

DIRECTORATE GENERAL BORDER ROADS
GENERAL MAINTENANCE INSTRUCTION : 207

ON
TATA 407 TRUCK

1. **INTRODUCTION**

Tata 407 Truck is a 1 Ton Army Rating Vehicle, with short wheel base. This vehicle is ideal for use on hill roads.

The 407 vehicle is highly reliable and economical provided it is systematically maintained in accordance with the laid down instructions.

2. **ACTION BY**

a) **USER UNIT**

- i) Carry out the maintenance of the vehicle fag complying with the instructions as laid down
- ii) Enter the maintenance task in the log book

b) **FIELD WKSP (GREF)**

- i) To check the records of maintenance and lubrication of the vehicle in the log book during its inspection and enter repair record if carried out, as per maintenance schedule given in the instruction.
- ii) Advise user unit in respect of any discrepancy/short comings noticed.

3. **DETAILS**

- a) Routine service & maintenance check - Appx 'A'
driving instructions and cautions during running in period.
- b) Recommended lubricants, coolants and their - Appx 'B'
aggregate filling capacities.
- c) Technical specifications - Appx 'C'

4. please ack receipt.

Sdxxxxxxx
(Hans Raj)
SE (E&M), SG
Director (Tech)
For Dir Gen Border Roads

Dated: 13 Aug 1999

Distribution :-

Normal

**ROUTINE SERVICE & MAINTENANCE VEHICLE,
DRIVING INSTRUCTIONS AND CAUTION DURING
RUNNING IN PERIOD**

1. **ROUTINE SERVICE & MAINTENANCE**

1. **Daily**

- (i) Check engine oil level in sump. If necessary top up with recommended brand of oil
- (ii) Check water level in radiator. Top up if necessary with clean water. Secure radiator cap.
- (iii) Check for oil leakage, rectify if necessary
- (iv) Check fuel level in tank and secure fuel tank cap. Rectify fuel leakage if any.
- (v) Check tyre inflation pressure
- (vi) Check brakes
- (vii) Check functioning of lights, gear, wiper, blinkers, switches and gauges.

2. **After every 1,000 km of operation**

- (i) Check engine oil level in sump. If necessary, top up with recommended brand of oil
- (ii) Check water level in radiator. Top up if necessary with water and secure radiator cap.
- (iii) Check and rectify leakage of oil, fuel and water if found/noticed.
- (iv) Lubricate with oilcan, Accelerator, linkages and brake cable, door hinges, clutch pedal pivot pins
- (v) Grease with grease gun
 - (a) Propeller shaft 'U' joints (3), Propeller shaft, Propeller shaft center bearing (1)

- (b) King pins (4), Tie rod ball joints (2), Drag link ball joints (2)
- (c) Front spring pins (6)
- (d) Rear spring pins (6)
- (vi) Check level of brake fluid in plastic containers for brake and clutch. Top up if necessary.
- (vii) Check condition of oil level in air cleaner bowl. Top up if necessary.
- (viii) Check and tighten if necessary 'U' bolts of front and rear springs.
- (ix) Check wheel nuts and tighten if necessary.
- (x) Check battery mountings, clean battery posts and terminals, tighten terminals and gear Vaseline/petroleum jelly

Note: - In case any abnormal conditions are observed during driving, stop the vehicle and report for assistance to the nearest Tata Diesel Vehicle Dealer.

3. **Driving Instructions**

- (i) Ensure your vehicle in road worthy condition before you drive.
- (ii) Especially check the steering system, tyres, brakes and clutch.
- (iii) Check parking brake
- (iv) Check smooth starting of vehicle without jerks, Pully, clutch pedal
- (v) Always start the vehicle in first gear.
- (vi) Always change gears at appropriate speeds and don't loup the engine by top early high gear changes at low speeds.
- (vii) Always maintain steady speed, avoid quick acceleration and sudden braking. High speed driving saves little time out increase fuel and oil consumption. Therefore this vehicle suggest to drive in the fifth gear at a steady speed of about 0 to 60km ph. Optimum fuel economy is achieved at this speed.

4. **CAUTION DURING RUNNING IN PERIOD**

During the first 2000 Km observe the following speed condition limits: -

- (i) The speed of this vehicle not more than 60 km ph into gear and correspondingly lesser in lower gears.
- (ii) The gross vehicle weight should not exceed 3.5 tones
- (iii) Avoid panic braking during first 500 km. Drive in lower gear when negotiating stage down gradient, thus avoiding excessive braking and brake overheating. Brake application should be gradual to avoid fast wear of brake linings, brake drums and tyres.

TECHNICAL SPECIFICATIONS DATA

Model	: TATA 497 SP
Type	: high speed, water cooled, naturally aspirated, high pressure direct injection diesel engine with dry liners.
No of cylinders	: 4 in line
Bore/Stroke	: 97/100 mm
Capacity	: 2356 rpm
Maximum engine output	: 600 rpm
Maximum operating speed	: 3500 rpm
Idling speed	: 600 rpm
Maximum	: 16.0 mkg (157 km) at 2200 rpm
Firing order (From F.W end)	: 1-3-4-2
Compression Ratio	: 17:1
Compression pressure at 150–200rpm:	Atleast 20 bar
Maximum permissible compression pressure between any two cylinder	: 1.5 bar
Air filter	: Oil bath type
Oil filter	: Full flow paper type
Fuel filter	: Single stage fine filtration
Fuel injection pump	: Inline type – MICS
Governor	: Centrifugal type variable speed RSV
Fuel injection begins	: 15 degree before TDC
Timing	: Automatic advance

Opening pressure of nozzles

- (a) New nozzles : 200 + 10 bar
- (b) Used nozzles : 180 bar at least

Maximum permissible variation in injection : 5 bar
nozzle pressure

Inlet valve clearance : 0.20 mm }
Exhaust valve clearance : 0.30 mm } Cold or moderately warm engine,
(Cooling system temp max 50 °C)

Weight of Engine : 270 Kg (Dry)

Cooling water temperature : 85 ° C to 95 ° C

Cooling system pressure : 0.5 bar

Radiator frontal area : 2533 Cm²

Maximum oil pressure (New engine) : 5.2 +- 0.5 bar

Min oil pressure for used engine : 2.5 bar at Max speed 0.5 bar at idling speed

Clutch

Model : TATA 240 diaphragm type, Dry friction
type single plate

Outside diameter of clutch facing : 240 mm

Friction area (both sides) : 527 Sq. cm (approx)

Thickness of facing : 4.6 mm Pressure plate side 3.4 mm
Fly wheel side

Clutch actuation : Hydraulic

Gear Box

Model : TATA GBS –18 gear box, synchromesh on
all forward gears and sliding on reverse gear

No of gears : 5 forward and 1 reverse

Gear ratios : Ist 6.01:1

2nd 3.46 : 1

3rd 1.97 : 1

4th 1.37 : 1

5th 1.00 : 1

Reverse 5.69 : 1

Rear Axle

Model	: TATA 407 Rear Axle
Type	: Single speed hypoid gears, fully floating axle shaft
Ratio	: 4.525:1(37/8)
Front axle	: Forged 1 beam, reverse elliot type

Steering

	: Manual steering constant ratio recalculating ball and nut type with universal joints.
Ratio	: 22.5 : 1
Steering wheel diameter	: 425 mm
Parking Brake	: Cable operated, mechanical brake acting on rear wheels only
Service brake	: Vaccum assisted hydraulic, duel circuit brake with tandem master cylinder

Suspension

Type	: semi-elliptical multi-leaf springs at front and rear
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Wheel Alignment data

Toe in (measured on wheel rim)	: 0 to 3 mm
Caster	: $2^{\circ} - 30^{\circ}$ (+ ve)
Camber	: 1° + ve
King pin inclination	: $9^{\circ} - 30^{\circ}$, +- 1°
Wheel lock angle	: 41° +- 1°

Electric system

System voltage	: 12 V, - ve warth
Alternator capacity	: 12V/38 Amp
Battery	: 1 No. 12 V 70 Ah capacity
Wiper motor	: 12 V/17 W, two speed

RECOMMENDED LUBRICANTS, COOLANTS AND THEIR AGGREGATE FILLING CAPACITIES FOR TATA

VEHICLE MODEL – 407

S/No	Description	Periodicity of changes & top up at KM		Ambient Temp °C	Lubricants to be used	Capacities in Ltrs	Remarks
		Oil	Filter				
1	2	3	4	5	6	7	8
1.	Engine The engine oil recommended for use on TATA Diesel Vehicle should conform to specifications of HIL-I-2104 c and grade selected according to range of ambient temperature	18000 (Servo Pride 30) or 9000 (Other grades)	9000	+ 5 and above - 10 to +20 - 20 to 0 - 20 & below	SAE 30 SAE 20E/20 SAE 10W SAE 5W	Engine Oil sump Max – 8 Ltrs Min – 6 Ltrs Oil Filter – 1 Ltr	Servo pride 30 to be changed at 18000 Kms & other grades at 9000 Kms
2.	Gear Box	18000	-	-	Servo Trans Fluid 'A'	2.90 Ltrs	
3.	Rear Axle	18000	-	-	Servo Gear Super – 90	1.50 Ltrs	
4.	Steering gear box	9000	-	-	-do-	0.50 Ltr	
5.	Wheel boaring	Every 10000	-	-	Servo Grease HP	Front hub – 140 gms Rear hub – 300 gms	
6.	Chassis application	As and when required	-	-	-do-	-	
7.	Clutch Clutch release bearing, release for support bearing	As and when required	-	-	Servo grease rolar	-	
8.	Brake & Clutch hydraulic system	Top up as and when required	-	Operation upto 40 °C	J/1703 B/P	-	

1	2	3	4	5	6	7	8
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9. Coolants

The anti-corrosion agents (oils) recommended for use in the cooling system are mentioned under Col 6

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|--|---------|
| 1. Bharat Sherol B (DP) | 13 Ltrs |
| 2. Calf Esulsil NA (Perosil) | |
| 3. HP Radiator protractor | |
| 4. Castrol Cooledge SL (Indrol) | |
| 5. Veedol – Aeulcut 4 tide water | |
| 6. Servo cut – 5 (ICC) | |
| 7. Aqua clear engine (Add 60 (60) cc of the oil for the entire cooling system and when replenishing the water, add 5 cc per litre of water | |

10. Anti freeze agent should be added to the water in the cooling system as per data which depends on ambient temperature.

<u>Upto ambient Temp (cc)</u>	<u>Castrol Anti – Freeze (Water)</u>	<u>Anti-Freeze-Agent</u>
Minus 10	80	20
Minus 20	66	34
Minus 30	56	54 (44)
Minus 40	10	50

Do not intermix different brand of Anti-freeze agent. Anti Freeze agent affective up to -40 °C Do not drain cooling system.