CAUSE OF Wheel Shelling

(LHB coaches)

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Wheel Shelling

- Shelling can be identified by pieces of metal breaking out of the tread surface in several places more or less continuously around the rim.
- Shelling takes place when small pieces of metal break out between the fine thermal checks.
- These are generally associated with small skid marks or “chain sliding.”
- Such wheels should be withdrawn from service and sent to workshops for reprofiling.

Guidelines for wheel inspection in open line depots (Ref RDSO CMI-K003)

For this purpose, following shelling limits need to be followed.

1. Depth of shelling marks has reached to 1.5 mm.
2. Length of shelling marks has reached to 40 mm.
3. Depth of hollow tyre reached to 3 mm.
4. This limit of 3 mm is kept to study the effect of wheel shelling and service life of wheels.
5. The rejectable limit of hollow tyre will continue as more than 5 mm as specified in IRCA part IV.

Following major causes have been identified

For wheel shelling:

- Non-optimal choke sizes of Dump Valves.
- Obstructions in air-brake piping between dump valves and brake cylinders.
- Wrong / Loose electrical connections of WSP system.
- Jamming of Brake Calipers / Actuators.
- Poor design of Junction Box prone to dust/water ingress.

Item wise consolidated list of instructions issued by RDSO (2018-19):

1.Brake Cylinder Pressure

(Ref: RDSO letter no. MC/LHB/Brake dated 20.04.2018 to PCMEs All Zonal Rlys and PUs)

Zonal Railways / PUs should not resort to alteration in Brake Cylinder pressure of LHB Coaches from the specified value of 3.0+0.1kg/cm2 .

2.Dump Valve Chock Size

(Ref: RDSO letter no. MC/LHB/Brake dated 27.09.2018 to PCMEs All Zonal Rlys and PUs)

Dump valve chock size should be ensured as under.

Brake system Make/model	Exhaust chock size	Charging chock size
KBIL (Model MGS2)	Remove existing 7mm chock	Replace existing 5 mm chock with 9mm chock
FTRIL (Model SWKP AS20R)	Remove existing 9mm chock	Replace existing 6 mm chock with 9mm chock
Above modification should be ensured in all newly manufactured as well as existing LHB coaches		

3.Modification in air brake pipeline & associated fittings in LHB Coaches.

Ref: 1)RDSO letter no.MC/LHB/Brake dated 08.03.2019 to PCMEs/RCF,MCF,ICF

2)Presentation on wheel shelling by Bengaluru Division/SW Railway in 18th CMG

3) RDSO letter no.MC/LHB/Brake dated 12.04.2019 to PCMEs/All Zonal Rlys and Pus

1. Flexible Air Hose (600mm) for Bogie

During the field studies by RDSO at BCT/WR & SBC/SWR;

- Problems are observed with the existing hose results in restriction in smooth air flow in pipe line.
- Ultimately affects the performance of brake system which may leads to Wheel Shelling in case of wheel slip.

S.No.	Observations	Causes	Photographs
i.	***Less inner diameter***	Insufficient air flow passage	
ii.	***Washers***	The Nylon/Teflon washers provided inside the hose gets perished/shrink due to over tightening or during in service of the coach, which results in blockage of the air passage and thus to inoperativeness of brake cylinders.	
iii.	***More nos. of pipe joints/fittings***	Restriction in air flow & more chances of occurring leakages.	

To overcome above issues, RDSO has developed a standardized design of flexible hose

d. Details of standardized flexible hoses:

S.No.	DRAWING/PART NO.		
A.	M/s Knorr-Bremse	M/s Faiveley Transport	M/s Escorts
	Flexible Hose (650mm) – for body to bogie		
	KP0274893	FT0052512-001	1J112000031
B.	Flexible Hose (500mm) – for Brake Actuators		
	KP0313153	FT0052512-002	3EB9942

Note: *The upgraded flexible hose should only be procured from RDSO approved sources for Axle Mounted Disc Brake system to ensure quality of this critical item.*

The upgraded flexible air hose for bogie has following advantages:

Bigger Inner diameter: Sufficient air flow passage -The diameter of hose was increased from 9mm to 12mm.

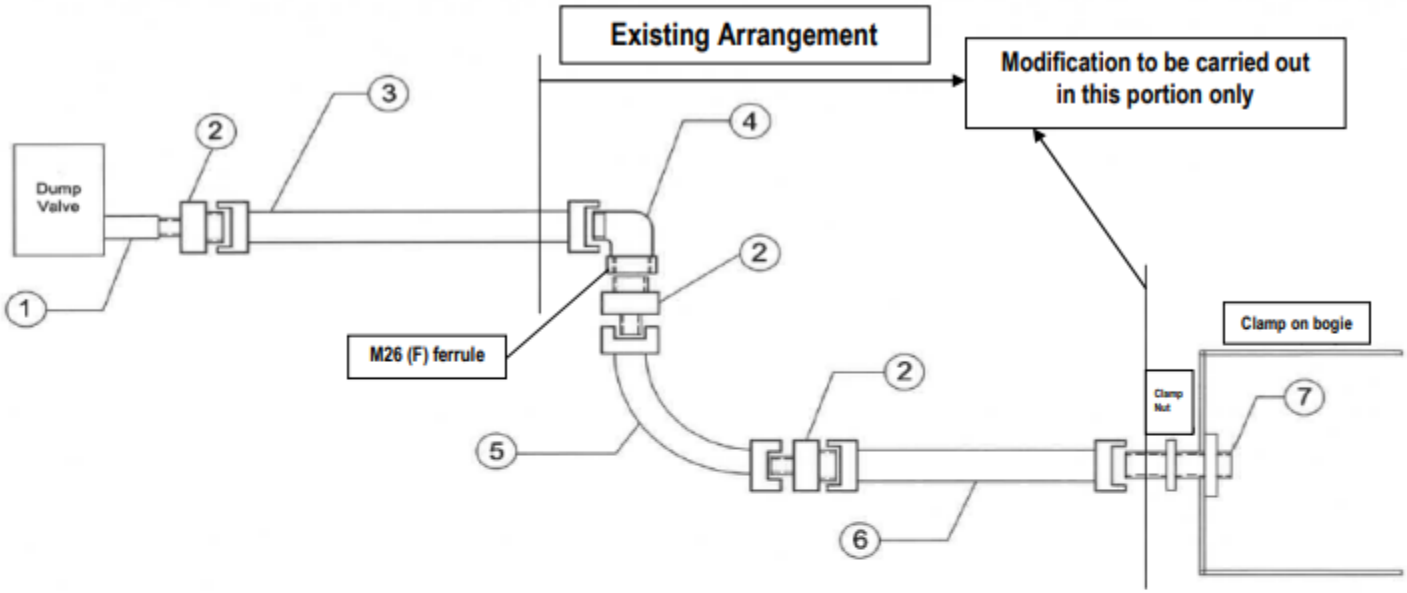
No washers: Avoids blocking of air passage and increase smooth operation of brakes- The new hose eliminates the use of washers and have ferrule arrangement at both ends.

Less pipe joints/fittings: Avoids air flow restriction & leakages- By the use of upgraded hose associated joints/fittings for air connections were reduced from 9 to 6nos.

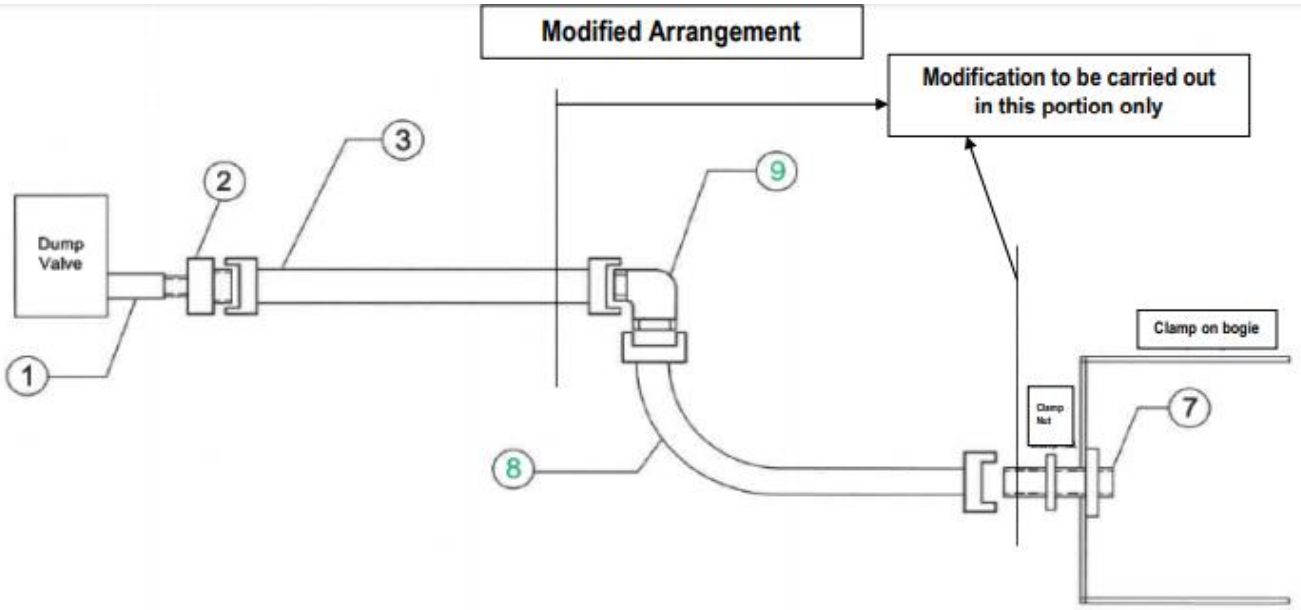
Increase in hose length: Avoids stretching & rupture- The length of upgraded hose was increased from 600 to 650mm, as in original Alstom design and also to avoid stretching & rupture of the hose.

Existing piping arrangement

Modified piping arrangement with reduced joints and modified hose



LEGEND		
S.No.	**Description**	**Quantity**
1.	Adopter	01
2.	Ferrule Stud ½" (M) X M26 (M)	03
3.	18 OD Pipe with M26 ferrule fittings	01
4.	Elbow M26 (M) X M26 (F) ferrule	01
5.	Hose ½" with ½" BSP (F) both sides	01
6.	18 OD Pipe with M26 ferrule fittings	01
7.	Stud M26 both sides	01
	Total Quantity	**09**



LEGEND			
S.No.	**Description**	**Quantity**	**Remarks**
1.	Adopter	01	--
2.	Ferrule Stud ½" (M) X M26 (M)	01	Quantity reduced from 3 nos. to 1 nos.
3.	18 OD Pipe with M26 ferrule fittings	01	--
4.	Elbow M26 (M) X M26 (F) ferrule	00	Replace with S.No.9
5.	Hose ½" with ½" BSP (F) both sides	00	Replace with S.No.8
6.	18 OD Pipe with M26 ferrule fittings	00	Eliminated
7.	Stud M26 both sides	01	--
8.	Hose 5/8" with M26 (F) both sides	01	To replace with S.No.5
9.	Elbow Male Connector M26 (M)	01	To replace with S.No.4
	Total Quantity	**06**	

Note: Items at S.No.4, 5 & 6 (in Red) to be deleted and at S.No.8 & 9 (in Green) to be added.

4.Self Lubricating Bushes for Brake calipers /Actuators

(Ref: RDSO letter no. MC/LHB/Brake dated 06.09.2018

1.Only Self lubricating bus.hes should be fitted in Brake calipers /Actuators.

2. Practice of oiling with self lubricating bushes needs to be stopped .

3. Due to use oil, the grease film of self lubricating bushes gets damaged and these bushes no longer function as designed.

4.Also dust gets accumulated in form of muck which may obstruct freeness of caliper and can affect brake releasing and application timing.

5.Ensuring Integrity of Electrical connections of WSP System and Free movement of Brake calipers

(Ref: RDSO letter no. MC/LHB/Brake dated 27.09.2018 to PCMEs All Zonal Rlys and PUs)

Integrity of Electrical connections of WSP System and Free movement of Brake calipers during Brake application/release is absolutely vital in reducing wheel shelling.

Any Questions !

Thank You