Link voltage too low or too high.	• Check MCB No. 127.22/3 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-3 isolated. • Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0398	AUX 3 output voltage not in range, AUX 3 isolated.	AUX 3 output voltage not in range, AUX 3 isolated, * AUX 3 is isolated. The auxiliary loads are shifted to Aux 1 & Aux 2 * AUX 3 output voltage too low or too high.	• Check MCB No. 127.22/3 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-3 isolated. • Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0399	AUX 3 Load overload or short circuited, AUX 3 isolated.	AUX 3 Load overload or short circuited, AUX 3 isolated: * Aux 3 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 2. * AUX 3 output overloaded or short circuited. * AUX 3 output sine filter error or phase error.	• Check MCB No. 127.22/3 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise Panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-3 isolated. • Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0400	AUX1 DC-link Current min/max detected.	AUX1 DC-link Current min/max detected, AUX 1 isolated: * Aux 1 is cutout. The auxiliary loads are shifted to Aux 2 & Aux 3.	• Check MCB No. 127.22/1 in SB-1. reset it once. • Switch OFF the electronics and switch it ON once again. Raise Panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated. • Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0401	AUX1: Permanent fault	Reserve	• Check MCB No. 127.22/1 in SB-1. reset it once. • Switch OFF the electronics and switch it ON once again. Raise Panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-1 isolated. • Energize the loco and work the train with AUX-1 isolated. Under such condition LSFI will glow permanently.

			• Inform TLC and record in the logbook.
0410	AUX1: Request for auxiliaries load shedding	Due to overload, a reduction in auxiliaries consumers is necessary. The supplementary heaters as well as the air conditioner both driver's cabs are to be shut down.	• Switch off the loads by switching off one by one • Check which load causing over current. IF NOT SUCCESSFUL: • Report to TLC and record in the logbook
0411	AUX2: Request for auxiliaries load shedding	Due to overload, a reduction in auxiliaries consumers is necessary. The supplementary heaters as well as the air conditioner both driver's cabs are to be shut down.	• Switch off the loads by switching off one by one • Check which load causing over current. • IF NOT SUCCESSFUL: Report to TLC and record in the logbook
0412	VCB locked: AUX1 overload -> cutout TCU1 and bogie 1 consumers	Traction Bogie 1 DISTURBANCE IN CONVERTER1 Due to overload of the AUX2 Transformer, a reduction in auxiliaries consumers is necessary. The TCU 1 consumers and bogie 1 are to be shut down.	• To release the VCB, shut down following CB's: a. Traction motor blower 1 (53.1/1) b. Scavenge blower 1 (55.1/1) c. Cooling unit 1 (59.1/1) d. Oil pump 1 (62.1/1) e. Coolant pump 1 (63.1/1) f. TCU1 (127.11/1) • Continue service with TCU1 cutout: Report to TLC and record in the logbook
0413	VCB locked: AUX2 overload -> cutout TCU2 and bogie 2 consumers	Traction Bogie 2 DISTURBANCE IN CONVERTER1 Due to overload of the AUX1 Transformer, a reduction in auxiliaries consumers is necessary. The TCU 2 consumers and bogie 1 are to be shut down.	• To release the VCB, shut down following CB's: g. Traction motor blower 2 (53.1/2) h. Scavenge blower 2 (55.1/2) i. Cooling unit 2 (59.1/2) j. Oil pump 2 (62.1/2) k. Coolant pump 2 (63.1/2) l. TCU2 (127.11/2) • Continue service with TCU2 cutout: Report to TLC and record in the logbook
0421	F0603P1 Aux-converter1 CONTACTOR FAULT IN AUX-CONV 1/HB1	F0603P1 Aux-converter1 CONTACTOR FAULT IN AUX-CONV 1/HB1	• Press BLDJ to close VCB. • If fault still persist, then ACI-1 will get isolated. • Driver should continue normal operation till next schedule stop.
0422	F0703P1 Aux-converter2 CONTACTOR FAULT IN AUX-CONV 2/HB2 Contactor 52/1/2/4 stuck off or ON	F0703P1 Aux-converter2 CONTACTOR FAULT IN AUX-CONV 2/HB2	• Press BLDJ to close VCB. • If fault still persist, then ACI-2 will get isolated. • Driver should continue normal operation till next schedule stop.
0423	Auxiliaries in redundancy mode	Only a single auxiliary converter supplies power to the auxiliary consumers. All consumers operate on 50 Hz.	• This message only for information of AUX operating in redundancy mode. • Check for any failure related to AUX. • Continue service with AUX redundancy mode. • Report to TLC and record in the logbook
0424	Auxiliary contactor fault	One or more of the AUX contactors (-Q01 / -K01 /-K02 / -K03) are faulty.	• Press BLDJ to close the VCB. • Continue normal service If not successful: Continue service with AUX redundancy mode. • Report to TLC and record in the logbook.
0425	Auxiliary contactor -K01 fault	AUX contactors (-K01) is faulty, to reclose the VCB: Check the Aux related control wiring and switch off the Aux loads. (Traction motor blower, Scavenge blower)	• Press BLDJ to close the VCB. • Continue normal service If not successful: Continue service with AUX redundancy mode. • Report to TLC and record in the logbook.

0426	Auxiliary contactor -K02 fault	AUX contactors (-K02) is faulty, to reclose the VCB: Check the Aux related control wiring and switch off the Aux loads (Traction motor blower, Scavenge blower)	- Press BLDJ to close the VCB. - Continue normal service If not successful: Continue service with AUX redundancy mode. - Report to TLC and record in the logbook
0427	VCB off due to aux Inverter	VCB off due to aux Inverter: Aux. reconfigure is active. Aux1 is disconnected/not available Aux2 is disconnected/not available. Aux redundancy mode activated.	- Press BLDJ to close the VCB & Continue service. - IF NOT SUCCESSFUL: Try by MCE ON/OFF once. - Report to TLC and record in the logbook
0430	AUX 2 DC-link Current min/max detected.	AUX 2 DC-link Current min/max detected, AUX 2 isolated: * Aux 2 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 3.	- Check MCB No. 127.22/2 in SB-2. reset it once. - Switch OFF the electronics and switch it ON once again. Raise Panto, close VCB and resume traction if loco gets normal. - If the same message repeated resume normal operation with AUX-2 isolated. - Energize the loco and work the train with AUX-2 isolated. Under such condition LSFI will glow permanently. - Inform TLC and record in the logbook.
0431	AUX 3 DC-link Current min/max detected.	AUX 3 DC-link Current min/max detected, AUX 3 isolated: * Aux 3 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 2.	- Check MCB No. 127.22/3 in SB-2. reset it once. - Switch OFF the electronics and switch it ON once again. Raise Panto, close VCB and resume traction if loco gets normal. - If the same message repeated resume normal operation with AUX-3 isolated. - Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. - Inform TLC and record in the logbook.
0432	AUX 1 input fuse opened.	AUX 1 Input fuse opened, AUX 1 isolated: * Aux 1 is cutout. The auxiliary loads are shifted to Aux 2 & Aux 3.	- Continue service with AUX-1 isolated. Under such condition LSFI will glow permanently - Report to TLC and record in the loco logbook
0433	AUX 2 input fuse opened.	AUX 2 Input fuse opened, AUX 2 isolated: * Aux 2 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 3.	- Continue service with AUX-2 isolated. Under such condition LSFI will glow permanently - Report to TLC and record in the loco logbook
0434	AUX 3 input fuse opened.	AUX 3 Input fuse opened, AUX 3 isolated: * Aux 3 is cutout. The auxiliary loads are shifted to Aux 1 & Aux 2.	- Continue service with AUX-3 isolated. Under such condition LSFI will glow permanently - Report to TLC and record in the loco logbook
0435	F0602P1 Aux-converter1 FAULT IN AUXILIARY CONVERTER 1	F0602P1 Aux-converter1 FAULT IN AUXILIARY CONVERTER 1 & Try to close VCB again	Press BLDJ to close VCB.
0436	F0702P1 Aux-converter2 FAULT IN AUXILIARY CONVERTER 2	F0702P1 Aux-converter2 FAULT IN AUXILIARY CONVERTER 2 & Try to close VCB again	Press BLDJ to close VCB.
0437	F0802P1 Aux-converter3 FAULT IN AUXILIARY CONVERTER 3	F0802P1 Aux-converter3 FAULT IN AUXILIARY CONVERTER 3 & Try to close VCB again	Press BLDJ to close VCB.
0450	Auxiliary 2 contactor 52/1 failed to Pickup/Dropout	Aux-converter2 CONTACTOR FAULT IN AUX-CONV 2/HB One of the following problems occurred: * Contactor tips melted * Wiring on contactor fault * Contactor coil damaged	- Press BLDJ to close VCB. - If fault still persist, then AUX-2 will get isolated. - Driver should continue normal operation till appropriate stop

0451	Auxiliary 2 contactor 52/2 failed to Pickup/Dropout	Aux-converter2 CONTACTOR FAULT IN AUX-CONV 2/HB One of the following problems occurred: * Contactor tips melted * Wiring on contactor fault * Contactor coil damaged	- Press BLDJ to close VCB. - If fault still persist, then AUX-2 will get isolated. - Driver should continue normal operation till appropriate stop
0452	F0803P1 Aux-converter3 CONTACTOR FAULT IN AUX-CONV 3	F0803P1 Aux-converter3 CONTACTOR FAULT IN AUX-ONV 3 Contactor 52/3 stuck off or on	- Press BLDJ to close VCB. - If fault still persist, then AUX-3 will get isolated. - Driver should continue normal operation till appropriate stop
0453	Auxiliary 1 contactor 52/4 failed to Pickup/Dropout	Aux-converter1 CONTACTOR FAULT IN AUX-CONV 1/HB1 One of the following problems occurred: * Contactor tips melted * Wiring on contactor fault * Contactor coil damaged	- Press BLDJ to close VCB. - If fault still persist, then AUX-1 will get isolated. - Driver should continue normal operation till appropriate stop
0454	Auxiliary 2 contactor 52/4 failed to Pickup/Dropout	Aux-converter2 CONTACTOR FAULT IN AUX-CONV 2/HB One of the following problems occurred: * Contactor tips melted * Wiring on contactor fault * Contactor coil damaged	- Press BLDJ to close VCB. - If fault still persist, then AUX-2 will get isolated. - Driver should continue normal operation till appropriate stop
0455	Auxiliary 1 contactor 52/5 failed to Pickup/Dropout	Aux-converter1 CONTACTOR FAULT IN AUX-CONV 1/HB1 One of the following problems occurred: * Contactor tips melted * Wiring on contactor fault * Contactor coil damaged	- Press BLDJ to close VCB. - If fault still persist, then AUX-1 will get isolated. - Driver should continue normal operation till appropriate stop
0456	F0109P1 AUXILIARY WINDING OVERCURRENT	F0109P1 AUXILIARY WINDING OVERCURRENT Try to close VCB again	- Press BLDJ to close the VCB - If problem not repeated, resume normal traction IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0460	F0600P0 AUXILIARY CONVERTER 1 ISOLATED	F0600P0 AUXILIARY CONVERTER 1 ISOLATED Auxiliary 1 is cutout. The auxiliary loads are shifted to Aux 2 & Aux 3. Driving still possible	- Check for any failure recorded for AUX1. - Check MCB No. 127.22/1 in SB-1. reset it once. - Switch OFF the electronics and switch it ON once again. Raise Panto, close VCB and resume traction if loco gets normal. - If the same message repeated resume normal operation with AUX-1 isolated. - Energize the loco and work the train with AUX-1 isolated. Under such condition LSF1 will glow permanently. - Inform TLC and record in the logbook.
0461	F0700P0 AUXILIARY CONVERTER 2 ISOLATED	F0700P0 AUXILIARY CONVERTER 2 ISOLATED The aux loads are shifted to Aux 1 & Aux 3. Driving still possible	- Check for any failure recorded for AUX2. - Check MCB No. 127.22/2 in SB-2. reset it once. - Switch OFF the electronics and switch it ON once again. Raise Panto, close VCB and resume traction if loco gets normal. - If the same message repeated resume normal operation with AUX-2 isolated. - Energize the loco and work the train with AUX-3 isolated. Under such condition LSF1 will glow permanently. - Inform TLC and record in the logbook.

0462	F0800P0 AUXILIARY CONVERTER 3 ISOLATED	F0800P0 AUXILIARY CONVERTER 3 ISOLATED The aux loads are shifted to Aux 1 & Aux 2. Driving still possible	• Check for any failure recorded for AUX3. • Check MCB No. 127.22/3 in SB-2. reset it once. • Switch OFF the electronics and switch it ON once again. Raise Panto, close VCB and resume traction if loco gets normal. • If the same message repeated resume normal operation with AUX-3 isolated. • Energize the loco and work the train with AUX-3 isolated. Under such condition LSFI will glow permanently. • Inform TLC and record in the logbook.
0497	CB Traction motor blower 1 is off	Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1 The circuit breaker 53.1/1 "Traction motor blower 1" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB1. If MCB 53.1/1 "Traction motor blower 1" found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • Inform TLC and record in loco logbook.
0498	CB Traction motor blower 2 is off	Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2 The circuit breaker 53.1/2 "Traction motor blower 2" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB2. If MCB 53.1/2 "Traction motor blower 2" found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • Inform TLC and record in loco logbook.
0499	CB TM Scavenge blower 1 is off	Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1. The circuit breaker 55.1/1 "TM Scavenge blower 1" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB1. If 55.1/1 "TM Scavenge blower 1" found tripped, then reset it once after opening VCB. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • Inform TLC and record in loco logbook.
0500	CB TM Scavenge blower 2 is off	Auxiliaries HB2 MCB(S) TRIPPED IN Auxiliary CUBICLE 2. The circuit breaker 55.1/2 "TM Scavenge blower 2" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB2. If 55.1/2 "TM Scavenge blower 2" found tripped, then reset it once after opening VCB. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • Inform TLC and record in loco logbook.

0501	CB MR Scavenge blower 1 is off	Auxiliaries HB1 MCB(S) TRIPPED IN Auxiliary CUBICLE 1. The circuit breaker 56.1/1 "MR Scavenge blower 1" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB1. If MCB 56.1/1 "MR Scavenge blower 1" found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • Inform TLC and record in loco logbook.
0502	CB MR Scavenge blower 2 is off	Auxiliaries HB1 MCB(S) TRIPPED IN Auxiliary CUBICLE 1 The circuit breaker 56.1/2 "MR Scavenge blower 2" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB2. If MCB 56.1/2 "MR Scavenge blower 2" found tripped, then reset it once after opening VCB. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • Inform TLC and record in loco logbook.
0503	CB MR blower 1 is off	Auxiliaries HB1 MCB(S) TRIPPED IN Auxiliary CUBICLE 1 The circuit breaker 54.1/1 "Machine room blower 1" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB1. If MCB 54.1/1 "Machine room blower 1" found tripped, then reset it once after opening VCB. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • Inform TLC and record in loco logbook.
0504	CB MR blower 2 is off	Auxiliaries HB1 MCB(S) TRIPPED IN Auxiliary CUBICLE 1. The circuit breaker 54.1/2 "Machine room blower 2" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB2. If MCB 54.1/2 "Machine room blower 2" found tripped, then reset it once after opening VCB. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • Inform TLC and record in loco logbook.
0505	F1103P2 Auxiliaries HB1 MCB OFF MAIN COMPRESSOR OPEN	F1103P2 Auxiliaries HB1 MCB OFF MAIN COMPRESSOR OPEN Compressor 1 not available	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB1. If MCB 47.1/1 "Main Compressor 1", found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver ensure that cut-out cock of the unloader valve is open. should not try to reset these MCBs. IF NOT SUCCESSFUL: Operate with one compressor. • Observe main reservoir pressure. Possibly, reduce air consumption by switching off pneumatic consumers.

			Report the issue to TLC and record in loco logbook.
0506	F1202P2 Auxiliaries HB2 MCB OF MAIN COMPRESSOR OPEN	F1202P2 Auxiliaries HB2 MCB OF MAIN COMPRESSOR OPEN Compressor 2 not available	- Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. - Check MCB in Auxiliary cubicle HB2. If MCB 47.1/2 "Main Compressor 2", found tripped then reset it once after opening VCB. - If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. - If MCB getting tripped after resetting it once above, then driver ensure that cut-out cock of the unloader valve is open. should not try to reset these MCBs. IF NOT SUCCESSFUL: Operate with one compressor. - Observe main reservoir pressure. Possibly, reduce air consumption by switching off pneumatic consumers. - Report the issue to TLC and record in loco logbook.
0507	CB Cooling unit 1 is off	Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1 The circuit breaker 59.1/1 "Cooling unit 1 blower" is off.	- Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. - Check MCB in Auxiliary cubicle HB1. If MCB 59.1/1 "Cooling unit 1 blower", found tripped then reset it once after opening VCB. - If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. - If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: - Aux-1 to be isolated by tripping MCB 127.22/1 located in SB-1. - Keeping Aux-1 isolated, Cooling unit1 blower will work on Aux-2 if Blower didn't work, switch off the blower MCB CB 59.1/1 - Report the issue to TLC and record in loco logbook.
0508	CB Cooling unit 2 is off	Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2 The circuit breaker 59	- Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. - Check MCB in Auxiliary cubicle HB2. If MCB 59.1/2 "Cooling unit 2 blower", found tripped then reset it once after opening VCB. - If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. - If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: - Aux-1 to be isolated by tripping MCB 127.22/2 located in SB-1. - Keeping Aux-1 isolated ,Cooling unit1 blower will work on Aux-2 if Blower didn't work ,switch off the blower MCB CB 59.1/2 - Report the issue to TLC and record in loco logbook.
0509	CB trafo oil pump 1 is off	Auxiliaries HB1 MCB(S) TRIPPED IN Auxiliaries CUBICLE 1 The circuit breaker 62.1/1 "Transformer oil pump 1" is off.	- Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. - Check MCB in Auxiliary cubicle HB1. If MCB 62.1/1 "Transformer oil pump 1", found tripped then reset it once after opening VCB. - Check manually if transformer oil pump are working by touching the pump outlet and inlet pipes in the under frame. - If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB.

			• If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Inform the TLC before operate the loco with one bogie.
0510	CB trafo oil pump 2 is off	Auxiliaries HB2 MCB(S) TRIPPED IN Auxiliaries CUBICLE 2 The circuit breaker 62.1/2 "Transformer oil pump 2" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB2. If MCB 62.1/2 "Transformer oil pump 2", found tripped then reset it once after opening VCB. • Check manually if transformer oil pump are working by touching the pump outlet and inlet pipes in the under frame. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Inform the TLC before operate the loco with one bogie.
0511	CB Coolant pump 1 is off	Auxiliaries HB1 MCB(S) TRIPPED IN Auxiliaries CUBICLE 1 The circuit breaker 63.1/1 "Traction converter coolant pump 1" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB1. If MCB 63.1/1 "Traction converter coolant pump 1", found tripped then reset it once after opening VCB. • Check manually if oil pump is working by touching the pump outlet and inlet pipes in the under frame. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Cut out bogie 1 through switch 154 in SB1. • Switch off TCU 1 via CB 127.11/1 • Inform to TLC and record in the log book. • Continue service with bogie 1 cut out
0512	CB Coolant pump 2 is off	Auxiliaries HB2 MCB(S) TRIPPED IN Auxiliaries. CUBICLE 2 The circuit breaker 63.1/2 "Traction converter coolant pump 2" is off.	• Acknowledge the fault by pressing BPFA and continue normal operation till block section is cleared. • Check MCB in Auxiliary cubicle HB2. If MCB 63.1/2 "Traction converter coolant pump 2", found tripped then reset it once after opening VCB. • Check manually if oil pump is working by touching the pump outlet and inlet pipes in the under frame. • If MCB is not tripped but still message is coming and all auxiliaries are working, ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Cut out bogie 1 through switch 154 in SB1. • Switch off TCU 2 via CB 127.11/2 & Continue service with bogie 2 cut out. • Inform to TLC and record in the log book.

0513	CB Ext.IO 11 is off	The circuit breaker 127.9/1 "Ext.IO 11" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in SB1. If circuit breaker 127.9/1 "Ext.IO 11" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Enable Limited drive mode from display, this will switch over to redundancy mode. • Inform to TLC and record in the log book & Continue service • Note: Operation restriction to be considered.
0514	CB Ext.IO 12 is off	The circuit breaker 127.9/2 "Ext.IO 12" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in SB1. If circuit breaker 127.9/2 "Ext.IO 12" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Enable Limited drive mode from display, this will switch over to redundancy mode. • Inform to TLC and record in the log book & Continue service • Note: Operation restriction to be considered.
0515	CB Ext.IO 21 is off	The circuit breaker 127.9/3 "Ext.IO 21" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in SB2. If circuit breaker 127.9/3 "Ext.IO 21" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Enable Limited drive mode from display, this will switch over to redundancy mode. • Inform to TLC and record in the log book & Continue service • Note: Operation restriction to be considered.
0516	CB Ext.IO 22 is off	The circuit breaker 127.9/4 "Ext.IO 22" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in SB2. If circuit breaker 127.9/4 "Ext.IO 22" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL:

			• Enable Limited drive mode from display, this will switch over to redundancy mode. • Inform to TLC and record in the log book & Continue service • Note: Operation restriction to be considered.
0517	CB TCU 1 voltage sensor tripped	The circuit breaker -F01 "TCU 1 voltage sensor" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F01 "TCU 1 voltage sensor" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Cut out bogie 1 through switch 154 in SB1. • Switch off TCU 1 via CB 127.11/1 • Inform to TLC and record in the log book. • Continue service with bogie 1 cut out
0518	CB TCU 2 voltage sensor tripped	The circuit breaker -F02 "TCU 2 voltage sensor" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F02 "TCU 2 voltage sensor" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Cut out bogie 1 through switch 154 in SB1. • Switch off TCU 2 via CB 127.11/2 • Inform to TLC and record in the log book. • Continue service with bogie 2 cut out
0519	CB auxiliary transformer earth tripped	The circuit breaker -F03 "Aux Transformer earth" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F03 "Aux Transformer earth" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Inform to TLC and record in the log book.
0520	F0901P2 Battery system WARNING: LOW BATTERY VOLTAGE	F0901P2 Battery system WARNING: LOW BATTERY VOLTAGE Driving available for less than 30 min Check battery charger MCB	• Check battery charger output MCB 110 in SB-2. If found tripped, reset battery charger output MCB. • Check the battery charger is working. • Try by MCE ON/OFF once. IF NOT SUCCESSFUL: • Unrecoverable fault - Inform TLC and ask for relief loco. Loco can work till battery voltage drops to 86 V.

0521	F0902P1 Battery system BATTERY VOLTAGE LOW	F0902P1 Battery system BATTERY VOLTAGE LOW Converters being switched off Open VCB, lower Panto	• Check MCB (112.1 & 110) in SB-2. MCB 112, located besides battery Box No. 2, should not be in tripped condition. If so, then reset the MCB. • Isolate the AUX3 and check if battery is charging with AUX2. • Try by MCE ON/OFF once. IF NOT SUCCESSFUL: • Unrecoverable fault - Inform TLC and ask for relief loco.
0522	F0901P1 Battery system BATTERY VOLTAGE TOO LOW	F0901P1 Battery system BATTERY VOLTAGE TOO LOW Electronics will switch off	• Check MCB (112.1 & 110) in SB-2. MCB 112, located besides battery Box No. 2, should not be in tripped condition. If so, then reset the MCB. • Isolate the AUX3 and check if battery is charging with AUX2. • Try by MCE ON/OFF once. IF NOT SUCCESSFUL: • Unrecoverable fault - Inform TLC and ask for relief loco.
0523	Battery Charger Overcurrent	Battery Charger: Overcurrent Detected	• Switch OFF the Electronics and Switch it ON once again. Raise panto and close VCB. IF NOT SUCCESSFUL: • Report to TLC and record in the logbook
0524	Battery charger is not operational	Battery charger not in operation.	• Switch OFF the Electronics and Switch it ON once again. Raise panto and close VCB. Check if battery charging. • Isolate the AUX3 and check if battery is charging with AUX2. continue operation. IF NOT SUCCESSFUL: • Report to TLC and record in the logbook
0525	BC control temp High >75 degC	The battery charger controller is overheating, if the temperature continues to increase the battery charger will switch off.	• if the battery charger is switched off please note that the locomotive has a limited time to operate on the energy stored in the battery. • Shut down the loco for 10-15 minutes. • Try by MCE ON/OFF once • Resume normal traction.
0526	CB auxiliary transformer blower tripped	The circuit breaker -F04 "Aux Transformer blower" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F04 "Aux Transformer blower" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Inform to TLC and record in the log book.
0527	CB Battery charger tripped	Battery system BATTERY CHARGER MCB OFF The circuit breaker -F05 "Battery charger" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F05 "Battery charger" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • IF NOT SUCCESSFUL: • Inform to TLC and record in the log book.
0528	CB single phase transformer tripped	The circuit breaker -F06 "Single phase transformer" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F06 "Single phase transformer", found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB.

			• If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Inform to TLC and record in the log book.
0529	CB Auxiliary transformer 1 earth fault tripped	Main Power EARTH FAULT AUX. WINDING CIRCUIT The circuit breaker -F01 "Aux Transformer 1 earth fault" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F01 "Aux Transformer 1 earth fault", found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Inform to TLC and record in the log book.
0530	CB Auxiliary transformer 2 earth fault tripped	Main Power EARTH FAULT AUX. WINDING CIRCUIT Normal operation can continue. The circuit breaker -F02 "Aux Transformer 2 earth fault" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F02 "Aux Transformer 2 earth fault", found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Inform to TLC and record in the log book.
0531	CB AUX 1 voltage sensor tripped	The circuit breaker -F03 "AUX 1 voltage sensor" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F03 "AUX 1 voltage sensor", found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Inform to TLC and record in the log book. • Continue operation with redundant AUX.
0532	CB AUX 2 voltage sensor tripped	The circuit breaker -F04 "AUX 2 voltage sensor" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F04 "AUX 2 voltage sensor", found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. IF NOT SUCCESSFUL: • Inform to TLC and record in the log book. • Continue operation with redundant AUX.

0534	CB single phase transformer tripped	The circuit breaker -F06 "Single phase transformer" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -F06 "Single phase transformer", found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • IF NOT SUCCESSFUL: • Inform to TLC and record in the log book.
0535	CB 100 Battery charger input tripped	The circuit breaker -100 "Battery charger input" is off.	• Acknowledge the fault by pressing BPFA . • Check CB in Auxiliary cubicle . If circuit breaker -100 "Battery charger input" , found tripped then reset it once after opening VCB. • If MCB is not tripped but still message is coming then ignore it. This may be due to defective control contact of concerned MCB. • If MCB getting tripped after resetting it once above, then driver should not try to reset these MCBs. • IF NOT SUCCESSFUL: • Inform to TLC and record in the log book. • Loco can work till battery voltage drops to 86 V.
0536	Battery overcurrent	Battery overcurrent detected	• Open VCB • Check battery charger CB IF NOT SUCCESSFUL: • Unrecoverable fault - Inform to TLC and record in the log book
0537	Battery Charger DC Voltage High.	DC Voltage High Detected.	• Open VCB • Check battery charger CB • Check battery charger voltage if it is greater than 117V stop where appropriate and inform shed IF NOT SUCCESSFUL: • Unrecoverable fault - Inform to TLC and record in the log book
0538	Battery charger input AC Overvoltage.	Battery charger input AC Overvoltage	• No corrective action needed while operating
0539	Battery charger AC Undervoltage detected.	Battery charger AC Undervoltage detected.	• No corrective action needed while operating
0540	VCD Simulation Test is Active	Simulation test was activated via Monitor menu. Traction locked as long as test active. Make sure to disable Simulation test from monitor menu after test completed.	• Simulation test to be deactivated via Monitor menu
0541	Failure mode Simulation Test is Active	Simulation test was activated via Monitor menu. Traction locked as long as test active. Make sure to disable Simulation test from monitor menu after test completed.	• Simulation test to be deactivated via Monitor menu
0542	Battery charger controller overheating.	The battery charger controller is overheating, if the temperature continues to increase the battery charger will switch off.	• No corrective action needed while operating
0543	Battery Charger input overcurrent.	Battery Charger over current detected	• Switch OFF the Electronics and Switch it ON once again. Raise panto and close VCB. IF NOT SUCCESSFUL: • Report to TLC and record in the logbook

0544	F0903P2 Battery system FH BATTERY CHARGER LOCKED	F0903P2 Battery system FH BATTERY CHARGER LOCKED Driving available for max. 2 hours Battery not being charged.	- Switch OFF the Electronics and Switch it ON once again. Raise panto and close VCB. - If the Fault still persists acknowledge the fault and inform TLC that battery is not being charged.
0545	Battery Charger heat sink temperature high	The battery charger controller or Heatsink is overheating, if the temperature	- If the battery charger is switched off please note that the locomotive has a limited time to operate on the energy stored in the battery. - Shut down the loco for 10-15 minutes. - Try by MCE ON/OFF once - Resume normal traction.
0550	Water Closet occupied, Traction Inhibit.	Water Closet occupied, Traction Inhibit.	- Water Closet occupied, Traction Inhibit. - Put master control to zero position. - Check for water closet clearance. - Resume traction
0561	Harmonic Filter - Contact 8.2 Faulty	Main Power FILTER ON/OFF CONTACTOR STUCK ON VCB Harmonic filter contactor 8.2 has failed. Further operation is not possible.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0562	Harmonic Filter - Contact 8.2 stuck closed	Harmonic filter contactor 8.2 has failed. Further operation is not possible.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0563	Harmonic Filter: Contact 8.1 faulty	Main Power FILTER ON/OFF CONTACTOR STUCK ON VCB Harmonic filter contactor 8.1 has failed. Further operation is not possible.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. - IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0564	Harmonic Filter: Contact 8.1 stuck closed	Harmonic filter contactor 8.1 has failed. Further operation is not possible.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. - IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0565	Harmonic Filter: Contact 8.41 Faulty	Main Power FILTER ON/OFF CONTACTOR STUCK ON VCB Harmonic filter contactor 8.41 has failed. Further operation is not possible.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook

0566	Harmonic Filter: Contact 8.41 stuck closed	Harmonic filter contactor 8.41 has failed. Further operation is not possible.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0567	Harmonic Filter: Inrush current too high	Harmonic filter HARMONIC FILTER CURRENT TOO HIGH The inrush current for the harmonic filter was too high. The VCB was opened.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0568	F0401P1 Harmonic filter HARMONIC FILTER CURRENT TOO HIGH	F0401P1 Harmonic filter HARMONIC FILTER CURRENT TOO HIGH Try to close VCB again	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0569	Harmonic filter contactor test failed	Locomotive operation not possible with faulty filter contactors.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0570	Harmonic Filter : Overcurrent VCB Locked	The harmonic filter overcurrent detection has triggered too many times. The VCB will be locked to prevent damage to the system.	- Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0571	Harmonic Filter Current Deviation	TCU1 and TCU2 report a different value for the Harmonic Filter Current. Difference > 40A.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook
0572	F0400P0 HARMONIC FILTER ISOLATED	F0400P0 HARMONIC FILTER ISOLATED Speak to TLC Max. permitted speed is 40 Kmph	- Speed will be reduced to 40 KMPH. - Inform TLC and Resume normal Traction. - After passing 1-2 section, switch OFF the CE and switch it ON again. - If Harmonic filter comes in service, resume normal traction with normal speed If not successful - Work the train with 40 KMPH and both TRC in service or isolate - TRC1 by switch 154, and work with half TE / BE at normal speed.
0573	Harmonic Filter fault -> VCB open	VCB open due to fault in Harmonic filter circuit.	- If VCB opened it will not be possible to close VCB again by pressing BLDJ. - Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction. IF NOT SUCCESSFUL: - Report to TLC and record in the logbook - Continue operation, speed limit will be activated upto 40 kmph

0593	Wheel Slipping	Slip Slide control has triggered a sanding request.	• Ensure no brake binding on Loco. • Check all parking brakes are released fully. • Check physically if any wheel rotating abnormally. • Select direction and use sanding. IF NOT SUCCESSFUL: • Report to TLC and record in the logbook
0595	F0207P2 WHEEL SKIDING IN BOGIE 1	Reduce BE	• Ensure free running of wheels. • Ensure that there is no brake binding on loco. • Check all parking brakes are released properly. • If speed is more than 1 KMPH and there is message in DDS" Error Tacho Generator". Then driver can work normally after switching OFF and ON control electronics. • Reduce braking effort, physically experience the wheel skidding sound in running condition. • Inform TLC & make entry in Logbook
0596	F0307P2 Traction Bogie 2 WHEEL SKIDING IN BOGIE 2	F0307P2 Traction Bogie 2 WHEEL SKIDING IN BOGIE 2 Reduce BE	• Ensure free running of wheels. • Ensure that there is no brake binding on loco. • Ensure that all parking brakes are released. • If speed is more than 1 KMPH and there is message in DDS" Error Tacho Generator". Then driver can work normally after switching OFF and ON control electronics. • Reduce braking effort; physically experience the wheel skidding sound in running condition. • Inform TLC & make entry in Logbook
0600	SDTv2 TCU1_ Error	Please check MVB Connections.	• Recycle TCU 1 via CB 127.11/1 , If fault not repeated, continue service - IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Cut out bogie 1 through switch 154 in SB1. • Continue operation with one bogie
0601	SDTv2 TCU2_ Error	Please check MVB connections.	• Recycle TCU 2 via CB 127.11/2 • If fault not repeated, continue service - IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Cut out bogie 2 through switch 154 in SB1. • Continue operation with one bogie
0602	VCB off, Traction Interface	Please check the manual CutOut of TCUs, Capacitor feedbacks, DC link Earth switches positions.	• Please check the manual CutOut of TCUs through switch 154 in SB1 • Capacitor feedbacks, DC link Earth switches positions. • Switch OFF the electronics and switch it ON once again. Raise panto, close VCB and resume Traction - IF NOT SUCCESSFUL: • Report to TLC and record in the logbook

0625	Activate Limited drive mode. Ext.IO 11 failure	Communication with Ext.IO station 11 has failed. Start/Run interlock is initiated. Please initiate limited drive mode for further operation.	- Bring the master controller to the zero position - Enable Limited drive mode from display, this will switch over to redundancy mode. - Inform to TLC and record in the log book & Continue service Note: Operation restriction to be considered
0626	Activate Limited drive mode. Ext.IO 12 failure	Communication with Ext.IO station 12 has failed. Start/Run interlock is initiated. Please initiate limited drive mode for further operation.	- Bring the master controller to the zero position - Enable Limited drive mode from display, this will switch over to redundancy mode. - Inform to TLC and record in the log book - Continue service Note: Operation restriction to be considered
0627	Activate Limited drive mode. Ext.IO 21 failure	Communication with Ext.IO station 21 has failed. Start/Run interlock is initiated. Please initiate limited drive mode for further operation.	- Bring the master controller to the zero position - Enable Limited drive mode from display, this will switch over to redundancy mode. - Inform to TLC and record in the log book & Continue service Note: Operation restriction to be considered
0628	Activate Limited drive mode. Ext.IO 22 failure	Communication with Ext.IO station 22 has failed. Start/Run interlock is initiated. Please initiate limited drive mode for further operation.	- Bring the master controller to the zero position - Enable Limited drive mode from display, this will switch over to redundancy mode. - Inform to TLC and record in the log book & Continue service - Note: Operation restriction to be considered
0629	Limited drive mode active. Ext.IO Failure	Locomotive is under Limited drive mode (Station redundancy mode) due to the failure of Ext.IO 11/12/21/22.	- There could be failure related to Ext.IO. - Limited drive mode enabled from display, locomotive will operate with redundant channels. - Inform to TLC and record in the log book - Continue service - Note: Operation restriction to be considered
0633	Deactivate limited drive mode (Redundancy mode)	Please deactivate limited drive mode via display screen	- Failure of EXTIO is not active - Use display screen to deactivate Limited Drive mode
0634	Limited Drive mode is deactivated	Locomotive is in normal operation mode. (Limited drive mode is deactivated)	Continue service
0635	Comm. error with multiple Ext.IO modules.	Communication to multiple Ext.IO stations has failed. Further locomotive operation is not possible.	- There could be failure related to Ext.IO. - Try by MCE ON/OFF once, check for fault again. IF NOT SUCCESSFUL: - Unrecovered fault- Inform to TLC and ask for relief locomotive
0636	Limited drive mode active for more than 24 Hrs.	Limited drive mode has been active for more than 24 hours. Dropout of a second Ext.IO station will render the locomotive inoperable.	- Continue service - Operational rules and restrictions must be taken into account
0657	Daily self test active	The daily component self test is active. Please wait for the test to complete.	Please wait for the test to complete.

0658	Daily self test failure	The daily component self test is failed. Check the crew messages for a list of defective components.	• Check crew messages and diagnostic data for defective components. • Retest individual components by selecting the appropriate self test. IF NOT SUCCESSFUL: • Operational rules and restrictions must be taken into account • Report to TLC and record in the logbook
0687	F1802P1 Processor ICP2 SOFTWARE MISMATCHED WAP-5/WAG-9	F1802P1 Processor ICP2 SOFTWARE MISMATCHED WAP-5/WAG-9 Panto will not raise	• Use the display service menu to check the installed software versions. • Try by MCE ON/OFF once, check for fault again. IF NOT SUCCESSFUL: • Unrecoverable fault - Report to TLC and record in the logbook
0688	Software version conflict, Traction block override	The traction block set by the software version monitoring system is overridden. Please note that this mode is only intended for use during commissioning or testing. The locomotive may NOT operate in normal service while the override is active.	• The software conflict override by the workshop mode of DDU. • Operational rules and restrictions must be taken into account • Unrecoverable fault - Report to TLC and record in the logbook
0699	Locomotive will switch off in 5 minutes	The locomotive will switch off in 5 minutes. Reason: * The locomotive is in Drive Mode (BL-Key in "D") The pantographs are already lowered for 5 minutes.	• If BL key is at D and panto is lowered longer than 5 minutes, then this message is expected. • Driver could avoid occurrence of such fault message by raising one pantograph within 5 minutes after activating the particular cab by putting BL Key in driving position. • If panto pan is not raising and message arise then trouble shoot as per specific fault
0700	Safety Relay (126.6) failed	Safety Relay Control Electronics On 126.6 has failed! Once the VCB is opened by manual or automatic operation, it can not be closed again. Once Control System is switched off, via the BL-Key, it cannot be switched on again.	• Try by MCE ON/OFF once, check for fault again. IF NOT SUCCESSFUL: • Unrecoverable fault - Report to TLC and record in the logbook
0701	001 SELF HOLD MODE ACTIVE	Information 001 SELF HOLD MODE ACTIVE After 10 min. loco will switch off	• If BL key is at D and panto is lowered longer than 10 minutes, then this message is expected. • Driver could avoid occurrence of such fault message by raising one pantograph within 10 minutes after activating the particular cab by putting BL Key in driving position. • If panto pan is not raising and message arise then trouble shoot as per specific fault
0702	Display 2 temperature above limit	The temperature of display 2 in cab 2 is above its warning threshold. The display may turn off if the temperature continues to increase. The locomotive can be operated without display.	• Train can be operated with the display off. • Try to clear the section • Shut down the loco for 10-15 minutes. • Try by MCE ON/OFF once • Resume normal traction.

0703	Display 1 temperature above limit	The temperature of display 1 in cab 1 is above its warning threshold. The display may turn off if the temperature continues to increase. The locomotive can be operated without display.	• Train can be operated with the display off. • Try to clear the section • Shut down the loco for 10-15 minutes. • Try by MCE ON/OFF once • Resume normal traction.
0704	HW-configuration conflict	VCU has detected a conflict between HW variant and SW variant. Traction Locked	• Check the VARIANT through monitor menu. • If necessary check HW variant coding on I/O-Station 12. • Try by MCE ON/OFF once • Resume normal traction. IF NOT SUCCESSFUL: • Unrecoverable fault- Inform to TLC and ask for relief locomotive
0705	Locomotive variant changed - Traction lock	The CCU has detected a change of the locomotive variant. Traction is locked	• Reset both CCUs by switching off/on CB 127.1/1 and CB 127.1/2. - IF NOT SUCCESSFUL: • Unrecoverable fault - Report to TLC and record in the logbook
0706	Locomotive settings not complete	The locomotive setting in the CCU is not complete.	• Check monitor menu "Commiss" / "Loco Setting". • Complete the Settings. • (Menu only available in standstill!)
0707	BRAM Error - Wheel diameter	The reference wheel diameter stored in the BRAM was lost. Until a new reference wheel diameter is entered by workshop personnel, the maximum wheel diameter is used for internal speed comparison.	• Report to TLC and record in the logbook • Have the reference wheel diameter reentered
0708	Speed sensor calibration run required	The wheel diameters calculated are not within the acceptable limits. An adjustment of the speed sensors is required.	• Accelerate the vehicle to over 40 km/h and let it roll at a constant speed for several hundred meters without any braking force or tractive effort • IF NOT SUCCESSFUL: • Report to TLC and record in the logbook
0709	Reentry of wheel diameter required	The reference wheel diameter entered is not within the acceptable limits. For safety reasons the vehicle control system uses the maximum wheel diameter. The reference wheel diameter needs to be reentered in the workshop.	• Travel can be continued with potentially excessive speed indicated • Operational rules and restrictions must be taken into account • Report to TLC and record in the logbook
0710	Actual CDS speed invalid	The speed determined in the CCU is invalid. For safety reasons, the nominal maximum speed is used for internal CCU functions. No valid speeds are available to the drive, the pneumatic wheel slide protection or the train control system. There are no valid RPM values available for the drive to regulate traction.	• Switch off and on the control electronics • Check for any speed sensor related failure IF STILL NO SUCCESS: • Unrecoverable fault - Report to TLC and record in the logbook
0711	Fault - Speed sensor locked	At least one RPM counter or speed sensor permanently failed. Corrective action possible only in workshop.	• Check the traction motor and gear system for any abnormality • Check for any locked wheel • Check for any faulty speed sensor • Report to TLC and record in the logbook
0712	Mileage invalid	The available kilometer reading is invalid. The kilometer reading needs to be reentered in the workshop.	• Report to TLC and record in the logbook • Continue to travel with invalid kilometer reading • Operational rules and restrictions must be taken into account

0713	Limited speed value displayed	The displayed speed is limited due to slipping and sliding Processes.	• Switch off and on the control electronics • Check for any speed sensor related failure IF STILL NO SUCCESS: • Unrecoverable fault - Report to TLC and record in the logbook
0714	Fault - Calculation wheel diameter	The routine used to calculate the wheel diameter failed. The CCU must be switched off and on again to clear the fault. The indicated speed can differ slightly from the actual speed.	• Recycle control electronics IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Travel can be continued with potentially excessive speed indicated • Operational rules and restrictions must be taken into account
0715	TM1 Speed sensor faulty	TM1 Speed sensor faulty, Please check the speed sensor and speed sensor related circuit of TM1.	• Please check speed sensor at TM1 • Please check speed sensor Connector HA1 and HA2 at TCC1 Interface plate • Please check visually speed sensor related cables from TCC1 Interface plate to TM1 IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service with TM1 isolated
0716	TM2 Speed sensor faulty	TM2 Speed sensor faulty, Please check the speed sensor and speed sensor related circuit of TM2.	• Please check speed sensor at TM2 • Please check speed sensor Connector HC1 and HC2 at TCC1 Interface plate • Please check visually speed sensor related cables from TCC1 Interface plate to TM2 IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service with TM2 isolated
0717	TM3 Speed sensor faulty	TM3 Speed sensor faulty, Please check the speed sensor and speed sensor related circuit of TM3.	• Please check speed sensor at TM3 • Please check speed sensor Connector HE1 and HE2 at TCC1 Interface plate • Please check visually speed sensor related cables from TCC1 Interface plate to TM3 IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service with TM3 isolated
0718	TM4 Speed sensor faulty	TM4 Speed sensor faulty, Please check speed sensor and speed sensor related circuit of TM4.	• Please check speed sensor at TM4 • Please check speed sensor Connector HE3 and HE4 at TCC2 Interface plate • Please check visually speed sensor related cables from TCC2 Interface plate to TM4 IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service with TM4 isolated

0719	TM5 Speed sensor faulty	TM5 Speed sensor faulty, Please check speed sensor and speed sensor related circuit of TM5.	• Please check speed sensor at TM5 • Please check speed sensor Connector HC3 and HC4 at TCC2 Interface plate • Please check visually speed sensor related cables from TCC2 Interface plate to TM5 IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service with TM5 isolated
0720	TM6 Speed sensor faulty	TM6 Speed sensor faulty, Please check speed sensor and speed sensor related circuit of TM6.	• Please check speed sensor at TM6 • Please check speed sensor Connector HA3 and HA4 at TCC2 Interface plate • Please check visually speed sensor related cables from TCC2 Interface plate to TM6 IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service with TM6 isolated
0721	Constant speed mode condition not fulfilled	The necessary conditions to activate the Constant Speed Control are not fulfilled. Possible reasons are: * Locomotive speed < 5kmph * Reverser direction not selected * Throttle in idle * Traction interlock active * Loco is not leading	• Assure that the following conditions are fulfilled: • Locomotive speed > 5kmph • Reverser direction selected • Throttle not in idle • No Traction interlock active • Own loco is leading • When the conditions are fulfilled, you can press the START-Button to activate the Constant Speed mode
0722	CSC: EB not sufficient!	EB is not sufficient to keep set speed. Manual braking with pneumatic brake is necessary to keep the speed.	• EB is not sufficient to keep set speed. • Bring TE/BE Throttle to '0' position, loco brakes will be released. • Control the train through A-9. Press PVEF, till BC-1/BC-2 gauge pressure reaches '0' Kg/cm² • Limited electrical Brake power available; braking can be done with A9/SA9 only. • Resume Normal Traction • Inform TLC and record in the Logbook.
0731	Inching mode condition not fulfilled	The necessary conditions to activate the Inching Mode are not fulfilled. Possible reasons are: * Locomotive not in standstill * Throttle not in idle * Reverser direction not selected * Traction interlock active * ZTEL open * Loco is not leading When the conditions are fulfilled, you can press the START-Button to start the inching mode	• Assure that the following conditions are fulfilled: • Locomotive in standstill • Throttle in idle • Reverser direction selected • No traction interlock active • ZTEL closed • Own loco is leading • When the conditions are fulfilled, you can press the START-Button to start the inching mode

0741	Shunting Mode condition not fulfilled	The necessary conditions to activate the Shunting Mode are not fulfilled.: Possible cause(s): * Locomotive not in standstill * Throttle not in idle * Reverser not in position center * Loco is not leading When the conditions are fulfilled, you can press the START-Button to activate the shunting mode	- Assure that the necessary conditions to activate the Shunting Mode are fulfilled: - Locomotive in standstill - Throttle in idle - Reverser in position center - Own loco is leading - When the conditions are fulfilled, you can press the START-Button to activate the shunting mode
0742	Shunting Mode: EB not sufficient! Manual brake required!	The electric brake is not sufficient to keep the speed constant. It is necessary that the driver supports the electric brake by activating the pneumatic brake	- EB is not sufficient to keep set speed. - Bring TE/BE Throttle to '0' position, loco brakes will be released. - Control the train through A-9. Press PVEF, till BC-1/BC-2 gauge pressure reaches '0'Kg/cm2 - Limited electrical Brake power available; braking can be done with A9/SA9 only. - Resume Normal Traction - Inform TLC and record in the Logbook.
0743	Leaving Shunting Mode not possible!	Leaving Shunting Mode is only possible when Lock is in standstill.	- Recycle Control Electronics & press button "STOP" on the DDU Display - If not successful Try by MCE ON/OFF once - Continue service
0744	Shunting mode activated	Shunting mode activated	- Shunting mode activated - This is only for information
0753	F1003P1 Brake System VIGILANCE EMERGENCY BRAKE APPLICATION	F1003P1 Brake System VIGILANCE EMERGENCY BRAKE APPLICATION Bring TE/BE Throttle to 0 Press vigilance reset push button	- If this message is due to not acknowledging VCD by crew, then - Bring TE/BE Throttle to '0' position. - Apply A-9 to emergency to avoid depletion of MR through BP. - Wait for 120 seconds / 35 sec as Penalty Brake applied due to Vigilance can be reset only after 120 seconds / 35 sec. So, don't press BPVR during these 120 seconds / 35 sec. - Press yellow Vigilance Reset Pushbutton BPVR on Panel A of Driving Desk after 120 seconds / 35 sec. - Press and Release 'Vigilance' Paddle Switch. - Move A9 Handle to run. After resetting Penalty Brake, BP will be charged to 5 Kg/cm2. - If the penalty brakes remains applied even after the above, Switch OFF the Electronics and Switch it ON once again. Raise panto, close VCB and resume normal traction. If vigilance penalty brakes are applied even when driver is alert during running, there is a chance that vigilance control Device may be defective or vigilance acknowledge switch of driver side not working. In this condition check with Asst. Driver's side pushbutton. If still the same condition, Vigilance control device may be defective. So switch OFF control Electronics and put vigilance isolating switch (Vigilance Cut-out Switch 237.1) provided on SB1 panel to '0' position. This will make vigilance control device isolated. - Switch ON electronics, close VCB and resume Normal traction with VCD in isolated condition.

			Inform TLC and be vigilant
0754	VIGILANCE Alarm Active - Press VCD Acknowledge button	VCD alarm active, please acknowledge VCD via VCB cycle reset buttons. (Hand Switch or Foot Switch)	- Use VCD acknowledge button to reset VCD cycle reset - Continue operation
0755	F1502P2 Fire detection WARNING SMOKE IN MACHINE ROOM	F1502P2 Fire detection WARNING SMOKE IN MACHINE ROOM Inspect machine room.	- Open VCB, lower pantograph and switch off the Electronics. - Inspect the Machine Room carefully. In case of any fire/smoke, extinguish the fire by using portable fire extinguishers. - In case of larger fire, especially in Traction converter, then open the cock of CO2 and operate regulator Cylinder provided in the locker on Asst. Driver side in each cab. - Keep the machine room door locked - If every thing is found normal, resume normal Traction. - Inform TLC and record in the logbook.
0756	F1501P2 Fire detection FAULT IN FIRE DETECTION UNIT	F1501P2 Fire detection FAULT IN FIRE DETECTION UNIT No fire detection, Possible normal operation can continue	- Resume Normal Traction. - Keep on checking the Machine Room as frequently as possible for the sign of any smoke/fire. - Inform TLC and record in the logbook
0757	F1501P1 Fire detection FIRE IN MACHINE ROOM	F1501P1 Fire detection FIRE IN MACHINE ROOM Extinguish the fire Reset the fire detection unit	- Open VCB, Lower Pantograph and switch off the Electronics. - Inspect the Machine Room. If there is any sign of smoke emission, use portable fire extinguisher. - In case of larger fire, especially in Traction converter, then open the cock of CO2 Cylinder provided in the locker on Asst. Driver side in each cab. Keep the Machine room door locked. - Subsequently, reset the fire detection unit by pressing reset push button provided on fire detection unit (located in SB-2 cubicle) then acknowledge the fault by pressing BPFA. - Inform TLC and record in loco logbook.
0758	F0905P2 Battery system EARTH FAULT BATTERY CIRCUIT	F0905P2 Battery system EARTH FAULT BATTERY CIRCUIT Normal operation can continue To be checked during maintenance	- Resume normal operation. - Inform TLC and record in the logbook.
0759	F0402P2 Harmonic filter EARTH FAULT HARMONIC FILTER CIRCUIT	F0402P2 Harmonic filter EARTH FAULT HARMONIC FILTER CIRCUIT Normal operation can continue To be checked during maintenance	- Acknowledge the fault by pressing BPFA & resume normal operation. - Inform TLC and record in the logbook
0761	F0103P2 EARTH FAULT AUX.WINDING CIRCUIT	F0103P2 EARTH FAULT AUX.WINDING CIRCUIT Normal operation can continue To be checked during maintenance.	- Inform TLC and record in the logbook. - Check visually machine room for burning / burning smell of Auxiliaries. If found, trip MCB of that Aux.
0763	Vigilance manually cutout	Driver has cutout VCD (Vigilance Control Device) by VCD cutout switch 237.1.	- Cut in VCD again by rotary switch 237.1 - IF FAULT OBSERVED WITH VCD - Close VCB and resume Normal traction with VCD in isolated condition. - Inform TLC and be vigilant

0765	F0903P1 PAN LOWERED LONGER THAN 10 MINUTES	F0903P1 PAN LOWERED LONGER THAN 10 MINUTES Control electronics will switch off	• If BL key is at D and panto is lowered longer than 10 minutes, then this message is expected. • Switch ON electronics once again by BL Key if required. • Driver could avoid occurrence of such fault message by raising one pantograph within 10 minutes after activating the particular cab by putting BL Key in driving position. • If panto pan is not raising and message arise then trouble shoot as per F0103P1.
0766	F0504P1 Over Current In Hotel Load Circuit.	F0504P1 Over Current In Hotel Load Circuit. Try to close the VCB again	• Press BLDJ to close VCB. Inform maintenance staff.
0817	F1900P0 TRAINBUS ISOLATED	F1900P0 TRAINBUS ISOLATED Multiple operation not possible	• Inform maintenance staff
0822	Number of WTB nodes changed	Number of WTB nodes changed. If the bus connection is interrupted while driving, on the guided vehicles the VCB switches off and the pantograph is lowered. In the case that a direct brake is applied it is automatically released.	• If there is an undesired change in the number of cars: • Check the UIC connections between vehicles • Go to other vehicle and troubleshoot IF NOT SUCCESSFUL: • Continue travel with remaining locomotives / traction vehicles • Perform a new brake calculation
0824	Gateway comm. error or gateway off	Train Bus COMMUNICATION DISTURBANCE. One of the following problems occurred: * MVB communication with WTB gateway is faulty. * WTB gateway is switched off	• Switch WTB gateway on • If gateway is already switched on: • Switch WTB gateway off and on again IF NOT SUCCESSFUL: • WTB operation not possible
0825	WTB communication error	Train Bus COMMUNICATION DISTURBANCE. One of the following problems occurred: * WTB communication with another participant is faulty. * WTB gateway is asleep. * Power supply of WTB or control electronics failed in guided vehicle. * The WTB or control electronics failed in guided vehicle	• Switch WTB gateway off and on again In case of one or more missing participants: • Check the UIC connections between vehicles • Go to other vehicle and troubleshoot IF NOT SUCCESSFUL: • Open VCB & Command panto down • Isolate the active CCU IF STILL NO SUCCESS: • WTB operation not possible
0826	WTB master conflict	A master conflict on the train bus was detected. Possible cause(s): * There are more than one active cabs in the train set (traction vehicles and/or pilot cars)	• Wait 10 seconds • Check if other cabs in the train set are active • Activate only 1 cab in the train set IF NOT SUCCESSFUL: • Cut-out WTB gateway
0865	Both Cabs are Active	Cab Activating Key Switch "BL" active in both cabs.	• Check the positions of BL Keys, only one key may be active at a time. IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • Report to TLC and record in the loco logbook
0866	002 MORE THAN ONE CAB ACTIVE	Information 002 MORE THAN ONE CAB ACTIVE Deactivate non driving cab, otherwise after 10 min. MCE switches off	• Bring Angle Transmitter Drive Controller to zero to reset traction interlock. • Activate failure mode through display • Resume traction and continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • Report to TLC and record in the loco logbook
0867	F1803P1 FAULT IN ANGLE TRANSMITTER OF THROTTLE	F1803P1 FAULT IN ANGLE TRANSMITTER OF THROTTLE	• Change the direction to the direction of travel.

		Bring TE/BE Throttle to zero Operate switch failure mode	- Direction selection only allowed in standstill. IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - Report to TLC and record in the loco logbook
0868	Failure Mode activated	Failure Mode activated on the Display by the Driver. Activation of Failure Mode was necessary cause of Angle Transmitter Mismatch or Angle transmitter may be faulty	- To leave Failure Mode, deactivate it on the DDU. Attention: - Failure Mode can only be left, if Angle Transmitter Mismatch is no longer there.
0869	Main Compressor Unit (20) turned off manually	Spring Loaded Switch Compressor "BLCP" 172 turned off manually. Main Compressor Unit (20) is switched off.	- No measures are required. - Compressors are not operational - Use BLCP switch to turn on compressors
0870	Main Compressor Unit (20) turned on manually	Spring Loaded Switch Compressor "BLCP" 172 turned on manually. Both Main Compressor Unit (20) units are switched ON.	- No measures are required - Both the compressor will operate in manual mode
0872	Sanding requested without valid direction	Spring Loaded Foot Switch Sanding 192.1 pressed without a valid direction.	- Select a direction and try sanding again. IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - Report to TLC and record in the loco logbook
0873	TE limitation activated when Ang. Transmitter not in zero position.	Switch Max. Tract. Effort Limit "ZTEL" operated when Angle Transmitter Drive Controller 150.1 not in zero position.	- Bring angle transmitter(150.1) back to zero position - Turn on ZTEL.
0874	ZTEL operated	Switch Max. Tract. Effort Limit "ZTEL" / 151.1 has been turned on. Locomotive will be operating with limited traction.	- The ZTEL switch can be turned ON/OFF only with the angle transmitter in Pos. "0". - TE limitation cannot be turned ON in case of one bogie in isolated mode.
0875	Hotel Load turned on	Spring Loaded Switch Hotel Load "BLHO" (169.1) turned on. HEP converter will be active.	Operational rules and restrictions must be taken into account
0876	Direction Conflict – Multiple direction inputs available	Multiple direction has been selected at the same time.	- Try by MCE ON/OFF once - Resume the traction. IF NOT SUCCESSFUL: - Check the traction in other Cab
0880	F0205P2 Traction Bogie 1 EQUIPMENT TEMPERATURE HIGH	F0205P2 Traction Bogie 1 EQUIPMENT TEMPERATURE HIGH TE/BE is being reduced	- Clear block section. Bring throttle to '0' position. - Wait for 10 minutes or some time till transformer oil / converter coolant temperature normalizes. - Check MCBs in HB/SB, if tripped, reset it once. - Ensure working of all auxiliaries and MRB. - Resume normal traction. - If message persists, switch OFF the electronics and Switch it ON once again. Raise panto, close VCB and resume traction if loco get normal otherwise isolate bogie-1 by switch (154) & work the train on one bogie after making conversation with TLC. - If no success within 20 minutes, ask for relief loco.

0881	CCU 1 is overheating	Main Power(CCU1) OVER TEMPERATURE CONTROL ELECTRONICS The CCU 1 internal temperature has exceeded 75°C. The CCU will switch off in 10 minutes if the internal temperature does not drop below 75°C.	• Trip the CB 127.1/1 If CCU1 is overheating. • Continue service with CCU1 disabled. • Try to clear the section before CCU2 is getting overheated. • If CCU2 is overheated, Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction
0882	CCU 2 is overheating	Main Power(CCU2)OVER TEMPERATURE CONTROL ELECTRONICS The CCU 2 internal temperature has exceeded 75°C. The CCU will switch off in 10 minutes if the internal temperature does not drop below 75°C.	• Trip the CB 127.1/2 If CCU2 is overheating. • Continue service with CCU2 disabled. • Try to clear the section before CCU1 is getting overheated. • If CCU1 is overheated, Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction
0883	TCU 1 is overheating	The TCU 1 internal temperature has exceeded 75°C. The TCU will switch off in 10 minutes if the internal temperature does not drop below 75°C.	• Trip the CB CB 127.11/1 if TCU1 is overheating. • Continue service with TCU 1 disabled. • Try to clear the section before TCU2 is getting overheated. • If TCU2 is overheated, Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction
0884	TCU 2 is overheating	The TCU 2 internal temperature has exceeded 75°C. The TCU will switch off in 10 minutes if the internal temperature does not drop below 75°C.	• Trip the CB 127.11/2 if TCU2 is overheating. • Continue service with TCU 2 disabled • Try to clear the section before TCU1 is getting overheated. • If TCU1 is overheated, Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction
0885	ACU 1 controller is overheating	The ACU 1 controller temperature has exceeded 75°C. The ACU will switch off in 10 minutes if the controller temperature does not drop below 75°C.	• The ACU's will automatically switch to redundancy mode when ACU 1 is switched off. • Reset the CB if found tripped. • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction

0886	ACU 2 controller is overheating	The ACU 2 controller temperature has exceeded 75°C. The ACU will switch off in 10 minutes if the controller temperature does not drop below 75°C.	• The ACU's will automatically switch to redundancy mode when ACU 2 is switched off. • Reset the CB if found tripped. • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction
0887	ACU 3 controller is overheating	The ACU 3 controller temperature has exceeded 75°C. The ACU will switch off in 10 minutes if the controller temperature does not drop below 75°C.	• The ACU's will automatically switch to redundancy mode when ACU 3 is switched off. • Reset the CB if found tripped. • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction
0888	ACU 1 is overheating	The ACU 1 internal temperature has exceeded it's limits. The ACU will be switched off.	• The ACU's will automatically switch to redundancy mode when ACU 1 is switched off. • Reset the CB if found tripped. • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction
0889	ACU 2 is overheating	The ACU 2 internal temperature has exceeded it's limits. The ACU will be switched off.	• The ACU's will automatically switch to redundancy mode when ACU 2 is switched off. • Reset the CB if found tripped. • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction

0890	ACU 3 is overheating	The ACU 3 internal temperature has exceeded it's limits. The ACU will be switched off.	• The ACU's will automatically switch to redundancy mode when ACU 3 is switched off. • Reset the CB if found tripped. • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction
0891	ExtIO 11 is overheating	The external IO station 11 is overheating. The IO station will switch off if it does not cool down.	• Switch off Ext.IO 11 by tripping CB 127.9/1 • Enable limited drive mode on DDU • Continue service with Ext.IO 11 disabled • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume normal traction
0892	ExtIO 12 is overheating	The external IO station 12 is overheating. The IO station will switch off if it does not cool down.	• Switch off Ext.IO 12 by tripping CB 127.9/2 • Enable limited drive mode on DDU • Continue service with Ext.IO 12 disabled • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume normal traction
0893	ExtIO 21 is overheating	The external IO station 21 is overheating. The IO station will switch off if it does not cool down.	• Switch off Ext.IO 21 by tripping CB 127.9/3 • Enable limited drive mode on DDU • Continue service with Ext.IO 21 disabled • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume traction

0894	ExtIO 22 is overheating	The external IO station 22 is overheating. The IO station will switch off if it does not cool down.	• Switch off Ext.IO 22 by tripping CB 127.9/4 • Enable limited drive mode on DDU • Continue service with Ext.IO 22 disabled • Try to clear the section • Shut down the loco for 10-15 minutes. • Turn on the control electronics and raise pantograph and close VCB, ensure that machine room blowers are running and control electronics temperature is reduced. • Resume normal traction
0895	Display 1 is overheating	The display 1 temperature has exceeded 70°C. The display will switch off in 10 minutes if the temperature does not drop below 70°C.	• Train can be operated with the display off. • Try to clear the section • Shut down the loco for 10-15 minutes. • Try by MCE ON/OFF once • Resume normal traction.
0896	Display 2 is overheating	The display 2 temperature has exceeded 70°C. The display will switch off in 10 minutes if the temperature does not drop below 70°C.	• Train can be operated with the display off. • Try to clear the section • Shut down the loco for 10-15 minutes. • Try by MCE ON/OFF once • Resume normal traction.
0897	Battery charger overheating	The battery charger temperature has exceeded 75°C. The battery charger will switch off in 10 minutes if the temperature does not drop below 70°C.	• if the battery charger is switched off please note that the locomotive has a limited time to operate on the energy stored in the battery. • Please pay careful attention for low battery warnings. • Shut down the loco for 10-15 minutes. • Try by MCE ON/OFF once • Resume normal traction.
0898	Battery charger overheating	The battery charger temperature has exceeded 75°C. The battery charger will switch off in 10 minutes if the temperature does not drop below 70°C.	• No measures are required, if the battery charger is switched off please note that the locomotive has a limited time to operate on the energy stored in the battery. • Please pay careful attention for low battery warnings.
0900	TCU 1 communication error	Traction Bogie 1 DISTURBANCE IN CONVERTER1. A communication error with TCU 1 has been detected. Isolation of TCU 1 is required.	• Try by MCE ON/OFF once • Resume traction IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Isolate TCU 1 by switching off Circuit Breaker TCU1 (127.11/1) • Resume traction with TCU2
0901	F0301P1 Traction Bogie 2 DISTURBANCE IN ONVERTER2	F0301P1 Traction Bogie 2 DISTURBANCE IN CONVERTER2 Try to close VCB again	• Try by MCE ON/OFF once • Resume traction , IF NOT SUCCESSFUL: • Isolate TCU 2 by switching off Circuit Breaker TCU2 (127.11/2) • Resume traction with TCU1

0902	F0601P1 Aux-converter1 DISTURBANCE IN PROCESSOR ACI 1	F0601P1 Aux-converter1 DISTURBANCE IN PROCESSOR ACI 1 Try to close VCB again	• Try by MCE ON/OFF once • Resume traction IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service with the ACU's in redundancy mode. • Resume Normal traction
0903	F0701P1 Aux-converter2 DISTURBANCE IN PROCESSOR ACI 3	F0701P1 Aux-converter2 DISTURBANCE IN PROCESSOR ACI 2 Try to close VCB again	• Try by MCE ON/OFF once • Resume traction IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service with the ACU's in redundancy mode. • Resume normal traction
0904	F0801P1 Aux-converter3 DISTURBANCE IN PROCESSOR ACI 3	F0801P1 Aux-converter3 DISTURBANCE IN PROCESSOR ACI 3 Try to close VCB again	• Try by MCE ON/OFF once • Resume traction IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service with the ACU's in redundancy mode. • Resume normal traction
0905	Communication error Display 1	A communication error with display 1 has been detected. Operating the train without a display is possible.	• Train can be operated with the display off. • Try by MCE ON/OFF once IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service • Operational rules and restrictions must be taken into account
0906	Communication error Display 2	A communication error with display 2 has been detected. Operating the train without a display is possible.	• Train can be operated with the display off. • Try by MCE ON/OFF once IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue service • Operational rules and restrictions must be taken into account
0911	Communication error CCUS	Processor ICP2 ICP1 ISOLATED. A communication error with the slave CCU has been detected.	• Recycle both CCU's by resetting CB 127.1/1 & 127.1/2 IF NOT SUCCESSFUL: • Report to TLC and record in the logbook • Continue operation
0912	Communication error Ext.IO 11	Cab 1 DISTURBANCE IN Bus coupler 11/BRIO input A communication error with Ext.IO 11 has been detected.	• Reset Ext.IO 11 by CB 127.9/1 IF NOT SUCCESSFUL: • Enable Limited drive mode through DDU • Report to TLC and record in the logbook • Continue operation

0913	Communication error Ext.IO 12	Cab 1 DISTURBANCE IN Bus coupler 12/BRIO input A communication error with Ext.IO 12 has been detected.	- Reset Ext.IO 11 by CB 127.9/2 IF NOT SUCCESSFUL: - Enable Limited drive mode through DDU - Report to TLC and record in the logbook - Continue operation
0914	Communication error Ext.IO 21	Cab 2 DISTURBANCE IN Bus coupler 21/BRIO input A communication error with Ext.IO 21 has been detected.	- Reset Ext.IO 11 by CB 127.9/3 IF NOT SUCCESSFUL: - Enable Limited drive mode through DDU - Report to TLC and record in the logbook - Continue operation
0915	Communication error Ext.IO 22	Cab 2 DISTURBANCE IN Bus coupler 22/BRIO input A communication error with Ext.IO 22 has been detected.	- Reset Ext.IO 11 by CB 127.9/4 IF NOT SUCCESSFUL: - Enable Limited drive mode through DDU - Report to TLC and record in the logbook - Continue operation
0916	EXT.IO11:Module FLT status	One or more module with Ext.IO 11 has been detected faulty.	- One or more IO modules faulty: - Restart VCU1 station 11 using CB127.9/1. IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - The VCU redundant will be in action - Driving restriction will be followed - Report to TLC and record in Loco Logbook.
0917	EXT.IO12:Module FLT status	One or more module with Ext.IO 12 has been detected faulty.	- One or more IO modules faulty: - Restart VCU1 station 12 using CB127.9/2. IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - The VCU redundant will be in action - Driving restriction will be followed - Report to TLC and record in Loco Logbook.
0918	EXT.IO21:Module FLT status	One or more module with Ext.IO 21 has been detected faulty.	- One or more IO modules faulty: - Restart VCU2 station 21 using CB127.9/3. IF NOT SUCCESSFUL: - Try by MCE ON/OFF once - The VCU redundant will be in action - Driving restriction will be followed - Report to TLC and record in Loco Logbook.

0919	EXT.IO22:Module FLT status	One or more module with Ext.IO 22 has been detected faulty.	• One or more IO modules faulty: • Restart VCU2 station 22 using CB127.9/4. IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Driving restriction will be followed • Report to TLC and record in Loco Logbook.
0920	E112: Hardware error status	Hardware error detected in module E112.	• Module E112 Faulty: • Restart VCU1 station 11 using CB127.9/1. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Report to TLC and record in Loco Logbook.
0921	E113: Short circuit status	Short circuit detected in module 3 of IO station 11.	• Module E113 Faulty: • Restart VCU1 station 11 using CB127.9/1. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once & The VCU redundant will be in action. • Report to TLC and record in Loco Logbook.
0922	E114: Short circuit status	Short circuit detected in module 4 of IO station 11.	• Module E114 Faulty: • Restart VCU1 station 11 using CB127.9/1. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Report to TLC and record in Loco Logbook.
0923	E124: Short circuit status	Short circuit detected in module 4 of IO station 12.	• Module E124 Faulty: • Restart VCU1 station 12 using CB127.9/2. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Report to TLC and record in Loco Logbook.
0924	E125: Short circuit status	Short circuit detected in module 5 of IO station 12.	• Module E125 Faulty: • Restart VCU1 station 12 using CB127.9/2. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Report to TLC and record in Loco Logbook.

0925	E213: Hardware error status	Hardware error detected in module E213.	• Module E213 Faulty: • Restart VCU1 station 21 using CB127.9/3. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Report to TLC and record in Loco Logbook.
0926	E214: Short circuit status	Short circuit detected in module 4 of IO station 21.	• Module E214 Faulty: • Restart VCU2 station 21 using CB127.9/3. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Report to TLC and record in Loco Logbook.
0927	E215: Short circuit status	Short circuit detected in module 5 of IO station 21.	• Module E215 Faulty: • Restart VCU2 station 21 using CB127.9/3. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Report to TLC and record in Loco Logbook.
0928	E224: Short circuit status	Short circuit detected in module 4 of IO station 22.	• Module E224 Faulty: • Restart VCU2 station 22 using CB127.9/4. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Report to TLC and record in Loco Logbook.
0929	E226: Short circuit status	Short circuit detected in module 6 of IO station 22.	• Module E226 Faulty: • Restart VCU2 station 22 using CB127.9/4. • Continue service IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • The VCU redundant will be in action • Report to TLC and record in Loco Logbook.

0930	Overspeed 105% detected by MEMOTEL	Overspeed 105% detected by MEMOTEL Please reduce speed. It may lead to emergency brake	• Acknowledge the fault by pressing BPFA. • Bring throttle to zero position to reduce loco speed. • When speed comes down the limit, resume normal traction. • If the speed shown in speedometer is not coming within the limits, but actual speed has come down this means that speedometer is defective. The drivers advise to open the speedometer MCB (127.92) provided in SB2 cubicle. • Now the speedometer will be isolated. So drive carefully and watch speed on display in simulation mode screen. • Inform TLC and record in loco logbook and act accordingly.
0931	F1601P1 Speedometer SPEED LIMIT EXCEEDED	F1601P1 Speedometer SPEED LIMIT EXCEEDED Emergency brakes TE/BE Throttle to 0	• Acknowledge the fault by pressing BPFA. • Bring throttle to zero position to reduce loco speed. • When speed comes down the limit, resume normal traction. • If the speed shown in speedometer is not coming within the limits, but actual speed has come down this means that speedometer is defective. The drivers advise to open the speedometer MCB (127.92) provided in SB2 cubicle. • Now the speedometer will be isolated. So drive carefully and watch speed on display in simulation mode screen. • Inform TLC and record in loco logbook and act accordingly.
0932	F1601P2 Speedometer FAULT IN SPEEDOMETER	F1601P2 Speedometer FAULT IN SPEEDOMETER NO display of speed in the cab meters DRIVE CAREFULLY, use display screen	• Inspect the speedometer MCB (127.92) in SB2 cubicle. If found in tripped condition • then reset the MCB once and resume normal operation if loco gets normal. • If fault still persist, then isolate the speedometer by opening MCB (127.92) provided in SB2 cubicle. • Now the speedometer will be isolated. So drive carefully and watch speed on display. • Inform TLC and record in the logbook. • As per instruction of TLC. Normal traction can be resumed.
1000	ALG test Running, Please wait	Simulation mode ALG test is running, Please wait.	• Simulation mode ALG test is running. • Please check the main screen for Precharge and disconnecter contactor error messages IF NOT SUCCESSFUL: • Try by MCE ON/OFF once • Report to TLC and record in Loco Logbook.
1001	TC1 or TC2 Pre_charge or DC_Link Cont. not ready. Please recycle CB	TCC1 or TCC2 Pre_charge or DC_Link contactor not ready. Simulation mode can not be executed. Please recycle TCU1 and TCU2 through respective circuit breaker.	• Try by MCE ON/OFF once IF NOT SUCCESSFUL: • Please recycle TCU1 and TCU2 through respective circuit breaker and check. • Report to TLC and record in Loco Logbook.
1010	BRIO 11 IO channel hardware error.	BRIO 11 IO channel hardware error. Please check the download data and check the channel health.	• Try by MCE ON/OFF once IF NOT SUCCESSFUL: • if BRIO 11 IO channel hardware error exists, report to TLC and record in Loco logbook. • Please check the download data and check the channel health.

1011	BRIO 21 IO channel hardware error.	BRIO 21 IO channel hardware error. Please check the download data and check the channel health.	• Try by MCE ON/OFF once IF NOT SUCCESSFUL: • if BRIO 21 IO channel hardware error exists, report to TLC and record in Loco logbook. • Please check the download data and check the channel health.
1012	RIOM 12 IO channel hardware error.	RIOM 12 IO channel hardware error. Please check the download data and check the channel health.	• Try by MCE ON/OFF once IF NOT SUCCESSFUL: • if BRIO 12 IO channel hardware error exists, report to TLC and record in Loco logbook. • Please check the download data and check the channel health.
1013	RIOM 22 IO channel hardware error.	RIOM 22 IO channel hardware error. Please check the download data and check the channel health.	• Try by MCE ON/OFF once IF NOT SUCCESSFUL: • if BRIO 22 IO channel hardware error exists, report to TLC and record in Loco logbook. • Please check the download data and check the channel health.

9 Annextures - IV

Status: released TRIPATH_ASH 26.07.2023
DCC: ADC045 Obj.Desgn. Prod: TS_RGC07

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CODE ID	DIAG. TEXT	SUB	ENV	PRIO	POP-UP	POP-UP TEXT
3	PMEM: error read buffer (not empty)	SYSTEM	1	2	NODISP	
4	PMEM: error write buffer	SYSTEM	1	2	NODISP	
5	PMEM: error user data length (read buffer)	SYSTEM	1	2	NODISP	
6	PMEM: error checksum (read buffer)	SYSTEM	1	2	NODISP	
7	PMEM: error user data length (write buffer)	SYSTEM	1	2	NODISP	
8	PMEM: error checksum (write buffer)	SYSTEM	1	2	NODISP	
9	PMEM: service buffer initialization not ok	SYSTEM	1	2	NODISP	
10	Logging SW-Versions and operating hours	SYSTEM	512	3	NODISP	
30	System: Invalid device HW ID	SYSTEM	1	1	NODISP	
31	System: Background manager failure	SYSTEM	1	1	NODISP	
32	System: Reset error	SYSTEM	1	1	NODISP	
33	System: Standard memory error	SYSTEM	1	1	NODISP	
34	System: Fast memory error	SYSTEM	1	1	NODISP	
40	triggered by CM_MANAG (CM_MANAG)=CM_MANAG internal event	SYSTEM	3	0	NODISP	
41	triggered by TM_MANAG (TM_MANAG)=TM_MANAG internal event	SYSTEM	1	0	NODISP	
49	Locomotive variant invalid, check variant settings.	SYSTEM	1	1	0704	HW-configuration conflict
60	Communication error TCU 1	MVB	1	1	0900	TCU 1 communication error
61	Communication error TCU 2	MVB	1	1	0901	F0301P1 Traction Bogie 2 DISTURBANCE IN CONVERTER2
62	Communication error ACU 1	MVB	1	1	0902	F0601P1 Aux-converter1 DISTURBANCE IN PROCESSOR ACI 1
63	Communication error ACU 2	MVB	1	1	0903	F0701P1 Aux-converter2 DISTURBANCE IN PROCESSOR ACI 2
64	Communication error ACU 3	MVB	1	1	0904	F0801P1 Aux-converter3 DISTURBANCE IN PROCESSOR ACI 3
65	Communication error Display 1	MVB	1	1	0905	Communication error Display 1
66	Communication error Display 2	MVB	1	1	0906	Communication error Display 2
67	Communication error CCUS	MVB	1	1	0911	Communication error CCUS
130	Datashot: Debug	SYSTEM	1	3	NODISP	
131	Datashot: Protocol other	SYSTEM	1	3	NODISP	
139	Datashot: Protocol pulse	SYSTEM	1	3	NODISP	
239	Panto 1: Raising fault (no pressure feedback)	MAINPWR	3	1	0016	Panto A raising fault
					0004	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO
240	Panto 2: Raising fault (no pressure feedback)	MAINPWR	3	1	0017	Panto D Raising fault
					0004	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO
243	Panto 1: Lowering fault (error in active pressure feedback)	MAINPWR	3	1	0012	Panto A lowering fault
					0004	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO
244	Panto 2: Lowering fault (error in active pressure feedback)	MAINPWR	3	1	0013	Panto D lowering fault
					0004	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO
245	Wrong Panto selected	MAINPWR	1	3	0010	wrong Panto selected
					0004	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO
246	Panto configuration changed	MAINPWR	1	3	0011	Panto config. Changed
					0004	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO
255	Panto 1: Sudden pressure loss	MAINPWR	3	1	0020	Panto A loss of pressure
					0004	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO
256	Panto 2: Sudden pressure loss	MAINPWR	3	1	0021	Panto D loss of pressure
					0004	F0103P1 LOW PRESSURE PANTO/FAULTY PANTO
280	VCB: Switch-on acknowledgement fault	VCB	3	1	0048	F0102P1 VCB STUCK IN OFF POSITION
281	VCB: Switch-off acknowledgement fault	VCB	3	1	0049	F0101P1 VCB STUCK IN ON POSITION
282	VCB: loss of ON feedback	VCB	3	1	0057	VCB off without reason
287	VCB: Current detected with open VCB	VCB	3	1	0054	VCB locked - I fault
295	VCB: TCU requested help from CCU to open the VCB	VCB	3	1	0058	TCU requested to open the VCB from CCU
320	HEP: HEP_CB1_Tripped	HEP	9	2	0070	HEP: HEP_CB1_ON
321	HEP: HEP_CB2_Tripped	HEP	9	2	0071	HEP: HEP_CB2_ON
322	HEP: ZCT Feeder1 Earth fault	HEP	9	1	0069	F0503P1 Earth Fault In Hotel Load Circuit.
323	HEP: ZCT Feeder2 Earth fault	HEP	9	1	0069	F0503P1 Earth Fault In Hotel Load Circuit.
324	HEP:Sine filter Cap1 fault	HEP	9	1	0072	HEP Capacitor fault, HEP/Auxiliary Load Isolated.
325	HEP:Sine filter Cap2 fault	HEP	9	1		
326	HEP Converter 1 Faulty.	HEP	1	1	0067	HEP Converter 1 Faulty.
327	HEP Converter 2 Faulty.	HEP	1	1	0068	HEP Converter 2 faulty.
329	HEP: VCB Inhibit-Overcurrent detected HLC	HEP	3	2	0076	HLC inhibit: HLC Overcurrent.
330	Water Closet occupied, Traction Inhibit.	VCB	3	2	0550	Water Closet occupied, Traction Inhibit.
340	VCB off: Catenary overvoltage	VCB	3	1	0083	Catenary overvoltage - VCB off
					0005	F0104P1 CATENARY VOLTAGE OUT OF LIMIT
341	VCB locked: Catenary thermal protection	VCB	3	1	0086	Continued catenary overvoltage - VCB lock for 2min
342	VCB off: Catenary undervoltage	VCB	3	1	0085	Catenary undervoltage - VCB off
					0005	F0104P1 CATENARY VOLTAGE OUT OF LIMIT
343	VCB off: Line voltage 5th harmonic too high	VCB	3	1	0081	Catenary voltage not stable - VCB lock for 1 min
344	VCB off: Voltage instantaneous value too high	VCB	3	1	0081	Catenary voltage not stable - VCB lock for 1 min
347	TCU1-> No catenary voltage detected	VCB	3	2	0093	TCU1-> no cat volt detect
348	Variance between TCU 1 and TCU 2: Catenary voltage detection	TRACTION	3	3	0080	U_variance between TCU1_2
349	Variance between TCU 1 and TCU 2: Catenary frequency detection	TRACTION	3	3	0080	f_variance between TCU1_2
350	TCU2-> No catenary voltage detected	TRACTION	3	2	0094	TCU2-> no cat volt detect
367	VCB off: Catenary overcurrent	VCB	3	1	0090	Catenary overcurrent current - VCB off
					0008	F0108P1 PRIMARY OVER CURRENT
384	VCB off: Inrush current exceeding limit	VCB	3	1	0091	No-load current monit. - VCB off
					0008	F0108P1 PRIMARY OVER CURRENT
364	VCB locked: Current monitoring triggered twice	VCB	3	1	0092	Catenary overcurrent current - VCB locked
					0008	F0108P1 PRIMARY OVER CURRENT
375	Variance between TCU 1 and TCU 2: Catenary current detection	VCB	3	2	0080	Catenary input detection difference TCU 1 and TCU
400	VCB loop test: conditions missing	VCB	3	2	0024	VCB loop test: abort
403	VCB loop test: contact failed	VCB	3	1	0028	VCB contacts loop test
421	VCB loop: TCU 1 is switched off but VCB loop is opened	VCB	3	2	0030	TCU1 off but VCB loop open
					0001	F0100P0 MAIN POWER ISOLATED; VCB inhibited
422	VCB loop: TCU 2 is switched off, but VCB loop is opened	VCB	3	2	0031	TCU2 off but VCB loop open
					0001	F0100P0 MAIN POWER ISOLATED; VCB inhibited
423	CB 127.12 is tripped	VCB	3	2	0032	CB 127.12 is tripped
424	VCB: VCB loop not released by TCU-1	MAINPWR	3	1	NODIS	
425	VCB: VCB loop not released by TCU-2	MAINPWR	3	1	NODIS	
426	VCB: Feedback not Valid	MAINPWR	3	1	NODIS	
427	VCB loop: VCB Loop open after TCU-2	MAINPWR	3	3	NODIS	
428	VCB: Temporary loss of VCB feedback	MAINPWR	3	3	NODIS	
430	Safety Relay Control Electronics On 126.6 Failed	MONITORING	3	1	0700	Safety Relay (126.6) failed
431	MCE_ON Triggered	MONITORING		3	NODISP	
432	MCE_OFF Triggered	MONITORING		3	NODISP	
433	TC1 or TC2 Pre_charge or DC_Link Cont. not ready. Please recycle CB	TRACTION	1	3	1001	TC1 or TC2 Pre-charge or DC Link Cont. not ready. Please recycle CB
450	TE without demand Bogie 1	TRACTION	65	2	0280	Tractive effort without demand at bogie 1
457	TE without demand Bogie 2	TRACTION	65	2	0328	Tractive effort without demand at bogie 2
460	Angle transmitter: mismatch detected	MONITORING	1	2	0866	F1803P1 FAULT IN ANGLE TRANSMITTER OF THROTTLE
461	Angle transmitter: Value implausible	MONITORING	1	3	NODISP	
490	TCC1 Cutout requested by TCU1 MCU	TRACTION	1	1	NODISP	
491	TCC1 Cutout requested by ICU 4QC	TRACTION	1	1	NODISP	
492	TCC1 Cutout requested by ICU PWR A	TRACTION	1	1	NODISP	
493	TCC1 Cutout requested by ICU PWR B	TRACTION	1	1	NODISP	
494	TCC1 Cutout requested by ICU PWR C	TRACTION	1	1	NODISP	
495	TCC1 Cutout requested by ICU AUX1	TRACTION	1	1	NODISP	
496	AUX1 inverter Cutout requested by TCU1 MCU	TRACTION	1	1	NODISP	
497	AUX1 inverter Cutout requested by ICU AUX	TRACTION	1	1	NODISP	
498	TCC2 Cutout requested by TCU2 MCU	TRACTION	1	1	NODISP	
499	TCC2 Cutout requested by ICU 4QC	TRACTION	1	1	NODISP	
500	AGT traction release fault TCU 1.	TRACTION	65	2	0368	Traction release fault (AGT)

501	AGT traction interlock fault TCU 1.	TRACTION	65	2	0368	Traction release fault (AGT)
505	SW version conflict, Traction block	TRACTION	1	1	0687	F1802P1 Processor ICP2 SOFTWARE MISMATCHED WAP7/WAG9
506	SW version conflict, Traction block override	TRACTION	1	2	0688	Software version conflict, Traction block override
507	TCC2 Cutout requested by ICU PWR A	TRACTION	1	1	NODISP	
508	TCC2 Cutout requested by ICU PWR B	TRACTION	1	1	NODISP	
509	TCC2 Cutout requested by ICU PWR C	TRACTION	1	1	NODISP	
510	TCC2 Cutout requested by ICU AUX2	TRACTION	1	1	NODISP	
511	AUX2 Inverter cutout requested by TCU2 MCU	TRACTION	1	1	NODISP	
512	AUX2 Inverter cutout requested by AUX2 ICU	TRACTION	1	1	NODISP	
513	Please switch off Circuit Breaker TCU1 (127.11/1)	TRACTION	65	2	0355	Please switch off Circuit Breaker TCU1 (127.11/1)
514	Please switch off Circuit Breaker TCU2 (127.11/2)	TRACTION	65	2	0356	Please switch off Circuit Breaker TCU2 (127.11/2)
516	TCU 1 fault Self OFF req	TRACTION	65	2	0361	TCU 1 Isolated
517	TCU 2 fault Self OFF req	TRACTION	65	2	0362	TCU 2 Isolated
520	AGT traction release fault TCU 2.	TRACTION	65	2	0368	Traction release fault (AGT)
521	AGT traction interlock fault TCU 2.	TRACTION	65	2	0368	Traction release fault (AGT)
522	SDTv2 error in TCU1 MVB ports	TRACTION	65	1	0600	SDTv2 TCU1_ Error
523	SDTv2 error in TCU2 MVB ports	TRACTION	65	1	0601	SDTv2 TCU2_ Error
524	VCB off, Traction Interface	TRACTION	65	1	0602	VCB off, Traction Interface
525	Regenerative brake failure	TRACTION	65	3	0256	F1007P1 Brake System REGENERATIVE BRAKE FAILURE
526	TCU 1 Isolated	TRACTION	65	2	0361	TCU 1 Isolated
527	TCU 2 Isolated	TRACTION	65	2	0362	TCU 2 Isolated
528	Power reduction is active	TRACTION	65	3	0364	Power reduction is active
529	TCU Master conflict	TRACTION	65	2	0366	TCU Master conflict
531	TC1: Water Circulation fault	TRACTION	65	2	0511	CB Coolant pump 1 is off
532	TC1: Coolant Pressure High	TRACTION	65	2	0262	TC1 water pressure fault-High/Low
533	TC1: Coolant Pressure Low	TRACTION	65	2	0273	F0206P1 CONVERTER 1 COOLANT PRESSURE NOT OK
534	TC1: Coolant level Warning	TRACTION	65	2	0262	TC1 water pressure fault-High/Low
535	TC1: Coolant level Alarm	TRACTION	65	2	0273	F0206P1 CONVERTER 1 COOLANT PRESSURE NOT OK
536	TC1: Temp sensor Faulty	TRACTION	65	2	0263	TC1 coolant level low (Warning)
538	TC2: Water Circulation fault	TRACTION	65	2	0264	TC1 coolant level low (Alarm) - Leakage
539	TC2: Coolant Pressure High	TRACTION	65	2	0266	TC1 inside air temperature sensor faulty
540	TC2: Coolant Pressure Low	TRACTION	65	2	0512	CB Coolant pump 2 is off
541	TC2: Coolant level Warning	TRACTION	65	2	0316	TC2 water pressure fault-High/Low
542	TC2: Coolant level Alarm	TRACTION	65	2	0309	F0306P1 Traction Bogie 2 CONVERTER 2 COOLANT PRESSURE NOT OK
543	TC2: Temp sensor Faulty	TRACTION	65	2	0310	TC2 water pressure fault-High/Low
547	TC1 Capacitor Pressure High, Capacitor faulty.	TRACTION	65	2	0311	F0306P1 Traction Bogie 2 CONVERTER 2 COOLANT PRESSURE NOT OK
548	TCC2 Capacitor Pressure High, Capacitor faulty.	TRACTION	65	2	0313	TC2 coolant level low (Warning)
550	Switch-on fault primary coupling contactor -Q01/Q02/Q03	TRACTION	9	2	0313	TC2 coolant level low (Alarm) - Leakage
551	Switch-off fault primary coupling contactor -Q01/Q02/Q03	TRACTION	9	2	0330	TC2 inside air temperature sensor faulty
553	Switch-on fault AUX contactor -K01	AUX	9	2	0424	F0206P2 TCC1 DC LINK CAPACITORS PRESSURE NOT OK
554	Switch-off fault AUX contactor -K01	AUX	9	2	0425	F0306P2 TCC2 DC LINK CAPACITORS PRESSURE NOT OK
556	Switch-on fault AUX contactor -K02	AUX	9	2	0426	Auxiliary contactor fault
557	Switch-off fault AUX contactor -K02	AUX	9	2	0426	Auxiliary contactor fault
560	Switch-on fault secondary coupling contactor -K03	AUX	9	2	0424	Auxiliary contactor -K01 fault
561	Switch-off fault secondary coupling contactor -K03	AUX	9	2	0424	Auxiliary contactor -K01 fault
562	TC1 DC link isolation sw. at earthed position	TRACTION	65	3	0267	Auxiliary contactor -K02 fault
563	TC 1 is cutout	TRACTION	65	2	0268	K03 close error
564	TC1 manual cut-in not possible	TRACTION	65	2	0272	K03 open error
565	TC2 DC link isolation sw. at earthed position	TRACTION	65	3	0314	iso sw ->TC1 DC link Earth
566	TC 2 is cutout	TRACTION	65	2	0315	TC1 is Cut Out (Traction)
567	TC2 manual cut-in not possible	TRACTION	65	2	0320	TC1cutout reset not posibl
570	415/110 Circuit fuse open.	AUX	9	1	0369	iso sw ->TC2 DClank Earth
571	AUX1: Permanent fault	AUX	9	1	0401	TC2 is Cut Out (Traction)
572	AUX2: Permanent fault	AUX	9	1	0402	TC2cutout reset nt posibl
573	AUX1: Temporary error	AUX	9	2	0403	AUX1: Permanent fault
574	AUX2: Temporary error	AUX	9	2	0404	AUX2: Permanent fault
582	AUX1: Load_shedding_Load_reduction	AUX	9	2	0410	AUX1: disabled
583	AUX2: Load_shedding_Load_reduction	AUX	9	2	0411	AUX2: disabled
594	Current / voltage limitation AUX1 is active	AUX	9	2	0405	Load Shedding Aux1.
595	Current / voltage limitation AUX2 is active	AUX	9	2	0406	Load Shedding Aux2.
597	AUX1 degrouped due to current/voltage limitation	AUX	9	1	0407	AUX1: I limit active
598	AUX2 degrouped due to current/voltage limitation	AUX	9	1	0408	AUX2: I limit active
601	VCB off due to Auxiliary inverter	AUX	9	2	0427	AUX1 degrouped due I_lim
603	AUX1 degrouped due to faulty filter capacitor (BRAM)	AUX	9	1	0412	AUX2 degrouped due I_lim
604	AUX2 degrouped due to faulty filter capacitor (BRAM)	AUX	9	1	0413	VCB off due to aux Inverter
606	Ground fault detected AUX1	AUX	9	1	0413	VCB locked: AUX2 overload -> cutout TCU1 and bogie1 consumers
607	Ground fault detected AUX2	AUX	9	2	0414	VCB locked: AUX1 overload -> cutout TCU2 and bogie2 consumers
610	Switch-off fault AUX disconnecter 1	AUX	9	2	0415	AUX1 earth fault
613	Switch-off fault AUX disconnecter 2	AUX	9	2	0416	AUX2 earth fault
621	Failure voltage transformer AUX1 detected	AUX	9	2	0409	AUX1 disconnecter fault
622	Failure voltage transformer AUX2 detected	AUX	9	2	0420	AUX2 disconnecter fault
627	AUX1 Filter capacitor monitoring is not active	AUX	9	2	0419	AUX1 U_converter fault
628	AUX2 Filter capacitor monitoring is not active	AUX	9	2	NODISP	AUX2 U_converter fault
631	ACU 1: Overcurrent detected	AUX	9	1	NODISP	
632	ACU 2: Overcurrent detected	AUX	9	1	0379	AUX1 overcurrent
633	ACU 3: Overcurrent detected	AUX	9	1	0380	AUX2 overcurrent
634	ACU Overcurrent detected-VCB Locked	AUX	9	1	0381	AUX3 overcurrent
635	Earth fault in AUX Circuit.	AUX	9	1	0437	F0802P1 Aux-converter3 FAULT IN AUXILIARY CONVERTER 3
640	TM1 is isolated.	TMC	65	2	0257	AUX overcurrent VCB locked.
641	TM2 is isolated.	TMC	65	2	0258	F0100P0 MAIN POWER ISOLATED; VCB inhibited
642	TM3 is isolated.	TMC	65	2	0259	F0103P2 EARTH FAULT AUX.WINDING CIRCUIT
643	TM4 is isolated.	TMC	65	2	0305	Traction Motor 1 is isolated
644	TM5 is isolated.	TMC	65	2	0306	Traction Motor 2 is isolated
645	TM6 is isolated.	TMC	65	2	0307	Traction Motor 3 is isolated
650	AUX 1 Isolated/Cutout	AUX	9	1	0460	Traction Motor 4 is isolated
651	AUX 2 Isolated/Cutout	AUX	9	1	0461	Traction Motor 5 is isolated
652	AUX3 Isolated/Cutout.	AUX	9	1	0462	Traction Motor 6 is isolated
664	Auxiliary 1 M1300 / Rectifier Temperature error.	AUX	9	0	0374	F0600P0 AUXILIARY CONVERTER 1 ISOLATED
665	Auxiliary 1 Communication error	AUX	9	0	0375	F0700P0 AUXILIARY CONVERTER 2 ISOLATED
666	Auxiliary 1 master or inverter Voltage sensor fault / voltage difference.	AUX	9	0	0377	F0800P0 AUXILIARY CONVERTER 3 ISOLATED
667	Auxiliary 1 M1300 Power supply faulty / Internal error.	AUX	9	0	0370	AUX 1 master or rectifier temperature sensor Faulty, AUX1 Isolated.
668	Auxiliary 1 Rectifier input voltage min / max detected.	AUX	9	0	0371	AUX 1 Communication Error, AUX1 Isolated.
669	Auxiliary 1 DC-Link voltage min / max detected.	AUX	9	0	0372	AUX 1 Inverter input voltage sensor Faulty or Invalid, AUX1 Isolated.
670	Auxiliary 1 Inverter output voltage min / max detected.	AUX	9	0	0373	Aux 1 M1300 power supply faulty or Internal error. AUX1 Isolated.
671	Auxiliary 1 Loads short circuit / overload / Sine filter error detected.	AUX	9	0	0383	AUX 1 rectifier input voltage not in range, AUX1 Isolated.
672	Auxiliary 2 M1300 / Rectifier Temperature error.	AUX	9	0	0385	AUX 1 DC-Link voltage not in range or DC-Link earthed, AUX 1 isolated.
673	Auxiliary 2 Communication Error.	AUX	9	0	0386	AUX 1 output voltage not in range, AUX 1 isolated.
674	Auxiliary 2 master or inverter voltage sensor fault / voltage difference.	AUX	9	0	0387	AUX 1 Load overload or short circuited, AUX 1 isolated.
675	Auxiliary 2 M1300 Power supply faulty / Internal error.	AUX	9	0	0384	AUX 2 Master or Rectifier Temperature sensor Faulty, AUX2 Isolated.
676	Auxiliary 2 Rectifier input voltage min / max detected.	AUX	9	0	0388	AUX 2 Communication Error, AUX2 Isolated.
677	Auxiliary 2 DC-Link voltage min / max detected.	AUX	9	0	0394	AUX 2 Inverter input voltage sensor Faulty or Invalid, AUX2 Isolated.
678	Auxiliary 2 Inverter output voltage min / max detected.	AUX	9	0	0395	Aux 2 M1300 power supply faulty or Internal error Aux2 Isolated.
						AUX 2 rectifier input voltage not in range, AUX 2 isolated.
						AUX 2 DC-Link voltage not in range or DC-Link earthed, AUX 2 isolated.
						AUX 2 output voltage not in range, AUX 2 isolated.

679	Auxiliary 2 Loads short circuit / overload / Sine filter error detected.	AUX	9	0	0396	AUX 2 Load overload or short circuited, AUX 2isolated.
680	Auxiliary 3 M1300 / Rectifier Temperature error.	AUX	9	0	0390	AUX 3 Master or Rectifier Temperature Faulty, AUX3Isolated.
681	Auxiliary 3 Communication Error.	AUX	9	0	0391	AUX 3 Communication Error, AUX3 Isolated.
682	Auxiliary 3 master or inverter voltage sensor fault / voltage difference.	AUX	9	0	0392	AUX 3 Inverter input voltage sensor Faulty or Invalid, AUX 3 Isolated.
683	Auxiliary 3 M1300 Power supply faulty / Internal error.	AUX	9	0	0389	Aux 3 M1300 power supply faulty or Internal error. AUX 3 isolated.
684	Auxiliary 3 Rectifier input voltage min / max detected.	AUX	9	0	0393	Aux 3 rectifier input voltage not in range, AUX 3isolated.
685	Auxiliary 3 DC-Link voltage min / max detected.	AUX	9	0	0397	AUX 3 DC-Link voltage not in range or DC-Link earthed, AUX 3 isolated.
686	Auxiliary 3 Inverter output voltage min / max detected.	AUX	9	0	0398	AUX 3 output voltage not in range, AUX 3 isolated.
687	Auxiliary 3 Loads short circuit / overload / Sine filter error detected.	AUX	9	0	0399	AUX 3 Load overload or short circuited, AUX 3isolated.
689	Auxiliary 1 DC-Link voltage min / max detected.	AUX	9	1	0400	F0802P1 Aux-converter3 FAULT IN AUXILIARY CONVERTER 3
690	Auxiliary 2 DC-Link voltage min / max detected.	AUX	9	1	0430	AUX1 DC-link Current min/max detected.
691	Auxiliary 3 DC-Link voltage min / max detected.	AUX	9	1	0431	AUX 2 DC-link Current min/max detected.
692	AUX 1 input fuse opened.	AUX	9	1	0432	AUX 3 DC-link Current min/max detected.
693	AUX 2 input fuse opened.	AUX	9	1	0433	AUX 1 input fuse opened.
694	AUX 3 input fuse opened.	AUX	9	1	0434	AUX 2 input fuse opened.
700	ACU1: detected Aux cont 52/4 dropout error	AUX	9	3	0453	Auxiliary 1 contactor 52/4 failed to Dropout
701	ACU1: detected Aux cont 52/4 pickup error	AUX	9	1	0421	F0603P1 Aux-converter1 CONTACTOR FAULT IN AUX-CONV 1/HB1
702	ACU1: detected Aux cont 52/5 dropout error	AUX	9	3	0455	Auxiliary 1 contactor 52/4 failed to Pickup
703	ACU1: detected Aux cont 52/5 pickup error	AUX	9	1	0421	F0603P1 Aux-converter1 CONTACTOR FAULT IN AUX-CONV 1/HB1
704	ACU2: detected Aux cont 52/1 dropout error	AUX	9	1	0455	Auxiliary 1 contactor 52/5 failed to Pickup
705	ACU2: detected Aux cont 52/1 pickup error	AUX	9	1	0451	F0603P1 Aux-converter1 CONTACTOR FAULT IN AUX-CONV 1/HB1
706	ACU2: detected Aux cont 52/2 dropout error	AUX	9	1	0450	Auxiliary 2 contactor 52/1 failed to Dropout
707	ACU2: detected Aux cont 52/2 pickup error	AUX	9	1	0422	F0703P1 Aux-converter2 CONTACTOR FAULT IN AUX-CONV 2/HB2
708	ACU2: detected Aux cont 52/4 dropout error	AUX	9	1	0422	Auxiliary 2 contactor 52/1 failed to Pickup
709	ACU2: detected Aux cont 52/4 pickup error	AUX	9	1	0451	F0703P1 Aux-converter2 CONTACTOR FAULT IN AUX-CONV 2/HB2
710	ACU3: detected Aux cont 52/3 dropout error	AUX	9	3	0452	Auxiliary 2 contactor 52/4 failed to Dropout
711	ACU3: detected Aux cont 52/3 pickup error	AUX	9	1	0422	F0703P1 Aux-converter2 CONTACTOR FAULT IN AUX-CONV 2/HB2
712	AUX winding overcurrent, VCB off	AUX	9	2	0456	Auxiliary 2 contactor 52/4 failed to Pickup
713	Two or more AUX isolated	AUX	9	1	NODISP	F0703P1 Aux-converter2 CONTACTOR FAULT IN AUX-CONV 2/HB2
836	Earth fault AUX2 consumers	AUX	9	2	0529	F0803P1 Aux-converter3 CONTACTOR FAULT IN AUX-CONV 3
837	Earth fault AUX1 consumers	AUX	9	2	0530	F0803P1 Aux-converter3 CONTACTOR FAULT IN AUX-CONV 3
838	VCB locked: AUX2 overload -> cutout TCU1 and bogie 1 consumers	AUX	9	1	0412	F0109P1 AUXILIARY WINDING OVERCURRENT
839	VCB locked: AUX1 overload -> cutout TCU2 and bogie 2 consumers	AUX	9	1	0413	CB Auxiliary transformer 1 earth fault tripped
870	Contact 8.2 stuck Open	MAINPWR	65	1	0561	F1102P2 Auxiliaries HB1 EARTH FAULT 415/110V CIRCUIT
871	Contact 8.2 stuck Closed	MAINPWR	65	1	0357	CB Auxiliary transformer 2 earth fault tripped
872	Harmonic filter: Contact 8.1 Stuck Opned	MAINPWR	65	1	0562	F1102P2 Auxiliaries HB1 EARTH FAULT 415/110V CIRCUIT
873	Harmonic filter: Contact 8.1 Stuck Closed	MAINPWR	65	1	0357	VCB locked: AUX2 overload -> cutout TCU1 and bogie1 consumers
874	Harmonic filter: Contact 8.41 Stuck Open	MAINPWR	65	1	0565	VCB locked: AUX1 overload -> cutout TCU2 and bogie2 consumers
875	Harmonic filter: Contact 8.41 Stuck closed	MAINPWR	65	1	0357	Harmonic Filter - Contact 8.2 Faulty
876	Harmonic filter: Inrush current to high, VCB off	MAINPWR	65	1	0566	F0106P1 FILTER ON/OFF CONTACTOR STUCK ON
877	Harmonic filter: Over current detected, VCB off	MAINPWR	65	2	0568	Harmonic Filter - Contact 8.2 Faulty
878	Harmonic filter: Harmonic filter test failed	MAINPWR	65	2	0569	F0106P1 FILTER ON/OFF CONTACTOR STUCK ON
879	Harmonic Filter fault -> VCB open	MAINPWR	3	3	0573	Harmonic Filter - Contact 8.1 Faulty
880	Harmonic filter Isolated, Speed limit 40kmph	MAINPWR	3	3	0572	F0106P1 FILTER ON/OFF CONTACTOR STUCK ON
910	Battery charger: Fault detected	BATT	1	2	0524	Harmonic Filter - Contact 8.41 Faulty
911	Battery Charger Overcurrent.	BATT	1	2	0523	F0106P1 FILTER ON/OFF CONTACTOR STUCK ON
912	Battery Overcurrent.	BATT	1	3	0536	Harmonic Filter - Contact 8.41 Faulty
913	DC Overvoltage	BATT	1	2	0537	F0106P1 FILTER ON/OFF CONTACTOR STUCK ON
914	Battery charger input AC Overvoltage .	BATT	1	2	0538	Harmonic Filter: Inrush current too high
915	Battery Charger AC input Undervoltage.	BATT	1	2	0539	F0401P1 Harmonic filter HARMONIC FILTER CURRENT TOO HIGH
916	Battery Charger controller overtemperature.	BATT	1	2	0542	Harmonic filter contactor test failed
917	Battery Charger input overcurrent.	BATT	1	3	0543	HF Fault -> VCB open
918	Battery Charging Current Low	BATT	1	2	0544	F0400P0 HARMONIC FILTER ISOLATED
919	Battery Charger heat sink temperature high.	BATT	1	2	0545	Battery charger is not operational
920	BATT < 82 Vdc, Self OFF timer start	BATT	1	1	10522	Battery Charger Overcurrent
921	Battery Charger diagnosis triggered	BATT	1	2	0376	Battery overcurrent
931	CDS: Speed invalid	SPEED	33	3	0710	Battery Charger DC Voltage High.
932	Limited speed value displayed	SPEED	1	3	0713	Battery charger input AC Overvoltage.
934	CDS: Milage invalid	SPEED	33	3	0712	Battery charger AC Undervoltage detected.
936	CDS: Reference axle diameter out of range	SPEED	33	2	0709	Battery charger controller overheating.
947	CDS: Stored value for reference axle diameter out of range	SPEED	33	2	0707	Battery Charger input overcurrent.
951	CDS: Speed sensor axel 1 failure	TMC	33	2	0715	F0903P2 Battery system FH BATTERY CHARGER LOCKED
952	CDS: Speed sensor axel 2 failure	TMC	33	2	0716	Battery Charger heat sink temperature high
953	CDS: Speed sensor axel 3 failure	TMC	33	2	0717	Battery Charger heat sink temperature high
954	CDS: Speed sensor axel 4 failure	TMC	33	2	0718	F0901P1 Battery system BATTERY VOLTAGE TOO LOW
955	CDS: Speed sensor axel 5 failure	TMC	33	2	0719	Battery charger diagnosis triggered
956	CDS: Speed sensor axel 6 failure	TMC	33	2	0720	Actual CDS speed invalid
957	Fault - Speed sensor locked	TMC	129	0	0711	Limited speed value displayed
980	REMMLOT Transfer error	RDS	1	3	NODISP	Milage invalid
981	REMMLOT communication error	MONITORING	3	257	0907	Reentry of wheel diameter required
982	REMMLOT ext memory not available	MONITORING	3	257	0908	BRAM Error - Wheel diameter
984	REMMLOT ext. Memory 100% filled	MONITORING	3	257	0910	TM1 Speed sensor faulty
1001	Emergency exhaust cock closed no traction	BRAKE	5	2	0206	TM2 Speed sensor faulty
1002	Brake Pipe Pressure Switch Signal is not valid.	BRAKE	5	2	0146	TM3 Speed sensor faulty
1003	MR-Pressure Switch Signals are not valid.	BRAKE	5	2	0149	TM4 Speed sensor faulty
1004	Low main reservoir pressure	BRAKE	5	2	0148	TM5 Speed sensor faulty
1158	Parking Brake Releasing failed.	BRAKE	5	1	0158	TM6 Speed sensor faulty
1159	Parking Brake Application failed.	BRAKE	5	2	0159	Fault - Speed sensor locked
1160	Traction with parking brakes not allowed	BRAKE	5	2	0157	F1006P1 Brake System TRACTION WITH PARKING BRAKES NOT ALLOWED
1161	Brake Pipe Cut Out	BRAKE	5	2	0161	Brake Pipe Cut Out
1162	Fault in Brake Electronics	BRAKE	5	1	0162	F1001P1 Brake System FAULT IN BRAKE ELECTRONICS
1163	Activation of Banking not possible in Running Loco.	BRAKE	5	3	0163	Activation of Banking not possible in Running Loco.
1164	Deactivation of Banking not possible with VCB closed	BRAKE	5	3	0164	Deactivation of Banking not possible with VCB closed
1165	Alarm Chain pulling	BRAKE	5	3	0165	F1002P2 Brake System ALARM CHAIN PULLING
1166	Air brake emergency activated	BRAKE	5	1	0166	Air brake emergency activated
1171	Traction with applied auto brakes not allowed	BRAKE	5	3	0171	F1005P1 Brake System TRACTION WITH AUTO BRAKE NOT ALLOWED
1172	Traction with applied independent brakes not allowed	BRAKE	5	3	0172	Traction with applied independent brakes not allowed
	Traction with applied pneumatic brakes not allowed	BRAKE	5	3	0173	F1009P1 Brake System TRACTION NOT ALLOWED WITH APPLIED BRAKE
1173					0150	Traction with applied pneumatic brakes not allowed
1280	CSC: EB not sufficient!	TRACTION	1	3	0722	F1009P1 Brake System TRACTION NOT ALLOWED WITH APPLIED BRAKE
1285	Shunting Mode: EB not sufficient! Manual brake required!	TRACTION	129	3	0742	CSC: EB not sufficient! Manual brake required!
1286	Shunting mode activated	VCU	1	3	0744	Shunting mode activated

1300	Ext.IO 11: AS Module defective	VCU	3	10912	Communication error Ext.IO 11
1301	Ext.IO 11: One/More IO Module defective	VCU	3	20916	EXT.IO11:Module FLT status
1308	Ext.IO 12: AS Module defective	VCU	3	10913	Communication error Ext.IO 12
1309	Ext.IO 12: One/More IO Module defective	VCU	3	20917	EXT.IO12:Module FLT status
1316	Ext.IO 21: AS Module defective	VCU	3	10914	Communication error Ext.IO 21
1317	Ext.IO 21: One/More Module defective	VCU	3	20918	EXT.IO21:Module FLT status
1324	Ext.IO 22: AS Module defective	VCU	3	10915	Communication error Ext.IO 22
1325	Ext.IO 22: One/More Module defective	VCU	3	20919	EXT.IO22:Module FLT status
1335	E112: Hardware error status	VCU	3	20920	E112: Hardware error status
1339	E113: Short circuit status	VCU	3	20921	E113: Short circuit status
1347	E114: Short circuit status	VCU	3	20922	E114: Short circuit status
1355	E124: Short circuit status	VCU	3	20923	E124: Short circuit status
1363	E125: Short circuit status	VCU	3	20924	E125: Short circuit status
1375	E213: Hardware error status	VCU	3	20925	E213: Hardware error status
1379	E214: Short circuit status	VCU	3	20926	E214: Short circuit status
1387	A215: Short circuit status	VCU	3	20927	E215: Short circuit status
1395	A224: Short circuit status	VCU	3	20928	E224: Short circuit status
1403	A226: Short circuit status	VCU	3	20929	E226: Short circuit status
1411	BRIO 11 J1 connector channel hardware error.	VCU	3	01010	BRIO 11 IO channel hardware error.
1412	BRIO 11 J2 connector channel hardware error.	VCU	3	01010	BRIO 11 IO channel hardware error.
1413	RIOM 12 J1 connector channel hardware error.	VCU	3	01012	RIOM 12 IO channel hardware error.
1414	RIOM 12 J2 connector channel hardware error.	VCU	3	01012	RIOM 12 IO channel hardware error.
1415	RIOM 12 J3 connector channel hardware error.	VCU	3	01012	RIOM 12 IO channel hardware error.
1416	RIOM 12 J4 connector channel hardware error.	VCU	3	01012	RIOM 12 IO channel hardware error.
1417	RIOM 12 J0 connector channel hardware error.	VCU	3	01012	RIOM 12 IO channel hardware error.
1418	BRIO 21 J1 connector channel hardware error.	VCU	3	01011	BRIO 21 IO channel hardware error.
1419	BRIO 21 J2 connector channel hardware error.	VCU	3	01011	BRIO 21 IO channel hardware error.
1420	RIOM 22 J1 connector channel hardware error.	VCU	3	01013	RIOM 22 IO channel hardware error.
1421	RIOM 22 J2 connector channel hardware error.	VCU	3	01013	RIOM 22 IO channel hardware error.
1422	RIOM 22 J3 connector channel hardware error.	VCU	3	01013	RIOM 22 IO channel hardware error.
1423	RIOM 22 J4 connector channel hardware error.	VCU	3	01013	RIOM 22 IO channel hardware error.
1424	RIOM 22 J0 connector channel hardware error.	VCU	3	01013	RIOM 22 IO channel hardware error.
1425	BRIO 11 Sink Port Error	VCU	3	0NODISP	
1426	RIOM 12 Sink Port Error	VCU	3	0NODISP	
1427	BRIO 21 Sink Port Error	VCU	3	0NODISP	
1428	RIOM 22 Sink Port Error	VCU	3	0NODISP	
1940	Main transformer: all PT100s defective	MAINPWR	1	20103	Trafo both temp reading not valid - VCB Open
1941	Main transformer: Oil circuit 1 overtemperature, VCB off	MAINPWR	1	20105 0117	Transformer overtemperature - VCB locked F0105P1 TRANSFORMER OIL TEMPERATURE OR PRESSURE NOT OK
1942	Main transformer: Oil circuit 2 overtemperature, VCB off	MAINPWR	1	20105 0117	Transformer overtemperature - VCB locked F0105P1 TRANSFORMER OIL TEMPERATURE OR PRESSURE NOT OK
1943	Main transformer: Oil circuit 1 overtemperature, power limitation	MAINPWR	1	20105 0117	Transformer overtemperature - VCB locked F0105P1 TRANSFORMER OIL TEMPERATURE OR PRESSURE NOT OK
1944	Main transformer: Oil circuit 2 overtemperature, power limitation	MAINPWR	1	20105 0117	Transformer overtemperature - VCB locked F0105P1 TRANSFORMER OIL TEMPERATURE OR PRESSURE NOT OK
1945	Main transformer: Oil circuit 1 invalid pressure	MAINPWR	1	20110	Main transformer: Oil circuit 1 invalid pressure
1946	Main transformer: Oil circuit 2 invalid pressure	MAINPWR	1	20111	Main transformer: Oil circuit 2 invalid pressure
1947	Main transformer: Oil circuit 1 pressure fault	MAINPWR	1	20104 0118	Transformer oil pressure-1 - power limitation F0102P2 TRANSFORMER OIL PRESSURE NOT OK
1948	Main transformer: Oil circuit 2 pressure fault	MAINPWR	1	20104 0118	Transformer oil pressure-2 - power limitation F0102P2 TRANSFORMER OIL PRESSURE NOT OK
1949	Main transformer: Oil circuit 1 Temperature Variance	MAINPWR	1	20109 0117	Transformer Oil circuit in TCU 1 invalid temperature F0105P1 TRANSFORMER OIL TEMPERATURE OR PRESSURE NOT OK
1950	Main transformer: Oil circuit 2 Temperature Variance	MAINPWR	1	20109 0117	Transformer Oil circuit in TCU 2 invalid temperature F0105P1 TRANSFORMER OIL TEMPERATURE OR PRESSURE NOT OK
1951	VCB off; CB pump open/Oil pressure fault	MAINPWR	1	10102 0118	Transformer oil pressure - VCB off F0102P2 TRANSFORMER OIL PRESSURE NOT OK
1952	Trafo oil temp sensor 1 faulty	MAINPWR	3	30107	Trafo oil temp sensor 1 faulty
1953	Trafo oil temp sensor 2 faulty	MAINPWR	3	30108	Trafo oil temp sensor 2 faulty
2001	TM1 Temperature sensor faulty or not valid. TM1 Isolated.	TMC	129	30281 0276	TM1 Temp. snsr faulty F0204P2 TRACTION BOGIE-1 FAULTY MOTOR TEMPERATURE SENSORS
2002	TM2 Temperature sensor faulty or not valid. TM2 Isolated.	TMC	129	30282 0276	TM2 Temp. snsr faulty F0204P2 TRACTION BOGIE-1 FAULTY MOTOR TEMPERATURE SENSORS
2003	TM3 Temperature sensor faulty or not valid. TM3 Isolated	TMC	129	30283 0276	TM3 Temp. snsr faulty F0204P2 TRACTION BOGIE-1 FAULTY MOTOR TEMPERATURE SENSORS
2004	TM4 Temperature sensor faulty or not valid. TM4 Isolated	TMC	129	30284 0322	TM4 Temp. snsr faulty F0304P2 TRACTION BOGIE-2 FAULTY MOTOR TEMPERATURE SENSORS
2005	TM5 Temperature sensor faulty or not valid. TM5 Isolated.	TMC	129	30285 0322	TM5 Temp. snsr faulty F0304P2 TRACTION BOGIE-2 FAULTY MOTOR TEMPERATURE SENSORS
2006	TM6 Temperature sensor faulty or not valid. TM6 Isolated.	TMC	129	30286 0322	TM6 Temp. snsr faulty F0304P2 TRACTION BOGIE-2 FAULTY MOTOR TEMPERATURE SENSORS
2020	WTB Gateway: MVB communication error	WTB	17	10824 0817	Gateway comm. error or gateway off F1900P0 TRAINBUS ISOLATED
2021	WTB Gateway: Hardware failure	WTB	17	10825 0817	WTB communication error F1900P0 TRAINBUS ISOLATED
2022	WTB Gateway: WTB communication error	WTB	17	10825 0817	WTB communication error F1900P0 TRAINBUS ISOLATED
2023	Number of WTB nodes changed	WTB	17	20822	Number of WTB nodes changed
2024	WTB master conflict	WTB	17	30826 0817	WTB master conflict F1900P0 TRAINBUS ISOLATED
2100	Fire Detection Equipment (212) is faulty	SAFETY	3	20756	F1501P2 Fire detection FAULT IN FIRE DETECTION UNIT
2101	Fire detection: Smoke detected in locomotive machine room	SAFETY	3	20755	F1502P2 Fire detection WARNING SMOKE IN MACHINE ROOM
2102	Fire detection: Fire detected in locomotive machine room	SAFETY	3	10757	F1501P1 Fire detection FIRE IN MACHINE ROOM
2103	Multiple IO station failed VCB opened	VCU	3	10635	Comm. error with multiple Ext.IO modules.
2104	MEMOTEL Device faulty	SAFETY	3	20932	F1601P2 Speedometer FAULT IN SPEEDOMETER
2105	Fire detection: Fire detected in slave locomotive	SAFETY	3	20762	Fire Detected in Slave Loco
2106	TCU1 Earth fault detected	TRACTION	3	10290	F0201P2 Traction Bogie 1 EARTH FAULT IN CONVERTER1
2107	TCU2 Earth fault detected	TRACTION	3	10338	F0301P2 Traction Bogie 2 EARTH FAULT IN CONVERTER 2
2321	Emergency Push button pressed from Cab 1	SAFETY	1	00201	F1008P1 Brake System EMERGENCY STOP, SHUTDOWN ON THE LOCO
2322	Emergency Push button pressed from Cab 2	SAFETY	1	00201	
2338	Emergency stop activated	SAFETY	1	10201	
2339	Tractive Effort limitation (ZTEL) activated	VCU	1	20874	ZTEL operated
2348	Locomotive in Banking operation	VCU	1	20160	F1001P2 Brake System LOCO IS IN BANKING MODE
2360	TCU1 switched OFF via CB (127.11/1)	TRACTION	1	30353	TCU1 switched OFF via CB
2361	TCU2 switched OFF via CB (127.11/2)	TRACTION	1	30354	TCU2 switched OFF via CB
2370	Both Cabs are Active	VCU	1	30865	002 MORE THAN ONE CAB ACTIVE
2371	Direction changed while in movement	VCU	1	20867	Switch Travel Direction (Reverser) changed while in movement
2372	Direction Conflict - Multiple direction inputs selected	VCU	1	00876	Direction Conflict – Multiple direction inputs available
2600	CB Traction motor blower 1 is off.	MONITORING	257	20497 0097	CB Traction motor blower 1 is off F1101P2 Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1
2601	CB Traction motor blower 2 is off.	MONITORING	257	20498 0098	CB Traction motor blower 2 is off F1201P2 Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2
2602	CB TM scavenge blower 1 is off.	MONITORING	257	20499 0097	CB TM scavenge blower 1 is off. F1101P2 Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1
2603	CB TM scavenge blower 2 is off.	MONITORING	257	20500 0098	CB TM scavenge blower 2 is off. F1201P2 Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2
2604	CB MR scavenge blower 1 is off.	MONITORING	257	20501 0097	CB MR scavenge blower 1 is off. F1101P2 Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1
2605	CB MR scavenge blower 2 is off.	MONITORING	257	20502 0098	CB MR scavenge blower 2 is off. F1201P2 Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2

2606	CB MR blower 1 is off.	MONITORING	257	2	0503	CB MR blower 1 is off.
2607	CB MR blower 2 is off.	MONITORING	257	2	0097	F1101P2 Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1
2608	CB Main compressor 1 is off.	MONITORING	257	2	0504	CB MR blower 2 is off.
2609	CB Main compressor 2 is off.	MONITORING	257	2	0098	F1201P2 Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2
2610	CB Cooling unit 1 is off.	MONITORING	257	2	0505	F1103P2 Auxiliaries HB1 MCB OFF MAIN COMPRESSOR OPEN
2611	CB Cooling unit 2 is off.	MONITORING	257	2	0506	F1202P2 Auxiliaries HB2 MCB OF MAIN COMPRESSOR OPEN
2612	CB Oil pump Trafo 1 is off.	MONITORING	257	2	0507	CB Cooling unit 1 is off.
2613	CB Oil pump Trafo 2 is off.	MONITORING	257	2	0097	F1101P2 Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1
2614	CB Coolant pump 1 is off.	MONITORING	257	2	0508	CB Cooling unit 2 is off.
2615	CB Coolant pump 2 is off.	MONITORING	257	2	0098	F1201P2 Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2
2616	CB 127.9/1 Ext.IO 11 is off.	MONITORING	257	2	0509	CB Oil pump Trafo 1 is off.
2617	CB 127.9/2 Ext.IO 12 is off.	MONITORING	257	2	0097	F1101P2 Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1
2618	CB 127.9/3 Ext.IO 21 is off.	MONITORING	257	2	0510	CB Oil pump Trafo 2 is off.
2619	CB 127.9/4 Ext.IO 22 is off.	MONITORING	257	2	0098	F1201P2 Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2
2620	CB F01 TCU 1 voltage sensor off	MONITORING	257	2	0511	CB Coolant pump 1 is off.
2621	CB F01 TCU 2 voltage sensor off	MONITORING	257	2	0097	F1101P2 Auxiliaries HB1 MCB(S) TRIPPED IN AUX. CUBICLE 1
2622	CB Auxiliary transformer earth off	MONITORING	257	2	0512	CB Coolant pump 2 is off.
2623	CB Auxiliary transformer blower off	MONITORING	257	2	0098	F1201P2 Auxiliaries HB2 MCB(S) TRIPPED IN AUX. CUBICLE 2
2624	CB Battery charger is off	MONITORING	257	2	0513	CB 127.9/1 Ext.IO 11 is off.
2625	CB Single phase transformer is off	MONITORING	257	2	0514	CB 127.9/2 Ext.IO 12 is off.
2626	CB Auxiliary transformer 1 earth fault is off	MONITORING	257	2	0515	CB 127.9/3 Ext.IO 21 is off.
2627	CB Auxiliary transformer 2 earth fault is off	MONITORING	257	2	0516	CB 127.9/4 Ext.IO 22 is off.
2628	CB Voltage sensor for TCC1 is off	MONITORING	257	2	0517	CB F01 TCU 1 voltage sensor off
2629	CB Voltage sensor for TTC2 is off	MONITORING	257	2	0518	CB F01 TCU 2 voltage sensor off
2630	CB Battery charger is off	MONITORING	257	2	0519	CB Auxiliary transformer earth off
2631	CB Single phase transformer is off	MONITORING	257	2	0526	CB Auxiliary transformer blower off
2632	CB 100 Battery charger input is off	MONITORING	257	2	0527	CB Battery charger is off
2700	Wheel Slipping	TMC	129	3	0096	F0902P2 Battery system BATTERY CHARGER MCB OFF
2702	Locomotive is creeping	TMC	1	3	0528	CB Single phase transformer is off
2703	Sanding Activated	VCU	1	3	0529	CB Auxiliary transformer 1 earth fault is off
2704	VCD Emergency Brakes Active	SAFETY	3	1	0099	F1102P2 Auxiliaries HB1 EARTH FAULT 415/110V CIRCUIT
2705	Overspeed 105%	SAFETY	1	2	0530	CB Auxiliary transformer 2 earth fault is off
2706	Overspeed 110%	SAFETY	1	2	0099	F1102P2 Auxiliaries HB1 EARTH FAULT 415/110V CIRCUIT
2707	Limited Drive mode activated	VCU	1	3	0531	CB Voltage sensor for TCC1 is off
2709	BATT < 86 V Tr. Interlock	BATT	1	1	0532	CB Voltage sensor for TTC2 is off
2710	Deactivate limited drive mode (Redundancy mode)	VCU	65	3	0533	CB Battery charger is off
2712	Harmonic Filter Earth Fault	MAINPWR	1	2	0096	F0902P2 Battery system BATTERY CHARGER MCB OFF
2713	DC circuit earth fault	VCU	1	2	0534	CB Single phase transformer is off
2714	1ph. Load earth fault	AUX	1	3	0535	CB 100 Battery charger input is off
2716	TC1 cutout req. Manual	VCU	1	3	0096	F0902P2 Battery system BATTERY CHARGER MCB OFF
2717	TC2 cutout req. Manual	VCU	1	3	0593	Wheel Slipping
2722	Vigilance manually cutout	SAFETY	1	2	0596	F0307P2 Traction Bogie 2 WHEEL SKIDING IN BOGIE 2
2723	Harmonic Filter Current Deviation	MAINPWR	3	3	0363	Reduce the TE demand – Excess load on gear system
2750	Loco Variant changed, Traction locked. Reset of both VCUs required.	VCU	1	2	0593	Wheel Slipping
2760	No Angle Transmitter Mismatch detected, but Failure Mode activated by driver.	VCU	1	3	10753	F1003P1 Brake System VIGILANCE EMERGENCY BRAKE APPLICATION
2801	Dangerous overvoltage detected (U > 33 kV)	MAINPWR	1	1	0930	Overspeed 105% detected by MEMOTEL
2802	No catenary voltage detected (U < 0,5 kV)	MAINPWR	1	2	0931	F1601P1 Speedometer SPEED LIMIT EXCEEDED
2806	VCB loop test: test mode TCU 1 could not be set	MAINPWR	3	3	0629	Limited drive mode active. Ext.IO Failure
2807	VCB loop test: test mode TCU 2 could not be set	MAINPWR	3	3	0521	F0902P1 Battery system BATTERY VOLTAGE LOW
2809	Line voltage 5. harmonic too high - condition 2	MAINPWR	3	3	0633	Deactivate limited drive mode (Redundancy mode)
2810	Line voltage 5. harmonic too high - condition 1	MAINPWR	3	3	0759	F0402P2 Harmonic filter EARTH FAULT HARMONIC FILTER CIRCUIT
2903	AUX inverter redundancy mode active	AUX	9	3	0758	F0905P2 Battery system EARTH FAULT BATTERY CIRCUIT
2904	AUX inverter: 1 transformer cutout	AUX	9	3	0760	Earth fault in single phase load circuit
3008	ACU1 master Temp OOR Controller	AUX	1025	2	0274	TC1 isolated manually through rotary switch or DDU screen.
3028	ACU1 rectifier Temp OOR Heatsink	AUX	1025	2	0275	TC2 isolated manually through Rotary switch or DDU screen.
3043	ACU1 Inverter Temp OOR Controller	AUX	1025	2	0763	Vigilance manually cutout
3044	ACU1 Inverter Temp OOR HeatSink	AUX	1025	2	0571	Harmonic Filter Current Deviation
3108	ACU2 master Temp OOR Controller	AUX	1025	2	0705	Locomotive variant changed - Traction lock
3127	ACU2 rectifier Temp OOR Heatsink	AUX	1025	2	0868	Failure Mode activated
3140	ACU2 Inverter Temp OOR Controller	AUX	1025	2	0025	Catenary overvoltage > 33 kV - Panto down
3141	ACU2 Inverter Temp OOR HeatSink	AUX	1025	2	0005	F0104P1 CATENARY VOLTAGE OUT OF LIMIT
3208	ACU3 master Temp OOR Controller	AUX	1025	2	0026	No catenary voltage detected
3227	ACU3 rectifier Temp OOR Heatsink	AUX	1025	2	0005	F0104P1 CATENARY VOLTAGE OUT OF LIMIT
3240	ACU3 Inverter Temp OOR Controller	AUX	1025	2	0886	ACU 1 controller is overheating
3241	ACU3 Inverter Temp OOR HeatSink	AUX	1025	2	0888	ACU 1 is overheating
3400	Failure mode activated from display by driver	VCU	1	2	0888	ACU 1 is overheating
3450	Component overtemperature detected: logging temperature values every 300s.	MONITORING	1025	2	0889	ACU 1 is overheating
3451	CCU 1 temperature has exceeded the temperature limit for reaction 2.	MONITORING	1025	2	0889	ACU 2 is overheating
3452	CCU 2 temperature has exceeded the temperature limit for reaction 2.	MONITORING	1025	2	0889	ACU 2 is overheating
3453	TCU 1 temperature has exceeded the temperature limit for reaction 2.	MONITORING	1025	2	0887	ACU 3 controller is overheating
3454	TCU 2 temperature has exceeded the temperature limit for reaction 2.	MONITORING	1025	2	0890	ACU 3 is overheating
3455	Display 1 temperature has exceeded the limit for reaction 2.	MONITORING	1025	2	0890	ACU 3 is overheating
3456	Display 2 temperature has exceeded the limit for reaction 2.	MONITORING	1025	2	0890	ACU 3 is overheating
3460	Battery charger control module temperature (via ACU2) has exceeded the limit for reaction 2.	MONITORING	1025	2	0868	Failure Mode activated
3461	Battery charger control module temperature (via ACU3) has exceeded the limit for reaction 2.	MONITORING	1025	2	0880	Over temperature detected-VCU/TCU/AUX/BCH
3465	ExtIO 11 temperature has exceeded the limit for reaction 1.	MONITORING	1025	2	0881	CCU 1 is overheating
3466	ExtIO 12 temperature has exceeded the limit for reaction 1.	MONITORING	1025	2	0095	F0101P2 OVER TEMPERATURE CONTROL ELECTRONICS
3467	ExtIO 21 temperature has exceeded the limit for reaction 1.	MONITORING	1025	2	0882	CCU 2 is overheating
3468	ExtIO 22 temperature has exceeded the limit for reaction 1.	MONITORING	1025	2	0095	F0101P2 OVER TEMPERATURE CONTROL ELECTRONICS
3900	Switch Off Announcement active	VCU	1	1	0701	001 SELF HOLD MODE ACTIVE

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Environment 1: Basic

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		
It shows status of parking brake applied at bogie 1		

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2. = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		

Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		
It shows status of shunting mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active. = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected= 0		
It shows smoke detection status		

Signal	\$3203020	Fire detected
Fire detected = 0		
It shows fire detection status		

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Environment 3: Main Power

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		
It shows status of parking brake applied at bogie 1		

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2. = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active..... = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active..... = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		
Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		
It shows status of shunting mode activation		

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active. = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected= 0		
It shows smoke detection status		

Signal	\$3203020	Fire detected
Fire detected= 0		
It shows fire detection status		

Signal	\$9911FLG	Pantograph FLAG
Pantograph FLAG = 0000 0000 0000 0000 0000 0000 0010 0000 0000		
Bit	0	reserved for flag structure
	1	pantos inhibited: CB 127.12 tripped
	2	dummy PAN flag
	3	pantos locked: over current counter
	4	pantos inhibited: invalid feedback signals / MVB communication not ok
	5	pantos inhibited: locomotive shut down in progress
	6	pantos inhibited: no cab activated
	7	pantos inhibited: VCB off feedback fault
	8	pantos inhibited: Self test active
	9	pantos inhibited: no communication with TCU-Master
	10	dummy PAN flag
	11	pantos locked: current detected by opened VCB
	12	pantos inhibited: panto down request by TCU1 and/or TCU2
	13	catenary overvoltage U > 33 kV
	14	pantos inhibited due to emergency push button
	15	Command panto down by the driver
	16	pantos locked: raising fault panto A
	17	pantos locked: raising fault panto D
	18	pantos locked: lowering fault panto A
	19	pantos locked: lowering fault panto D
	20	pantos locked: loss of pressure panto A
	21	pantos locked: loss of pressure panto D
	22	pantos inhibited: temporary restart interlock
	23	pantos inhibited: Simulation mode, ALG Test is Running
	24	dummy PAN flag
	25	dummy PAN flag
	26	dummy PAN flag
	27	dummy PAN flag
	28	dummy PAN flag
	29	AC line voltage not valid
	30	AC frequency not valid
	31	AC line current not valid

Signal	\$9911A00	State Panto1
State Panto1..... = 1		
It shows status of Panto 1		

Signal	\$9912FLG	VCB FLAG
VCB FLAG = 0000 0000 0000 0000 0000 0000 0010 0000 0000		
Bit	0	reserved for flag structure
	1	VCB inhibited: No catenary volt detected
	2	VCB inhibited: Over or under voltage VCB open
	3	VCB temporary locked: Line voltage 5. harmonic too high
	4	VCB temporary locked: Reclose interlock
	5	VCB inhibited: Over or inrush current too high -> VCB open
	6	VCB inhibited: transformer oil temperature too high
	7	VCB temporary locked: line voltage instantaneous value too high
	8	VCB inhibited: Invalid feedback signals / MVB communication not ok
	9	VCB inhibited: One TCU is off but VCB loop is still opened
	10	VCB inhibited: Transformer oil pressure/MCBs of both transformer oil pumps are tripped
	11	VCB inhibited: VCB opened by the driver
	12	VCB inhibited: VCB opened due to switch on fault
	13	VCB inhibited: No panto raised
	14	VCB inhibited: Dummy Flag
	15	VCB inhibited: Call for help by TCU1 and/or TCU2 inhibited: Call for help by TCU1 and/or TCU2
	16	VCB inhibited: VCB loop not released by TCU1
	17	VCB inhibited: VCB loop not released by TCU2
	18	VCB inhibited: VCB loop test failed by TCU1
	19	VCB inhibited: VCB loop test failed by TCU2
	20	VCB inhibited: VCB loop test failed by EXT_IO St. 11 and 12
	21	VCB inhibited: End of VCB loop test but one TCU is still in test mode
	22	VCB inhibited: VCB loop test aborted
	23	VCB inhibited: MCBs of both TCC Coolant pumps are tripped
	24	VCB inhibited: Harmonic filter over current or inrush current high
	25	VCB inhibited: Traction Interface
	26	VCB inhibited: More than one IO station not available
	27	VCB inhibited: VCB opened by AGT traction release monitoring
	28	VCB inhibited: AUX Inverter Fault
	29	VCB inhibited: AUX inverter fault or reconfiguration
	30	VCB inhibited: Aux Winding overcurrent
	31	VCB inhibited: Two or more AUX isolated/ AUX Isolated

Signal	\$9911D00	State Panto2
State Panto2..... = 1		
It shows status of Panto 2		

Signal	\$9912VCB	State VCB
State VCB..... = 1		
It gives VCB state		

Signal	\$9912REL	VCB loop test released
VCB loop test released = 0		0000 0000
Bit	0	CCU is master
	1	TCU1 is available or switched off
	2	TCU2 is available or switched off
	3	TCU1 & TCU2 are not switched off
	4	External I/O module 117 or 126 is ok
	5	VCB CB(127.12) is not tripped
	6	VCB CB(127.12) is not tripped valid
	7	VCB is off & there is no switch off fault present

Signal	\$9912LOP	State VCB Loop Test
State VCB Loop Test = 1		
It gives VCB loop test state		

Signal	\$9910UHA	env: U_AC 5. harmonic
env: U_AC 5. harmonic = 0.00 V		
It measures harmonic voltage in AC line		

Signal	\$9910UPE	U_peak voltage
U_peak voltage = 0.00 kV		
It measures peak voltage		

Signal	\$260154	Transformer oil pressure 1
Transformer oil pressure 1 = 0.00 bar		
It measures transformer oil pressure at TCU1		

Signal	\$260454	Transformer oil pressure 2
Transformer oil pressure 2 = 0.00 bar		
It measures transformer oil pressure at TCU2		

Signal	\$260031	Temperature Transformer oil Temperature 1
Temperature Transformer oil Temperature 1 = 0.00 degC		
It measures transformer oil temperature at TCU1		

Signal	\$260331	Temperature Transformer oil Temperature 2
Temperature Transformer oil Temperature 2 = 0.00 degC		
It measures transformer oil temperature at TCU2		

Signal	\$9910CUR	AC current monitoring
AC current monitoring. . . . = 0		0000 0000 0000 0000
Bit	0	AC line current (max) is more than transformer no-load current (level 1) & VCB stays on for a pre set time in FSM state
	1	AC line current (max) is more than transformer no-load current (level 2) & VCB stays on for a pre set time in FSM state
	2	AC line current (max) is more than transformer no-load current (level 3) & VCB stays on for a pre set time in FSM state
	3	AC line current (max) is more than transformer no-load current (level 4) & VCB stays on for a pre set time in FSM state
	4	AC line current (max) is more than transformer no-load current (level 5) & VCB stays on for a pre set time in FSM state
	5	AC line current (max) is more than transformer no-load current (level 6) & VCB stays on for a pre set time in FSM state
	6	AC line current is more than set value & it stays for a certain period
	7	AC overcurrent at TCU1 or TCU2
	8	Input available at I/O module E123_07
	9	Reserve
	10	Reserve
	11	Reserve
	12	Reserve
	13	Reserve
	14	Reserve
	15	Reserve

Environment 5: Brakes

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		
It shows status of parking brake applied at bogie 1		

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2. = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active..... = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active..... = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		

Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		
It shows status of shunting mode activation		

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active. = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected = 0		
It shows smoke detection status		

Signal	\$3203020	Fire detected
Fire detected = 0		
It shows fire detection status		

Signal	\$4502001	Type of Brake Equipment
Type of Brake Equipment. = 1		
It defines the make of the brake equipment		
No.	1	Faiveley E70
	2	Knorr CCBII

Signal	\$4502002	Pushbutton BPPB installed
Pushbutton BPPB installed. = 1		
It gives information of parking brake push button		
No.	1	BPPB installed
	2	BPPB not installed

Signal	\$2801001	Disp BCU fault status
Disp BCU fault status. = 1 0000 0001		
It gives status of BCU working		
Bit	0	Invalid
	1	BCU is ok
	2	BCU is faulty
	3	Reserve
	4	Reserve
	5	Reserve
	6	Reserve
	7	Reserve

Signal	\$2801002	Brake pipe isolation cock status
Brake pipe isolation cock status. = 1 0000 0001		
It gives status of cock of brake pipe		
Bit	0	Invalid
	1	BP cut out cock open (=CUT IN)
	2	BP cut out cock closed (=CUT OFF)
	3	Reserve
	4	Reserve
	5	Reserve
	6	Reserve
	7	Reserve

Signal	\$2808003	Status MR press own loco
Status MR press own loco. = 1 0000 0001		
It shows status of main reservoir pressure		
Bit	0	Invalid
	1	MR pressure < 5.6 bar
	2	MR pressure < 8 bar
	3	MR pressure > 8 bar
	4	Reserve
	5	Reserve
	6	Reserve
	7	Reserve

Signal	\$2808002	Display Status FP pressure
Display Status FP pressure = 1 0000 0001		
It shows status of feed pipe pressure		
Bit	0	Invalid
	1	ON -> FP pressure > 5.6 bar
	2	OFF -> FP pressure < 5.0 bar
	3	Reserve
	4	Reserve
	5	Reserve
	6	Reserve
	7	Reserve

Environment 9: Auxiliaries

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		
It shows status of parking brake applied at bogie 1		

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2. = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active..... = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active..... = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		

Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		
It shows status of shunting mode activation		

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active. = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected= 0		
It shows smoke detection status		

Signal	\$3203020	Fire detected
Fire detected= 0		
It shows fire detection status		

Signal	\$3103031	Aux Converter 1 Status
Aux Converter 1 Status = 1 000 H		
It shows status of Aux Converter 1		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$3103032	Aux Converter 2 Status
Aux Converter 2 Status = 1 000 H		
It shows status of Aux Converter 2		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$3103033	Aux Converter 3 Status
Aux Converter 3 Status = 1 000 H		
It shows status of Aux Converter 3		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$31E1U01	Aux1 Input Voltage
Aux1 Input Voltage = 0.00 V		
It gives input voltage available at ACU 1 in volts		

Signal	\$31E1U02	Aux1 Output Voltage
Aux1 Output Voltage = 0.00 V		
It gives output voltage available at ACU 1 in volts		

Signal	\$31E1I01	Aux1 Input Current
Aux1 Input Current = 0.00 A		
It shows input current for ACU 1 in amperes		

Signal	\$31E1I02	Aux1 Output Current
Aux1 Output Current = 0.00 A		
It shows output current for ACU 1 in amperes		

Signal	\$3101050	AUX 1 freq. setpoint
AUX 1 freq. setpoint = 0.00 Hz		
It shows frequency for ACU 1 in Hertz		

Signal	\$31E1F01	AUX1 O/P Frequency
AUX1 O/P Frequency. = 0.00 Hz		
It shows output frequency for ACU 1 in Hertz		

Signal	\$31E2U01	Aux2 Input Voltage
Aux2 Input Voltage = 0.00 V		
It gives input voltage available at ACU 2 in volts		

Signal	\$31E2U02	Aux2 Output Voltage
Aux2 Output Voltage = 0.00 V		
It gives output voltage available at ACU 2 in volts		

Signal	\$31E2I01	Aux2 Input Current
Aux2 Input Current = 0.00 A		
It shows input current for ACU 2 in amperes		

Signal	\$31E2I02	Aux2 Output Current
Aux2 Output Current = 0.00 A		
It shows output current for ACU 2 in amperes		

Signal	\$3102050	AUX 2 freq. setpoint
AUX 2 freq. setpoint = 0.00 Hz		
It shows frequency for ACU 2 in Hertz		

Signal	\$31E2F01	AUX2 O/P Frequency
AUX2 O/P Frequency. = 0.00 Hz		
It shows output frequency for ACU 2 in Hertz		

Signal	\$31E3U01	Aux3 Input Voltage
Aux3 Input Voltage = 0.00 V		
It gives input voltage available at ACU 3 in volts		

Signal	\$31E3U02	Aux3 Output Voltage
Aux3 Output Voltage = 0.00 V		
It gives output voltage available at ACU 3 in volts		

Signal	\$31E3I01	Aux3 Input Current
Aux3 Input Current = 0.00 A		
It shows input current for ACU 3 in amperes		

Signal	\$31E3I02	Aux3 Output Current
Aux3 Output Current = 0.00 A		
It shows output current for ACU 3 in amperes		

Signal	\$ACU1ISO	ACU1 Isolation Status
ACU1 Isolation Status. = 1 0000 0000 0000 0000		
It shows messages for ACU1 isolation		
Bit	0	ACU1 master Locked
	1	ACU1 master Connector code M1300
	2	ACU1 master CAN1-Bus fault
	3	ACU1 master MVB Timeout
	4	ACU1 master Temperature sensor error
	5	ACU1 master Input voltage sensor fault
	6	ACU1 master Shutdown
	7	ACU1 rectifier Fault detection temperature sensor
	8	ACU1 rectifier Shutdown
	9	ACU1 Inverter U in difference
	10	ACU1 Inverter Shutdown
	11	ACU1 Out of order
	12	ACU1 Is locked
	13	Reserve
	14	Reserve
	15	Reserve

Signal	\$3103050	AUX 3 freq. setpoint
AUX 3 freq. setpoint = 0.00 Hz		
It shows frequency for ACU 3 in Hertz		

Signal	\$31E3F01	AUX3 O/P Frequency
AUX3 O/P Frequency. = 0.00 Hz		
It shows output frequency for ACU 3 in Hertz		

Signal		\$ACU2ISO	ACU2 Isolation Status	
ACU2 Isolation Status. =		1	0000 0000 0000 0000	
It shows reason for ACU2 isolation				
Bit	0	ACU2 master Locked		
	1	ACU2 master Connector code M1300		
	2	ACU2 master CAN1-Bus fault		
	3	ACU2 master CAN2-Bus fault		
	4	ACU2 master MVB Timeout		
	5	ACU2 master Temperature sensor error		
	6	ACU2 master Input voltage sensor fault		
	7	ACU2 master Shutdown		
	8	ACU2 rectifier Fault detection temperature sensor		
	9	ACU2 rectifier Shutdown		
	10	ACU2 Inverter Temperature sensor error		
	11	ACU2 Inverter Shutdown		
	12	ACU2 Out of order		
	13	ACU2 Is locked		
	14	Reserve		
	15	Reserve		

Signal	\$ACU3ISO	ACU3 Isolation Status
ACU3 Isolation Status. = 1		0000 0000 0000 0000
It shows reason for ACU3 isolation		
Bit	0	ACU3 master Locked
	1	ACU3 master Connector code M1300
	2	ACU3 master CAN1-Bus fault
	3	ACU3 master CAN2-Bus fault
	4	ACU3 master MVB Timeout
	5	ACU3 master Temperature sensor error
	6	ACU3 master Input voltage sensor fault
	7	ACU3 master Shutdown
	8	ACU3 rectifier Fault detection temperature sensor
	9	ACU3 rectifier Shutdown
	10	ACU3 Inverter Temperature sensor error
	11	ACU3 Inverter Shutdown
	12	ACU3 Out of order
	13	ACU3 Is locked
	14	Reserve
	15	Reserve

Signal		\$ACUOOR	ACUs OOR Temp Status
ACUs OOR Temp Status. =		1	0000 0000 0000 0000
Bit	0	ACU1 master Temp OOR Controller	
	1	ACU1 rectifier Temp OOR Heatsink	
	2	ACU1 Inverter Temp OOR Controller	
	3	ACU1 Inverter Temp OOR HeatSink	
	4	ACU2 master Temp OOR Controller	
	5	ACU2 rectifier Temp OOR Heatsink	
	6	ACU2 Inverter Temp OOR Controller	
	7	ACU2 Inverter Temp OOR HeatSink	
	8	ACU3 master Temp OOR Controller	
	9	ACU3 rectifier Temp OOR Heatsink	
	10	ACU3 Inverter Temp OOR Controller	
	11	ACU3 Inverter Temp OOR HeatSink	
	12	Reserve	
	13	Reserve	
	14	Reserve	
	15	Reserve	

Signal	\$ACU1RES	ACU1 Reset Status
ACU1 Reset Status. . . . = 0000		
0000 0000 0000 0000 0000 0000 0000 0000		
It is the information for ACU1 restart		
Bit	0	ACU1 master Unknown Error
	1	ACU1 master Power supply unit fault
	2	ACU1 master Internal error
	3	ACU1 rectifier U in Max/Min peak
	4	ACU1 rectifier U in Max rms
	5	ACU1 rectifier U in Min rms
	6	ACU1 rectifier U DC-Link max peak
	7	ACU1 rectifier U DC-Link min
	8	ACU1 rectifier U DC-Link Max rms
	9	ACU1 rectifier DC Link current Max peak
	10	ACU1 rectifier DC Link current Min peak
	11	ACU1 rectifier DC Link current Max rms
	12	ACU1 rectifier Phase error
	13	ACU1 Inverter U in peak max,min
	14	ACU1 Inverter U in rms max,min
	15	ACU1 Inverter U out peak L1/L2,L2/L3,L3/L1
	16	ACU1 Inverter U out (rms) max L1/L2,L2/L3,L3/L1
	17	ACU1 Inverter U out (rms) min L1/L2,L2/L3,L3/L1
	18	ACU1 Inverter U out difference
	19	ACU1 Inverter I out (peak) IL1,IL2,IL3
	20	ACU1 Inverter I out (rms) IL1,IL2,IL3
	21	ACU1 Inverter I out total
	22	ACU1 Inverter Sine filter error
	23	ACU1 Inverter Phase failure
	24	ACU1 Inverter Control electronic fault
	25	ACU1 Inverter Earth fault DC-link
	26	ACU1 Inverter Shortcircuit
	27	ACU1 Inverter UCE
	28	ACU1 Inverter Temperature sensor error
	29	ACU1 Inverter Internal error
	30	ACU1 Overload
	31	Reserve

Signal	\$ACU2RES	ACU2 Reset Status
ACU2 Reset Status. . . . = 0000		
0000 0000 0000 0000 0000 0000 0000 0000		
It is the information for ACU2 restart		
Bit	0	ACU2 master Unknown Error
	1	ACU2 master Power supply unit fault
	2	ACU2 master Internal error
	3	ACU2 rectifier U in Max/Min peak
	4	ACU2 rectifier U in Max rms
	5	ACU2 rectifier U in Min rms
	6	ACU2 rectifier U DC-Link max peak
	7	ACU2 rectifier U DC-Link min
	8	ACU2 rectifier U DC-Link Max rms
	9	ACU2 rectifier DC Link current Max peak
	10	ACU2 rectifier DC Link current Min peak
	11	ACU2 rectifier DC Link current Max rms
	12	ACU2 rectifier Phase error
	13	ACU2 Inverter U in peak max,min
	14	ACU2 Inverter U in rms max,min
	15	ACU2 Inverter U in difference
	16	ACU2 Inverter U out peak L1/L2,L2/L3,L3/L1
	17	ACU2 Inverter U out (rms) max L1/L2,L2/L3,L3/L1
	18	ACU2 Inverter U out (rms) min L1/L2,L2/L3,L3/L1
	19	ACU2 Inverter U out difference
	20	ACU2 Inverter I out (peak) IL1,IL2,IL3
	21	ACU2 Inverter I out (rms) IL1,IL2,IL3
	22	ACU2 Inverter I out total
	23	ACU2 Inverter Sine filter error
	24	ACU2 Inverter Phase failure
	25	ACU2 Inverter Control electronic fault
	26	ACU2 Inverter Earth fault DC-link
	27	ACU2 Inverter Short circuit
	28	ACU2 Inverter UCE
	29	ACU2 Inverter Internal error
	30	ACU2 Overload
	31	Reserve

Signal	\$ACU3RES	ACU3 Reset Status
ACU3 Reset Status. . . . = 0000		
0000 0000 0000 0000 0000 0000 0000 0000		
It is the information for ACU3 restart		
Bit	0	ACU3 master Unknown Error
	1	ACU3 master Power supply unit fault
	2	ACU3 master Internal error
	3	ACU3 rectifier U in Max/Min peak
	4	ACU3 rectifier U in Max rms
	5	ACU3 rectifier U in Min rms
	6	ACU3 rectifier U DC-Link max peak
	7	ACU3 rectifier U DC-Link min
	8	ACU3 rectifier U DC-Link Max rms
	9	ACU3 rectifier DC Link current Max peak
	10	ACU3 rectifier DC Link current Min peak
	11	ACU3 rectifier DC Link current Max rms
	12	ACU3 rectifier Phase error
	13	ACU3 Inverter U in peak max,min
	14	ACU3 Inverter U in rms max,min
	15	ACU3 Inverter U in difference
	16	ACU3 Inverter U out peak L1/L2,L2/L3,L3/L1
	17	ACU3 Inverter U out (rms) max L1/L2,L2/L3,L3/L1
	18	ACU3 Inverter U out (rms) min L1/L2,L2/L3,L3/L1
	19	ACU3 Inverter U out difference
	20	ACU3 Inverter I out (peak) IL1,IL2,IL3
	21	ACU3 Inverter I out (rms) IL1,IL2,IL3
	22	ACU3 Inverter I out total
	23	ACU3 Inverter Sine filter error
	24	ACU3 Inverter Phase failure
	25	ACU3 Inverter Control electronic fault
	26	ACU3 Inverter Earth fault DC-link
	27	ACU3 Inverter Short circuit
	28	ACU3 Inverter UCE
	29	ACU3 Inverter Internal error
	30	ACU3 Overload
	31	Reserve

Signal	\$31E1012	ACU 1 Contactor 52/4 closed
ACU 1 Contactor 52/4 closed = 0		
It gives status of ACU 1 contactor 52/4		

Signal	\$31E1013	ACU 1 Contactor 52/5 closed
ACU 1 Contactor 52/5 closed = 0		
It gives status of ACU 1 contactor 52/5		

Signal	\$31E2012	ACU 2 Contactor 52/1 closed
ACU 2 Contactor 52/1 closed = 0		
It gives status of ACU 2 contactor 52/1		

Signal	\$31E2013	ACU 2 Contactor 52/2 closed
ACU 2 Contactor 52/2 closed = 0		
It gives status of ACU 2 contactor 52/2		

Signal	\$31E2014	ACU 2 Contactor 52/4 closed
ACU 2 Contactor 52/4 closed = 0		
It gives status of ACU 2 contactor 52/4		

Signal	\$31E3013	ACU 3 Contactor 52/3 closed
ACU 3 Contactor 52/3 closed. = 0		
It gives status of ACU 3 contactor 52/3		

Signal	\$3104214	Cont. -Q01 Switched on
Cont. -Q01 Switched on. = 0		
It gives status of contactor Q01		

Signal	\$3104217	Cont.-K01 Switched on
Cont.-K01 Switched on. = 0		
It gives status of contactor K01		

Signal	\$3104220	Cont.-K02 Switched on
Cont.-K02 Switched on. = 0		
It gives status of contactor K02		

Signal	\$3104223	Cont.-K03 Switched on
Cont.-K03 Switched on. = 0		
It gives status of contactor K03		

Signal	\$31E4004	AUXx_BCH_Input_Volt
AUXx_BCH_Input_Volt = 0.00 V		
It displays input voltage available for battery charger from ACU		

Signal	\$31E4U01	BCH: Output Voltage
BCH: Output Voltage = 0.00 V		
It displays output voltage from battery charger in Volts		

Signal	\$31E4I01	BCH: Output Current
BCH: Output Current. = 0.00 A		
It displays output current from battery charger in Amperes		

Signal	\$31E4I02	BCH: Battery Current
BCH: Battery Current. = 0.00 A		
It displays current drawn from battery in Amperes		

Signal	\$31E4003	BC: Diagnostics
BC: Diagnostics. . . . = 0000		
0000 0000 0000 0000 0000 0000 0000 0000		
It shows battery charger diagnostic messages		
Bit	0	BCR BCH Locked
	1	BCR I device HW,SW,GW
	2	BCR I battery SW
	3	BCR I difference battery
	4	BCR U in max
	5	BCR U in min
	6	BCR U in difference
	7	BCR U Bat Max SW,HW
	8	BCR U Bat Min SW,HW
	9	BCR Temperature sensor error
	10	BCR Temp OOR Controller
	11	BCR Temp OOR Heatsink
	12	BCR Temp OOR Battery
	13	BCR Short circuit
	14	BCR UCE
	15	BCR Software fault
	16	BCR U bat sensor difference, failure
	17	BCR Power supply unit fault
	18	BCR Battery temperature sensor error
	19	Reserve
	20	Reserve
	21	Reserve
	22	Reserve
	23	Reserve
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	BCR Normal operation
	30	BCR Shutdown
	31	BCR Internal error

Environment 17: WTB

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		
It shows status of parking brake applied at bogie 1		

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2 = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		

Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		
It shows status of shunting mode activation		

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active..... = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected = 0		
It shows smoke detection status		

Signal	\$3203020	Fire detected
Fire detected = 0		
It shows fire detection status		

Signal	\$9908090	Master train number
Master train number = 0		
It displays the master train number		

Signal	\$9908091	Slave train number
Slave train number = 0		
It displays the slave train number		

Signal	\$9908009	Node Number Slave
Node Number Slave. = 0		
It displays the node number of slave train		

Signal	\$2803002	Disp Status Ind Brk Slave
Disp Status Ind Brk Slave. = 1		
It gives status of independent brake of slave Loco		
No.	0	invalid
	1	Independent brake (direct brake) applied
	2	Independent brake (direct brake) released

Signal		WTB status
WTB status. = 1		
It gives status of WTB		
Signal no.	\$9908010	WTB R1 valid
	\$9908021	WTB R2 S1 valid
	\$9908001	WTB Master
	\$9908002	WTB Slave

Environment 33: Speed

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		
It shows status of parking brake applied at bogie 1		

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2. = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active..... = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active..... = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		

Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		
It shows status of shunting mode activation		

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active. = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected= 0		
It shows smoke detection status		

Signal	\$3203020	Fire detected
Fire detected = 0		
It shows fire detection status		

Signal:	\$43A3D51	Wheel diameter axle 1
Wheel diameter axle 1... = 00.0 mm		
Wheel diameter of axle 1 in mm		

Signal:	\$43A3D52	Wheel diameter axle 2
Wheel diameter axle 2... = 00.0 mm		
Wheel diameter of axle 2 in mm		

Signal:	\$43A3D53	Wheel diameter axle 3
Wheel diameter axle 3... = 00.0 mm		
Wheel diameter of axle 3 in mm		

Signal:	\$43A3D54	Wheel diameter axle 4
Wheel diameter axle 4... = 00.0 mm		
Wheel diameter of axle 4 in mm		

Signal:	\$43A3D55	Wheel diameter axle 5
Wheel diameter axle 5... = 00.0 mm		
Wheel diameter of axle 5 in mm		

Signal:	\$43A3D56	Wheel diameter axle 6
Wheel diameter axle 6... = 00.0 mm		
Wheel diameter of axle 6 in mm		

Signal:	\$43A3A08	Loco Acceleration
Loco Acceleration = 0.00 m/s^2		

Signal:	\$43A5V21	Speed TM 1
Speed TM 1= 0.00 km/h		
Speed of Traction Motor 1		

Signal:	\$43A5V22	Speed TM 2
Speed TM 2= 0.00 km/h		
Speed of Traction Motor 2		

Signal:	\$43A5V23	Speed TM 3
Speed TM 3= 0.00 km/h		
Speed of Traction Motor 3		

Signal:	\$43A5V24	Speed TM 4
Speed TM 4= 0.00 km/h		
Speed of Traction Motor 4		

Signal:	\$43A5V25	Speed TM 5
Speed TM 5= 0.00 km/h		
Speed of Traction Motor 5		

Signal:	\$43A5V26	Speed TM 6
Speed TM 6= 0.00 km/h		
Speed of Traction Motor 6		

Signal:		Speed sensor faulty status
Speed sensor faulty status = 0000 0000 0000 0000		
Bit	0	\$D0715 - TM1 Speed sensor faulty
	1	\$D0715 - TM2 Speed sensor faulty
	2	\$D0715 - TM3 Speed sensor faulty
	3	\$D0715 - TM4 Speed sensor faulty
	4	\$D0715 - TM5 Speed sensor faulty
	5	\$D0715 - TM6 Speed sensor faulty
	6	Reserve
	7	Reserve
	8	Reserve
	9	Reserve
	10	Reserve
	11	Reserve
	12	Reserve
	13	Reserve
	14	Reserve
	15	Reserve

Environment 65: Traction

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		
It shows status of parking brake applied at bogie 1		

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2 = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		

Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		
It shows status of shunting mode activation		

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active..... = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected= 0		
It shows smoke detection status		

Signal	\$9921X01	Traction interlock status (FLAG)
Traction interlock status (FLAG). . . . = 0 0000 0000 0000 0000 0000 0000 0000 0000		
It shows status of traction interlock		
Bit	0	reserved for flag structure
	1	Traction locked: Emergency brake by vigilance control
	2	Traction locked: Emergency brake due to overspeed (MEMOTEL)
	3	Traction locked: Overspeed detected by vehicle control
	4	Traction locked: Emergency brake applied
	5	Traction locked: Independent brake applied (leading/guided loco)
	6	Traction locked: Water Closet Occupied
	7	Traction locked: Emergency stop activated by the driver
	8	Traction locked: End of CSC. Confirm with MSB to zero
	9	Traction locked: End of Inching Mode. Confirm with MSB to zero
	10	Traction locked: End of Shunting Mode. Confirm with MSB to zero
	11	dummy TRL flag
	12	dummy TRL flag
	13	dummy TRL flag
	14	dummy TRL flag
	15	Traction locked: Request from leading loco
	16	Traction locked: Tractive effort without demand
	17	Traction locked: Implausible values from traction control
	18	dummy TRL flag
	19	dummy TRL flag
	20	dummy TRL flag
	21	dummy TRL flag
	22	dummy TRL flag
	23	dummy TRL flag
	24	dummy TRL flag
	25	dummy TRL flag
	26	dummy TRL flag
	27	dummy TRL flag
	28	dummy TRL flag
	29	dummy TRL flag
	30	dummy TRL flag
	31	dummy TRL flag

Signal	\$9921X02	Running interlock status (FLAG)
Running interlock status (FLAG). . . . = 0000 0000 0000 0000 0000 0000 0000 0000		
It shows status of Running interlock		
Bit	0	reserved for flag structure
	1	Traction blocked: Parking brake applied (leading/guided loco)
	2	Traction blocked: Pneumatic brakes applied (leading/guided loco)
	3	dummy TRB flag
	4	Traction blocked: Software versions conflict (leading/guided loco)
	5	Traction blocked: Direction change with speed above 2 km/h
	6	Traction blocked: Angle transmitter mismatch
	7	Traction blocked: No Driving Direction selected
	8	Traction blocked: Train bus inauguration
	9	dummy TRB flag
	10	Traction blocked: Automatic brake applied
	11	Traction blocked: Main reservoir pressure too low
	12	Traction blocked: Brake pipe control cut OUT on leading loco
	13	Traction blocked: Emergency brake exhaust isolated
	14	Traction blocked: Brake electronics (BCU) failure
	15	Traction blocked: Request from guided loco
	16	Traction blocked: Traction blocked, BC pressure below 3.5bar
	17	Traction blocked: VCB Closed -> Throttle not in 0 position
	18	dummy TRB flag
	19	Traction blocked: Brake pipe control cut IN on Banking loco
	20	dummy TRB flag
	21	Traction blocked: Simulation Test is active
	22	dummy TRB flag
	23	dummy TRB flag
	24	Traction blocked: TCU Isolation required
	25	Traction blocked: TCU Master Conflict
	26	Traction blocked: Battery voltage too low
	27	Traction blocked: Comm. To one IO st. Failed - Start Limited Drive Mode
	28	Traction blocked: Requested by Variant Control
	29	Traction blocked: Fire Detected
	30	Traction blocked: No traction available or VCB open
	31	Traction blocked: No traction built up after 20 seconds

Signal	\$3203020	Fire detected
Fire detected = 0		
It shows fire detection status		

Signal	\$9921S11	TE/BE dem BG1 kN
TE/BE dem BG1 kN. = 0.00 kN		
It displays the TE/BE demand for Bogie 1		

Signal	\$9921S12	TE/BE dem BG2 kN
TE/BE dem BG2 kN. = 0.00 kN		
It displays the TE/BE demand for Bogie 2		

Signal	\$9921F11	TE/BE act BG1 kN
TE/BE act BG1 kN. = 0.00 kN		
It displays the TE/BE actual applied in Bogie 1		

Signal	\$9921F12	TE/BE act BG2 kN
TE/BE act BG2 kN. = 0.00 kN		
It displays the TE/BE actual applied in Bogie 2		

Signal	\$260040	TCU1_ Water Inlet Prs.
TCU1_ Water Inlet Prs.. = 0.00 bar		
It shows water inlet pressure in TCU1		

Signal	\$260039	TCU1_ Temp. Water
TCU1_ Temp. Water.. = 0.00 degC		
It shows temperature of water in TCU1		

Signal	\$260340	TCU2_ Water Inlet Prs.
TCU2_ Water Inlet Prs.. = 0.00 bar		
It shows water inlet pressure in TCU2		

Signal	\$260339	TCU2_ Temp. Water
TCU2_ Temp. Water.. = 0.00 degC		
It shows temperature of water in TCU2		

Signal	\$260037	TCU1 DC Link Voltage
TCU1 DC Link Voltage. = 0.00 V		
It shows DC link voltage at TCU1		

Signal	\$260337	TCU2 DC Link Voltage
TCU2 DC Link Voltage. = 0.00 V		
It shows DC link voltage at TCU2		

Signal	\$21B411	Traction Rel AGT1 TCU 1
Traction Rel AGT1 TCU 1. = 0		
It shows status of traction release at AGT1 of TCU1		

Signal	\$21B421	Traction Rel AGT2 TCU 1
Traction Rel AGT2 TCU 1. = 0		
It shows status of traction release at AGT2 of TCU1		

Signal	\$21B412	Traction Rel AGT1 TCU 2
Traction Rel AGT1 TCU 2. = 0		
It shows status of traction release at AGT1 of TCU2		

Signal	\$21B422	Traction Rel AGT2 TCU 2
Traction Rel AGT2 TCU 2. = 0		
It shows status of traction release at AGT2 of TCU2		

Signal	\$9921B11	Traction interlock train
Traction interlock train.....= 0		
It shows status of traction interlock at train level		

Signal	\$9921B12	Traction interlock local
Traction interlock local.....= 0		
It shows status of traction interlock in local		

Signal	\$9921B13	Running interlock train
Running interlock train.= 0		
It shows status of Running interlock at train level		

Signal	\$9921B14	Running interlock local
Running interlock local.....= 0		
It shows status of Running interlock in local		

Signal	\$9921B20	Set Point open AGT
Set Point open AGT= 0		
It shows status of the set point to open AGT		

Signal	\$9921B21	Open VCB (AGT Monitoring)
Open VCB (AGT Monitoring). = 0		
It shows status of AGT monitoring to open VCB		

Signal	\$9921B30	Autom Brake Cut Out
Autom Brake Cut Out = 0		
It shows status of Automatic brake cut out condition		

Signal	\$2400005	TCU 1 is not available.
TCU 1 is not available.= 0		
It shows availability of TCU1 operation		

Signal	\$2400006	TCU 2 is not available.
TCU 2 is not available.= 0		
It shows availability of TCU2 operation		

Signal	\$2400007	CCU request TCU 1 off
CCU request TCU 1 off.....= 0		
It indicates CCU request for TCU1 off		

Signal	\$2400008	CCU request TCU 2 off
CCU request TCU 2 off.....= 0		
It indicates CCU request for TCU2 off		

Signal	\$260140	TCU1_PrechargeContact_ON
TCU1_PrechargeContact_ON = 0		
It shows status of TCU1 pre charge contactor ON		

Signal	\$260440	TCU2_PrechargContact_ON
TCU2_PrechargContact_ON = 0		
It shows status of TCU2 pre charge contactor ON		

Signal	\$260141	TCU1_LineDisconnecto_ON
TCU1_LineDisconnecto_ON = 0		
It shows status of TCU1 Line disconnecter ON		

Signal	\$260441	TCU2_LineDisconnecto_ON
TCU2_LineDisconnecto_ON = 0		
It shows status of TCU2 Line disconnecter ON		

Environment 129: Traction Power

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		
It shows status of parking brake applied at bogie 1		

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2. = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active..... = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active..... = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		

Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		

It shows status of shunting mode activation

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active. = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected= 0		
It shows smoke detection status		

Signal:	\$260092	TM 1 PWI active
TM 1 PWI active= 1		
Traction Motor 1 PWI active, when it becomes 1		

Signal:	\$260093	TM 1 Status driving
TM 1 Status driving= 1		
Traction Motor 1 Status driving, when it becomes 1		

Signal:	\$260094	TM 1 Status braking
TM 1 Status braking= 1		
Traction Motor 1 Status braking, when it becomes 1		

Signal:	\$260111	TM 2 PWI active
TM 2 PWI active= 1		
Traction Motor 2 PWI active, when it becomes 1		

Signal:	\$260112	TM 2 Status driving
TM 2 Status driving= 1		
Traction Motor 2 Status driving, when it becomes 1		

Signal:	\$260113	TM 2 Status braking
TM 2 Status braking= 1		
Traction Motor 2 Status braking, when it becomes 1		

Signal:	\$260130	TM 3 PWI active
TM 3 PWI active= 1		
Traction Motor 3 PWI active, when it becomes 1		

Signal:	\$260131	TM 3 Status driving
TM 3 Status driving= 1		
Traction Motor 3 Status driving, when it becomes 1		

Signal:	\$260132	TM 3 Status braking
TM 3 Status braking= 1		
Traction Motor 3 Status braking, when it becomes 1		

Signal:	\$260392	TM 4 PWI active
TM 4 PWI active = 1		
Traction Motor 4 PWI active, when it becomes 1		

Signal:	\$260393	TM 4 Status driving
TM 4 Status driving = 1		
Traction Motor 4 Status driving, when it becomes 1		

Signal:	\$260394	TM 4 Status braking
TM 4 Status braking = 1		
Traction Motor 4 Status braking, when it becomes 1		

Signal:	\$260411	TM 5 PWI active
TM 5 PWI active = 1		
Traction Motor 5 PWI active, when it becomes 1		

Signal:	\$260412	TM 5 Status driving
TM 5 Status driving = 1		
Traction Motor 5 Status driving, when it becomes 1		

Signal:	\$260413	TM 5 Status braking
TM 5 Status braking = 1		
Traction Motor 5 Status braking, when it becomes 1		

Signal:	\$260430	TM 6 PWI active
TM 6 PWI active = 1		
Traction Motor 6 PWI active, when it becomes 1		

Signal:	\$260431	TM 6 Status driving
TM 6 Status driving = 1		
Traction Motor 6 Status driving, when it becomes 1		

Signal:	\$260432	TM 6 Status braking
TM 6 Status braking = 1		
Traction Motor 6 Status braking, when it becomes 1		

Signal:	\$24B3041	TM1 Temp. sensor faulty
TM1 Temp. sensor faulty = 1		
Temperature Sensor of Traction Motor 1 is faulty, when it becomes 1		

Signal:	\$24B3053	TM2 Temp. sensor faulty
TM2 Temp. sensor faulty = 1		
Temperature Sensor of Traction Motor 2 is faulty, when it becomes 1		

Signal:	\$24B3054	TM3 Temp. sensor faulty
TM3 Temp. sensor faulty = 1		
Temperature Sensor of Traction Motor 3 is faulty, when it becomes 1		

Signal:	\$24B3069	TM4 Temp. sensor faulty
TM4 Temp. sensor faulty = 1		
Temperature Sensor of Traction Motor 4 is faulty, when it becomes 1		

Signal:	\$24B3070	TM5 Temp. sensor faulty
TM5 Temp. sensor faulty = 1		
Temperature Sensor of Traction Motor 5 is faulty, when it becomes 1		

Signal:	\$24B1011	TM6 Temp. sensor faulty
TM6 Temp. sensor faulty = 1		
Temperature Sensor of Traction Motor 6 is faulty, when it becomes 1		

Signal:	\$D0715	TM1 Speed sensor faulty
TM1 Speed sensor faulty..... = 1		
Speed Sensor of Traction Motor 1 is faulty, when it becomes 1		

Signal:	\$D0716	TM2 Speed sensor faulty
TM2 Speed sensor faulty..... = 1		
Speed Sensor of Traction Motor 2 is faulty, when it becomes 1		

Signal:	\$D0717	TM3 Speed sensor faulty
TM3 Speed sensor faulty..... = 1		
Speed Sensor of Traction Motor 3 is faulty, when it becomes 1		

Signal:	\$D0718	TM4 Speed sensor faulty
TM4 Speed sensor faulty..... = 1		
Speed Sensor of Traction Motor 4 is faulty, when it becomes 1		

Signal:	\$D0719	TM5 Speed sensor faulty
TM5 Speed sensor faulty..... = 1		
Speed Sensor of Traction Motor 5 is faulty, when it becomes 1		

Signal:	\$D0720	TM6 Speed sensor faulty
TM6 Speed sensor faulty..... = 1		
Speed Sensor of Traction Motor 6 is faulty, when it becomes 1		

Signal:	\$260083	TCU1_Tractive Effort_Available_PWIA
TCU1_Tractive Effort_Available_PWIA = 1.0 kN		
Tractive effort of Traction converter module A (PWMI A – A3) in Kilo Newtons		

Signal:	\$260084	TCU1_Braking Effort_Available_PWIA
TCU1_Braking Effort_Available_PWIA..... = 1.0 kN		
Braking effort of Traction converter module A (PWMI A – A3) in Kilo Newtons		

Signal:	\$260085	TCU1_Actual_TB_Eff_PWIA
TCU1_Actual_TB_Eff_PWIA = 1.0 kN		
Actual tractive effort of Traction converter module A (PWMI A – A3) in Kilo Newtons		

Signal:	\$260087	TCU1_Rotatin Speed1_TMA
TCU1_Rotatin Speed1_TMA = 0.00 1/s		
Rotational speed of Traction motor 1 in rotation per second		

Signal:	\$260102	TCU1_Tractive Effort_Available_PWIB
TCU1_Tractive Effort_Available_PWIA = 1.0 kN		
Tractive effort of Traction converter module B (PWMI B – A4) in Kilo Newtons		

Signal:	\$260103	TCU1_Braking Effort_Available_PWIB
TCU1_Braking Effort_Available_PWIA..... = 1.0 kN		
Braking effort of Traction converter module B (PWMI B – A4) in Kilo Newtons		

Signal:	\$260104	TCU1_Actual_TB_Eff_PWIB
TCU1_Actual_TB_Eff_PWIB = 1.0 kN		
Actual tractive effort of Traction converter module B (PWMI B – A4) in Kilo Newtons		

Signal:	\$260106	TCU1_Rotatin Speed1_TMB
TCU1_Rotatin Speed1_TMB..... = 0.00 1/s		
Rotational speed of Traction motor 2 in rotation per second		

Signal:	\$260121	TCU1_Tractive Effort_Available_PWIC
TCU1_Tractive Effort_Available_PWIA = 1.0 kN		
Tractive effort of Traction converter module C (PWMI C – A5) in Kilo Newtons		

Signal:	\$260122	TCU1_Braking Effort_Available_PWIC
TCU1_Braking Effort_Available_PWIA..... = 1.0 kN		
Braking effort of Traction converter module C (PWMI C – A5) in Kilo Newtons		

Signal:	\$260123	TCU1_Actual_TB_Eff_PWIC
TCU1_Actual_TB_Eff_PWIA = 1.0 kN		
Actual tractive effort of Traction converter module C (PWMI C – A5) in Kilo Newtons		

Signal:	\$260125	TCU1_Rotatin Speed1_TMC
TCU1_Rotatin Speed1_TMC = 0.00 1/s		
Rotational speed of Traction motor 3 in rotation per second		

Signal:	\$260383	TCU2_Tractive Effort_Available_PWIA
TCU2_Tractive Effort_Available_PWIA = 1.0 kN		
Tractive effort of Traction converter module A (PWMI C – A5) in Kilo Newtons		

Signal:	\$260384	TCU2_Braking Effort_Available_PWIA
TCU2_Braking Effort_Available_PWIA..... = 1.0 kN		
Braking effort of Traction converter module A (PWMI C – A5) in Kilo Newtons		

Signal:	\$260385	TCU2_Actual_TB_Eff_PWIA
TCU2_Actual_TB_Eff_PWIA = 1.0 kN		
Actual tractive effort of Traction converter module A (PWMI C – A5) in Kilo Newtons		

Signal:	\$260387	TCU2_Rotatin Speed1_TMA
	TCU2_Rotatin Speed1_TMA = 0.00 1/s	
	Rotational speed of Traction motor 4 in rotation per second	

Signal:	\$260402	TCU2_Tractive Effort_Available_PWIB
	TCU2_Tractive Effort_Available_PWIA = 1.0 kN	
	Tractive effort of Traction converter module B (PWMI B – A4) in Kilo Newtons	

Signal:	\$260403	TCU2_Braking Effort_Available_PWIB
	TCU2_Braking Effort_Available_PWIA..... = 1.0 kN	
	Braking effort of Traction converter module B (PWMI B – A4) in Kilo Newtons	

Signal:	\$260404	TCU2_Actual_TB_Eff_PWIB
	TCU2_Actual_TB_Eff_PWIB = 1.0 kN	
	Actual tractive effort of Traction converter module B (PWMI B – A4) in Kilo Newtons	

Signal:	\$260406	TCU2_Rotatin Speed1_TMB
	TCU2_Rotatin Speed1_TMB..... = 0.00 1/s	
	Rotational speed of Traction motor 5 in rotation per second	

Signal:	\$260421	TCU2_Tractive Effort_Available_PWIC
	TCU2_Tractive Effort_Available_PWIA = 1.0 kN	
	Tractive effort of Traction converter module C (PWMI A – A3) in Kilo Newtons	

Signal:	\$260422	TCU2_Braking Effort_Available_PWIC
	TCU2_Braking Effort_Available_PWIA..... = 1.0 kN	
	Braking effort of Traction converter module C (PWMI A – A3) in Kilo Newtons	

Signal:	\$260423	TCU2_Actual_TB_Eff_PWIC
	TCU2_Actual_TB_Eff_PWIA = 1.0 kN	
	Actual tractive effort of Traction converter module C (PWMI A – A3) in Kilo Newtons	

Signal:	\$260425	TCU2_Rotatin Speed1_TMC
	TCU2_Rotatin Speed1_TMC = 0.00 1/s	
	Rotational speed of Traction motor 6 in rotation per second	

Signal:	\$260086	TM1 Temperature
	TM1 Temperature = 0.00 degC	
	Temperature of Traction Motor 1 in Degree Celsius	

Signal:	\$260105	TM2 Temperature
	TM2 Temperature = 0.00 degC	
	Temperature of Traction Motor 2 in Degree Celsius	

Signal:	\$260124	TM3 Temperature
	TM3 Temperature = 0.00 degC	
	Temperature of Traction Motor 3 in Degree Celsius	

Signal:	\$260424	TM4 Temperature
TM4 Temperature = 0.00 degC		
Temperature of Traction Motor 4 in Degree Celsius		

Signal:	\$260405	TM5 Temperature
TM5 Temperature = 0.00 degC		
Temperature of Traction Motor 5 in Degree Celsius		

Signal:	\$260386	TM6 Temperature
TM6 Temperature = 0.00 degC		
Temperature of Traction Motor 6 in Degree Celsius		

Environment-257: IO Station

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		

It shows status of parking brake applied at bogie 1

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2. = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active..... = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active..... = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		

Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		
It shows status of shunting mode activation		

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active. = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected= 0		
It shows smoke detection status		

Signal	\$3203020	Fire detected
Fire detected = 0		
It shows fire detection status		

Signal:	\$9902000	Ext IO 11 Status
Ext IO 11 Status = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02103 - Station 11 Safety Error
	1	\$02104 –Station 11 Temperature Warning
	2	\$02105 –Station 11 Uptime Limit
	3	\$02106 - Station 11 unused
	4	\$02107 - Station 11 General status Error
	5	\$02108 - Station 11 Shift Register Error
	6	\$02109 - Station 11 NSDB Error
	7	\$02110 - Station 11 Component Error
	8	\$02111 - Station 11 Sink Port Error
	9	\$02112 - Station 11 Watchdog Error
	10	\$02113 - Station 11 SlotStatus1
	11	\$02115 - Station 11 SlotStatus3
	12	\$02116 - Station 11 SlotStatus4
	13	\$02117 - Station 11 SlotStatus5
	14	\$02118 - Station 11 SlotStatus6
	15	\$02119 - Station 11 SlotStatus7
	16	\$02114 - Station 11 SlotStatus2
	17	\$02120 - Station 11 SlotStatus8
	18	\$02121 - Station 11 SlotStatus9
	19	\$02122 - Station 11 SlotStatus10
	20	\$02123 - Station 11 SlotStatus11
	21	\$02124 - Station 11 SlotStatus12
	22	\$02125 – Station 11 SlotStatus13
	23	Reserve
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$02126	Ext IO E111 Input status
Ext IO E111 Input status... = 0000 0001 1100 0010		
Bit	0	\$02E0064 Tractive effort Demand
	1	\$02E0001 Acknowledge Switch
	2	\$02E0062 Brake effort Demand
	3	\$02E1113 Simmode/Prk Brk
	4	\$02E0012 MAuxConVCB
	5	\$02E0002 LActKSWC
	6	\$02E0011 MRelMCEOn
	7	\$02E0004 Emergency Stop
	8	\$02E0132 Circuit Breaker 127.9/2
	9	\$02E0005 LVCB On
	10	\$02E0042 LFootSwSand
	11	\$02E0006 LTrvDirRev
	12	\$02E0007 LTrvDirFor
	13	\$02E0008 LFootSwLoBk
	14	\$02E0009 LPBFaultAck
	15	\$02E0045 VCBLoopFB

Signal:	\$02141	Ext IO E117 Input status
Ext IO E117 Input status = 0000 0111 1111 0000		
Bit	0	\$02E0043 Q01-Q02-Q03-K01 feed back
	1	\$02E0046 -K01 feed back
	2	\$02E0047 -K02 feed back
	3	\$02E0048 -K03 feed back
	4	\$02E0049 -F01 feed back
	5	\$02E0050-F02 feed back
	6	\$02E0051 -F03 feed back
	7	\$02E0052 -F04 feed back
	8	\$02E0054 -F05 feed back
	9	\$02E0055 -F06 feed back
	10	\$02E0078 -F04 feed back
	11	\$02E0079 BC Fail Bit1
	12	\$02E0080 BC Fail Bit2
	13	\$02E0081 BC Fail Bit3/CAP1 Pr
	14	\$02E0083 HEP_PWI2_Capacitor_Prs
	15	Reserve

Signal:		E112_00 Hardware Error Status
E112_00 Hardware Error Status = 0000 0000 0000 0000		
Bit	0	\$02131 Hardware Error
	1	\$02132 Hardware Error
	2	\$02133 Hardware Error
	3	\$02134 Hardware Error
	4	Reserve
	5	Reserve
	6	Reserve
	7	Reserve
	8	Reserve
	9	Reserve
	10	Reserve
	11	Reserve
	12	Reserve
	13	Reserve
	14	Reserve
	15	Reserve

Signal:	\$020036	E113 Short circuit detection
E113 Short circuit detection..... = 0000 0000 0000 0000		
Bit	0	Short Circuit detected A113_00
	1	Short Circuit detected A113_01
	2	Short Circuit detected A113_02
	3	Short Circuit detected A113_03
	4	Short Circuit detected A113_04
	5	Short Circuit detected A113_05
	6	Short Circuit detected A113_06
	7	Short Circuit detected A113_07
	8	Reserve
	9	Reserve
	10	Reserve
	11	Reserve
	12	Reserve
	13	Reserve
	14	Reserve
	15	Reserve

Signal:	\$02456	F_CCUM_LION11_A113
F_CCUM_LION11_A113..... = 0000 0000		
Bit	0	\$2806003 MLampParkBK
	1	\$2801012 MLampTPart
	2	\$3204005 MLampWSlip
	3	\$22A4001 MLampCSpeed
	4	\$3203003 BBuzzRed
	5	\$3203004 BBuzzBlack
	6	\$41EA001 MLampFault
	7	\$3104442 HL I/P CON

Signal:	\$020037	E114 SC detection
E114 SC detection = 0000 0000		
Bit	0	Short Circuit detected A114_00
	1	Short Circuit detected A114_01
	2	Short Circuit detected A114_02
	3	Short Circuit detected A114_03
	4	Short Circuit detected A114_04
	5	Short Circuit detected A114_05
	6	Short Circuit detected A114_06
	7	Short Circuit detected A114_07

Signal:	\$02143	Ext IO A114 Output status
Ext IO A114 Output status = 0000 1001		
Bit	0	\$3201003 Self Hold
	1	\$3103054 Compressor
	2	\$3201004 MCE off
	3	\$3201003 SELF MCE
	4	\$3104214 -Q1-Q2-Q3
	5	\$3104217 -K01
	6	\$3104220 -K02 HL1FL
	7	\$3104223 -K03 HL2FL

Signal:	\$02148	Ext IO A116 Output status
Ext IO A116 Output status = 0000 1000		
Bit	0	\$1204002 BVCBOn
	1	\$1204003 BVCBOn
	2	\$1204001 BVCBOnPuls
	3	\$1204006 VCB is disabled
	4	\$3103056 Air Dryer ON
	5	\$3205005 BC Enable
	6	\$3104217 -K01
	7	\$3104220 -K02 HL1FL

Signal:	\$02144	A115_00 Output
A115_00 Output..... = 3.75 V		
TE/BE meter BG1 cab1 in volts (0 to 10V)		

Signal:	\$02145	A115_01 Output
A115_01 Output..... = 3.75 V		
TE/BE meter BG2 cab1		

Signal:	\$02146	A115_02 Output
A115_02 Output..... = 3.75 V		
Spare		

Signal:	\$02147	A115_03 Output
A115_03 Output..... = 3.75 V		
Spare		

Signal:	\$9902001	Ext IO 12 Status
Ext IO 12 Status..... = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02204 – Station 12 Temperature Warning_DI2
	1	\$02205 – Station 12 uptime_DI3
	2	\$02206 – Station 12 unused_DI4
	3	\$02207 – Station 12 General status error
	4	\$02208 – Station 12 Shift register error_DI7
	5	\$02209 – Station 12 NSDBEr_DI8
	6	\$02210 – Station 12 Component error_DI9
	7	\$02211 – Station 12 Sink port error_DI10
	8	\$02212 – Station 12 Watchdog error_DI11
	9	\$02213 – Station 12 Slot status 1_DI12
	10	\$02214 – Station 12 Slot status 2_DI13
	11	\$02215 – Station 12 Slot status 3_DI14
	12	\$02216 – Station 12 Slot status 4_DI15
	13	\$02217 – Station 12 Slot status 5_DI16
	14	\$02218 – Station 12 Slot status 6_DI17
	15	\$02219 – Station 12 Slot status 7_DI18
	16	Reserve
	17	Reserve
	18	Reserve
	19	Reserve
	20	Reserve
	21	Reserve
	22	Reserve
	23	Reserve
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$2226	Ext IO E121 Input status
Ext IO E121 Input status..... = 1000 0000 0001 0001		
Bit	0	\$02E0004- LEmgStop
	1	\$02E0057 - LMaxTELimit
	2	\$02E0058 - LSwComprOff
	3	\$02E0059 - TimRelMR1
	4	\$02E0060 - LSwBankOp
	5	\$02E0061 - LSwComprDir
	6	\$02E0007 - LTrvDirFor
	7	\$02E1217 - Shnt mode/Prk Brk
	8	\$02E0008 LFootSwLoBk
	9	\$02E0006 LTrvDirR
	10	\$02E0062 LBEDemand
	11	\$02E0063 - LT/Bdem>2/3
	12	\$02E0064 LTEDemand
	13	\$02E0065 - LT/Bdem>1/3
	14	\$02E0009 LPBFaultAck
	15	\$02E0001 LActKSwD

Signal:	\$2227	Ext IO E122 Input status
Ext IO E122 Input status..... = 1000 1000 1111 1111		
Bit	0	\$02E0066 MFuseAux
	1	\$02E0067 MMCBBloMR1
	2	\$02E0068 MMCBPumpC1
	3	\$02E0069 MMCBBloTM1
	4	\$02E0070 MMCBBloCT1
	5	\$02E0071 MMCBMScBlo1
	6	\$02E0072 MMCBPumpT1
	7	\$02E0073 MMCBTScBlo1
	8	\$02E0074 MEFR415/110
	9	\$02E0012 MAuxConVCB
	10	\$02E0075 MEFRFilter
	11	\$02E0011 MRelMCEOn
	12	\$02E0005 LVCBOn
	13	\$02E0076 MEFRContrl
	14	\$02E1218 LActKSwC
	15	\$02E0077 Circuit Breaker 127.9 /1

Signal:	\$02228	Ext IO E123 Input status
Ext IO E123 Input status..... = 0101 0000 0100 0110		
Bit	0	\$02E0010 VCBLoopFB
	1	\$02E0030 MBrakeElec
	2	\$02E0038 MMCBCompr1
	3	\$02E0039 LConstSpeed
	4	\$02E0040 LHotelOn
	5	\$02E0041 LHotelOff/ FL Mod
	6	E123_6 MRelCEOn
	7	\$02E0044 MIPrimHigh
	8	E123_08 LPBFaultAck
	9	\$02E0086 ManVigCutout
	10	\$02E0087 Bg1 Cut (6k)
	11	\$02E0088 Bg2 Cut (6k)
	12	\$02E0013 Coding_1
	13	\$02E0014 Coding_2
	14	\$02E0015 Coding_3
	15	\$02E0016 Coding_4

Signal:	\$02233	Ext IO E127 Input status
Ext IO E127 Input status..... = 0000 0111 1111 0000		
Bit	0	\$02E0043 Q01-Q02-Q03-K01 feed back
	1	\$02E0046 -K01 feed back
	2	\$02E0047 -K02 feed back
	3	\$02E0048 -K03 feed back
	4	\$02E0049 -F01 feed back
	5	\$02E0050 -F02 feed back
	6	\$02E0051 -F03 feed back
	7	\$02E0052 -F04 feed back
	8	\$02E0054 -F05 feed back
	9	\$02E0055 -F06 feed back
	10	\$02E0078 BC OK
	11	\$02E0079 BC Fail Bit1
	12	\$02E0080 BC Fail Bit2
	13	\$02E0081 BC Fail Bit3/CAP Pr
	14	\$02E0083 HEP_PWI2_Capacitor_Prs
	15	Reserve

Signal:	\$020075	E124 SC detection
E124 SC detection = 0000 0000		
Bit	0	Short Circuit detected A124_00
	1	Short Circuit detected A124_01
	2	Short Circuit detected A124_02
	3	Short Circuit detected A124_03
	4	Short Circuit detected A124_04
	5	Short Circuit detected A124_05
	6	Reserve
	7	Short Circuit detected A124_07

Signal:	\$02234	Ext IO A124 Output Status
Ext IO A124 Output Status = 0001 0000		
Bit	0	Short Circuit detected A124_00 in Lamp test
	1	Short Circuit detected A124_01 in Lamp hotel
	2	Short Circuit detected A124_02 in Buzz red
	3	Short Circuit detected A124_03 in Buzz black
	4	Short Circuit detected A124_04 in MLampFind
	5	Short Circuit detected A124_05 in MLampFault
	6	Short Circuit detected A124_06 Spare
	7	Short Circuit detected A124_07 in BContHotel

Signal:	\$020076	E125 SC detection
E125 SC detection = 0000 0000		
Bit	0	Short Circuit detected A125_00
	1	Short Circuit detected A125_01
	2	Short Circuit detected A125_02
	3	Short Circuit detected A125_03
	4	Short Circuit detected A125_04
	5	Short Circuit detected A125_05
	6	Short Circuit detected A125_06
	7	Short Circuit detected A125_07

Signal:	\$02235	Ext IO A125 Output Status
Ext IO A125 Output Status = 0000 0110		
Bit	0	\$3103054 BContComp1
	1	\$3201003 BSelMCE
	2	\$3201003 BContSelfH
	3	\$3201004 BRelMCEOff
	4	\$3104214 -Q1-Q2-Q3
	5	\$3104217-K01
	6	\$3104220 -K02 HL1FL
	7	\$3104223-K03 HL2FL

Signal:	\$02236	Ext IO A126 Output Status
Ext IO A126 Output Status = 0000 0110		
Bit	0	\$1204001 BVCBOnPuls
	1	\$1204004 BVCBOn
	2	\$1204005 BVCBOn
	3	\$1204006 VCB is disabled
	4	\$3205005 BC Enable
	5	\$1204018 WC_Door_Enable
	6	\$32A0010 HLC1 On Command
	7	Reserve

Signal:	\$9902002	Ext IO 21 Status
Ext IO 21 Status = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02304 – Station 21 Temperature Warning
	1	\$02305 – Station 21 uptimeLimit
	2	\$02306 – Station 21 unused
	3	\$02307 – Station 21 General status error
	4	\$02308 – Station 21 Shift register error
	5	\$02309 – Station 21 NSDBEr
	6	\$02310 – Station 21 Component error
	7	\$02311 – Station 21 Sink port error
	8	\$02312 – Station 21 Watchdog error
	9	\$02313 – Station 21 Slot status 1
	10	\$02314 – Station 21 Slot status 2
	11	\$02315 – Station 21 Slot status 3
	12	\$02316 – Station 21 Slot status 4
	13	\$02317 – Station 21 Slot status 5
	14	\$02318 – Station 21 Slot status 6
	15	\$02319 – Station 21 Slot status 7
	16	Reserve
	17	Reserve
	18	Reserve
	19	Reserve
	20	Reserve
	21	Reserve
	22	Reserve
	23	Reserve
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$02326	Ext IO E211 Input status
Ext IO E211 Input status..... = 0010 0000 0000 1000		
Bit	0	\$02E0017 LActKSwd
	1	\$02E0089 LConstSpeed
	2	\$02E0019 LParkBrake
	3	\$02E0090 Circuit Breaker 127.9 /4
	4	\$02E0018 LActKSwd
	5	\$02E0091 MPrSwPan2
	6	\$02E0020 MPrSwBkCyl2
	7	\$02E0021 MPrSwLocoB
	8	\$02E0092 LFootSwSand
	9	\$02E0022 LTrvDirRev
	10	\$02E0093 MSpeed105%
	11	\$02E0023 LTrvDirFor
	12	\$02E0094 MSpeed110%
	13	\$02E0095 MSpeedAlarm
	14	\$02E0031 LPBFaultAck
	15	\$02E0025 LCockBkCon

Signal:	\$02327	Ext IO E212 Input status
Ext IO E212 Input status..... = 0010 0000 0100 0001		
Bit	0	\$02E0026 LEmgStop
	1	\$02E0027 LFootSwLoBk
	2	\$02E0028 MPrSw75bar
	3	\$02E0029 MPrSwLowMR
	4	\$02E0111 LBEDemand
	5	Reserve
	6	\$02E0096 MMCBBoTM2
	7	\$02E0097 MEFRBUR
	8	\$02E0032 LPanUp
	9	\$02E0098 MSmogWarn
	10	\$02E0033 MPrSwEmgBk
	11	\$02E0034 MVigWarn
	12	\$02E0035 MPrSwBkCyl1
	13	\$02E0036 MEmgBkVig
	14	\$02E0037 MPrSwParkBk
	15	\$02E0113 LTEDemand

Signal:		E213_00Hardware Error Status
E213_00Hardware Error Status = 0000 0000		
Bit	0	\$02332 E213_00Hardware Error
	1	\$02333 E213_00Hardware Error
	2	\$02334 E213_00Hardware Error
	3	\$02335 E213_00Hardware Error
	4	Reserve
	5	Reserve
	6	Reserve
	7	Reserve

Signal:	\$020104	E214 SC detection
E214 SC detection = 0000 0000		
Bit	0	Short Circuit detected A214_00
	1	Short Circuit detected A214_01
	2	Short Circuit detected A214_02
	3	Short Circuit detected A214_03
	4	Short Circuit detected A214_04
	5	Short Circuit detected A214_05
	6	Short Circuit detected A214_06
	7	Short Circuit detected A214_07

Signal:	\$02349	Ext IO A214 Output Status
Ext IO A214 Output Status = 0000 0000		
Bit	0	\$2806004 Lamp PrkBrk ON Cab 2
	1	\$2801012 Air flow high Flasher ON
	2	\$3204006 CAB2 -> WhSlip Indication
	3	\$22A4001 CSC active
	4	\$3203005 Alarm_CAB 2_BuzRED
	5	\$3203006 Alarm_CAB2_BuzBLK
	6	\$41EA001 CAT A > LSFI led
	7	\$32A0020 HLC On ind power car

Signal:	\$020105	E215 SC detection
E215 SC detection = 0000 0000		
Bit	0	Short Circuit detected A215_00
	1	Short Circuit detected A215_01
	2	Short Circuit detected A215_02
	3	Short Circuit detected A215_03
	4	Short Circuit detected A215_04
	5	Short Circuit detected A215_05
	6	Short Circuit detected A215_06
	7	Short Circuit detected A215_07

Signal:	\$02350	Ext IO A215 Output Status
Ext IO A215 Output Status = 0000 0000		
Bit	0	\$3103055 Compressor 2 ON
	1	\$3203008 VCD Emrg Brk RESET
	2	\$3204003 Sanding at direction C1
	3	\$3204004 Sanding at direction C2
	4	\$2802001 BEPAutBkOut
	5	\$3103053 Unloader Valve ON
	6	\$2806002 PrkBrk Relea magnet valve
	7	\$2806001 PrkBrk Apply magnet valve

Signal:	\$02351	Ext IO A216 Output Status
Ext IO A216 Output Status = 0000 0000		
Bit	0	\$3203001 VCD Disable
	1	\$1104002 BEPPan2
	2	\$1104008 pantos are disabled
	3	Reserve
	4	Reserve
	5	Reserve
	6	Reserve
	7	Reserve

Signal:	\$02352	A217_00 Output
A217_00 Output..... = 3.75 V		
TE/BE meter BG1 cab2 in volts		

Signal:	\$02353	A217_01 Output
A217_01 Output..... = 3.75 V		
TE/BE meter BG2 cab2		

Signal:	\$02354	A217_02 Output
A217_02 Output..... = 0.00 V		
W_Pn_BE_Dem		

Signal:	\$02344	A217_03 Output
A217_03 Output..... = 0.00 V		
Spare		

Signal:	\$9902003	Ext IO 22 Status
Ext IO 22 Status = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02404 – Station 22 Temperature Warning_DI2
	1	\$02405 – Station 22 uptimeLimit_DI3
	2	\$02406 – Station 22 unused_DI4
	3	\$02407 – Station 22 General status error
	4	\$02408 – Station 22 Shift register error_DI7
	5	\$02409 – Station 22 NSDBEr_DI8
	6	\$02410 – Station 22 Component error_DI9
	7	\$02411 – Station 22 Sink port error _DI10
	8	\$02412 – Station 22 Watchdog error_DI11
	9	\$02413 – Station 22 Slot status 1_DI12
	10	\$02414 – Station 22 Slot status 2_DI13
	11	\$02415 – Station 22 Slot status 3_DI14
	12	\$02416 – Station 22 Slot status 4
	13	\$02417 – Station 22 Slot status 5
	14	\$02418 – Station 22 Slot status 6
	15	\$02419 – Station 22 Slot status 7
	16	Reserve
	17	Reserve
	18	Reserve
	19	Reserve
	20	Reserve
	21	Reserve
	22	Reserve
	23	Reserve
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$02426	Ext IO E221 Input Status
Ext IO E221 Input status..... = 0010 0000 0000 1000		
Bit	0	\$02E0105 MMCBCompr2
	1	\$02E0026 LEmgStop
	2	\$02E0106 LMaxTELimit
	3	\$02E0107 LSwComprOff
	4	\$02E0108 TimRelMR2
	5	\$02E0109 LSwBankOp
	6	\$02E0110 LSwComprDir
	7	\$02E0027 LFootSwLoBk
	8	\$02E0022 LTrvDirRev
	9	\$02E0111 LBEDemand
	10	\$02E0112 LT/BDem>2/3
	11	\$02E0023 LTrvDirFor
	12	\$02E0113 LTEDemand
	13	\$02E0114 LT/BDem>1/3
	14	\$02E0031 LPBFaultAck
	15	\$02E0019 LParkBrake

Signal:	\$02427	Ext IO E222 Input Status
Ext IO E222 Input status..... = 0000 0001 0011 0000		
Bit	0	\$02E0115 MPrSwPan1
	1	E222_01 MPrSwParkBk
	2	E222_02 LCockBkCon
	3	MPrSwLocoB
	4	\$02E0116 MFailFireEq
	5	\$02E0030 MBrakeElecOK
	6	\$02E0117 LEmgBkOut
	7	\$02E0033 MPrSwEmgBk
	8	\$02E0024 MPrSwAFlow
	9	\$02E0028 MPrSw75bar
	10	\$02E0020 MPrSwBkCyl2
	11	\$02E0118 MPrSw8bar
	12	\$02E0032 LPanUp
	13	\$02E0119 MFireAlarm
	14	\$02E0029 MPrSwLowMR
	15	\$02E0120 MPrSwBkFP

Signal:	\$02428	Ext IO E223 Input Status
Ext IO E223 Input status..... = 0001 0011 1111 1000		
Bit	0	\$02E0138 HI_FB_CAB1
	1	\$02E0139 HI_FB_CAB2
	2	\$02E0140 Flrs_lig_FB
	3	\$02E0141 Wiper_fb_CAB1
	4	\$02E0142 Wiper_fb_CAB2
	5	\$02E0143 Hrn_fb_cab1
	6	\$02E0144 Hrn_fb_cab2
	7	\$02E0145 EBAss_dr_fb
	8	\$02E0125 MMCBBlMR2
	9	\$02E0126 MMCBPumpC2
	10	\$02E0127 LHotelOn
	11	\$02E0128 LHotelOff
	12	\$02E0129 Circuit Breaker 127.9 /3
	13	\$02E0035 MPrSwBkCyl1
	14	Reserve
	15	Reserve

Signal:	\$020153	E224 Short circuit detection
E224 Short circuit detection = 0000 0000 0000 0000		
Bit	0	Short Circuit detected A224_00
	1	Short Circuit detected A224_01
	2	Short Circuit detected A224_02
	3	Short Circuit detected A224_03
	4	Short Circuit detected A224_04
	5	Short Circuit detected A224_05
	6	Short Circuit detected A224_06
	7	Short Circuit detected A224_07
	8	Reserve
	9	Reserve
	10	Reserve
	11	Reserve
	12	Reserve
	13	Reserve
	14	Reserve
	15	Reserve

Signal:	\$02433	Ext IO A224 Output Status
Ext IO A224 Output Status = 0001 0000		
Bit	0	\$7500088 Lamp Test running
	1	\$32A0019 MLampHotel
	2	\$3203005 BBuzzRed
	3	\$3203006 BBuzzBlack
	4	\$51E4470 Indicator BPFA Cab2
	5	\$41EA001 MLampFault
	6	Reserve
	7	Reserve

Signal:	\$02434	Ext IO A225 Output Status
Ext IO A225 Output Status = 0000 0101		
Bit	0	\$3203001 VCD Disable
	1	\$1104001 BEPPan1
	2	\$1104008 pantos are disabled
	3	\$21B601 Automatic Brake Cut Out
	4	\$3103055 Compressor 2 ON
	5	\$32A0011 HLC2 On Command
	6	Reserve
	7	Reserve

Signal:	\$020154	E226 SC detection
E226 SC detection = 0000 0000		
Bit	0	Short Circuited detected A226_00
	1	Short Circuited detected A226_01
	2	Short Circuited detected A226_02
	3	Short Circuited detected A226_03
	4	Short Circuited detected A226_04
	5	Short Circuited detected A226_05
	6	Short Circuited detected A226_06
	7	Short Circuited detected A226_07

Signal:	\$02435	Ext IO A226 Output Status
Ext IO A226 Output Status = 0000 0000		
Bit	0	BEPLBkOut
	1	BEPCPUloa
	2	BEPSand13
	3	BEPSand24
	4	BEPRelPBk
	5	BEApplyPB
	6	VCD cycle reset
	7	BResVigPeB

Signal:	\$9902005	BRIO1_J1_Connector_Hardware Error
BRIO1_J1_Connector_Hardware Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02160 BRIO 1 Digital Input Channel 1 Status
	1	\$02161 BRIO 1 Digital Input Channel 2 Status
	2	\$02162 BRIO 1 Digital Input Channel 3 Status
	3	\$02163 BRIO 1 Digital Input Channel 4 Status
	4	\$02164 BRIO 1 Digital Input Channel 5 Status
	5	\$02165 BRIO 1 Digital Input Channel 6 Status
	6	\$02166 BRIO 1 Digital Input Channel 7 Status
	7	\$02167 BRIO 1 Digital Input Channel 8 Status
	8	\$02168 BRIO 1 Digital Input Channel 9 Status
	9	\$02169 BRIO 1 Digital Input Channel 10 Status
	10	\$02170 BRIO 1 Digital Input Channel 11 Status
	11	\$02171 BRIO 1 Digital Input Channel 12 Status
	12	\$02172 BRIO 1 Digital Input Channel 13 Status
	13	\$02173 BRIO 1 Digital Input Channel 14 Status
	14	\$02174 BRIO 1 Digital Input Channel 15 Status
	15	\$02175 BRIO 1 Digital Input Channel 16 Status
	16	\$02176 BRIO 1 Digital Input Channel 17 Status
	17	\$02177 BRIO 1 Digital Input Channel 18 Status
	18	\$02178 BRIO 1 Digital Input Channel 19 Status
	19	\$02179 BRIO 1 Digital Input Channel 20 Status
	20	\$02192 BRIO 1 Digital Output Channel 1 Status
	21	\$02193 BRIO 1 Digital Output Channel 2 Status
	22	\$02194 BRIO 1 Digital Output Channel 3 Status
	23	\$02195 BRIO 1 Digital Output Channel 4 Status
	24	\$02196 BRIO 1 Digital Output Channel 5 Status
	25	\$02197 BRIO 1 Digital Output Channel 6 Status
	26	\$02198 BRIO 1 Digital Output Channel 7 Status
	27	\$02199 BRIO 1 Digital Output Channel 8 Status
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902006	BRIO1_J2_Connector_Hardware Error
BRIO1_J2_Connector_Hardware Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02180 BRIO 1 Digital Input Channel 21 Status
	1	\$02181 BRIO 1 Digital Input Channel 22 Status
	2	\$02182 BRIO 1 Digital Input Channel 23 Status
	3	\$02183 BRIO 1 Digital Input Channel 24 Status
	4	\$02184 BRIO 1 Digital Input Channel 25 Status
	5	\$02185 BRIO 1 Digital Input Channel 26 Status
	6	\$02186 BRIO 1 Digital Input Channel 27 Status
	7	\$02187 BRIO 1 Digital Input Channel 28 Status
	8	\$02188 BRIO 1 Digital Input Channel 29 Status
	9	\$02189 BRIO 1 Digital Input Channel 30 Status
	10	\$02190 BRIO 1 Digital Input Channel 31 Status
	11	\$02191 BRIO 1 Digital Input Channel 32 Status
	12	\$02250 BRIO 1 Digital Output Channel 9 Status
	13	\$02251 BRIO 1 Digital Output Channel 10 Status
	14	\$02252 BRIO 1 Digital Output Channel 11 Status
	15	\$02237 BRIO 1 Digital Output Channel 12 Status
	16	\$02238 BRIO 1 Digital Output Channel 13 Status
	17	\$02239 BRIO 1 Digital Output Channel 14 Status
	18	\$02240 BRIO 1 Digital Output Channel 15 Status
	19	\$02241 BRIO 1 Digital Output Channel 16 Status
	20	\$02242 BRIO 1 Analog Input Channel 1 Status
	21	\$02243 BRIO 1 Analog Input Channel 2 Status
	22	\$02244 BRIO 1 Analog Input Channel 3 Status
	23	\$02245 BRIO 1 Analog Input Channel 4 Status
	24	\$02247 BRIO 1 AVOF1 status
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902009	RIOM1_J1_Connector_Hardware_Error
RIOM1_J1_Connector_Hardware_Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02203 – RIOM1 Safety Error_DI1
	1	\$02204 – RIOM1 Temperature Warning_DI2
	2	\$02205 – RIOM1 Uptime Limit_DI3
	3	\$02206 - RIOM1 unused_DI4
	4	\$02584 – RIOM1 Digital Input Channel 5 status
	5	\$02585 – RIOM1 Digital Input Channel 6 status
	6	\$02208 – RIOM1 Shift register error_DI7
	7	\$02209 – RIOM1 NSDB Error_DI8
	8	\$02210 – RIOM1 Component error_DI9
	9	\$02211 – RIOM1 Sink port error_DI10
	10	\$02212- RIOM1 Watchdog error_DI11
	11	\$02213 - RIOM1 Slot status 1_DI12
	12	\$02214 - RIOM1 Slot status 2_DI13
	13	\$02215 - RIOM1 Slot status 3_DI14
	14	\$02216 - RIOM1 Slot status 4_DI15
	15	\$02217 - RIOM1 Slot status 5_DI16
	16	\$02540 RIOM1 Digital Output Channel 01 Status
	17	\$02541 RIOM1 Digital Output Channel 02 Status
	18	\$02542 RIOM1 Digital Output Channel 03 Status
	19	\$02543 RIOM1 Digital Output Channel 04 Status
	20	\$02544 RIOM1 Digital Output Channel 05 Status
	21	\$02545 RIOM1 Digital Output Channel 06 Status
	22	\$02546 RIOM1 Digital Output Channel 07 Status
	23	\$02547 RIOM1 Digital Output Channel 08 Status
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902008	RIOM1_J2_Connector_Hardware_Error
RIOM1_J2_Connector_Hardware_Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02218 – RIOM1 Slot status 6_DI17
	1	\$02219 – RIOM1 Slot status 7_DI18
	2	\$02220 – RIOM1 Slot status 8_DI19
	3	\$02221 – RIOM1 Slot status 9_DI20
	4	\$02222 – RIOM1 Slot status 10_DI21
	5	\$02223 – RIOM1 Slot status 11_DI22
	6	\$02224 – RIOM1 Slot status 12_DI23
	7	\$02225 – RIOM1 Slot status 13_DI24
	8	\$02500 – RIOM1 Digital Input Channel 25 status
	9	\$02501 – RIOM1 Digital Input Channel 26 status
	10	\$02502 – RIOM1 Digital Input Channel 27 status
	11	\$02503 – RIOM1 Digital Input Channel 28 status
	12	\$02504 – RIOM1 Digital Input Channel 29 status
	13	\$02505 – RIOM1 Digital Input Channel 30 status
	14	\$02506 – RIOM1 Digital Input Channel 31 status
	15	\$02507 – RIOM1 Digital Input Channel 32 status
	16	\$02548 – RIOM1 Digital Output Channel 09 status
	17	\$02549 – RIOM1 Digital Output Channel 10 status
	18	\$02550 – RIOM1 Digital Output Channel 11 status
	19	\$02551 – RIOM1 Digital Output Channel 12 status
	20	\$02552 – RIOM1 Digital Output Channel 13 status
	21	\$02553 – RIOM1 Digital Output Channel 14 status
	22	\$02554 – RIOM1 Digital Output Channel 15 status
	23	\$02555 – RIOM1 Digital Output Channel 16 status
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902011	RIOM1_J3_Connector_Hardware_Error
RIOM1_J3_Connector_Hardware_Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02508 – RIOM1 Digital Input Channel 33 Status
	1	\$02509 – RIOM1 Digital Input Channel 34 Status
	2	\$02510 – RIOM1 Digital Input Channel 35 Status
	3	\$02511 – RIOM1 Digital Input Channel 36 Status
	4	\$02512 – RIOM1 Digital Input Channel 37 Status
	5	\$02513 – RIOM1 Digital Input Channel 38 Status
	6	\$02514 – RIOM1 Digital Input Channel 39 Status
	7	\$02515 – RIOM1 Digital Input Channel 40 Status
	8	\$02516 – RIOM1 Digital Input Channel 41 Status
	9	\$02517 – RIOM1 Digital Input Channel 42 Status
	10	\$02518 – RIOM1 Digital Input Channel 43 Status
	11	\$02519 – RIOM1 Digital Input Channel 44 Status
	12	\$02520 – RIOM1 Digital Input Channel 45 Status
	13	\$02521 – RIOM1 Digital Input Channel 46 Status
	14	\$02522 – RIOM1 Digital Input Channel 47 Status
	15	\$02523 – RIOM1 Digital Input Channel 48 Status
	16	\$02556 – RIOM1 Digital Output Channel 17 status
	17	\$02557 – RIOM1 Digital Output Channel 18 status
	18	\$02558 – RIOM1 Digital Output Channel 19 status
	19	\$02559 – RIOM1 Digital Output Channel 20 status
	20	\$02560 – RIOM1 Digital Output Channel 21 status
	21	\$02561 – RIOM1 Digital Output Channel 22 status
	22	\$02562 – RIOM1 Digital Output Channel 23 status
	23	\$02563 – RIOM1 Digital Output Channel 24 status
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902010	RIOM1_J4_Connector_Hardware_Error
RIOM1_J4_Connector_Hardware_Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02524– Digital Input Channel 49 Status
	1	\$02525 – Digital Input Channel 50 Status
	2	\$02526 – Digital Input Channel 51 Status
	3	\$02527 – Digital Input Channel 52 Status
	4	\$02528 – Digital Input Channel 53 Status
	5	\$02529 – Digital Input Channel 54 Status
	6	\$02530 – Digital Input Channel 55 Status
	7	\$02531 – Digital Input Channel 56 Status
	8	\$02532 – Digital Input Channel 57 Status
	9	\$02533 – Digital Input Channel 58 Status
	10	\$02534 – Digital Input Channel 59 Status
	11	\$02535 – Digital Input Channel 60 Status
	12	\$02536 – Digital Input Channel 61 Status
	13	\$02537 – Digital Input Channel 62 Status
	14	\$02538 – Digital Input Channel 63 Status
	15	\$02539 – Digital Input Channel 64 Status
	16	\$02564 – RIOM1 Digital Output Channel 25 status
	17	\$02565 – RIOM1 Digital Output Channel 26 status
	18	\$02566 – RIOM1 Digital Output Channel 27 status
	19	\$02567 – RIOM1 Digital Output Channel 28 status
	20	\$02568 – RIOM1 Digital Output Channel 29 status
	21	\$02569 – RIOM1 Digital Output Channel 30 status
	22	\$02570 – RIOM1 Digital Output Channel 31 status
	23	\$02571 – RIOM1 Digital Output Channel 32 status
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902012	RIOM1_J0_Connector_Hardware_Error
RIOM1_J0_Connector_Hardware_Error = 0000 0000		
Bit	0	\$02572– Analog Input Channel 1 Status
	1	\$02573– Analog Input Channel 2 Status
	2	\$02574– Analog Input Channel 3 Status
	3	\$02575– Analog Input Channel 4 Status
	4	\$02576– Analog Input Channel 5 Status
	5	\$02577– Analog Input Channel 6 Status
	6	Reserve
	7	Reserve

Signal:	\$9902007	BRIO2_J1_Connector_Hardware Error
BRIO2_J1_Connector_Hardware Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02800 BRIO 2 Digital Input Channel 1 Status
	1	\$02801 BRIO 2 Digital Input Channel 2 Status
	2	\$02802 BRIO 2 Digital Input Channel 3 Status
	3	\$02803 BRIO 2 Digital Input Channel 4 Status
	4	\$02804 BRIO 2 Digital Input Channel 5 Status
	5	\$02805 BRIO 2 Digital Input Channel 6 Status
	6	\$02806 BRIO 2 Digital Input Channel 7 Status
	7	\$02807 BRIO 2 Digital Input Channel 8 Status
	8	\$02808 BRIO 2 Digital Input Channel 9 Status
	9	\$02809 BRIO 2 Digital Input Channel 10 Status
	10	\$02810 BRIO 2 Digital Input Channel 11 Status
	11	\$02811 BRIO 2 Digital Input Channel 12 Status
	12	\$02812 BRIO 2 Digital Input Channel 13 Status
	13	\$02813 BRIO 2 Digital Input Channel 14 Status
	14	\$02814 BRIO 2 Digital Input Channel 15 Status
	15	\$02815 BRIO 2 Digital Input Channel 16 Status
	16	\$02817 BRIO 2 Digital Input Channel 17 Status
	17	\$02818 BRIO 2 Digital Input Channel 18 Status
	18	\$02819 BRIO 2 Digital Input Channel 19 Status
	19	\$02820 BRIO 2 Digital Input Channel 20 Status
	20	\$02831 BRIO 2 Digital Output Channel 1 Status
	21	\$02832 BRIO 2 Digital Output Channel 2 Status
	22	\$02833 BRIO 2 Digital Output Channel 3 Status
	23	\$02834 BRIO 2 Digital Output Channel 4 Status
	24	\$02835 BRIO 2 Digital Output Channel 5 Status
	25	\$02836 BRIO 2 Digital Output Channel 6 Status
	26	\$02837 BRIO 2 Digital Output Channel 7 Status
	27	\$02838 BRIO 2 Digital Output Channel 8 Status
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902013	BRIO2_J2_Connector_Hardware Error
BRIO2_J2_Connector_Hardware Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02821 BRIO 2 Digital Input Channel 21 Status
	1	\$02822 BRIO 2 Digital Input Channel 22 Status
	2	\$02823 BRIO 2 Digital Input Channel 23 Status
	3	\$02824 BRIO 2 Digital Input Channel 24 Status
	4	\$02277 BRIO 2 Digital Input Channel 25 Status
	5	\$02278 BRIO 2 Digital Input Channel 26 Status
	6	\$02825 BRIO 2 Digital Input Channel 27 Status
	7	\$02826 BRIO 2 Digital Input Channel 28 Status
	8	\$02827 BRIO 2 Digital Input Channel 29 Status
	9	\$02828 BRIO 2 Digital Input Channel 10 Status
	10	\$02829 BRIO 2 Digital Input Channel 11 Status
	11	\$02830 BRIO 2 Digital Input Channel 12 Status
	12	\$02839 BRIO 2 Digital Output Channel 9 Status
	13	\$02840 BRIO 2 Digital Output Channel 10 Status
	14	\$02841 BRIO 2 Digital Output Channel 11 Status
	15	\$02842 BRIO 2 Digital Output Channel 12 Status
	16	\$02843 BRIO 2 Digital Output Channel 13 Status
	17	\$02844 BRIO 2 Digital Output Channel 14 Status
	18	\$02845 BRIO 2 Digital Output Channel 15 Status
	19	\$02846 BRIO 2 Digital Output Channel 16 Status
	20	\$02847 BRIO 2 Analog Input Channel 1 Status
	21	\$02848 BRIO 2 Analog Input Channel 2 Status
	22	\$02849 BRIO 2 Analog Input Channel 3 Status
	23	\$02850 BRIO 2 Analog Input Channel 4 Status
	24	\$02851 BRIO 2 AVOF 1 Status
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902015	RIOM2_J1_Connector_Hardware_Error
RIOM2_J1_Connector_Hardware_Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02403 – RIOM2 Safety Error_DI1
	1	\$02404 – RIOM2 Temperature Warning_DI2
	2	\$02405 – RIOM2 Uptime Limit_DI3
	3	\$02406 – RIOM2 unused_DI4
	4	\$02980 – RIOM2 Digital Input Channel 5 status
	5	\$02981 – RIOM2 Digital Input Channel 6 status
	6	\$02408 – RIOM2 Shift register error_DI7
	7	\$02409 – RIOM2 NSDB Error_DI8
	8	\$02410 – RIOM2 Component error_DI9
	9	\$02411 – RIOM2 Sink port error_DI10
	10	\$02412- RIOM2 Watchdog error_DI11
	11	\$02413 – RIOM2 Slot status 1_DI12
	12	\$02414 – RIOM2 Slot status 2_DI13
	13	\$02415 – RIOM2 Slot status 3_DI14
	14	\$02416 – RIOM2 Slot status 4
	15	\$02417 – RIOM2 Slot status 5
	16	\$02940 RIOM2 Digital Output Channel 01 Status
	17	\$02941 RIOM2 Digital Output Channel 02 Status
	18	\$02942 RIOM2 Digital Output Channel 03 Status
	19	\$02943 RIOM2 Digital Output Channel 04 Status
	20	\$02944 RIOM2 Digital Output Channel 05 Status
	21	\$02945 RIOM2 Digital Output Channel 06 Status
	22	\$02946 RIOM2 Digital Output Channel 07 Status
	23	\$02947 RIOM2 Digital Output Channel 08 Status
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902014	RIOM2_J2_Connector_Hardware_Error
RIOM2_J2_Connector_Hardware_Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02418 – RIOM2 Slot status 6
	1	\$02419 – RIOM2 Slot status 7
	2	\$02420 – RIOM2 Slot status 8
	3	\$02421 – RIOM2 Slot status 9
	4	\$02422 – RIOM2 Slot status 10
	5	\$02423 – RIOM2 Slot status 11
	6	\$02424 – RIOM2 Slot status 12
	7	\$02425 – RIOM2 Slot status 13
	8	\$02900 – RIOM2 Digital Input Channel 25 status
	9	\$02901 – RIOM2 Digital Input Channel 26 status
	10	\$02902 – RIOM2 Digital Input Channel 27 status
	11	\$02903 – RIOM2 Digital Input Channel 28 status
	12	\$02904 – RIOM2 Digital Input Channel 29 status
	13	\$02905 – RIOM2 Digital Input Channel 30 status
	14	\$02906 – RIOM2 Digital Input Channel 31 status
	15	\$02907 – RIOM2 Digital Input Channel 32 status
	16	\$02948 – RIOM2 Digital Output Channel 09 status
	17	\$02949 – RIOM2 Digital Output Channel 10 status
	18	\$02950 – RIOM2 Digital Output Channel 11 status
	19	\$02951 – RIOM2 Digital Output Channel 12 status
	20	\$02952 – RIOM2 Digital Output Channel 13 status
	21	\$02953 – RIOM2 Digital Output Channel 14 status
	22	\$02954 – RIOM2 Digital Output Channel 15 status
	23	\$02955 – RIOM2 Digital Output Channel 16 status
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902017	RIOM2_J3_Connector_Hardware_Error
RIOM2_J3_Connector_Hardware_Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02908 – RIOM1 Digital Input Channel 33 Status
	1	\$02909 – RIOM1 Digital Input Channel 34 Status
	2	\$02910 – RIOM1 Digital Input Channel 35 Status
	3	\$02911 – RIOM1 Digital Input Channel 36 Status
	4	\$02912 – RIOM1 Digital Input Channel 37 Status
	5	\$02913 – RIOM1 Digital Input Channel 38 Status
	6	\$02914 – RIOM1 Digital Input Channel 39 Status
	7	\$02915 – RIOM1 Digital Input Channel 40 Status
	8	\$02916 – RIOM1 Digital Input Channel 41 Status
	9	\$02917 – RIOM1 Digital Input Channel 42 Status
	10	\$02918 – RIOM1 Digital Input Channel 43 Status
	11	\$02919 – RIOM1 Digital Input Channel 44 Status
	12	\$02920 – RIOM1 Digital Input Channel 45 Status
	13	\$02921 – RIOM1 Digital Input Channel 46 Status
	14	\$02922 – RIOM1 Digital Input Channel 47 Status
	15	\$02923 – RIOM1 Digital Input Channel 48 Status
	16	\$02956 – RIOM1 Digital Output Channel 17 status
	17	\$02957 – RIOM1 Digital Output Channel 18 status
	18	\$02958 – RIOM1 Digital Output Channel 19 status
	19	\$02959 – RIOM1 Digital Output Channel 20 status
	20	\$02960 – RIOM1 Digital Output Channel 21 status
	21	\$02961 – RIOM1 Digital Output Channel 22 status
	22	\$02962 – RIOM1 Digital Output Channel 23 status
	23	\$02963 – RIOM1 Digital Output Channel 24 status
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902016	RIOM2_J4_Connector_Hardware_Error
RIOM2_J4_Connector_Hardware_Error = 0000 0000 0000 0000 0000 0000 0000 0000		
Bit	0	\$02924– Digital Input Channel 49 Status
	1	\$02925 – Digital Input Channel 50 Status
	2	\$02926 – Digital Input Channel 51 Status
	3	\$02927 – Digital Input Channel 52 Status
	4	\$02928 – Digital Input Channel 53 Status
	5	\$02929 – Digital Input Channel 54 Status
	6	\$02930 – Digital Input Channel 55 Status
	7	\$02931 – Digital Input Channel 56 Status
	8	\$02932 – Digital Input Channel 57 Status
	9	\$02933 – Digital Input Channel 58 Status
	10	\$02934 – Digital Input Channel 59 Status
	11	\$02935 – Digital Input Channel 60 Status
	12	\$02936 – Digital Input Channel 61 Status
	13	\$02937 – Digital Input Channel 62 Status
	14	\$02938 – Digital Input Channel 63 Status
	15	\$02939 – Digital Input Channel 64 Status
	16	\$02964 – RIOM1 Digital Output Channel 25 status
	17	\$02965 – RIOM1 Digital Output Channel 26 status
	18	\$02966 – RIOM1 Digital Output Channel 27 status
	19	\$02967 – RIOM1 Digital Output Channel 28 status
	20	\$02968 – RIOM1 Digital Output Channel 29 status
	21	\$02969 – RIOM1 Digital Output Channel 30 status
	22	\$02970 – RIOM1 Digital Output Channel 31 status
	23	\$02971 – RIOM1 Digital Output Channel 32 status
	24	Reserve
	25	Reserve
	26	Reserve
	27	Reserve
	28	Reserve
	29	Reserve
	30	Reserve
	31	Reserve

Signal:	\$9902018	RIOM2_J0_Connector_Hardware_Error
RIOM2_J0_Connector_Hardware_Error = 0000 0000		
Bit	0	\$02972– Analog Input Channel 1 Status
	1	\$02973– Analog Input Channel 2 Status
	2	\$02974– Analog Input Channel 3 Status
	3	\$02975– Analog Input Channel 4 Status
	4	\$02976– Analog Input Channel 5 Status
	5	\$02977– Analog Input Channel 6 Status
	6	Reserve
	7	Reserve

Environment 1025: Temperature

Signal	\$43A3V00	Locomotive Speed
Locomotive Speed. = 0.00 km/h		
It shows measured speed of Locomotive		

Signal	\$43MC001	Odometer
Odometer. = 0.00 km		
It shows last mileage of the Loco		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$9921F10	TE/BE actual Loco
TE/BE actual Loco. = 0.00 kN		
It shows Tractive or braking effort on Loco		

Signal	\$41H56	Angle Transmitter
Angle Transmitter. = 0.00 %		
It shows throttle applied in Loco		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$9910UAC	Catenary voltage
Catenary voltage. = 0.00 kV		
It shows High Voltage available at catenary		

Signal	\$9910FAC	AC frequency catenary
AC frequency catenary. = 0.00 Hz		
It shows Line Frequency available at Catenary		

Signal	\$9910IAC	AC line current
AC line current. = 0.00 A		
It shows Current drawn from Catenary		

Signal	\$2805001	Emergency brake activated
Emergency brake activated. = 1		
It shows status of emergency brake activation		

Signal	\$2804006	Pneumatic brake applied bogie 1
Pneumatic brake applied bogie 1. = 0		
It shows status of parking brake applied at bogie 1		

Signal	\$2804007	Pneumatic brake applied bogie 2
Pneumatic brake applied bogie 2. = 0		
It shows status of parking brake applied at bogie 2		

Signal	\$0901001	Cab 1 active
Cab 1 active..... = 0		
It shows status of cab activation		

Signal	\$0901002	Cab 2 active
Cab 2 active..... = 0		
It shows status of cab activation		

Signal	\$1104004	one panto is actuated
one panto is actuated. = 1		
It shows status of panto actuation		

Signal	\$02E0012	E111_04/122_09 VCB On
E111_04/122_09 VCB On = 0		
It shows status of VCB On input at E111 module		

Signal	\$D0201	Emergency Stop activated
Emergency Stop activated = 0		
It shows status of emergency stop activation		

Signal	\$0902000	Driving direction cab 1 selected
Driving direction cab 1 selected = 0		
It shows driving direction of Loco		

Signal	\$0902001	Driving direction cab 2 selected
Driving direction cab 2 selected = 0		
It shows driving direction of Loco		

Signal	\$0908000	Traction limitation active
Traction limitation active = 0		
It shows status of traction limitation		

Signal	\$21B105	Interlock own Loco activated
Interlock own Loco activated = 0		
It shows status of interlock activation		

Signal	\$22A4001	Const speed activated
Const speed activated = 0		
It shows status of constant speed activation		

Signal	\$22A4002	Inching mode active
Inching mode active = 0		
It shows status of inching mode activation		

Signal	\$22A4003	Shunting mode active
Shunting mode active = 0		
It shows status of shunting mode activation		

Signal	\$9932000	Failure mode active
Failure mode active = 0		
It shows status of failure mode activation		

Signal	\$3202009	Limited drive mode active
Limited drive mode active. = 0		
It shows status of limited drive mode activation		

Signal	\$3204021	Simulation mode activated
Simulation mode activated = 0		
It shows status of simulation mode activation		

Signal	\$41E0013	Workshop mode active
Workshop mode active = 0		
It shows status of workshop mode activation		

Signal	\$0901004	Cooling mode selected
Cooling mode selected = 0		
It shows status of cooling mode activation		

Signal	\$D0160	Loco is in Banking Mode
Loco is in Banking Mode = 0		
It shows status of banking mode activation		

Signal	\$2407003	Harmonic Filter ON
Harmonic Filter ON = 0		
It shows status of harmonic filter		

Signal	\$2407008	HF Cont. 8.1 trigger
HF Cont. 8.1 trigger = 0		
It shows status of harmonic filter contactor 8.1		

Signal	\$2407009	HF Cont. 8.41 trigger
HF Cont. 8.41 trigger = 0		
It shows status of harmonic filter contactor 8.41		

Signal	\$02E0030	BCU ok
BCU ok..... = 0		
It shows status of BCU		

Signal	\$3203007	VCD -> Emerg brakes appl
VCD -> Emerg brakes appl = 0		
It shows status of VCD emergency brakes		

Signal	\$080WTBM	WTB Master
WTB Master = 0		
It shows status of WTB status		

Signal	\$2404039	TC1 is Cut Out (Traction)
TC1 is Cut Out (Traction) = 0		
It shows status of TC1 traction		

Signal	\$2404040	TC2 is Cut Out (Traction)
TC2 is Cut Out (Traction) = 0		
It shows status of TC2 traction		

Signal	\$3203010	Smoke detected
Smoke detected= 0		
It shows smoke detection status		

Signal	\$3203020	Fire detected
Fire detected = 0		
It shows fire detection status		

Signal	\$41H03	Temp_CCU1
Temp_CCU1. = 0 degC		
It shows temperature of CCU1		

Signal	\$41H04	Temp_CCU2
Temp_CCU2. = 0 degC		
It shows temperature of CCU2		

Signal	\$260009	TCU1_Temperature
TCU1_Temperature. = 0 degC		
It shows temperature of TCU1		

Signal	\$260309	TCU2_Temperature
TCU2_Temperature. = 0 degC		
It shows temperature of TCU2		

Signal	\$41OE17	Display 1 Temperature
Display 1 Temperature. = 0 degC		
It shows temperature of Display 1		

Signal	\$41NE17	Display 2 Temperature
Display 2 Temperature. = 0 degC		
It shows temperature of Display 2		

Signal	\$31E1C01	ACU1 Temperature Heatsink
ACU1 Temperature_Heatsink. = 0 degC		
It shows temperature of ACU1 heatsink		

Signal	\$31E1C02	ACU1 Temperature _Sibcos
ACU1 Temperature_Sibcos. = 0 degC		
It shows temperature of ACU1 sibcos		

Signal	\$31E2C01	ACU2 Temperature Heatsink
ACU2 Temperature_Heatsink. = 0 degC		
It shows temperature of ACU2 heatsink		

Signal	\$31E2C02	ACU2 Temperature _Sibcos
ACU2 Temperature_Sibcos. = 0 degC		
It shows temperature of ACU2 sibcos		

Signal	\$31E3C01	ACU3 Temperature Heatsink
ACU3 Temperature_Heatsink. = 0 degC		
It shows temperature of ACU3 heatsink		

Signal	\$31E3C02	ACU3 Temperature _Sibcos
ACU3 Temperature_Sibcos. = 0 degC		
It shows temperature of ACU3 sibcos		

Signal	\$31E4C01	BCH: Temperature Control
BCH: Temperature Control. = 0 degC		
It shows temperature of Battey charger		

Signal	\$260086	Temperature_TM1
Temperature_TM1..... = 0 degC		
It shows temperature of Traction Motor 1		

Signal	\$260105	Temperature_TM2
Temperature_TM2..... = 0 degC		
It shows temperature of Traction Motor 2		

Signal	\$260124	Temperature_TM3
Temperature_TM3..... = 0 degC		
It shows temperature of Traction Motor 3		

Signal	\$260386	Temperature_TM4
Temperature_TM4..... = 0 degC		
It shows temperature of Traction Motor 4		

Signal	\$260405	Temperature_TM2
Temperature_TM2..... = 0 degC		
It shows temperature of Traction Motor 2		

Signal	\$260424	Temperature_TM6
Temperature_TM6..... = 0 degC		
It shows temperature of Traction Motor 6		

Signal		IO stn. Temperature Warning
IO stn. Temperature Warning. = 1 0000 0000		
It gives temperature of I/O station		
Signal no.	\$02104- Bit 0	Ext I/O 11 Temp warning
	\$02104-Bit 1	Ext I/O 12 Temp warning
	\$02104-Bit 2	Ext I/O 21 Temp warning
	\$02104-Bit 3	Ext I/O 22 Temp warning
	Bit- 4	Reserve
	Bit- 5	Reserve
	Bit- 6	Reserve
	Bit- 7	Reserve

Signal	\$31E1022	ACU 1 Internal Temperature warnings
ACU 1 Internal Temperature warnings. = 1 0000 0000		
It shows temperature warning Inside ACU1		
Bit	0	ACU1 Temp Warning Controller 1
	1	ACU1 Temp Warning Heatsink 1
	2	ACU1 Temp Warning Controller 2
	3	ACU1 Temp Warning Heatsink 2
	4	Reserve
	5	Reserve
	6	Reserve
	7	Reserve

Signal	\$31E2028	ACU 2 Internal Temperature warnings
ACU 2 Internal Temperature warnings. = 1 0000 0000		
It shows temperature warning Inside ACU2		
Bit	0	ACU2 Temp Warning Controller 1
	1	ACU2 Temp Warning Heatsink 1
	2	ACU2 Temp Warning Controller 2
	3	ACU2 Temp Warning Heatsink 2
	4	ACU2 Temp Warning Controller 3
	5	ACU2 Temp Warning Heatsink 3
	6	Reserve
	7	Reserve

Signal	\$31E3022	ACU 3 Internal Temperature warnings
ACU 3 Internal Temperature warnings. = 1 0000 0000		
It shows temperature warning Inside ACU3		
Bit	0	ACU3 Temp Warning Controller 1
	1	ACU3 Temp Warning Heatsink 1
	2	ACU3 Temp Warning Controller 2
	3	ACU3 Temp Warning Heatsink 2
	4	ACU3 Temp Warning Controller 3
	5	ACU3 Temp Warning Heatsink 3
	6	Reserve
	7	Reserve

Environment 2048: Prepost

Signal:	\$2600100	TCU1_Rotatin Speed1_TMA
TCU1_Rotatin Speed1_TMA = 0.00 1/s		
Rotational speed of Traction motor 1 in rotation per second		

Signal:	\$260200	TCU1_Rotatin Speed1_TMB
TCU1_Rotatin Speed1_TMB..... = 0.00 1/s		
Rotational speed of Traction motor 2 in rotation per second		

Signal:	\$2601250	TCU1_Rotatin Speed1_TMC
TCU1_Rotatin Speed1_TMC = 0.00 1/s		
Rotational speed of Traction motor 3 in rotation per second		

Signal:	\$2603870	TCU2_Rotatin Speed1_TMA
TCU2_Rotatin Speed1_TMA = 0.00 1/s		
Rotational speed of Traction motor 4 in rotation per second		

Signal:	\$2604060	TCU2_Rotatin Speed1_TMB
TCU2_Rotatin Speed1_TMB..... = 0.00 1/s		
Rotational speed of Traction motor 5 in rotation per second		

Signal:	\$2604250	TCU2_Rotatin Speed1_TMC
TCU2_Rotatin Speed1_TMC = 0.00 1/s		
Rotational speed of Traction motor 6 in rotation per second		

Signal	\$3103032	Aux Converter 2 Status
Aux Converter 2 Status = 1 000 H		
It shows status of Aux Converter 2		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal:	\$4255T1	Speed TM 1 tn -3/+1 s
Speed TM 1 tn -3/+1 s..... = 0.00 km/h		
Speed of Traction Motor 1 from -3 to +1 interval		

Signal:	\$4255T1	Speed TM 2 tn -3/+1 s
Speed TM 2 tn -3/+1 s..... = 0.00 km/h		
Speed of Traction Motor 2 from -3 to +1 interval		

Signal:	\$4257T1	Speed TM 3 tn -3/+1 s
Speed TM 3 tn -3/+1 s..... = 0.00 km/h		
Speed of Traction Motor 3 from -3 to +1 interval		

Signal:	\$4258T1	Speed TM 4 tn -3/+1 s
Speed TM 4 tn -3/+1 s..... = 0.00 km/h		
Speed of Traction Motor 4 from -3 to +1 interval		

Signal:	\$4259T1	Speed TM 5 tn -3/+1 s
Speed TM 5 tn -3/+1 s..... = 0.00 km/h		
Speed of Traction Motor 5 from -3 to +1 interval		

Signal:	\$4260T1	Speed TM 6 tn -3/+1 s
Speed TM 6 tn -3/+1 s..... = 0.00 km/h		
Speed of Traction Motor 6 from -3 to +1 interval		

Signal:	\$4246T11	Speed TM 1 tn -2/+2 s
Speed TM 1 tn -2/+2 s..... = 0.00 km/h		
Speed of Traction Motor 1 from -2 to +2 interval		

Signal:	\$4247T11	Speed TM 2 tn -2/+2 s
Speed TM 2 tn -2/+2 s..... = 0.00 km/h		
Speed of Traction Motor 2 from -2 to +2 interval		

Signal:	\$4248T11	Speed TM 3 tn -2/+2 s
Speed TM 3 tn -2/+2 s..... = 0.00 km/h		
Speed of Traction Motor 3 from -2 to +2 interval		

Signal:	\$4249T11	Speed TM 4 tn -2/+2 s
Speed TM 4 tn -2/+2 s..... = 0.00 km/h		
Speed of Traction Motor 4 from -2 to +2 interval		

Signal:	\$4250T11	Speed TM 5 tn -2/+2 s
Speed TM 5 tn -2/+2 s..... = 0.00 km/h		
Speed of Traction Motor 5 from -2 to +2 interval		

Signal:	\$4251T11	Speed TM 6 tn -2/+2 s
Speed TM 6 tn -2/+2 s..... = 0.00 km/h		
Speed of Traction Motor 6 from -2 to +2 interval		

Signal:	\$4237T10	Speed TM 1 tn -1/+3 s
Speed TM 1 tn -1/+3 s..... = 0.00 km/h		
Speed of Traction Motor 1 from -1 to +3 interval		

Signal:	\$4238T10	Speed TM 2 tn -1/+3 s
Speed TM 2 tn -1/+3 s..... = 0.00 km/h		
Speed of Traction Motor 2 from -1 to +3 interval		

Signal:	\$4239T10	Speed TM 3 tn -1/+3 s
Speed TM 3 tn -1/+3 s..... = 0.00 km/h		
Speed of Traction Motor 3 from -1 to +3 interval		

Signal:	\$4240T10	Speed TM 4 tn -1/+3 s
Speed TM 4 tn -1/+3 s..... = 0.00 km/h		
Speed of Traction Motor 4 from -1 to +3 interval		

Signal:	\$4241T10	Speed TM 5 tn -1/+3 s
Speed TM 5 tn -1/+3 s..... = 0.00 km/h		
Speed of Traction Motor 5 from -1 to +3 interval		

Signal:	\$4242T10	Speed TM 6 tn -1/+3 s
Speed TM 6 tn -1/+3 s..... = 0.00 km/h		
Speed of Traction Motor 6 from -1 to +3 interval		

Signal	\$1104H00	Panto QTY [Flag]
Panto QTY [Flag] = 0000		
0000 0000 0000 0000 0000 0010 0000 0000		
Bit	0	reserved for flag structure
	1	pantos inhibited: CB 127.12 tripped
	2	dummy PAN flag
	3	pantos locked: over current counter
	4	pantos inhibited: invalid feedback signals / MVB communication not ok
	5	pantos inhibited: locomotive shut down in progress
	6	pantos inhibited: no cab activated
	7	pantos inhibited: VCB off feedback fault
	8	pantos inhibited: Self test active
	9	pantos inhibited: no communication with TCU-Master
	10	dummy PAN flag
	11	pantos locked: current detected by opened VCB
	12	pantos inhibited: panto down request by TCU1 and/or TCU2
	13	catenary overvoltage U > 33 kV
	14	pantos inhibited due to emergency push button
	15	Command panto down by the driver
	16	pantos locked: raising fault panto A
	17	pantos locked: raising fault panto D
	18	pantos locked: lowering fault panto A
	19	pantos locked: lowering fault panto D
	20	pantos locked: loss of pressure panto A
	21	pantos locked: loss of pressure panto D
	22	pantos inhibited: temporary restart interlock
	23	pantos inhibited: Simulation mode, ALG Test is Running
	24	dummy PAN flag
	25	dummy PAN flag
	26	dummy PAN flag
	27	dummy PAN flag
	28	dummy PAN flag
	29	AC line voltage not valid
	30	AC frequency not valid
	31	AC line current not valid

Signal	\$4179T3	TE/BE act loco tn -3/+1 s
TE/BE act loco tn -3/+1 s. = 0.00 kN		
It shows Tractive or braking effort on Loco from -3 to +1 interval		

Signal	\$4181T3	BP pressure tn -3/+1 s
BP pressure tn -3/+1 s = 0.00 bar		
It shows measured value of pressure in brake pipe from -3 to +1 interval		

Signal	\$1004U0	AC line voltage
AC line voltage = 0.00 kV		
It shows measured value of AC line voltage		

Signal	\$4178T3	Loco Speed tn -3/+1 s
Loco Speed tn -3/+1 s = 0.00 km/h		
It shows measured speed of Locomotive from -3 to +1 interval		

Signal	\$2801006	Brake pipe pressure
Brake pipe pressure = 0.00 bar		
It shows measured value of pressure in brake pipe		

Signal	\$3205006	Battery Voltage
Battery voltage = 0.00 V		
It shows measured value of battery voltage		

Signal	\$3201005	Loco node num. -> Disp
Loco Node Number = 0.00		
It shows loco node number		

Signal	\$3103031	Aux Converter 1 Status
Aux Converter 1 Status = 1 000 H		
It shows status of Aux Converter 1		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$4185T3	Panto FLAG tn -3/+1 s
Panto FLAG tn -3/+1 s = 0000 0000 0000 0000 0000 0000 0010 0000 0000		
Bit	0	reserved for flag structure
	1	pantos inhibited: CB 127.12 tripped
	2	dummy PAN flag
	3	pantos locked: over current counter
	4	pantos inhibited: invalid feedback signals / MVB communication not ok
	5	pantos inhibited: locomotive shut down in progress
	6	pantos inhibited: no cab activated
	7	pantos inhibited: VCB off feedback fault
	8	pantos inhibited: Self test active
	9	pantos inhibited: no communication with TCU-Master
	10	dummy PAN flag
	11	pantos locked: current detected by opened VCB
	12	pantos inhibited: panto down request by TCU1 and/or TCU2
	13	catenary overvoltage U > 33 kV
	14	pantos inhibited due to emergency push button
	15	Command panto down by the driver
	16	pantos locked: raising fault panto A
	17	pantos locked: raising fault panto D
	18	pantos locked: lowering fault panto A
	19	pantos locked: lowering fault panto D
	20	pantos locked: loss of pressure panto A
	21	pantos locked: loss of pressure panto D
	22	pantos inhibited: temporary restart interlock
	23	pantos inhibited: Simulation mode, ALG Test is Running
	24	dummy PAN flag
	25	dummy PAN flag
	26	dummy PAN flag
	27	dummy PAN flag
	28	dummy PAN flag
	29	AC line voltage not valid
	30	AC frequency not valid
	31	AC line current not valid

Signal		\$4186T3	VCB FLAG tn -3/+1 s
	VCB FLAG tn -3/+1 s = 0000 0000 0000 0000 0000 0000 0010 0000 0000		
Bit		0	reserved for flag structure
		1	VCB inhibited: No catenary volt detected
		2	VCB inhibited: Over or under voltage VCB open
		3	VCB temporary locked: Line voltage 5. harmonic too high
		4	VCB temporary locked: Reclose interlock
		5	VCB inhibited: Over or inrush current too high -> VCB open
		6	VCB inhibited: transformer oil temperature too high
		7	VCB temporary locked: line voltage instantaneous value too high
		8	VCB inhibited: Invalid feedback signals / MVB communication not ok
		9	VCB inhibited: One TCU is off but VCB loop is still opened
		10	VCB inhibited: Transformer oil pressure/MCBs of both transformer oil pumps are tripped
		11	VCB inhibited: VCB opened by the driver
		12	VCB inhibited: VCB opened due to switch on fault
		13	VCB inhibited: No panto raised
		14	VCB inhibited: Dummy Flag
		15	VCB inhibited: Call for help by TCU1 and/or TCU2 VCB inhibited: Call for help by TCU1 and/or TCU2
		16	VCB inhibited: VCB loop not released by TCU1
		17	VCB inhibited: VCB loop not released by TCU2
		18	VCB inhibited: VCB loop test failed by TCU1
		19	VCB inhibited: VCB loop test failed by TCU2
		20	VCB inhibited: VCB loop test failed by EXT_IO St. 11 and 12
		21	VCB inhibited: End of VCB loop test but one TCU is still in test mode
		22	VCB inhibited: VCB loop test aborted
		23	VCB inhibited: MCBs of both TCC Coolant pumps are tripped
		24	VCB inhibited: Harmonic filter over current or inrush current high
		25	VCB inhibited: Traction Interface
		26	VCB inhibited: More than one IO station not available
		27	VCB inhibited: VCB opened by AGT traction release monitoring
		28	VCB inhibited: AUX Inverter Fault
		29	VCB inhibited: AUX inverter fault or reconfiguration
		30	VCB inhibited: Aux Winding overcurrent
		31	VCB inhibited: Two or more AUX isolated/ AUX Isolated

Signal	\$4180T3	Loco node num tn -3/+1 s
Loco node num tn -3/+1 s = 0.00		
It shows loco node number from -3 to +1 interval		

Signal	\$4252T12	AUX-1 Status tn -3/+1 s
AUX-1 Status tn -3/+1 s = 1 000 H		
It shows status of Aux Converter 1 from -3 to +1 interval		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$4253T12	AUX-2 Status tn -3/+1 s
AUX-2 Status tn -3/+1 s = 1 000 H		
It shows status of Aux Converter 2 from -3 to +1 interval		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$4254T12	AUX-3 Status tn -3/+1 s
AUX-3 Status tn -3/+1 s = 1 000 H		
It shows status of Aux Converter 3 from -3 to +1 interval		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$4182T3	Battery Voltage tn -3/+1 s
Battery Voltage tn -3/+1 s = 0.00 V		
It shows measured value of battery voltage from -3 to +1 interval		

Signal	\$4175T2	Panto FLAG tn -2/+2 s
Panto FLAG tn -2/+2 s = 0000 0000 0000 0000 0000 0000 0010 0000 0000		
Bit	0	reserved for flag structure
	1	pantos inhibited: CB 127.12 tripped
	2	dummy PAN flag
	3	pantos locked: over current counter
	4	pantos inhibited: invalid feedback signals / MVB communication not ok
	5	pantos inhibited: locomotive shut down in progress
	6	pantos inhibited: no cab activated
	7	pantos inhibited: VCB off feedback fault
	8	pantos inhibited: Self test active
	9	pantos inhibited: no communication with TCU-Master
	10	dummy PAN flag
	11	pantos locked: current detected by opened VCB
	12	pantos inhibited: panto down request by TCU1 and/or TCU2
	13	catenary overvoltage U > 33 kV
	14	pantos inhibited due to emergency push button
	15	Command panto down by the driver
	16	pantos locked: raising fault panto A
	17	pantos locked: raising fault panto D
	18	pantos locked: lowering fault panto A
	19	pantos locked: lowering fault panto D
	20	pantos locked: loss of pressure panto A
	21	pantos locked: loss of pressure panto D
	22	pantos inhibited: temporary restart interlock
	23	pantos inhibited: Simulation mode, ALG Test is Running
	24	dummy PAN flag
	25	dummy PAN flag
	26	dummy PAN flag
	27	dummy PAN flag
	28	dummy PAN flag
	29	AC line voltage not valid
	30	AC frequency not valid
	31	AC line current not valid

Signal	\$4176T2	VCB FLAG tn -2/+2 s
VCB FLAG tn -2/+2 s. = 0000 0000 0000 0000 0000 0000 0010 0000 0000		
Bit	0	reserved for flag structure
	1	VCB inhibited: No catenary volt detected
	2	VCB inhibited: Over or under voltage VCB open
	3	VCB temporary locked: Line voltage 5. harmonic too high
	4	VCB temporary locked: Reclose interlock
	5	VCB inhibited: Over or inrush current too high -> VCB open
	6	VCB inhibited: transformer oil temperature too high
	7	VCB temporary locked: line voltage instantaneous value too high
	8	VCB inhibited: Invalid feedback signals / MVB communication not ok
	9	VCB inhibited: One TCU is off but VCB loop is still opened
	10	VCB inhibited: Transformer oil pressure/MCBs of both transformer oil pumps are tripped
	11	VCB inhibited: VCB opened by the driver
	12	VCB inhibited: VCB opened due to switch on fault
	13	VCB inhibited: No panto raised
	14	VCB inhibited: Dummy Flag
	15	VCB inhibited: Call for help by TCU1 and/or TCU2VCB inhibited: Call for help by TCU1 and/or TCU2
	16	VCB inhibited: VCB loop not released by TCU1
	17	VCB inhibited: VCB loop not released by TCU2
	18	VCB inhibited: VCB loop test failed by TCU1
	19	VCB inhibited: VCB loop test failed by TCU2
	20	VCB inhibited: VCB loop test failed by EXT_IO St. 11 and 12
	21	VCB inhibited: End of VCB loop test but one TCU is still in test mode
	22	VCB inhibited: VCB loop test aborted
	23	VCB inhibited: MCBs of both TCC Coolant pumps are tripped
	24	VCB inhibited: Harmonic filter over current or inrush current high
	25	VCB inhibited: Traction Interface
	26	VCB inhibited: More than one IO station not available
	27	VCB inhibited: VCB opened by AGT traction release monitoring
	28	VCB inhibited: AUX Inverter Fault
	29	VCB inhibited: AUX inverter fault or reconfiguration
	30	VCB inhibited: Aux Winding overcurrent
	31	VCB inhibited: Two or more AUX isolated/ AUX Isolated

Signal	\$4170T2	Loco node num tn -2/+2 s
Loco node num tn -2/+2 s. = 0.00		
It shows loco node number from -2 to +2 interval		

Signal	\$4243T11	AUX-1 Status tn -2/+2 s
AUX-1 Status tn -2/+2 s. = 1 000 H		
It shows status of Aux Converter 1 from -2 to +2 interval		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$4169T2	TE/BE act loco tn -2/+2 s
TE/BE act loco tn -2/+2 s. = 0.00 kN		
It shows Tractive or braking effort on Loco from -2 to +2 interval		

Signal	\$4183T3	AC line voltage tn -3/+1 s
AC line voltage tn -3/+1 s = 0.00 kV		
It shows measured value of AC line voltage from -3 to +1 interval		

Signal	\$4168T2	Loco Speed tn -2/+2 s
TE/BE act loco tn -2/+2 s = 0.00 kN		
It shows Tractive or braking effort on Loco from -2 to +2 interval		

Signal	\$4171T2	BP pressure tn -2/+2 s
BP pressure tn -2/+2 s = 0.00 bar		
It shows measured value of pressure in brake pipe from -2 to +2 interval		

Signal	\$4172T2	Battery Voltage tn -2/+2 s
Battery Voltage tn -2/+2 s = 0.00 V		
It shows measured value of battery voltage from -2 to +2 interval		

Signal	\$4173T2	AC line voltage tn -2/+2 s
AC line voltage tn -2/+2 s = 0.00 kV		
It shows measured value of AC line voltage from -2 to +2 interval		

Signal	\$4159T1	Loco Speed tn -1/+3s
Loco Speed tn -1/+3s = 0.00 km/h		
It shows measured speed of Locomotive from -1 to +3 interval		

Signal	\$4244T11	AUX-2 Status tn -2/+2 s
AUX-2 Status tn -2/+2 s = 1 000 H		
It shows status of Aux Converter 2 from -2 to +2 interval		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload
Signal	\$4160T1	TE/BE act loco tn -1/+3s
TE/BE act loco tn -1/+3s = 0.00 kN		
It shows Tractive or braking effort on Loco from -1 to +3 interval		

Signal	\$4162T1	BP pressure tn -1/+3s
BP pressure tn -1/+3s = 0.00 bar		
It shows measured value of pressure in brake pipe from -1 to +3 interval		

Signal	\$4163T1	Battery Voltage tn -1/+3s
Battery Voltage tn -1/+3s = 0.00 V		
It shows measured value of battery voltage from -1 to +3 interval		

Signal	\$4245T11	AUX-3 Status tn -2/+2 s
AUX-3 Status tn -2/+2 s. = 1 000 H		
It shows status of Aux Converter 3 from -2 to +2 interval		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload
Signal	\$4164T1	AC line voltage tn -1/+3s
AC line voltage tn -1/+3s. = 0.00 kV		
It shows measured value of AC line voltage from -1 to +3 interval		

Signal	\$1204H00	VCB QTY [Flag]
VCB QTY [Flag] = 0000		
0000 0000 0000 0000 0000 0010 0000 0000		
Bit	0	reserved for flag structure
	1	VCB inhibited: No catenary volt detected
	2	VCB inhibited: Over or under voltage VCB open
	3	VCB temporary locked: Line voltage 5. harmonic too high
	4	VCB temporary locked: Reclose interlock
	5	VCB inhibited: Over or inrush current too high -> VCB open
	6	VCB inhibited: transformer oil temperature too high
	7	VCB temporary locked: line voltage instantaneous value too high
	8	VCB inhibited: Invalid feedback signals / MVB communication not ok
	9	VCB inhibited: One TCU is off but VCB loop is still opened
	10	VCB inhibited: Transformer oil pressure/MCBs of both transformer oil pumps are tripped
	11	VCB inhibited: VCB opened by the driver
	12	VCB inhibited: VCB opened due to switch on fault
	13	VCB inhibited: No panto raised
	14	VCB inhibited: Dummy Flag
	15	VCB inhibited: Call for help by TCU1 and/or TCU2VCB inhibited: Call for help by TCU1 and/or TCU2
	16	VCB inhibited: VCB loop not released by TCU1
	17	VCB inhibited: VCB loop not released by TCU2
	18	VCB inhibited: VCB loop test failed by TCU1
	19	VCB inhibited: VCB loop test failed by TCU2
	20	VCB inhibited: VCB loop test failed by EXT_IO St. 11 and 12
	21	VCB inhibited: End of VCB loop test but one TCU is still in test mode
	22	VCB inhibited: VCB loop test aborted
	23	VCB inhibited: MCBs of both TCC Coolant pumps are tripped
	24	VCB inhibited: Harmonic filter over current or inrush current high
	25	VCB inhibited: Traction Interface
	26	VCB inhibited: More than one IO station not available
	27	VCB inhibited: VCB opened by AGT traction release monitoring
	28	VCB inhibited: AUX Inverter Fault
	29	VCB inhibited: AUX inverter fault or reconfiguration
	30	VCB inhibited: Aux Winding overcurrent
	31	VCB inhibited: Two or more AUX isolated/ AUX Isolated

Signal	\$4166T1	Panto FLAG tn -1/+3s
Panto FLAG tn -1/+3s = 0000		0000 0000 0000 0000 0000 0010 0000 0000
Bit	0	reserved for flag structure
	1	pantos inhibited: CB 127.12 tripped
	2	dummy PAN flag
	3	pantos locked: over current counter
	4	pantos inhibited: invalid feedback signals / MVB communication not ok
	5	pantos inhibited: locomotive shut down in progress
	6	pantos inhibited: no cab activated
	7	pantos inhibited: VCB off feedback fault
	8	pantos inhibited: Self test active
	9	pantos inhibited: no communication with TCU-Master
	10	dummy PAN flag
	11	pantos locked: current detected by opened VCB
	12	pantos inhibited: panto down request by TCU1 and/or TCU2
	13	catenary overvoltage U > 33 kV
	14	pantos inhibited due to emergency push button
	15	Command panto down by the driver
	16	pantos locked: raising fault panto A
	17	pantos locked: raising fault panto D
	18	pantos locked: lowering fault panto A
	19	pantos locked: lowering fault panto D
	20	pantos locked: loss of pressure panto A
	21	pantos locked: loss of pressure panto D
	22	pantos inhibited: temporary restart interlock
	23	pantos inhibited: Simulation mode, ALG Test is Running
	24	dummy PAN flag
	25	dummy PAN flag
	26	dummy PAN flag
	27	dummy PAN flag
	28	dummy PAN flag
	29	AC line voltage not valid
	30	AC frequency not valid
	31	AC line current not valid

Signal	\$4167T1	VCB FLAG tn -1/+3s
VCB FLAG tn -1/+3s. = 0000		0000 0000 0000 0000 0000 0010 0000 0000
Bit	0	reserved for flag structure
	1	VCB inhibited: No catenary volt detected
	2	VCB inhibited: Over or under voltage VCB open
	3	VCB temporary locked: Line voltage 5. harmonic too high
	4	VCB temporary locked: Reclose interlock
	5	VCB inhibited: Over or inrush current too high -> VCB open
	6	VCB inhibited: transformer oil temperature too high
	7	VCB temporary locked: line voltage instantaneous value too high
	8	VCB inhibited: Invalid feedback signals / MVB communication not ok
	9	VCB inhibited: One TCU is off but VCB loop is still opened
	10	VCB inhibited: Transformer oil pressure/MCBs of both transformer oil pumps are tripped
	11	VCB inhibited: VCB opened by the driver
	12	VCB inhibited: VCB opened due to switch on fault
	13	VCB inhibited: No panto raised
	14	VCB inhibited: Dummy Flag
	15	VCB inhibited: Call for help by TCU1 and/or TCU2 VCB inhibited: Call for help by TCU1 and/or TCU2
	16	VCB inhibited: VCB loop not released by TCU1
	17	VCB inhibited: VCB loop not released by TCU2
	18	VCB inhibited: VCB loop test failed by TCU1
	19	VCB inhibited: VCB loop test failed by TCU2
	20	VCB inhibited: VCB loop test failed by EXT_IO St. 11 and 12
	21	VCB inhibited: End of VCB loop test but one TCU is still in test mode
	22	VCB inhibited: VCB loop test aborted
	23	VCB inhibited: MCBs of both TCC Coolant pumps are tripped
	24	VCB inhibited: Harmonic filter over current or inrush current high
	25	VCB inhibited: Traction Interface
	26	VCB inhibited: More than one IO station not available
	27	VCB inhibited: VCB opened by AGT traction release monitoring
	28	VCB inhibited: AUX Inverter Fault
	29	VCB inhibited: AUX inverter fault or reconfiguration
	30	VCB inhibited: Aux Winding overcurrent
	31	VCB inhibited: Two or more AUX isolated/ AUX Isolated

Signal	\$4234T10	AUX-1 Status tn -1/+3 s
AUX-1 Status tn -1/+3 s = 1 000 H		
It shows status of Aux Converter 1 from -1 to +3 interval		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$4235T10	AUX-2 Status tn -1/+3 s
AUX-2 Status tn -1/+3 s = 1 000 H		
It shows status of Aux Converter 2 from -1 to +3 interval		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload

Signal	\$4236T10	AUX-3 Status tn -1/+3 s
AUX-3 Status tn -1/+3 s = 1 000 H		
It shows status of Aux Converter 3 from -1 to +3 interval		
Bit	0	Invalid
	1	Ready
	2	Pulsing
	3	Faulty
	4	Locked
	5	Overload