Operator's Manual

HP 140-180 | MF7100

Tractors

Models: 7140 - 7150 - 7170 - 7180

6287050M1 - 09/10

INNOVATION - COMMITMENT - PROXIMITY - VISION - RELIABILITY - LEADERSHIP - SUPPORT - TECHNOLOGY

MASSEY FERGUSON

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2 - General Recommendations

Why is safety important to you?

1 - Accidents disable and kill.

2 - Accidents can be very costly.

3 - Accidents can be avoided.

This manual is compiled to cover those safe working practices that are associated with the base tractor operation. It does not cover all operation and safety instructions relevant to all known implements and attachments that may be fitted at the time of tractor delivery or at some future date.

This section of the Manual aims at presenting some basic safety situations involving your tractor and suggestions on how to avoid risky situations and accidents.

Additional precautions may be necessary, depending on attachments used and conditions at the work site or in the service area. For each implement, attachment and working situation, there is always a set of cares to be taken. Therefore, it would be impossible to have them all listed in this Manual.

AGCO do Brasil has no direct control over tractor application, operation, inspection, lubrication or maintenance. Therefore, it's YOUR responsibility to use good safety practices in these areas.

3 - Your Tractor

The tractor is a source of mechanical and hydraulic power.

- On its own, the tractor is of little practical value. Only when used in conjunction with an implement or other attachment does it become a working unit.
- This Maintenance Guide was compiled to cover safety practices when the tractor is operating under normal conditions.
- This manual does not cover all operation and safety instructions relevant to all known implements and attachments that may be fitted at the time of tractor delivery or at some future date.
- It is essential that operators read and understand the manuals about implements and related attachments.

4 - Safety Notes Used Throughout the Text

Read the symbols below. Whenever they appear next to a text, read the instructions carefully.

DANGER!

This symbol together with the word DANGER indicates an imminently hazardous situation that, if not avoided, will result in DEATH OR SERIOUS INJURY.

ATTENTION!

This symbol together with the word ATTENTION indicates a potentially hazardous situation that, if not avoided, will result in DEATH OR SERIOUS INJURY.

IMPORTANT:

This symbol and the word IMPORTANT identifies special instructions or procedures that, when not strictly followed, may result in damage or destruction of the machine, of the operating process or even objects near the machine.

NOTE:

This symbol and the word NOTE indicates additional information about a topic or procedure that will make the operation or repair more convenient or efficient.

Do not operate near ditches or sand banks. The distance from the obstacle should be equal or higher than the overall height of the obstacle (Fig. 16).

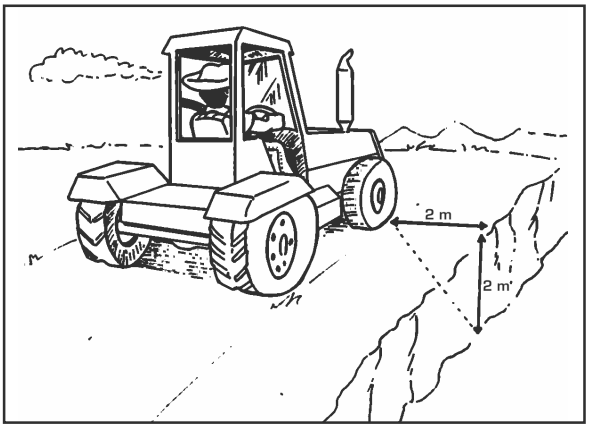

Fig. 16

11.4 - To Avoid Rear Overturns

ATTENTION!
Hitching to the rear axle or any other point above the swinging drawbar can cause a rear overturn.

- ✓ DO NOT pull any implement or attachment through the top link or any point in the rear axle or above. Always use an approved AGCO drawbar, and only use a drawbar pin that locks it in place.
- ✓ Coupling in high positions can cause rear overturns, which can result in serious accidents or death. Hitch loads to the drawbar only.
- ✓ Only use a 3-point linkage drawbar when fasteners are fitted to keep it in the down position.
- ✓ Use front counterweights to increase tractor stability when towing a heavy load or to counter balance a heavy rear mounted implement.
- ✓ Start to move the tractor slowly and increase speed gradually. DO NOT select reverse or release the clutch suddenly. If the tractor is attached to a heavy load or stationary object, improper clutching may cause overturn.
- ✓ If the front end of the tractor starts to lift, reduce speed and if necessary disengage the clutch.
- ✓ If the tractor gets stuck in the mud or snow, DO NOT try to move forward, since the rear wheels may slip and the tractor can overturn. Lift any coupled implement and try to move rearward with REVERSE selected. If this is not possible, tow it out using another vehicle.
- ✓ If you get stuck in a ditch, BACKOUT, if possible. If you have to move forward, do it slowly and carefully.
- ✓ Tractors with no implement engaged or with implements engaged to the rear should be turned around and the tractor should be moved forwards.
- ✓ Tractors with front loaders should be turned around and the tractor should be moved forwards. While moving a loaded bucket, keep it as close to the ground as possible.
- ✓ Always keep the tractor engaged while going down slopes. DO NOT coast down slopes with the clutch disengaged or with the transmission in neutral.

11.5 - To Avoid Side Overturns

- ✓ Adjust the wheel track to the widest setting, the one that is most appropriate to the work being performed.
- ✓ Latch the brake pedals together before driving at transport speeds.
- ✓ Reduce speed to match operating conditions. If the tractor is equipped with a front-end loader, carry the bucket and load as low as possible.
- ✓ When making sharp turns, select low speeds. Avoid trepidation or you may lose control of the tractor.
- ✓ Do not pull loads that are too heavy for the tractor capacity, as the load can fall out the tractor and go down a slope or the tractor may slip out and hit against the load being towed.

1

17.6 - CONAMA Resolution

CONAMA - the Brazilian National Environment Council - in resolution 257, dated June 30, 1999, defines rules and responsibilities related to the disposal and management of used batteries. This resolution determines that all establishments that distribute or resell these products must be aware of such resolution and must receive enough information and advertisements capable of guiding end users on their responsibility of returning used batteries to the manufacturer through the establishments that sell them and/or render technical service assistance.

DEAR CLIENT

All customers/end users are obliged to return their used battery to a point of sale. Do not throw batteries away.

NOTE:

Points of sale are obliged to accept your used battery. Store it in a proper place and return it to the manufacturer for recycling.

17.7 - Risks Involved in Contact with Acids and Lead

If the lead and acid solution contained in the battery are discarded into the environment, they may contaminate the ground, underground and water.

The consumption of contaminated water may cause arterial hypertension, anemia, sadness, weakness, leg pain and drowsiness.

Acid solution in contact with the eyes can cause chemical conjunctivitis, and with the skin it can cause contact dermatitis.

In case of accidental contact with the skin or eyes, wash the spot immediately with running water and call a physician for medical assistance.

Basic compound: Lead, plastic and diluted sulphuric acid.

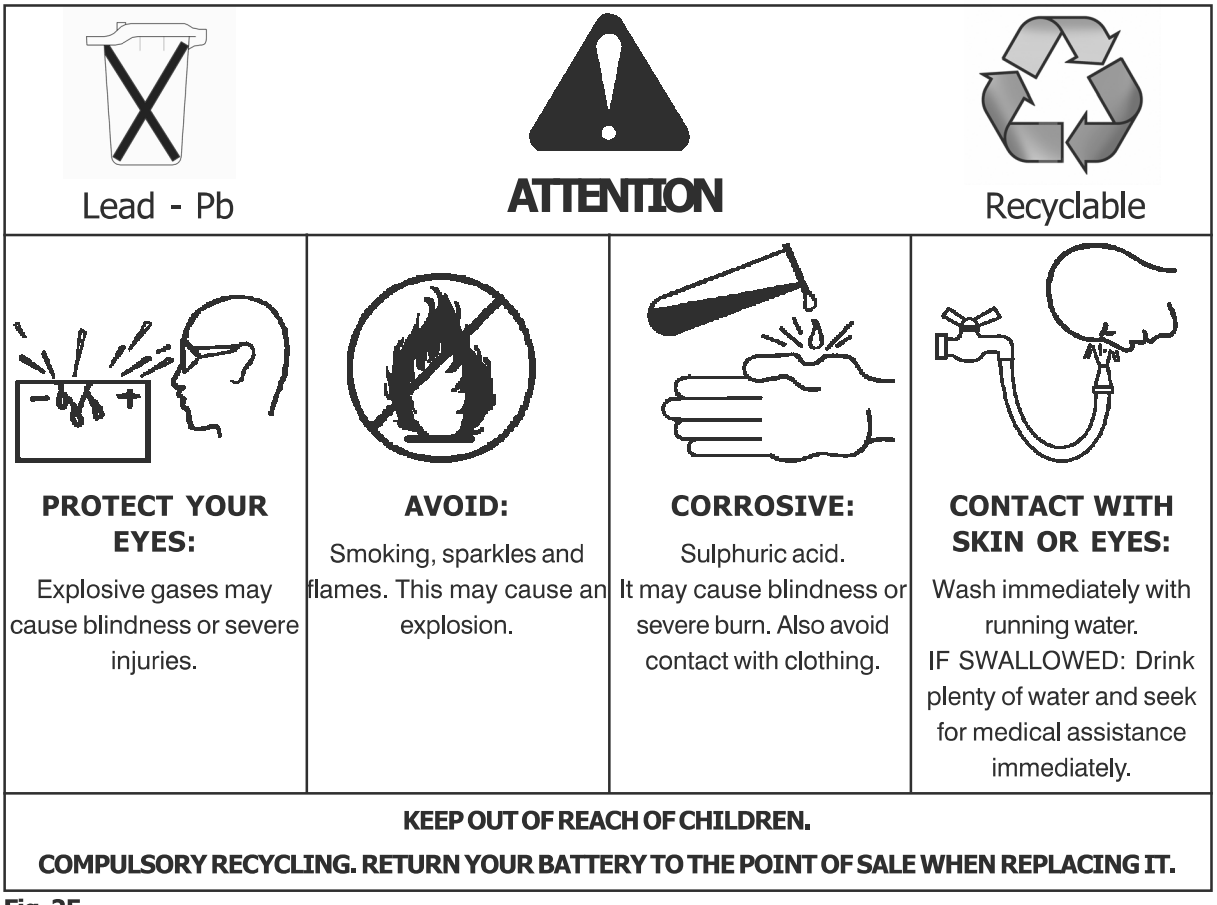

Fig. 25

3

Display messages

The prioritization sequence shows which message will be displayed according to its importance, when more than one occurs at the same time. Scale: 1st - highest priority, 5th - least priority.

Descriptions

- SUCÇÃO / SUCTION: Indicates that the suction filter (1) is clogged.
- VÁLV._LS / LS_VALVE: Indicates that the valve filter (1) is clogged.
- DIREÇÃO / STEERING: Indicates that the steering filter (3) is clogged.
- PTO: Indicates the power take-off output shaft speed.
- HORAS / HOURS: Shows the tractor operating hours.

When there is no clogged filter in the tractor and the PTO is not engaged, usually the hours will be shown in the display.

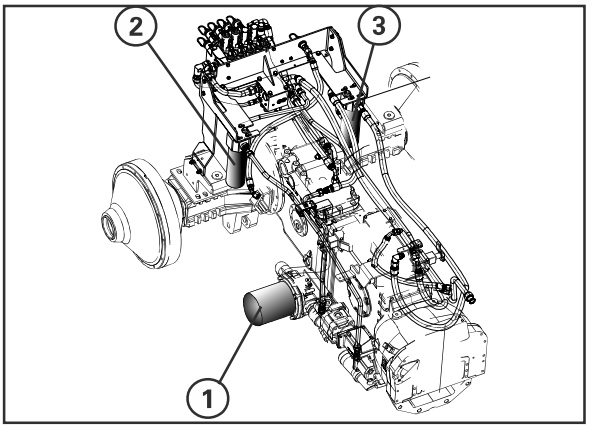

Fig. 73

Description	Priority
SUCÇÃO / SUCTION	1°
VÁLV._LS / LS_VALVE	2°
DIREÇÃO / STEERING	3°
PTO	4°
HORAS / HOURS	5°

IMPORTANT:

When one of the priority messages 1, 2 or 3 shows, stop the tractor immediately and inspect the filters. See the maintenance section in this manual.

Power take-off speed adjustment

For tractors that have the option of power take-off speed of 540 or 1000 rpm, the panel should be adjusted when the shaft used is changed.

Tractors leave the factory configured to show in the tachometer display the speed of the shaft installed.

However, when the 540 rpm shaft is changed to the 1000 rpm shaft, or vice versa, the switch (P) should be pressed so as the speed displayed is correct. See the adjustment procedure in the Preparation section of this manual.

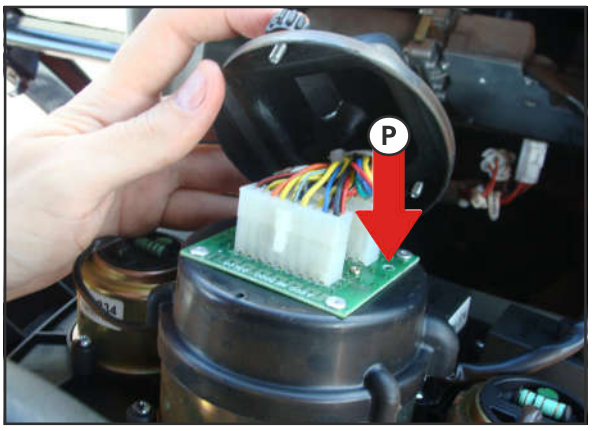

Fig. 74

Side windows (12)

The side windows are pivoted by means of hinges on the rear edge. To open them, push the handle out.

Fig. 95

SMV (slow moving vehicle) emblem (13)

It must be use when traveling on public roads.

Toolbox

Fig. 96

Rearview mirrors (14)

Outside rear mirrors can be adjusted. If it is necessary to adjust positioning firmness, the following procedures should be taken:

- Mirror angle:
  Turn it around the vertical axis by loosening the bolt (14A); then retighten it.
- Shifting forward or backward:
  Loosen the bolts (14B) and relocate the mirror assembly (mirror + frame) as required.

Retighten the bolts (14B).

When installed, the mirror distance can also be adjusted in relation to the cab, by increasing the length of the mirror supports.

Fig. 97

Internal rearview mirror (15) (when installed)

The internal rearview mirror can have its angle and position adjusted.

Change it by hand when required.

Fig. 98

2.2 - 4WD front axle

A) Reversible rim and disc type

The wheels fitted to these axles are the reversible disc and rim type. This system allows up to 8 settings with different track widths, according to the selected mounting scheme.

Variations are as follows:

- Position of the wheel disc (3): concave side inwards (schemes A, B, C and D) or outwards (schemes E, F, G and H).
- Position of the disc (3) onto the rim mounts (4): mount to the inside of the disc (A, C, E and G) or to the outside (B, D, F and H).
- Rim mounting side: larger extension inwards (A, B, E and F) or outwards (C, D, G and H).

Procedure

1 - To change the track width, lock the rear wheels. Raise the front axle, supporting it on a suitable, safe trestle.

2 - When it is necessary to invert the rims, change the complete wheels; (left wheel to the right side and vice-versa).

3 - After having carried out the alteration, apply the correct torque to the nuts holding the disc to the hub and to the rim.

* Disc to rim torque = 21 to 25 kgf.m

* Disc to hub torque = 25 to 28 kgf.m

4 - Retighten after working for several hours. Never operate with bolts which are not properly tightened.

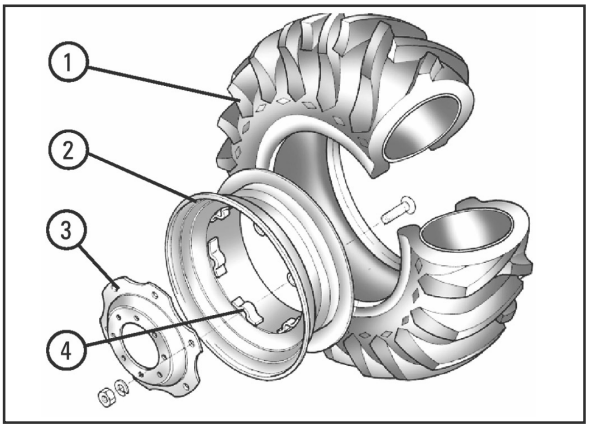

Fig. 117

Legend:

1 - Tire
2 - Rim
3 - Disc
4 - Disc mount

5 - It is advisable to check the front wheel alignment after track adjustment.

6 - When assembling the wheels according to the above diagram, there will be a variation of tread width in ascending order. Setting “A” gives the minimum track width, whereas setting “H” supplies the maximum track width.

7 - Depending on the size of tires being used, some narrower tracks will be impossible to use, because wider tires cause interference in sharp turns.

8 - In other cases, reduction of the steering angle may be sufficient. However, in this case there is an increase in the tractor’s turning radius, making sharper turns impossible. See the following instructions.

2nd Output shaft change.

a) Park the tractor in such a way that its front is lower than its rear. This prevents oil leaks through the shaft housing.

b) Shut off engine and apply the parking brake.

c) Remove the shaft cover (1) from shaft.

d) With a suitable tool, remove the threaded cover (2).

e) By using multigrip pliers, compress the ends of the split ring (3), releasing it from its housing.

f) By hand, pull the shaft out of its housing.

g) Then introduce the other shaft carefully onto the internal gear splines.

h) Refit the lock ring into its groove and then the cover (2).

i) Apply grease in the cover after changing the output shaft.

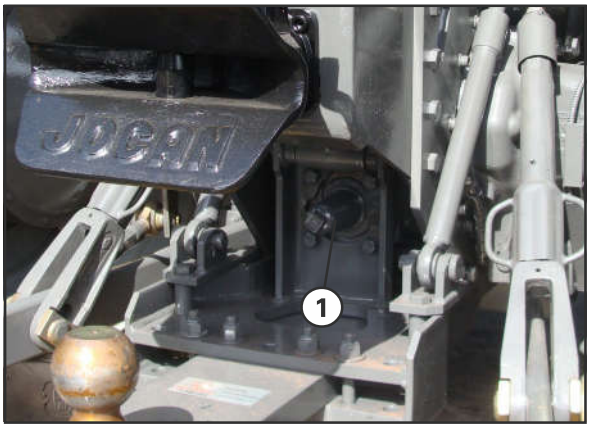

Fig. 134

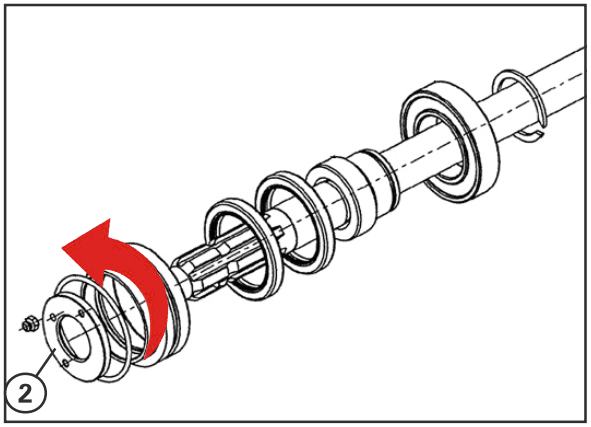

Fig. 135

NOTES:

Never operate the tractor if no axle has been mounted. Before adjusting or repairing the equipment driven by the PTO, always turn off the PTO and the engine, and apply the parking brake.

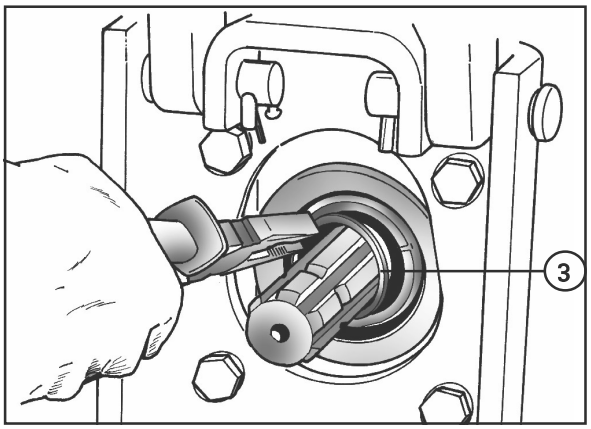

Fig. 136

3rd Change in the panel programming.

Due to a power take-off speed detection electronic system in the panel, it's necessary that the programming be changed every time the shaft is changed.

To do so, follow the procedure below.

Procedure

a) Shut off engine and apply the parking brake.

b) Remove all bolts (1) that fasten the instrument panel. There are four.

Fig. 137

3.1 - How the safety system affects tractor operation

All tractor commands and controls remain the same. However, note the following:

1 - When the starting switch is placed in the "run" position - "3", the engine has to start operating within 36 seconds tops. Otherwise, the safety system will cut the voltage supply of the injection pump solenoid. The safety system "interprets" this as malfunction. Therefore, if the switch remains on during 36 seconds for any reason, turn it off and try to start the engine again. If you turn off the starting switch, the system is reset.

2 - If the safety system is activated, shut off the engine.

3.2 - How the safety system affects tractor maintenance

The only difference in the maintenance procedures is the fuel system bleeding, more specifically in the high pressure circuit (injection pump and nozzles). The injection pump solenoid needs to remain energized during the entire procedure to allow the fuel flow and the air to be purged.

To do that, place the starting switch in the 2nd position. But remember that if after 36 seconds the engine does not start operating, the safety system will cut the voltage supply to the solenoid.

If this occurs, turn off the starting switch every time the solenoid shuts off.

Repeat this procedure as many times as necessary during the bleeding of the pump and nozzles.

The bleeding of the injection pump and nozzles is only necessary in special cases, such as fuel depletion during operation or disassembly of the high prssure system (tubes, injection pump or nozzles).

The bleeding of the fuel filter should be carried out normally after the filter has been replaced. The solenoid does not have to be energized, in this case.

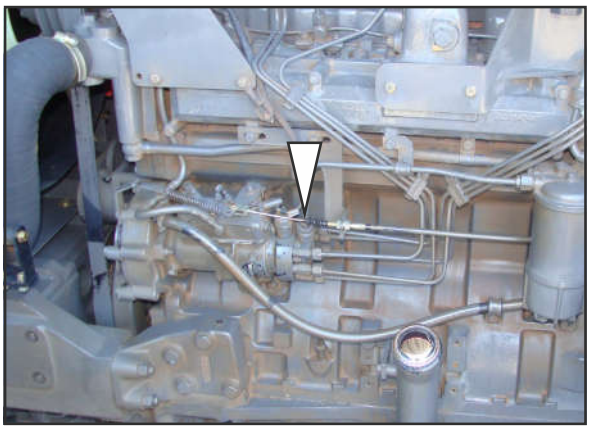

Fig. 158

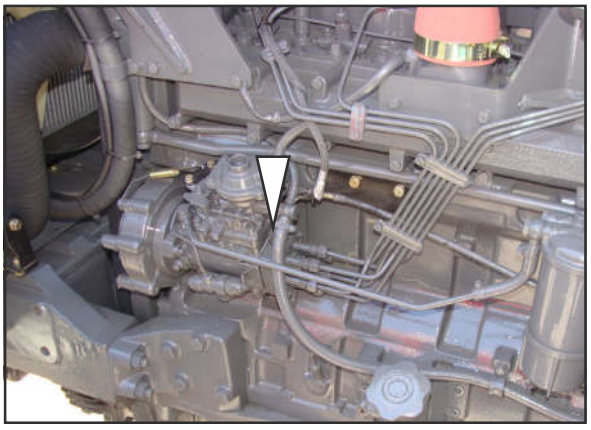

Fig. 159

Lateral stabilizers

The function of side stabilizers is to ensure the implement side (centering) alignment in relation to the tractor. See diagram.

Whenever coupling an implement, lift it and carry out the alignment so that the center line of the implement matches that of the tractor.

a) Raise the implement halfway.
b) Remove the lock (1) from both stabilizers.
c) Push the implement laterally so as to centralize it. If necessary, turn spindle (2) to match the holes and install the pin (1).
d) If lateral movement of the implement is needed during work, install pins (1) in oblong holes.

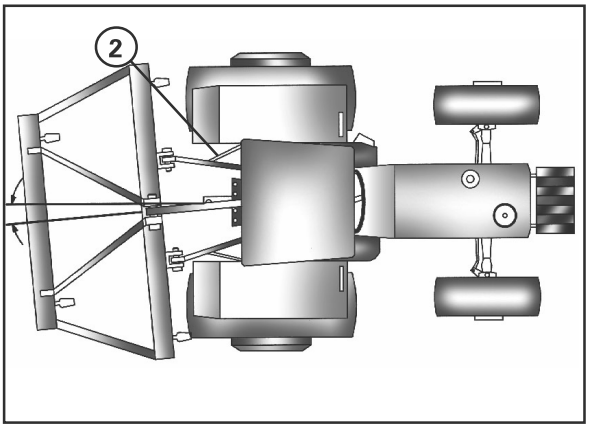

Fig. 181

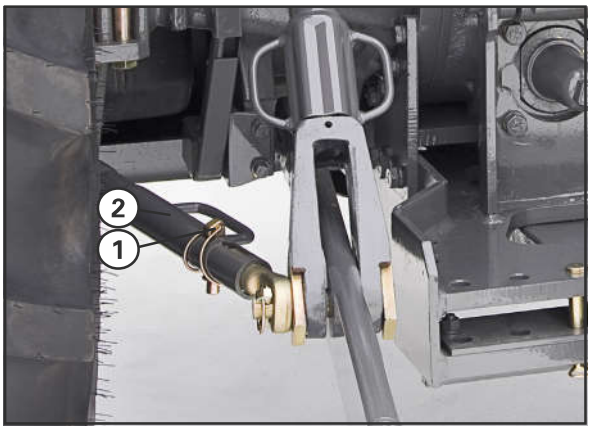

Fig. 182

9.3 - Lift system categories

For the correct implement coupling and in-field adjustments, the previously described function of the hydraulic system's components should be taken into consideration.

The 7100 series meets category II in the lift system and also some implements from category III. The standard followed is ASAE S217.12.

Category II

L - Approximately from 550 to 625 mm
L_1 - Approximately 435 mm

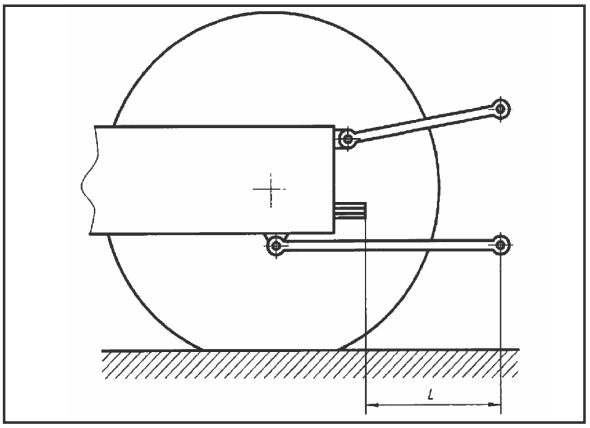

Fig. 183

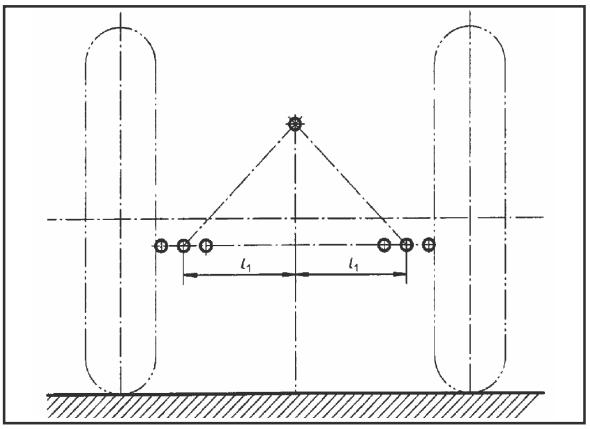

Fig. 184

11.8 - Operation with implement above the ground surface (Position control)

When operating with implements working above the gorund surface at a certain and controlled height “H”, only the Position control should be used.

Position of commands on the panel:

- ✓ Lift control (1): position “A” or “B”
- ✓ Lock button (2): unlocked (fully to the left)
- ✓ Lowering speed (3): depends on the type of implement and operation.
- ✓ Maximum height control (5): place control (1) in “A” (lifting) and turn the selector (5) until you reach the desired position for the implement. When raising it with control (1), it will only reach the selected position.

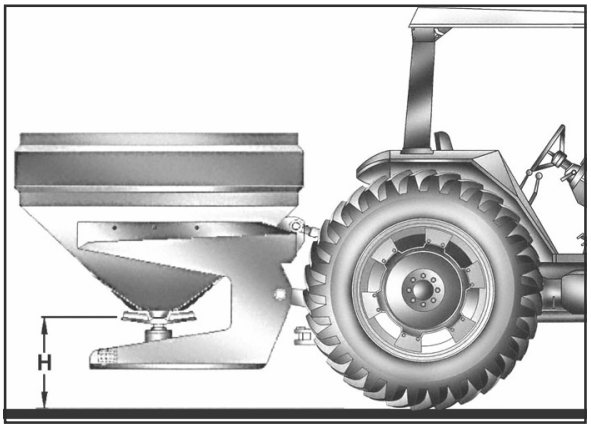

Fig. 199

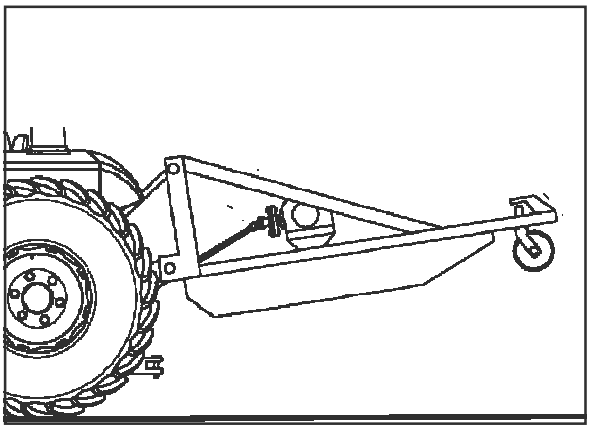

Fig. 200

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NOTES:

See item “Headland operation” about the limits to raising and lowering implements

✓ Lift arm lowering limiting control (implement depth - 4): if there isn’t any limitations to lowering the implement, turn the selector fully counter-clockwise, so as the lift arms can be fully lowered. To adjust, place control (1) to lower “C” and turn selector (4) to obtain desired position. Each time implement is lowered using control (1), it will stop at the selected position:

NOTE:

Whenever you use the maximum depth adjustment (or lowering), do not lower the implement using position “D” in control (1), since with a very fast drop the linkage and/or implement may be damaged.

11.9 - Operation with implement below the ground surface (depth) (Draft control)

When operating with a penetration implement, use the Draft control. The main adjustments that interfere in the operation with depth implements are:

Mixing control (6)

- When turning the control (6) fully clockwise, the system provides maximum response, that is, only the Draft control acts on.
- When turned fully clockwise, the response will be null, and only the Position control will act on.

- ✓ When coupling implements for the first time, make sure that the drive shaft length is adjusted correctly. See the implement instruction book.
- ✓ When using equipment that requires power at constant loads, it is not recommended to use more than 90% of maximum PTO power. Examples include water pumps and electricity generators.
- ✓ It is not recommended to use the PTO at 540 rpm for applications that require power higher than 75 hp. Both the output shaft and drive shafts can be damaged, creating a serious risk of accidents with unpredictable results. For power higher than 75 hp, use the IPTO at 1000 rpm and the appropriate shaft.
- ✓ Always use the lift system position control when operating implements driven by PTO, except in special cases.
- ✓ Drive shaft maximum operating angle: Consult your equipment manual. If you can't find this information, consider 30° (degrees) as maximum angle.

I - In implements assembled on the hydraulic lift, note the lifting limit so as not to exceed the drive shaft operating angle.

I I - In implements towed by the drawbar it may be necessary to shut off the PTO during maneuvers.

Drive shaft length adjustment

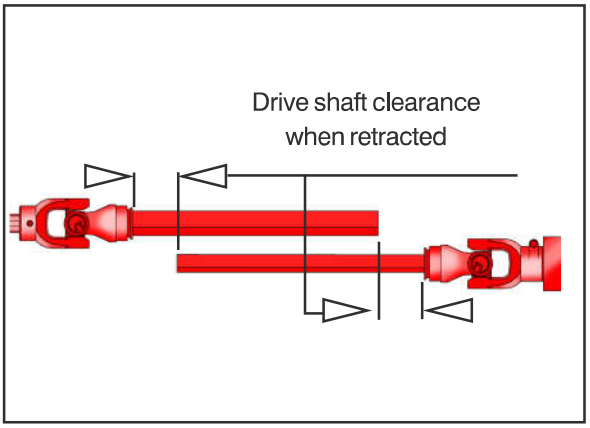

Fig. 224

Drive shaft maximum angle for implements assembled on the 3 point linkage.

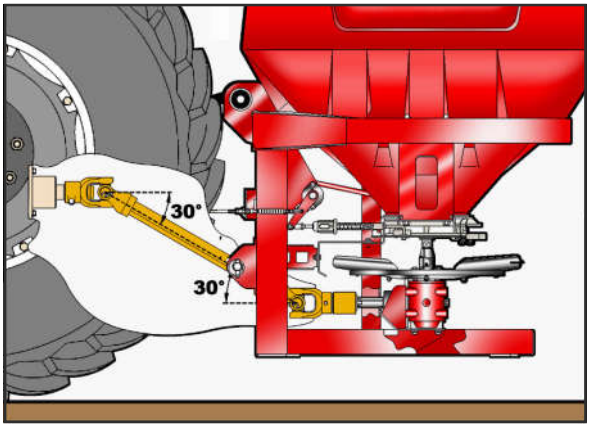

Fig. 225

Drive shaft maximum angle for towed implements

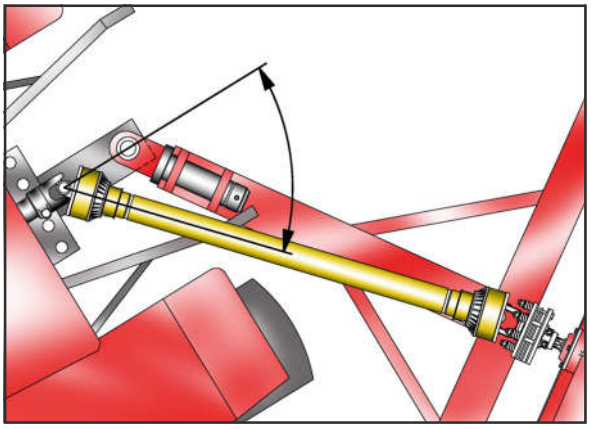

Fig. 226

General

1 - Clutch cross shaft (1 fitting on each side of the transmission).

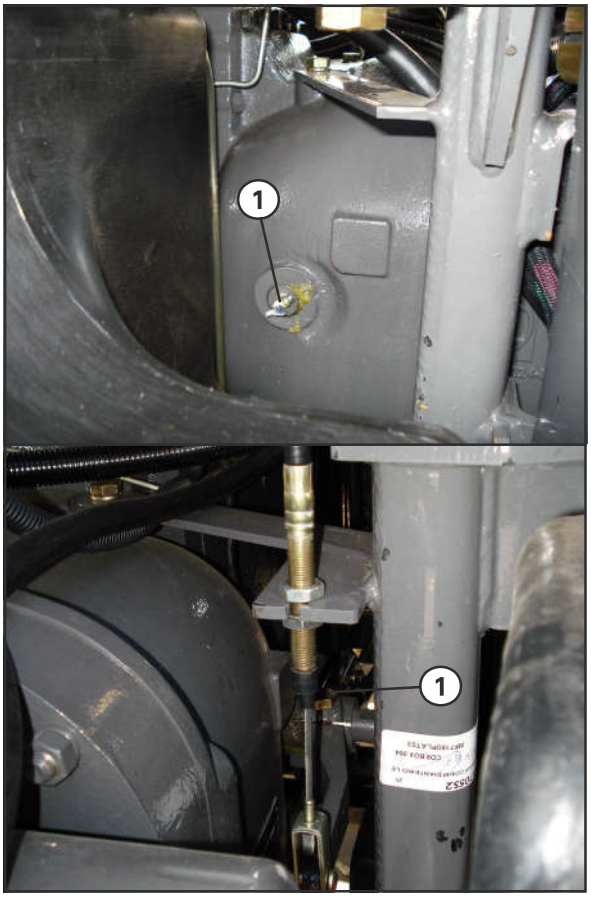

Fig. 231

2 - Water pump

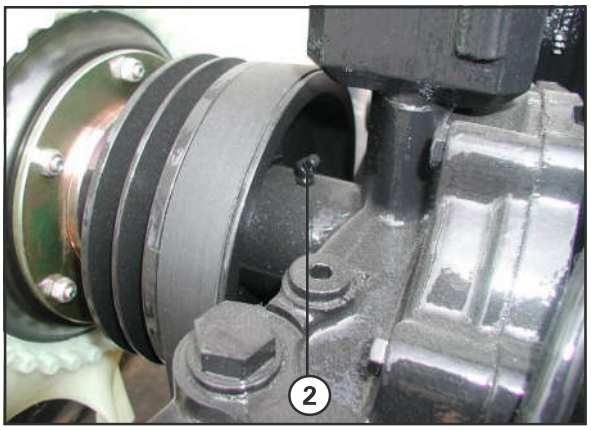

Fig. 232

8.6 - Restriction indicator test

The restriction warning system should be checked regularly, and whenever you have doubts about its operation. The inspection is quick and easy.

1 - Open the left-hand cover from the engine.
2 - Start engine and run it at around 1200 rev/min.
3 - Use a plane and flat plate (2) to cover the filter inlet. the light (3) should come on in the instrument panel. If it remains off:
- Check the restriction sensor wire connections (1) at the air filter.
- Make sure the warning light bulb (3) is not damaged.
- Also check the electrical connections in the panel (connectors and cables).
- If necessary, contact your Dealer.

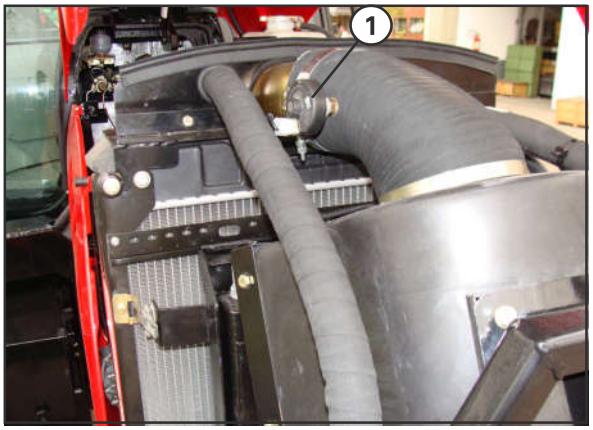

Fig. 254

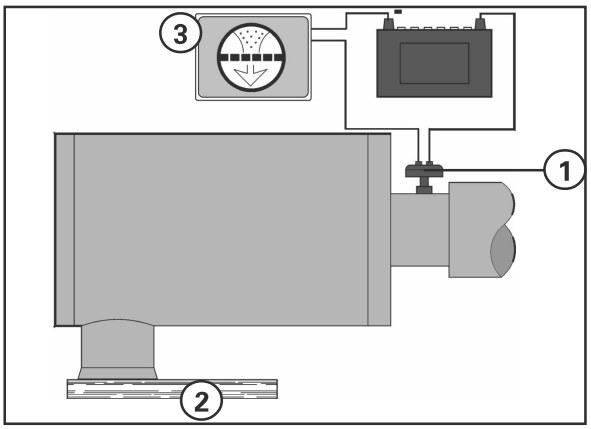

Fig. 255

8.7 - Dust ejector

The tractors are equipped with a dust ejector (1).
Its function is to automatically eliminate accumulated dust from the air filter housing.
Regularly inspect the lines in the system.

Ejector function:

A line connected to the discharge tube creates a depression capable of aspirating dust from the filter housing.
At the end, dust is sucked from the inside of the housing.

Fig. 256

Cleaning of the suction filter element

NOTE:
It is important that the tractor, or at least the filter area, be flushed before performing the operation below.
The removal of the right-hand wheel is not mandatory, but if it is removed, the procedure will be made easier.

1 - Drain the oil from the transmission, as previously described.
2 - Remove the protective cap (2).
3 - Put a tray under the filter to collect the oil drained.
4 - Loosen the 4 nuts (3).
5 - Remove the filter components (1):
Seat (5)
Strainer (6)
Spring (7)
Sealing rings (8 and 9)
6 - Wash the strainer (6) by using a brush and diesel oil or kerosene.
If available, use compressed air to dry and help cleaning.
7 - Also clean the support (10) and seat (5).
8 - Install all components by following the reverse order.
- Fit the seals correctly (8 and 9).
- Pay attention to the fitting and position of the spring (7) when mounting the seat (5).
- Replace the seals (8 and 9).
9 - Check the condition of wires and plugs (4) in the filter restriction sensor.
10 -Install the protective cap (2).

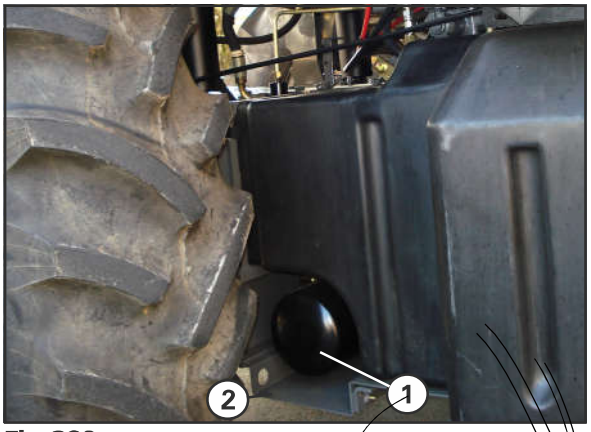

Fig. 280

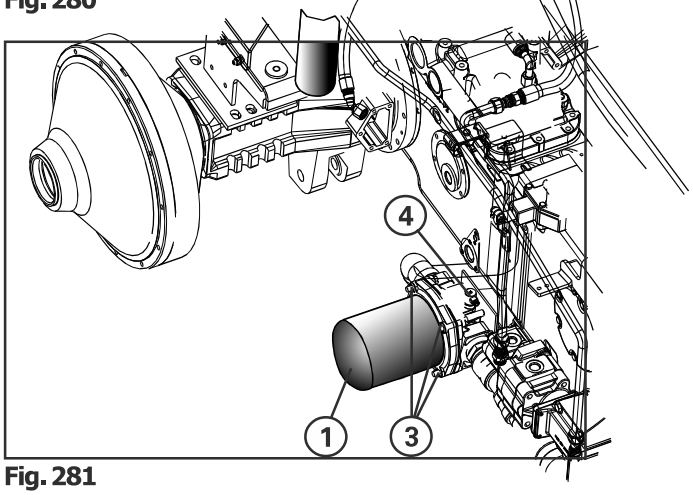

Fig. 281

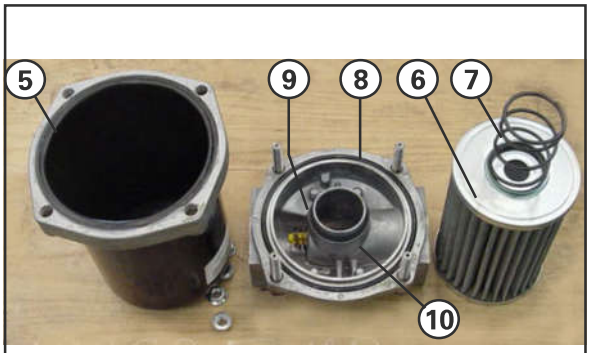

Fig. 282

15.3 - Front headlight adjustment

1 - Park the tractor opposite a wall at a two-meter distance. The tractor should be standing on plain, leveled ground.

2 - Draw a horizontal line (1) on the wall, matching with the center of each lamp (B).

3 - Draw two vertical lines that match the width (C), representing the distance between headlight centers.

4 - Draw an horizontal line (2) according to D, and use equation (D=B x 0.1) for the horizontal line distance (1)

5 - Regulate each headlight individually, covering the opposed headlight and aligning the upper edge of the light zone with the line upper portion (2), as shown. Adjust as necessary by turning the bolts (3).

NOTE:
Check them separately. While you check one lamp, keep the other one covered. Also cover the front auxiliary lamps, in order to allow better visual control.

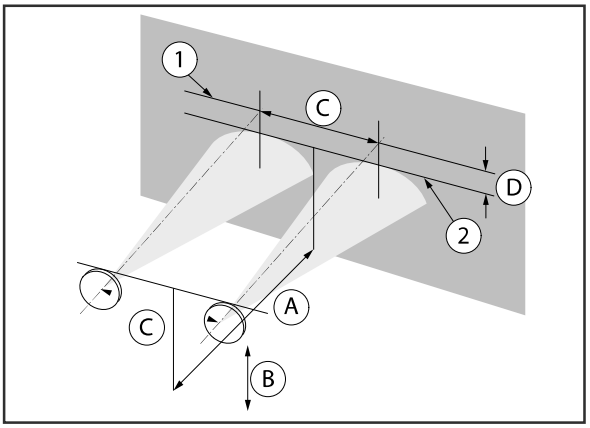

Fig. 301

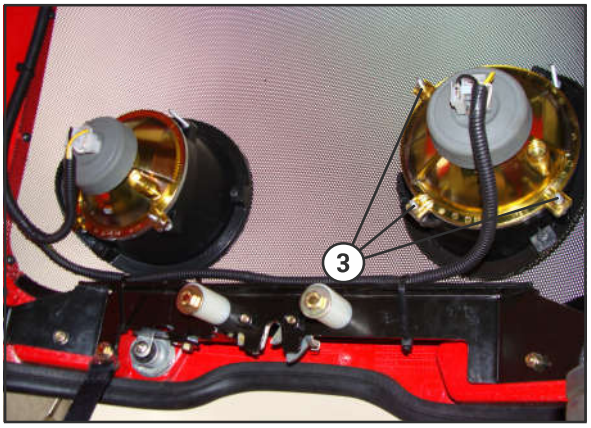

Fig. 302

16.4 - Minor failures related

The light starts blinking 3 times and then more 1, 2, 4 or 6 times.

If this occurs, it's not necessary to stop the operation as the system will continue working. However, make the necessary arrangements as soon as possible so that the failure doesn't get worse, shutting the system off.

Failure code	Failure cause	Solution
Code 31 Sequence: 3 + 1	- Open circuit, short circuit or disconnected sensor: The control unit is blocked (similar to severe failures): Eliminate the failure and turn the starter switch key to the ON and then to the OFF position. If the draft sensor is not connected while the key is in the ON position, the system will work, but only in the Position control (Draft control is inoperative).	# Inspect all electrical connectors. Contact the nearest dealer.
	- The right hand draft sensor is overloaded. In this case the system continues to work, without any blockage, despite the fact the warning light blinks in the control panel.	# Inspect all electrical connectors. Contact the nearest dealer.
Code 32 Sequence: 3 + 2	- Open circuit, short circuit or disconnected sensor: The control unit is blocked (similar to severe failures): Eliminate the failure and turn the starter switch key to the ON and then to the OFF position. If the draft sensor is not connected while the key is in the ON position, the system will work, but only in the Position control (Draft control is inoperative).	# Inspect all electrical connectors. Contact the nearest dealer.
	- The left hand draft sensor is overloaded. In this case the system continues to work, without any blockage, although the warning light blinks in the control panel.	# Inspect all electrical connectors. Contact the nearest dealer.
Code 34 Sequence: 3 + 4	- Signal of lowering control potentiometer not OK: * Open circuit. * Potentiometer is disconnected.	# Inspect all electrical connectors. Contact the nearest dealer.
Code 36 Sequence: 3 + 6	- Signal of Mixing control potentiometer not OK: * Open circuit. * Potentiometer is disconnected.	# Inspect all electrical connectors. Contact the nearest dealer.

Closing of exhaust, air filter and engine breather tube

Preventing the infestation of insects is of great importance.

Many insects could carry refuse into the engine to build nests, with disastrous consequences.

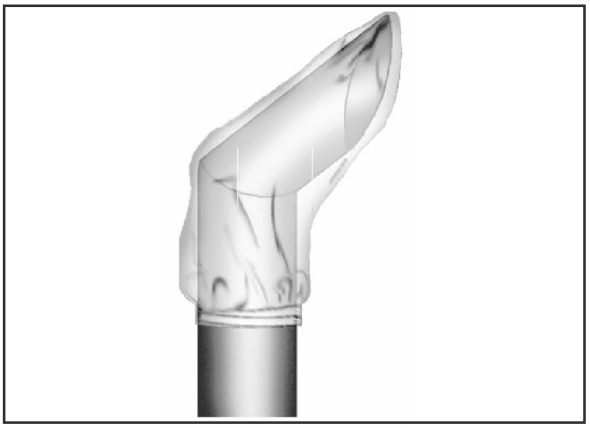

Fig. 334

Clutch operation

In the case of clutches with organic discs, it is advisable to keep the clutch pedal pressed to the end of the 1st stage (MF 650 with dual clutch). This prevents the transmission disc from sticking onto the pressure plate and flywheel.

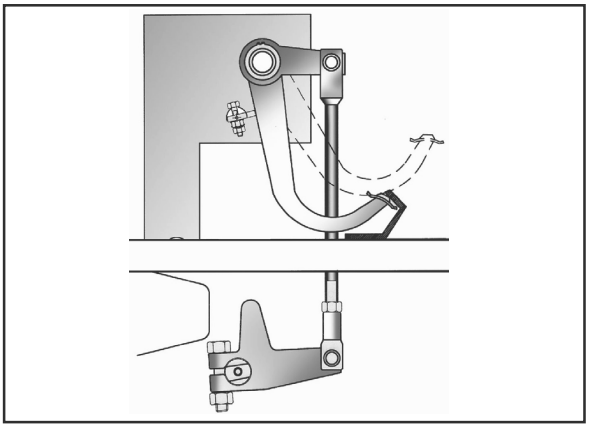

Fig. 335

Fuel refilling and lubrication

When leaving the tractor inactive, fill the fuel tanks completely, in order to prevent moisture condensing and the resulting oxidation within the tank, as well as damage to the injection system.

If possible, refill the tanks with special fuel for injection pump tests. Run the engine for a few minutes with this fuel. Then carry out a thorough lubrication of all greasers.

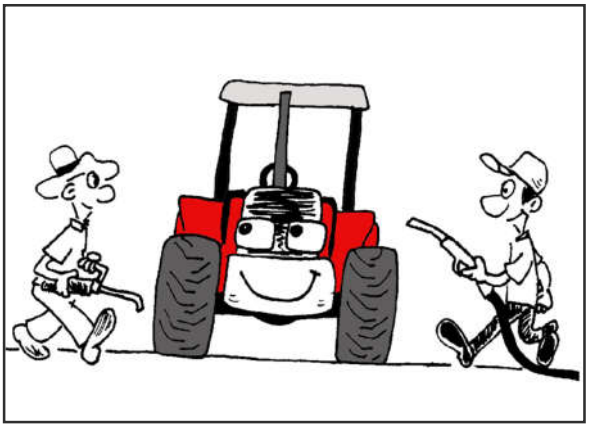

Fig. 336

Other procedures

A) Remove the battery from the tractor, clean it thoroughly and keep it in a dry place, with the correct solution level.
   Every month slow charge the battery, preventing sulphate deposition on the plates, which also happens because of lack of charge. If you leave the battery on the tractor, remove the negative cable and do what has been recommended here.

B) Change engine oil and the oil from other systems if within the recommended interval.

C) Drain the water from the radiator and flush the system.
   After that, refill the system using a corrosion inhibitor.

7. Technical Specifications

1.5 - Fuel supply system

Water separator	It separates the largest impurity particles (up to 30 microns) and the water contained in the fuel.
Fuel filters	Double fuel filter with parallel particle filtering (up to 5 microns) and makes the separation of the water contained in the fuel. The separator pre-filter and the main filter element has a drain plug in the base. Use it to drain the water.
Fuel feed pump	Diaphragm type mounted on the right-hand side of engine. They have a lever used to bleed the fuel system.
Injection pump	Delphi, rotary - DP100 - Engine 620DS Bosch, rotary - VE - Engine 66DTA (Tier 2)
Fuel cut-off	Through the solenoid assembled behind the injection pump that acts upon its governor.

2 - Electrical system - powers and capacities

Neutral start switch	Allows the engine to start only when the clutch pedal is fully depressed.
Battery:	170 A/h
Alternator - Cab version:	14 V / 120 A/h
Alternator - Footstep version:	14 V / 120 A/h
Starter motor	5.0 kw
Brake lights and direction indicators	21 watts
Front lamps (in the cab)	4 watts
Taillights (in the cab)	5 watts
Front work lights (high beam)	48 watts
Front work lights (Low)	48 watts
Rear work lights	55 watts
Front auxiliary lights	55 watts

3 - Clutches

Type (7140)	Membrane spring
Features	It incorporates one cerametallic disc with springs for transmission, with 342 mm diameter and 7 pads each. Mechanical by cable.
Type (7150-7170-7180)	Dry / Double disc
Features	It has 2 cerametallic discs with springs for the transmission, with 345 mm diameter and 4 pads each. O mechanical by cable. The IPTO shaft is connected directly to the flywheel flange.
Clutch collar - type	It has a play of 40 to 50 mm in the pedal.