LHB COACH



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HOW IT BENEFITS RAILWAY

<u>A LONGER COACH</u>

- LHB coaches are approximately 2meters longer than the conventional ICF type coaches.
- This means "more travel space" "increased seating capacity", "wider bays and doorways" etc.

A LIGHTER COACH

Per meter length, weight of LHB coach is approximately "10%" lesser than the conventional coach.

This not only means lower haulage costs but also less wear and tear of the coaches and track.

<u>A HIGHER SPEED COACH</u>

- LHB coaches are designed to run at a maximum speed of 160 kmph.
- For speeds of 200 kmph, minor changes are required.

LESSER MAINTENANCE

- **\$ Use of superior materials with longer life.**
- **\$ Superior braking with WSP.**
- **\$ Bogie with less moving parts.**
- \$ Items of wear & tear shall not require replacement/renewal before 10lakh kms.

LESSER MAINTENANCE

\$ Use of stainless steel and less bogie moving parts shall reduce maintenance requirements.
\$ Entrance doors flush with side wall

allowing automatic car washing.

HOW IT BENEFITS THE PASSENGER

BETTER RIDE QUALITY

- Improved ride comfort ride index reduced from over 3.0 to 2.5 at a speed of 160 kmph.
- Plush interiors of international standards.
- Improved air-conditioning through better duct designing & humidity control.
- Bigger size sealed windows filled with "argon" gas for a panoramic view & heat insulation.

BETTER RIDE QUALITY

- Modular "oriental" & "western" style toilets with "cdts" & "Bio Toilets" to avoid soiling of station premises.
- Well equipped pantry with hot cases, deep freezer, bottle coolers etc.
- **Image: Flush type swiveling berth reading light.**
- Polycarbonate transparent centre tables.



- □ Safety of passengers is of paramount importance, so a number of precautionary measures have been adopted in LHB design coaches, like :-
- □ Four emergency exit windows for faster passenger evacuation during emergencies.
- □ Wider vestibule design for smooth inter coach movement.



- Convenient to operate emergency alarm pull operation and fire- retardant furnishing.
- □ Tight lock center buffer coupler makes coaches anti-climbing.
- **Crashworthiness.**

गाडी खड़ी करने के लिए संडिल खीचें

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उधित एव गर्याप्त कारण के बिना इंडिस्ट पुन्स्मे की राजा 1000 रामये तक जुर्माना और / या एत: **भिक्ष-येन्व ।

TO STOP TRAIN PULL HANDLE

PENALTY FOR USE WITHOUT REASONABLE AND SUFFICIENT CAUSE FINE UPTO Ra. 1090 AND / OR IMPRISONMENT INTO ONE YEAR



(Complete Assembly)



BOGIE FRAME

• Solid welded frame -steel sheets and forged, steel cast parts .

• Two side frames connected by two cross beams –support brake units. Various brackets on frame.

BOGIE FRAME

• The bogie frame rests on the primary suspension spring units and supports the vehicle body by means of a bolster beam.

• The bolster beam is connected to the bogie frame by secondary suspension.

BOGIE FRAME

1.-SIDE FRAME



- Primary suspension
- Two coil springs, one vertical damper, articulated control arm, elastic joints connecting the axle bearing to the bogie frame
- Better curve negotiation





(Wheel set with Primary springs removed)



(Bogie frame lifted)





DISC BRAKE SYSTEM

- Axle mounted disc brake.
- Two discs per axle of dia. 640 mm.
- Inbuilt slack adjuster in brake cylinders.
- 35 mm Brake pads.





SECONDARY SUSPENSION

- Nest of flexi-coil springs inner and outer, rubber spring and secondary pad
- Vertical dampers
- Lateral dampers
- Yaw dampers
- Anti-roll bar
- Anchor links

(With Secondary Spring System Exploded)



(Bolster removed)







LHB COACH MAINTENANCE SCHEDULES

Coaching Depot Schedule

- Schedule D1 : Every Trip/Weekly
- Schedule D2 : Monthly \pm 3 days
- Schedule D3 : Half Yearly \pm 15 days
- Shop Schedule
- Shop Schedule I : 18 months/ 6 lakh Kms whichever is earlier
- Shop Schedule II : 36 months/ 12 lakh Kms whichever is earlier
- Shop Schedule III : 72 months/ 24 lakh Kms whichever is earlier
- The details of activities to be carried out during these schedules are given below .

SCHEDULE D1 : TRIP/WEEKLY (on rake at nominated primary depot)

• 1. Coach

- Coach should be washed both from outside & inside.
- Disinfect and spray at corner and crevices of coaches after washing all coaches.

• 2 .Shell

- Visually check body panels/end walls for damages
- Visually inspect destination boards brackets.
- Visually inspect window bars for damage/missing
- Examine body side doors for working/ damages
- Inspect door handles for damages/missing
- Inspect vestibule and its Rubber fittings for damages/missing, repair if necessary
- Visually check vestibule fall plate, mounting brackets, pins and lock lever for ease of operation, damages/ deficiency

- 3. Bogie Frame and Bolster Assembly
- Perform a visual check on longitudinal beams, cross beams & bolster for cracks, damages and corrosion.
- Perform a visual check on brake supports, damper supports, traction center supports and anti roll bar.
- supports for cracks, damages and corrosion.
- Check bogie bolster sub assembly and brackets for cracks, damages and corrosion.

• 4. Brake Equipment

- Check functionality of brake equipment and Hand brake equipment.
- Perform a visual check on Brake cylinders/ brake levers and Hand brake equipment for damage, cracks and corrosion.
- Perform a functional test on pneumatic brake system. Make sure that no leaks are present.
- Perform a visual check on hoses.
- Visually inspect steel piping for cracks/ damages/ ballast hitting. Repair/ replace as necessary.

• 5. Axle Bearing Instruments

- Perform a visual check on all grounding cables & WSP equipment cables for breaks/ damages.
- Visually check equipment for absence of damages, cracks, and corrosion marks.
- Check functioning of WSP equipment.

• 6. Primary & Secondary Suspension

- Visually check springs for broken & damages,
- Visually check safety cables for damages, cracks and corrosion.

• 7. Primary/Secondary/Yaw dampers

- Perform a visual check on dampers for damage, cracks and oil leaks.
- Perform a visual check on all fixings for loosening and/or missing components.
- Perform a visual check on rubber elements for cracks and ageing.

• 8. Bearings

- Carry out bearing feeling for detection of hot bearing.
- Check Axle box for grease leakage.
- 9. Wheel & Axle
- Check axle for cracks and signs of corrosion .

• 10. Control Arm

- Perform a visual check on all fixings for loosening and / or missing components.
- Visually check control arm parts for damages, cracks or corrosion marks.
- Inspect the rubber joint until it is visible for, damages and ageing.

• 11. Anti Roll bar assembly

- Perform a visual check on Anti roll bar, links and Brackets for cracks, damages and corrosion.
- Visually inspect for grease oozing out of anti-roll bar bearings, which may result in bearing failure.
- Perform visual check on all fixing for loosening/missing fittings.

• 12. Traction Centre

- Perform a visual check on the traction center lever and on the rods for cracks, damages and corrosion.
- The assembly should be free to move, and not blocked by any foreign objects.
- Perform a visual check on all fixings for loosening.
- Perform a visual check on rubber joints for cracks/damages.

• 13. Rotation Limiter

• Perform a visual check of rotation limiter, components.

• 14. Draw & Buffing Gear -

- (Ref: CMI No: RDSO/2006/CG/CMI/01 Re v No: Nil)
- Visual Inspection of coupler head for damage.
- Checking of coupler operating mechanism for damage, loose, bolts etc.
- Greasing of glide rod of coupler operating mechanism.
- Checking tell tale recess for ensuring proper coupling.
- Inspection of coupler carriers/supporting device & its spring for cracks & breakage.
- Inspection of loose/broken/missing nuts & bolts (M-16) of coupler pin support plate & draft gear support plate.

- 15. Corridor Connections -
- Check corridor connections for external damage & foreign bodies.
- Check vestibule connection for external damage & foreign bodies.
- 16. Pressure Air Equipment
- Safety valve check for correct function.

• 17. Interior fitting passenger accommodation

- General visual check for damage .
- Check for regulation provision of rubbish bins & operational fire extinguishers.
- Check hand rails, sliding door, shutters, toilet doors, vestibule doors, functioning.
- Check bath room fitting (visual).
- Clean top & bottom guide rails of luggage doors of power cars & greasing of guide bearing.
- 1-leaf sliding door general function check (ease of movement, how it shuts).
- 2-leaf connection door general function check (ease of movement, how it shuts).

• 18. Passenger Doors

- General function checks (ease of movement)
- 19. Water supply system
- Check tanks pipes for leakage.
- Check tank mountings.

• 20. Pantry

- Check for damages & deficiencies in the pantry construction & fittings.
- Check water supply & drainage of the pantry area.

• 21. Sanitary Equipment

• Check functioning of toilet system.

SCHEDULE D2 : MONTHLY 30 ± 3 DAYS (On rake at nominated primary depot)

- 1. All items of Schedule D1
- 2. Coach
- Disinfect and spray insecticide at corner and crevices of coaches after washing all coaches.
 (AC & Pantry Car – 15 Days)
- Intensive cleaning of coach.
- 3. Bogie Frame and Bolster Assembly
- Wash the bogie frame thoroughly with water jet.

• 4. Brake Equipment

- Perform a visual check on brake discs.
- Check wear of brake pads/ brake discs.
- Lubricate the brake levers, fixings and all moving parts.

• 5. Axle Bearing Instruments

• Monthly / Quarterly inspection of WSP equipment to be carried out as per schedule given by OEM.

• 6. Wheel & Axle

- Perform a visual check on wheels for cracks.
- Check by wheel profile gauge .
- Check tread diameter and wear of wheel profile. If necessary, perform re-profiling.
- 7. Rubber and Rubber/Metal Bonded parts
- Perform a visual check on Rubber and Rubber -Metal bonded parts for cracks, damages and ageing.

• 8. Pins and bushes

• Lubricate all pins and Bushes.

• 9. Body works -

• General inspection of Vehicle body work (paint work, glazing).

• 10. Pressure Air Equipment

- Dry out air filter
- Clean air filter
- Clean airline filter

• 11. Interior fitting passenger accommodation

- Inspect seats & check for completeness.
- Inspect luggage racks & check for completeness.
- Check handrails manually for fitment of fixing.
- Inspect floors.
- Checks stick-on notices and directions for condition & completeness.

• 12. Passenger Doors

- Clean & lubricate door mechanisms.
- 13. Water supply system
- Rinsing the pipes & water tanks.

SCHEDULE D3 : HALF YEARLY 6 MONTHS \pm 15 DAYS (On rake at nominated primary depot)

- 1. All items of Schedule D2
- 2. Shell
- Thoroughly clean and remove dust, rust accumulated at pillars with coir brush and compressed air.
- Examine for corrosion of sole bar and other under frame members with torch light or inspection lamp.
- Touch up damaged paint both inside & outside.
- Check roof ventilator for damages.

• 3. Bogie Frame and Bolster Assembly

- Examine the bogie frame for corrosion / damages, especially at critical locations.
- Carry out paint touch up with high built epoxy primer and paint as per RCF specifications MDTS – 166.

• 4. Brake Equipment

• Verify that the clearance between each pad and disc surface is 1-1.5 mm.

• 5. Axle Bearing Instruments

- Inspect the Earthing equipment for wear of slip assembly / carbon bars.
- 6. Primary & Secondary Suspension
- Check miner pads for cracks, damages and ageing.
- 7. Wheel & Axle
- Check wheels offset on axle $(1600 \pm 1 \text{ mm})$

• 8. Anti Roll bar assembly

- Perform a visual check on rubber joints for cracks, damage and ageing.
- 9. Body works -
- Replenish supplies.
- 10. Passenger Doors
- Lubricate door seals with silicone paste.

