

भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
रेलवे बोर्ड Railway Board

No. 2007/M(C)/137/16 Vol.VII

(E-File No.:3346834)
New Delhi, Date: 20.06.2024

General Managers,
All Zonal Railways and PUs

Sub: LHB coaches with provision of TPU rings in suspension arrangements.

**Ref: i) RDSO letter no. SV.FIAT Spring dated 07.06.2024
ii) RDSO letter no. SV.FIAT Spring dated 21.12.2023
iii) RB letters of even no. dt. 27.03.2024 and 07.06.2024**

1. RDSO has advised ZRs for providing TPU rings in suspension of LHB coaches as detailed in Annexure-I of letter under reference (i), during SS-I/SS-II/SS-III Schedules of the coaches. RDSO has also advised that:

- While providing TPU rings in suspension of LHB coaches, proper combination of bogie frame, coil springs, thickness of disc/compensating ring, type of bogie frame and thickness & position of TPU ring has to be done by ZRs.*
- For coaches not covered in Annexure-I of letter at (i) above, primary suspension shall remain same as mandated vide letter under ref.(ii) till further advice. Moreover, till provision of TPU rings in the coaches as per Annexure-I of letter at (i) above, proper combination of coil spring, thickness of disc/compensating ring and type of bogie frame has to be ensured as per RDSO letter referred at (ii) above.*
- Material be purchased from BLW Vendor directory for "Happy pads" as per Spec. No. MP.0.40.99.01 Rev- Latest, till the time that vendor development is done by RDSO for TPU rings.*

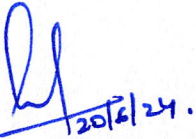
2. Considering the importance of the modification, the provision of TPU rings in LHB coaches has been made a NTXR rejectable item in continuation to Railway Board's letters issued vide reference (iii). The following item to be included in list of NTXR rejectable defects:

- For the type of LHB coaches specified in Annexure-I of RDSO's letter at (i) above, the provision of TPU rings as per RDSO letter no. SV.FIAT Spring dated 07.06.2024 be made a NTXR rejectable defect at the time of turnout after SS-II/SS-III, w.e.f 01/10/2024.
- For the trollies of LHB Coaches specified in Annexure-I of RDSO's letter at (i) above, the provision of TPU rings as per RDSO letter no. SV.FIAT Spring dated 07.06.2024, be made a NTXR rejectable defect at the time of turnout of bogies for SS-I w.e.f 01/10/2024.

3. Further, Production Units should also ensure that the LHB coaches are turned out after provision of TPU rings as per RDSO Letter no. SV.FIAT Spring dated 07.06.2024, with immediate effect. The cut-in date may be advised to Board by 25.06.2024.

Necessary action on procurement and fitment of the item may be initiated by Zonal Railways and PUs.

This issues with the approval of competent authority.


20/6/24.

(प्रांजल मिश्रा)

संयुक्त निदेशक/ यांत्रिक इंजी. कोचिंग-II
रेलवे बोर्ड

D/A : As above

Copy to:

- 1) PSO/AM/PU: For kind information of AM/PU/RB.
- 2) PCMEs/all Zonal Railways & PUs: for information and necessary action please.
- 3) EDME(W&D)&ED/Carriage/RDSO for kind information and necessary action please.
- 4) Director/NCO: For kind information and n/a on updating the NTXR pro-forma please.



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226 011
EPBX (0522) 2451200
Fax (0522) 2458500

Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226 011
DID (0522) 2450115
DID (0522) 2465310



No:SV.FIAT Spring

Dated: - 07.06.2024

Principal Chief Mechanical Engineer,

1. Northern Railway, Baroda House, New Delhi-110 001
2. Western Railway, Churchgate, Mumbai-400020
3. Central Railway, CSTM, Mumbai - 400 001
4. Eastern Railway, Fairly Place, Kolkata- 700 001
5. Southern Railway, Park Town, Chennai - 600 003
6. North Frontier Railway, Maligaon, Guwahati- 781 001
7. North Eastern Railway, Gorakhpur-273 001
8. South Eastern Railway, Garden Reach, Kolkata-700 043
9. South Central Railway, Secunderabad-500 071
10. West Central Railway, Jabalpur-482 001
11. South East Central Railway, Bilaspur-495 004
12. South Western Railway, Hubli-580023
13. East Coast Railway, Railway Complex, Bhubaneswar-751 023
14. East Central Railway, Hajipur-844 101
15. North Western Railway, Jaipur-302 006
16. North Central Railway, Allahabad-211 001
17. Konkan Railway Corporation Limited, Belapur Bhavan, Plot No 6, Sector 11, CBD,Belapur, Navi Mumbai-40061
18. Integral Coach Factory, Chennai-6000038
19. Modern Coach Factory, Lalganj, Raebareli-229 006

Sub: LHB coaches with provision of TPU rings in suspension arrangements.

Ref: i) Railway Board's letter no. 2019/M(C)/137/13CS dated 03-06-2024.

ii) This office letter of even number dated 26-05-2024.

iii) This office letter of even number dated 21-12-2023.

To address the problems of failures of coils springs, primary vertical dampers, control arm lugs, control arm bushes and primary rubber bump stop in non-AC LHB coaches, non Ac LHB coaches were put under service trials with provision of TPU rings in suspension arrangements. Extensive trials of these coaches were done under close monitoring by NR, CR, SWR & RDSO. Based on encouraging performance of trials LHB coaches with TPU rings in terms of reduction of coil spring failures, primary vertical damper failures, control arm lug failures and secondary suspension rubber spring failures, RDSO had recommended for regular provision of TPU rings in suspension of LHB coaches vide letter under reference (ii) and the same has been approved by Railway Board vide their letter under reference (i).

Accordingly, TPU rings shall be provided in suspension of LHB coaches as detailed in Annexure-I of this letter during SS-I/SS-II/SS-III of the coaches. It is emphasized here that while provision of TPU rings in suspension of LHB coaches, proper combination of bogie frame, coil springs, thickness of disc/compensating ring, type of bogie frame and thickness & position of TPU ring must be ensured.

For coaches not covered in Annexure-I of this letter, primary suspension shall remain same as mandated vide letter under ref (iii) till further advice. Moreover, till provision of TPU rings in the coaches as per Annexure-I of this letter, proper combination of coil spring, thickness of disc/compensating ring and type of bogie frame shall be ensured as per RDSO letter referred at (iii) above.

Further, RDSO is in process of development of vendors of TPU ring. Till development of vendors by RDSO, TPU rings as per enclosed drawings may be procured from vendors from BLW vendor directory for "Thermoplastic polyurethane Pads (Happy pads) for Locomotives to RDSO Specification No. mp.0.40.99.01 Rev – Latest".

DA: As above

Handwritten signature and date: 07.06.2024

(A.K Singh)

Executive Director (Standards)/Carriage

Copy to:

EDME/Coaching/Railway Board, New Delhi - For kind information please.

PCME/RCF/Kaputhala

For kind information and issuing primary/secondary suspension arrangement drawings for LHB coaches with TPU rings as detailed in Annexure-I

ANNEXURE-I

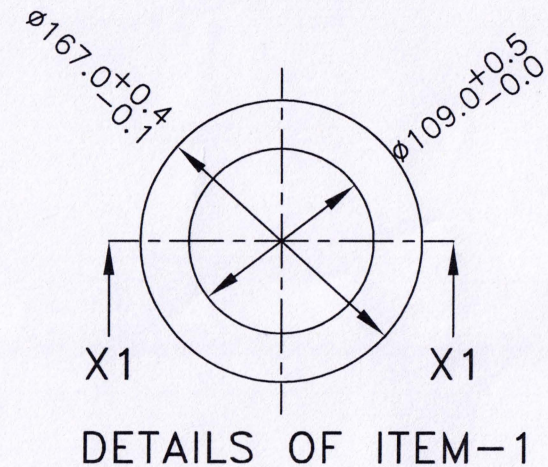
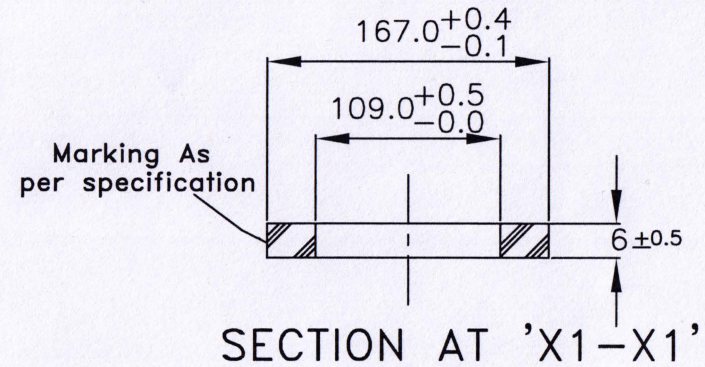
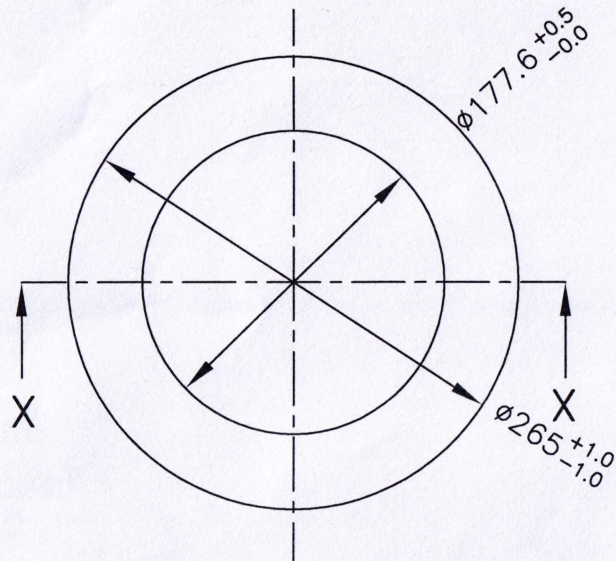
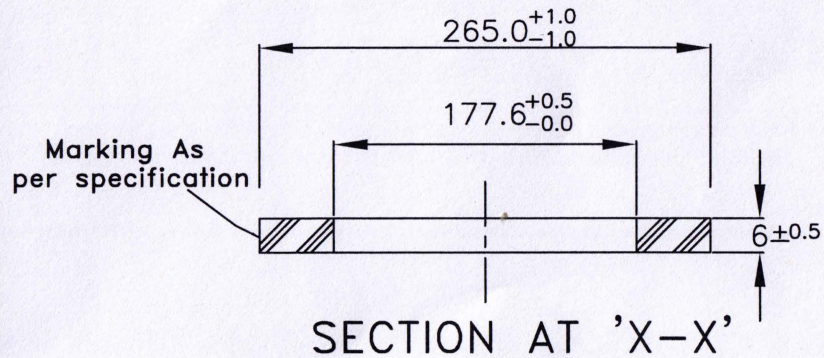
Specified Suspension Components with TPU rings in LHB Coaches

S. No.	Description of coach	Primary outer spring (Drg. Number & Colour Code)	Primary inner spring (Drg. Number & Colour Code)	Thickness of disc/compensating ring between Primary rubber bump stop & bottom centering disc (in mm)	TPU rings in Primary Suspension	TPU rings in Secondary Suspension	Type of Bogie Frames
Primary Suspension of LHB AC Coaches							
1.	LHB AC Chair car (LWSCZAC / LWSCZAC2), LHB Executive Chair car (LWFCZAC / LWFCZAC2), LHB First AC coach (LWFAC / LWFAC2), , LHB Air Conditioned Railway Administration Coach (LRAAC), LHB Vistadome Coach (LWCTZAC), LHB AC Vistadome Dining Car (LWCTDAC), LHB AC Pantru cum dining car of Deccan Queen (LWCBACDQ), LHB AC pantry car with coil spring/Air Spring in secondary suspension (LWCBAC / LWCBAC2/LWCBACAA)	1267411 (Green)	1267412 (Green)	08	#6 mm thick TPU rings only at bottom of primary outer & inner springs as per RDSO drg. CG-20049 Alt 1	None	Bogie frame having top metal primary stop of 242.5 mm nominal height (from bogie frame bottom in spring pot)
2.	LHB AC power car with two on-board DA set (LWLRRM / LWLRRM2/LWLRRMAA)	1277142 (Yellow)	1277143 (Yellow)	12			
Primary suspension of LHB Non-AC Coaches (With 140 KN &160 KN Air Springs in Secondary suspension of Bogie)							
3.	LHB Non-AC unreserved second class coach (LS-5/LWS/L5A/LWSPP), LHB Non-AC Three tier coach (LWSCNA/LWSCNAA/LWSCNPP), LHB Non-AC DSLR coach with underslung power pack & compartments for Divyangjan, second class passenger, Guard & Luggage (LDSLRA), LHB Non-AC Chair car (LWSCZA/LWSCZAA), LHB Non-AC SLRD coach (LSLRD/LSLRDAA/LSLRDPP), LHB Non-AC power car with single on board DG set and compartment for Divyangjan, luggage and Guard (LWLRRMD)	LG01100 (Black)	LG01101 (Black)	15	*6 mm thick TPU rings at top & bottom of primary outer & inner springs as per RDSO drg. CG-20049 Alt 1	None	Bogie frame having top metal primary stop of 227.5 mm nominal height (from bogie frame bottom in spring pot)
Primary suspension of LHB Non-AC Coaches (With Coil Springs in Secondary suspension) and provision of TPU Rings in secondary suspension							
4.	LHB Non-AC unreserved second class coach (LS-3), LHB Non-AC three tier coach (LWSCN 1), LHB Non-Ac Chair Car Coach (LWSCZ)	LG01100 (Black)	LG01101 (Black)	04	*6 mm thick TPU rings at top & bottom of primary outer & inner springs as per RDSO drg. CG-20049 Alt 1	*6 mm thick TPU rings only at bottom of secondary outer & inner springs as per RDSO drg. CG-20057 Alt 1	Bogie frame having top metal primary stop of 242.5 mm nominal height (from bogie frame bottom in spring pot)

One TPU ring below outer primary spring & one TPU ring below inner primary spring; both TPU rings above bottom centering disc are to be provided.

* One TPU ring each below & above outer primary spring and one TPU ring each below & above inner primary spring; 2 TPU rings above bottom centering disc & 2 TPU rings below upper centering disc are to be provided.

\$ One TPU ring below outer secondary spring & one TPU ring below inner secondary spring; both TPU rings above bottom centering disc are to be provided.



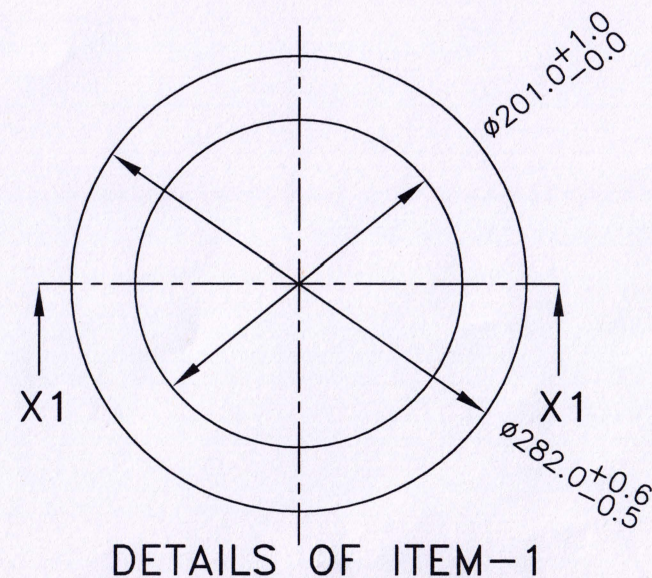
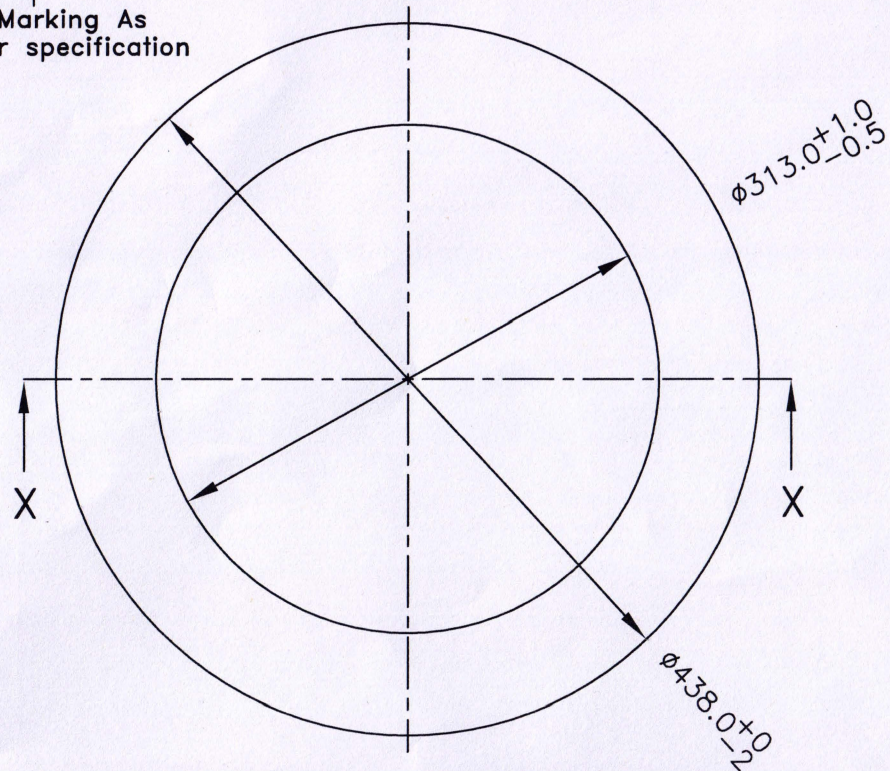
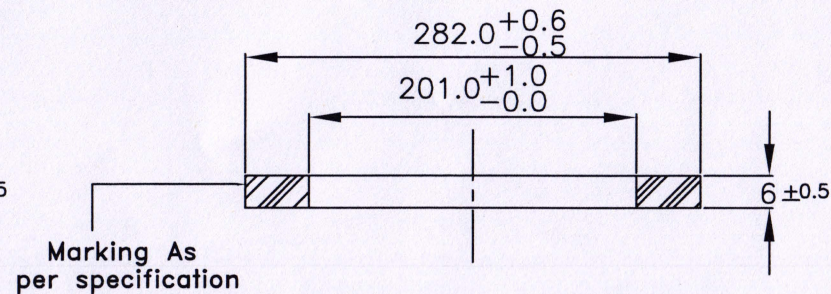
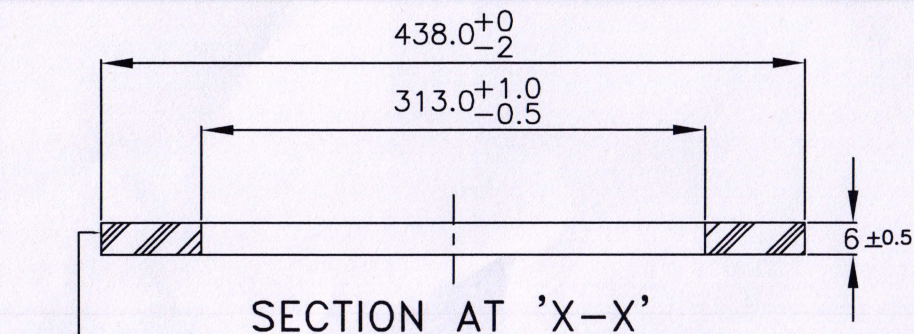
ALL DIMENSIONS ARE IN mm.

NOTE: FOR MATERIAL SPECIFICATION, MANUFACTURING, INSPECTION AND TESTING OF TPU RING (HAPPY PAD) REFER TO RDSO SPECIFICATION NO. MP-0.40.99.01 (REV.-LATEST).

01	Dim.	----	Dimension reviewed	14.05.2024
ALT	ITEM	AUTHY.	DESCRIPTION	DATE

2	TPU RING OUTER, 6 MM THICK	-	AS PER RDSO SPEC NO. MP-0.40.99.1	
1	TPU RING INNER, 6 MM THICK	-	AS PER RDSO SPEC NO. MP-0.40.99.1	
ITEM	DESCRIPTION & DIMENSIONS	QTY PER COACH	Wt. OF ONE (gm)	MATL. & SPEC. REMARKS

RDSO	SUPERSEDED BY:	INDIAN RAILWAY STANDARDS
ASSEMBLY DRGS.	SUPERSEDES:	LHB SHELL ON FIAT BOGIE
REFERENCE:-	SCALE	TPU RING (HAPPY PAD) FOR PRIMARY SUSPENSION OF FIAT BOGIE OF LHB COACHES
	NOT TO SCALE	
	J.S. VDG/02/20	
CHECK SHEET No.	B.G. R.D.S.O. [CG]	CG-20049



ALL DIMENSIONS ARE IN mm.

NOTE: FOR MATERIAL SPECIFICATION, MANUFACTURING, INSPECTION AND TESTING OF TPU RING (HAPPY PAD) REFER TO RDSO SPECIFICATION NO. MP-0.40.99.01 (REV.-LATEST).

01	Dim.	-----	Dimension reviewed	14.05.2024
ALT.	ITEM	AUTHY.	DESCRIPTION	DATE

2	TPU RING OUTER, 6 MM THICK	-	AS PER RDSO SPEC NO. MP-0.40.99.1	
1	TPU RING INNER, 6 MM THICK	-	AS PER RDSO SPEC NO. MP-0.40.99.1	
ITEM	DESCRIPTION & DIMENSIONS	QTY PER COACH	Wt. OF ONE (gm)	MATL. & SPEC.
RDSO	SUPERSEDED BY:	INDIAN RAILWAY STANDARDS		
ASSEMBLY DRGS.	SUPERSEDES:	LHB SHELL ON FIAT BOGIE		
REFERENCE:-	SCALE	P	TPU RING (HAPPY PAD) FOR SECONDARY SUSPENSION OF FIAT BOGIE OF LHB COACHES	
	NOT TO SCALE	C		
		D		
		J.S.		
CHECK SHEET No.	B.G.	R.D.S.O. [CG]	CG-20057	

**IREPS**

Indian Railways E- Procurement System

Unified Vendor Approval Module**AKIL HAIDER (SSEvdg sprng), RDSO HQ-MECHANICAL,
RDSO (IREPS ID- 20504)****07-Jun-2024 19:12:38 IST**

Vendor Directory (Published)

Organization	Indian Railway ▼	Item/Sub-Item Description/ID/PL No	2201253
Approving Agency	BLW ▼	Specification	
Department	Mechanical ▼	Drawing	
Sub-Directorate	--All-- ▼	STR	
Reference Date	07/06/2024 	Items Per Page	25

[Proceed](#)**Total : 1****Vendor Directory status as of 07/06/2024 19:11**

BLW **Item ID:** 2201253 , Thermoplastic Polyurethane Spring Pads (Happy Pads) for Locomotives ((Spec. No. MP.0.40.99.01 Rev. 03, Aug'17; PL No. 11275984 / 11983760 / 11982986 / 11275868 / 11276435 / 11276319 / 11275820 / 11275832 / 17140997) **Spec:** [MP.0.40.99.01 Rev 03 August 2017](#), **Drw:** [SK.VL-279 Alt-2](#), [SK.VL-280 AIT-NIL](#), [SK.VL-281Alt-1](#), [SK.VL-283 Alt-NIL](#), [SK.VL-284 Alt-NIL](#), [SK.VL-323 Alt-1](#), [SK.VL-458 Alt-1](#), [SK.VL-282 Alt-NIL](#), [SK.VL-291Alt-3](#), [SK.VL-459 Alt-1](#),



Vendor Directory Remarks

(1) 05 Loco sets is required for field trial for upgradation from category Developmental Limited to Developmental. (2) PL No. - 11275984 for SK.VL-279 for WDP1 loco for bogie of IS:2062; 11983760 for SK.VL-280 (item no. 2 of SK.VL-280 is part of Kit of spring pads comprises 03 items); 11982986 for SK.VL-281 for WDG4/WDP4 loco; 11275868 for SK.VL-291 for WDM3D / WDM3E / WDP1M loco; 11276435 (item no. 1 of TPL-9320 Alt.-J & 11276319 (item no. 2 of TPL-9320 Alt.-J for SK.VL-323 for WDM3A (ATHS bogie); 11275820 for SK.VL-458 for WDG3A loco; 11275832 for SK.VL-459 for WDG3A loco; 17140997 for DLW Part no. 17140997/EMD Part no. 400887273).

(Total Vendor Count: 10)

Approved Vendors (Vendor Count: 9)

<p>M/s ARYAN EXPORTERS (P) LTD.- LUCKNOW (ID- 1518)</p> <p>Regd Add. : T-31,Green Park New Delhi,Delhi - 110016, India Corr. Add. : - B-1, Industrial Area, Amausi Lucknow,Uttar Pradesh - 226008, India</p>	<p>Works B-1, Industrial Area, Amausi, Lucknow,Uttar Pradesh - 226008, India Current status since - before 01/01/2020 Capacity (PA) :- 42000 Numbers Last Quality Audit Date : -, Next Quality Audit Date : -</p>
<p>M/s AVADH RAIL INFRA LIMITED- Lucknow (ID- 11704)</p> <p>Regd Add. : B-12, Industrial Area Amausi Lucknow 226008 Lucknow,Uttar Pradesh - 226008, India</p>	<p>Unit-1 B-12, Industrial Area Amausi Aerodrome Opp. Amausi Aerodrome Lucknow,Uttar Pradesh - 226008, India Current status since - before 01/01/2020 Capacity (PA) :- 49920 Numbers Last Quality Audit Date : -, Next Quality Audit Date : -</p> <p>Works 3 Plat No. 105, Sector-7, IIE SIDCUL, Haridwar,Uttarakhand - 249403, India Current status since - before 01/01/2020 Last Quality Audit Date : -, Next Quality Audit Date : -</p>
<p>M/s BALAJI RUBBER FACTORY-MUMBAI (ID- 113153)</p> <p>Regd Add. : Flat no. 102, A-Wing, Sunny Estate-II, Golf View , Chembur Mumbai,Maharashtra - 400071, India Corr. Add. : - Flat No. 102, A Wing, Sunny Estate, II Golf View, CHS, LD, ST Road, Chembur, Mumbai-400071 Mumbai,Maharashtra - 400071, India</p>	<p>Pune Plot No. PAPG 18, Infront of Bridgestone Tyre Co. Main Gate Sarwadhari Phase-II, MIDC Chakan Pune,Maharashtra - 410501, India Current status since - 02/09/2020 Capacity (PA) :- 48000 Numbers Last Quality Audit Date : -, Next Quality Audit Date : -</p>
<p>M/s BASANT RUBBER FACTORY PVT LTD-MUMBAI (ID- 84736)</p> <p>Regd Add. : 103 B LBS MARG Vikhroli West Mumbai,Maharashtra - 400083, India Corr. Add. : - 103-B, LBS Marg, Vikhroli (West), Mumbai-400083 Mumbai,Maharashtra - 400083, India</p>	<p>Unit-1 103-B, L.B.S Marg Vikhroli (W) Mumbai ,Maharashtra - 400083, India Current status since - before 01/01/2020 Capacity (PA) :- 86400 Numbers Last Quality Audit Date : -, Next Quality Audit Date : -</p>
<p>M/s ELECTRO PLAST-GHAZIABAD (ID- 16690)</p> <p>Regd Add. : 1/34 South side G.T.Road,</p>	<p>Works 1/34, South Side G.T. Road, Industrial Area Ghaziabad,Uttar Pradesh - 201001, India</p>

Industrial Area Ghaziabad,Uttar Pradesh - 201001, India	Current status since - 02/09/2020 Capacity (PA) :- 60000 Numbers Last Quality Audit Date : -, Next Quality Audit Date : -
M/s MCAM SURLON INDIA LTD.- GHAZIABAD (ID- 2314) Regd Add. : 4, Pocket-1 Jasola, New Delhi,Delhi - 201010, India Corr. Add. : - 4, Pocket-1, Jasola, New Delhi,Delhi - 110025, India	Unit-II A-39/2, Gate No.-1, Site-IV, Industrial Area, Sahibabad Ghaziabad,Uttar Pradesh - 221010, India Current status since - before 01/01/2020 Last Quality Audit Date : -, Next Quality Audit Date : - Unit-I 54/11, Site-IV, Industrial Area Sahibabad Ghaziabad,Uttar Pradesh - 221010, India Current status since - before 01/01/2020 Capacity (PA) :- 299520 Numbers Last Quality Audit Date : -, Next Quality Audit Date : -
M/s MGM RUBBER COMPANY-KOLKATA (ID- 1310) Regd Add. : 86/1, B.T. Road undefined Kolkata,West Bengal - 700002, India Corr. Add. : - 86/1,BT Road,Kolkata-700002. Howrah,West Bengal - 700002, India	Unit-I 18 Mahatma Sisir Kumar Sarani (Formerly Galiff Street) Kolkata,West Bengal - 700004, India Current status since - before 01/01/2020 Last Quality Audit Date : -, Next Quality Audit Date : - Unit-II 277, Jessore Road Kolkata,West Bengal - 700048, India Current status since - before 01/01/2020 Capacity (PA) :- 174000 Numbers Last Quality Audit Date : -, Next Quality Audit Date : -
M/s PRAG INDUSTRIES (INDIA) PVT. LTD.-LUCKNOW (ID- 2349) Regd Add. : E-7 Talkatora Industrial Estate Lucknow,Uttar Pradesh - 226011, India	works E-7, Talkatora Industrial Estate, Talkatora Road, Lucknow,Uttar Pradesh - 226011, India Current status since - before 01/01/2020 Capacity (PA) :- 180000 Numbers Last Quality Audit Date : -, Next Quality Audit Date : -
M/s RAMA ENGINEERING WORKS-HYDERABAD (ID- 1877) Regd Add. : Plot No. 768, Phase-I, IDA, Subash Nagar, Jeedimetla	RAMA Plot No. 768, Phase-1, IDA, Subash Nagar, Jeedimetla, Hyderabad-500 055 Hyderabad,Telangana - 500055, India Current status since - before 01/01/2020

Hyderabad,Telangana - 500055, India
Corr. Add. : - Plot No. 768, Phase-1,
IDA, Subash Nagar, Jeedimetla,
Hyderabad-500 055
Hyderabad,Telangana - 500055, India

Capacity (PA) :- 100000 Numbers
Last Quality Audit Date : -, **Next
Quality Audit Date :** -

Developmental Vendors (Vendor Count: 1)

M/s MICRO ENGINEERS-GREATER
NOIDA
(ID- 13534)

Regd Add. : B-37, Gali No. 1, Kabir
Nagar, Shahdara SAHADARA Delhi,Delhi
- 110094, India

Works

Plot No.104, Udyog Kendra Extn. 1, Near
Habibpur Village, Greater Noida,Uttar
Pradesh - 201306, India

Current status since - before
01/01/2020

Capacity (PA) : 276500 Numbers

General Remarks: (1) 05 Loco sets is
required for field trial forupgradation
from category Developmental Limited
toDevelopmental.

Last Quality Audit Date : -, **Next
Quality Audit Date :** -

**This is conditional approval subject to
Field Trials :** Supplies beyond the field
trials quantity shall commence only after
successful completion of the field trials
(after fitment) for 240 Numbers / over 12
months period.



भारत सरकार रेल मन्त्रालय
GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

TECHNICAL SPECIFICATION FOR
THERMOPLASTIC POLYURETHANE SPRING PADS (HAPPY PADS)
FOR LOCOMOTIVES



SPECIFICATION NO. MP- 0.40.99.01
(Revision - 03)

August, 2017

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ANNEXURE

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TECHNICAL SPECIFICATION FOR THERMOPLASTIC POLYURETHANE SPRING PADS (HAPPY PADS) FOR LOCOMOTIVES

1. SCOPE

- 1.1 This Specification covers the technical requirements relating to material, design, tests and Inspection Plan for Polyurethane Spring Pads (Happy Pads) used below and above the helical coil springs of locomotives to enhance their life due to reduced fretting and better shock absorption capability. It also includes minimum requirements for manufacturing, testing and quality control of these pads. However, this specification does not include all the necessary provisions required for a supply contract.
- 1.2 During service, the spring pad is subjected to a compressive load about 5 tonnes in static condition. In addition, the pad is also subjected to dynamic load of about ± 1.5 tonnes.
- 1.3 The pad shall have good wear resistance and tear strength properties. It shall be capable of withstanding wide climatic variations prevailing in the country without deterioration and without any marked change in characteristics.
- 1.4 This document draws reference to some of the relevant ASTM / ISO specifications. Latest versions of these specifications shall be taken as reference unless mentioned otherwise.
- 1.5 While preparing this specification, due consideration has been given to the latest development in the field of polymeric materials & process technologies and service requirements of Indian Railways.

2. DEFINITION

Wherever "Inspecting Agency" has been mentioned in this document, it shall be taken as "Authorized Inspecting Agency" as mentioned in the Purchase Order.

3. INSTRUCTIONS FOR PURCHASER

- 3.1 The manufacturer shall be an RDSO Approved Vendor for supply of Thermoplastic Polyurethane Spring Pads (Happy Pads) for locomotives.
- 3.2 Inspection of Spring Pads (Happy Pads) shall be carried out as per the instructions given in the RDSO Vendor Directory. The Purchaser shall clearly indicate this in the Purchase Order.
- 3.3 The material, manufacturing and testing of Spring Pads shall conform to this specification. The Purchaser shall clearly indicate this in the Purchase Order.

4. MINIMUM REQUIREMENTS OF INFRASTRUCTURE, MANUFACTURING, TESTING & QUALITY CONTROL FOR APPROVAL OF MANUFACTURER

- 4.1 The manufacturer should have acquired ISO: 9000 series certification for manufacturing of Thermoplastic Polyurethane spring pads for locomotives.
- 4.2 The manufacturer shall have at least the following infrastructure and manufacturing facilities:
 - .1 Adequate space and covered area with cemented floor to accommodate the following:
 - a. Damp-free space for storage of raw materials
 - b. Manufacturing Activities
 - c. Finishing
 - d. Inspection and Testing
 - e. Storage and dispatch of finished products
 - .2 One Injection Moulding Machine of minimum injection capacity of 500 gms with control panel equipped with the following features:
 - a. Microprocessor Controlled Machine
 - b. Minimum clamping force (locking tonnage) of 150 tonnes
 - c. PLC Controlled Mould Temperature Controller (MTC)
 - d. Auto Loader/ Hopper Dryer
 - e. Auto Visual Alarm
 - f. Mould Height Adjustment Facility
 - g. Hot Air Oven for Annealing the Finished Product

- h. Cooling Water System
- i. Desiccant Dryer of Dehumidifier Attached with Dew Point Meter
- .3 At least one set of injection mould.
- .4 Suitable material and mould handling facilities like chain pulleys, trolleys, electric hoists or other suitable equipment.
- .5 Suitable tools, cutters, polishing files and buffing machine for deflashing of moulded products.
- .6 Electronic weighing machine of minimum 2kg capacity with an accuracy of at least $\pm 0.2\%$.
- .7 The manufacturer shall have facilities for maintenance and polishing of dies and moulds.
- .8 If at a later stage after approval of a manufacturer for supply of happy pads, it is found that any machine/infrastructure required for its manufacture is deficient; the approval of the manufacturer can be withdrawn.
- 4.3 Testing Facilities
 - .1 The manufacturer shall have atleast the following testing facilities and other equipments installed in the laboratory with controlled temperature and humidity for carrying out various tests specified under Para 8:
 - a. Tensile Testing Machine of adequate capacity
 - b. Load Compression Testing Machine with a capacity of at least 10 tonnes
 - c. Equipment for humidity control of laboratory
 - d. Shore 'A' Hardness Tester
 - e. Melting Point Apparatus
 - f. Weighing Balance with Specific Gravity determination Kit
 - g. Muffle Furnace
 - h. Equipment to test Compression Set as per ISO 815
 - i. Melt Flow Index Tester
 - .2 The manufacturer shall have facilities for compressive load-deflection characteristics test in accordance to this specification.
 - .3 Dies /moulds for preparation of various test specimens for the relevant tests shall be available.
 - .4 All gauges required for checking of dimensions of spring pads shall be available.
 - .5 The manufacturer shall have suitable jigs & fixtures for conducting Load Deflection Test and other tests as per this specification.
- 4.4 Quality Control Requirements
 - .1 The manufacturer shall have a system of easy traceability of the product from raw material stage to finished product stage.
 - .2 The manufacturer shall submit Quality Assurance Plan (QAP) as per the standard format to Motive Power Directorate, RDSO for approval. QAP shall cover all aspects of process / quality control requirement to obtain quality product.
 - .3 The manufacturer shall have a system to ensure that moulds are checked at regular intervals. Also, it is ensured that dies/moulds are checked dimensionally prior to release for production and records of these checks are maintained.
 - .4 The calibration of the Testing/Measuring Equipments/Weighing machines should be done at least once in a year unless stated otherwise.
 - .5 The manufacturer should have a Quality Manual indicating the extent of control over manufacturing and testing.
 - .6 The manufacturer shall have a system of review of rejections detailing rejection rate, cause of rejection, corrective action taken etc. on regular basis and records thereof should be maintained.
 - .7 The manufacturer shall have a system of documentation in respect of rejection at customer end, warranty replacement and failure of spring pads in service.

- .8 The manufacturer should have a system of recording plant, machinery & control equipments remaining out of service, nature of repairs done etc.
- .9 Latest versions of relevant specifications and drawings shall be available with the manufacturer.
- 4.5 Qualification and Training
 - .1 Training needs for all personnel should be identified. Regular training should be organized covering personnel identified for a particular period.
 - .2 The Inspection/Quality Control section should be headed by a graduate Engineer with at least 5 years experience or a Diploma holder with at least 10 years experience.
 - .3 Inspection staff conducting non-destructive testing should be adequately trained & qualified by recognized agency and should have adequate experience.
 - .4 Laboratory and Shift Engineers shall have a minimum qualification either a Diploma or a Degree in Engineering (Plastic, Mechanical or Electrical).
5. **MATERIAL**
 - 5.1 The material used in the manufacture of spring pads shall be "Thermoplastic Polyurethane (TPU)" manufactured by M/s Bayer or any other world-renowned primary manufacturer of this material.
 - 5.2 Before offering the material for tests, the spring pad manufacturer shall have a suitable tie-up in the form of a written Memorandum of Understanding (MoU) with the raw material supplier covering supplies and technical support.
 - 5.3 The material shall conform to the properties given in Para 8.
 - 5.4 Use of regenerated / re-constituted material is not permitted.
 - 5.5 Unless and otherwise specified in the purchase order, the colour of spring pad shall be natural colour of the TPU material.
6. **DIMENSIONS AND TOLERANCES**

The spring pad shall conform to the dimensions and tolerances as given in the relevant RDSO drawing.
7. **MANUFACTURING PROCESS AND FINISH**
 - 7.1 The pad shall be manufactured by injection moulding only.
 - 7.2 The spring pad shall be smooth, free from air bubbles, surface streaks, splash marks, pinholes, voids, crazing, blistering etc. All the edges shall be neatly finished and free from flash.
 - 7.3 The machining on spring pads after moulding is permitted, if required. However, the finished dimensions must conform to relevant RDSO drawing.

8. TECHNICAL REQUIREMENTS OF SPRING PADS

The prescribed checks for material of spring pad shall be undertaken on the test specimen prepared from the finished product or manufactured under the identical conditions of moulding of spring pads being inspected using the same raw material. However, visual inspection, dimensions, hardness & compressive load deflection test should be conducted on finished product.

8.1 Physical Properties

The checks shall be conducted as per methods given in ASTM/ ISO Standards mentioned below and their values shall conform to the following limits:

Sl.	Property	Test Method	Units	Permissible Limit
1.	Specific Gravity	ASTM D792/ ISO 1183-1	-	1.12 to 1.25
2.	Tensile Strength	ASTM D638 / ISO 527-1 & ISO 527-3	kg/cm ²	250 (Minimum)
3.	Elongation at Break	ASTM D638/ ISO 527-1 & ISO 527-3	%	300 (Minimum)
4.	Hardness	ISO 868	Shore 'A'	85 – 95
5.	Compression Set at 80 ⁰ ± 1 ⁰ C for 24 (+0/-2) hours	ISO 815	%	45 (Maximum)

8.2 Oil Resistance Test

The swelling as determined by the method given in IS: 3400 (Part VI) using an immersion period of 72 (+0 / -2) hours at $100 \pm 1^{\circ}$ C shall not be more than the limits given below:

Sl.	Volume Swelling Medium	Permissible Limit
1.	In Lubrex -150	20 % (Maximum)
2.	In Grease (Servo gem 2 or 3)	15 % (Maximum)

8.3 Resistance to Hydrolysis

After Hydrolysis on boiling in distilled water at atmospheric pressure for 72 (+0/-2) hours, the tensile strength, elongation at break and hardness shall not vary from the value obtained before boiling by more than the following limits:

Sl.	Property	Permissible Limit
1.	Tensile Strength	± 20 %
2.	Elongation at break	± 20 %
3.	Hardness (Shore 'A')	± 5

8.4 Compressive Load-Deflection Test

The spring pad shall be subjected to three successive loadings upto 5 tonnes. During the fourth cycle, the spring pad shall be compressed with a load of 50 kg and deflection taken as 'zero' at this point. The deflection at load of 5 tonnes shall then be recorded with the help of dial gauge(s) / digital display. The deflection value shall not be less than 0.50 mm.

9. LOT SIZE, SAMPLING AND CONFIRMATORY TESTS

The Inspecting Agency for the purpose of inspection of the product in reference to a Purchase Order shall carry out the checks as enclosed in Annexure I.

10. MARKING

Each spring pad shall be suitably marked containing the following information by embossing with height of letters of 4 mm size at the location specified in relevant drawing:

- Drawing number
- Manufacturer's name (initial / trade mark)
- Month and Year of manufacture.

11. PACKING

The spring pads shall be suitably packed in cardboard/ wooden boxes to protect them against damage during transit and storage.

12. STORAGE

The spring pads shall be stored in a cool and dry place.

13. FIELD TRIAL

After fitment of the component on locomotives, approval may be considered after satisfactory field performance.

14. VENDOR CHANGES IN APPROVED STATUS

All the provisions contained in RDSO's ISO procedures laid down in document no. QO-D-7.1-11, dated 19.07.2016 or latest (Titled "Vendor changes in approved status) and subsequent version/amendment thereof, shall be binding and applicable on the successful vendor/vendors in the contract floated by Railways to maintain quality of products supplied to Railways.

ANNEXURE- I**INSPECTION PLAN FOR THERMOPLASTIC POLYURETHANE (TPU) SPRING PADS (HAPPY PADS) FOR LOCOMOTIVES****A. SCOPE**

This inspection plan covers the checks to be carried out by the Authorized Inspecting Agency during inspection of "Thermoplastic Polyurethane Spring Pad (Happy Pad)" for locomotives and on the manufacturer in reference to the Purchase Order. The polyurethane spring pads (PU Pads) shall be subjected to inspection by the Authorized Inspecting Agency as detailed in this Inspection Plan to ascertain the quality of these pads.

B. CONTRACT DOCUMENTS

Srl.	Description
1.	Purchase order in reference
2.	Drawing(s) referred in purchase order
3.	RDSO's specification No.MP-0.40.99.01(Rev. 03)
4.	RDSO approved Quality Assurance Plan of the manufacturer for happy pads

C. DEFINITIONS

The various abbreviations used in this inspection plan and their interpretations are tabulated as follows:

Srl.	Abbreviation	Description
1.	Spring pads	Thermoplastic polyurethane (TPU) Spring pads (happy pads)
2.	Manufacturer	Manufacturer on which PO in reference is placed
3.	Inspector	Authorized Representative of Inspecting Agency
4.	TC	Test Certificate
5.	IC	Inspection Certificate
6.	DP	Delivery Period
7.	PO	Purchase Order
8.	QAP	Quality Assurance Plan

D. FACILITIES FOR INSPECTION

- i. The Inspector shall be permitted to carry out all the checks included in this Inspection Plan.
- ii. The Inspector shall have free access to the works of the manufacturer at all reasonable times. He shall be at liberty to reject any material that does not conform to the drawing / specification for happy pads.
- iii. The manufacturer shall provide free of charge, all the facilities to the Inspector, such as labour, measuring instruments, testing facilities and necessary assistance in carrying out all the tests in accordance with this Inspection Plan. If facilities for carrying out any checks mentioned in this Inspection Plan are not available at manufacturer's works, the manufacturer shall arrange such checks elsewhere at their expense.

E. GENERAL CHECKS BY THE INSPECTOR

Before commencing the inspection, the Inspector shall ensure that:

- i. The delivery period of the Purchase Order is valid.
- ii. Check the internal inspection record carried out at various stages of manufacture of the product by the manufacturer's quality control department for the product being offered and confirms that the results of the internal inspection records are in order.
- iii. The measuring instruments, gauges, testing facilities, etc are in working order and they are properly calibrated.
- iv. The copies of latest versions of all the reference specifications are available with the manufacturer.
- v. Memorandum of Understanding (MOU) with primary raw material supplier is valid.

F. INSPECTION PROCEDURE**i. Lot Size**

The lot size of spring pads to be offered in one inspection shall be **500 nos.** or full quantity if the order quantity is less than 500 nos.

ii. Sample Size

Sample size as given below for various tests shall be drawn from the lots offered for inspection by the representative of Authorized Inspecting Agency. The following tests shall be carried out:

Srl.	Tests	Sample Size
1.	Type of Elastomer	02 Nos.
2.	Visual Inspection	50 Nos.
3.	Dimensions	50 Nos.
4.	Specific Gravity	02 Nos.
5.	Tensile Strength	02 Nos.
6.	Elongation at Break	02 Nos.
7.	Hardness	10 Nos.
8.	Compression Set at $80 \pm 1^\circ\text{C}$ for 24 (+0/-2) hours	02 Nos.
9.	Oil Resistance Test	02 Nos.
10.	Resistance to Hydrolysis	02 Nos.
11.	Compressive Load-Deflection Test	10 Nos.

iii. Technical Requirements for Spring Pads

The Inspecting Authority shall witness following tests for checking of properties of TPU material. These properties of TPU shall conform to this specification.

- a. Physical Properties
- b. Oil Resistance Test
- c. Resistance to Hydrolysis

iv. Visual, Dimensional Checks & Compressive Load-Deflection Tests

a. Visual Checks

Samples picked up at random per lot of spring pads offered for inspection shall be subjected to the following visual checks:

- .1 The spring pad shall be smooth, free from air bubbles, surface streaks, splash marks, pinholes, voids, crazing, blistering etc. All the edges shall be neatly finished and free from flash.
- .2 It must be ensured that each spring pad is identification marking by the manufacturer as per Para 10 of this specification.

The results of visual check shall be recorded in the check sheet provided with this Inspection Plan.

b. Dimensional Checks

Samples picked up at random per lot of spring pads offered for inspection shall be subjected to the dimensional checks. The spring pads shall conform to the dimensions and tolerances as given in relevant drawings and recorded in the check sheet provided with this Inspection Plan.

c. Compressive Load-Deflection Test

- .1 The compressive load-deflection characteristics test of spring pad shall be carried out on randomly selected samples as per this specification from the lot offered for inspection by the manufacturer.
- .2 The spring pad samples should meet the criteria laid down when tested as per the procedure prescribed in this specification.
- 3 The deflection value shall not be less than 0.50mm.

G. ACCEPTANCE CRITERIA

- i.** The manufacturer shall not withdraw the material offered for inspection during the course of inspection. Any move by the manufacturer in any way to withdraw the material / interfere / hinder with the inspection, shall render rejection of the entire quantity of material offered for inspection.
- ii.** If any sample fails in one or more criteria given in Para F of this Inspection Plan, double the sample size shall be drawn and tested against the criteria in which the failure had occurred. If all the samples of double sampling pass the criteria, the entire quantity shall be accepted.
- iii.** Failure of any sample of the double samples will, however, result in rejection of the entire offered quantity. The intimation of failure and rejection shall also be sent to RDSO.
- iv.** In the event of rejection, the entire quantity offered for inspection shall be made un-suitable for Railway application in presence of the inspecting agency.

H. STAMPING

The spring pad, which has been inspected and passed, shall be double stamped by the Inspecting Agency. The entire quantity of spring pads from which the sampling has been taken shall be stamped (single stamp mark) by the Inspecting Agency. Double stamping mark is to identify the samples, which were drawn for inspection for future reference in the event of any dispute.

PROFORMA 1

GENERAL CHECK SHEET

Srl.	Description	Observations
1.	Name of Component	
2.	Firm's Name	
3.	Date (Period) of Inspection	
4.	Contract Details as per P.O.	
	a) Purchase Order No. & Date	
	b) Order placing Authority	
	c) Specification No.	
	d) Drawing No.	
5.	Quantity on Purchase Order	
6.	Quantity offered for Inspection	
7.	Consignee	
8.	Validity of D.P. of P.O.	
9.	Remarks on internal checks carried out by the firm	
10	Remarks on calibration of Measuring Instruments & Testing Facilities	
11.	Remarks on availability of copies of latest versions of Specifications & Standards referred	
12.	Tie-up with raw material Supplier with memorandum of understanding (MOU) : Yes/No	

Quality Control Manager of Firm	Authorised Representative of Inspecting Agency

PROFORMA 2

MATERIAL PROPERTIES CHECK SHEET

A. Raw Material Checks

Specified Sample/ Lot Size:

Whether material conforms to Specifications (Yes / No):

Parameter	Specified	Observations	
		Sample 1	Sample 2
Raw Material	Polyurethane (TPU)		
Color of pad	Natural		

Property	Specified Value	Observed Value	
		Sample 1	Sample 2
Specific Gravity	1.12 to 1.25		

B. Physical Properties

i. Tensile Strength (Specified Value: 250 kg /cm² (minimum))

Parameters	Observed Value										Remarks
	Sample 1					Sample 2					
	a	b	c	d	e	a	b	c	d	e	
Load at Break (kg)											
Tensile Strength (kg /cm ²)											
Mean Value (kg /cm ²)											

ii. Elongation at Break (Specified Value: 300 % (minimum))

Parameters	Observed Value										Remarks
	Sample 1					Sample 2					
	a	b	c	d	e	a	b	c	d	e	
Length at break											
Elongation (%))											
Mean Value (%)											

iii. Hardness (Specified Value: 85-95 Shore A)

Parameters	Observed Value										Remarks
	Sample 1					Sample 2					
	a	b	c	d	e	a	b	c	d	e	
Hardness											
Mean Value (Shore A)											

iv. Oil Resistance Test

Volume swelling	Specified Value	Observed Value		Remarks
		Sample 1	Sample 2	
In Lubrex-150	20% (Max)			
In Grease (Servogem-2 or 3)	15% (Max)			

Quality Control Manager of Firm	Authorised Representative of Inspecting Agency

iv. Hardness (Specified Value: 85-95 Shore A)

Parameters		Observed Value					Remarks
		a	b	c	d	e	
Sample 1	Hardness						
	Mean						
Sample 2	Hardness						
	Mean						
Sample 3	Hardness						
	Mean						
Sample 4	Hardness						
	Mean						
Sample 5	Hardness						
	Mean						
Sample 6	Hardness						
	Mean						
Sample 7	Hardness						
	Mean						
Sample 8	Hardness						
	Mean						
Sample 9	Hardness						
	Mean						
Sample 10	Hardness						
	Mean						

v. Resistance to Hydrolysis:

- **Tensile Strength** (Percentage Variation in Tensile Strength: $\pm 20\%$)

Parameters	Observed Value										Remarks
	Sample 1					Sample 2					
	a	b	c	d	e	a	b	c	d	e	
Load at Break (kg)											
Tensile Strength (kg /cm ²)											
Mean Value (kg /cm ²)											
Variation in Tensile Strength (%)											

- **Elongation at Break** (Percentage Variation in Elongation at Break: $\pm 20\%$)

Parameters	Observed Value										Remarks
	Sample 1					Sample 2					
	a	b	c	d	e	a	b	c	d	e	
Length at break											
Elongation (%)											
Mean Value (%)											
Variation in Elong. at Break (%)											

Quality Control Manager of Firm	Authorised Representative of Inspecting Agency

• **Hardness (Percentage Variation in Hardness: ± 5)**

Parameters	Observed Value										Remarks
	Sample 1					Sample 2					
	a	b	c	d	e	a	b	c	d	e	
Variation in hardness											
Mean Value (Shore A)											
Variation in Hardness in (Shore A)											

vi. Compression Set (Specified Value: 45% Max)

Parameters	Observed Value										Remarks
	Sample 1					Sample 2					
	a	b	c	d	e	a	b	c	d	e	
Thickness before ageing											
Thickness after ageing											
Compression set											
Median Value											

vii. Compressive Load-Deflection Test at 5t Load (Specified Value: 0.50 mm Min.)

Sample No.	1	2	3	4	5	6	7	8	9	10	Remarks
Observed Value											

Quality Control Manager of Firm	Authorised Representative of Inspecting Agency

PROFORMA 3

VISUAL & DIMENSIONAL CHECK SHEET

A. Drawing No.:

B. Lot No.:

C. Visual Check:

Sample No.	1	2	3	4	5	6	7	8	9	10	Remarks
Visual Check											
Identification Marking											

	11	12	13	14	15	16	17	18	19	20	Remarks
Visual Check											
Identification Marking											

	21	22	23	24	25	26	27	28	29	30	Remarks
Visual Check											
Identification Marking											

	31	32	33	34	35	36	37	38	39	40	Remarks
Visual Check											
Identification Marking											

	41	42	43	44	45	46	47	48	49	50	Remarks
Visual Check											
Identification Marking											

Quality Control Manager of Firm	Authorised Representative of Inspecting Agency

D. Dimensional Check

Sample No.	1	2	3	4	5	6	7	8	9	10	Remarks
Outer Diameter (mm)											
Inner Diameter (mm)											
Thickness (mm)											

Sample No.	11	12	13	14	15	16	17	18	19	20	Remarks
Outer Diameter (mm)											
Inner Diameter (mm)											
Thickness (mm)											

Sample No.	21	22	23	24	25	26	27	28	29	30	Remarks
Outer Diameter (mm)											
Inner Diameter (mm)											
Thickness (mm)											

Sample No.	31	32	33	34	35	36	37	38	39	40	Remarks
Outer Diameter (mm)											
Inner Diameter (mm)											
Thickness (mm)											

Sample No.	41	42	43	44	45	46	47	48	49	50	Remarks
Outer Diameter (mm)											
Inner Diameter (mm)											
Thickness (mm)											

Quality Control Manager of Firm	Authorised Representative of Inspecting Agency

भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
रेलवे बोर्ड Railway Board

No.2019/M(C)/137/13CS

(E-File No.- 3346834)
New Delhi, Date: 03.06.2024

Director General
RDSO, Lucknow

Sub: LHB coaches with provision of TPU rings in suspension arrangements.

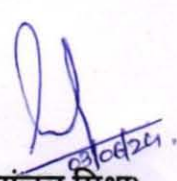
Ref: RDSO letter no. SV.FIAT dated 26.05.2024.

The recommendations received vide letter under reference regarding the subject matter above have been examined and the following have been decided for implementation:

- Provision of TPU rings in primary suspension of all non-AC LHB coaches.
- Provision of TPU rings only at bottom in secondary suspension of all non-AC LHB coaches with coil spring in secondary suspension.
- Provision of TPU rings in primary suspension of all AC LHB coaches except LWACCN, LWACCW & LWFCWACA coaches.
- The trials of fitment of TPU rings in remaining AC LHB Coaches (viz. LWACCN, LWACCW and LWFCWACA) are to be carried out at JUDW/NR, MTN/CR and RCF/KXH respectively, in consultation with RDSO.
- RDSO is authorized for developing specification and vendor development of TPU Rings of primary suspension and secondary suspension of coaching stocks. In mean time, TPU rings in primary suspension (CG-20049 Alt. '01') & secondary suspension (CG- 20057 Alt. '01') may be procured with BLW Vendor Directory for "Thermoplastic polyurethane Pads (Happy Pads) for Locomotives to RDSO Specification No. mp.0.40.99.01 Rev- Latest".

The above issues with the approval of **Board (MTRS)**.

For further necessary action please.


(प्रांजल मिश्रा)
संयुक्त निदेशक / यांत्रिक इंजी. कोचिंग-II
रेलवे बोर्ड

C/-PED/RS/RDSO - for kind information and necessary action please.

No. SV. FIAT Spring

Date: 21.12.2023

Principal Chief Mechanical Engineer,

1. Northern Railway, Baroda House, New Delhi - 110 001	11. South East Central Railway, Bilaspur - 495 004.
2. Western Railway, Churchgate, Mumbai – 400020	12. South Western Railway, Hubli - 580023.
3. Central Railway, CSTM, Mumbai - 400 001.	13. East Coast Railway, Railway Complex, Bhubaneswar - 751 023.
4. Eastern Railway, Fairly Place, Kolkata- 700 001	14. East Central Railway, Hajipur - 844 101.
5. Southern Railway, Park Town, Chennai – 600 003.	15. North Western Railway, Jaipur - 302 006.
6. North Frontier Railway, Maligaon, Guwahati – 781 001.	16. North Central Railway, Allahabad -211 001.
7. North Eastern Railway, Gorakhpur -273 001.	17. Integral Coach Factory, Chennai – 600 038.
8. South Eastern Railway, Garden Reach, Kolkata – 700 043.	18. Konkan Railway Corpo. Ltd., Corporate Office, Belapur Bhawan, Navi Mumbai - 400 614.
9. South Central Railway, Secunderabad – 500 071.	19. Rail Coach Factory, Kapurthala, Punjab – 144 602.
10. West Central Railway, Jabalpur-482 001.	20. Modern Coach Factory, Raebareli, 229120.

Sub: Failure of primary suspension in LHB Coaches.

Ref: i. NEFR's letter No. GHY/CDO/GEN/ASSET FAILURE/23 dated 16.12.2023.
ii. WR's letter No. LHB/SPRINGS/KKF/2023/11/38 dated 29.11.2023.
iii. This office letter of even no. dated 16.12.2019, 19.02.2020 & 17.03.2022.
iv. This office letter of even no. dated 11.10.2023.

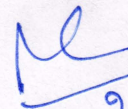
A recent case of enroute coach detachment on account of primary spring breakage in Train No. 12520 has been reported from NEFR vide letter under reference (i). WR has also submitted investigation report of broken primary inner spring in Coach No. 224796-LWACCN/ECOR vide letter referred at (ii). In both investigations, it has been noted that outer coil spring of primary suspension was not as per RDSO letter under reference (iii). Moreover, one case of primary spring failure of Coach No. 196310 LWACCN of Train No. 20415 was thoroughly examined by RDSO on 05.10.2023 at NR Coaching Depot of Lucknow and it was observed in the report under ref (iv) that proper combination of correct bogie frame with specified springs & discs/compensating rings as per RDSO letter under reference (iii) was not ensured.

RDSO has recommended remedial measures from time to time to Railways to avoid such springs failures. Instructions on provision of optimum thickness of discs/compensating rings along-with specified coil springs & bogie frames in primary suspension of LHB AC & Non-AC coaches have been issued to PUs & ZRs for implementation vide RDSO letters under reference (iii). Despite this, non-compliances of RDSO instructions are still being observed during investigations of coil spring failures as was observed in reports/letters under reference (i), (iii) & (iv).

Further, for introduction of some new variants of LHB coaches, the details of primary suspension (drawings of primary outer & inner springs with their colour codes, thickness of discs/compensating rings & type of bogie frames) of LHB AC & Non-AC coaches have been updated and enclosed as **Annexure-I**.

In view of above, PUs & Zonal Railways are again advised to ensure that suspension elements (primary outer & inner springs with their colour codes, thickness of discs/compensating rings & type of bogie frames) are provided in primary suspension of LHB AC & Non-AC coaches as specified in updated **Annexure-I**, during manufacturing, workshop attention & sick line attention. PUs & Zonal Railways are also requested to submit the compliance in this regard.

DA: As above.


21.12.2023
(Anil Kumar Singh)
Executive Director (Stds.)/Carriage

Copy to:

EDME (Coaching),
Railway Board, Rail Bhawan
New Delhi – 110 001.,

For kind information please.

ANNEXURE-I

Specified Primary Suspension Components of LHB Coaches:

S. No.	Description of coach	Primary outer spring (Drg. Number & Colour Code)	Primary inner spring (Drg. Number & Colour Code)	Thickness of disc/compensating ring between Primary rubber bump stop & bottom centering disc (in mm)	Type of Bogie Frames
Primary Suspension of LHB AC Coaches					
1.	LHB AC Chair car (LWSCZAC / LWSCZAC2), LHB Executive Chair car (LWFCZAC / LWFCZAC2), LHB First AC coach (LWFAC / LWFAC2), LHB AC first cum two tier coach with coil spring in secondary suspension (LWFCWAC), LHB AC two tier coach with coil spring in secondary suspension (LWACCW), LHB Air Conditioned Railway Administration Coach (LRAAC), LHB Vistadome Coach (LWCTZAC), LHB AC Vistadome Dining Car (LWCTDAC)	1267411 (Green)	1267412 (Green)	04	Bogie frame having top metal primary stop of 242.5 mm nominal height (from bogie frame bottom in spring pot)
2.	LHB AC pantry car with coil spring/Air Spring in secondary suspension (LWCBAC / LWCBAC2)	1267411 (Green)	1267412 (Green)	06	
3.	LHB AC first cum two tier coach with Air Spring in secondary suspension (LWFCWACA), LHB AC two tier coach with Air spring in secondary suspension (LWACCW2)	1267411 (Green)	1277143 (Yellow)	08	
4.	LHB AC Double Decker coach (LWSCZDAC / LWSCZDAC1 / LWCZDACAA), LHB AC power car with two on-board DA set (LWLRRM / LWLRRM2)	1277142 (Yellow)	1277143 (Yellow)	08	
5.	LHB AC three tier coach (LWACCN / LWACCN2 / LWACCNAA), LHB Economy AC Coach (LWACCNE)	1277142 (Yellow)	1277143 (Yellow)	12	
Primary suspension of LHB Non-AC Coaches (With 140 KN &160 KN Air Springs in Secondary suspension of Bogie)					
6.	LHB Non-AC unreserved second class coach (LS-5/LWS/LS-5A), LHB Non-AC Three tier coach (LWSCNA/LWSCNAA), LHB Non-AC DSLR coach with underslung power pack & compartments for Divyangjan, second class passenger, Guard & Luggage (LDSLRA)	LG01100 (Black)	LG01101 (Black)	08	Bogie frame having top metal primary stop of 227.5 mm nominal height (from bogie frame bottom in spring pot)
7.	LHB Non-AC Chair car (LWSCZA/LWSCZAA), LHB Non-AC SLRD coach (LSLRD/LSLRDAA), LHB Non-AC power car with single on board DG set and compartment for Divyangjan, luggage and Guard (LWLRRMD), LHB parcel van (LVPH/LVPHR)	LG01100 (Black)	LG01101 (Black)	12	
Primary suspension of LHB Non-AC Coaches (With Coil Springs in Secondary suspension)					
8.	LHB Non-AC unreserved second class coach (LS-3), LHB Non-AC three tier coach (LWSCN 1)	LG01100 (Black)	LG01101 (Black)	04	Bogie frame having top metal primary stop of 242.5 mm nominal height (from bogie frame bottom in spring pot)
Primary suspension of LHB Non-AC Coaches (With 120 KN Air Springs in Secondary suspension of Bogie)					
9.	LHB power car with under slung power pack & compartments for Guard & Luggage only (LWLRRMU)	1267411 (Green)	1277143 (Yellow)	04	Bogie frame having top metal primary stop of 242.5 mm nominal height (from bogie frame bottom in spring pot)



भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
रेलवे बोर्ड Railway Board



No. 2007/M(C)/137/16 Vol VII

(E-File No. 3322292)

New Delhi, Date: 27.03.2024

General Managers
All Zonal Railways

Sub: Additional NTXR rejectable items during shop schedule attention of LHB coaches (SS-II/SS-III).

Various coach modifications and alteration instructions for improvement in safety and reliability of LHB stock have been issued in recent past by RDSO/PU, to be implemented during SS-2/SS-3 Schedules. During inspections and surprise checks, it has been seen that some of the modifications are yet to be fully implemented in coaches being turned out from Workshops after SS-2/SS-3 Schedules.

In this regard, it has been decided that the list of items/modifications pertaining to safety/reliability as attached in Annexure-1 have been categorized as NTXR Rejectable defect in addition to the existing rejectable defects and should be ensured by NTXR in all LHB coaches being turned-out after shop schedule attention (SS-2/SS-3).

These items will be NTXR rejectable defect w.e.f 01/05/24 (except Item at S. No. 8, which will be NTXR rejectable defect w.e.f 01/08/24). Existing NTXR rejectable defects presently in the list may also be reviewed and items which are fully implemented may also be proposed for deletion.

Necessary action may be taken to ensure the same.

This issues with the approval of competent authority.

DA: Annexure I

(प्रांजल मिश्रा)

संयुक्त निदेशक / यांत्रिक इंजी. कोचिंग-II
रेलवे बोर्ड

C/- PCMEs/ All Zonal Railways- for kind information and necessary action please.

- Director/ Neutral Control office – for kind information and necessary action please, monthly report of NTXR examinations may be submitted to Board.

Annexure I of Railway Board letter no. 2007/M(C)/137/16 Vol VII dated 26.03.2024.

List of items to be inspected by NTXR during shop schedule attention of LHB coaches (SS-II/SS-III)

S. No.	Description	Reference Letter	Defect (Rejectable/Not Rejectable) ^{w.e.f. 01/5/24}
1	Implementation of CAI regarding identification for differentiating LHB bogie frames based on primary bump stop height.	SV.FIAT Dated 27.12.2023 with RCF CAI No. CAI/RCF/MECH/LHB/053.	Rejectable
2	Ensuring of Suspension elements (primary outer & inner springs with their colour codes, thickness of discs/compensating rings & type of bogie frames) in primary suspension of LHB AC & Non-AC coaches as per RDSO letter	SV.FIAT Spring dated 21.12.2023	Rejectable
3	Inspection of under-slung mounting brackets of ICF & LHB coaches as per RDSO letter under reference.	MC/LHB/MM Dated 19.09.2023	Rejectable
4	Ensuring proper fitment of installation lever assembly of air suspension control equipment	SV. AS. FIBA, dated 20.02.2023	Rejectable
5	Ensuring provision of dirt collector in BP line.	SV. AS. FIBA, dated 20.02.2023 with RCF CAI No. CAI/RCF/MECH/LHB/040 Rev.00 and ICF CAI No. B-2022/07 regarding provision of dirt collector in BP line.	Rejectable
6	Implementation of modification in pneumatic pipeline layout of air spring, air suspension control equipments and FIBA with provision of SAE 100 R3 grade Hose Pipe as per RDSO letter	SV. AS. FIBA, dated 16.08.2022 with RCF CAI No. CAI/RCF/MECH/LHB/024 Rev.01, CAI/RCF/MECH/LHB/034 Rev.00 and ICF CAI No. B-2021/02 Rev. 01	Rejectable

7	Implementation of modification in air brake pipeline & associated fittings in LHB Coaches as per RDSO letter	MC/LHB/Brake Dated 24.06.2019, 23.08.2019, 17.12.2019, 04.08.2020 & 07.12.2020.	Rejectable
8	Revised wiring scheme for WSP system of LHB Coaches.	MC/LHB/Brake Dated 27.02.2019	Rejectable w.e.f 01 Aug 2024
9	Ensuring provision of tertiary locking pin arrangement in AAR H type tight lock CBC with BDG to RDSO spec RDSO/2011/CG-03 (Rev-03)	MC/BLB/CBC Dt 07.07.2021 and MC/BLB/CBC Dt 28.02.2023	Rejectable
10	Ensuring 100% dropping of CBC during SS-II and 100% during CBC & BDG during SS-III	MC/BLB/CBC Dt 10.06.2022	Rejectable
11	Ensuring Projection of BP and FP metal pipe from headstock as specified in RDSO letter under reference	RDSO's letter no. MC/LHB/Brake dtd 31.01.24	Rejectable
12	Ensuring modification in wire rope arrangement fitted with M/s Faiveley Transport brake system	RDSO L. No. MC/LHB/Brake dated 27.07.2020	Rejectable
13	Attention to Bogie Frame and Bogie Bolster during SS-II/SS-III for corrosion checking and painting as per Para 10.6 of CAMTECH manual	Para 10.6 of CAMTECH manual for LHB coaches (2022)	Not rejectable



भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
रेलवे बोर्ड Railway Board

No.2007/M(C)/137/16/VolVII

(E-File No.3322292)
New Delhi dated: 07.06.2024

General Managers,
All Zonal Railways & PUs.

Sub: Standard Installation of WSP Junction box & Sensor in LHB Coaches.

Ref: i. Railway Board letter no. 2007/M(C)/137/16 Vol VII dated 27.03.2024.
ii. RDSO letter no. MC/LHB/Brake dated 21.05.2024.

Vide letter under reference (i) above, Railway Board has issued the list of items/modifications to be included in list of NTXR rejectable items. One of the items in the list was as under:


S. No.	Description	Reference letter	Defect
8	Revised wiring scheme for WSP system of LHB Coaches.	MC/LHB/Brake dated 27.02.2019	Rejectable w.e.f 01 Aug 2024.

In context of this item, RDSO has issued instructions vide letter under reference (ii) above for standardized layout & mounting arrangement of WSP junction box.

In view of the above, the following actions have to be taken:

- At open line:** All Zonal Railways are advised to ensure that the fitment of Modified WSP junction box in open line should be as per latest RDSO instructions under reference (ii) above, with immediate effect.
- At Workshops:** Following to be NTXR reject-able defects :
 - Fitment of WSP junction box as per latest RDSO guidelines will be rejectable defect with effect from 1/8/24.
 - In LHB coaches where junction box modification has already been done (at open line or at Workshop), the layout and mounting arrangement to be as per RDSO instructions under reference (ii) with immediate effect.
- At PUs:** All PUs are advised to ensure that fitment of WSP junction box is carried out as per standardized arrangement issued vide RDSO letter under reference (ii) above with immediate effect.

The above issues with the approval of Competent Authority.


(प्रांजल मिश्रा)
संयुक्त निदेशक/ यांत्रिक इंजी. कोचिंग-II
रेलवे बोर्ड
07/06/24.

Copy: PCMEs/All ZRs & PUs- for kind information and necessary action please.

Director/NCO - for kind information & necessary action pls.