

**Government of India
Ministry of Railways
Research, Designs & Standards Organisation
Manak Nagar, Lucknow - 226 011**

No. EL/3.2.5

Dated 15.5.1997

SPECIAL MAINTENANCE INSTRUCTIONS NO.ELRS/SMI/186

1. Title :

Bonded rubber sandwich mounting for nose suspension of Traction Motors.

2. Application :

All Electric Locomotives fitted with Traction Motors type TAO-659/HS-1050 Er/HS 15250A.

3. Object :

Railways have reported few cases of premature failure of nose suspension bonded rubber sandwich mounting of Traction Motors. The premature failures of bonded rubber sandwich mounting of Traction Motors are due to :

- Non maintenance of specified clearance between Traction Motor lugs and bogie frame lugs.
- Less overall height of nose suspension unit
- Failure of bond between rubber and metal parts
- Mis-alignment of upper and lower metallic plates.
- Tearing of rubber blocks.

The multiple bonded sandwich units absorb the shocks resulting due to change of tractive efforts and vibration of traction units while in service. Hence it is essential to verify the dimensions of sandwich assembly, gap between bogie transom brackets and Traction Motor nose gap whenever the Traction Motors are dismantled from bogie either for overhaul purpose or for attention of service engineering problems.

To overcome the above problems and also to improve the service performance of the Electric Locomotives, **this 'SMI' is issued and is to be followed as a guide line for maintaing the specified dimensions of bonded rubber sandwich assembly for the nose suspension of Traction Motors.**

4. Particulars of sandwich assembly :

<u>S.No.</u>	<u>Description</u>	<u>Specified dimension/limit(mm)</u>	
		<u>New</u>	<u>Serviceable</u>
4.1	Free height of sandwich unit	185 \pm 2	180
4.2	Top and bottom end plates having		

	10 mm thick Manganese steel liner	66 ± 1.0 (each)	65
4.3	Overall free assembled height of sandwich assembly :		
-	Nominal	317	-
-	Max.	321	310
-	Min.	315	-

lower Keep the element on flat surface and check the misalignment of upper and plates caused by permanent set of rubber as follows :

a) OFF Set off set of upper and lower metallic plates must not exceed 5 mm

b) Parallelism Difference in overall height of element on opposite sides must not exceed 3 mm.

5. Particulars of Traction Motors nose dimension between wearing plates :

New dimension $304.8 + 0.75 \text{ mm}$
- 0

Condemning dimension 310 mm

Replace wearing plates if dimensions between them measure 310 mm or more.

6. Particulars of dimension between bogie transom wearing plates :

New dimension $304.0 + 0$
- 0.75 mm

Condemning dimension 308 mm

Attend transom bracket wearing plate on priority if dimension between them exceed 308 mm, otherwise cracks start developing in transom bracket.

Note :

- i) The bonded rubber sandwich unit for nose suspension of Traction Motors used on BG Electric Locomotives should be as per Indian Railway Specification No.IRS R49-1975.
- ii) A cyclic check should be carried out to ascertain the dimensional suitability of sandwich unit.
- iii) Don't use the sandwich assembly if the overall free assembled height exceed the limit as per clause 4.3 above.
- iv) The maximum permanent set of 5 mm should be allowed in the rubber block unit, hence the serviceable limit for the complete sandwich assembly should be as per clause 4.1, 4.2, and 4.3 above.
- v) The material of liners of wearing plates of Traction Motor nose, bogie transom bracket and top & bottom end plate of sandwich assembly should be manganese steel as per JIS G4106 only and finished thickness should be 10 mm.
- vi) All the units which have completed one year of service should be tested for load deflection characteristics and value should as per GEL-1074(copy enclosed). Deflection of sandwich unit under different loads must be in between two curves.
- vii) The material of top/bottom end support plates of sandwich mounting assembly should be spring steel as per JIS G4801

7. Reference Drawing & Specification :

- i) Specification - IRS R 49-1975
- ii) Drawing - RDSO SKEL. - 4401 (copy enclosed)
- iii) Curve - GEL 1074 (copy enclosed)

**8. Periodicity of implementation :
AOH/IOH/POH**

9. **Agency of implementation :**

- i) All Production Unit
- ii) All Electric Loco sheds
- iii) All Repair/POH Shops

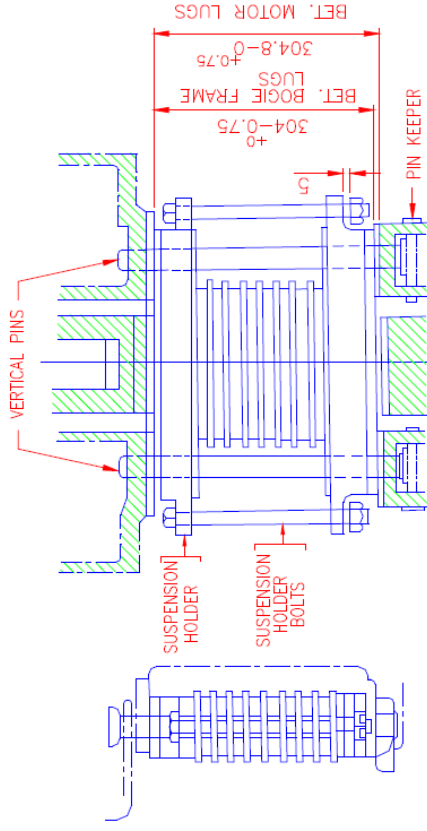
10. **Distribution :**

As per list enclosed.

Encl: As Above



(R.K. Kulshrestha)
for Director General (Elec.)

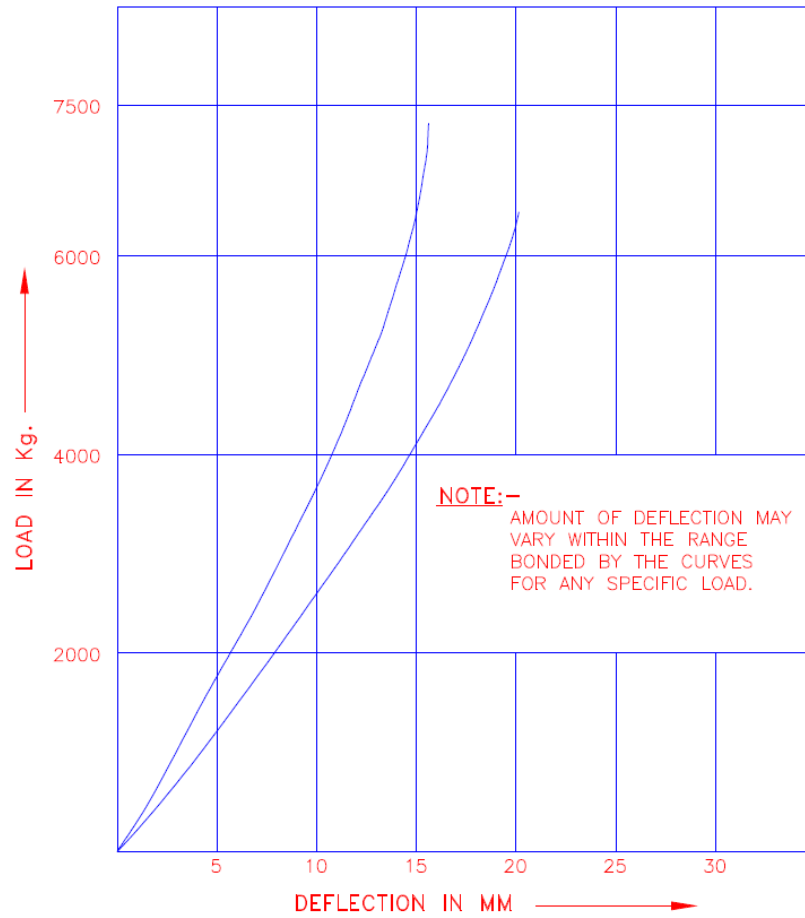


305 mm. NOSE SPACING

REF: SKDL : 2212	SCALE:- NTS	APPROVED	FOR DG
TRACTION MOTOR BONDED RUBBER SANDWICH MOUNTING ASSEMBLY.			
R.D.S.O. ELECT. DTE.		SKEL - 4401	

Dt 8.4.97
D S.CHANDRA
T H.N.S.
T DHILLON

GEL-1074



REF:-

SCALE:-

APP.BY.

BONDED SANDWICH MOUNTING
LOAD DEFLECTION CHARACTERISTICS

RDSO.ELEC.DTE.

GEL- 1074

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GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
RESEARCH DESIGNS & STANDARDS ORGANISATION.

No:EL/3.2.5

Manak Nagar, Lucknow – 226 011.

Dated : 5th 3.2001.

(Distribution as per enclosed list)

Amendment No.1

Sub : Amendment to RDSO's SMI No.ELRS/SMI/186 of May'97 for bonded rubber Sandwich Mounting for nose suspension of traction motors.
Ref : RDSO's SMI No.ELRS/SMI/186 dated 15.5.1997 circulated to all Railways vide this office letter of even no., dated 15.5.1997.

The following clauses and paras of the above referred SMI have been modified as follows :

I. Clause – 4

Particulars of Sandwich Assembly

Sl.No	Description	Specified Dimension/limit-mm	
		New	Serviceable
4.1	Free Height of sandwich unit	185 ± 2	180
4.2	Top and Bottom end plates having 6 mm thick Manganese Steel liner	65 (each)	64.5 (each)
4.3	Overall free assembled height of sandwich assembly - Nominal - Maximum - Minimum	315 317 313	- 309 - 208963

II **Note**

- (i) Follow IRS R 49 – 1975, Amendment – 1 & 2 in lieu of IRS R 49 – 1975.
- (v) Follow IS 276 – 1992, forth Rev., Amendment –1, Gr.1 in place of JIS G 4106.
Use 6 mm thick Manganese steel liner in lieu of 10 mm thick Manganese Steel liner.


DO NOT USE SPRING STEEL/STEEL FOR WEARING PLATE OF TRACTION MOTOR NOSE AS WELL AS FOR BOGIE NOSE WHERE NOSE SUSPENSION UNIT BUTT.

DO NOT USE SANDWICH UNIT HAVING FREE HEIGHT LESS THAN 180 MM.

III **Clause – 7 Reference Drawing & Specification**

SPECN – Follow IRS R49 – 1975, Amendment 1 & 2 in lieu of IRS R49 – 1975.

However, there is no other changes in the above referred SMI.


(R.K. Kulshrestha)
for Director General/Electrical

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be a
(copy)
for DG
5/3/2007

9 c

208964

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS RESEARCH DESIGN & STANDARD ORGANISATION
MANAK NAGAR, LUCKNOW – 226011

No. EL/3.2.172

Dated: 01.04.2014

(Distribution as per enclosed standard mailing list)

Sub: Amendment to RDSO SMI No. ELRS/SMI/No. 186 of May' 1997 for bonded rubber sandwich mounting for nose suspension of Traction Motors.

Ref: (i) RDSO SMI No. ELRS/SMI/No. 186 dtd 15.05.1997 circulated to all Railways vide RDSO letter No. EL/3.2.5 dtd 15.05.1997.

(ii) Amendment no.1 to RDSO SMI No. ELRS/SMI/No. 186 circulated to all Railways vide RDSO letter no. EL/3.2.5 dtd 05.03.2001.

The following clauses and paras of the above referred SMI and its amendment no. 1 have been modified as follows:

I. Clause – 4

SN	Description	Specified Dimension/Limit (mm)	Serviceable
		New	
4.1	Free Height of sandwich unit	185±2	180
4.2	Top and bottom end plates having 6mm thick Manganese Steel Liner	65 + 0.5 - 0 (each)	64.5 (each)
4.3	Overall free assembled height of sandwich assembly		
	- Nominal	315	-
	- Maximum	318	309
	- Minimum	312	-

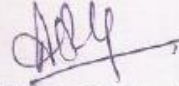
II. Note

- (i) Follow IRS R49 – 1975, Amendment -1& 2 with Drawing No. SK.DL – 2126, Alt '3'.
- (ii) Follow IS: 276 – 2000 (Vth Rev.) or latest revision.

III. Clause – 7 Reference Drawing & Specification

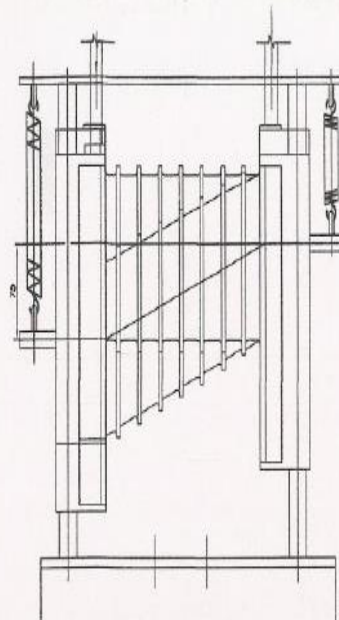
Specification – Follow IRS R49 – 1975, Amendment No. 1 & 2 with Drawing No. SK.DL – 2126, Alt '3'.

However, there are no other changes in the above referred SMI and its amendment no. 1.



(A. K. Rastogi)
for Director General/ Electrical

- Encl:** 1. Copy of drawing No. SK.DL – 2126, Alt '3'.
2. Standard Mailing list no. EL/M/0019 Version '3'.



③	6 DM X 8 GROOVES (OPTIONAL) MKS 6 DM X 8 GROOVES	12-1043	1/2" x 1/4"	SCALE-1:2	REF-NO.	FIRST ISSUE
④	NOTE NO. 6 ADDED	100-170	1/2" x 1/4"			SUPPLEMENT
⑤	DRAWING REVISED & REISSUED	100-100	1/2" x 1/4"			SUPPLEMENT
ALT. NO. OF REFNO.	DESCRIPTION	AT/REV	SGA DATE	INDIAN PLYS RCSO (VGE)	DRG. NO.	SK.DL-2126



भारत सरकार - रेल विभाग
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No. EL/3.2.172

Dated: 16.04.2014

Sub: Corrigendum of amendment no. 2 to RDSO SMI No. ELRS/SMI/No. 186 of May' 1997 for bonded rubber sandwich mounting for nose suspension of Traction Motors.

Ref: This office letter of even no. dtd 01.04.2014.

Vide letter under reference, **amendment no. 2** to RDSO SMI No. ELRS/SMI/No. 186 of May' 1997 for bonded rubber sandwich mounting for nose suspension of Traction Motors had been distributed in Indian Railway.

Due to some typographical error wrong parameter was mentioned in amendment no. 2. As such following corrections have been done in the amendment no. 2:

1. **SN 4.3 of clause no. 4 (page-1):** Minimum specified dimension/limit for overall free assembled height of new sandwich assembly may be read as 313mm in place of 312mm.
2. **Note – ii (page-2):** May be read as below:

Follow IS: 276 – 2000 (Vth Rev.) grade – 1 or latest revision.

(A. K. Rastogi)
for Director General/ Electrical

Encl: Standard Mailing list no. EL/M/0019 Version '3'.