

## **SOUTH CENTRAL RAILWAY**

Safety.387/Fly Leaf/9/2013

### **Fly Leaf No. 9/2013**

#### **ATTENTION....**

#### **LOCO, OPERATING AND MECHANICAL OFFICIALS KNOW ABOUT **LHB** (**LINK HOFFMAN BOSCH**) COACHES**

#### **Salient Features:**

1. Fit to run upto 180 KMPH & upgradable to 200 KMPH
2. Superior riding comfort
3. Provided with 9 dampers
4. Bump stops in primary and secondary suspension
5. Rubber pads in primary and secondary suspension.
6. Bearing assembly with Anti skid device
7. Provided with disc brake system
8. Provided with wheel slide protection device(WSP)
9. Wheel Diameter New 915mm  
Condemn 845mm
10. Provided with 'H' type tight lock CBC
11. Provided with CDTS
12. Provided with graduated release air brake system.
13. IOH periodicity - 18 months or 6 lakh KMs whichever is earlier

#### **Major differences between LHB and ICF coaches:**

S. No.	Description	LHB	ICF
1	Track gauge	1676 mm	1676 mm
2	Speed	Max 160 kmph	Max. 130 kmph
3	Type of Bogie	EUROFIMA type FIAT bogie	ICF all coil
4	Length of car body	23540 mm	21770 mm
5	Length over Buffer	24000 mm	22297 mm
6	Distance between center pivots	14900 mm	14785 mm
7	Anti skid arrangement	Wheel Slip Protection (WSP) device provided	No such device provided
8	No. of Brake Cylinder/Coach	8	BMBC-4 VFMBC-2
9	Resetting arrangement after ACP	From inside the coach	From outside
10	Type of coupling	CBC	Screw coupling
11	<b>Tare weight:</b> 1 <sup>st</sup> AC 2 <sup>nd</sup> AC	43.4 t 44.6 t	53.5 t 52.5 t

	3 <sup>rd</sup> AC	45.6 t	44.9 t
	Pantry Car	40.9 t	43.5 t
	Power Car	53.4 t	58.2 t
<b>12</b>	<b>No. of berths</b>		
	1 <sup>st</sup> AC	24	18
	2 <sup>nd</sup> AC	52	46
	3 <sup>rd</sup> AC	72	64
	Chair Car (Executive)	56	46
	Chair Car (2 <sup>nd</sup> Class)	76	70
<b>13</b>	Toilet discharge system	CDTS (Control Discharge Toilet System)	Direct discharge
<b>14</b>	Water consumption in toilets	AICON/VIBHU -2.5 Ltrs for Indian style & 1.5/2 Ltrs for European style	No limit
<b>15</b>	Furnishing panel inside	GRP/FRP	Sunmica
<b>16</b>	Window glass	Wide exposure	Narrow exposure

### ACP resetting method:

PEASD (Passenger Emergency Alarm Signal Device) is provided inside the passenger compartment. There is no mechanical linkage chain. To stop the train, the PEASD is pulled and this handle directly operates the PEASD valve for venting the BP Pressure through **19mm choke**. It is designed to stop the train and not just warn the LP. Once ACP is done, a red light provided at the end of the coach and a red light provided near PEASD inside the cabin will glow to indicate the coach on which ACP is pulled.

After ACP, for resetting the PEASD, the resetting key is to be inserted on the projection available near the PEASD inside the coach from where the PEASD handle is pulled and key is to be rotated in the clock-wise direction. This will result in stopping of the venting of air from BP.

### Causes of brake binding and releasing method with special emphasis for disc brake provision:

- As a 1<sup>st</sup> step, pull quick release valve wire of DV, if brakes are released, a green indicator will appear; if not released, a red light indication will appear.
- If the brakes are not released, as a 2<sup>nd</sup> step, isolate the affected trolley by isolating cock of brake panel unit. In spite of this, if the brakes are not released;
- As a 3<sup>rd</sup> step, open flexible pipe of BC line of one / both the axles of one / both trolleys having brake binding, brakes will release.
- After step 1 or step 2 or step 3, isolate DV by lifting handle upwards, isolate FP connection to AR isolating cock fitted in brake module panel, drain out AR fully, pull quick release wire of DV again for release and finally, ensure physically that the brake pads of all wheels by shaking; and brake indicator is in 'green' position.

### Action in case of metallic pipe breakage:

#### Breakage of branch pipe of BP/FP & working out of angle cock:

1. Clamping arrangement of branch pipe needs to be removed.
2. Uncouple the branch pipe of affected BP/FP from the main BP/FP pipe line 'T' Joint by pressing the branch pipe towards outer side.
3. Provide the dummy plug of 'T' joint size.

4. After plugging the affected line, start the pressure from the spare branch pipe.
5. Check the leakage from the dummy of joint.
6. After attending, the entire branch pipes are to be clamped properly.

**Breakage BETWEEN main pipe line and brake panel:**

1. Provide main pipe line dummy (28 mm) on 'T' Joint.
2. Release the brake of coach.
3. Isolate the braking system.
4. Use the BP main pipe as passage to pass the pressure to next coach.

**Breakage of main pipe line:**

- Use the coach Bypass length pipe.
  - For BP - Directly use the bypass length pipe.
  - For FP - Use the pipe with BP/FP Palm end.
- Provide the bypass pipe from side of coach & tie the pipe at maximum location.

**Cattle run over (CRO):**

- Thorough examination of rake should be done one time & attend to the damages at the same location.
- The rake to be checked for air brake system, watering system, CDTS retention tank, footboard & brake panel for damages/leakages.

**Controlled Discharge Toilet System (CDTS)**

- LHB coaches are fitted with CDTS units to avoid soiling of track in station areas.
- It is designed to operate with pressurized water. The waste is removed from the toilet bowl and transferred to a retention tank.
- Simply pressing a flush button activates a flush cycle. Depressing the flush button starts the flow of water into the toilet bowl and opens the upper flapper valve connecting the toilet bowl to the waste retention tank. At the end of each flush cycle the wash water stops and the toilet is sealed off from the retention tank by the upper flapper valve.
- When the speed is above 30 KMPH and the no. of flushes is more than 5 the retention tank bottom discharge valve opens expelling the contents of the tank away from the railway stations. It remains close until the two parameters are again satisfied.

**Fail Safe Mode:**

It is provided with pushbutton type bypass valve to enable use of toilet in the event of air loss or loss of electricity. In such cases, the retention tank upper flapper valve will open to use the toilet by the passengers as an ordinary toilet.

**Wheel Slide Protection (WSP):**

In LHB coaches, air brake system with Disc brakes is used. During brake application, factors like variation of co-efficient of friction (due to composition of brake blocks and disc) and adhesion between rail and wheels which may cause difference in rotation of axles on the same coach. This may lead to wheel skidding/ flat tyres. To prevent this, a Wheel Slide Protection (WSP) device is provided in these coaches.

The equipment works on the principle of rotation of each axle is constantly measured and compared with a reference speed for that coach. (The rotation of the fastest axle of the coach). In case there is a variation in rotation among the axles, WSP automatically releases or

applies the brakes accordingly, so that the speeds of all the axles become uniform. The limit of variation of speed and acceleration are defined as threshold values. The Micro Computer constantly compares the signals from the speed sensor mounted on each axle with the reference speed. If the speed/ acceleration of any axle is crossing the present threshold values, it gives signal to the respective Rapid Discharge Valve to vary the BC pressure accordingly, thus maintaining the speed/acceleration within the threshold level

A micro-processor, speed sensor and rapid discharge valve (dump valve) is fitted to this component. The micro-processor gets input from speed sensors, compares with reference speed and gives output signal to Rapid Discharge Valve to open or close in case of variations. The speed sensor consisting of a fixed Magnetic Resistor (MR) and a Phonic Wheel (P) having 80 teeth, fitted on the axle. It gives tachometric pulse signal to Micro Computer due to variation in air gap (A and A +X) between the phonic wheel and the magnetic resistor.

Rapid discharge valve is an Electro-Pneumatic Valve which is connected in series with the Brake Cylinder (BC). It regulates the BC Pressure by disconnecting the DV from BC and also by connecting the BC with atmosphere when the output signal is received from Micro Computer.

**OPERATING INSTRUCTIONS OF AIR-SUSPENSION SYSTEM  
FITTED ON HYBRID COACHES (new DEMU RAKES,  
DURONTO, RAJDHANI, MMTS, etc.,)**

**IN CASE OF HEAVY LEAKAGE FROM ANY BOGIE OR COACH;**

- VISUALLY CHECK THE LEAKY / FAILED SPRING BY THE POSITION OF THE HORIZONTAL LEVEL.
- VISUALLY CHECK THE LEAKAGE AREA OF THE AIR SUSPENSION AND TAKE ACTION AS GIVEN BLEOW;
  1. IF LEAKAGE IS BETWEEN COACH SUSPENSION ISOLATING COCK AND BOGIE SUSPENSION ISOLATING COCK, THEN 'CLOSE' THE COACH SUSPENISON ISOLATING COCK.
  2. IF LEAKAGE IS FOUND BETWEEN BOGIE SUSPENSION ISOLATING COCK AND AIR-SPRING, THEN 'CLOSE' THE BOGIE SUSPENSION ISOLATING COCK.
  3. AFTER ISOLATING THE COACH / BOGIE AIR-SPRING, LIMIT THE SPEED OF THE TRAIN TO **60 KMPH**.

**CHIEF SAFETY OFFICER  
SAFETY ORGANISATION  
SOUTH CENTRAL RAILWAY**