

TENDER SPECIFICATION

NO. CLW/MS/3/0017

ALT: ① ② ③

ENCLOSURES:

- DRG. NOS: 1) ~~CLW/MS/3/0017/00~~ (209-18.437-052 ALT-NIL
- 2) 1209-18.437-053 ALT-2

TOTAL NO. OF SHEETS: - 6 (INCL. ANNEX.)

ALT					
SHEETS					

SPECIFICATION FOR
BUSH MAGI HL TO BE USED IN
WAG-9 (COCO) ELECTRIC LOCOMOTIVES

ISSUED BY:
DY. CHIEF ELECTRICAL ENGINEER/CON/TU
CHITTARANJAN LOCOMOTIVE WORKS
P.O.: CHITTARANJAN-713331
DIST: BURDWAN, WEST BENGAL (INDIA)

PREP BY <i>[Signature]</i>	CHKD BY <i>[Signature]</i>	REVIEWED BY <i>[Signature]</i> 21.5.97	APPROVED BY <i>[Signature]</i> DY. CEE CON/TU	WAG-9 (COCO) SPECIFICATION FOR BUSH MAGI HL	D & D CENTRE CHITTARANJAN LOCOMOTIVE WORKS, CHITTARANJAN, W.B
				NO: CLW/MS/3/017 alt-02 ③	DATE: 19.5.97

**SPECIFICATION FOR BUSH MAGI HL TO BE USED
IN WAG-9 (CO-CO) LOCOMOTIVE**

1. SCOPE:-

This specification outlines the requirements of Bush Magi HL, which are as used as flexible joints between roof and side wall in WAG-9 locos.

The Bushes shall be manufactured according to drawing nos. indicated below.

2. SCOPE OF SUPPLY:

One set of Bush Magi HL shall consist of 12 (twelve) nos. Bush Magi HL to CLW Drg.No. 1209-18.437-052 and 4 (four) nos. Bush Magi HL to CLW Drg.No. 1209-18.437-053.

3. CLIMATIC AND ENVIRONMENTAL CONDITIONS:

* Maximum Atmospheric temperature : Under Sun : 70°C
in shade : 50°C

* Humidity : 100% saturation during rainy season

* Reference site conditions :
i) Ambient Temp. : max.47°C min.0°C

ii) Humidity : 60%

iii) Altitude : 160 m above mean sea level

iv) Rain fall : Very heavy in certain areas. The locomotive will be designed to permit its running at 10 Km/hr in flood water level of 102 mm above rail level.

* Atmosphere during hot weather : Extremely dusty and desert terrain in certain areas.

* Coastal area : Locomotive and equipment will be designed to work in coastal areas in humid and salt laden atmosphere.

vibration : The equipment, sub-system and their mounting arrangement will be designed to withstand vibrations and shocks encountered in service as specified in corresponding IEC publications unless otherwise prescribed.

PREP'D BY	REVIEWED BY	APPROVED BY	WAG-9 (COCO)	D & D CENTRE
<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	SPECIFICATION FOR BUSH MAGI HL	CHITTARANJAN LOCOMOTIVE WORKS, CHITTARANJAN, W.B
SAPDT. S M E P 4 D	21.5.97	DY. CEE / CON/TU		NO: CLW/MS/3/017 alt 023
				DATE: 19.5.97

4. GENERAL AND TECHNICAL DATA:

The Bush Magi HL shall be manufactured according to CLW drawings indicated at clause-2 (scope of supply). All bushes shall fully comply with dimensions and tolerances shown on these drawings. The supplier shall be responsible for all tooling design.

The Bush Magi HL shall be suitable for operation under tropical conditions of high temperature, high humidity, heavy rainfall and fungus conducive environment.

Bush Magi HL should withstand high radiality, axial and torsional loads without the rubber being displaced in relation to the metal parts. A small cardanic angular displacement of the axis of the inner tube in relation to that of the outer tube, or vice versa, is possible. The bushes are however, relatively resistant to such angular displacement.

Technical Data for both types of Bush Magi HL are indicated at Annex-A.
The supplier shall select the elastomeric material based on their experience with similar arrangements. This may include natural rubber/chloroprene or nitrile butadiene synthetic rubbers. An alternative elastomeric compound may be used provided the supplier can demonstrate that this material will provide on better performance characteristics with respect to deterioration of rubber. However the tenderer must indicate all the details and characteristics of the materials in their offer(s).

The use of reclaimed rubber or vulcanised waste is not permitted. All ingredients of the rubber mix shall be free from grit and extraneous material.

The elastomers selected shall have high resistance to heat, sun shine, rain and dust as these items shall be exposed to direct sunlight.

The metal parts shall be manufactured from mild steel suitably chosen to achieve the load values indicated in Annexure-A and drawings. The exposed metal surface shall be coated suitably to prevent corrosion in mounted condition. Bonding between the metal and the elastomers shall be of a proven type, the bond shall be atleast as strong as the parent elastomers itself.

5. TYPE TEST:

a) The tenderer shall submit a complete type test plan including endurance test indicating different types of deflection etc. based on the drawings for approval of the purchaser. *and tech. data at annex-A*

b) Routine Test:- For routine tests, test plan to be furnished by the manufacturer along with their tender offer for scrutiny and approval of the purchaser. The supplier is required to conduct a test for rubber deterioration due to temperature and ozone. The supplier shall nominate a preferred method of testing the rubber deterioration and submit the test plan to the purchaser for approval.

PREP: CHKD	REVIEWED:	APPROVED:	WAG-9 (COCO)	D & D CENTRE
BY: <i>Subal</i>	BY: <i>Subal</i>	BY: <i>Subal</i>	SPECIFICATION: 1957 FOR BUSH	CHITTARANJAN LOCOMOTIVE WORKS, CHITTARANJAN, W.B
<i>Subal</i>	<i>Subal</i>	BY: DY. CEE/	MAGI HL	NO: CLW/MS/3/017 alt 1 2 3
<i>Subal</i>	<i>Subal</i>	CON/TU		DATE: 19.5.97

c) Inspection Plan:- Complete inspection plan indicating sampling (if required) and its method as well as the acceptance criteria should be submitted along with the offers. The sampling and selection of tests for the requirements of quality shall be sufficient to ensure that the requirements of this specification are attained and maintained.

d) SEE SHEET 5
SUPPLY OF DOCUMENTS (In addition to those indicated in BID documents of CLW:

a) Along with tender offer:

- i) Technical details, composition and characteristics of the material to be used for manufacture of bush magi HL.
- ii) Sources of Raw Materials.
- iii) Manufacturing Process.
- iv) Type Test(s) Plan.
- v) Routine Test Plan.
- vi) Inspection Plan.
- vii) Details about similar items supplied for locomotives, if any.

b) Along with supplies:

- i) Certificates of the results of all the tests performed in accordance with specifications duly signed by the purchaser's authorized representative.
- ii) Certificate of inspection/acceptance duly signed by purchaser's authorized representative.
- iii) Certificate of performance guarantee.
- iv) A certification of compliance shall be provided stating that the bush magi HL comply with this specification and the relevant drawing. Each certification so furnished shall be signed by an authorised agent of the manufacturer. This certificates may be made the basis of the component acceptance and payment.

7. QUALITY ASSURANCE:

It should be as per ISD-5000.

8. MARKINGS:

Each bush magi HL shall bear the following legible and indelible markings at suitable locations:

- a) Specification No. and drawing No. with alteration No.
- b) Manufacturer's Name or Trade Mark.
- c) Month and Year of Manufacturing.
- d) Serial No. and Batch No.

9. GUARANTEE/DEFECT LIABILITY:

The supplier is required to guarantee the Bush Magi HL for the period of 30 months from fitment or 36 months from supply, whichever is earlier.

PREP'D BY <i>[Signature]</i> BY <i>[Signature]</i> S.D. Supt.	REVIEWED BY <i>[Signature]</i> BY <i>[Signature]</i> 21.5.97	APPROVED BY <i>[Signature]</i> BY <i>[Signature]</i> DY. CEE/ CON/TU	WAG-9 (COCO) SPECIFICATION FOR BUSH MAGI HL D & D CENTRE CHITTARANJAN LOCOMOTIVE WORKS, CHITTARANJAN, W.B NO: CLW/MS/3/017 at 0023 DATE: 12.8.97
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10. PACKING AND DELIVERY:

The Bush Magi HL shall be prepared and packed in such a manner as will properly protect them from damage or corrosion during transit and storage period to installation. A storage period of atleast 24 months shall be considered.

11. REFERENCE:

Bush Magi HL used in WAG-9 Locos have been supplied to M/s. ABB Transportation by

PHOENIX AG (AUSTRALIA) PTY LTD.,
26 MOCKRIDGE STREET
WANTIRNASTH - 3152
AUSTRALIA.

TYPE:- ABB Drg. Nos. 182-00572 & 182-00310.

--- END ---

5.d) Prior to prototype inspection CLW's representative will be deputed to seal the locomotive piece of the material specified for test in the Govt. ment approved RDSO approved test Lab. The Lab test report should be produced at the time of prototype inspection.

PREP BY M. S. 9	CHKD BY [Signature]	REVIEWED BY [Signature]	APPROVED BY DY. CEE	WAG-9 (COCO)	D & D CENTRE CHITTARANJAN LOCOMOTIVE WORKS, CHITTARANJAN, W.B
CON/TU	CON/TU	CON/TU	CON/TU	SPECIFICATION FOR BUSH MAGI HL	NO: CLW/MS/3/017 wt-023
SUPDT					DATE: 19-5-97

ANNEXURE - A TO CLW SPECIFICATION NO. CLW/MS/3/017

TECHNICAL DATA:

Sl. No.	Data	Unit	Bush Magi HL to CLW Drg. No 1209-18.437-052	Bush Magi HL to CLW Drg. No 1209-18.437-053
1.	Radial Load.			
a)	Max. Static Radial Load, FF	N	4910	1570
b)	Radial Spring constant, K _r	N/mm	14715	3237
2.	Axial Load			
a)	Max. Static Axial Load, F _a	N	2550	930
b)	Axial Spring Constant, C _a	N/mm	1020	417
3.	Torsion			
a)	Max. Static Torsional Angle, θ	Degree	7	14
b)	Max. Static Torque, M _d	Nm	28.0	12.0
c)	Torsional Spring Constant, C _t	Nm/deg	3.90	0.9
d)	Max. Peak Torsional Angle, θ max.	Degree	14	28
e)	Max. Peak Torque, M _d max	Nm	55.0	25.0

NOTE:-

The above values are for guidance only. Manufacturer can use a better material for this particular use. Tenderer should indicate the values for above parameters for their products along with their offer.

PREPARED BY	REVIEWED BY	APPROVED BY	MAG-9 (CODE)	D & D CENTRE
<i>Subh</i>	<i>Srinivas</i>	<i>Subh</i>		CHITTARANJAN LOCOMOTIVE WORKS, CHITTARANJAN, M.B
	21.5.97	BY. CEE	SPECIFICATION FOR BUSH MAGI HL	
<i>S. M. Sath</i>	SME (DAD)	CON/TU		IND: CLW/MS/3/017 At 023
				DATE: 19.5.97

CHITTARANJAN LOCOMOTIVE WORKS
CENTRE FOR DESIGN & DEVELOPMENT

ALTERATION RECORD SHEET

ALT. NO.	DATE	DESCRIPTION	REASON	INITIAL BY DY. CEE/ CON/TU-I
①	04-07-1997	THICKNESS 2mm & 2.5 mm. FOR INNER & OUTER TUBES ADDED.	DIMENSION WAS NOT GIVEN.	hnd
②	04-07-2000	REF. NO.-2 NOTE-2 & CLASS OF LOCO WAP 5 ADDED.	QTY. IS DIFFERED BUT ITEM IS COMMON TO WAP/5 LOCOS.	hnd
③	05.03.02	CLAUSE 5d) ADDED.	AS DECIDED BY COMPETENT AUTHORITY VIDE LETT. NO. C-DE/D/TOT/III, DT. 18.02.02.	General - 15/3
PREP	C.H.D.	CLW SPECN. NO.- CLW/MS/3/0017 SPECN. FOR BUSH MAGI H4 FOR WAG-5 E'WAP-5 3 PHASE ELECTRIC LOCO	REVIEWED	APPROVED hnd DY. CEE/CON/TU-I