Mahindra
Rise.

OPERATOR'S MANUAL

3540P/3550P PST Cabin

TIER-4

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The Mahindra Group ▪ Mahindra USA, Inc. ▪ 9020 Jackrabbit Road, Suite 600 ▪ Houston, Texas 77095 ▪ 1-877-449-7771 ▪ www.mahindrausa.com

Fuel Metering System:

- Fuel Injection Pump
- Common Rail
- CR Injector

Air Induction System:

- Air Cleaner
- Intake Manifold
- Intake Elbow
- Intake Duct and Hoses

Electrical Exhaust Gas Recirculation (EEGR) System:

- EEGR Valve
- EGR Rate Feedback and Control System
- EGR Cooler

Positive Crankcase Ventilation (PCV) System:

- Oil Filler Cap
- Oil Separator

Miscellaneous items used in above systems:

- Electronic Control Unit (ECU)
- Phase Sensor
- Speed Sensor
- Coolant Temperature Sensor
- Accelerator Pedal Sensor
- Hoses, connectors, assemblies, clamps, fittings, tubing, sealing gaskets and mounting hardware

Since emission related parts may vary slightly from model to model, certain models may not contain all of these parts and certain models may contain functionally equivalent parts.

Warranty Service and Charges

Warranty service shall be provided during customary business hours at any authorized Mahindra & Mahindra Limited Commercial and Consumer Equipment Retailer. Repair or replacement of any warranted part will be performed at no charge to the owner, including diagnostic labor which leads to the determination that a warranted part is defective, if the diagnostic work is performed at an authorized Mahindra & Mahindra Limited Commercial and Consumer Equipment Retailer. Any parts replaced under this warranty shall become the property of Mahindra & Mahindra Limited.

Maintenance Warranty Coverage

a) Any warranted part which is not scheduled for replacement as required maintenance shall be warranted as to defects for the warranty period. Any such part repaired or replaced under the warranty shall be warranted for the remaining warranty period.

b) Any warranted part which is scheduled only for regular inspection to the effect of "repair or replace as necessary" shall be warranted as to defects for the warranty period. Any such part repaired or replaced under the warranty shall be warranted for the remaining warranty period.

c) Any warranted part which is scheduled for replacement as required maintenance shall be warranted as to defects only for the period of time up to the first scheduled replacement for that part. Any such part repaired or replaced under the warranty shall be warranted for the remainder of the period prior to the first scheduled replacement point for that part.

d) Normal maintenance, replacement or repair of emission control devices and systems, which are being done at the customer's expense, may be performed by any repair establishment or individual; however, warranty repairs must be performed by an authorized Mahindra & Mahindra Limited Commercial and Consumer Equipment Retailer.

e) Any replacement part that is equivalent in performance and durability may be used in the performance of any non-warranty maintenance or repairs, and shall not reduce the warranty obligations of Mahindra & Mahindra Limited.

f) The owner shall not be charged for diagnostic labor that leads to the determination that a warranted part is in fact defective, provided that such diagnostic work is performed at an authorized Mahindra & Mahindra Limited warranty station.

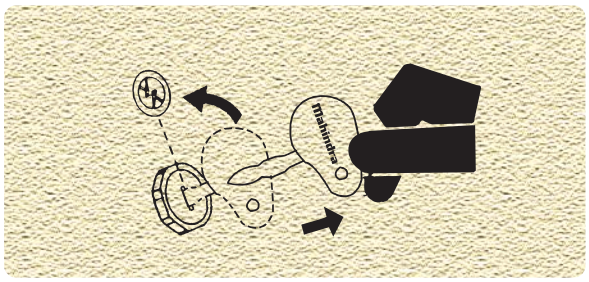
g) Mahindra & Mahindra Limited shall be liable for damages to other engine components proximately caused by a failure under warranty of any warranted part.

h) Throughout the engine's warranty period defined in subsection "Length of Warranty Coverage", Mahindra & Mahindra Limited shall maintain a supply of warranted parts sufficient to meet the expected demand for such parts.

Park Tractor Safely

Before parking the tractor :

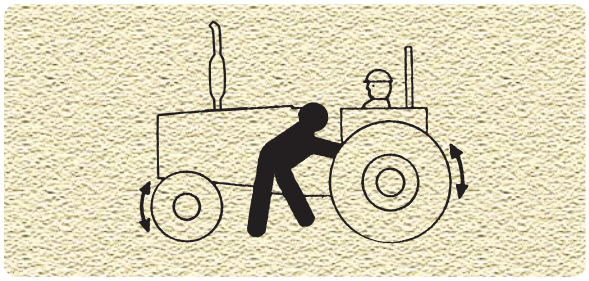
Lower all equipments to the ground, bring transmission in neutral. Engage the parking brake. Stop the engine and remove the key.



Keep Riders Off Tractor

Do not allow riders on the tractor.

Riders on tractors subject to injury such as being struck by foreign objects and being thrown off from the tractor.



Handle Fuel Safely — Avoid Fires

Handle fuel with care. It is highly flammable. Do not refuel the tractor while smoking or near open flame or sparks.

Always stop engine before refueling tractors.

Always keep your tractor clean of accumulated grease and debris. Always clean up spilled fuel.

Stay Clear of Rotating Shafts

Entanglement in rotating shaft can cause serious injury or death.

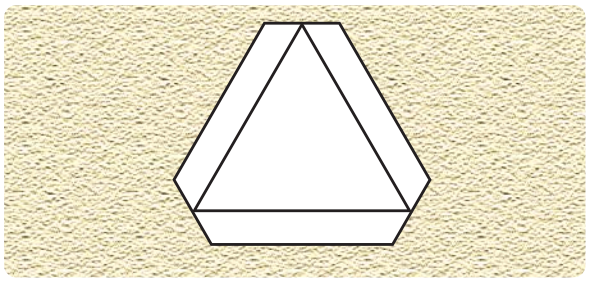
Keep PTO shields in place at all times.

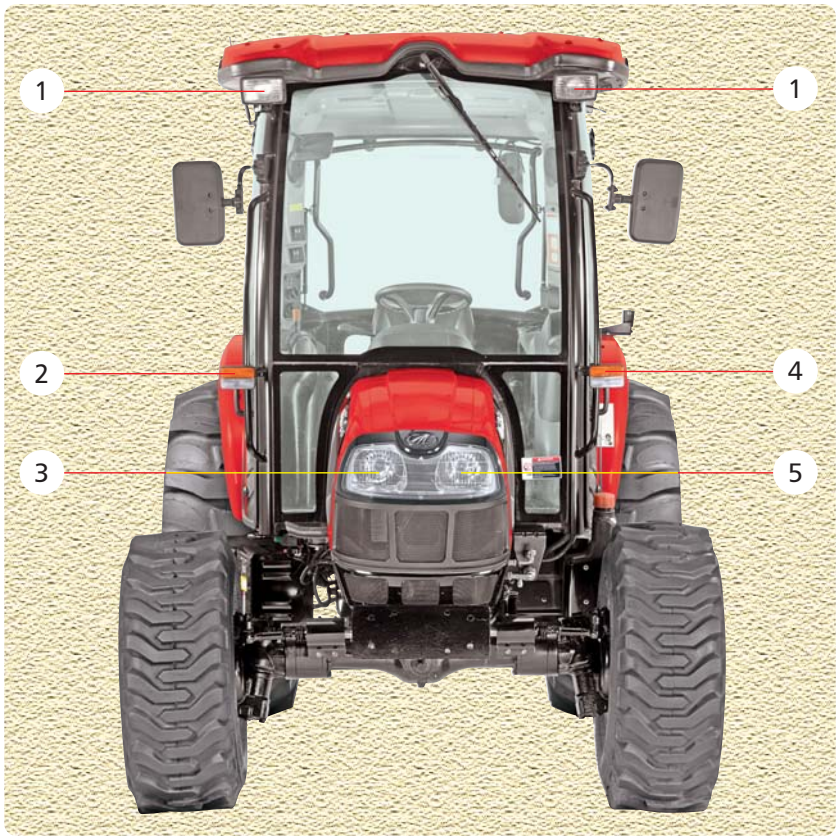
Wear close fitting clothing. Stop the engine and be sure PTO drive is stopped before making adjustments, connections, or cleaning out PTO driven equipment.

Always Use Safety Lights And Devices

Use of hazard warning lights and turn signals are recommended when driving the tractor on public roads unless prohibited by state or local regulations.

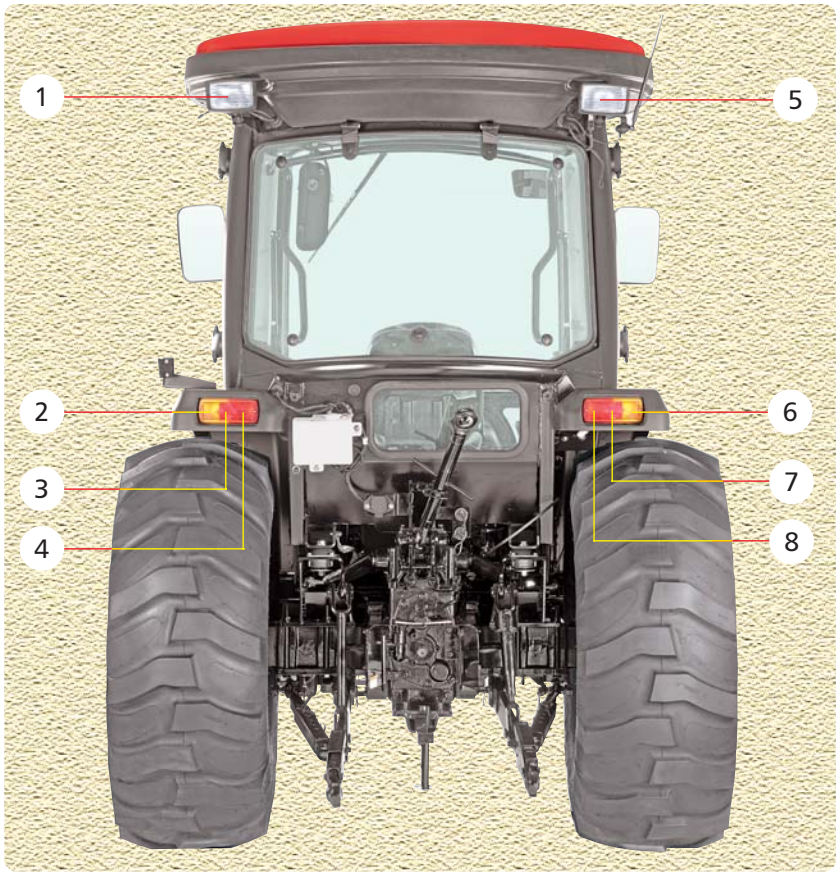
Use slow moving vehicle (SMV) sign when driving on public road during both day & night time, unless prohibited by law.





Front View :

1. Front Roof Work Lights
2. Parking & Turn Indicator Lamp (RH)
3. Head Lamp (RH)
4. Parking & Turn Indicator Lamp (LH)
5. Head Lamp (LH)



Rear View :

1. Rear Roof Work Light (LH)
2. Rear Turn Signal (LH)
3. Reflector / Position Lamp (LH)
4. Rear Brake Lamp (LH)
5. Rear Roof Work Light (RH)
6. Rear Turn Signal (RH)
7. Reflector / Position Lamp (RH)
8. Rear Brake Lamp (RH)

LH - Left Hand
RH - Right Hand

POWER TAKE OFF

PTO is operated electrically. PTO can be operated by using a combination of "PTO Engage - Disengage Switch" and "PTO Mode Switch".

After switching ON the "PTO Engage - Disengage Switch" the operator has a CHOICE to select AUTO or MANUAL MODE through "PTO Mode Switch".

The PTO will turn-Off if the "PTO Engage - Disengage Switch" or "PTO Mode Switch" is in OFF position.

Refer table shown for combinations of PTO Operations.

PTO ON / OFF Switch	PTO Control Switch	Clutch Pedal	PC Lever	PTO Switch	PTO Shaft
ON	Manual Mode	Either pressed or released	Either raised or lowered	Glows	Rotates
ON	Auto Mode	Pressed	Either raised or lowered	Blinks	Stationary
ON	Auto Mode	Either pressed or released	Raised	Blinks	Stationary
ON	Auto Mode	Released	Lowered	Glows	Rotates

Keys

Your Mahindra Tractor comes with four keys (Two for cabin door lock and two for tractor). The key operates all locks in your tractor including the cabin doors and ignition. We advise you to keep one of these keys at a safe place for emergency use (but not in the tractor cabin).

⚠ WARNING

Do not leave the ignition key in your tractor. Never leave children and pet animals unattended in the tractor cabin.

Opening the Doors from outside

Unlock the door using the keys provided. Press the inner knob and pull the grab handle lever.

Opening the Doors from inside

Press the door lock and push the door.

Draft Control

As the draft of the implement varies due to irregularities of ground contour, soil texture, or pitching of the tractor, the load on the top link of the three point linkage will vary. These changes are transferred through the internal mechanism into hydraulic valve movement.

By means of the top link, the draft control system reacts not only when the top link is in compression, as is usually the case, when plowing, but also when the top link is in tension, as with shallow working implements. An increase in implement draft will increase the compression or reduce the tension on the top link and the system will go to lift. Conversely, a decrease in implement draft will cause the system to go lower.

Due to setting of the draft control lever, the load required to maintain the valve in the hold position is governed. Therefore, the load the tractor has to pull is maintained irrespective of ground contour, soil conditions, or the pitching of the tractor.

The lever is moved Forward to deepen the implement and Rearward to shallow it.

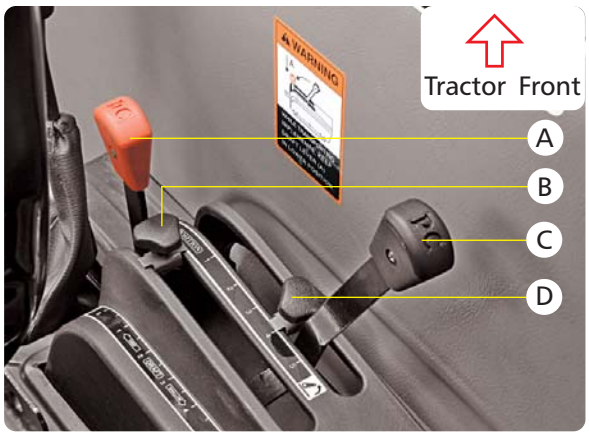
⚠ WARNING

Do not transport or attach equipment when the hydraulic system is in Draft Control. Use Position Control for these operations. Always lower hydraulic equipment to the ground before stopping the Tractor.

Under No Circumstances must the Draft Control Lever be used to Lift the implement to its uppermost Position. To do so will cause overheating of the system. All movements into and out of the soil must be made by using the Position Control lever.

Setting the Draft Control

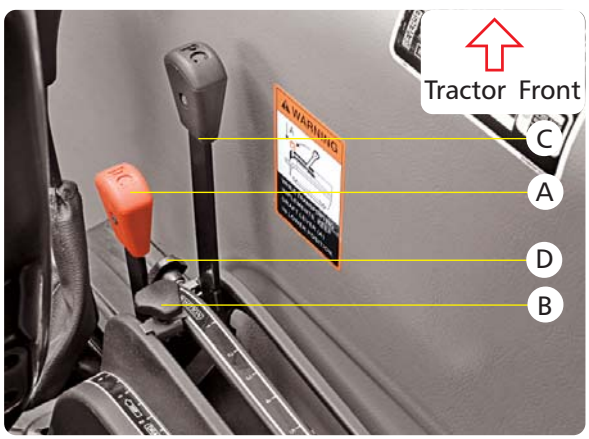
1. Move the PC lever (D) to its most forward position.
2. Move the position control stop screw (C) to the front of the quadrant and lock it.
3. Lift the implement off the ground by pulling the PC lever back to upper limit.
4. Lower the implement into work by moving the PC lever to its most forward position. The faster the lever is moved Forward the quicker the implement will drop.
5. Move the tractor slowly in forward gear. When the implement has reached the desired working depth, move the draft control lever (A) rearward, until the linkage begins to lift, due to the load on top link. This will be the position of the lever for that particular depth in a particular type of ground.
6. Having obtained a desired setting move DC Stop screw (B) until it touches the DC lever (A) and lock it in this position.



When the soil texture remains constant, the implement is partially carried on the three point linkage. Therefore, proportion of the implement weight is transferred to the tractor rear wheels to improve traction. When a condition arises which causes an increase in draft, the system will go to lift and all the weight of the implement will be transferred to the tractor rear wheels to provide maximum traction. As soon as the draft returns to normal, the system goes to lower position and the situation returns to its former condition.

When the front wheels of the tractor drop into a furrow, the tendency for the implements is to lift out of the ground. As the implement lifts, the draft decreases and the system goes lower to maintain the pre-set depth. If the rear wheel drops into a furrow, the reverse will occur.

Thus under all operating conditions, the "Vary-Touch" system provides maximum traction and constant implement depth.



Driving the Tractor

With the engine running and the clutch in disengaged position, engage forward reverse shuttle, speed lever and the range lever to their appropriate desired positions. Free the parking brake. Slowly release the clutch and tractor will start moving.

During the field operations, assistance in making sharp turns can be gained by applying pressure to the independent foot brake pedal of the side to which the turn is to be made.

The brakes can be latched together to act simultaneously by means of the brake pedal latch.

Do not attempt to start the engine while standing beside the Tractor, because serious injury or death would occur. Always sit on the operator's seat.

Always latch the brake pedals together when tractor is not being used in field.

⚠ CAUTION

Do not apply load on tractor at low engine speeds.

Always apply heavy loads at full throttle rpm of engine.

If the tractor is being used after long storage, care must be taken to prime the engine by cranking the engine for at least 5 seconds without firing the engine.

To avoid firing of engine while cranking, remove the electrical connection to FIP solenoid and crank the engine.

IMPORTANT

If the engine stalls while operating under load, start engine immediately to prevent abnormal heat build up in engine.

TRACTOR STORAGE

If the tractor is not in frequent use then ensure to run the tractor for atleast 15 minutes once is ten days.

However if the tractor is to be out of service for extended period, it should be stored in a dry place. Leaving the tractor exposed to weather will shorten its life considerably.

When placing the tractor in storage for more than a month, follow the procedure given below,

1. Wash down and thoroughly clean and dry the tractor.
2. Completely lubricate the tractor in accordance with the lubrication chart.
3. Drain the fuel tank, water trap, feed pump and fuel filters.
4. Disconnect the return pipe at the fuel tank and connect a suitable tubing to allow excess fuel to drain into a container. Fill the system with calibrating oil (if available) of 4 US gallon (15 lit.) quantity.
5. Drain the old lubricating oil from the crankcase sump and fill to normal level with new rust preventive lubricating oil.
6. Run the engine for 1.5 minutes. Switch off the engine. Remove the starting key.
7. If calibrating oil is filled, drain it from the fuel tank only.
8. Seal the fuel system with the same quantity of calibrating oil (if available) in it.
9. Remove air cleaner hose from the manifold of the engine and spray rust preventive oil through the air intake while the engine is being turned.
10. Drain the cooling system.
11. Plug all orifices which expose the internal parts of engine to the atmosphere. Detach additional weights from tractor, if any.
12. Jack the tractor so that the tires are clear off the ground. If this is not possible, check tire pressures regularly and keep inflated to recommended pressures. Rotate wheels periodically to prevent them from standing on the same place for long periods.
13. Remove batteries and store in a cool dry place, keep topped up and fully charged.
14. Disconnect the hydraulic accessories.

USING THE TRACTOR AFTER STORAGE

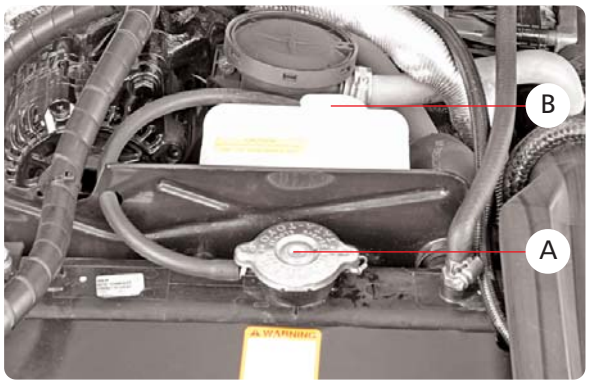
1. Check tire air pressure and inflate, if necessary
2. Jack the tractor up and remove the support blocks from under the front and rear axles.
3. Install the battery. Be sure it is fully charged.
4. Check the fan and alternator belt tension.
5. Refill coolant into the cooling system.
6. Drain the rust preventive oil from engine and oil filter and fill the crankcase with specified oil & refit oil filter.
7. Check all fluid level (engine oil, transmission / hydraulic oil and engine coolant.
8. Remove the extra plugs, if fitted on the engine.
9. Service air cleaner.
10. Drain the calibrating oil from fuel system and fill the fuel tank with clean fuel.
11. Open all the doors and windows or move the tractor out of storage room, to avoid danger from exhaust fumes. Then start the engine and run it at 1500 rpm to ensure that the lubricant attains operating temperature and reaches all points. Observe all gauges and be sure they are functioning properly and reading normal. Ensure there is no evidence of oil or water leakage. Now run the engine at low idle rpm for 1 min. and shut off the engine. Remove the key and apply the parking brake.

Adding Coolant to the System

Allow the engine to cool if it is hot.

1. Open the Hood.
2. Remove the radiator cap.
3. Fill the radiator from fill neck (A) with clean coolant upto a level approx. 2" below the radiator neck.
4. Start the engine and let it idle to remove air from the system. Coolant level in radiator will reduce.
5. Slowly pour coolant into the radiator till the coolant level in radiator does not go down further.
6. Fill coolant in surge tank from fill neck (B) upto the Max level mark.
7. Refit the radiator cap.
8. Shut down the Engine.
9. Close the Hood.

Ensure that the filler cap is clean and free of dirt particles before replacing.



Cooling System Protection

A common cause of the engine overheating is a rust clogged cooling system. Rust causes overheating by interfering with circulation and cooling. The tractors are filled with a mixture of new low silicate antifreeze (50% - antifreeze - 50% water) with a rust inhibitor in it.

Use of approved supplemental corrosion inhibitor along with ethylene glycol will add increased rust prevention, reduce scale formation, minimize cylinder wall erosion & reduce foaming or tendency to foam.

Antifreeze : There are numerous antifreeze products marketed today. Diesel engines are adversely affected by the additives added to protect the aluminum surfaces. Antifreeze suitable for diesel engines conforms to an industry recognised standards which limits silicates to 0.1%. Once silica-gel has formed it is very difficult and costly to remove.

We are listing below some low silicate antifreezes that meet GM 6038 M formulation specification. There may be other suppliers who can make available low silicate antifreezes.

No.	Company	Product
1	Texaco (1)	2354 / 2055 Startex (Was JC-04)
2	BASF WYANDOTTE	241-7
3	Shell	ShellZone-LS
4	International Harvester	I.H. Antifreeze
5	Old Water Trading	Full Force
6	Conoco	Fleet Antifreeze
7	Northern Petrochemical	All Weather (NPC 220)

Note :

% Anti Freeze / % Water	50/50	60/40
Freeze Protection	-34^{0}F -36.67^{0}C	-64^{0}F -53^{0}C
Boil over protection	+265^{0}F 129^{0}C	+275^{0}F 135^{0}C

(with 13 psi (0.91kg/cm^2) radiator cap)

Recommended change period : 1 year or when ever the radiator water is drained.

Battery Maintenance Cleaning

Battery terminals must be kept clean and tight. The cable terminals will corrode and interfere with battery performance unless regularly checked. A light smear of petroleum jelly on the terminal posts and connections will help to resist corrosion.

Occasionally remove the connections and clean the terminal posts with wire wool or emery cloth, smear with petroleum jelly and reassemble.

Wash the battery top with warm water and soda. Ensure that none of this solution gets into the battery cells. Finally rinse with plain water. The vent holes in the filler caps should be open at all times.

Servicing

Check the battery at every 50 hrs. of operation for electrolyte level and specific gravity. If the battery shows need of charging it must be given immediate attention. Keeping the battery fully charged not only preserve its life but makes itself available for instant use when needed.

When replacing the battery the earth cable must be connected to the negative (– ve) terminal and the battery cover secured in its correct position.

Do not, under any circumstances, allow an electric spark or open flame near the battery, during or immediately after charging. Do not lay steel tools across the terminals, as this may result in a spark or a short circuit which could cause an explosion. Be careful to avoid spilling electrolyte on hands or clothing.

Effect of Low Temperatures

Battery capacity is greatly reduced in cold condition which has a decided numbing effect on the electrochemical action of the battery. Based on ambient temperature cranking power is available as listed below:

At 80°F : 100%

At 32°F : 65%

At 0°F : 40%

If your tractor is not to be operated for some time during winter months, it is advisable to remove the battery and store in a dry place where the temperature will not fall below freezing point.

Maintaining the electrical system in good working order will enable the alternator to provide the current needed necessary to keep battery fully charged thus ensuring maximum efficiency of the electrical devices.

Ensure that the terminals are clamped tight, and the battery is securely fastened down in the battery tray.

Do not over-tighten.

⚠ WARNING

When the alternator is charging, an explosive gas is produced inside the battery. Therefore always check the electrolyte level with the engine stopped. Do not use an exposed flame and do not smoke while checking the battery.

⚠ CAUTION

Before working on any part of the electrical system disconnect the battery ground cable. Do not reconnect this cable until all electrical work has been completed. This will prevent short circuits and damage to electrical units.

Electric storage batteries give off a highly inflammable gas when charging and continue to do so some time after receiving a steady charge

NOTE : Contact 'Exide' Dealer for Warranty.

Website : www.exideworld.com

Phone : 1 - 800 - start it

General

Oil has a limited working life after which the effects of time, condensation, engine heat and by-products of combustion will combine to reduce its lubricating properties. **It is therefore, detrimental to use a lubricant for more than the specified period.** The intervals between lubricant changes detailed in this manual have been determined after prolonged tests and have been proved the most suitable for normal operation. **In extremely arduous conditions, however, it may be necessary to reduce these periods** and this point should be discussed with Mahindra tractor dealer.

Oil can go bad while in the engine due to condensation and leakage of Diesel. Also running of engine in cold conditions may lead to such contamination.

Lubricant Storage

Tractors can operate efficiently only when clean oils are used Oils when stored shall be protected from dust, moisture and other contaminants. Store containers on their side to avoid water and dirt contamination. Please ensure that old and used oils are suitably disposed.

Alternate and Synthetic Lubricants

Conditions in certain locations may warrant usage of other lubricants than specified in the manual. In such cases the alternates may be used provided they meet the minimum performance levels specified.

Synthetic lubricants may be used if they meet minimum performance levels specified in the manual. Manufacturers of these oils may be consulted for temperature applicability and suitability.

Bio-degradable oils and fuels are not advised.

Diesel Engine Lubricating Oil

Engine oil (for use in the crankcase) should be a well refined petroleum oil free from water and sediment.

Heavy duty oils are additive type oils possessing the oxidation-stabilising, anti-corrosive and anti-sludging properties necessary to make them generally suitable for high speed diesel engines. They provide the most satisfactory lubrication and should be used in diesel engines with present day diesel fuels. The quality of the base oil and the amount and type of additives used, determines their suitability for use in high speed diesel engines under severe operating conditions and also their suitability for use with diesel fuel containing sulphur or other injurious products.

Please note that engine breathes even while it is not running and once condensation take place rapid deterioration of oil may happen.

Hence idle time for the engine should not be longer than one year but it is advisable to check the oil after 6 months.

High-speed diesel fuels and lubricants should be procured from a reliable source. When in doubt, consult your Mahindra tractor dealer.

Mixing of Lubricants

It is generally advised not to mix different brands or types of oil.

Certain additives blended by the oil manufacturers to meet certain performance levels may adversely affect that of other brands causing compatibility problems.

NOTE : The term heavy duty as used here does not refer to the viscosity rating or “weight” of the oil.

PROBABLE CAUSE	POSSIBLE REMEDY
Engine Knocks	
One or more cylinders misfiring	Refer ENGINE MISFIRES.
Loose main or connecting rod bearing	*
Injection nozzles defective	*
Insufficient oil	Add oil.
Low coolant temperature	Remove and check thermostat.
Faulty CR fuel injection system functioning	*
Excessive Oil Consumption	
Crankcase oil to light	Use proper viscosity oil
Piston rings worn, broken, stuck or not staggered	*
Oil level in crankcase too high	Maintain correct oil level.
Oil leaking	Rectify the leakage.
Sump drain plug loose or worn	Tighten or replace.
Overheating	Refer to ENGINE OVERHEATS.
PCV system clogged	Check for blockage or shrinkage in the PCV system hoses & rectify it. Check the filter element & replace it if required.
	Check the PCV oil pre-separator and replace it if required.
Engine operating temperature too low	Check the thermostat opening temperature.
Restricted turbocharger drain pipe	Check & rectify it.
Engine Overheats	
Faulty heat indicator	Replace.
Cooling system clogged	Clean out radiator and engine
Fan and water pump belt slipping	Check tension and make proper adjustment.
Insufficient oil	Maintain proper oil level.
Defective thermostat	*
Water pump defective	*
Faulty CR fuel injection system functioning	*
Valve clearance incorrect	*
Clutch plate slippage	*
Brakes dragging	Check brake linkages for free movement and adjust free pedal play.
Engine overloaded	Select gear according to load.
Low coolant level	Fill cooling system to proper level; check radiator, coolant recovery tank, and hoses for loose connections or leaks.
Faulty radiator cap	Have service person check.
Dirty radiator core or grille screens	Remove all trash.
Defective thermostat	Remove and check thermostat
Faulty radiator cowl	Check the cowl for gap between cowl & radiator. Check for any breakage & replace it.