

TENDER SPECIFICATION
NO. CLW/ES/I-10.

(ALT | L | M | N | O | P)

ENCLOSURES :

1. ~~DRG. NO. CLW/ES/SK-1/I-10~~ (K)
2. DRG. NO. CLW/ES/SK-2/I-10
3. ~~DRG. NO. CLW/ES/SK-3/I-10~~ (I)
4. ~~DRG. NO. CLW/ES/SK-4/I-10~~ (K)
5. DRG. NO. CLW/ES/SK-5/I-10
6. ~~DRG. NO. CLW/ES/SK-6/I-10~~ (O)
7. DRG. NO. CLW/ES/SK-7/I-10 (M)
8. ~~DRG. NO. CLW/ES/SK-8/I-10~~ (N)

ALT.	L	M	N	O	P
SHEETS	11	12	13	14	14

SPECIFICATION FOR
INSULATED SUPPORT FOR
E.P. CONTACTOR FOR
25 K.V. A.C. ELECTRIC LOCOMOTIVE
{(WAG-7 (MOD) & WAP)}

ISSUED BY
DY. CHIEF ELECTRICAL ENGINEER (DEV)
CHITTARANJAN LOCOMOTIVE WORKS
P.O. CHITTARANJAN - 713 331
DIST BURDWAN, WEST BENGAL, INDIA

जांचा
DRN.

INSULATED SUPPORT
FOR E.P. CONTACTOR
FOR WAG-7(MOD) &
WAP LOCOS.

उप.मु.वि.अ. (अभि.)
DY. CEE. (D)

चितरंजन रेल इंजन कारखाना
पश्चिम बंगाल, भारत
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA

क्रमांक, NO. CLW/ES/I-10
दिनांक/DATE : 16.12.98

ALT. NO.	AUTHY	DESCRIPTION	INITIAL	DATE
A	Dy. CEE/D	For WAP-1 Loco, SK.No. CLW/ES/ SK-2/I-10 and CLW/ES/SK-3/I-10 added.	Sd-	19-3-83
B	Dy. CEE/D	Tolerance on outside Dia of Insulated tube changed from ± 0.2 to ± 0.1 mm, clause 8.0 added. -0.2	Sd-	4-10-83
C	Dy. CEE/D	Machining Symbols added, Modified Cl.No. 4,1, added Cl.No. 5.3.	Sd-	19-4-84
D	Dy. CEE/D	Clause-5.3 modified and 5.4 added. Type nos. added in the drgs.	Sd-	30-5-84
E	Dy. CEE/D	Special condition Cl. 9.0 added.	Sd-	20-11-84
F	Dy. CEE/D	Tolerance on bar's overall dia 40 changed.	Sd-	2-11-85
G	Dy. CEE/D	Length of contact for Type-1 reduced by 5mm.	Sd-	25-3-88
H	Dy. CEE/D	Type-IV added for WAG5 Loco (Weak field).	Sd-	4-6-88
I	Dy. CEE/D	Type-III deleted due to introduc- tion of 6-P arrangement from LOCO No. 27032 and onwards vide ACOS/ EL's L/No. MCO/EL/Review, Pt. III dt. 21-3-94	Sd-	15-4-94
J	Dy. CEE/D	Sht. No. 9 added for WAG7 (Modular) Loco.	Sd-	19-3-96
K	Dy. CEE/D	Type-I & IV deleted for WAG7 (Mod) only.	Sd-	6-2-97
L	Dy. CEE/D	i) Alt. Sheet No. 2 & Drg. No. CLW/ES/ SK-3/I-10 at sheet No. 11 added. ii) Ref. No. for Drg. No. 1.4.1 and C&D No. in Drgs. Deleted. iii) Top sheet and other sheet no. revised	<i>Am</i>	08.1.97
M	Dy. CEE/D	SKETCH No. 7 IN SHEET No. 12 OF ^M WAP-1 (MODULAR) LOCO.	<i>Am</i>	28.8.97
N	DY. CEE/D	SKETCH NO. 8 IN SHEET NO. 13 & 14 ADDED FOR WAP-1 (MOD) LOCO.	<i>Am</i>	9.5.98

INSULATED SUPPORT
FOR E.P. CONTACTOR
FOR WAG-7(MOD) &
WAP LOCOE.

Am
16.12.98
डॉ. ए. व. (सि.)
DY. CEE. (D)

चिटारंजन लोकोमोटिव वर्क्स
WEST BENGAL, INDIA
CLW/ES/I-10
दिनांक/DATE : 16.12.98

अर्थ
= DRN.

ALT.NO	AUTHY.	DESCRIPTION	INITIAL	DATE
0	DY.CEE/D	SHT. NO. 2A ADDED AND SHT. NO. 11, 13 & 14 OF 14 DELETED FROM LOCO NO. R-432 ONWARDS.	<i>[Signature]</i>	21-09-05
P	DY.CEE/D	Insulated Support Type - VI, VII & IX are required for WAG-7 (crew-friendly) Loco in Modified BA Panel.	<i>[Signature]</i>	16-8-08-

जाँचा
CHKD

आरेखित
DRN

**INSULATED SUPPORT
FOR E.P CONTACTOR
FOR WAG-7 (MOD) &
WAP-LOCOS.**

उप.मु.वि.अ. (अभि.)
DY. CEE. (D)

चित्तरंजन रेल इंजन कारखाना
पश्चिम बंगाल, भारत
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA
क्रमांक/NO. CLW/ES/I-10
दिनांक/DATE : 16.12.1995

1.0 SCOPE

1.1 The insulated support for E.P. Contactors covered by this specification will be required for 25 kV AC 50 Hz electric locomotives. This insulated support shall be used for mounting of E.P. Contactors in the locomotives.

2.0 GOVERNING SPECIFICATIONS

- 2.1 Insulating & other materials shall conform to relevant IS & BS Specifications.
- 2.2 Any deviation from this specification intended to improve performance, of the equipment, proposed by the manufacturer will be given due consideration provided full particulars with reasons thereof are furnished in tender.

3.0 SERVICE CONDITIONS

3.1 The support bar shall be suitable for service in ambient temperatures varying from 0°C to 60°C with maximum relative humidity of 100% in altitudes upto 1200 meters above sea level and in dusty atmospheric conditions.

3.2 The support bar shall withstand satisfactorily the vibrations and shocks normally encountered to service as indicated below:

- a) Maximum vertical acceleration ... 1.0 g
 b) Maximum transverse acceleration ... 2.0 g
 c) Maximum longitudinal acceleration.. 3.0 g

('g' being acceleration due to gravity).

3.3 Frequency of power supply ... 50 Hz \pm 3%.

4.0 TECHNICAL SPECIFICATION

4.1 Insulating support bar shall comprise of seamless galvanized steel pipe wrapped with adequate nos. of layers of glass fibre filament winding impregnated with flame retardant epoxy resin and duly cured preferably under vacuum. The resin content shall be of the order 40-50%. The insulating material shall have resistance to moisture & moisture absorption shall be restricted to 0.10% (max).

The above insulation shall be finished in natural colour of epoxy resin and shall be machined/ground to the required dimension and smooth finish indicated in Dwg. (E)

5.0 ACCEPTANCE TEST

5.1 Dimension check and general workmanship.

INSULATED
SUPPORT
FOR E.P.
CONTACTORS


 ज.स.बी. (स.बी.)
 DY. CEE (D)

चित्तारञ्जन रेल इंजन कारखाना
 पश्चिम बंगाल, भारत
 CHITTARANJAN LOCOMOTIVE WORKS
 WEST BENGAL, INDIA
 स्क्रिप्ट / No. : CLW/ES/T-10
 दिनांक / DATE : 16-11-98

संख्या
 1000/20
 अर्थिक
 DWS

5.2 Insulated support shall withstand 15 Kv, 50 Hz for 1 minute applied between an aluminium foil closely wrapped on the insulation & galvanised pipe at earth potential.

5.3 Surface tracking test

The sample shall be kept immersed in water for 24 hrs. The sample shall be wiped dry and allowed to dry further in natural air for 2 hours. The sample shall then be wrapped with two aluminium foils tightly over the insulation 40 mm apart. Apply a voltage of 6 Kv r.m.s. gradually, no tracking should take place.

5.4 For the purpose of ensuring consistency in quality and use of glass and resin as per our specification, some of the samples (Say 2 Nos) from each lot shall be subjected to a DE Test voltage of 30 Kv for 1 min. which should be successfully withstood by the samples. The tenderers shall have arrangement for carrying out the test upto 30 Kv at their works. The tenderers shall indicate on their tender the details and capacity of the DE testing equipment available at their works.


6.0 TECHNICAL DOCUMENTS

Manufacturer shall supply the following documents alongwith the supply of first batch of the insulated support.

6.1 Acceptance Test Report.

This shall be supplied in standard A4 size of sheets with punched holes for filing. It shall be suitably enclosed in cover. The test reports shall be signed both by the supplier's Engineer & CLW's Engineer. 4 copies of the test report shall be supplied.

Contd-----

04/01 04/01 04/01	INSULATED SUPPORT FOR E.P. CONTACTOR.	 14/12/98 Dy. Engr. (Genl) DYCES (D)	चित्तरञ्जन रेल इंजन कारखाना पश्चिम बंगाल, भारत CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL, INDIA क्रम / No. : CLW/ES/1-10 दिनांक / DATE : 16.12.98
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7.0 SPECIAL INSTRUCTIONS TO TENDERERS

7.1 Following documents shall accompany with the tender without which the tender may be treated as incomplete and rejected:

- i) Clausewise comments on the specification & test programme.
- ii) Technical documents and Drgs. of the proposed insulated bar.
- iii) Sufficient information to prove that the manufacturer has adequate test facilities and manufacturing facilities.

7.2 Guarantee:

Supplier must give a clear guarantee of 18 months from supply or 12 months from the date of commissioning whichever is earlier. If any defect is noticed or failure occurs during this period due to defective material of workmanship or faulty design, the supplier shall have to give replacement free of cost.

7.3 Conditions of contract.

7.3.1 The standard I.R.S. Conditions of contract will be applicable for the supply of those insulated support.

7.3.2 Technical documents and drawings etc. shall be supplied by the supplier as a part of the contract.

7.4 Approval of samples.

7.4.1 The supplier shall make available one prototype for inspection and tests at his works and advise the Dy. Chief Electrical Engineer/Design & Dev., Chittaranjan and Controller of Stores, Calcutta as and when he is ready with the prototype sample and necessary testing and measuring apparatus and facilities for carrying out the tests.

Contd-----

सं. 1 चि. 1 दि. 1	"INSULATED" SUPPORT FOR E.P. CONTACTOR	 16/12/98 डी. सी. ई. (डि. ई.) DY.CEE (D)	चित्तारञ्जन रेल इंजन कारखाना पश्चिम बंगाल, भारत CHITTARANJAN LOCOMOTIVE WORKS WEST BENGAL, INDIA क्रम/ No. : CLW/ES/1-10 दिनांक/ Date : 16.12.98
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- 7.4.2 If it is considered necessary by the Dy. Chief Electrical Engineer/Design & Dev. or his authorized representative to carry out certain tests of the prototype at Chittaranjan, the supplier will arrange to send the samples to Dy. CEM/D.
- 7.4.3 Any short comings or defects in the design and workmanship shall be pointed out after the tests, to enable the manufacturer to incorporate the necessary improvements before bulk manufacture is commenced, without affecting the guaranteed deliveries or guaranteed performance characteristics.
- 7.4.4 Any testing and approval by the purchaser of the design, working dra. and prototype shall in no way absolve the supplier of his responsibilities under the terms of the contract for the equipment supplied.
- 7.4.5 The supplier shall not offer any commitment of series production to the Inspector authorized under the contract until the prototype has been finally approved.

7.5 Progress Report.

The contractor shall furnish monthly progress report, one copy each to Controller of Stores/CLW/Calcutta, Addl. Chief Elect. Engineer (Insp), District Controller of Stores (EL), and Dy. Chief Electrical Engineer (Dev)/CLW/Chittaranjan during the first week of every month showing the position of supply.

8.0 Markings:

The manufacturer shall engrave/emboss permanent identification mark indicating their Name/Workshop/Brand name and date of manufacture at a conspicuous place on unworn portion of steel pipe.

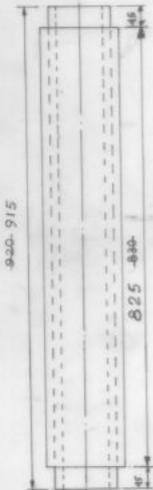
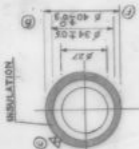
9.0 SPECIAL CONDITION

Once a prototype is approved, no contractor shall change his source of supply or sub-contractor for purchased components and sub-assemblies without CLW's approval.

INSULATED
SUPPORT FOR
E.P. CONTACTOR

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA.

NO. CLW/ES/1-10
DATE 16.3.98



DELETED
 WIDE ALT. (K)

TYPE - I

Type - 9th/Loco

WAG5 - 6 Nos

WAG7 - 6 Nos.

NOTE: ALL DIMENSIONS ARE IN mm

 ROUGH MACHD.	 FINISH MACHD.
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INSULATED SUPPORT FOR CONTACTORS (WAG-5)

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA.

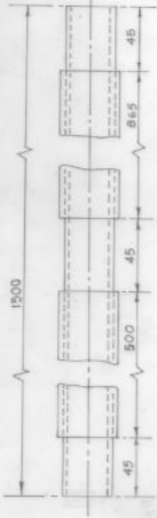
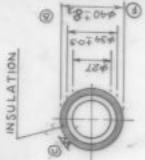
NO. CLW/ES/SK-1/110

DATE :

BY: CEE (D)

CHKD.

DRN.



TYPE - II

WAP-4 Nos.

DELETED

NOTE - ALL DIMENSIONS ARE IN mm.

CHKD
V.S.

ROUGH
MACHD

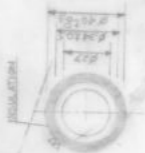
FINISH
MACHD

WAP
INSULATED SUPPORT
FOR CONTACTORS

CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA

16.12.98
DY. C.E.E/O

NO - CLW/ES/SK-2/1-1 O
DATE - 16.12.98



DELETED
 VIDE ALT (K)



TYPE - IV

WAG5 - 2nos./L
 WAG7 - 2nos./L

NOTE : ALL DIMENSIONS ARE IN MM

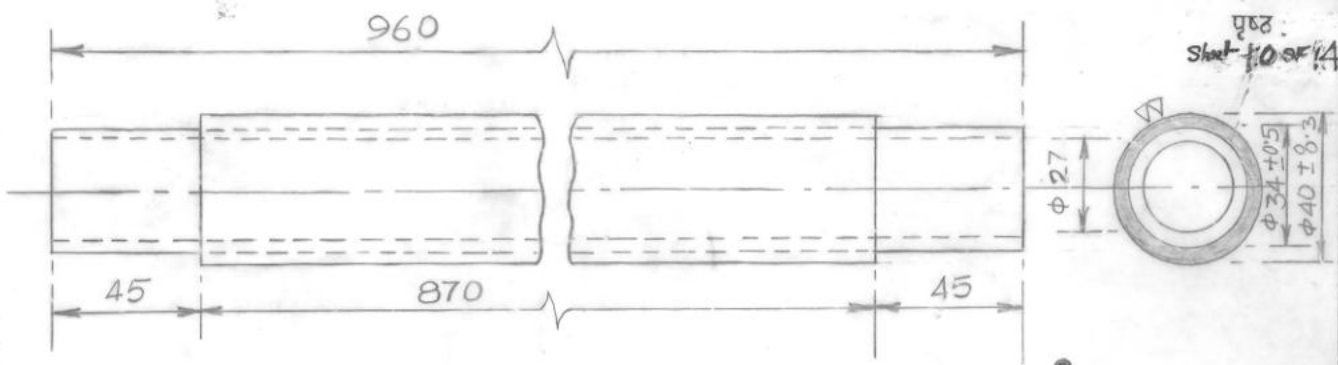
 ROUGH MACHD.	 FINISH MACHD.
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INSULATED SUPPORT FOR
 CONTACTORS (WAG-5)
 ONLY FOR WEAK-FIELD
 LOCO

[Signature]
 20.5.64.2. (HPL)
 -DY. CEE. (D)

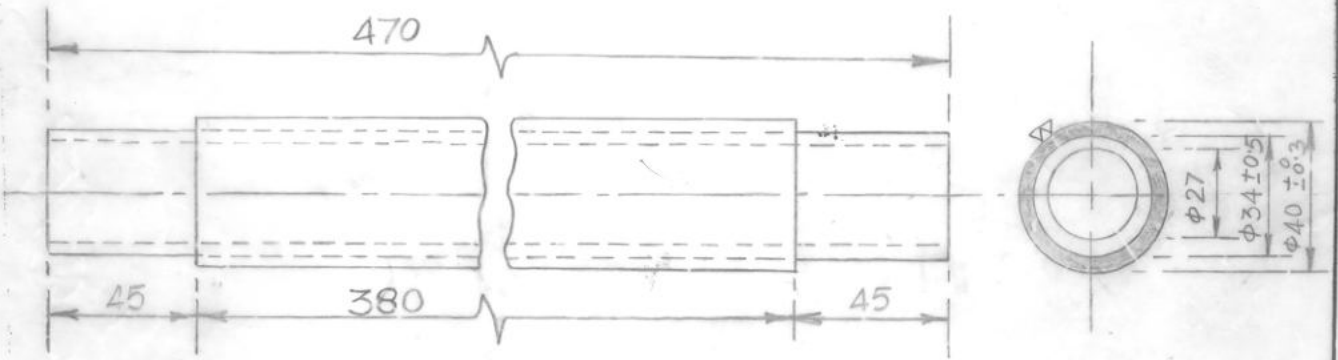
चितरंजन रेल इंजन कारखाना
 बंगलूर, मध्य
 CHITTARANJAN LOCOMOTIVE WORKS
 WEST BENGAL INDIA
 ड्राइंग नं. : CLW/ES/SK-4/1-10
 VIDE/ALT

DRW. CHKD.
 DRW.



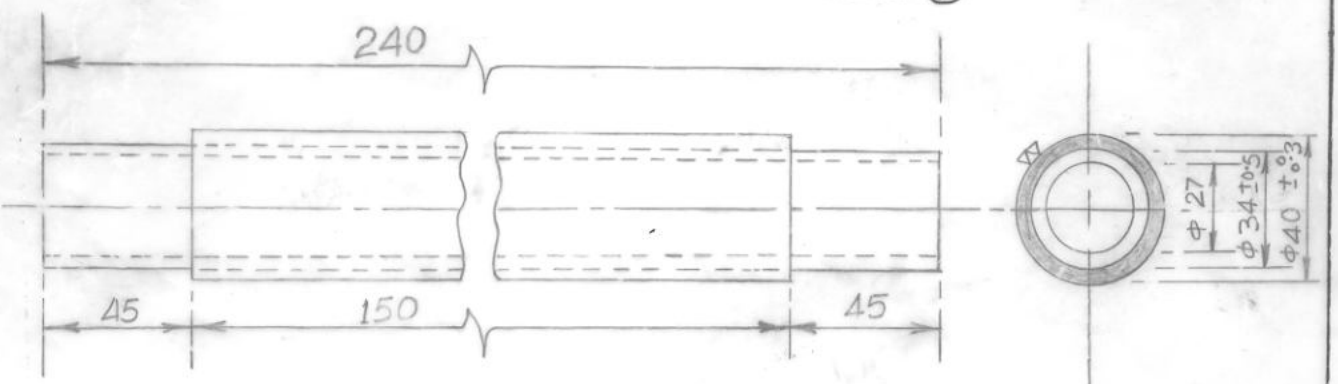
QTY./LOCO :- 4

TYPE - V (ONLY FOR WAG-7/MOD)



QTY./LOCO - 4

TYPE - VI (WAG-7/MOD, AND WAP-4/MOD & WAG-7 (CREW-FRIENDLY) LOCO (P))



QTY./LOCO :- 2

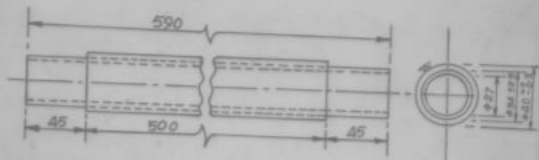
TYPE-VII (WAG-7/MOD, & WAP-4/MOD & WAG-7 (crew-friendly) LOCO. (P))

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CHKD.
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**WAG-7 (MODULAR)
INSULATED SUPPORT
FOR E. P. CONTACTOR.**

[Signature]
16.12.98
उप.मु.बि.अ. (अभि.)
DY. CEE. (D)

चितरंजन रेल इंजन कारखाना
पश्चिम बंगाल, भारत
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA
क्रमांक/NO. CLW/ES/SK-5/14
दिनांक/DATE :



QTY./LOCO-4

TYPE-VIII

(FOR WAP-4 ONLY)

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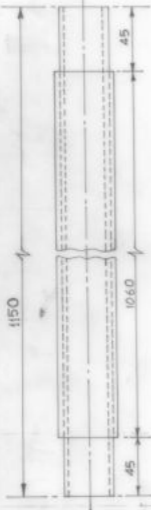
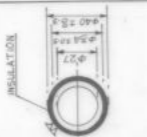
WAP(4-STEP SHUNTING)

INSULATED SUPPORT
FOR E.P. CONTACTOR

১৭.১২.৯৮ (১৭/১২/৯৮)
DY. CEE. (D)

চিটারঞ্জন লোকমোটিভ
ওয়ার্কস
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA

স্মারক/NO. CLW/ES/SK-6/X-10
তারিখ/DATE: 16-12-98



FOR WAP-4 (MODULAR) LOCO ONLY.
QTY./LOCO - 4

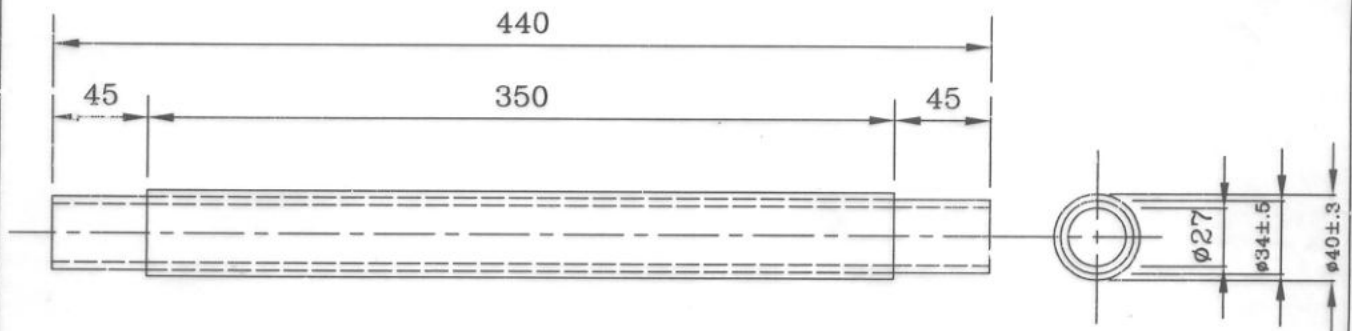
TYPE - IX (M)

সি.সি.সি. ড্রইং
SEE ID

WAP-4 (MODULAR)
INSULATED SUPPORT
FOR E.P. CONTACTOR.

২৫-১১-৭৭
ডায়.সি.সি. (সি.সি.)
DY. CEE. (D)

বিতরণ রেল ইংল কারখানা
চীফ ম'ফস, কল
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA
ক্রমিক/NO. CLW/ES/SK-7/I-10
দিনাক/DATE: 4-11-99



QTY./LOCO-2

(FOR WAP-4 CAB MODIFIED LOCO)


(BA-3 PANEL)

TYPE: - **XI**

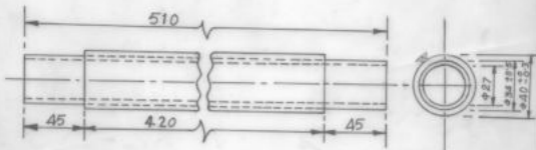
DELETED

 SEE/D-I
 CHKD.
T.K.BOSE. DRN.

WAP-4(VERTICAL DBR)
 (CAB MODIFIED LOCO)
 INSULATED SUPPORT
 FOR E.P. CONTACTOR


 DY.CEE.(D)

CHITTARANJAN LOCOMOTIVE WORKS
 WEST BENGAL, INDIA
 NO. CLW/ES/SK-8/I-10/L
 DATE:-01-03-2002



QTY./LOCO-2

TYPE-X

(FOR WAP-4 ONLY)

DELETED

12-12-2000
S.S.S/D
S.S.S/D
S.S.S/D
S.S.S/D

WAP(4-STEP SHUNTING)

INSULATED SUPPORT
FOR E.P. CONTACTOR.


सद.सु वि.स. (समवि.)
DY. CEE. (D)

वितरक रेल इंजन कारखाना
वर्धमान नगर, कोल
CHITTARANJAN LOCOMOTIVE WORKS
WEST BENGAL, INDIA
कमंक/NO.CLW/ES/SK-9/1-10/
दिनांक/DATE : 30-11-2000