EAST COAST RAILWAY

Office of the
Chief Safety Officer
Bhubaneshwar

No. ECoR/SFY/67/2024/ 228

Date 28.03.24

Safety Circular – 04/2024

Subject – Brake Binding in Coaching Stock

Recently, an increase in incidents of brake binding is observed in coaching trains over ECoR territory. It has been noticed that brake binding, in some of the cases, occurred within 40-50 km from the originating station or from the point of loco reversal. In this regard, following is being communicated for ensuring proper maintenance of coaching stock to avoid incidences of brake binding. Also, a brief trouble-shooting guide is provided for ready reference for C&W staff and LP/ALP/TMRs.

Brake Binding in Coaching Stock

Brake Binding can be defined as gripping of brake blocks/pads on the surface of wheels/disks, with excessive force, during brake application and subsequently sticking to it even when the brakes are released from the locomotive. Brake Binding damages the surface of wheels and can result into bearing failure. It may result into detachment of coaches and hence detention of trains and loss of punctuality.

Major causes of Brake Binding

1. Blockage in air brake system (pathway) in coaches.
2. Air leakage from air brake system (pathway) in coaches.
3. Transient malfunctioning of DV.
4. Overcharging of CR.
5. Poor maintenance practices like improper adjustment of brake gears, fitment of wrong type of Brake Blocks, fitting brake blocks of uneven thickness over same truss, etc.
6. Improper release of Hand Brakes.
7. Improper release of DVs during loco reversal.
8. Dirt and/or moisture captured in compressed air system (pathway).
9. Inadequate charging of pressure from locomotive.
10. Improper release of brake after application. Improper release of brakes and subsequent application may lead to brake binding.

Recommendations to Coaching Depots to avoid incidences of Brake Binding -

1. Air lines for SCTR and RTR should be fitted with Air Dryer with moisture and water trap. It should be checked for proper functioning at least once every three months.
2. Air Dryers installed in compressors in Pit Lines to be checked for proper functioning on monthly basis.
3. Reservoirs of compressors in Pit Line and Sick Line to be drained monthly.
4. Pressure Gauges of SCTR and RTR to be calibrated periodically.
5. All chokes provided in the test rigs to be checked monthly.
6. AR of all coaches to be drained out monthly.
7. Dirt Collector of coaches to be cleaned quarterly.
8. Piston Stroke of Brake Cylinder and clearance between brake blocks/pads and wheels/disk to be maintained as per specified standards.
9. It should be ensured during maintenance that leakages in FP & BP is rakes/coaches should not be more that prescribed values of 0.2 kg in one minute.
10. It should be ensured during maintenance that there are no leakages in PEAS.
11. Nylon Filters may be provided in entry point of PEAVs to avoid entry of dust.
12. Is should be ensured during maintenance that there are no leakages in DVs during charging, application and release.
13. DVs to be handle with utmost care.
14. DVs to be stored with all their ports covered and sealed.
15. DVs should be stored inside polythene packing.
16. Brake Release Wire/Handle to be fitted/replaced when found missing/damaged.
17. Staff to be instructed to ensure that CR is released before loco changing.

Recommendations to carriage repair workshops to avoid incidences of Brake Binding -

1. BP & FP Hose pipes should be tested with 10 kg/cm^2 pressure before fitting in the coaches at the time of POH/IOH.
2. Low Pressure Air Jet to be made available for cleaning debris and dirt on air brake system equipment and pipes.
3. Cut Off Angle Cock should be overhauled in the coaches during POH.
4. Filter of Centrifugal Dirt Collector should be changed at every IOH and POH.
5. BMBC to be properly align on bogie frame.
6. Pressure gauges provided in test rigs to be checked and calibrated periodically.
7. All chokes provided in the test rigs to be checked monthly.
8. Air lines for SCTR should be fitted with Air Dryer with moisture and water trap. It should be checked for proper functioning at least once every three months.
9. Reservoirs of compressors to be drained periodically.
10. Seals, gaskets, rubber washers and other rubber items used for air brake system repair to be stored as per specified storage conditions.
11. FIFO system to be used for consumption of rubber items.
12. DV Repair Section of the shop to be made dust free.
13. Specified grease shall be used for DV overhauling.

14. Specified tool in sufficient numbers to be provided for maintenance of DVs.
15. DV cleaning and dismantling area has to be separated from the final assembly and testing area.
16. Waxing of DVs is to be ensured.
17. Locking arrangement may be provided in DVs to save their accidental isolation from external factors like hitting by flying ballast, CRO, etc.
18. DVs to be handle with utmost care.
19. DVs to be stored with all their ports covered and sealed.
20. DVs should be stored inside polythene packing.
21. Testing of DVs can be computerised.
22. All new DVs supplied by firms to be checked.

Recommendations to CLIs & LP/ALPs to avoid incidences of Brake Binding -

1. CLIs to counsel attached LP/APLs about proper brake application and release.
2. MR to be charged up to the appropriate pressure at the time of loco reversal/change.
3. Brakes are to be released properly after each application. Improper release and subsequent application of brakes may lead to brake binding.

Steps for trouble-shooting of enroute Brake Binding (Conventional Air Brake Coaches)

1. Pull the Quick Release Lever of DV.
2. Isolate FP & BP branch pipes and drain the AR. Isolate DV by lifting Isolating Handle and again pull the release lever of DV. Check if the brakes are released by shaking the Brake Blocks. If the brakes are release, close the Isolation Cocks of both Brake Cylinders and release the train. If not, follow step 3.
3. If Brake Blocks are gripping on the wheels in one bogie, then close the Isolation Cock of the Brake Cylinder and rotate the Slack Adjuster of the affected bogie in anti-clockwise direction while facing the bogie. Check if the brakes are released by shaking the Brake Blocks. If not, follow step 4.
4. In case the Brake Blocks are still gripping on the wheels in one bogie, then remove the Slack Adjuster Pull Rod Pin of the affected bogie and secure it. Check that the brakes are released by shaking the Brake Blocks and allow the train to run.

Steps for trouble-shooting of enroute Brake Binding (ICF BMBC Coaches)

1. Pull the Quick Release Lever of DV.
2. Isolate FP & BP branch pipes and drain the AR. Isolate DV by lifting Isolating Handle and again pull the release lever of DV. Check if the brakes are released by shaking the Brake Blocks. If the brakes are release, close the Isolation Cocks of both Brake Cylinders and release the train. If not, follow step 3.
3. If there are bents or crimps in flexible Pipe, straighten the pipe to allow pressure release from Brake Cylinder. Check if the brakes are released by shaking the

Brake Blocks. If the brakes are release, close the Isolation Cocks of both Brake Cylinders and release the train. If not, follow step 4.

4. If the Brakes Blocks are gripping on a particular pair of wheels, then close the isolation cock of the Brake Cylinder, then pull the latch of the Brake Cylinder and rotate the Resetting Plate in clockwise direction to release the brakes. Check if the brakes are released by shaking the Brake Blocks. If the brakes are release, close the Isolation Cocks of both Brake Cylinders and release the train. If not, follow step 5.
5. In case there is a problem in pulling the latch of the Brake Cylinder, remove the Brake Cylinder Piston Rod Pin. Check that the brakes are released by shaking the Brake Blocks and allow the train to run.

Steps for trouble-shooting of enroute Brake Binding (LHB Coaches with FIAT Trolley)

1. Pull the Quick Release Lever of DV.
2. Rotate the Isolation Cock, provided in Brake Panel, of the affected bogie by 90° in anti-clockwise direction to release and isolate the Brake Cylinders.
3. If brakes are released, brake indicators of the affected bogie will change colour to green. Check if the brakes are released by shaking the Brake Callipers. If the brakes are released, then allow the train to run. If not, follow step 4.
4. Loosen the hexagonal nut of the Brake Cylinder. Check that the brakes are released by shaking the Brake Callipers and allow the train to run.

Steps for trouble-shooting of enroute Brake Binding (LHB Coaches: If both the bogies are affected)

1. Pull the Quick Release Handle of DV.
2. If brakes are released, isolate DV by lifting handle upward and tying it with securing wire. Isolate FP connection to AR Isolating Cock, fitted in Brake Panel, and drain out the AR. Pull Quick Release Handle of DV again for releasing it. Check that the brakes are released by shaking the Brake Callipers and allow the train to run.
3. If brakes are not released after pulling the Quick Release Handle of DV, close the Isolating Cock of Brake Cylinders. If brakes are released, follow step 2. If not, open flexible pipes of the axles of bogies still having Brake Binding. Check that the brakes are released by shaking the Brake Callipers and allow the train to run.

Steps for trouble-shooting of enroute Brake Binding (LHB Coaches: If one bogie is affected)

1. Isolate the bogie from Isolating Cock.
2. If brakes are released, isolate DV by lifting handle upward and tying it with securing wire. Isolate FP connection to AR Isolating Cock, fitted in Brake Panel, and drain out the AR. Pull Quick Release Handle of DV again for releasing it.

Check that the brakes are released by shaking the Brake Callipers and allow the train to run.

3. If brakes are not released, loosened the nut of flexible pipes of the affected bogie and then isolate DV by lifting handle upward and tying it with securing wire. Isolate FP connection to AR Isolating Cock, fitted in Brake Panel, and drain out the AR. Pull Quick Release Handle of DV again for releasing it. Check that the brakes are released by shaking the Brake Callipers and allow the train to run.

Steps for trouble-shooting of enroute Brake Binding (LHB Coaches: If one axle of a bogie is affected)

1. Increase the slack between Brake Pad and Brake Disk by Slack Adjuster Nut on Brake Cylinder.
2. If brakes are released, isolate DV by lifting handle upward and tying it with securing wire. Isolate FP connection to AR Isolating Cock, fitted in Brake Panel, and drain out the AR. Pull Quick Release Handle of DV again for releasing it. Check that the brakes are released by shaking the Brake Callipers and allow the train to run.
3. If brakes are not released, crush the Brake Pads of the affected Calliper Unit and remove the Brake Calliper Pivot Pin. Isolate DV by lifting handle upward and tying it with securing wire. Isolate FP connection to AR Isolating Cock, fitted in Brake Panel, and drain out the AR. Pull Quick Release Handle of DV again for releasing it. Check that the brakes are released by shaking the Brake Callipers and allow the train to run.
4. If brakes are not released, then remove the Brake Calliper Unit from the bogie. Physically ensure for loosing of Calliper Unit and Brake Pads. Isolate DV by lifting handle upward and tying it with securing wire. Isolate FP connection to AR Isolating Cock, fitted in Brake Panel, and drain out the AR. Pull Quick Release Handle of DV again for release. Check that the brakes are released by shaking the Brake Callipers and allow the train to run.

(P. C. Sahu)
CSO/ECoR/BBS

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