Mahindra
Rise.

OPERATOR'S MANUAL

4540/4550 4WD

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

OPERATOR'S MANUAL

Models - 4540/4550 4WD

TIER-4 FINAL mCRD

CALIFORNIA
Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

If this product contains a gasoline engine:

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The state of California requires the above two warnings.

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Product Warranty

Product warranty is provided as part of Mahindra & Mahindra Limited support program for customers who operate and maintain their equipment as described in this manual.

Engine related warranties stated in this manual refer only to emissions-related parts and components of your engine. The complete engine warranty, less emission-related parts and components, is provided separately as the Limited Warranty for New Mahindra & Mahindra Limited Commercial & Consumer Equipment.

Mahindra & Mahindra Limited And California Emission Control System Warranty (heavy duty off-road Compression ignition engines)

Your Warranty Rights and Obligations

The California Air Resources Board (CARB) and Mahindra & Mahindra Limited are pleased to explain the emission control system warranty on your heavy duty off-road compression ignition engine. In California, new heavy-duty off road compression ignition engines must be designed, built and equipped to meet the State's stringent anti-smog standards. Mahindra & Mahindra Limited must warrant the emission control system on your heavy duty off-road compression ignition engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel-injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, Mahindra & Mahindra Limited will repair your heavy duty off-road compression ignition engine at no cost to you including diagnosis, parts and labor.

Mahindra & Mahindra Limited Emission Control System Warranty Coverage

In California, 2012 heavy duty off-road compression ignition engine emissions control-related parts are warranted by Mahindra & Mahindra Limited for five years or 3000 hours of operation, whichever occurs first. If any emission related part on your engine is defective, the part will be repaired or replaced by Mahindra & Mahindra Limited.

Owner's Warranty Responsibilities

As the heavy duty off-road compression ignition engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Mahindra & Mahindra Limited recommends that you retain all receipts covering maintenance on your heavy duty off-road engine, but Mahindra & Mahindra Limited cannot deny warranty solely for lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the heavy duty off-road engine owner, you should however be aware that Mahindra & Mahindra Limited may deny you warranty coverage if your heavy duty off-road engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

Your engine is designed to operate on Diesel fuel only. Use of any other fuel may result in your engine no longer operating in compliance with California's emissions requirements.

You are responsible for initiating the warranty process. The CARB suggests that you present your heavy duty off-road engine to an authorized Mahindra & Mahindra Limited Commercial and Consumer Equipment Dealer / Retailer as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

"If you have any question regarding your warranty rights and responsibilities, you should contact Mahindra, USA Inc at 1-877-449-7771.

Length of Warranty Coverage

Mahindra & Mahindra Limited warrants to the initial owner and each subsequent purchaser that the heavy duty off-road compression ignition engine is:

- Designed, built and equipped so as to conform with all applicable regulations adopted by the California Air Resources Board (CARB) for 2012 pursuant to its authority in Chapters 1 and 2, Part, Division 26 of the Health and Safety Code; and
- Free from defects in materials and workmanship which can cause the failure of a warranted part to be identical in all material respects to the part as described in the application of Mahindra & Mahindra Limited for certification for a period of five years or 3000 hours of operation, whichever occurs first, after the engine is delivered to the initial retail purchaser. Mahindra & Mahindra Limited is liable for damages to other engine components caused by the failure of a warranted part during the warranty period. If any emission related part on your engine is defective, the part will be repaired or replaced by Mahindra & Mahindra Limited.

Warranted Parts

Coverage under this warranty extends only to the parts listed below (the emission control system parts) to the extent these parts were present on the engine purchased.

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

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 for the warranty period defined in subsection "Length of Warranty Coverage." If any such part fails during the period of warranty coverage, it shall be repaired or replaced by Mahindra & Mahindra Limited. 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 shall be warranted for the warranty period defined in subsection "Length of Warranty Coverage" to the effect of "repair or replace as necessary" shall not reduce the period of warranty coverage. 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 for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part shall be repaired or replaced by Mahindra & Mahindra Limited. 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) Repair or replacement of any warranted part under the warranty provision of this statement shall be performed at no charge to the owner at an authorized Mahindra & Mahindra Limited warranty station.

e) Notwithstanding the provisions of subsection "d" above, warranty services or repairs shall be provided at all authorized Mahindra & Mahindra Limited Commercial and Consumer Equipment Retailer and distribution centers that are franchised to service the subject engines.

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.

i) Any replacement part may be used in the performance of any maintenance or repairs and must be provided without charge to the owner. It is not necessary for replacement parts to be the same brand or by the same manufacturer as the original part sold with the engine. Such use shall not reduce the warranty obligations of Mahindra & Mahindra Limited.

j) Add-on or modified parts may not be used. Such use shall be grounds for disallowing a warranty claim made in accordance with this warranty statement shall not be liable under this article to warrant failures of warranted parts caused by the use of such an add-on or modified part.

k) The Executive Officer may request and in such case, Mahindra & Mahindra Limited shall provide, any documents which describe warranty procedures or policies of Mahindra & Mahindra Limited.

Consequential Warranty Coverage

Warranty coverage shall extend to the failure of any engine components caused by the failure of any warranted part still under warranty.

Limitations

This Emission Control System Warranty shall NOT cover any of the following.

a) Repair or replacement required as a result of (i) misuse or neglect, (ii) improper maintenance or unapproved modifications, (iii) repairs improperly performed or replacements improperly installed, (iv) use of replacement parts or accessories not conforming to Mahindra & Mahindra Limited specifications which adversely affect performance and/or durability, (v) alterations or modifications not recommended or approved in writing by Mahindra & Mahindra Limited.

b) Replacement parts, other services and adjustments necessary for normal maintenance.

c) Transportation to and from the Mahindra & Mahindra Limited Commercial and Consumer Equipment Retailer, or service calls made by the Retailer.

Limited Liability

a) The liability of Mahindra & Mahindra Limited under this Emission Control System Warranty is limited solely to the remedying of defects in materials or workmanship. This warranty does not cover inconvenience or loss of use of the heavy duty off-road compression ignition engine or transportation of the engine to or from the Mahindra & Mahindra Limited Commercial and Consumer Equipment Retailer. Mahindra & Mahindra Limited SHALL NOT BE LIABLE FOR ANY OTHER EXPENSE, LOSS, OR DAMAGE, WHETHER DIRECT, INCIDENTAL, CONSEQUENTIAL (EXCEPT AS LISTED ABOVE UNDER "COVERAGE") OR EXEMPLARY ARISING IN CONNECTION WITH THE SALE OR USE OF OR INABILITY TO USE THE HEAVY DUTY OFF-ROAD COMPRESSION IGNITION ENGINE FOR ANY OTHER PURPOSE.

b) NO EXPRESS EMISSION CONTROL SYSTEM WARRANTY IS GIVEN BY Mahindra & Mahindra Limited WITH RESPECT TO THE ENGINE EXCEPT AS SPECIFICALLY SET FORTH IN THIS DOCUMENT. ANY EMISSION CONTROL SYSTEM WARRANTY IMPLIED BY LAW, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS EXPRESSLY LIMITED TO THE EMISSION CONTROL SYSTEM WARRANTY TERMS SET FORTH IN THIS DOCUMENT.

c) No dealer is authorized to modify this California and Mahindra & Mahindra Limited Emission Control System Warranty.

Product Warranty

Product warranty is provided as part of Mahindra & Mahindra Limited support program for customers who operate and maintain their equipment as described in this manual.

Engine related warranties stated in this manual refer only to emissions-related parts and components of your engine. The complete engine warranty, less emission-related parts and components, is provided separately as the Limited Warranty for New Mahindra & Mahindra Limited Commercial & Consumer Equipment.

Mahindra & Mahindra Limited, Federal Emission Control System Warranty (Non-Road Diesel)

Your Warranty Rights and Obligations

The United States Environmental Protection Agency (EPA) and Mahindra & Mahindra Limited are pleased to explain the emission control system warranty on your non-road diesel equipment engines must be designed, built and equipped to meet the U.S. EPA regulations for non-road diesel engines. Mahindra & Mahindra Limited must warrant the emission control system on your non-road diesel equipment engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your non-road diesel equipment engine.

Your emission control system may include parts such as the fuel-injection system and the air induction system. Also included may be connectors and other emission related assemblies.

Where a warrantable condition exists, Mahindra & Mahindra Limited will repair your non-road diesel equipment engine at no cost to you including diagnosis, parts and labor.

Mahindra & Mahindra Limited Emission Control System Warranty Coverage

Your non-road diesel equipment engine emissions control-related parts are warranted by Mahindra & Mahindra Limited for five years or 3000 hours of operation, whichever occurs first. If any emission related part on your engine is defective, the part will be repaired or replaced by Mahindra & Mahindra Limited.

Owner's Warranty Responsibilities

As the non-road diesel equipment engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Mahindra & Mahindra Limited recommends that you retain all receipts covering maintenance on your non-road diesel equipment engine, but Mahindra & Mahindra Limited cannot deny warranty solely for lack of receipts or for your failure to ensure all scheduled maintenance is performed.

As the non-road diesel equipment engine owner, you should however be aware that Mahindra & Mahindra Limited may deny you warranty coverage if your non-road diesel equipment engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your non-road diesel equipment engine to an authorized Mahindra & Mahindra Limited Commercial and Consumer Equipment Retailer as soon as a problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days.

"If you have any question regarding your warranty rights and responsibilities, you should contact (Mahindra, USA Inc) at 1-877-449-7771.

Length of Warranty Coverage

Mahindra & Mahindra Limited warrants to the initial owner and each subsequent purchaser that the non-road diesel equipment engine is:

- Designed, built and equipped so as to conform with all applicable regulations of the United States Environmental Protection Agency (EPA) for non-road diesel equipment engines;
- Free from defects in materials and workmanship which can cause the failure of an emission warranted part for a period of five years or 3000 hours of operation, whichever occurs first, after the engine is delivered to the initial retail purchaser. Mahindra & Mahindra Limited is liable for damages to other engine components caused by the failure of a warranted part during the warranty period. If any emission related part on your engine is defective, the part will be repaired or replaced by Mahindra & Mahindra Limited.

Warranted Parts

Coverage under this warranty extends only to the parts listed below (the emission control system parts) to the extent these parts were present on the engine purchased.

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.

Consequential Warranty Coverage

Warranty coverage shall extend to the failure of any engine components caused by the failure of any warranted part still under warranty.

Limitations

This Emission Control System Warranty shall NOT cover any of the following:

a) Repair or replacement required as a result of (i) misuse or neglect, (ii) improper maintenance or unapproved modifications, (iii) repairs improperly performed or replacements improperly installed, (iv) use of replacement parts or accessories not conforming to Mahindra & Mahindra Limited specifications which adversely affect performance and/or durability, (v) alterations or modifications not recommended or approved in writing by Mahindra & Mahindra Limited.

b) Replacement parts, other services and adjustments necessary for normal maintenance.

c) Transportation to and from the Mahindra & Mahindra Limited Commercial and Consumer Equipment Retailer, or service calls made by the Retailer.

Limited Liability

a) The liability of Mahindra & Mahindra Limited under this Emission Control System Warranty is limited solely to the remedying of defects in materials or workmanship. This warranty does not cover inconvenience or loss of use of the non-road diesel equipment engine or transportation of the engine to or from the Mahindra & Mahindra Limited Commercial and Consumer Equipment Retailer. Mahindra & Mahindra Limited SHALL NOT BE LIABLE FOR ANY OTHER EXPENSE, LOSS, OR DAMAGE, WHETHER DIRECT, INCIDENTAL, CONSEQUENTIAL (EXCEPT AS LISTED ABOVE UNDER "COVERAGE") OR EXEMPLARY ARISING IN CONNECTION WITH THE SALE OR USE OF OR INABILITY TO USE THE NON-ROAD DIESEL ENGINE FOR ANY OTHER PURPOSE.

b) NO EXPRESS EMISSION CONTROL SYSTEM WARRANTY IS GIVEN BY Mahindra & Mahindra Limited WITH RESPECT TO THE ENGINE EXCEPT AS SPECIFICALLY SET FORTH IN THIS DOCUMENT. ANY EMISSION CONTROL SYSTEM WARRANTY IMPLIED BY LAW, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, IS EXPRESSLY LIMITED TO THE EMISSION CONTROL SYSTEM WARRANTY TERMS SET FORTH IN THIS DOCUMENT.

c) No dealer is authorized to modify this Federal and Mahindra & Mahindra Limited Emission Control System Warranty.

This Manual has been prepared to assist you in following the correct procedure for break-in, operation and maintenance of your new Mahindra tractor.

Your tractor has been designed and built to give maximum performance, with good fuel economy and ease of operation under a wide variety of operating conditions. Prior to delivery, the tractor was carefully inspected, both at the factory and by your Mahindra Dealer, to ensure that it reaches you in optimum condition. To maintain this condition and ensure trouble free performance, it is important that the routine services, as specified in this manual, are carried out at the recommended intervals.

We have enclosed a page on new tractor inspection sheets. The first sheet is the Dealer's copy and should be removed by the Dealer after the inspection has been carried out. The second sheet is your copy of the service performed. Ensure that you & the Dealer sign both copies.

Read this manual carefully and keep it in a convenient place for future reference. If at any time you require advice concerning your tractor, do not hesitate to contact your authorised Mahindra Dealer. He has trained personnel, genuine Mahindra parts and necessary equipments to undertake all your service requirements.

Mahindra USA Inc's. policy is one of continuous improvement, and the right to change prices, specifications or equipments at any time without notice is reserved.

All data given in this book is subject to production variations and all Tractor images are representative. Dimensions & weight are approximate only and the illustrations do not necessarily show tractors in standard condition. For exact information about any particular tractor, please consult your Mahindra Dealer.

Tractor

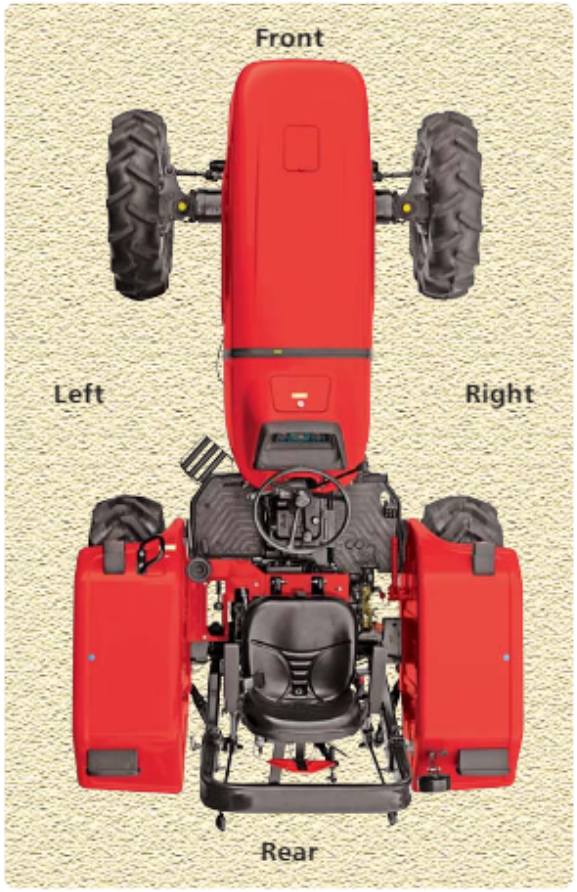
The word, 'Tractor' has been derived from 'traction' which means pulling. A tractor is required to pull or haul an equipment, implement or trolley, which are coupled to the tractor chassis through suitable linkage.

A tractor can also be used as a prime mover as it has a power outlet source which is also called Power Take Off or PTO shaft.

In this book the operating, maintenance and storage instructions for 4540/4550 4WD models of Mahindra diesel tractors have been compiled. This material has been prepared in detail to help you in better understanding of maintenance and efficient operation of the Tractor.

If you need any information not given in this manual or require the services of a trained mechanic, please get in touch with the Mahindra Dealer in your locality. Dealers are kept informed of the latest methods of servicing tractors. They stock genuine repair parts and are backed by the company's full support.

Throughout this manual, the use of the terms LEFT, RIGHT, FRONT and REAR must be understood, to avoid any confusion when following the instructions. The LEFT and RIGHT means left and right sides of the tractor when facing forward in the driver's seat. Reference to the FRONT indicates the radiator end of the tractor, while the REAR, indicates the drawbar end.



Tractor Serial Number

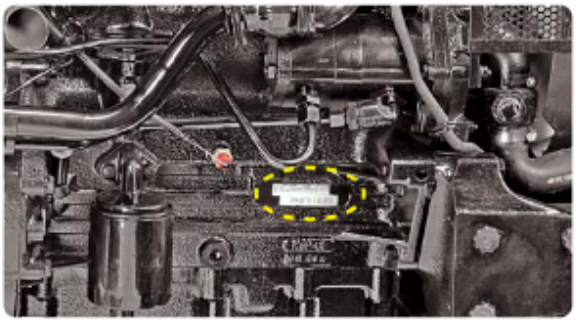
The tractor serial number is stamped on a plate riveted on the tractor. For easy reference, we suggest you to write this number in the space provided in the owner's personal data.

When spare parts are required, always specify the tractor and engine serial number. This will facilitate faster delivery and help ensure that the correct part for your particular tractor is received.

A plate rivetted on tractor

Serial Number

Note the serial number and date of manufacturing of your tractor. (Punched to the right side of Engine). Always quote this serial number in any communication to your authorised Mahindra Dealer.



Right Side of Engine

General Construction

The transmission case, clutch housing, engine and front axle are bolted together to form a rigid unit called as chassis.

Engine

These Tractors are fitted with fuel efficient US EPA (Comply with US TIER-4 Final emission norms) certified Mahindra MDI 2700 E series Engines. These are 4 cylinder, Naturally Aspirated, Water cooled, Direct Injection type, comprising of high pressure CRS system, cooled and controlled EGR.

Front Axle & Wheels

Front axle is live front axle (4WD), with bevel gear reduction. The front wheels are directly mounted on the axle. The front track is adjustable with adjustment provided on the rims. The turning angles are all preset.

Clutch

4540/4550 4WD tractors are fitted with dual clutch assembly, having one each of 11" & 11" driven plates for transmission and CRPTO (Constant Running Power take-off).

Transmission

Mahindra 4540/4550 4WD tractors are fitted with FCM 8X2 transmission. The transmission gear box is equipped with eight forward speeds & two reverse speeds with a high-low selector lever.

Mahindra 4540/4550 4WD tractors are equipped with CRPTO, a dual plate clutch is used. The P.T.O. drive shaft is hollow and runs out side the transmission driving shaft. The front of the P.T.O. drive shaft is splined to the rear plate of the clutch, while the shaft itself carries a gear on the front P.T.O. shaft. The front P.T.O. shaft runs through the hollow transmission shaft and at the rear end, has a spigot to support the rear power take off shaft and splines by which the P.T.O. clutch engage the two shafts. The clutch has two friction plates. The rear plate is splined to the PTO drive shaft. The Clutch pedal can be depressed half way to stop tractor movement while the PTO continues to run or depressed fully, stopping both tractor and PTO movement.

Steering System

The Power Steering system consists of a Hydrostatic Steering unit (HSU), Hydraulic cylinder. A separate pump is mounted on the engine front which supplies oil to this system. Oil for Steering system is common with Transmission-Hydraulic oil.

Rear Axle & Wheels

The rear axle is mounted on bearings and is enclosed in a removable housing which is bolted to the transmission case. The rim & disc, fitted with rear tires, are bolted to the outer flange of rear axle. The Rear track adjustment is provided on the rims.

Brakes

These tractors are provided with independent disc brakes operated by two independent pedals which can be latched together for road travel. The independent pedals assist in making sharp turns at slow speeds in the field. The operator has to unlatch the brake pedals and depress the right or left brake pedal as required.

A hand brake lever is fitted for parking.

Hydraulic System

The tractor is fitted with fully "live" Hydraulic System. Using a pump driven directly from the Engine, it is able to operate the three-point linkage and auxiliary valve entirely independent of any clutch movement when changing gear or operating the power take-off.

Three Point Linkage

Three Point Linkage is suitable for category 1 & 2 type implements.

Electrical System

A 12 Volt battery is used to crank the engine with the starter motor. The electrical system is comprised of the head lamp, Turn signal indicators, work lamp, brake light, parking lamp, ECU, sensors, instrument cluster, alternator and fuse box and relays.

Safety

PTO and Transmission neutral switch are a standard feature.

Sheet Metal

Hood, fuel tank, panel, battery tray, scuttle support, foot plates, fenders, etc. are manufactured of Sheet Metal and front grill, perforated grill and bezel are manufactured of SMC. After undergoing through surface preparation, it is first primed & then painted.

We at Mahindra USA Inc. and your Mahindra Dealer want you to be completely satisfied with your investment. Normally any problems with your equipment will be handled by your Dealer's service department. Sometimes, however, misunderstanding can occur. If you feel that your problem has not been handled to your satisfaction, we suggest the following:

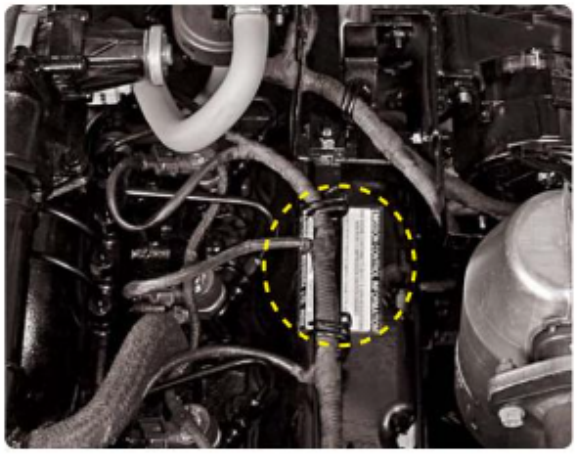
Contact the Owner or General Manager of the dealership, explain the problem, and request assistance. Your Dealer has direct access to the Mahindra office. If you cannot obtain satisfaction through your Dealer, contact the Mahindra USA Inc. office (1-877-449-7771) and provide the following:

- Your Name, Address and Telephone number
- Model and Tractor Serial number
- Dealer Name and Address
- Tractor Purchase Date and Hours used
- Nature of Problem

Before contacting Mahindra USA Inc. office, be aware that your problem is likely to be resolved at your retail Mahindra dealership by Dealer personnel. So it is important that your initial contact be with your retail Mahindra Dealer.

Owner's Personal Data

A sticker having important engine information is fitted on the LH side of engine.



EPA & CARB Sticker

Name :

Address :

Tractor Details

Model :

Tractor Serial Number :

Date of Purchase :

Expiration of Warranty :

Nearest Authorised Dealer

Name :

Address :

Telephone No. :

Fax No. :

Keep this operators manual safely for regular reference. Ensure that all operators have access to it and that they understand its contents.

Roll Over Protective Structure (ROPS)

Mahindra & Mahindra Ltd. tractors are fitted with a frame for the protection of tractor operators to minimize serious operator injury resulting from accidental roll over. These frames, known as ROPS, form a safety zone within which the operator is offered some protection in the event that the tractor turns over. It is necessary that the tractor operator fasten the seat belt around him/her to be protected by the ROPS. The mounting structure and fasteners forming the mounting connection with the tractor are part of the ROPS.

(ROPS) Maintenance and Inspection

The ROPS has been certified to industry and/or government standards. Any damage or alteration to the ROPS, mounting hardware or seat belt voids the certification and will reduce or eliminate protection for the operator, in the event of a roll-over.

The ROPS, mounting hardware and seat belt should be checked after the first 100 hrs. of tractor operation and every 500 hours thereafter for any evidence of damage, wear or cracks. In the event of damage or alteration, the ROPS must be replaced prior to further operation of the tractor. The seat belt must be worn during tractor operation when it is equipped with a certified ROPS. Failure to do so will reduce or eliminate protection of the operator in the event of a roll-over.

Substitution of mounting hardware, seat belt etc. with components not equal to or superior to the original certified components will void the certification and will reduce or eliminate protection for the operator in the event of a roll-over.

Operating Foldable ROPS

To Fold-Down ROPS Crossbar (A):

1. Remove quick-lock pins (B) and headed pins (C).
2. Loosen the knob (D)
3. Turn the crossbar (A) of ROPS onto stops.
4. Reinstall pins (C and B) into its position on ROPS

To raise ROPS in Operating Position:

1. Remove quick-lock pins (B) and headed pins (C).
2. Loosen the knob (D)
3. Turn to raise the crossbar (A) of ROPS.
4. Install pins (C) and quick-lock pins (B).
5. Tighten the knob (D)

A - ROPS crossbar
B - Quick-lock Pins
C - Headed Pins
D - Knob

Damage of the ROPS

If the Tractor has rolled over or the ROPS has been damaged (such as striking an overhead object during transport), it must be replaced to provide the original protection. After an accident, check for damages to the 1. ROPS 2. Seat 3. Seat belt & seat mountings. Before you operate a Tractor, replace all damaged parts.

⚠ WARNING

When improperly operated, a tractor can roll over. For low clearance storage only, the roll bar may be folded. No protection is provided when the tractor is operated with the roll bar in the folded position. Always raise the roll bar immediately after low clearance storage. Always use the seat belt when the roll bar is raised. Seat belts save lives when they are used. Do not use the seat belt when the roll bar is lowered. Never attach chains or ropes to the ROPS for pulling purposes; this will cause the tractor to tip backwards. If the ROPS is removed or replaced, make certain that the proper hardware is used to replace the ROPS and the recommended torque values are applied to the attaching bolts.

Always wear your seat belt if the tractor is equipped with a ROPS.

ROPS Folded

Recognize Safety Information

This symbol means ATTENTION ! YOUR SAFETY IS INVOLVED. The message that follows the symbol contains important information about safety. Carefully read the message.

Signal Words

A signal word - DANGER, WARNING OR CAUTION is used with safety alert symbol. DANGER identifies the most serious hazards. Safety signs with signal word - DANGER OR WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety signs.

Read Safety Instructions

Carefully read all safety instructions given in this manual for your safety. Tampering with any of the safety devices can cause serious injuries or death. Keep all safety signs in good condition. Replace missing or damaged safety signs.

Keep your tractor in proper condition and do not allow any unauthorised modifications to be carried out on the tractor which may impair the function / safety and affect tractor life.

Safety for Children

Tragedy can occur if the operator is not alert to the presence of children. Children generally are attracted to machines and the work they do.

1. Never assume that children will remain where you last saw them.
2. Keep children out of the work area and under the watchful eye of another responsible adult.
3. Be alert and shut your machine down if children enter the work area.
4. Never carry children on your machine. There is no safe place for them to ride. They may fall off and be run over or interfere with your control of the machine.
5. Never allow children to operate the machine even under adult supervision.
6. Never allow children to play on the machine or on the implement.
7. Use extra caution when backing up. Look behind and down to make sure are is clear before moving.
8. When parking your machine if at all possible park on a firm, flat and lever surface; if not, park across a slope. Set the parking brake(s), lower the implements to the ground, remove the key from the ignition (and lock the cab door if equipped) and chock the wheels.

Precautions to Avoid Tipping

Do not drive where the tractor could slip or tip.

Stay alert for holes and rocks in the terrain, and other hidden hazards.

Slow down before you make a sharp turn.

Driving forward out of a ditch or mired condition could cause tractor to tip over backward. Back out of these situations if possible.

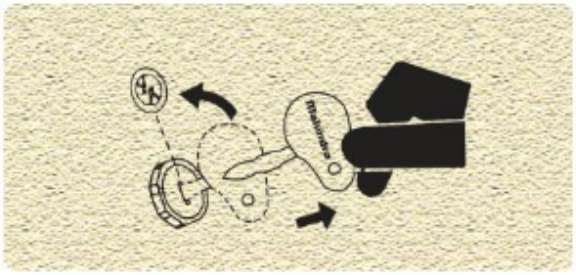
Use of ROPS & Seat Belt

The Roll Over Protective Structure (ROPS) has been certified to industry and/or government standards. Any damage or alteration to the ROPS, mounting hardware, or Seat belt voids the certification and will reduce or eliminate protection for the operator in the event of a roll-over. The ROPS, mounting hardware, and seat belt should be checked after the first 100 hours of tractor operation and every 500 hours thereafter for any evidence of damage, wear or cracks. In the event of damage or alteration, the ROPS must be replaced prior to further operation of the tractor.

The seat belt must be worn during machine operation when the machine is equipped with a certified ROPS. Failure to do so will reduce or eliminate protection for the operator in the event of a roll-over.

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.

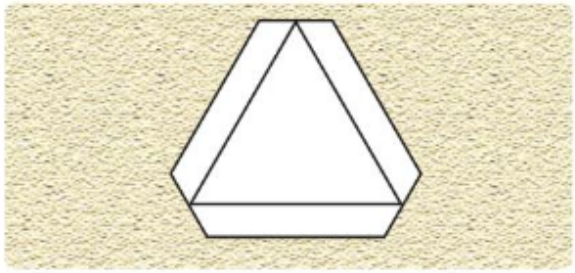
Keep PTO shields in place at all times.

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 & 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.

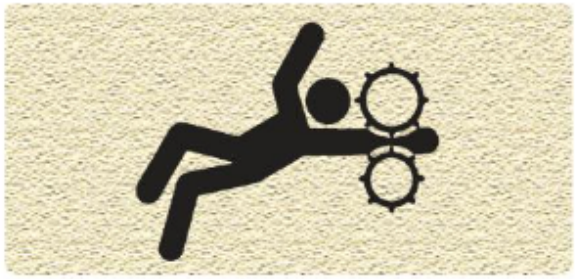
Use slow moving vehicle (SMV) sign when driving on public road during both day & night time, unless prohibited by law.



Service Tractor Safely

Do not wear a necktie, scarf or loose clothing when you work near moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewellery to prevent electrical shorts and entanglement in moving parts.



Practice Safe Maintenance

Understand service procedure before doing work. Keep the surrounding area of the tractor clean & dry.

Do not attempt to service tractor when it is in motion. Keep body and clothing away from rotating shafts. Always lower equipment to the ground. Stop the engine. Remove the key. Allow tractor to cool before any work/repair is performed on it.

Securely support any tractor components that must be raised for service work.

Keep all parts in good condition and properly installed. Replace worn or broken parts. Replace damaged or missing decals. Remove any buildup of grease or oil from the tractor.

Disconnect the battery ground cable (-) before making adjustments on electrical systems or welding on tractor.

Prevent Acid Burns

Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, cause holes in clothing and cause blindness if it contacts the eye.

For adequate safety always :

1. Fill batteries in a well-ventilated area.
2. Wear eye protection and acid proof hand gloves.
3. Avoid breathing direct fumes when electrolyte is added.
4. Do not add water to electrolyte as it may splash off causing severe burns.

If you spill acid on yourself :

1. Flush your skin with water.
2. Flush your eyes with water for 10-15 minutes. Get medical attention immediately.

Prevent Battery Explosions

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the poles.

Avoid High-pressure Fluids

Escaping fluid under pressure can penetrate the skin causing serious injury. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Do not operate Auxiliary valve when terminal pipes are open.

If ANY fluid is injected into the skin. Consult your doctor immediately.

Work In Ventilated Area

Do not start the tractor in an enclosed building unless the doors & windows are open for proper ventilation, as tractor exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area remove the exhaust fumes by connecting exhaust pipe extension and drawing them out with an exhaust fan.

Slow Moving Vehicle Emblem

Observe the following precautions when operating the tractor on road.

1. Ensure that Slow Moving vehicle (SMV) emblem (A) affixed on back side of operator seat is clean and visible.
2. If towed or rear-mounted equipment obstructs this emblem, install SMV emblem on equipment.

Tractor Runaway

Avoid possible injury or death from possible runaway. Do not start the engine by shorting across electrical circuit. The tractor will start in gear if starting circuit is bypassed.

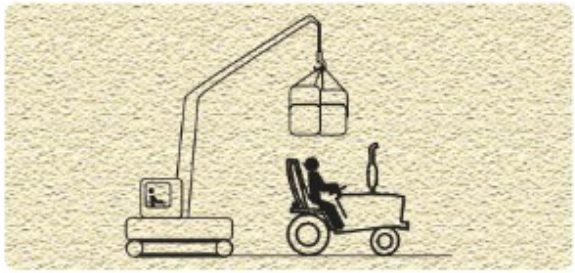
NEVER start engine while standing on ground. Start engine only from operator's seat with, transmission in neutral position, hand brake lever engaged and PTO lever in disengaged position

The tractor can start only if the transmission is in neutral position and PTO lever in neutral as well.

For additional safety keep, the engine starting key in OFF position, transmission in neutral position, hand brake lever engaged, PTO lever in disengaged position while servicing the tractor.

Overhead Protection

This tractor does not have any protection from overhead falling objects. Do not use this tractor in an application where there is a risk of falling objects striking the operator.



Sunlight Protection

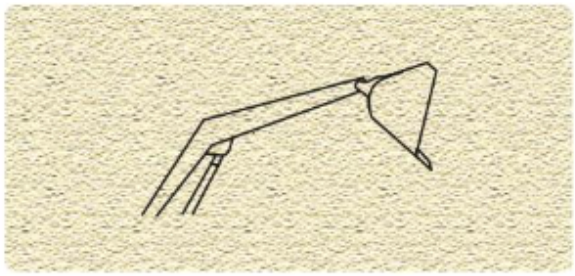
To Protect the operator from the sun light, it is recommended to use the canopy.

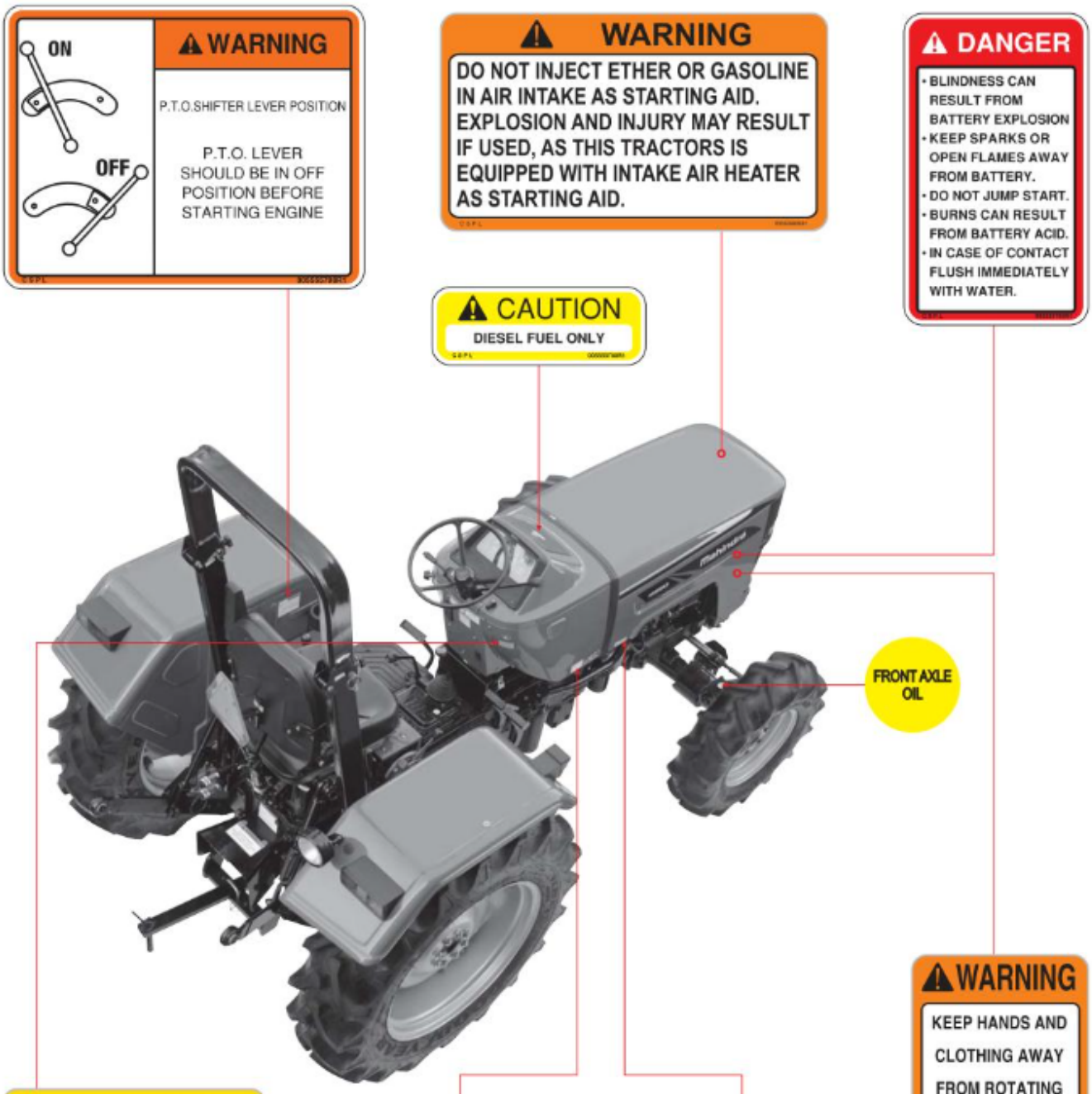
Hearing Protection

It is recommended to use hearing protection while tractor is in operation.

Precautions While Using Loader

When using a loader, be conscious of bucket location at all times, particularly when raising a loader with bucket rolled back.




ON
OFF
WARNING
P.T.O.SHIFTER LEVER POSITION
P.T.O. LEVER SHOULD BE IN OFF POSITION BEFORE STARTING ENGINE
WARNING
DO NOT INJECT ETHER OR GASOLINE IN AIR INTAKE AS STARTING AID. EXPLOSION AND INJURY MAY RESULT IF USED, AS THIS TRACTORS IS EQUIPPED WITH INTAKE AIR HEATER AS STARTING AID.
DANGER
• BLINDNESS CAN RESULT FROM BATTERY EXPLOSION
• KEEP SPARKS OR OPEN FLAMES AWAY FROM BATTERY.
• DO NOT JUMP START.
• BURNS CAN RESULT FROM BATTERY ACID.
• IN CASE OF CONTACT FLUSH IMMEDIATELY WITH WATER.
CAUTION
DIESEL FUEL ONLY
FRONT AXLE OIL
CAUTION
COLD START AID
FOR PREHEATING, TURN KEY TO "ON" POSITION. START AFTER HEATER INDICATOR IS OFF.
CAUTION
CHECK THE ENGINE OIL LEVEL BEFORE STARTING THE TRACTOR, TO GET CORRECT OIL LEVEL.
CAUTION
DO NOT TOUCH MUFFLER (HIGH TEMPERATURE)
WARNING
KEEP HANDS AND CLOTHING AWAY FROM ROTATING FAN AND BELTS TO PREVENT SERIOUS INJURY.

⚠ WARNING

- The cooling system operates under pressure.
- It is dangerous to remove the radiator cap while the system is hot.
- Always turn the cap slowly to the first stop and allow pressure to escape before removing the cap completely.
- When operating below 32° F, use suitable anti-freeze solution as coolant.

⚠ WARNING

- Before starting and operating know the operating and safety instructions in the Operators Manual and on the tractor.
- Clear the area of bystanders.
- Locate and know operation of controls.
- Start engine only from Operators seat with depressed cluth pedal, transmission in the neutral, PTO disengaged and hydraulic control in lower position.
- Lock brakes together, use warning lights and SMV emblem while driving on roads.
- Do not permit anyone but the operator to ride on the tractor. There is no safe place for riders, unless mate seat is provided on fender.
- Slow down on turns, rough ground and slopes to avoid upset.
- Lower equipment, place gear shift levers in neutral, stop engine and apply parking brake before leaving the tractor seat.

FAILURE TO FOLLOW ANY OF THE INSTRUCTIONS ABOVE CAN CAUSE SERIOUS INJURY TO THE OPERATOR

⚠ WARNING

DO NOT DISTURB HYDRAULIC MAX. LIFT SETTING STOPPER (A)

WHILE TRANSPORTING IMPLEMENTS OR USING AUTOMATIC HITCH, KEEP DRAFT LEVER (C) IN LOWER POSITION

WHEN ISOLATING VALVE IS IN CLOSED POSITION, KEEP BOTH THE LEVERS (B&C) IN LOWER POSITION.

⚠ CAUTION

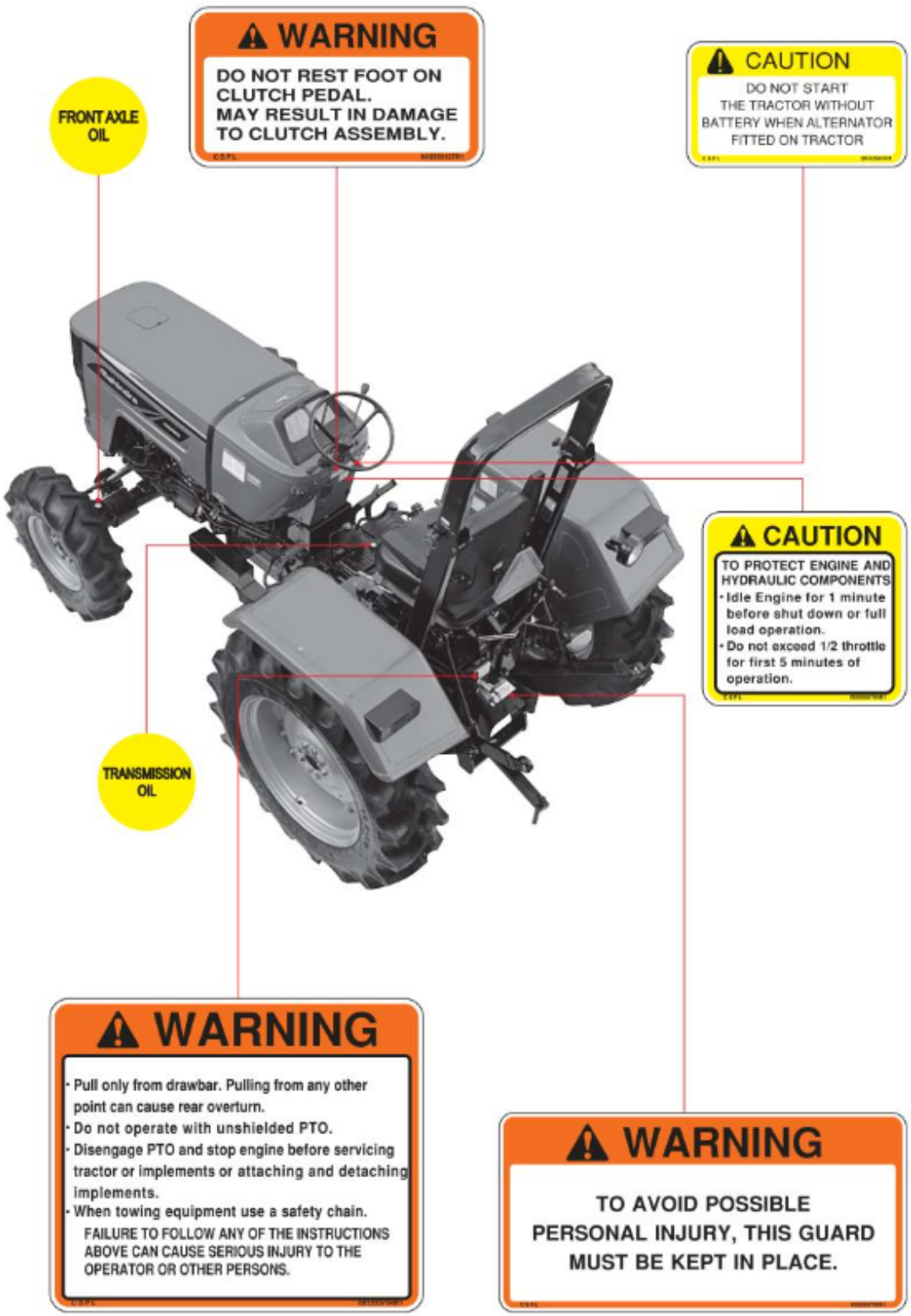
BEFORE OPERATING THE TRACTOR, READ THE OPERATOR'S MANUAL THOROUGHLY, TO UNDERSTAND THE IMPORTANT FUNCTIONS AND CONTROLS.

⚠ WARNING

KEEP HANDS AND CLOTHING AWAY FROM ROTATING FAN AND BELTS TO PREVENT SERIOUS INJURY.

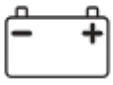
⚠ WARNING

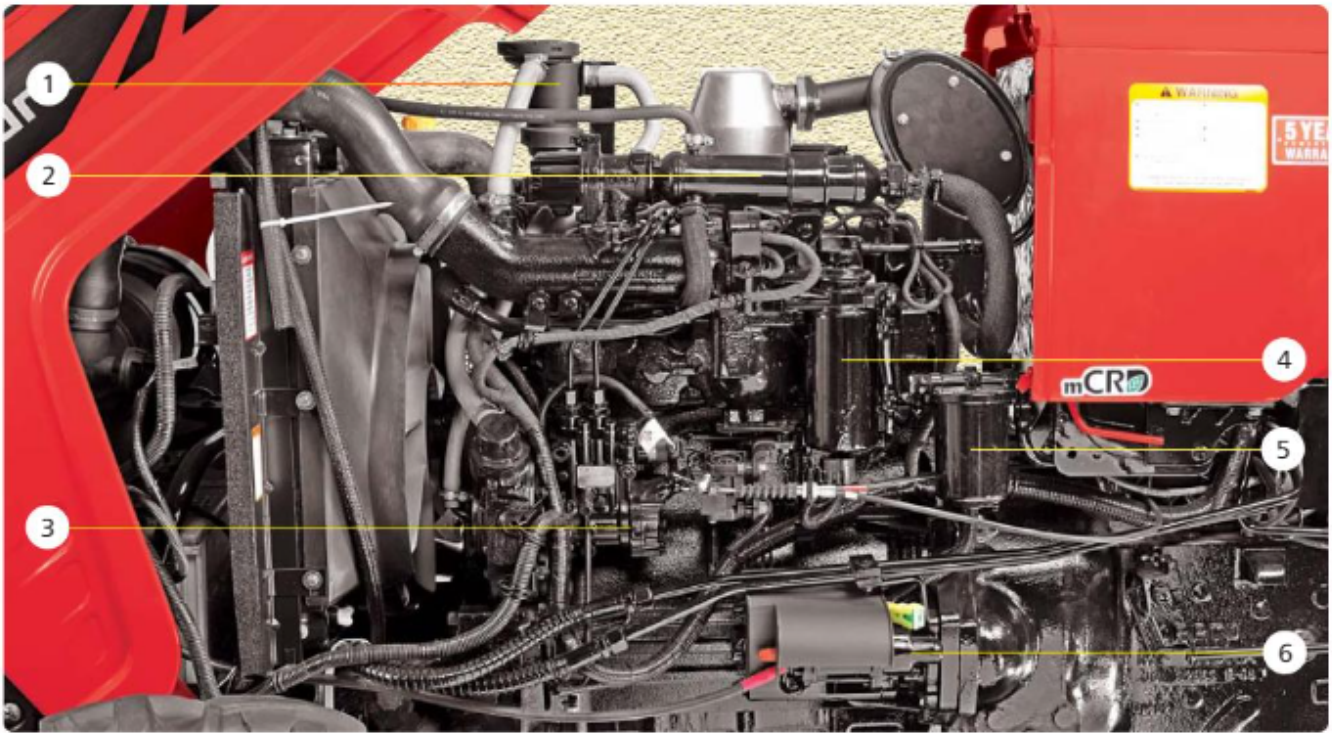
- Start engine only from operator's seat. If safety start switch is bypassed engine can start with transmission in gear.
- Do not connect or short across terminal on starter solenoid.
- Attach booster cables as shown on battery decal and operator's manual.
- Starting in gear causing runaway can result in serious injury.


FRONT AXLE OIL
WARNING
DO NOT REST FOOT ON CLUTCH PEDAL.
MAY RESULT IN DAMAGE TO CLUTCH ASSEMBLY.
CAUTION
DO NOT START THE TRACTOR WITHOUT BATTERY WHEN ALTERNATOR FITTED ON TRACTOR
CAUTION
TO PROTECT ENGINE AND HYDRAULIC COMPONENTS
• Idle Engine for 1 minute before shut down or full load operation.
• Do not exceed 1/2 throttle for first 5 minutes of operation.
TRANSMISSION OIL
WARNING
• Pull only from drawbar. Pulling from any other point can cause rear overturn.
• Do not operate with unshielded PTO.
• Disengage PTO and stop engine before servicing tractor or implements or attaching and detaching implements.
• When towing equipment use a safety chain.
FAILURE TO FOLLOW ANY OF THE INSTRUCTIONS ABOVE CAN CAUSE SERIOUS INJURY TO THE OPERATOR OR OTHER PERSONS.
WARNING
TO AVOID POSSIBLE PERSONAL INJURY, THIS GUARD MUST BE KEPT IN PLACE.

Universal Symbols

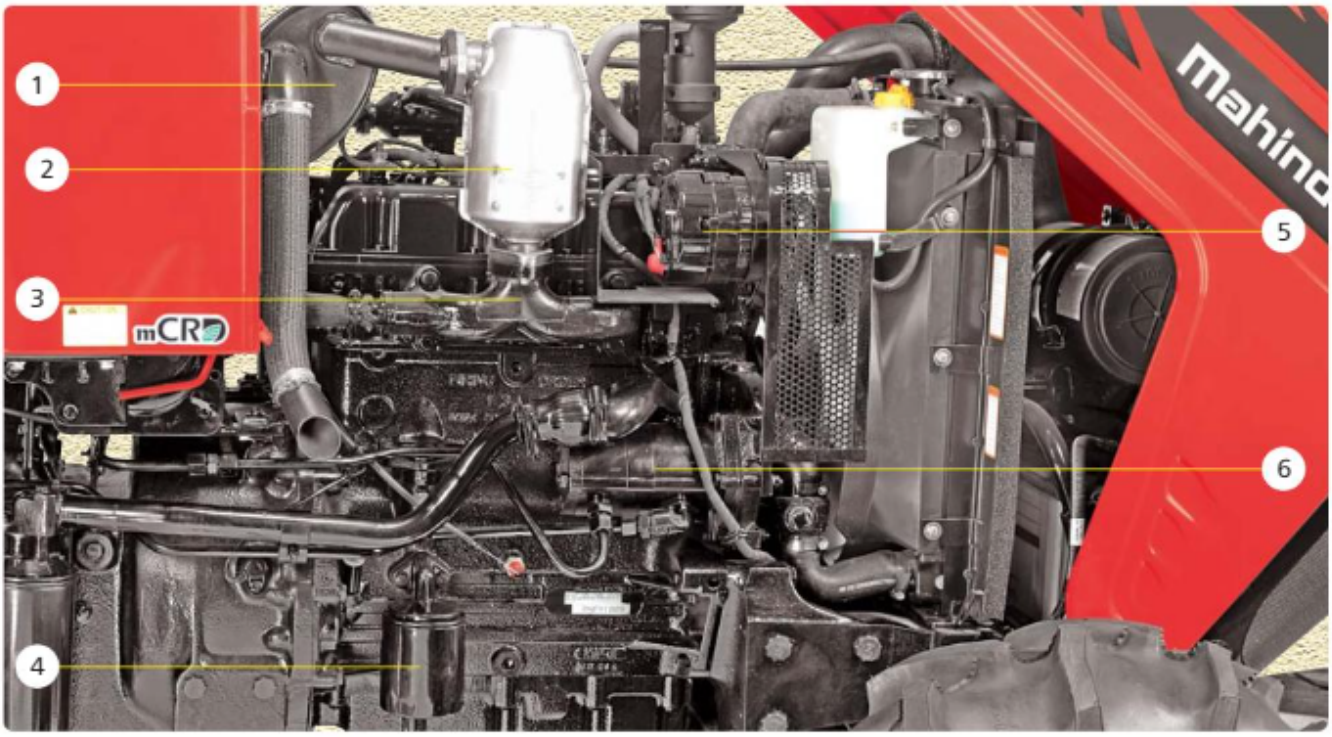
Some of the universal symbols have been shown below with an indication of their meaning.

 Engine speed (rev/minX100)	 Pressured-open slowly	 Corrosive substance
 Hours, recorded	 Continuous variable	 "Tortoise" slow or minimum setting
 Engine coolant temperature	 Warning	 "Hare" fast or maximum setting
 Fuel level	 Hazard warning	 Transmission oil pressure
 Engine stop control	N Neutral	 Turn signal
 Lights	 Fan	 Transmission oil temperature
 Horn	 Power take off engaged	 Parking brake
 Engine oil pressure	 Power take off disengaged	 Work lamps
 Air filter	 Lift arm/raise	 Differential lock
 Battery charge	 Lift arm/lower	 See operator's manual
 MIL (Malfunction Indicator Lamp)	CHK ENG Check Engine Indicator	 4WD Indicator



LH View:

1. PCV Oil Separator
2. EGR Cooler
3. Common Rail Pump
4. Fuel Filter
5. Fuel Pre Filter
6. Starter Motor

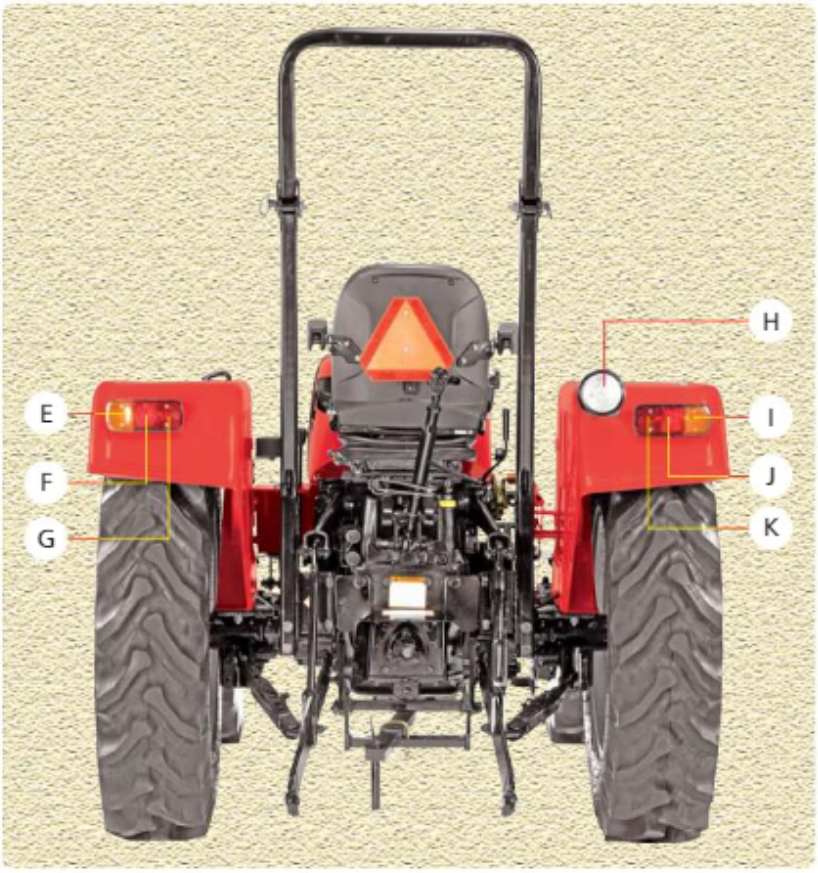


RH View:

1. Underhood Muffler
2. DOC
3. Exhaust Manifold
4. Oil Filter Engine
5. Alternator
6. Hydraulic Pump

Front View :

A. Turn Signal & Parking Lamp - RH
B. Head Lamp - RH
C. Turn Signal & Parking Lamp - LH
D. Head Lamp - LH



Rear View :

E. Turn Signal Lamp LH
F. Position Lamp LH
G. Brake Lamp LH
H. Work Lamp
I. Turn Signal Lamp RH
J. Position Lamp RH
K. Brake Lamp RH

The following pages in this section detail the location and function of various instruments, switches and controls on your tractor. Even if you operate other tractors, you should read through this section of the manual and ensure that you are thoroughly familiar with the location and function of all the features of your new tractor.

Do not start the engine or attempt to drive or operate the tractor until you are fully accustomed to all the controls. It is too late to learn once the tractor is moving. If in doubt about any aspect of operation of the tractor consult your Mahindra USA Inc. Tractor Dealer.

This section explains briefly the operation of instruments, and controls. Full details wherever necessary will be found in forthcoming chapters at relevant operating sections.

Instrument Cluster

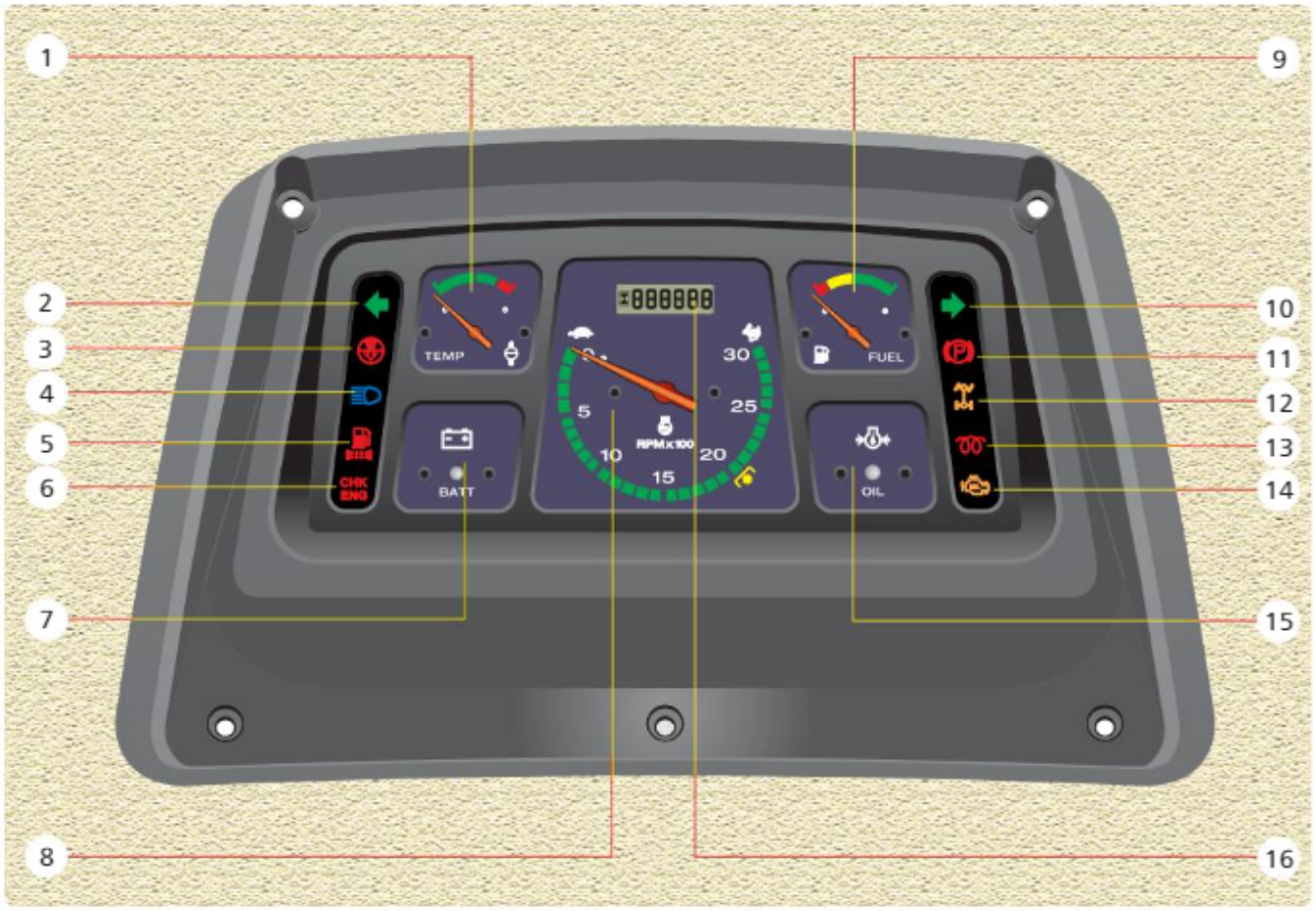
Operator Controls - Front

Operator Controls - LH, RH

Switches

⚠ WARNING

The operator must be thoroughly acquainted with the location and use of all instruments and controls regardless of experience, must read this section carefully before attempting to operate the tractor.



Instrument Cluster

The Instrument Cluster is a descriptive unit that gives the user various indications about the working of the tractor and its various features. It consists of the following.

1. Engine Coolant Temperature Gauge
2. LH Turn Signal Indicator
3. Air Cleaner Clog Indicator
4. High Beam Indicator
5. Water In Fuel Indicator
6. CHK ENG (Check Engine) Lamp
7. Battery Charge Indicator
8. RPM Meter
9. Fuel Level Gauge
10. RH Turn Signal Indicator
11. Parking Brake Indicator
12. 4WD Indicator
13. Heater Indicator
14. MIL (Malfunction) Indicator Lamp
15. Low Oil Pressure Indicator
16. Digital Hourmeter Counter

RPM Meter

This meter gives the number of Revolution Per Minute of the engine. To arrive at the RPM value at any given point of time, multiply the pointer reading by 100.

Example : If the reading shows 15, the actual engine RPM value = 15 x 100 = 1500.

PTO 540 rpm Mark

This Mark is located in the RPM meter at 2058 rpm of Engine. It indicates the Engine rpm at which the PTO shaft will rotate at 540 rpm.

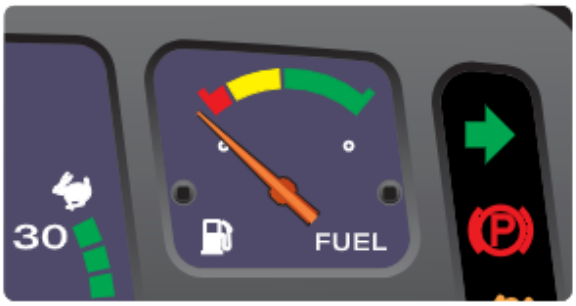
Hour Counter

This is a Digital Hour counter located in the RPM meter. It is operated by pulses coming from ECU when the engine is running. Hour counter displays the cumulative engine running hours.

Fuel Gauge

The Fuel Gauge indicates quantity of fuel available in the fuel tank. The Indication is divided into three stages Viz. Red, Yellow and Green.

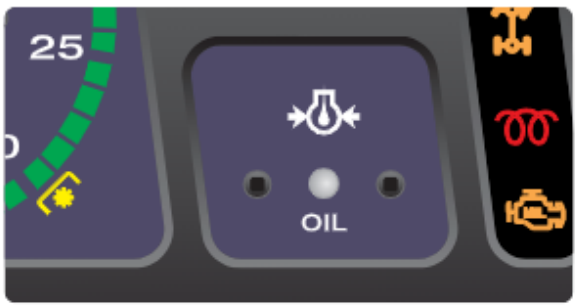
The Red Band starts at 2.90 US Gallon (11 lit)



Low Oil Pressure Indicator

This indicator will glow if Engine Lubricating oil pressure is less.

After putting ignition switch in "ON" position, the oil pressure indicator should be "ON". When Engine is running and healthy, it should be "OFF". If the indicator is "ON", the problem should be eliminated before starting the Engine.

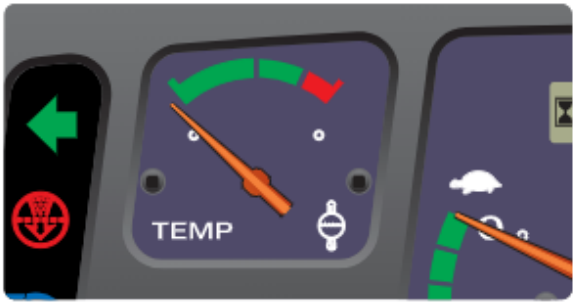


Engine Coolant Temperature Gauge

This gauge indicates coolant temperature of the engine.

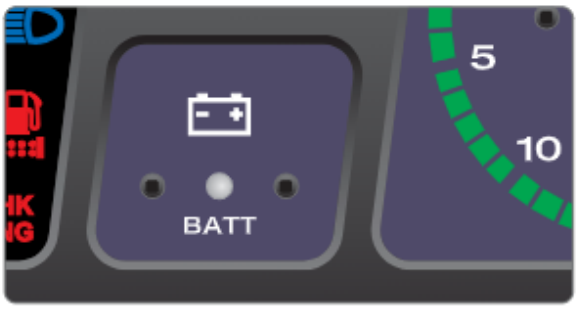
When the pointer lies in RED band :

1. Indicates excessive engine coolant temperature.
2. Get the cause identified.
3. Further engine operation should be done only after elimination of the problem.



Battery Charging Indicator

The indicator will glow if battery is not getting charged. Once the engine is running, this indicator should go OFF if the battery is getting charged. If the indicator glows continuously even when the engine is running above low idle rpm of engine, the cause should be investigated to prevent complete discharge of battery and possible damage of alternator.



High Beam Indicator

This indicator (C) glows when Head Lamps are operated in High Beam.

Parking Brake Indicator

This indicator (G) glows when either brakes or parking brake is applied.

Turn Signal Indicators

LH and RH turn signal indicators (A & F) are provided to indicate the direction of turning.

A blinking LH turn signal indicator (A) implies that the LH Turn Signal of tractor is ON whereas a blinking RH turn indicator (F) implies that the RH Turn Signal indicator of tractor is ON.

Heater Indicator

It glows for 60 seconds when key is in "ACC" position and would be activated from ECU only when the engine runs at a higher idle rpm (1200 rpm) until coolant temperature reaches to 20°C (68°F) from 0°C.

Air Filter Clog Indicator

This indicator (B) is ON when Air filter requires cleaning.

Water In Fuel Indicator

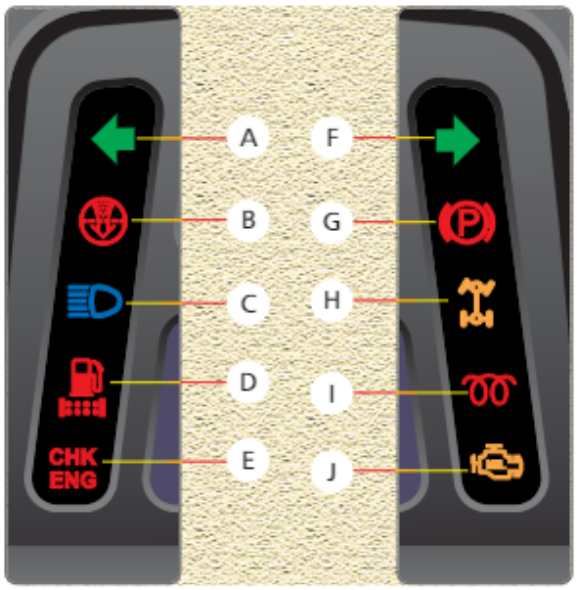
This indicator (D) should be "ON" for 2 seconds when ignition switch is turned to second position.

This indicator will remain "ON" if the water level in the Fuel Filter needs to be drained. The indicator will go "OFF" after draining water from Fuel Filter.

CHK ENG (Check Engine) Indicator

This indicator (E) will glow when the starter switch is turned to "ON" position. This indicator shall turn-off after engine is CRANKED.

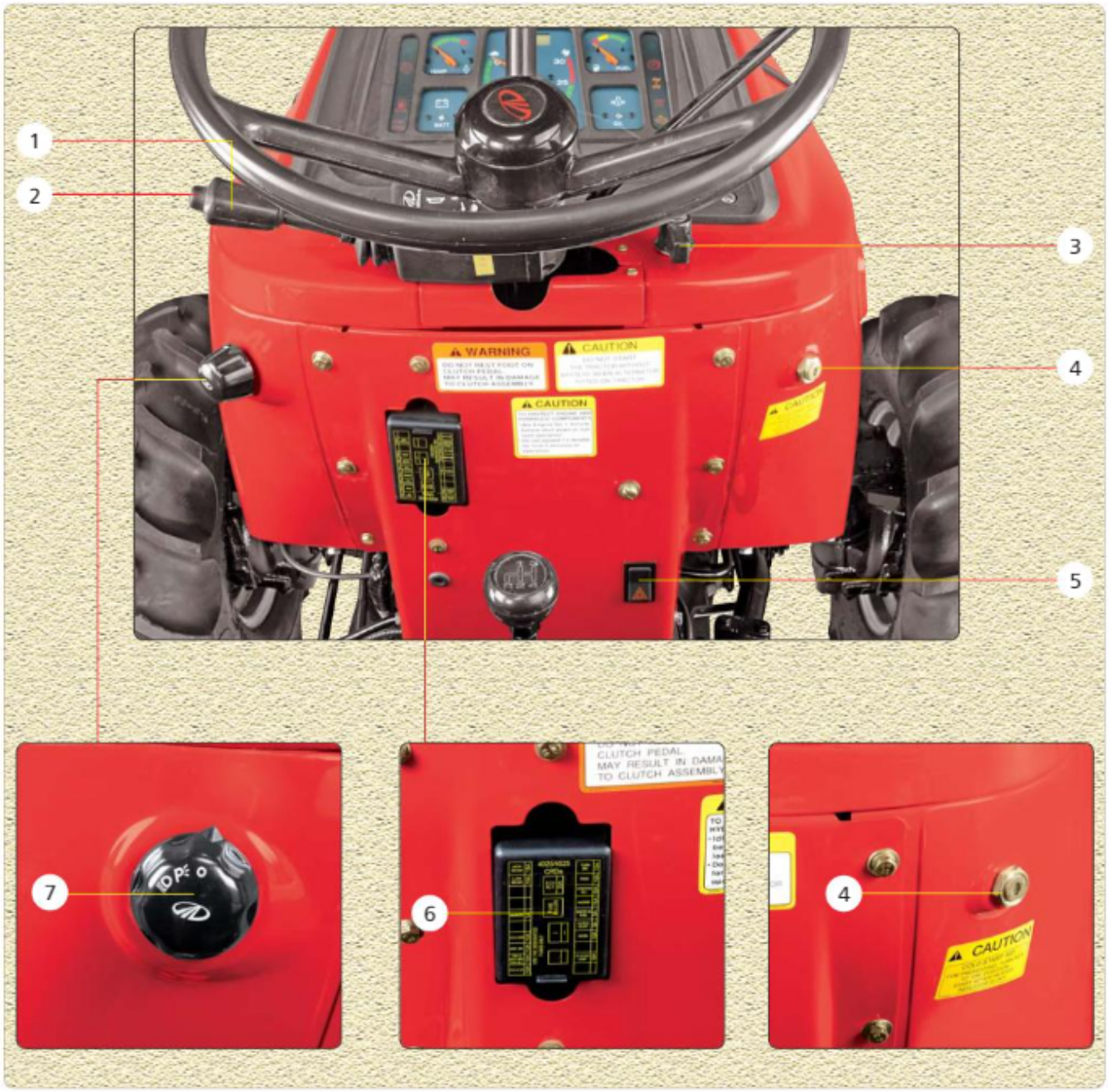
A malfunction other than Emission, such as Sensor failures would be indicated by a continuously "GLOWING" or "BLINKING" Indicator, even past CRANKING of the engine. In such an event, get the problem rectified by an authorized Mahindra Dealer.



MIL (Malfunction) Indicator

This indicator (J) will glow when the starter switch is turned to "ON" position. This indicator shall turn-off after engine is CRANKED.

A malfunction in the electronic emission control system (ECU) is indicated by a continuously "GLOWING" or "BLINKING" Indicator, even past CRANKING of the engine. In such an event, get the problem rectified by an authorized Mahindra Dealer.



Switches

1. Combination Switch (High-Low & Turn Signal)
2. Horn Button
3. Work Lamp Rotary Switch
4. Key Switch
5. Hazard Switch
6. Fuse Box
7. Rotary Light Switch

4WD Switch

This switch is located below LH Footplate. This switch gives indication to the cluster when 4WD is engaged.

Rotary Light Switch

This is 3-Way rotary switch located on LH side of Scuttle. It operates in clockwise direction and the positions give operations as follows:

1 st – OFF

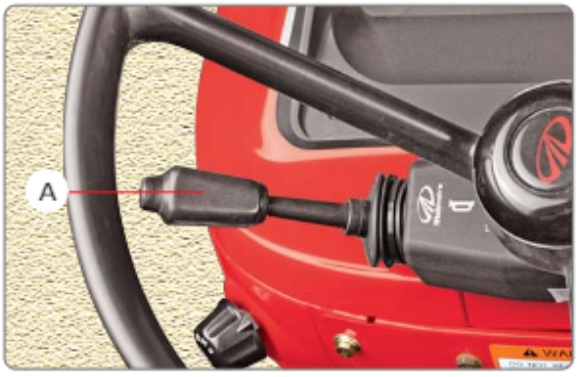
2 nd – Parking Lamp & Instrument Cluster Illumination

3 rd – High Beam, Parking Lamp, Instrument Cluster illumination

Combination Switch

This switch is located on LH side of Steering column. The lever operates in Five positions as follows.

1. Towards the operator
   Operates LH Turn signal in both up and down position
2. Away from the operator
   Operates RH Turn signal in both up and down position
3. Upwards from Centre
   Low Beam of Head Lamp with light switch in 3rd position.
4. Downwards from Centre
   High Beam of Head Lamp with light switch in 3rd position.
5. Centre
   Turn Off Turn Signal.



Horn Button

Press the Button (A) to blow horn.

Work Lamp Rotary Switch

This rotary switch when turned clockwise operates work lamp.

Key

The Key operates the Key Switch.

Starter Key Switch

It is a key operated 3 position rotary switch. It is located on RH side of steering column on dashboard. It operates in clockwise direction and positions are as follows:

1. Off
2. It gives readiness to electrical circuit for operation of work lamp switch, combination switch, instrument cluster.
3. Activates the starting circuit for engine.

Stopping the Engine

Movement of the key in the anti-clockwise direction to the 1st position will discontinue the fuel supply to the engine thereby stopping the engine.

Hazard Switch

This is a Piano type switch and is located on the rear-scuttle in front of Operator's Seat.

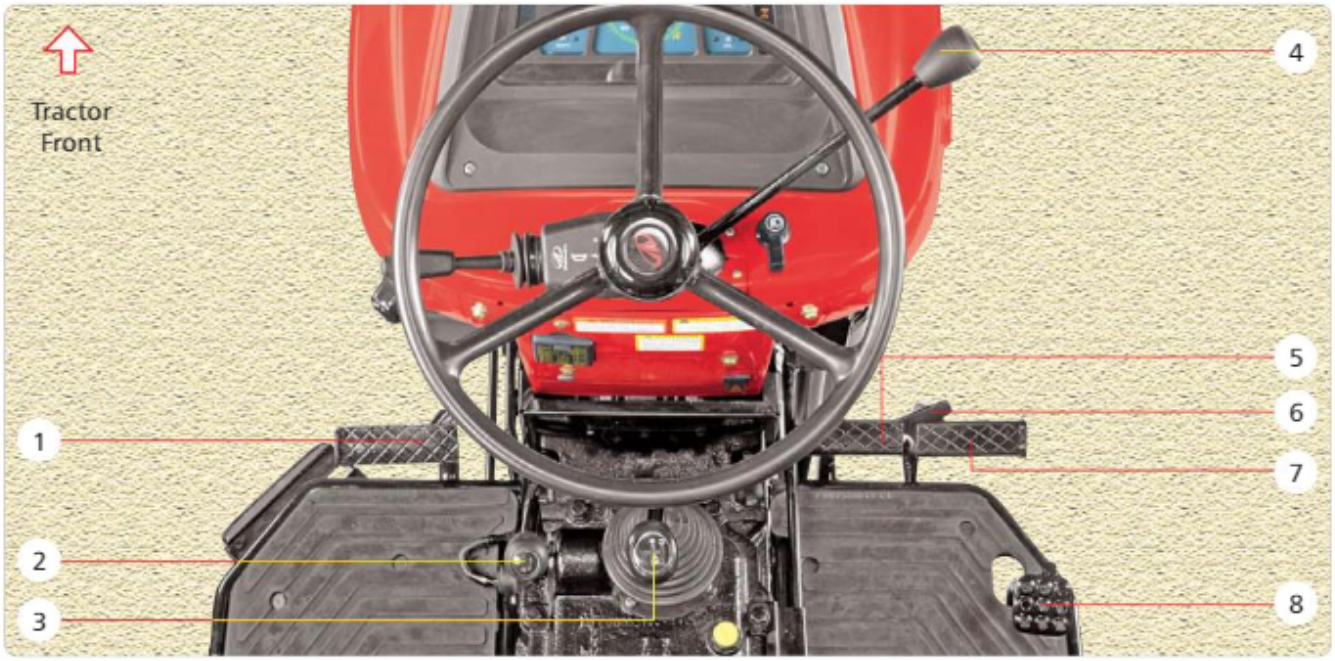
Operation of this switch will activate all the turn Signal Lamps.

Fuse Box

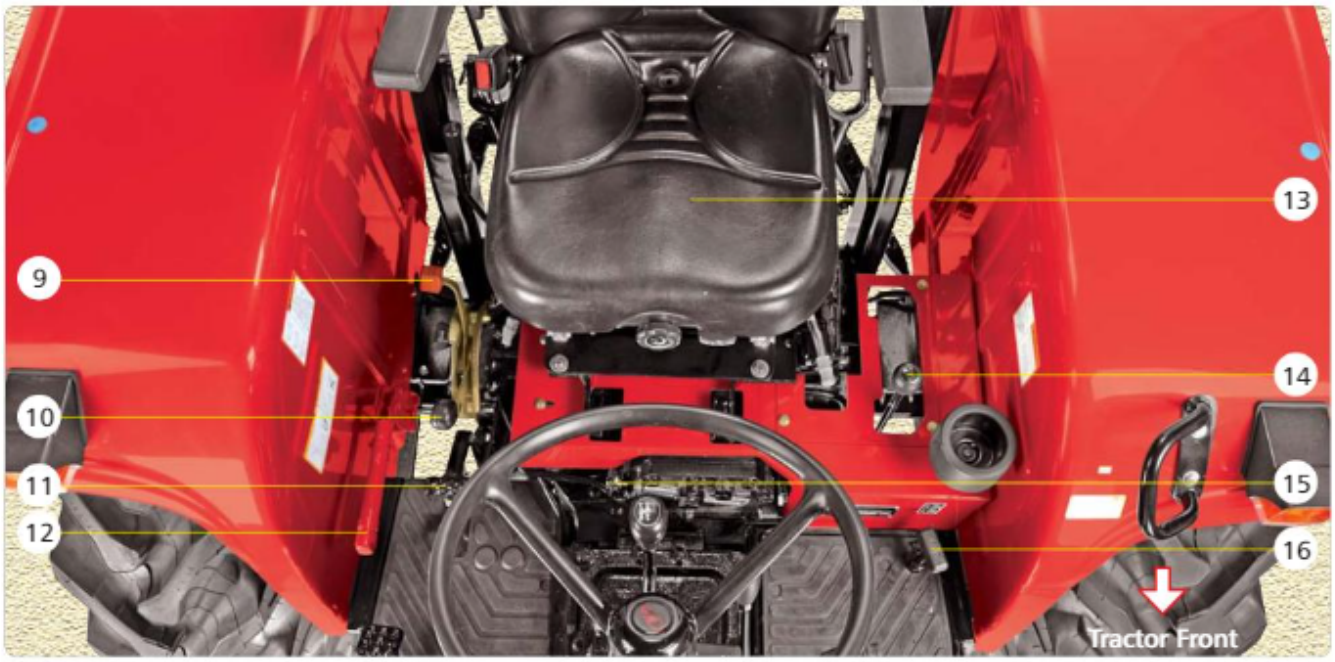
The fuses protecting the circuits are mounted in a fuse Box. A blown fuse can be confirmed by examination of the fuse. If it has blown, the separate ends of the wire will be visible inside the glass housing.

A separate fuse is provided for fuel injection pump starting solenoid. The blown fuse will not let the tractor to start.

Before replacing a blown fuse, inspect the wiring of the circuit for evidence of short circuit or any other fault which may have caused the fuse to blow. If no fault can be detected and another fuse blows, have the equipment examined by your Mahindra tractor Dealer.



Operator's Front Side Controls



Operator's LH & RH Side Controls

Controls

1. Clutch Pedal
2. Hi-Low Range Selection Lever
3. Gear Shifter Lever
4. Hand Throttle Lever
5. LH Brake Pedal
6. Brake Latch
7. RH Brake Pedal
8. Foot Throttle
9. Draft Control Lever
10. Position Control Lever
11. Differential Lock Pedal
12. Parking Brake Lever
13. Seat
14. PTO Lever
15. Isolating Valve
16. 4WD Engagement Lever

Operator Seat

The operator seat can be adjusted for position, tilt and weight of operator. These adjustments are to be done prior to starting the engine.

Adjusting Seat Position

1. Sit on the operator seat.
2. Lift the lever (D) upwards & slide the seat forward or rearward to desired position.
3. Release lever to lock seat in position. Ensure that all controls can be accessed easily.

Weight Adjustment

To achieve optimum seat suspension, turn the knob (C) till the weight indicator registers your approximate weight on indicator (B).

Tilt Adjustment

To achieve optimum seat tilt, turn the knob (E) till the desired angle of tilt is achieved.

Using Seat Belt

Use a seat belt when you operate with Roll Over Protective Structure (ROPS) to minimise chance of injury from an accident such as an overturn. Do not jump if machine tips.

Fasten Seat Belt

1. Pull belt end (A) across operator lap.
2. Install tab into buckle (F). A click will be heard when the tab locks into the buckle.

Release Seat Belt

Press red button (G). The seat belt will automatically retract.

Cold Starting Aid

A heater element (D) is provided in engine intake manifold to aid the engine starting during cold weather [for temperatures below 20°C (68°F)].

When the Key is turned to "ON" position, the element is activated. The heater indicator in the instrument cluster indicates the heater element operation. Based on the prevailing ambient cold temperature, the heater operating duration is adjusted automatically. The element continues to heat the air in the intake manifold for some specific duration.

Follow the below procedure during the cold weather starts:

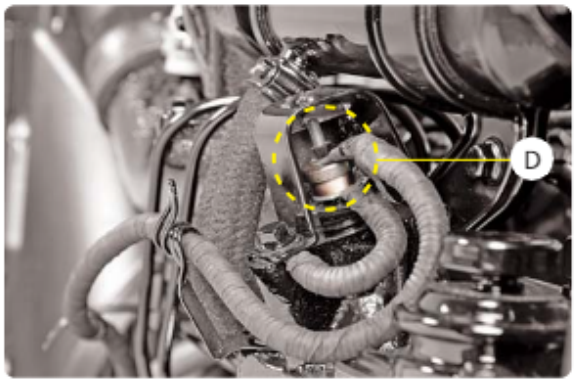
1. Turn the Key to "ON" position & hold it till the heater indicator on the Instrument Cluster turns OFF.
2. Crank the engine when the heater indicator on the Instrument Cluster turns OFF.

⚠ CAUTION

Attempting to adjust the seat while driving the tractor may cause the operator to lose control of the tractor.

⚠ WARNING

Do not use seat belt if operating without a ROPS or with an optional folding ROPS in the folded position.



NOTE : Engine runs at a higher idle rpm (about 1200 rpm) and drops gradually to the normal idling speed (750 rpm) until coolant temperature reaches to 20°C (68°F).

The heater indicator glows for some specific duration after starting the engine, depending on the ambient temperature.

Hand Throttle Lever

Use the Hand Throttle Lever (A) to set a constant engine speed for stationary operation or for field operation wherever desired.

Increasing Engine Speed : Pull throttle lever towards the operator.

Decreasing Engine Speed : Push throttle lever away from the operator.

Constant Speed Setting : Certain operations may require a particular engine speed. This can be achieved by resting the Hand Throttle Lever in a position where you get the desired engine speed.

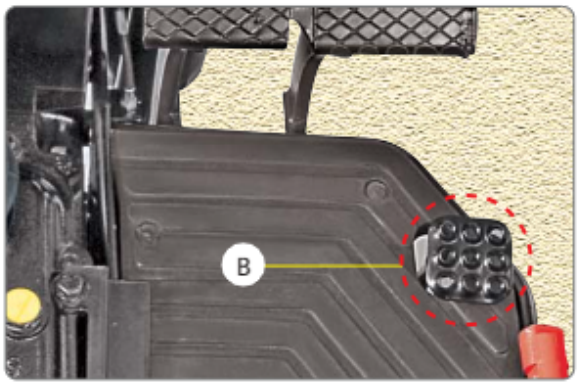
Foot Throttle Operation

When tractor operation requires repeated speed change, use the foot throttle pedal (B) to temporarily increase engine speed above hand throttle setting. We recommend to keep the hand throttle at minimum and use foot throttle when driving on highway

a. Set the hand throttle lever at desired rpm.

b. Depress foot throttle pedal -to Increase Engine rpm.

c. Release foot throttle pedal to decrease Engine rpm to achieve the previous engine speed set by hand throttle lever.



Clutch Operation

Dual Clutch

Constant running P.T.O. with dual clutch is offered as a standard feature. This has a speed of 540 rpm @ 2058 engine rpm. It has two clutch plates and two pressure plates which work in two stages of pressing the clutch pedal. When the clutch pedal is depressed to the first stage, the drive of engine to main gear box gets disconnected, while the P.T.O. output shaft (if engaged) will continue to be driven by the engine. When the clutch pedal is depressed further to second stage, the drive to the PTO shaft also gets disconnected.

While changing transmission gears, it is necessary to depress the clutch pedal only up to the first stage. This will not affect the drive to the P.T.O. shaft. If it is required to stop the tractor but keep the P.T.O. running, only depress the clutch pedal through the first stage. This has great advantage while using PTO driven equipment. If an extra load is encountered, the forward movement of the equipment can be halted while still permitting full power to be available at the P.T.O.

IMPORTANT

To prevent transmission damage, do not use gear / speed shift on-the-go. To prevent unnecessary wear, never "ride" the clutch by resting a foot on the pedal.

High-Low Range Selection Lever

This lever is used to select the high or low speed range which has the effect of doubling the number of available gear ratios for a tractor.

High Gear : Push the lever Rearward.

Low Gear : Push the lever forward.

Neutral : Keep the lever in central position.

A safety neutral switch is provided on the transmission high-low range selection lever for the safety of operator. The starter will not activate unless safety neutral switch is operated. Only when the hi-low range selection lever is in neutral position, the safety neutral switch will be activated causing the electrical circuit to complete and starter motor to crank.

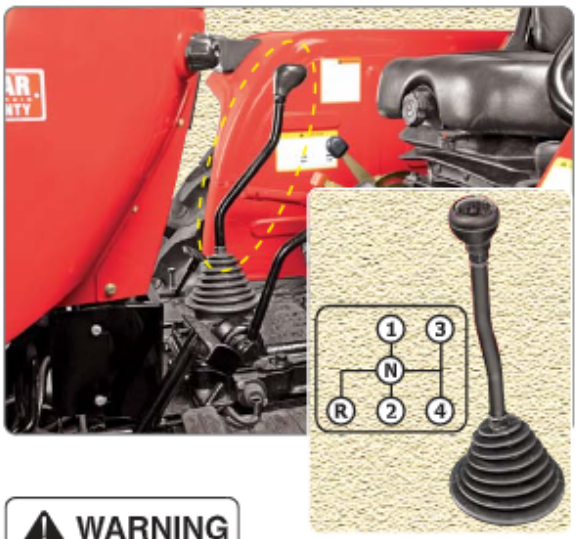
Gear Shifter Lever

This lever is used to select any one of the four forward & one reverse gear ratio. The positioning of gears is as depicted.

Refer Chart for road speed of tractor in different gears.

Chart for road speed of 4540/4550 4WD tractor for 16.9 x 24 tire as per rolling radius 0.618 m

Gear Selection	Km / Hour.	Miles / Hour
L1	2.80	1.74
L2	4.46	2.77
L3	6.41	3.98
L4	9.89	6.14
H1	8.0	4.97
H2	12.78	7.94
H3	18.34	11.40
H4	28.29	17.58
LR	4.23	2.63
HR	12.12	7.53



⚠ WARNING

To prevent inadvertent tractor movement, avoid accidental contact with the gearshift levers. Always stop the engine, firmly apply the parking brake and place all transmission levers in neutral before leaving the tractor.

4WD Engagement Lever

This lever is located on L.H side of operator's seat. It is used to engage or disengage the drive to front wheels and is recommended to be done with tractor in stand still condition.

1. Depress clutch pedal and stop the tractor motion completely.
2. Lift the lever upwards to engage the drive to front wheels.
3. Press the lever downwards to disengage the drive.

4WD Lever Engaged

4WD Lever Disengaged

⚠ WARNING

Do not engage or disengage the 4WD lever while the tractor is in motion.

Brakes

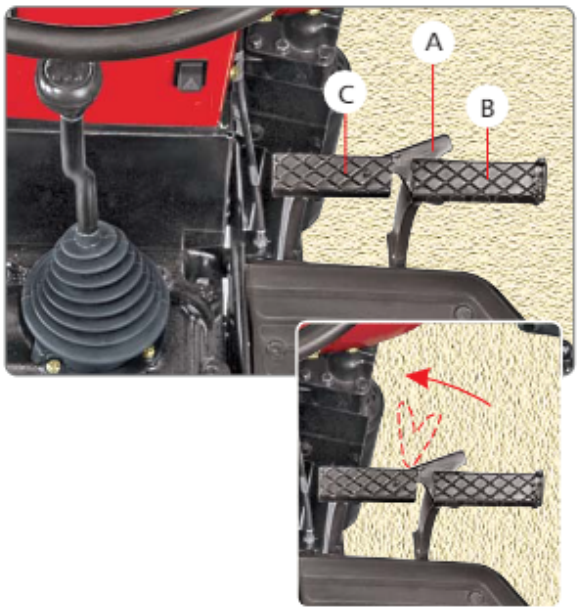
Two independent brake pedals are provided for LH and RH wheel braking to enable sharp turns during field operations.

- To make a sharp turn to the right, depress RH brake pedal (B).
- To make a sharp turn to the left, depress LH brake pedal (C).

The brakes can be latched together to act simultaneously by means of brake pedal latch (A) as follows,

1. Rotate brake pedal latch (A) clockwise until it locks into RH brake pedal (B)
2. Depress any of the brake pedal to slow or stop the tractor.
3. When brakes are applied with brake pedals latched together, the tractor should stop in a straight line. Check and adjust brake settings if the tractor is dragged to either side on applying brakes.

The Hand Throttle Lever should be brought to low idle rpm position before applying brakes.



⚠ CAUTION

Using unlocked brakes to stop the tractor at high speeds may cause accidental turning or tipping.

Lock pedals together when not using the turn brakes or for road travel.

Slow down before making a turn.

Do not apply independent brakes while an attachment is engaged with the ground. This can cause damage to the attachment, three point linkage of tractor and may also result in tipping of the tractor.

⚠ WARNING

The "balancing" of the braking system should be checked every week, or whenever the tractor is taken on the road after working extensively or when one brake is used more often than the other. If this precaution is not taken an accident may occur.

Hand brake should only be used for parking purpose.

Parking Brake

The Parking brake lever (A) is provided on RH side of operator's seat.

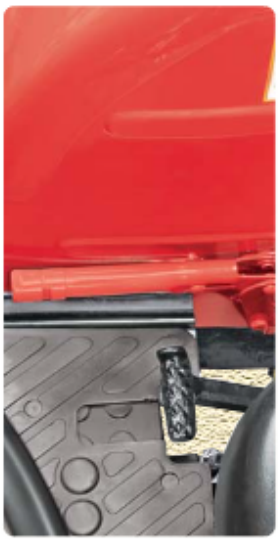
For Applying the Parking Brake :

1. Press the foot brakes fully.
2. Pull the hand brake lever top side in vertical position.

For Releasing the Parking Brake :

1. Push the lever to front side in horizontal position.

Engaged


Disengaged

⚠ CAUTION

Always lock the parking brake when the tractor is left unattended.

Differential Lock Pedal

Differential lock pedal (B) located on the RH side of the Operator's Seat. When depressed by heel pressure, it operates a differential lock mechanism which locks both of the axle shafts together. Its purpose is to overcome completely the one-wheel slip encountered under adverse field conditions, especially while ploughing or hauling heavy trailers on slippery surfaces.

The condition where one wheel spins completely uselessly digging itself Into the soil while the other stands idle, is thus overcome resulting in saving fuel and power, minimise brake wear and tire abuse.

Differential lock is designed for occasional use. Do not attempt to lock differential while,

a. The tractor is in high speed.

b. Turning tractor.

⚠ CAUTION

The Differential Lock design is solely for the use with pneumatic tires. If steel wheels, girdles etc. are fitted, the differential lock should be removed as a precaution.

⚠ WARNING

Attempting to turn the tractor while differential lock is engaged may result in damage to transmission.

Power Take Off

1. Move hand throttle lever to the low idle position.
2. Depress the clutch pedal fully.
3. Engage the power take-off shaft by moving the lever to the rearward position.
4. Engage the desired tractor gear (this does not apply if the tractor is to remain stationary).
5. Move throttle to obtain required power.
6. Release the clutch pedal gradually.

To change gears without stopping the power takeoff shaft, depress the clutch. Change gears in the normal manner and release the clutch.

PTO Disengaged

PTO Engaged

⚠ WARNING

Firmly apply the parking brake, place all gear shift levers in neutral and block all four wheels before operating any stationary P.T.O. equipment.

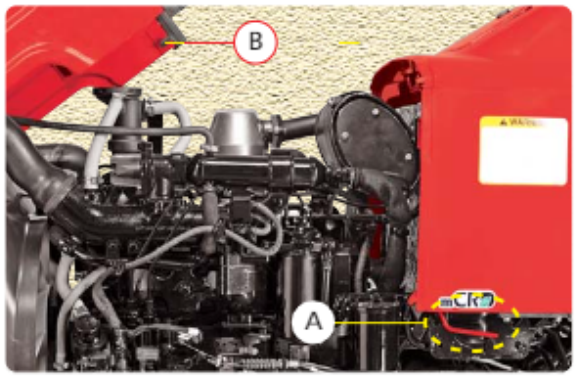
Do not approach or work on the P.T.O. shaft or equipment with the P.T.O. in motion. Shut off the tractor engine and the P.T.O. and wait for all movement to stop before working on the P.T.O. or equipment.

Do not operate P.T.O. in high range for tractors.

Opening the Hood

The hood is hinged at the front side and opens away from the operator as follows.

1. Turn the lever (A) on one side of the hood.
2. Turn the lever (A) on other side of the hood.
3. The hood will unlock from lock (B).
4. Turn the hood upwards by hand.
5. Rest the hood in fully open position.



Closing the Hood

1. Push the Hood downwards.
2. Turn the lever (A) on one side of the hood.
3. Press the Side of Hood against the Tractor gently.
4. Release the lever (A) ensuring that it locks into the hood.
5. Repeat the procedure for locking other side of hood.

Lock

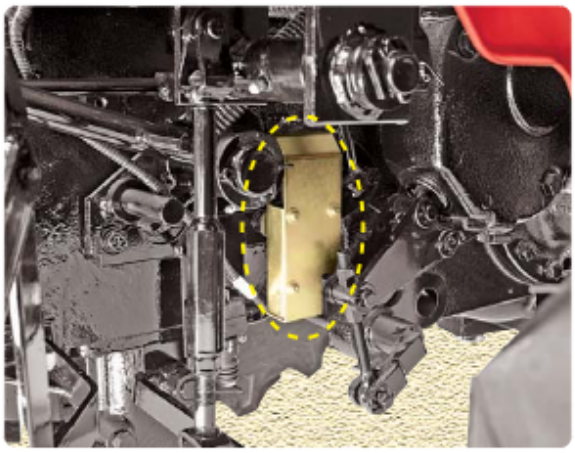
Lever

PTO Neutral Switch

This switch is located under the LH Footplate. The starting circuit of the tractor is connected through this switch which becomes operative to complete the starting circuit only if the PTO lever is disengaged

This switch thus ensures that engine can be started only when PTO lever is in disengaged position. This feature hence gives additional safety near PTO.

Consult your Mahindra tractor Dealer if your safety starting switch malfunctions.



PTO Neutral Switch

⚠ WARNING

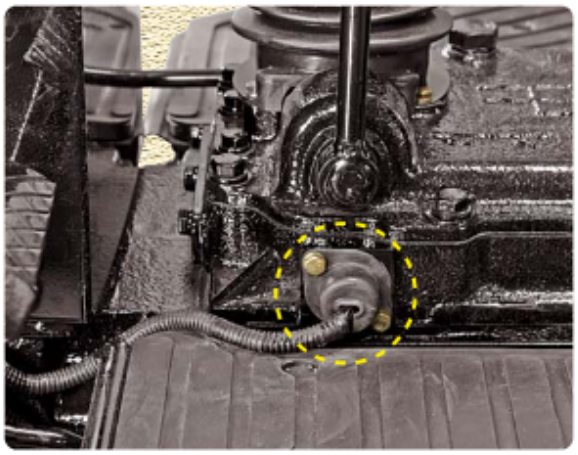
Do not bypass the PTO Neutral switch.

Transmission Neutral Switch

This switch is located on the High-Low Range Selection System. The starting circuit of the tractor is connected through this switch which becomes operative to complete the starting circuit only if the High-Low Range Selection Lever is in neutral position.

This switch thus prevents accidental starting of the tractor in gear.

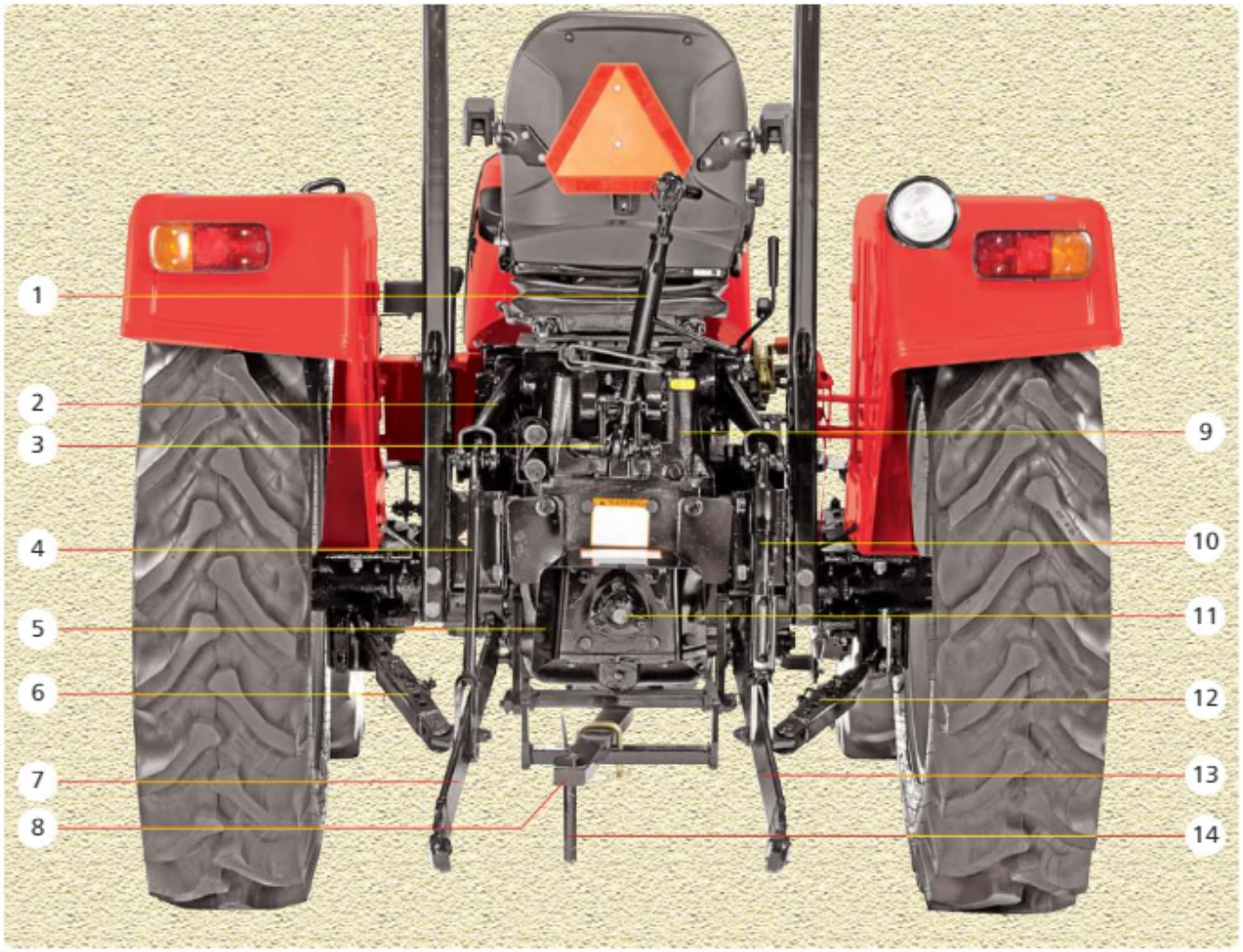
Consult your Mahindra tractor Dealer if your safety neutral switch malfunctions.



Transmission Neutral Switch

⚠ WARNING

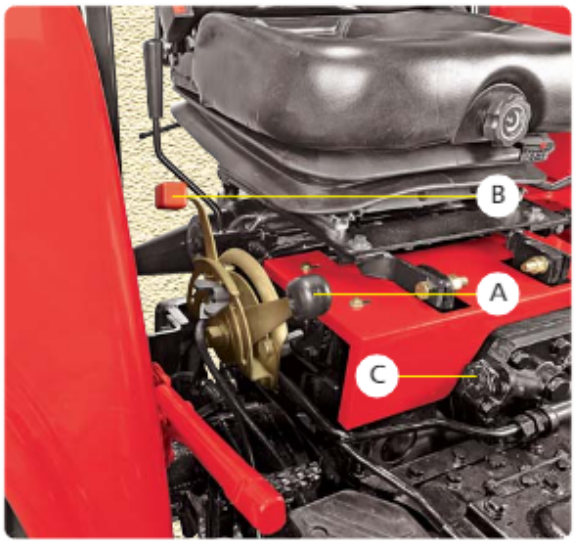
Do not bypass the Transmission Neutral switch.



1. Top Link
2. Lift Arm
3. Draft Sensing Bracket
4. Fixed Lift Rod LH
5. PTO Shield
6. Lateral Strut Stabilizer LH
7. Lower Link LH
8. Swinging Drawbar
9. VTU Housing
10. Adjustable Lift Rod RH
11. PTO Shaft
12. Lateral Strut Stabilizer RH
13. Lower Link RH
14. Towing Pin
15. Draft Control Lever
16. Position Control Lever
17. Auxiliary valve lever

Full Live "Vary-Touch" Hydraulic System

The tractor is fitted with a completely self-contained and fully "live" hydraulic system. Using a pump driven directly from the Engine, it is able to operate the three-point linkage or external tapings, independent of any clutch movement when changing gear or operating the power take-off.



This system incorporates the following

1. Position Control (A)
2. Draft Control (B)
3. Isolating Valve (C)

All these controls are within easy reach of the operator. The upper limit stop is set at the factory and serious damage will result if this is altered in any way.

Position Control Lever

This lever controls the lifting and lowering of all implements used on the three point linkage.

1. The lever is moved Forward to lower the implement.
2. The lever is moved Backward to raise the implement.

Draft Control Lever

This lever is used to set the amount of load which the tractor has to pull irrespective of ground contour, soil conditions, or the pitching of the tractor.

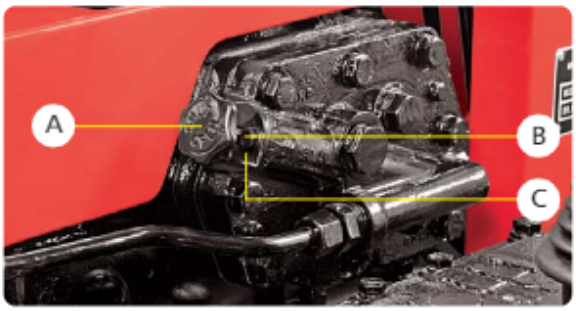
The lever is moved Forward to deepen the implement and Rearward to shallow it.

⚠ CAUTION

Ensure at all times that both the draft & the position control levers slide just adjacent to their respective quadrants with minimum clearance.

Isolating Valve

While carrying implement on a tractor for a longer distance it is essential that the implement does not drop down suddenly due to inadvertent movement of PC lever. An Isolating Valve provided on the tractor serves this purpose and can be used as follows.



a. Lift the implement to maximum height vide PC lever.
b. Loosen the locking bolt (B).
c. Turn the lockplate (C) outwards.
d. Turn the Knob (A) in clockwise direction fully.
e. Tighten the locking bolt (B).

The implement now cannot be lowered vide lowering the PC Lever and hence can be transported safely for longer distances.

For lowering the implement when desired,

a. Turn the Knob (A) in anticlockwise direction fully.
b. Turn the lockplate (C) inwards.
c. Tighten the Locking bolt (B).
d. Lower the implement vide PC lever.

Position Control

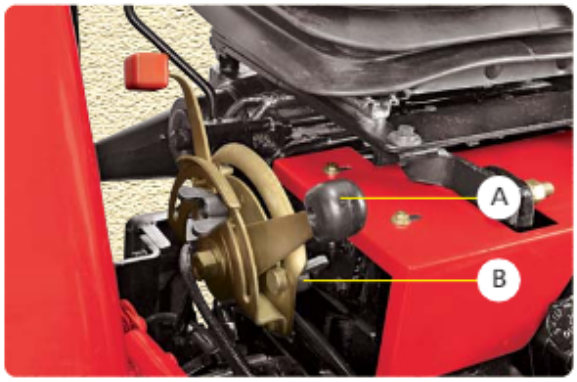
This lever (A) controls the lifting and lowering of all implements used on the three point linkage.

1. Moving the lever Forward will lower the implement.
2. Moving the lever Rearward will raise the implement.

The control can also be set by PC stop screw (B) to govern the height of out-of-ground implements such as mowers, rakes etc., so that the implement can be lowered to exactly the same height at the commencement of each run.

PC lever (A) should be used for the following applications:

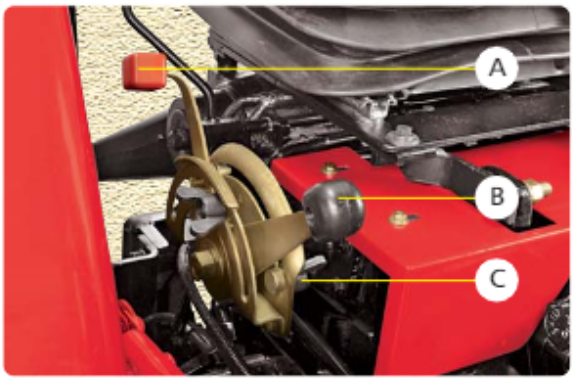
1. TRANSPORT of implements and turn around at the end of the field.
2. CONSTANT DEPTH of implements on level terrain and for non-ground engaging implements such as spreaders or sprayers. Place the PC lever at desired depth.



Position Control Lever Stop

1. Move the DC lever (A) to its most forward position.
2. Move the PC lever (B) back to the upper limit and allow the implement to lift fully.
3. Move the PC lever (B) forward until the implement has reached the desired working height.
4. Set the position control stop screw (C) against the PC lever & tighten the knob.

Whenever the lever is returned to the stop from the lift position, the implement will return to and remain at the preset height.



⚠ WARNING

The operator must be thoroughly acquainted with the location and use of all controls regardless of experience, must read this section carefully before attempting to operate the tractor.

⚠ CAUTION

Never move the position control lever beyond the upper limit stop.

Draft Control

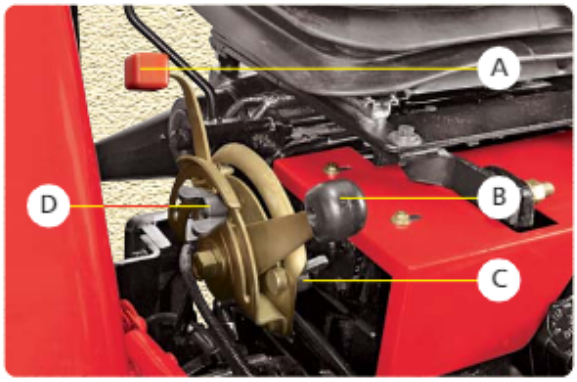
As the draft of the implement varies due to irregularities of ground contour, soil texture, or pitching of the tractor, so the load on the top link of the three point linkage will vary.

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 ploughing, 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.



Setting the Draft Control

1. Move the DC lever (A) 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 (B) back to upper limit.
4. Lower the implement into work by moving the PC lever (B) 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 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 (D) 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.

⚠ 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.

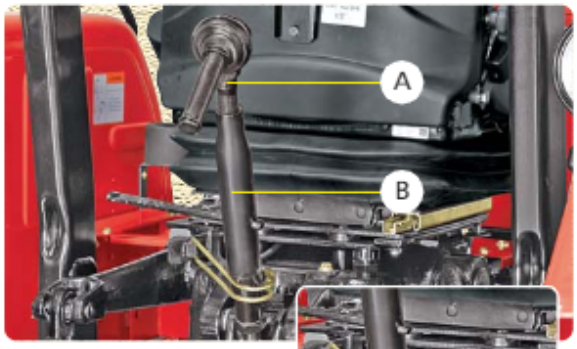
Under No Circumstances must the Draft Control Lever be used to lift the implement to its uppermost position. To do so will cause overheating of the system.

All movements into and out of the soil must be made by using the Position Control lever.

Toplink

It is used to attach the implement and control its inclination front-to-rear with respect to ground. The distance between its two ball-joints can be increased or decreased by rotating the turn-buckle as follows.

1. Loosen the locknut (A).
2. Clockwise rotation of turn buckle (B) will decrease the distance.
3. Anticlockwise rotation will increase the distance.
4. Tighten the locknut (A) after desired adjustment.



Toplink

Draft Sensing Bracket

Draft sensing bracket transfers the toplink force to the draft sensing mechanism.

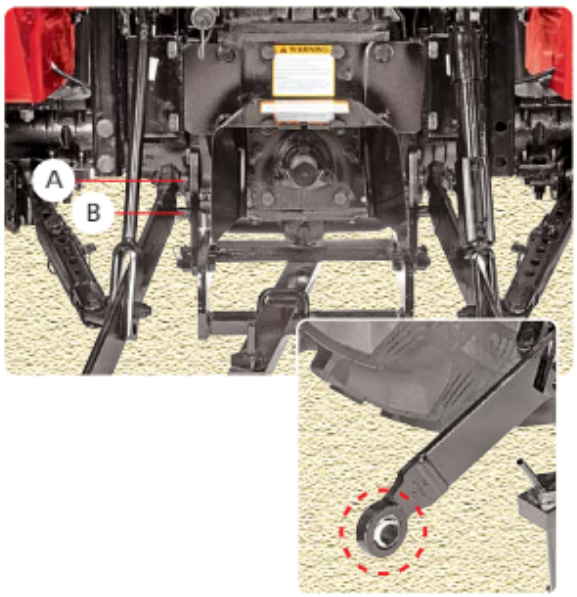

Draft Sensing Bracket

Lower Links

Lower link is available with adaptability of Cat-I & Cat-II implements. The spherical bushl can be rotated suitably for attaching Cat-I and Cat-II implements.

Lower Link Hitch Point

Two Hitch points (A) and (B) are provided to which the lower links can be attached. The upper hitch pins (A) should normally be used for three point linkage equipment, but improved penetration and lift height can be obtained when the lower hitch pins (B) are used.

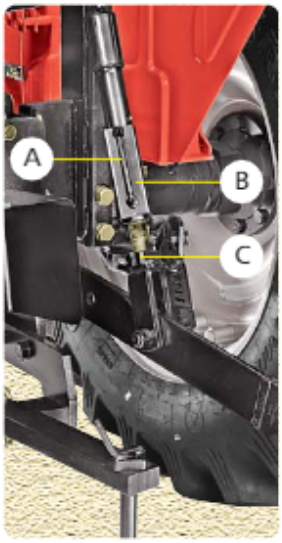


Adjustable Lift Rod

Use turn handle (A) on the adjustable lift rod to raise or lower the lower link for side-to-side levelling of implement with respect to ground.

1. Raise lift rod turn handle (A) out of locking tab (C).
2. Rotate turn handle (A) clockwise to raise the lower link or anti-clockwise for lowering.
3. After adjustment, make sure to engage the box (B) with locking tab (C). Always transport the implement with turn handle in this position.

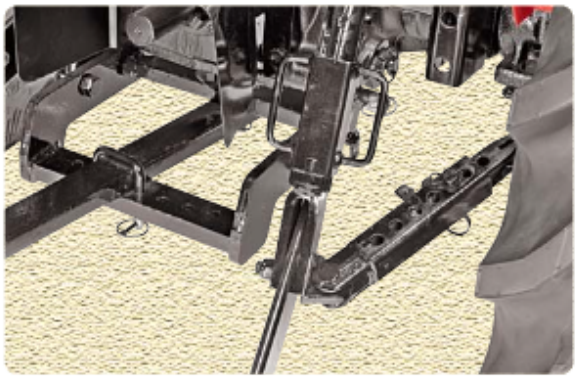
Lock



Unlock

Lateral Strut Stabilizer

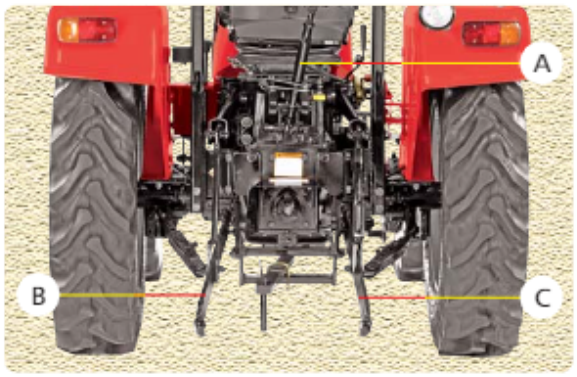
These are provided to prevent both lower links fouling with tires. Its Length can be increased or decreased for adjustment according to varying implement's spans.



Attaching Implement

Hitching is made easy if the implement is left standing on level ground. Attach the implement as follows.

1. Park tractor safely.
2. Place the tractor central and square with implement.
3. Slowly back tractor into position and align the LH - Lower link (B) with implement pin.
4. Attach the LH lower link (B) & secure it with lynch pin.
5. Attach the RH lower link (C) using the turnbuckle adjustment to align with implement pin and secure it with lynch pin.
6. Attach the top link (A) to the implement using the turnbuckle adjustment to align the holes and install the implement lynch pin.
7. Start the engine, operate the PC lever and lift the implement.
8. Adjust the implement and its inclination front-to-rear with respect to ground.

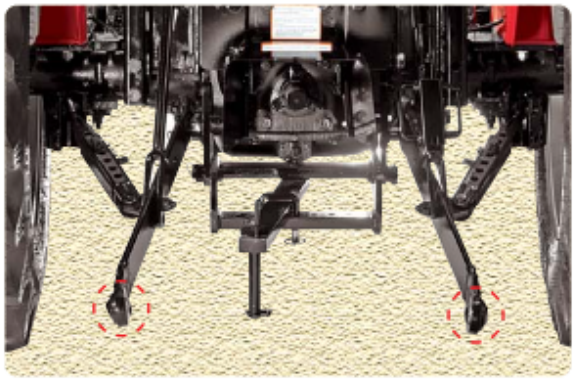


Lower Links

The lower link is available with adaptability of Cat–I and Cat–II implements.

Provision is given in the spherical bush of lower link for Cat-I and Cat-II implements.

The spherical bush shall be rotated in the lower link for appropriate implement pin size.



Cat - I

Cat - II

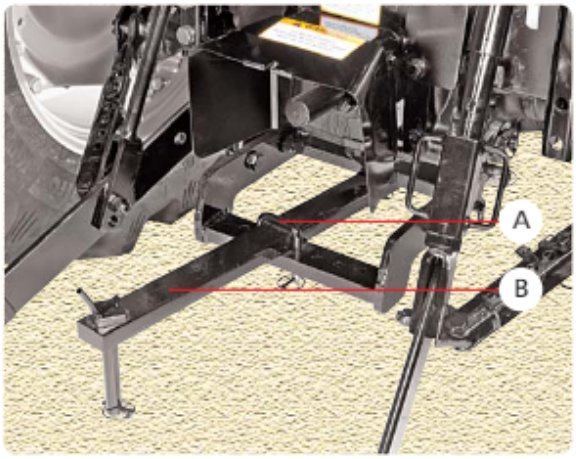
Swinging Drawbar

Tractor is equipped with a drawbar for connecting to pull behind implements. It can swing from side to side.

Certain heavy equipment such as a loaded single axle trailer can place excessive strain on the drawbar. Strain is greatly increased by rough road and high speed.

The drawbar must be locked in center position when

1. Operating a drawbar pulled PTO driven implement.
2. Towing implements / Trailers on road or field.

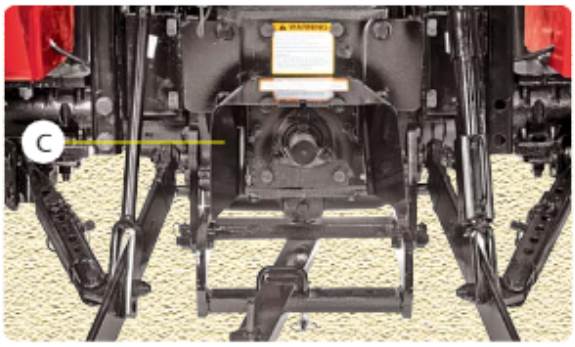


Using Swinging Drawbar

1. Remove "U" bolt (A).
2. Shift to the drawbar (B) to next hole as desired.
4. Lock the "U" bolt (A).
5. See your implement operator's manual for drawbar positions.

Attaching PTO Driven Implement

1. Turn Key to "OFF" position.
2. Disengage the PTO lever.
3. Position the drawbar according to the requirement of implement and drive line.
4. Attach implement to tractor before connecting PTO driveline. Raise Hitch upwards if it is not to be used.
5. Rotate PTO shield (C) upward for clearance.
6. With the engine still OFF, turn the shaft slightly by hand if necessary to line up splines. Connect driveline to PTO shaft. Pull out on shaft to be sure drive line is locked to PTO shaft.
7. Place PTO shield in downward position.



⚠ WARNING

- Rear roll-over can result if pulling from wrong location on tractor. Hitch only to drawbar. Use 3 point hitch only with implements designed for its use, not as a drawbar.
- Try to balance the load primarily on the implement wheels. Avoid overloading the drawbar. Add Jerrycan weights for improved stability. Engage the clutch smoothly, avoid jerking and use brakes cautiously to avoid jackknifing.
- Always secure the drawbar to prevent swinging when transporting equipment or when operating any but ground engaging equipment.
- Do not pull from the lower links with the links above the lowest position. Always use the drawbar or lower links in the lowered position for pull-type work, otherwise the tractor may overturn rearwards.

Adjustment of Rear Wheel Tread & Front Wheel Tread

Setting various offset combinations can do adjustment of the Front and Rear wheel tread.

The Wheel tread obtained are as follows:

Track Setting Combinations

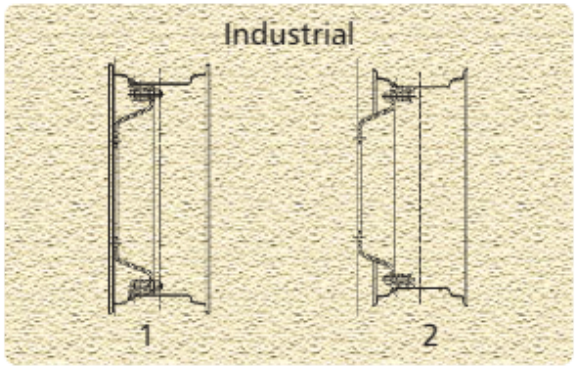
Model	Tire Type	Side	Value in	1*	2**
4540/ 4550 4WD	Ind.	Front	mm	1562	
			in.	61.52	
		Rear	mm	1691	1804
			in.	66.60	71.03

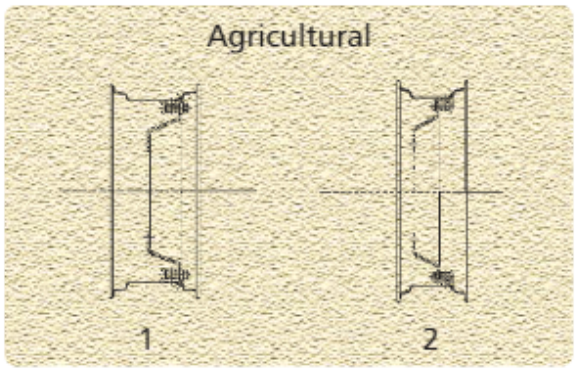
Model	Tire Type	Side	Value in	1*	2**	3**	4**
4540/ 4550 4WD	Agri.	Front	mm	1536			
			in.	60.48			
		Rear	mm	1616	1729	1820	1932
			in.	63.66	68.09	71.66	76.09

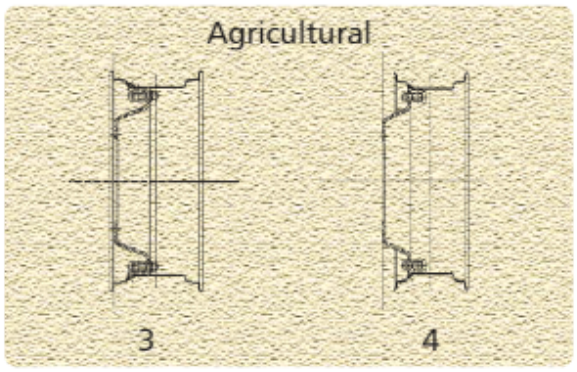
* Standard Track Settings

** Settings are possible but not recommended

REAR TIRE







IMPORTANT

An arrow is marked on the sidewall of the tire, which must always point in the direction of forward rotation to obtain maximum traction.

Adding Liquid Weight

It is acceptable to add liquid ballast to the tire / wheel assembly on your Mahindra Tractors.

Consult your Local Tire Dealer or Manufacturer of Tires for ballasting process.

Inflation

Keep tires properly inflated to the pressure as shown in the Chart below. Under inflation will damage tire cord and may cause the tire to slip on the rim and tear out the tube valve stem. Over inflation results in excessive slippage, causing rapid tire wear. Air pressure should be checked once a week with an accurate low pressure gauge having one pound graduations. Air pressure should not be allowed to drop or exceed the recommendations.

Always see that the tire valve caps are in place and screwed tight. The caps prevent loss of air through the valve core. Further, they prevent debris from entering and damaging the valve core and air chamber in the tires.

Exceptions (Rear Tires only)

When ploughing with a moulded plough, the left hand or land wheel should be inflated to 2 p.s.i. lesser than right hand or furrow wheel.

Chart A-1

MODEL	Tire Size		Tire Type	Tire SLR mm	Tire Capacity @ 25mph kg @ kg/scm	Rolling Circumference (mm)	Ply Rating
4540/ 4550 4WD	Front	12 x 16.5, 6 PR TL TT	Industrial Tires	383	2785 @ 2.80*	2565	6 Ply, R-1
	Rear	16.9 x 24, 8 PR TL TT	Industrial Tires	584	5840 @ 1.96	3886	8 Ply, R-1
	Front	9.5 x 16, 8 PR TL GY	Agricultural Tires	388	1390 @ 2.11	2514	8 Ply, R-4
	Rear	12.4 x 28, 4 PR TT GY	Agricultural Tires	589	1980 @ 1.12	3759	4 Ply, R-4

* 20 mph kg

Care of Tires

Cuts in tires should be repaired immediately. If neglected, it will decrease the tire life. Avoid stumps, stones, deep ruts and other hazards. Keep tires free from oil and grease as both destroy rubber. After using the tractor for spraying, wash off any chemicals that may be left on the tractor and tires.

Shipping Tractors Equipped with Pneumatic Tires

When tractors are transported on a carrier, inflation pressure should be as follows to make possible rigid blocking and to prevent bouncing.

Model	Side	Type	Max. Inflation	
			kg/cm^2	PSI
4540/ 4550 4WD	Front	Industrial	2.81	40
	Rear	Industrial	1.96	28
	Front	Agricultural	2.81	40
	Rear	Agricultural	1.12	16

Tire Protection during Storage

When not in use the tractor should be stored where the tires are protected from light. Before storing the tractor clean the tires thoroughly. Jack up the tractor so that the load is off the tires when it is to be out of service for a long period. If it is not jacked up, the tires should be inflated at regular intervals. Before putting the tractor in service, always inflate tires to the correct operating pressures.

Do not load tires beyond their rated capacity.

Mounting Tires on the Rim

Consult your Local Tire Dealer for methodology of mounting Tires on the rim.

⚠ WARNING

Inflating or servicing tires can be dangerous. Whenever possible, trained personnel should be called in to service or install tires. In any event to avoid the possibility of serious or fatal injury, follow the safety precautions below:

- Upon receiving your tractor, check the air pressure in the tires and recheck every 50 hours or weekly.
- When checking tire pressures, inspect the tires for damaged tread and side walls. Neglected damage will lead to early tire failure.
- Inflation pressure affects the amount of weight that a tire may carry. Do not over or under inflate the tires.
- Never attempt tire repairs on a public road or highway.
- Do not inflate a steering tire above the manufacturer's maximum pressure shown on the tire or beyond the maximum shown in the tire pressure and load Chart A-1, if tire is not marked with the maximum pressure.
- Never inflate a traction tire (front tire on a four wheel drive tractor or any rear tire) over 35 psi (2.46 kg/cm^2). If the bead does not seat on the rim by the time this pressure is reached, deflate the tire, relubricate the bead with a soap/water solution and re-inflate. Do not use oil or grease. Inflation beyond 35 psi (2.46 kg/cm^2) with unseated beads may break the bead or rim with explosive force sufficient to cause a serious injury.
- After seating the beads, adjust inflation pressure to the recommended operating pressure.
- Do not re-inflate a tire that has been run flat or seriously under-inflated until it has been inspected for damage by a qualified person.
- Torque wheel to axle nuts to specification after re-installing the wheel. Check nut tightness daily until torque stabilizes.
- Ensure the jack is placed on a firm, level surface.
- Ensure the jack has adequate capacity to lift your tractor.
- Use jack stands or other suitable blocking to support the tractor while repairing tires.
- Do not put any part of your body under the tractor or start the engine while the tractor is on the jack.
- Never hit a tire or rim with a hammer.
- Ensure the rim is clean and free of rust or damage. Do not weld, braze, repair or use a damaged rim.
- Do not inflate a tire unless the rim is mounted on the tractor or is secured so that it will not move if the tire or rim should suddenly fail.
- When fitting a new or repaired tire, use a clip on valve adapter with a remote gauge that allows the operator to stand clear of the tire while inflating it. Use a safety cage, if available.

Before Starting the Tractor

1. Clean the tractor.
2. Make all pre-start checks according to preventive maintenance schedule.
3. Check coolant level in radiator, oil level in engine and transmission.
4. Check fuel level in fuel tank.
5. Ensure all the tires are properly inflated as per the load conditions.
6. For operator's maximum comfort, adjust seat suspension as per the operator's weight. Also adjust seat position forward or rearward as per operators convenience to operate all controls and switches.
7. If necessary ballast the tractor.
8. Adjust wheel tread if necessary.
9. Adjust stabilizer and three point linkage.

Starting the Tractor

1. Move the controls as under :
   a. Speed and Range shift lever in neutral.
   b. PC and DC levers in lowermost position.
   c. PTO lever in neutral.
   d. Auxiliary valve lever in neutral position.
2. Turn the Key to ON position and observe the heater indicator to glow for 42 seconds.
3. Turn the starter key in clockwise to engage the starter and hold in this position till the engine fires. When released, the key springs back to the "ON" position.
4. Idle the Engine for 1 to 2 minutes before driving it.

   If required, warm-up the engine at suitable speed. For faster warm-up, raise the engine rpm to approx. 2000.

The starter safety switches are provided on the transmission speed shifter and PTO lever. The tractor can be started when speed shifter lever is in neutral and PTO lever as well in neutral.

Never push or tow the tractor to start the engine. Doing so may overstress the drive train.

Do not crank the starter continuously for more than 30 seconds to avoid starter motor failure.

Stopping the Engine/Tractor

a. Idle the Engine for 1 to 2 minutes.

b. Turn the Key to "OFF" position.

⚠ WARNING

Do not use starting fluid. Tractor is equipped with intake manifold heater.

NOTE: It is normal for the engine to be louder and have bluish-white exhaust smoke during engine warm-up. The amount of smoke depends on the temperature of air entering the engine.

In cold weather, idle the engine and warm-up for 5 minutes at approx. 2000 rpm before loading.

Driving the Tractor

With the engine running and the clutch in disengaged position, engage 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 can occur. Always sit on the operator's seat.

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

⚠ WARNING

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

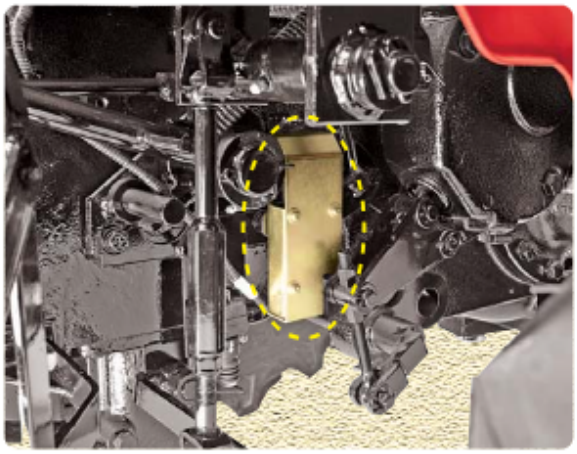
If the engine stalls while operating under load, start engine immediately to prevent abnormal heat build up in engine.

Operating the Tractor

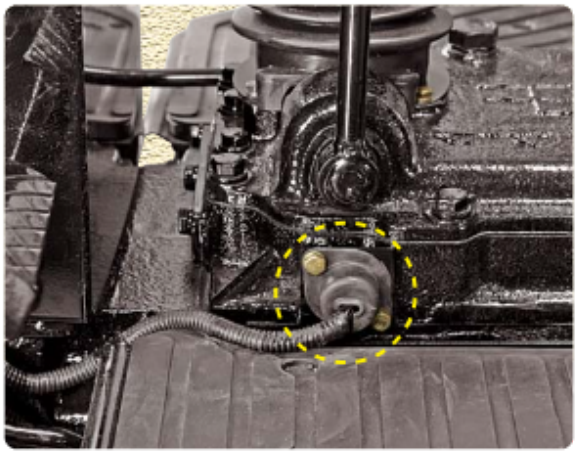
1. Before starting the tractor ensure parking brake is engaged, place the P.T.O. lever in the "OFF" position, hydraulic control levers in downward position, remote control valve levers and transmission in neutral.
2. Do not apply load on tractor at low engine speeds. Always apply heavy loads at full throttle rpm of engine.
3. Do not start the engine or operate controls while standing besides the tractor. Always sit on the tractor seat when starting the engine or operating controls.
4. **PTO and Transmission Neutral switch**

   In order to prevent accidental starting of the tractor in gear, safety switches are provided. The starting system of the tractor is connected through switches on High-Low Range Selection System and PTO lever. These become operative to complete the starting circuit only if the transmission is in neutral position and PTO lever disengaged. Do not bypass the safety Key Switch.

   Consult your Mahindra tractor Dealer if your Safety starting switch malfunctions.
5. Avoid accidental contact with the gear shifter lever while the engine is running. Unexpected tractor movement can result from such contact and may cause accident.
6. Do not get off or climb the tractor while it is in motion.
7. Shut off the engine and apply the parking brake before getting off the tractor.
8. Do not operate tractor in an enclosed building without adequate ventilation. Exhaust fumes can cause death.
9. Do not park the tractor on a steep slope.
10. If power steering ceases to operate, stop the tractor immediately.
11. Pull only from the swinging drawbar or the lower link drawbar in the down position. Use only a drawbar pin that locks in place. Pulling from the tractor rear axle carriers or any point above the rear axle may cause the tractor's front end to lift and the tractor to turnover.
12. Always use hydraulic position control lever when attaching equipment / implements and when transporting equipment. Be sure that the hydraulic couplers are properly mounted and will disconnect safely in case of accidental detachment of implement.
13. Do not leave equipment / implements in the raised position.
14. Use the turn signal lamps and slow moving vehicle (SMV) signs when driving on public roads during both day and night time, unless prohibited by law.
15. Dim tractor Head lamps when approaching a vehicle from opposite direction at night. Be sure the Head lamps are adjusted to prevent blinding on the eyes of oncoming vehicle operator.
16. Emergency stopping instruction : If tractor fails to stop even after application of brakes shut off the engine while the tractor is in gear and clutch engaged.



PTO Neutral Switch



Transmission Neutral Switch

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. Read and take the following precautions before operating the tractor to prevent accidents.

The tractor should be operated only by those who are responsible and instructed to do so.

The Tractor

1. Read the operator's manual carefully before using the tractor. Lack of operating knowledge can lead to accidents.
2. Use an approved rollover bar and seat belt for safe operation. Overturning of a tractor without a rollover bar can result in death or injury.
3. Do not remove ROPS (Roll Over Protective Structure). Always use the seat belt.
4. Be aware that fiber glass canopies do not give any protection.
5. To prevent fall, keep steps and platform cleared of mud, oil and debris.
6. Do not permit anyone but the operator to ride on the tractor. There is no safe place for extra riders.
7. Replace all missing, illegible or damaged safety signs.
8. Keep safety signs clean of dirt and grease.

Driving the Tractor

1. Watch where you are going especially at row ends, on roads, around trees and low hanging obstacles.
2. To avoid rollover, drive the tractor with care and at speeds compatible with safety, especially when operating over rough ground, crossing ditches or slopes and when turning at corners.
3. Lock the tractor brake pedals together when transporting on roads to provide proper wheel braking.
4. Keep the tractor in the same gear when going downhill as used on uphill. Do not coast or free wheel down hills
5. Any towed vehicle and/or trailer, whose total weight exceeds that of the towing tractor, must be equipped with its own brakes for safe operation.
6. When the tractor is stuck or tires are frozen to the ground, back out to prevent roll over.
7. Always check overhead clearance, especially when transporting the tractor.
8. Do not engage the High-low Range Shift lever while the tractor is in motion.
9. The "balancing" of the braking system should be checked every week, or whenever the tractor is taken on the road after working extensively or when one brake is used more often than the other. If this precaution is not taken an accident may occur. Hand brake should only be used for parking purpose.
10. When driving on wet, icy or graveled surfaces, reduce speed and be sure tractor is properly ballasted to avoid skidding and loss of steering control.

Servicing the Tractor

1. Keep the tractor in good operating condition for your safety. An improperly maintained tractor can be hazardous.
2. Stop the engine before performing any service on tractor.
3. The cooling system operates under pressure which is controlled by the radiator cap. It is dangerous to remove the cap while the system is hot. First turn the cap slowly to stop and allow the pressure to escape before removing the cap entirely.
4. The fuel in injection system is under high pressure and can penetrate the skin. Unqualified persons should not remove or attempt to adjust fuel injection pump, injector, nozzle or any part of the fuel injection system. Failure to follow these instructions can result in serious injury.
5. Keep open flame away from battery or cold weather starting aids to prevent fire or explosions.
6. Do not alter or permit anyone else to modify or alter this tractor or any of its components or functions.
7. Ensure all electrical connections are secure and clean.
8. Ensure that no connection in the charging circuit, including battery, is broken while engine is running.
9. Observe correct polarity when refitting the battery or when using a slave battery to start the engine.
10. Do not short the Alternator output leads to check its working.

Operating the PTO (Power Take Off)

1. When operating PTO driven equipment, shut off the engine and wait until the PTO stops before getting off the tractor and disconnecting the equipment.
2. Do not wear loose clothing when operating the power take-off or near rotating equipment.
3. When operating stationary PTO driven equipment, always apply the tractor parking brake and block the rear wheels from front and rear side.
4. To avoid injury, always move down flip part of PTO shield do not clean, adjust or service PTO driven equipment when the tractor engine is running.
5. Make sure the PTO master shield is installed at all times and always replace the PTO shield cap when the PTO is not in use.

ROPS

1. Never attach chains or ropes to the ROPS for pulling purposes; this will cause the tractor to tip backwards.
2. Always pull from the tractor drawbar.
3. Be careful when driving through door openings or under low overhead objects. Make sure there is sufficient overhead clearance for the ROPS.
4. If the ROPS is removed or replaced, make certain that the proper hardware is used to replace the ROPS and the recommended torque values are applied to the attaching bolts.
5. Always wear your seat belt if the tractor is equipped with a ROPS.

Transporting Tractor on a Trailer

1. Drive machine forward onto a trailer.
2. Lower any attachments to trailer deck.
3. Lock the parking brake.
4. Stop the engine.
5. Remove the key.
6. Fasten tractor to trailer with heavy-duty straps, chains or cables. Both front and rear straps must be directed down and outward from the tractor. Trailer must have signs and lights as required by law.
7. Cover the silencer outlet with water proof material to avoid entry of foreign material.

Towing

1. Hitch the towed load only to the drawbar. Lock the drawbar and pin in place.
2. Before descending a hill, shift to a gear low enough to control tractor travel speed without having to use the brake pedals to brake the tractor and installed attachments.
3. Try to balance the load primarily on the implement wheels. Avoid overloading the drawbar. Add Jerrycan weights for improved stability. Engage the clutch smoothly, avoid jerking and use brakes cautiously to avoid jackknifing.
4. Use 3 point hitch only with implements designed for its use, not as a drawbar.
    1. Pull PTO "ON-OFF" rearward to OFF position.
    2. Disengage differential lock.
    3. Place Range shift lever in neutral
    4. Place Speed shift lever in neutral.
    5. Connect LH & RH brake pedals together to slow down or brake the tractor.

Diesel Fuel

1. Keep the equipment clean and properly maintained.
2. Under no circumstances should gasoline, alcohol or blended fuels be added to diesel fuel. These combinations can create an increased fire or explosive hazard. Such blends are more explosive than pure gasoline in a closed container, such as a fuel tank. DO NOT USE THESE BLENDS.
3. Never remove the fuel cap or refuel the tractor with the engine running.
4. Do not smoke while refuelling or standing near fuel.
5. Maintain control of the fuel filler pipe when filling fuel.
6. Do not fill the fuel tank to capacity. Allow room for expansion.
7. Wipe up spilled fuel immediately.
8. Always tighten the fuel cap securely.
9. If the original fuel tank cap is lost, replace it with Mahindra approved cap. A non-approved cap may not be safe.
10. Do not drive equipment near open fire.
11. Never use fuel for cleaning purposes.
12. Arrange fuel purchases such that winter grade fuel are not held over and used in the spring.

NOTE: It is suggested that after repairs if any of the safety decal/sign is peeled/damaged, the same must be replaced immediately in interest of your safety.

DO'S - For Better Performance

DO - Ensure that all safety shields are in place and in good condition.

DO - Read all operating instructions before commencing to operate tractor.

DO - Carry out all maintenance tasks without fail.

DO - Keep the air cleaner clean.

DO - Ensure that the correct grade of lubricating oils are used and that they are replenished and changed at the recommended intervals.

DO - Watch the oil pressure warning light and investigate any abnormality immediately.

DO - Keep the radiator filled with clean anti-freeze mixture. Drain the system only in an emergency and fill before starting the engine.

DO - Ensure that the transmission is in neutral before starting the engine.

DO - Keep all fuel in clean storage and use a filter when filling the tank.

DO - Attend to minor adjustments and repairs as soon as necessity is apparent.

DO - Allow the engine to cool before removing the radiator cap and remove the radiator cap slowly.

DO - Shift into low gear when driving down steep hills.

DO - Latch the brake pedals together when driving on a highway.

DO - Keep draft control lever and position control lever fully down when not in use.

DO - Visit Dealer for adjustment on Injector pressure. Adjust if required.

DO - Keep the auxiliary valve levers in neutral (N) when not in use.

DONT'S - For Safe Operation

DON'T - Run the engine without the air cleaner.

DON'T - Start the tractor in high idle.

DON'T - Start the tractor in an enclosed building unless the doors and windows are open for proper ventilation.

DON'T - Operate the tractor or engine while lubricating or cleaning.

DON'T - Allow the tractor to run out of diesel fuel otherwise it will be necessary to bleed the system.

DON'T - Tamper with the fuel injection pump. If the seal is broken the warranty becomes void. Tampering with the injection pump may constitute an EPA violation. Significant fines could apply.

DON'T - Allow the engine to run idle for a long period.

DON'T - Run the engine if it is not firing on all cylinders

DON'T - Ride the brake or clutch pedal. This will result in excessive wear of the brake linings, clutch driven member and clutch release bearing.

DON'T - Use the independent brakes for making turns on the highway or at high speeds.

DON'T - Refuel the tractor with the engine running.

DON'T - Use draft control lever for lifting of implements

DON'T - Start the engine with the P.T.O. engaged.

DON'T - Use the hand throttle while driving on roads.

DON'T - Run cold engine at full throttle.

DON'T - Operate the power steering when the oil level is below the minimum level in the reservoir.

DON'T - Run the tractor if the power steering system is damaged. In this condition, contact the Dealer.

DON'T - Park the tractor on a gradient with transmission gear engaged and with no parking brake.

DON'T - Run the tractor on road with 4WD engaged above 10 mph.

(For Service & Maintenance)

DO'S - ECU (Electronic Control Unit)

DO - Ensure right terminals /connections are made to battery.

DO - Check for condition of fuses, relay & wiring harness before replacing ECU.

DO - Always use anti static mat, straps & gloves while handling ECU to avoid electrical overstress (EOS).

DO - Tightening torque of mounting screws to be maintained.

DO - Ensure proper dataset is flashed into the ECU & also ensure proper dataset is selected while flashing into ECU. *

DO - After mounting ECU, as soon as possible assemble the harness connector.

DO - Ensure proper grounding / earthing. Ground line of ECU to be free from paints, dust.

DO - Make sure there are no joints in the cable between PC / laptop & Diagnostic connector. *

DO - Ensure no power interruptions, communication loss during flashing of dataset to ECU.

DO'S - Sensor (Engine Speed Sensor)

DO - Engine speed sensor must be removed from its packing just prior to installation in the vehicle.

DO - Sensor to be mounted by pushing it into place.

DO - First support of wire after connection: Max 250 mm. It should be on the sensor carrier.

DO - Replace damaged O-Ring.

DO - The storage area must be dry, dust-free and within the permissible storage temperature range.

DO - Clean and grease O-Ring prior to installation with mineral oil-based grease.

DO - Fix with only partially self-sealing cylindrical screw M6X12.

DO - Tightening Torque specification should be 8 ± 2 Nm.

DO - Storage temperature: -20°C to 50°C.

DO - Short-term storage temperature: -10°C to 55°C at 85%.

DO'S - Sensor (Accelerator Pedal Sensor)

DO - Tightening Torque of the retaining screws should not exceed 9±1.5 Nm.

DO - Use only self locking screws.

DO - After damage or in doubt of damage (e.g. dropped APM) the APM has to be separated and scrapped.

DONT'S - ECU (Electronic Control Unit)

DON'T - Avoid jump starting.

DON'T - Do not allow part to fall.

DON'T - Don't try to dismount parts.

DON'T - Avoid any damages to ECU while handling and assembly.

DON'T - While ignition is ON, avoid removing or assembling sensors / actuators / ECU / ECU MAIN RELAY coupler.

DON'T - Before removing ECU connector, wait upto 1 min after switching OFF the ignition key.

DON'T - When vehicle is off-road, avoid using battery source for direct supply to FIE components.

DON'T - Avoid short circuit with high current flow while welding, towing & servicing the vehicle.

DON'T - Ensure no power interruptions, communication loss during flashing of dataset to ECU.

DONT'S - Sensor (Engine Speed Sensor)

DON'T - Don't drop the sensor.

DON'T - Direct sunlight must be avoided.

DON'T - The sensor is mounted by pushing it into place (not by hammering).

DON'T - Sensor should not be kept near any strong Magnetic Materials.

DON'T - Do not short circuit the connector pins while the sensor is functioning.

DON'T - Do not Hammer the sensor while fitting.

DON'T - Do not bend sensor wire with radius less than R = 50 mm.

DON'T - Angle between sensor exit and first support of wire should not be more than 90°.

DON'T - Sensor should not be kept near Hot medium or objects with Temp > 120°C.

DON'T - None of the application guidelines should be deviated (Air gap etc).

DON'T - Engine speed sensor must not be removed from its packaging until immediately prior to installation in the vehicle.

DONT'S - Sensor (Accelerator Pedal Sensor)

DON'T - Don't drop the sensor.

DON'T - Do not exceed the maximum permissible tightening Torque.

* by Mahindra Dealership

Do's & Dont's

(For Service & Maintenance)

DO'S - Sensor (Phase Sensor)

DO - Phase Sensor should be unpacked directly before installation.

DO - Sensor to be mounted by pushing it into place.

DO - Clean and grease O-Ring prior to installation with mineral oil-based grease

DO - First support of wire after connection: Max 250 mm. It should be on the sensor carrier.

DO - Sensor terminal pins should be free from water/ moisture.

DO - Fix with only partially microcapsuled screw M6.

DO - Tightening Torque specification should be 8±0.5 Nm.

DO - Parts as delivered to assembly shall be clean and free of debris, residual abrasive material and corrosion products affecting function or appearance.

DO - The storage area must be dry, dust-free and within the permissible. storage temperature range. Direct sunlight must be avoided.

DO - Before mounting coat the seal ring with mineral based oil lubrication.

DO - Storage temperature: -40ºC to +80ºC at 0...80% humidity for 4 years.

DO'S - Sensor (Coolant Temperature Sensor)

DO - Protect parts against rain, snow and solar radiation and store them dry and dust-free.

DO - Storage temperature is -30ºC to 60ºC with relative humidity 0 to 60%

DO - During service - After removing temperature sensor, existing Aluminum washer is to be carefully cut (without damaging the brass threading) and taken out.

DO - Replace the washer with Copper washer.

DO'S - HP Pump

DO - Handle the pump by holding on to housing.

DO - Remove protection caps just before assembly.

DO - Fill the pump with 15 ml of fuel before starting.

DO - Pre-fill with 35 ml of Lube oil.

DO - MPROP connector to be connected / removed only in switch off condition.

DO'S - Solenoid Injector

DO - Keep the access of injector, clamping screw & support parallel while clamping.

DO - Ensure symmetrical force on to the injector body.

DO - Ensure HP connector is not loosened while tightening or loosening HPP nuts.

DO - Replace entire injector if HP connector is loosed.

DO - Use protection caps immediately after removal of injectors & interfaces.

DONT'S - Sensor (Phase Sensor)

DON'T - Don't drop the sensor.

DON'T - Do not Hammer the sensor while fitting.

DON'T - Do not bend sensor wire between the connection and the first support.

DON'T - None of the application guidelines should be deviated (Air gap etc).

DON'T - Sensor should not be kept near hot medium or objects with Temp > 120 ºC.

DON'T - The installation is made by pressing in and not forcing in with blunt instrument (e.g., hammer).

DON'T - The Phase sensor should be unpacked directly before installing in the car or on the test bench.

DON'T - Do not touch the sensor pins or the wiring harness pins with hand (to avoid ESD).

DON'T - If the sensor is taken out of its installation bore after having operated under thermal and mechanical loads, it is not allowed to put the same sensor back in the installation bore. Instead, it has to be replaced by a new sensor in order to ensure tightness.

DON'T - Mount sensor by pushing in (not knocking, no tools allowed) until seat of flange.

DONT'S - Sensor (Coolant Temperature Sensor)

DON'T - Don't drop the sensor.

DON'T - Do not exceed the maximum permissible tightening torque is 25Nm.

DONT'S - HP Pump

DON'T - Do not try to disassemble or repair pump & external components.

DON'T - Do not remove pump inlet connector sieve filter.

DON'T - Do not change the banjo and hollow bolt.

DONT'S - Solenoid Injector

DON'T - Do not handle injectors by holding through connector & magnet group.

DON'T - Do not use tightening tools on magnet group.

DON'T - Do not remove the injector before removing electrical connection.

DO'S - Rail

DO - The rail should be mounted directly and rigidly on the engine block or cylinder head.

DO - Protect the rail assembly against external damages.

DO - Ensure the electrical connectors and wires are not in contact with hot engine parts and sharp edges.

DO - Protection caps to be placed immediately after the rail is removed.

DO'S - Fuel Filter

DO - Ensure filter mounting nut & bolt tighten properly.

DO - Ensure inlet & outlet pipes are not interchanged.

DO - Ensure 250 μm strainer is installed in the tank.

DO - Ensure that no leakage after cranking the engine.

DO - Store the filter in room temperature and under dry condition.

DO - Ensure water sensor is tightened properly.

DO - Change the sealing ring of the water sensor on every spin-on exchange.

DONT'S - Rail

DON'T - Do not mount the rail on intermediate brackets.

DON'T - Do not mount the rail close to exhaust manifold, EGR valve and other hot devices.

DON'T - Do not paint on the name plate and the add on of the rail.

DONT'S - Fuel Filter

DON'T - Do not use the physically damaged filter for assembly.

DON'T - Do not use hammer for tightening or loosening air vent screw and mounting fasteners.

DON'T - Do not install the filter in tilted angle or horizontally.

DON'T - Do not remove protection caps till fuel lines are connected.

DON'T - Do not fill the spin-on filter with diesel before mounting.

DON'T - Do not use wrenches for mounting.

DON'T - Do not use spin-on sealing ring more than one service interval.

DON'T - Do not unscrew the water level sensor completely.

DON'T - Do not let the diesel drain out from the filter while draining water.

DON'T - Do not repair the flap assembly in hand primer head assembly.

Cooling System

The cooling system consists of :

A. Radiator
B. Recovery Bottle
C. Hoses & Connections
D. Thermostat
E. Belts
F. Water Pump
G. Fan

To ensure an even temperature within the engine, the cylinder head and cylinder walls of the engine are water cooled. This water is in turn cooled in the radiator. The water is circulated from the radiator to the engine and back through the radiator by means of a water pump.

Radiator

The radiator consists of a cluster of hollow tubes enshrined into a number of fins and enclosed at both ends vide a Top Tank and a bottom tank.

Air drawn in by fan passes through the radiator fins thereby cooling the coolant flowing through radiator tubes.

The fins should be kept clear of mud or dirt accumulation. Over heating may be caused by bent or clogged radiator fins. If the spaces between the radiator fins become clogged, clean them with compressed air or coolant blown from engine side.

Radiator Cap

A pressurised radiator cap is provided which is set at 13 psi (0.9 kg/cm2) pressure. This cap ensures better cooling and avoids loss of coolant due to evaporation. It also reduces corrosion in engine sleeve & crankcase, hence it is strongly recommended that the engine should not be run without radiator cap. Also ensure that rubber gasket is intact & perfectly sealing the system pressure.

Recovery Bottle

When the engine is in operation, certain amount of coolant passes out of the radiator overflow pipe. This coolant is not allowed to escape into the atmosphere and captured into a recovery bottle.

When the engine is not operating and the coolant cools down, certain amount of coolant comes back into the radiator from surge tank. The surge tank thus helps to prevent loss of coolant.

Thermostat

This device prevents coolant circulating through the radiator until the engine reaches its operating temperature. With the thermostat closed, the coolant circulates only through the engine block.

It is important that if the thermostat is defective, do not attempt to repair it, replace with new. When installing a new thermostat, ensure the valve is facing upward. The thermostat operating temperature is 180^0F (82^0C).

⚠ WARNING

When straightening bent fins be careful not to damage the tubes or to break the bond between the fins and tubes.

⚠ WARNING

The cooling system operates under pressure.

- It is dangerous to remove the radiator cap while the system is hot.
- Always turn the cap slowly to the first stop, and allow pressure to escape before removing the cap completely.

⚠ CAUTION

Do not run the engine when the cooling system is empty, and do not add cold coolant or cold antifreeze solution if the engine is hot.

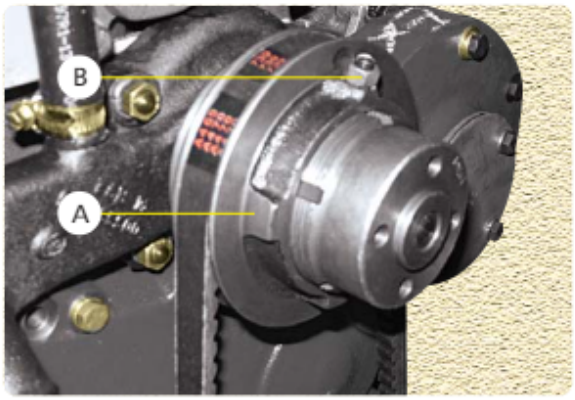
Coolant Check : Coolant level should be 2" below the radiator neck. Use clean water and rust preventive solution (Antifreeze in cold conditions). A maximum of 50% antifreeze with 50% water is recommended.

⚠ WARNING

Do not run the Engine without Thermostat Valve.

Water Pump

The water pump is provided with a sealed bearing. Adjusting or greasing will not be necessary.



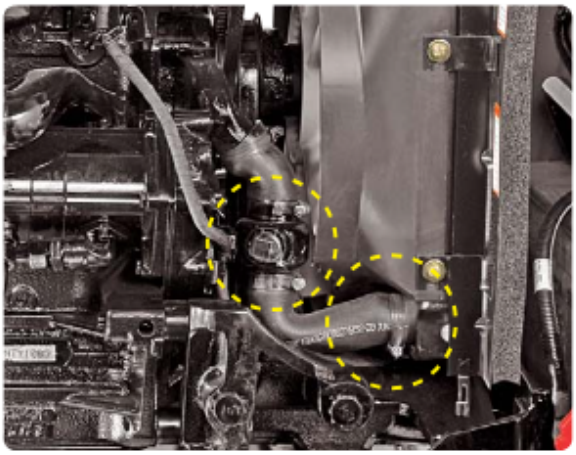
Block Heater

In order to improve cold starting ability of tractor, new radiator outlet hose with heater introduced. It heats engine water in cold ambient temperature and helps to start the engine easily.

Hose Connections

Check periodically to ensure all the connections are in good order and the clips are tight. A leaking connection results in loss of coolant and thus engine efficiency.

When using antifreeze in the cooling system, it is absolutely essential to have efficient connection so check these and should there be any doubt as to their serviceability, renew.



Fan & Fan Belts

A 7 Blade plastic fan is mounted on water pump and is driven vide fan belt by the main drive pulley. While the engine is in operation, the fan draws air through the radiator core.

Slippage of belt on pulley can cause over heating. The fan belts shall always be dry and free from oil or grease. Incorrect belt tension results in its rapid wear.

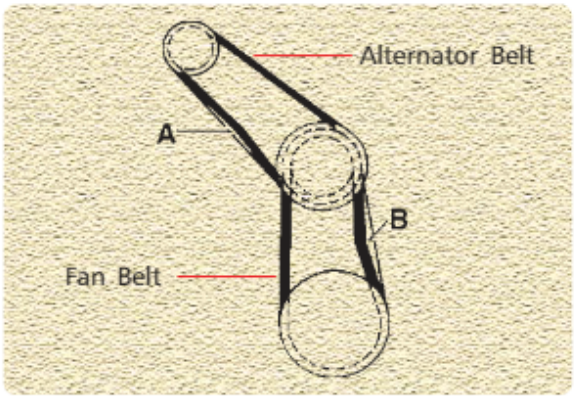
Belt Tension Adjustment

The belt tension is correct when the belt can be depressed without much effort by the thumb, 3/8 to 1/2 inch. midway between the two pulleys.

1. Turn the fan until the setscrew (B) can be reached then loosen the setscrew.
2. Screw the flange (A) towards the fan belt to tighten or away from the fan belt to slacken.
3. When the tension is correct, lock the flange by means of the setscrew, ensuring that the setscrew is in one of the slots in the pulley hub.

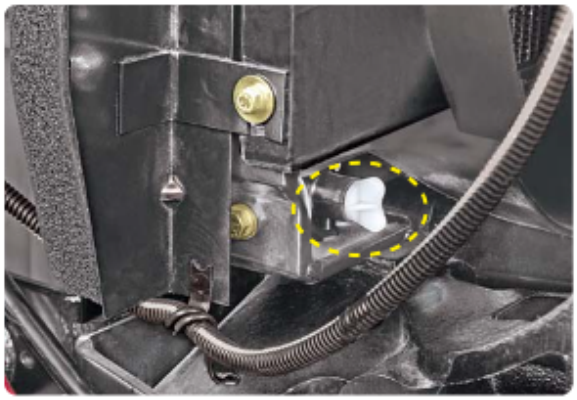
Belt Replacement

1. Loosen the setscrew (B) then screw the flange (A) as far as possible from the fan belt.
2. Ease the fan belt off the crankshaft pulley.
3. Work the fan belt over the fan blades, (a slot is provided at the bottom of the fan cowl for this purpose), until the belt is between the fan and the radiator.
4. Remove the fan belt from the top between two blades of the fan.
5. Feed the new fan belt, from the top, between two of the fan blades until it is between the fan and the radiator.
6. Work the fan belt over each fan blade in turn, using the slot provided in the fan cowl, and onto the crankshaft pulley.
7. Adjust the fan belt tension as previously detailed.



Draining the System

Two drain plugs must be opened. One is on LH side of crankcase and one on radiator bottom tank. To speed up draining, remove the radiator cap. Ensure that the drains are not clogged. Close the taps after draining is complete.



Cleaning out Dirt and Sludge

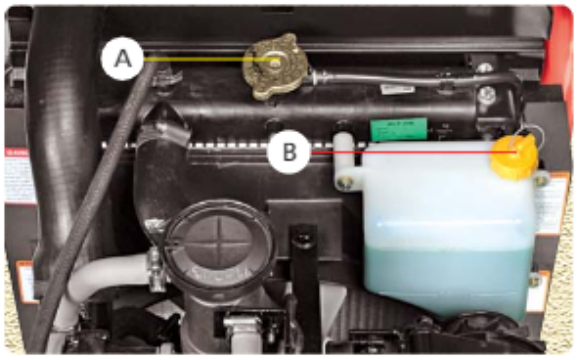
Drain cooling system as directed above. Fill the cooling system with solution of water (90%) and ordinary baking soda (10%) by volume.

Do not refit the radiator cap. Operate the engine until the coolant is hot. Drain, flush with clean water and refill with a rust inhibitor or anti-freeze solution.

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" (5cm) 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 and 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.

Low silicate antifreeze is available through out the United States. 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.

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

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.

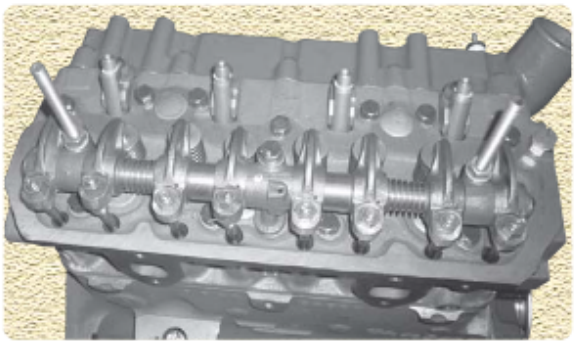
Adjusting the Valve Clearance

After the first 1000 hrs. the cylinder head bolts should be re-tightened to a torque as recommended. The bolt in the center should be tightened first and then work outwards. Check the valve clearance as given in specifications. Following this a further check should be made after every 1000 hrs.

1. Remove the valve housing.
2. Turn the engine until the No. 1 cylinder is at the top dead center of the compression stroke.
3. Loosen the locknut and adjust the screw in each valve lever so that the feeler gauge slips snugly between the ends of the valve lever and the valve stem.
4. Tighten the locknut and re-check the clearance.
5. Crank the engine for 2/3 revolutions in case of 3 cylinder engine in order to bring the TDC position of subsequent cylinder number as per the respective firing orders. Now adjust the valve clearance as explained earlier.

Repeat the process until clearance for each set of valves is adjusted.

Replace the valve housing and ensure that the valve housing gasket makes an oil tight seal with the cylinder head. Use a new gasket, if necessary.



Checking Valve Clearance

IMPORTANT

Be accurate - use a feeler gauge for checking the valve clearance.

Valve Clearance

		Intake	Exhaust
Clearance	mm	0.3	0.4
(Cold Values)	Inch	0.012	0.016

Air Cleaner

The important function of the air cleaner is to filter the air entering into combustion chamber so that no dust or chaff etc. enters the engine to cause abrasion and excessive wear. Thus it is most important that the air cleaner should have regular maintenance to continually and efficiently protect the engine from dust and other harmful substances.

The air cleaner comprises of the following parts:

Body Air-Cleaner

This serves as the main frame for housing all parts associated with the air cleaner system.

Cyclopack or built-in Pre-Cleaner

The coarse dust particles are separated by the curved blades of the Cyclopack and get collected in the dust collector.

Paper Element Filter

Paper element filter screens the fine impurities. This has to be cleaned by compressed air during every service or earlier if required. The filter should be replaced after every 2 cleanings or 900 hrs. or earlier if required.

Safety Cartridge

Safety cartridge fits inside the paper element filter. It is a safeguard against uncontrolled dust entry into engine due to paper filter element rupture and also when the paper element is removed for cleaning

Dust Collector Bowl

It collects the dust and releases it automatically.

The following are the service instructions for the Air Cleaner assembly :

1. Check functioning of auto unloader of the dust collector regularly.
2. Paper element of air cleaner should be cleaned with compressed air every 300 hrs. or earlier if required.
3. Paper element of air cleaner should be replaced after every 2 cleanings or 900 hrs. or even earlier if required.
4. Safety Cartridge should be replaced after every 900 hrs. or earlier if required.
5. Assemble the air cleaner and refit the same on the Tractor ensuring all joints to be leak-proof.
6. After ensuring all fittings to be O.K., start the Tractor.

NOTE: During every service of dry type air cleaner, the paper element should be cleaned with compressed air directed from inside to outside. Even after this if the element is found choked, replace it with a new one. Do not use dirty or damaged paper element as the impure air may severely reduce the engine performance/ life.

Hose and Clamps

Check Hose clamps for proper tightness.

Clean Diesel Fuel

Diesel Fuel should be poured so that no sediment can enter the tractor fuel tank whilst it is being filled. Fuel storage facilities should allow for the periodic removal of sediment from the bottom of the storage tank.

The Diesel fuel filters will remove any sediment still present in the fuel and ensure that the fuel reaching the injection pump and injectors is free of impurities. The fuel filter should be serviced regularly to ensure maximum engine reliability.

Bleeding the Fuel Filter

The presence of air in the fuel can cause fuel stoppages.

The air should be completely bled so that the tractor operates satisfactorily. Loosen air bleeding screw (B) on fuel filter and push hand primer (A) down till you get the flow of fuel free of air from air bleeding screw. Retighten the screw (B).

Bleeding the Fuel Injection Pump

Loosen the High-Pressure pipes at the nozzle end. Operate the hand primer (A) on fuel filter till you get a streamline flow of fuel from the High-Pressure pipes. Retighten the High-Pressure pipes and start the engine. Observe till the engine runs smoothly and then shut-off till further use.

⚠ CAUTION

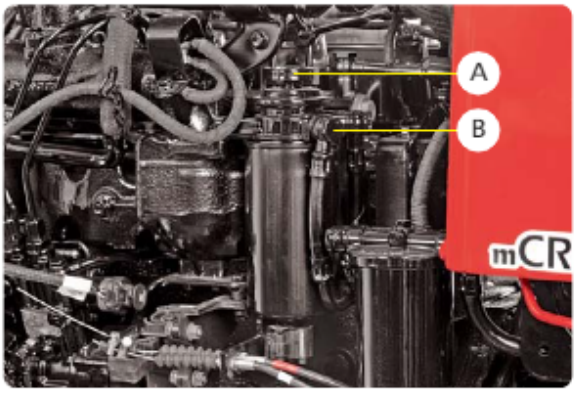
Escaping hydraulic diesel fluid under pressure can penetrate the skin causing serious injury.

Do not use your hand to check for leaks. Use piece of cardboard or paper to search for leaks.

Stop engine and relieve pressure before connecting or disconnecting lines.

Tighten all connections before pressurizing lines.

If any fluid is injected into the skin obtain medical attention immediately or else, serious injury may result.



Tractor Front

Fuel Tank and Fuel Pipes

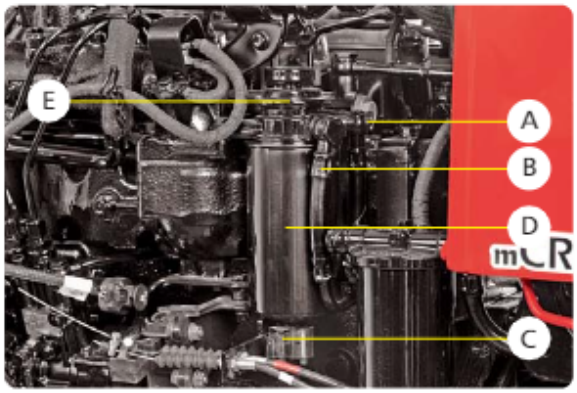
Fill the tank each time the tractor finishes the days work. This prevents condensation inside the fuel tank. Check regularly to ensure all fuel pipe unions are tight and in good order. Ensure that vent hole provided on fuel tank cap is not choked. Water or dirt settled in the bottom of fuel tank should be drained daily, before starting the engine by loosening the drain cock till clean diesel flows.

Fuel Filter

This filter provides clean, moisture free fuel for the injection process. A hand primer is provided to manually remove excess air from the fuel filter and fuel lines.

Major Components:

- Hand Primer
- Air Bleeding Screw
- Fuel Filter



Fuel enters the filter at inlet (A) and flows through the filter element separating water if it is present, before flowing through outlet (B) to the fuel injection pump.

Since water and contaminants settle at the bottom of the sediment bowl, a drain plug (i.e. Adaptor cum Water Sensor) is provided.

Drain water from the fuel filter when water level indicator in instrument cluster glows on.

To drain water from fuel filter, unscrew the water sensor in anticlockwise direction by hand. Rotate only 1 to 2 turns by hand. Place a small tray to collect water or water and diesel emulsion. Tighten water sensor by rotating clockwise. Tightening torque 2 to 3 Nm or hand tighten and fix connector (C).

NOTE: Drain water once in a week or earlier if water contamination is excessive. Continued driving with water accumulation in fuel filter will cause damage to fuel pump / other fuel system components.

Servicing the Fuel Filter

1. It is recommended to replace the fuel filter every 200 hrs.
2. To remove Filter, unscrew the filter (D) from adaptor (E).
3. Check O'rings of fuel filter for any crack / damage. Smear oil on the new O'ring before installation.
4. Assemble the new filter. Do not over tighten.
5. Clean Water Sensor to remove sludge and retighten to filter.
6. Prime the system and bleed the filter. Tighten the bleeding screw.

NOTE: Replace fuel filter at the recommended period or whenever it gets clogged. Discard the old filter and do not repair or clean the filter.

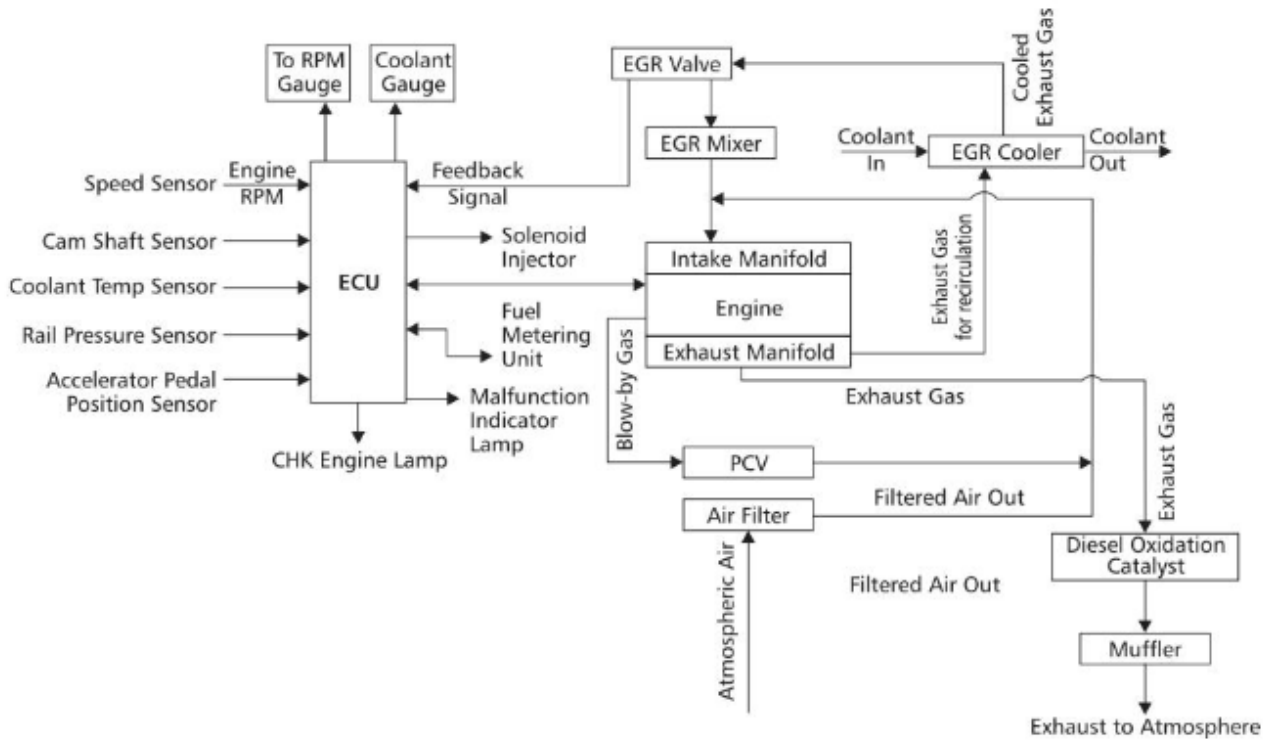
Always fit the spin-on filter dry.

EMISSION CONTROL SYSTEM (ECS)

The tractor engine is equipped with the following emission control systems

1. Positive Crankcase Ventilation (PCV) System
2. Exhaust Gas Recirculation (EGR) System
3. Diesel Oxidation Catalyst (DOC)
4. Under-Hood Muffler (UHM)

The schematic layout of the ECS is as follows :



Positive Crankcase Ventilation (PCV) System

The tractor engine is equipped with a positive crankcase ventilation system. This separates the oil efficiently from the engine blow-by gases through a high performance media, maintains the crankcase pressure within acceptable safe limits.

⚠ CAUTION

Always carry out the maintenance work only when the engine is switched off and parked properly.

Never start the engine without an oil separator and/or cover.

Exhaust Gas Recirculation (EGR) System

The tractor engine is equipped with an electrically controlled EGR system. This system comprises the following units,

- EEGR Valve
- EEGR Mixing Unit
- EEGR Cooler

NOTE:

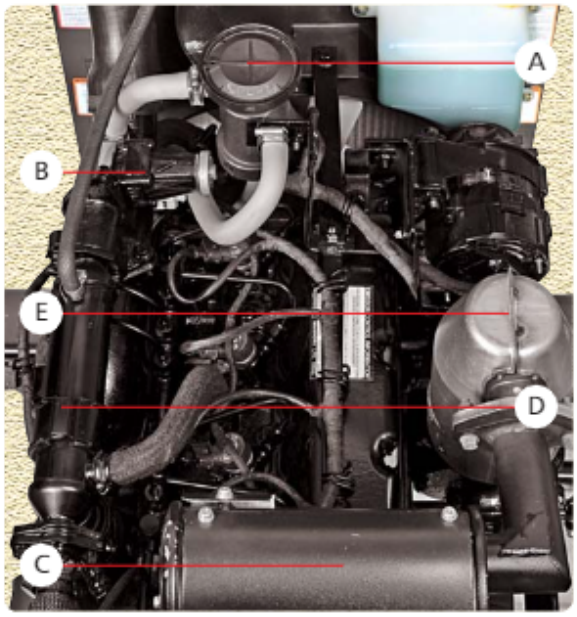
Check the EGR system regularly to ensure that its electrical, pipe and hose connections are proper and damage free and free from external soiling and leakages.

Periodic inspection and tightening of mounting hardware is typically appropriate.

A faulty EGR system is noticeable by,

1. Black smoke
2. Reduction in engine power output
3. Abnormal vehicle shakes
4. Emission control System indicator blinks continuously past two minutes.

If you observe the above conditions in your tractor, please immediately consult a Mahindra authorized dealer/service centre and get the problem rectified.



A - PCV Oil Separator
B - EEGR Valve
C - UHM
D - EGR Cooler
E - DOC

Diesel Oxidation Catalyst (DOC)

A Diesel Oxidation Catalyst (DOC) is an emission control device which uses a chemical process in order to break down pollutants from diesel engines in the exhaust stream, turning them into less harmful components. It is a part of the exhaust system.

Under-Hood Muffler (UHM)

An Under-Hood Muffler (UHM) is an emission control device which maintains exhaust back pressure and also reducing exhaust noise by absorption. It is a part of the exhaust system which can be found fitted next to the DOC.

NOTE:

Avoid long duration idling than the recommended idling time.

Avoid frequent cold starts.

Periodic inspection and tightening of mounting hardware is typically appropriate.

⚠ CAUTION

The DOC may be damaged by excessive fuel or oil consumption or a poorly maintained engine.

Always use recommended fuel and lubricating oil for your engine.

Exhaust system involves high temperature. Wait until the temperature cools down to carry out any maintenance work in the exhaust system or nearby area.

Never operate the tractor without the DOC and UHM.

Never operate the tractor with improperly fitted or physically damaged DOC and UHM

Never let the water into the exhaust system which may damage the exhaust system.

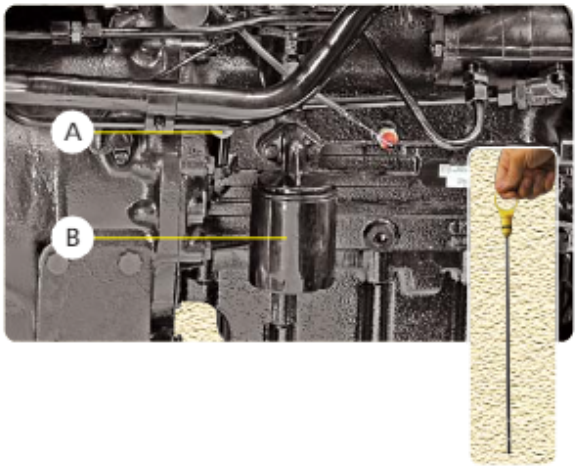
Service your vehicle periodically as recommended.

Oil Level Check

Check engine oil before starting the engine.

1. Remove dipstick gauge (A) provided on the right hand side of the crankcase.
2. Oil level should be between the two marks provided on the dipstick (A).

Never allow to let the oil level drop below the 'Lower' mark. Add only recommended grade of oil (15W40).



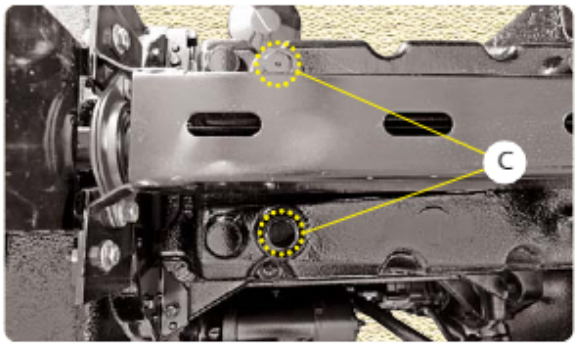
Engine Oil Filter

The life of engine depends upon clean oil being circulated to its bearings. In the normal course of engine operation the lubricating oil undergoes changes which produce harmful by-products. The purpose of the oil filter is to separate and remove dirt and other injurious foreign materials from the oil and prevent these from being circulated in the engine.

The oil filter element should be replaced after every 200 hrs. of operation or whenever engine oil is changed.

Changing Spin On Filter

1. Ensure that engine is stopped before changing filter.
2. Unscrew the oil filter (B).
3. Prime the new spin-on filter with clean oil.
4. Screw the new filter to the adapter.
5. Move the Hand and foot throttle to engine "Idle" position.
6. Start the engine, check the oil pressure gauge to see whether the lubricating oil is circulating through the Engine.
7. Inspect the oil filter for oil leaks.

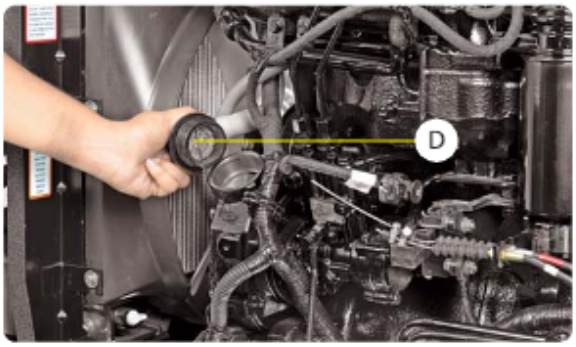


Oil Change

Change engine oil as per Routine Service Schedule Chart given in this manual.

1. Ensure that the engine is stopped before changing oil.
2. Remove the drain plug (C) provided at bottom of oil sump.
3. Allow the oil to drain at least for five minutes. All the oil can be drained out when engine is still warm.
4. Now reinstall the drain plug (C). Service the oil filter as explained below.
5. Remove the oil filler cap (D) to expose the oil filler neck.
6. Refill the oil sump slowly by recommended grade of oil (15W40) from the oil filler neck.
7. Clean and place the oil filler cap (D) again.

Stop the engine immediately if Oil pressure is not recorded within 10 seconds of engine starting or Leakage is observed. Get the cause identified and rectified before proceeding further.



NOTE: Engine oil and filter element must be changed after initial 50 hrs. of operation in new tractor or whenever major overhaul of engine is carried out and subsequently after every 350 hrs. respectively.

To avoid delays, we recommend that you carry extra filter elements on hand so that replacements can be made at the correct time. The filter is located on the right-hand side of the crankcase.

Filling oil consumes time. Allow sufficient time for the oil to settle down in crankcase.

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

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 (–) 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. Taking 100% of cranking power at 80°F then at 32°F, only 65% and 0°F only 40% cranking power is available.

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. 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

Alternator

Following checks of alternator charging system will avoid many problems that might otherwise develop.

1. Check belt tension. Refer your operator's manual for proper belt tension.
2. Keep pulley nut tight.
3. Check alternator terminals and cable connections for good condition, secure fastening and freedom from corrosion.
4. Check battery cables and connections for good condition, secure fastening and freedom from corrosion.
5. If battery will not take adequate charge, or is otherwise unsatisfactory replace battery.

NOTE: Alternator Maintenance should be done by authorised Dealer.

Too tight a belt will cause rapid wear of belt and damage to bearings.

A slack belt will not drive the Alternator, and therefore the battery will not be charged.

Charging Circuit

Should the battery be in a low state of charge, which will be shown by lack of power when starting or poor lights. This may be due to either alternator not charging or giving lower intermittent output, then proceed as below :

- Check Battery Charging Indicator when the engine is running steadily at working speed.
- If the Battery Charging Indicator glows, have the equipment checked by your Mahindra tractor Dealer.
- Inspect alternator drive belt and adjust as necessary.
- Examine the charging and field circuit wiring, tighten any loose connections, replace any broken cables, pay particular attention to the connections.

⚠ WARNING

To avoid damage to alternator charging system, service precautions should be observed as follows.

1. Never make or break any of the charging circuit connections, including the battery when engine is running.
2. Never short any of the charging components to ground.
3. Do not use a jumper battery of higher than 12 volts.

Always disconnect the battery ground cable before carrying out arc welding on the tractor or any implement attached to the tractor.

Use only specified cable for replacement

Starter Motor Removal

1. Disconnect the battery to starter solenoid coil cable, earth cable from the battery, Key Switch to solenoid coil cable.
2. Remove the mounting bolts and withdraw the starter motor. To install the starter motor, reverse the above procedure.

IMPORTANT

Should the starter motor be removed, and a replacement motor or drive end bracket be fitted, a check must be made of the out of mesh clearance after assembling the starter motor to the engine. The dimension between the leading edge of the pinion and the engine flywheel should be no less than 0.32 cms.

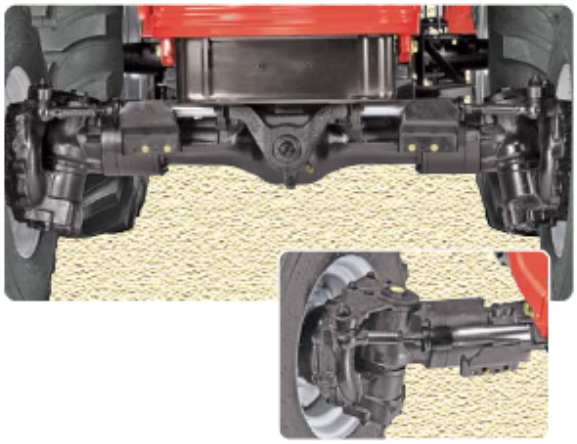
Front Axle - Front Wheel "Toe-in" Check

In the event of the tie rod setting being interfered with, it is necessary to adjust the TOE-IN. Before measuring and adjusting the TOE-IN, ensure the front wheels are in the straight ahead position and the front axle is not tilted.

After adjusting the front wheel tread and with all connections secured, the front wheel Toe-in shall be as follows,

MODEL	Toe-in Value	
	inch.	mm.
4540/4550 4WD	0 - 0.23	0 - 6

Measure the distance between the outer edges of the wheel rims at the same height as the hub caps. Mark the point measured and turn the wheels half revolution so that the marked points are at the rear. Measure again the distance between these two points and this distance must be the same as measured before without variance. To adjust the TOE-IN shorten or extend the tie rod clockwise or anti-clockwise.



Front Axle

Oil Level Checking

To check the oil level, keep the tractor on level ground. Clean the area around dipstick (B), remove the dipstick, clean it and refit it in the housing till it reaches its bottom. Again remove the dipstick and check oil level. The oil level should be maintained between upper and lower mark on it.

Draining Front Axle Oil

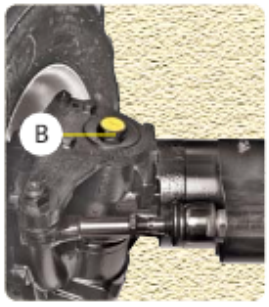
Drain oil from both, differential housing (C) as well as left hand side and right hand side swivel housing (D) through respective drain plug.

Remove the respective drain plug and allow the oil to drain out. Be patient and allow the oil to drain for sufficient time. Refit the plug.

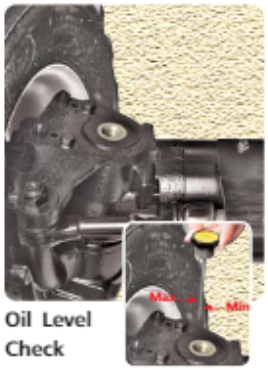
Reinstall the drain plug and fill the oil gradually from the oil filler neck till the oil reaches desired level on the dipstick. Be patient and wait till the oil settles down in housing before checking oil level on the dipstick.

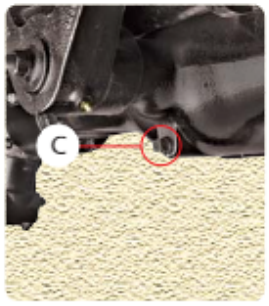
Adding Oil to Front Axle

Add equal amount of oil in both left hand side and right hand side swivel housing. To add oil in front axle, open dipstick and refill oil via the filler neck (E), upto the required level if necessary. Refit dipstick.

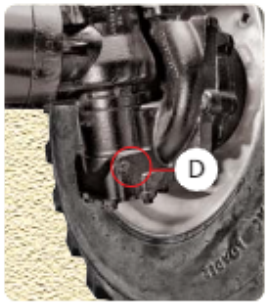


Dipstick Location

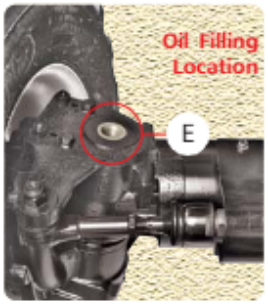

Oil Level Check



Oil Drain Plug



Oil Drain Plug



The oil reservoir is common for Transmission, Hydraulics and Steering.

Transmission Oil Level

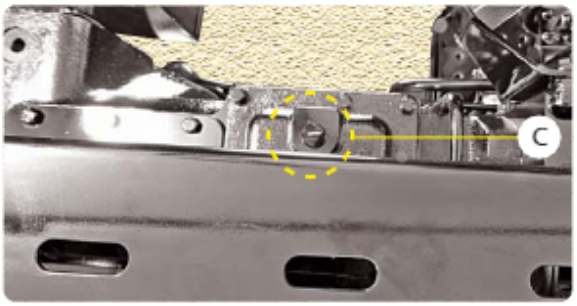
Remove the dipstick cum breather (A) and check oil level.

Refill oil from filler neck (B) till the required level.

Transmission Oil Filling

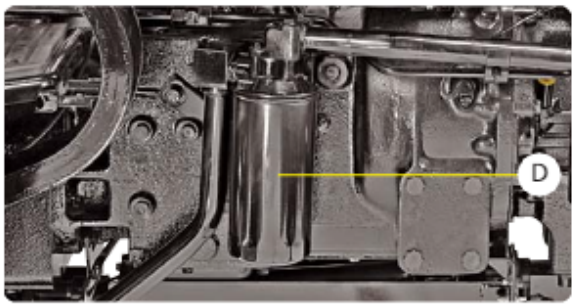
Transmission Oil Drain

A drain plug (C) is provided on the transmission for draining transmission oil.



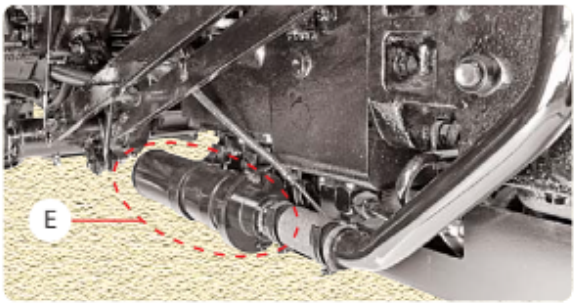
Hydraulic Suction Filter

The oil filter element (D) should be replaced initially at 50 hours and subsequently after every 500 hours of operation or whenever hydraulic oil is changed.



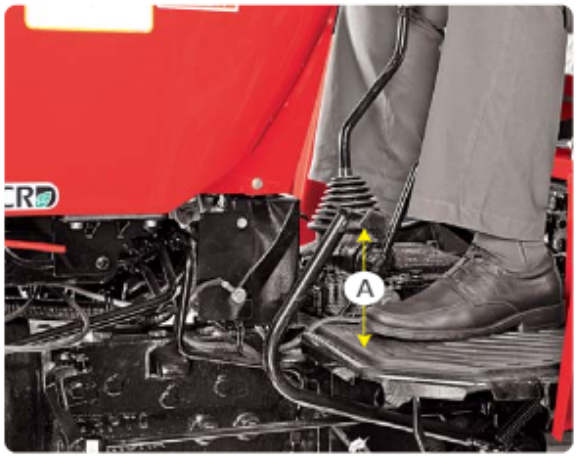
Transmission Strainer

Remove the transmission strainer (E) and clean initially at 50 hrs. and subsequently every 500 hrs. of operation or whenever the transmission oil is changed.



Clutch Pedal Adjustment

The clutch pedal should be adjusted to give a measurement (A) of 6.7" (17 cm) between the pedal pad and the foot plate.

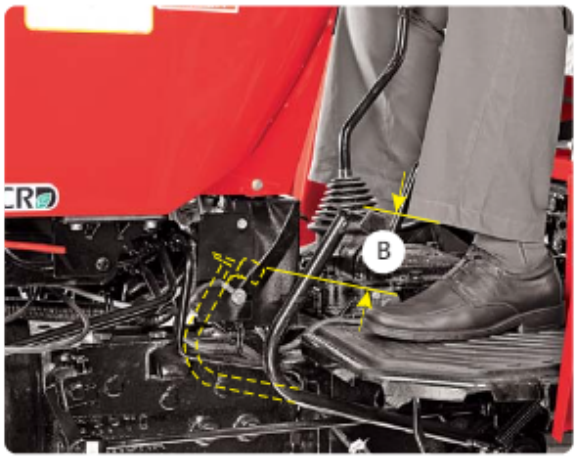


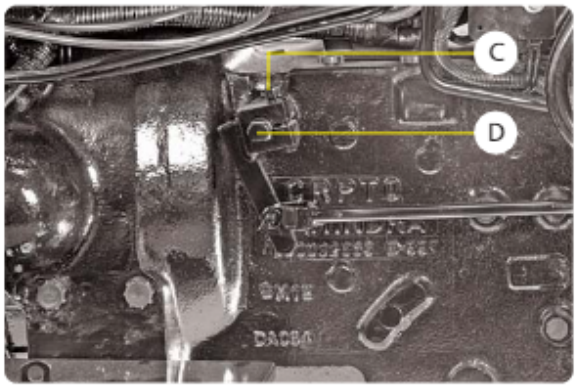
Clutch Pedal Free Play

With the clutch fully engaged, the pedal should have a free movement (B) of 1/2" (1.25 cms).

The free movement is obtained as follows :

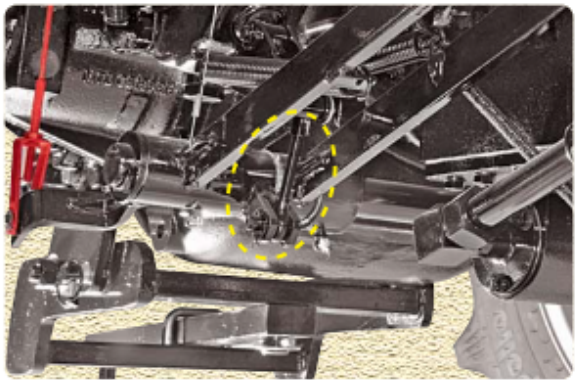
1. Loosen the retaining nuts (C).
2. Move the pedal round the clutch release shaft (D) until the required adjustment has been made.
3. Retighten the retaining nuts after adjustment.





Disc Brakes

The brakes consist of two actuating discs, two friction discs and operating linkages, enclosed in a brake housing. The two friction discs are driven by bull pinion/brake shaft, the speed of rotation of which is reduced by the engagement of the actuating discs when downward pressure is applied to the brake pedals. The actuating discs force the friction discs against the inner face of the brake housing and the outer surface of bull pinion cage.

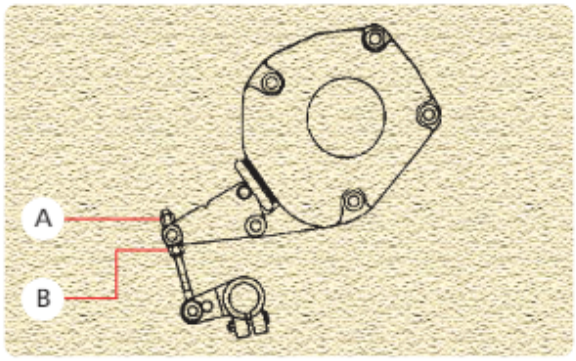


Brake Pedal Adjustment

Adjust the brake as follows :

1. Loosen the jamnut (A) on the foot-brake adjuster bolt.
2. Tighten the nut (B) to tighten the brake and loosen the nut (B) to loosen the brake.

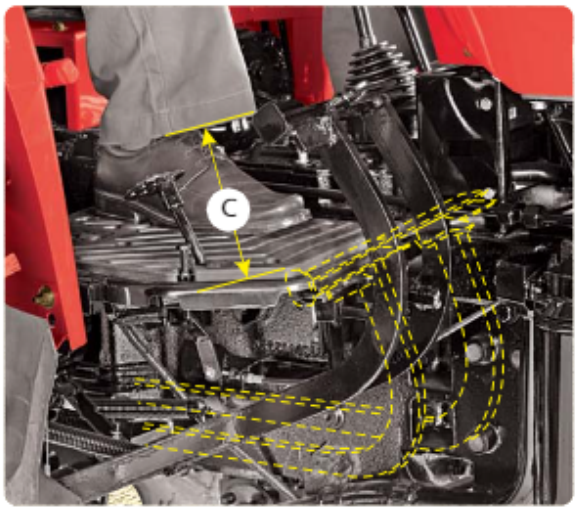
It is very important to ensure that both brakes have the same amount of free movement before taking hold. A definite way to check this equalisation is to jack up the rear wheels so that they turn freely. Start the engine and operate in 3rd or 4th gear. Application of the brakes should slow both wheels at the same time, and also tend to reduce engine speed. If, when the brakes are applied, one wheel stops and the other continues to spin, adjust the brakes until both wheels stop simultaneously with application of the brakes.



Brake Pedal Free Play

Measure free play of pedal stroke (C). Ensure free play is within specified limits. If free play is not within specified limits, adjust linkage as shown below.

Free Play - Distance 3/4" (1.90 cms).



NOTE: Brakes should not drag.

Special Bolt Torque

Special Bolt Torque N.m / Lbs. ft.

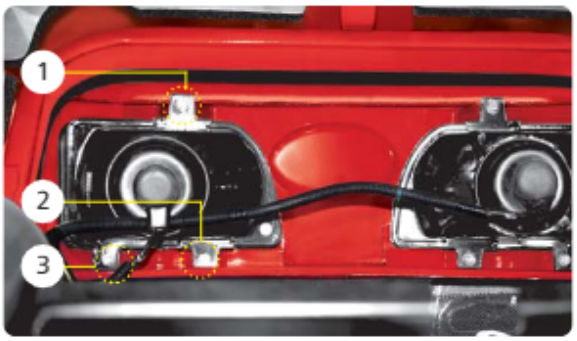
	N.m	Lbs. ft.
Bolt Cylinder Head	81 - 88	60 - 65
Bolt Crankshaft Main Bearing Cap	122 - 129	90 - 95
Bolt Connecting Rod	54 - 61	40 - 45
Bolt Flywheel Mounting	81 - 95	60 - 70
Bolt Crank Pulley	169 - 202	125 - 150
Nut Nozzle Holder	22 - 24	16 - 18
Nut Stay Rod	651 - 718	480 - 530
Bolt Bull Gear Retaining	266 - 293	196 - 216
Bolt Carrier Rear Axle	87 - 115	65 - 85
Nut Steering Wheel	47	35
Nut Rear Wheel	230 - 244	170 - 180
Nut Rear Wheel Rim / Disc	108 - 149	80 - 110
Bolt Retaining Bevel Drive Gear	104 - 118	77 - 87
Drain Plug for Engine Oil Pan	22 - 29	30 - 40
Bolt Front Wheel	85 - 96	115 - 130
Allen bolt for injector clamp M8	12 - 14	15 - 20

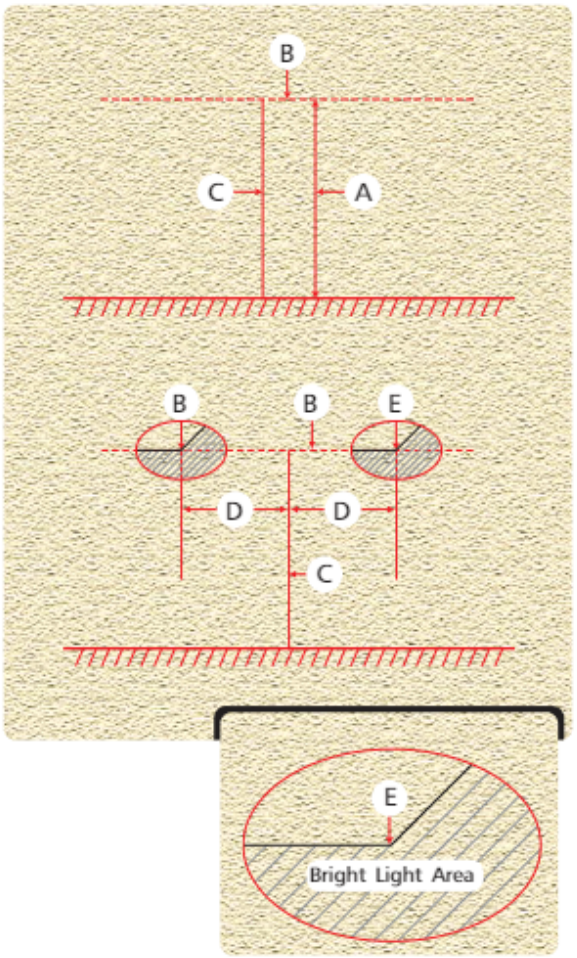
Head Lamp Adjustment

1. Open the hood.
2. Tighten screws (1), (2) & (3) fully.
3. Turning screw (1) in anticlockwise direction will raise the Beam.
4. Turning screw (2) & (3) in anticlockwise direction will lower the Beam.

Aiming Head Lamps

1. Park tractor on level ground, with lights 9.8 ft. (3m) from a wall.
2. Measure centre of headlamp to ground height (A). Place a strip of masking tape (B) on the wall at the same height.
3. Place a piece of tape, folded in the middle to make a point, on the top front center of the hood.
4. Using the tape on hood as a guide, sight across steering wheel and hood to locate tractor centerline. Mark tractor centerline (C) on wall.
5. From tractor centerline (C), mark a point (D) 6" (152.4 mm) out in each direction.
6. Turn light switch to dim position.
7. Locate point (E) of bright light projected by each lamp by adjusting screws (1), (2), (3) and (4) as required. Cover other lamps, if necessary.





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

It is not the policy of the Mahindra & Mahindra Ltd. to guarantee oil performance under the conditions of operation, and its compatibility with the diesel fuels used, must remain with the supplier of the lubricant. 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.

Engine Oil

Refer table A for oil specifications. Other oils can be used if they meet minimum requirement of :

- API service classification 15W40-CJ4 + Mb228.1
- CCMC D-4 / G-4 / PD-2
- MIL - L - 2104E.

Multi-Viscosity Diesel Engine oils are preferred.

Selecting the Viscosity of Engine Oil (EO)

During cold weather the selection of oil should be based on the coldest anticipated operating temperature to make starting easier.

During hot weather, selection should be based on the highest anticipated operating temperature.

When the prevailing temperature changes substantially, even though the regular intervals of lubricant change have not been reached, the lubricant must be changed.

Refer Oil Specifications Chart for oil specifications at different range of ambient temperatures.

Following oils of SAE grade 15W40 are recommended for temperature range of -15°C to 50°C with CJ4 API quality grade..

1. Citgo - Citgard 600 15W40
2. ESSO - XD3 Extra CJ4
3. Chevron - Delo 400 LE
4. Mobil - Delvac Elite 15W40
5. Shell - Rotella T3
6. Texaco - Ursa Premium TDS EC SAE15W40

Ambient temperature conditions in other range warrants other SAE grade of oil as per illustration.

Transmission, Hydraulics and Steering Oil (GL)

Use mild EP type gear lubricant. They should meet API GL4 performance category with suitable additives meant for paper based brake liner. Use viscosity based on the expected air temperature range during the period between oil changes.

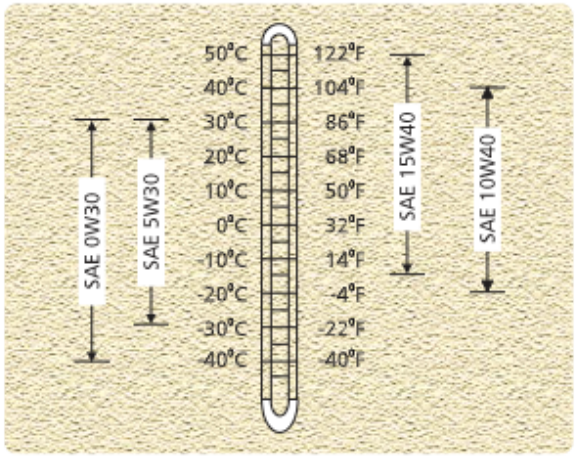
Please refer Oil Specifications Chart for oil specifications at different range of ambient temperatures.

Following oils are recommended,

1. GULF Universal Tractor Transmission Fluid.
2. Exxon Torque fluid 56
3. Shell Donax TD
4. Mobil fluid 424
5. Tractelf BF 12
6. Tractelf C4 - 1000
7. Hydro Clear Power Train Fluid

Other brands may be used if they meet all the specifications and performance levels of the above.

NOTE : If diesel fuel with sulphur content greater than 0.05% is used, reduce the service interval by 50%.

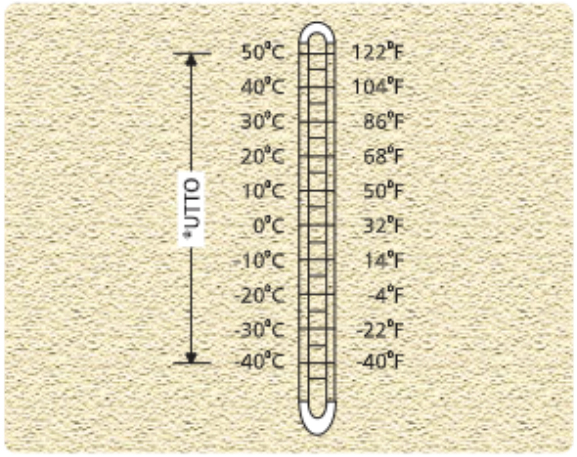


NOTE : It is not necessary to change the lubricant when the temperature enters into a different range during a working day, unless difficulty in starting is experienced. Change oil if the tractor is not used for 6 months.

PRECAUTIONS :

After changing the oil, operate the engine at low speed without load, for at least 5 minutes. This will allow the oil to work into the bearings and onto the cylinder walls.

* Factory filled oil is 15W40-CJ4 and may change in future.



NOTE : Universal Tractor Transmission Oil. Oil shall meet API GL4 performance category.

Factory filled oil is Tractelf MM H3 and is subject to change in future.

Chassis Lubricant (CL)

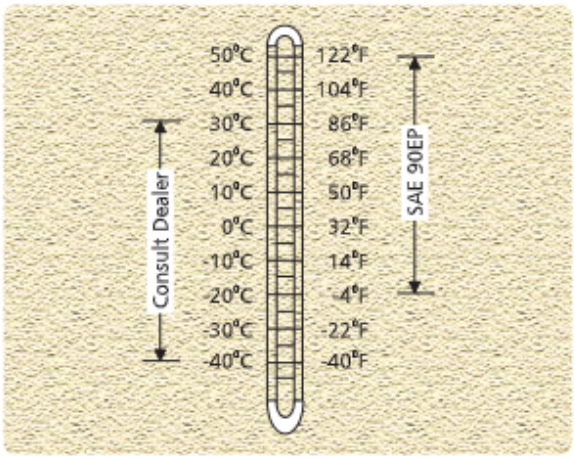
Use good grade of grease designed for pin and bushings on agricultural equipment. Lithium or aluminium complex type grease with high viscosity base oil, tackiness and molybdenum disulphide are suitable. Grease approved for the NLGI certification mark GC-LB are recommended.

Grease must be SAE Multipurpose High Temperature Grease with Extreme Pressure (EP) performance and capable of operating at assembly temperatures above 150°C (302°F) Depending upon the expected ambient temperature range during the service interval, use grease as shown on the Lubricant Recommendation Chart.

Front Axle

Use gear oil complying to API GL5, MIL-L-2105D specifications. Please refer Oil Specifications Chart for oil viscosity grade at different range of ambient temperatures.

Universal Tractor Transmission Oil. Oil shall meet API GL4 performance category.



NOTE : At temperatures below -30°C (-22°F), use arctic greases such as those meeting Military Specification MIL-G-10942C.

Grease Type	Temperature Limits
Arctic Grease	Below -30°C (-22°F)
SAE (NLGI) #0 or #1	-30°C to 0°C (-22°F to 32°F)
SAE (NLGI) #2	0°C to 50°C (32°F to 122°F)

Following **Mahindra Grade Oils** are also available as per product configurations you have :

Engine Oil (EO)

MAHINDRA HEAVY DUTY SAE 15W40-CJ4

Transmission, Hydraulics and Steering Oil (GL)

MAHINDRA UNIVERSAL TRACTOR FLUID

Front Axle

MAHINDRA EP GEAR OIL SAE 80W-90

Lubricant Recommendation Chart

Application	Capacity	Air Temperature Gauge				
	Gallon / Litre	–40 to +88°F	–22 to +88°F	–4 to +122°F	+32 to 104°F	+50 to 122°F
Crankcase	2.14 / 8.1	SAE 0W30	SAE 5W30	SAE 10W40 / SAE 15W40	SAE 15W40	SAE 15W40
Transmission & Hydraulics	10.57 / 40	SAE 75W UTTO		SAE 80W UTTO Listed above		
Lubrication Fittings	C. L.	NLGI No. as recommended				
Front Axle	2.24 / 8.98	SAE75W90EP		SAE80W140EP	*SAE80W90EP	SAE80W140EP
		*SAE80W90EP listed above for ambient temperature range –4°F to 104°F				

Mahindra - 4540 4WD (TIER-4)

ENGINE

Four Stroke, Direct Injection, Water Cooled Diesel Engine

Model	: MDI 2700 R2
No. of Cylinders	: 4
Displacement	: 167 in^3 (2732 cc)
Bore	: 3.50 in.
Stroke	: 4.33 in.
Compression Ratio	: 18.7 : 1
Horse Power Max.	: 41 HP Max as per DIN-70020 (-10%)
Max. Torque@RPM,N.m	: 144@1300 – 1500 (Max)
Backup Torque %	: 11-13 @1400 ± 100 rpm
Rated speed	: 2300 rpm
High idle r.p.m.	: 2500 ± 50
Low idle r.p.m.	: 750 ± 50
Fuel injection pump	: Common Rail System - BOSCH
Cylinder sleeve	: Wet-Replaceable
Air cleaner	: Dry type with safety cartridge & dust unloader valve
Exhaust muffler	: (DOC+Muffler) with sideout Tail pipe
Firing order	: 1 - 3 - 4 - 2
Injector type	: Solenoid Operated Injectors

COOLING SYSTEM

Type	: Water Cooled
Feature	: Thermostat between Thermostat Housing & Radiator
Throttle Control	: Hand & Foot Accelerator assisted by electronic sensor

ELECTRICAL STARTING AND LIGHTING

Battery Type	: Exide HP 31E
Battery Capacity & Rating	: 12 volts, 96 Ah
Starter Type, Rating & Power	: 3.6 KW Heavy Duty Starter Motor, Solenoid engaged, Key start with safety neutral in Range & PTO
Alternator / Generator	: 12 volts, 45 Amps
Instrumentation	: Water Temp Gauge, Electrical Fuel Level Gauge, Electro Mechanic RPM Meter with LCD Hour Meter, Oil Pressure Indicator, Error Lamp & MIL
Lighting	: Head Lights, Turn Indicators, Rear Brake Lights, Common Front Parking Light with Indication on Dash Board, Work Lamp with Indication at Dash Board, Indication of Heater ON, Air Clog Indication, Water in Fuel Indication, Battery Charging Indicator, Turn Signal Indicators and Hazard Warning & 4WD indication on Instrument Cluster
Electrical System for CRDI	: ECU, Engine Speed Sensor, Phase Sensor, Rail Pressure Sensor, Accelerator Pressure Sensor, Coolant Temperature Sensor, Wire Harness
EGR System	: EEGR Valve
Cold Start Provision	: Air Intake Manifold Heater
Horn	: Sealed Type
Fuse Box	: Blade type fuses with fuse name indication on cover
Switches	: Key switch, Rotary type for light, Turn signal, Work lamp, Piano type for hazard, Push type for horn

CLUTCH

Type	: Dual Clutch
Diameter	: 11" for PTO & 11" for main drive

TRANSMISSION

Type of Mesh	: Full Constant Mesh
No. of Gears	: 8 Forward + 2 Reverse
Type of Final Reduction & Ratio	: Bull Gear & Pinion / 15/68
Differential Lock	: Foot Operated
4WD Operation Lever	: On LH Corner on LH Floor Panel (Vertical movement for engagement)

STEERING

	: Hydrostatic Power Steering
Type	: Open Center Non Load Reaction
Column Angle	: 63°

POWER TAKE OFF

Type	: CRPTO, Rear mounted, 6 Splines
PTO HP Max (-10%)	: 31 HP
PTO RPM	: Standard 540 @ 2058 Engine RPM clockwise direction

BRAKES

Service Brakes	: Foot Operated Independently with provision of interlock for simultaneous operation. A hand brake lever is fitted for parking.
Type	: Dry Brakes
Size	: 6.5 in.
Effective friction area (each side)	: 23.9 in^2
Number of lining (each side)	: 4
Total effective friction area	: 191 in^2

PARKING BRAKES

Type	: Toggle link locking to service brakes
Method of Operation	: With Hand Brake Lever

HYDRAULIC SYSTEM & LINKAGES

Type	: Open centre full live Hydraulics with Position and Draft controls with isolator valve. (common oil for hydraulics, transmission & power steering)
Max. lifting capacity at lift (hitch) point	: 3527 lbs. (1600 kgf) without Aux Valve
Max. Pressure psi (Bar)	: 2400-2900 (165-199)
Max. Flow at rated rpm Gallon/min (lpm)	: 8.7 (33.0)
Levers	: Position Control Lever, Draft Control Lever and Isolating Knob
Linkage	: Category 1 & 2
Sensing Type	: Top link draft sensing

OPTIONAL FITMENT

Auxiliary Valve	: Single Spool with QDC for Hydraulic Output Connection

Mahindra - 4540 4WD (TIER-4)

DIMENSIONS (STANDARD) - inch (mm)

Length overall	: 128.9 (3275)
Width overall	: 82.59 (2098)
Height overall	: 92.59 (2352) upto ROPS
Ground clearance	: 8.57 (217.82)
Wheel base	: 76.69 (1948)

TREAD ADJUSTMENT (inch)

Front	: 61.52
Rear	: 66.60

OPERATING WEIGHT (APPROX.)

Basic tractor including fuel, oil coolant, hydraulic system, three point linkage, transmission, PTO, lighting and standard wheel sizes, with ROPS.

SEAT

Sliding seat with Arm rest & Retractable seat belt.

WEIGHT DISTRIBUTION (lbs)

Front weight	: 2124
Rear weight	: 3168
Total weight	: 5192 (Estimated)

TIRES & WHEELS *

Industrial (Standard)

Front	: 12 x 16.5 - 6 PR
Rear	: 16.9 x 24 - 8 PR

Agri (Optional)

Front	: 9.5 x 16 - 8 PR
Rear	: 12.4 x 28 - 4 PR

TURNING RADIUS (Minimum)

Without brake	: 147.63 in. (3.75 m)
With brake	: 125.98 in. (3.2 m)

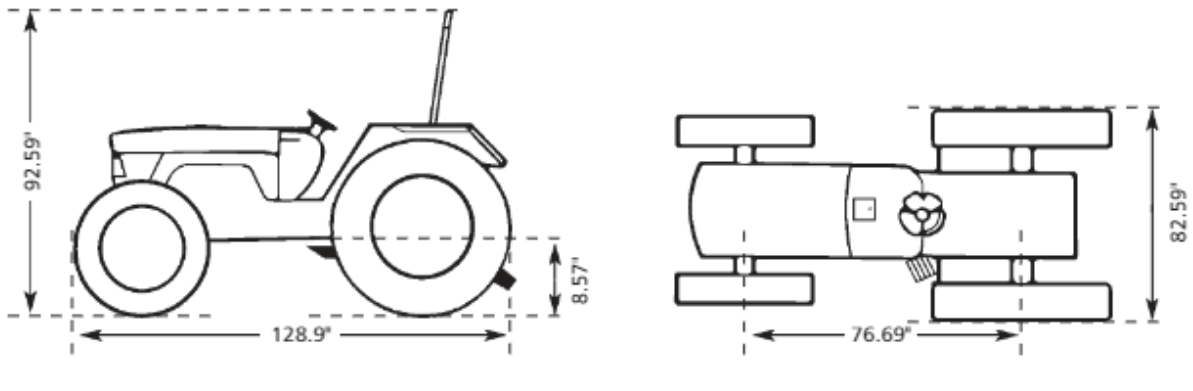
CAPACITIES	US Gallons	Ltrs
Fuel Tank	14.55	55
Transmission / Hydraulic	10.57	40
Cooling System	2.25	8.5
Engine Oil	2.14	8.1

SPEEDS

Speed chart in mph for Standard Ind. 16.9 x 24 tire as per rolling radius 0.618 m.

Gear	km/Hr	mph
L1	2.80	1.74
L2	4.46	2.77
L3	6.41	3.98
L4	9.89	6.14
LR	4.23	2.63
H1	8.0	4.97
H2	12.78	7.94
H3	18.34	11.40
H4	28.29	17.58
HR	12.12	7.53

Note :- One US gallon = 4 quarts.



Dimensions are in inch and based on standard 12 x 16.5 front tires and 16.9 x 24 rear tires

NOTE: Roll over protection structure is standard fitment on all tractors.

NOTE: Specifications and design subject to change without notice.

* Manufacturer's estimate under standard condition.

Mahindra - 4550 4WD (TIER-4)

ENGINE

Four Stroke, Direct Injection, Water Cooled Diesel Engine

Model	: MDI 2700 R1
No. of Cylinders	: 4
Displacement	: 167 in^3 (2732 cc)
Bore	: 3.50 in.
Stroke	: 4.33 in.
Compression Ratio	: 18.7 : 1
Horse Power Max.	: 48 HP Max as per DIN-70020 (-10%)
Max. Torque@RPM,N.m	: 167@1300 – 1500 (Max)
Backup Torque %	: 11-13 @1400 ± 100 rpm
Rated speed	: 2300 rpm
High idle r.p.m.	: 2500 ± 50
Low idle r.p.m.	: 750 ± 50
Fuel injection pump	: Common Rail System - BOSCH
Cylinder sleeve	: Wet-Replaceable
Air cleaner	: Dry type with safety cartridge & dust unloader valve
Exhaust muffler	: (DOC+Muffler) with sideout Tail pipe
Firing order	: 1 - 3 - 4 - 2
Injector type	: Solenoid Operated Injectors

COOLING SYSTEM

Type	: Water Cooled forced circulation
Feature	: Thermostat between Cylinder Head & Radiator
Throttle Control	: Hand & Foot Accelerator assisted by electronic sensor

ELECTRICAL STARTING AND LIGHTING

Battery Type	: Exide HP 31E
Battery Capacity & Rating	: 12 volts, 96 Ah
Starter Type, Rating & Power	: 3.6 KW Heavy Duty Starter Motor, Solenoid engaged, Key start with safety neutral in Range & PTO
Alternator / Generator	: 12 volts, 45 Amps
Instrumentation	: Water Temp Gauge, Electrical Fuel Level Gauge, Electro Mechanic RPM Meter with LCD Hour Meter, Oil Pressure Indicator, Error Lamp & MIL
Lighting	: Head Lights, Turn Indicators, Rear Brake Lights, Common Front Parking Light with Indication on Dash Board, Work Lamp with Indication at Dash Board, Indication of Heater ON, Air Clog Indication, Water in Fuel Indication, Battery Charging Indicator, Turn Signal Indicators and Hazard Warning & 4WD indication on Instrument Cluster
Electrical System for CRDI	: ECU, Engine Speed Sensor, Phase Sensor, Rail Pressure Sensor, Accelerator Pressure Sensor, Coolant Temperature Sensor, Wire Harness
EGR System	: EEGR Valve
Cold Start Provision	: Air Intake Manifold Heater
Horn	: Sealed Type
Fuse Box	: Blade type fuses with fuse name indication on cover

CLUTCH

Type	: Dual Clutch
Diameter	: 11" for PTO & 11" for main drive

TRANSMISSION

Type of Mesh	: Full Constant Mesh
No. of Gears	: 8 Forward + 2 Reverse
Type of Final Reduction & Ratio	: Bull Gear & Pinion / 15/68
Differential Lock	: Foot Operated
4WD Operation Lever	: On LH Corner on LH Floor Panel (Vertical movement for engagement)

STEERING

	: Hydrostatic Power Steering
Type	: Open Center Non Load Reaction
Column Angle	: 63°

POWER TAKE OFF

Type	: Rear, 6 Splines, Single Speed, CRPTO
Engine RPM for 540 PTO RPM	: 2058
PTO HP Max (-10%)	: 38 HP

BRAKES

Service Brakes	: Foot Operated Independently with provision of interlock for simultaneous operation. A hand brake lever is fitted for parking.
Type	: Dry Brakes
Size	: 6.5 in.
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Linkage	: Category 1 & 2
Sensing Type	: Top link draft sensing

STANDARD FITMENT

Auxiliary Valve	: Single Spool with QDC for Hydraulic Output Connection

Mahindra - 4550 4WD (TIER-4)

DIMENSIONS (STANDARD) - inch (mm)

Length overall	: 127 (3227)
Width overall	: 73.55 (1868)
Height overall	: 93.7 (2380) upto ROPS
Ground clearance	: 13 (330)
Wheel base	: 76.77 (1950)

TREAD ADJUSTMENT (with Industrial Tyres) - inch

Front	: 61.52
Rear	: 66.60

OPERATING WEIGHT (APPROX.)

Basic tractor including fuel, oil coolant, hydraulic system, three point linkage, transmission, PTO, lighting and standard wheel sizes, with ROPS.

SEAT

Sliding seat with Arm rest & Retractable seat belt.

WEIGHT DISTRIBUTION - lbs

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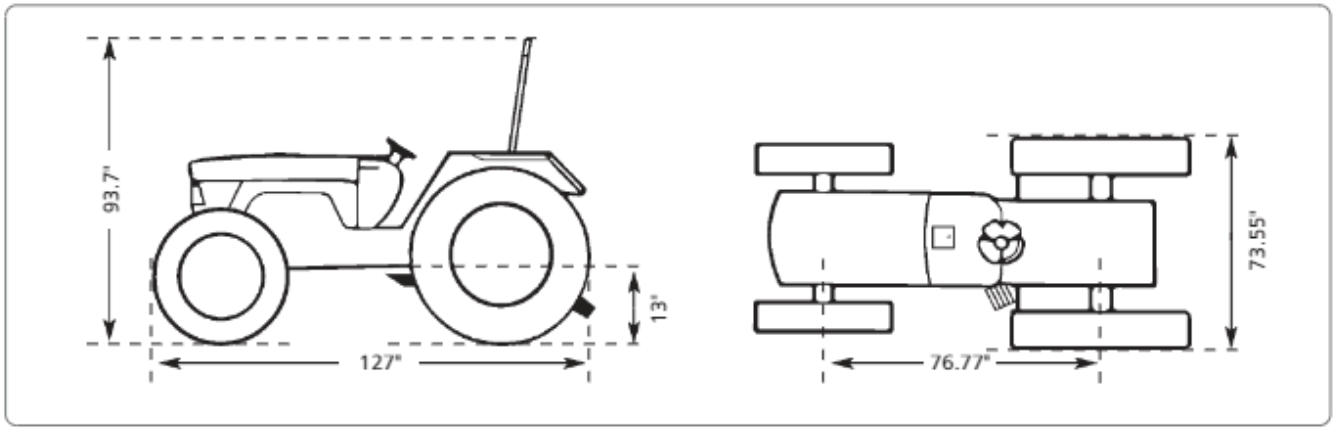

Dimensions are in inch and based on standard 12 x 16.5 front tires and 16.9 x 24 rear tires

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NOTE: Specifications and design subject to change without notice.

* Manufacturer's estimate under standard condition.

Precautions for CRDI Engines

Potential Issue / Failure Mode	Causes	Precautions / Solutions
Injector rattling / sticky / blocked.	Adulterated fuel causing deposition of very fine residue / dirt inside injectors having fine tolerances	1. Efficient fuel filtration system with water separator and indicator. 2 Customer & dealer education on importance of quality of fuel for CRDI Engines. 3. Maintain and change the fuel filter regularly according to the manufacturer's recommendations. 4. When changing the fuel filter it is beneficial to empty the old filters contents into a clean container and inspect for evidence of water and foreign debris
Less power & more fuel consumption of engine	When the injector becomes dirty, the full ignition detonation of the fuel results in less power & more fuel consumption	
Poor fuel economy and / or bluish white smoke at idle	Nozzle erosion causing seepage of fuel.	
Engine not starting due to water ingress / Engine Misfiring / Wiring harness cut / Shorting of wiring harness	1. Rain water entry into harness 2. Water ingress in puddling operation. 3. Electrical wiring harness tampering is done in the field for doing all extra connections. 4. A fuel tank that is hot from continuous driving will suddenly be cooled if submerged in cold water and will cause a slight suction back into the tank. This will allow water to enter the tank through any loose or leaking seals, hoses, fuel level sender unit gaskets etc. 5. Solenoid coil windings short.	1. Ensure that the filler cap seal is in good condition and all fuel lines and connections to the tank are in good condition and tight (especially in puddling application). 2. Wiring harness tampering should be mandatorily avoided & to be linked with warranty acceptance / rejection criteria. 3. All the wiring harness couplers should be made water sealed & all Dealers to be instructed & trained for proper assembly, removal & replacement of electrical connectors & couplers. 4. Proper enclosures should be designed to avoid exposure of electrical sensors e.g. Boost pressure, crankshaft position, Accelerator pedal sensors, etc. to dust, water, mud, etc. 5. No extra welding during implement fitments to be carried out. 6. Wiring harness protection conduits / cot tubes to be used. 7. Proper routing of wiring harness with clips to avoid contact with moving parts or hot surfaces like exhaust manifold/UHMs to be done.
ECU - Electronic Control Unit failures	1. Vibrations 2. Handling / tampering	1. Mounting with AVMs to be explored. 2. No accessibility to user/customer for loosening. 3. Keep fuel hose clamps tight and ensure anti vibration clamps on injector lines are tight, with the rubber insulators in the correct position.
High degree of engine maintenance and costly spare parts.	Lapses in service maintenance practices like clogged fuel filter may lead to damaging entire fuel system & replacement will be costly.	Change of fuel filter as per service maintenance interval is a MUST.
May expect more warranty disputes like rejecting claims.	Lapses in service maintenance practices.	Educating customers during promotional events / service camps etc.
The cost of "good will" claims may rise.	It is very difficult to prove the fuel adulteration as a root cause without opening engine. The warranty claims will be rejected by QA after receiving & opening these engines at warranty yard.	Proper training of dealer mechanics & workmen to handle problems reported. Diagnosis should be preferably done at workshops than in the field by proper trained personnel only.

* See Mahindra Tractor Dealer

If any trouble is experienced, make sure of the cause before attempting to make any adjustments. Before making any adjustments make note of the previous setting, in case, the new adjustment is not effective.

PROBABLE CAUSE	POSSIBLE REMEDY
ENGINE	
Engine Fails To Start	
Defective key switch	Inspect for faulty cables and terminals. Replace key switch if necessary.
Faulty safety starter switch	Replace.
Battery too low to turn engine	Charge or install new battery.
Faulty shut-off solenoid	Replace.
Engine oil too heavy	Drain oil and refill with correct grade.
Internal seizure	Hand crank the engine, with the injector nozzles removed, and engine clutch disengaged. If engine does not turn easily seizure due to internal damage is indicated/*
Starter motor inoperative	Inspect cables and terminals. Check for tightness of mounting screw. Inspect brushes for wear or damage and commutator for dirt, wear or damage.
No fuel	Check fuel tank.
Cold weather	Use cold weather starting aids and start with throttle at 1/2 to 1/3 position .
Water, dirt, or air in fuel system	Drain, flush, fill and bleed system.
Clogged fuel filter	Replace filter element.
Dirty or faulty injectors	Clean and replace nozzle body and if required replace the injector.
Engine Cranks But Will Not Start	
Mechanical lever pulled out on FIP	Push the lever in to rest on stopper.
Water in fuel	Drain system, clean and refill with proper fuel.
Fuel system clogged	Check through and remove blockage.
Batteries discharged	Charge or replace.
Lack of compression	*
Intake or Exhaust system clogged	Service air cleaner and check air intake for restriction. Clean exhaust system.
Lubricating oil of wrong viscosity	Drain and refill with proper lubricant - (refer to LUBRICANT SPECIFICATION).
Fuel feed pump inoperative	Check pump for restriction in system and clean out. Also check valves and spring./*
Fuel injection pump has lost its efficiency	*
Loss Of Power	
Engine overloaded	Reduce load or shift to lowergear.
Restriction in engine air supply	Check air cleaning system.
Restriction in exhaust	Clean exhaust system.
Restriction in fuel supply	Clean fuel system.
Water in the fuel	Drain and clean fuel system.

PROBABLE CAUSE	POSSIBLE REMEDY
Air lock in fuel system	Check vent hole in tank filler cap.
Faulty valve action	Check valve clearance. If valves are stuck, burnt or warped, replace them.
Clogged fuel filter	Replace filter element.
Lack of engine compression	*
Engine overheating	*
Fuel injection timing incorrect	*
Governor operating improperly/overflow valve faulty	*
Fuel injection pump has lost its efficiency	*
Clutch plate slippage	*
Brakes dragging	Check brake linkages for free movement & adjust free play.
Dirty or faulty injectors	Have Mahindra dealer check injectors.
Restriction in intake manifold	Check and rectify.
Air leak from intake manifold	Check and rectify.
Air leak between intake manifold and engine	Check and rectify.
Foreign object in exhaust manifold (from engine)	*
Restricted exhaust system	Check and rectify.
Exhaust manifold cracked, gaskets blown or missing	Check and replace.
Gas leak at exhaust manifold joint	Check and replace.
Engine Misfires	
Restriction in engine air supply	Check air cleaning system.
Air lock in fuel system	Vent air from fuel system.
Poor compression	*
Sticking valves	*
Fuel injection timing incorrect	*
Vent in fuel tank cap obstructed	Clean cap in solvent. Blow dry.
Low coolant temperature	Remove and check thermostat.
Clogged fuel filter	Replace filter element.
Water, dirt, or air in fuel system	Drain, flush, fill and bleed system.
Dirty or faulty injectors	Have Mahindra dealer check injectors.
Improper type of fuel	Use proper fuel. See Fuels and Lubricants section.
Engine solenoid linkage out of adjustment	*
Engine Does Not Idle Properly	
Low idle rpm too less	Check and correct.
Restriction in fuel delivery	Inspect fuel system. Clean out fuel lines.
Injection nozzles defective	*
Injection timing incorrect	*
Excessive wear on throttle shaft	*
Poor compression	*
Sticking valves	*
Governor inoperative	*

* See Mahindra Tractor Dealer

PROBABLE CAUSE	POSSIBLE REMEDY
Engine Operates Unevenly And Vibrates	
Valve and spring assembly inoperative	*
Injection timing incorrect	*
Injection nozzles defective	*
Fuel injection pump needs recalibration	*
Engine Knocks	
One or more cylinders misfiring	Locate and correct cause.
Loose main or connecting rod bearing	*
Injection nozzles defective	Get them serviced.
Insufficient oil	Add oil.
Injection pump out of time	*
Low coolant temperature	Remove and check thermostat.
High speed too slow	Check high speed.
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.
Crankcase breather clogged	Wash in mineral spirits or naphtha, blow dry and replace.
Engine operating temperature too low	Check the thermostat opening temperature.
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	*
Fuel injection timing incorrect	*
Valve clearance incorrect	Adjust correctly.
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

PROBABLE CAUSE	POSSIBLE REMEDY
Lubricating Oil Pressure Too High Or Too Low	
Defective oil pressure indicator	Replace.
Wrong viscosity, diluted or insufficient oil	Refer to LUBRICANT SPECIFICATIONS. Select correct grade of oil, drain fill crankcase with oil of proper viscosity and quality.
Broken, loose or plugged oil lines	Replace, clean and tighten./*
Low oil level in the crankcase	Add oil and check for oil leakage, also refer to LUBRICATION GUIDE and ENGINE AND CHASSIS. LUBRICANT SPECIFICATIONS.
Defective or dirty oil pressure regulating valve	*
Oil pump strainer clogged or pump not working	*
Worn bearings	*
Clogged oil filter	Change filter element.
Excessive Smoke	
Air cleaner pipe clogged	Remove, check and clean.
Improper grade of fuel/oil	Drain off and replace with correct grade of fuel/oil.
Worn pistons, rings and/or sleeves	*
Air-cleaner clogged/Paper element choked	Remove and clean. If defective, replace paper element.
Incorrect valve adjustment	Set valve clearance as specified.
Fuel injection pump has lost its efficiency	*
Engine overloaded with respect to gear selection	Select gear according to load.
Engine Emits White Smoke	
Improper type of fuel	Use proper fuel.
Low engine temperature	Warm engine to normal operating temperature.
Defective thermostat	Remove and check thermostat.
Restriction / choking of fuel lines	Clean lines, replace filter element if required
Engine Emits Blue Smoke	
Air leak from intake manifold	Check and rectify.
Air leak between intake manifold & engine	Check and rectify.
Foreign object in exhaust manifold (from engine)	*
Engine Emits Black Or Gray Exhaust Smoke	
Improper type of fuel	Use proper fuel.
Clogged or dirty air cleaner	Service air cleaner.
Engine overloaded	Reduce load or shift to a lower gear.
Injection nozzles dirty	*
Restriction in intake manifold	Check and rectify
Air leak between intake manifold and engine	Check and rectify
Foreign object in exhaust manifold (from engine)	*
Restricted exhaust system	*
Exhaust manifold cracked, gaskets blown or missing	*
Gas leak at exhaust manifold joint	Check and rectify

* See Mahindra Tractor Dealer

PROBABLE CAUSE	POSSIBLE REMEDY
Excessive Fuel Consumption	
Valve clearance incorrect	*
Fuel leaks	Tighten or replace fuel lines.
Engine overloaded	Select the gear with respect to load, speed, & soil condition.
Engine not operating at proper temperature	Check cooling system and thermostat.
Air cleaner clogged	Service the air cleaner.
Incorrect viscosity or quantity of lubricating oil	Refer to LUBRICANT SPECIFICATIONS. Keep oil up to the correct level.
Fuel injection nozzles not operating properly	Do not service or remove injection nozzles. The service life of the injection nozzles may be shortened by : 1. Overheating 2. Improper operation 3. Poor quality fuel 4. Excessive idling If injection nozzles are not working correctly or are dirty, engine will not run normally. /*
High idle rpm too high	Check and rectify.
Fuel injection pump has lost its efficiency	Do not change service faulty injection pump. See your Mahindra dealer
Incorrect tire pressure	Inflate/deflate up to recommended pressure to avoid wheel slippage and improper tire wear.
Improper type of fuel	Use proper fuel.
HYDRAULICS	
No Lifting Or Slow Lifting	
Less/no oil in system	Check & fill oil to correct level.
Suction filter clogged	Clean filter replace damaged.
Hydraulic pump has lost its efficiency	Get the pump replaced.
Control valve defective	*
Control linkage defective	*
System overloaded	Reduce load on system.
Hydraulic oil too cold	Allow oil to warm.
Screen clogged	Clean or replace screen.
Hydraulic Lift Arms Lifting Without Lever Operation	
Control valve/linkage defects	*
System Overheating	
Air in the system	Locate the source of air entry and seal it.
Water in the system	Drain oil & refill.
Restriction in suction delivery pipes	Clean and refit.
Relief valve continuously blowing	Check linkage & upper limit stop. /*
Control valve defects	*

PROBABLE CAUSE	POSSIBLE REMEDY
Lift Arms Will Not Hold	
Control valve defective	*
BRAKES	
Does not hold or slips	Adjust brakes or change linings if needed. Linings oil soaked; check bull pinion shaft oil seal. /*
Drag or uneven	Adjust brakes.
Return spring broken	Replace.
Will not release	Release hand-brake. Check brake shaft for seizure.
TRANSMISSION	
Hard to shift gears	Use correct viscosity lubricant. /*
Shifter fork or lever defective	Replace. /*
Gears slipping out of mesh	*
Excessive noise	Check oil level, use proper viscosity lubricant. /*
Damaged parts	*
Noisy gear shifting	Adjust clutch pedal play. /*
REAR WHEELS	
Do not turn	Release brake lock. Transmission, differential or clutch faulty. Refer to TRANSMISSION above. /*
Engine clutch drags	*
ELECTRICALS	
Battery Does Not Charge	
Loose or corroded connections	Clean and tighten connections.
Sulfated or worn-out battery	Check electrolyte level and specific gravity.
Loose or defective fan belt	Adjust belt tension or replace belt.
Low engine speed	Increase speed.
Alternator malfunctioning	*
Charging System Indicator Glows With Engine Running	
Defective battery	Check electrolyte level and specific gravity.
Defective alternator	Have your Mahindra dealer check alternator.
Loose defective fan belt	Adjust belt tension or replace ball.
Starter Inoperative	
Loose or corroded connections	Clean and tighten loose connections.
Low battery output	Check electrolyte level and specific gravity.
Gear shift lever in gear	Move lever to neutral.
PTO engaged	Disengage PTO.
Starter Cranks Slowly	
Low battery output	Check electrolyte level and specific gravity.
Crankcase oil too heavy	Use proper viscosity oil.
Loose or corroded connections	Clean and tighten loose connections.

* See Mahindra Tractor Dealer

PROBABLE CAUSE	POSSIBLE REMEDY
No Lights	
Fuse blown	Replace fuse.
Loose wiring or improper connections causing mal-functioning	Check wiring to see that all connections are clean and tight.
Lights burn dim	Re-charge battery, tighten cable terminals, check lamps, clean contacts.
POWER STEERING	
Steering wander	Check the size of tires. Check tire pressure.
	Check for loose or worn steering linkage parts.
	Check wheel bearings for wear.
	Check front wheel alignment.
No recovery for open cylinder unit	Check tire pressure.
	Check for tightness of front axle kingpins.
	Check for alignment of steering column.
Shimmy	Check for proper mounting of tires.
	Check steering linkages for looseness, improper adjustment, wear and rectify accordingly.
	Check for air in hydraulic system and bleed.
High steering effort in one direction	Check if the vehicle is overloaded.
	Check for correct hydraulic system pressure.
	Check if the flow plate value is stuck due to excessive heat in the system.
	Check for correct size tires.
	Check the hydraulic fluid level.
	Check for correct flow pressure of the pump.
	Check if the steering linkages are binding.
	Check for restriction in fluid return line.
Lost motion (Lash) at the steering wheel	Check for firmness of steering wheel on column.
	Check for components of the steering linkages.
	Check for tightness of flow unit at mounting.
	Check for air in the hydraulic system & bleed it.
Excessive heat (200°F Maximum)	Check for correct size of hose.
	Check for the centering of control unit.
	Check for excessive fluid flow.

Tractor History Card

Date	Job	Card No.	Nature of Defect	Parts Replaced	W/Claim No. and Date	Remarks

Date	Tractor Hours	Nature / Type of Repair / Service Carried Out

Part Replacement Record

Date	Part Description	Qty	Cost	Date	Part Description	Qty.	Cost

Daily Operating Log

Date	Job Done	Machine Hours		Fuel Consumed	Engine Oil Topped Up	Remarks
		Start	End			

Tractor Storage Precautions

Precautions to be taken for Tractor Storage

Sr. No.	Activity	Objective	Every 15 days	Every 45 days	More than 45 days
1	a) First start the Engine & allow it to idle for 2 to 3 minutes.	Lubrication to internal parts of the Engine.	✔		
	b) Then Run the Tractor for 10 minutes from once place to Another Place at 1800 to 2000 RPM.	Lubrication to Internal parts of the Transmission.	✔		
		Charging of the Battery.	✔		
		Splashing of fuel from inside of the fuel tank.	✔		
2	Operate all Electricals such as Switches, Flasher, Lamps, horn.	To avoid malfunctioning due to oxidation of the contacts.	✔		
3	Drain the water inside the Fuel tank using Drain Plug.	To avoid Algae/ Rust formation & subsequent chocking of the fuel lines.		✔	
4	Raise The Lift arms of Hydraulics to their full raised position & lock the Hydraulic System using the isolating valve on right hand side of control valve on 05,25,30 & 00 series tractors & in 20 series just raise the lift arms using PC lever on right hand.	This raised position will fill the Cylinder & protect it's walls from corrosion.		✔	
5	Apply Anti-oxidant spray on the Battery / Alternator / Starter motor terminals.	To avoid oxidation of terminals.		✔	
6	Clean Sheet Metal & Chassis with dry cloth.	To avoid accumulation dust which may result into detoriation of Paint Quality.		✔	
7	Keep the Tractor with Hand brake disengaged.	To avoid locking of the Brakes			✻
8	De-clutching - Place spacers between clutch pedal & foot plate to keep clutch plate free.	To avoid sticking of the clutch plate & subsequent damage.			✻
9	Masking (with Tape) of all the openings (Such as Aircleaner, Fuel tank cap, Silencer, Breathers of Engine / Brakes / Transmission / VTU).	To avoid rusting due to moisture entry.			✻
10	Disconnect Battery Terminals.	To avoid discharge of the Battery.			✻

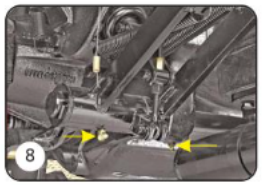
✔ Indicates Activity to be carried out at these intervals.

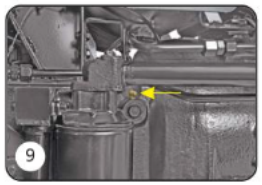
✻ To be done whenever tractor is not in use for a long period of time i.e. more than 45 days.

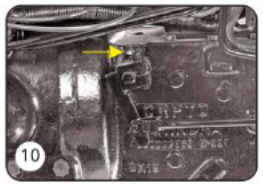
a) It is recommended to Fill the fuel Tank with Diesel fuel & Top up the tank to prevent any condensation in unfilled portion of the tank resulting into rust formation & contamination.

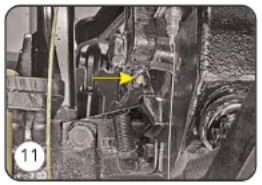
b) If the tractor is standstill (not run) for more than 3 months then It is recommended to replace the Diesel to avoid detoriation in the performance.

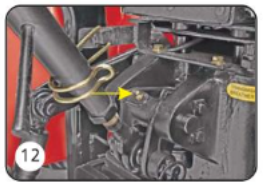
Lubrication and Greasing Chart - 4540/4550 4WD

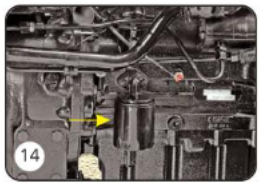


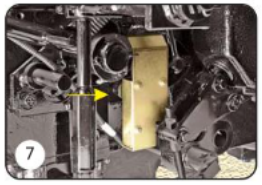


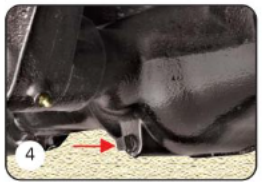


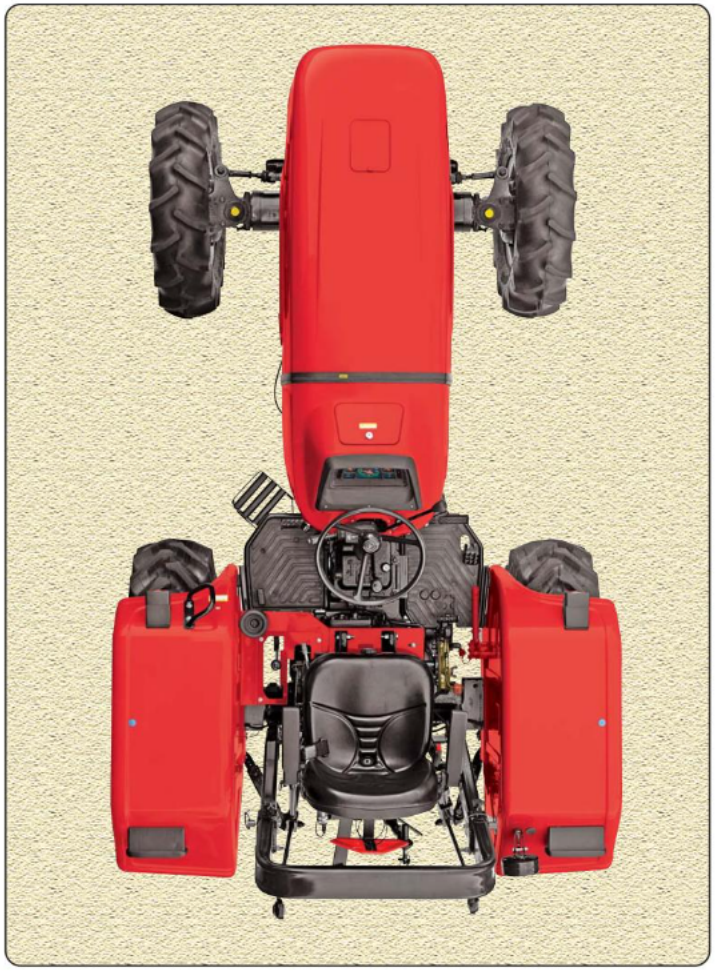




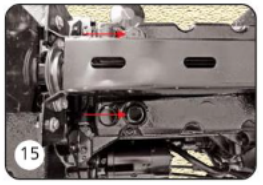


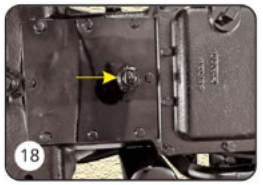






No.	Description	Lubricant
1	4WD Engagement Lever	CL
2	Front Pillow Block	CG
3	Rear Pillow Block	CG
4	Front Axle Oil Drain Plug	FO
5	Front Axle Oil Level Check	FO
6	Front Axle Oil Filling Port	FO
7	Clutch Pedal Shaft	CL
8	Brake Pedal Shaft (RH)	CL
9	Antifriction Bearing	CL
10	Clutch Shaft Linkages (Dual Clutch)	CL
11	Differential Lock Pedal	CL
12	Top Link	CL
13	Levelling Rod (LH/RH)	CL
14	Engine Oil Filter	EO
15	Engine Oil Drain Plug	EO
16	Engine Oil Filler Cap	EO
17	Transmission Oil Filling Port	GO
18	Transmission Oil Drain Plug (Front)	GO
19	Transmission Oil Drain Plug (Rear)	GO





Routine Service Schedule - 4540/4550 4WD

CHECK POINTS	Perio-dically	10 Hrs. or Daily	50 Hrs.	100 Hrs.	150 Hrs.	200 Hrs.	250 Hrs.	300 Hrs.	350 Hrs.	400 Hrs.	450 Hrs.	500 Hrs.	550 Hrs.	600 Hrs.	650 Hrs.	700 Hrs.	750 Hrs.	800 Hrs.	850 Hrs.	900 Hrs.	950 Hrs.	1000 Hrs.	Since then
ENGINE																							
Check Oil Level and top-up if necessary		●																					Daily
Change Oil and Filter Element			#							■							■						Every 350 Hrs.
Tighten Cylinder Head Bolts to specified torque and adjust Valve Clearance																						■	Every 1000 Hrs.
Radiator Descaling																						■	Every 1000 Hrs.
Change Rubber Clutch Gear Hydraulic Pump																						■	Every 1000 Hrs.
AIR CLEANER																							
Clean dust collector	●	●																					Daily
Check Air-cleaner connections and tighten if required							■					■					■					■	Every 250 Hrs.
Clean Primary Element								■						■						■			Every 300 Hrs.
Change Primary Element																				■			Every 900 Hrs.
Change Safety Cartridge																				■			Every 900 Hrs.
FUEL SYSTEM																							
Drain Water from Main Fuel Filter (every 15 days & check water in fuel indicator on dash board frequently)	*																						Periodically
Change Main & Pre Fuel Filter (earlier, if required) Spinon Element						■				■				■				■				■	Every 200 Hrs.
EGR SYSTEM																							
Cleaning of EGR Cooler, Pipings, Valve & Intake Elbow using Compressed Air and Petroleum Solvent																							Every 1800 Hrs.
COOLING SYSTEM																							
Check Coolant Level in Radiator & top-up if necessary			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	Every 50 Hrs.
Check Radiator Hose Connections & tighten if required			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	Every 50 Hrs.
Check Fan Belt Tension and adjust if necessary			#					■					■					■					Every 250 Hrs.
Flush Cooling System																						■	Every 1000 Hrs.
ELECTRICAL SYSTEM																							
Clean Battery Terminals							■					■					■					■	Every 250 Hrs.
Check Starter Motor and Alternator Carbon Brushes and replace if necessary																						■	Every 1000 Hrs.
TRANSMISSION																							
Check Oil Level and top-up if necessary			#					■					■					■					Every 250 Hrs.
Change Transmission Oil																						■	Every 1000 Hrs.
Clean Strainer (During every oil change)			#									■										■	Every 500 Hrs.
Change Strainer																							Every 2000 Hrs.
WHEELS AND TIRES																							
Check Tire Pressure and inflate if necessary	*		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	Every 50 Hrs.
Torque Wheel Nuts			#					■					■					■					Every 250 Hrs.
FRONT AXLE																							
Check Oil Level			#					■					■					■					Every 250 Hrs.
Change Oil																						■	Every 1000 Hrs.
HYDRAULICS																							
Change Suction Filter			#									■										■	Every 500 Hrs.
CLUTCH AND BRAKES																							
Check and adjust Brake Pedal Free Play	*																						Periodically
Check and adjust Clutch Pedal Free Play	*																						Periodically
GREASE ALL NIPPLES	*		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	Every 50 Hrs.

* Depends upon the conditions in which the tractor is being operated.
\# Indicates that this must be done initially at specified hrs.

■ Activity due.
● Repeat the activity.

DECODING OF WIRES

COLOR CODE	DESCRIPTION
R	RED
B	BLACK
W-G	WHITE-GREEN
L-R	BLUE-RED
R-W	RED-WHITE
B-W	BLACK-WHITE
R-L	RED-BLUE
L-B	BLUE-BLACK
L-Y	BLUE-YELLOW
L-W	BLUE-WHITE
G-W	GREEN-WHITE
R-W	RED-WHITE
BR-W	BROWN-WHITE
R-G	RED-GREEN
R-Y	RED-YELLOW
W-R	WHITE-RED
Y	YELLOW
SB	SKY BLUE
G-L	GREEN-BLUE
G-R	GREEN-RED
GR	GRAY
R-B	RED-BLACK
BR	BROWN
W-B	WHITE-BLACK
G-B	GREEN-BLACK
Y-G	YELLOW-GREEN
O	ORANGE
L	BLUE
W	WHITE
P	PINK
G	GREEN
G-R	GREEN-RED
GR-B	GRAY-BLACK
W-R	WHITE-RED
BR	BROWN
Y-L	YELLOW-BLUE
Y-R	YELLOW-RED

WIRES COLOR OF CIRCUIT MAY CHANGE

INSTRUMENT CLUSTER CONNECTORS DECODING OF WIRES

COLOR CODE	DESCRIPTION
RED	POWER SUPPLY IGN SWITCH
YELLOW-RED	POWER SUPPLY(BAT +VE)
BLACK	GROUND
BLUE-RED	CHARGE INDICATOR
WHITE	TEMP. INDICATOR
LIGHT BLUE	CLOG INDICATOR
YELLOW	FUEL LEVEL INDICATOR
BLUE	HIGH BEAM
VIOLET	LEFT TURN INDICATOR
BLUE-WHITE	PARK BRAKE INDICATOR
BROWN	RIGHT TURN INDICATOR
GREY	ILLUMINATION
PINK	HEATER INDICATOR
GREEN	WID INDICATOR
GREEN-RED	CHK ENGINE INDICATOR
GROWN-WHITE	MIL INDICATOR
BLUE-WHITE	ENGINE SPEED SIGNAL FROM ECU
ROSE	LOW OIL PRESSOR INDICATOR

NOTES :-

4WD INDICATION SWITCH IS APPLICABLE ONLY FOR 4550 4WD TRACTOR