GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
RESERCH DESIGNS & STANDARDS ORGANISATION
MANAK NAGAR, LUCKNOW – 226011

No.SV.IB Dt: 31.01.2012

INSTRUCTION BULLETIN No. MP.IB.VL. 01.02.12 (Rev.00)

1. TITLE

Instructions to arrest loosening/ failures of primary damper mounting bolts and damper bracket bolts fitted in WDG4 and WDP4 series locomotives.

2. BACKGROUND

There are six vertical hydraulic dampers in the primary stage between axle box and bogie frame in WDG4/WDP4 locomotives. The primary vertical hydraulic dampers are secured by two mounting brackets i.e. upper damper brackets and lower damper brackets. The upper damper brackets is fixed with bogie frame by three hexagonal bolts (bolt size 5/8''), while the lower damper bracket is fixed with bearing adopter with the help of four hexagonal bolts (bolt size 3/4''). These bolts / fasteners are subjected to severe vibrations and dynamic loadings in service. Cases of their loosening/ failures have been reported on these locomotives by various Zonal Railways.

3. OBJECT

This IB is intended to overcome the problem of failures of hydraulic damper mounting bolts & damper bracket bolts during service.

4. DETAILS OF STUDY/ EXPERIMENTATION DONE

RDSO had earlier circulated an Instruction Bulletin No. MP.IB.VL – 03.19.09 (Rev.00) dated: 25.03.2009 for design modification of lower bracket for primary dampers of WDG4 & WDP4 locomotives to prevent their failures by ensuring proper installation height of primary damper. With this, although cases of failure of lower damper brackets reduced, but failures due to breakage of primary damper bracket bolts and mounting bolts continued to be reported. A study of the problems associated with failures of damper mounting bolts and damper bracket bolts of WDG4/WDP4 locomotives was done at BGKT, AMV, Pune and TKD sheds. It was noticed that in many locomotives, lower damper bracket has not been modified .In some cases modification has been done to maintain the desired installation height, but not as per Instruction Bulletin No. MP.IB.VL – 03.19.09 (Rev.00) dated: 25.03.2009.However it was observed that breakage of primary damper upper bracket bolts and mounting bolts is occurring even in the locomotives in which lower damper brackets have been modified.

The maintenance practice of sheds was also studied with regard to tightening of damper bracket bolts and damper mounting bolts with reference to Para 5.3 of the Maintenance Instruction MI.1517, issued by M/s EMD,which stipulates certain torque values for damper mounting bolts (115 ft-lb), upper damper bracket bolts (115 ft-lb) and lower damper bracket bolts (115 ft-lb). It has been the general experience that despite applying the recommended torque for tightening on damper bracket bolts, they become loose in service. Some diesel sheds like AMV shed has started applying 140 ft-lb torque in the damper upper bracket and mounting bolts, and 210 ft-lb for lower bracket bolts, and results for the last two years has been encouraging, with no bolt failure. FEM analysis to understand the effect of looseness of upper bracket bolts revealed that the upper bracket is very vulnerable and is likely to break, in case of looseness of upper bracket bolts. Because of the space constraint in that region, the upper bracket is

designed with three bolts as against 4 bolts of larger size in the lower bracket. So upper bracket bolts are more prone for failure.

To overcome this problem, it is necessary that proper attention is given to ensure appropriate quality and tightness of these bolts.

5. APPLICATIONS TO CLASS OF LOCOMOTIVES

All WDG4 & WDP4 class of locomotives

6. INSTRUCTIONS CONTENT

a. RDSO Instruction Bulletin No. MP.IB.VL – 03.19.09 (Rev.00) of Dated: 25.03.2009 should be implemented to ensure proper installation height of primary dampers.
b. Quality of bolts must be ensured. The bolt material must be as per the relevant drawing (GM280-M has been specified in the drawing) with minimum tensile strength of about 800N/sq mm.GM280M is equivalent to SAE grade 5 (Medium Carbon H.T.Steel).
c. 25 ft. lbs torque should be applied initially on upper as well as lower damper bracket bolts at the time of fitment for fixing , and thereafter upper damper brackets bolts and lower damper brackets bolts should be tightened with torque values of 140 ft. lbs and 210 ft. lbs respectively. For damper mounting bolts the torque value should be 140 ft. Lbs.
d. A pair of Disc-lock /Inter-lock washer (5/8" size for upper damper brackets and damper mounting bolts & 3/4 inch size for lower damper bracket) should be used in place of special washer .In this regard, reference should be made to instruction bulletin no. MP.I.B.VL-18.82.09 (Rev.00) dated: 27.11.2009. Both the disc lock/Interlock washers in each pair should be applied such that the sides with cams are matted together.
e. The performance of the damper bracket bolts should be monitored, before as well as after implementation of this I.B., and feed back to RDSO should be given in the attached format.

7. AGENCY FOR IMPLEMENTATION

Maintenance Sheds, Workshops & PUs

8. DISTRIBUTION

As per enclosed list.

(N.K. Barnawal)
Director / MP (Vehicle)
For Director General / MP

PROFORMA FOR FEEDBACK OF PRIMARY DAMPER MOUNTING BOLTS AND DAMPER BRACKET BOLTS FITTED IN WDG4 AND WDP4 SERIES LOCOMOTIVES

Railway …….. Date ……

| S. No. | Loco No./ Type | Shed | Commissioning Date / Fitment Date | Date of failure | Location | Failure of mounting bolt/ upper bkt. bolt/ lower bkt. bolt | Installation height of the primary damper | Nature of failure of the bolt | Make of the bolt | Whether fitted with disc lock/ interlock washer | Remark |
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