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## SPECIAL MAINTENANCE INSTRUCTION NO. RDSO/2011/EL/SMI/0270(Rev '0')

1. **Title:** Special Maintenance Instruction for Axial Wear of serviceable Spheriblocs used in WAP5/WAP7/WAG9 Locomotives

2. **Brief History:**
Healthy spheriblocs are mandatory for trouble free working of gear cases in WAP5 locomotives, traction motors and Torque transmitting system in WAP5/WAP7/WAG9 locomotives. In order to use these spheriblocs, leading to repeated pressing in and out causes unnecessary wear, results in improper interference fit between the spheriblocs and the eyes on the support arms of traction motor, gear case and guide rods. Such unhealthy spheriblocs cause higher vibration in gearcases & traction motors and unsatisfactory torque transmission. Railways have reported falling of traction motors in WAG9 locomotive & gear cases in WAP5 locomotives due to breakage of support lugs, which are potential accident hazards. Merely checking spheriblocs visually doesn't help in eliminating unhealthy spheriblocs .Manufacturer of the spheriblocs has set a limit for maximum axial wear , beyond which a spheriblocs can't be re-used .In order to decide the health of spheriblocs, it is required to measure their axial wears besides carrying out regular visual inspection as recommended in Maintenance & Repair Manual.

Sheds may not be having proper facilities for measurement of axle wear on spheriblocs and there is possibility of using spheriblocs having more than specified value of axial wear. This is a safety item which support various vital components in the bogies .Hence It is mandatory for check the soundness of spheriblocs. Sheds shall create facility for measurement of axle wear of spheriblocs, if not available and must measure axle wear before re-using the spheriblocs.
Moreover , Railway Board vide letter no. 2008/Elect.(TRS)/440/6/3-PH/FA Pt , dated 26.09.2011 ,while approving short term and long term measures to prevent breakage of lugs of the gear case on the basis of report of committee nominated by Board comprising

Director(Elect)/RDSO(Convener), Dy.CEE(Design/CLW and Sr.DEE(TRS)/GZB for addressing the problem of gear case crack in WAP5 locomotives has approved one of the short term measures , which is reproduced as under :

"Creating of facility for measurement of axial wear of spheribloc before re-using them as per Maintenance Manual. RDSO shall issue a SMI for procedure & facility required to measure the axial wear separately."

3. **Object:** Objective of this SMI to ensure measurement of axial wear in Spheriblocs before its re-use.

4. **Procedure:** While overhauling, spheriblocs are to be taken out from support arms/guide rods as per respective Maintenance & Repair Manual. Before carrying out measurement of axial wear of spheriblocs , following inspections are recommended:

4.1. Check the spheribloc collar for the formation of cracks, pitting or damage and replace if necessary

4.2. Look for scratches or gouge marks around the circumference of the collar may indicate rotation of spheriblocs. Discard the spheriblocs if there is sign of rotation.

4.3. Inspect the traction motor support arm carefully and check for damage

4.4. Inspect the rubber area of spheribloc for tears, cracks or evidence of disintegration. Replace the spheribloc if worn or the rubber is getting detached from the collar or is loose and ragged.

4.5. No damage is permissible to the collar or rubber portion of spheriblocs.

4.6. Measure the outside diameter of the spheriblocs, which should be in according to Table A ( for WAP7/WAG9 Locomotives) and Table B ( for WAP5 locomotives):

| **Table A: For WAP7 / WAG9 Locomotives** | | | | |
|---|---|---|---|---|
| **S. No.** | **Position of Spheribloc** | **ABB Drg no.** | **Dimension** | **Axial wear** |
| 1. | Axle Guide Rod | IA016-00005,Rev.3 | 110.144--110.198 | **< 0.6 mm** |
| 2. | Traction Motor Support arm | | | |

| **Table B: For WAP5 Locomotives** | | | | |
|---|---|---|---|---|
| **S. No.** | **Position of Spheribloc** | **ABB Drg no.** | **Dimension** | **Axial wear** |
| 1. | Gear Case | IA016-00005,Rev.3 | 110.144--110.198 | **< 0.6 mm** |
| 2. | Traction Motor support arm | IA016-00003,Rev.1 | | |
| 3. | Axle Guide Rod | IA016-00269,Rev.3 | 90.144—90.198 | |

**4.7. Measurement of Axial Wear :**

If none of the above defects are observed and spheriblocs pass above visual inspection prepare the spheriblocs for axial wear test.

4.7.1. Before measuring axial wear of the spheribloc, remove it from the bogie and store for 48 hours for normalisation.

4.7.2. Position the Spheriblocs in a press and support the collar on a piece of steel tube "A" as shown in fig.1. Ensure there is sufficient space within the steel tube "A" to allow clearance of the rubber part of the Spheribloc. The collar of the Spheribloc must be supported around its entire perimeter with steel tube "A" while conducting the test.

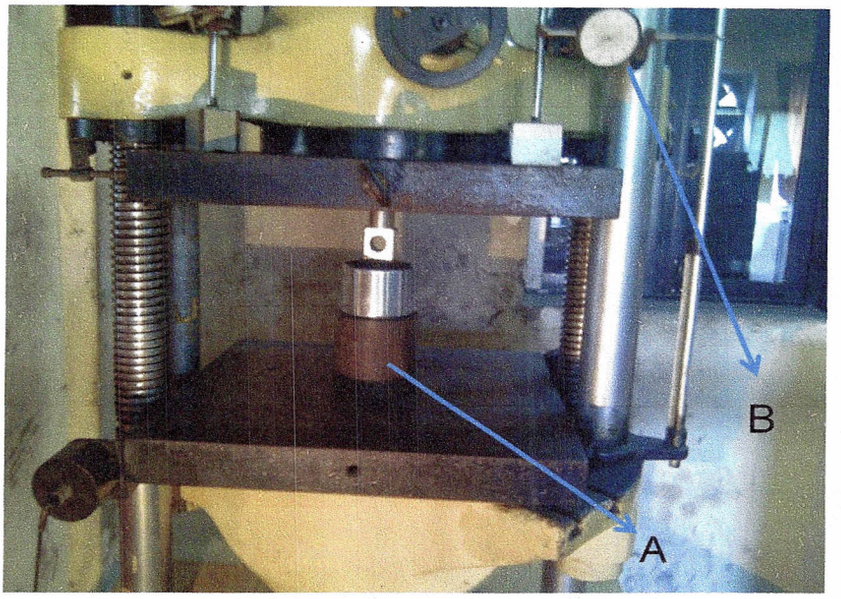


Fig 1

4.7.3. Apply an axial load of 50 kg to the Spheribloc cross-pin .Position the plunger of the dial indicator/gauge as shown in fig. 1, so that it can measure axial movement of cross pin of spheribloc. Now, set the dial indicator to zero.

4.7.4. Increase the load on the cross-pin to 1,500 kg, once only, then decrease the load to 50 kg and maintain for one minute.

4.7.5. Check the reading on the dial indicator. If the reading is within the specified diameter and wear limits as specified in Table A and B, turn over the Spheribloc and repeat the procedure on the other side. If the reading still remains within the tolerance the Spheribloc is serviceable. If either reading is not within tolerance, replace the Spheribloc.

4.7.6. Maximum axial travel of spheribloc must be less than 0.6 mm.

5. **Application to class of Locomotives:** WAP5/WAP7/WAG9
6. **Agency of Implementation:-** All Sheds holding WAP5/WAP7/WAG9 Locomotives
7. **Periodicity of Implementation:** Every overhauling schedules

**(GANESH)**
**for Director General/Electrical**

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