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Government of India - Ministry of
Railways
Research, Designs & Standards
Organization, LUCKNOW - 226011

No. EL/3.2.13/6

Date: 8-12-2004

Modification Sheet No. ELRS/MS/0332/Rev '0' – Dec'2004

1.0 **Title:** Prevention of shifting of center pivot rubber bush and steel bush provided in worn out center pivot pin in WAG-7 locomotives.

2.0 **Object:**

CLW has manufactured 502 WAG-7 locomotives (27001 to 27502) with center pivot pin having uniform dia of 246 mm as per CLW's drawing no. 06/1/15/14. Railways had reported problem of longitudinal wear in center pivot pin in these locomotives. To overcome the above problem modification sheet no. ELRS/MS/0316 was issued by RDSO vide letter no. EL/3.2.13/6 dt 31/2-7/8-2002 for providing 5 mm steel sleeve on center pivot pin. Central Railway vide their letter no. L.253.AC.02 dt 30-8-2004 have reported the problem of shifting of wearable steel sleeve on machined center pivot pin.

Railways have also reported the problem of upward shifting of outer steel sleeve of imported center pivot rubber bush along with center block in the above locomotives (27001 to 27502).

To overcome the above problem this modification sheet is being issued. This modification sheet supercedes RDSO's modification sheet no. ELRS/MS/0316.

3.0 **Work to be carried out:**

3.1 **Rectification of worn out center pivot pin:**

3.1.1 The worn out center pivot pin having maximum ovality upto 4 mm radially can be rectified as follows (Refer Drawing no. SK.VL-294 for itemization)

- The worn out pivot pin (Item 1) should be machined in-situ to the diameter of 236 mm (+0.109/+0.080).
- A sleeve (item 11) should be manufactured from steel CL-3 as per IS-1875 and dimensions as shown in the drawing SKVL-294.
- The sleeve should be heated up to a temperature of 120°C in oil bath and shrunk fitted on the machined center pivot pin.

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3.1.2. Centre pivot rubber bush:

The Material specification and dimensions of center pivot rubber bush shall conform to RDSO's drawing no. SK.VL-266.

3.2 Spacer of polyamide material:

A non-metallic spacer (item 12) of polyamide material conforming to the properties and dimension given in the drawing no. SKVL-294 is to be used between center block assembly and pivot pin to restrict the upward movement of center block assembly on the pin.

3.3 Assembly of center block and center pivot (reference drawing no. SK.VL-294):

3.3.1 The center block (item 3) should be assembled with rubber bush (item 2), the stopper top plate (item 5) screwed to the center block with screw hex head (item 10) and spring washer (item 9)

3.3.2 The spacer (item 12) and the assembled center block should be mounted on the center pivot pin and tightened with stopper bottom (item 4) using spring washer (item 7), screw hex head (item 8) and should be locked with locking wire (item 14) and locking plate (item 15). The locking plate shall be tack welded to the screws to prevent loosening of screws in service.

4.0 Application:

WAG-7 locomotives having no. 270001 to 27502.

5.0 Agency to implement:

All Electric Loco Sheds having above WAG-7 locomotives and POH shops.

6.0 References:

MP Directorate's Instruction Bulletin No. MP.IB.VL.01.08.04 dt 17-11-2004 and RDSO's drawing no. SKVL-294, SKVL-266.


(Ram Prakash)
for Director General Std/Elect

DA: SKVL-294 & SKVL-266

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TECHNICAL REQUIREMENTS

1. MATERIAL FOR INNER & OUTER SLEEVES: CAST STEEL TO IS:1030 Gr.280-520W OR SEAMLESS STEEL TUBE TO BS:6323.
2. METHOD OF MOULDING: INJECTION, MOULDING ONLY.
3. PROPERTIES OF RUBBER COMPOUND SHALL BE CHECKED AS PER IS:3400 AND SHALL CONFORM TO THE FOLLOWING:

- A. TYPE OF POLYMER: NATURAL RUBBER.
- B. PROPERTIES BEFORE AGEING:

Sl.	PROPERTIES	PERMISSIBLE VALUE
1.	TENSILE STRENGTH(kg/cm ²), Min.	180
2.	ELONGATION AT BREAK (%), Min.	450
3.	COMPRESSION SET (%) AT 70±1°C. FOR 24 +0/-2hrs., Max.	25

- C. PROPERTIES AFTER ACCELERATED AGEING:

AFTER AGEING AT 70±1°C IN AIR OVEN FOR 72 HOURS, THE PERMISSIBLE VARIATIONS GIVEN BELOW WITH REFERENCE TO PROPERTIES GIVEN AT 'B' SHALL NOT EXCEED THE FOLLOWING LIMITS:

Sl.	PROPERTIES	PERMISSIBLE VARIATION
1.	TENSILE STRENGTH(kg/cm ²)	± 23%
2.	HARDNESS (SHORE'A)	+7 UNITS -0
3.	ELONGATION AT BREAK	+10% -30%

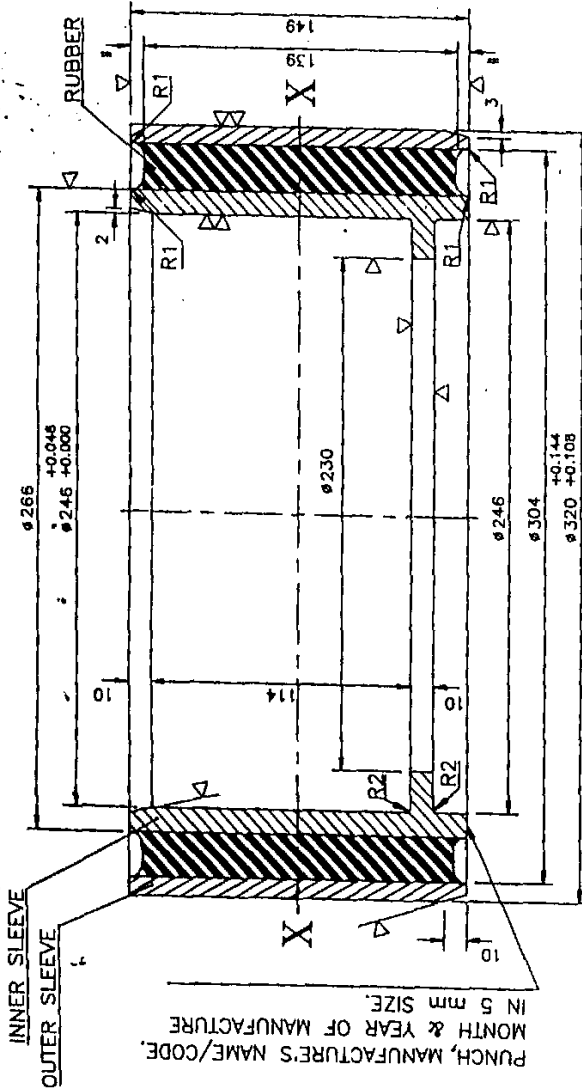
4. RUBBER TO BE BONDED BOTH WITH OUTER & INNER SLEEVES.

5. LOAD-DEFLECTION CHARACTERISTICS:

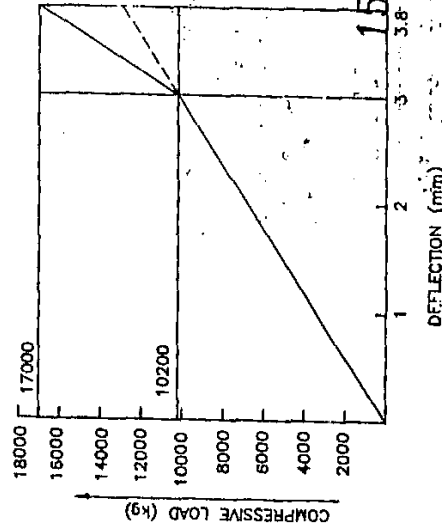
- i) COMPRESSIVE LOAD-DEFLECTION TEST (X-X DIRECTION):
-THE DIFFERENCE OF DEFLECTIONS AT COMPRESSIVE LOADS OF 8500kg AND 2000kg SHOULD BE WITHIN 1.9mm TO 2mm.
-THE BUSH SHALL BE TESTED UP TO A MAXIMUM COMPRESSIVE LOAD OF 17000kg.
- ii) TORSIONAL TEST:
-THE BUSH SHALL BE TESTED IN TORSIONAL MODE FOR 5° ROTATION IN CLOCKWISE AS WELL AS ANTI CLOCKWISE DIRECTION FROM MEAN POSITION.

AFTER THE ABOVE TESTS, THE RUBBER BUSH SHALL NOT HAVE ANY CRACKS IN RUBBER OR BOND FAILURE.

6. FOR PROCEDURE OF INSPECTION, TESTING AND QUALITY CONTROL, REFER TO RDSO'S INSPECTION PLAN NO. IP/MP(VDG)/BUSH/002 (REV. LATEST).



PUNCH, MANUFACTURER'S NAME/CODE, MONTH & YEAR OF MANUFACTURE, IN 5 mm SIZE.



CHARACTERISTICS DIAGRAM ON X-X DIRECTION

2	50
3	25
4	6.3
5	0.8
6	0.1

SURFACE ROUGHNESS TO IS:3073
WELDING SYMBOLS TO IS:813
TOLERANCES ON UNDIMENSIONED SYMBOLS TO IS:2102 (MEDIAN) ALL DIMENSIONS ARE IN (mm)

REF. LR. NO.	DESCRIPTION	NO. OF SHEETS	MATL. SPEC.
APPLICABLE FOR: TDCAL, REF.1, WAG7, TFCAL & WAG1.	RUBBER BUSH		
SOLE: 1-2	REF: - DRG. NO. WAG2-79	FIRST ISSUED	SUPERSEDES
INDIAN RLYS. DRG. NO. SK.VI-266	NO. OF SHEETS	SUPERSEDED BY	

ALT. PAGES	NO.	DESCRIPTION	DATE

DRAWING VALID
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