

DIRECTOR GENERAL BORDER ROADS
GENERAL MAINTENANCE INSTRUCTION NO 223
OF
ASHOK LEYLAND WATER TRUCK 9 KL CAPACITY

INTRODUCTION: - Ashok Leyland CG 1613 H 4330 MM (170.5") WB chassis fitted with Hino WO 6 DTI (BSII) diesel engine turbo charged, 6 cylinder, water cooled developing 132 Ps@ 2400 RPM, 24 V starting alternator, 5 speed synchromesh gear box power steering, exhaust brake spare wheel carrier and rim, and water tanker of 9 KL capacity with gravity spray with 7 Nos tyres 1000 X20 PR PP nylon, the regular servicing and maintenance are essential for optimal user of which to achieve maximum life for planning and timely repair to arrest defect from developing into major one; which is minimising the down time and production losses. This GMI covers the periodical maintenance and lubrication schedule of vehicles for regular maintenance to keep the vehicles in good mechanical condition.

AIM: - Instructions are issued as guidelines for schedule of preventive maintenance, lubrication of water truck manufacture by Ashok Leyland for regular attention to keep the vehicle in good mechanical condition and it must be strictly followed.

ACTION BY

USER UNIT: - To carry out periodic maintenance as laid down in this instruction and enter the all task/record in concerned log book of vehicles.

FIELD WORKSHOP

- (a) To check the maintenance, lubrication tasks are actually carried out by the user unit as per Log book record.
- (b) Advise user unit in respect of any discrepancies/shortcomings noticed.

DETAILS :-

- (i) Maintenance Instruction - Appendix 'A'
- (ii) Hints for driver - Appendix 'B'
- (iii) Technical data - Appendix 'C'
- (iv) Recommended lubricants - Appendix 'D'

(Hari Prakash)
SE (E&M) FS
Dir (Tech)
for Dir Gen Border Roads

Distribution
Normal

Maintenance Instruction

To get maximum service life from your vehicle, always make a habit to carry out simple check, periodic check, general check and maintenance of vehicles. These checks and inspections are carried out time to time will ensure minimum operating cost and maximum uptime of your vehicles:-

Check engine oil level top up if necessary.

Check coolant level top up if necessary.

Drain condensate from air tanks.

Check the vacuum indicator provide on the instrument panel for the appearance of red band.

Check water separator for collected water and drain if necessary. If water separator is not drained periodically, fuel contaminates with water enter the FIP and injectors effecting performance and damaging the fuel system.

Check tyre wear and pressure, if necessary inflate to the specified pressure

Check brakes

Check all light, warning indicators and wind screen wipers are in functioning condition.

Check oil level of steering gear box.

Check the battery electrolyte level, if necessary top up using distilled water at rest and cold.

Check the exhaust system visually, if exhaust is excessively smoky or engine is noisy refer vehicle to nearest workshop for necessary check up.

Periodically check and ensure that the radiator cowl is intact, and replace a defective thermostat or a missing header tank filler cap immediately as other wise the efficiency of cooling system would be affected and this will be damage the engine.

Check all gauges fitted on instrument pannel are proper functioning.

Check all lights and electric connections, if found loose light it properly.

Fill up diesel tank at the end of each working day to reduce water condensation in the tanks.

Disconnect the propeller shaft while towing the vehicle for the long distance.

Drain air tank once in a week to drain water and oil sediments from the system.

Disconnect alternator/battery electric connection while carrying out welding work on the vehicle.

Do not operate starter for more than 15 seconds at a time and wait for 30 to 60 second before trying again.

Do not add cold water to hot engine as this can lead to crack in crankcase and other associated parts.

Fuel pump setting should not be tempered.

Check wheel nut torques after driving 150 kms or 250kms regularly.

Do not apply radial tyres and cross ply tyres on the same axle. Tyre on the same axle must be of the same type and nominal size.

Check radiator hoses and clamps for leakages and tightness.

Check fan belt tension and adjust if necessary.

Drain cooling system and fill recommended coolant every 20,000 Kms or 2 years which ever is earlier.

Check lever control valve, if found excessive play in control lever unit must be replaced or over hauled. Excessive play indicates probable wear on the cam, pin, plunger face or a weak or distorted plunger return spring.

Check and tighten front and rear engine mounting/other peripheral bolts.

Check and tighten cylinder head nut and bolt for correct torque in correct sequence if found loose.

Change engine oil and oil filter element. First change at 16000 Km, there after every 16000 Km.

Clean oil cooler.

Check engine oil pressure (min 1 Kg/Cm² at idling and 80 degree C engine Temp.

Replace fuel filter element, Primary every 16000 km and secondary element at first time 24000 km there after every 16000 km.

Clean fuel pumps Stainer every 8000 km.

Lubricate accelerator linkages every 8000 km and pedal shaft etc.

Check FIP control lever return spring.

Check and tighten FIP mounting.

Check and clear air cleaner primary element. Replace air cleaner primary element after two consecutive cleaning.

Replace air cleaner safety element (at the time of 3rd replacement of primary element or once in a year whichever earlier).

Check restriction indicator, if necessary clean the element.

Check air inlet hose for any puncture/damage.

Check turbo charger mounting.

Check exhaust manifold and silencer for leakage and tightness.

Lubricate gear shaft ball joint periodically and weekly.

Lubricate propeller shaft UJ cross and splines periodically and weekly. Also check UJ cup for wear and replace it if found burn out.

Lubricate centre joint bearing periodically and weekly.

Check and tighten propeller shaft flange bolts periodically and weekly.

Check oil level of rear axle, top up if necessary.

Lubricate track rod/drag link ball joint of front axle periodically and weekly.

Lubricate the king pin and check play, adjust if necessary.

Check wheel alignment and adjust if necessary.

Check 'I' bold 'U' bolts tightness and spring clip fitment helper spring bracket, spring shackle periodically.

Check shock absorber, rod pads, mounting brackets, bolts and nuts.

Lubricate shackle pin weekly.

Check steering gear box oil level and leakage, top up if necessary.

Check steering wheel free play and adjust if necessary.

Always block vehicle wheels and stop engine while working under vehicle.

Check pneumatic hand brake for proper functioning daily.

Check compressed air build up on air gauge (8.25 Kg/Cm²) daily.

HINTS FOR DRIVER FOR SAFE DRIVING:-

Safe driving is possible with total concentration and involvement of the driver. Safety is more important than speed.

Firstly check the vehicle for road worthiness.

Check that all the safety equipment and fire extinguisher are in good working condition.

Always wear seat belt while driving. This safety feature reduces the Chance of personal injury.

While going down a hill, always use the same gear as would have been used for climbing it.

Never drive down hill with your engine switch off or gear in neutral position.

Control the speed by staying in the correct gear to avoid excessive use of brakes.

Avoid down shifting at high speeds which may cause engine over racing.

While parking on a hill, place wheel chock or wooden block under the wheels in addition to hand brake.

Don't use vehicle with bald tyres and incorrect tyre pressure, may cause of skidding of vehicle.

Don't apply brake violently on slippery road to avoid skidding.

Never leave vehicle with engine running, always put on parking lights if vehicle is parked on busy road side.

When you are halt, make a habit of checking and cleaning wind screen, lights, reflectors, rear view mirrors and tyres.

Don't use cell phone while driving, it effect the concentration and control on driving adversely. Please park the vehicle off the road safely while using cell phone.

If vehicle drive in deep water may wet the brake and adversely affect the performance. To dry it quickly, apply brakes softly a few times while maintaining safe road speed till the braking ability return to normal.

Drive slow in Fog, use fog light for better visibility.

Do not leave the vehicle unattended.

Always drive on approved route.

Do not allow passenger to travel in the vehicle.

Modification to the vehicle in any form (i.e. drilling or welding on frame, adding extra leaf in suspension) is strictly prohibited as it can affect the safety and economical aspect adversely.

Do not coast down hill with the transmission in neutral, or with clutch disengaged.

Appendix 'C'

RECOMMENDED LUBRICANTS

Aggregates	Asoka Leyland specification	Ambient temp °C	Co-branded lubricants	Approved lubricants	Change period in Kms	
			Gulf oil India	IOC		
Bharat stage II & III Diesel engine Hino (6DTI & 6ET) engine	API CH-4+MB 228.3+VDS 3	-15 and above	Super fleet LE max SAE 15W-40	Servo pride ALT 15W-40	First oil change period at 16,000 Km & there after every 24,000 Kms for city and Ghat operation. 36,000 Kms for long haul operation. 24,000 Kms or 500 hrs which ever is earlier	
BSII AL 412 TC AC & BSII & III HA4CTI diesel engine	API CH-4+MB 228.3+VDS 3	-15 and above	Super fleet LE max SAE 15W-40	Servo pride ALT 15W-40	<u>For long haul operation</u> Oil change at every 16,000 KM	
<u>Gear box constant mesh</u> <u>Steering gear box (Manual)</u> <u>Gear box synchromesh</u>	API GL-4 with specified additive	>0 >0 >0	Gear XP MAX SAE 90	SERVO GEAR ALT 90	AL	40,000
					RANE	72,000
					ZF	40,000
Power steering	General motors type A suffix A	-	Power steering fluid Max	Servo power steer ALT	RANE	80,000/1 year
					ZF	
Rear axle spiral and pinion	API GL-4 (OR) MIL-L-2105 (OR) IS 1118-EP TYPE GL-4	>30	Gear EP Max SAE 140	Servo Gear ALT 140	8T/ 10T	24,000
Rear axle hypoid drive	API GL 5 with specified additive	-12 and above	Gear DB Max 85W140	Servo gear super ALT 85W-140	Q109,RS145,RS120,R149.5 R160, SQR10960SHO, C100	48,000 Kms
Wheel bearing	IS 12203	-	Crown Max RR3	Servo gem ALT	-	48,000
Engine water pump, Gear shift ball joints,S cam shaft & slack adjuster (front & rear) shackle pin						
	IS12203	-	MP Grease Max NLGI 2	Servo grease ALT	-	Weekly

Accelerator pedal ball joints, Accelerator control shaft (Pedal end & crankcase rear)					-	8000
Clutch pedal, Brake pedal, Relay shaft & ball joints (clutch withdrawal),clutch withdrawal sleeve & liner, Centre bearing joint, Propeller shaft UJ cross, Drag line& track rod, King pin					-	Weekly/8000
Ram base, Ram cross head Tees, Tipper body hinger,5 th wheel coupling.					-	Daily
Tipping unit	IS 10522	-	Harmony AW Max ISO VG 32	Servo hydraulic ALT 32	WIPRO,UT,HYVA	6 months
Hydraulic clutch Hydraulic brake	FM VSS 116-Dot 3 (OR) IS 8654	-	Brake fluid Max Dot 3	Servo power brake ALT	-	40,000

ENGINE COOLENT

Aggregate	Asoka ley land specification	Ambient Temp °C	Gulf oil India	IOC	Change period in KMs
All AL/Hino engines with brass – copper radiator			20 % Euro cool Max		Every 75,000 Kms
All AL/Hino engines with Aluminum radiator	JIS K 2234-94 Class 2 and plus	>0	50 % Euro cool Max		Every 75,000 Kms

TECHNICAL SPECIFICATION

Model	CG 1613 (H) 170.5" WB HAULAGE
Engine (Hino)	HINO HA6DTI2D MARK-II BS 2, 4 stroke, 6 cylinder diesel engine with turbocharger and inter cooler
Bore & Stroke (mm)	104x113
Displacements (l)	5.759
Compression ratio	17.5:1
Max Output	132 ps/97 kw @ 2400 rpm
Max torque	(430 Nm) 43.8 Kgm @ 1200-1600 rpm
Firing order	1-4-2-6-3-5
Direction of Rotation	Counter clockwise viewed from Flywheel
Emission Standard	Meets Bharat Stage II mass emission norms
Cooling System	Forced circulation by volute pump
Drive	Cogged V-belt drive
Fan	Fan with viscous clutch, 520 mm Dia
Thermostat Type	Single thermostat wax type (bottom bypass) opens at 82 degree + 2 degree C
Lubricating system	Circulating pump, Pressurised Lubrication, driven by timing Gear
Oil Filter Type	Full Flow paper element
Oil Cooler Type	Plate Type Oil cooler (5 plates)
Fuel system	
Injection Pump	Distributor type (VE) with Manifold pressure compensator (LDA) (Optional hydraulic cold start injection advance – KSB)
Governor	Mechanical, engine speed control
Injector	Multi Hole Nozzle with bar filter
Feed Pump	Engine driven feed pump mounted on FIP timer cover
Fuel Filter	I, II Dual Filter (Both micro filter with coil type paper element)
Service Data	
Nozzle opening pressure	247-261 bar
Fuel Injection timing	1.30+0.02mm plunger lift at TDC with No: 1 cylinder on Compression stroke
Compression pressure	29 – 32 kg/cm ² @ 280rpm
Valve clearance	Intake – 0.30mm, Exhaust – 0.45mm
Electrical Equipment	
Alternator	Lucas TVS 24 V, 55 Amps Belt driven
Starter Motor	Lucas TVS, 24V – GBS5, Axial drive
Air Filter	Twin element dry type
Clutch	Single plate dry type 14" four finger clutch (Non-Asbestos)
Actuation	Hydraulic
Facing dia (mm)	353
Wear Allowance per side (in mm)	3.35
Gross frictional area (cm ²)`	1220

Gear Box	ZF S5 – 36 Synchronmesh
Gear ratios	
1st	7.20 : 1
2nd	4.22 : 1
3rd	2.44 : 1
4th	1.52 : 1
5th	1.00 : 1
Reverse	8.05 : 1
Propeller shaft	1550 Series
No. of propeller shafts	2
Type of centre bearing	Self aligned
Rear Axle	Fully floating single speed hypoid gear (RS145)
Axle Capacity (kg)	10200
Axle ratio	6.167 : 1
Slack adjuster	Manual
Front Axle	Forged 1 – Section Reverse Elliot Type
Axle capacity (kg)	5460
Slack adjuster	Manual
Suspension	Regular
Type	Semi-elliptic laminated multi leaf with centre bolt arrangement
Leaf width (mm)	Front – 76, Rear 80
Shock absorbers	Double acting telescopic on front axle only
Steering	ZF Power
Type	Integral power steering
Angle of steering column to frame	73°
Electrical System	24 V negative earth, 80 Ah (20 h rating), 2x12V batteries
Brakes	Dual Line diaphragm operated 5 cam brake, flick valve operated pneumatic hand brake on rear wheels only
Frame	All Steel Ladder Type bolted
No. of Cross Member	6
Frame Dimension (mm)	228.6x76.2x6.35 (depth X width X thickness)
Wheels and Tyres	
Rim size	B 7" x 20"
Offset	157mm
Front tyre	10.00 x 20 16 PR
Rear tyre	10.00 x 20 16 PR
Front End Structure	G45 <LIII
Cabin (Tipper)	

Performance data		
Maximum speed (km/hr)	74.5	
Maximum gradeability (%)	21.40	
Unladen Weights (kg)		
Front Axle	2500	
Rear Axle	1820	
Total	4320	
Laden Weights (kg)		
Front Axle	6000	
Rear Axle	10200	
Total	16200	
Major Dimension (mm)		
Wheel base	4330	
Front overhang (including bumper)	1446	
Rear overhang	1990	
Overall length	7766	
Overall width	2425	
Front track	1963	
Rear track	1816	
Frame width	864	
Laden height	970	
Min. ground clearance	253	
Turning circle radius	8750	
FILLING CAPACITIES		In Litres
Engine (including Oil Filter)	Hino HA DDTI2D	10.5
Cooling system capacity	Hino HA 6DTI 2D	19 Approx
Gear box	ZF-S5 36/S6-36 Synchronesh	6.5
	ZF-S5-36/S6-36 Synchronesh with PTO	7.5
Rear Axle	RS145/Q109	13.0
Steering	Rane Power	4.0
	ZF Power	4.5