

TENDER SPECIFICATION

NO:- CLW/MS/3/009

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ENCLOSURES:

1. ANNEXURE. NIL
- ② 2. DRG. NO. 1209-01.215-014 ALT, ①

TOTAL NO. OF SHEETS. - 6 + 1 ALT. SHEET

ALT.	NIL	①	②	③			
SHEETS	-	6		1			

SPECIFICATION FOR

DAMPERS (SHOCK ABSORBERS) FOR USE ON
WAG-9 ELECTRIC LOCOMOTIVES.

ISSUED BY:
DY. CHIEF ELECTRICAL ENGINEER/CON/TU
D&D CENTRE
C.L.W./CHITTARANJAN

Date - 24.1.97

PREPD. BY <i>[Signature]</i>	CHKD. BY <i>[Signature]</i>	REVIEWED BY <i>[Signature]</i> SME/D&D 20.1.97	APPROVED BY <i>[Signature]</i> DY. CEE/CON.TU	WAG-9 (Co'Co) SPECIFICATION FOR DAMPERS	D&D CENTRE CHITTARANJAN LOCOMOTIVE WORKS. CHITTARANJAN-713331 NO. CLW/MS/3/009.
CPM	SUP.DT.				
					ALT. NO NIL ① ② ③

Technical specification for Dampers (shock absorbers) for use on WAG/9 Electric Locomotives.

1. Scope

This specification covers the design, manufacture, supply and delivery of dampers for use on WAG/9 Electric Locomotives.

1.2 Scope of supply

Qty. one (1) set shall comprise Qty/Loco as indicated below;

- | | | | | |
|----|-------------------|---|-------------|--|
| a) | Axle damper | - | 8 per loco- | ^{DRAWINGS NO 814/1} 1209-01.215-814/1 |
| b) | Vertical damper | - | 4 per Loco- | 1209-01.215-014/2 |
| c) | Horizontal damper | - | 4 per Loco- | 1209-01.215-014/3 |
| d) | Yaw damper | - | 4 per Loco- | 1209-01.215-014/4 |

2. General

In WAG/9 locomotive, isolation and absorption of shock loads and vibration is performed by the primary and secondary suspension. Amount and rate of lateral movement between bogie and body is limited by the horizontal dampers. Vertical dampers limit the amount and rate of the vertical rebound of the locomotive body and springs. Yaw dampers control the body yaw & pitch rate.

3. Climatic and Environmental Condition ;

3.1 Maximum atmospheric temperatures :

- | | | |
|----|-----------|------|
| a) | Under Sun | 70°C |
| b) | In shade | 50°C |

Humidity : 100% saturation during rainy season.

3.3 Reference site conditions :

- | | | |
|----|--------------|--------------------|
| a) | Ambient temp | 0°C Min, 47°C Max. |
|----|--------------|--------------------|

b) The contractor will indicate the expected temperature rise under reference site conditions.

- | | | |
|----|----------|-----|
| c) | Humidity | 60% |
|----|----------|-----|

- | | | |
|----|----------|----------------------------|
| d) | Altitude | 160m above mean sea level. |
|----|----------|----------------------------|

3.4 Rain fall :

Very heavy in certain areas.

3.5 Atmosphere during hot weather;

Extremely dusty and desert terrain in certain areas.

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<i>[Signature]</i>	<i>[Signature]</i> 27.1.97	<i>[Signature]</i>					
CDM	SMF /D&D	BY CEE/COM/II	NO. CLW/MS/3/009	AIT NO. <table border="1"> <tr> <td>1</td> <td>2</td> <td>3</td> </tr> </table>	1	2	3
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3.6 Coastal area;

Dampers will be designed to work in coastal areas in humid and salt laden atmosphere.

3.7 Vibration :

The dampers, 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.

4. Technical requirement

4.1 The dampers shall be designed by the manufacturer to suit the following features of WAG/9 locomotives.

- a) Spring weight of the loco body - 78200 Kg.
- b) Possible upgrate of the loco body - 90200 Kg.
- c) Sprung weight of the bogie(without motors) - 7700 Kg.
- d) Un sprung mass of one axle - 3900 Kg.
- e) Weight of the axle including the motors - 4900 Kg.
- f) Wheel set mass(without motor) - 2750 Kg.
- g) Expected annual activity - 6570 hour.
- h) Gauge Broadgauge (1676mm)
- i) Maximum service speed - 100 km/h
- j) Maximum Test speed - 110 km/h
- k) Type of suspension - Coil springs
- l) Type of damping - Hydraulic

4.2

The nominal points of the force-velocity characteristics specified on the relevant drawing shall not be considered as maximum forces the dampers may be subjected to. The dampers shall be designed and manufactured by the manufacturer to withstand heavy instantaneous shock loads experienced on the railway vehicles operating on inferior tracks.

4.3

The manufacturer shall provide uniform dampening characteristic and nominate the changes of the dampening characteristic in the region of 0°C to 70°C.

4.4

The load testing of the dampers shall not be conducted using a rotating test stand as rotating test stand is not able to generate the necessary acceleration of the dampers will be subjected to.

4.5

The dampers shall be continuously operating at high ambient temperatures. As such sufficient attention should be given to heat dissipation during the entire life of the dampers including the expected surface deterioration and contamination.

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PREP.D. CDM	CHKD. BY <i>[Signature]</i>	APPROVED BY <i>[Signature]</i>	REVIEWED BY <i>[Signature]</i> 27.1.97	WAG-9 (CO'CO) SPECIFICATION FOR DAMPERS	D&D CENTRE CHITTARANJAN LOCOMOTIVE WORKS CHITTARANJAN - 713391
	SUPD.T. SME /D&D	DI. CEE/CON/TD <i>[Signature]</i>			NO. CLW/MS/3/009 ALT. NO. Nil ① ② ③

- 4.6 Correct rubber attachment shall be ensured. This attachment shall consider the occurings shock absorber forces and angular rotation. The rubber compound selected shall have sufficient chemical and atmospheric resistance to provide a life comparable with that of the damper.
- 4.7 The dampers shall be suitable for being delivered, stored and operated under tropical conditions of high temperature, high humidity, heavy rain fall and fungus-conducive environment.
- 4.8 The manufacture and supply of the dampers shall be strictly in conformance with the relevant drawings.
- 4.9 Test parameters and procedures to be followed by the manufacturer shall be put up to purchaser and prior approval to be obtained.
5. Colouring
- Colour by which dampers to be painted shall be nominated by the manufacturer with the prior approval of purchaser.
6. Marking
- Each damper shall have clear readable marking on its body. The marking shall be as follows ;
- Manufacturer's name/Trade mark.
 - Designation and type of damper with unique model number.
 - Year and month of manufacture.
 - Capacity.
7. Documents to be supplied.
- 7.1 Following to be supplied along with offer;
- Endurance testing for one million cycles for proto-type samples- Test plan to be submitted by the firm.
 - Force velocity characteristics curve - To be indicated by the firm and its testing method and equipments.
 - Maximum force/moment (Capacity)
 - Compression
 - Tension
 - Bending moment (iv) Torsional moment
 - method of testing and equipment to be indicated
 - Dimensional checking
- Maximum force and bending moment, which may be absorbed by the damper without showing any sign of failure.
- 7.2 Minimum ten(10) copies of the maintenance manual shall be supplied incorporating the following informations along with the supply of materials.
- repairing procedure of the dampers.
 - List of spare parts which may be required for its repair.
 - Parameters of removed parts to be checked
 - Condemnation and permitted dimensions of the loose parts.
 - Drsg./Design of special tooling, if any required for maintenance purpose including testing equipment for examining fitness of repaired/overhauled dampers.

PREP. Y	CHKD. BY	REVIEWED BY	APPROVED BY	WAG-9 (CO'CO)	D&D CENTRE CHITTARANJAN LOCOMOTIVE WORKS CHITTARANJAN - 713331		
	SUPDT.	SME /D&D	DI. GEE/CON/TU	SPECIFICATION FOR DAMPERS	NO. CLW/MS/3/009	ALT. NO. NIL	① ② ③
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8. Inspection and acceptance.

8.1 Proto-type inspection shall consist of endurance test for one million cycles apart from all routine examinations.

8.2 Routine examination -

- a) Visual examination
- b) Dimensional checking
- c) Maximum force (Capacity) test.
- d) Maximum bending and torsional moments tests
- e) Force-velocity characteristics test.

8.3 Firms should indicate proto-type and routine test plans and equipments available at their end for this purpose along with their offer.

8.4 The inspecting authority of the purchaser shall have free access to the works of the manufacturer at all times during the manufacture of dampers. He shall be free to inspect the manufacture at any stage, to reject any material or items which do not conform to the terms of this specification.

8.5 Dampers 10% or part of it from the lot shall be selected for carrying out test/inspection approved for test parameters. Any deviation other than the specified values shall not be accepted.

8.6 Overall dimensions shall conform to the dimensions of the relevant drawing.

8.7 The inspector shall affix his stamp/seal on each assembled damper after inspection as a token of the material passed by him.

9. Guarantee

9.1 The manufacturer/supplier shall have guarantee for damper and its satisfactory performance for the period of Five(5) years from putting into service or Six (6) years from the installation whichever ever is earlier. All aspects of the workmanship and material will be covered with this guarantee. The dampers which fail during the guarantee period shall be replaced by the supplier free of cost.

9.2 The manufacturer shall nominate expected minimum reliability in terms of operating hours or distance travelled between failures. The reduction or increase of the damping force by more than 30% will be considered as a failure.

9.3 "Reliability" is defined as the mean kilometers between serious engineering faults. Such an engineering fault occurs when a defect of an engineering nature develops which is of sufficient importance to require the locomotive to be repaired before return to revenue service.

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				D&D CENTRE CHITTARANJAN LOCOMOTIVE WORKS CHITTARANJAN - 713331		NO. CLW/MS/3/009	
CDM				ALT. NO	NIL-①	②	③

10. Packing and delivery :

The dampers shall be prepared and pack in such a manner as will properly protect them from damage or deterioration during transit and storage prior to installation. The storage period of at least 24 months shall be considered.

11. Reference :

11.1 The dampers used by M/s ABB transportation for WAG/9 class (Co-Co) Electric locomotives is supplied by

M/s KONI BV
 P.O. BOX 1014 3260AA
 LANGEWEGE QUD-BEYERLAND
 HOLLAND

11.2 Type - ABB Drg. No. IBO16 - 00372.

- ① 12. The manufacturer(s) shall prepare a quality plan in conformity with ISO-9000-2000 and submit it to the Railway Adviser, sufficiently in advance of inspection. The inspection shall proceed only after acceptance of the QP by Railway Adviser.
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EPD. BY		CHKD. BY	REVIEWED BY	APPROVED BY	WAG-9 (CO'CO) SPECIFICATION FOR	D&D CENTRE
[Signature]		[Signature]	[Signature] 24.1.97	[Signature]	DAMPERS	CHITTARANJAN LOCOMOTIVE WORKS CHITTARANJAN - 743301
SME / D&D		SUPDT.	DY. CEE/CON/TU		NO. CLW/MS/3/009	
CDM					ALT. NO. NIL	
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Date - 24.1.97

ALTERATION SHEET

DETAILS OF ALTERATION

ALT.No.	DATE	DESCRIPTION	REASON	SIGNATURE
①	13-5-2002	CLAUSE 12 ADDED & ALTERATION SHEET ADDED.	AS SUGGESTED BY RAILWAY BOARD VIDE THEIR LETTER No. 2002/M/L/466/1905 DT.10-4-02	<i>[Signature]</i> 13.5.02
②	18-6-2003	ALT. ① ADDED TO DRG.No. ON COVER SHEET AND SHEET No.2.	TOLERANCE SPECIFIED ON DAMPING FORCES ON THE DRAWING VIDE ALT. ①	<i>[Signature]</i> 20/6/03
③	28-7-2003	CLAUSE 12 DELETED. LARE	SOME INDIGENOUS FIRMS ALSO THERE HENCE THIS CLAUSE IS NOT REQUIRED. FURTHER GRAP OF THE FIRM IS TO BE CHECKED BEFORE PLACEMENT OF ORDER DURING ASSESSMENT ITSELF.	<i>[Signature]</i>

PREPD. BY	CHKD BY	REVIEWED BY	APPROVED BY	WAG-9 (CO CO)	CENTRE for D & D CHITTARANJAN LOCOMOTIVE WORKS CHITTARANJAN-713331
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					NO. CLW/MS/3/009
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