

DIRECTOR GENERAL BORDER ROADS
GENERAL MAINTENANCE INSTRUCTION NO 232
OF
HMT 6522 TRACTOR

INTRODUCTION

1. HMT 6522 Tractor fitted with 04 strokes, water cooled, direct fuel injection diesel engine, wheel base 2250 mm is one of the time tested, robust, fuel efficient and reliable equipment.
2. This GMI gives the technical specifications and know how on the maintenance and repair procedures of aggregates of the model tractor. Assuming that the technicians in the workshop are fully conversant with the repair and maintenance practices of HMT 6522 Tractor in general, the repair procedures out lined in this GMI emphasizes the special features of this product. Compliance with procedures given in this GMI will enable you to derive the maximum service from equipment.
3. To prolong the life of HMT Tractor and reduce maintenance cost, the periodic maintenance must be carried out according to the 'periodic maintenance schedule described in this GMI. Periodic maintenance is essential for preventing trouble and accident to ensure your satisfaction and safety. Daily care and inspection is essential for prolonging the operating life of the tractor and for its safe operation. It also reduces the wear and tear on your tractor, prolongs its life, give more fuel economy, the failure of the guide lines below can result in personal injury or serious damage to the equipment. All information and instructions in this GMI is based on the latest Owner's manual and service booklet.

AIM:-

The instruction are issued as guide lines for schedule of preventive maintenance, lubrication of HMT 6522 Tractor manufactured by HMT Ltd for regular attention to keep the equipment 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 log book.

(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) | Maintenance/ technical inspection | - Appx 'A' |
| (b) | Current repair & over haul of equipment | - Appx 'B' |
| (c) | Technical inspection of the overhauled tractor | - Appx 'C' |
| (d) | Tech specifications | - Appx 'D' |
| (e) | Lubricants | - Appx 'E' |

5. Please ack receipt.

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SE (E&M) FS
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Distribution

Normal

Maintenance /Technical inspection

Maintenance/inspection is one of the most important operations. In due time and correctly carried out maintenance ensure the trouble free tractor performance. Average fuel consumption is 4, 5-6 Ltrs/ hrs. All following instructions are to be observed carefully.

Before starting to operate the tractor check daily.**Starter motor**

1. Input cable terminals should be tighten well and protected with a thin coating of jelly/grease to avoid their corrosion.
2. Damage cable should be replaced by new one.
3. Check collector, carbon brushes and brush holding springs once for six month.
4. Starter motor should be repaired and cleaned once in a year for better performance.

Alternator:-

When washing and cleaning the tractor it should be avoided penetration of water or fuel in to the alternator.

Daily check:-

1. Condition of the steering system, steering linkage unions, tightening of bolts and nuts and steering wheel,
2. Check water level in the radiator, replenish if necessary with stuff water for free of sediments. Apply antifreezing coolant during the winter season.
3. Check brake fluid level, top up if necessary.
4. Check oil level in the sump, top up if necessary.
5. Check and tighten important joint, bolts, screws, nuts.
6. Check brakes, if some resistance is felt when depressing latched and unlatched pedals.
7. Check electrical system, head lamp, indicators are functioning properly.
8. Check tyre pressure, inflate fully if necessary.
9. Check brake system (both the hand and foot brake)
10. Don't operate starter motor longer than 5 second, if engine fail to start, wait 30 second to restart.
11. Check the oil level in air cleaner and clean the pre-filter for removing dust from it.
12. Check water pump drive belt for tightness.
13. Before starting to drive the tractor with trailers or trails in toe check their coupling and locking elements.

14. Check and clean magnet oil filter in each 10 to 100 performance hours of tractor during the starting period of the hydraulic power lift. Check each 30-35 engine hours the oil level in the injection pump.

Technical inspection – 1

This inspection is to be carried out after each 500 litres of fuel consumption or 100 engine hours' operations.

1. Check oil level in the crank case oil sump and clean the centrifugal oil cleaner drum rotor.
2. Check oil level in gear box.
3. Check oil level in air cleaner.
4. Lubricate the water pump and check fan belt sag which is to be maximum 15 mm.
5. Lubricate front axle bracket, wheel extensions, pedals shaft to the clutch disengagement, right hand Street, strut of the draft control, struts-tension nuts and the collar with the steering wheel small control lever.
6. Check the electrolyte level in the battery.

Technical inspection – 2

This inspection is to be carried out after each 1000 litres of fuel consumption or 175 engine hours'.

1. Change oil in the crank case oil sump.
2. Clean the centrifugal oil cleaner.
3. Replace the cartridge of the coarse full filter.
4. Check clearance between the clutch disengaging levers and the sleeve.
5. Inspect and if necessary clean and setup the injector, inspect the oil level and replenish if necessary the gear box.

Technical inspection – 3

This inspection is to be carried out after each 3000 litres of fuel consumption or 600 engine hours' operations.

1. Replace the fine fuel filter cartridge.
2. Check valve clearance.
3. Check the front wheel toe-in and the divergency as well as the play of the front wheel head taper roller bearings, replenish the grease in the front wheel heads.
4. Check and adjust the hand brake if necessary.
5. Flush the cooling system under the pressure of pure water in order to remove sediments.

Technical inspection – 4

This inspection is to be carried out after each 6000 litres of fuel consumption or 1000 engine hours' operations.

1. Change oil in the steering box.
2. Change oil in gear box.
3. Clean the suction strainer of the oil sump.
4. Check tightness of the injection pump elements.

Current repair and overhaul**Current Repair**

This repair is to be carried out after each 12000 litres of fuel consumption or 2000 engine hours' operations.

1. Check and repaired the steering wheel play according to the steering wheel dead point position.
2. Check the alternator and the starter motor in a specialized workshop.
3. Clean and rinse the radiator with the sodium solution.
4. Turn the front wheel tyre casings with respect to one side wear of them.
5. Change engine oil in injection pump.

Overhaul

The tractor overhaul is to be carried out after each 4000 to 6000 engine hours' of the tractor performance.

1. If the reliability of individual parts of the tractor can no longer be assured and if the whole technical condition of the tractor jeopardizes.
2. If many tractor parts need to be repaired.
3. If further tractor performance is no more economical.

Technical inspection of the overhauled Tractor

This inspection is to be carried out after each 250 litres of fuel consumption or 50 engine hours' of the tractor performance.

1. Check the cleaner for tightness and clean its rotor.
2. Drain oil in the crank case oil sump and refill it with new pure engine oil.
3. Change oil in the injection pump housing and the governor box.
4. Change oil in the steering box.
5. Check connection bolt or tightness.
6. Check oil level in the gear box.
7. Check fan “V” belt for sag max. Sag is 15 mm.

Technical inspection – 1

This inspection is to be carried out after each 500 litres of fuel consumption or 100 engine hours' operations.

1. Check the cylinder head stud nuts for tightness.
2. Setup valve clearance on the cold engine.
3. Clean the fuel filters.

Technical inspection – 2

This inspection is to be carried out after each 1000 litres of fuel consumption or 200 engine hours' of the tractor performance.

1. Change oil in gear box and clean the suction strainer of the hydraulic power lift.

Technical inspection – 3

This inspection is to be carried out after each 3000 litres of fuel consumption or 600 engine hours' of the tractor performance.

1. Change the engine oil in the gear box and portals as well as check oil level in the steering gear box.

TECHNICAL DATA1. **Engine**

Make & Type	- HMT 6522/Diesel 4 Stroke, engine, Water cooled, direct fuel injection
Power output	- 65 HP
Bore	- 102 mm
Stroke	- 110 mm
No of cylinders	- 4
Compression ratio	- 17.4:1
Rated speed	- 2200 rmp
Air Cleaner	- Dry Type (Double Stage)
Cooling system	- Forced water circulation type with thermostat suction type, street fan with 6 blade. Sheet metal fan cool.
Lubrication system	- Pressure type circulation with wet crankcase, feed system through gear type lub oil pump with centrifugal full flow oil filter.

2. **Capacity**

Cooling system	- 13 Litre
Fuel Tank	- 70 Litre
Engine Oil Sump	- 12 Litre
FI Pump	- 0.3 Litre
<u>Gear box when working with hyd lift system</u>	
On flat ground	- 2.5 Litre
On hilly Terrain	- 32 Litre
Capacity of each portal	- 1.9 Litre
Steering system	- 2.5 Litre

3. **Gear Box**

Number of gear	- 10+2
Road speeds	- 5 Forward, 1 reverse
Field speeds	- 5 Forward, 1 reverse

4. **Clutch:** - Dry, double clutch plate, 1st for Tractor travel, 2nd for PTO Shaft. Actuation through a diaphragm plate spring ensuring longer clutch life at constant operating pressure.
5. **Steering:** - Hydrostatic power steering.
6. **Break**
 - Foot operated - Hydraulic Shoe, type, two pedals with latch to break the wheel simultaneously and independently
 - Emergency parking - Band type mechanical control.
7. **PTO shaft:-**
 - (a) Standardized revolution at engine RPM 2000 - 540 RPM, clockwise, viewed facing driving end
 - (b) Through gear box:-
 - 1st speed - 2,732 rpm
 - 2nd speed - 4,540 rpm
 - 3rd speed - 6,395 rpm
 - 4th speed - 7,972 rpm
 - 5th speed - 13,316 rpm
 - Reverse - 5,340 rpm

Hydraulic power life system:-

- (a) Working pressure maximum - 160+20 kg/cm²
- (b) Out put of hydraulic power lift pump - 20 ltrs at 540 rpm of PTO shaft
- (c) Lifting capacity on ends -1700 kgs

Electrical equipment:-

- (a) Battery - 12 V 110 AH
- (b) Alternator - 12 V 36 Amp
- (c) Starter motor - 12 V 2.2 Kw
- (d) Front light - 12 V 60/55 W
- (e) Rear light - 12 V 21 W
- (f) Parking light - 12 V 5 W
- (g) Indicator light - 12 V 21 W
- (h) Plough light - 12 V 35 W

Tyres:-

Front - 6, 5 - 20

Rear - 16.9/14-28

Dimension:-

Over all length - 3,655 mm

Width - 1910 mm

Height up to upper rim of steering wheel - 1761 mm

Max height with upper exhaust - 2,340 mm

Height of swinging drawbar from ground - 460 mm

Ground clearance - 470 mm

Wheel base - 2250 mm

LUBRICATION CHART FOR HMT 6522 TRACTOR**LUBRICATION:-**

Lubrication	Maintenance	Capacity	Recommended lubricant		
			Indian oil	Hindustan petroleum	Bharat petroleum
<i>lubrication of new tractor during running-in</i>					
Engine	Flush after 50 hours	10 litres	Lubrex flush 22	HP flushing oil	Flushing oil
	Change after 50 hours	12 litres	Servo super Multy grade 20W-40	HP super engine oil multigrade 20W-40	Bharat Avtuma T20 W-40
F.I.P.	Change after 50 hours	0.6 litres	-do-	-do-	-do-
Gear box	Change after 200 hours	25 Litres	Servo gear 90 HP	HP oil EP 90	Spirol 90 EP
Portals both	Change after 200 hours	3.8 litres	-do-	-do-	-do-
<i>Daily lubrication after each 8-10 operating hours</i>					
Engine	Inspection	12 Litres	Servo super Multy grade 20W-40	HP super engine oil multigrade 20W-40	Bharat Avtuma T20 W-40
<i>lubrication after each 70 operating hours</i>					
Injection pump	Inspection	0.6 Litres	same as engine oil	same as engine oil	same as engine oil
Clutch disengaging sleeve	to be filled up	0.06 Litres	same as engine oil	same as engine oil	same as engine oil
Gear box	Inspection	25 Litres	Servo gear 90 HP	HP gear oil EP 90	Spirol 90EP
Portals both	Inspection	3.8 Litres	Servo gear 90 HP	HP gear oil EP 90	Spirol 90EP
Water pump	to be turned by 1/3	-	Servo grease MP	Multiple grease H	Univex A
Front axle pin	grease thoroughly	0.1 Kg	-do-	-do-	-do-
King pin Strut of three	-do-	0.06 Kg	-do-	-do-	-do-

Point linkage	-do-	0.05 Kg	-do-	-do-	-do-
Clutch linkage and pedal	-do-	0.04 Kg	-do-	-do-	-do-
Top link mounting bracket & link	-do-	0.001 Kg	-do-	-do-	-do-
<i>Lubrication after 175 operating hrs</i>					
Engine	Change	12 litres	Servo Super multi grade 20W-40	HP Super engine oil Multi grade 20W-40	Bharat Avtuma T20W-40
<i>Lubrication after 1000 operating hrs</i>					
Gear box	flush	15 litres	Lubrex 22	HP flushing oil	flushing oil
	change	25 litres	Servo gear 90 HP	HP gear oil EP 90	Spirol 90 EP
Portals both	change	3.8 litres	-do-	-do-	-do-
Front wheel hub	to be filled up	-	Servo grease MP	Multi purpose grease H	Univex- "A"
Steering	change	2.5 litres	Servo super multi grade 10W-30	-	-
<i>Lubrication after 2000 operating hrs</i>					
Injection pump	change	0.6 litres	same as engine oil	same as engine oil	same as engine oil