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New Delhi, dated 20.06.2018

Principal Chief Mechanical Engineers
All Indian Railways except SCR

Sub: Innovations and system improvements in IR

SCR through MCDO for the month of May, 2018 has informed about the following innovations/system improvements on the freight side:

- **Workshops:** Computerized BMBS Cylinder Test Bench by WWS/Rayanapadu
- **C&W:** Gadget for removing head from ATL (Automatic Lock) assembly
- **Gadget for changing defective PU pads on train**

The same is enclosed for your kind information.

DA: As above

(Vivek Mohan)
Dir. Mech. Engg (Frt.)
Railway Board

Copy to: PCME/SCR- for kind information
5.0 INNOVATIONS:

A. WORKSHOPS:

COMPUTERIZED BMBS CYLINDER TEST BENCH by WWS/Raynapadu

Wagons fitted with Bogie mounted brake system (BMBS) are increasing gradually day by day and almost all the new fleet are being received with BMBS. After overhauling of the 10” BMBS cylinder they have to be tested for leakages, strength and functioning of slack adjuster to ensure its working before assembling on to the Bogies.

To ensure accuracy in testing of BMBS cylinders, shop has developed a Computerized BMBS cylinder Test Bench. Shop has procured important components such as Solenoid valves, Laser distance measuring instrument, Pressure transmitters, required pipe fittings, ram extraction cylinder, Computer, etc. The necessary software and panel board were supplied by the agency. The test bench was fabricated in house and complete fittings were assembled and commissioned by the agency. This test bench is having feature of automatic data logging and reports can be retrieved and print out can be taken as and when required. Approx. Rs. 7.5 Lakhs.

BMBS cylinders are to be tested for leakage test at 0.7 Kg/Cm² and 3.8 Kg/Cm². The overhauled cylinder is fitted on to the test bench and compressed air supply connection is given. MR pressure and BP pressures are ensured to the prescribed values. The following two stage tests are conducted on each BMBS cylinder:

(i) Low pressure leakage and piston indication test

By clicking on the “start” tab, the solenoid valves are opened and initially 0.7 Kg/Cm² pressure is allowed in to the brake cylinder and ram extends completely, indicator comes out and both red colour and un painted portion of the indicator appears. The Slack adjustment is ensured to be 500±1.6 mm. After air enters into Brake cylinder at 0.7 Kg/Cm², timer starts from 0 and reaches up to 120 seconds. If pressure drop is noticed, “Fail” result is displayed. Accordingly leakage is checked by applying the soap water at all the joints and leakage is rectified and ensured the test result as “Pass”.

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Similarly test is progressed further for 10 min. if pressure drop is noticed more than 0.03 Kg/Cm², checked for location of leakage and arrested and again tested for 10min. The ram is retracted back in to BMBS cylinder by applying air pressure in to an auxiliary pneumatic cylinder which is kept opposite to the BMBS brake cylinder arrangement.

(ii) High pressure leakage and piston indication test

By clicking on the “start” tab the solenoid valves are opened and 3.8 Kg/Cm² pressure is allowed in to the brake cylinder and ram extends completely, indicator comes out up to only red colour portion of the indicator is appears. After compressed air enters into Brake cylinder at 3.8 Kg/Cm², timer starts from 0 reaches up to 120 seconds and if pressure drop is noticed, “Fail” result is displayed. Accordingly leakage is checked by applying the soap water at all the joints and rectified and ensured the test result as “Pass”. Similarly test is progressed further for 10 min and no pressure drop is allowed, checked for location of leakage and arrested and again tested for 10min. The ram is retracted back in to BMBS cylinder.

Record of the each BMBS cylinder is saved by clicking the tab “Save Data”.

With this test bench, all the overhauled BMBS cylinders are tested and ensured its functioning before fitment to the bogies for reliability and test data is saved for future reference.

i. Photographs of the innovation:

[Images of Computerized BMBC test bench and Leakage testing]
B. CARRIAGE & WAGON:

1. Gadget for removing head from ATL (Automatic Lock) assembly: The retention spring inside ATL assembly (used to hold containers) get damaged frequently requiring their replacement on BLC wagons. The head has to be removed from ATL assembly to replace the defective spring. It is difficult task as ATL head gets jammed and needs hammering. A gadget has been developed by SNF depot for easy removal of head from ATL lock assembly without damage to the lock assembly.

2. Gadget for changing defective PU pads on train: Presently, replacement/attention to side bearers on train is being carried out with the help of jack to lift the body of wagon requiring 3 to 4 staff. A gadget has been developed by DKJ depot, by which the work can be done with the help of 2 staff.