

**DIRECTOR GENERAL BORDER ROADS**  
**GENERAL MAINTENANCE INSTRUCTION NO 217**

**OF**

**ASHOK LEYLAND TAURUS 2516/2 3810 mm(150") DUMPER/WB TIPPER**

**Introduction**

1. Ashok Leyland vehicle 2516/2 with AL BS-II engine has been designed to ensure ease of access to mechanical component. This will enable to carry out a number of simple maintenance tasks. This GMI covers the periodical maintenance and lubrication of various components of 2516/2 Ashok Leyland Taurus Tipper. The regular servicing and preventive maintenance are essential for optimal usages of vehicle to achieve maximum life for planning and timely repair to arrest defect from developing in to major one, where a minimising the down time and production losses.

**AIM:-**

The instruction are issued as guide lines for schedule of preventive maintenance, lubrication of Dumper/tippers manufactured by Asoka Leyland for regular attention to keep the vehicle in good mechanical condition and it must be strictly followed.

**Action by**

(a) **User Unit** :

To carry out periodic inspection and monitor regular/periodical maintenance as laid down in this instruction and record the tasks done in the logbook.

(b) **Field Wksp (GREF)**

(i) To carry out and monitor, maintenance schedule and oil changes as per periodical maintenance laid down in the maintenance instructions and to check the record of maintenance including lubrication.

(ii) To advise the user unit in respect of any lapses noticed

(c) **Mobile maintenance team** :

To ensure that proper maintenance is carried out and report accordingly to Task Force Commander and OC Fd Wksp for necessary action

4. **Details** : The details of maintenance and lubrication with their periodicity are as under :-

- |  |            |
|--|------------|
| (a) Periodical maintenance schedule          | - Appx 'A' |
| (b) Driving instructions & cautions          | - Appx 'B' |
| (c) Recommended lub oils, grease and coolant | - Appx 'C' |
| (d) Tech specifications                      | - Appx 'D' |

5. Please ack receipt.

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

**Distribution**

Normal

**PERIODICAL MAINTENANCE SCHEDULE MINI TVRR ED-30**

**Daily routine service/maintenance task**

01. Check water level in radiator. Top up if necessary with recommended coolant.
02. Check engine oil level in sump, if necessary top up with recommended brand of oil.
03. Check for oil leakage, rectify if necessary.
04. Check tyre inflation pressure.
05. Check all nut & bolts of bodies of the vehicles, if found loose tight it in recommended torque.
06. Check fuel level in tank and secure fuel tank cap. Rectify fuel leakage if any.
07. Check air pressure on air pressure gauge.
08. Check brakes.
09. Check all lights, switches, gauges wiper & horn are in functioning condition.
10. Keep engine and its surrounding area clean and free from leakage/ spillage of any inflammable liquid.

DRIVING INSTRUCTION & CAUTION

01. Before you drive ensure that your vehicle is in a road worthy condition.
02. Watch the gauges on instrument panel every now and then while driving.
03. Drive in the appropriate speed in the individual gear.
04. Maintain a steady speed avoiding quick acceleration and sudden braking. Fast speed saves your little time, but increases the fuel and oil consumption. It also cause faster tyre wear.
05. Always wear seat belt while driving. This safety feature reduces the chance of personal injury.
06. 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. Avoid excessive use of brakes it may cause of excessive heating of brake and sudden failure of brakes.
07. Never use cell phone while driving, it effect the concentration and control on driving adversely. If necessary please park your vehicle off road safely while using cell phone.
08. Before commencing the journey drive ensure that the head lights, signal lights & brake lights clean and functioning properly.
09. If you find any thing wrong or unsafe get it replaced/repared before commencing the journey. Never take a chance it may prove too costly or lose of life.
10. Maintain the correct tyre pressure. Under inflation and over inflation of tyre will only ruin them.
11. Do not open radiator cap when the engine is hot. The boiling water can splash over you and cause serious burn.
12. Do no remove thermostat, if got defective ones replaced. It increases engine life
13. Do not operate starter for more then 15 second at a time and wait for 30 to60 second before trying again.
14. Fill up diesel tank at the end of each working day to reduced water condensation in the tank.
15. Check engine oil and oil filter element, if found dirty clean it and refill with recommended oil.
16. Check cooling system, if found less top up with recommended coolant.

17. Check oil level of rear axle, change oil when hot, and refill up to correct level.
18. Check and clean air cleaner-primary element, if restriction indicator shown red band.
19. Check steering gear box for oil leak & level, top up if necessary.
20. Check battery electrolyte level, top up if necessary with distilled water only.
21. Check battery terminal, Apply petroleum jelly.
22. Check fan belt tension at regular intervals and adjust as needed.

**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 HA6DTI,HA6ETI,HA6DTI2 1 & HA6DT12S 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 5000 hrs which ever is earlier for tipper application with long life filter housing/element.	
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>For tipper</u> 10,000Km OR 250 Hrs of operation which ever is earlier.	
<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 <sup>th</sup> 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	JIS K 2234-94 Class 2 and plus	>0	20 % Euro cool      Max		Every 75,000 Kms
All AL/Hino engines with Aluminum radiator			50 % Euro cool      Max		Every 75,000 Kms

**TECHNICAL SPECIFICATION**

<b>Model</b>	<b>2516/2 TAURUS TIPPER 6X4</b>
<b>Engine</b>	AL BS 2 (L62N Mark II ) 4stroke, 6 cylinder diesel engine with turbocharger and inter cooler
Bore &stroke (mm)	107X121
Displacement ratio	17.5: 1
Max out put	117 Kw @ 2400 Rpm
Max . torque	580 Nm @ 1080-1400 rpm
Firing order	1-5-3-6-2-4
<b>Emission standard</b>	Meet Bharat stage II mass emission norms
<b>cooling system</b>	Pump circulated pressurized cooling, thermostat controlled with deaeration tank.
Drive	V Belt
Fan	Fan with viscous clutch,520 mm dia
Thermostat type	Twin, bottom by pass Wax type
<b>Lubricating system</b>	Pressurised lubrication, through gear driven pump
Drive	Driven by camshaft
Oil filter	Full flow paper element
Oil cooler	Plate type
<b>Fuel system</b>	
Injection pump	Distributor type (VE) with Manifold pressure compensator (LDA)
Governor	Mechanical, engine speed control
Injector	Multi Hole Nozzle
Fuel filter	1.1 L Dual filter ( Both micro filter with coil type paper element-frame mounted)
<b>Service Data</b>	
Nozzle opening pressure	260-268 bar
Fuel injection timing	1.30 to 1.33mm plunger lift at TDC with NO:I cylinder on compression stroke.
Compression pressure	390-410 PSI @ 200 rpm
Tappet clearance	
Intake	0.45mm
Exhaust	0.45 mm
<b>Electrical equipment</b>	
Alternator	Lucas TVS, 24 V - 45 Amps belt driven
Starter motor	Lucas TVS 24 V - GBS 5, Axial drive
Air filter	Twin element dry type
Air compressor	Water cooled compressor
<b>Clutch</b>	Single plate dry type 15" four finger clutch (Ceramic)
Actuation	Hydraulic
Facing dia (mm)	381
Wear allowance per side (in mm)	3.05
Gross frictional aera (cm <sup>2</sup> )	464.52



<b>Gear box</b>	ZF S6-36 Synchromesh
Gear ratio Ist gear	8.97 :1
IInd gear	5.22 :1
IIIrd gear	3.10 :1
IVth gear	1.96 :1
Vth gear	1.33 :1
VIth gear	1.00 :1
Reverse gear	8.05 :1
<b>Propeller shaft</b>	
Main	1600 series
Inter axle	1710 splines and 1550 ends
<b>Rear axle</b>	Fully floating single speed hypoid gear (SQR 109 )
Axle capacity (Kgs)	19000 (Each 9500)
Axle ratio	6.83 :1
Slack adjuster	Manual
<b>Front axle</b>	Forged I section Reverse Elliot Type
Axle capacity (Kg)	6000
Slack adjuster	Manual
<b>Suspension</b>	
Front - Regular	Semi – elliptic laminated multi leaf with centre bolt arrangement
Rear - None reactive	Inter connected through bell crank lever and radius rods enabling equal sharing of load on twin rear axles.
Leaf with (mm)	Front - 76 Rear - 80
Shock observers	Double acting, telescopic on front axle only
<b>Steering</b>	ZF Power
Type	Integral power steering
Angle of steering column to frame	73°
<b>Electrical system</b>	24 V negative earth, 80 Ah (20 h rating ) 2X12 V batteries
<b>Brakes</b>	Dual line diaphragm operated S cam brake, flick valve operated pneumatic hand brake on rear wheel only.
<b>Frame</b>	All steel ladder type bolted
No. of cross. Member	8
Frame dimension (mm)	228.6 x 76.2 x 6.35 (depth x width x thickness )
Wheels and Tyres	
Rim size	B 7.5"x 20
Off set	160 mm
Front & rear tyres	10.00 x 20 -16 PR
Front end rear structure	G45 MKIII
<b>Body (Tipper)</b>	
Capacity (cu.m)	12
Optional cubic capacity (cu.m)	14
Interior length (mm)	5167
Interior width (mm)	2288
Interior height (mm)	1033
Side height from ground (mm)	2530

<b>Tipping gear</b>		
Tipping angle in (degree)	45	
Tipping time in (seconds)	32	
<b>Performance data</b>		
Maximum speed( Km/hrs)	67	
Maximum gradeability (%)	12.4	
<b>Unladen weights (Kg)</b>		
Front axle	2750	
Rear axle	3300	
Total	6050	
<b>Laden weights (Kg)</b>		
Front axle	6000	
Rear axle	19000	
Total	25000	
<b>Major dimension (mm)</b>		
Wheel base	3810	
Front overhang (frame)	1218	
Front overhang (including bumper)	1468	
Rear overhang (frame)	1597	
Rear overhang(RUPD/Load body)	1977	
Over all length (Frame)	6625	
Overall length(with bumper & RUPD/Load body)	7255	
Overall width	2432	
Front track	1917	
Rear track	1816	
Frame width	864	
Laden height	1022	
Min. ground clearance	260	
Turning radius	8250	
<b>Filling capacities</b>		
	In litres	
Engine including oil filter	ALBS 2 (L62N-MKII)	13
Engine (without oil filter)		12.5
cooling system cap	ALBS 2 (L62N-MKII)	24.5 Apppx.
Gear box	ZF-S5-36 /S6-36 synchromesh	6.5
	ZF-S5-36 /S6-36 synchromesh with PTO	7.5
Rear axle	SQR 109 ( I axle )	19.0
	SQR 109 ( II axle )	13.5
Steering	Rane power	4.0
Front hub		450 g approx.
King pin per side		120 g approx.

### MAINTENANCE MONITERING CHART

	Lubricant	No. of point	PDI	Daily	Weekly	EVERY 8000 Km	EVERY 16000 Km	EVERY Km x1000	REMARKS
<b>AL BSII Engines</b>									
<b>A. General</b>									
01. Check and tighten ,front and rear engine mounting/other peripherals bolts			√			√			
02. Check and tighten cylinder head nuts/bolts for correct torque in correct sequence.			√					96	
03. Check and adjust valve clearance on cold engine			√				√		
04. Check vibration damper and replace if necessary								72	
05. Check compression pressure								60	
<b>B. Lubrication system</b>									
01. Check oil pressure (minimum 1 Kg/cm <sup>2</sup> at idle rpm and 85°C engine temp			√	√					
02. Check and top up oil level in sump	0	1		√					
03. Change engine oil and filter element(long life filter housing/element) – for long haul operation		1						16	
04. Change engine oil filter and element (log life filter housing/element) – for tipper application		1							10000 Km or 250 hrs. which ever is earlier.
05. Remove and clean breather								48	
06. Clean and refit sump engine sump and oil pump strainer								48	
<b>C Cooling system</b>									
Check and top up coolent level in radiator				√					