

**DIRECTORATE GENERAL BORDER ROADS GENERAL
MAINTENANCE INSTRUCTION NO. 204**

GENERAL MAINTENANCE INSTRUCTION NO. 204

The following amendments may please be carried out in Appendix 'C' to GMI No. 204:-

Against item 'Gear Box & Transfer case'

Under sub columns 'Oil' & Filter'

"For"	- Ist change	2000
	Thereafter every	2000
"Read"	- Check & top up at every 2000	
	Change oil at every 20,000	

Against Item 'Differential'

Under sub columns 'Oil' & 'Filter'

"For"	- Ist Change	2000
	Thereafter every	2000
"Read"	- Check & top up at every 2000	
	Change at every	20,000

All other entries will remain unaltered.

Dated : 13 Aug 1999

Sdx-x-x-x-
(S S Dogra)
EE (E&M)
Dty Director (Tech)
For Dir Gen Border Roads

GENERAL MAINTENANCE INSTRUCTION NO 204 ON MAHINDRA AND
MANINDRA 540 DP DIESEL VEHICLE

INSTRUCTION:

1. Regular servicing preventing maintenance are essential to prolong the life of the vehicle. Maximum mileage can be extracted from the vehicle by ensuring timely repairs of defects thereby avoiding then developing into major ones and minimizing in opportune break down and downtime losses.

AIM

2. The aim of issuing this GMI is keep the vehicle working efficiently at all time, minimise the breakdown and down time. This is achieved by ensuring regular and periodical preventive maintenance, at every level.

ACTION BY

(a) To carry out periodical. Inspection/preventive maintenance at regular intervals as per details given in succeeding paragraph. Arrange for timely repairs by Fd wksp to improve the road worthiness of the vehicle and avoid breakdown due to major defects.

(b) Field workshop (GREF)

(i) To check the record of maintenance and lubrication in the logbook of the vehicle during inspection and repairs if carried out as per maintenance and lubrication schedule given in this instruction.

(ii) Advise user unit in respect of any discrepancy short coming noticed.

(c) Mobile Maintenance Team:-

(i) To ensure that proper maintenance & lubrication is carried out.

DETAILS

4. The instructions cover the following:-

- | | |
|--|----------------|
| (a) Periodic Maintenance schedule | - Appendix 'A' |
| (b) Engine specification Data | - Appendix 'B' |
| (c) Periodicity of lubricant, oil filter element change. | - Appendix 'C' |
| (d) Engine coolant/antifreeze Data | - Appendix 'D' |
| (e) Does and Don'ts | - Appendix 'E' |

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

PERIODIC MAINTENANCE SCHEDULE : M&M 540 DP DIESEL VEHICLE

DAILY MAINTENANCE TASK

1. Check engine oil level and replenish it up to level if required.
2. Check radiator coolant/water level and replenish it up to level.
3. Check radiator cap and change it if damaged/perished.
4. Check free play of clutch and brake paddle and re-adjust if it is less/more than specified free play (Free play specified as 25 km)
5. Check all gauges on dash board and change if any of the gauge found defective.
6. Check for correct functioning of foot brake and parking brake operation.
7. Check wheel nuts for lightness if found loose tighten them.

SAFTY TASK

1. Carry out all daily tasks.
2. Check radiator hose serviceability and change if it is perished.
3. Check tyre pressure and maintain it as per specification.
4. Check Bty terminal and cable joint. Keep clean/tighten if it is dirty/loose and use mineral jelly to protect them from corrosion.
5. Check regularly all electrical contact points to avoid corrosion.
6. Check shackle pins and bushes for damage and grease if required.
7. Check fan belt tension while pressed sagging should not increase 10mm. If incorrect, tighten or replace fan belt.
8. Check the brake fluid level and replenish if required.
9. Check Battery charge indicator if found defective report to field workshop.
10. Check air filter and service if vehicle deployed in dusty area.
11. Grease all grease points/nipples

Contd...P/3

MONTHLY TASK

1. Check tightness of the following mounting. If found loose tighten them properly (as per torque specified in the operators manual).
 - (i) Rocker arm shaft mounting bolt
 - (ii) Injection pump
 - (iii) Air cleaner base
 - (iv) Oil sump pan (gasket)
 - (v) Water pump joint base
 - (vi) Cylinder head mounting bolt to be tightened 6 KGM Torque.
2. Clean air filter, if cartridge found damaged replace it.
3. Check the state of Rubber hose of air filter and change it if found perished.
4. Check tension of fan belt and replace if found worn out, damaged or excessively sagging.
5. Check for fuel sediments trapped and drains them out.
6. Check all grease points and grease them if found dry.
7. Check battery electrolyte level and replenish it up to level if required.

TASK SPECIFIED FOR EVERY 4000 KM RUN OF VEHICLE

1. Carryout monthly task specified.
2. Drain engine oil and refill new engine oil of the specified specification as per appendix attached.
3. Remove oil filter cartridge and replace it.
4. Check fuel filter assy and drain the trapped water or sediments.
5. Check fuel filter body seal if found perished change them.
6. Check for any suspect noise from engine. Report to workshop if any abnormal noise coming.
7. Check radiator hose and clean/replace if found choked or damaged required.

Contd...P/4

TASKS SPECIFIED FOR EVERY 10000 KM RUN OF VEHICLE

1. Carryout monthly tasks.
2. Replace fuel filter cartridge.
3. Check fuel circuit seal and change if seal damage
4. Carryout tyre rotation task.
5. Get following checked from workshop
 - (i) Valve clearance
 - (a) Inlet valve: 0.15 mm
 - (b) Exhaust valve: 0.25 mm
 - (ii) Engine cylinder head mounting bolt torque.
 - (iii) Idling speed, it should be 700 to 750 rpm if required adjust.
6. Check generator and lubricate it by few drops of engine oil.
7. Check electrical wiring for changing insulate/replace if required.
8. Check chassis assy and report to wksp if found cracked.
9. Check body mounting pad and change if found any unserviceable condition.
10. Check the steering connecting rod and tie rod boll joints snug and change them if worn out.

Appx-‘D’

ENGINE COOLANT/ANTIFREEZE DATA

S/ No	System	Amb Temp	% & Type of coolant	Capacity (Ltrs)	Qty (Ltrs)	Remarks
01	Cooling system	Upto (-) 16° C	20% mixture of IOC brand servo kool	8-10 Ltrs	1.6-2	
		From (-) 17 °C to (-) 36° C	50% by vol mixture of IOC brand servo kool	8-10 lrts	4-4.6	

Contd...P/5

Don't

1. Do keep Mahindra operator's manual where it is conveniently accessible.
2. Do maintain correct oil level in engine, gear box, rear axle, steering box, master cylinder and oil bath air cleaner using specified grades of oil only.
3. Do check radiator water level and pressure cap for sealing.
4. Do check radiator hose pipes for leaks.
5. Do check clutch pedal free play and brake pedal free play.
6. Do press clutch pedal fully when engaging gears. Always allow the clutch pedal to return slowly and smoothly.
7. Do allow the starter pinion to come to rest before again attempting to start the engine, otherwise the flywheel ring gear and pinion mt get damaged.
8. Do keep a check on all the gauges on dash board while driving.
9. Do attend immediately to oil and fuel leaks.
10. Do use only genuine oil filter and fuel elements. Replace them at recommend intervals.
11. Do use only genuine 'MAHINDRA' spares parts for all replacements.
12. Do maintain correct tyre pressure as per model specified in chart (Chock in the morning).
13. Do check engine oil level in the sump everyday in the morning.
14. Do check battery every week and top up electrolyte level with distilled water, Keep battery terminals clean and cable joints tight. Apply Vaseline/petroleum jelly on terminals.
15. Do observe correct polarity when connecting battery terminals.
16. Do ensure that parking brake is released before driving off.
17. Do check valve clearance periodically.

Contd...P/6

18. Do check fan belt for correct adjustment.
19. Do start off the vehicle always in first gear.
20. Do use the hazard warning with to flash all the blinker lights to warn other road user, in case of emergency parking or brake down or road.
21. Do keep the engine clean always.
22. Do keep the vehicle clean at all times.
23. Do disconnect alternator terminals while carrying out any welding to the vehicle.
24. Do power wash & lubricate (Service) your vehicle at every 2000 kms or once a month.
25. Do fill up fuel tank (Diesel tank) completely every evening (after the days work) to avoid condensation of vapour.

DONT's

1. Do not run the engine unless the gauge shows oil pressure or warning light goes off.
2. Do not unnecessarily interfere with any adjustment. When vehicle runs smoothly.
3. Do not use clutch pedal as foot rest . This will reduce clutch life.
4. Do not run the engine with out radiator cap. Use genuine cap only, to keep the system pressurized.
5. Do not continue to run the engine when the temperature gauge shows more than 100 degree C.
6. Do not remove radiator cap, when engine is hot.
7. Do not over tighten engine oil filter.
8. Do not continue to run the engine, if black smoke is coming from the exhaust.
9. Do not tamper or brake the fuel pump or venture seals. Remember if tampered or broken your warranty may not be valid.
10. Do not use cotton waste or any fluffy cloth when cleaning.

11. Do not use stored fuel oil from open container.
12. Do not use loose engine oil, always use oil from sealed tins.
13. Do not race or rev the engine especially when starting. This is destructive to the engine and will not heat the engine quickly.
14. Do not run the engine with oil bath air cleaner removed or with the oil container of the air cleaner empty. Maintain correct oil level at all times.
15. Do not run the engine, if the charging indicator light glows.
16. Do not overload the vehicle/lug the engine.

Appx-'B'

ENGINE SPECIFICATION DATA: XDP 4.90 DIESEL ENGINE

Cylinder block	- Cast iron
Cylinder line	- Removable wet type
Crank shaft	- Forged steel, 5 bearing journal
Connecting rods	- Forged steel
Main bearings	- Aluminum tin
Pistons	- Aluminum
Cylinder head	- Aluminum with turbulence chambers
Camshaft	- Chilled casting, 3 bearing
Arrangement of valve	- Overhead rocker arm operated.
Timing	- Gear operated
Lubrication	- Pressure lubrication
Cooling	- By water
Bore (mm)	- 99
Stroke (mm)	- 83
Compression ratio	- 22.4:1
Operating cycle	- 4 stroke (order 1-3-4-2)
Cylinders	- In line arrangement
Max BHP	- 62 at 4500 RPM
Max Torque	- 12.3 Kg.m (89 Lb.ft) at 2000 RPM
Rocker arm Intake	- 0.15 mm + 0.05
Clearance Exhaust	- 0.25 mm + 0.05
Fan belt Tension	- 10 mm (3/8")
Clutch pedal (free play)	- 25 mm (1")
Toe-in	- 1.19 mm to 2.38 mm (3/64"-3/32")
Clutch plate	- Single plate, dry disc type
Tyre rotation	- Every 10000 Kms

PERIODICITY OF LUBRICANT, OIL FILTER ELEMENT CHANGE
INDICATING EQUIVALENT OILS BY IOC LTD

S/No	Make & Type of Veh/eqpt	Assy	Capacity in Ltr	Periodicity of change at KM		Ambient Temp	Multi grade lub oil of IOC Ltd
				Oil	Filter		
01	Jeep M&M 540 DP Diesel veh	Engine	4.5000	Ist change 2000 2 nd change 4000 there after every 4000	2000 4000 4000	Up to -7 ^o C From 8 ^o C to 20 ^o C Below - 20 ^o C	<u>Multi Grade</u> Servo Pride 20W40 Or 15W40, 10W40 5W30
		Air cleaner	0.5	(a) Ist change 1000 at (b) Thereafter 2000 at every	- -	-do- -do-	-do- -do-
		Gear Box & transfer case	3.2	Ist change 2000 Thereafter 2000 every	- -	Upto - 26 ^o C from -27 ^o C to -40 ^o C	Servo Super 80W Servo Super 75W
		Differential	1.2	Ist change 2000 Thereafter 2000 every	- -	-do-	-do-
		Steering gear box	0.50	20,000	-	(a) Winter (b) Summer	Servo gear HP 90 Servo gear HP 140
		Brake system	.325	Check the level each 2000	-	-	-
		Wheel bearing	-	-	-	All Tem (a)	EP-1 for chassis application
		Speedo meter cable & Hand brake cable	-	-	-	Servogram (b) Servogram	EP-2 for wheel bearing

Appendix 'C' to GMI No. 204 (contd)

S/No	Make & Type of Veh/eqpt	Assy	Capacity in Ltr	Periodicity of change at KM		Ambient Temp	Multi grade lub oil of IOC Ltd
				Oil	Filter		

Fuel filter maintenance and changes

Drain of water & sediment from fuel filter as follows:-

- (1) First stage metal body-every 1,000 kms or earlier.
- (2) Second stage CAV glass bowl-every 5,000 kms or earlier.

Stage 1 - MICO of ELOFIC FILTER ELEMENT – Change at every 10,000 kms

Stage 2 - CAV FILTER ELEMENT - Change at every 20,000 kms

Note: - The draining period should be reduced if excess water or sedimentation is observed while draining.

If filter elements are found clogged due to dirt of adulterated fuel before the normal change period, it should be immediately replaced.
