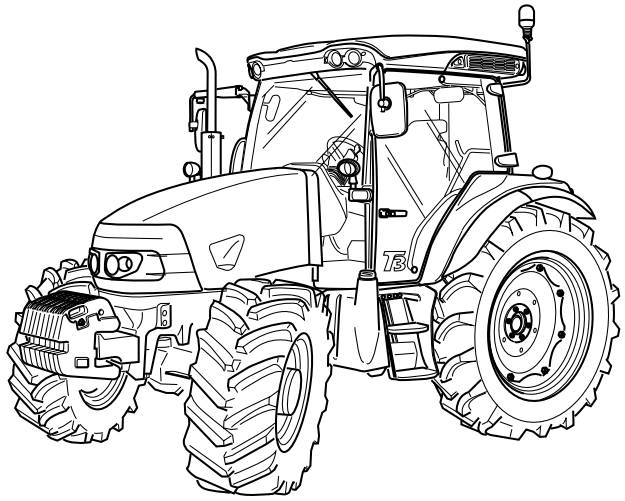
# X60 Series
# Operator's Manual

**ORIGINAL INSTRUCTIONS**

**Valid for the following tractor models with cab**

**X60.20**
**X60.30**
**X60.40**
**X60.50**



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Gruppo Industriale ARGO


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***This manual was compiled in compliance with the the ISO 3600 standards and the here contained instructions comply the requirements of the Machinery Directive 2006/42/EC and Directive 2010/52/EC in force in the European Community. For tractors sold or used outside the European Community, local laws will prevail.***

Main protections on the tractors discussed in this manual. [4.1.o][4.1.p][4.1.q][4.5.b][4.5.c][4.5.3]

| CAB | DE LUXE |
|---|---|
| ROPS (protection against overturning) | YES |
| FOPS (protection against objects falling from above) | YES |
| OPS (protection against penetration of objects from sides) | NO |
| Protection against hazardous chemicals | CLASS 1* |

**** In compliance with EN 15695-1:2009***

***This operation and service manual is valid for all countries and all models. It contains photos, notes and directions both for standard and optional equipment. Therefore it can give details for parts not installed on your tractor with respect to the local laws in force and according to ordered optional equipment.***
***The tractor is supplied complete with safety devices according to national or international laws. For your own safety, please always use correctly such devices and check them for function. If you have any doubts concerning their operation or use, do not hesitate to ask your Dealer for details.***

***WARNING: Any warranties for modified operation units (safety frame, electric and hydraulic systems a.s.o) expire if cabs are mounted that are not approved by the tractor's maker. Moreover, noise levels and compliance with the approvals cannot be verified in this case.***

**CALIFORNIA**
**Statement 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.**

## Units Of Measurement

All units of measurement used in this manual are metric unless otherwise stated.
Use the following table to convert from metric to imperial units.

| |
|---|
| mm x 0.03937 = inches |
| kg x 2.2 = pounds |
| Bar x 14.5038 = PSI |
| Litres x 0.22 = British gallons |
| Litres x 0.264 = US gallons |
| N (Newton) x 0.225 = pound/foot |
| Nm x 0.738 = pound/foot |
| Nm x 8.85 = pound/inch |
| °C x 1.8 (=32) = °F |
| km/h x 0.62 = MPH |

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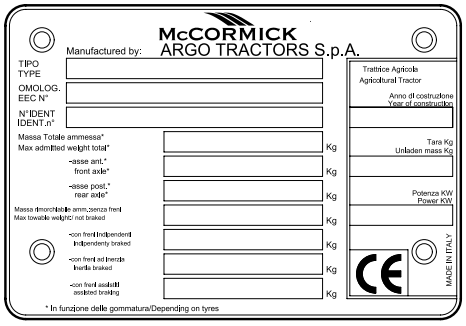
# Tractor identification

## Machine identification data

The tractor and its main components are identified by serial numbers and/or manufacturing codes. Here under the positions of the various identification data are illustrated. (Fig.1-3)

*NOTE: Identification data should be communicated to your Dealer for requests of spare parts or service.*

## Tractor identification plate




The manufacturer's plate (1) is placed on the right-hand side on the front of the tractor and features the following data:
- Manufacturer
- Machine type
- Number of authorization for road circulation
- Frame number
- Manufacturing year
- Weights
- Rated engine power in kW
- CE mark

Other data are indicated on the authorization certificate.

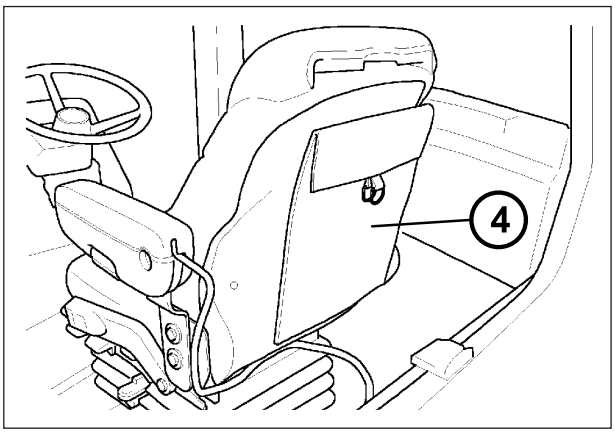
## Tractor identification number

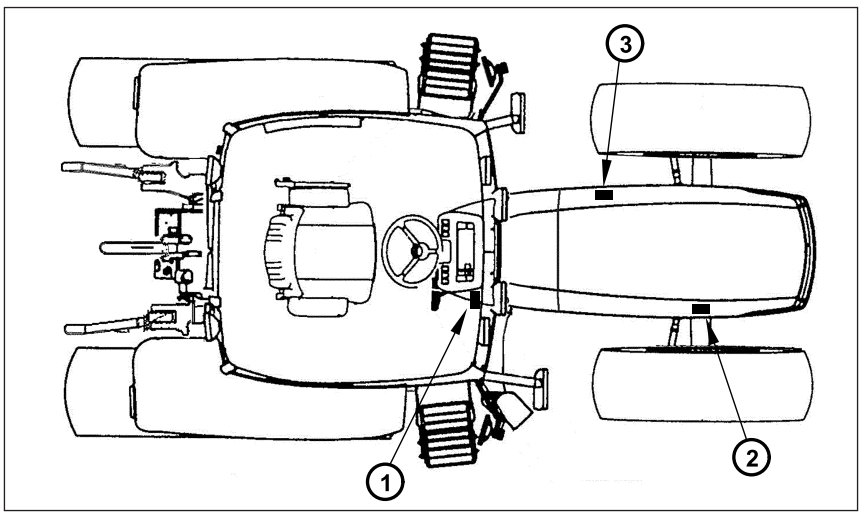
The vehicle identification number is punched both on the data plate and on the right-hand front side of the weight frame. (2)

## Tractor identification data

The engine has its own serial number stamped on the engine data plate (3).

*IMPORTANT: Keep with care this operation and maintenance manual on your tractor. Before driving or operating your tractor, it is mandatory to read this manual very carefully, with special attention to the chapter concerning safety rules. Keep the manual always ready at hand in the manual storage compartment for easier reference. If the tractor should be used also by persons that do not understand the language of the country, the employer (or the machine user) must translate the operating instructions in the language understood by these operators (4).*




Position of plates and tractor identification references: 1 - Machine identification plate; 2 - Chassis serial number; 3 - Engine identification plate.

# Introduction

## INTRODUCTION

**NOTE**: *This manual is distributed with tractors all over the world. The equipment indicated as standard or optional may vary according to the country where the tractor operates. Please ask your Dealer for full details of the equipment available in your country.*

The purpose of this book is to enable the owner and driver to operate the tractor in a safe manner. Provided that the instructions are followed carefully, the equipment will give years of service in our tradition.

If you should not understand any part of this booklet, please do not hesitate to ask your Dealer for advice, as these instructions must be correctly understood and complied with. It is advisable to perform a daily maintenance routine and to keep a register to record the work hours of the machine.

When new parts are required it is important that only genuine service parts are used. Authorized Dealers supply genuine parts and can give advice regarding their fitment and use. . Customers are therefore required to buy their service parts only from an authorized Dealer.

***These tractors are designed exclusively for normal an typical agricultural operations, following the operating instructions contained in this manual. THE TRACTOR IS UNSUITABLE FOR USE IN FORESTAL OPERATIONS. [4.5.b]***
***It may become suitable for such use if a forestal kit is installed which is CE marked and approved and whose installation is approved by the manufacturer.***
***The installation and modification of the tractor must be carried out with the highest technical standards by specialised workshops with qualified personnel. Such workshops must be able to guarantee and attest the risk analysis provided for in the Machinery Directive 2006/42/EC concerning the foreseen and predictable use of the tractor for forestal work and environment, in order to carry out all required adaptations of the tractor. This specific forestal kit must protect the driver's seat from falling and penetrating objects.***

Use in any other way is considered as contrary to the intended use. The Manufacturer of the tractor accepts no liability for any damage or injury resulting from misuse; any resulting risks must be borne solely by the user.

Also compliance with and strict adherence to the operation service and maintenance conditions specified by the Manufacturer are substantial part of the intended use.

If the tractor must be used in very heavy-duty conditions (e.g. deep water or extremely muddy soils), you should ask your Dealer for specific instructions, to avoid invalidating the guarantee.

For the operation, service and maintenance of this tractor you need to know perfectly its specific features and to be precisely informed about the pertaining safety standards (injury prevention).

Customers are strongly advised to turn to an official Dealer in connection with any problem regarding service and adjustments.

## WARRANTY, PRE-DELIVERY INSPECTIONS AND INSTALLATION

The Company, when selling new goods to their Dealers, gives a warranty that, subject to certain conditions, guarantees that the goods are free from defects in material and workmanship. As this manual is published for worldwide diffusion, it is impossible to give a precise and detailed description of the terms and clauses of the warranty granted in each country for retail sale. The buyers of new tractors should therefore ask their Dealer for full details.

According to the Company's policy of continuous improvement to its machines, changes in their technical features may be made at any time without notice. The Company accepts no responsibility for discrepancies which may occur between the specifications of its machines and the descriptions thereof contained in its publications.

A Dealer is required to carry out certain activities when supplying a new tractor. These consist of a full pre-delivery inspection to ensure that the tractor supplied is ready for immediate use, and full instruction in the basic principles of operation and maintenance of the tractor. These instructions will cover instruments and controls, routine maintenance and safety precautions. All persons who will be concerned with the operation and maintenance of the machine should be present for these instructions.

*NOTE:* The Manufacturer will not accept responsibility for any claim resulting from the fitment of non-approved parts or attachments, or unauthorized modification or alteration.

## WARRANTY CLAIM

A correct installation, followed by a regular maintenance, can do much to prevent malfunctions or breakdowns. If operation problems should be however encountered during the warranty period, the warranty should be claimed with the following procedure.

The Dealer by whom you purchased the tractor should be promptly informed, stating model and serial number. It is most important that there should be no delay, and you should realise that, even where the original failure is covered by warranty, if the failure is not repaired immediately, warranty cover may not apply.

You should give your Dealer as many information as possible, for instance work hours, current type of work and warning signs.
It should be noted that normal maintenance services such as tuning, brake/clutch adjustments, and the supply of materials used to service the tractor (oil, filters, fuel and antifreeze) are not covered by terms of the warranty.

## SPARE PARTS WARNING

The fitment of parts of inferior quality may not only impair machine performances, but also be dangerous for operator's health and safety. The manufacturer of the tractor will not take the responsibility for any loss, damage or liability resulting from the fitment of such parts, and, if fitted during the normal warranty period, the manufacturer's warranty may be invalidated.

## IF YOU MOVE

The Dealer by whom you bought your tractor is sole responsible for the protection given by your warranty. We recommend that any repair of your machine should be made by the Dealer. If you, however, move to another area or the tractor must momentarily operate in an area far from the original Dealer, you should ask your Dealer for name and address of the Dealer nearest to the new work site, so that the warranty is transferred to the latter. If you moved from the area of your original Dealer without any arrangements with the new Dealer, the latter will give you assistance for emergencies, but will charge normal prices, unless:

a. You make it clear that the warranty has not expired, and

b. the Dealer making the repair can make the due arrangements with the original Dealer.

## POST-WARRANTY SERVICE

During the warranty period it is advisable to let your Dealer perform every repair and servicing. In this way the Dealer is able to keep under control operation and performances of your new tractor.

In order to obtain the best performances from your tractor, it is important to go on with regular checks and servicing even after the warranty is expired. Make use of your local Dealer for all major tractor services: a trained engineer will spot any problems between one service and the next.

Our engineers are regularly trained and updated on the product, servicing techniques and the use of modern service tools and diagnostic equipment. They receive regular Service Bulletins, have all Workshop Manuals and other such technical information to ensure that the repair or service is to the standard required.

## SAFETY

The safety of the operator is one of the main concerns in designing and developing a new tractor. Designers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds thought and a more careful approach to handling farm machinery and implements. Therefore you are required to read through and implement the safety instructions detailed in the Safety Notes section of this book.

***CAUTION: In some of the illustrations used in this Operator Instruction Book, panels or guards may have been removed for clarity. Never operate the tractor without these components in position. If the removal of panels or guards is necessary to make a repair, they MUST be replaced before operation.***

# Chapter 2
Safety notes



## REGULAR USE

This is an agricultural tractor, whose function consists essentially in traction power. It is therefore specially designed to push, pull, carry or operate some interchangeable implements for agricultural purpose, or to tow agricultural trailers.

This machine must be driven and operated by an operator suitably instructed, firmly seated and wearing a fastened seat belt.

This machine is NOT designed:

- To be driven or operated standing or from outside the cab or the operator's seat, or without a fastened seat belt.
- To lift persons.
- To transport persons, within or outside the cab or the operator's seat, in any condition (work or road transport).
- To be used in hazardous atmosphere.
- To be used in forestry.
- To be equipped with front loaders if the tractor is not provided with a suitable structure to protect the operator's seat from falling and projected objects.

More basic rules
- Keep the cab doors closed while the machine is being used.
- The machine must be used only by a skilled operator who knows perfectly controls and driving technique.
- External controls of hitch and electro-hydraulic power take-off (if equipped) must be operated standing on one side outside the tractor and keeping oneself out of the overall width of mudguards. It is expressly forbidden to operate the controls from the rear of the tractor or standing on the inner side of wheels.
- Before any operations, carefully analyze all risks and check that the user is skilled enough to safely operate the machine.

**WARNING: Improper use of the machine, specially on rough terrain or slopes, can make it tilt over. Pay particular attention in case of rain, snow, ice or anyway on slippery ground. It may be necessary to step out of the tractor to check personally ground quality. In the described conditions, always keep the load as close as possible to the tractor and the ground.**

**WARNING: Do not try to get off the moving tractor, even if it is overturning, to avoid being crushed under it, but remain seated with the well fastened seat belt and hold firmly the steering wheel.**

**WARNING: If the tractor is used as a fixed power unit without supervision (e.g. connection to a pump unit for irrigation), put up warnings against this dangerous situation and barriers to keep off unauthorized personnel.**

# Safety notes

## SAFETY ALERT SYMBOLS AND TERMS

This safety symbol means WARNING! BEWARE! YOUR SAFETY IS IN DANGER!

This alert symbol draws your attention on important warnings on the implement, in the manual or anywhere else. Pay great attention whenever you see this symbol: there is a great danger of serious or deadly injuries. Follow the instructions given in the warning.

## WHY IS SAFETY IMPORTANT FOR YOU?
## « ACCIDENTS CAN MAIM and KILL «
## « ACCIDENTS COST A HIGH PRICE «
## « ACCIDENTS can be AVOIDED «

## SAFETY - TRACTOR AND IMPLEMENT [4.2.a]

- **The tractor is a source of mechanical and hydraulic power.**
- **This Operator's Manual is compiled to cover safe working practices that are associated with the basic tractor operation.**
- **It does not cover all operation and safety instructions relevant to all known implements and attachments that may be fitted to your tractor in the future.**
- **All implements connected to the tractor must bear the CE mark (Europe only). All equipment to be connected must be accompanied by a operation and maintenance handbook, to be read before assembling and using the equipment.**
- **It is essential that operators use and understand the relevant Operator's Manual which accompany such implements and attachments not treated in this book.**
- **The above mentioned tractor is not suitable for forestry.**

## SAFETY - INTRODUCTION

This safety section of your Operator Instruction Book is intended to point out some of the basic danger situations that may be encountered during the normal operation and maintenance of your tractor, and to suggest possible ways of dealing with these situations. This section is **NOT** a replacement for other safety practices featured in other sections of this book.

Additional precautions may be needed according to the implements used and to work conditions in the field or in repair or maintenance areas. The Manufacturer of the tractor has no direct control over application, operation, inspection, lubrication or maintenance of utility tractor. Implementation of correct safety practices in such areas is therefore **YOUR** own responsibility.

## SAFETY - ADVICE FOR THE OPERATOR

It is **YOUR** responsibility to read and understand the safety section in this manual before operating your tractor. You must follow these safety instructions that take you step by step through your working day. DO NOT USE THE MACHINE IF YOU HAVE ANY DOUBTS:

In reading this section, you will note that illustrations have been used to highlight certain situations. Each illustration is numbered and the same number appears in the text in parenthesis. This reference number is composed of two digits separated by a dash: the first digit before the dash identifies the section, the second one the progressive number of the picture in the section. (e.g. Fig.2-34 = Figure 34 of Section 2).
In further sections (Section 1, 3, 4, 5, 6, 7, 8, 9) the figures are not numbered, as each figure is placed beside the relative text. Reference to components in the text have progressive numbers (1, 2 , 3, etc.) to immediately identify the figure they refer to.

Remember that **YOU** are the only key to safety. Good safety practices not only protect you, but also the people around you. Study the features in this manual and make them a working part of your safety program.

Keep in mind that this safety section is written only for this type of machine. Practice all other usual and customary safe working precautions, and above all - REMEMBER - SAFETY IS YOUR RESPONSIBILITY. YOU CAN PREVENT SERIOUS INJURY OR DEATH.

## SAFETY - DANGER, WARNING AND CAUTION

Whenever you see the words and symbols shown below, used in this book and on decals, you MUST take note of their instructions as they relate to personal safety.

**DANGER: The symbol and the word DANGER indicate an imminently hazardous situation which, if not avoided, will result in DEATH OR VERY SERIOUS INJURY.**

**WARNING: The symbol and the word WARNING indicate a potentially hazardous situation. If the instructions or procedures are not correctly followed, it could result in DEATH OR SERIOUS INJURY IN EXTREME CASES.**

**CAUTION: The word CAUTION indicates a limited risk situation which, if not avoided, will result in MATERIAL DAMAGES AND/OR MINOR INJURIES.**

*IMPORTANT:* The word IMPORTANT is used to identify special instructions or procedures which, if not strictly observed, could result in damage to, or destruction of the machine, of the work carried out or its surroundings.

NOTE:*The word NOTE is used to indicate points of particular interest for more efficient and convenient repair or operation*.

## SAFETY - DECALS

**WARNING: DO NOT remove or efface Danger, Warning, Caution or Instruction decals.**

Any lost or effaced Danger, Warning, Caution or Instruction decals must be replaced. Replacement decals are available from your Dealer in the event of loss or damage. The actual location of these Safety Decals is illustrated at the end of this section.
If a second-hand tractor has been purchased, refer to the illustrations at the end of this section to ensure that all the safety warning decals are in the correct position and readable.

## SAFETY - FOLLOWING A SAFETY PROGRAM

### Safe use of the tractor

Only qualified and authorized operators are able to use farming tractors in safety. To be qualified you must understand the written instructions supplied in this Operator Instruction Book, have training in the work area, and know the safety rules and regulations for the job.
Some regulations stat, for instance, that no one younger than 18 may use machines with engines (according to European directives). Tractors are such machines. It is your responsibility to know these regulations and comply with them in the area or the situation in which the tractor is used.
Such regulations include, without limitation, the following instructions for a safe use of the tractor.

**WARNING: The operator must not be under influence of alcohol or drugs that can impair his/her coordination or alert conditions. An operator under prescription for narcotic drugs needs a medical certificate stating if he/she is able to use the tractor safely.**

Take the following precautions:

- Do not allow children or unauthorized persons to drive or use your tractor. Keep others away from your area of work.
- Fasten your seat belt if the tractor is fitted with an upright safety frame or a cab.
- Whenever possible, do not operate the tractor near ditches, pits or holes in the ground. Slow down when steering, driving on slopes or driving over rough, slippery or muddy terrain.
- Keep clear from slopes too steep to operate safely.
- Drive carefully, specially on headlands, on road, near a ditch and around trees.
- Never let anyone else get on to the tractor or the implement.
- Hitch only to the drawbar and recommended hitch points. Never hitch above the central line of the rear axle.
- Operate the tractor smoothly, with no sudden turns, starts or stops. Apply the parking brake whenever the tractor is stopped.
- Do not remove or alter any part of the equipment or of the guards. Do not use the tractor if the safety frame is removed or damaged. Never use attachments that are not designed for your tractor.

## SAFETY - CAB [4.1.q][4.1.o]

The safety cab is designed on purpose for this tractor series and complies with all law requirements concerning safety and noise level. (Fig.2-1)

The safety cab complies with international safety standards prescribed by laws in force. It must NEVER be drilled or modified in order to install accessories or implements. The cab components MUST NOT be welded, nor repaired if damaged. Never attach tow chains or ropes to the cab main frame.

**DE LUXE CAB**

**WARNING: Tractors equipped with De Luxe cab have a protection (FOPS) against objects and loads that might fall from above in typical work conditions, but not against objects and loads that might be projected into the area normally occupied by the operator.**

- Seat belts must always be worn and adjusted snugly (Fig.2-2).
- From time to time, check the seat belt for damage and replace it if worn or damaged (Fig.2-2).

**WARNING: Always fasten your safety belt.**

After an accident, let a specialised workshop check the safety frame, the driving seat, the safety belts and the anchor points of the safety belts. Replace all damaged parts before using the tractor again.

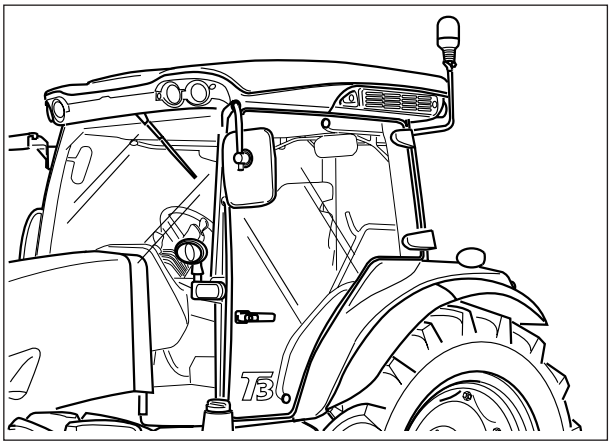


Fig.2-1

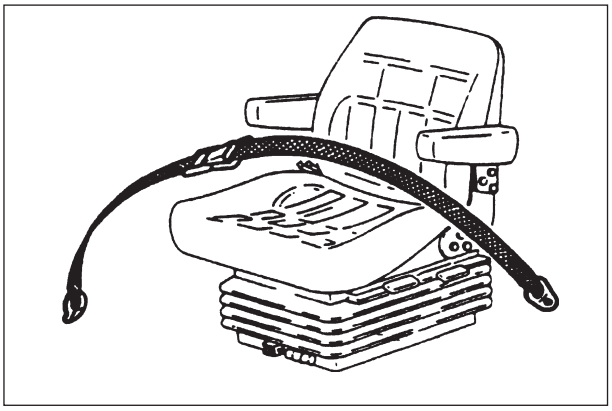


Fig.2-2

## PRECAUTIONS FOR WORKING IN SAFETY

Protect yourself
NEVER take any risks. Wear all protective clothing and any personal protection devices called for by the work conditions. (Fig. 2-3).

The following personal safety devices are always necessary:
- Hearing protection.
- Safety shoes.

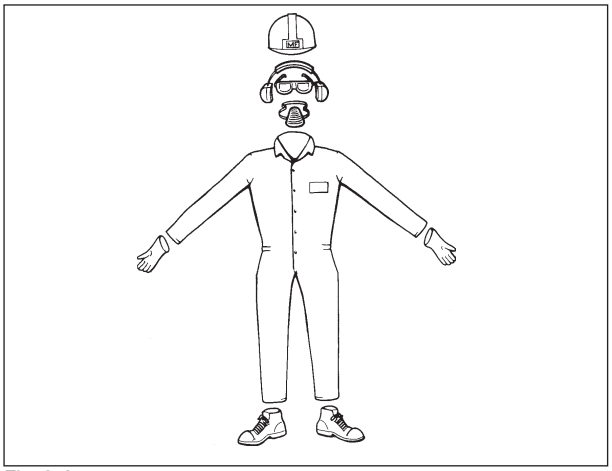


Fig.2-3

**WARNING: the tractor is not protected against dangerous matters and emissions. If you are working in an environment where there is a danger of inhaling, ingesting or contacting dangerous matters, the operator should wear specific personal safety devices. [4.1.p][4.5.3] DO NOT wear loose clothing, jewellery or other items and tie up long hair that could get entangled in controls or moving parts.**

A first aid kit should be available on any work site (Fig.2-5).

**WARNING: The tractor is designed and built to avoid any fire risks during normal operation. Therefore, it is not provided of a self-extinguishing system or a fire extinguisher on board as a standard. The tractor is anyway designed to install a 1 kg dust fire extinguisher complying with UNI EN 3/7 2004 standard. The fire extinguisher must be mounted in the reserved and indicated position (Fig.2-4a & Fig.2-4b)**
**The fire extinguisher with its support can be bought as a kit by our Dealers or authorized workshops. The kit consists in a fire extinguisher, support, fastening means, directions for its mounting and a decal to be applied in the indicated area. The decal, when applied, declares that the tractor may not be used if the ire extinguisher is not in its place.**
**It is up to the owner of the farm or to the person responsible for safety at the farm to judge the opportunity of using the tractor in areas at high fire risk. They are also responsible for use of the tractor with the extinguisher duly mounted.**

First aid box
If the tractor's owner or safety manager provides the tractor with a first aid box, we recommend storing the box in a suitable place when the tractor is not used for a long time, owing to its highly perishable content.

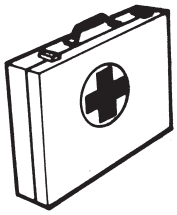


Fig.2-5

The fire extinguisher position changes according to tractor model

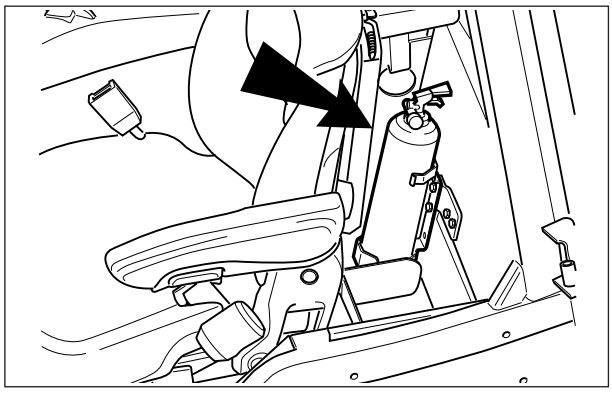


Fig.2-4a

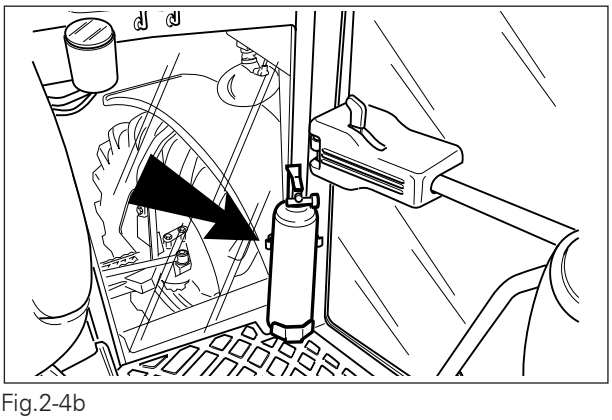


Fig.2-4b

# Safety notes

## Know your equipment

Know your tractor. Know how to operate all equipment on your machine and the implements and attachments used with it. Know the purpose of all the controls, gauges and dials. Know the rated load capacity, speed range, braking and steering characteristics, turning radius, and operating clearances.

Keep in mind that rain, snow, ice, loose gravel, soft ground, etc. can change the way your tractor operates.. *Under poor conditions, slow down and be extra careful, engage four-wheel drive, if fitted.*

Study the **DANGER, WARNING** or **CAUTION** safety signs on your tractor and the information signs also.

READ THIS OPERATOR INSTRUCTION BOOK BEFORE STARTING THE ENGINE.

STUDY IT BEFORE YOU START WORK (Fig. 2-6).

IF THERE IS SOMETHING YOU DO NOT UNDERSTAND, ASK SOMEONE SPECIALISED (e.g. your Dealer) FOR EXPLANATION.

**IMPORTANT:** *This manual covers general safe practices for agricultural tractors. It must always be kept with the tractor. For further copies contact your Dealer.*

Fig.2-6

## Use all available protective devices

Keep all protective devices in place and securely fastened. Make certain all guards, shields and safety signs are properly installed, as specified, and are in good condition.

**To help keep yourself and others around you safe, your tractor should be equipped and kept in perfect service order with:**

- Safety belts complying with law requirements of the various countries.
- Power take-off shields.
- Shields against heat.
- Shields and guards against shearing, pinching and moving parts.
- Rear view mirrors.
- Anti-deflagration shields on tubes, if required.
- Dust filters in the cab
- Decals and pictograms.
- Means to access the driver's seat.
- Driver's seat.
- Controls.
- Operator's manual.
- Slow Moving Vehicle emblem (**SMV**). Additional safety guards, lights or decals and a back-up alarm (Fig.2-38 and 2-39) (North America).

Know which devices are required for safe operation of your tractor. Use them at all times. Make sure they are in place and in good condition. NEVER remove or disconnect any safety device.

## Check the equipment

Before you begin your working day, take time to check your tractor and ensure that all systems are in good operational condition.

**WARNING: personal safety devices must be worn for each check and maintenance operation.**

- DO NOT smoke while refuelling the tractor. Keep any type of open flame away (Fig. 2-7). [4.1.l]
- Check for loose, broken, missing, or damaged parts. Have everything put into good repair. Make certain all safety devices are in place.
- Check the seat belts for damage: Damaged belts MUST be replaced.
- Ensure that implements and attachments are properly installed and that the tractor and implement PTO RPM ratings match.
- Check the tires for cuts, bulges and correct pressure. Replace worn or damaged tyres. Check foot and parking brakes for proper operation. Adjust if necessary.
- Stop the engine and wait for it to cool before refuelling.
- Check the engine oil level and add oil if required.
- Perform all maintenance procedures outlined in the maintenance and adjustment section of this manual.
- Check that the PTO drive locking devices are latched.
- Check that the tractor PTO shield and driveline guards are in place and operating properly.
- Check the tractor and implement hydraulic system. Have any leaks or damaged parts repaired or renewed.
- HYDRODYNAMIC SYSTEMS: HOSES Hoses are an important component in modern machines. Hoses can change their characteristics in the course of time because of pressure, vibrations, weather etc. Laws in force prescribe that hoses are replaced within 6 years from their construction. WE RECOMMEND COMPLIANCE WITH THIS RULE. [4.1.i]

**WARNING: When auxiliary control valves are used, their quick couplings can reach high temperatures. Therefore, safety gloves suitable for such temperatures must be worn every time the connected implements are connected to or disconnected from the couplings.**

**WARNING: Diesel fuel or hydraulic fluid under pressure can pierce the skin or eyes and cause serious personal injury, blindness or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Never use your bare hand. Wear safety goggles for eye protection. If any fluid is injected into the skin, it MUST be surgically removed within a few hours by a doctor familiar with this type of injury (Fig.2-8).**

Before applying pressure to the fuel or hydraulic system, be sure all connections are tight and that lines, pipes, and hoses are not damaged. Before disconnecting fuel or hydraulic lines, be sure to relieve all pressure.

Make sure that all hydraulic lines are correctly installed and not tangled.

**WARNING: Liquid cooling systems build up pressure as the engine gets hot. Before removing the radiator cap, stop the engine and let the system cool.**

- Check the engine cooling system and add coolant as required.

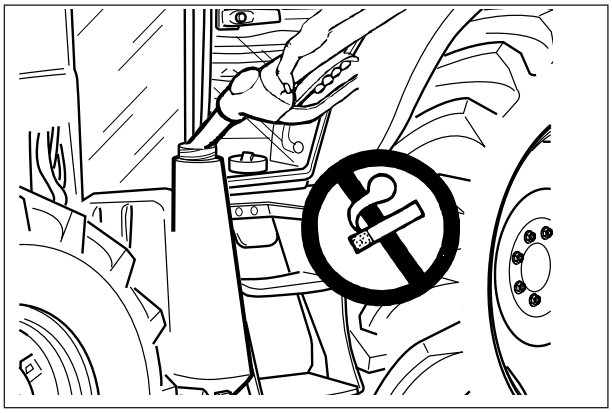


Fig.2-7

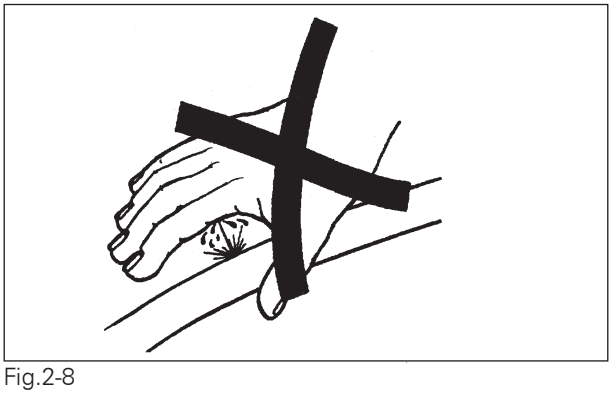


Fig.2-8

Clean the tractor

- Keep work surfaces and engine compartments clean.
- Before cleaning the machine, always lower implements to the ground, engage the first gear, engage the parking brake, turn the engine off and remove the key.
- Always use specific personal safety devices for each service operation.
- Clean steps, pedals and floor. Remove grease or oil. Brush away dust or mud. In winter, scrape away snow and ice. Remember - slippery surfaces are dangerous.
- When plastic parts need to be cleaned (such as console, instrument panel, monitors, indicators etc), do not use petrol, paraffin, diluents etc.
  They could cause discoloration, cracking or warping of the cleaned parts..
  These parts should ONLY be cleaned with water, neutral soap and a soft cloth.
- Remove and store implements, keys, hitches etc. in their proper places.

Protect the environment

- It is illegal to pollute drains, water courses or soil. Use authorized waste disposal facilities, including civic amenity sites and garages providing facilities for disposal of used oil. If in doubt, contact your local authority for advice.
- To get to know the correct methods to dispose of oils, filters, tyres etc. contact your Dealer or the local agency for waste recycling.
- Only for North America:
  The safety sheets of each material give information on chemicals contained in a product, procedures to use it safely, first-aid and procedure to be followed in case of leakage or spills. In all North America such safety sheets are available at the Dealer's.
  Before any maintenance on the machine, refer to the above mentioned safety sheets for fluids, oils etc. used in this machine. The sheets inform about risks and safe maintenance procedures. We strongly recommend to follow these indications during any maintenance operations.
- Disposal of the tractor: The tractor is made up of parts subject to rules and laws for their disposal. When the tractor is not used any more, it must be disposed of through proper agencies according to such rules. Do not pollute the environment with the tractor or its parts.

## SAFETY - TRACTOR MAINTENANCE
**[4.1.h]**

**CAUTION: With exception of normal service, as explained in the Maintenance section, all other servicing or reparations must be carried out by properly skilled personnel in authorised workshops.**

- DO NOT carry out maintenance operations while the engine is hot or the tractor is moving.

**WARNING: Hot parts of the machine are suitably guarded, wherever possible. This does not exclude, however, that great care should be used when working on the machine, to avoid burns or scalding. [4.1.n]**

- Before any adjustments or servicing on the electrical system, disconnect the battery by operating the master disconnect switch (if equipped) or disconnecting the cables of the battery. See the section concerning battery servicing.
- To prevent fire or explosion, do not go with free flames near the battery or cold starting device. Carefully follow the directions for the use of coupling cables to avoid sparks that may cause an explosion.
- Consult your Dealer for any repairs or adjustments; such works should be carried out by specialised workmanship.
- Check regularly that all nuts and bolts are securely tightened, specially the nuts in wheel hubs, disks or rims. Tighten to the prescribed driving torques.
- Check the oil level at regular intervals and top up if required.
- Check the brakes regularly, top up the reservoir and/or adjust where necessary. Make sure that the brakes are evenly adjusted, especially when using a trailer.

**WARNING: When it is necessary to carry out service, filling up, cleaning or adjustment operations in places at an height above 1.5 m (e.g. engine coolant reservoir or cab air filters, work light lamps etc.) a stable and safe mean (e.g. a ladder) is required to reach the service point.**

**WARNING: Work and road lights can be very hot and dangerous if on since a long time. Take care to avoid contacts that could cause burns. If work on these lights is needed, turn them off and let them cool down.**
**Always use safety gloves suitable for high temperatures.**

- Carry out the following operations before any operation about the tractor: engage the first gear, engage the parking brake, turn the engine off and remove the ignition key.

Maintenance operations must be carried out when the engine is cold. If the maintenance operation must be carried out while the engine is hot (e.g. when changing engine oil), start the engine and let it idle for the required time, then turn it off before the maintenance operation.

If you need to open the bonnet, follow the procedure indicated under “How to open the bonnet”. In this case beware the risk of burning and shearing.

Personal safety devices must be worn for each check and maintenance operation.

If the tractor must be lifted for servicing, take it to a suitably equipped workshop.
Carry out the following operations before any operation about the tractor: engage the four-wheel drive, the first gear and the parking brake and put chocks to the wheels touching the ground.
Before lifting the tractor, avoid its swinging by means of wooden wedges applied to the front axle (Fig.2-9b): the chocks must avoid any swinging of the tractor.
Use jack lifts of suitable capacity and apply them at the centre of the front and rear axles (Fig. 2-9b and Fig.2-9c) paying due attention to weight distribution. [4.1.k]
No decals for the lifting point are applied on the tractor, as they would be too difficult to apply in the available spaces and would be all too easily removed or effaced during normal operation of the tractor. Apply the jack lift to the lifting points (Fig. 2-10a ) according to the type of operation and following the safety procedures given before.

**WARNING: DO NOT raise the tractor using the tow hook.**

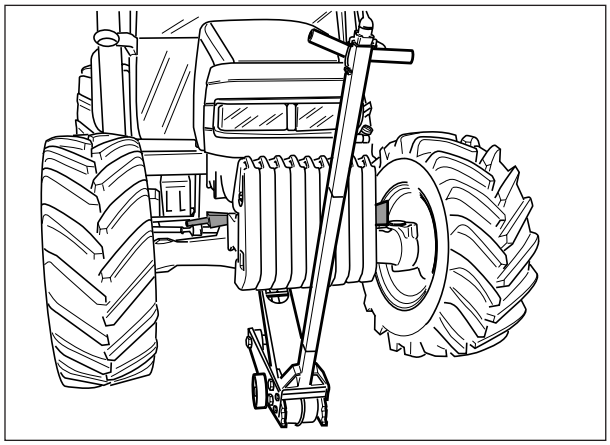


Fig.2-9b

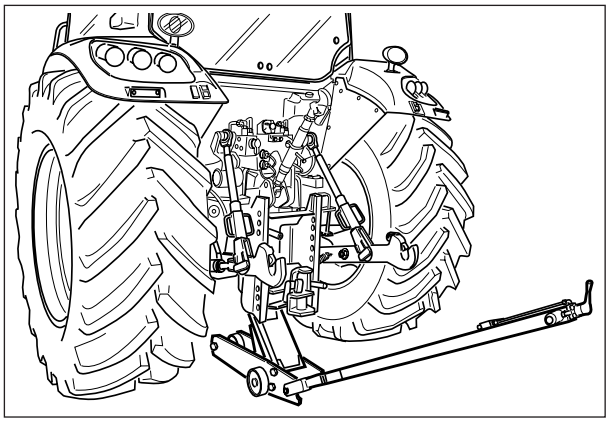


Fig.2-9c

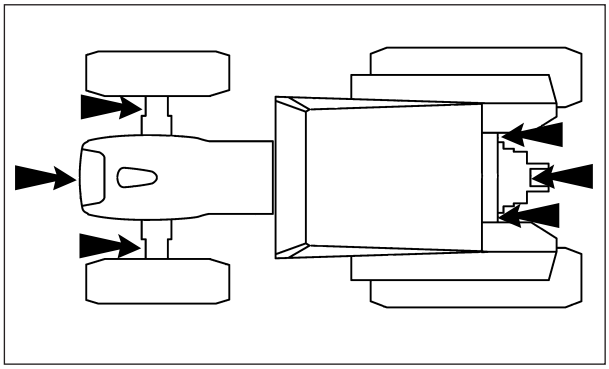


Fig.2-10a

## SAFETY - STARTING UP

### Warn bystanders before starting the engine.

Before starting, walk around the whole tractor and any attached equipment. Make sure that no one is under, on, or close to the tractor or equipment. Let other workers and bystanders know you are starting up and don't start until everyone is clear of the tractor, implements and towed equipment.

Make sure that everyone, **particularly children**, is in a safe position before starting the engine.

### Mount and dismount safely. [4.1.e]

Always use 'three point contact' with the machine, and face the machine when you mount it. Three point contact means both hands and one foot or one hand and both feet are in contact with the machine at all times during mounting and dismounting.

Clean your shoes and wipe your hands before climbing on. Use handrails, grab handles, ladders or steps (as provided) when mounting or dismounting.

NEVER use control levers as a hand hold and NEVER step on foot controls when mounting or dismounting.

NEVER try to go on or off the moving tractor.

## Safety at starting [4.1.c]

**WARNING: Make sure that there is enough ventilation before starting the engine. Never start the engine in an enclosed space. Exhaust fumes may cause asphyxiation (Fig.2-10b).**

Make sure that the tractor dual brake pedals are locked together at all times unless you are making turns in the field which require independent use of the brakes. Make sure the brakes are properly adjusted so that both brakes engage at the same time.

Adjust the seat and fasten your seat belt (if applicable, according the description in this book),

Always start the engine from the operator's seat, after depressing the clutch pedal, with all the transmission levers and PTO and auxiliary spool valve control levers in neutral.

**DANGER: The engine must be started with the ignition key only from the driver's seat. DO NOT attempt to start the engine by shorting across the terminals of the starter motor. If the starter circuit is bypassed to neutral, the tractor could start with an engaged gear, with danger of serious injury or death to bystanders (Fig.2-11).**

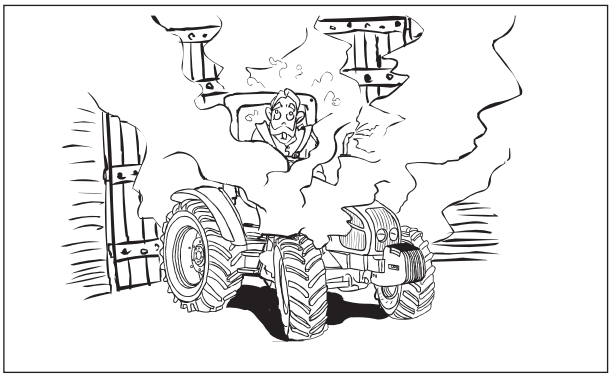


Fig.2-10b


Fig.2-11

### Follow recommended starting procedures.

Follow the starting procedures recommended in the Operation section of this Operator Instruction Book. This includes normal starting, cold starting, and the use of starting fluids.

### Overhaul the controls.

After engine ignition, overhaul all instruments and lights. Be sure that all are operating correctly. If the machine does not respond properly to controls, DO NOT use it until the fault is mended.

Make sure that the starter motor solenoid valve fuse is always installed.

### Starting fluid

**CAUTION: Do not inject fluids (ether) to make the engine easier to start in cold weather. The tractor is equipped with a cold weather starting system (Fig.2-12).**

Before starting the tractor, make sure that there are no persons or hindrances in its operating range (Fig.2-13).

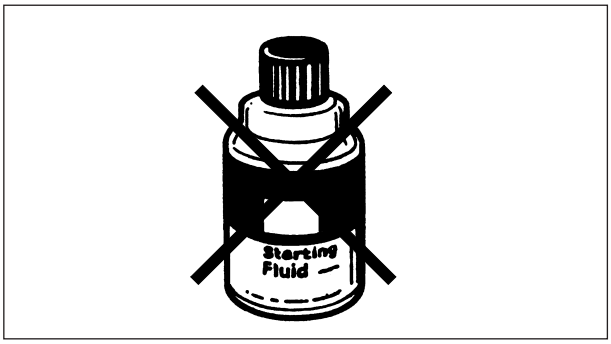



Fig.2-12

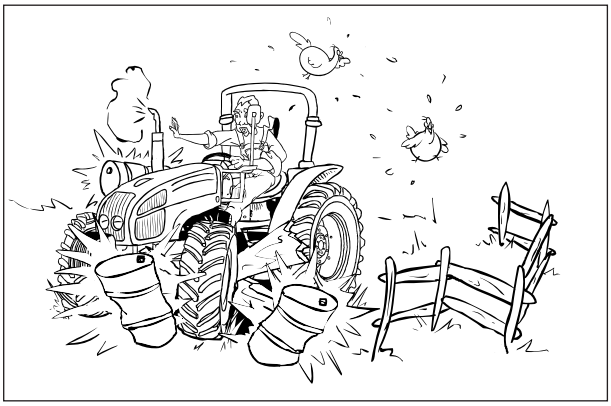


Fig.2-13

## DIRECTIONS TO AVOID IMPROPER USE OF THE TRACTOR

## WORKING IN SAFETY

**WARNING: An unbalanced tractor could overturn and cause injury or death. If required, put ballast weights on their front support and on rear wheels as described in this section of the Operation chapter. Ballast weights must be used according to the manufacturer's directions. NEVER add extra counterweights to compensate for an overload. It is better to reduce the load.**

**WARNING: Keep all parts of your body inside the operator's compartment while operating the tractor.**

### Follow the rules when using your tractor.

Be sure the tractor is ready for the job on hand. Learn the rated loads by heart and never exceed them. Make sure that any implement or equipment you are going to use does NOT exceed the load capacity of your tractor. Check that the coupling PTO shaft/implement is correct (see the Technical Specifications section for mass data).

Keep in mind that tractors normally operate on uneven, unpaved, and often bumpy or sloping surfaces. Operating conditions can reduce the amount of weight you should carry or pull.

### Follow safe operating practices

- Operate the controls smoothly - don't jerk the steering wheel or other controls.
- DO NOT get on or off a moving tractor. Keep a firm grip on the steering wheel at all times, with the thumbs clear of the spokes when driving the tractor.
- Always use specific personal safety devices for each operation.
- Make sure you have adequate clearance in all directions for tractor, cab, asfety frame and implement.
- NEVER play games with a tractor or equipment.
- NEVER attempt to work the controls except from the operator's seat.
- Before getting off the tractor, always disengage the PTO, lower all attachments and implements to the ground, place the tractor in neutral, engage parking brake, shut off the engine and remove the key.
- NEVER attempt to work the controls except from the operator's seat.
- Carry out the following operations before leaving the tractor: engage the first gear, engage the parking brake, turn the engine off and remove the ignition key.
  As an alternative, if the tractor is to be used as a fixed power unit, before leaving the tractor shift the gear to neutral, engage the parking brake and make sure there are no people within the operating range of the machine.

Do not start the tractor without ensuring a perfect command of speed and steering controls (Fig.2-14).

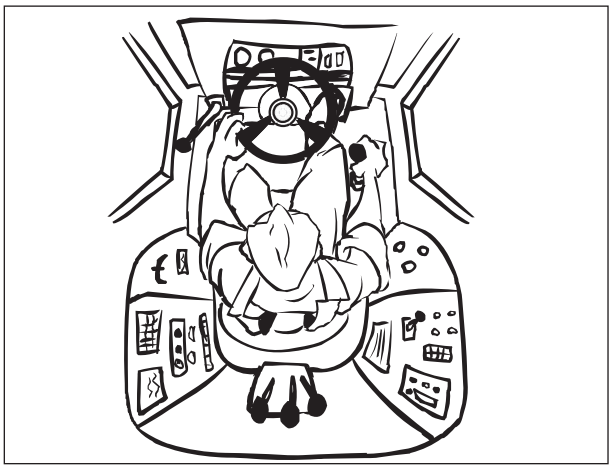


Fig.2-14

- Before starting, inspect the work area to establish the best and safest procedure. Plan your work so that you drive as straight as possible forward. Beware of trenches, pits, ditches, slopes, trunks or stumps, ponds etc. Watch for any possibly dangerous condition. If you are using a front loader or foldable implements or implements with high components, watch out for obstacle in the tractor's way.

**WARNING: Accidental contact with high-voltage lines causes death. In case of contact with high-voltage conductors DO NOT leave the tractor, but move the tractor and/or the loader in such a way as to eliminate the contact and reach a safe distance (Fig.2-15).**

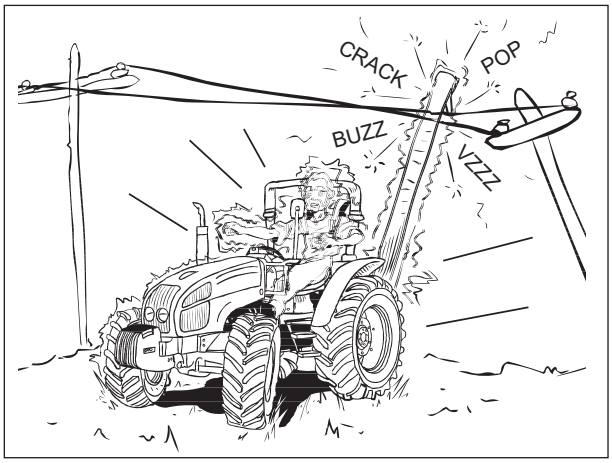



Fig.2-15

Beware of other people

- Think about what you are going to do. Never allow persons that are not qualified or suitably skilled to operate your tractor. They could be a danger for themselves or for others.

**WARNING: Your tractor is designed to be operated by one person. DO NOT allow others to ride on the tractor or the implement (Fig.2-16). Never allow anyone to ride on the implements or other equipment including trailers, except on certain harvesting equipment, specifically designed for riders during the actual harvest operation only (not during transport). Such equipment must have provision for a safe riding area. NEVER allow children on a tractor.**

**WARNING: Make sure you can safely control speed and driving direction of the tractor before moving it. Start slowly until you are sure everything is operating regularly. After starting, turn the steering right and left to check for correct operation. Check steering and brake system for operation. If differential is locked, DO NOT operate at high speed or turn the tractor until the differential lock is disengaged.**

- Keep others away from your operation area. Never allow anyone to stand or pass under a raised implement (Fig.2-17).
- DO NOT lift objects that cannot be contained safely in the bucket, get the appropriate attachment. Never allow anyone to stand on the safety frames or fenders.
- When using a loader, avoid sudden stops, starts, turns, or changes of direction. Keep loads as near as possible to the ground during transport.
- Never stand (or allow anyone else to stand) in front of, under, or behind loaded or loading equipment. Never drive a tractor up to someone standing in front of a fixed object.

**WARNING: NEVER lift a load over anyone (Fig.2-17).**

- Keep others away from articulation joints, hitches, drawbar, lift arms, PTO drives, cylinders, belts, pulleys, and other moving parts. Keep safety guards in place.

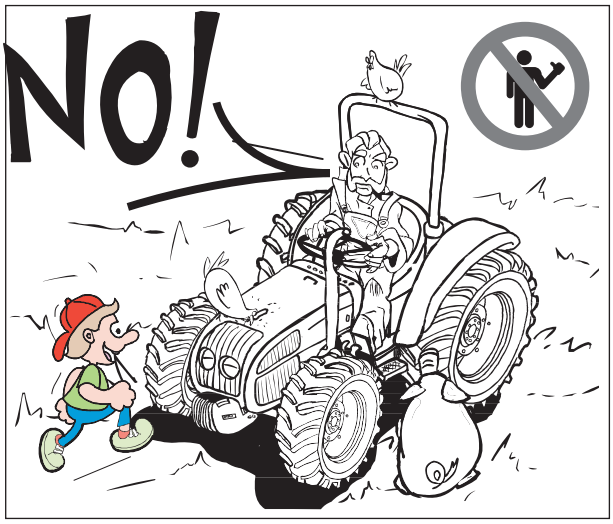


Fig.2-16

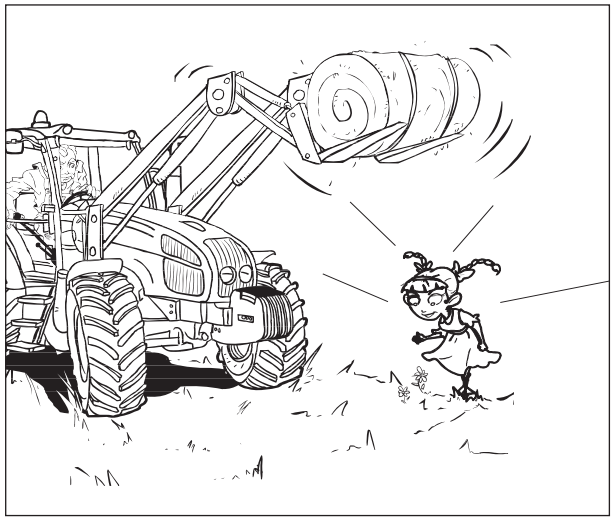


Fig.2-17

**WARNING: NEVER stand, or allow anyone else to stand between the tractor and implement unless the engine is turned off and the parking brake is engaged, a gear is engaged and all attachments or implements are lowered to the ground.**

**WARNING: NEVER stand, or allow anyone else to stand between the tractor and the trailer unless the engine is turned off and the parking brake is engaged and a gear is engaged. [4.2.m]**

## Risk of overturning

For your safety, tractors must be equipped with original safety belts (Fig.2-18).

In case of overturning, hold firmly the steering wheel e DO NOT try to get off the seat until the tractor has come to a stop. If the doors are locked, leave the tractor through the duly indicated emergency exits (Fig.2-18).

**IMPORTANT: The safe working practices listed hereunder concerns only a few cases of overturning risk. The list is therefore NOT comprehensive of all possible cases. [4.1.m]**

## To avoid side overturns

- Set the wheel track at the widest setting suitable for the job being done.
- Lock 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.
- Make wide slow turns at reduced speed. DON'T let your tractor bounce. You may loose steering control.
- DON'T pull a load too heavy for your tractor. It could run away on the down slope or the tractor could jackknife around a towed load.
- DON'T brake suddenly. Apply brakes smoothly and gradually.
- When going down a slope use the throttle to slow the tractor engine and use the same gear you would use to up the slope. Shift into gear before you start downhill.
- Engage four-wheel drive (if equipped); this will give greater stability.

**WARNING: NEVER disengage the clutch or attempt to shift gear after you have started downhill.**

- Always go up and down slopes following a straight upward or downward line.
- Do not overload a front implement or a trailer. Use suitable counterweights to keep the tractor stable (Fig.2-20).
- If a load is towed at transport speed, the drawbar must be locked in central position.
- NEVER use the tractor to round up animals or cattle.

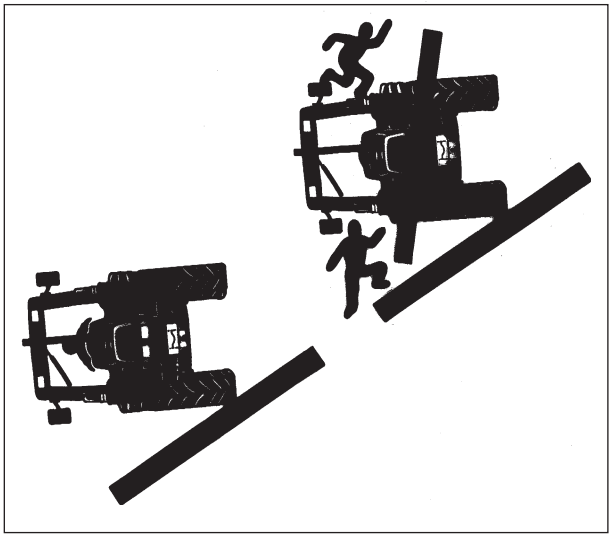


Fig.2-18

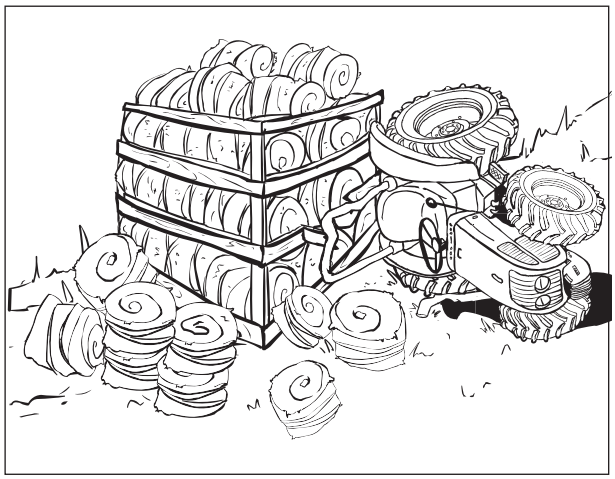


Fig.2-19

Fig.2-20

- Avoid crossing steep slopes if possible. If you must do so, avoid any holes or depressions on the downhill side. Avoid any stumps, rocks, bumps or raised areas on the uphill side. When operating near ditches or banks, always keep your tractor behind the shear line (A, Fig.2-22). Avoid ditches, embankments and river banks which might cave in (Fig.2-21).

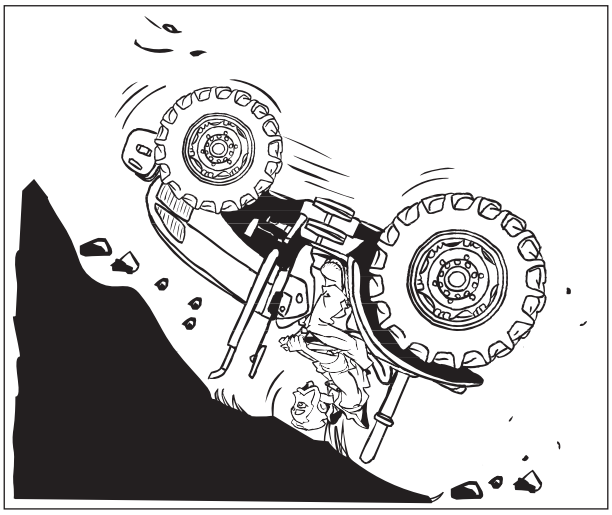


Fig.2-21

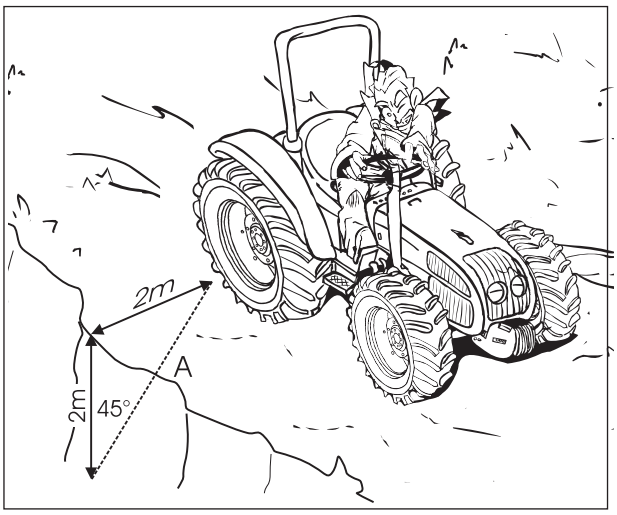



Fig.2-22

- If you need cross a steep slope, do not steer uphill, but slow down and take a wide turn. Always drive straight up or down a slope, never across it. When travelling up or down a slope, keep the heavy end of the tractor and the implement pointed uphill. (Fig.2-23)
- When driving across a slope with mounted implements, keep such implements on the uphill side (Fig.2-24). Do not raise implements. Keep them as low and near to the ground as possible.
- Avoid crossing steep slopes if possible. If you must do so, avoid any holes or depressions on the downhill side. Avoid any stumps, rocks, bumps or raised areas on the uphill side (Fig.2-25).

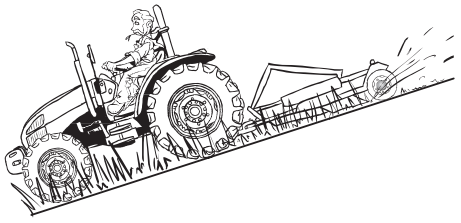


Fig. 2-23

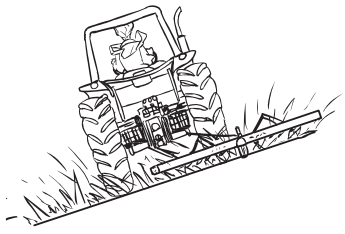


Fig. 2-24

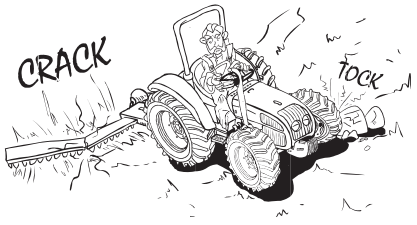



Fig. 2-25

To avoid rear overturns

**WARNING: Hitching to the rear axle, or any other point above the swinging drawbar, can cause a rear overturn.**

- DO NOT pull anything using the top link connection, or from any point above the centre line of the rear axle. Always use an approved drawbar, and only use a drawbar pin that locks into place.
- High hitching can cause rear overturn, which may cause serious injury or death. Hitch loads to the drawbar only.
- Use front counterweights to increase tractor stability when towing a heavy load or to counter balance a heavy rear mounted implement (Fig.2-26).
- DO NOT overload your tractor and DO NOT ballast it beyond its carrying capacity. Never add ballast weight to conterbalance an overload. Reduce the load instead (Fig.2-27).

**WARNING: Overload is ALWAYS dangerous. Check the load capacity of your tractor and NEVER exceed it (Fig.2-28). See the Technical Specifications section.**

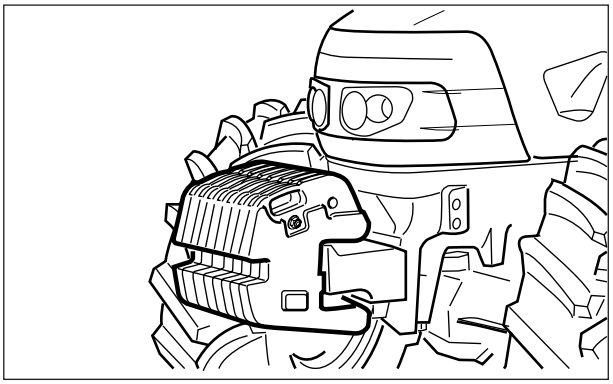


Fig. 2-26

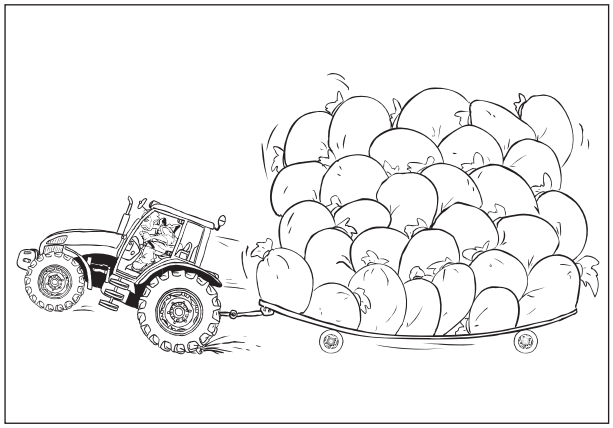


Fig. 2-27

Fig.2-28

- Start slowly and increase your speed gradually. DO NOT rev the engine or drop the clutch. If the tractor is attached to a heavy load, or immovable object, improper clutching may cause overturn (Fig.2-30 and 2-31).
- If the front part of the tractor begins lifting, disengage the clutch at once (Fig.2-29).
- If your tractor is bogged down in mud or frozen to the ground, DO NOT attempt to drive forwards. The tractor can spin around its rear wheels and overturn (Fig.2-29). Lift any attached implement and attempt to BACK OUT. If this is not possible, tow it out with another vehicle.
- If you get stuck in a ditch, BACK OUT, if possible. If you must go forward, do it slowly and carefully.
- When driving on a slope with a trailer hitched at the back you should drive the tractor in forward gear when moving both uphill and downhill.
- A tractor with a loaded front-end (e.g. loader, bucket etc.) and without a rear trailer should be backed down the slope and travel forward uphill. Always keep the loader bucket as low as possible. (Fig.2-31b)
- Always keep the tractor in gear when going downhill. Never let the tractor coast with clutch disengaged or transmission in neutral.

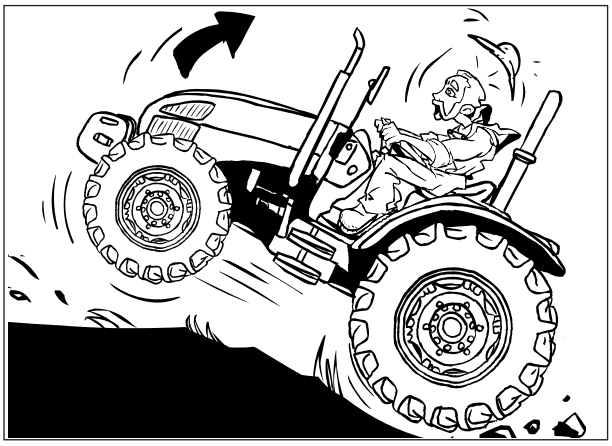


Fig.2-29

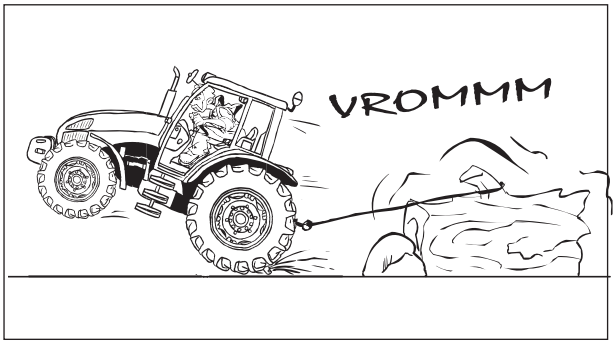



Fig.2-30

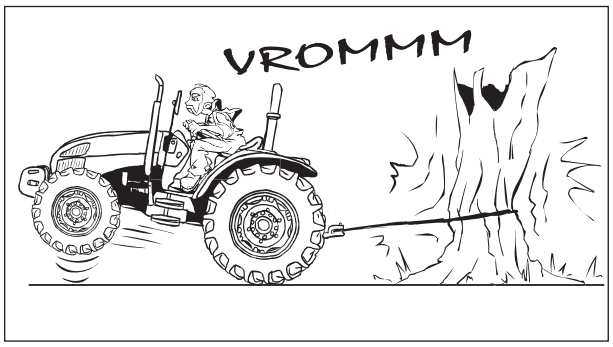



Fig.2-31

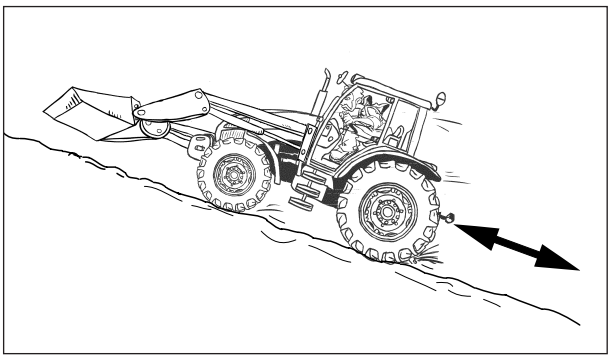


Fig.2-31b

General operating hazards [4.2.e][4.2.b]

- Ensure that the PTO shield (1) is in place and that the cap (2) is fitted when the PTO driveline is not in use (Fig. 2-32).
- Before connecting, disconnecting, cleaning or adjusting implements driven by the power take-off, disengage the PTO, turn the engine off, remove the ignition key and make sure that the PTO shaft is at standstill (Fig.2-33).
- Ensure that all the PTO driveline guards are in place and observe all safety signs (Fig. 2-33).
- Make sure that everyone stands clear of the tractor before engaging the PTO. During stationary use of your tractor, always shift the gear lever, the reverse shuttle and the ranges to neutral, engage the parking brake and secure the wheels of tractor and implement with wooden wedges or chocks.
- When working with implements powered by power take-off, never leave the driver's seat unless the PTO is disengaged, the first gear and the parking brake are engaged, the engine is off and the ignition key removed. As an alternative, if the tractor is to be used as a fixed power unit, before leaving the tractor shift the gear to neutral, engage the parking brake and make sure there are no people within the operating range of the machine.
- DO NOT use PTO adaptors, reducers or extensions as they extend the PTO coupler and universal joint out beyond the protection offered by the PTO shield.
- The top link and lift rods must not be extended beyond the point where threads begin to show.

**DANGER: NEVER attempt to unplug the hydraulic connections, or adjust an implement with the engine running or the PTO drive in operation. There is a great danger of serious or deadly injuries (Fig.2-34).**

- When using chemicals, carefully follow any directions for their use, storage and discharge. Also follow the directions given by manufacturers of equipment for applying chemicals. Always use specific personal safety devices for each operation.
- When operating under poor visibility conditions, or in the dark, use your tractor field lights and reduce your ground speed. (**DO NOT** use your field lights when travelling on a roadway because rear pointed white lights are illegal except when reversing and may confuse following drivers).
- Operate your tractor with the wheels set at the widest setting possible, consistent with the particular task you are performing. To adjust wheel settings refer to Maintenance and Adjustment section.
- Reduce your speed when operating over rough or slippery ground and when foliage restricts your view of hazards.
- **DO NOT** make sharp turns at high speed.

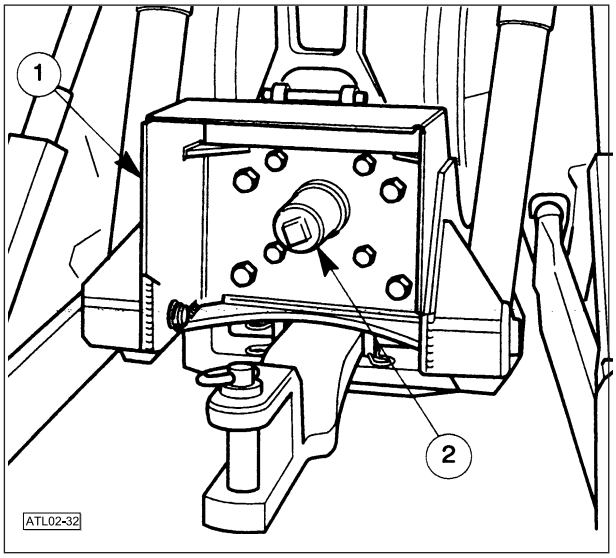


Fig.2-32

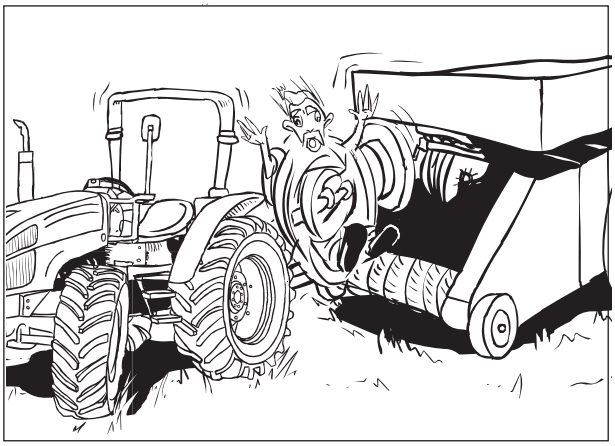


Fig.2-33

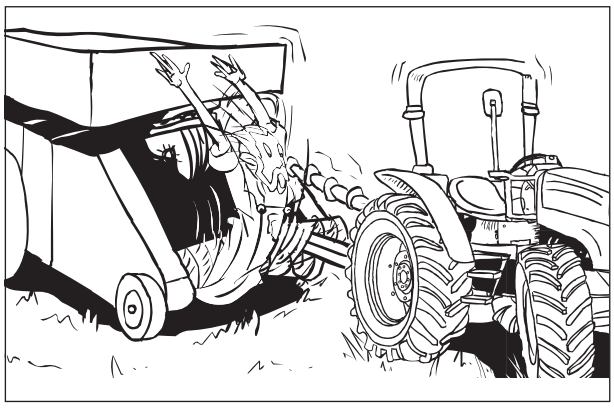


Fig.2-34

Implements and attachments [4.5.1.1]

**WARNING: Use exclusively front loader approved by the tractor's manufacturer, with CE mark and parallelogram type. The installation and modification of the tractor must be carried out with the highest technical standards by specialised workshops with qualified personnel. Such workshops must be able to guarantee and attest the risk analysis provided for in the Machinery Directive 2006/42/EC concerning the foreseen and predictable use of the tractor with front loader, in order to carry out all required adaptations of the tractor. Use the front loader and all supplied equipment as prescribed by the loader's operator manual.**

*IMPORTANT: Keep the loader's operation manual together with the tractor's manual, always at hand in the storage compartment of the tractor. Before driving or operation your tractor, it is mandatory to read this manual very carefully, with special attention to the chapter concerning safety rules.*

**WARNING: Use of the front loader and of the tractor equipped with front loader, if not correctly carried out, and handling not secured loads constitute a serious danger for the operator and everyone standing by, due to possible objects falling from above. (Fig. 2-35) [4.5.a]**

- Three-point hitch and side mounted implements make a much larger arc when turning than towed equipment. Make certain to maintain enough clearance for safe turning. [4.2.b]
- To use mounted, semi-mounted or towed equipment and trailers it is required to use exclusively CE marked implements, after reading their operation handbooks carefully, giving maximum attention to risks connected with their association to the tractor. [4.2.a]
- Implements must be hitched to the tractor by means of the three-point linkage. It is therefore necessary to check couplings for compatibility according to their classes.
  The implement has to be fitted with suitable supports in order to avoid tipping or accidental shifting during hitching.
  Always check three-directional fastening to the tractor of the mounted or semi-mounted implement, to avoid dangerous swinging and shaking during transport and work that could jeopardize the stability of the tractor-implement assembly.
- The cardan shaft must be always CE-marked and suitable to tractor-implement coupling. Follow all directions of the operation manual, concerning both the fastening according to connection direction and safety rules to avoid rotation of protections (chains) and overlaying of the telescopic tubes. Also keep articulation angles. [4.2.e][4.2.k]
- Hitch loads to the drawbar only. Towing or attaching to other locations may cause the tractor to overturn (Fig.2-36)

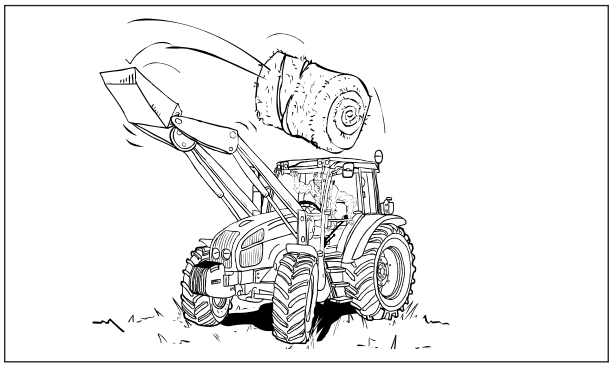


Fig.2-35

**To reduce the risk:**
**- Use only loaders equipped with load self-leveling system, commonly defined as parallelogram type.**
**- Use only implements that are specifically dedicated to the work to be done. Strictly follow all directions and warnings mentioned by the loader handbook. [4.1.g]**
**- Use the tractor and implement carefully. Drive on flat ground and avoid holes, ditches and trenches. Do not turn, start or stop abruptly.**
**- If a front loader is mounted, it is advisable to use a tractor with cab or with a 4-post frame with FOPS safety system. The loader installer should carefully analyze all risks and make all required adjustments.**

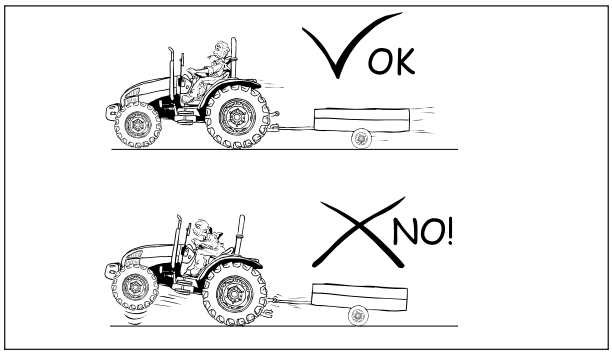



Fig. 2-36

- Improper use of the drawbar, even if correctly positioned, can cause a rear overturn.
- DO NOT overload an attachment or towed equipment. Use proper counterweights to maintain tractor stability. Hitch heavy loads to the drawbar only.

- Check for correct coupling between tow hook and trailer. See the Towing Attachments chapter.
- Use ballast weight as recommended. NEVER add more ballast to compensate a higher load than allowed. Reduce load.
- Only North American markets. A safety chain will help control drawn equipment should it be accidentally separated from the drawbar while transporting. Using the proper adaptor parts, attach the chain to the tractor drawbar support or other specified anchor location. Provide only enough slack in the chain to permit turning. See your Dealer for a chain with a strength rating equal to, or greater than the gross weight of the towed machine (Fig.2-37).

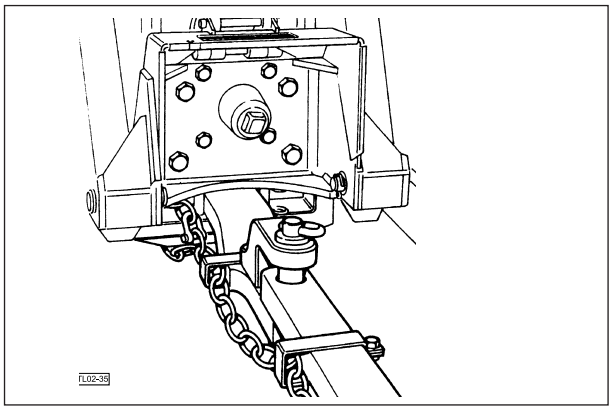



Fig.2-37



## Road transport

Before operating your tractor on a public road, a number of precautions must be taken.

- Family yourself - and comply - with all local bye-laws, and national laws appropriate to your tractor.
- Lock both brake pedals together.
- Raise all implements to their transport position and lock them in place.
- Place all implements into their narrowest transport configuration.
- Disengage the PTO and differential lock.
- Make sure tractor and equipment are equipped with slow moving vehicle (SMV) signs or beacon if the law requires them (Fig.2-38 and 2-39).
- Make sure any required clearance flags or hazard lights are in place and in working order.
- Make sure you use a proper safety hitch pin with a safety clip retainer.
- Clean off all reflectors and road lights, front and rear, and be certain they are in working order.
- Three-point hitch and implements jutting out from the sides make a much larger arc when turning than towed equipment. Make certain to maintain enough clearance for safe turning.

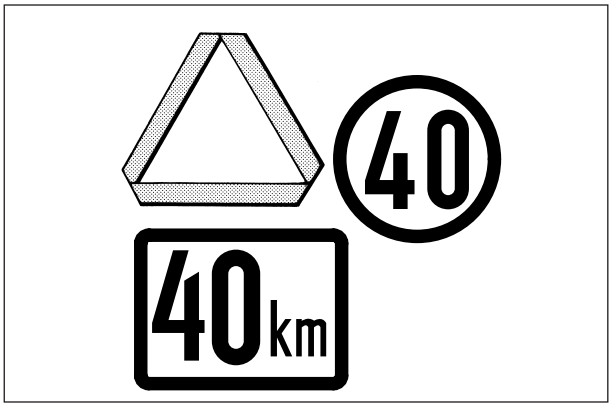



Fig.2-38 - Use the symbol in force in your country

## Road circulation rules

Before operating your tractor on a public road, a number of precautions must be taken.

**WARNING: DO NOT allow any passengers on the tractor or towed equipment.**

- Know the route you are going to travel.
- Use the prescribed lights or, if required, the rotating beacon, both in the daytime and in the night-time (Fig.2-39).
- North America - Use regulation lights and blinking hazard lights when travelling on road.
- Use caution when towing a load at transport speeds especially if the towed equipment is NOT equipped with brakes.
- Observe all local or national regulations regarding the road speed of your tractor.
- Use extreme caution when driving on snow-covered or slippery roads.

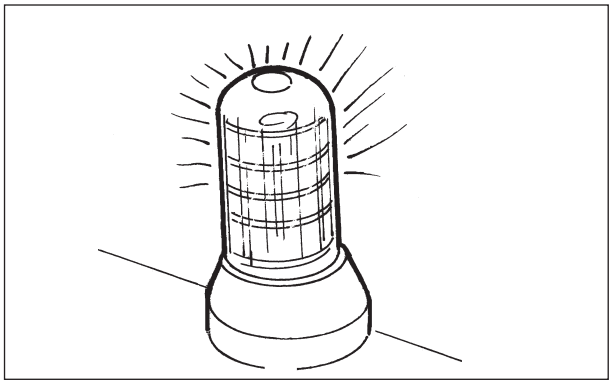


Fig.2-39

- Wait for traffic to clear before entering a public road.
- Beware of blind intersections. Slow down until you have a clear view.
- DO NOT attempt to pass at any intersection.
- Slow down for turns and curves.
- Make wide, gentle turns.
- Signal your intent to slow, stop or turn.
- Shift to a lower gear before going up or downhill. (Fig.2-40)
- Keep tractor in gear. Never coast with the clutch disengaged or transmission in neutral (Fig.2-40).
- Check for correct coupling between power steering on the tractor and corresponding system on the tractor.
- STAY OUT of the path of oncoming traffic.
- Drive in your correct lane keeping as near to the curb as possible.
- If traffic builds up behind you, pull off the road and let it go by.
- Drive defensively. Anticipate what other drivers might do.
- When towing a heavy load, start braking sooner than normal and slow down gradually.
- Watch out for overhead obstructions (bridges, trees etc.).

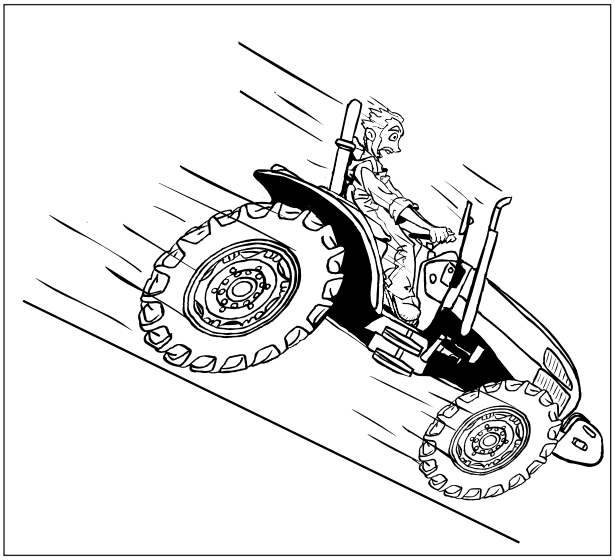


Fig.2-40

## SAFETY - AFTER USE [4.2.c]

Always stop the tractor safely (DO NO park the tractor on a slope). Engage the parking brake, engage the Park-Lock (if equipped), disengage the PTO, engage the lowest gear, lower any implement to the ground, stop the engine and remove the ignition key BEFORE leaving the driver's seat (Fig.2-41).

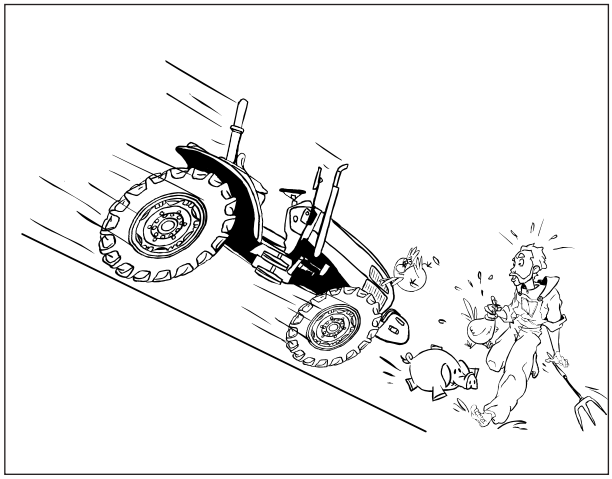


Fig.2-41

## Further notes

The following notes are designed to complete the Operation and Maintenance Manual to ensure that your tractor always works safely, reliably and efficiently.

Tractors are mainly designed for hitching implements that are held by a drawbar or three-point linkage or for driving implements using the PTO.

To obtain the greatest possible towing force, particularly when using a tractor with dual rear wheels, you should observe the following rules concerning axle loads and wheel slip.

If an extra implement is attached, the extra loads must conform to the specifications given in the Manual or by your dealer.

1. Front axle payload: 4WD tractors.

   The front axle normally bears 40% of the tractor weight on the road without implements; it may thus be necessary to add an extra weight on the front end to ensure that the front axle has traction.

   If an implement is mounted on the front end of the tractor, check the weight of the fully loaded implement by placing the front axle on a scale: the maximum axle load must be less than the capacity of the front axle.

   Check the maximum payload capacity of the front axle (maximum weight allowed on it) in your Operation and Maintenance Manual).

2. Rear axle payload.

   The maximum permissible payload for the rear axle depends on whether or not the tractor is carrying a weight or towing a load.

   When the tractor is only carrying a load, without towing, the wheels must have sufficient capacity that is ensured if the tyres are of the exact size and have the specified number of plies.

   In certain conditions, extra weight may be applied to the rear axle but it is not normally necessary unless the ground offers very little grip.

   When fully loaded, the weight of the tractor must be less than the maximum permissible ballasted weight since the tractor cannot be loaded right up to the maximum static payload for each of the axles, front and rear, at the same time.

3. Ballast and wheel slip.

   Wheel slip must be measured for the tractor to operate efficiently during tillage.

   On normal terrain in good operating conditions, wheel slip should be between 4 and 10%.

   On loose soil, wheel slip can exceed 12%.

   If wheel slip is found to be greater than this amount, proceed with care as operating conditions might quickly become unstable and cause early tyre wear.

   In certain conditions, it might be better to add ballast in order to reduce wheel slip, but this increases the workload of the transmission and thus reduces the working life of the tractor.

   Read the operation handbook or ask your Dealer who will be able to help you ascertain the maximum ballast weight you can use in normal working conditions.

   Using dual wheels or wider tyres, the tractor will have greater grip but the workload on the transmission will also be greater in dry and difficult soil conditions.

   Dual wheels or wider tyres can sometimes be mounted for use on slippery or sandy terrain but the axle weight on hard, dry surfaces must be limited as the greater grip provided by wider tyres can damage the transmission.

   The only torque limiter in transmission is wheel slip.

4. Front axle lead when four-wheel drive is engaged.

   In a 4WD tractor, the ground speed of the front wheels must be slightly greater than that of the rear wheels, in order to ensure traction.

   The front wheel advance must be preferably between 1% and 4%, at an rate not over 5%.

   Greater percentages may be used only on very soft ground.

   The tyres supplied with your tractor have been checked for the correct advance of the front wheels, but when you change them, make sure you use tyres of the same make and size in order to maintain the same speed ratio between front and rear wheels.

   If tyres of different makes are used, their size and internal pressure may modify this ground speed ratio, or advance. This could increase the load on the front axle and lead to unacceptable operating conditions, excessive tyre wear and, in extreme conditions, damage to the front axle or to the transmission.

   Changes in the weight of the tractor, in the pressure or size of the tyres can cause the tyres themselves to bounce. This is not only annoying for the driver in the cab, but it can also cause a loss of grip and excessive wear in the transmission unit.

5. Economy PTO.
   As shown in the Operation and Maintenance Manual, the economy PTO on large tractors is a feature that makes it possible to use the PTO at standard speed using lower engine RPM rates.

   This feature can only be used when the implements powered by the PTO are to be used only for light operations, such as for sprinklers or rakes, which require less than 30 H.P.

   The economy PTO does not need to use the maximum power of the engine but it is designed to save fuel.

   When using the Economy PTO, make sure that the implement input shaft RPM NEVER exceeds the recommended RPM for the implement, e.g. max. 610 RPM for a 6 spline shaft (540 RPM), and max. 1170 RPM for a 21 spline shaft (1000 RPM).

6. Working on slopes.
   The Operation and Maintenance Manual provides information on using the tractor on slopes in a safe manner

   It is also important to note that, when working on very steep slopes, the lubrication conditions in the transmission may be reduced. This is caused by the oil flowing towards the front or rear part of the transmission unit.

   Special measures and extra lubrication may be required when using the tractor under extreme conditions.

   Your dealer will be able to assist you if you expect to work on slopes of over 15°.

7. Remote hydraulic controls.
   The hydraulic system of the tractor may be used in some particular applications to operate the hydraulic motors.

   When using these applications, note that the hydraulic motors can generate considerable heat and the oil cooling system of the tractor may not be sufficient when these high-power hydraulic motors are used.

   Some remote applications have an extra cooling system. However, every time they are used, make sure that the oil is cooled and filtered sufficiently in order to avoid damage to the tractor's hydraulic system.

8. Towing heavy loads (trailers, etc.)
   When heavy loads are towed, the road rules in some countries require a supplementary braking system (e.g. air or hydraulic trailer brakes).

   Check with your dealer possible additional requirements for special spplications

9. Operating a dry-disc clutch.
   Most tractors with a manual gearshift are equipped with a dry-disc clutch for changing gear.

   Since the clutch slips every time the gear is changed, it can cause a certain amount of wear and thus create heat. To ensure long life for the clutch, it is thus advisable to reduce the load of the tractor and reduce engine speed when starting up the tractor from a standing position.

   Prolonged slipping at high engine speed with large loads will cause the clutch disc to heat up, thereby reducing its working life.

10. Further instructions for the operator.
    The Operation and Maintenance Manual provides instructions to ensure that the tractor is always used in safe conditions.

    If your tractor is also driven by other people, make sure that they are fully aware of these accident prevention instructions.

    It is forbidden to carry anyone on the outer structure of the tractor in any circumstances.

    This is because the safety frame that protects against overturning is only designed to protect persons inside the cab or roll-over protection structure.

11. Chemical filters for the cab. [4.5.c]
    Use of a filter with chemical absorbent in air-conditioned cabs can increase the degree of protection in certain applications.

    PERSONAL PROTECTION EQUIPMENT MAY BE HOWEVER NECESSARY WHEN USING CHEMICAL SUBSTANCES.
    Wash the tractor and driver's seat accurately according to the directions on the product label.

    ALWAYS follow the instructions on the labels of the chemical substances and on the filters to be used.

12. Battery
    For detailed information, see the sections Maintenance - Electric system.

## Risks deriving from exposure to noise

### Noise characteristics and measurement

Noise is a pressure variation in an elastic medium, generally the air, produced by the vibration of a material body (source) that determines an undesired and often annoying acoustic sensation. Noise is mainly characterized by:

- **sound intensity or level:** expresses the entity of the pressure variation due to the sound wave. Measured in decibels (dB), it doubles the sound intensity and, thus, the energy that reaches the ear.
- **frequency:** expresses the number of pressure variations of the wave per second and is measured in Herz (Hz) - acute noises have high frequencies (2000-4000 Hz or more) while low-pitched noises have low frequencies (250 Hz or less).

## How the risk is evaluated

The higher the sound level and exposure time, the greater the noise risk will be.

Two parameters are used:

- **LAeq** (Equivalent continuous weighted level A): this is a sound level measurement that takes into account noise fluctuations and the varying sensitivity of the ear to the frequencies: LAeq is measured with a sound-level meter;
- **PEL** (Personal Exposure Level): this is a measurement that takes the various noise levels into account along with the time the worker remains on the individual machines or working at determined processes: PEL is calculated mathematically.

## Noise Pathologies

### Damage To The Hearing

Noise causes hypoacusis or deafness because it destroys the acoustic receptors, nervous cells able to transform the mechanical sound vibrations into nervous impulses that, on reaching the brain, determine the aural sensation. These receptors are irreplaceable if they are destroyed and the resulting damage is irreversible: hypacusia worsens if exposure to noise continues and does not improve even if this terminates.

Moreover, it is also bilateral since it can be accompanied by annoying buzzing and whistling sounds, and by intolerance to loud noise.

The damage is insidious since it proceeds slowly and unexpectedly: in the initial phase, when it is limited to a diminished ability to perceive acute sounds (music, bells) or the spoken voice when there is a background noise, it can only be detected by means of an audiometric test. Pulsating noises of great intensity lasting a very short time are highly damaging since the ear is unable to actuate any physiological protective measures in time.

Hypacusia from noise generally arises after several years of exposure and depends on the PEL (risk almost null below 80 dBA) and on individual characteristics. It is an incurable disease: the only efficacious means of protection against it is prevention.

### Other effects

Noise does not just determine aural sensation. For levels exceeding* 70 dBA, it causes stress by means of the cerebral integration centers and determines a specific neurovegetative reaction responsible for effects that lead to cardiocirculatory and gastroenteric diseases.

Amongst these, it is worthwhile noting: an increase in gastric acidity, a decrease in the heart rate, visual range and reflex speed; a sensation of discomfort and weariness with an increased sense of fatigue.

These effects are dangerous because they also increase the risk of accidents.

## Personal equipment to protect against noise

Individual protective equipment attenuates the sound energy transmitted to the ear through the air.

This equipment is used when dangerous exposure cannot be avoided in any other way.

There are different types of devices with different attenuating capacities: helmets, ear muffs, ear plugs (Fig. 2-42).

Helmets and headsets have the highest dampening capacity and their use is mandatory when working off road and noise is over the above limits.

Earplugs are generally better tolerated and are particularly useful for prolonged exposition to lower noise levels.

**CAUTION: It is prescribed that suitable personal hearing protection be used if exposed every day to a noise level equal or higher than 85 dBA.**

**Consult the "Technical specifications" section of this manual in relation to tractor noise measured in instantaneous conditions in compliance with the laws in force.**

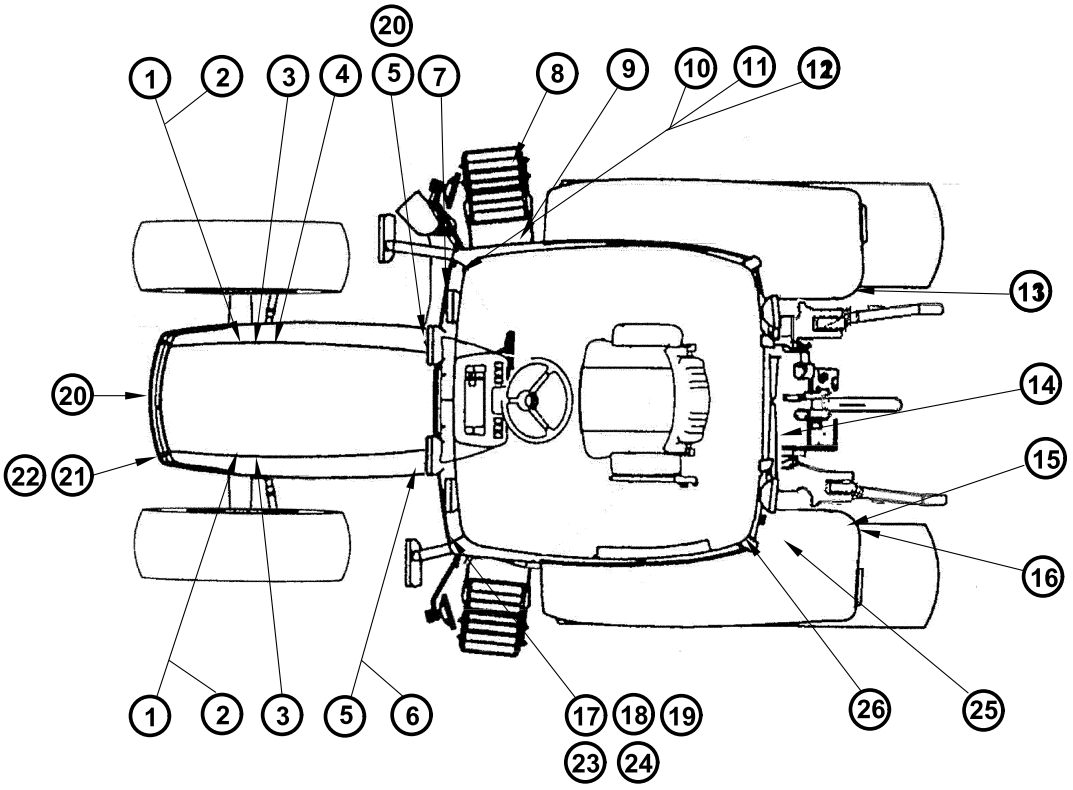
**CAUTION: Do not open the windscreen, the doors or the side and rear windows during work. The noise in the cab could rise to such level as to oblige the operator to wear headsets or other individual protection against noise.**

Helmets and headsets have the highest dampening capacity and their use is mandatory when working off road and noise is over the above limits.

## POSITIONS OF THE SAFETY DECALS
## All markets (North America excluded)

**WARNING: Decals must be always readable. Failing this, ask your Dealer for new ones.**

### Fig.2-43 Position on tractors with cab




**DECAL 1**

**WARNING: Very hot surfaces. The hands and fingers could be scorched. Keep well clear of hot parts. Keep at a safe distance. Keep all guards mounted when the engine is running.**

**DECAL 2**

**WARNING: Danger of entanglement. Keep hands well clear of moving parts and be careful not to get caught up in belts or pulleys when engine is on. Keep guards in place.**

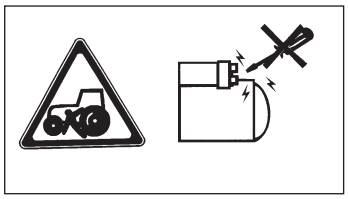
**DECAL 3**

**WARNING: Danger of entanglement. Keep hands well clear of fan blades when engine is running. Keep guards and screens in place.**

**DECAL 4**

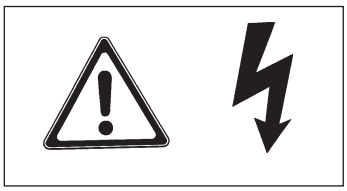
**DANGER: Hot steam or water jets. Protect your face. Radiator under pressure when engine is hot. Remove cap with caution only when engine is cold.**

### DECAL 5



**DANGER: Risk of being crushed. DO NOT short across starter terminals to start the engine. This operation could put your life at risk. Start engine only from driving seat.**

### DECAL6



**WARNING:**
**Risk of electrocution. Always disconnect the negative terminal of the battery before removing the solenoid cover and before servicing the electrical system.**

### DECAL 7

**WARNING: Very hot surfaces. The hands and fingers could be scorched. Keep well clear of hot parts. Keep at a safe distance. Keep all guards mounted when the engine is running.**

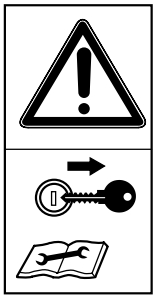
### DECAL 8

**WARNING: Danger of being crushed. Enter or leave the tractor through the left-hand door. If entering or leaving the tractor through the right-hand door, avoid any contact with control levers.**

### DECAL 9

**WARNING: Risk of electrocution. Always disconnect the negative lead before the positive lead when removing the battery or servicing the electrical system.**

### Decal 10



**WARNING: General warning. Turn off the engine and remove the ignition key before any servicing operations and before getting off the machine for any reason.**

### DECAL 11

**DANGER:The tractor could overturn and crush the chest. Hold firmly on to the steering wheel if the tractor is overturning. DO NOT leave your seat or jump off the tractor.**

### DECAL 12

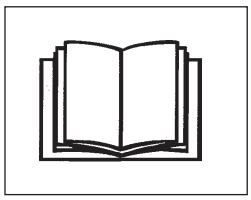
**WARNING:Danger of being crushed. In tractors with cab, always fasten your seat belt.**

### DECAL 13

Only with electronic hitch.

**DANGER: Risk of blows and serious accidents. Keep to one side of the tractor when using external lift controls. NEVER STAND between tractor and implement - you could be hit by the implement.**

### DECAL 14



(If equipped with a front hitch - Located near the multi-purpose control valve)

**WARNING: Before operating the multi-valve, read the safety and operating instructions in your Operator's Manual.**

# Safety notes

**DECAL 15**

**DANGER: Risk of entanglement. Keep clear of rotating shafts. Be careful NOT to get caught up by the cardan shaft of the PTO driveline. Keep all guards in place on the transmission shafts on the tractor and implements.**

**DECAL 16**

Only with electronic power lift.

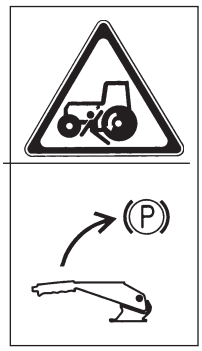
**DANGER: Risk of blows and serious accidents. Keep to one side of the tractor when using external lift controls. NEVER STAND between tractor and implement - you could be hit by the implement.**

**DECAL 17**

**WARNING: Risk of being crushed. DO NOT allow any passenger to sit on the fenders or on any other part of the tractor or towed implements.**

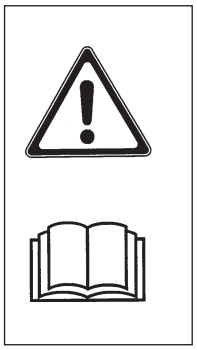
**DECAL 18**

**DANGER: Danger of being crushed. Always pull the parking brake lever and engage the Park Lock (if equipped) when you stop the tractor and before getting off it.**




**DECAL 19**

**WARNING: Take care. Read this book through before using the machine. Read the directions for a safe usage with the greatest attention.**



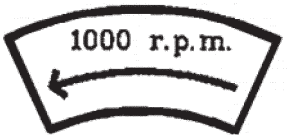
**DECAL 20**

**WARNING: Risk of damage to the tractor components. (In particular, the circuit of the suspended front axle, if equipped). Before servicing, it is essential for you to have read through the warnings and the instructions in the Operator's Manual.**

**DECAL 21**

Located near the front hitch (if equipped).

**DANGER:Beware of hanging loads. Keep at a safe distance to avoid being hit or crushed.**




**DECAL 22**

Provided by the front PTO maker. (If equipped with Front PTO)

**WARNING: Keep yourself at a safe distance. Speed (rpm) and spinning of the front PTO shaft.**

**Decal 23**

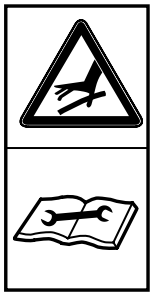
**WARNING: Use individual protections during work, such as overalls, heavy duty gloves and safety footwear.**


**Decal 24** **[4.1.p][4.5.3]**

**WARNING: Tractors with cab have no protection against harmful substances and dusts (protection level 1). If the tractor is used in dusty environment and to spray phytosanitary products or chemicals generally thought of as hazardous to health, the operator must wear individual protections (mask, goggles) suitable to the harmfulness of the actual product used.**

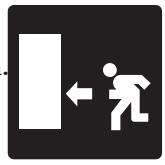
**Decal 25**

**WARNING: Danger of liquid under pressure being ejected from hydraulic circuits.**



**Decal 26**

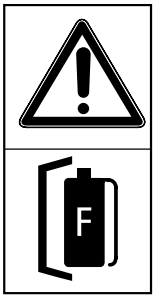
**WARNING: Emergency exit indication.**



**Decal**

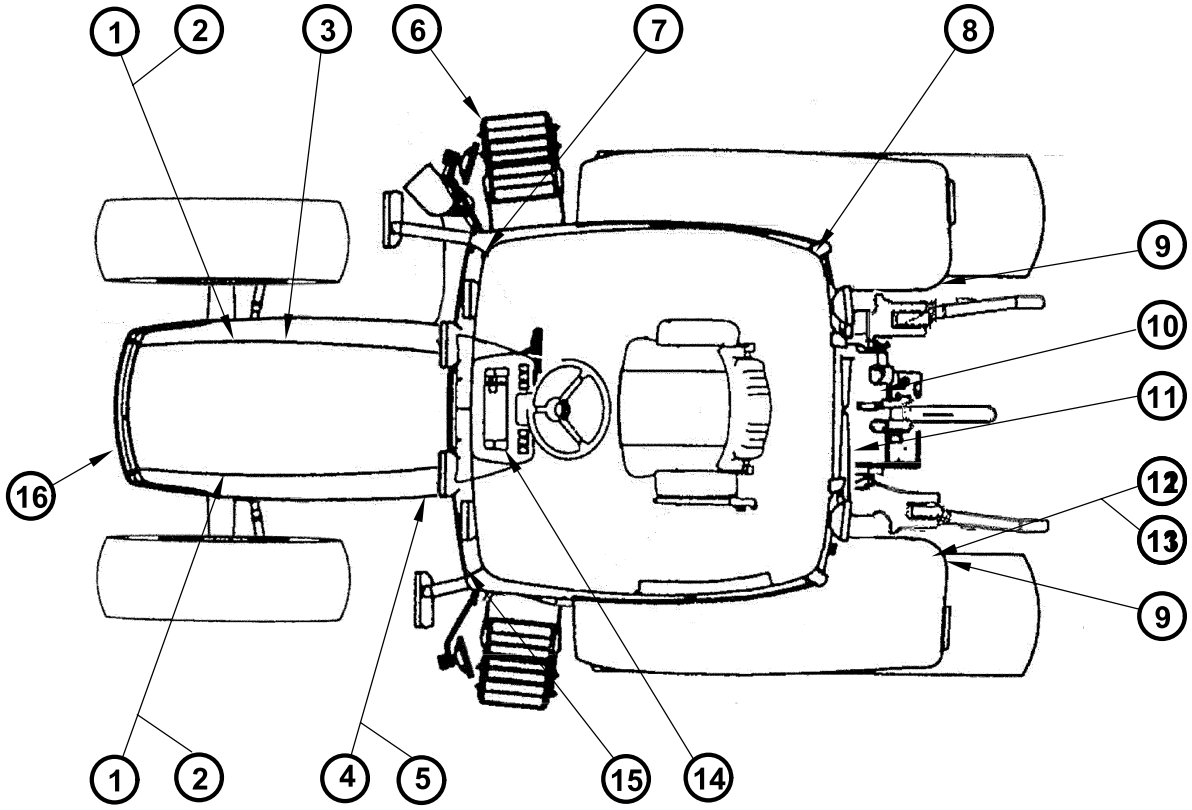
Used only when the fire extinguisher is mounted (supplied as kit).

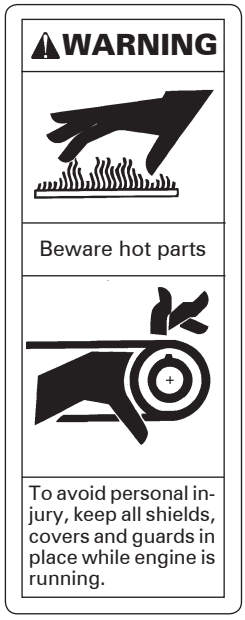
**WARNING: General warning. Position where the fire extinguisher and its support are placed. The fire extinguisher must be in this position during work.**



## POSITIONS OF THE SAFETY DECALS
## (North American Tractors)

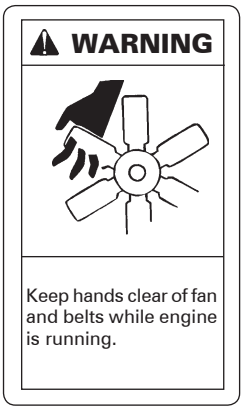
**WARNING: Decals must be always readable. Failing this, ask your Dealer for new ones.**



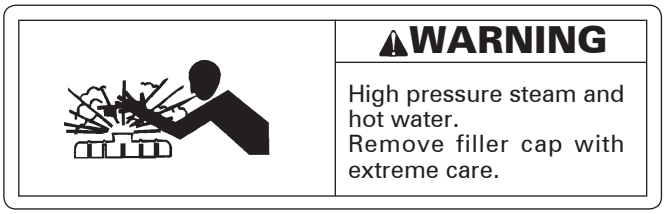

**DECAL 1**

*Warning: Very hot surfaces.*
*Do not remove any guards to avoid injuries.*



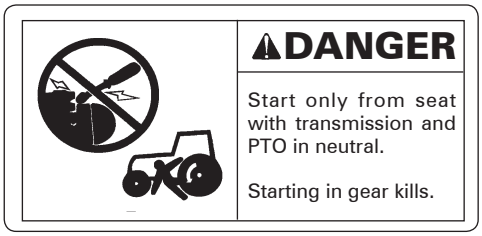

**DECAL 2**

*Keep your hands well clear of the fan blades when the engine is running.*



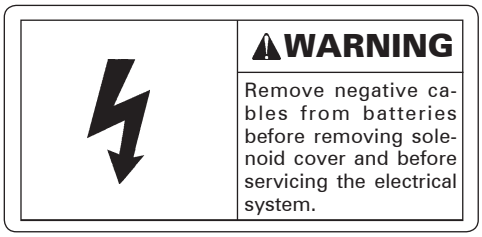

**DECAL 3**

*High pressure and hot water. Remove the plug with caution when the engine is cold.*



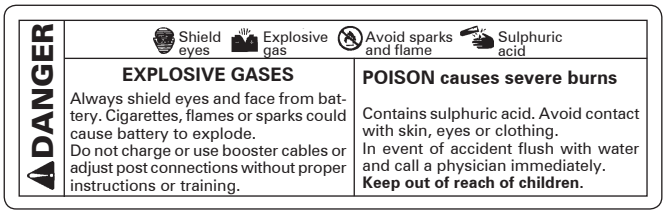

**DECAL 4**

*Risk of being crushed. ONLY start the engine when you are sitting in the driver's seat.*



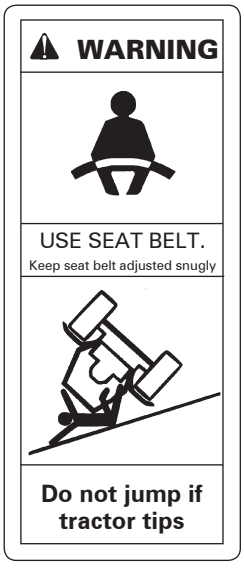

**DECAL 5**

*Danger of electric shock. Always disconnect the negative cable from the battery before carrying out any repairs on the electrical system.*



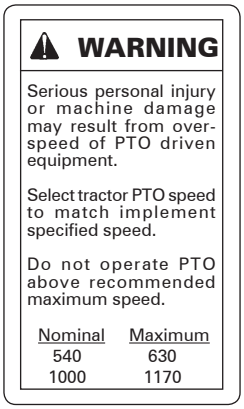

**DECAL 6**

*Batteries produce explosive gases. Keep clear of sparks and naked flames.*
*KEEP OUT OF REACH OF CHILDREN.*



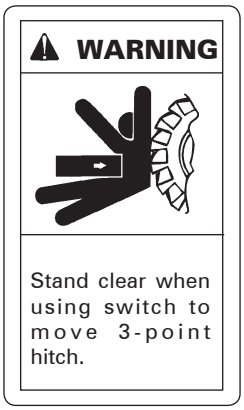

**DECAL 7**

*Always fasten your safety belt. DO NOT leave your seat if the tractor overturns.*



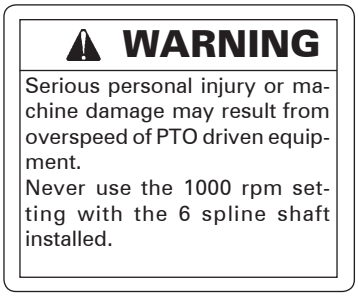

**DECAL 8**

*Choose a suitable PTO speed for the use of the implement.*




**DECAL 9**
Only with electronic lift

*Keep at a safe distance from the tractor when using external lift controls.*




**DECAL 10**

*A PTO used at a speed over the max. allowed might cause serious accidents.*


**DECAL 11**
(If equipped with a front hitch - Located near the multi-purpose control valve)

*Read the Operator's Manual carefully before using.*

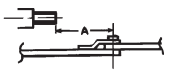
# Safety Notes

**⚠ WARNING**

Personal injury could result from PTO driveline separation.

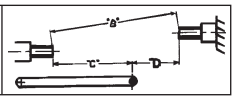
1. Drawbar supplied provides standard distance "A". Do not change.

| PTO | SHAFT SIZE | DISTANCE "A" |
|---|---|---|
| 540 | 35mm (1.38 in) | 356mm (14.0 in) |
| 1000 | 35mm (1.38 in) | 406mm (16.0 in) |




2. Three-point link distance "C" and mounter implement distance "D" may not be standard.

Measure distance "B" over complete lift range for tractor and implement combination. Select driveline length to ensure that driveline will not bottom out at minimum distance "B" and will have sufficient overlap at maximum distance.



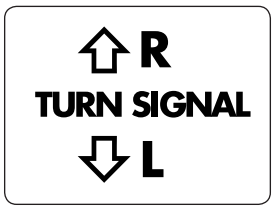

**DECAL 12**

*Warning: Separation of the PTO drive line might cause serious accidents. Adjust the connections carefully.*

| ⚠DANGER | ⚠DANGER |
|---|---|
|  |  |
| Pull only from approved drawbar or lower links of 3-point linkage at horizontal position or below. | Rotating driveline contact may cause serious injury or death. Keep all driveline, tractor and equipment shields in place during operation. |

**DECAL 13**

*Only use an approved drawbar to tow implements. Danger of entanglement: Keep well away from spinning shafts.*




**DECAL 14**

*Use the turn indicator to signal a change in your drive direction.*

**⚠ CAUTION**

Read the operator instruction Book for safety information and operating instructions.

Fasten your seat belt before tractor operation.

Start engine only when seated in operator's seat.

Make sure everyone is clear of tractor and equipment before starting engine or operation.

Keep all shields, covers and guards in place and stay away from moving parts while engine is running.

Place transmission shift lever in neutral and apply parking brake before using external 3-point hitch controls.

Apply parking brake, lower equipment, stop engine and remove key before leaving the tractor unattended.

Wait for all movement to stop before servicing tractor or equipment.

Securely support or block lifted implements which must be in the raised position for servicing or adjustment.

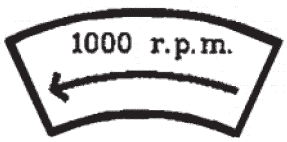
Couple brake pedals together for road travel.

Use flashing warning lights and SMV emblem when on public roads, except where prohibited by law.

Always drive with care and attention.

**DECAL 15**

***WARNING:*** *Consult the operation and maintenance manual for information about safety and how to use the tractor.*




**DECAL 16**

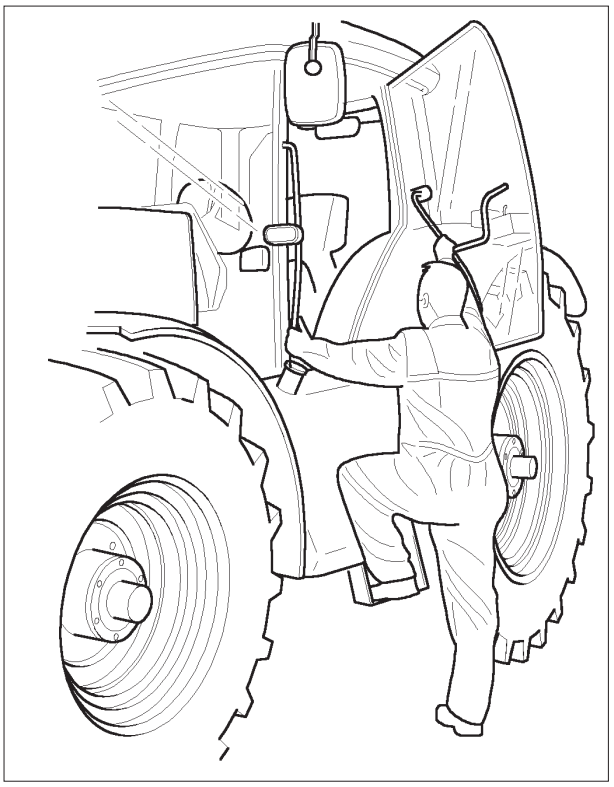
Provided by the front PTO maker. (If equipped with front PTO).

***WARNING:*** *Keep yourself at a safe distance. Speed (rpm) and spinning of the front PTO shaft.*

# Section 3
Controls - Cab

## TRACTOR ACCESS [4.1.e]

***WARNING: Do not jump on or off the tractor. It may cause injuries. Always face the tractor, use the hand rails and steps, and get on or off slowly. Maintain a minimum three point contact to avoid falling (both hands on rails and one foot on the step, or one hand on the hand rail and both feet on the steps).***



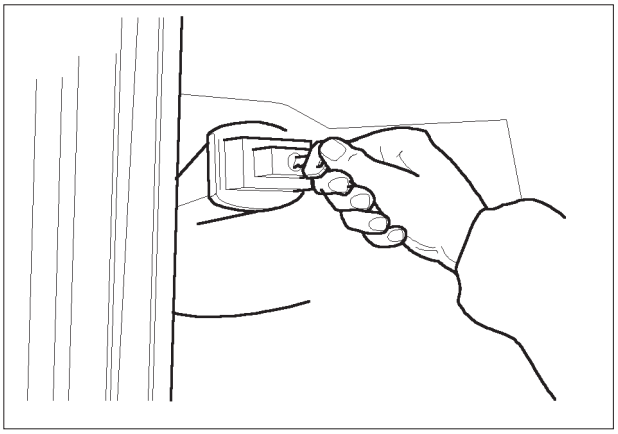
When entering or leaving the tractor, use the left-hand door whenever possible. If you enter or leave the tractor through the right-hand door, avoid interference with the control levers.

### Access to the tractor with cab

***WARNING: Do not jump on or off the tractor. It may cause injuries. Always face the tractor, use the hand rails and steps, and get on or off slowly. Maintain a minimum three point contact to avoid falling (both hands on rails and one foot on the step, or one hand on the hand rail and both feet on the steps).***

### Cab Door Lock

The ignition key is also used to lock or unlock the cab door from the outside.



### Cab emergency exit [4.1.d]

The rear window of the cab may be used as an emergency exit.

If you have to get out the cabin an emergency and it is not possible to use the left door: turn the engine off, open the rear door by means of the central handle and get out quickly.

## Operator present sensor

The seat cushion acts as a switch. The moment no load is sensed (the operator's own weight) an alarm sounds.

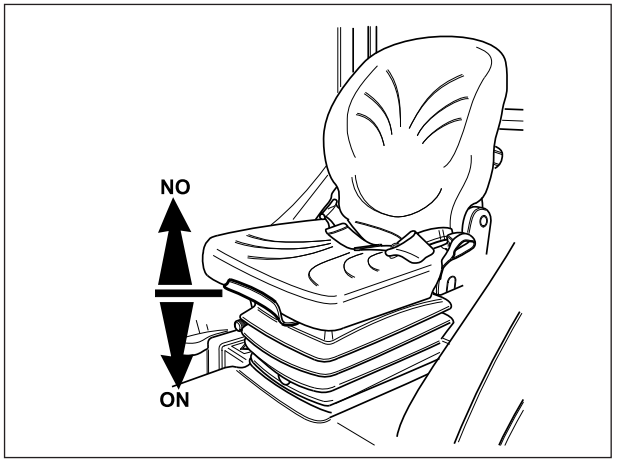
***WARNING: To warn the operator of incorrect usage, the tractor has an automatic alarm system that sounds when the operator is not correctly seated in driving position while the machine is being used.***

**In all machines, both with mechanic and hydraulic gearbox, this alarm sounds whenever the operator leaves his/her seat without turning off the engine, and is silenced only after engaging the parking brake and shifting the gear to neutral.**

***Machines with hydraulic reverse shuttle are equipped with a further restraint that acts (whenever the operator gets off his/her seat without turning off the engine) with inhibition of forward and reverse hydraulic clutches if the tractor is at standstill. If the tractor is on the move, the system inhibits the same clutches as soon as the neutral position of the reverse shuttle lever is sensed: In this case, the transmission goes automatically to Neutral. The operator must then return to his/her seat and the reverse shuttle shifted to Neutral in order to get the tractor started again.***

***WARNING: Do not tamper with this component in any way.***

Contact your Dealer immediately if the system is not operating correctly.

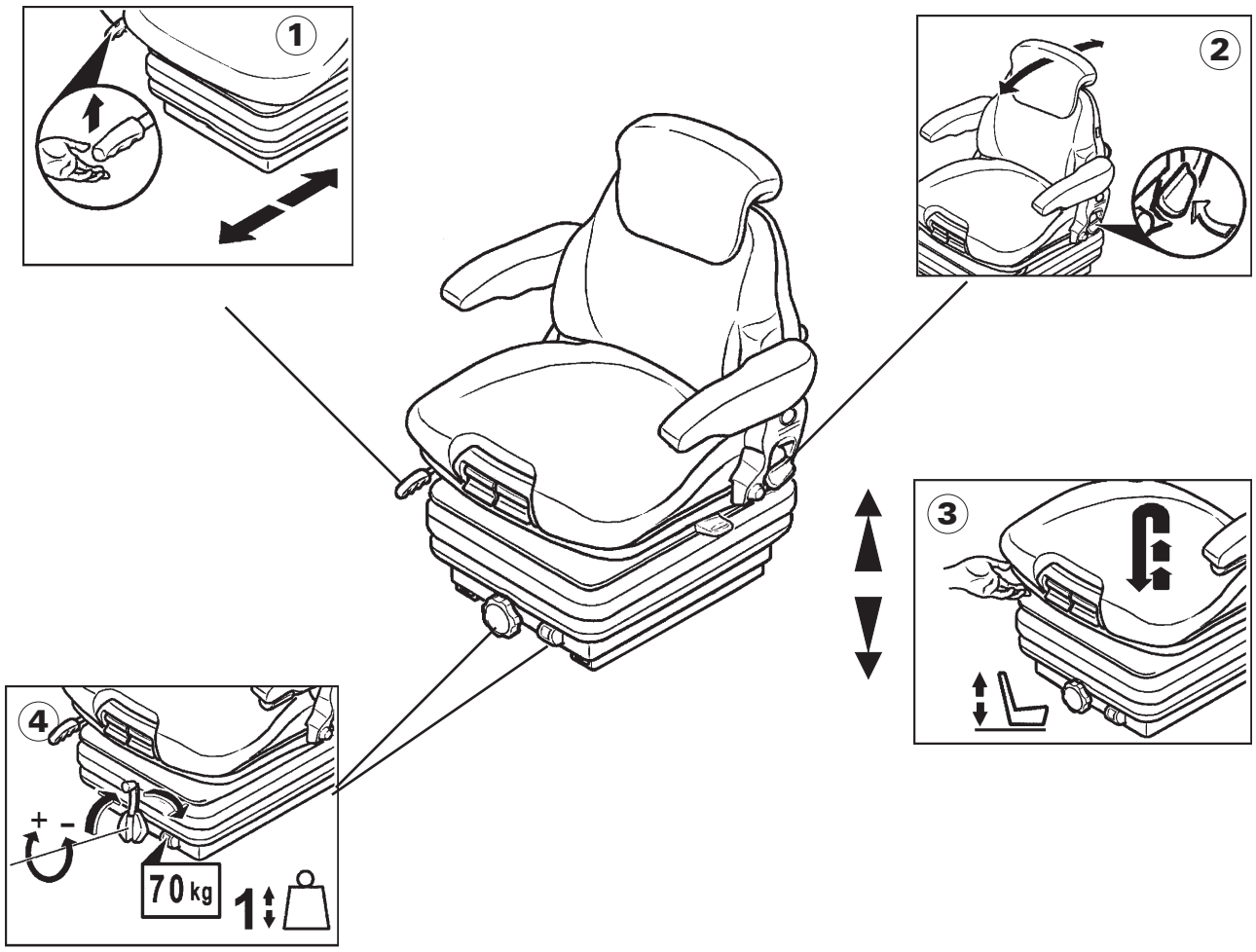


## SEAT [4.1.a]

***WARNING: Do not adjust the seat while driving. Loss of control and injury can result.***

Mechanical suspension seat - Tractors with cab

*NOTE: The standard mechanical seat is offered as option for ROPS (footstep) tractors with waterproof cover.*



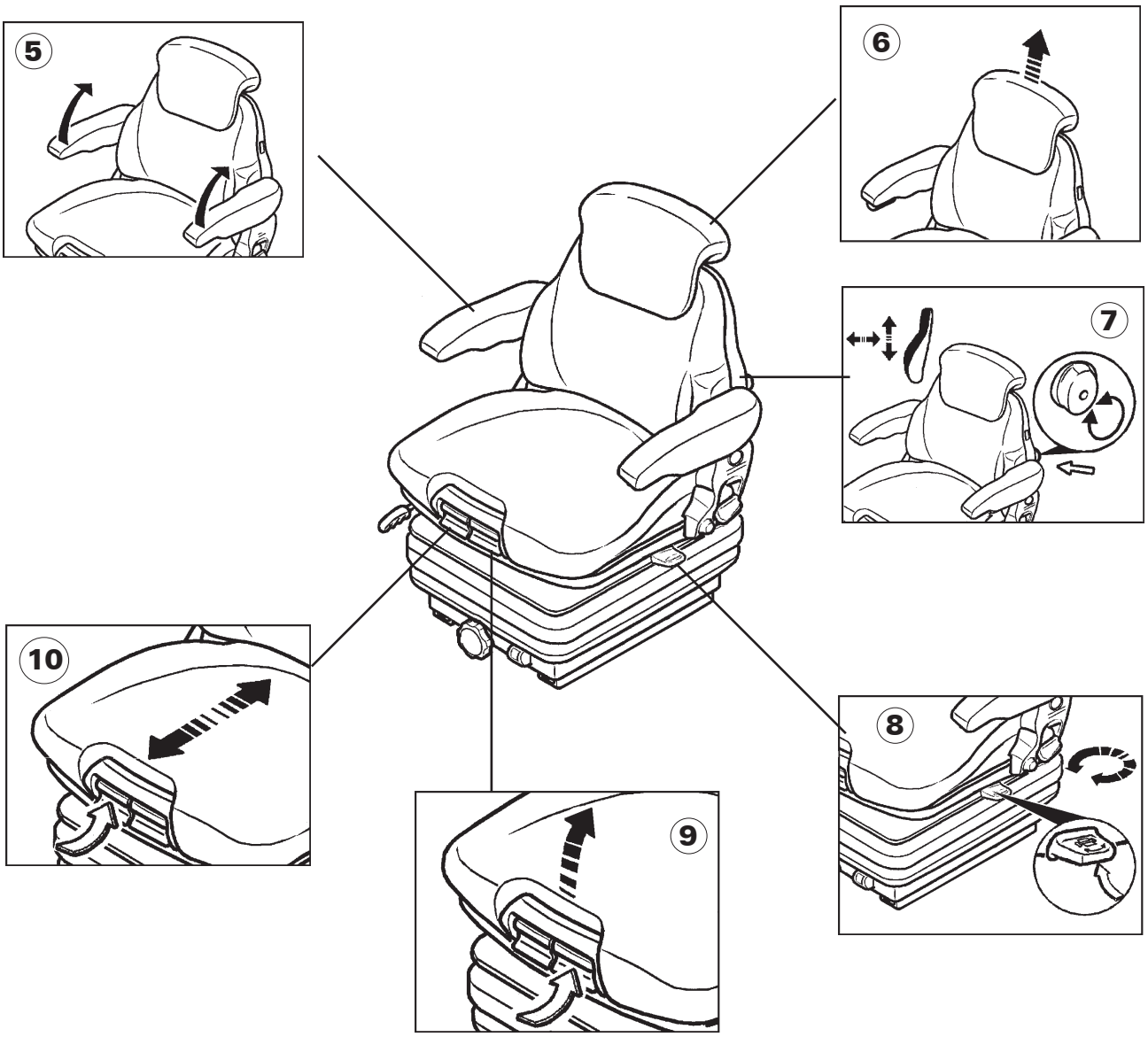

1. FORE/AFT ADJUSTMENT CONTROL -
Lift lever and adjust seat as required, release lever to lock in position.

2. BACK REST ADJUSTMENT CONTROL - Lift control to tilt the back rest as required, release lever to lock in position.

3. HEIGHT ADJUSTMENT CONTROL - Grasp the seat and lift it to the required height. To lower it, raise the seat and move it beyond the upper end stop, then lower to the required height.

4. WEIGHT ADJUSTMENT CONTROL AND WEIGHT INDICATOR - Without the operator in the seat, turn the knob as required, until the operator's weight is displayed in the indicator.

***WARNING: To avoid injuries, the operator's weight setting should be checked and adjusted to the operator before starting the tractor.***




5. ARMRESTS - Raise or lower armrests.

6. BACK REST REMOVAL/HEIGHT ADJUSTMENT (if equipped) - Raise or lower the back rest to the required height. Pull up past end stop to remove the back rest.

7. LUMBAR ADJUSTMENT CONTROL - Turn the adjustment knob as required.

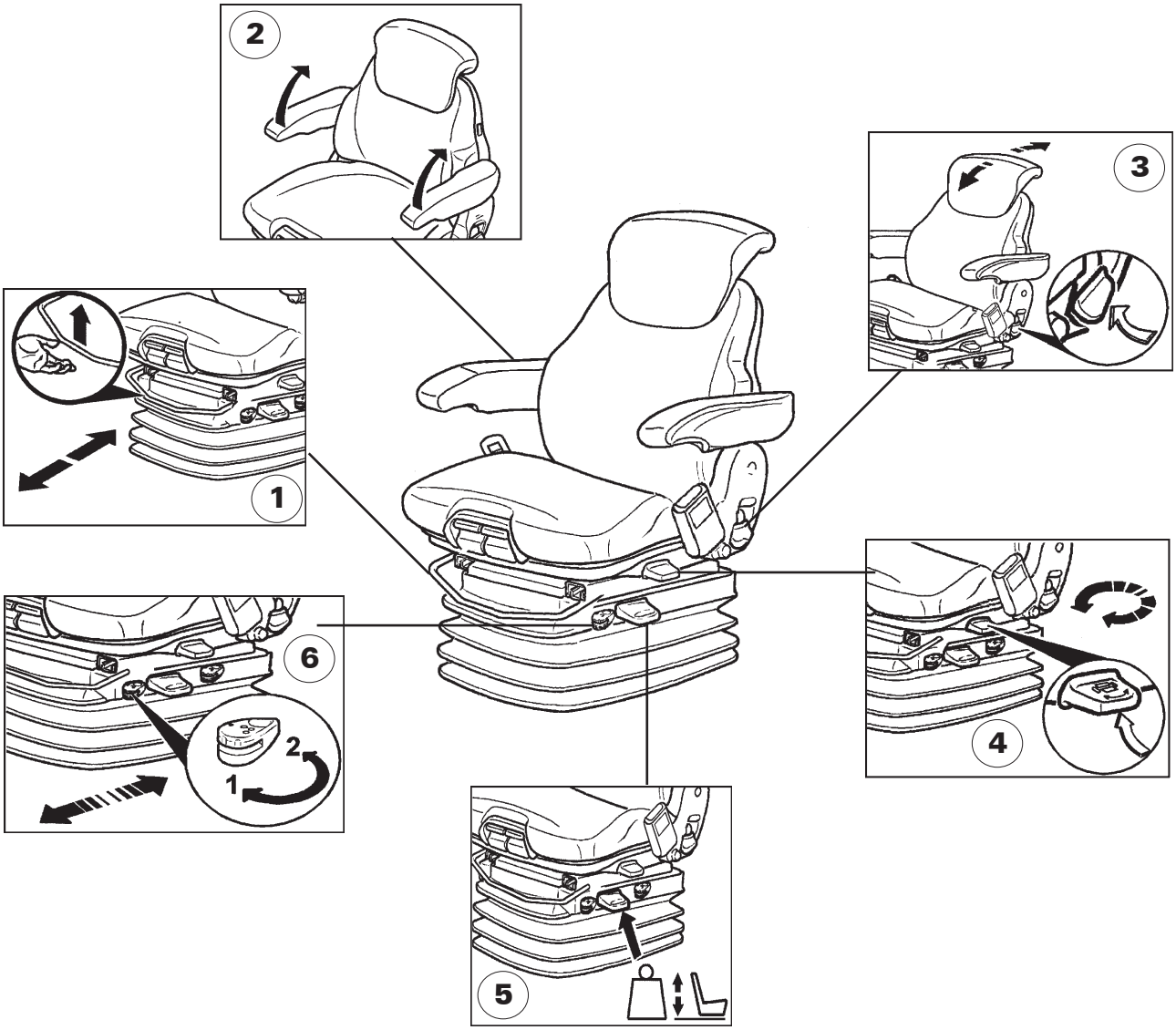
8. SWIVEL ADJUSTMENT CONTROL (only Deluxe seat) - Lift the lever to adjust the seat as required.

*NOTE: There is no fore/aft adjustment in the offset positions.*

9. CUSHION TILT ADJUSTMENT (Deluxe seat only) - Lift lever to adjust seat cushion tilt angle.

10. CUSHION FORE/AFT ADJUSTMENT (Deluxe seat only) - Lift lever to adjust seat cushion depth.

## Air suspension seat - Tractors with cab




1. FORE/AFT ADJUSTMENT CONTROL - Lift lever and adjust seat as required, release lever to lock in position.

2. ARMRESTS - Raise or lower armrests.

3. BACK REST ADJUSTMENT CONTROL - Lift control to tilt as required. Release the lever to lock in position.

4. SWIVEL ADJUSTMENT CONTROL (only Deluxe seat) - Lift the lever to adjust the seat as required.

*NOTE: There is no fore/aft adjustment in the offset positions.*

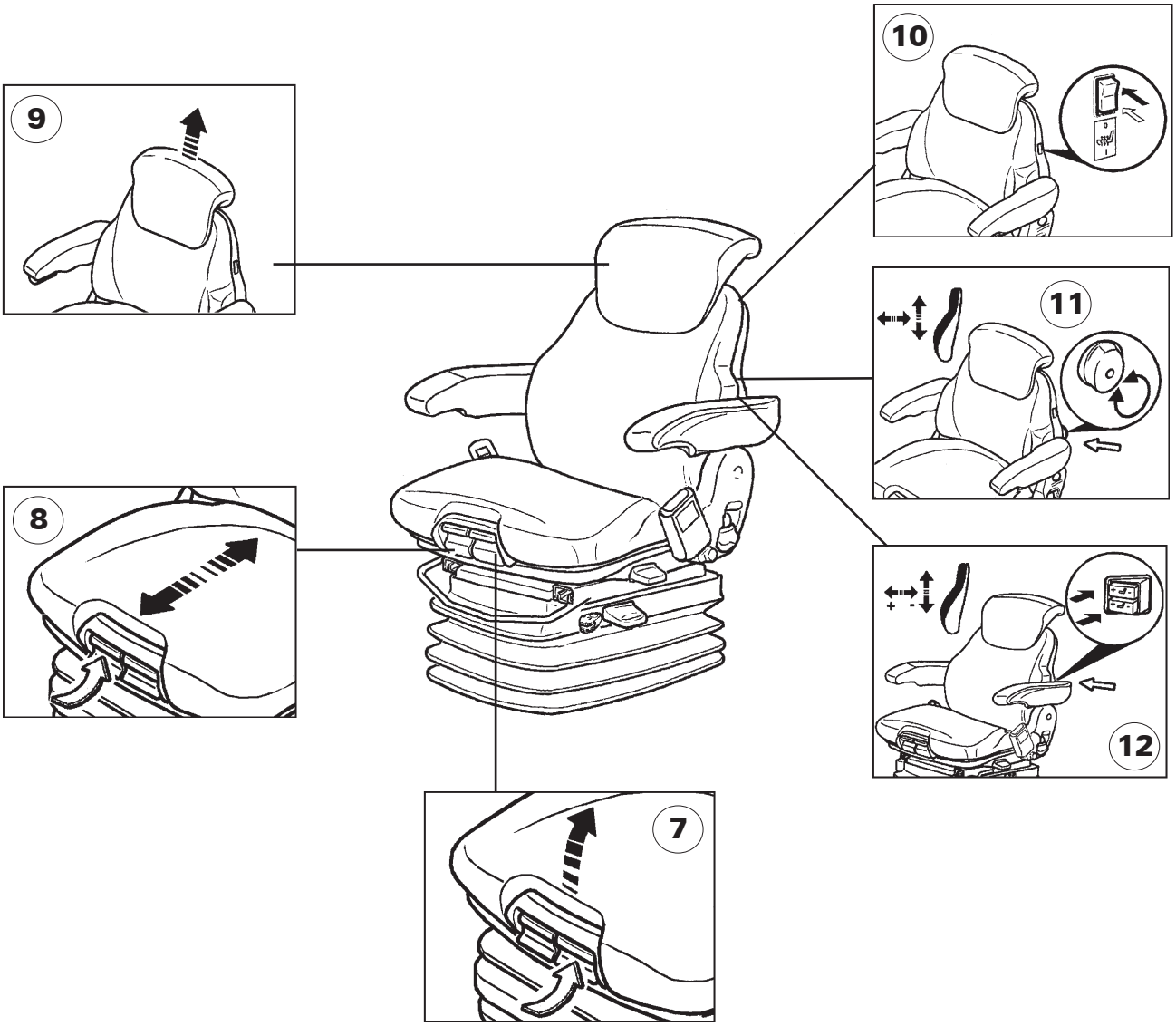
5. HEIGHT & WEIGHT ADJUSTMENT CONTROL - Lift and release for automatic weight adjustment. Lift and hold to raise, or push and hold to lower.

*NOTE: Seat must be lowered before the automatic weight adjustment can be made.*

*IMPORTANT: Never operate the compressor for longer than 1 minute.*

***WARNING: To avoid injuries, the operator's weight setting should be checked and adjusted to the operator before starting the tractor.***

6. ISOLATOR CONTROL - Move control from rear to front (position 1) for float. Move control from front to rear (position 2) to lock.






7. CUSHION TILT ADJUSTMENT (Deluxe seat only) - Lift lever to adjust seat cushion tilt angle.

8. CUSHION FORE/AFT ADJUSTMENT (Deluxe seat only) - Lift lever to adjust seat cushion depth.

9. BACK REST REMOVAL/HEIGHT ADJUSTMENT (if equipped) - Raise or lower the back rest to the required height. Pull up past end stop to remove the back rest.

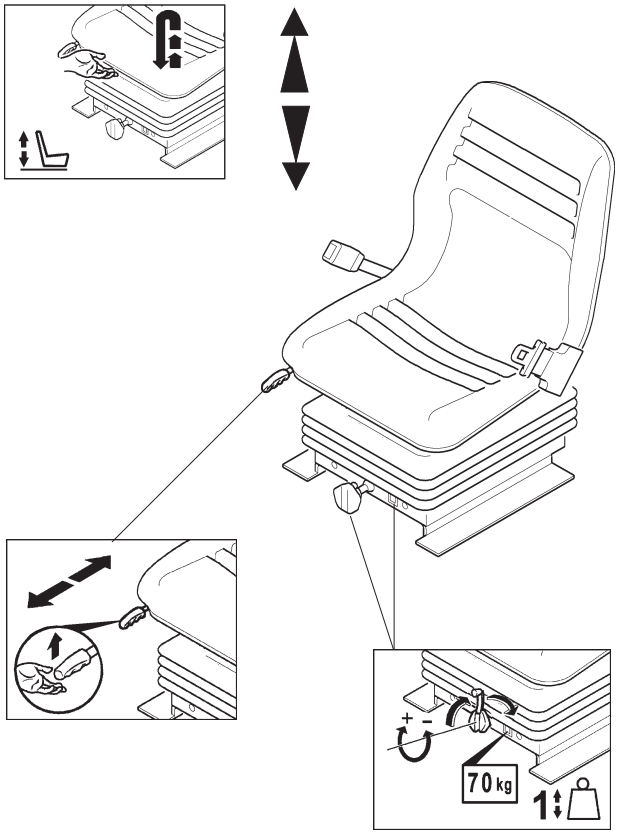
10. THERMIC SEAT CUSHION (only Super Deluxe seat) (if equipped) - Depress the switch to operate seat heating. Press the switch again to turn the heater OFF.

11. MANUAL LUMBAR ADJUSTMENT CONTROL - Turn the adjustment knob as required.

12. AIR LUMBAR ADJUSTMENT CONTROL (only Deluxe seats) - Operate the switches as required.

*IMPORTANT: Never operate the compressor for longer than 1 minute.*

## Mechanical suspension seat (if equipped)




1. FORE/AFT ADJUSTMENT CONTROL - Lift lever and adjust seat as required, release lever to lock in position.

2. HEIGHT ADJUSTMENT CONTROL - Grasp the seat and lift it to the required height. To lower it, raise the seat and move it beyond the upper end stop, then lower to the required height.

3. WEIGHT ADJUSTMENT CONTROL - Without the operator in the seat, turn the knob as required, until the operator's weight is displayed in the indicator.

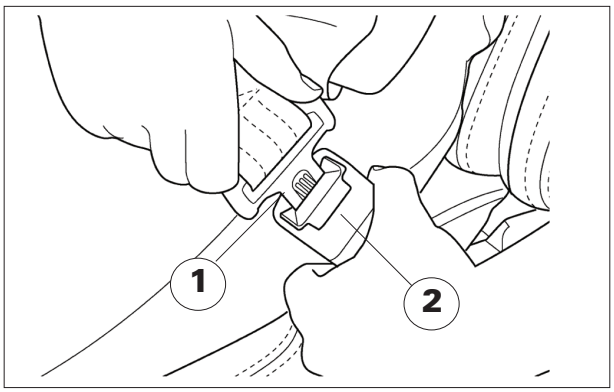
***WARNING: To avoid injuries, the operator's weight setting should be checked and adjusted to the operator before starting the tractor.***

## Seat Belt

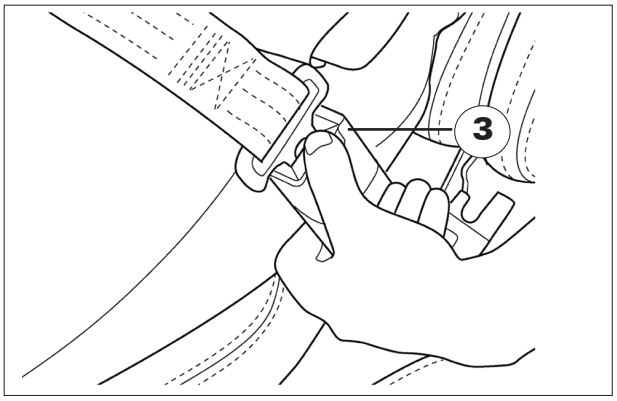
***WARNING: Always securely fasten your safety belt. Your tractor is equipped with a ROPS cab for your protection. The seat belt can help insure your safety if it is properly used and maintained. Never wear the belt in a twisted condition or pinched between the seat structural members.***

Adjust the seat to your requirements.

Lean with your back straight against the back rest. Pull the seat belt completely across your body and push the metal eye (1) into the latch assembly (2) until it locks.




Adjust the position of the seat belt as low on your body as possible.




To release the seat belt, push the red button (3) on the latch assembly.

***IMPORTANT:*** *From time to time, carefully inspect the seat belt and replace it if worn or damaged.*

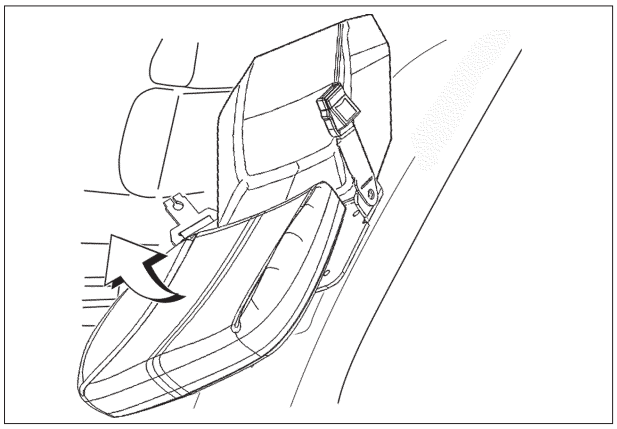
## Passenger Seat

The passenger seat allows a colleague to ride in safety and comfort.

***IMPORTANT:***

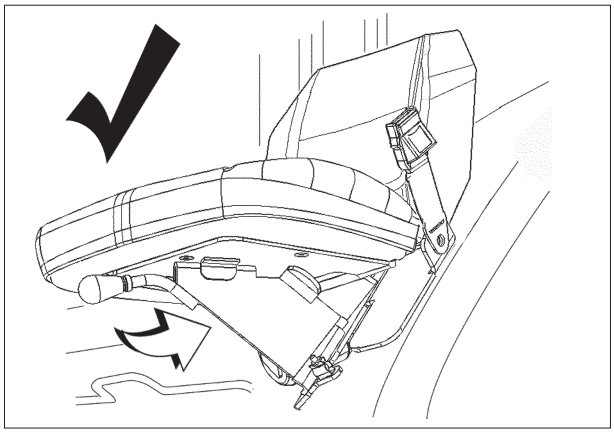
*1. Children are NOT allowed to use the passenger seat.*
*2. The left-hand door MUST be closed at all times whenever the passenger seat is occupied and the tractor is in motion.*
*3. See Safety Notes section for further safety information.*

OPERATION 1



Raise the seat base.

OPERATION 2



Insert the seat base support between the seat base stops as shown above.

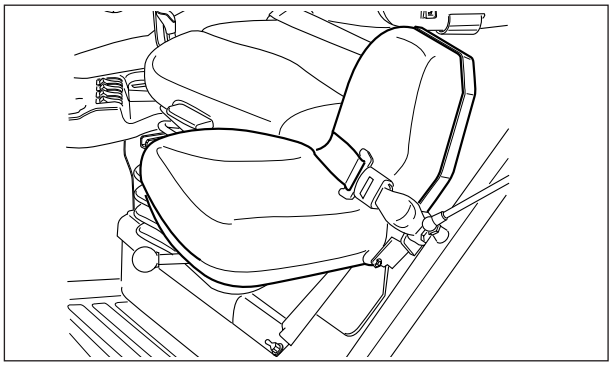
***IMPORTANT:*** *Before using the passenger seat, make sure the seat base and support are fully secure.*

OPERATION 3

Store the seat in the reverse sequence.

**CAUTION: For machines with a seat for a second passenger. The seat for a second passenger (with a seat belt that must be worn at all times) may be occupied only when driving on road, but not when working in the field.**

## Passenger Seat Safety (if equipped).



- The passenger seat allows a colleague to ride in safety and comfort.
  **This seat MAY NOT be used to transport children.**
- When the passenger seat is occupied, the following precautions must be taken:
- Tractor should be driven at a slow speed and on level ground.
- Avoid driving on highways or public roads.
- Avoid quick starts or stops.
- Avoid sharp turns.
- The left-hand door MUST be closed at all times, while the tractor is in motion.

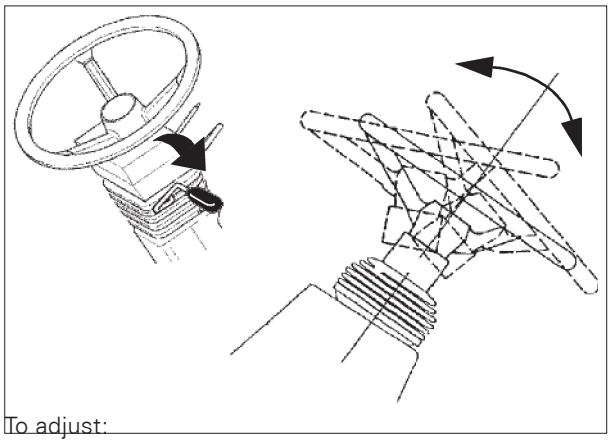
***WARNING: A frequent cause of personal injury or death is persons falling off and being run over. DO NOT permit others to ride, except on the designated Passenger Seat.***

## STEERING COLUMN ADJUSTMENT

***WARNING: Do not adjust the steering column while driving. Adjusting the steering column while driving can cause loss of control resulting in injury or death.***

### Column Tilt Adjustment

The steering column can be adjusted up or down as required.

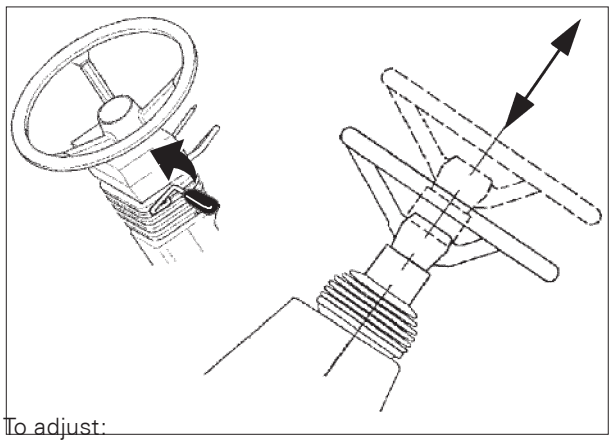


To adjust:

Push down the lever and hold in this position. Move the column up or down to the required position, then release the lever to lock the column in position.

### Telescopic Column Adjustment

The steering column can be moved in or out at any tilt position.

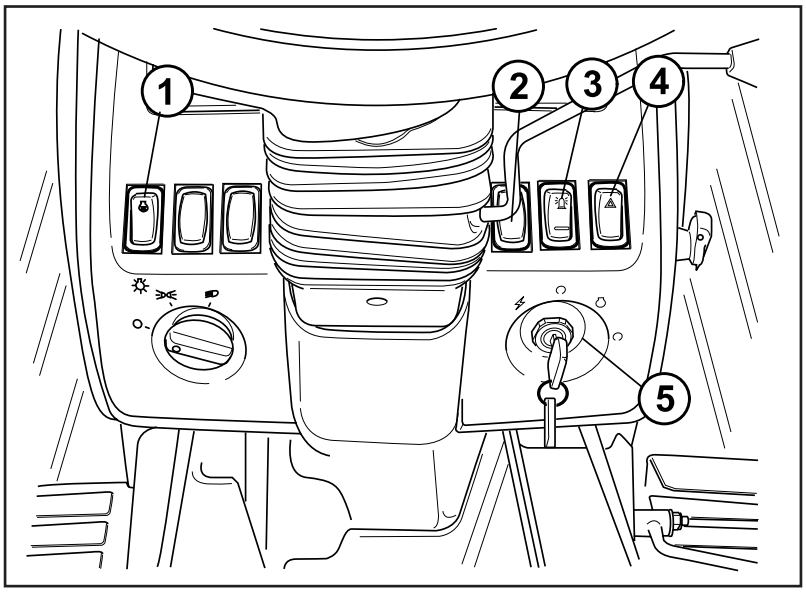


To adjust:

Lift and hold the locking lever up.
Pull or push the column in or out to the required position, then release the lever to lock the column in position.

## CONTROLS

### Controls on the dashboard




1. THERMOSTART (COLD START) SWITCH (if equipped) (Only equipped on engines with mechanical injection system)

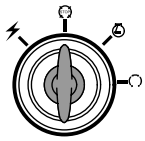
2. SWITCH FOR UPPER HEAD LIGHTS (if equipped with front hitch) - With the front lamp switch in third position, press the front of the switch down: upper head lamps will turn on and main head lamps will go off.

3. ROTATING BEACON SWITCH (if equipped)

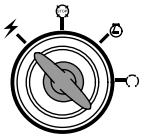
4. HAZARD WARNING SIGNAL SWITCH

*NOTE: Switch positions may vary according to tractor model.*

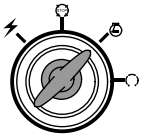
5. KEY SWITCH - The key switch has four positions as follows:



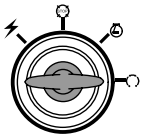
Off Position - Turn from On/Contact position anticlockwise to stop the tractor. The key can only be removed from this position.



Accessory Position - The radio can be operated in this position and some of the cluster displays; this position is also used for programming the digital instrument cluster.



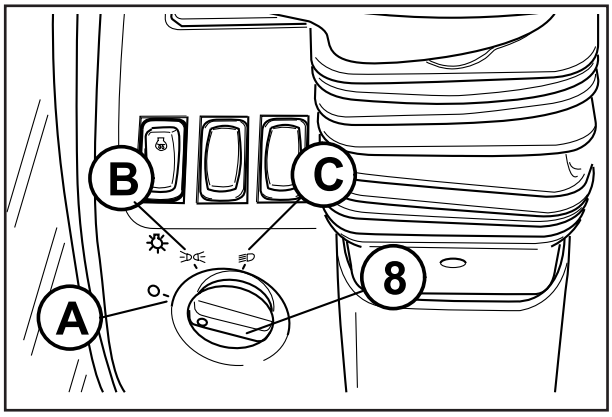
On/Contact Position - All bar graphs, digital displays, warning and indicator lamps will be turned on for approximately 3.5 seconds. This position is also used for dynamic calibration of rear tyre size and true ground speed sensor, if equipped.



Start Position - Turning the key fully clockwise against spring pressure will energise the starter motor in addition to the circuits already mentioned above.

6. HEAD LAMP SWITCH -

Three Position Switch

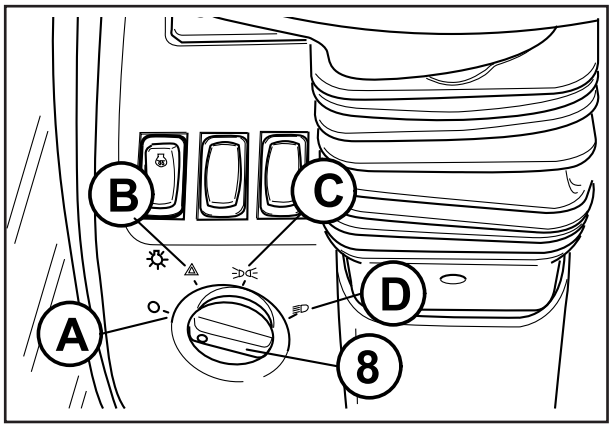



A. First Position - All lamps OFF.

B. Second Position - Front position lamps, tail lamps, license plate lamps and the side console illumination lamp will illuminate. Also analog cluster illumination lamps will be ON.

C. Third Position - Front side lamps, tail lamps, license plate lamps, the side console illumination lamp and main head lamps will illuminate.

Four Position Switch



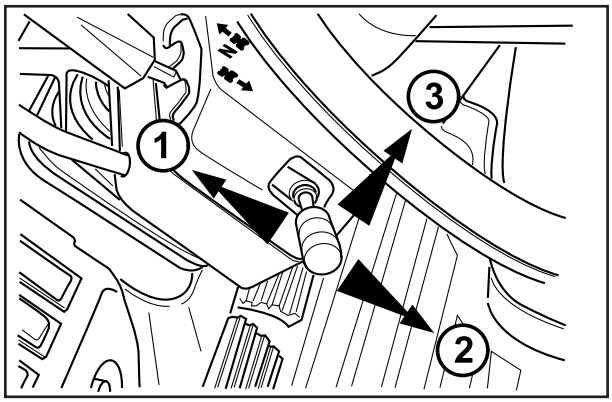

A. First Position - All lamps OFF.

B. Second position - ALL amber coloured light blink. (Road - Daytime).

C. Third position - ALL amber coloured light blink. Tail lights and front lights light up. (Road - night).

D. Fourth position - The light on the side console and the main headlights light up. The work lights switch is activated (on field).

## Direction Turn Signal, Hi/Low Beam Switch and Horn.




TURN SIGNALS:

Position 1 = right-hand indicator operated.

Position 2 = left-hand indicator operated.

*NOTE: Self cancelling switch only: The turn signal lamps will continue to flash until the steering wheel is turned in the opposite direction. You can override this function to cancel the indicator by moving the switch in the opposite direction chosen.*

HEADLAMP HI/LOW BEAM:

Position 3 = With the headlamp hi/low beam switch in the third or fourth position, push the lever toward the steering wheel then release it. The hi beam in the headlights will be selected (blue indicator light on the instrument panel will go on). Lifting the switch again will select low beam (blue indicator lamp will go off).
With headlamp switch in First or Second position, lifting the switch towards the steering wheel and releasing will flash the headlamps.

HORN:

Press the end of the switch to operate.

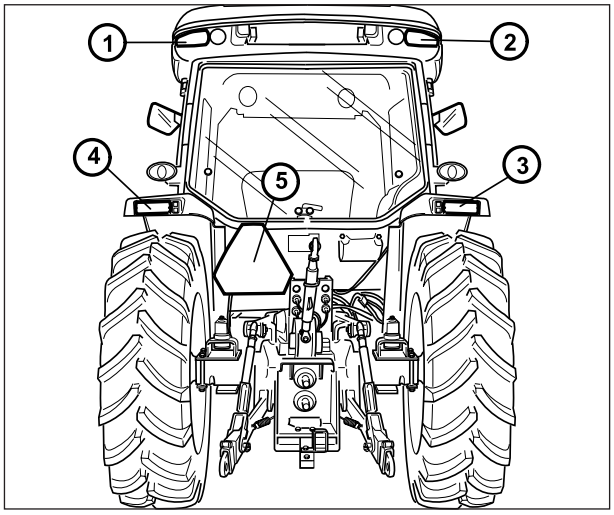
## Highway/Public Road Operation

- Comply with road traffic laws, including any speed restrictions and the correct use of Hazard Warning Lamps and SMV Symbol.
- Connect the brake pedals together with the brake pedal interlock. This will ensure uniform braking and maximum stopping ability.
- Check clearance before going under electric power lines, bridges etc.

## Tractor Warning Lamp Usage North American Tractors

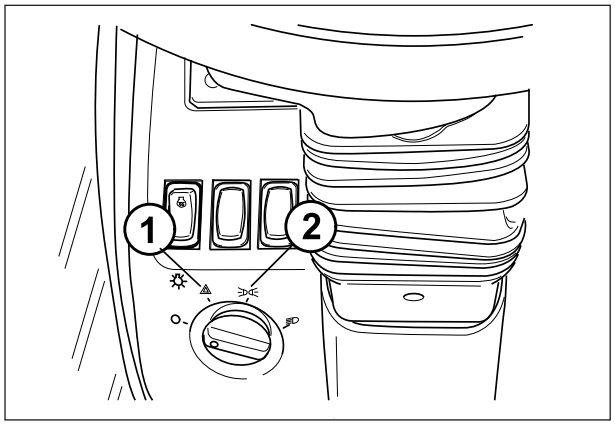
- The flashing amber warning lamps must be used according to road traffic laws.

The flashing amber warning lamps must be used when operating the tractor on the road during the day or night. A vehicle operator that comes near the tractor must see an SMV symbol and the tail lamps from the rear and the flashing amber warning lamps from the front and rear.




1. AMBER WARNING LAMP AND TURN SIGNAL LAMP (LEFT SIDE)
2. AMBER WARNING LAMP AND TURN SIGNAL LAMP (RIGHT SIDE)
3. TAIL LAMP (RIGHT SIDE)
4. TAIL LAMP (LEFT SIDE)
5. SLOW MOVING VEHICLE (SMV) SYMBOL

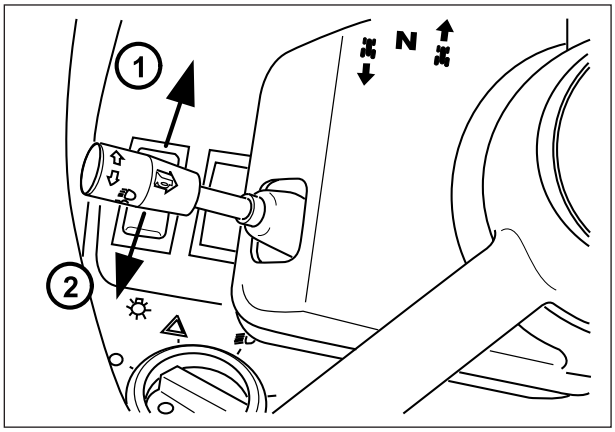
**Use of amber hazard warning lights**
Amber hazard warning are operated by turning the main light switch clockwise to the 1st and 2nd position.




FIRST POSITION (1) - ALL amber hazard lights are blinking.

SECOND POSITION (2) - ALL hazard warning lights are blinking, and front and rear side lights light up.

When the direction turn signal switch is used, the amber warning lamps will operate as follows:



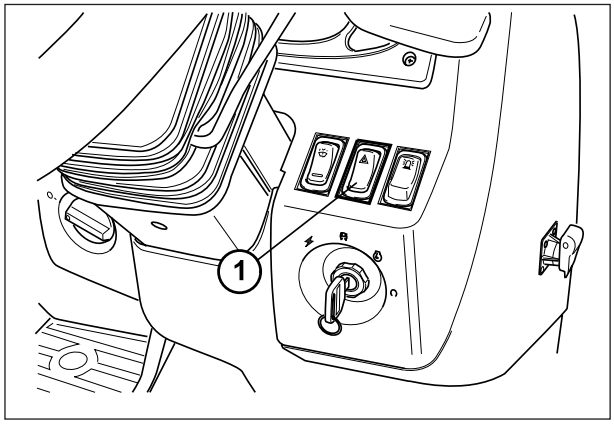

1. When indicating to turn right, the Right amber warning lamp will flash ON and OFF and the Left amber warning lamp will illuminate but will not flash.
2. On the contrary, when indicating to turn left, the Left amber light blinks and the right one lights up, but does not blink.

*IMPORTANT: When towing an implement or wagon with the tractor, the complete rear area warning system (amber warning lamps, red tail lamps and SMV symbol) must be easily seen by any vehicle operator coming near the tractor.*

## Tractor Warning Lamp Usage - Rest Of World Tractors

-

The flashing amber warning lamps must be used according to road traffic laws.




The amber warning lamps are used to indicate a hazard to other road users. To operate, press the switch (1) as shown above. ALL the amber warning lamps will flash ON and OFF.

*IMPORTANT: When operating the tractor, towing an implement or trailer, the complete rear area warning system (amber warning lamps, when applicable, and red tail lamps) must be easily seen by any vehicle operator coming near the tractor.*

## Implement warning lamps (if equipped).

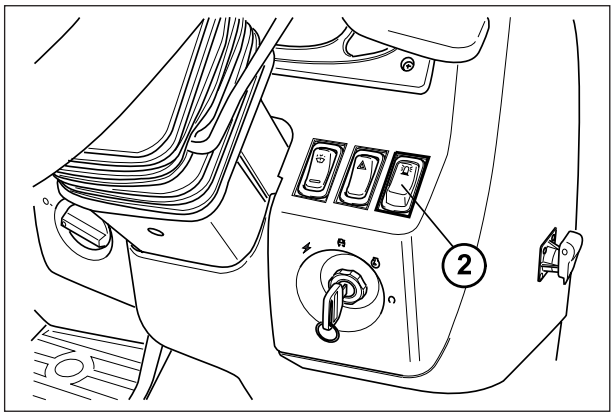
It is recommended that implement warning lamps are used:

- If the flashing warning lamps and red tail lamps on the tractor cannot be seen because they are obstructed by the implement.
- If the towed implement is 1219 mm or more behind the hitch point of the tractor.
- If the towed implement is 1219 mm or more to the left or right of the centre of the tractor.
- If the towed implement has a minimum 3000 mm width.

Install the warning lamps to indicate the side of the implement nearest the centre of the road.

## Rotating Beacon (if equipped).

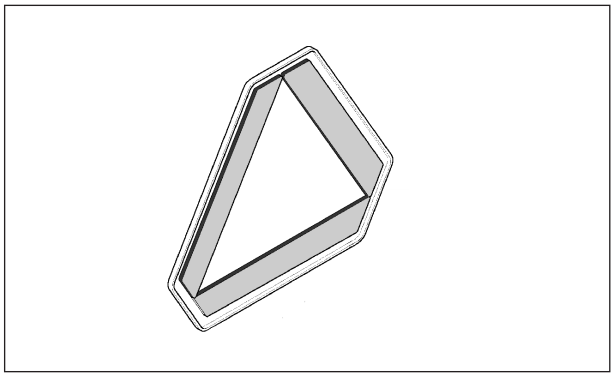
- The rotating amber beacon must be used according to local road traffic laws.




The rotating amber beacon is operated by pressing the switch (2) with the flashing beacon symbol.

## Slow Moving Vehicle (SMV) Symbol (if equipped).

- For correct use of the SMV symbol (3), observe local road traffic laws.

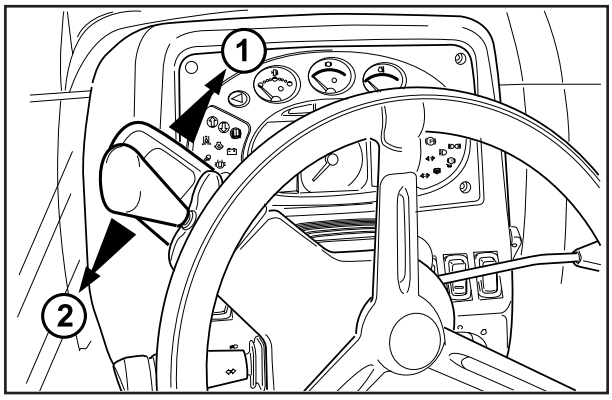


If a Slow Moving Vehicle (SMV) symbol is equipped it must be installed on the rear part of the tractor.

To install the SMV symbol on an implement or trailer a special bracket must be obtained from your dealer.

***WARNING: Collision of high speed road traffic and tractors or implements can cause personal injury or death. On roads, use amber warning lamps according to local laws. Keep SMV emblem visible. Pull over to let faster traffic pass. Slow down and signal before turning off.***

## Forward/Neutral/Reverse switch




POWERSHUTTLE GEARBOX (XTRASHIFT TRACTORS)

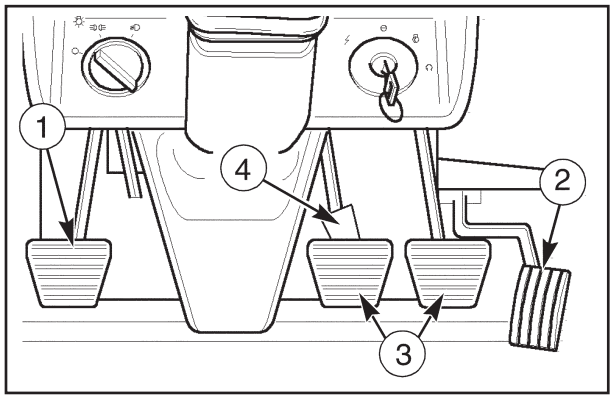
Use the Forward/Neutral/Reverse (F/N/R) shuttle lever to change direction of travel.

**Position 1=Forward**

**N NEUTRAL - Neutral**

**Position 2=Reverse**

## Pedal Controls




1. CLUTCH PEDAL - Used to temporarily disengage drive.
   Gradually and completely releasing the clutch pedal for a controlled smooth start and gear changes.

2. THROTTLE PEDAL

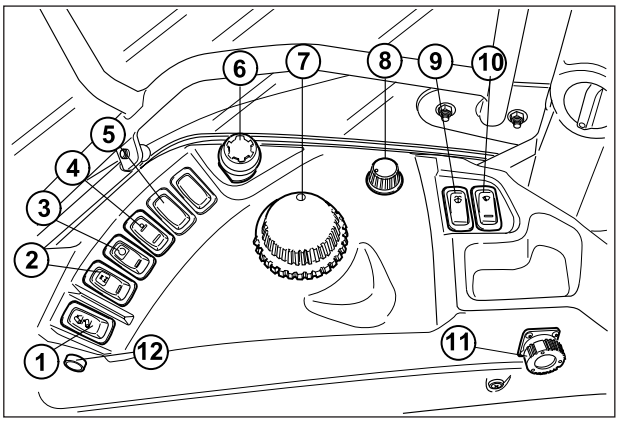
3. BRAKE PEDALS - The left brake pedal stops the left rear wheel and the right brake pedal stops the right rear wheel. When using the tractor in the field, the pedals may be used independently to make turns easier. When driving on roads, the pedals MUST be locked together.

***WARNING: Extra weight and bad traction conditions, such as mud or ice, increase your stopping distance. Remember that liquid in the tires, weights on the machine or wheels, tanks filled with fertilizer, herbicides or insecticides; all these add weight and increase the distance you need to stop. Do not exceed maximun permitted operating weights on axle or tractor.***

4. BRAKE PEDALS INTERLOCK - Used to lock the brake pedals together.

***WARNING: Brake pedals must be locked together for road travel. This will ensure uniform brake operation and maximum stopping ability.***

## CONTROLS ON RIGHT-HAND PANEL




1. UP/DOWN SWITCH, HITCH
2. FOUR-WHEEL DRIVE (if equipped)
3. DIFFERENTIAL LOCK SWITCH

***NOTE:****NEVER use four-wheel drive for light work or when driving the tractor on public roads.*

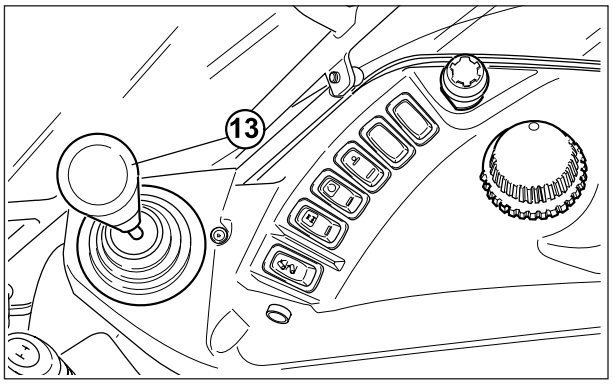
***WARNING: Tractors equipped with four-wheel drive (4WD) have a better drive and can cope with steeper slopes. Stay off slopes too steep for safe operation. To avoid tractor overturning, drive up steep slopes in reverse gear.***

4. SWITCH FOR SHOCK ABSORBER CONTROL (if provided).
5. FRONT PTO CONTROL SWITCH (optional)
6. ELECTROHYDRAULIC REAR PTO CLUTCH SWITCH
- ENGAGEMENT - Lift the locking collar on the PTO ON/OFF switch and pull the switch up to the ON position to engage the PTO. Now the switch will remain on the ON position, while the PTO indicator light on the instrument panel lights up.
- DISENGAGEMENT - Push the ON/OFF switch fully down. The PTO indicator light on the instrument panel goes off.

*NOTE: The engine can be started only if the PTO engagement switch is in the OFF position.*

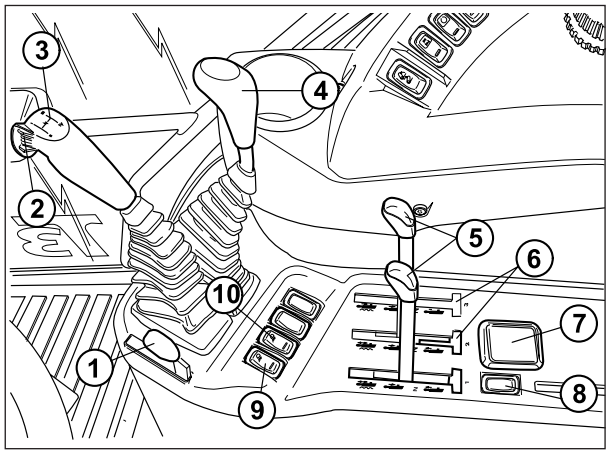
7. IMPLEMENT WORK DEPTH/HEIGHT CONTROL.
8. FUNCTION SELECTOR KNOB (POSITION-DRAFT-INTERMIX)
9. FRONT WINDSCREEN WASHER
10. FRONT WINDSCREEN WIPER
11. DIAGNOSTIC RECEPTACLE
12. QUICK DIG-IN SWITCH

13. FRONT LOADER CONTROL LEVER (if provided)

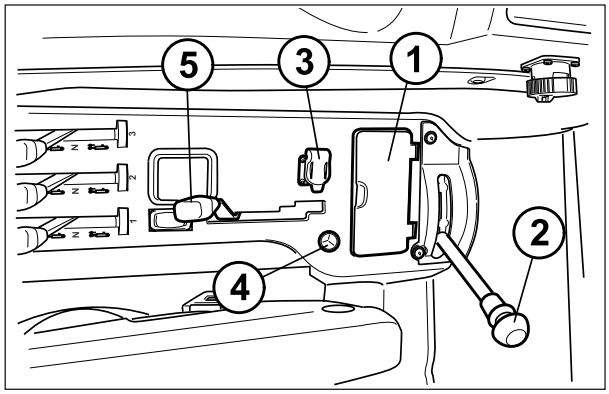



Refer to the loader manual or to your dealer for information about correct use of the loader.

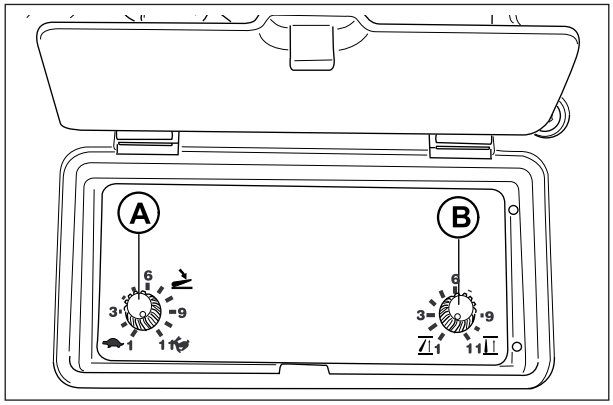
## CONTROLS ON LOWER RIGHT-HAND PANEL




1. ACCELERATOR LEVER - To increase or reduce engine speed rate.
2.XTRASHIFT CONTROL - It controls the engagement of POWERSHIFT ranges (only available in forward speeds).
3. GEARSHIFT LEVER
4. RANGE SHIFT LEVER (and CREEPER LEVER, if equipped)
5. AUXILIARY CONTROL VALVE LEVERS
6. LEVER LOCKING DEVICE
7. ASHTRAY
8. Not used.
9. FRONT FIELD LIGHTS ON ROOF AND HANDGRIPS (if provided).
10. REAR FIELD LIGHTS ON ROOF AND MUDGUARDS (if equipped)



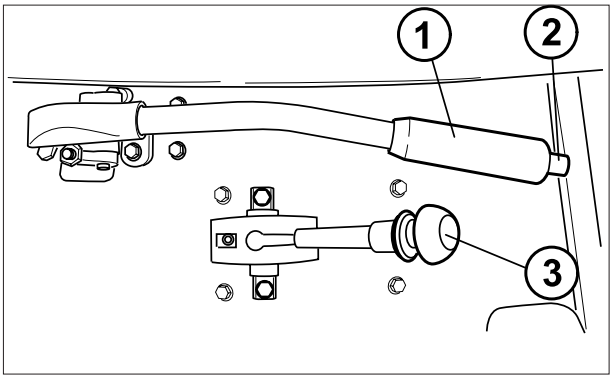

1. HITCH CONTROLLER




A. HITCH DROP RATE CONTROL KNOB.
B. HITCH MAX. LIFT CONTROL KNOB.
See hitch description in this manual.

2. 2-3 SPEED REAR PTO LEVER
3. THREE-WAY SOCKET
4. CIGARETTE LIGHTER
5. SELECTOR LEVER OF PTO OPERATION, INDEPENDENT OR SYNCHRONIZED WITH GROUND SPEED (if equipped)

## Park brake




1. PARK BRAKE LEVER
2. PARK BRAKE BUTTON
3. PARK-LOCK ENGAGEMENT LEVER (optional)

The park brake (1) is located at the LH side of the operators seat. Pull the lever fully up to engage the park brake. If you set the tractor in motion, release the parking brake after putting the tractor in neutral (see note). Press the button (2) on the end of the lever, then lower the lever to release the brake.

When the parking brake is engaged, the warning lamp on the instrument cluster will illuminate when the key switch is turned to ON. The master warning lamp will flash when the engine is started.

The lamps will go off when the brake is disengaged.

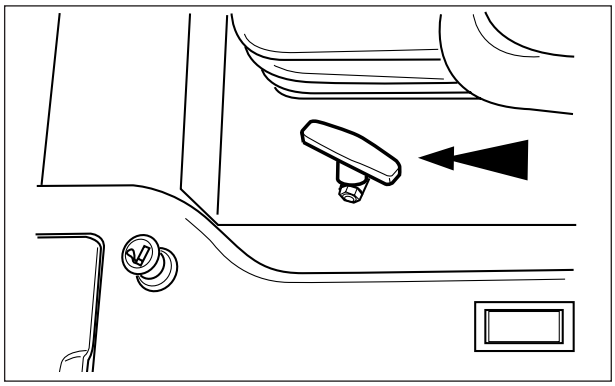
*NOTE: When a gear is engaged (1, 2, 3, 4) with the engine running and the parking brake angaged, an audible alarm will sound.*

*IMPORTANT: Driving the tractor with the park brake partially engaged will cause damage to internal transmission components. Make sure brake is fully off.*

## Pick Up Hitch
## Auto Hitch Locking Latches Release Control (if equipped)

This control is located behind the seat on the RH side.

Pull the auto hitch release control to unlock the locking latches.



## CAB

All non-metallic components within the cab comply with the ISO 3795 standard.
The cab is approved according to OECD codes concerning ROPS test (protection against overturning) and safety belts.

## Cab

The cab is made of steel sections and is fastened to the tractor by means of a double system of rubber dampers (silent block) protecting the driver's seat both from vibrations and from engine noise. The noise peak is therefore limited to low values, for more comfort for the operator.

### Doors (5)

Both doors can be opened both from the inner and outer side, and kept open by dampening cylinders. Both doors are provided with a lock with key.

### Rear window (4)

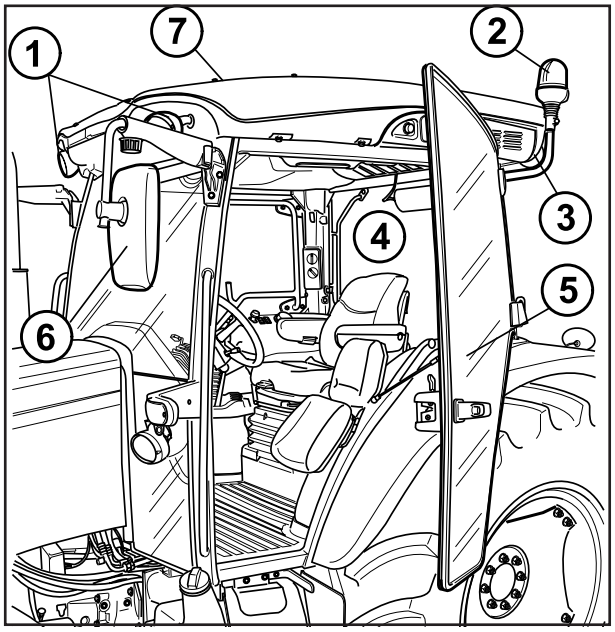
Release the rear window lock and turn the handle counterclockwise to open it. The window is kept open by dampeners.

### Field lights

The cab can be provided with front (1) and rear (3) field lights to improve visibility when working at night. The on/off switches are on the cab roof.

### Rotary beacon

The rotary beacon is installed on the rear side of the cab.

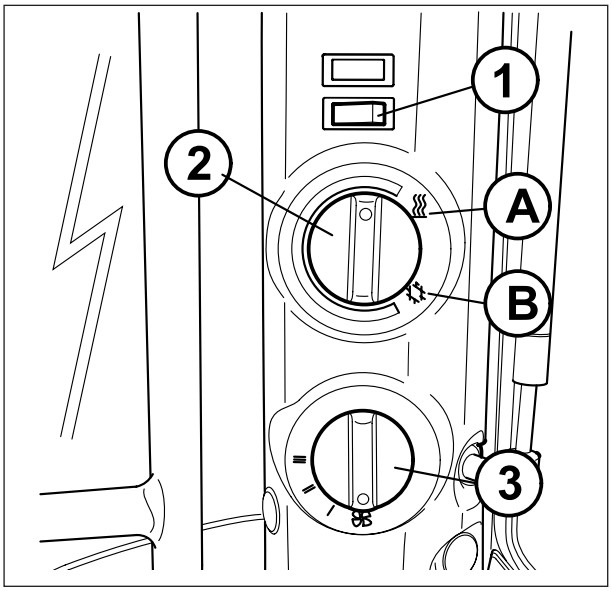



Main components of the cab

1 - Front field lights; 2 - Rotary beacon, 3 - Rear field lights; 4 - Rear window; 5 - Full opening doors, with safety lock; 6 - Rear view mirros; 7 - Sunroof (Top version).

*NOTE: See the cab maintenance section for filter use and maintenance.*

## Heating, air circulation and air conditioning in De Luxe cab [4.1.b]




1 - Air conditioning switch:
- Press to turn air conditioning on.
- Press the switch again to turn it off.

2 - Temperature control knob
A - Warm air
B - Cold air

3 - Fan speed switch
0 - OFF
I - Slow
2 - Middle
3 - Fast

## Ventilation

The cab ventilation is operated by means of 6 air vents. Position the air flow in the required direction by turning the vents.

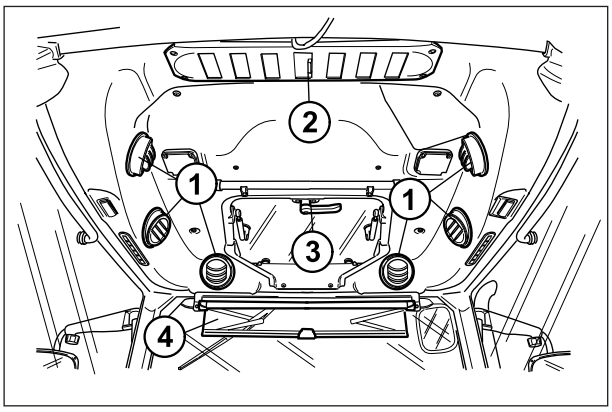
The air that flows into the cab can be drawn from either inside the cab or outside by means of the vents.

Air Recycling Inside The Cab

The rear vent (2) allows the internal air to be recycled.

– Open vent: a great quantity of air is sucked up from inside the cab by this vent and recycled through the air vents.
- Closed vent: air is sucked in from the outside nto the cab after passing through the external filters.

***WARNING: Do not open the windscreen, the doors or the side and rear windows during work. The noise in the cab could rise to such level as to oblige the operator to wear headsets or other individual protection against noise.***




1 - Air vents
2 - Vents for internal air recycling in the cab
3 - Handle to open the sun-roof
4 - Sun screen.

## ADJUSTMENTS WITHIN CAB [4.1.b] (De Luxe)

### Cab cooling from the outside

- Turn the fan control on the required position, from (I) for minimum cooling to (III) for maximum cooling.
- Open all air vents.
- Open the defrost vents and adjust as required.
- Turn the temperature knob on OFF.
- Close the air recycling vent (if equipped). When the air recycling vent is closed, air recycling inside the cab is reduced to aminimum, while the outside air intake is maximized.

*NOTE: Whatever is the position of the recycling vent, outside air is sucked into the cab.*

### Cab heating

For maximum cab heating, let the engine run until it reaches the operating temperature, then proceed as follows:

- Adjust the electric fan control as required, from (I) for minimum heating to (III) for maximum heating. When the electric fan control is turned on (I), air quantity and speed are reduced. Therefore, temperature of the heated air is greater than when the electic fan speed regulator is turned on (III).
- Adjust air vents as required.
- Open the defrost vents and adjust as required.
- Adjust the temperature control as required. Turn it completely clockwise for max. heating, or completely anticlockwise to exclude heating (OFF).
- Open the air recycling vent (if equipped). When the air recycling vent is closed, air recycling inside the cab is reduced to aminimum, while the outside air intake is maximized.
- If an air conditioning system is equipped, turn it OFF.

### Pressurized cab (dusty or windy environment)

***WARNING: Cab air filters remove dust in the air, but are not capable of removing chemicals used in spraying crops or in weed control. Many chemicals used for these purposes are toxic when improperly used, and can be hazardous to operators and others in the area. Follow the instructions of manufacturers of both the equipment and the chemicals regarding prohibitions against inhalation of dust or spray, personal hygiene practices, and other precautions noted by the manufacturers.***

- Turn the electric fan control on maximum (III).
- Open all air vents.
- Open the defrost vents and adjust as required.
- Adjust the temperature control as required.
- Close the air recycling vent (if equipped). When the air recycling vent is closed, air recycling inside the cab is reduced to aminimum, while the outside air intake is maximized.

*NOTE: Whatever is the position of the recycling vent, outside air is sucked into the cab.*

- If an air conditioning system is provided, turn it on and adjust as required.

### Window Demisting/Defrosting

- Turn the electric fan control on maximum (III).
- Open all air vents.
- Open the defrost vents and directtheir air flows toward windscreen / windows.
- Turn the temperature control on maximum (III).
- Close the air recycling vent (if equipped).
- If an air conditioning system is provided, turn it on and adjust as required.

## Operation of air conditioning unit (If provided)

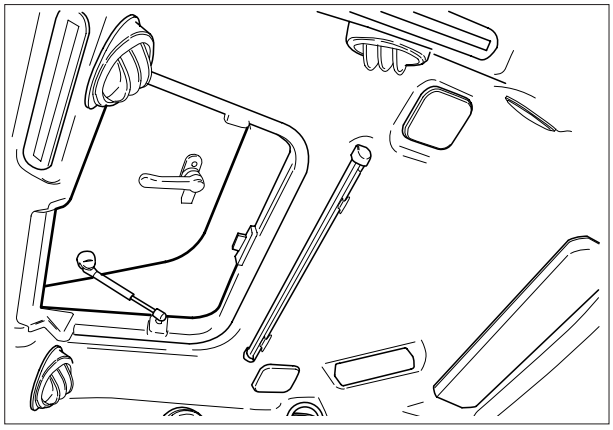
To operate the air conditioner, the blower must be on. The blower speed, temperature control and all vents must be adjusted to obtain the best cooling for the ambient temperature and dust conditions. Under normal operating conditions, and with the windows and doors closed, temperatures in the cab of 6°C to 15°C (10°F to 25°F) less than the ambient temperature will occur. When operating the air conditioner system, the moisture level is decreased.

*NOTE: During cold weather, with ambient temperature above 0°C (-32°F), operate the air conditioner at least once per month, for a period of 10 to 15 minutes. This operation is useful to lubricate gaskets and helps to prevent leaks of cooling fluid.*

*NOTE: The system is provuded with safety devices to protect the system for low refrigerant level and restrictions in the system. If the air conditioner stops operating while the tractor is running, ask your Dealer's specialized workshop for help.*

*NOTE: The Air Conditioning system is equipped with an environmentally safe refrigerant, HFC-R134a. Never recharge the air conditioning system with refrigerant other than HFC-R134a as this will result in loss of cooling and permanent damage to all air conditioning components.*

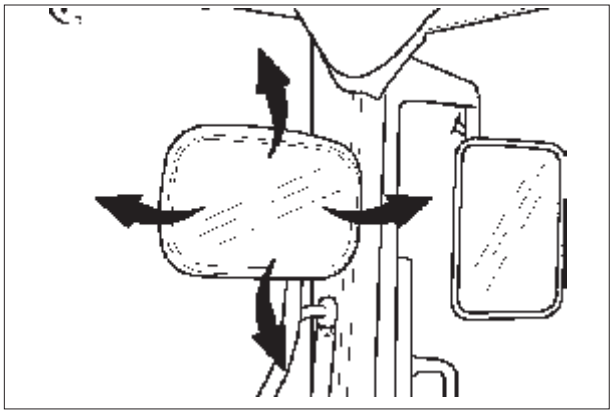
Roof Hatch (if equipped)



Ventilation - Push the latch towards the front of the tractor and then push the hatch up.
Emergency Exit - Push firmly upward to release the support struts from the lower retainer clips.

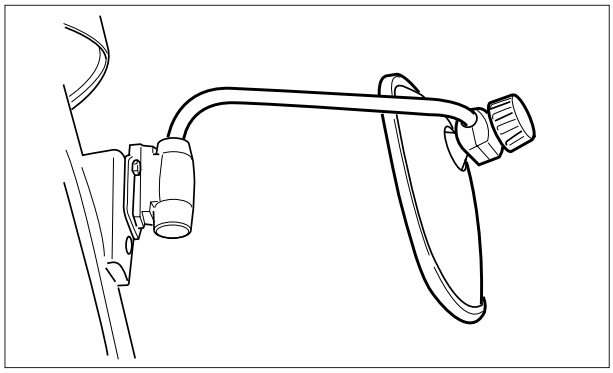
***ONLY CAB WITH HATCH (if equipped)***
***WARNING: If the batch in the cab roof is open during work, the required protection against falling objects is compromised. If there is such danger, keep the roof batch closed at all times.***

Internal Mirror



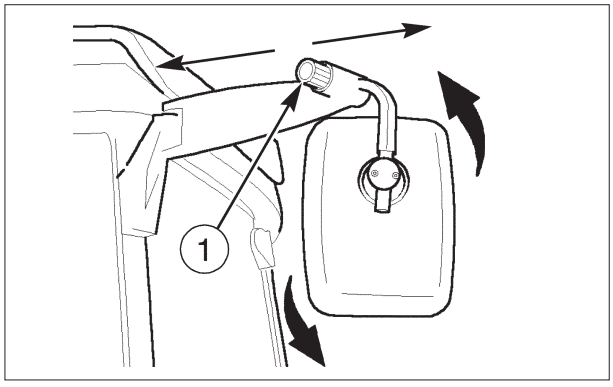
To adjust mirror head: hold firmly, tilt horizontally and vertically as required.

Standard rear view mirrors



To adjust mirror head: hold firmly, tilt in horizontal end vertical direction as required.

Adjustable rear view mirrors (if equipped)




To change the length: loosen the locking knob (1) and move the mirror to the required position, then tighten the locking knob.

To adjust mirror head: hold tightly and tilt
in horizontal and vertical direction as required.

## MISCELLANEOUS

1 - Quick couplings of the "Push-Pull" type for auxiliary spool valves for remote controls.

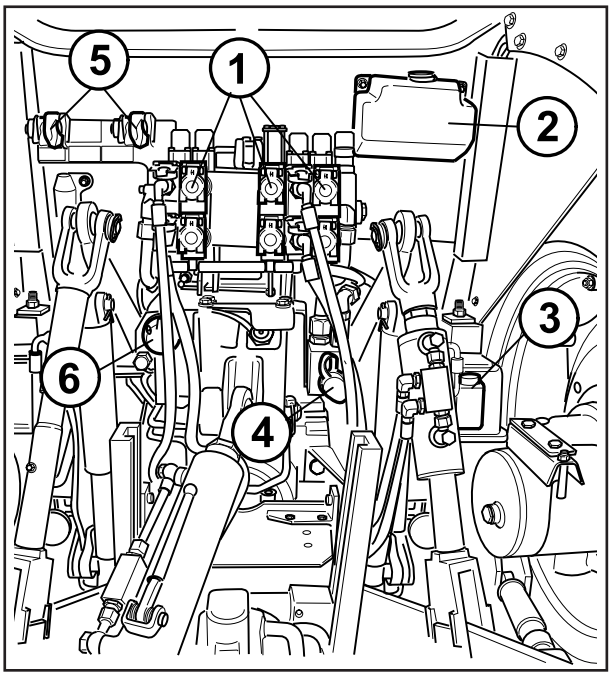
2 - Window washer liquid reservoir.

3 - Oil spillage collector.

4 - Oil union for hydraulic trailer brakes (optional, depending on markets).

5 - Trailer air brake unions (optional, depending on markets).

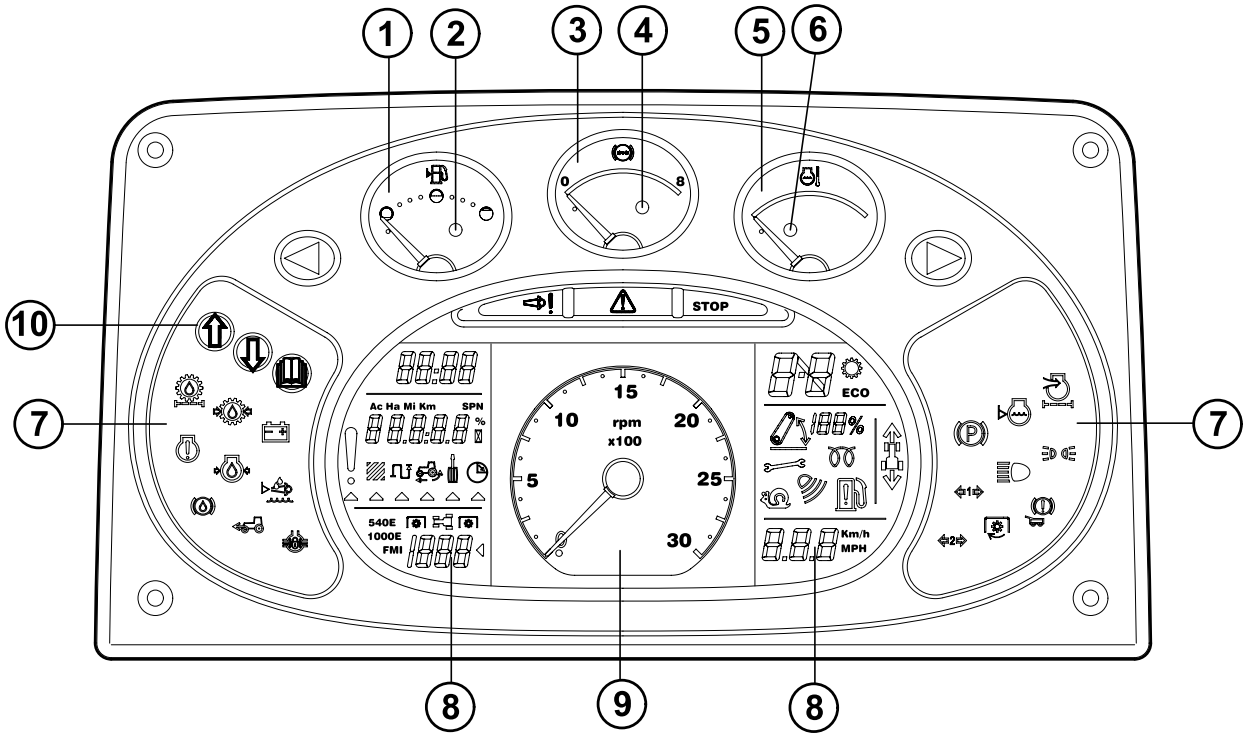
6 - Rear 7-pin power socket for trailer.



# Section 4
Instruments and Programming

# Instruments and Programming

## Instrument Cluster




1. FUEL LEVEL GAUGE

2. LOW FUEL WARNING LAMP

3. AIR PRESSURE GAUGE or LOGO (if provided) - Indicates system pressure for pneumatic trailer brakes.

4. RED WARNING LIGHT - LOW SYSTEM PRESSURE FOR PNEUMATIC TRAILER BRAKES

5. ENGINE COOLANT TEMPERATURE GAUGE

- Blue area: low temperature.
- Yellow area: normal operating temperature.
- Red area: overheating.

***IMPORTANT: If the pointer is in the red area, the master warning lamp will flash. STOP THE ENGINE IMMEDIATELY AND CHECK THE CAUSE OF OVERHEATING. Before beginning the inspection make sure that the engine has cooled down.***

6. RED WARNING LIGHT - OVERHEATING

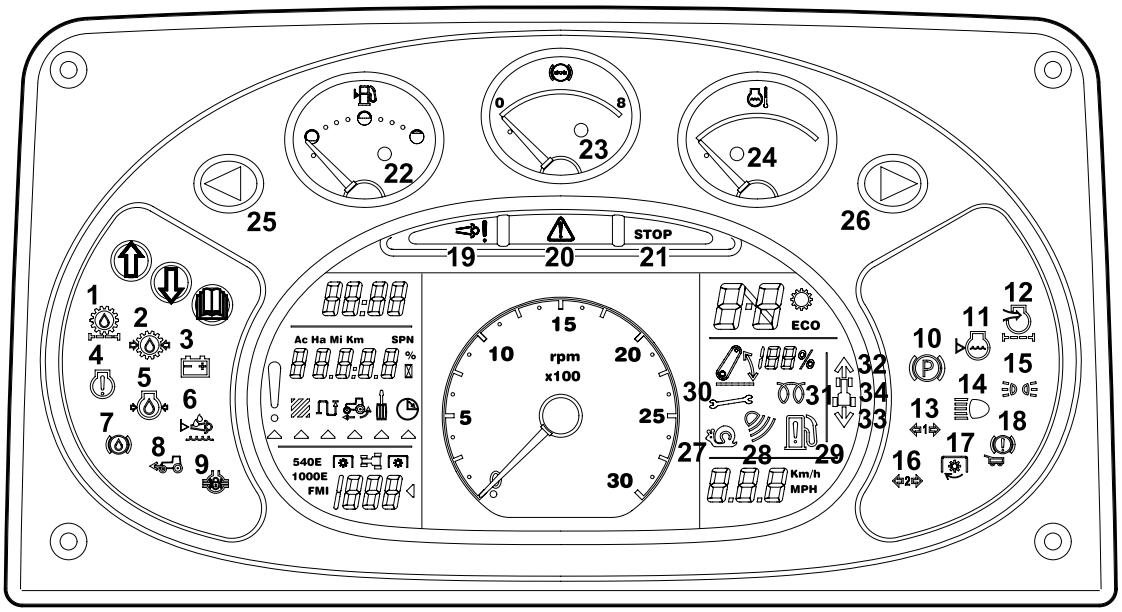
7. WARNING LAMPS - see following pages for more details.

8. MAIN DIGITAL DISPLAY - see following pages for more details.

9. ENGINE REV COUNTER

10. ADJUSTMENT PUSH BUTTONS - To go to MENUS and Functions in the digital display.
UP - Upward arrow
DOWN - Downward arrow
MENU - Book icon

## Indicator Lamps




4

### Warning lamps

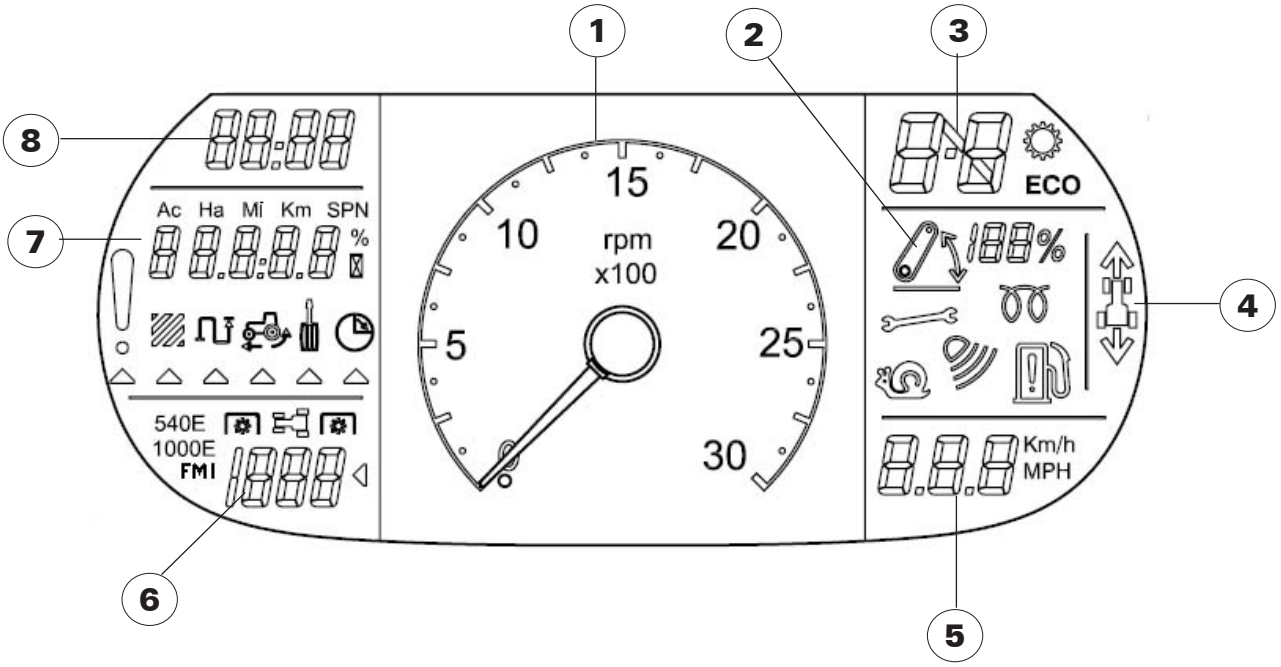
1 Hydraulic filter clogging, red.
2 Warning light for low pressure in transmission hydraulic circuit, red.
3 Battery charge, red.
4 Engine fault warning, yellow. Ask your Dealer's workshop for help.
5 Low engine oil pressure, red.
6 (Not valid) Low level of DEF (Diesel Emission Fluid), yellow.
7 (Not used) Low oil level in hydraulic trailer brake circuit, red.
8 4WD engaged, yellow.
9 Differential lock engaged, yellow.
10 Parking brake engaged, red.
11 Low engine coolant level, red
12 Engine air filter clogging, yellow
13 1st trailer indicator, green
14 Headlight high beam on, blue
15 Side lights on, green
16 2nd trailer indicator, green
17 Rear PTO on, yellow
18 Hydraulic trailer brake pressure, red (if equipped)
19 (Not valid) Error in DEF system, yellow
20 General warning, yellow
Tractor malfunction. An error has been detected by the vehicle's diagnostic system and an error code has been generated (active errors only).
21 Major warning, red. Stop the engine and ask your Dealer's specialized workshop for help.
22 Low fuel level, yellow
23 Air brake pressure (optional), red
24 High coolant temperature, red
25 Left turn indicator, green
26 Right turn indicator, green

### LCD Icons

27 Creeper engaged
28 Radar present (not available)
29 Water detected in fuel (if provided). Drain fuel filter.
30 Service interval indicator. Service the tractor.
31 Heater - Wait-to-start.
Electronic engine - Wait for the lamp to go off before starting the engine.
Mechanical engine - To operate the heater, press the heater button that activates the lamp. The lamp is controlled by a timer: as soon as it goes off, release the button and start the engine.
32 Forward speed indicator.
33 Reverse speed indicator.
34 Tractor icon: indicates the reverse shuttle lever is in neutral.

# Instruments and Programming

## LCD Display

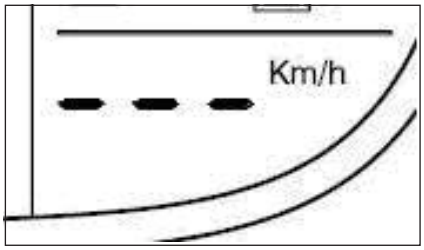



Layout

1. Engine rev counter
2. Hitch position up/down and lift percentage amount.
3. Indicator for gear engaged and reverse shuttle lever in neutral.
4. Drive direction indicator
5. Indicator for speed in kph or mph

If the following figure is displayed at ignition, the speed indicator is not provided: ask your dealer.

6. Speed and PTO function display.
7. Menu Display
8. Clock



## Display MENU

The menu system for the cluster is operated by using the three buttons on the left-hand panel.


UP


DOWN


MENU

The menu system is divided into 2 parts:

1-Operating menu
Accessed by using the UP/DOWN arrows when the key is on.

2-Accessories Menu
Is shown automatically when the key is turned to the Accessory position.



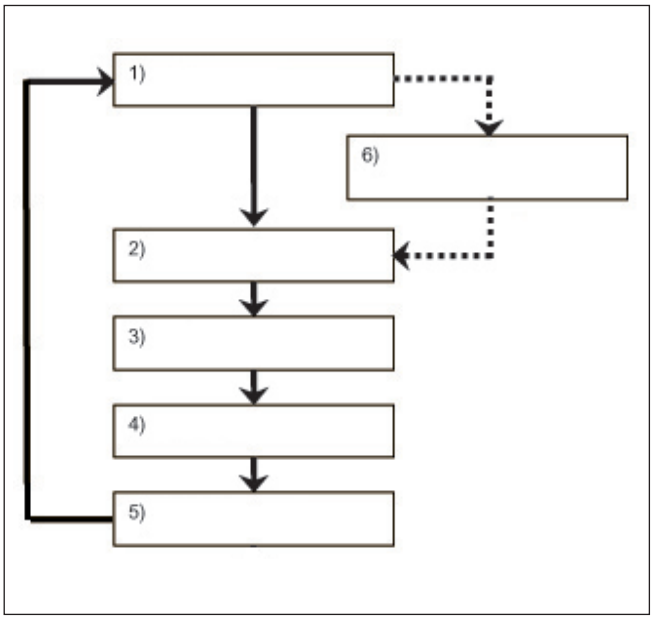
## 1.1 Operating menu

When the ignition is on, either with or without the engine running the Working Menu can be cycled through by using the UP and DOWN buttons.

After key-on the cluster will always default to the PTO/hours screen. As soon as Engine speed goes above 500 RPM for more than 2 seconds, the display will show the last selected working menu option before previous key off.

The diagram below shows the menu path when using the DOWN button, if UP is pushed the direction is reversed.

*NOTE: Count of worked area is active only if the engine is running and implement width is set on a value different from "0".*




1) Power take-off / hours

2) Worked area

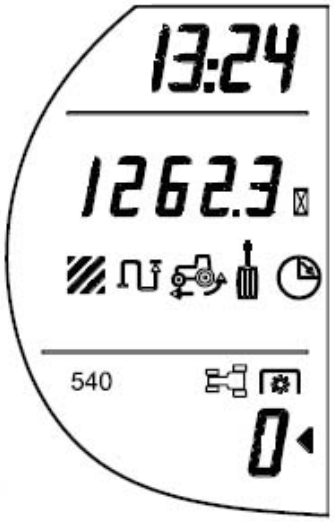
3) Distance

4) Calibration

5) Work timer

6) Vehicle errors - if active

### 1.1.1 PTO/Hour Display




The screen shows:

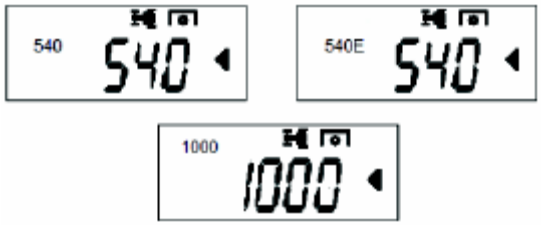
Time - 13:24
Total hours accumulated by the tractor - 1262.3
PTO mode currently selected - 540 Rear
PTO RPM - 0

The arrow indicates the PTO menu is active.

Use:

The following combination of screens can be displayed:

Rear Power Take-Off




These screenshots are self-configured according to the PTO type present and to the selected PTO.

The screenshots display the rear PTO speed of 540, 540E and 1000.

Front Power Take-Off


While inside the PTO menu (as indicated by the arrow on the right-hand side), the operator may use the MENU button to scroll the values of front and rear PTO speed.

Rear power take-off overspeed

- 540/540E: When the PTO shaft revolves faster than 630 RPM, the yellow PTO lamp on the instrument lights up and the buzzer sounds.

- 1000: When the PTO shaft revolves faster than 1170 RPM, the yellow PTO lamp on the instrument lights up and the buzzer sounds.

Reduce the engine rated speed to reduce the rear PTO shaft speed.

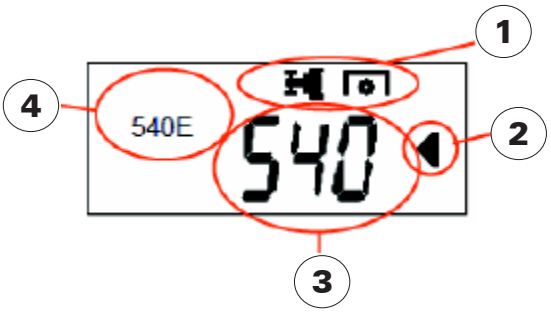
Front power take-off overspeed

-1000: The front PTO speed value and the front PTO symbol blink on the display.

Reduce the engine rated speed to reduce the front PTO shaft speed.

## Rear Power Take-Off [4.2.d]

According to the PTO on board, the display will show the following:




This display will be configured as follows:

1 - Rear/front PTO selected
The selected PTO display indicates that the LCD is showing whether the front or rear PTO was engaged.
The MENU button displays one of these indications.

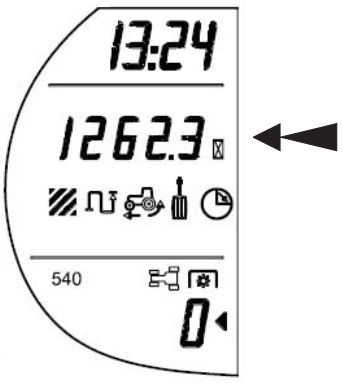
2 - Arrow indicating the PTO/hour menu is selected.
The arrow indicates that in this moment the functions of the PTO/hours menu are selected for display.
By means of the UP and DOWN buttons the operator can scroll the different MENU options and the arrow indicates which view has been selected.

3 - PTO instantaneous speed - RPM
Indicates the actual speed of the engaged PTO. If the PTO is not engaged, the display shows "0". If when the PTO is disengaged a value different from "0" is shown, that means a dragging effect is present. Ask your Dealer's workshop for help.

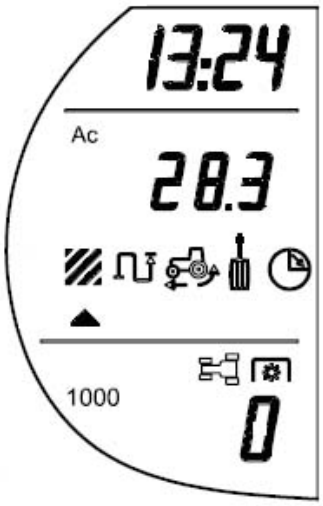
4 - PTO speed selected
The "PTO speed selected" display indicates 540 or 540E or 1000 (or 1000E, if applicable) according to tractor configuration and to the PTO speed that is selected by the speed selector lever.

Front Pto
- Ignition key ON. The front PTO can be displayed in the lower area of the left-hand LCD (select PTO display by the up/down arrows and press the MENU button). The display shows the front PTO speed, as calculated from engine speed rate with gear engaged in the factory setting. If the front PTO is not active, the display reads 0. If the front PTO is engaged, the value of the rev speed rate is shown on the LCD screen.
When the key is switched to OFF, the front PTO view is cancelled, and when the key is switched to ON, the procedure starts again at the first start of the front PTO.

WORK HOURS
The display shows the actual hours worked by the tractor. The count is only active when the engine is running. The value displayed ranges from 0.0 to 9999.9. When the maximum value is reached, the displayed value ranges from 10000 to 60000. When 60000 is reached, the count will stop.



### 1.1.2 Area worked

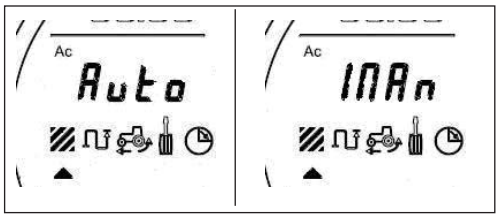



If the down button is pushed the Area Worked menu is selected:

The screen shows:

Time - 13:24
Area units selected - Acres
Area worked - 28.3 Acres
PTO mode currently selected - 1000 Rear
PTO RPM - 0

The arrow indicates the Area menu is selected. If the counter is operating, this arrow will flash when the menu is selected. Each time the menu is selected, the counter will display "AUTO" or "Man" (MANUAL) 2 seconds long before displaying the relative value. The operator is thus informed about the settings actually active. (See selection)




Use:
- The first screenshot shows the area worked in the units preset in the accessory menu. The units are Acres or Hectares.
- One decimal place will be shown until the amount of units reaches 9999.9, at this point the counter will show 10000+. If 99999 is exceeded the counter will reset.
- Counter can work in two different modes. Mode selection is available into accessory menu (see Auto Function Settings):

Manual Mode: when activated by the operator, the counter counts every time the tractors is moving (if implement width has been previously defined) until the operator stops it.
Auto Mode: if implement width has been previously defined, the counter starts and stops to count automatically when the tractor is moving and either the hitch is down or the Remote implement switch is on.

Auto and Manual mode will increment the same counter value.

Counter Activation:
- Pushing the MENU button for <2 secs starts/stops the area counter (only for Manual mode)
- Pushing the MENU button for >2 secs when counter is visualized and not active resets the counter.
- If pushed for longer than 2 seconds when active the counter will stop (only for Manual mode).
- If the UP or DOWN arrows are pressed to change the menu function selected when the counter is active, it will continue to count.

- To turn the distance counter off after exiting the menu the operator will have to go back into this screen and press the menu button (only for Manual mode).
- If active at key-off the unit will start again counting at key-on (only for Manual mode).

*Notes*:
1) Only Area worked function will be activated in manual
2) To count the area worked, the implement width has to be previously defined (Accessories Menu 4).

### 1.1.3 Distance travelled

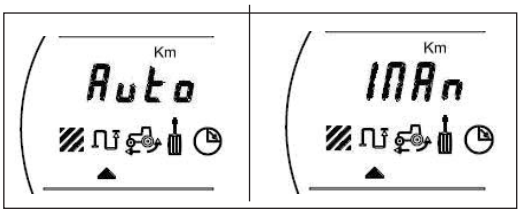

If the down button is pushed again the Distance Travelled menu is selected:

The screen shows:

Time - 13:24
Distance units selected - Km
Distance travelled/worked - 208.3 Km
PTO mode currently selected - 1000 Rear
PTO RPM - 0

The arrow indicates the Distance menu is selected.
If the counter is operating, this arrow will flash when the menu is selected.
Each time the menu is selected, the counter will display "AUTO" or "Man" (MANUAL) 2 seconds long before displaying the relative
value. The operator is thus informed about the settings actually active.






Use:
- The first screen shows the distance travelled/worked in the units preset in the Accessory menu. To indicate a distance shorter than 1 mile/1 km, the display shows the following symbol corresponding to the 5th digit:
- One decimal place will be shown until the amount of units reaches 9999.9, at this point the counter will show a value of 10000.
If 99999 is exceeded the counter will reset.
- Counter can work in two different modes. Mode selection is available into Accessory menu (see Auto Function Settings):

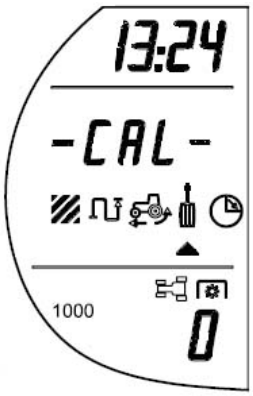
Manual Mode (Distance Travelled): when activated by the operator, the counter counts every time the tractors is moving until the operator stops it.

Auto Mode (Distance Worked): the counter starts to count when the tractor is moving and either the hitch is down or the Remote implement switch is on.

Auto and Manual mode will increment the same counter value.


Counter Activation:
- Pushing the MENU button for less than 2seconds starts/stops the distance counter (only for Manual mode).
- Pushing the menu button for longer than 2 seconds when selected but not active resets the counter,
- if pushed for longer than 2 seconds when active the counter will stop (only for Manual mode).
- If the UP or DOWN arrows are pressed to change the menu function selected when the counter is active it will continue to count.
- To turn the distance counter off after exiting the menu the operator will have to go back into this screen and press the menu button(only for Manual mode).
- If active at key-off the unit will start again counting at key-on (only for Manual mode).

### 1.1.4 Calibration Menu



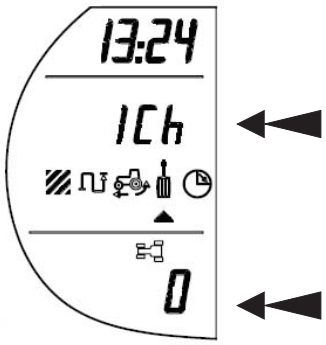

If the down button is pushed again the top level of the Calibration menu is selected:

The screen shows:

Time - 13:24
Calibration menu selected
PTO mode currently selected - 1000 Rear
PTO RPM - 0

The arrow indicates the Calibration menu is active.

Use:
- After the Calibration menu has been selected, by pressing the MENU button the operator can choose which controller to calibrate.
The following screen is shown:

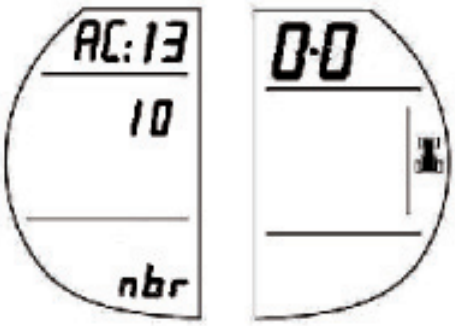



The instrument cluster is the first default controller to be calibrated.

After entering this menu, you may display the calibration state by means of the bottom part on the display that normally shows PTO speed rate.

***WARNING: The operator may only perform the calibrations quoted in the Operator column in the following table. The operator MAY NOT perform the operations quoted in the column NOT FOR THE OPERATOR. They may only be performed by specialized technicians at the Dealer's.***

*NOTE: If the indication " - - - " appears, during calibration selection, in the area of the display where the calibration status is shown, tje selected calibration is not available owing to some problem in the system. Ask your Dealer for help.*






- If the cluster is already calibrated, the operator can choose another controller by pressing the UP or DOWN buttons. The order of the controllers to be calibrated is the following:

| Controller | Display | Operator | NOT for the operator |
|---|---|---|---|
| Instrument cluster (hitch position) | ICh | OK | |
| Transmission | tc | - | NO |
| Cab suspension (if equipped) | CS | - | NO |

- After scrolling to the correct controller the operator will press the MENU button again to start the calibration sequence.
- After the calibration has been completed, the operator can choose to calibrate another controller by scrolling through using the UP and DOWN buttons, or can hold the MENU button longer than 2 seconds to exit to the top level of the calibration menu. From this point the other parts of the working menu can be accessed by using the UP and DOWN buttons.

### 1.1.5.1 ICh Calibration sub-menu, hitch position display

This calibration defines the hitch position display.
When the LCD shows "ICh" and the PTO display shows "0", the operator has to press the "MENU" button to access the hitch calibration menu.
Now the LCD will show "1", i.e. "ready to start". The instrument is waiting for the operator to lower the hitch down to minimum height. When the hitch reaches the minimum height, press "MENU" to save the lowest limit of hitch travel, which is stored as "0%". The code "10" is displayed for 2 seconds, followed by the code "11". Now the instrument is waiting for the operator to raise the hitch to its upper limit. Make sure the Upper Limit Control is set to maximum position. When the hitch reaches the maximum height, press "MENU" to save the upper limit of hitch travel, which is stored as "100%". The code "20" is displayed for 2 seconds, followed by the code "50" to show that the calibration was properly performed.

Press MENU for longer than 2 seconds to exit Calibration and go to another menu.

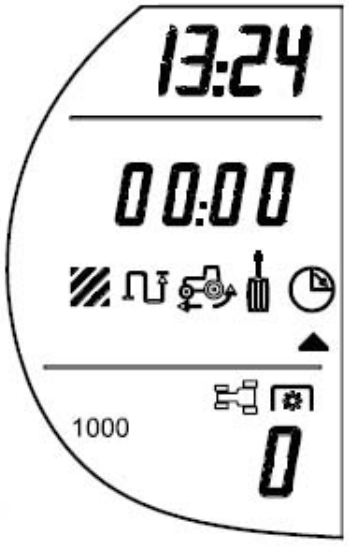
ICh calibration sequence

| | Calibration index |
|---|---|
| Display PTO | Description |
| 0 | Calibration mode not accessed |
| 1 | Ready to start - waiting for hitch down |
| 10 | Hitch lowest limit stored - 0% |
| 11 | Waiting for hitch up |
| 20 | Hitch upper limit stored - 100% |
| 50 | Calibration OK |

ICh calibration errors

| | Calibration index |
|---|---|
| Display PTO | Description |
| 100 | Calibration not OK. Repeat the calibration procedure |

### 1.1.6 Work timer menu

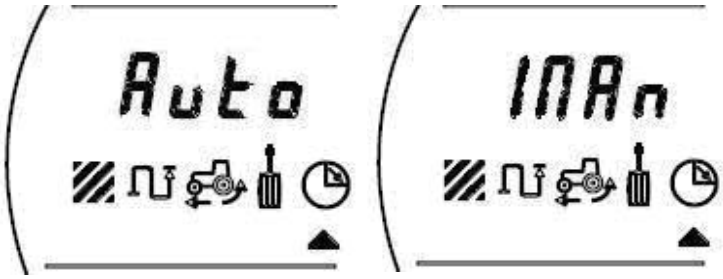



If the down button is pushed again the Work Timer menu is selected:

The screen shows:

Time - 13:24
Work Timer - 0 minutes, 0 seconds
PTO mode currently selected - 1000 Rear
PTO RPM - 0

The arrow indicates the Work Timer menu is active.
Each time the menu is selected, the counter will display "AUTO" or "Man" (MANUAL) 2 seconds long before displaying the relative value. The operator is thus informed about the settings actually active.




Use:
- When the Timer menu is first entered the display will show the screen above on the right.
- The timer will show minutes and seconds up to 99 minutes and 59 seconds.


- When the timer reaches 99 minutes and 59 seconds it will automatically change to show hours and minutes, and an 'h' will be displayed on the left-hand side.


- If the timer is allowed to run continuously to 99 hours and 59 minutes it will reset to 00:00 and then the count will start again.

- Counter could work in two different modes. Mode selection is available into Accessory menu (see Auto Function Settings):

Manual Mode: the timer counts every time the operator activates it until the operator stops it.

Auto Mode: the counter starts and stops to count automatically when the hitch is down or the Remote implement switch is on.

Auto and Manual mode will increment the same counter value.

Counter Activation:
- Pushing the MENU button for less than 2 secs starts/stops the Work Timer (only for Manual mode).
- Pushing the menu button for longer than 2 seconds when counter is visualized and not active resets the Timer.
- If pushed for longer than 2 seconds when active, the counter will stop (only for Manual mode).
- If the UP or DOWN arrows are pressed to change the menu function selected when the Timer is active, the count will go on.

*Note:*
*1) Only work time function will be activated in manual mode.*

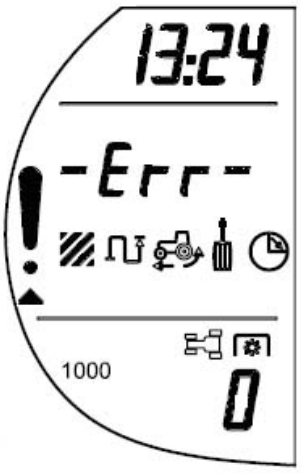
### 1.1.7 Error menu

When an error is active on the tractor, an exclamation mark will show on the left-hand side of the display. Once activated, the exclamation mark shall stay on 4 seconds at least.
In this case, the Error menu can be accessed by pressing DOWN when in the PTO/Hours menu or UP when in the Area Worked menu. When operator enters into Error menu, error codes active in that moment remain frozen until operator exits the menu. It is possible to add new errors, but not to deactivate the errors shown.

The screen shows:

Time - 13:24
Error menu selected
PTO mode currently selected - 1000 Rear
PTO RPM - 0

The arrow indicates the Error menu is active.




When the Error menu is first entered, the display will show the screen above. The PTO readout is still active.

- Pushing the MENU button will enter into the second level of the menu structure. This is a list of the ECUs on the tractor and the quantity of errors on each one. The list will only be populated when there is an active error for a particular controller. This will mean the operator does not have to scroll through the whole list to find the error.

In the example below the Engine has 4 errors:


List of controllers

| Controller | Designation |
|---|---|
| Instrument Cluster | IC |
| PTO/Hitch | Ehr |
| Transmission Controller | tc |
| The following units, only if mounted on the tractor | |
| Engine (if electronic engine) | Eng |
| Only with mounted mechanical transmission: | |
| PTO control | PTO |

- If the MENU button is pressed again for less than 2 seconds the third level of menu will be selected. This displays the error codes from the selected controller.
  The controller name is moved to the part of the LCD which usually displays the clock and the SPNs /FMIs are shown below it.


- Pressing the UP and DOWN buttons will scroll through all the error codes for the particular controller.
- If the MENU button is pressed again for less than 2 seconds the operator may select a different module by scrolling up to level 1.
- To exit the Error menu, the operator has to press the MENU button for longer than 2 seconds. This will exit to the first level where the rest of the working menu can be accessed.

***WARNING: When an operation ERROR is displayed, ask the Dealer's specilized personnel for help indicating the error code. The Dealer's personnel has specific competences to locate the error and the type of operation to be performed.***

## 2.1 Accessories Menu

If the ignition is turned to the accessory position the accessory menu is shown.

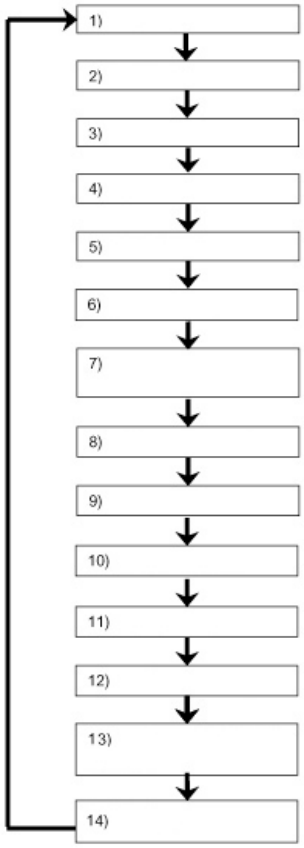
Before the menu is shown, the software version of the tractor is shown for 2 seconds after initialisation of the cluster. The image below shows the installed software version.

After this the cluster defaults to the first part of the accessory menu.


Key:

IC= Instument Cluster
C= McCormick
B = Model Code
0 300 = installed software version

## The menu structure for the Accessory menu will be as follows:




1) MPH/KPH

2) Acres/Hectars

3) Tyre size

4) Implement width

5) Service timer

6) Engine constant*

7) Rear and front PTO options*

8) Not used

9) Switch detecting gear selector lever in NEUTRAL available*

10) Tractor model code*

11) Previous work hours*

12) Auto functions adjustment*

13) Lighting adjustment

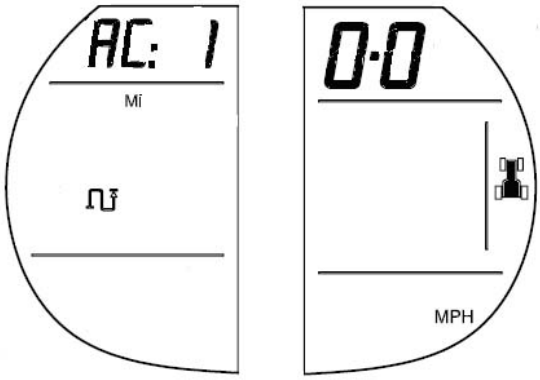
14) Clock setting

To scroll the menu, the operator will push the UP or DOWN button. The diagram shows the menu path when using the UP button. If DOWN is pushed, the direction is reversed.

** These calibrations are NOT AVAILABLE TO THE OPERATOR.*
*Do not enter these menus.*
*Entering this menus will affect the tractor operation.*
*Refer to your Dealer for more information.*

### 2.1.1 MPH/KPH

The default first part of the accessory menu is used to set the units for Distance Travelled and Vehicle Speed. The units can be Kilometres or Miles.






The display section usually reserved to the clock shows "AC", to signify the menu is accessed, and then a number to show the part of the menu currently being viewed.

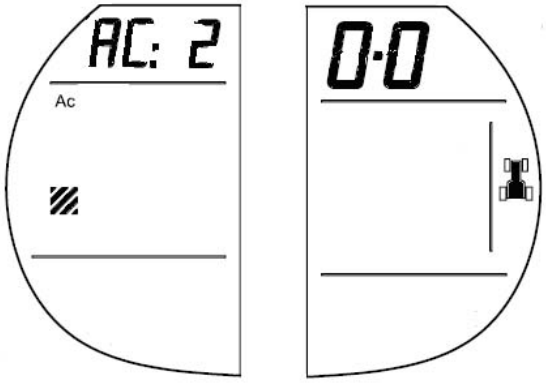
This first screen shows the units currently selected, in the example above this is Miles. Both the Mi for the distance covered and the MPH for vehicle speed are showing on the display.

To change to metric units:
1- Press the MENU button
2- The MI and MPH will flash
3- Press UP or DOWN to scroll between the options.
4- The KM and KPH will now be flashing.
5- To save this new setting press and hold the MENU button for longer than 2 seconds (the symbols will stop flashing) and press the UP and DOWN buttons to access other parts of the menu.

- If the key is turned to the off position before the new value is set the old value is used.
- Any values saved in the Distance Travelled memory will be converted to the new units.

### 2.1.2 Acres/Hectars

Press the UP button to go to the next menu section, that is used to set the units for the Area Worked.
The units can be Acres or Hectares.



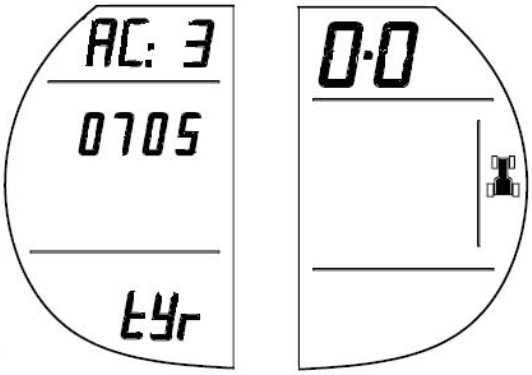

This first screen will show the units currently selected, in the example above this is Acres. The Ac symbol is showing on the display.

To change to Hectares:
1- Press the MENU button
2- The code Ac will flash.
3- Press UP or DOWN to scroll between the options.
4- Now the code HA will flash.
5- To save this new setting press and hold the MENU button for longer than 2 seconds (the symbols will stop flashing) and press the UP and DOWN buttons to access other parts of the menu.

- If the key is turned to the off position before the new value is set the old value is used.
- Any values saved in the Area Worked memory will be converted to the new units.

### 2.1.3 Tyre size

Press the UP button to go to the next menu section, that is used to set tyre size most suitable to your tractor. The units are mm and the Static Loaded Radius of the tyre is used.






This first screen will show "0705" as the current setting used as an example. The text tyr is shown at the bottom of the screen.

To change the tyre size:
1- Press the MENU button
2- The actual tyre size will flash (e.g. 0705).
3- Press UP or DOWN to scroll in units of 1 from 0300 to 1033 mm.
4- To save this new setting press and hold the MENU button for longer than 2 seconds (the numbers will stop flashing) and press the UP and DOWN buttons to access other parts of the menu.

- If the key is turned to the off position before the new value is set the old value is used.
- If there is a Distance Travelled value in the memory, it will not be changed when the tyre size is altered.

Note:
This value can also be modified by dynamic calibration, see the corresponding chapter.

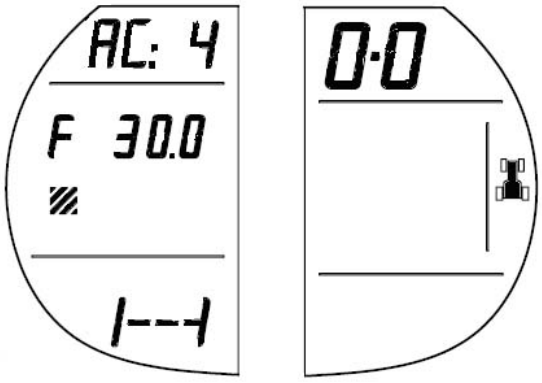
## Rear Tyre Rolling Radius

| REAR TYRES | **INDEX RADIUS* (mm)** |
|---|---|
| 13.6R28/13.6-28 | 625 |
| 14.9R28/14.9-28 | 650 |
| 16.9-28 o 16.9R28 | 675 |
| 14.9R30/14.9-30 | 675 |
| 16.9R30/16.9-30 | 700 |
| 18.4R30/18.4-30 | 725 |
| 480/70R30 | 700 |
| 12.4R32/12.4-32 | 650 |
| 16.9R34/16.9-34 | 750 |
| 18.4R34/18.4-34 | 775 |
| 480/70R34 | 750 |
| 520/70R34 | 775 |
| 540/65R34 | 750 |
| 540/70R34 | 775 |
| 600/65R34 | 775 |
| 12.4R36/12.4-36 | 700 |
| 13.6R36/13.6-36 | 725 |
| 12.4-38 | 725 |
| 13.6R38/13.6-38 | 750 |
| 15.5-38 / 15.5R38 | 750 |
| 12.4-42 | 750 |
| 18.4-16.1 | 480 |
| 21.5-16.1 | 485 |
| 18.4R38/18.4-38 | 825 |
| 16.9R38/16.9-38 | 800 |
| 520/70R38 | 825 |
| 600/65R38 | 825 |
| 540/65R38 | 800 |
| 480/70R38 | 800 |
| 420/85R38 | 800 |

** IMPORTANT: The rolling radius depends on tyre manufacturer, tyre wear, tyre pressure and load. For a more accurate rolling radius dimension, use the Dynamic Mode procedure.*

## 2.1.4 Implement Width

Press the UP button to go to the next menu section, that is used to set the implement width. This value is used to along with the distance travelled to calculate the Area Worked. When the cluster is brand new the default value should be 0 = 0,0 centimetres. The width can be set in Feet or Centimetres.






This first screen will show the current setting and units, 30.0 Feet in the example. A graphic is shown at the bottom of the screen to symbolise implement width.

To change the implement width:
1- Press the MENU button
2- The actual implement width will flash (e.g. 30.0).
3- press UP or DOWN to scroll metric units in divisions of 10 between 0000 and 9990. The range of imperial units will be 0 to 199.5 in divisions of 0.5.
If the MENU button is pressed now, you can directly set the unit of measurement as here described.
4- To save this new setting press and hold the MENU button for longer than 2 seconds (the numbers will stop flashing) and press the UP and DOWN buttons to access other parts of the Accessory menu.

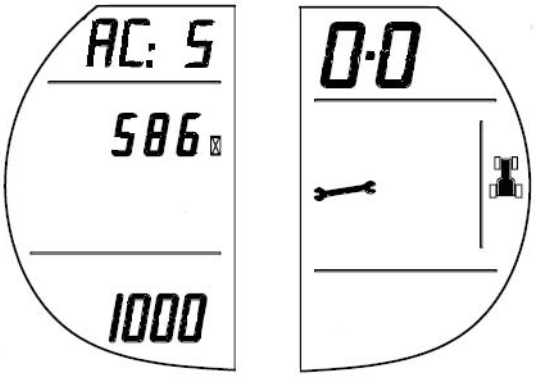
If the units need to be changed:
1- Press the MENU button
2- The actual implement width will flash.
3- Press the MENU button again and the units will flash.
4- Press UP or DOWN to switch between metric and imperial.
F= Feet C= Centimetres
If the MENU button is pressed now, you can directly set the width as here described.
4- To save this new setting press and hold the MENU button for longer than 2 seconds (the letter will stop flashing) and press the UP and DOWN buttons to access other parts of the Accessory menu.

Note: Press MENU again after stage 3 to return to width adjustment.

- If the key is turned to the off position before the new value is set the old value is used.

### 2.1.5 Service timer

By pressing the UP button, the Service Timer menu is entered. This is a simple count-down timer that can be set by the operator. In normal operation, when the timer reaches 0 the spanner symbol will show on the right-hand panel of the cluster. When the cluster is brand new the default value should be 0 (inactivated).




This first screen will show the time set originally (1000), the time left to run (586) and will also show the hourglass and spanner graphics to indicate which menu is being accessed.

To set the Service interval:
1- Press the MENU button
2- The time left to run (586 in the example) will flash.
3- Press UP or DOWN to scroll in units of 1 from 0 to 1999.
4- To save this new setting press and hold the MENU button for longer than 2 seconds (the number will stop flashing) and the new Service Interval will be recorded on the bottom line of the left-hand panel (1000 in the example). Pressing the UP and DOWN buttons will now access other parts of the menu.

If the interval is set to 0 the Service timer has been deactivated.

- If the key is turned to the off position before the new value is set the old value is used.

***This is NOT an operator menu.***
***DO NOT press to enter this menu.***

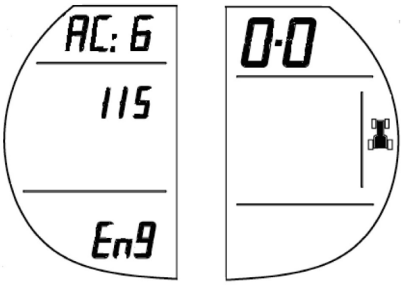
***Normally this menu is programmed at your Dealer's workshop.***

***Enter this menu only if absolutely required to add a specific service operation,***

Entering this menu might affect the tractor operation.
See your dealer for more information.

### 2.1.6 Engine constant

Pressing UP again will go to the Engine Constant menu. This is a ratio used to calculate the actual engine speed from the alternator pulses.
The following screen is shown:



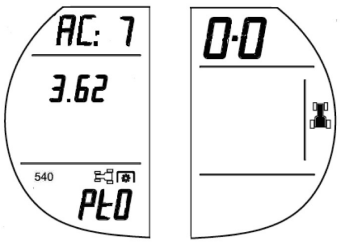

***This is NOT an operator menu.***
***DO NOT enter this menu.***

Entering this menu might affect the tractor operation.
See your dealer for more information.

### 2.1.7 Front/rear PTO options

Pressing the UP button again, the option menu of front/rear PTO can be accessed.

THE FOLLOWING SCREEN IS SHOWN

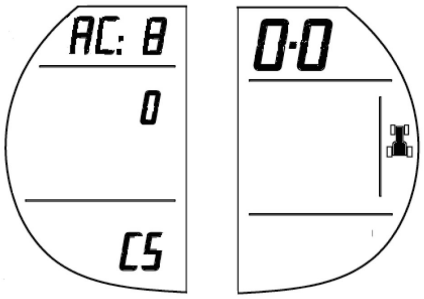



***This is NOT an operator menu.***
***DO NOT enter this menu.***

Entering this menu might affect the tractor operation.
See your dealer for more information.

### 2.1.8 Cab suspension (not available)

Pressing UP again will go to the Cab Suspension Present menu.
The following screen is shown:

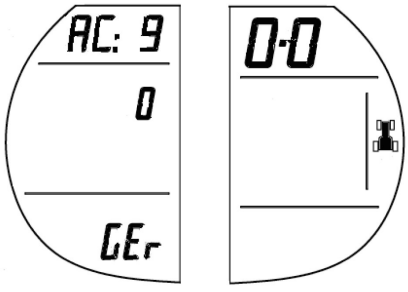



***This is NOT an operator menu.***
***DO NOT press to enter this menu.***

Entering this menu might affect the tractor operation.
See your dealer for more information.

### 2.1.9 Menu of switch detecting gear selector lever in NEUTRAL

Pressing UP again, the menu of the switch detecting gear selector lever in NEUTRAL is accessed.
This value was set at the factory and must not be changed.
THE FOLLOWING SCREEN IS SHOWN.

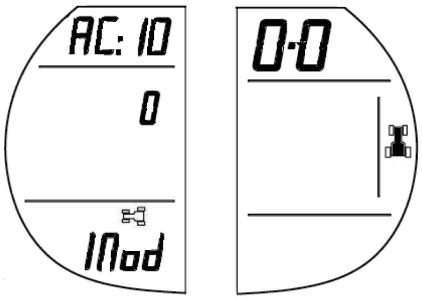



***This is NOT an operator menu.***
***DO NOT enter this menu.***

Entering this menu might affect the tractor operation.
See your dealer for more information.

### 2.1.10 Tractor model code

Pressing UP again will go to the Tractor Model Code menu.
The following screen is shown:

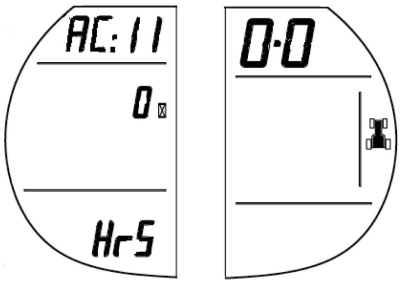



***This is NOT an operator menu.***
***DO NOT enter this menu.***

Entering this menu might affect the tractor operation.
See your dealer for more information.

### 2.1.11 Previous work hours

Pressing UP again will go to the Previous Work Hours menu. This is used in case the instrument cluster should be replaced for any reason.
The following screen is shown:

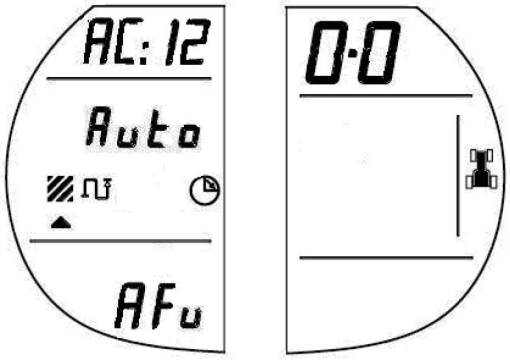



***This is NOT an operator menu.***
***DO NOT enter this menu.***

Entering this menu might affect the tractor operation.
See your dealer for more information.

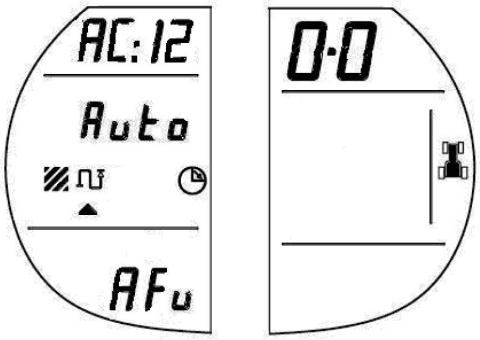
## 2.1.12 Auto Function Settings

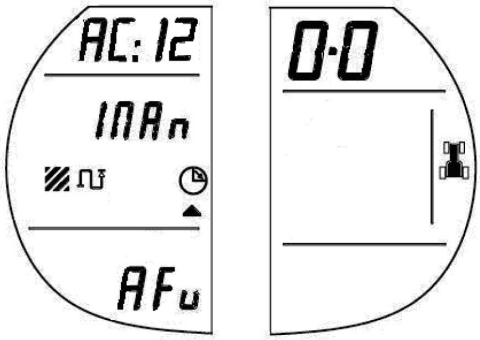
Pressing UP again will go to the Auto Function setting menu, to define if area worked, distance travelled or work timer counter needs to be set as manual or auto mode. This means that all these counters will depend from the position of the hitch (automatic) or from the start/stop menu button (manual). When the cluster is brand new, the default value should be Manual for all the functions.
The first screen is the following:




depending on the current settings of Area worked (Auto/Man). "AFu" means Auto Function.

To change the Auto Function Settings:
1- Press the MENU button
2- The arrow below area worked symbol will start to flash.
3- Press UP or DOWN to switch between Area Worked, Distance Travelled and Working Time Counter with arrow still flashing under the relevant symbol. The following screen should appear (depending on current settings - Auto/Man)




4- Once the right sub-menu to be modified has been selected, push Menu button again and the relevant Auto/Man text (depending on current settings saved) will start to flash whilst arrow will go steady on.
5- press UP or DOWN button to change the settings.
6- To save this new setting press the MENU button, the text will stop flashing, the arrow will flash again and you go back to point 3.
7- Pressing the UP and DOWN buttons will now access the other sub-menu of the Accessory menu.
8- Pressing and holding the MENU button longer than 2 seconds, you may in any moment save the current settings and quit the menu. Pressing the UP and DOWN buttons will now access other parts of the Accessory menu.

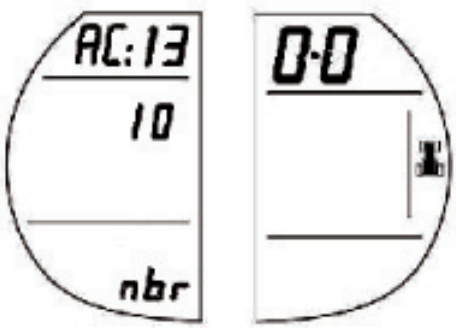
If the key is turned to the OFF position before the new value is set, the old value is used.

## 2.1.13 Screen brightness adjustment

Pressing UP again will go to the Screen Brightness menu. By this menu the operator can set the brightness of the lamps and of the LCD when the sidelights are on. The brightness by day cannot be adjusted.
The value goes from 1 to 10, where:
- 1 means lamp light = 5%  and LCD/indicators brightness = 13% of max. capacity.
- 10 means lamp light = 45%  and LCD/indicators brightness = 53% of max. capacity.

The default value is = 5 that means lamp light = 13%  and LCD/indicators brightness = 24% of max. capacity.

The screenshot is the following, according to the brightness setting.
"nbr" indicates brightness adjustment at night.



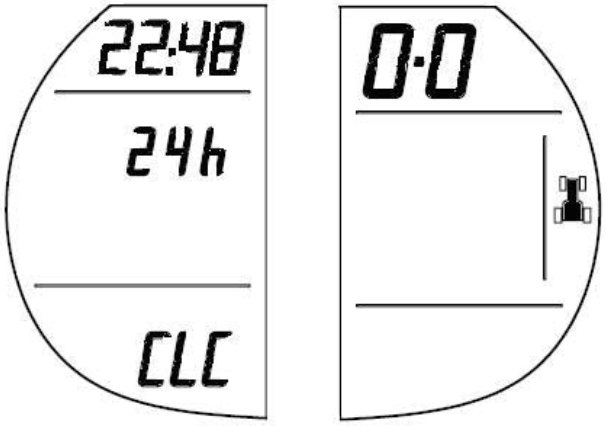

To adjust the brightness:
1- Press the MENU button.
2- The present value will flash.
3- Press UP or DOWN to scroll values from 1 to 10.
4- To save this new setting press and hold the MENU button for longer than 2 seconds (the number will stop flashing) and press the UP and DOWN buttons to access other parts of the Accessory menu.

If the key is turned to the OFF position before the new value is set, the old value is used.

NOTE: The brightness of indicators, LCD and lamps by day is set on 70% of max. capacity.

## 2.1.14 Clock setting

Pressing UP again will enable the operator to set the clock. Pressing DOWN from the AC:1 original screenshot will also reach this section. The clock can also be set to be 12 or 24 hours in this menu. When the cluster is brand new the default values should be 24h and 00:00.






This first screen will show the current time (22:48) and whether the clock is set to 12 or 24 hours (24h). The letters *CLC* will show at the bottom of the left-hand display to inform the operator this is the Clock Setting menu.

To change Clock:
1- Press the MENU button
2- The hour digits will flash.
3- Press UP or DOWN to scroll in units of 1 from 00 to 12 or 24.
4- Press the MENU button again to set the hours.
5- The minutes will flash.
6- Press UP or DOWN to scroll in units of 1 from 00 to 59.
7- Press the MENU button again to set the clock on 12 or 24 hours.
8- The text in the middle line will flash.
9- Press UP or DOWN to switch between 12h or 24h.
10-At this point the time can be saved and the menu exited by pressing and holding the MENU button for longer than 2 seconds (the digits will stop flashing), then press the UP and DOWN buttons to access other parts of the Accessory menu.

If the key is turned to the off position before the new time is set the old value is used.

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# Section 5
Operation

5

# GENERAL OPERATION

## Before Starting The Engine

*WARNING: Before starting the engine, be sure all operating controls are in neutral and the park brake is engaged. This will eliminate accidental movement of the machine or start up of power driven equipment.*

*WARNING: Never run the engine in a closed building. Proper ventilation is required under all circumstances.*

Do the following checks before starting the tractor for the first time.

1. Make sure all persons that operate or do maintenance on the tractor understand that clean fuel is important.
2. Check all lubrication fittings.
3. Check oil level in the engine sump and in the gearbox.
4. Check the water level in the batteries.
5. Check that the tractor tank is filled with clean fuel meeting the specifications given in this manual. Clean around the fuel tank cap before you remove the cap.
6. Check for leaks from fuel system, cooling system and engine oil sump.
7. Check that all drive belts are adjusted correctly.
8. Remove any water or sediment from the fuel primary filter.
9. Check the air pressure of the tyres.
10. If your tractor has a power take-off, make sure the safety guard is installed and in good condition.
11. Check for coolant level in the coolant recovery reservoir. If required, top up with an ethylene glycol coolant fluid.

## Start - Important recommendations

Starting

*WARNING: Carefully read the starting instructions before starting the tractor.*

*WARNING: Always take into account the use of the machine and the work place. Take every precaution, specially if there is a high risk of fire.*

*WARNING: DO NOT start the tractor from the ground. Always start the tractor only from the operator's seat.*

*WARNING: DO NOT start the tractor if the bonnet is open or the guards are removed.*

*WARNING: The operator must always seat in his/her place when driving the tractor both in the field and on roads. DO NOT stand up from your seat when the tractor is moving.*

## Run In Procedure

- For a correct running in, it is necessary to observe al precautions called for in the Maintenance section.
- A gradual run-in of a new engine is not necessary.
- Continuous use of light loads when the engine is still new may cause lubrication oil to enter the discharge system.
- You should begin using heavy loads as soon as the engine is put into service and the coolant reaches a minimum temperature of 60°C.
- The engine will benefit if heavy loads are applied immediately after the first start.
- DO NOT run the engine for long periods at maximum load.
- Do NOT let the engine run for a long period at high RPM without any draft applied. If the engine is used without any drafts, be careful to keep the right operating temperature.

## STARTING PROCEDURE [4.1.c]

*WARNING: The engine may be started only in the conditions given here under. If this fails to occur, have the tractor repaired by your Dealer or authorized service centre.*

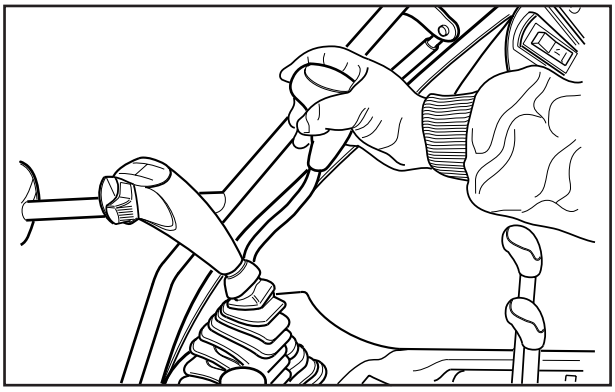
*WARNING: On electrically operated 4WD tractors, the 4WD clutch is spring loaded into engagement and relies on hydraulic pressure for disengagement. A failure in the 4WD hydraulic system will therefore automatically engage the 4WD even though the 4WD switch is in the disengaged position. This is a built in safety feature. DO NOT operate 4WD tractor transmissions with the rear wheels off the ground or removed, UNLESS THE FRONT WHEELS ARE ALSO JACKED UP CLEAR OF THE GROUND OR THE FRONT AXLE DRIVE SHAFT IS DISCONNECTED. Failure to do this can result in the tractor being pulled off the rear supports by the front axle.*

*WARNING: Operate controls only when seated in the Operator's seat.*

*IMPORTANT: Set the engine rpm to low idle for a few minutes to make sure that enough lubricant reaches the turbocharger bearings and engine parts before operating the engine at a high rated speed.*

OPERATION 1
Make sure the Master Disconnect Switch (if equipped) is in the ON position.

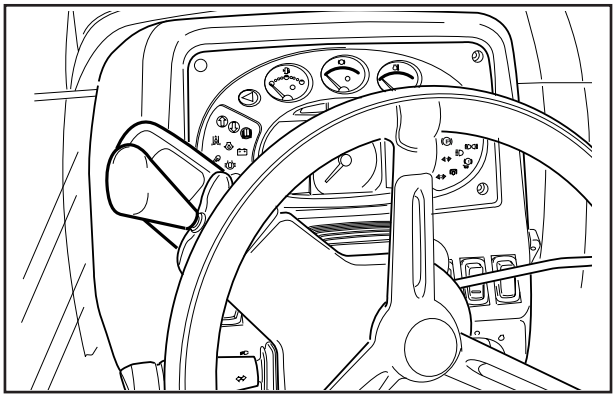
OPERATION 2



Fully depress the clutch pedal. Shift the range lever and the gear lever to the NEUTRAL position.

*NOTE: The gearshift lever MUST be in NEUTRAL, or the starter motor will not operate.*

OPERATION 3

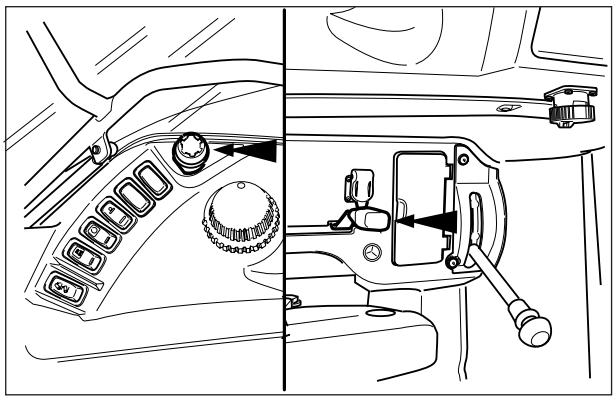


XTRASHIFT

Shift the F/N/R lever to NEUTRAL.

*NOTE: XtraShift tractors are equipped with a neutral start switch in the reverse shuttle circuit. However, if the Forward/Neutral/Reverse lever is not on neutral, the engine will NOT start.*

OPERATION 4



Check that the engagement switch/lever of the PTO clutch is in the disengaged position.
For tractors with front PTO, disengage the control switch.

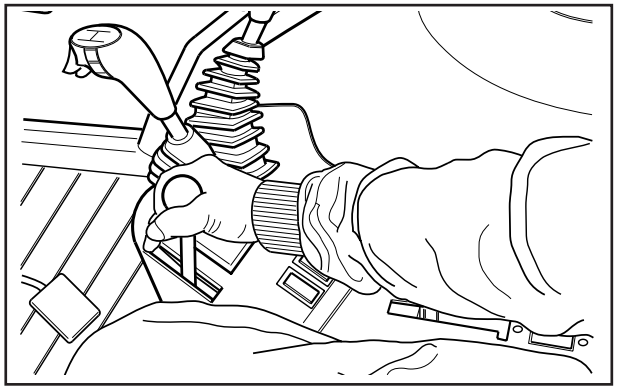
Check that the auxiliary control valves levers are in neutral position.

*NOTE: The engagement switch/lever of the rear PTO clutch MUST be in the disengaged position or the starter motor will not operate.*

*To next page...*

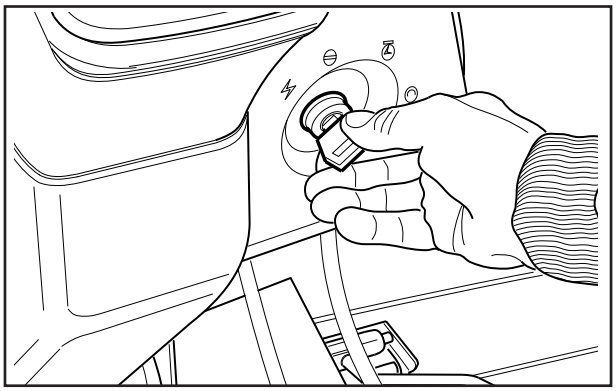
*WARNING: The tractor must only be started with the auxiliary valve levers are in neutral.*

OPERATION 5



Move the throttle lever to 1/4 open position.

OPERATION 6



Turn the key switch to the START position until the engine starts, but no more than 30 seconds, then release the key. Run the engine for 2 minutes.

Release the parking brake.
Desengage the Park Lock (if equipped).

*IMPORTANT: If the engine does not start and an alarm sounds, make sure that the gearshift lever is on NEUTRAL.*

*IMPORTANT: If the engine starts and then stops wait for the starter motor to stop turning before you turn the key switch to the start position again.*

*IMPORTANT: DO NOT use the starter motor for more than 30 seconds without stopping. Wait 3 minutes between starts to allow the battery to recharge and the starter motor to cool.*

OPERATION 7
Check that all indicator lamps are giving normal indications and, when warm, that the coolant temperature gauge is in the green area.

*IMPORTANT: If the indicator lamps or gauge does not give the correct indications, STOP THE ENGINE IMMEDIATELY AND CHECK FOR THE CAUSE.*

**TURBO ENGINE:** Allow the engine to run for a few seconds with the starter motor to allow the turbo compressor to be lubricated at a 1000-1200 RPM rate without increasing further until the engine reaches the normal operating temperature.

## COLD TEMPERATURE OPERATION

Before you start the engine and operate your tractor during cold ambient temperatures, check the following items:

- BATTERIES Must have a full charge.
- FUEL: Must be clean and contain no water.
- ENGINE OIL - Must have the correct viscosity for the ambient temperature range. DO NOT mix oils different for type, characteristics and viscosity from the prescribed ones.
- TRANSMISSION HYDRAULIC FLUID - The oil used must be an approved type. Use the transmission fluid prescribed by the Lubricant Chart.
- COOLING SYSTEM - Must contain a minimum of 33 percent and a maximum of 50 percent ethylene glycol for protection. This ratio will vary with different market requirements. DO NOT mix protective fluids different for colour and characteristics to preserve their quality.
- TYRES - If there is liquid ballast in the tyres, the tyres must have protection against freezing temperatures below 0°C. Ask your dealer for help.
- STOPPING THE ENGINE. Permit the engine temperature to decrease before stopping.
- CONDENSATION IN FUEL TANK - To prevent condensation in the fuel tank and water entering the fuel system, fill the fuel tank after each operating day.
- FUEL FILTER - During cold ambient temperatures, make sure you remove water from the fuel filter each day or damage will occur to the injection system. Loosen the drain plug each day before starting the engine. Tighten the drain plug after the water has drained.

*IMPORTANT: During cold ambient temperatures never run the engine at low idle speed for long periods of time. Never run the engine for long periods of time when the coolant temperature is below normal.*

***WARNING: The tractor is equipped with a cold weather starting system.***
***To avoid injuries or explosions, DO NOT spray ether or gasoline into the air induction manifold.***

When running at low ambient temperatures, the engine and gearbox will not heat to or keep the rated operating temperature at slow engine speeds. Low engine speeds in cold temperatures can cause damage to the engine and gearbox.

Use the following procedures to warm the engine oil and transmission oil and to keep the correct operating temperatures.

1. WARMING UP THE ENGINE AND TRANSMISSION.

   A. To heat the transmission oil, run the engine at 1500 rpm for approximately five minutes.

2. KEEP ENGINE AT THE CORRECT OPERATING TEMPERATURE.

   A. When the engine is operating in cold ambient temperatures without a load, keep the engine warm as described below.

   B. Run the engine at approximately 1500 rpm.

   C. Put a cover in front of the grille to control the amount of air going through the radiator.

3. STOPPING THE ENGINE.

   A. Run the engine at slow speed for a short period of time. This will allow the engine temperature to decrease gradually before stopping the engine.

## Starting the engine with the thermostarter (if equipped)

*WARNING: DO NOT spray ether or gasoline into the air induction manifold of the tractor fitted with a thermostart system. It could cause explosion and injury.*

To start a diesel engine at an ambient temperature of 7°C or less, the under described cold starting procedure with thermostarter should be followed.

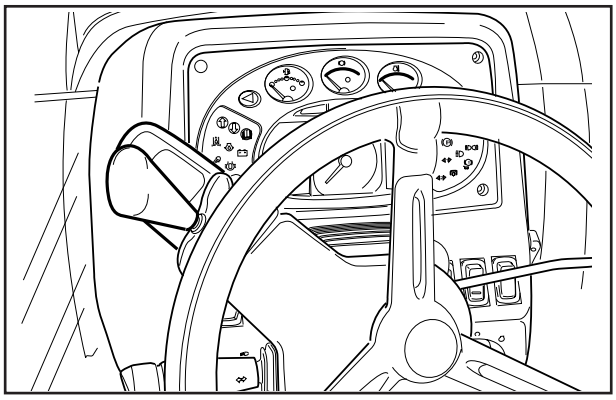
OPERATION 1

The general disengagement switch (if equipped) must be turned on.

OPERATION 2

Fully depress the clutch pedal. Shift the range lever and the gear lever to the NEUTRAL position.

OPERATION 3



XTRASHIFT TRACTOR

Shift the F/N/R lever to NEUTRAL.

*NOTE: XtraShift tractors are equipped with a neutral start switch in the reverse shuttle circuit. However, if the Forward/Neutral/Reverse lever is not on neutral, the engine will NOT start.*

*To next page...*

OPERATION 4
Make sure that the PTO clutch control is on the disengaged position.

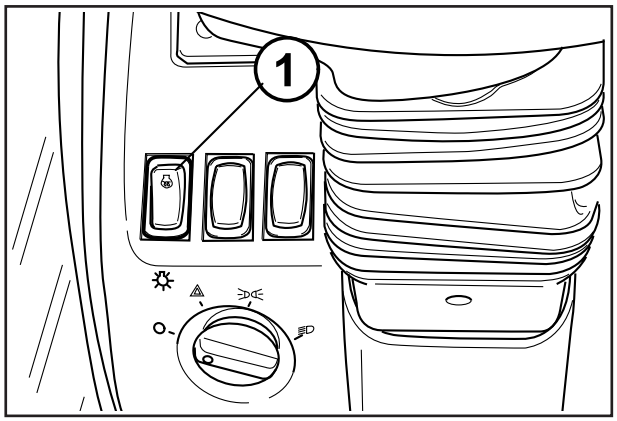
For tractors with front PTO, disengage the control switch.

Check that the auxiliary control valves levers are in neutral position.

*IMPORTANT: The control of the rear PTO clutch MUST be in the disengaged position or the starter motor will not operate.*

OPERATION 5
Move the throttle lever to the FULL open position.

OPERATION 6




Mechanical engine
Press the top part of the thermostarter (1) for 10-15 seconds, then turn the ignition key on the start position. During the starting, the thermostarter switch should be kept depressed not longer than 30 seconds. When the engine has started, bring the throttle on 1/3 of the open position and let the engine run for 2 minutes.

*NOTE: If the engine does not start and no alarm is heard, check that ALL controls are in NEUTRAL. If the engine operates erratically, press the thermostarter button again while the engine is running. If the engine does not start in the first 15 seconds then repeat the procedure, but push the thermostart button for only 10 seconds. If the engine still does not start, DO NOT try to start it again for 3 minutes at least.*

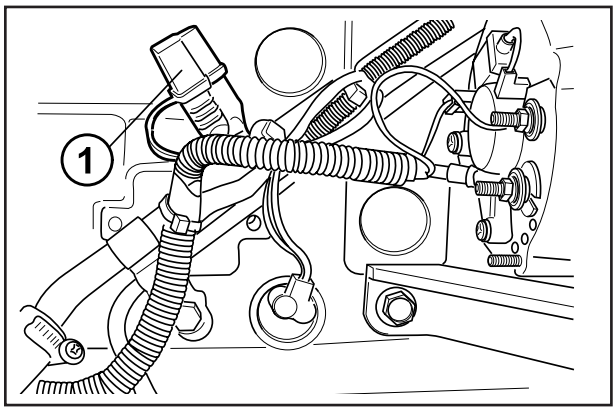
OPERATION 7
Once the engine has started, check that all indicator lamps and gauges are giving normal indications and, when the engine is warm, the coolant temperature indicator is in the correct area.

*IMPORTANT: If the indicator lamps or gauges do not give the correct indications, STOP THE ENGINE IMMEDIATELY AND CHECK FOR THE CAUSE.*

## Engine coolant heater (if equipped)

This heater is installed in the engine block and keeps the engine coolant worm to make starting the engine easier in cold weather.

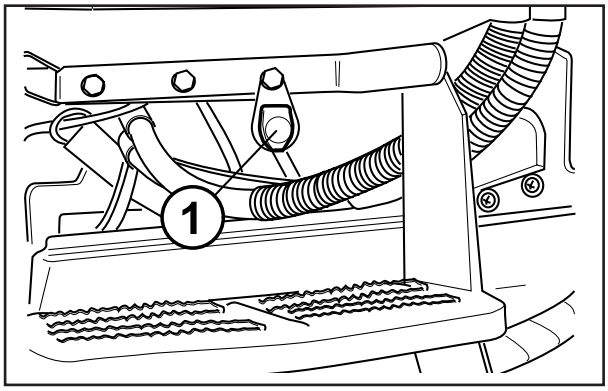
North American Tractors




Connect the connector plug (1) on the engine block to an electrical supply.

*NOTE: If required, use a three-wire extension of proper capacity.*

Other tractors




Connect the connector plug (1) beside the right-hand step to an electrical supply.

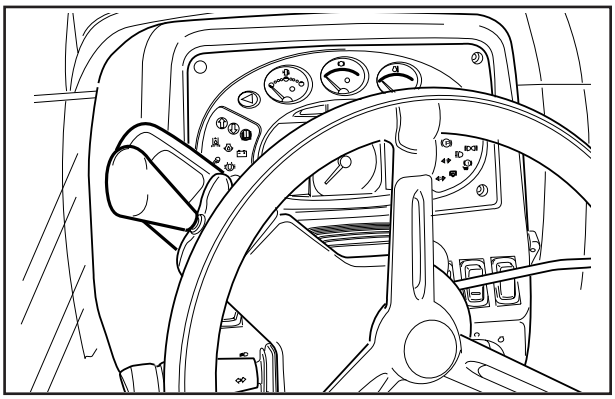
*NOTE: If required, use a three-wire extension of proper capacity.*

## PARKING THE TRACTOR [4.1.c]

### Use of accessories with the tractor at standstill (with engine running)

Before operating the PTO or the hydraulic system in any way, proceed as follows:

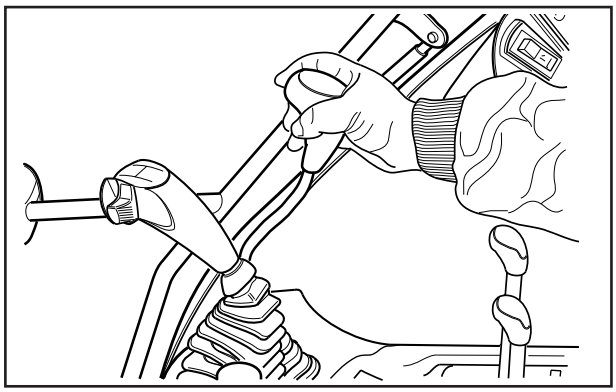
OPERATION 1



XTRASHIFT TRACTOR

Stop the tractor and bring the lever of gearbox with reverse shuttle to the NEUTRAL position.

OPERATION 2

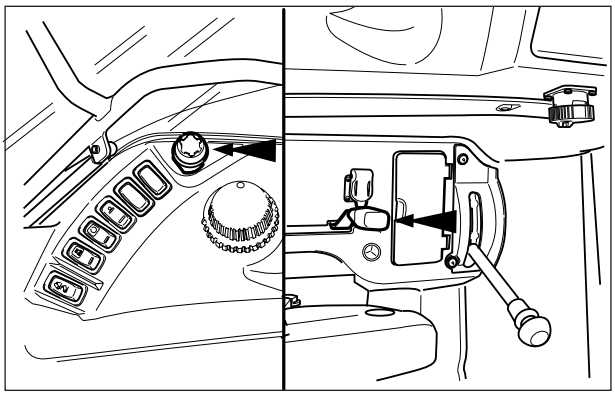


Press the clutch pedal and put into neutral both the range lever and the gearshift lever.

### Turning off the engine

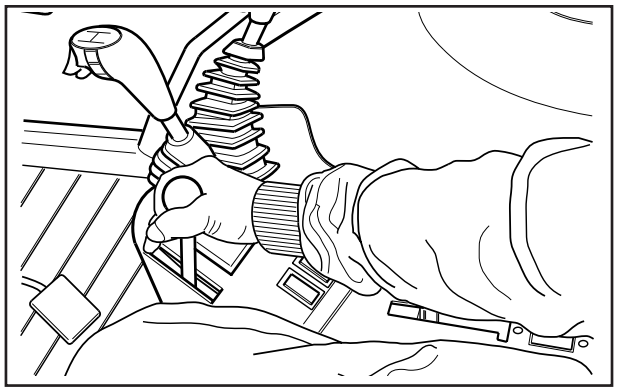
- Perform the previous Operatione 1 and 2.

OPERATION 3



Disengage the PTO clutch control, if in use.

OPERATION 4



Bring the throttle lever fully back to the idle position and let the engine idle.

Apply the parking brake.

Engage the Park Lock (if equipped).

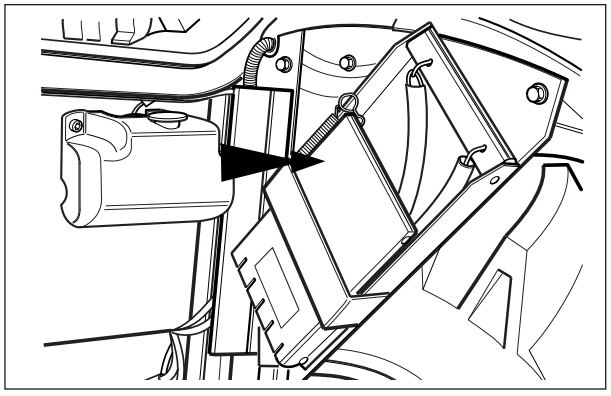
OPERATION 5
Turn the key switch to the OFF position and remove the key.

*IMPORTANT: When stopping the engine after operating under heavy load, run the engine at idle speed for a short period of time. This will allow the engine and turbocharger temperature to decrease gradually.*

***WARNING: whenever the tractor is left unattended, the ignition key must be removed.***

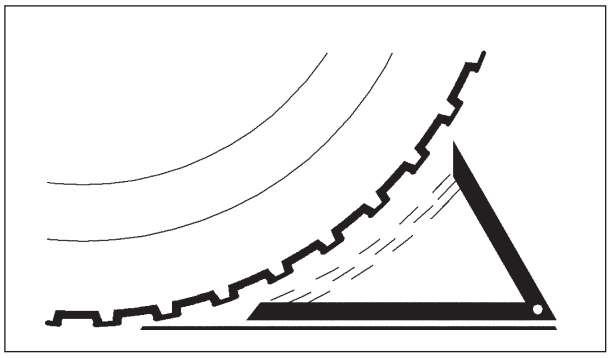
OPERATION 6
Turn off master disconnect switch (if equipped) and remove the master switch key.

## Wedges for folding wheels (if equipped)



(position depends on model)

Use the wheel wedge in front of or behind a rear wheel, (depending on the direction of the tractor), when parking the tractor on a slope.



*IMPORTANT: To prevent accidents do not park the tractor with equipment raised.*

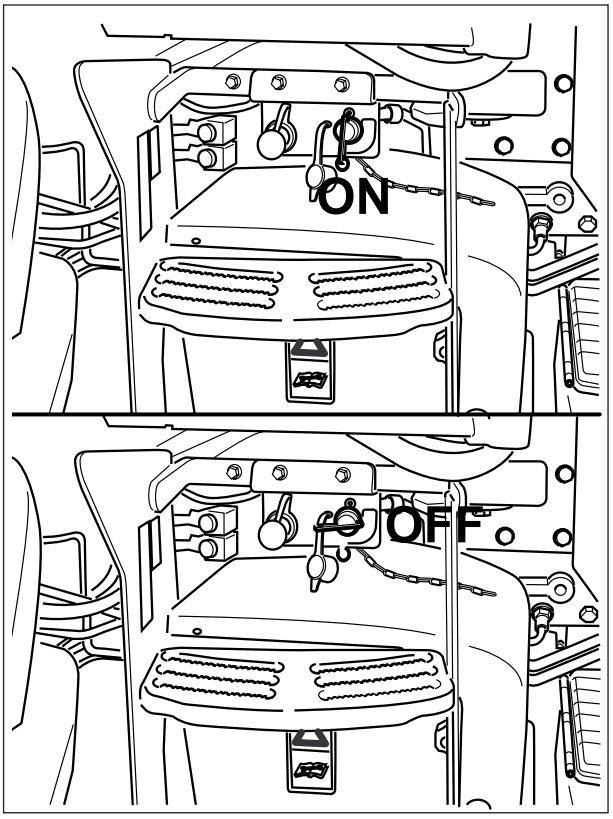
## Master disconnect switch (if equipped)

Use the master disconnect switch to disconnect the battery power from the electrical systems on the machine, when leaving the tractor or during servicing to prevent accidental start up.
It is a good habit to always remove the key to prevent unauthorized use or accidents.

*IMPORTANT: Do not use the master disconnect switch to STOP the Diesel engine, or the machine power units will be damaged. Such operation can only be considered as an emergency intervention.*

Even if not actually required, it is advisable to insulate the machine electric system at the end of each work day by means of the master disconnect switch. This operation increases safety and prolongs battery life.

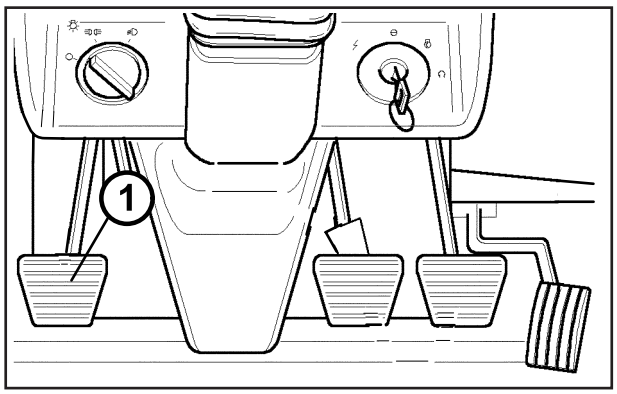
*NOTE: The master disconnect switch must be used for any operation on the electric system. It is at any rate advisable to disconnect the battery completely if welding is carried out on the machine.*




The position of the master disconnect switch changes according to tractor model.

*IMPORTANT: In case of fire, immediately detach the cable from the positive terminal or, if equipped, operate the master disconnect switch.*

## Clutch pedal operation




The clutch pedal is used to temporarily disengage drive.

- Pedal up = drive engaged.

- Pedal down = drive disengaged.

Make your gear changes gradually. When the engine is under load, do not slip the clutch to accelerate, but change to a lower gear.

The clutch pedal should be used during short travel distances or when the tractor is used in confined spaces, when hitching implements to the tractor and stopping the tractor.

The operator uses the clutch pedal to start a standing tractor. Gradually and completely releasing the clutch pedal for a controlled smooth start.

ALWAYS use the clutch pedal during the following operations:

- Selection or change of RANGE and GEAR, but not with POWERSHIFT ranges.

- Creeper engaging and disengaging (if equipped).

- When stopping the tractor.

*DO NOT ride the clutch pedal when the transmission is under load. Always release the clutch pedal immediately for improved clutch service life.*

***WARNING:***
***- Never keep your foot resting on the gearshift clutch pedal when driving.***
***- Never coast down slopes with the gear lever in neutral.***

## USE OF THE GEARBOX

*NOTE: At ambient temperatures of -10°C or less, the gearshift lever and the controls may be difficult to operate for the first minutes after the start, until the oil in the gearbox is not warm.*

*IMPORTANT: If the tractor is moving, a gear should always be engaged (except when changing range, gear or direction). To do so could result in the operator not having full control of the tractor and may result in personal injury.*

### Xtrashift

The Xtrashift gearbox with electro-hydraulic reverse shuttle is available in two versions.

- 4 synchro gear gearbox for 3 ranges (Low - Normal - High) 3 Powershift ranges under load (only available in forward gears) and electro-hydraulic reverse shuttle: 36FWD + 12REV - 40 kph.
- 4 synchro gear gearbox for 4 ranges (Creeper - Low - Normal - High) 3 Powershift ranges under load (only available in forward gears) and electro-hydraulic reverse shuttle: 46FWD + 16REV - 40 kph.

**Xtrashift functions of electro-hydraulic Power Shuttle and 3 Powershift ranges under load.**

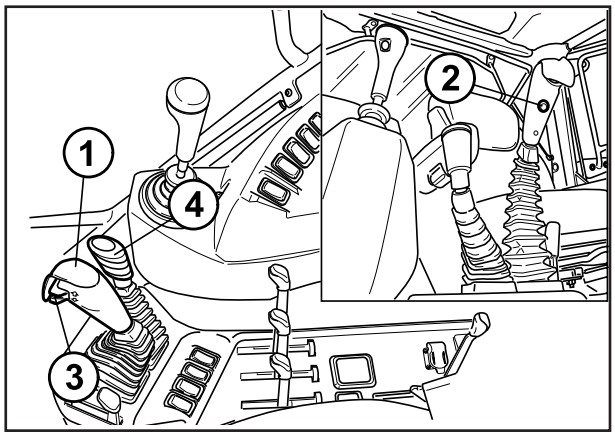
- Reverse shuttle under load: Allows the driving direction to be reversed by simply moving the small lever on the left hand near the steering wheel. The electronic control unit guarantees smooth and gradual reversing. For safety reasons, the direction can only be reversed at speeds of less than 10 Kph.
- The Declutch system disengages the main hydraulic clutch by means of the button on the actual gearshift lever. With this button the driver can change mechanical gears without using the clutch pedal.
  The clutch pedal is only used for very small movements of the tractor, e.g. to hitch or unhitch an implement, and for greater safety, when sudden stops are made or obstacles are encountered.
- Xtrashift: use of the electro-hydraulic gearbox in the 3 operating Powershift ranges: Direct - Direct - Overdrive.
  The operator can shift from a range to another without using the clutch pedal, under load and while the tractor is moving, simply depressing the button on the gearshift lever: press + to increase speed, press - to slow down.

X60.20-X60.30-X60.40

On tractors with mechanically regulated engine, the Overdrive is automatically selected on reaching a 40 kph speed.

X60.50 - earbox 40 kph ECO

The transmission controller limits max. speed to 40 kph at 1900 engine RPM, thus obtaining a significant reduction in fuel consumption when transporting and driving on road.




1 - Gearshift lever.
2 - Declutch disengaging button (orange)
3 - Electro-hydraulic gearbox Powershift switch
4 - Range selector lever: Creeper (on request), Low, Normal, High.

Potentiometer to regulate the engagement speed of electro-hydraulic clutches (5) - All models

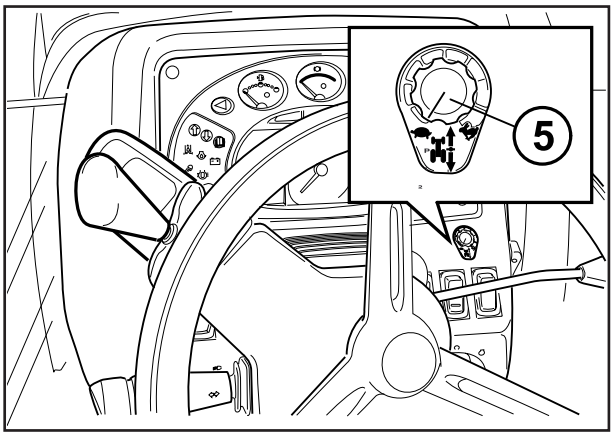
The potentiometer controls the solenoid valves of electro-hydraulic clutches engaging forward gears, underdrive, overdrive, reverse gears.

In particular, it can progressively change the clutch engagement time, so that the tractor response is selected according to the condition of its use.

Such a variation is displayed on the instrument cluster by a number from 0 to 100:

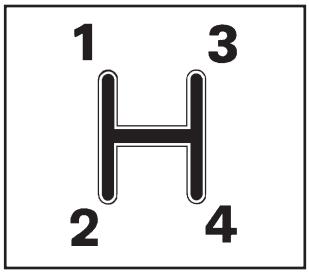
0 - Slow response.

100 - Quick response.



**Gearshift lever**

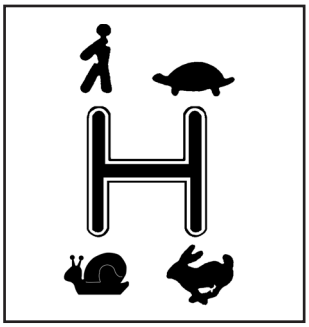
The lever has 4 possible positions, corresponding to 4 totally synchronized speeds.




To shift gears in the same range, just operate the lever after disengaging the drive, without stopping the tractor.

## Speed range selector lever

The speed range selector lever has four possible positions corresponding to the creeper, low, standard and high speed ranges.
Each speed range is identified by a symbol on the knob of the lever.



Four lever positions equivalent to four speed ranges.

Creeper range (optional)

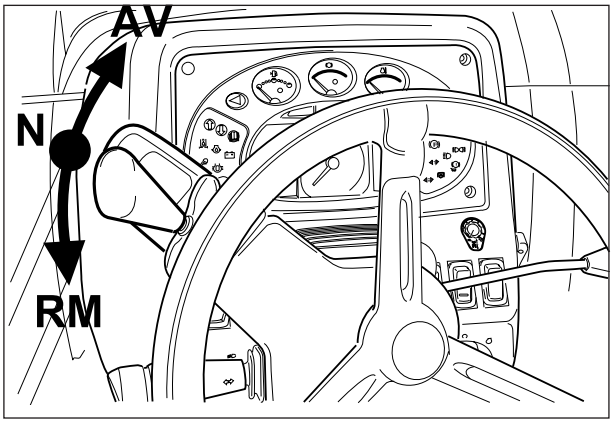
Low range

Standard range

High range

To change from one speed range to another, disengage the gearshift clutch pedal, and bring the tractor to a complete standstill before moving the speed range selector to its new position.

## Power Shuttle control lever




Shuttle control lever.

AV - Lever forward: Forward gears.
N - Neutral: Always move the lever to this position to start the engine.
RM - Lever backward: Reverse gears.

## Xtrashift warning lamps

For warning lamps and information on the instrument panel, see the Instruments and Programming Section in this manual.

# Operation

X60.20-X60.30-X60.40 - Xtrashift gearbox with Powershuttle electro-hydraulic reverse shuttle and 3 Powershift ranges under load (only available for forward gears): 36FWD + 12REV without Creeper; 48 FWD + 16 REV with Creeper.
* In tractors with mechanically adjusted engine, the Overdrive is automatically downshifted as soon as a 40 kph speed is reached.

| ENGINE AT 2200 RPM - Speed in Kph with rear tyres | | | | | | |
|---|---|---|---|---|---|---|
| FORWARD | 16.9 R 34 - 540/65 R 34<br>480/70 R 34 - 13.6 R 38 | | | 16.9 R 38 | | |
| SPEED | POWERSHIFT | | | POWERSHIFT | | |
| | UNDERDRIVE | DIRECT DRIVE | OVERDRIVE* | UNDERDRIVE | DIRECT DRIVE | OVERDRIVE* |
| 1 Creeper speed | 0,29 | 0,35 | 0,46 | 0,31 | 0,38 | 0,49 |
| 2 Creeper speed | 0,46 | 0,56 | 0,72 | 0,49 | 0,59 | 0,76 |
| 3 Creeper speed | 0,58 | 0,70 | 0,90 | 0,62 | 0,75 | 0,96 |
| 4 Creeper speed | 0,86 | 1,04 | 1,33 | 0,92 | 1,11 | 1,42 |
| 1 Low | 1,40 | 1,69 | 2,17 | 1,49 | 1,80 | 2,32 |
| 2 Low | 2,20 | 2,65 | 3,42 | 2,35 | 2,83 | 3,65 |
| 3 Low | 2,78 | 3,35 | 4,32 | 2,96 | 3,57 | 4,61 |
| 4 Low | 4,10 | 4,94 | 6,37 | 4,37 | 5,27 | 6,79 |
| 1 Standard | 3,34 | 4,03 | 5,20 | 3,57 | 4,30 | 5,54 |
| 2 Standard | 5,25 | 6,34 | 8,17 | 5,60 | 6,76 | 8,71 |
| 3 Standard | 6,64 | 8,01 | 10,31 | 7,08 | 8,54 | 11,00 |
| 4 Standard | 9,79 | 11,81 | 15,22 | 10,44 | 12,60 | 16,23 |
| 1 High | 8,24 | 9,95 | 12,82 | 8,79 | 10,61 | 13,67 |
| 2 High | 12,96 | 15,64 | 20,14 | 13,82 | 16,68 | 21,49 |
| 3 High | 16,37 | 19,75 | 25,44 | 17,46 | 21,06 | 27,14 |
| 4 High | 24,15 | 29,14 | 37,54 | 25,76 | 31,08 | 40,04 |

| ENGINE AT 2200 RPM - Speed in Kph with rear tyres | | | | | | |
|---|---|---|---|---|---|---|
| REVERSE | 16.9 R 34 - 540/65 R 34<br>480/70 R 34 - 13.6 R 38 | | | 16.9 R 38 | | |
| REVERSE SPEED | POWERSHIFT | | | POWERSHIFT | | |
| | UNDERDRIVE | DIRECT DRIVE | OVERDRIVE* | UNDERDRIVE | DIRECT DRIVE | OVERDRIVE* |
| 1 Creeper speed | - | 0,36 | - | - | 0,38 | - |
| 2 Creeper speed | - | 0,56 | - | - | 0,60 | - |
| 3 Creeper speed | - | 0,71 | - | - | 0,76 | - |
| 4 Creeper speed | - | 1,05 | - | - | 1,12 | - |
| 1 Low | - | 1,71 | - | - | 1,82 | - |
| 2 Low | - | 2,68 | - | - | 2,86 | - |
| 3 Low | - | 3,39 | - | - | 3,61 | - |
| 4 Low | - | 4,99 | - | - | 5,33 | - |
| 1 Standard | - | 4,07 | - | - | 4,35 | - |
| 2 Standard | - | 6,40 | - | - | 6,83 | - |
| 3 Standard | - | 8,09 | - | - | 8,63 | |
| 4 Standard | - | 11,93 | - | - | 12,73 | - |
| 1 High | - | 10,05 | - | - | 10,72 | - |
| 2 High | - | 15,80 | - | - | 16,85 | - |
| 3 High | - | 19,95 | - | - | 21,28 | - |
| 4 High | - | 29,43 | - | - | 31,39 | - |

X60.50 - Xtrashift gearbox with Powershuttle electro-hydraulic reverse shuttle and 3 Powershift ranges under load (only available for forward gears): 36FWD + 12REV without Creeper; 48 FWD + 16 REV with Creeper.
* In the 4th high Overdrive range the engine speed rate is reduced to 1900 RPM.

| ENGINE AT 2200 RPM - Speed in Kph with rear tyres | | | | | | |
|---|---|---|---|---|---|---|
| FORWARD | 16.9 R 34 - 540/65 R 34<br>480/70 R 34 - 13.6 R 38 | | | 16.9 R 38 | | |
| SPEED | POWERSHIFT | | | POWERSHIFT | | |
| | UNDERDRIVE | DIRECT DRIVE | OVERDRIVE* | UNDERDRIVE | DIRECT DRIVE | OVERDRIVE* |
| 1 Creeper speed | 0,29 | 0,35 | 0,46 | 0,31 | 0,38 | 0,49 |
| 2 Creeper speed | 0,46 | 0,56 | 0,72 | 0,49 | 0,59 | 0,76 |
| 3 Creeper speed | 0,65 | 0,79 | 1,02 | 0,70 | 0,84 | 1,08 |
| 4 Creeper speed | 1,02 | 1,23 | 1,59 | 1,09 | 1,31 | 1,69 |
| 1 Low | 1,40 | 1,69 | 2,17 | 1,49 | 1,80 | 2,32 |
| 2 Low | 2,20 | 2,65 | 3,42 | 2,35 | 2,83 | 3,65 |
| 3 Low | 3,12 | 3,76 | 4,85 | 3,33 | 4,01 | 5,17 |
| 4 Low | 4,87 | 5,88 | 7,57 | 5,20 | 6,27 | 8,08 |
| 1Standard | 3,34 | 4,03 | 5,20 | 3,57 | 4,30 | 5,54 |
| 2 Standard | 5,25 | 6,34 | 8,17 | 5,60 | 6,76 | 8,71 |
| 3 Standard | 7,45 | 8,99 | 11,58 | 7,95 | 9,59 | 12,35 |
| 4 Standard | 11,64 | 14,04 | 18,09 | 12,41 | 14,98 | 19,29 |
| 1 High | 8,24 | 9,95 | 12,82 | 8,79 | 10,61 | 13,67 |
| 2 High | 12,96 | 15,64 | 20,14 | 13,82 | 16,68 | 21,49 |
| 3 High | 18,38 | 22,18 | 28,57 | 19,61 | 23,65 | 30,47 |
| 4 High | 28,70 | 34,63 | 38,53* | 30,62 | 36,94 | 41,10* |

| ENGINE AT 2200 RPM - Speed in Kph with rear tyres | | | | | | |
|---|---|---|---|---|---|---|
| REVERSE | 16.9 R 34 - 540/65 R 34<br>480/70 R 34 - 13.6 R 38 | | | 16.9 R 38 | | |
| REVERSE SPEED | POWERSHIFT | | | POWERSHIFT | | |
| | UNDERDRIVE | DIRECT DRIVE | OVERDRIVE* | UNDERDRIVE | DIRECT DRIVE | OVERDRIVE* |
| 1 Creeper speed | - | 0,36 | - | - | 0,38 | - |
| 2 Creeper speed | - | 0,56 | - | - | 0,60 | - |
| 3 Creeper speed | - | 0,80 | - | - | 0,85 | - |
| 4 Creeper speed | - | 1,24 | - | - | 1,33 | - |
| 1 Low | - | 1,71 | - | - | 1,82 | - |
| 2 Low | - | 2,68 | - | - | 2,86 | - |
| 3 Low | - | 3,80 | - | - | 4,05 | - |
| 4 Low | - | 5,94 | - | - | 6,33 | - |
| 1 Standard | - | 4,07 | - | - | 4,35 | - |
| 2 Standard | - | 6,40 | - | - | 6,83 | - |
| 3 Standard | - | 9,08 | - | - | 9,69 | |
| 4 Standard | - | 1,18 | - | - | 15,13 | - |
| 1 High | - | 10,05 | - | - | 10,72 | - |
| 2 High | - | 15,80 | - | - | 16,85 | - |
| 3 High | - | 22,40 | - | - | 23,89 | - |
| 4 High | - | 34,98 | - | - | 37,32 | - |

## Use of the Xtrashift

### Starting the engine

Put in neutral:

1. Orange coloured reverse shuttle control lever at the left of the steering wheel.
2. PTO switch on the cab right-hand post.
3. Turn the ignition key clockwise to position 1 (contact), then to position 3 (engine starting).

### Forward starting

***WARNING: To start the tractor when the weather is particularly cold, it is advisable to heat the transmission oil by running the engine until it reaches a temperature of 20°C. This ensures that Deltashift is able to operate correctly. During the first few minutes of work with the tractor, only change gear with Deltashift when strictly necessary until the normal operating temperature has been reached.***

- After engine ignition, select the range (Low, Standard or High) with the relative lever according to the job on hand.
- Engage the required gear.
- Move forward the orange shuttle control lever at the left of the steering wheel.
  Thus the tractor moves automatically forward without using the clutch pedal.

### Reverse starting

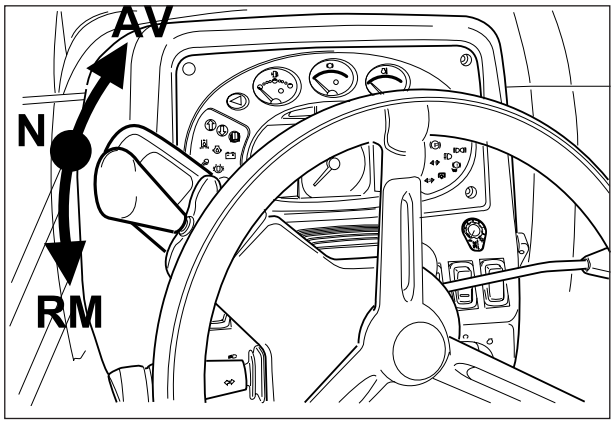
Proceed as described above, only moving the shuttle lever back.
The tractor automatically starts in reverse.

### Starting with the clutch pedal

The clutch pedal should only be used for precision approaches and manoeuvres.

1. Depress the clutch pedal (1) completely.
2. Move the reverse shuttle lever (1) forward or backwards.
3. Gradually release the pedal to control the tractor movement as necessary.

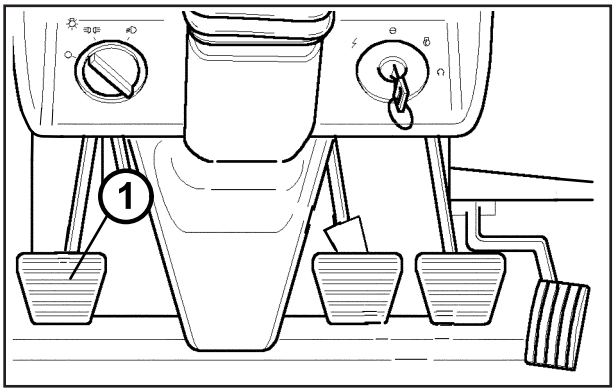
Starting is usually in direct drive mode. Press the relative buttons on the control lever handle to start the tractor in underdrive mode.




### Clutch pedal (1)

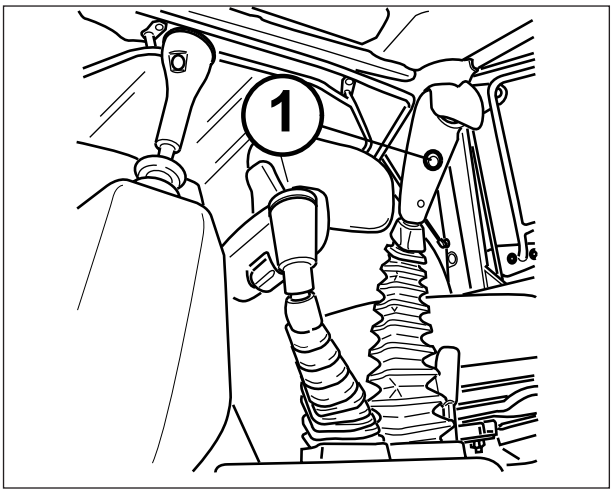
The clutch pedal is only used for:

- Safety manoeuvres, sudden obstacles, etc.
- Precision approaches, such as implement hitching.
- When the clutch pedal (or the Declutch button) is depressed to select the gear, the gearbox remains in the previously engaged range.



## Declutch button

The Declutch system allows the gear to be changed by pressing the relative orange button on the gearshift lever handle.




### Changing gear with the Declutch system.

The Declutch button (1) practically acts as the clutch pedal.

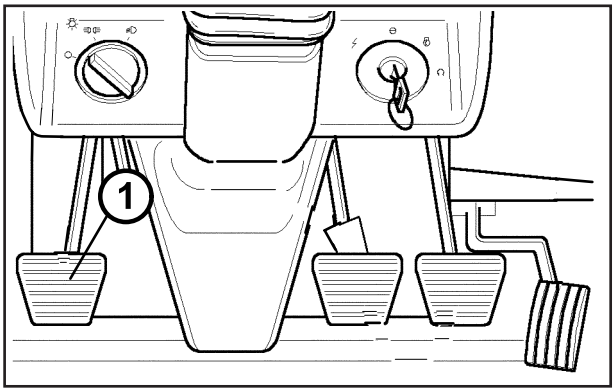
Press the button to disengage the hydraulic clutch, and keep it depressed while engaging the required gear. Release the button.

### Gear change with the clutch pedal (1)

When the clutch pedal is depressed to change gear, Deltashift remains in the range previously engaged.

### Changing the range (creeper, low, standard, high) with the clutch pedal

Depress the clutch pedal and wait for the tractor to stop before selecting a range (creeper - low - standard - high).



### Engagement of Powershift ranges under load

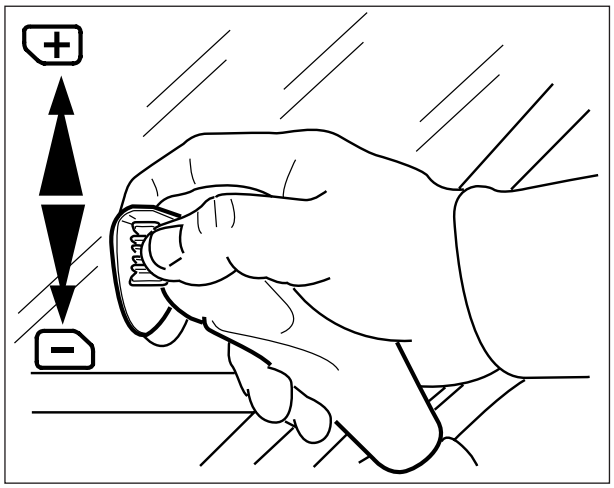
The gearbox provides 3 Powershift ranges (underdrive, direct drive and overdrive) that can be engaged under load in forward gears.
For each engaged gear, 3 speeds are available: Underdrive - Direct - Overdrive.

To select, turn the Powershift switch on the gearshift lever: changes from one range to the next are automatic and under load (Fig.4-15).

Turn the switch up to shift the range up: + sign.

Turn the switch down to shift the range down: -- sign.

The switch always returns to the centre position.



The Powershift switch can be set on any position with the tractor moving, without depressing the clutch pedal or the clutch pedal or the Declutch disengagement button. To ensure that the ranges are shifted in the correct sequence, move the switch one range at a time in the 1, 2, 3 order.

*IMPORTANT: To prevent excessive deceleration of the tractor ALWAYS downshift one range at a time in sequence 3, 2, 1.*

On the digital instrument panel, the Powershift screen displays the selected speed: see the Instruments and Programming Section in this manual.

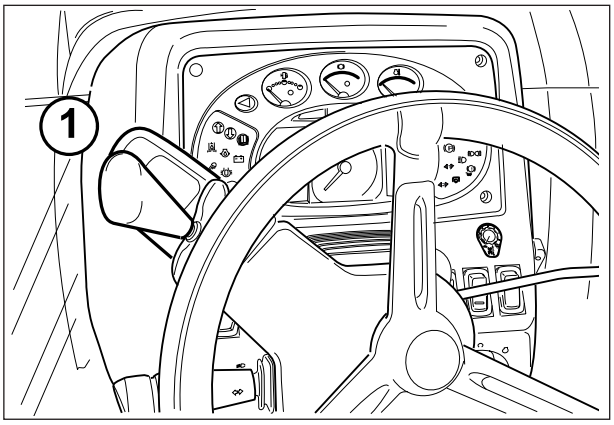
### Reaction to control settings

The monitoring system automatically analyzes the conditions in which the tractor is used and chooses reaction times most suitable to any condition.

## Xtrashift warning lamps

For warning lamps and information on the instrument panel, see the Instruments and Programming Section in this manual.

### Use of reverse shuttle under load



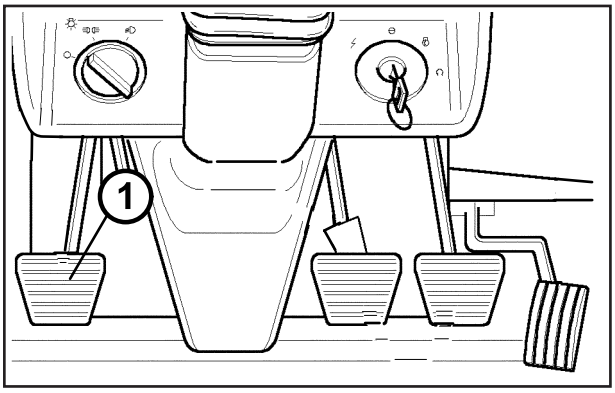

The tractor's driving direction is automatically reversed by pushing the orange lever at the left of the steering wheel forwards or backwards (1).

The reverse shuttle is automatically controlled through the following phases:
- DECELERATION
- STOP
- CHANGE OF DIRECTION
- ACCELERATION

The speed at which these phases take place by software.

*Warning: Reversing can be obtained at any speed. However, to protect mechanical parts from damage, this operation should be made ONLY at speeds UNDER 10 Kph. A buzzer sounds to warn from reversing at speeds over 10 Kph. To correctly engege the reverse shuttle, reduce your speed to under 10 Kph.*

### Use of reverse shuttle with clutch pedal

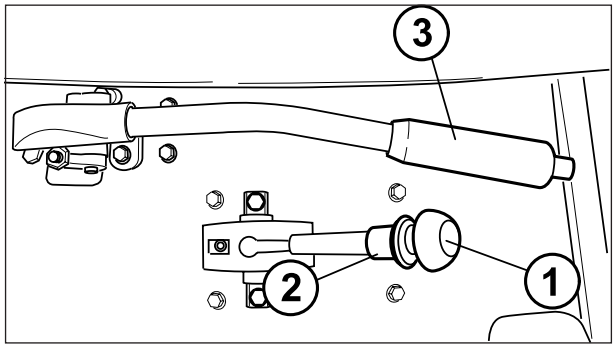



The clutch pedal is used to obtain small and precise movements for certain work requirements.

- Completely depress the clutch pedal (1).
- Shift the orange shuttle control lever.
- Wait for the reverse indicator LED to come on.
- Use your foot on the pedal to engage the clutch gradually and let the tractor move forward or backward as required.

### Stopping the tractor Xtrashift

Always stop the tractor safely: Engage the parking brake (3), engage the Park-Lock (1) (if equipped), disengage the PTO, bring all the gearshift levers to neutral position, lower any implement to the ground, stop the engine and remove the ignition key BEFORE leaving the driver's seat.




Park-Lock (on request)

The Xtrashift transmission is mechanically blocked by the lever engaging the Park-Lock device (1). Therefore the Park-Lock should be engaged every time you want to stop the tractor with the engine stopped, particularly when the tractor is on a slope.
To shift the lever (1), pull the block (2) upward.

The Park-Lock must be disengaged before using the reverse shuttle. Should the reverse shuttle be engaged in forward or reverse gear with the Park-Lock still engaged, the buzzer is activated until the Park-Lock is disengaged. Disengage the Park-Lock and shift the shuttle switch to neutral.
Now the shuttle can be shifted to forward or reverse gear and the tractor started.

*ATTENTION: To avoid damage to the Park Lock system, proceed as follows. Brake first, then engage the Park Lock. Always disengage the Park Lock first, then the parking brake.*

***ATTENTION:When the Park-Lock is engaged, the engine starts but the tractor does not and the buzzer is activated. The Park-Lock must be disengaged for the tractor to start.***

## Xtrashift Maintenance

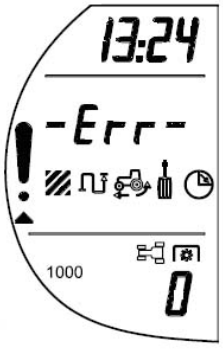
Xtrashift Transmission oil: See Lubricant and Fuel Chart.

For the maintenance operations, see the Maintenance chapter.

## Xtrashift troubleshooting

In case of malfunction of the Xtrashift system, an exclamation mark will show on the left-hand side of the display together with the message - Errr -.
For error codes, see the Instruments and Programming Section in this manual.

To solve your problem, indicate the error code to your Dealer's service.



## Electro-hydraulic PTO

The rear power take-off is fully independent from the transmission. It is engaged by means of a multi-disc oil-cooled hydraulic clutch.

The PTO is engaged by means of the switch (1).

An indicator light on the instrument panel comes on when the PTO is engaged.

**Use: engagement/disengagement**
Engage/disengage the front PTO (1) by the ON/OFF button switch with engine at idling speed.

**Depressed button switch**: disengaged PTO

**Released button switch:** engaged PTO

To engage the PTO, release the switch (1) by pulling up the locking collar (2).

Always shift the switch in the OFF disengaged position after using the PTO or before starting the engine.

***NOTE:*** *The engine can be started only if the PTO engagement switch is in the OFF position and the PTO engagement lever (3) is in the neutral position.*

Engage the PTO at a low RPM speed to protect the clutch and driveline.

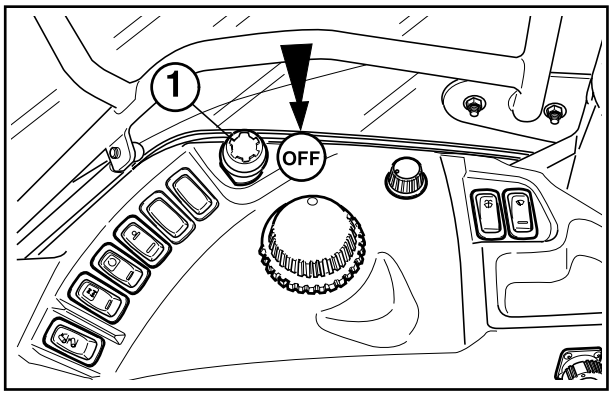
Select the operating mode and the required speed before engaging the PTO.

**IMPORTANT: For high-inertia implements (e.g. stone crusher, mill etc.) the universal joint for cardan shaft is to be used.**

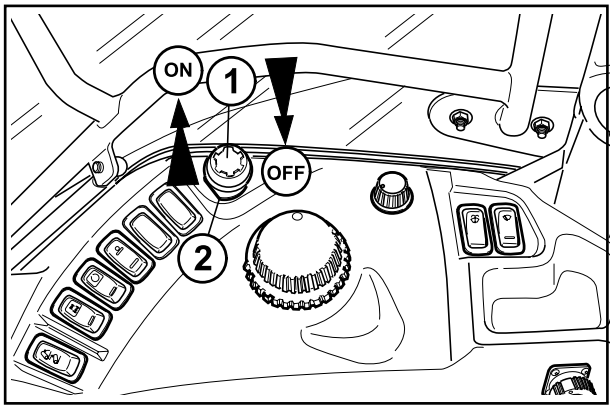
**WARNING: When using the PTO with the tractor at a standstill, always make sure that the creeper lever of the gearshift in neutral position and that the parking brake is engaged.**

**WARNING: High-inertia implements do not stop immediately after the independent PTO has been disengaged. Wait for the implement to slow down or stop completely before performing any cleaning or adjustment operations.**

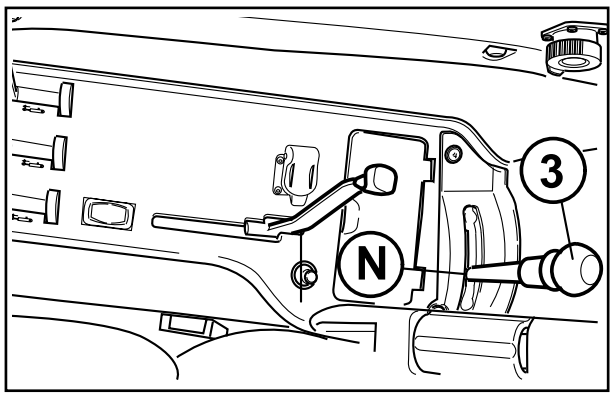
***IMPORTANT:*** *When using implements that cause shock loads, always use a safety coupler between the implement and the PTO drive shaft. Before using the implement, check the correct operation both of the safety coupler and of the implement.*




Disengagement
Fully depress the ON/OFF switch (1). The PTO indicator light on the instrument panel goes off.




Engagement
Pull up the locking collar (2) of the ON/OFF button, then pull the button (1) to the ON position. Now the button will remain on the ON position, while the PTO indicator light on the instrument panel lights up.




***IMPORTANT:*** *When using implements with quickly moving parts (such as mowers, reapers, snowplows) ALWAYS fit an overrun device on the implement drive shaft, as a protection against possible PTO faults.*

## X60.50 Dual Power

The Dual Power system increases the available power when working under load with engaged PTO. Dual Power takes advantage of the potential of the electronic engine control system to maintain steady power delivery even when there are load variations. This is done by automatically supplying an extra power reserve whilst the PTO is being operated, thus allowing this latter to be used in a better way while improving the performances and productivity.
For power values, see the Technical Specifications chapter in this manual.

## Power take-off operation [4.2.d]

**PTO mode selector lever (1).**
The symbols on the decal beside the control lever have the following meanings:

A - Independent PTO engaged.
Directly driven by the engine.

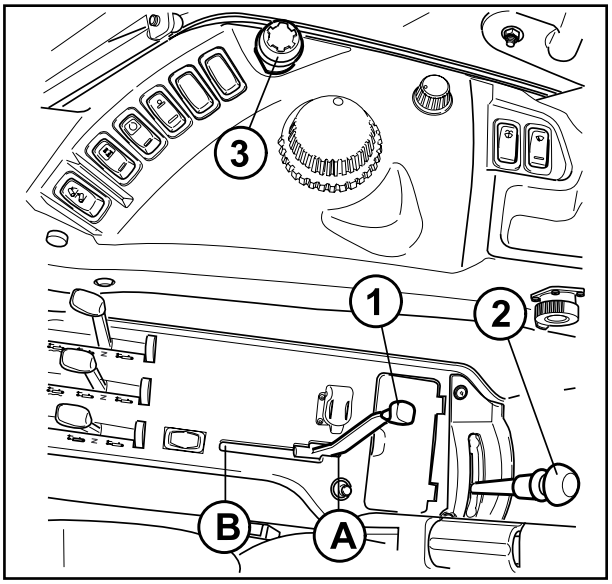
**CAUTION:The selector lever should always be kept in A position. Shift it to B only when the synchronized PTO has to be used. After the use of the synchronized PTO shift the laver to A again.**

B - Engagement of the ground speed synchronized PTO (optional)
Driven by the gearbox.

***NOTE:*** *The PTO mode selector lever (1) has no neutral position. This is obtained when the speed selector lever (2) is shifted to the position "N".*

***IMPORTANT:*** *The PTO mode selector lever, independent or synchronized (optional), controls a mechanical coupler that ensures the maximum safety in both operation modes. The passage from a mode to another, however, is only possible when the teeth are aligned. The procedure is described under the headings "Direct power take-off" and "Synchronyzed power take-off" hereunder.*

Dual Power also engages to improve performances during transport operation according to load, ground speed and engine speed rate.




## Power take-off engagement

- Select the required speed 540/540ECO/1000 RPM with the selector lever (2).
- Engage the PTO mode selector lever (1).
- Engage the power take-off (3).
- During the work, the PTO can be engaged/disengaged by means of the relative control lever (3).

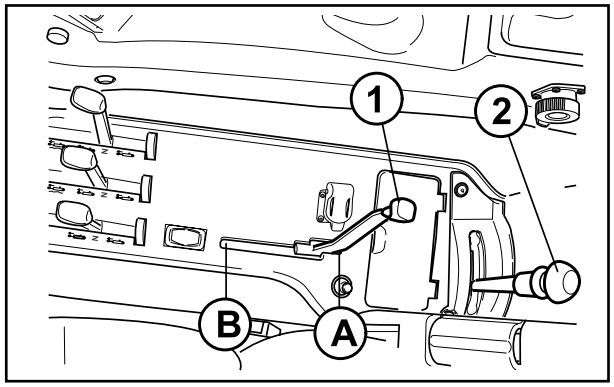
## Direct power take-off

The direct PTO can operate at 540 RPM with the engine at 1944 RPM, or at 1000 RPM with the engine at 1956 RPM. (At request 540ECO RPM with the engine at 1375 RPM). The PTO is directly driven by the engine and its operation is fully independent from the tractor's ground speed.

**Engagement of direct PTO**
The direct PTO must be engaged with the engine at idling speed, without hesitating and not caring for any noises which are due to the alignment of the gear teeth.
Always keep the lever on the "A" position - direct PTO engaged.
The synchronized PTO should be engaged only when needed (see Synchronized Power Take-Off).

## Synchronized Power Take-Off (Optional)

Use of the synchronized rear power take-off with the gearbox is solely designed for towing self-driven trailers and, more generally, for all those farming implements which have to operate synchronised with tractor movement and which do not require more than 40 - 45% of rated engine power.
Engage the synchronized power take-off with the tractor at standstill. Depress the clutch pedal to disengage the gearshift clutch and shift the lever (1) to the "B" position.




### Synchronized PTO engagement

The synchronized PTO has to be engaged without applying any force, with the engine at idling speed. Move the tractor a little forward to make the engagement easier. Sometime you may need to engage the hydraulic PTO clutch for an instant in order to allow the gear teeth to align and make their engagement easier. When the synchronized PTO is not used, the lever should be shifted to the direct PTO position (lever 1, position A).

**CAUTION: When using the synchronized PTO and if you are forced to reverse once or several times, remember that the driveline inverts its spinning direction. Thus, with certain implements, it is advisable to disengage the PTO when reversing in order to avoid major damage (lever 2, position N).**

### Synchronized PTO revolutions (optional)

Whichever forward gear is engaged, the splined shaft of the PTO accomplishes, for each turn of the rear wheels:

*NOTE: For a table of the revolutions of the synchronized power take-off output shaft for each revolution of the rear wheels, see the "Technical specifications" Section.*

## External buttons for PTO engagement

Use the buttons on the rear fender (3) for easier connection.

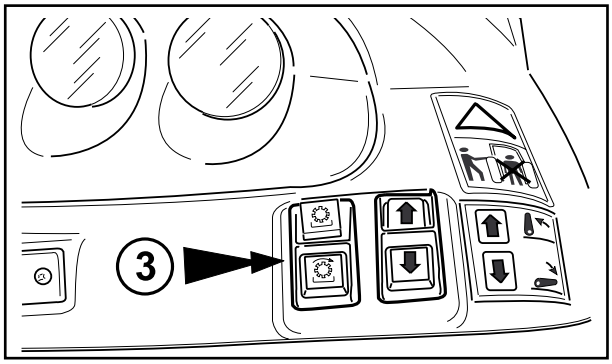
**WARNING: Danger of entanglement. Keep well away from spinning shafts. Take care NOT to remain caught up by the PTO driveline. Keep all the guards mounted at any time on the transmission shafts of the tractor or implements.**

**WARNING: High-inertia implements do not become stationary immediately when PTO is disengaged. Allow sufficient time for implement to «run down» to a halt before cleaning or adjusting.**

External buttons are always active.
If the yellow switch in the cab is OFF:
- red button OFF: the PTO shaft rotation is stopped.
- yellow button ON: the PTO shaft turns slowly for 5 seconds, then stops. The switch in the cab must be shifted to ON to start the PTO from the external buttons.

If the yellow switch in the cab is ON:
- red button OFF: the PTO shaft rotation is stopped.
- yellow button ON:

1 - if the button is pressed less than 5-6 seconds, the PTO shaft turns slowly, but stops as soon as the button is released. This function is handy when an implement must be hitched.
2 - if the button is pressed more than 5-6 seconds, the PTO shaft turns slowly for about 5 seconds, then starts spinning at the set spinning rate.




**WARNING: External controls must be operated at a safe distance, standing on one side outside the tractor and out of the overall width of mudguards. It is expressly forbidden to operate the controls from the rear of the tractor or standing on the inner side of wheels. [4.2.b]**

## Speed range selection

The speed range selector lever (1) allows to change from 540 RPM PTO (or 540ECO RPM) and back

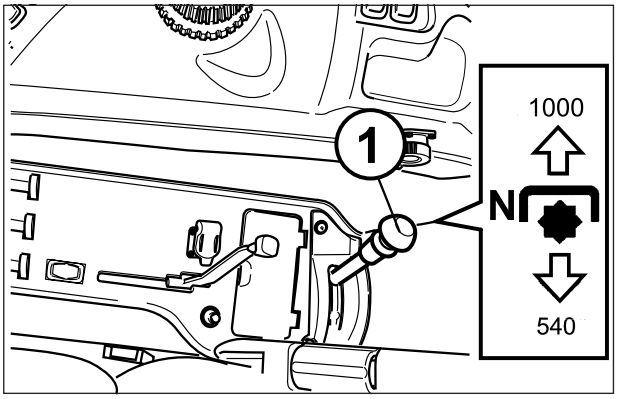
Two speed PTO
- PTO at 540 RPM
**N** -PTO in neutral
- PTO at 1000 RPM or 540ECO RPM

Three speed PTO
- PTO at 540 RPM
**N** -PTO in neutral
- PTO at 1000 RPM
- PTO at 540ECO RPM

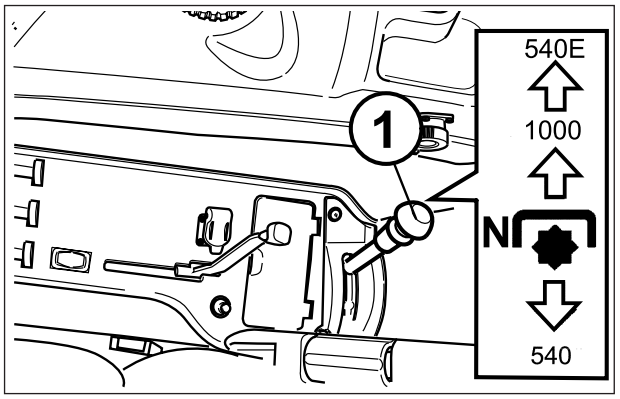
**CAUTION: When the PTO is not used, the speed range selector lever should always be in neutral position.**

**CAUTION: Disengage the PTO clutch before switching between two speed ranges.**

**WARNING: Only use PTO at 540 RPM (or 540ECO) or at 1000 RPM to drive implements designed for such respective rotation speeds. Never allow the PTO shaft to rotate at more than 630 RPM with implements designed for 540 RPM.**




Two speed PTO




Three speed PTO

## Economy PTO

A PTO speed of 540 RPM can be obtained for implements that do not require maximum power, such as fertilizer spreaders, sprayers, etc.) by using the PTO at 540ECO RPM and decelerating to 1375 RPM. The PTO economy mode has a number of advantages, including a reduction in fuel consumption, noise and vibrations.

**CAUTION: Economy PTO 540 ECO runs at 1375 RPM. Never exceed 1890 RPM engine rate (corresponding to 630 RPM of the PTO driveline) to avoid damages to the driveline itself and the connected implement.**

*NOTE: For the indicator of the PTO output shaft and further indicators, see the "Instruments and programming" Section, Power Take-Off paragraph in this manual.*

## PTO overspeed (NAO markets only)

The indicator light on the dashboard blinks if the max. allowed rated PTO speed is exceeded.
Reduce the engine rated speed to reduce the PTO speed.
For further details, see the "Instruments and programming" Section, Power Take-Off paragraph in this manual.

## Interchangeable PTO shaft

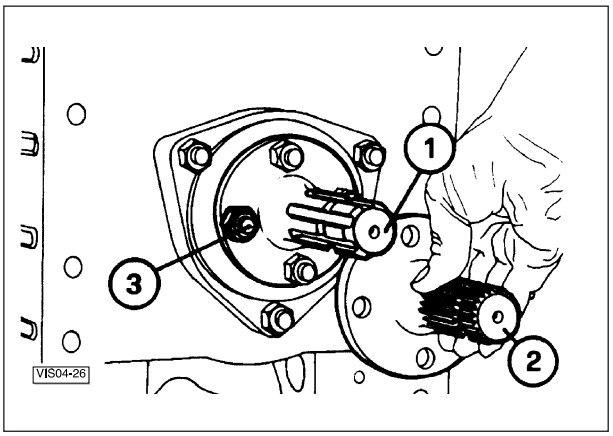
Different PTO output shafts are available:

- diameter 1 3/8" (34.9 mm.) shaft with 21 splines for 1000 RPM power take-off, standard assembly (2).
- diameter 1 3/8" (34.9 mm.) shaft with 6 splines for the 540 RPM PTO, provided with the tractor (1).

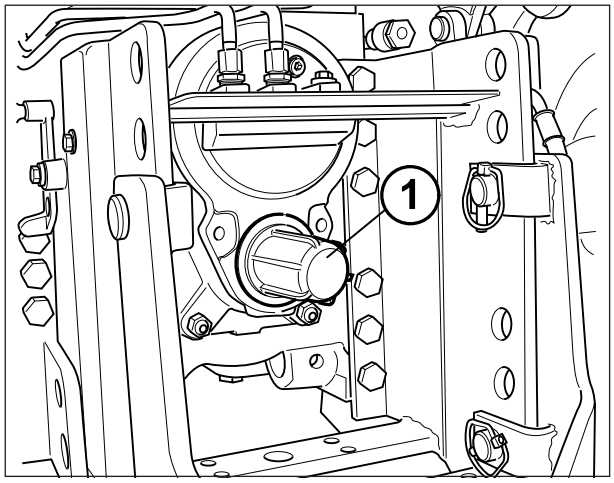
**CAUTION: Only use the PTO driveline for 540 RPM if the implement used requires a power greater than 56 kW (75 HP) since damages to the driveline itself and to the connected implements could injure bystanders. Implements requiring more than 56 kW (75 HP) may be used only with PTO drivelines at 1000 RPM, 21 splines.**

Proceed as follows to change the shaft:
- Remove the guard (4)
- Remove the four fixing bolts (3) and replace the output shaft 1 or 2.
- Correctly tighten the for fixing bolts of the output shaft (3).
- Mount the guard again (4).

After mounting the shaft, select the correct rotation speed by means of the relative lever.




Replacing the interchangeable PTO shaft.

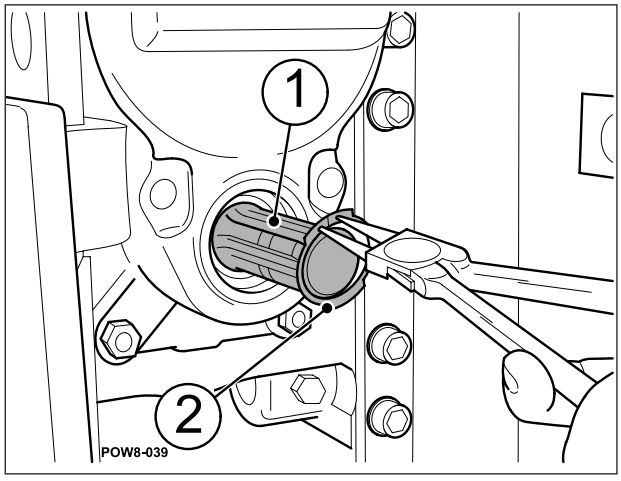



## North America

**1000RPM PTO with 540RPM shaft, 6 splines. 1000 RPM PTO only allowed with 1000 RPM shaft, 21 splines.**

To change the output shaft (1), first remove the spring ring (2) using suitable pliers.
Remove the shaft. Thoroughly grease the new shaft and install it. Make sure that it has been completely seated.
Fit the spring ring back in place and make sure that it is positioned correctly: replace it if it is damaged or deformed.
After mounting the required shaft, use the lever to select the correct spinning speed.

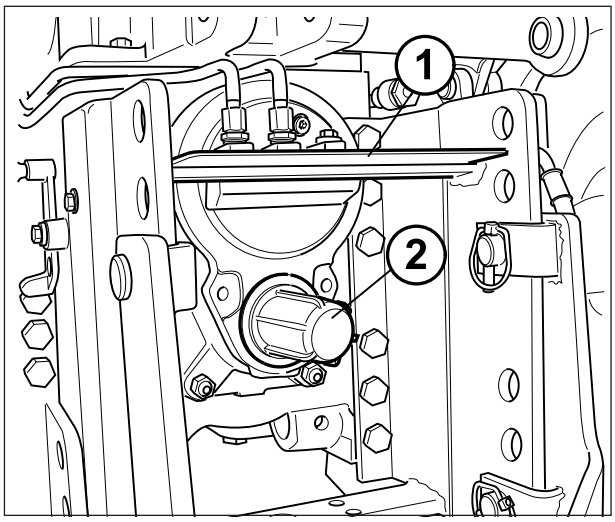
**WARNING: Do not use the 540RPM PTO driveline if the implement requires a power over 56 kW (75 HP). A damage to the shaft or the connected implement could be dangerous for nearby persons. Implements that require more than 56 kW (75 HP) should only be attached to the 1000 rpm PTO driveline, 21 splines.**




Changing the PTO driveline - NAO.
1 - PTO driveline. 2 - Spring ring.

## PTO Safety Guards [4.2.e]

All tractors with a power take-off have a large safety guard (1) and a small tube type guard (2) for the splined output shaft. To prevent injury to the operator, the tractor power take-off safety guard and the shields for the telescopic shaft assembly must be used.
Keep the guards in place.



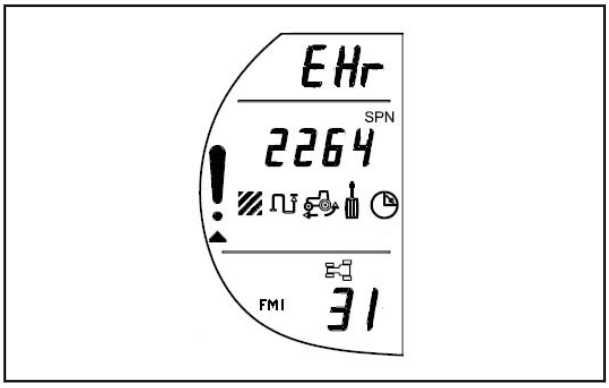

**WARNING: Do not exceed the recommended speeds of the driven machine. Do not operate the PTO unless the shaft and drive line shields are in position and the tachometer is working correctly. Read and learn to understand the Operator's Manuals supplied with any PTO driven equipment which may be attached to the machine.**

**WARNING: Whenever a PTO driven implement is in operation, the PTO guards MUST be in place during operation to prevent injury to the operator or bystanders. Where attachments, such as pumps, are installed on the PTO shaft (especially if the tractor PTO guard is moved upward or removed) extended shielding equivalent to the PTO guard must be installed with the attachment. Install the PTO guard again to its original position immediately after removing the attachment.**

**WARNING: Never drive without the PTO caps (2) or protection (1) mounted. These components protect the operators from injury and the shaft splines from damage.**

## PTO error codes

In case of PTO malfunction, the instrument cluster will display an exclamation mark. To check the PTO error code, refer to the Error menu on the digital instrument cluster.




**WARNING: When an operation ERROR is displayed, ask the Dealer's specialized personnel for help indicating the error code. The Dealer's personnel has specific competences to locate the error and the type of operation to be performed.**

## Precautions when using the PTO

**WARNING: PTO drivelines and implements operated by the PTO can be extremely dangerous. It is important to comply with the following instructions:**

**WARNING: Before connecting, adjusting or working on implements operated by the PTO, disengage the PTO, stop the engine, remove the ignition key and engage the parking brake. Never work under raised implements.**

**WARNING: Make sure that all implements operated by the PTO are fitted with the correct protections, are in a good condition and comply with the laws in force.**

**WARNING: Before driving an implement through the PTO, ALWAYS make sure that all bystanders are well away from the tractor.**

**WARNING: Fix the draw bar in the central position when using implements operated by the tractor's PTO.**

**WARNING: When using the PTO with the tractor at a standstill, always make sure that the gears are in neutral position and that the parking brake is engaged.**

**WARNING: Before starting up any PTO-driven implement hitched to the three-point linkage, lift the implement to its full height and check that at least 1/4 of the total length of the telescopic section of the drive shaft is engaged. Adjust the height limiter on the electronic power lift to limit the maximum height of the stroke.**

### Paddy fields warning

*When using the tractor in paddy fields or marshy ground, where the water level could rise above the height of the PTO, ask your dealer for instructions on all necessary waterproofing and sealing measures. If such measures are not taken, the guarantee could be rendered invalid.*

***IMPORTANT:*** *When using implements that cause shock loads, always use a safety coupler between the implement and the PTO drive shaft. Before using the implement, check the correct operation both of the safety coupler and of the implement.*

***IMPORTANT:*** *When using implements with quickly moving parts (such as mowers, reapers, snowplows) ALWAYS fit an overrun device on the implement drive shaft, as a protection against possible PTO faults.*

***IMPORTANT:*** *Ensure that the implement PTO shaft is not too long or the PTO is not damaged when the front mounted implement must be lifted fully up.*

***IMPORTANT:*** *When using implements such as mowers, reapers, etc., check and clean every day the front grills, the cooling radiator, the transmission oil radiator and the air conditioning system radiator.*

**WARNING: High-inertia implements do not stop immediately after the independent PTO has been disengaged. Wait for the implement to slow down or stop completely before performing any cleaning or adjustment operations.**

**WARNING: Connect the implement to the tractor drawbar before connecting the implement driveline to the power take-off. When connecting the implement driveline to the tractor, check the driveline for correct length, for practicable slant and for free telescopic movement. The correct length is important to prevent the driveline from hitting bottom or from separating in any tractor or implement operating position. An excessive slant could damage also the power take-off guards. [4.2.k]**

## Brakes

The rear and front brakes are multi-disc oil bath units. Brake action is hydraulic, controlled by pumps operated by the pedals.
A brake fluid reservoir keeps the brake circuit supplied with fluid.

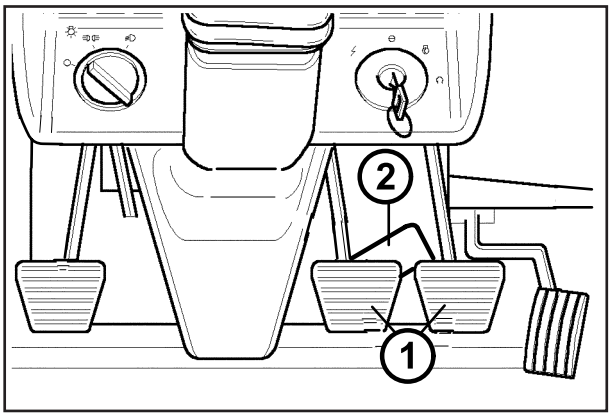
**WARNING: When changing or topping up the brake fluid in the reservoir, be absolutely sure to use the correct type of fluid as different varieties have totally different properties. These machines use an LHM mineral-based fluid which is completely different from the normal LHS synthetic fluid used on other types of tractor.**
**Never mix or exchange these two types of brake fluid as this could rapidly bring about brake failure.**

## Main brakes

The main brakes are operated by means of two pedals (1), one for each rear wheel. Braking on one side assists steering in tight manoeuvres. By locking the rear wheel on the inside of a curve, you can virtually turn the tractor around on its own axis. For simultaneous braking during normal use and for on-road use, simply lock the two pedals together with the special brake coupling lock (2). It becomes even more important to do this if the tractor is also equipped with front brakes since a device installed in the hydraulic control circuit only allows the front brakes to be used if the two pedals are operated at the same time.

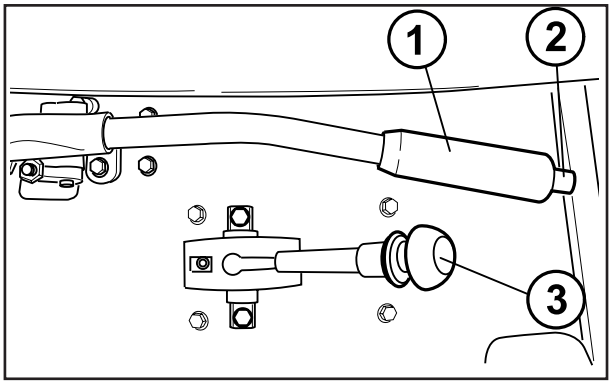
**WARNING: Always keep the brake pedals coupled for on-road driving to ensure simultaneous braking on all four wheels. Never use the brakes independently when driving on public roads.**

**WARNING: If you ever notice the brakes becoming less effective, identify the cause immediately and repair. When working on slopes, avoid using the brakes as much as possible and select a lower gear in order to use engine braking.**




(1) Brake pedals.
(2) Pedal coupling lock.

## Parking brake




A hand lever (1) controls the parking brake. This acts, via a series of linkages, directly on the brake discs and is fully independent of the foot brakes.

**Parking brake engagement**
- Fully depress the brake pedals.
- Pull the lever completely to operate the parking brake (1).
- Release the brake pedals and make sure that the tractor is stopped.
- If this is not the case, pull the parking brake lever with higher force.

When the parking brake is engaged, the warning lamp on the instrument cluster will illuminate when the key switch is turned to ON.

*NOTE: The indicator light in the instrument panel lights up when the parking brake is engaged, independently of the force used for the engagement.*

To start the tractor, shift into gear and release the parking brake.

**Parking brake release**
- Fully depress the brake pedals.
- Pull the lever lightly (1), push down the button (2), let the lever down and release the button.

***IMPORTANT:*** *Driving the tractor with the parking brake partially engaged will cause damage to internal transmission components. Make sure the brake is fully off.*

**NOTE:** For the Xtrashift transmission with Park-Lock (optional) see description in "Stopping the Xtrashift tractor by means of the Park Lock control lever" (3).

## **Hydraulic trailer brake** (Approved for ITALY) [4.2.i]

The tractor braking system can be equipped with a hydraulic valve (1) which, if connected to the hydraulic circuit of the trailer brakes, allows the trailer itself to be braked along with the tractor. .
Comply with the following instructions to correctly connect and disconnect the flexible trailer brake tube to and from the union (2) at the rear of the tractor and to always operate in conditions of the utmost safety.

The trailer-tractor connecting tube can be connected and disconnected with the engine either running or at a standstill:

- With the engine at a standstill: there are no difficulties when either connecting or disconnecting as there is no oil pressure in the brake circuit.

- With the engine running: it is essential to engage the hand brake since this ensures that no pressure remains in the brake circuit.

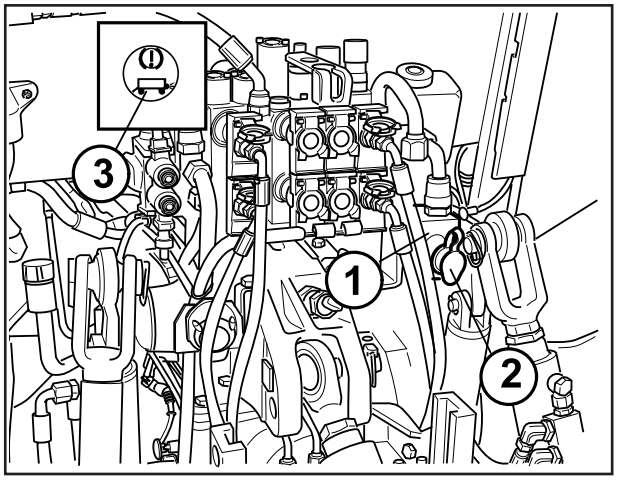
**WARNING: It is extremely important to always carry out this operation before detaching the trailer from the tractor since it ensures the immediate action of the automatic safety braking system with which this trailer braking system is obligatorily equipped.**

There is a specific indicator light (3) on the control panel of the tractor which keeps the operator constantly informed about the operating conditions of the trailer brake oil tap.

Indicator light off:
- When the oil tap is not connected to the trailer.
- When the pressure of the oil in the circuit is regular with the trailer connected.

Indicator light on:
- When the engine is at a standstill and the ignition key is turned to first position.
- When the hand brake is engaged with the engine running.

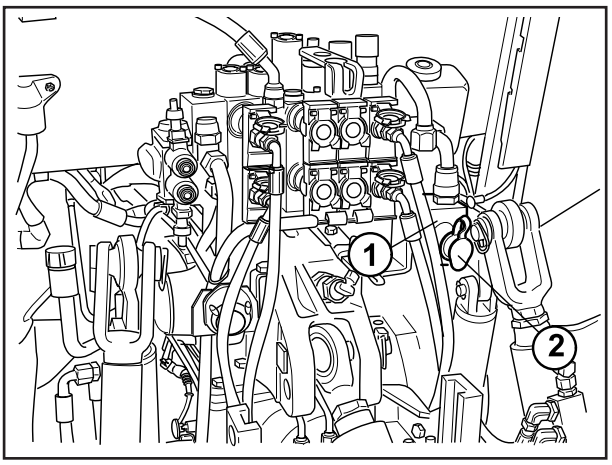
**WARNING: If the indicator light should come on in conditions differing from those mentioned above, this means that there is a fault in the braking system and that use of it must immediately stop for safety reasons.**




Hydraulic trailer braking tap (Approved for ITALY).
1 - Valve unit.
2 - Oil tap union.
3 - Indicator light on dashboard.

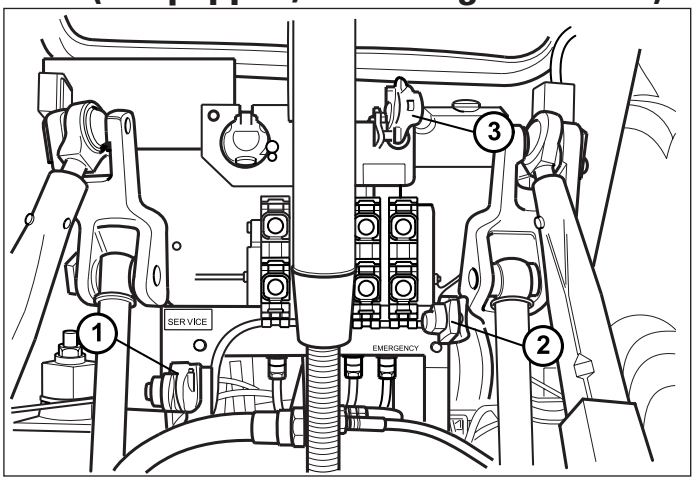
## **Hydraulic trailer brake** (Approved for FRANCE and EXPORT market)

The tractor braking system can be equipped with a dedicated hydraulic valve (1) that, if connected to the hydraulic circuit of the trailer brakes, allows the trailer to be braked along with the tractor.
The flexible tube of the trailer brakes should be connected to the union (2) installed at the rear of the tractor.




Hydraulic trailer braking tap
(Approved for FRANCE and EXPORT market).
1-Valve unit.
2- Oil tap union.

## TRAILER AIR BRAKE COUPLINGS [4.2.i] (if equipped, according to market)




1. YELLOW COUPLING - BRAKE SERVICE LINE (DUAL LINE SYSTEM)
2. RED COUPLING - BRAKE EMERGENCY LINE (DUAL LINE SYSTEM)
3. BLACK COUPLING - FEED AND RETURN (SINGLE LINE SYSTEM) - (OPTIONAL)

**WARNING: Make sure the system is at working pressure before operating the brakes with a trailer(s) fitted. Failure to do this can result in injury or death.**

**WARNING: DO NOT park an unattended tractor/trailer(s) combination using air pressure to apply the brakes (Dual Line Pneumatic Braking System). The mechanical park brake on both the tractor and trailer(s) MUST be applied.**

The air reservoirs store air under pressure to operate the trailer brakes.

Maximum Permitted Pressure ..... 12.5 bar

Working Pressure

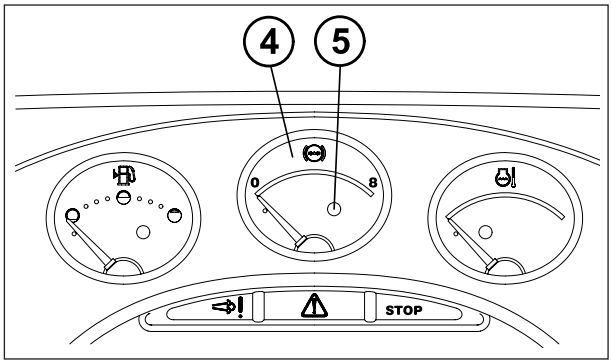
Dual Line System ..... 7.5 bar

Single Line System ..... 5.0 bar

***NOTE:*** *If the pressure in the system, as indicated by the pressure gauge, is lower than 4 bar, the red light (5) on the pressure gauge lights up. In this case, ask your Dealer's specialized workshop for help.*

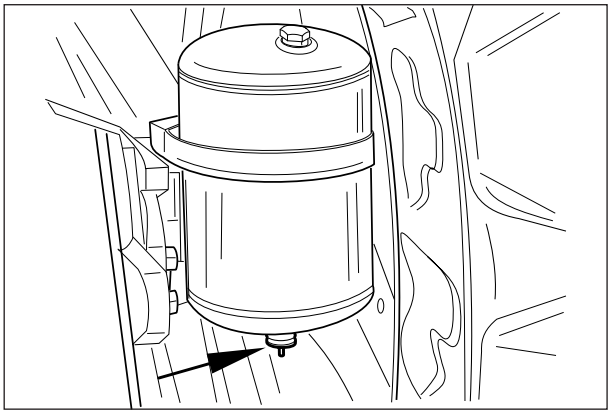
Capacity.....10 litres

Drain the reservoirs.....Daily (or every 10 work hours).




4. Air pressure indicator; 5. Red warning light - low system pressure.

## Drain pneumatic trailer brake reservoirs (if equipped)



Daily or every 10 work hours - Operate the drain valve plunger under each reservoir to drain any water which has collected.

## Locking the differential

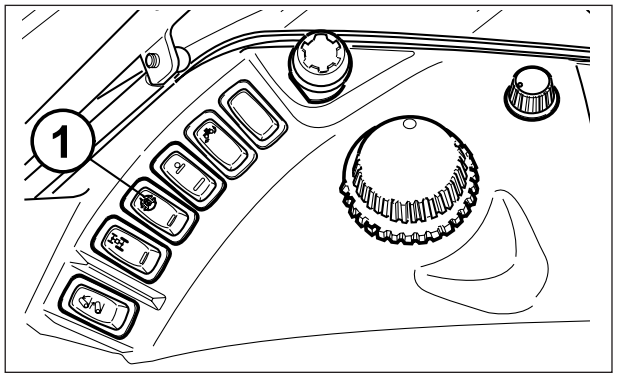
The tractors are fitted with a system for locking the differential on the rear and front axles on 4WD models. The system is used when a wheel slips because of lack of grip. To lock the differentials, just press the button (1) under the control panel of the electronic power lift for a second.

A yellow function indicator on the instrument panel lights up to indicate that the diff lock is engaged.

**NOTE:** *For the best results, engage the diff lock before the wheels are likely to slip. Do not engage the lock while one of the wheels is actually slipping.*

Depress one or both of the brake pedals to disengage the diff lock. The indicator light on the instrument panel goes out.

**WARNING: Disengage the diff lock when traveling on roads and when you need to turn the tractor. Disengage the differential lock before steering the wheels.**

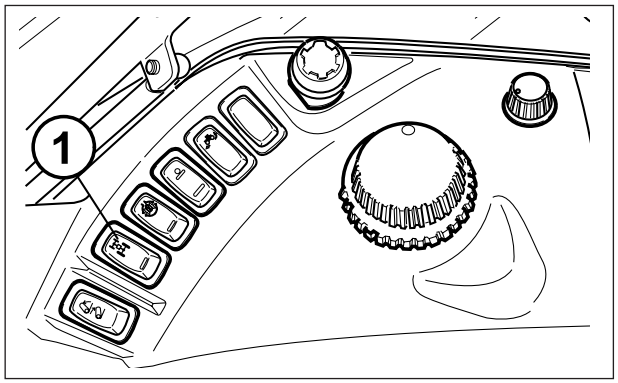



Fully depress the top of the switch (1) to engage the differential lock.

## Four-wheel drive

4WD increases traction on broken ground, muddy and slippery surfaces, etc.
Press the button (1) to engage 4WD. When 4WD is engaged, an indicator light on the instrument panel comes on. When it is disengaged, the light goes out.

**NOTE:** *Only use four-wheel drive when strictly necessary. Avoid use of 4WD when maximum traction is not required, e.g. on hard ground, roads, etc., since this would only increase tyre wear unnecessarily.*




Fully depress the top of the switch (1) to engage four-wheel drive.

## Three point linkage

The three point linkage is used to connect the tractor to implements controlled by the hydraulic lift.

The three-point linkage is suitable for connection to implements of 2nd class as shown by the diagram and data given in the figure.

**WARNING: Always take great care when using or adjusting the three point linkage.**

## Hitching the implement

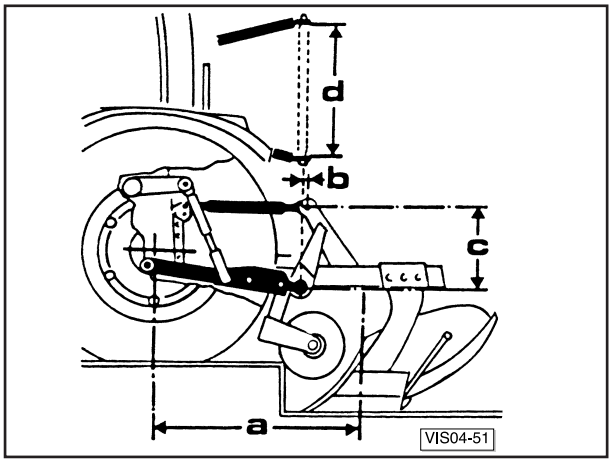
To allow the lift to operate in the correct way, you must carefully check the dimensions of the implements to be coupled to the tractor.

These couplings must be the same standard size as the three point linkage of the tractor to prevent the whole assembly from being subjected to irregular stress during work, caused by dimensional incompatibility. See dimensions given in the figure.

## Weight of the implement

To prevent the regular operation of the lifting system from being impaired, the weight of the implements must be less than the maximum load the lift can raise. This value (given in the specifications) is only indicative, since the distance at which the center of gravity of the implement is set in relation to the three point linkage can also exercise a notable influence.

If an implement, even when lighter than the indicated weight, is set at an excessive distance from the tractor, it will bear down on the three point linkage with a much greater weight than the weight of the implement itself.




Implement hitch dimensions.

a - Horizontal distance between lower link pins of the three-point hitch and the implement's centre of gravity.
As small as possible (the greater is the weight of the implement, the smaller it is).

b- Retraction of the third point: 0 to 80 mm (0 to 3.1 in.)

c- Height of top link hitch ball: 500-600 mm (19.7 to 23.6 in.)

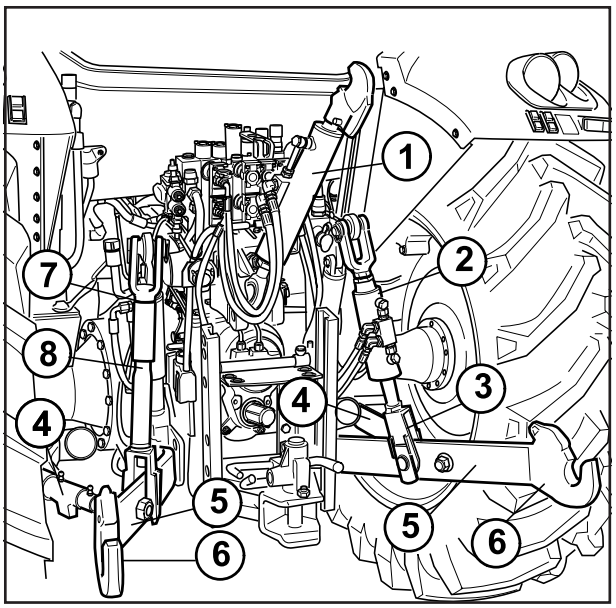
d- Length of bar: 825+1.5 mm (32.5 in.)

**NOTE:** *The plough shown in the figure is purely indicative since the dimensions are valid for any type of implement.*

## Three point linkage components

The articulated device with three point suspension mainly consists of the following components:

1 - Adjustable top link with length adjuster sleeve
2 - Adjustable rh lift rod.
3 - Rh rod adjustable fork
4 - Lateral stabilizers (2 pcs).
5 - Lower links.
6 - Hitch couplings.
7 - Lh rod adjustable fork.
8 - Lh lift rod.



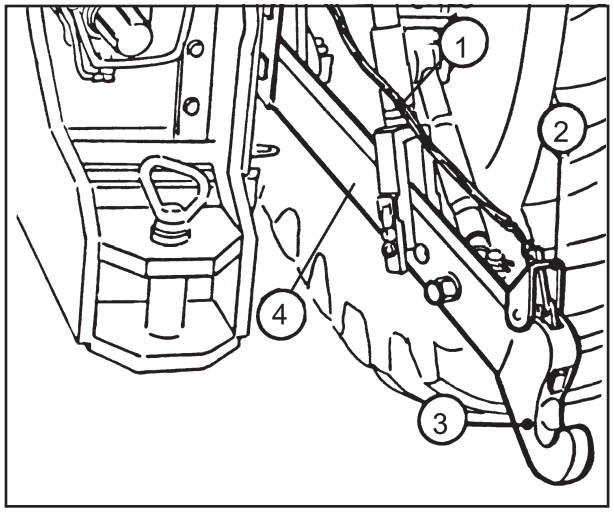

Mechanically adjusted three point linkage (Class 2).

## Lower links

The lower links (4) transmit draft and support to the implement. The lower links are available with fixed ball-ends or with quick-hitch couplings (on request).
The tractor is supplied complete with Class 2 and 3 interchangeable ball ends to be installed on the implement hitch crossbar.

## Quick hitch couplings

To hitch the implement, first pull the connecting cables (1) from the driving seat to open the hitch lock (2).
Reverse the tractor towards the implement so that the lower links are in the direction of the ball-ends fixed to the crossbar of the implement.
Slowly raise the links of the power lift until the ball-ends (C) automatically push against the spring-loaded quick-hitch couplings (D) and are locked into place.
The hitch couplings can be opened driectly from the cab by means of the control cables. RH adjustable rod.




Quick hitch couplings.
C - Quick hitch coupling.
D - Lock.
E - Control cable.

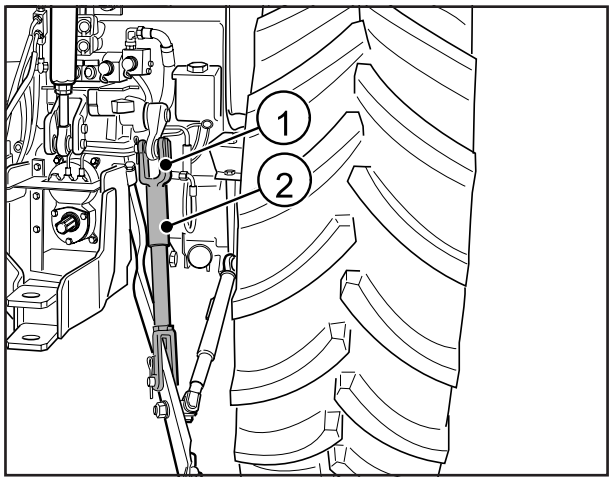
## Adjustable rh lift rod

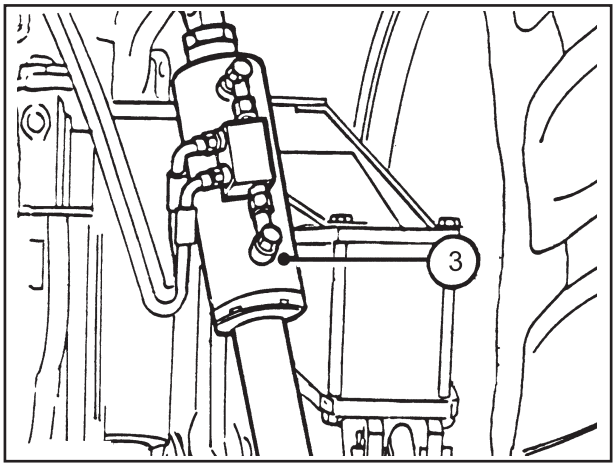
The length of the rh adjustable lift rod (2) can be adjusted by means of the relative crank (1). This adjustment is very useful since it levels the implement depending on the type of work being carried out.

Turn the lever clockwise to shorten the rh vertical lift rod.

Turn the lever anticlockwise to lengthen the rh vertical lift rod.

On request the rh adjustable lift rod can be equipped with a hydraulic jack (3), operated from the driving seat, to adjust the cross angle of the implement.

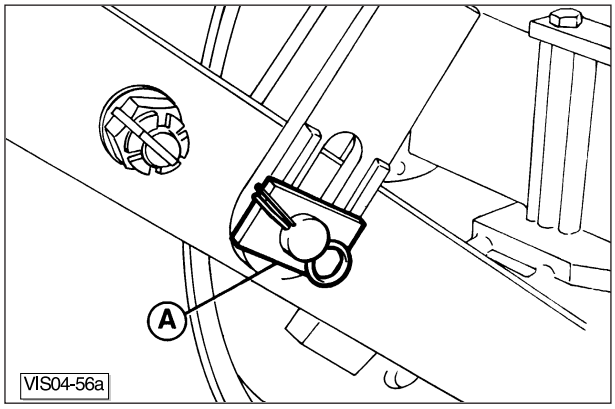


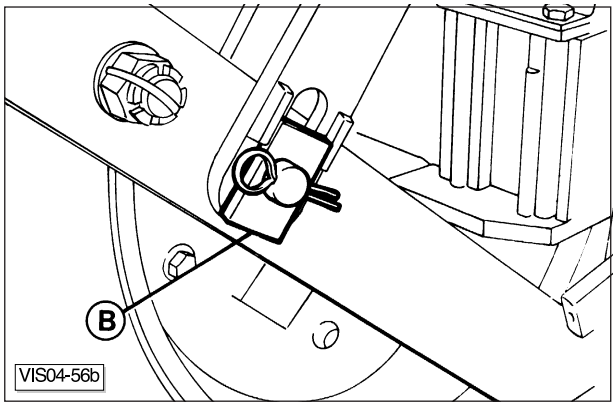

Rh lift road with hydraulic adjuster device (on request).

## Vertical lift rods

The right and left vertical lift rods can be regulated by means of an adjustment crank in order to alter the lateral angle of the implements. They can also be adjusted by turning the backing plate through 90°: this gives two settings, one with the plate fixed (A), the other with the plate free to slide (B). This latter position must be used for implements that require a certain freedom of sideways movement (cultivators, spaders, harrows).




Fixed backing plate.




Free-sliding backing plate.

Backing plates for the hinge pins of the vertical rod forks.

## Side stabilizers

The side stabilizers (1) can be set to reduce side swing of the lower links of the three-point linkage.
When working with implements such as graders, rollers, hoes, weeders, etc. the side swing of the lower links can be adjusted according to the job on hand.
When working instead with ploughs, disk harrows, etc. the stabilizers can be set to allow the lower links to swing freely.

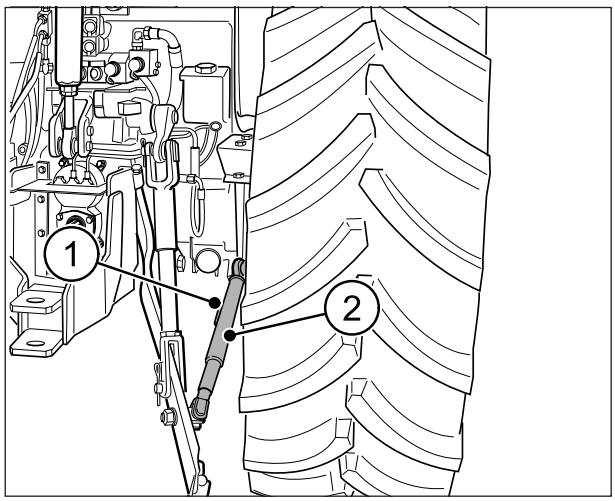
For the transport on road with lift links in high position, lower links side swing must be restricted independently of any previous adjustment during work.

Turn the stabilizers (2) for the adjustment:
- turn anti-clockwise to increase side swing of three-point linkage;
- turn clockwise to reduce or even stop side swing of three-point linkage.

If the three-point linkage is set on float mode, it is necessary to check that side swing is simmetrical on both sides, taking the rear wheel rim as a reference.

Swing the three-point linkage all to the right and measure the distance from lower link to wheel rim.

For special requirements, the link length can be so adjusted as to offset the implement relatively to the tractor axis. In this case the links must be adjusted to different lengths, always assuring that the implement is safely locked.



## Adjustable top link (3rd point)

The adjustable top link (1) is connected to the tractor through a bearing with two holes (2). The connection hole should be selected according to the reaction to the draft control.

Connection to the top hole gives a lower sensitivity, to the bottom hole a higher sensitivity to the hitch draft control.

The length of the link is varied so that the angle of the implement can be regulated in relation to the ground.

During work, the top link should go slightly down toward the tractor, when the lower links are parallel to the ground.

For works in draft control mode, remember that it is better to hitch the implement in the top hole if the carried load is particularly heavy. This way a greater uniformity of work is achieved.

On request, the adjustable top link is available with a hydraulic device (1) to adjust the length of the link from the driving place during work.

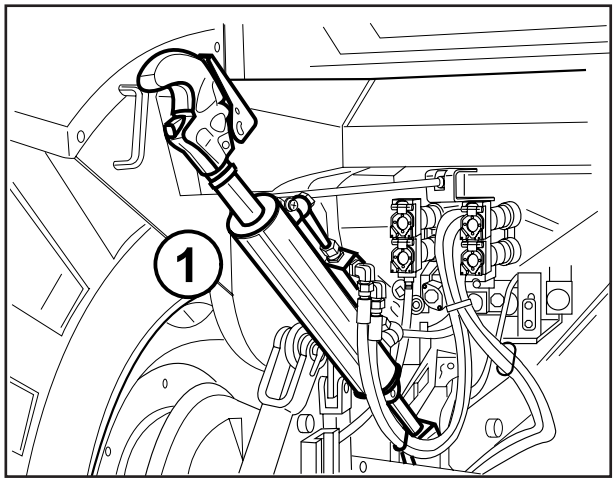
The top link has two holes for hitching the implement and adjusting its slant.

### Hitching the implement

1 - Set the lift controls in position control mode..
2 - Allow the three point linkage to descend.
3 - Adjust the top links to have maximum side play.
4 - Back up the tractor.
5 - Connect the coupling bar of the implement to the ball-ends of the lower links and lock it in place with the safety pins.
6 - Adjust the length of the top links to give the implement freedom of sideways movement or lock it in place according to the type of work required.

### Releasing the implement

1 - Lower the implement completely to the ground.
2 - Shorten the side stabilizers to give maximum play to the lower hitching links.
3 - Remove the safety pins and release the coupling bar.




Hydraulic adjustment of top link (3rd point) (on request).

Important recommendations when using and adjusting the three point linkage.

**WARNING: before any adjustments in the three point linkage, the following operations are required: engage the first gear, engage the parking brake, turn the engine off and remove the ignition key.**

**WARNING: Always use the lift in position control mode when transporting implements hitched to the three point linkage.**

**WARNING: Always use the lift in position control mode when an implement is hitched or unhitched to or from the three point linkage.**

**WARNING: When the tractor is stopped, always lower any implements connected to the three point linkage. [4.2.c]**

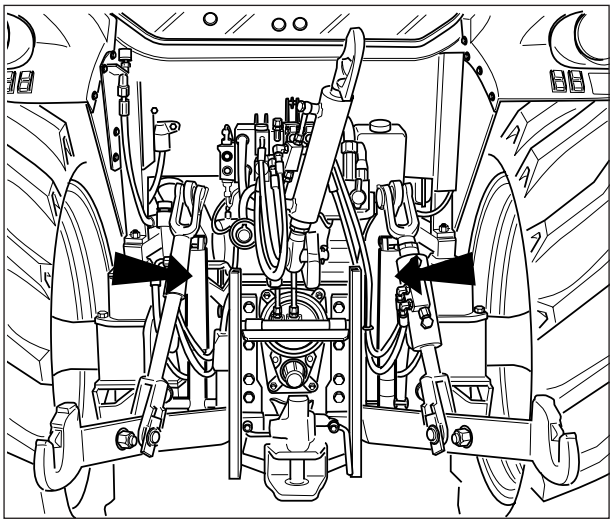
**WARNING: Never work under an implement that is kept raised only by the hydraulic hitch, but always secure it with a suitable support. Engage the first gear, engage the parking brake, turn the engine off and remove the ignition key.**

## Auxiliary cylinders [4.2.g]

The hydraulic hitch can be equipped (on request) with two auxiliary cylinders, directly supplied by the hitch valve.

The lifting capacity with the auxiliary cylinders, diam. 60 mm (max. pressure 200 bar) is 5000 kg.

Contact your Dealer or area Agent to mount the auxiliary cylinders and relative hydraulic fittings.



Supplementary cylinders.

## ELECTRONICALLY CONTROLLED HYDRAULIC POWER LIFT

### Description

The electronically controlled hydraulic power lift is available as an option on certain tractor models, depending on the requirements of the particular market.

Electronic control of the power lift gives a number of major benefits. In particular, control and response signals can be processed and action taken to adjust for variations in ground conditions encountered by the implement in a fraction of the time possible with manual controls.

To obtain the best results from the electronic control system, you must be fully familiar with the controls on the power lift control panel. A full description is given below.

### Power lift control panel

1 - 3-position up/down switch.
- A: Lowering - Work position. This depends on the way the controls (3 and 2) are regulated.
- B: Stop - The lift arms are unable to move in any way in the stop position.
- C: Lifting - Transport: the fully raised position is established by the limiter (7).

2 - Implement work depth/height control:
- 0 - Maximum depth.
- 10 - Max. height from ground.

3 - Function selector:
- Position Control, turned clockwise.
- Draft Control, turned anti-clockwise.
- Intermediate position: mixed Draft and Position Control (INTERMIX).

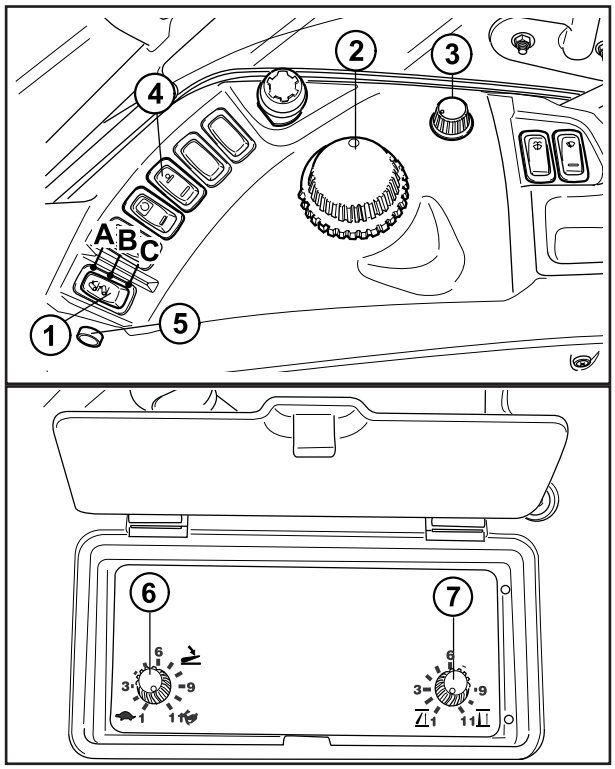
4 - Transport shock absorber engaged button and indicator light

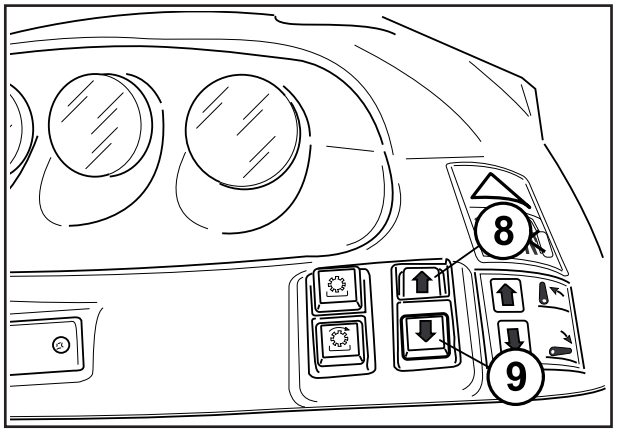
5 - Quick soil engagement button.

6 - Down speed selector:
- 0 - Does not lower. Lock - Turned in anticlockwise direction.

7 - Maximum height limiter:
- Minimum height: turned anti-clockwise.
- Maximum height: turned clockwise.

- External power lift controls - Buttons on the fenders:
- 8 - up; 9 - down.




8-up 9-down

## USE OF THE ELECTRONIC POWER LIFT

### Enabling the power lift

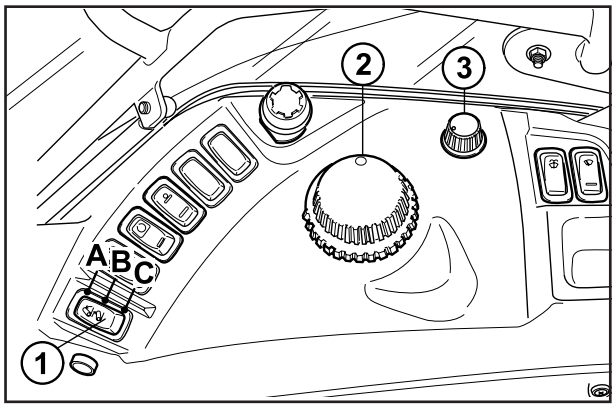
The power lift incorporates a safety device which disables the hydraulic power lift controls when the engine is off or if the external controls have been used. This prevents accidental movement of the lift arms and links as a result of interference with the controls or settings while the tractor was stopped. When the engine has been started, or after the external controls have been used, simply turn the control switch (1) to position C.

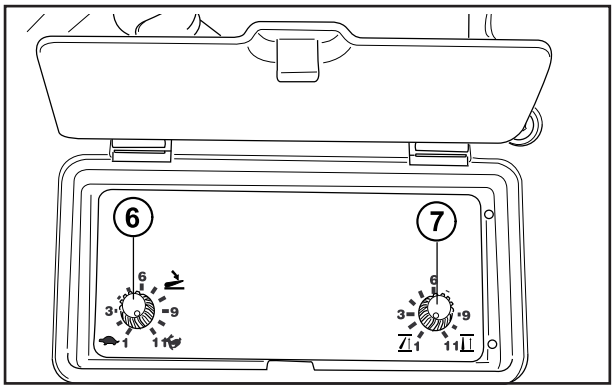
- If the switch is already in Pos. C, turn the switch (1) to Pos. A then back to Pos. C again.

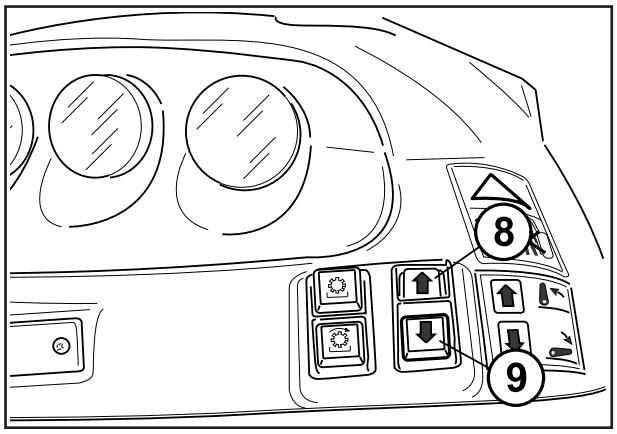
- If the switch (1) is not in Pos. C and the lift is lowered, turn switch (1) to Pos. C.

**WARNING: The lift arms will rise as soon as the control panel is enabled. Limit the max. lifting height with the control (7) before re-activating the electronic power lift.**
**- If you need to stop lift movement immediately, simply turn the switch (1) to Pos. B.**
**- Before you enable the power lift controls, check that the settings of controls (3 and 2) do not cause any dangerous movement of the implement.**

**NOTE:** *The electronic power lift control system also incorporates safety devices which disable the lift functions if any of the following faults are detected:*
*1 - Insufficient battery power.*
*2 - Short circuit in the power line.*
*3 - Position-control circuit malfunction.*
*If the electronic power lift fails to operate correctly after the controls have been enabled as instructed above, have the circuits checked by your local dealer.*




8-up 9-down

**WARNING: External controls must be operated at a safe distance, standing on one side outside the tractor and out of the overall width of mudguards. It is expressly forbidden to operate the controls from the rear of the tractor or standing on the inner side of wheels.** [4.2.b]

## Hitching an implement

From the internal control panel

- Turn the power lift control switch (1) to Pos. C to enable the power-lift control panel.
- Turn the control switch to the working position (A).
- Turn the function selector (3) clockwise to select position control mode.
- Turn the knob (2) anti-clockwise to lower the arms. The arms-down indicator should light up.
- Manoeuvre the tractor to the right position and hitch the implement's ball-ends on to the ends of the links. Fit safety pins to secure the hitch. Hitch up the top link.
- Turn knob (2) clockwise to raise the implement. The arms-up indicator should light up.

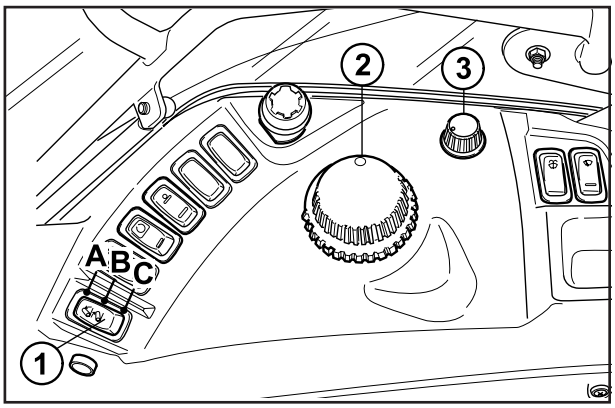
With the external control buttons (8 - 9)

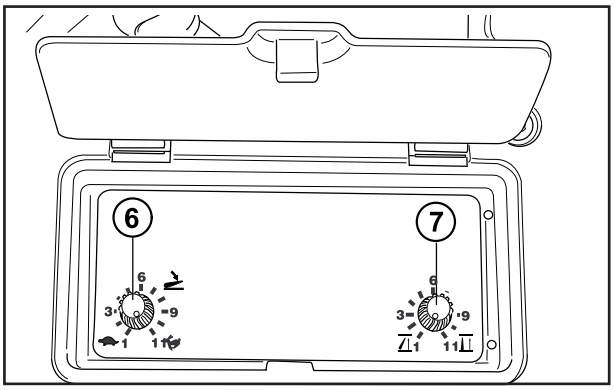
There is no need to enable the power lift in order to use the external control buttons (8 - 9).

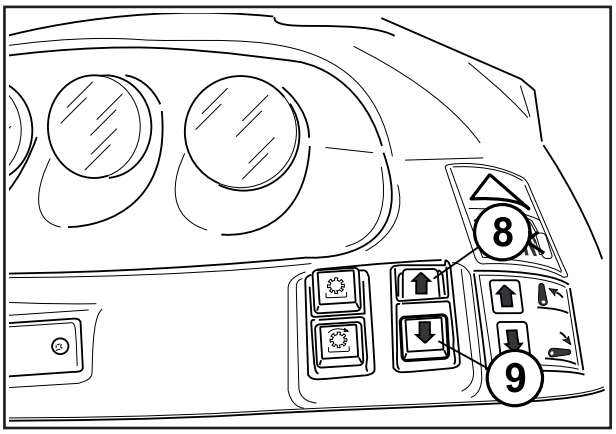
To use the external controls, just press on the buttons to raise or lower the lift arms. Now enable the power lift control panel by means of the switch (1).

**NOTE:**
*- Arm movement stops as soon as the buttons are released.*
*- Descent speed is 30% slower than max. speed with the external controls. Down speed regulation remains disabled.*
*- To enable the control panel controls after the external ones have been used, release the safety device by setting the switch (1) to Pos. C and then to working position A.*

**WARNING: External controls must be operated at a safe distance, standing on one side outside the tractor and out of the overall width of mudguards. It is expressly forbidden to operate the controls from the rear of the tractor or standing on the inner side of wheels. [4.2.b]**




8-up 9-down

## Operating the power lift

- Select the power lift operating mode by means of the mode selector (3).

| | |
|---|---|
| Position 1 - | Turn the knob anti-clockwise for draft control mode. Use for ploughing and similar operations that require constant tractive force. |
| Position 6 - | Turn the knob clockwise for position control mode. The implement will remain at a con stant height or depth. |
| Intermed. positions (2 - 3 - 4 - 5) | "Intermix" mode. Combining position control and draft control; for use on variable soils or with subsoilers, etc. |

- Use the selector (6) to set a suitable descent speed for the type of implement being used.
- Set the switch (1) to working position (A).
- Turn the control knob (2) to obtain the correct working depth/height.

## Working with tillage implements

- If the implement pitches (makes large lifting and lowering adjustments) in draft control mode, turn the mode selector knob (3) clockwise to introduce an element of position control (Intermix).
  The sensitivity of the electronic power lift to variations in the traction force required in working conditions is automatically controlled and thus the operator need not intervene to make corrections.

## Intermix/draft/position control adjustment

Tillage work: position 3 or 4.
Ploughing: positions 1 - 2 - 3 - 4.
Light soil turning: positions 4 - 5.
Grubbing: position 3 or 4.
Carried implement: position 6 (position control).

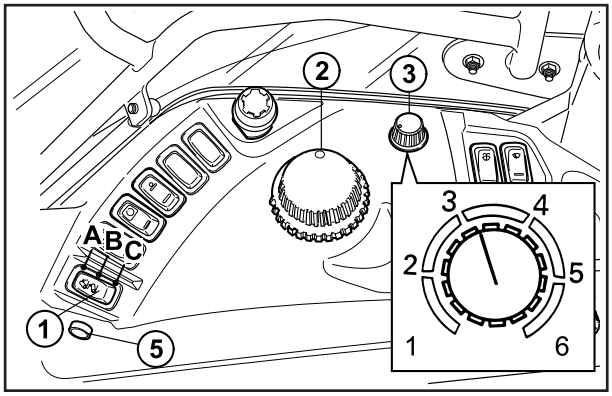
These settings are purely indicative and may vary depending on the implement used and the soil.

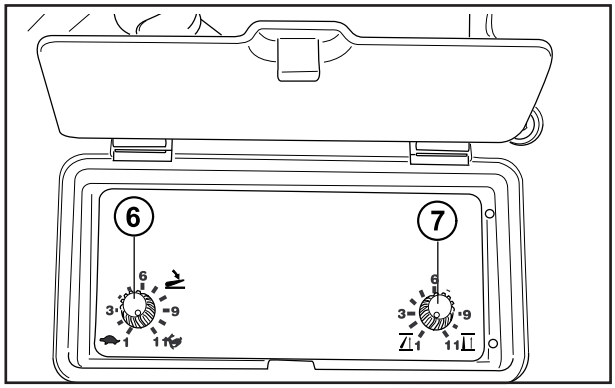
## Headland manoeuvres

- Raise the implement at the end of the field by setting the switch (1) to Pos. C. The arms lift to the height set on the lift height limiter (7). Adjust the lift height limiter so that if a drive shaft is connected between the PTO and the implement, it is not twisted into acute angles. This will also avoid wasting time lifting the implement to transport height.

- To re-engage the implement, simply turn the switch (1) to the working position (A). The implement will lower at the speed set with selector (7) until is reaches the position selected with knob (2).

- To make the implement quickly re-engage the soil, press the button (5).



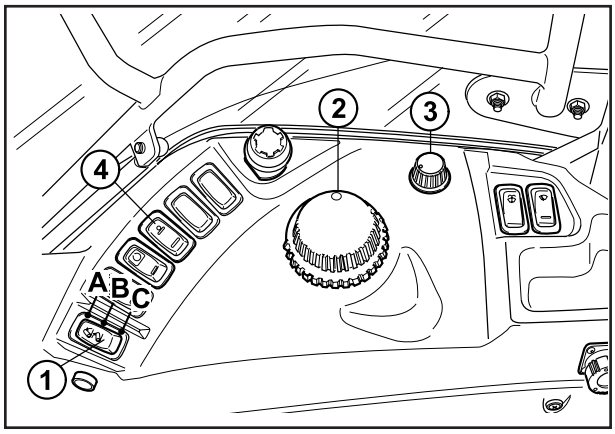



## Float mode

Used for implements that rest on the earth and follow the relief of the ground.

- Turn switch (1) to position (A).
- Turn knob (2) to position (MAX), fully anti-clockwise as far as it will go.

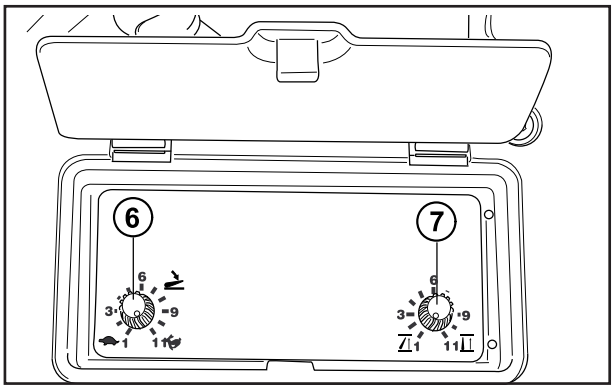
**CAUTION:Comply with the maintenance and safety regulations governing the electrical system of the tractor to safeguard and protect the electronic power lift.**




## Transporting implements

- Select the maximum transport height with the selector (7).
- Raise the three-point linkage by turning the switch (1) to Pos. C.
- Set the selector (3) to position control mode (Pos. 6) by turning it in an clockwise direction.
- Set the down-speed selector (6) to position (1) (lock) to prevent any accidental lowering movement should the controls be accidentally operated.

**WARNING: If the control lever (1) is moved to the links down position (A) and the work height control knob (2) is moved, the arms could be lowered. Set the lowering speed control (6) to Pos. 1 (lock) to prevent any accidental movement.**




## Shock absorber function in the transport position

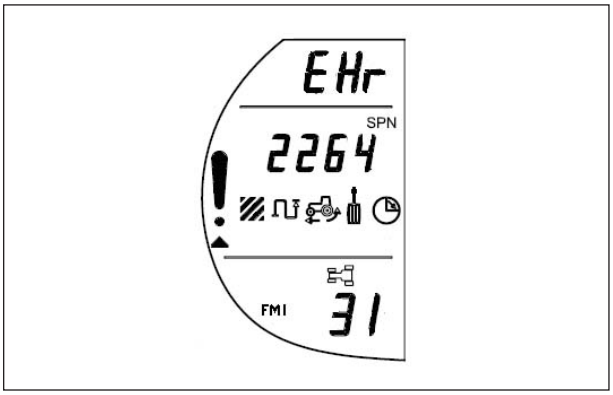
This function is activated by moving the selector (1) up (C) and pressing the button (4). Indicator light will come on.

Press the button (4) again to deactivate the shock-absorber function in the transport position.

## Electronic hitch error codes

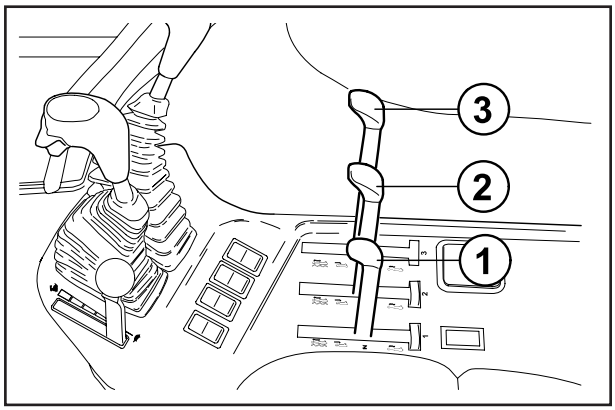
In case of electronic hitch malfunction, the instrument cluster will display an exclamation mark. To check the electronic hitch error code, refer to the Error menu EHr on the digital instrument cluster.

**WARNING: When an operation ERROR is displayed, ask the Dealer's specialized personnel for help indicating the error code. The Dealer's personnel has specific competence to locate the error and the type of operation to be performed.**



## AUXILIARY CONTROL VALVES [4.2.f]

Control valve levers operate the corresponding valve: lever 1 operates valve number 1, lever 2 operates valve number 2 and so on.




**NOTE:** *To ensure that the hydraulic circuit operates in a regular way, the level of the transmission oil must be frequently checked and topped up if necessary, as indicated in the "Checking the transmission oil level" part of the Maintenance section.*

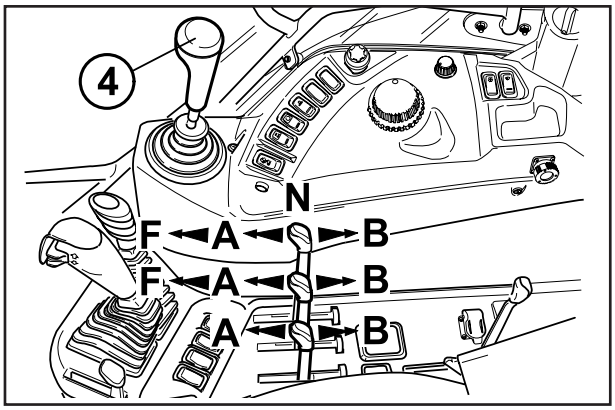
**WARNING: Make sure that the hydraulic cylinders of the connected implements contain the same type of oil as the transmission unit of the tractor to prevent this from being polluted and leading to faulty operation.**

**WARNING: The tractor must only be started with the auxiliary valve levers are in neutral.**

*IMPORTANT: As the auxiliary control valves have different configurations according to specific requirements of the user, please ask your Dealer for details about the proper and safe use of hydraulic equipment.*

**Joystick** (4) - It is coupled to two auxiliary control valves. If shifted forward, it controls the 1st valve, if shifted laterally it controls the 2nd valve. The lever can be locked by (5) in three positions:

- Turned anti-clockwise and downward: Every movement of the lever is locked in neutral.
- Turned clockwise and in intermediate position: The movement forward/back is allowed to control a single control valve. To control the second control valve, the locking device must be pulled up and the lever shifted laterally.
- Turned clockwise at the end of travel: The lever can be moved in every direction and controls both valves.



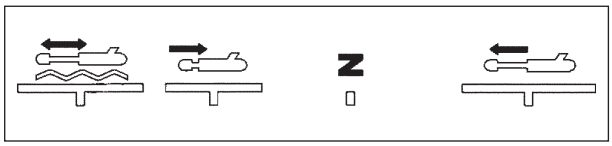

### Control valve operation

- Standard control valve.
  If set to positions A and B and released, the control lever automatically returns to the hold position (N), locking the implement in the position it has assumed.
- Control valve with "kick-out" automatic release (optional). If set to positions A and B, the control lever remains blocked in the assumed position.
  Once the cylinder has reached end of stroke, the pressure automatically releases the lever, setting it back in the neutral position (N).
  The lever can be moved back to the neutral position by hand before the cylinder reaches end of stroke.
- Control valve with floating position (optional), used for implements that normally rest on the ground and follow its relief (e.g. graders, snow-ploughs, etc.). The floating position is obtained by moving the lever (2) to the second setting in position (F), where it remains locked.
- Specific control valve (optional) for use with hydraulic motors.

***NOTE:*** *Do not use the control valve for hydraulic motors to supply single/double-acting cylinders to avoid any risks of accidents when using the connected hydraulic equipment.*

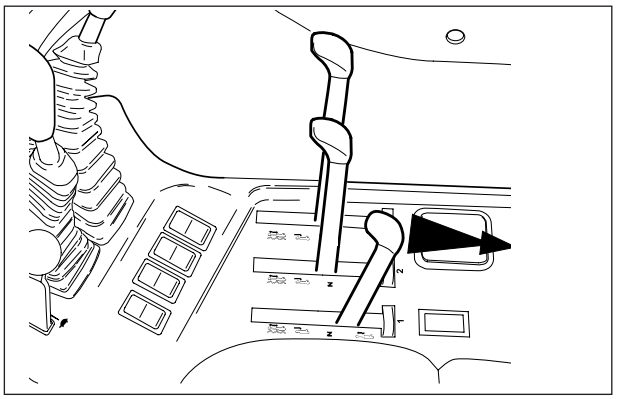
## REMOTE HYDRAULICS OPERATION

There can be up to three remote control levers, each having three or four positions (according to the type of valve):



POSITION
FLOATING RETRACT NEUTRAL EXTEND

The speed of movement of auxiliary equipment is determined by the distance the lever is moved from neutral to the control position.

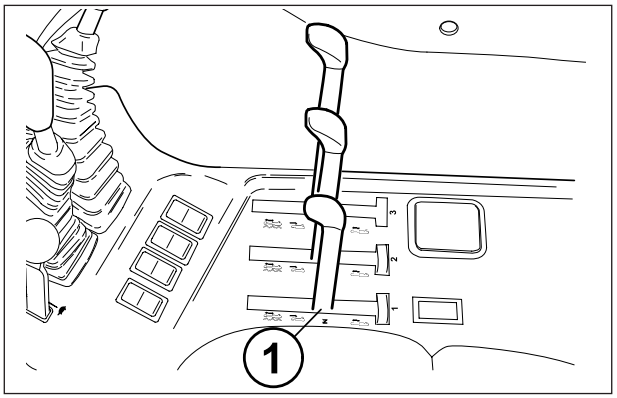


If the lever is moved fully rearward from neutral, the equipment hydraulic cylinder(s) will extend quickly. If the lever is moved rearward a short distance from neutral, the equipment hydraulic cylinder(s) will extend slowly.

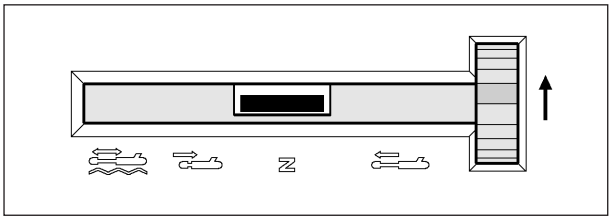
If the lever is moved fully forward from neutral (when float is locked out) the equipment hydraulic cylinder(s) will retract quickly. If the lever is moved a short distance forward from neutral the equipment hydraulic cylinder(s) will retract slowly.

*NOTE: If there is too much restriction in the implement cylinders or other attachments, the restriction can cause a back pressure in the remote valve which will cause the remote lever on the console to return to neutral before the cylinder has reached full stroke. If the condition occurs, it will be necessary to manually hold the lever in position until the cylinder has reached full stroke. Continual use of the remote valve in this condition will cause the hydraulic oil to over heat and possible damage to the hydraulic system. If the condition occurs at regular intervals the implement restriction should be corrected. It is normal for the control lever to return to neutral when the cylinders reach full stroke.*

### Neutral Lock

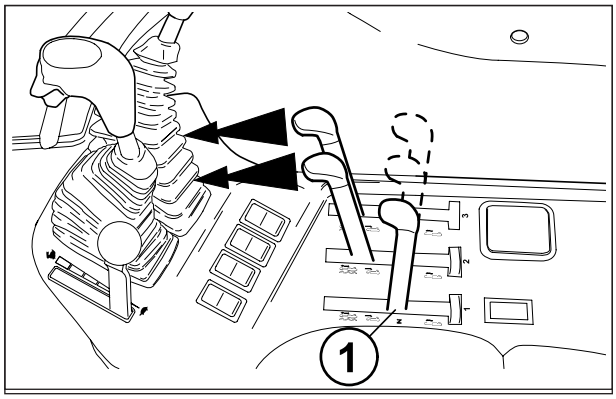



The remote hydraulic control levers can be locked in the neutral position (1) to prevent moving the remote valves. This can be done by moving the valve control levers to the neutral position and turning the lock control fully clockwise.

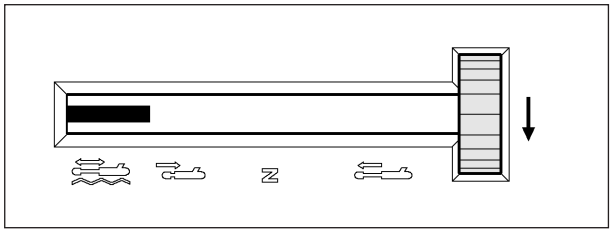


When used with equipment in the raised position, the neutral lock provides a positive means of preventing the accidental movement of the valve control levers.

## Float Position (if available)

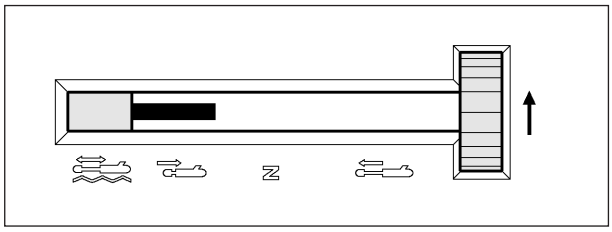



To operate the remote hydraulics in a float condition, turn the lock control (2) fully counterclockwise.



This will allow the control lever to go completely forward into the float position.

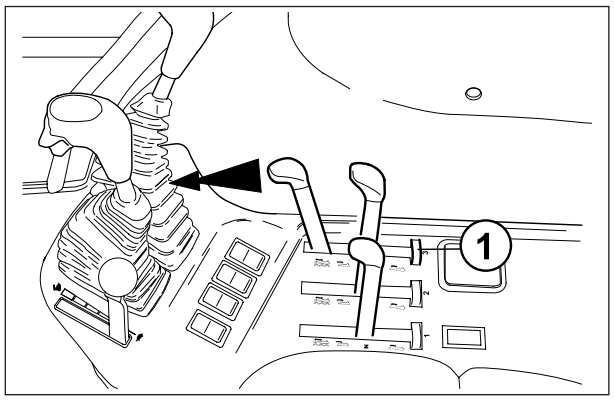
The remote hydraulic control levers can be locked out of the float position. When using equipment for work where the float position is not wanted, turn the lock control one position clockwise so that the control lever cannot be moved into the float position.



*NOTE: Single action cylinders can be operated in a float or no float position at the same time that the hitch is operated.*

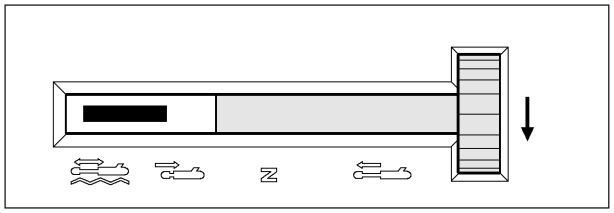
## Operating Hydraulic Motors

Connect hydraulic motors to the 1st remote circuit to make sure of a constant flow of oil to the motor.




Stop the engine. Move remote control lever forward to the float position.

Turn the locking control (1) fully anti-clockwise (three positions from neutral), so that the movement of the control lever is limited to two positions: retract and float.



In this way the lever has only available the two positions to be used with hydraulic motors.

To engage the hydraulic motor, start the engine and move the control lever forward from the float position until against the lever lock. The hydraulic motor will now operate.

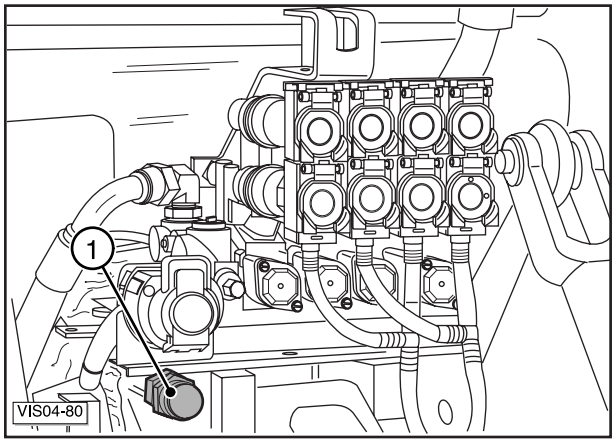
To disengage the hydraulic motor, move the remote control lever forward to the float position. Wait for the hydraulic motor to slowly stop.

DO NOT DISENGAGE THE LEVER LOCK. Allowing the control to return to the neutral position during motor application will cause the motor to stop immediately. This may cause damage to the hydraulic motor, hoses and equipment.

To change the direction of rotation of the hydraulic motor, change the hoses over on number 1 remote coupler.

*IMPORTANT: To avoid damages to hydraulic pumps in tractors, all hydraulic fluid flowing back from all implements must be returned through the return circuit of the hydraulic motor.*

## Free discharge - Hydraulic Motor Return Circuit (if equipped)




The hydraulic motor return circuit can be used to reduce restriction in the remote hydraulic motor return line. This will result in more efficient hydraulic motor operation.

To use the hydraulic motor return circuit, connect the return line from the hydraulic motor or implement to the connector (1).

## Selecting the single/double acting modes

(Available only on some control valve types)

Some control valves can be regulated to control single-acting cylinders.
To do this, just loosen the check nut (2 ) and turn the screw fully anti-clockwise (1). Now lock the check nut again.
To select the double-acting mode, turn the adjuster screw (1) clockwise.

## Flow divider (if installed)

On request, a flow divider is available (3) that is mounted on the input plate of the control valve pack and is coupled with the first auxiliary control valve, of a type specific for operation with a flow divider.

### Flow regulation

This device regulates the oil flow to the first control valve, and is specially useful for those implements that require a very limited oil flow to obtain precise movements, or to regulate the speed in a hydraulic engine. It also maintains an oil flow sufficient to use the lift system and the external circuit at the same time, if only the first auxiliary valve is used. To regulate the flow, simply turn the control knob on the flow divider.

## Quick couplings

Each control valve has two quick coupling female half-connections of the "Push-Pull" (4) type that can be connected to male half-couplings of any make so long as they are of the same size. The half-coupling is very simple to couple and uncouple: push to connect and pull to detach.
Red - delivery/lifted
Yellow - return/lowered

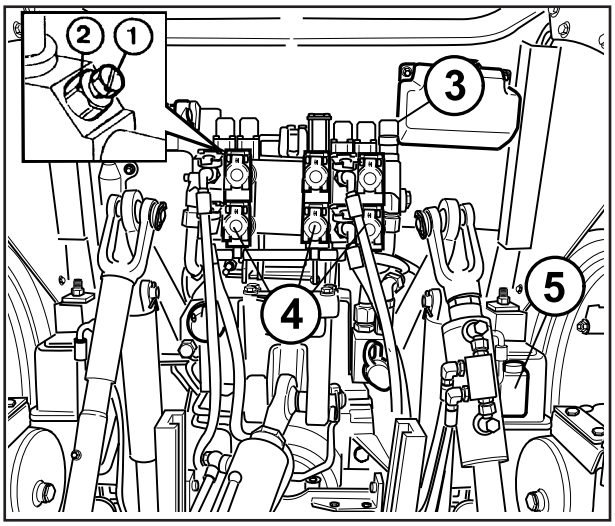
**WARNING: Remove any pressure from the circuit before hitching or unhitching the quick couplings.**

Remove the dust cap. Clean the implement male coupler before connecting.

## Oil sump

Each quick coupling is connected to an oil sump (5) that collects oil leaks due to hitching and unhitching of the quick couplings. When the oil reaches the maximum level, the sump should be emptied in collecting tanks so as not to contaminate the environment.

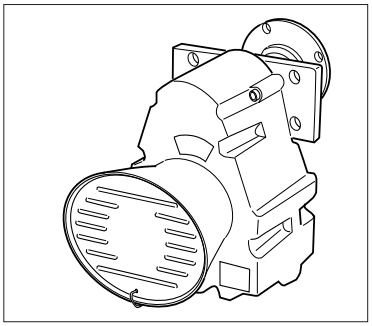
*IMPORTANT: DO NOT pour the reservoir contents back into the hydraulic system. Dispose of contents in accordance with local regulations. DO NOT drain the contents on the ground or into a drain. Be responsible for the environment.*




**WARNING: When auxiliary control valves are used, their quick couplings can reach high temperatures. Therefore, safety gloves suitable for such temperatures must be worn every time the connected implements are connected to or disconnected from the couplings.**

*IMPORTANT: When connecting the implement hose to the tractor, make sure the hose is long enough to permit the tractor to turn in both directions.*

## USE OF FRONT POWER TAKE-OFF (if equipped)



**WARNING: Always mount the plastic guard on the PTO shaft when the PTO is not being used.**

The front power take-off has a 6 spline output shaft which rotates at 1000 rpm. Engagement is electrohydraulic, actuated by a three position rocker switch (OFF, ON and ENGAGED) situated on the RH side console. Depending upon market requirements, the front PTO can be supplied with two different directions of rotation (clockwise or counter-clockwise).

***IMPORTANT:*** *When using implements that cause shock loads, always use a safety coupler between the implement and the PTO drive shaft. Before using the implement, check the correct operation both of the safety coupler and of the implement.*

***IMPORTANT:*** *When using implements with quickly moving parts (such as mowers, reapers, snowploughs) ALWAYS fit an overrun device on the implement drive shaft, as a protection against possible PTO faults.*

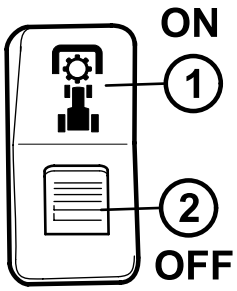
***IMPORTANT:*** *Ensure that the implement PTO shaft is not too long or the PTO is not damaged when the front mounted implement must be lifted fully up.*


**DECAL**
Provided by the front PTO maker. (If equipped with front PTO).

***WARNING:*** *Keep yourself at a safe distance. Speed (rpm) and spinning of the front PTO shaft.*

**Engage the PTO as follows:**
OPERATION 1
Reduce the engine rpm.

OPERATION 2




To engage the PTO, release the switch (2) by pushing the orange switch lock (1) down and at the same time press the switch down (ON).

***IMPORTANT:*** *PTO will not engage if engine is started with the switch in the engage position. Move switch to disengage and then engage.*

***IMPORTANT:*** *Never try to release dead locked implements by repeated clutch engagement and disengagement. The front power takeoff clutch will slip and become damaged.*

**Disengage the PTO as follows:**

OPERATION 1
Reduce the engine rpm.

OPERATION 2
Push the bottom of the switch (1) down to the OFF position. The indicator lamp in the switch will go out when the front power takeoff is disengaged.

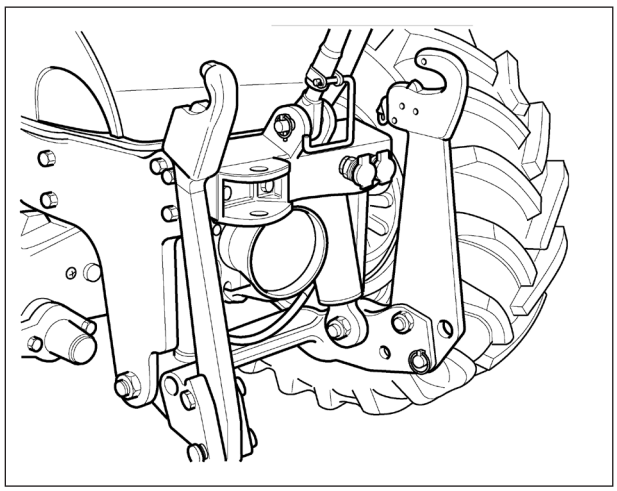
OPERATION 3
When the engine is switched off the front power takeoff is automatically disengaged. The indicator lamp in the switch will go out to indicate the front PTO is disengaged.

OPERATION 4
Always install the PTO shaft guard when the PTO is not being used.

***IMPORTANT:*** *High-inertia implements do not become stationary immediately when PTO is disengaged. Allow sufficient time for implement to "run down" to a halt before cleaning or adjusting.*

## FRONT POWER LIFT (if equipped) [4.2.g]

### Hitch System



The front power lift is operated via the tractor's remote hydraulic valve circuit and is double acting, (the linkage is power lifted and power lowered).

The hitch is designed for Category IIIN implements.
The top link has a ball end.

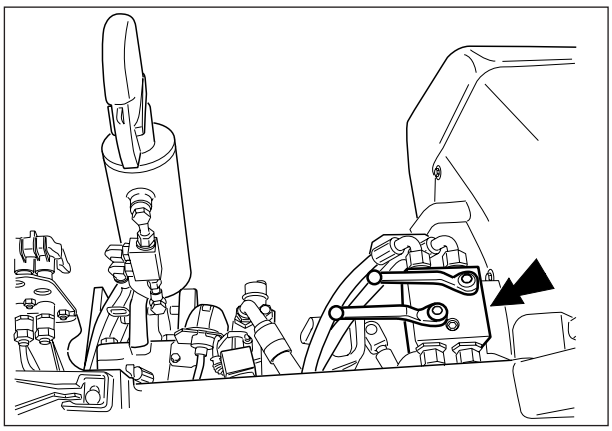
Maximum Lift Capacity.....2800 kg

**IMPORTANT:** *Do not exceed the maximum permitted front axle operating weight when using the front hitch. Observe tyre load capacities and any possible legal limitations.*


**DECAL**
(If equipped with a front hitch - Located near the multi-purpose control valve)

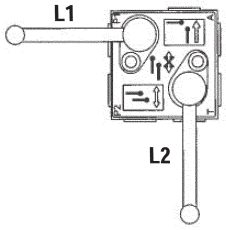
*Read the Operator's Manual carefully before using.*

### Multi Valve

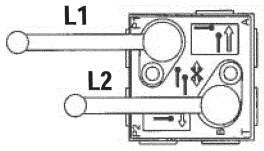


The valve is mounted at the rear of the tractor.
The multi valve has two operation modes.

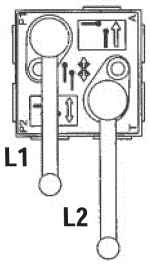
#### Valve Positions
**1st mode - Double acting**




**2nd mode - Single acting**




**3rd mode - Disengaged** (Transport) - For system safety during transport or travel on road.



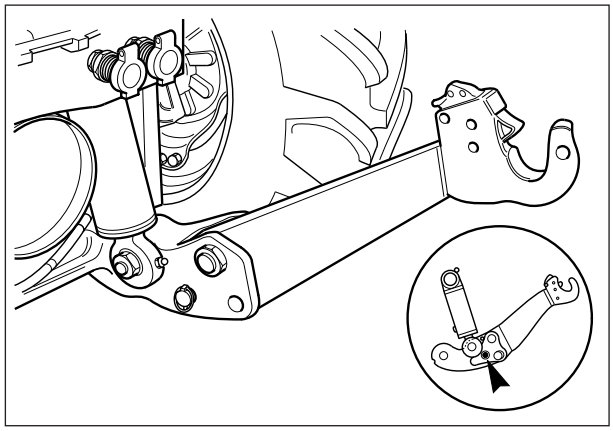

**IMPORTANT:** *The front power lift is operated using one of the tractors remote valves. In order to use the rear couplers of this valve the front power lift MUST be disengaged as shown.*

## Lower Links

The lower links have three positions. When changing the position of the lower links, support the links when removing the retaining pins.

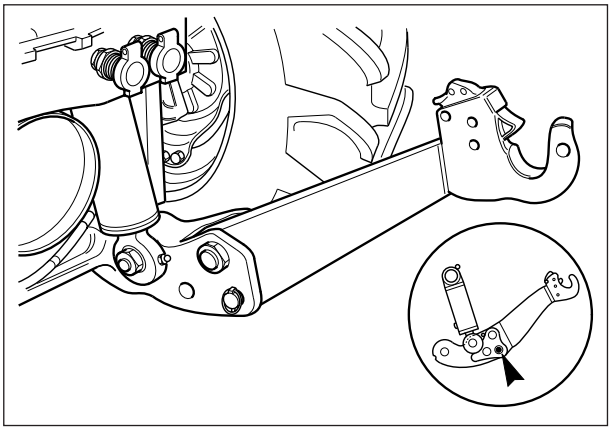
Both lift links must be set in the same position.

### Rigid Position



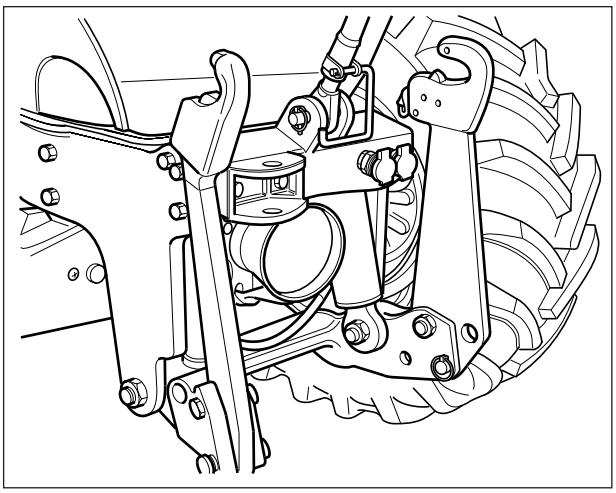
For operation with no vertical movement, install the retaining pins in the rear hole.

### Float position

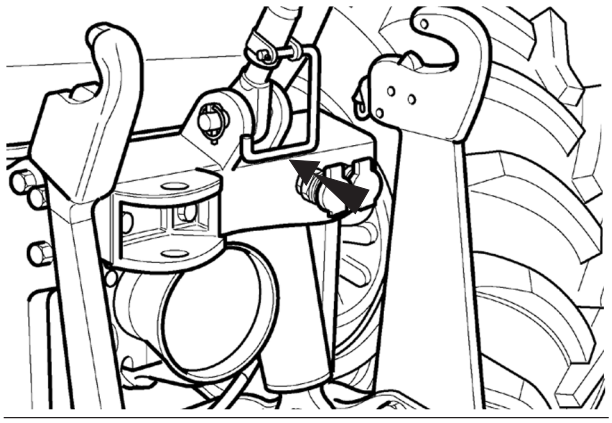


For operation with vertical float, independently of each other, install the retaining pins in the front hole.

### Transport position



## Top Link



When not being used store the top link as shown above.

When operating on the public highway without equipment attached always store the top link correctly.

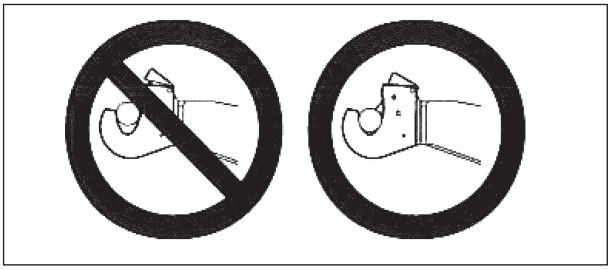
## Hitch Operation

OPERATION 1

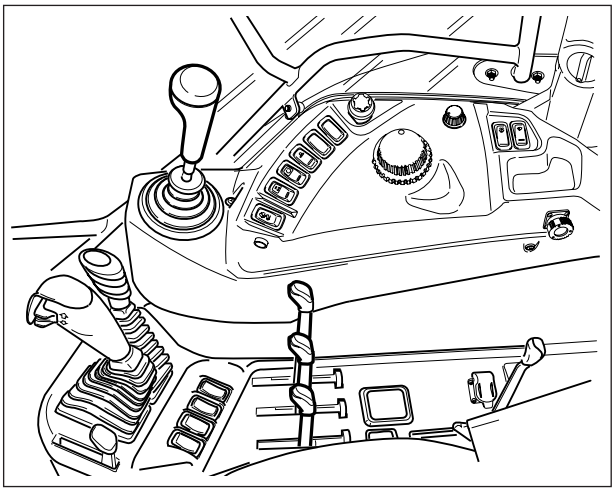
Lower the lower links and set for Rigid or Float application, as required.

OPERATION 2

Attach the implement to the hitch. Make sure the correct category implement is attached. A category indication is stamped on each lower link.
Make sure the claws on the front hitch engage with the implement and the latches lock.



OPERATION 3

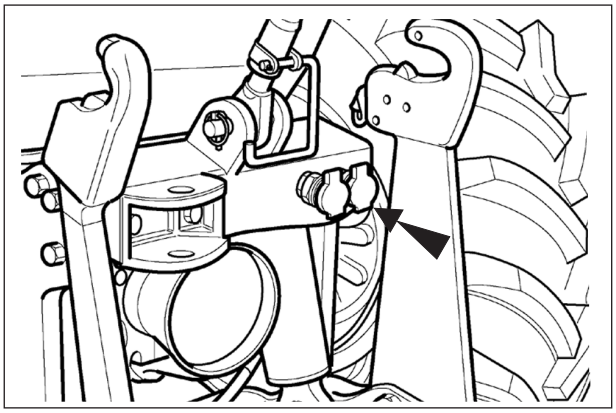


Move the relevant remote control to raise or lower the hitch as required.
(Except further applications when the tractor is equipped with a front loader).

## Optional Equipment

### Front Hydraulic Quick Couplers for Remote Valves (available as a kit)

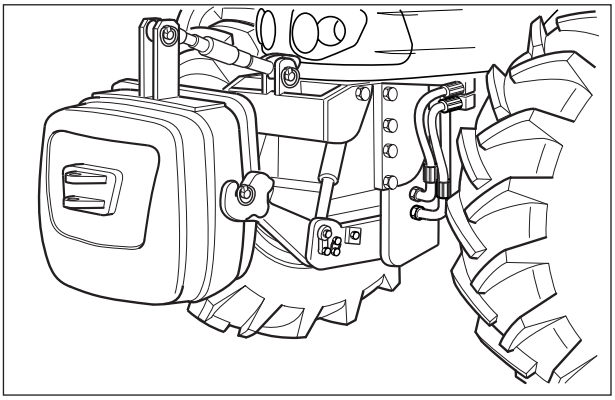
**IMPORTANT:** *The front remote couplers are supplied from one of the rear remote valves. DO NOT use both the front and the corresponding rear remote couplers at the same time.*



**WARNING: Stand well clear of the linkage or implement when operating the external controls or injury can result from contact with moving parts. Watch for possible pinch points between the implement and tractor when the hitch is moved.**

### Front Ballast

On request, a front ballast kit on the front power lift is available.



**WARNING: Use suitable lifting means when handling the ballast.**

**WARNING: When servicing work is required, lower the front lift to the ground and unhitch the implement. NEVER carry out servicing work by standing under the front lift.**

## Towing attachments

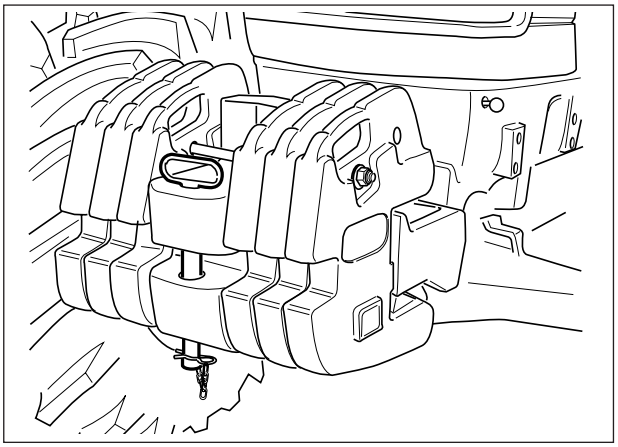
### Front tow hook

The tractor is equipped with a front tow hook for emergency operations for towing the tractor.

**CAUTION: DO NOT raise the machine with the tow hook.**

**CAUTION: Use exclusively the provided hooks to tow the machine.**

**CAUTION: Refer to licensing documents issued by the Ministry of Transport to know data relating to max. vertical and horizontal loads on tow hooks and max. trailer weights.**



Front tow hook.

### Rear pull hooks

The following rear pull hooks are available depending on approvals and regulations valid in each country.
**The availability should be checked on each market.**

### Weight to be towed by the tractor

The max. weight a tractor may tow varies according to the laws in force in each country.
Check the installed tyres for their load capacity.
Ask your Dealer for information about the max. towable weight.

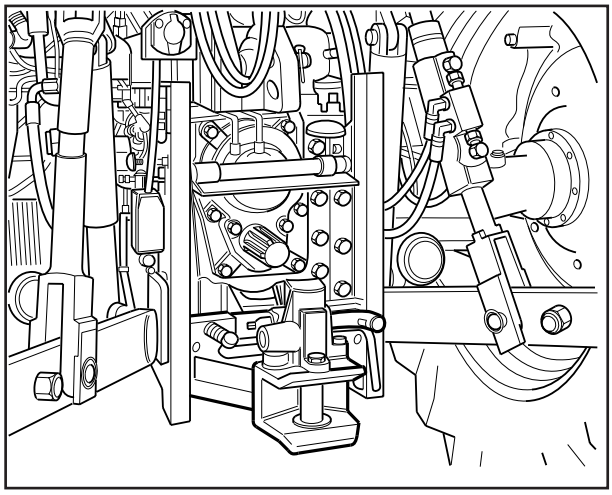
**Rear tow hooks, hand adjustable in height, with welded frame - Italian market.**

- CUNA 'C' tow hook (for the Italian market).
- CUNA 'D2' tow hook (trailer hydraulic brakes) (for the Italian market).
- CUNA drawbar, Class A (for the Italian market)
- CUNA C hook and CUNA drawbar, Class A (for the Italian market)
- EEC hook, not automatic - EEC market.

These tow devices can be used for agricultural implements and one or two-axle trailers on road.

To make hitching the implement easier, this device can be adjusted to different heights.

This operation requires great attention. A well adjusted hook means easier handling of the tractor and, above all, safety and stability of the tractor.



Rear tow hook.

If the towing attachment is placed in the highest position, towing is easier, but the tractor might pitch up at the front.

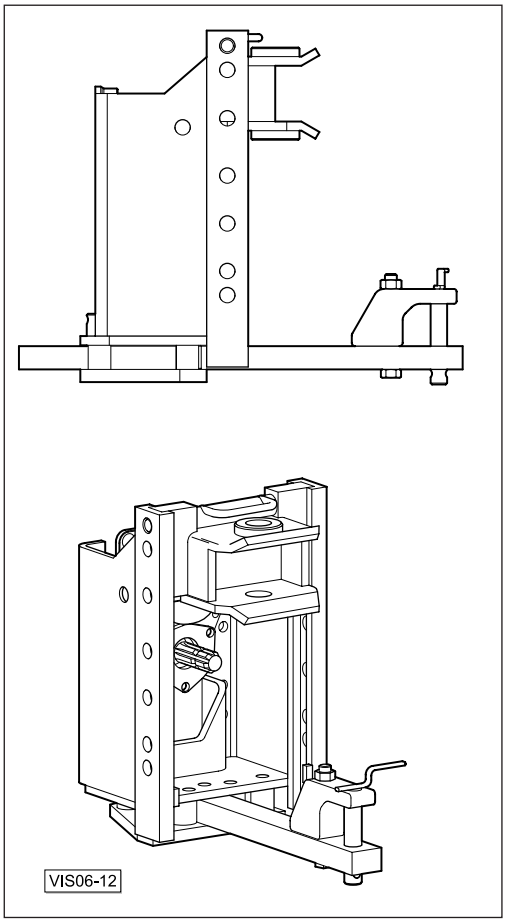
When using four-wheel drive, keep the tow hook in one of the lower positions so that the drawbar remains as horizontal as possible. This keeps the weight over the front axle and improves tractive force.

Standard sliding rear tow hooks, adjustable in height - Italian market.

- CUNA 'C' tow hook (for the Italian market).
- CUNA 'D2' tow hook (trailer hydraulic brakes) (for the Italian market).
- CUNA C hook and CUNA drawbar, Class A (for the Italian market)
- CUNA D2 hook (hydraulic trailer brake) and CUNA drawbar, Class A (for the Italian market)

**Standard sliding rear tow hook, adjustable in height - EEC market**

- EEC hook, not automatic
- EEC hook, automatic
- EEC hook, not automatic and EEC drawbar.
- EEC hook, not automatic and EEC drawbar.
- EEC Drawbar



## Rear tow hook, adjustable in height (type with safety guards) (not-EEC markets) (Not valid for Italy and EEC markets)

- Cat. C tow hook
- D2 tow hook (trailer hydraulic brakes)
- CUNA drawbar, Class A

## Cat. A drawbar

The tractor may be equipped with an A-type tow hook that consists of a drawbar, for use with agricultural implements and one or two-axle trailers. Never use this type of attachment to tow single axle trailers, because they can apply too much weight to the drawbar. The drawbar might be damaged because it is not built to sustain vertical loads.

The drawbar can be adjusted to allow correct coupling, besides to towed implements, to implements driven by PTO.

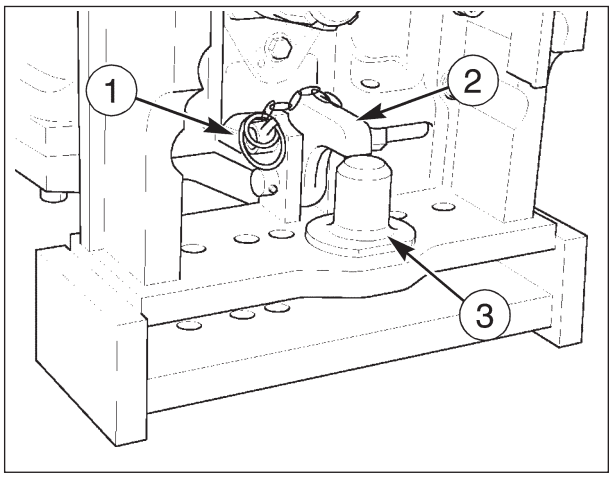
It is possible to change the pivoting point of the sector on the tractor support.

For those implements that need it (e.g. ploughs), the sector of the tow frame allows for a widespread horizontal adjustment to provide greater lateral swing in either direction.

Two locking pins can also be used to limit or reduce drawbar swing in either direction.

**WARNING: When towing implements driven by the PTO, adjust the height of the drawbar so that it lies between 150 (5.9”) and 300 mm (11.8”) below the height of the PTO shaft.**

## Piton-Fixe (if equipped, according to market)




To connect an implement/trailer, remove the spring clip and pin (1) and lift the retaining hook (2).

Install the implement towing eye over the towing pin (3) and lower the retaining hook (2).

Install the pin and spring clip (1).

***IMPORTANT:*** *Maximum vertical load capacity depends upon the capacity of the rear tyres fitted. Refer to your Dealer for more information.*

**Piton Fixe rear sliding draft gear - Available versions:**

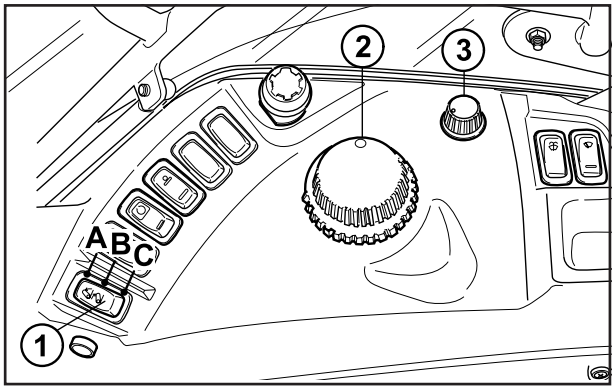
- EEC hook, not automatic
- EEC hook, automatic
- EEC hook, not automatic and EEC drawbar.
- EEC hook, not automatic and EEC drawbar.
- EEC Drawbar

## PICK UP HITCH
## (if fitted, on request on certain markets)

### Connecting an implement

OPERATION 1

**Electronic Power Lift System**
Turn the Upper Limit Control Knob (4) to the maximum setting.




- Raise the three-point linkage by turning the switch (1) to Pos. C.
- Set the selector (3) to position control mode (Pos. 1) by turning it in an anti-clockwise direction.
- Set the down-speed selector (6) to position (0) (lock) to prevent any accidental lowering movement should the controls be accidentally operated.

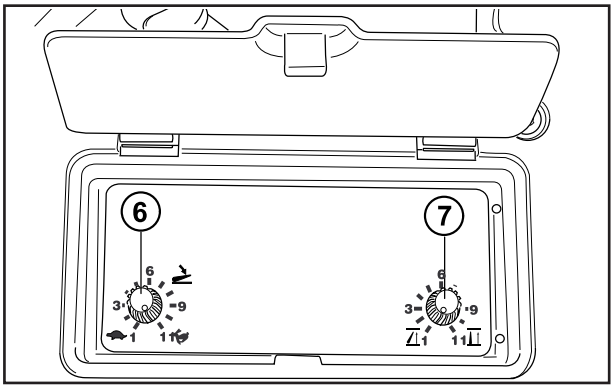
**WARNING: If the control switch (1) is moved to the links down position (A) and the work height control knob (2) is moved, the arms can be lowered. Set the lowering speed control (6) to Pos. 0 (padlock) to prevent any accidental movement.**

### Maximum permitted operating weights

**WARNING: comply with the max. load capacity of the automatic hitch and of the drawbar. Do not work with loads greater than the maximum allowed ones. This could damage the automatic hitch and the rod. It also reduces stability of the front part.**
**Maximum loads on axles also depend upon the capacity of the rear tyres fitted. For maximum allowed loads, see the "Technical specifications" Section.**
**Ask your Dealer for further information.**

**WARNING: The automatic Pick-Up Hitch and pulling trailers on public roads is not permitted unless a special approval note has been supplied with the machine documents. Ask your Dealer for further information.**

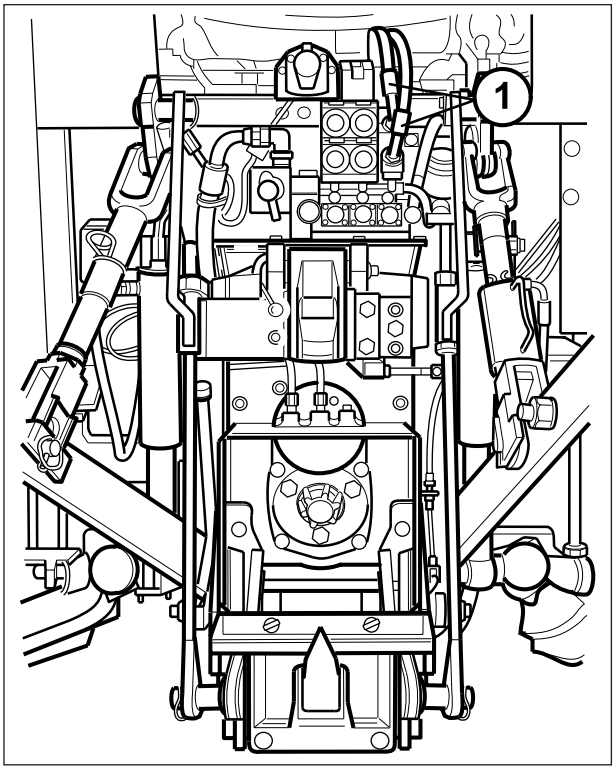
**WARNING: Pick-Up Hitch hook (PUH) - The coupling and uncoupling of the PUH must be made strictly with the lifting device in a controlled position to ensure the proper functioning of the fastening/release of the hook.**




**Two types of pick-up hitches are available.**

- Mechanical

- Hydraulic - Connect the hoses of the hydraulic pick-up hitch to the rear hydraulic taps (1) of the auxiliary hydraulic valve to be used.




Pick Up Hitch

OPERATION 2

Raise the hitch to maximum height.

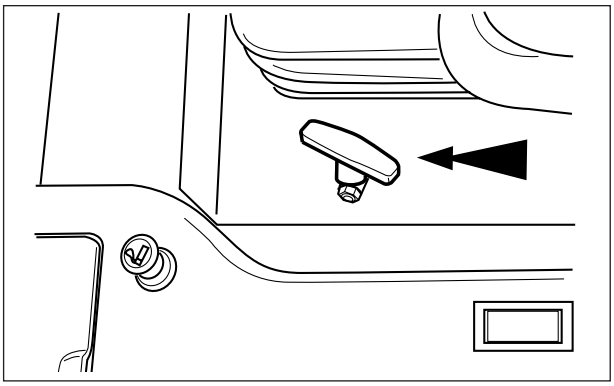
***IMPORTANT:*** *Electronic power lift - Make sure LOAD CONTROL is in the (0) off position, this will prevent unwanted hitch movement when the tractor is moving at more than 0.8 km/h (0.5 mph).*

OPERATION 3

Make sure the auto hitch is raised to maximum height.

Unlock the locking latches.

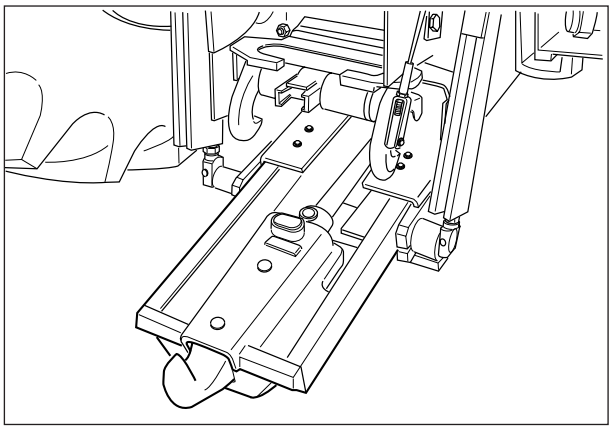
To unlock, pull the lever (1).



OPERATION 5

Lower the pick-up hitch using the power lift controls.

OPERATION 6



- Mechanical hitch - Reverse the tractor until the hook is aligned under the implement towing eye.

- Hydraulic hitch.
Extend the hook rearwards, by moving the corresponding hydraulic remote control until the hook is aligned under the implement towing eye.

OPERATION 7

Raise the auto hitch until the hook is engaged in the implement towing eye.

OPERATION 8

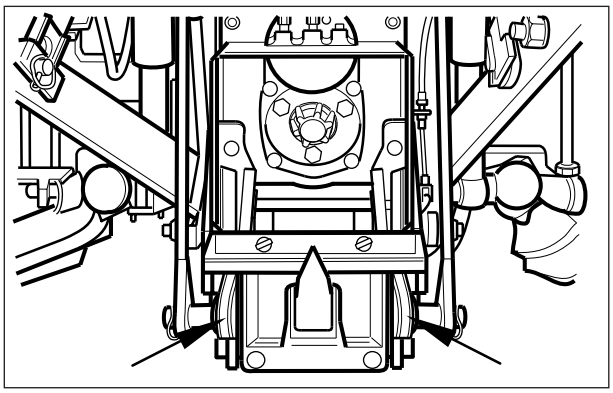
Fully retract the hook by moving the correct remote lever rearwards.

***IMPORTANT:*** *Always make sure the hook is fully retracted before raising the hitch.*

OPERATION 9

Raise the pick-up hitch to max. height until the hitch stops upward movement and the locking latches are latched. Release the lift controls.

OPERATION 10



Lower the hitch onto the locking latches to take the weight off the hydraulic system.

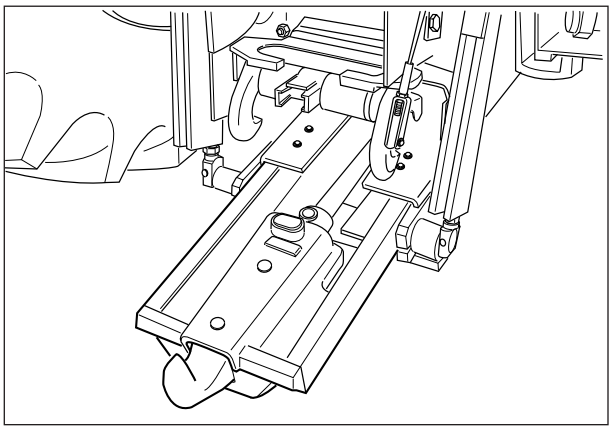
***IMPORTANT:*** *The hitch must always be supported on the locking latches and NOT by the hydraulic system. If the locking latches do not lock, adjust the lift rods. If after adjustment the locking latches still do not lock see your dealer.*

***IMPORTANT:*** *To prevent accidents, make sure the hook is fully retracted and the frame is correctly latched.*

## Hook/drawbar change over

(if fitted, on request on certain markets)

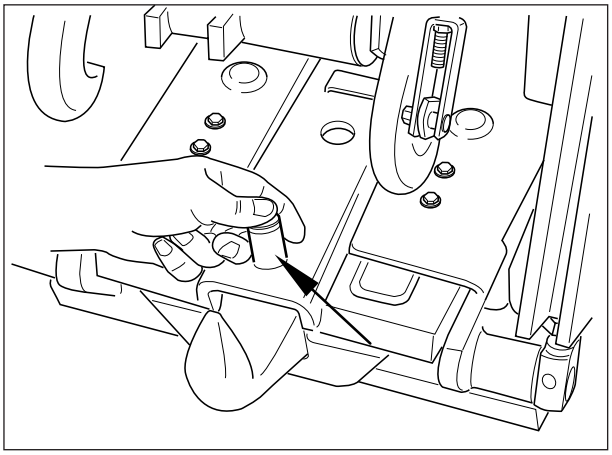
OPERATION 1



Lower the auto hitch half way. Extend the hitch/drawbar by moving the corresponding hydraulic remote control.

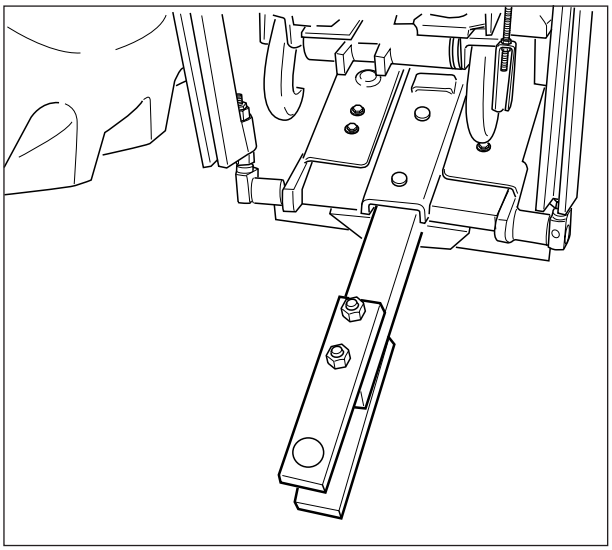
***IMPORTANT:*** *After lowering and extending the auto hitch, stop the engine, and engage the parking brake before leaving the tractor.*

OPERATION 2



Remove the hitch/drawbar locating pins.

OPERATION 3



Remove the hitch or drawbar. Stow away the removed hitch or drawbar in a suitable recess for transport.

Install the hitch or drawbar..

Install the lock pins.

Retract the hydraulic hitch and raise the pick-up hitch until locked, then lower onto latches.

**WARNING: BEFORE DRIVING OFF AND AFTER THE COUPLING, MAKE SURE THE LOCKING HITCH IS FULLY RETRACTED AND THE FRAME IS CORRECTLY LATCHED.**

## Towable weights [4.2.I]

| Ref | Make & Type | | Max horizontal Load |
|---|---|---|---|
| A | CBM GTF30019 | | 12000 kg |
| B | M.R. 17101000 | | 12000 kg |
| | GRASSI | V.ORLANDI | |
| C | EG39 or | / | 40000 kg |
| D | EG41 | / | 40000 kg |
| E | / | MH31 | 40000 kg |
| F | EG40 | AH31H-S | 40000 kg |
| G | / | AH31H | 40000 kg |
| H | / | AH31 | 40000 kg |
| Q | EG37 | EG37 | 13000 kg<br>12000 kg<br>11000 kg |
| R | DROMONE RMF 6000 | DRAWBAR | 24000 kg |
| S | | HOOK | |

## Max. vertical load relative to rear tyres and hitch/drawbar type (daN) [4.2.j]

| Tyres | Load capacity | Maximum weight technically permissible | Coupling see chart above | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | A, B | C, E, H | D, F, G | S | DRAWBAR | |
| | | | | | | | Q | R |
| 16.9-R-30 (137A8) | 4600 | 4500 | 1250 | 2000 | 2500 | 1800 | 600<br>800<br>900<br>(*) | 1700 |
| 480/70-R-30 (141A8) | 5150 | 4500 | | | | | | |
| 18.4-R-30 (142A8) | 5300 | 4500 | | | | | | |
| 13.6-R-38 (128A8) | 3600 | 3600 | | | | | | |
| 480/70-R-34 (143A8) | 5450 | 4500 | | | | | | |
| 16.9-R-34 (139A8) | 4920 | 4500 | | | | | | |
| 540/65-R-34 (140A8) | 5000 | 4500 | | | | | | |
| 600/65-R-34 (145A8) | 5800 | 4500 | | | | | | |
| 18.4-R-34 (144A8) | 5600 | 4500 | | | | | | |
| 520/70-R-34 (148A8) | 6300 | 4500 | | | | | | |
| 540/65-R-38 (142A8) | 5300 | 4500 | | | | | | |
| 16.9-R-38 (141A8) | 5150 | 4500 | | | | | | |
| 480/70-R-38 (145A8) | 5800 | 4500 | | | | | | |

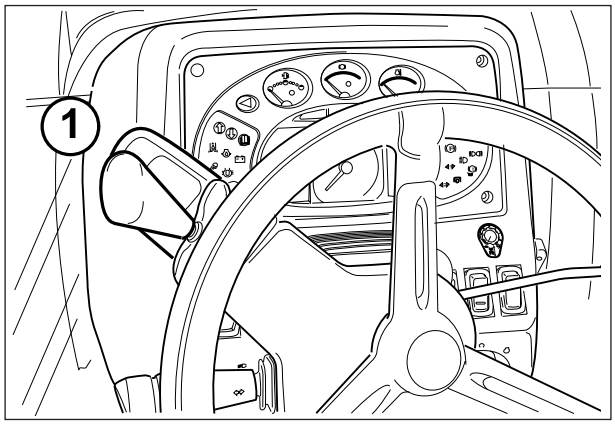
## Tractor transport [4.1.j]

Towing the tractor

If you need to tow or push the tractor for a brief distance, remember that the power steering system will allow you to drive and steer it for a short way with the engine off.

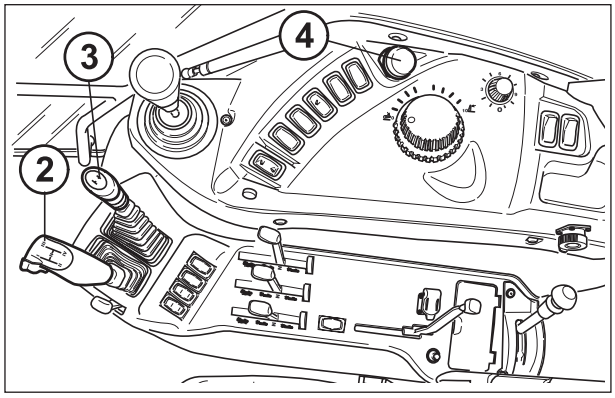
**Put the following controls in NEUTRAL:**

1- Reverse shuttle lever (1)
2- Gearshift lever (2)
3- Range selector lever (3)
4- (With Xtrashift only) Disengage the Park Lock (if equipped) (5)
5- Disengage the parking brake (6)
6- Make sure that the PTO engagement switch is disengaged (4) OFF.



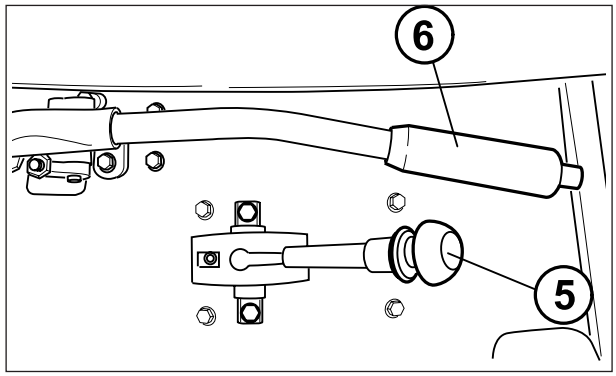

How to drive the tractor

- To drive the tractor, you will need to excercise greater effort if the engine is at a standstill.
- Slow and stop the tractor with the brake pedals latched together .
- Tow or push the tractor at moderate speed.




How to safely drive the tractor

- Affix the slow moving vehicle card (SMV-Slow Moving Veicle).
- Use the revolving beacon and the hazard lights.
- Strictly comply with the laws in force in the country where the tractor is used.



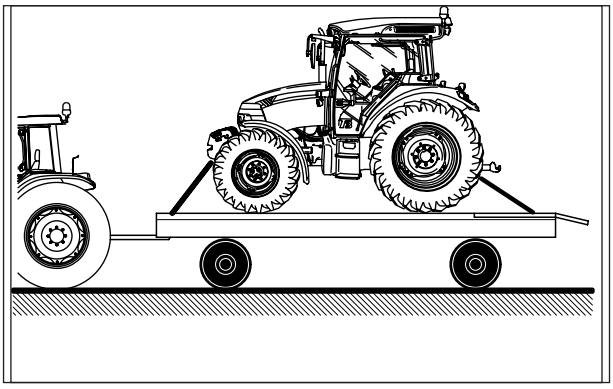

## Tractor transport

The tractor must be transported with a suitable vehicle.
Engage the first gear, then apply the parking brake. (6).
Engage the Park Lock (with Xtrashift only) (5).
Firmly fasten the tractor to the transport vehicle using suitable chains or straps.
Use the tow bar or its supports as rear fixing points for the tractor.

**CAUTION: Never hitch or connect chains around the tractor components as these could be damaged by the chains themselves or by excessive loads.**

The trailer must be provided with the warning signs and lights required by the local laws in force.

**WARNING: If the tractor needs to be transported, it should not be lifted, but should be driven onto the transport means.**
**If the tractor cannot be driven owing to a fault or malfunction, the operation should be entrusted to specialised firms having a suitable equipment.**



## Towing the tractor [4.1.j]

Towing the tractor is not recommended, but if it should be absolutely necessary, the procedure is different depending on the fact that the engine is on or off, and that the low pressure hydraulic circuit is operating or not operating.

Use the following procedures as applicable, at the following conditions:

- Connect safely one the tow hooks of the machine to the towing vehicle by means of a rigid drawbar, or a chain, or a metal cable of suitable size.

- In the middle of the linking means a red flag is to be hanged so that it is visible to other drivers on the road.

- The towing vehicle must keep the rotating beacon light operating. The towed tractor must keep the flashing hazard lights operating (turn indicators flashing contemporarily).

- Make sure that the brakes of the machine are operating.

- It is recommended that the machine is escorted by two cars, one in front of it and one at the rear, at a distance of 75÷150 m from the machine. These cars must carry danger signals according to the rules and laws of the country.

*NOTE: For the tow hooks fixed on the machine, see the Towing Attachments chapter in the Technical specifications section of this book.*

**CAUTION: Use only the appropriate tow hooks to tow the tractor.**

Towing the tractor with the engine off or low pressure hydraulic circuit not operating.

**WARNING: If the machine is towed with the engine off (or with the low pressure hydraulic circuit not operating), the brakes and steering will not be power assisted if this depends on the low pressure hydraulic circuit. The parking brake must be disengaged.**

- The machine can be towed for max. 10 Km at a max. speed of 8 Kph.

**WARNING: Make sure that the weight of a trailed vehicle that is not equipped with brakes NEVER EXCEEDS the weight of the tractor that is towing the vehicle or any national weight limitations which may apply. Stopping distance increases with increasing speed as the weight of the towed load increases, especially on slopes.**

Towing the tractor with the engine on or low pressure hydraulic circuit operating.

- Check that all controls are in neutral.

- If possible, level the machine and lower the telescopic boon completely.

- Check that the parking brake is disengaged.

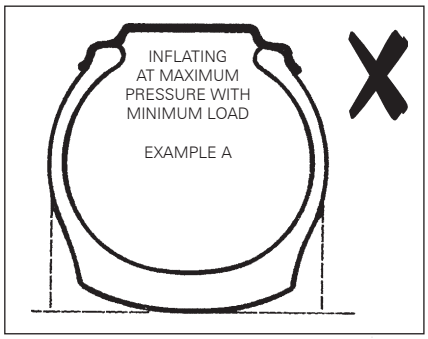
- Do not exceed a speed of 20 Kph when towing the tractor and check that the rear differential lock is disengaged.

- Run the engine at 1200 RPM at least, if possible.

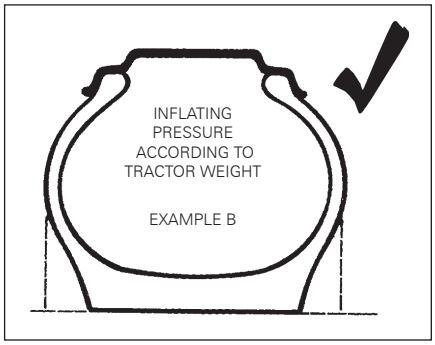
# Section 6
Tyres, Wheels, Ballasting

## TYRE INFLATION SPECIFICATIONS

For maximum tractor performance, always adjust the tyre pressure within the minimum/maximum range, to conform with the actual load on the tyres. Under normal conditions use the minimum pressure rating for general drawbar work. Use the higher pressure rating, up to the maximum, for heavy three-point hitch mounted equipment.




Example 'A' shows the cross section of a tyre inflated for maximum load but with a minimum load on the tyre. The tyre tread is not making full contact with the ground, which will give poor performance.




Example 'B' shows the cross section of a tyre with the inflated pressure correctly adjusted to the load on the tyre. The tyre tread is making full contact with the ground, which will give maximum performance.

Tyre pressure can also be adjusted as required to satisfy the following requirements.

### A. Severe Service.

Tyre pressure can be increased 28 kPa (0.27 bar - 4 psi) more than the maximum pressure shown in the charts, for tyres used in severe service. Severe service includes the furrow tyre in regular ploughing operations, and in hillside operations.

### B. Tyres With Liquid Ballast.

Inflate the tyres 14 kPa (0.14 bar - 2 psi) more than the normal operating pressure required for your operation. This will compensate for aeration that occurs when the tyres are in motion.

***WARNING: A tyre can explode during inflation and cause serious injury or death. Never increase air pressure beyond 241 kPa (2.4 bar) to seat the bead on the rim. Replace a tyre if it has a defect. Replace a wheel rim which has cracks, wear or severe rust. Make sure that all the air is removed from a tyre before removing the tyre from the rim. Never use force on an inflated or partially inflated tyre, make sure the tyre is correctly seated before inflating.***

See Tyre and Wheel Service on the following pages for further instructions on safe tyre inflation procedure, recommended tyre maintenance and tyre/rim repair.

*IMPORTANT: During transportation, by rail or road, tractor tyres are inflated to higher than normal operating pressures. Before using your tractor check the air pressure in the tyres to make sure that the air pressures are correct.*

## Air Pressure Check

Check the tyre inflation pressure every 50 hours of operation or once per week.

*NOTE: For best tyre life check tyre pressures as regular intervals. Too low a pressure causes early tyre wall failure. Too high a pressure causes higher tread wear or damage.*

Check the condition of the tyres and wheels for wear or damage. Keep the tyres inflated to the recommended pressures.

*NOTE: Cross ply tyres can have the pressure reduced to increase traction in field work. For speeds below 16 kph (10 mph), loads can be increased by 20%.*

*NOTE: Never use radial ply tyres below 1.2 bar (17 psi). It is not necessary to reduce the pressure in radial tyres to get better traction in the field.*

*IMPORTANT: Before leaving the factory the tyre pressures are increased. Check and adjust the pressures before operating the tractor.*

For tyres equipped with liquid ballast, check the air pressure as follows:

OPERATION 1

Use an air-water gauge. The valve must be at the bottom of the tyre to get an accurate reading.

OPERATION 2

Use a standard air gauge as follows:

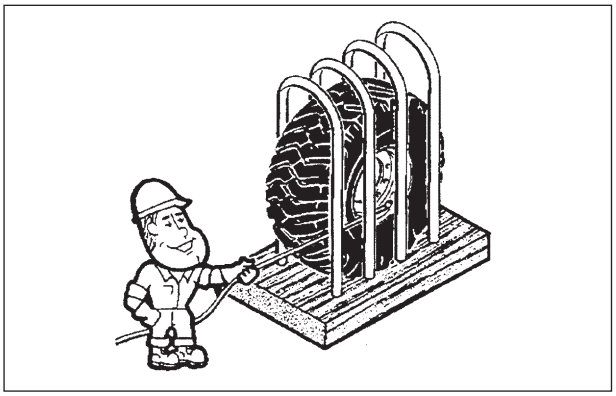
A. The valve must be at the top of the tyre.

B. Measure the wheel diameter.

C. Add 3.5 kPa (0.04 bar - 1/2 psi) for each 305 mm (12 inches) of rim diameter to the standard gauge reading.

## Tyre Inflation Procedure

DO NOT inflate a tyre that has had a complete loss of air. If the tyre has lost all air pressure, have a qualified tyre mechanic service the tyre.



*IMPORTANT: If the tyre wheel assembly has been removed from the tractor always use a restraining device (tyre inflation cage) when inflating a tyre.*

To ADD air to a partly inflated tyre, use the following procedure:

OPERATION 1

Use a SAFETY TYPE air hose with a remote shutoff valve and a self-locking air chuck.

OPERATION 2

Stand behind the tread of the tyre and make sure all persons are away from the side of the tyre before you start to add air.

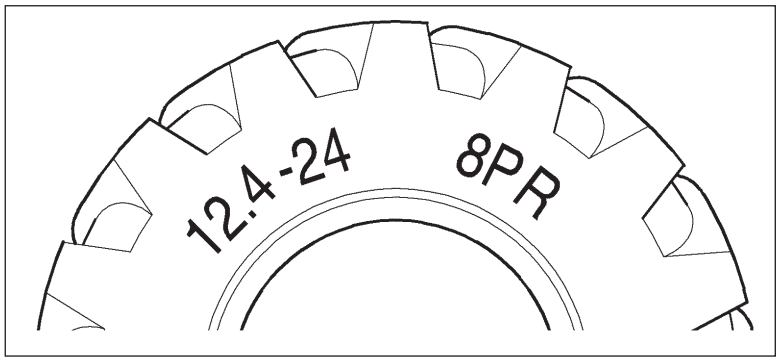
OPERATION 3

Inflate the tyre to the recommended air pressure. DO NOT INFLATE THE TYRE MORE THAN THE RECOMMENDED PRESSURE.

## TYRE PRESSURES, LOAD CAPACITIES AND SERVICE

Tyres can be marked in two ways, as shown in the examples below:

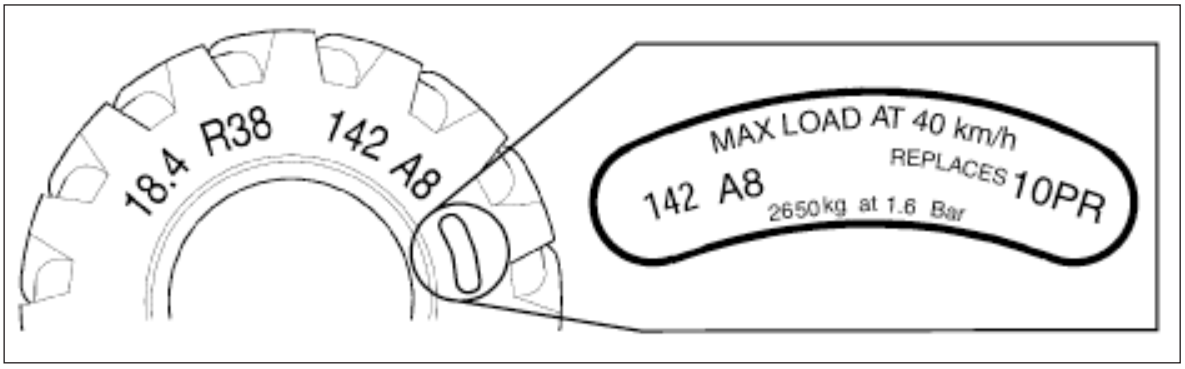
CROSSPLY STRUCTURE: Example




12.4-24 8PR
12.4 = Nominal tyre width in inches
- = Crossply structure
24 = Internal diameter
8PR = 8 ply rating

For correct tyre pressures/load capacities for CROSSPLY tyres see your dealer or tyre manufacturer.

RADIAL - Examples




18.4R38
18.4 = Nominal tyre width in inches
R = Radial structure
38 = Internal diameter
142 = Load index number, 142 = 2650 kg (see chart 1)
A8 = Speed code for 40 kph, (see chart 2)

710/75R34
710 = Nominal tyre width in mm
75 = Nominal aspect ratio (ratio of sidewall height/section width)
R = Radial structure
34 = Rim diameter at the bead seat in inches
168 = Load index number, 168 = 5,600 kg (see chart 1)
A8 = Speed code for 40 kph, (see chart 2)
165 = Load index number, 165 = 5,150 kg (see chart 1)
B = Speed code for 50 kph, (see chart 2)

The performance of a Radial tyre is determined by the Load Index and Speed Code which have replaced the Ply rating found on Crossply tyres.
The maximum load which can be carried by a tyre is dependant upon the Load Index quoted on the tyre wall. Charts 1 and 2, on the following page, give a guide to the maximum load a tyre can carry and a percentage (%) variation depending upon the speed code or travel speed.

*IMPORTANT: The charts below are only a guide. Loads may vary slightly with makes of tyre. For correct loads see your dealer or tyre manufacturer.*

## Chart 1 - Load Index Codes and Loads per Tyre

| INDEX | kg | INDEX | kg | INDEX | kg | INDEX | kg | INDEX | kg | INDEX | kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 90 | 600 | 105 | 925 | 120 | 1400 | 135 | 2180 | 150 | 3350 | 165 | 5150 |
| 91 | 615 | 106 | 950 | 121 | 1450 | 136 | 2240 | 151 | 3450 | 166 | 5300 |
| 92 | 630 | 107 | 975 | 122 | 1500 | 137 | 2300 | 152 | 3550 | 167 | 5450 |
| 93 | 650 | 108 | 1000 | 123 | 1550 | 138 | 2360 | 153 | 3650 | 168 | 5600 |
| 94 | 670 | 109 | 1030 | 124 | 1600 | 139 | 2430 | 154 | 3750 | 169 | 5800 |
| 95 | 690 | 110 | 1060 | 125 | 1650 | 140 | 2500 | 155 | 3875 | 170 | 6000 |
| 96 | 710 | 111 | 1090 | 126 | 1700 | 141 | 2575 | 156 | 4000 | 171 | 6150 |
| 97 | 730 | 112 | 1120 | 127 | 1750 | 142 | 2650 | 157 | 4125 | 172 | 6300 |
| 98 | 750 | 113 | 1150 | 128 | 1800 | 143 | 2725 | 158 | 4250 | 173 | 6500 |
| 99 | 775 | 114 | 1180 | 129 | 1850 | 144 | 2800 | 159 | 4375 | 174 | 6700 |
| 100 | 800 | 115 | 1215 | 130 | 1900 | 145 | 2900 | 160 | 4500 | 175 | 6900 |
| 101 | 825 | 116 | 1250 | 131 | 1950 | 146 | 3000 | 161 | 4625 | 176 | 7100 |
| 102 | 850 | 117 | 1285 | 132 | 2000 | 147 | 3075 | 162 | 4750 | 177 | 7300 |
| 103 | 875 | 118 | 1320 | 133 | 2060 | 148 | 3150 | 163 | 4875 | 178 | 7500 |
| 104 | 900 | 119 | 1360 | 134 | 2120 | 149 | 3250 | 164 | 5000 | 179 | 7750 |

## Chart 2 - Speed Codes

| SPEED CODE | kph | mph | % Variation factor (*) for different speeds |
|---|---|---|---|
| A2 | 10 | 6 | + 67% |
| A3 | 15 | 9 | + 50% |
| A4 | 20 | 12 | + 39% |
| A5 | 25 | 15 | + 28% |
| A6 | 30 | 19 | + 11% |
| A7 | 35 | 22 | + 4% |
| A8 | 40 | 25 | 0 |
| B | 50 | 31 | - 9% |

(*) The % variation factors are based on recommendations by the European Tyre And Rim Technical Organization (ETRTO).

## Tyre And Wheel Service

***WARNING: Do not remove, install or make repairs to tyres or rims. Take the tyre and rim to a tyre specialist where persons with special training and special safety tools are available. If the tyre is not correctly positioned on the rim, or if over inflated, the tyre bead can loosen on one side and cause air to leak at high force and can thrust the tyre in any direction. Explosive separation of the tyre can cause serious injury.***

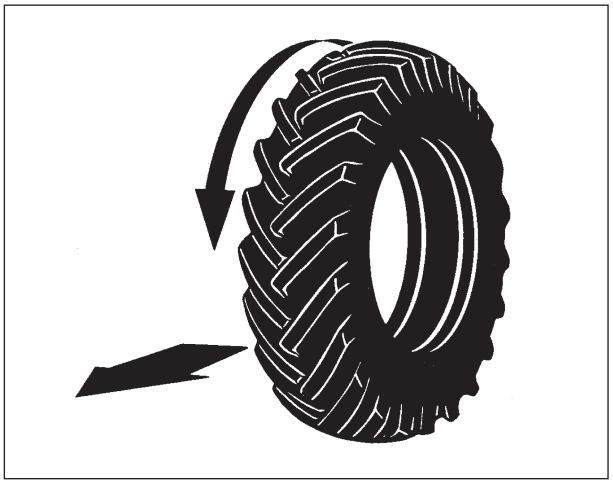
***WARNING: DO NOT weld to wheel or rim when a tyre is installed. Welding will cause an explosive air/gas mixture that will be ignited with high temperatures. This can happen to tyres inflated or deflated. Removing air or breaking bead is not adequate. The tyre MUST be completely removed from the rim prior to welding.***

***WARNING: Explosive separation of the tyre and/or rim parts can cause injury or death. When tyre service is necessary, have a qualified tyre mechanic service the tyre.***

Always have a qualified tyre mechanic service the tyres and wheels on this machine. If the tyre has lost all air pressure, take the tyre and wheel to a tyre specialist for service. The use of correct equipment and correct service/repair procedures will prevent accidents.

## Tyre Installation

To get the correct traction and cleaning action of the lugs, the tyres must be installed on the wheels so the tread pattern is turning as shown. DO NOT try to remove, repair or install a tractor tyre on a wheel.



## Wheel removing procedure

***WARNING: If a wheel has to be removed (e.g. to remove a punched tyre), this operation must be carried out by a suitably equipped workshop. If the suitable equipment or such a workshop are not available, take the tractor to a specialised workshop, where the tractor will be lifted with an equipment suited to its weight and dimensions.***

Procedure

- Turn off the engine, engage the parking brake and the first gear. Engage the Park Lock (if equipped).
- To remove a front wheel apply a jack lift of suitable capacity at the front axle next to the wheel to be remove (Fig. a).
- To remove a rear wheel, use wooden wedges on the front axle to block completely any tractor swing. Use a jack lift of suitable capacity in the centre of the rear axle (Fig. b).
- Loosen the nuts (bolts) fastening the wheel of about one turn by the provided wrench.
- Before lifting the tractor, check there are no persons next to it and do not touch the tractor again until it is not again lowered to the ground.
- Lift the tractor a few centimetres.
- Unscrew all nuts (bolts) that fasten the wheel and remove the wheel
- Inflate the tyre if required. See the inflating procedure in this chapter.
- Mount the wheel taking to exactly match the locating pins. Screw the nuts (bolts) down again.
- Lower the tractor to the ground. Remove the jack and fully tighten the nuts (bolts) alternating a nut (bolt) with the opposite one.
- As soon as possible, take your tractor to the service workshop to tighten the wheel nuts (bolts) to the prescribed torque.



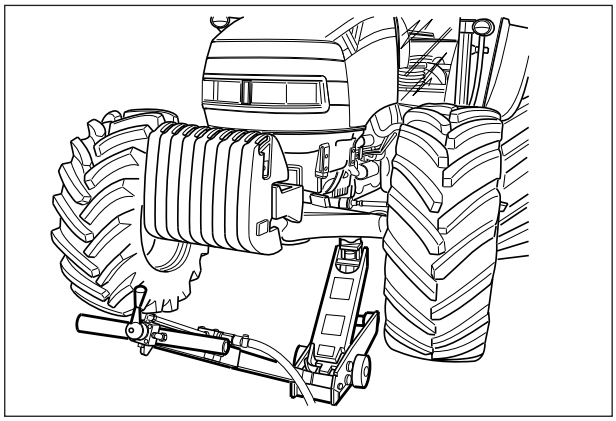


Fig. a

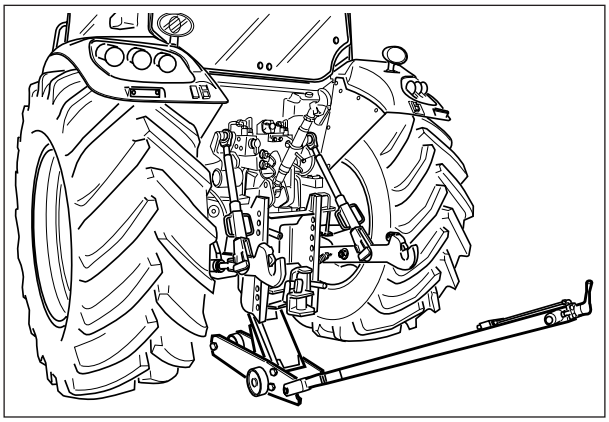


Fig. b

## Tyres - Front and rear tyre size combinations

The following is a list of tyre types and front/rear combinations. Please ask your Dealer for information on further combinations.

On tractors with 40 Kph overdrive gearbox only tures marked as «load index A8» may be used.

| Front tyres | | Rear tyres | | Mod. | | |
|---|---|---|---|---|---|---|
| Tyre | Rim | Tyre | Rim | X60.20 X60.30 | X60.40 | X60.50 |
| 420/70R 24 (130 A8) | W13-24 | 480/70R38 (145A8) | DWW15-38 | X | X | X |
| 11.2R24(114 A8) | W10-24 | 16.9R30 (137A8) | DW14L-30 | X | | |
| 12.4R24(119 A8) | W10-24 | 13.6R38 (128A8) | DWW12-38 | X | X | X |
| 12.4R24(119 A8) | W10-24 | 18.4R30 (142A8) | DWW15-30 | X | X | X |
| 13.6R24(121 A8) | W12-24 | 16.9R34(139 A8) | DWW15-34 | X | X | X |
| 380/70R 24 (125 A8) | W12-24 | 480/70R34 (143A8) | W15L-34 PAVT | X | X | X |
| 440/65R24 (122 A8) | W13-24 | 540/65R34 (140A8) | DWW15-34 | X | X | X |
| 480/65R24(127 A8) | W13-24 | 600/65R34(145 A8) | DWW18L-34 | X | X | X |
| 480/65R24(127 A8) | W13-24 | 540/65R38 (142 A8) | DWW15-38 | X | X | X |
| *14.9R24(126 A8) | W12-24 | *18.4R34(144 A8) | W15L-34 | | X | X |
| 420/70R24(130 A8) | W13- 24 | 520/70R34(148 A8) | DWW15-34 | | X | X |
| 14.9R24(126 A8) | W12-24 | 16.9R38(141 A8) | DWW15-38 | X | X | X |
| 320/70R24(116 A8) | W10-24 | 480/70R30 (141A8) | DWW15-30 | X | | |
| 380/85R24 | W12-24 | 420/85R38 | DWW15-38 | | | X |
| 13.6R24(121 A8) | W12-24 | 13.6R38 (128A8) | DWW12-38 | X | | |

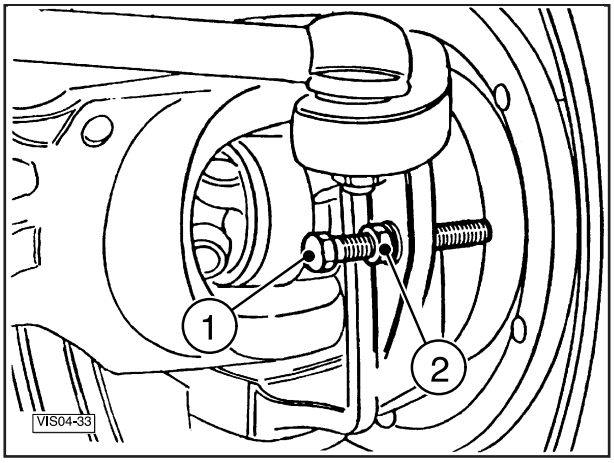
* Only radial tyres

4WD tyre combinations

*NOTE: Some of the tyre combinations considered here as acceptable MIGHT not be suited to all tractor models. To know the tyre combinations not listed here or for further information, see your dealer.*

## Adjusting the max. steering angle

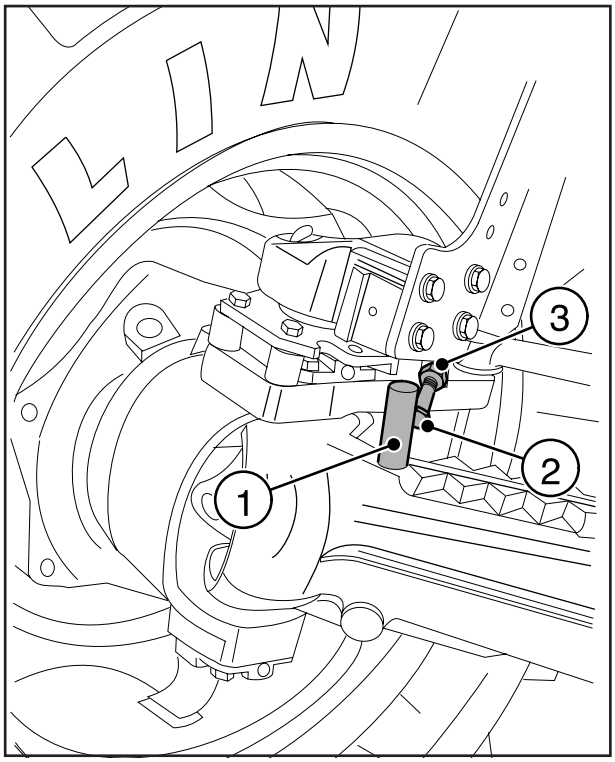
The maximum steering angle of the 4WD front axle can be varied depending on the type of tyre mounted and the way the tractor is used. The angle is changed by adjusting the stop screw (1) on the final drive of the axle.
This adjustment is very useful when adopting minimum track since it prevents the wheels from interfering with the engine housing.
The maximum steering angle is 55°.




Adjusting the steering angle.
1 - Adjuster screw.
2 - Check nut.

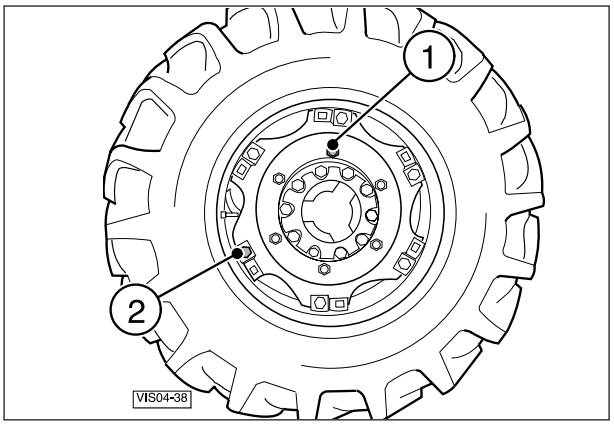
## Steering limit on front fender

To avoid the front fender clashing with the engine at the max. steering angle, the hub cap rotation can be stopped while leaving the kingpin free to reach the max. steering angle.
Adjust the screw (2) so that it hits the bolt (1) before the hub cap clashes with the engine.




Hub cap stop.
1 - Stud.
2 - Adjuster screw.
3 - Lock nut.

## Adjusting wheel track




### 4WD axle - Adjusting wheel track

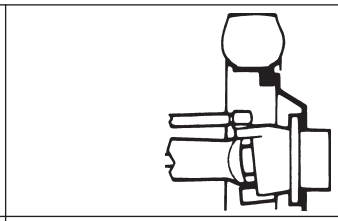
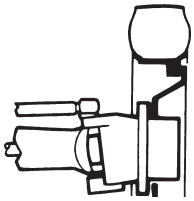
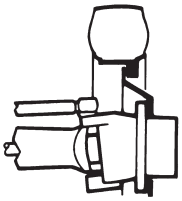
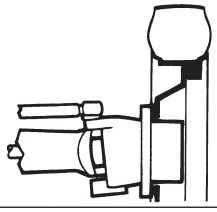
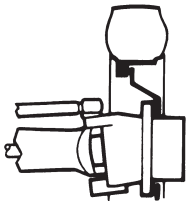
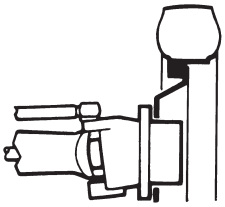
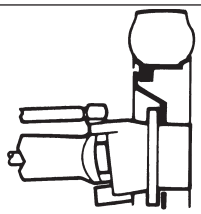
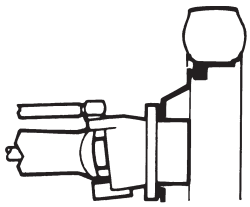
The front track on 4WD tractors can be adjusted by changing the position of the hubs and central wheel discs as shown in the table below.

Make sure that the wheel nuts are correctly tightened to the prescribed torque wrench setting:
Disk to hub: 270 Nm
Rim to disk: 210 Nm

***WARNING: When you lift up the tractor to adjust the wheel tracks, follow the directions for lifting in the Safety Notes section.***

***WARNING: Maximum attention must be used when dismounting the front wheels: because of their weight, a suitable hoist must be used to remove and handle the wheels.***

*IMPORTANT: After removing and fitting the wheels back again, it is important to check the torques of all bolts by means of a torque wrench at the following intervals:*
*- First check after 10 work hours.*
*- Second check after 50 work hours.*
*- Third check and further checks every 500 work hours.*

| Wheel track adjusting for 4WD axle | | | |
|---|---|---|---|
| Wheel disc pointing inwards | | Wheel disc pointing outwards | |
| A |  | E |  |
| B |  | F |  |
| C |  | G |  |
| D |  | H |  |



| Interflange 1887 mm - Wheel tracks for 4WD front axle - mm - | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Tyres A | B | C | D | E | F | G | H | |
| 440/65R24 (122 A8) | 1627 | 1740 | 1795 | 1886 | 1908 | 1999 | 2054 | 2167 |
| 480/65R24 (127 A8) | 1627 | 1740 | 1795 | 1886 | 1908 | 1999 | 2054 | 2167 |
| 12.4R24 (119 A8) | 1640 | 1753 | 1808 | 1873 | 1921 | 1986 | 2041 | 2154 |
| 13.6R24 (121 A8) | 1627 | 1740 | 1795 | 1886 | 1908 | 1999 | 2054 | 2167 |
| 14.9R24 (126 A8) | 1627 | 1740 | 1795 | 1886 | 1908 | 1999 | 2054 | 2167 |
| 420/70R24 (130 A8) | 1627 | 1740 | 1795 | 1886 | 1908 | 1999 | 2054 | 2167 |
| 380/70R24 (125 A8) | 1627 | 1740 | 1795 | 1886 | 1908 | 1999 | 2054 | 2167 |
| 11.2R24 (114 A8) | 1640 | 1753 | 1808 | 1873 | 1921 | 1986 | 2041 | 2154 |
| 320/70R24 (116 A8) | 1640 | 1753 | 1808 | 1873 | 1921 | 1986 | 2041 | 2154 |
| 380/85R24 | 1627 | 1740 | 1795 | 1886 | 1908 | 1999 | 2054 | 2167 |

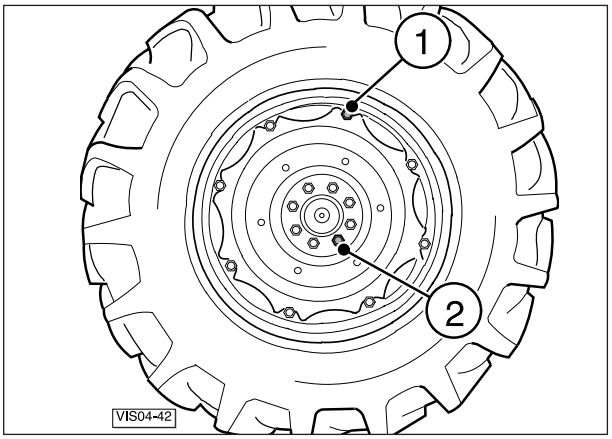
**Rear track width adjustment**
The rear track width can be adjusted by changing the position of the rim fixing points or the central wheel discs, as shown in the table below.

Torque the nuts and bolts that fix the rim to the disc to 240 Nm (1) and those that fix the disc to the wheel hub to 320 Nm (2). Always check tyre pressure.

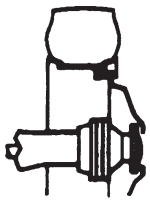
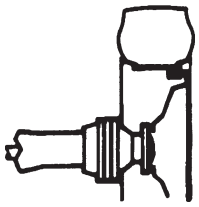
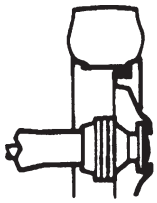
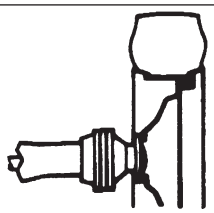
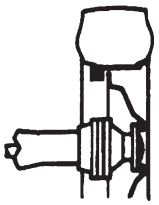
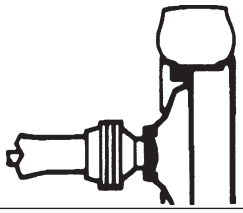
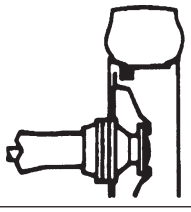
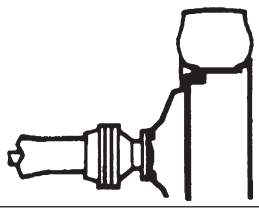
Certain track widths cannot be obtained with some tyre types (see table).

***WARNING: When you lift up the tractor to adjust the wheel tracks, follow the directions for lifting in the Safety Notes section.***

***WARNING: Maximum attention must be used when dismounting the rear wheels: because of their weight, a suitable hoist must be used to remove and handle the wheels.***




*IMPORTANT: After removing and fitting the wheels back again, it is important to check the torques of all bolts by means of a torque wrench at the following intervals:*
*- First check after 10 work hours.*
*- Second check after 50 work hours.*
*- Third check and further checks every 500 work hours.*

| Adjusting rear track widths - Rim and disc position | | | |
|---|---|---|---|
| Wheel disc pointing inwards | | Wheel disc pointing outwards | |
| A |  | E |  |
| B |  | F |  |
| C |  | G |  |
| D |  | H |  |

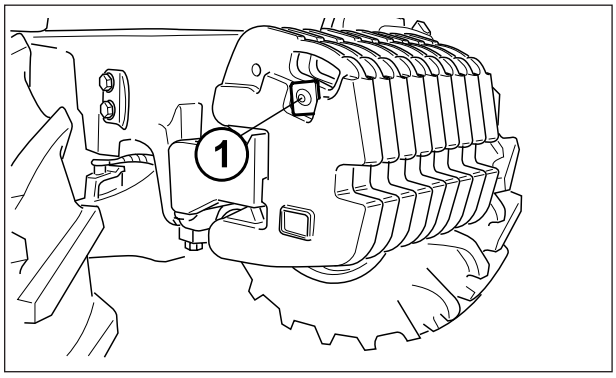
| Wheel tracks for rear axle - mm - | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Tyres** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** |
| 540/65R38 (142A8) | - | - | - | 1620 | 1720 | 1820 | 1920 | 2020 |
| 16.9R30 (137 A8) | - | - | 1515 | 1628 | 1712 | 1915 | 1825 | 2028 |
| 540/65R34 (140 A8) | - | - | - | 1620 | 1720 | 1820 | 1920 | 2020 |
| 600/65R34 (145 A8) | - | - | - | 1624 | 1720 | 1820 | 1924 | 2024 |
| 13.6R38 (128 A8) | - | 1420 | 1520 | 1620 | 1720 | 1820 | 1920 | 2020 |
| 18.4R30 (142 A8) | - | - | - | 1628 | 1712 | 1915 | 1825 | 2028 |
| 16.9R34 (139 A8) | - | - | 1520 | 1620 | 1720 | 1820 | 1920 | 2020 |
| 18.4R34 (144 A8) | - | - | 1520 | 1620 | 1720 | 1820 | 1920 | 2020 |
| 520/70R34 (148 A8) | - | - | - | 1620 | 1720 | 1820 | 1920 | 2020 |
| 16.9R38 (141 A8) | - | - | - | 1620 | 1720 | 1820 | 1920 | 2020 |
| 480/70R34 (143 A8) | - | - | - | 1620 | 1720 | 1820 | 1920 | 2020 |
| 480/70R30 (141 A8) | - | - | 1515 | 1628 | 1712 | 1915 | 1825 | 2028 |
| 480/70R38 (145 A8) | - | - | - | 1620 | 1720 | 1820 | 1920 | 2020 |
| 420/85R38 | - | - | - | 1620 | 1720 | 1820 | 1920 | 2020 |

**NOTE:** *If the tractor is not going to be used for a long period of time, support it on raised blocks to remove the load from the tyres.*

***WARNING: When jacking up the tractor, pay attention that its weight is correctly distributed and securely wedge the wheels on the ground. Tighten all nuts and bolts to the required torque.***

***WARNING: Always use a hoist or other suitable lifting equipment to handle, mount and dismount wheels.***

## Front ballast (if equipped) [4.2.h]

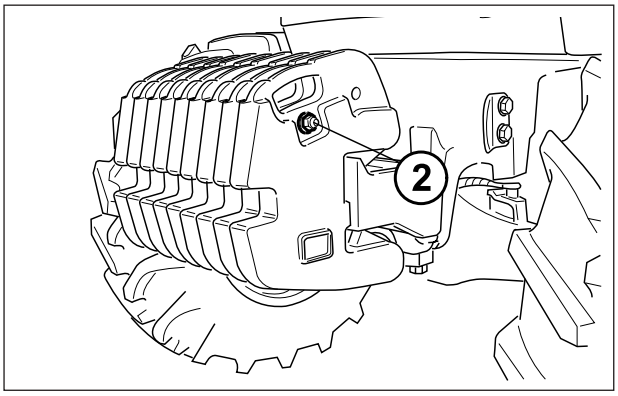



Do not hitch to the three point linkage any implements that weighs more than indicated. If the implement weight or the operating conditions (slope) might destabilise the tractor, cast iron plates can be added to the front end.

Front end weights can be mounted on the front of the tractor with a weight frame. The weights and weight frame are available from your Dealer.

The weight frame can accomodate a max. of 7 or 9 ballast weights. Each ballast weights 45 kg (100 Lbs) and the frame weights about 100 kg.

*IMPORTANT: The total tractor weight with full equipment and ballast weight must never be more than the maximum allowed operating weight. See Maximum Allowed Operating Weights in this manual. Comply with tyre capacities and any possible legal limitations.*

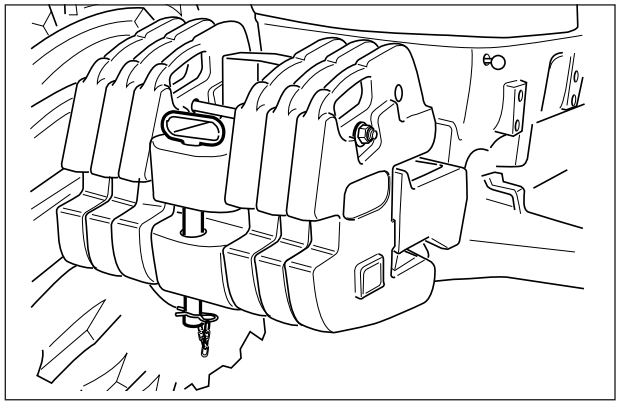



The ballasts must be mounted on the weight frame one at a time using suitable support aids.
Insert the threaded rod (19) into the hole in the weights.
Install the washer and the retainer nut (2).
Tighten the nut.

***WARNING: Due to the great weight of each ballast, manual lifting of front and rear ballast weights could be dangerous for your safety.***

***Use exclusively a hook or suitable equipment to lift front and rear ballast weights.***

***- Always use suitable personal safety devices (safety gloves and shoes) when applying or removing ballast.***



Central ballast with front tow hook (option)

Mount the central ballast first, then the three side ballasts on both sides.
Insert the threaded rod into the hole in the weights.
Install the washer and the retainer nut (2).
Tighten the nut.

*NOTE: Check the check screw in the tow hook pin for correct mounting.*

## Ballasting the rear wheels [4.2.h]

Two rings can be applied on each rear wheel (see figure). The first one is directly fixed to the wheel, the second one on the first ring.

The total weight that can be applied is therefore:
4 rings (2+2) each weighing 60 kg: total 240 kg.

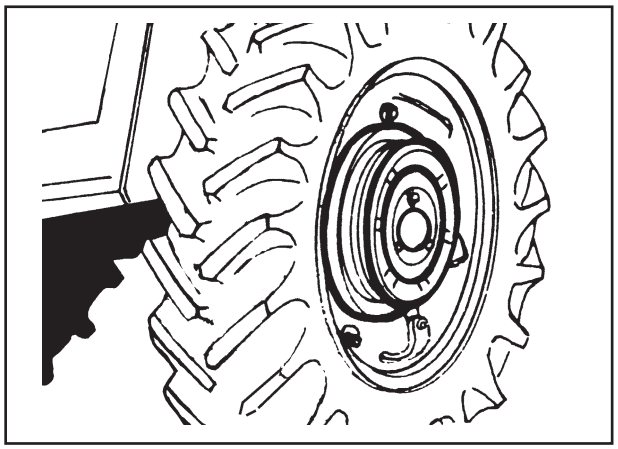
***WARNING: Due to the great weight of each ballast, manual lifting of front and rear ballast weights could be dangerous for your safety.***

***Use exclusively a hook or suitable equipment to lift front and rear ballast weights.***

***IMPORTANT:***

- *Do not ballast the tractor over its rated carrying weight.*
- *When using the tractor for light work, transport and on-road towing, remove the ballast weights to avoid unnecessary strain on the mechanical components.*
- *With semi-mounted and fully mounted implements (which inevitably increase the load on the rear axle of the tractor), ballast must only be used when strictly necessary. There is no point in increasing grip beyond the level required for efficient work, as this will reduce tyre life.*
- *Carefully check the tyre inflation pressure since this will make the tyre last longer and ensure a more regular wear.*
- *The softer the soil, the lower tyre inflation must be, while the tyre should be inflated to a greater extent as the soil becomes more compact.*

*IMPORTANT: The total tractor weight with full equipment and ballast weight must never be more than the maximum allowed operating weight. See Maximum Allowed Operating Weights in this manual. Comply with tyre capacities and any possible legal limitations.*



Ballasting the rear wheels. Max. 2 rings on each wheel.

***WARNING: Always use suitable personal safety devices (safety gloves and shoes) when applying or removing ballast.***

## Ballasting with water

The tractor can also be ballasted by filling the tyres with water.

To lower the freezing point a few degrees in winter, add calcium chloride to the water in compliance with the proportions given in the following table. The ballast should evidently be removed when the job does not require excessive draft, otherwise the soil could become excessively compressed.

The following table gives approximate values for the liters of water and kilos of calcium chloride required to prepare the antifreeze solution used to three-quarters (75%) fill each tyre.

In relation to ballasting with cast iron rings on the driving wheels, this type of weighting offers the following advantages:

- Low cost.
- Easy preparation.
- Improved steering.
- The weight of the driving wheels can be regulated according to the real requirements.

***CAUTION: Ballasting with water and calcium chloride antifreeze solution can increase corrosion of the components that come into contact with the mixture.***

***WARNING: Always use suitable personal safety devices (safety gloves and shoes) when applying or removing ballast.***

**TYRE CAPACITIES FOR BALLASTING WITH WATER**

| Tyre size | Capacity to valve level (75%) litres | Ballasting with antifreeze solution | | |
|---|---|---|---|---|
| | | Commercial sodium chloride 70-72% Kg | Water litres | Weight of solution Kg |
| 12.4-24 | 77 | 24 | 66 | 90 |
| 13.6-24 | 120 | 30 | 103 | 133 |
| 420/70-24 | 166 | 44 | 149 | 193 |
| 16.9-24 | 210 | 57 | 187 | 244 |
| 480/65-24 | 213 | 58 | 189 | 247 |
| 380/70-24 | 130 | 35 | 116 | 151 |
| 380/70-28 | 130 | 35 | 116 | 151 |
| 13.6-28 | 140 | 38 | 124 | 162 |
| 14.9-24 | 150 | 40 | 134 | 174 |
| 16.9-34 | 276 | 86 | 238 | 324 |
| 13.6-36 | 180 | 54 | 155 | 209 |
| 13.6-38 | 190 | 56 | 164 | 220 |
| 16.9-38 | 280 | 76 | 249 | 325 |
| 18.4-34 | 360 | 97 | 321 | 418 |
| 18.4-38 | 370 | 100 | 329 | 429 |
| 480/70-38 | 310 | 84 | 276 | 360 |
| 520/70-38 | 380 | 103 | 338 | 441 |
| 16.9-30 | 239 | 74 | 206 | 280 |
| 18.4-30 | 248 | 77 | 214 | 291 |

**NOTE:** This table contains only indicative data. The operator should ballast wheels with water on the base of the tables issued by the tyre manufacturer and according to the use anticipated for the tractor.

## How to fill the tyres with water

***WARNING: when you prepare a solution of calcium chloride to ballast the tyres, NEVER EVER pour the water on to the calcium chloride since this could lead to a violent reaction. This danger can be avoided by adding the calcium chloride very slowly to the water and stirring until it has completely dissolved.***

Jack up the wheel and position it with the valve right at the top.
Unscrew the movable union of the valve and wait until the tyre deflates.
Tighten the relative fitting (3) into the valve housing (1) and apply the tube (2). Air will escape from the little tube (4) as the tyre is filled with water.

The tyres are filled to the three-quarter mark when water escapes from the small tube (4) if this is positioned completely downwards.

To add less water, i.e. obtain a lower weight, turn the wheel so that the valve is in a more downward position.

Tighten the union on the valve casing again and inflate the tyre with air until obtaining the prescribed pressure.

Take the following precautions when preparing the water-calcium chloride mixture (antifreeze solution for the cold season):

- Pour the necessary amount of water in a vessel and then pour in calcium chloride until the established quantity has been reached. Never pour water on to the calcium chloride as this would cause a violent reaction.

- Only use the solution after it has completely cooled. To limit the acidity, add 1% of soda in proportion to the calcium chloride used.

- After inflating the tyre, thoroughly rinse any metal parts that may have been wetted with this corrosive solution, with water.

***WARNING: Always use suitable personal safety devices (safety gloves and shoes) when applying or removing ballast.***

## How to deflate the tyres

– Jack up the tyre in question (Fig. 4-50) and set it with its valve pointing downwards.

– Unscrew the mobile union of the valve and allow the water to drain from the tyre.

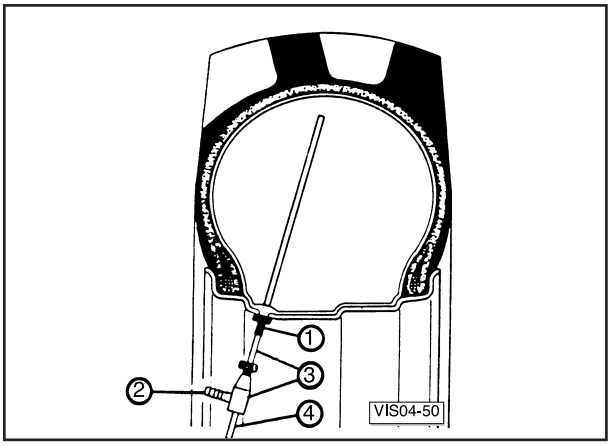
– Tighten the relative union into the valve housing and place the tube (4) in contact with the tyre.

– Blow in pressurized air through the union (2): the remaining water will drain through the tube (4).

– Remove the union (3), replace it with the valve retainer and then inflate the tyre.

*NOTE - Never use ballasting systems differing from the ones indicated above.*

***CAUTION: Ballasting with water and anti-freeze solution containing calcium chloride might cause corrosion of the parts in contact with the solution.***




Indicative layout for water ballasting.

1 - Valve housing.
2 - Water tube union.
3 - Special fitting to pour in and drain out the water.
4 - Air bleeding tube.

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# Section 7
Maintenance

## RECOMMENDATIONS BEFORE YOU SERVICE [4.1.h]

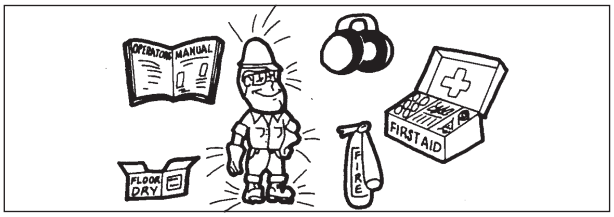
***WARNING: Before servicing, carefully read the instructions in this section. There is a risk of injury or death if servicing is not carried out or if the following instructions are not followed correctly. If you do not understand a service or adjustment procedure, see your dealer.***
***Before any adjustments are made carry out the following:***

1. ***Park the tractor on hard level ground and apply the parking brake.***
2. ***Stop the engine and remove the key.***
3. ***Put blocks in front of and behind the front and rear wheels.***

***WARNING:Do not carry out inspections, maintenance work or adjustments on the tractor whilst the engine is running, except when specifically requested. Wait for all moving parts to come to a complete stop.***
***- If the maintenance operation must be carried out while the engine is hot (e.g. when changing engine oil), start the engine and let it idle for the required time, then turn it off before the maintenance operation.***
***- If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet". In this case beware the risk of burning and shearing.***
***- Always use specific personal safety devices for each service operation.***

***WARNING: When handling lubricants (oil, grease etc.) and other chemical products, always follow instructions for their proper use. Use proper containers to collect fluid. Dispose of fluids and filters responsibly and in accordance with the law. DO NOT smoke or use an open flame during the service procedure. Use eye protection.***

- Read the safety decals and information decals on this tractor. Read the operator's manual. Understand the operation of the tractor before you start servicing.




- Use the correct safety clothing and safety equipment. If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing.
- Establish where your nearest first aid kit and fire extinguisher are located. Undertake suitable training to make sure you know how the fire extinguisher works.
- Put a warning tag, as shown below, on or near the key switch before carrying out servicing or repairs to the tractor. Warning tags are available from your dealer.


### Environment

*NOTE: Always dispose of replaced parts or substances (filters, oil, battery etc.) according to rules and laws. Refer to the manufacturer's specifications on the Material Safety Data Sheet.*

Before you service this machine and before you dispose of the old fluids, lubricants and filters always consider the environment.

DO NOT pour oil or fluids in the ground, down drains or into containers that can leak.

Dispose of all old fluids, lubricants and filters in accordance with local regulations.

Check with your local environmental recycling center or your dealer for correct information.

### Plastic And Resin Parts

Avoid using petrol, paraffin, paint thinner, etc., when cleaning plastic, e.g. console, instrument cluster, monitors and gauges etc.

Use ONLY water, mild soap and a soft cloth when you clean these parts.

Using petrol, paraffin, paint thinner etc., will cause cracking or deformation of the part being cleaned.

## SERVICE ACCESS

### Access for inspection and maintenance

***WARNING: In particular cases it may be required that an operation is carried out with open bonnet and running engine. In such cases, pay special attention to moving and hot parts, wear the required personal safety devices and work only with the minimum number of persons strictly required for the operation.***

***WARNING: All the surfaces inside the bonnet are hot. High burning danger. Be extremely careful and wait for the surfaces to cool down before operating inside the bonnet to avoid burns.***

***WARNING: Danger of shearing. Open the bonnet and remove the side panel only with engine off and rotating parts completely at standstill.***

***WARNING: A gas ram controls opening and closing of the bonnet. Replace the gas ram if not properly operating to avoid accidental fall of the bonnet.***

***WARNING: If the tractor is equipped with front hitch and power take-off, before opening the bonnet lower the links completely, whether there are implements or not.***

### How to open the bonnet

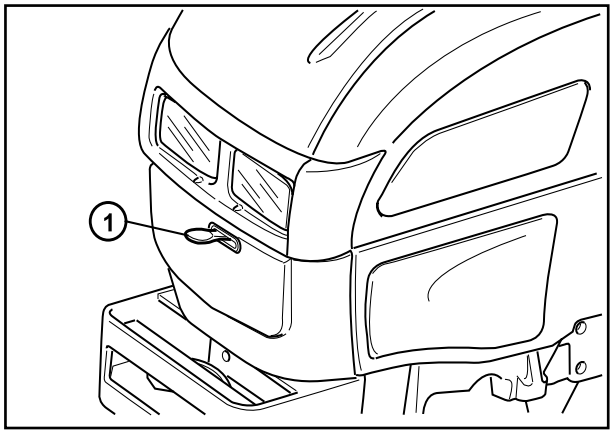
Park the tractor on hard, level ground, engage the first gear, engage the parking brake, turn the engine off and remove the ignition key.

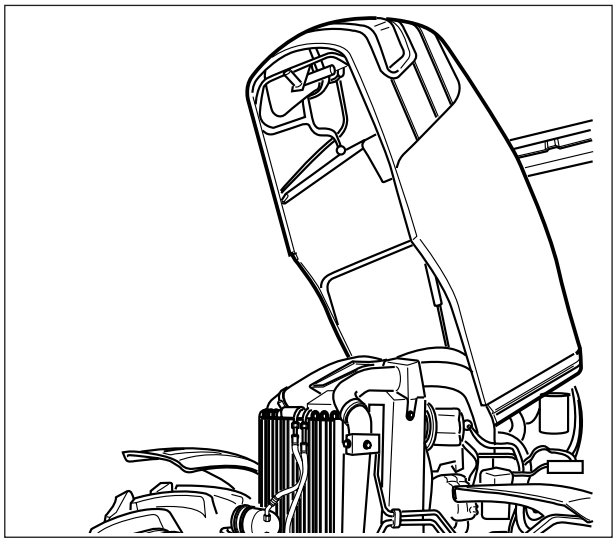
- To open the bonnet, insert the tool (1) in the front slit and hook up the bonnet closure device.
- Release the locking mechanism.
- Release the bonnet (2) and push the front upward keeping clear until the hood is fully raised. The gas strut will hold the bonnet in the upright position.

*IMPORTANT: When opening the bonnet in windy conditions, put the front of the tractor towards the wind with the back of the tractors against the wind direction.*

- To close, pull the cable and push the front down hard to close.
- Remove the tool.

***WARNING: Replace all covers or guards removed, close the bonnet and close any service access doors after servicing or cleaning this machine. NEVER operate the machine with any covers or guards removed or with the bonnet or service door open.***



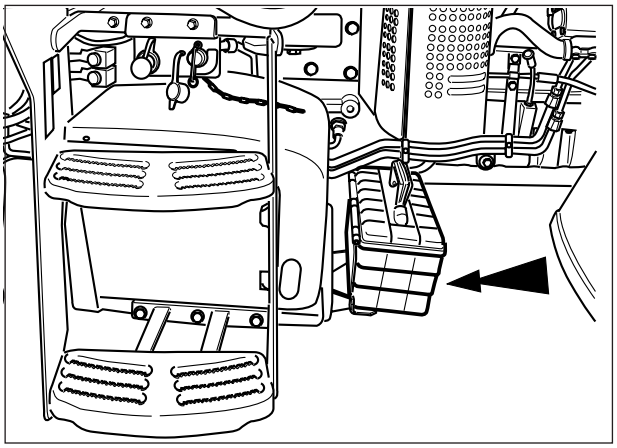



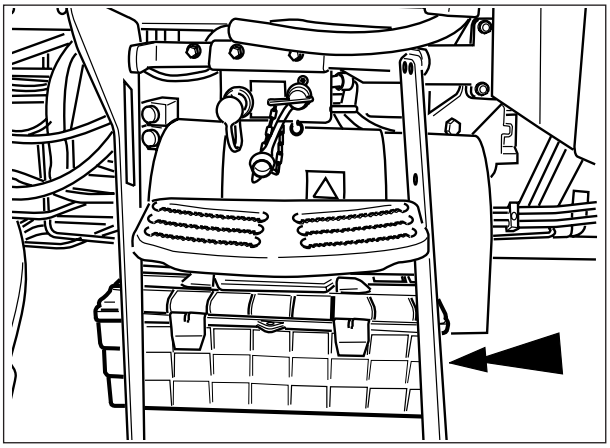
## TOOL BOX

The tool box (if equipped) is located in front of the front part of the cab.

The tool box can be removed by removing the retaining pin, located at the centre back of the tool box. Lift the tool box from the bottom outwards and upwards.

The tool box position may vary according to tractor model.





## LUBRICANTS AND CAPACITIES

| COMPONENT | Q.ty litres | SPECIFICATIONS | AMBIENT TEMPERATURE | AGROLUBE | SPECIFICATIONS | |
|---|---|---|---|---|---|---|
| COOLING CIRCUIT | 17,5 | AGROLUBE MUREX Concentrated antifreeze fluid to be used in the following percentages:<br>Specifications: GM 1899M (1970); FORD ESE-M97B | | | Degrees °C -8° -15° -25° -35°<br>% 20 30 40 50 | |
| FUEL TANK | 180 | | | | Viscosity at 40°C, cSt | Viscosity at 100°C, cSt |
| ENGINE WITH FILTER | 7,3 | ACEA E7/E5/ E3/B3<br>API CH-4/SL | ANY TEMPERATURE | SOLEA LD 15W40 | 115 | 15,2 |
| XTRASHIFT GEARBOX STEERING AND HYDRAULIC CIRCUIT, REAR FINAL DRIVES (2) (4) | 53 | API GL - 4<br>U.T.T.O<br>FORD M2C-86C<br>ALLISON C-4<br>LANDINI I-ENG-D-302 | ANY TEMPERATURE | VELA/C<br>VELA HTX | 65 | 9,8 |
| DIFFERENTIAL HOUSING FRONT AXLE WITH BRAKES (1) | 7 | API GL - 5<br>ZF TE-ML 05C,12C,16E | ANY TEMPERATURE | CARINA LS 90 (1) | 174 | 16,8 |
| FRONT FINAL DRIVES (each) | 1,5 | API GL - 5<br>MF1134M<br>FORDM2C 108C<br>MIL-L-2105 D | ANY TEMPERATURE | CARINA 80W-90 | 174 | 16,8 |
| BRAKING CIRCUIT | 1,0 | LANDINI S/ENG/I 102 | ANY TEMPERATURE | AZA RED (3) | 22,5 | 5,6 |
| GREASE POINTS | — | — | ANY TEMPERATURE | GENA GREASE EP | | |
| FRONT POWER TAKE-OFF (if equipped) | 2,7 | API GL - 4 U.T.T.O<br>MF 1145<br>LANDINI I-ENG-D-302 | ANY TEMPERATURE | VELA/C | 56 | 9,8 |

(1) Use only lubricants that comply with LANDINI I-ENG-D-302, NEW HOLLAND M2 C 86 C, M-F 1135 specifications. LANDINI specifications defines additives and anti-noise properties. The use of different types of oil, or mixing other types of oil into the oil supplied with the tractor can lead to increased noise.
(2) The Xtrashift gearbox with electro-hydraulic reverse shuttle uses AGROLUBE VELA / C - VELA HTX oil. Alternative products must have the same quality, conforming to international specifications as indicated and in accordance with the specifications of the tractor manufacturer.
(3) Mineral based oil for brake circuits complying with LANDINI S/ENG/I 102 specifications
(4) With front lift: + 6 litres. With front loader: +7 litres

## SERVICING YOUR TRACTOR

All tractors continued value, operation and reliability depend to a large extent on regular servicing. The tractors have been designed to provide easy daily and routine access.

When servicing your tractor ONLY use original service parts, oils, lubricants, coolants, filters etc. which are released or are approved, to avoid affecting the working life of this tractor.
Services must be carried out at varying Engine Hour intervals or periodically through out the year, depending on which comes first, see below for a list.

Every 10 Hours, or daily

Every 50 Hours, or weekly

Every 100 Hours, or bi-weekly

Every 250 Hours, or weekly

Every 500 Hours, or every 6 months

Every 1000 Hours, or every year

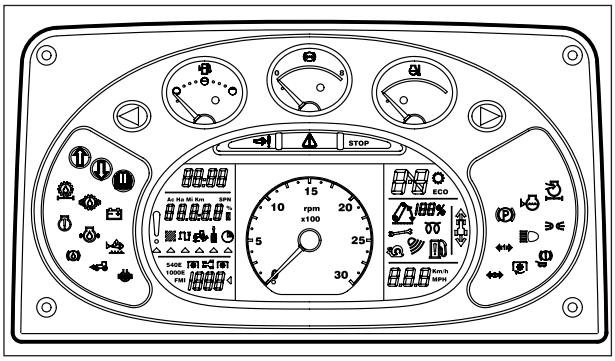
Every 2000 Hours, or every 2 years

### Engine Hour meter

Use the engine hour meter, along with the Service Charts on the following pages, to service your machine at the correct intervals.

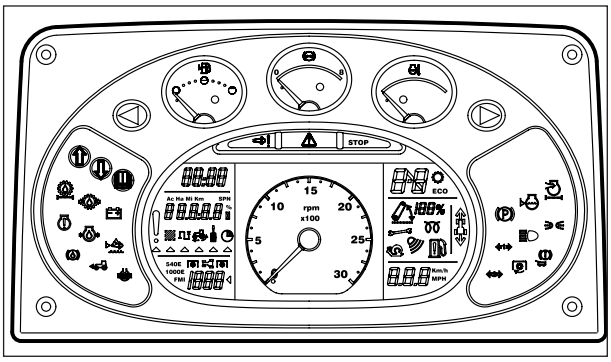
With the key switch in the ON position, the engine hour meter shows the actual hours the engine has run the number after the decimal point is tenths of an hour.

To view the hours for the routine servicing, see in Accessory menu the "Service timer" on the instrument panel.




***WARNING: Prior to commencing any servicing procedures on the tractor, make sure the engine is not running and the keyswitch is in the OFF position.***

## Service Indicator Lamps And Gauges




Warning and indicator lamps (see above) indicate the condition of the monitored system. If a lamp goes on when the engine is running, a service or repair are required.

The operation of the indicator lamps and gauges is described in the INSTRUMENTATION Section of this manual.

When the ignition key is switched to the ON position, the instrument panel automatically checks all monitored systems. Some warning lamps, indicator and digital displays light up for 3.5 seconds.

Before starting the tractor, make sure all systems are operating.

Service intervals can be programmed into the Digital Instrument Cluster by your Dealer's personnel to remind you when service is required.

## First service operations
## After the first 50 hours

- Change the engine oil and relative filter cartridge. After this, change the engine oil and engine oil filter at the intervals given in the 'Routine Maintenance Table'.
- Replace the fuel filters after the first 50 work hours. After this, replace the fuel filters at the intervals specified in the "Routine Maintenance Table".
- Hydraulic circuits: clean the filter on the intake of the steering and power lift circuit pumps, then clean it after every 250 hours service.
- Replace the filter on the delivery of the steering circuit, then replace it every 250 hours service.
- Check to make sure that all bolts, screws and nuts are correctly torqued.
- Check all oil levels. If necessary, top up with oil of the prescribed type.
- Check the brake pedal travel.
- Check the tension of the fan belt.
- Grease all points with grease nipples.
- Check the tyre pressures.

| HOURS SERVICE | Routine maintenance guide<br>SERVICE POINTS | OPERATION REQUIRED<br>GREASE | DRAIN | CHECK | CLEAN | REPLACE | SEE PAGE |
|---|---|---|---|---|---|---|---|
| **Every 10 hours (or daily) (Note 1)** | | | | | | | |
| | General tractor inspection (Note 2) | | | | X | | 176 |
| | Front wheel nuts (Notes 3-4) | | X | | | | 158 |
| | Rear wheel nuts (Notes 3-4) | | X | | | | 168 |
| | Fuel level | | | X | | | 177 |
| | Transmission/hydraulic oil level | | | X | | | 178 |
| | Engine oil level | | | X | | | 179 |
| | Coolant recovery reservoir level | | | X | | | 180 |
| | Pneumatic trailer brakes reservoir (if equipped) | | X | | | | 180 |
| **Every 50 hours (or weekly) (Note 1)** | | | | | | | |
| | Air pressure in tyres (Note 3) | | | X | | | 151 |
| | Fuel water trap - fuel filter | | X | | | | 181 |
| | Radiator and coolers | | | | X | | 182 |
| | Engine air filter valve (Note 7) (change every 1000 hours) (if equipped) | | | X | | | 183 |
| | Engine dry air filter cartridge (Notes 5-7) | | | | X | | 183 |
| | Cab air recycle filter (Note 6) | | | | X | | 184 |
| | Brake fluid reservoir | | | X | | | 185 |
| **Every 100 hours (or every 2 weeks) (Note 1)** | | | | | | | |
| | Brake adjustment | | | X | | | 186 |
| | Parking brake engagement check | | | X | | | 187 |
| | Oil level in front axle housing and front epicyclical final drives | | | X | | | 188 |
| | Grease points (Note 9) | X | | | | | 189 |
| | Greasing points in 4WD front axle and 4WD sleeve (Note 9) | X | | | | | 190 |
| | Front three-point linkage (if equipped) (Note 9) | X | | | | | 191 |
| | Check oil level in front PTO (if equipped) (Note 8) | | | X | | | 191 |
| | Cab air intake filter (Note 6) | | | | X | | 192 |
| **Every 250 hours (or monthly)** | | | | | | | |
| | Battery/ies | | | X | | | 194 |
| | Fan and alternator belt - Air conditioning compressor belt (if equipped) | | | | | | |
| | (Check tension after the first 50 hours) | | | X | | | 195 |
| | Clean oil filter on hydraulic circuits intake (Note 12) | | | | | X | 196 |
| | Replace oil filter on the delivery of the steering circuit (Note 12) | | | | | X | 197 |
| | Trailer hitch or auto pick-up hitch, moving parts (Notes 5-9) | X | | | | | 198 |
| | Trailer hitch, bolt torques (Notes 5-9) | | | X | | | 198 |
| | Drawbar, bolt torques (Notes 5-9) | | | X | | | 198 |
| **Every 500 hours (or every 6 months)** | | | | | | | |
| | Engine oil and oil filter (Note 10) | | | | | X | 199 |
| | Mechanical engine fuel filters (Note 13) | | | | | X | 200 |
| | Electronic engine fuel filters (Note 13) | | | | | X | 203 |
| | Check function of the operator presence switch | | | X | | | 205 |
| | Change oil and clean front PTO filter (if equipped) (Note 8) | | | | | X | 206 |
| | Adjustment of the auto hitch (if equipped) | | | X | | | 207 |

| HOURS SERVICE | Routine maintenance guide<br>SERVICE POINTS | OPERATION REQUIRED<br>GREASE | DRAIN | CHECK | CLEAN | REPLACE | SEE PAGE |
|---|---|---|---|---|---|---|---|
| **Every 1000 hours (or once a year)** | | | | | | | |
| | Cooling system anti-freeze fluid (yearly before winter) | | | X | | | 208 |
| | Tappet gap | | | O | | | 208 |
| | Fuel Injectors | | | | O | | 208 |
| | Transmission/hydraulic oil | | | | | X | 209 |
| | Steering cylinder ball joints | | | O | | | 209 |
| | Front axle differential and planetary oil, 4WD | | | | | X | 210 |
| | Starter motor and alternator | | | O | | | 211 |
| | Engine air intake system | | | X | | | 212 |
| | Engine primary air filter (Notes 5-7) | | | | | X | 213 |
| | Engine secondary air filter | | | | | X | 213 |
| | Dust discharge valve of engine air filter | | | | | X | 214 |
| | Cab intake air filter (Note 6) | | | | | X | 215 |
| | Grease door locks and hinges | X | | | | | 215 |
| | Air conditioner compressor (if equipped) | | | O | | | 216 |
| **Every 2000 hours (or every 2 years)** | | | | | | | |
| | Engine coolant change | | | | | O | 216 |
| | General inspection of injection system | | | O | | | 217 |
| | Drain sludge from fuel tank | | O | | | | 218 |
| **General Maintenance** | | | | | | | |
| | Bleeding the brake circuit (if required) | | | | O | | 219 |
| | Air conditioning system | | | O | | | 222 |
| | General inspection | | | X | | | 225 |
| | Preparing for long idle periods | | | X | | | 225 |
| | Electrical system | | | | | | 227 |

*O - Operations to be made by the Dealer.*

*NOTE 1: Operations requiring a regular service every 10, 50 or 100 work hours may be carried out with flexibility. They may be therefore carried out according to ambient and work conditions and as often as suggested by your experience, at any rate within the above indicated maximum deadlines. Always remember, however, that it is better to carry them out once too often than not often enough.*

*NOTE 2: Check the tractor for leaks, rubbing, squeezed or cracked hoses, loose nuts or bolts and dirt build up. Repair all leaks, hoses and tighten loose fittings, nuts and bolts before operation.*

*NOTE 3: For values of driving torques and air pressure, see the Tyres, Wheels, Ballasting Section in this manual.*

*NOTE 4: After removing and fitting the wheels back again, it is important to check the torques of all bolts by means of a torque wrench at the following intervals: - First check after 10 work hours. - Second check after 50 work hours. - Third check and further checks every 500 work hours.*

*NOTE 5: Check for wear and function.*

*NOTE 6: In dusty conditions the cab filter will require more frequent cleaning.*

*NOTE 7: Also clean the filter element whenever the service indicator lights up.*

*NOTE 8: After prescribed hours of PTO use.*

*NOTE 9: In extreme work conditions, a daily greasing is recommended.*

*NOTE 10: 500 hours is the maximum tolerated frequency for oil changes. The oil must be changed more frequently (e.g. every 250 hours) if the tractor is used in heavy duty conditions.*

*NOTE 11: Change the gearbox oil for the first time after 500 hours, then change it after every 1000 hours service (1000-2000-3000 etc...)*

*NOTE 12: Wash the filter on the pump intakes and change the filter on the steering circuit delivery for the first time after 50 hours. After this, repeat the same operations after every 250 hours service (i.e. 250-500-750-1000 hours…).*

*NOTE 13: During the running-in phase, the primary and secondary fuel filters should be changed for the first time after 50 work hours. Afterwards, the cartridges of both the primary and secondary fuel filters should be changed at the intervals prescribed by the Routine Maintenance Table.*

## 10 HOURS OR DAILY SERVICE

***CAUTION: If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".***
***WARNING: Always use specific personal safety devices for each operation.***
***WARNING: Maintenance operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.***
***WARNING: Beware of burns caused by hot tractor and engine parts. [4.1.n]***

### General tractor inspection

- Power steering cylinder hoses: the hoses must not be pinched or cracked. The outer sheath must not be swollen in any way and there must be no oil leaks between the hoses and unions.

- Hydraulic circuits tubes. Check for leaks, rubbing, squeezed or damaged hoses, loose nuts or bolts and dirt build up. Repair all leaks, hoses and tighten loose nuts/ bolts before operation.

- Parking brake lever: make sure that the ratchet locking mechanism is secure and reliable.

- Check for loose nuts, bolts and components.

- Make sure that the wheel nuts are correctly torqued.

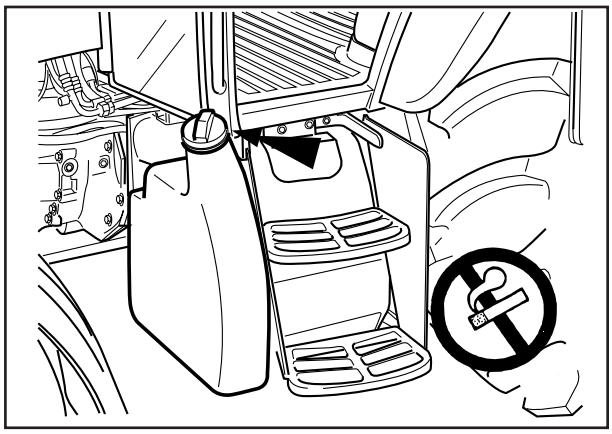
- Check to make sure that all other nuts and bolts are well tightened.

- Make sure that all shields and guards are in the correct position.

## 10 HOURS OR DAILY SERVICE

### Check fuel level

[4.1.I]



Fill the fuel tank at the end of each day after work has been completed to prevent condensation in the fuel tank.

Diesel Fuel

Use a high grade diesel fuel. The use of a low grade fuel will result in loss of engine power and high fuel consumption.

*IMPORTANT: Different grades of diesel fuel are required for summer and winter operations. See your fuel supplier for winter fuel requirements in your area.*

***WARNING: Never refuel the machine when the engine is hot or running. Never smoke while refueling.***

***WARNING: Engine fuel is flammable and can cause a fire or an explosion. DO NOT fill the fuel tank or service the fuel system near an naked flame, welding, burning cigars, cigarettes etc.***

**WARNING: Always use specific personal safety devices for each operation.**

***WARNING: Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin and cause infection or other injury. To prevent injury: release all pressure, before disconnecting fluid lines. Before applying pressure, make sure all connections are tight and components are in good condition. Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. If injured by leaking fluid, see a doctor immediately.***

### Fuel storage

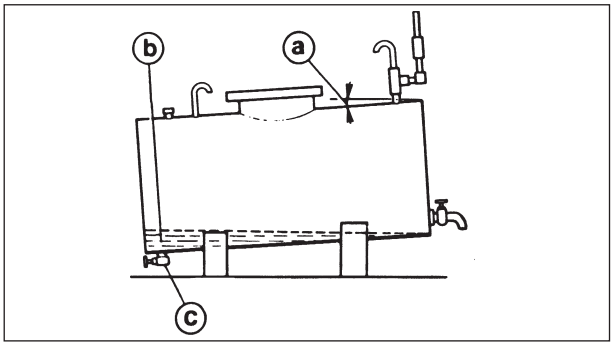
Use only good quality diesel fuel. Poor quality fuel can reduce the efficiency of the injection system.

Diesel fuel must be free from particles in suspension. If necessary, decant the fuel for two or three days before using it in the tractor.

Fuel oil can be decanted with a cheap, but safe system, as illustrated in the figure.

Never use fuel which has been left in an open can for any length of time and which could contain dirt or water.

Fill the tractor's fuel tank in the evening after finishing the day's work. This prevents condensation from forming inside the tank.




Setting up a tank for fuel storage and decanting.

a. Slope 25%.
b. Condensation water.
c. Sludge drain plug.

NOTE: *Never use galvanised containers to store fuel.*

## 10 HOURS OR DAILY SERVICE

### Oil level: transmission, power lift circuit and steering circuit, rear final drives

Check at regular intervals the oil level in the mechanical transmission and in the power lift and steering circuits.

Park the tractor on flat ground, stop the engine and lower the power lift links. Remove the dipstick (1) and check the oil level .

**NOTE:** *Allow the oil to settle in the transmission and rear final drives before checking the level.*

The oil level in the transmission must be over the midline, between the minimum and maximum marks of the dipstick with the lift links in the up position. If needed, fill up through the filler (2) to the required level with oil of the prescribed type.

When operating external hydraulics, such as hydraulic front loaders, rams, motors etc. that require a certain amount of oil, top up the oil level to the B mark on the dipstick (corresponding to about 10 litres). This ensures a correct oil level in the transmission at any time.

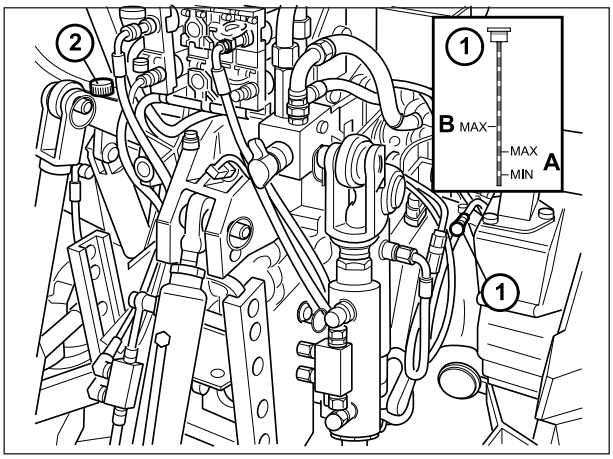
**NOTE:** *The level must never be under the Min. mark; When using external hydraulics, the level must always be between the Min. and Max. marks.*

**NOTE:** *When working with the tractor on slopes, add 5 extra litres of oil to guarantee a minimum oil level even in the most difficult conditions.*

**NOTE:** *The hydraulic rams of the implements being hitched to the tractor contain the same oil used in the transmission of the tractor. This excludes any oil contamination that could cause malfunction.*

#### Oil in the gearbox

The tractor's transmission and the steering and power lift circuits contain the same type of oil. See Lubricant and Fuel Chart.




1. Dipstick

A: Normal level marks

Min. - no oil consumption

Max. - max. consumption 5 litres

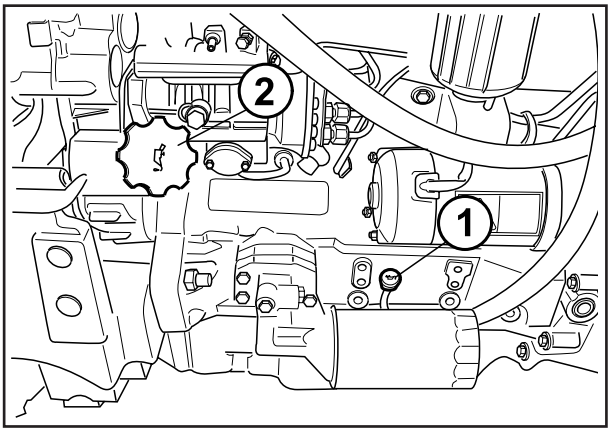
B: Level to be maintained if using a front loader or other hydraulic implements

2. Transmission oil filler

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

## 10 HOURS OR DAILY SERVICE

### Engine oil level




For the engine, it is necessary to use a detergent oil Supplement 3 as indicated in the Lubricants and Fuels Chart. Detergent oils contain additives that reduce corrosion, oil oxidation and deposits and have a high dispersion power of carbon matters produced by combustion.

***WARNING: The following operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.***

Personal safety devices must be worn for the indicated operations.
Beware of burns caused by hot oil and engine parts.
If required, let the engine idle for the prescribed time to reach the required temperature to let the oil flow easily. Then turn off the engine.
If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".

Leave the tractor parked on a flat surface for at least five minutes before checking the level, to allow the oil to settle in the sump:

- take out the dipstick (2), wipe it with a rag and then dip it into the filler again;

- wait 10—15 minutes, then remove the dipstick again and make sure that the oil level reaches and does not exceed the level marked on it.

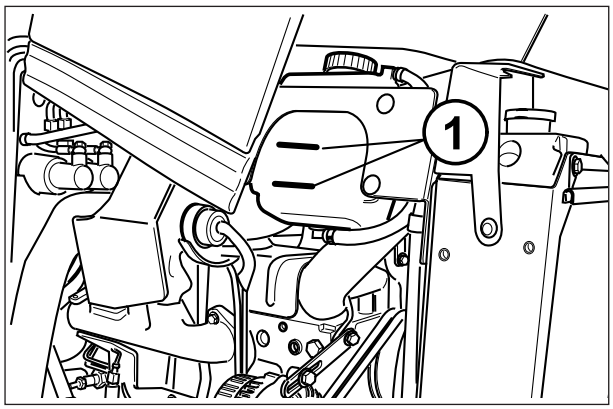
- If necessary, pour additional oil through the filler (1) until the required MAX level has been reached.

Never fill up to a level higher than the MAX mark on the dipstick.

***CAUTION: Never ever use the engine with the oil level below the "MIN" mark.***

## 10 HOURS OR DAILY SERVICE

### Check coolant level




***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and engine parts.***

Check the coolant level when the coolant is cold and with the engine stopped. DO NOT REMOVE THE RADIATOR CAP.

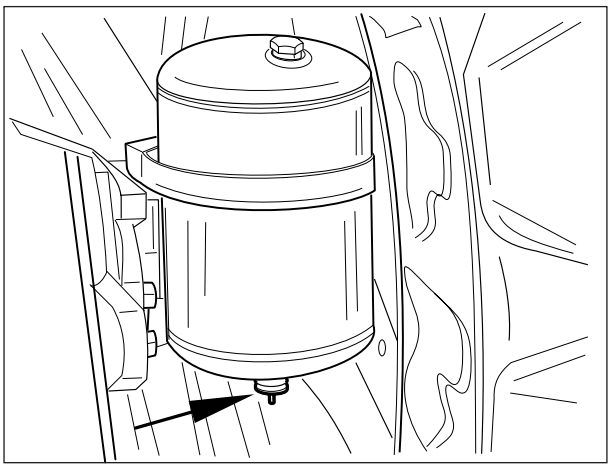
The coolant level must be within the normal cold range marks (1) on the reservoir. If the level is below the minimum mark, fill the reservoir to the top mark with correct coolant mixture (this will depend upon market requirements).

*Precautions against freezing temperatures*
To prevent ice from forming in the radiator, add specific products according to the instructions given by the antifreeze manufacturer.
Antifreeze also possesses antioxidant and rust-inhibiting properties and is suitable for all seasons.
The following amounts are indicatively required:

| Quick Reference Guide | | | | |
|---|---|---|---|---|
| | in the following percentages: | | | |
| Ambient temperature (°C) | -8 | -15 | -25 | -35 |
| Ambient temperature (°F) | -18 | -5 | -13 | -31 |
| Percentage of antifreeze % | 20 | 30 | 40 | 50 |

***WARNING: Hot coolant can spray out if the coolant recovery reservoir cap or radiator cap is removed while system is still hot. DO NOT REMOVE THE RADIATOR CAP. To remove the coolant recovery reservoir cap or radiator cap, let system cool, turn cap to first notch, then wait until pressure is released. Scalding can result from fast removal of radiator cap.***

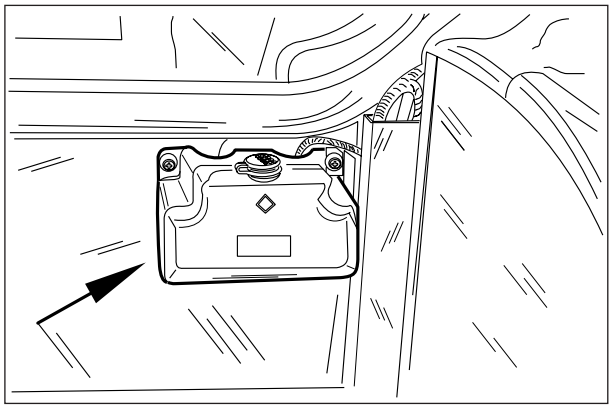
### Drain pneumatic trailer brake reservoirs (if equipped)



Operate the drain valve plunger under each reservoir to drain any water which has collected.

**WARNING: Always use specific personal safety devices for each operation.**

### Check windshield washer reservoir level



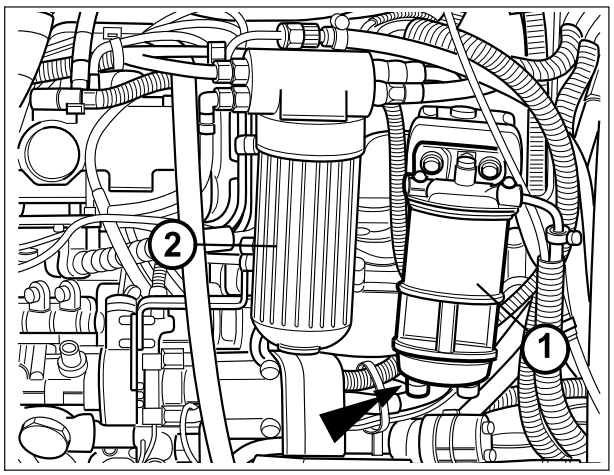
If the fluid level is low fill the reservoir.

**WARNING: Always use specific personal safety devices for each operation.**

## 10 HOURS OR DAILY SERVICE

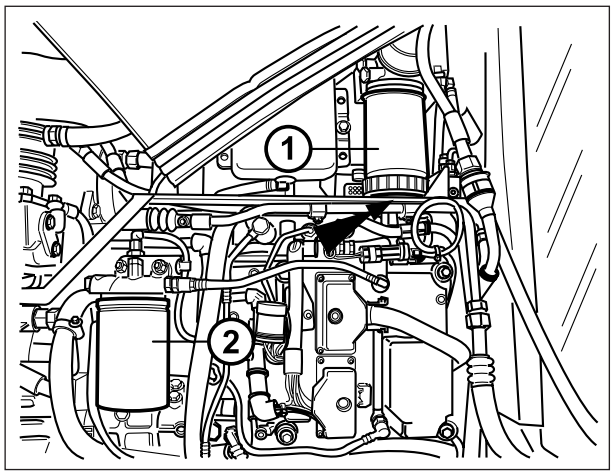
### Drain Fuel/Water Separator

Regularly drain off the water that collects from the cock of the water/fuel separator filter (1).




Mechanical engine

The drain plug is located on the bottom of the fuel filter. Loosen the plug to let any water or sediment drain from the filter. Tighten the plug after the water has drained.




Electronic engine

The drain plug is located on the bottom of the fuel separator filter. Loosen the plug to let any water or sediment drain from the filter. Tighten the plug after the water has drained.

*IMPORTANT: Dispose of fuel and filters in accordance with local regulations. DO NOT drain on the ground, into a drain or into a leaky container. Be responsible for the environment.*

**During running-in, replace the fuel filters after the first 50 work hours. Afterwards, replace the fuel filters after every 500 hours service.**

***WARNING: To open the bonnet, follow the procedure indicated under "How to open the bonnet".***

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and hot motor parts. [4.1.n]***

Shift the gear to neutral and engage the parking brake.

## 50 HOUR MAIN SERVICE

**WARNING: To open the bonnet, follow the procedure indicated under "How to open the bonnet".**
***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and engine parts. [4.1.n]***

### Clean grille screens and radiator area

Clean the grille screens, air conditioning condenser, oil cooler, fuel cooler, charge cooler (as equipped) and radiator area every 50 hours of operation, or more frequently if required when operating in dirty conditions.

***WARNING: These operations must be carried out when the engine is cold. When hot, the grilles and radiator will burn the hands and fingers.***

*IMPORTANT: Be careful not to bend or damage the fins during cleaning. Areas with restricted access should be carefully cleaned with compressed air.*

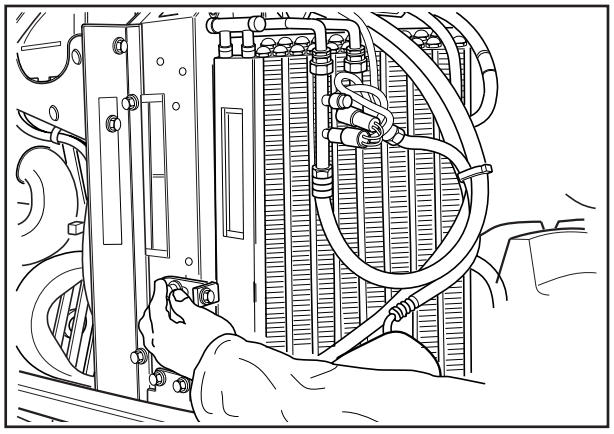
*IMPORTANT: If you clean using compressed air use an air hose with a safety ON/OFF control nozzle and ALWAYS WEAR FACE PROTECTION.*

***WARNING: DO NOT steam clean any air conditioning system parts while the system is charged. The heat will cause the refrigerant to rise to a pressure that could cause the system to explode.***

To gain access:

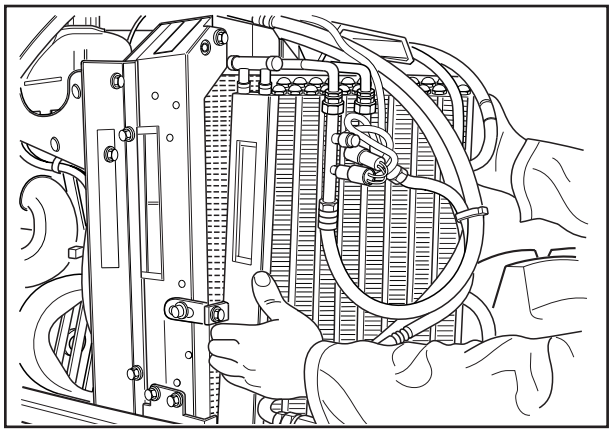
OPERATION 1
Lift the hood, if it is the tilting type.
Remove the hood, if it is the fix type.

OPERATION 2



Loosen the bolts fixing the condenser on both sides of the oil cooler of the air conditioner condenser (if equipped).

OPERATION 3



Pull forwards the top of the oil cooler or of the air conditioner condenser (if equipped).

Clean as required.

***WARNING: Never disconnect any pipes or hoses in the air conditioning system to reach the condenser.***

***WARNING: If the tractor is to remain unused for a long period of time, or if the system is not used, remember to allow the air conditioner to operate for about 15 minutes each week. This precautionary measure prevents gas from leaking from the compressor.***

**NOTE:** *The best results are obtained with a steam cleaner that softens up the dirt. Use a lamp to check the cleaning between the radiator fins. We recommend a daily cleaning when front implements are used, especially front mower-conditioners.*

## 50 HOUR MAIN SERVICE

**WARNING: To open the bonnet, follow the procedure indicated under "How to open the bonnet".**
***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and engine parts. [4.1.n]***

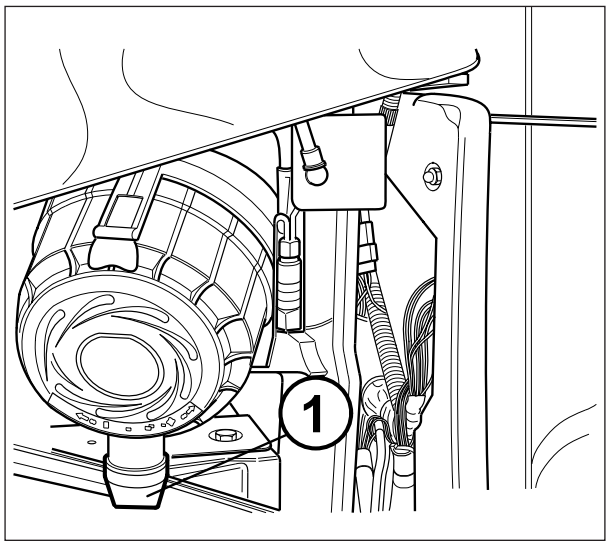
### Engine air filter discharge valve

(if equipped).

Discharge the dust deposits and sediments each day by pressing the rubber valve (1) on the air filter housing. Install a new dust valve if damaged, or not operating correctly.

*NOTE: The discharge valve is not available if an automatic dust ejector is fitted.*

*IMPORTANT: A new rubber dust valve MUST be installed every 1000 hours.*

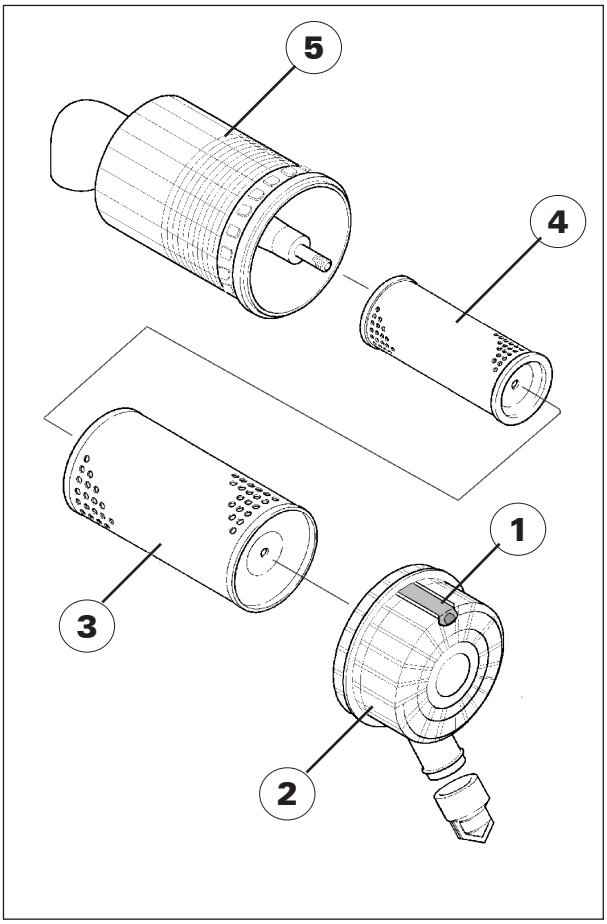



### Dry air filter outer cartridge

***WARNING: Always stop the engine before demounting the filter elements.***

Periodically, remove the cover (2) (Pull out the yellow tab (1), turn the cover (2) anti-clockwise and remove), take out the external cartridge (3) from the container (4) and clean it (this operation should be carried out more frequently if you work in a very dusty environment or the indicator on the instrument panel lights up). DO NOT remove the inner cartridge (4).

See the procedure for disassembling, cleaning and replacing of the cartridges of the dry air filter in the Regular Service at 1000 work hours in this section of the manual.



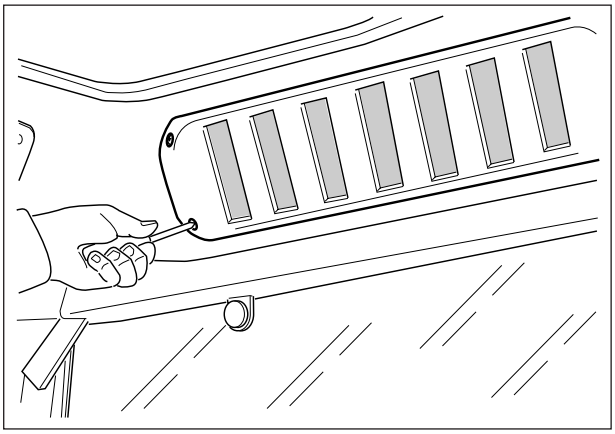
## 50 HOUR MAIN SERVICE

### Clean cab air recirculation filter

**WARNING: Always use specific personal safety devices for each operation.**

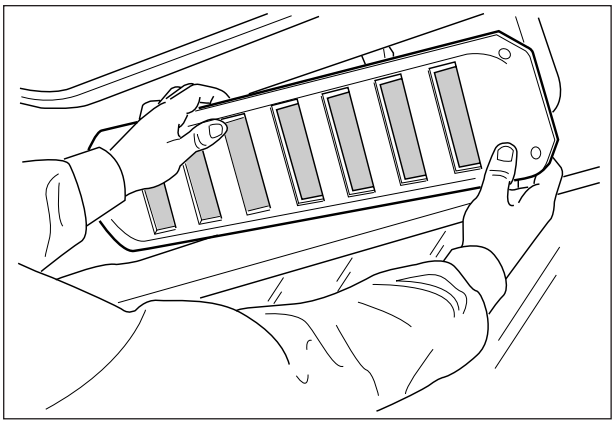
If working in very dusty environment, the cab air recirculation filter should be cleaned either at suitable intervals or every 50 work hours.

OPERATION 1



Remove the four screws from the recirculation grille.

OPERATION 2



Remove the recirculation grille and the filter.

OPERATION 3
Clean the filter using mild soap and water. Rinse with clear water and squeeze out the excess.

OPERATION 4
Install the filter in the recirculation grille.

OPERATION 5
Install the grille and filter. Install and tighten the screws.

## 50 HOUR MAIN SERVICE

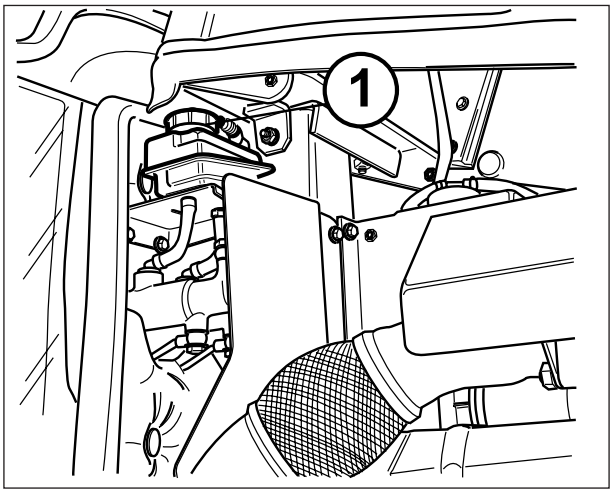
### Brake fluid reservoir

At suitable intervals, check the level of the fluid in the brake reservoir. The reservoir (1) must always be kept full. Top up only with the correct brake fluid, as indicated in the Lubricants and Fuels chart.

### Bleeding air from the rear brake circuit

It becomes necessary to bleed the circuit when air enters owing to lack of oil in the relative reservoir or when the braking system is serviced.
This operation should be carried out by specialized personnel. If, however, you decide to do it yourself, proceed in the following way.

***WARNING: See the Lubricants and Fuels chart to replace and top up oil in the brake circuit (1).***

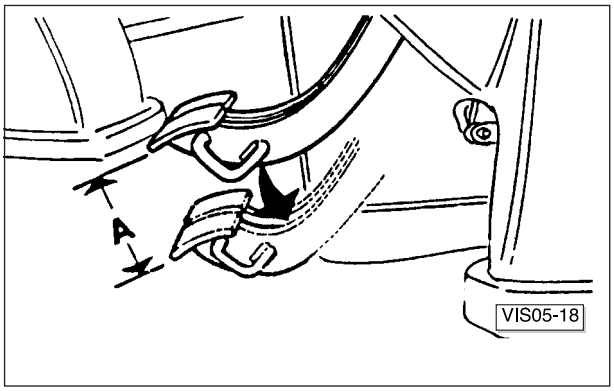


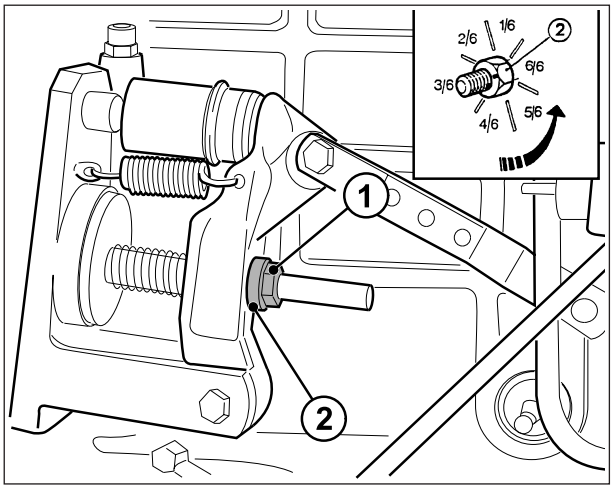

**WARNING: To open the bonnet, follow the procedure indicated under "How to open the bonnet".**

***WARNING: Beware of burns caused by hot tractor and engine parts. [4.1.n]***

## 100 HOUR MAIN SERVICE

### Adjusting the brakes




#### Rear brakes

Check the efficiency of the braking system regularly.

The braking system must be adjusted when the free travel of the pedals (A) becomes excessive and the pedals are near to end of travel.
Proceed in the following way to restore free pedal travel to its normal value of about 3.5 cm (1.4 in.) (dimension A):

1 - First make sure that there is no air in the hydraulic brake circuit. Bleed if necessary. (The presence of air in the circuit is normally denoted by a spongy braking action).

2 - Jack up the rear wheels of the tractor.

3 - Make sure that the parking brake is off.

4 - Free the brake pedals by raising the lock.

5 - Unscrew the check nut (1). Slowly tighten the adjuster nut (2) until you can no longer turn the wheel by hand.

6 - Make a reference mark on the adjuster nut (2) and on the support, then slacken off the adjuster nut by 2 - 2 and 1/4ths of a turn i.e. until the wheel can be freely turned. Now lock the adjuster with the relative check nut (1).

7 - Check that the brake pedal has a free travel of 3.5 cm (1.4 in.) and repeat the adjustment if necessary.

8 - Repeat the procedure for the other side. Finally, check that the free travel is the same for both pedals and that the brakes engage simultaneously on both sides.

9 - Check that the parking brake lever has not been affected and adjust if necessary. The procedure is described here under.

#### Front brakes

No periodic adjustment is required as the front brakes are self-regulating.

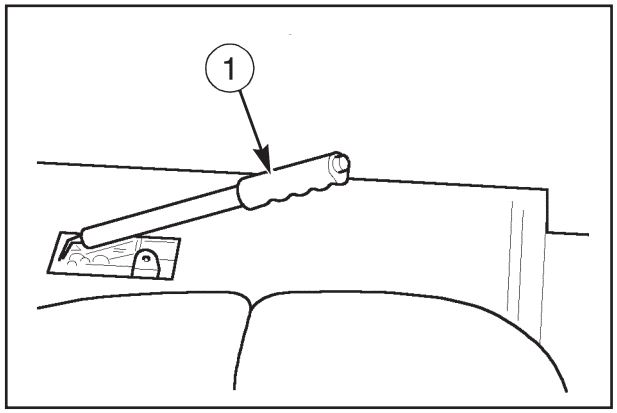
***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

## 100 HOUR MAIN SERVICE

### Check parking brake engagement

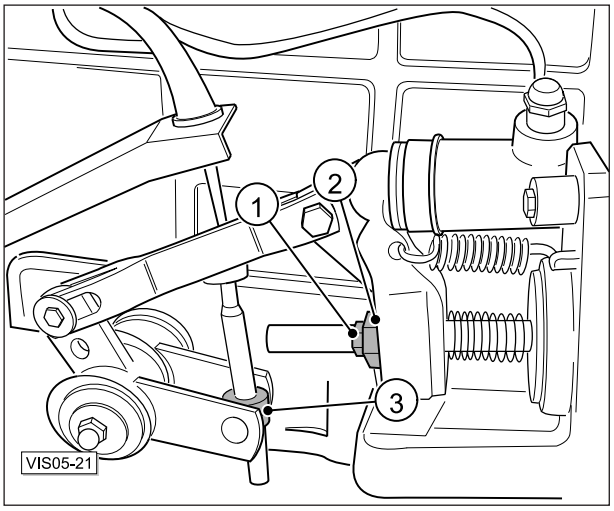
Make sure that the ratchet locking mechanism of the parking brake is secure and reliable.

*WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]*




The parking brake hand lever is directly linked to the brake pedals.
Make sure that free travel is identical for both pedals, since free travel of the pedals determines the free travel of the parking brake and left/right distribution of the braking action when the brakes are locked.

Once you have adjusted the brake pedals, adjust the free travel of the parking brake by means of the adjuster nut (3) on the brake lever, so that the parking brake engages after 2-3 clicks of the ratchet mechanism.




Travel adjustment of the lh brake pedal and parking brake hand lever.
1 - Fixing nut.
2 - Brake adjustment nut.
3 - Fixing and adjuster nut of the parking brake.

## 100 HOUR MAIN SERVICE

### Front axle oil level

### 4WD front axle

*Regularly check the oil level in the differential of the front axle and in the front axle side final drives.*

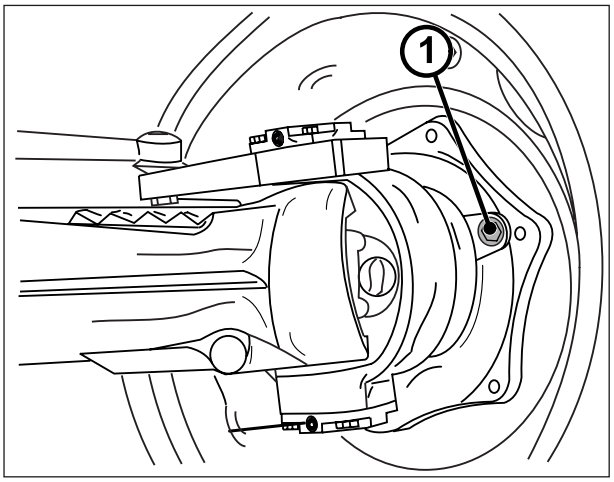
1. Park the tractor on level ground

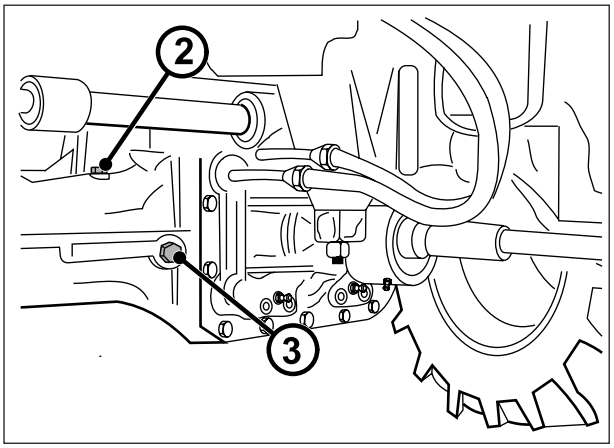
2. Position the final drive plugs (1) on the wheel center line. Remove the plugs and check the level. Top up if necessary with oil of the specified type through the plugs themselves..

3. Remove the level plug (3) from the central axle housing. The oil level must reach the hole. Top up if necessary with oil of the specified type through the plug (2).

**NOTE:** *See the Fuel and Lubricant chart for the correct type of oil.*

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***



## 100 HOUR MAIN SERVICE

### General lubrication

Lubricate the grease points every 100 hours or more often, depending on the working conditions.

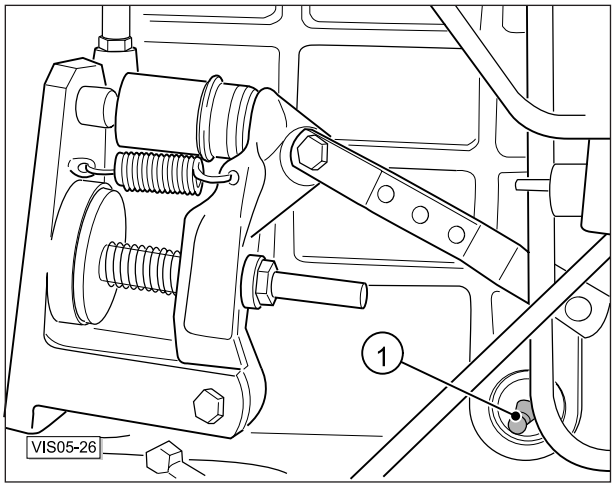
### Grease Points

*NOTE: Use lithium grease of the prescribed type.*

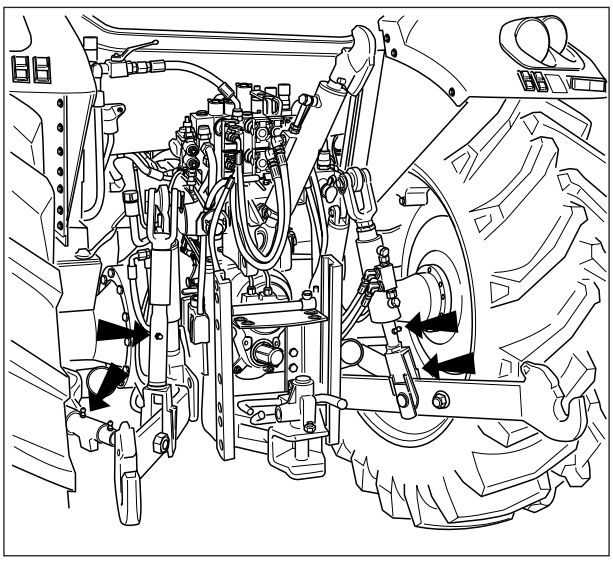
*NOTE: In severe conditions lubricate these points more frequently.*

*NOTE: Lubricate if not used frequently and also after washing with water pressure hose.*

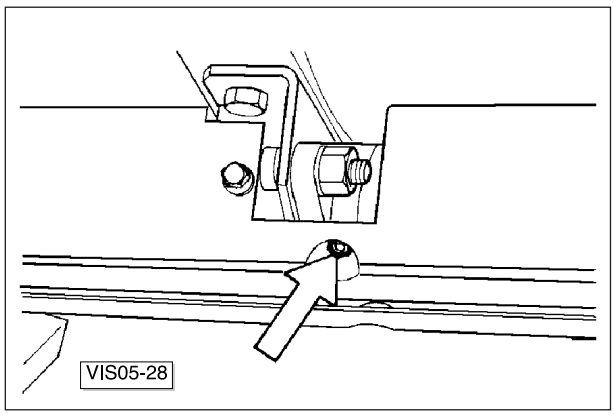
***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***




Grease nipples on brake control cross link, two points.



Three point linkage.




4WD drive shaft thrust bearing.

## 100 HOUR MAIN SERVICE

### 4WD front axle greasing

Lubricate the following greasing nipples every 100 hours or more frequently, depending on work conditions.

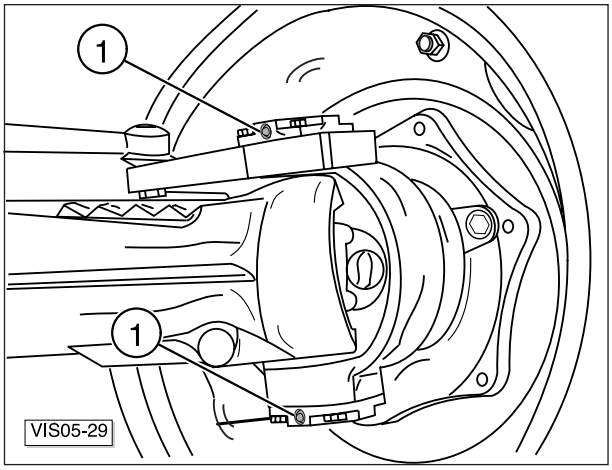
### Grease Points

*NOTE: Use lithium grease of the prescribed type.*

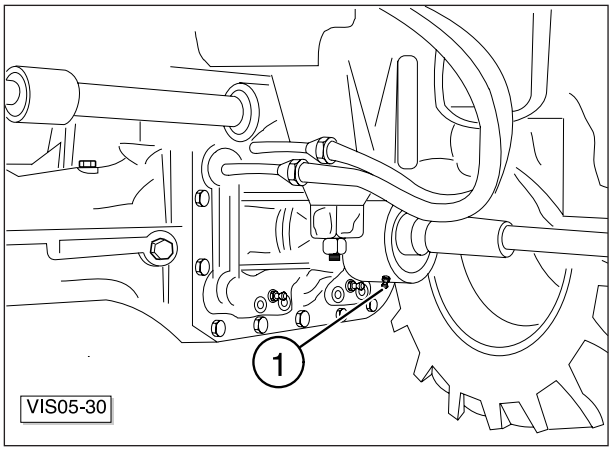
*NOTE: In severe conditions lubricate these points more frequently.*

*NOTE: Lubricate if not used frequently and also after washing with water pressure hose.*

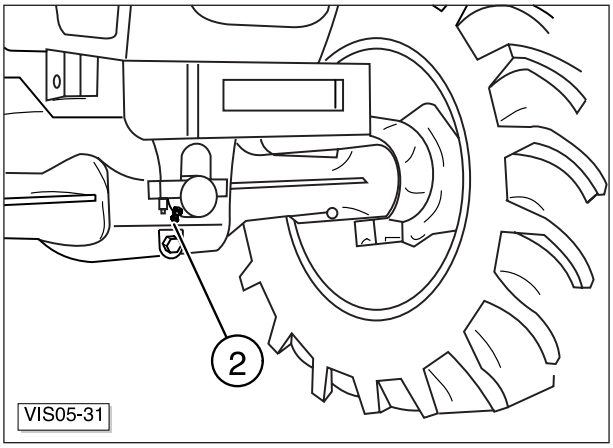
***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***




1 - Kingpins of 4WD axle (2 pcs).




1 - Grease nipple of front pivot bushing of the front axle.




2 - Grease nipple of rear pivot bushing of the front axle.

## 100 HOUR MAIN SERVICE

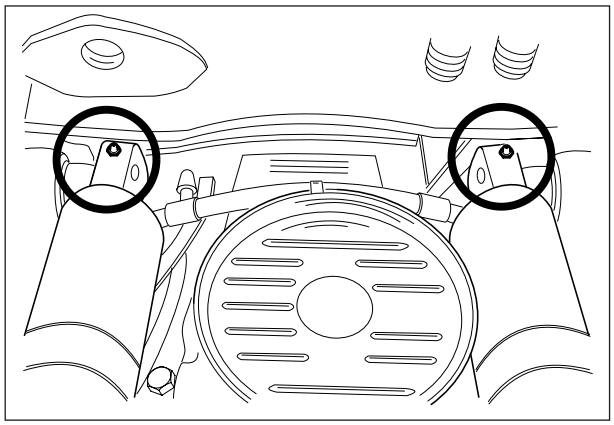
### Maintenance of the front PTO and front 3 point hitch (if equipped)

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

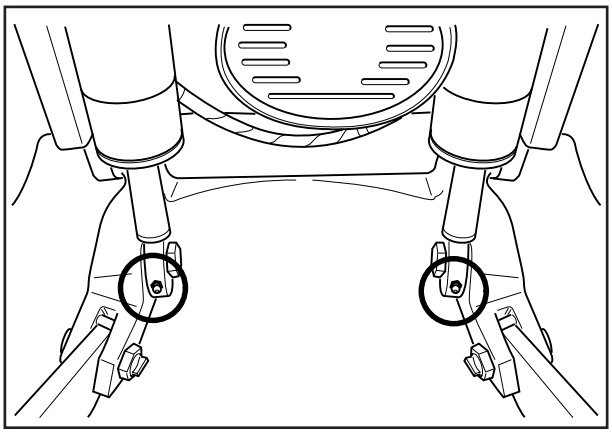
### Grease Points

*NOTE: Use lithium grease of the prescribed type.*
*NOTE: In severe conditions lubricate these points more frequently.*

### Front 3-point hitch (if equipped).



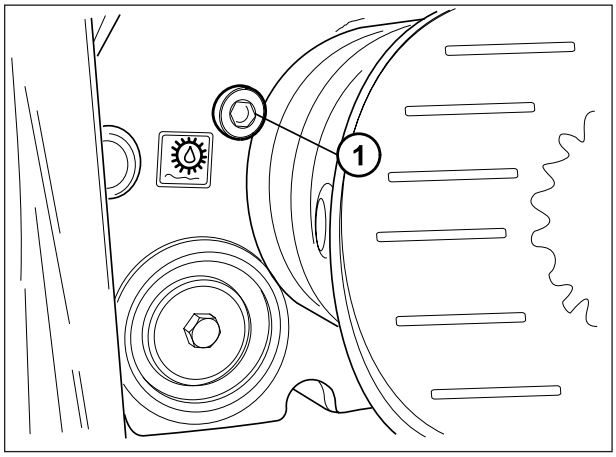
Top of lift cylinder, 2 points.



Bottom of lift cylinder.

*NOTE: Lubricate if not used frequently and also after washing with water pressure hose.*

### Check front PTO oil level (if equipped)




To check the power takeoff oil level, put the tractor on level ground.
Remove the fill/level plug (1) located on the front of the housing. If the oil level is low, add the recommended oil type to raise the oil level to the bottom edge of the fill hole. Install the plug and tighten.

### Servicing the front power take-off

Periodically throughout the year, additional attention should be made to the following:
- Check all bolts, screws and fixings etc. are tight.
- Check the PTO gearbox for any leaks.
  Operating the Front PTO at low oil levels can cause damage to the gearbox, incorrect operation of the PTO clutch and also damage to the environment.
- Check the condition of the flexible rubber drive coupling, mounted to the crankshaft pulley. Make sure the coupling is installed correctly and is not brittle.
- Apply grease to the drive shaft spline.

## 100 HOUR MAIN SERVICE

### Check and clean cab air intake filter

Check and clean the intake air filter every 100 hours or more often if needed. Keep the air filter clean for efficient operation of the heating and cooling system. Replace with a genuine part if damaged or when the filter can not be cleaned.

***WARNING: Cab air filters remove dust in the air, but are not capable of removing chemicals used in spraying crops or in weed control. Many chemicals used for these purposes are toxic when improperly used, and can be hazardous to operators and others in the area. Follow the instructions of manufacturers of both the equipment and the chemicals regarding prohibitions against inhalation of dust or spray, personal hygiene practices, and other precautions noted by the manufacturers.***

*IMPORTANT: Always wear protective clothing, e.g.: overalls, goggles, gloves and face mask when preparing equipment for chemical spraying operations and ALWAYS follow the chemical manufacturers instructions.*

DELUXE CAB - This type of tractor CANNOT be used to spray chemicals, unless the operator within the cab is wearing a complete protective suit.

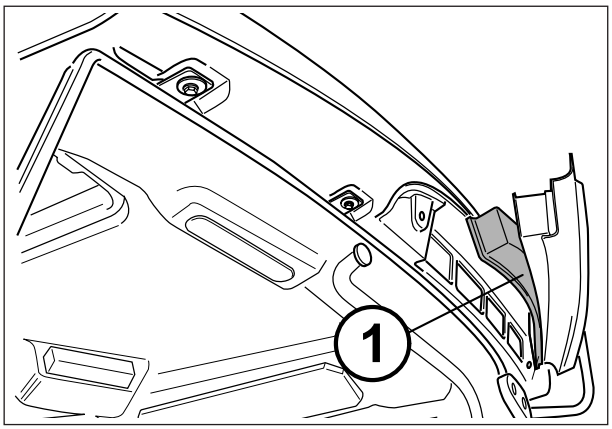
The air intake filters should be checked weekly or daily if used in extreme conditions. The standard paper element has the following efficiency with a maximum differential pressure increase of 2 mbar. SAE gross gauze mesh 99.5%.

*NOTE: This element gives no protection against chemical spray.*

*CAUTION: The Manufacturer has no responsibility whatever, either direct or indirect, for application of special filters and/or changes to the air intake system of the cab. Every change to the cab intake system can result in a health hazard for the operator and significantly alter the performance of the air conditioning system. In any case, the cab is not guaranteed as perfectly dust-tight. Always wear individual protections when working in particularly dusty environment.*

*NOTE: Replace filters with original spares only.*

***IMPORTANT: Dispose of filters correctly in accordance with local regulations. Be responsible for the environment.***




***WARNING: Remember that the cab filter is not suitable for chemicals in general.***
***Absolute protection against these products can therefore only be achieved by taking the precautionary measures required by the degree of harmfulness of the actual products used.***
***This latter precaution must be strictly observed for filters of any type.***

*CAUTION:Take the filter off before washing the cab. If the cab is washed and the filter has not been demounted, take care to prevent the jet of water from splashing on to the protective grille otherwise your cab's filter will be irreparably damaged.*

*CAUTION: If active carbon filters are used, mount only original filters supplied in a sealed package: follow the instructions for use on the container and attached to any filter package. Carefully comply with the operating instructions on the filter packages or labels. Replace the filters at the intervals specified by the filter manufacturer. Contact your Dealer if specific filters against chemicals must be used.*

**CAUTION: Always wear individual protections suitable to the harmfulness of the actual product used.**

### Protection level [4.1.p][4.5.3]


**WARNING: Tractors with cab have no protection against harmful substances and dusts (protection level 1). If the tractor is used in dusty environment and to spray phytosanitary products or chemicals generally thought of as hazardous to health, the operator must wear individual protections (mask, goggles) suitable to the harmfulness of the actual product used.**

## 100 HOUR MAIN SERVICE

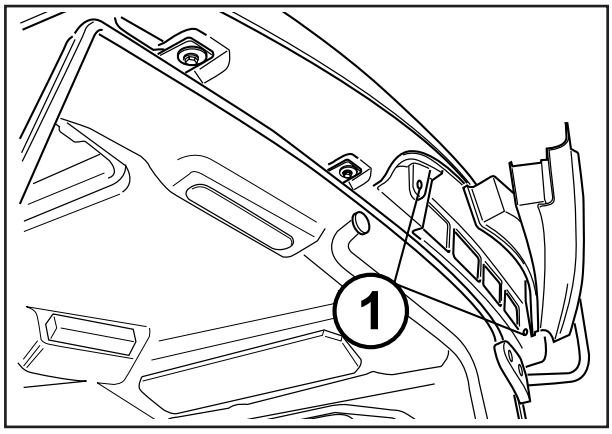
***WARNING: Do not stand on the tractor to service the filter, use the correct equipment for a safe standing platform or injury can result.***

For best performance, this filter should be serviced more often when working in particularly dusty environment. Replace with a genuine McCormick part if damaged or when the filter can not be cleaned.

*IMPORTANT: Respiratory protection equipment and protective clothing appropriate to the environment that the filter has been in contact with MUST be used during the cleaning of the filter.*

Deluxe cab

OPERATION 1




Loosen both knobs (1) fixing the cover.
Open the filter cover.

OPERATION 2

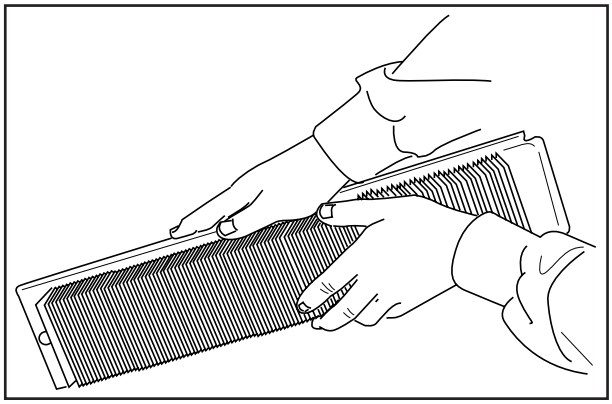
Remove the filter element and clean the filter seat.

To next page...

OPERATION 3
The filter element can be cleaned by one of the following two methods:

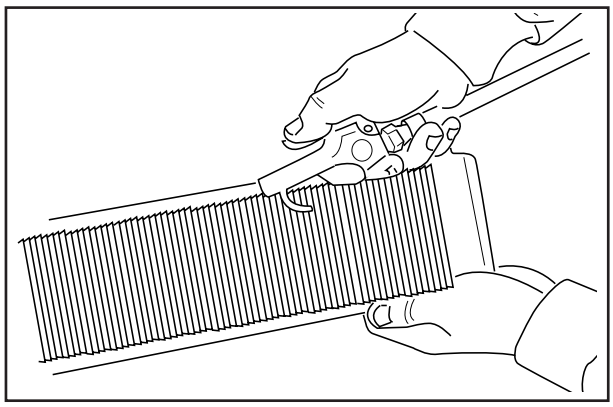
A. Tap it on a flat surface.
or
B. Blow it clean with compressed air.

METHOD A



If the dirt mainly consists in dust, this method can be used to clean the filter. Tap the dusty side of the filter on a flat surface. Do not use excessive force that can cause damage to the filter.

METHOD B



Use compressed air to blow dust away. Move the flow of air up and down the clean the side of the filter. Maximum air pressure must exceed 2 bar. Too much pressure will damage the filter.

*IMPORTANT: Always use an air hose with a safety ON/OFF control nozzle and ALWAYS WEAR FACE PROTECTION.*

OPERATION 4
Insert the filter element under the filter cover.
Close the cover and fix it with both knobs.

## 250 HOUR MAIN SERVICE

### Battery [4.1.I]

Periodically check the level of battery acid and add distilled water if necessary.

***WARNING: BATTERY ACID CAUSES SEVERE BURNS. Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL - Flush with water. INTERNAL - Drink large quantities of water or milk, DO NOT induce vomiting. Seek medical attention immediately. EYES - Flush with water for 15 minutes and get medical attention immediately. BATTERIES PRODUCE EXPLOSIVE GASES. Keep sparks, flame and cigarettes away. Ventilate when charging or using in enclosed area. Always wear eye protection when working near batteries. KEEP OUT OF REACH OF CHILDREN.***

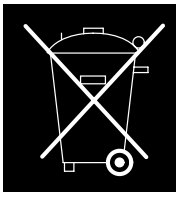
*NOTE: The level of the electrolyte must be checked with the engine off, the tractor parked on flat ground and the battery cold.*

*NOTE: Make sure that the battery terminal nuts are well fixed to their terminals.*

**WARNING:**
Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash your hands after handling these parts.

***WARNING: Do not use acid to top up the battery. The electrolyte will boil over. Use only deionised distilled water and top up to a level of 5/6 mm over the battery cells.***

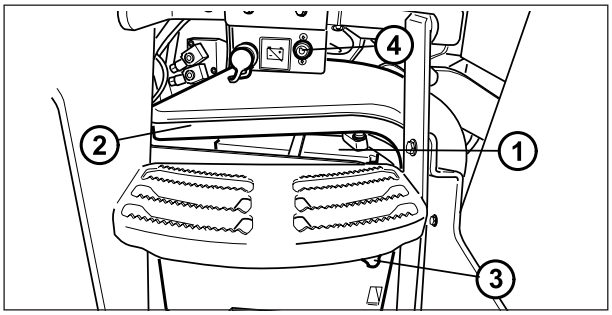
***WARNING: According to the Law it is mandatory to dispose of batteries in suitable containers provided to this purpose at authorized centres. DO NOT dispose of them in the environment.***



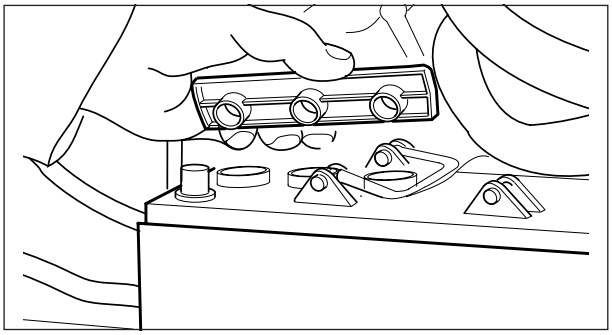
Pb

### Check electrolyte level

**WARNING: Always use specific personal safety devices for each operation.**




- Move the master disconnect switch (4) on OFF.
- Remove the knob (3) that closes the cover.
- Remove the cover (2). In a few models, the tool box and relative support must be removed for this operation.



- Remove cell cover plates carefully.
- Add distilled water to just cover the top of the separators. DO NOT OVERFILL. The right level should be 5 to 6 mm over the cells.
- When distilled water is added at ambient temperatures below 0°C (32°F), the batteries must be charged immediately to mix the water and electrolyte or the water will freeze, because the water will stay on top of the electrolyte.

*NOTE: For further information about battery servicing and charging and about components of the tractor's electrical system, see the Electrical system section in this manual.*

### Battery cables and terminals

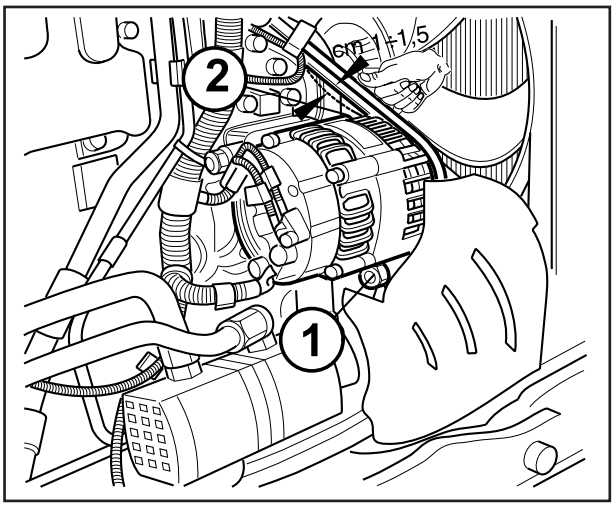
The battery terminals must be kept clean and tight. Remove all corrosion with a wire brush, then wash with a weak solution of baking soda or ammonia. Put some petroleum jelly or light grease on terminals to prevent more corrosion.

***WARNING: When connecting the battery to a charger, make sure that the positive (+) lead of the charger is connected to the positive of the battery and the negative (-) to the negative. Incorrect connection will damage the diodes and the other circuit components.***

## 250 HOUR MAIN SERVICE

**WARNING: To open the bonnet, follow the procedure indicated under "How to open the bonnet".**
***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and engine parts.*** *[4.1.n]*

### Fan and alternator belts

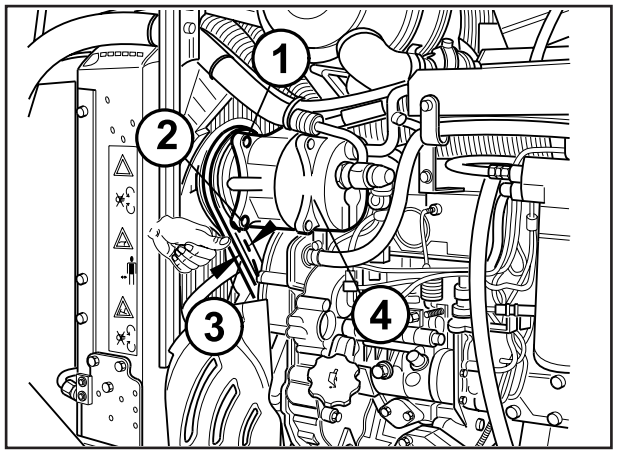



Periodically check the tension of the alternator and fan belts in the middle of its long side. It should give 10 - 15 mm.

To adjust the belt tension, loosen the fixing screws and check nut (1) on the idler and move the alternator until the correct tension has been obtained.
Now tighten all the screws and check nuts.
Also check the tension on the air conditioning compressor belt.

**NOTE:** *Check the belt tension frequently. The belt must be replaced if it is cracked or needs to be frequently adjusted. This operation must be carried out by authorized service personnel.*

### Compressor drive belt




Regularly check the tension of the A/C compressor drive belt and adjust in the following way if necessary.

1 - Loosen the fixing nuts (2).

2 - Loosen the nut of the slotted support (1), position the compressor (4) so that the belt (3) gives 15 mm in the center of its longest side.

3 - Tighten all the nuts (1 and 2).

4 - Also make sure that the alternator-fan belt is correctly adjusted.

## 250 HOUR MAIN SERVICE

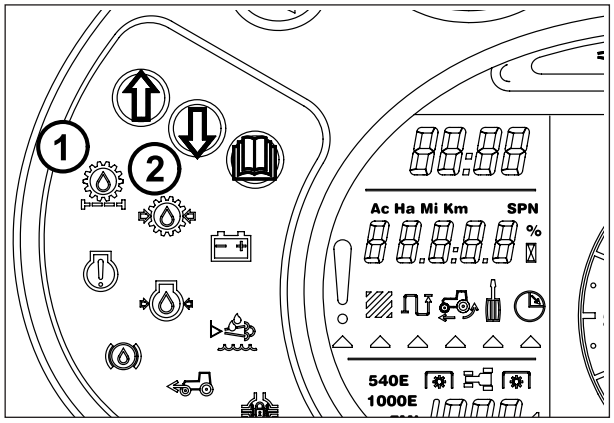
### Oil filters of the transmission and of the steering and power lift circuits

The following operations for the transmission oil filters must be carried out not only at the prescribed intervals, but also whenever the indicator lights on the instrument panel come on.

Warning lights for transmission and hydraulic circuit oil filter blockage.

1 - Fixed light: *Orange warning light for blockage of the oil filter of transmission and hydraulic circuit. The filter is mounted on the intake part of the hydraulic pumps.*

2 - Fixed light: *Red warning light for low pressure in transmission hydraulic circuit.* A warning buzzer will start operating when this light comes on during work. In this case, ask your Dealer's specialized workshop for help.




***NOTE:*** *When oil is cold, the red indicator might point out that the filter is clogged. Wait for the oil to heat to normal operation temperature: change the filter if the indicator is still lit, otherwise no replacement is required.*

### Oil filter of the transmission, steering and power lift circuit, mounted on the intake part of the hydraulic pumps

***WARNING: Clean thefilter on the intake part of the hydraulic pumps of the steering and power lift circuits after the first 50 hours. Following this, it should be cleaned after every 250 hours service.***

1. Loosen the screws (1) and remove the cover (3) of the intake filter (2).
2. Remove the filter cartridge (2) and wash it in a suitable solvent. Be sure to remove any metallic fragments from the filter cover and housing.

**NOTE:** *Replace the cartridge if damaged or excessive-lyclogged.*

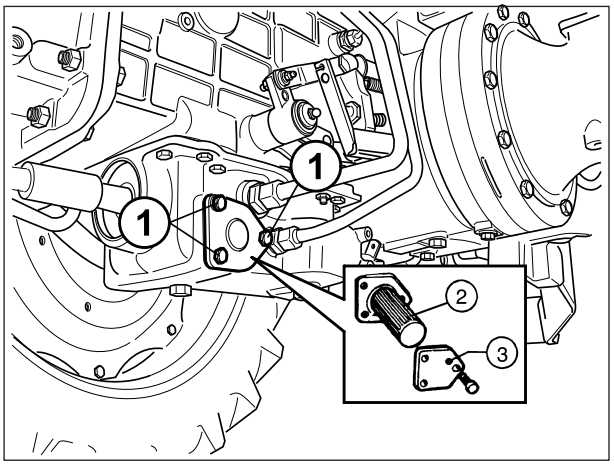
3. Clean and fit the filter cover.
4. Check the oil level. Top up if necessary with oil of the prescribed type.

**NOTE:** *After you have fitted the filter, allow the engine to run and make sure that there are no leaks. Check the oil level and top up if necessary.*

**NOTE:** *Use the oil indicated in the Lubricants and Fuels chart.*

**NOTE:** *Make sure that the hydraulic equipment connected to the tractor's hydraulic circuit uses the same type of oil. Use of different types of oil could damage the hydraulic circuit.*

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***



## 250 HOUR MAIN SERVICE

### Filter on the delivery of the steering circuit.

***WARNING: Change the paper filter on the delivery after the first 50 hours service and then after every 250 hours.***
***Also change the filter whenever the red indicator lights on the instrument panel come on.***

Change the element of the filter on the delivery of the steering circuit:
a - Unscrew the holder (1), remove and discard the filter element (3).
b - Fit the new filter element (3) into the cover of the filter (2).

To prevent the filter element from being dirtied (with mud, etc.) only completely remove the plastic protection after fitting.

c - Mount the holder (1) after having oiled its threaded part, the washer (4) and seal (5) with clean new oil. Take great care to fit the individual parts in the right directions.

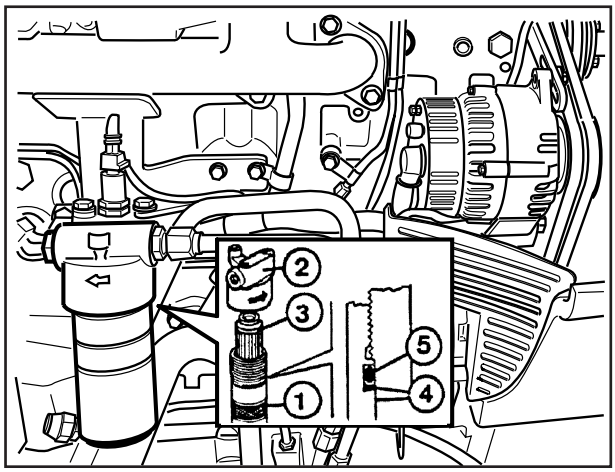
Change the seal (5) and the washer (4) every 1000 hours service or whenever necessary.

d - Fully screw on the holder (1) by hand.

**NOTE:** *After changing the oil and filters, run the engine for a while and make sure there are no leaks. Check the oil level again and top up if necessary.*

**NOTE:** *Use the oil indicated in the Lubricants and Fuels chart.*

**NOTE:** *Make sure that the hydraulic equipment connected to the tractor's hydraulic circuit uses the same type of oil. Use of different types of oil could damage the hydraulic circuit.*



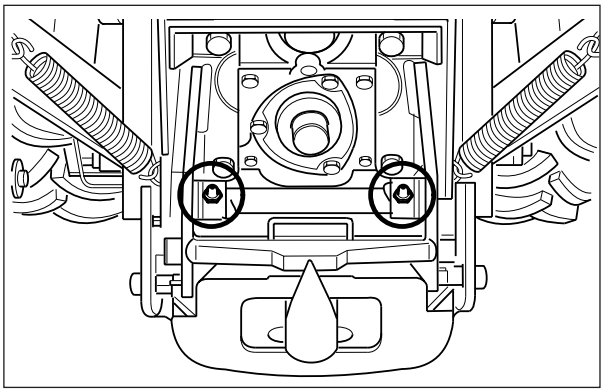

Oil filter of transmission and of the steering and power lift circuits.
1 - Holder.
2 - Cover.
3 - Filter element.
4 - Washer.
5 - Seal.

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

## 250 HOUR MAIN SERVICE

### Grease Points - Pick up Hitch ( if equipped)

Locking latches for auto hitch



Locking latches and rear pivot points.

*NOTE: Use lithium grease of the prescribed type.*

*NOTE: In severe conditions lubricate these points more frequently.*

1. The hitch should be carefully cleaned every 250 hour operation, and the moving parts (also inner slide rails) should be greased to avoid corrosion.

2. Make sure that all moving parts move freely and operate correctly.

*NOTE: In heavy duty operating conditions, the hitch could require a more frequent greasing to ensure it operates correctly.*

*IMPORTANT: The hitch clevis and pin are copiously greased before delivery from the manufacturing plant to ensure a correct operation for a long time. In heavy duty conditions, however, a more frequent lubrication of these points could be required. In this case, the operation must be performed EXCLUSIVELY by your Dealer.*

### Greasing points - Rear tow hooks (according to fitted type)

Various types of rear tow hooks are available depending on approvals and regulations valid in each country. Moving parts should be cleaned and greased according to the fitted type of tow hook and drawbar.

### Check torque of bolts and nuts of the tow hook (according to the fitted type)

Check the torque values of all bolts and nuts for ALL hitch types before the delivery, then every 250 hours.

### Check torque of bolts and nuts of the support bracket of the drawbar (according to the fitted type)

Check the torque of the drawbar support bracket bolts and nuts every 250 hours.

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

## 500 HOUR MAIN SERVICE

For the engine, it is necessary to use a detergent oil Supplement 3 as indicated in the Lubricants and Fuels Chart. Detergent oils contain additives that reduce corrosion, oil oxidation and deposits and have a high dispersion power of carbon matters produced by combustion.

***WARNING: The following operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.***

Personal safety devices must be worn for the indicated operations.
Beware of burns caused by hot oil and engine parts.
If required, let the engine idle for the prescribed time to reach the required temperature to let the oil flow easily. Then turn off the engine.
If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".

### Change engine oil and filter

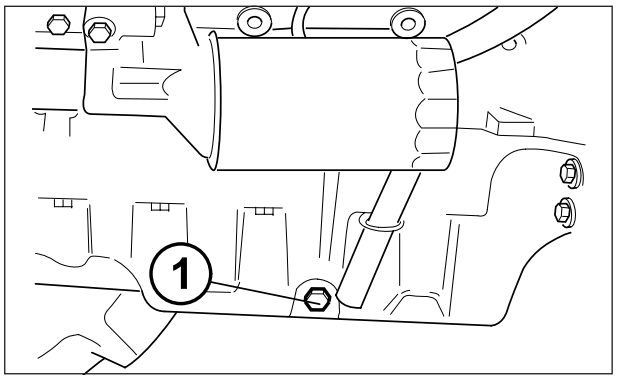
*During the running in period, the engine oil and oil filter must be changed after the first 50 hours. Following this, change the oil after every 500 hours service (500, 1000, 1500 hours, etc...)*

*NOTE: 500 hours is the maximum tolerated frequency for oil changes. The oil must be changed more frequently (e.g. every 250 hours) if the tractor is used in heavy duty conditions.*

To change the engine oil, put the tractor on level ground and stop the engine.

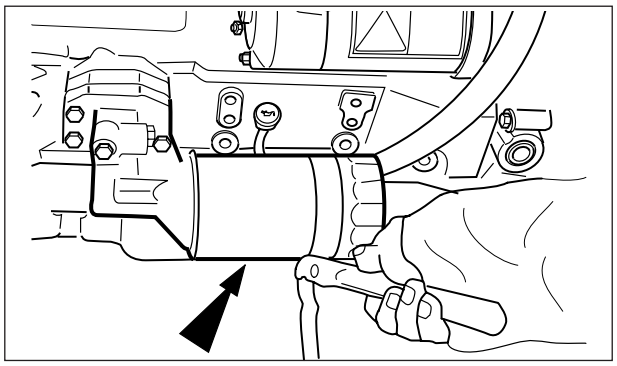
*NOTE: For best results change the oil when the engine is warm.*

***WARNING: Avoid contact with hot oil. Do not change a hot filter due to risk of burning skin on hands, Wait for the temperature to fall under 50 °C.***

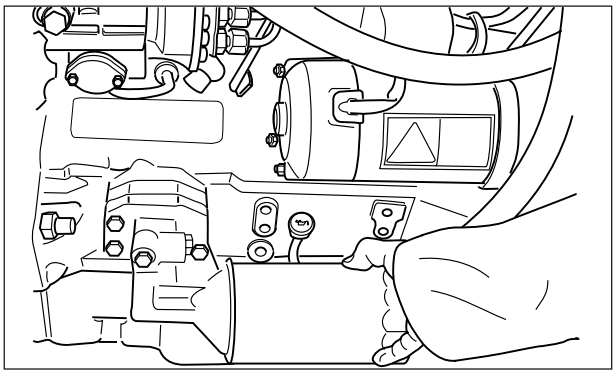



Put a container of suitable size (see Lubricants and Fuels chart for engine capacity) under the drain plug (1).
Remove the drain plug and drain the oil. Take care of hot oil when draining.

*IMPORTANT: Dispose of oil and filters in accordance with local regulations. DO NOT drain the oil on the ground, into a drain or put in a container that can leak. Be responsible for the environment.*



- Turn the oil filter counterclockwise with a suitable wrench to remove.



- Apply clean oil to the gasket on the new filter.
Install the filter. Turn the filter clockwise until the gasket comes in contact with the filter head.

***WARNING: Only use genuine filter cartridges. Use of spurious cartridges could damage the engine and shorten its working life.***

*IMPORTANT: DO NOT use a filter wrench to install the oil filter or you can cause damage to the gasket and filter.*

- Install a new seal on the drain plug (1). Install the drain plug in the crankcase and tighten.
- Fill with engine oil of correct grade, up to the MAX. level (see Lubricants and Fuels chart). Never fill up to a level higher than the MAX mark on the dipstick.

*NOTE: Allow the oil to settle in the engine sump before checking the level.*

## 500 HOUR MAIN SERVICE

## To change the fuel filters - Mechanical engine Mod. X60.20-X60.30-X60.40

**During running-in, the fuel filters should be changed for the first two times after every 50 hours. Afterwards, replace the fuel filter cartridges every 500 hours.**

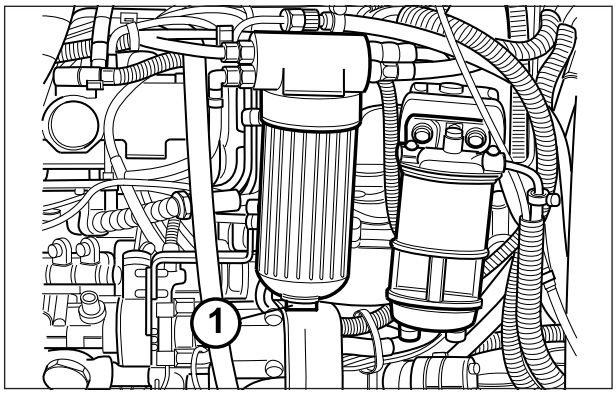
*NOTE: Filter positions may vary according to tractor model.*

The following operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.

***WARNING: Always use specific personal safety devices for each operation.***
***If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".***
***Beware of burns caused by hot water and engine parts. [4.1.n]***

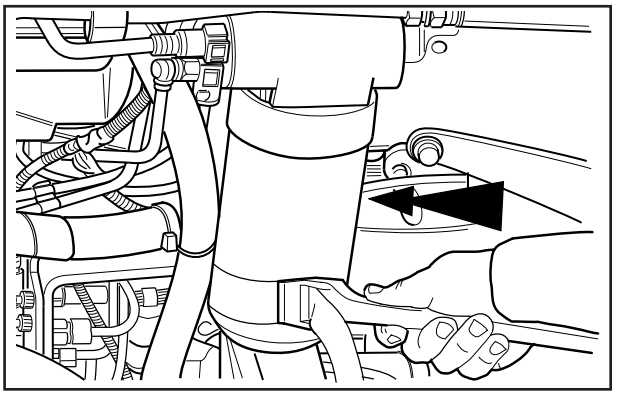
OPERATION 1
Clean the filter head, filter and engine area next to the filter before removing the filter.

OPERATION 2




Loosen the drain plug (1) on the bottom of the filter to drain any water.

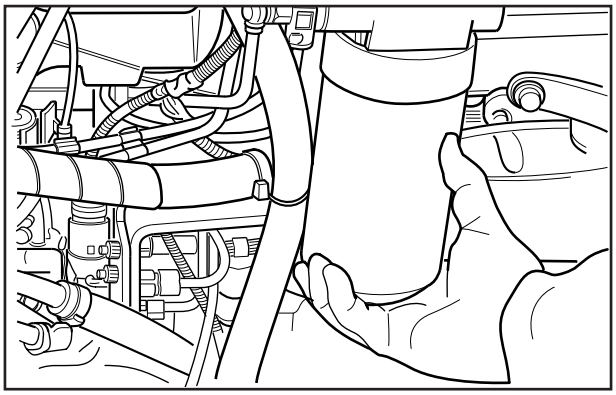
OPERATION 3



Use a filter wrench to remove the filter.

*IMPORTANT: Dispose of filter in accordance with local regulations. DO NOT drain fuel onto the ground, into a drain or into a container that can leak. Be responsible for the environment.*

OPERATION 4



Put clean oil or grease on the filter gasket of the new filter before installing.

Install the filter by hand. Turn the filter until the gasket contacts the filter head then turn a further 1/2 turn.

*IMPORTANT: DO NOT fill the new filter with fuel before installing.*

*IMPORTANT: Only use as original fuel filter. These filters have been specifically designed to provide superior engine protection.*

OPERATION 5

Fill the fuel tank and remove air from the fuel system. See Fuel System Air Removal on the following pages.

*IMPORTANT: DO NOT crank the engine before removing all the air from the fuel system or the fuel injection pump can be damaged.*

***WARNING: Engine fuel is flammable and can cause a fire or an explosion. DO NOT fill the fuel tank or service the fuel system near an naked flame, welding, burning cigars, cigarettes etc. [4.1.l]***

## 500 HOUR MAIN SERVICE

## Change Fuel/Water Separator Filter Element - Mechanical engine X60.20-X60.30-X60.40

The following operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.

***WARNING: Always use specific personal safety devices for each operation.***
***If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".***
***Beware of burns caused by hot water and engine parts. [4.1.n]***

OPERATION 1

Clean the filter head, filter and engine area next to the filter before removing the filter.

OPERATION 2

Loosen the drain plug (1) on the bottom of the filter to drain any water.

OPERATION 3

Remove the filter.

*IMPORTANT: Dispose of filter in accordance with local regulations. DO NOT drain fuel onto the ground, into a drain or into a container that can leak. Be responsible for the environment.*

OPERATION 4

Put clean oil or grease on the filter gasket of the new filter canister before installing.

Install and tighten the new filter.

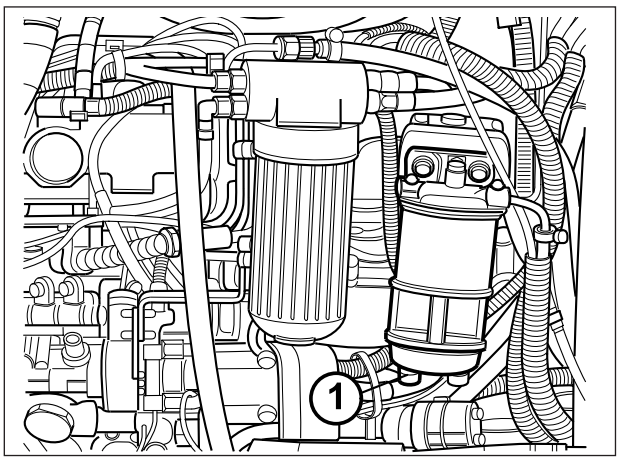
*IMPORTANT: DO NOT fill the new filter with fuel before installing.*

*IMPORTANT: Only use as original fuel filter. These filters have been specifically designed to provide superior engine protection.*

OPERATION 5

Fill the fuel tank and remove air from the fuel system. See following pages.

*IMPORTANT: DO NOT crank the engine before removing all the air from the fuel system or the fuel injection pump can be damaged.*




***WARNING: Engine fuel is flammable and can cause a fire or an explosion. DO NOT fill the fuel tank or service the fuel system near an naked flame, welding, burning cigars, cigarettes etc. [4.1.l]***

Mechanical engine
Mod. X60.20-X60.30-X60.40

On Mod.X60.20-X60.30-X60.40 tractors no air removing should be necessary as there is an electric pump which automatically operates and is controlled by the electronic control module.

Turn the keyswitch to the ON position, BUT DO NOT START THE ENGINE. The electric pump will run and purge air from the system. Keep the key in this position for approximately 60 seconds. After 60 seconds start the engine and check for leaks.

## 500 HOUR MAIN SERVICE

### To change the fuel filters - Electronic engine Mod. X60.50

**During running-in, the fuel filters should be changed for the first two times after every 50 hours. Afterwards, replace the fuel filter cartridges every 500 hours.**

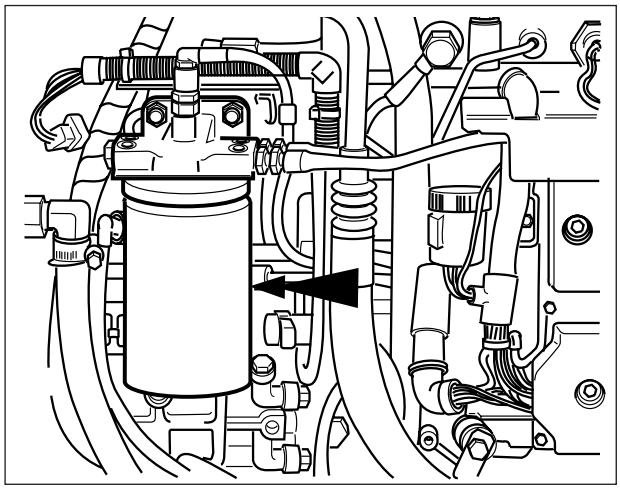
*NOTE: Filter positions may vary according to tractor model.*

The following operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.

***WARNING: Always use specific personal safety devices for each operation.***
***If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".***
***Beware of burns caused by hot water and engine parts. [4.1.n]***

OPERATION 1

Clean the filter head, filter and engine area next to the filter before removing the filter.



*NOTE: Mod.X60.50 fuel filters are note equipped with a drain plug. The drain plug is located on the bottom of the fuel/water separator.*

OPERATION 2

Use a filter wrench to remove the filter.

*IMPORTANT: Dispose of filter in accordance with local regulations. DO NOT drain fuel onto the ground, into a drain or into a container that can leak. Be responsible for the environment.*

OPERATION 3

Put clean oil or grease on the filter gasket of the new filter before installing.

Install the filter by hand. Turn the filter until the gasket contacts the filter head then turn a further 1/2 turn.

*IMPORTANT: DO NOT fill the new filter with fuel before installing.*

*IMPORTANT: Only use as original fuel filter. These filters have been specifically designed to provide superior engine protection.*

OPERATION 4

Fill the fuel tank and remove air from the fuel system. See Fuel System Air Removal on the following pages.

*IMPORTANT: DO NOT crank the engine before removing all the air from the fuel system or the fuel injection pump can be damaged.*

***WARNING: Engine fuel is flammable and can cause a fire or an explosion. DO NOT fill the fuel tank or service the fuel system near an naked flame, welding, burning cigars, cigarettes etc. [4.1.l]***

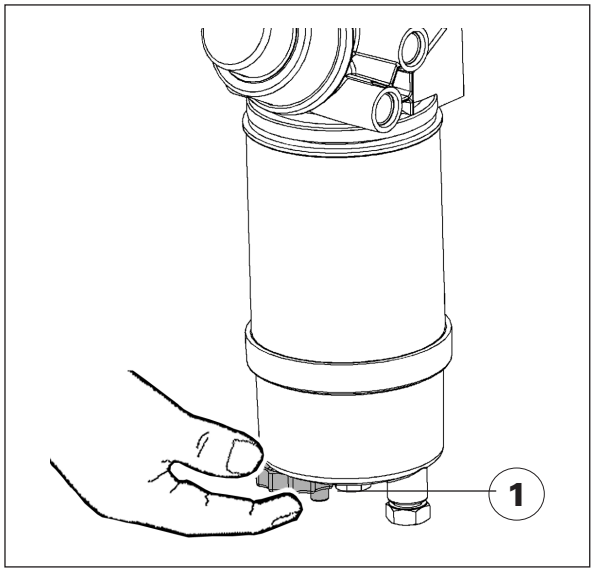
## 500 HOUR MAIN SERVICE

### Change Fuel/Water Separator Filter Element - Electronic engine X60.50

The following operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.

***WARNING: Always use specific personal safety devices for each operation.***
***If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".***
***Beware of burns caused by hot water and engine parts. [4.1.n]***

OPERATION 1
Clean the filter head, filter and engine area next to the filter before removing the filter.




OPERATION 2
Loosen the drain plug (1) on the bottom of the filter to drain any water into a suitable container.

OPERATION 3
Support the filter and remove the retaining screw. Lower the bottom glass bowl and element (2). Remove the element from the glass bowl and discard.

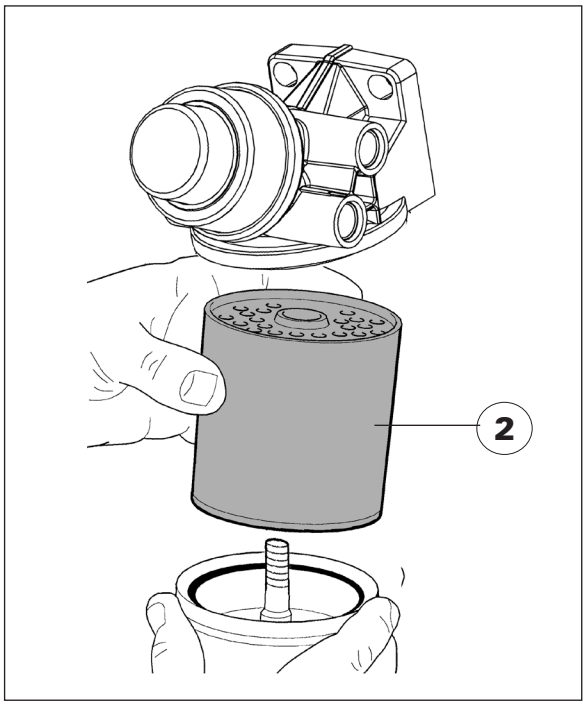
*IMPORTANT: Dispose of filter in accordance with local regulations. DO NOT drain fuel onto the ground, into a drain or into a container that can leak. Be responsible for the environment.*

OPERATION 4
Clean the inside of the filter housing and install new seals/"O" rings. Lubricate with clean fuel.

OPERATION 5
Install the filter element into the glass bowl and assemble into the filter head.

*NOTE: Make sure the element is installed in the centre against the seal in the filter head.*

*IMPORTANT: Only use as original fuel filter. These filters have been specifically designed to provide superior engine protection.*




OPERATION 6
Install the retaining screw. DO NOT over tighten.

OPERATION 7
Fill the fuel tank and remove air from the fuel system. See following pages.

*IMPORTANT: DO NOT crank the engine before removing all the air from the fuel system or the fuel injection pump can be damaged.*

***WARNING: Engine fuel is flammable and can cause a fire or an explosion. DO NOT fill the fuel tank or service the fuel system near an naked flame, welding, burning cigars, cigarettes etc. [4.1.l]***

## 500 HOUR MAIN SERVICE

## Remove Air From Fuel System - Electronic engine X60.50

Air can enter the fuel system in the following situations:

A. If the fuel tank becomes empty or is low on fuel.

B. After fuel system parts have been removed for service or repairs.

C. If the tractor has been in a garage for a long period of time.

**IMPORTANT:** *DO NOT crank the engine before removing all the air from the fuel system or the fuel injection pump can be damaged.*

***WARNING: If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet". Two persons are required to carry out this operation safely.***

Shift the gear to neutral and engage the parking brake.

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and engine parts. [4.1.n]***

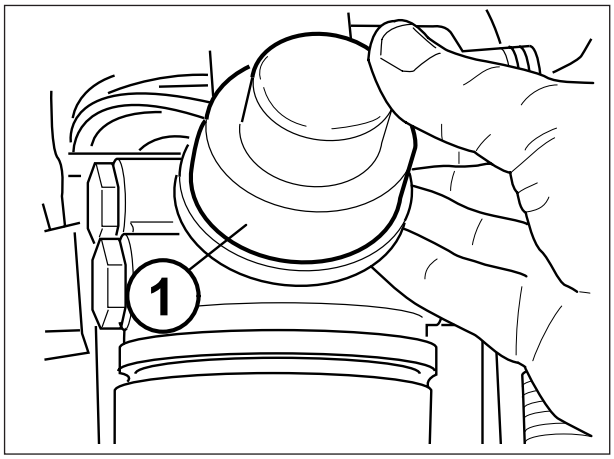
Mod.X60.50

On Mod.X60.50 tractors use the following procedure to remove air from the fuel system.

OPERATION 1

Make sure there is fuel in the tank.
Turn the key switch to ON to energize the cut off solenoid.

OPERATION 2




Operate the hand primer pump (1) until pressure is felt against the pump.

OPERATION 3

Start the engine and check for fuel leaks around the filter, the fuel lines and fittings.

If the engine fails to start operate the hand primer pump again. If the engine still fails to start see your dealer.

***WARNING: Never start the engine in a closed building. Proper ventilation is required under all circumstances.***

## 500 HOUR MAIN SERVICE

### Check function of the operator presence switch

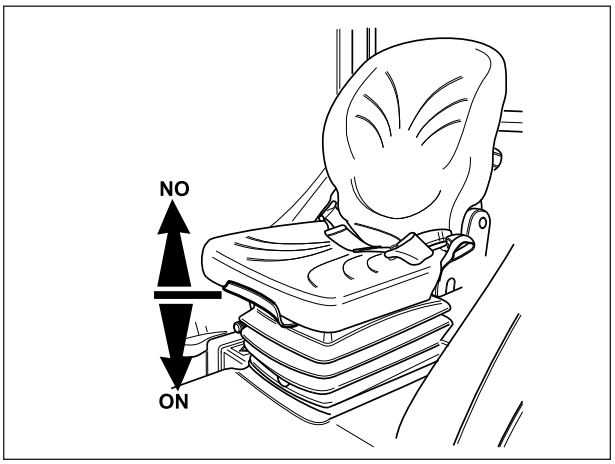
Check the switch for correct function every 500 hours of operation or at least once annually. When doing the following checks, do so in a clear open area with no other persons or objects near the tractor:

OPERATION 1
Engage the parking brake and a gear. Get up from the seat: the buzzer should sound.

OPERATION 2
While sitting on the operator's seat, with the engine running at low idle speed, and the F-N-R lever in NEUTRAL, without engaging the parking brake, engage the 1st gear and the slow range, and release the clutch pedal. Stand up out of the operator's seat while holding onto the steering wheel and move the F-N-R lever from NEUTRAL to either FORWARD or REVERSE. The buzzer sounds and the indicators N (neutral) and the forward or reverse arrow blink on the instrument cluster. The tractor MUST NOT move. If the tractor moves, see your dealer for repair.

OPERATION 3
While sitting on the operator's seat, with the engine running at low idle speed, put the F-N-R lever in FORWARD, the transmission in 1st gear and slow range range and release the clutch pedal to start the tractor moving. The tractor should start slowly. Stand up out of the operator's seat while holding onto the steering wheel, and move the FNR lever out of the FORWARD position into the REVERSE position. The buzzer sounds and the indicator N (neutral) blinks on the instrument cluster. The tractor MUST stop (default to Neutral). If the tractor does not default to Neutral, see your dealer immediately for repair.

***IMPORTANT: DO NOT bypass the operator presence circuit. Otherwise the situation can be risky both for the operator and the people near the tractor.***
***If the operator presence switch circuit is bypassed, the electronic system will sense the change and transmit the error code. The exclamation point in the instrument cluster will light up. The circuit must be enabled in any case.***



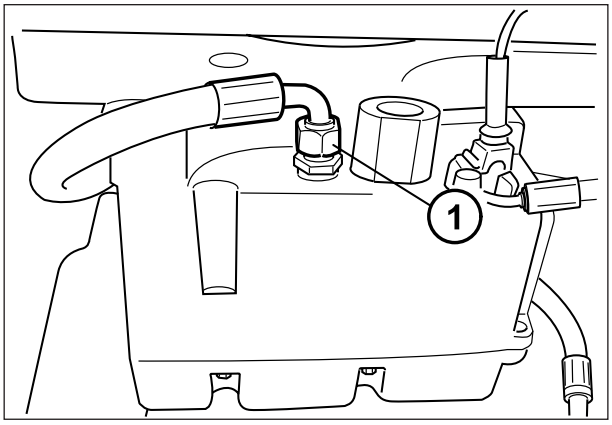

***WARNING: Always use specific personal safety devices for each operation.***

## 500 HOUR MAIN SERVICE

***CAUTION: If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".***
***WARNING: Always use specific personal safety devices for each operation.***
***WARNING: Maintenance operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.***
***WARNING: Beware of burns caused by hot tractor and engine parts. [4.1.n]***

### Change front PTO oil and clean the oil filter

OPERATION 1



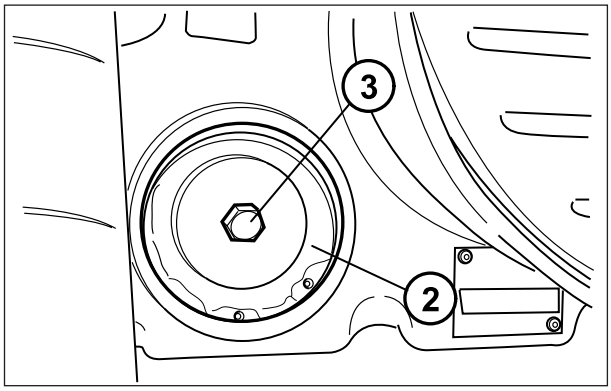

Put the tractor on level ground.

Remove the hose (1) and allow the oil to drain into a suitable container.

For best results drain the oil after operation when the oil is warm. Once the oil has completely drained re-attach the hose.

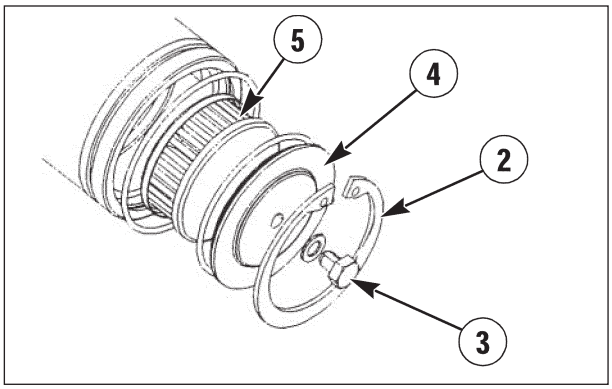
*IMPORTANT: Dispose of oil in accordance with local regulations. DO NOT DRAIN THE OIL ON THE GROUND OR INTO A DRAIN. Be responsible for the environment.*

OPERATION 2




Remove the circlip (2) and loosen the bolt (3).

OPERATION 3

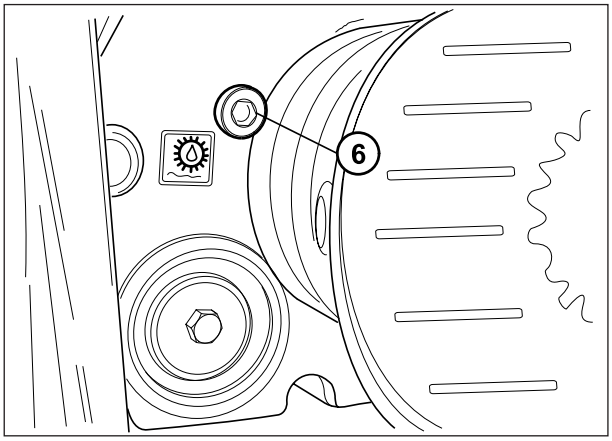



Remove the pump cover (4). Remove the oil filter (5) from the pump unit and clean the filter.

OPERATION 4

Install the clean oil filter, the pump cover (4) and tighten the bolt (3). Install the circlip (2).

OPERATION 5




Add the recommended oil type through the fill/level plug hole (6) until the oil is level with the bottom edge of the hole.

Wait approximately 5 minutes. Check the oil level again and add oil as necessary. Install the fill/level plug.

## 500 HOUR MAIN SERVICE

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

***WARNING: If the locking latches do not engage correctly thecable and/or the lift rods may need adjustment. Seeyour dealer to allow for necessary adjustments tobe carried out.***

### Check/adjustment of the auto hitch (if equipped)

As necessary or at least every 500 hours check the operation of the auto hitch and make sure the locking latches (1) engage and the hitch is operating correctly.

OPERATION 1
Attach the loaded trailer to the auto hitch.

OPERATION 2
Raise the three-point linkage to maximum height. The locking latches should snap into lock when the hitch reaches its maximum height.

***WARNING: When checking the operation of the auto hitch, stay well clear of moving parts or injury can result.***

***WARNING: Never run the engine in a closed building. Proper ventilation is required under all circumstances.***

If the locking latches do not engage correctly, uniformly adjust both lift rods as follows:

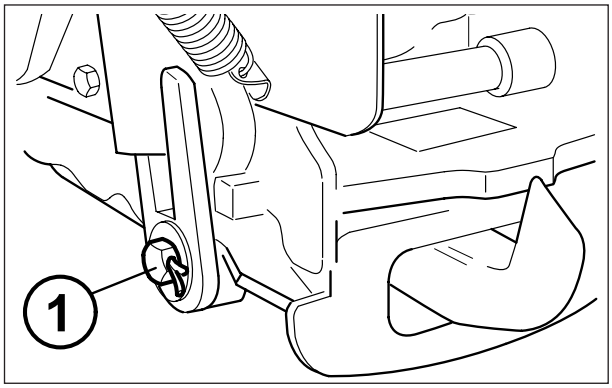
OPERATION 3
Unlatch the loaded trailer.

OPERATION 4
Raise the three-point linkage to maximum height.

IMPORTANT: Make sure the links are at max. height before adjusting the lift rods.

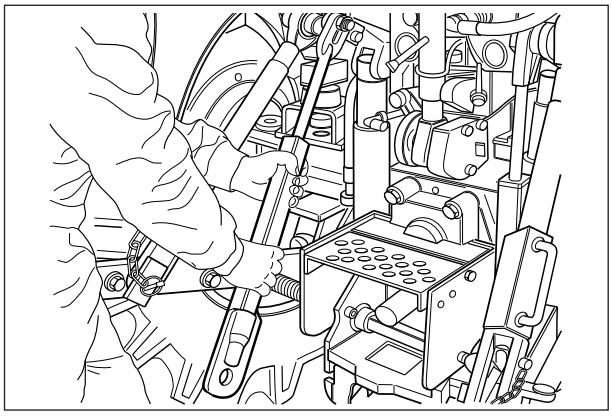
OPERATION 5
Place all controls on the NEUTRAL position.
Stop the engine and remove the key from the key switch.

OPERATION 6




Remove the split pin (1) and remove the lift rod at the lower end.

OPERATION 7



Turn the lift rod to the right to make it sorter, to the left to make it longer.

OPERATION 8
Attach the lift rod again and apply the split pin.

OPERATION 9
Perform operations 1 to 3 to check that the lift rod are adjusted by the same amount and that the locking latches engage correctly.

*IMPORTANT: If the lift rods are adjusted too precisely, the hydraulic system of the tractor operates under a constant pressure, with the risk of being damaged.*

## 1000 HOUR MAIN SERVICE

### Anti-freeze in engine cooling system

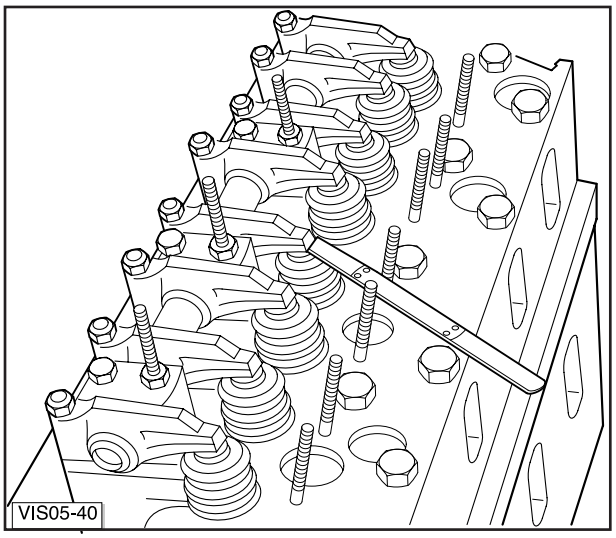
Once a year, before winter, check the anti-freeze fluid in the engine cooling system.
See the procedure to check the engine coolant level and the precautions against frost under service operations at 10 hours or daily.

**WARNING: To open the bonnet, follow the procedure indicated under "How to open the bonnet".**

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and engine parts. [4.1.n]***

### Engine valves

Have the tappet and valve gaps checked by your Dealer's authorized personnel.

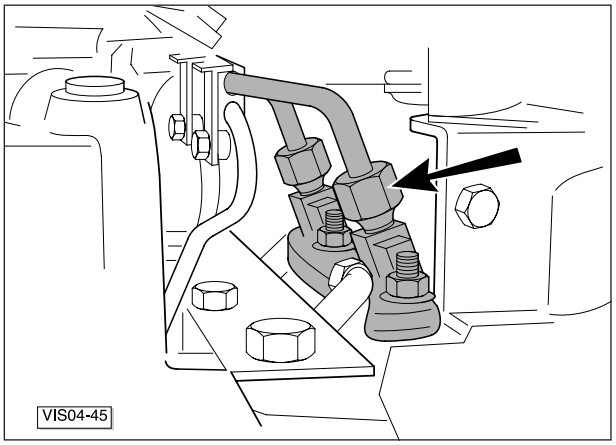



### Injectors and fuel system

Have these checked by your Dealer's specialized personnel.

**NOTE:** *Thoroughly clean the area in which you must work before loosening or disconnecting any part of the injection system.*

**NOTE:** *Place covers on all the tubes and injector orifices to prevent dirt from penetrating.*




### Check condition of fuel injectors

The fuel injectors must not be cleaned. New injectors must be fitted by your dealer if there is damage or a fault occurs as listed below:
- Engine will not start or is difficult to start.
- Not enough power.
- Engine misfires or runs erratically.
- High fuel consumption.
- Black exhaust smoke.
- Engine knocks or vibrates.
- Excessive engine temperature.

## 1000 HOUR MAIN SERVICE

### Oil changes for the transmission, steering circuit and power lift hydraulic circuit, rear final drives.

**NOTE:** *It is advisable to change the oil for the first time after 500 hours. After this, change the oil after every 1000 hours service.*

Transmission housing

1 - Lower the lift arms to the ground.

2 - Remove the plug (2).

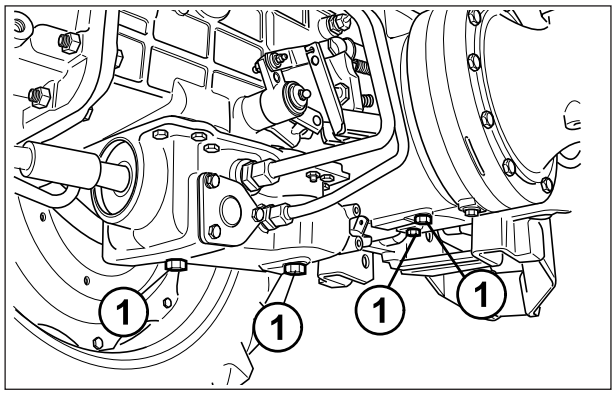
3 - Place vessels under all seven drain plugs to collect the oil as it drains out.

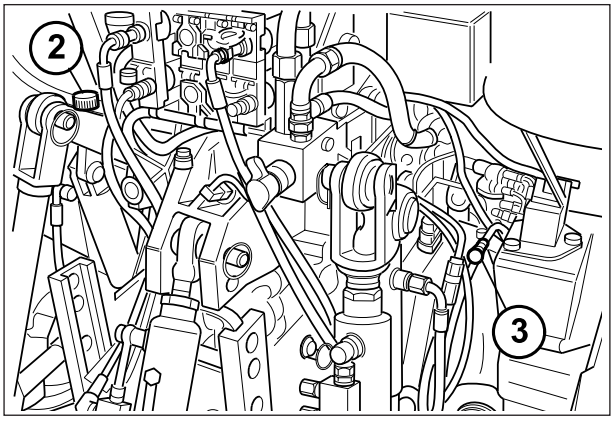
4 - Remove the plugs under transmission housing and drain out the oil.
Remove the plug (4) from the right-hand and left-hand rear final drives to drain out all oil.

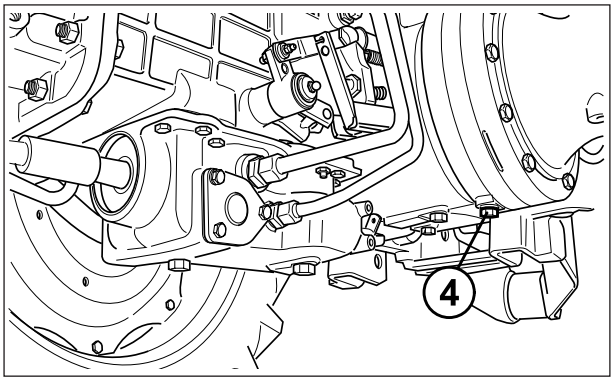
5 - Fit the drain plugs back in place, then pour oil of the approved type into the transmission until the correct level has been reached (3).

**NOTE:** *Let the oil stabilize before checking its level.*

***WARNING: See the Lubricants and Fuels chart for the type of oil to be used according to the transmission type.***



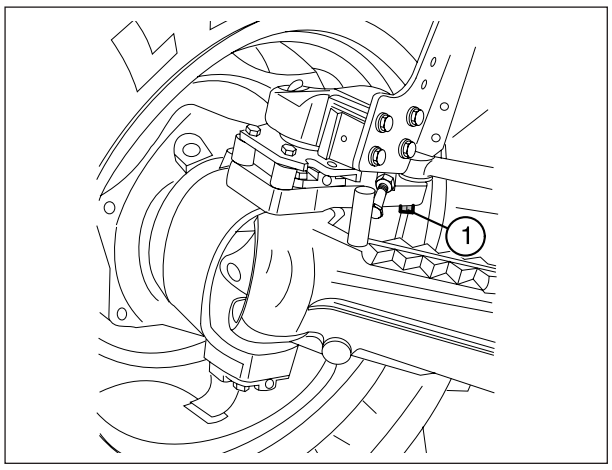




***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

### 4WD steering cylinder knuckle joints

Have the knuckle joint nuts (1) checked by an authorized service center after the first 50 hours and then after every 1000 hours service.



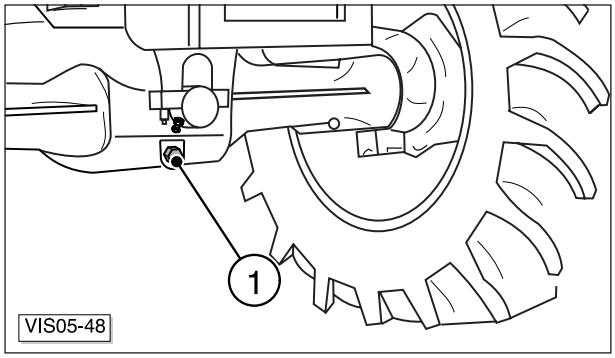
## 1000 HOUR MAIN SERVICE

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

### Oil changes in 4WD front axle

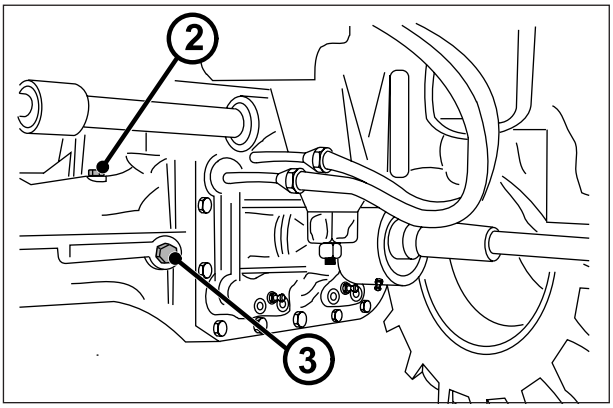
Axle housing

Place a vessel under the plug (1), Remove the plug and drain out all oil.




### Oil filling in 4WD front axle

**NOTE:** *See the Lubricants and Fuels chart for the correct type of oil.*




Front axle housing

Fit the plug (1) back when no more oil is coming out and fill up with fresh oil through the filler (2) up to the level of the plug (3).

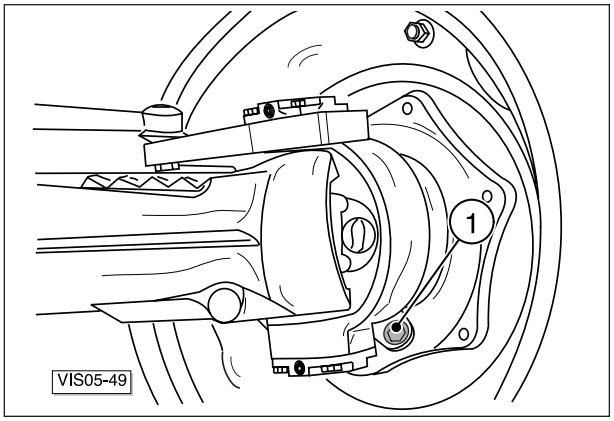
Wait for the oile to stabilize before checking the level. Top up if necessary.

Fit the plugs back (1,2 and 3).

### Oil changes in 4WD final drive

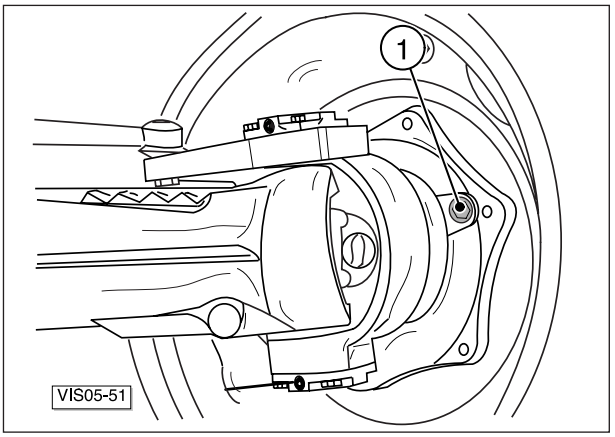
Front side final drives

Position the final drive plugs (1) downward. Place a vessel under each final drive plug (1) (one for each final drive). Remove the plugs and drain out all oil.




### Oil filling in 4WD front axle

**NOTE:** *See the Lubricants and Fuels chart for the correct type of oil.*



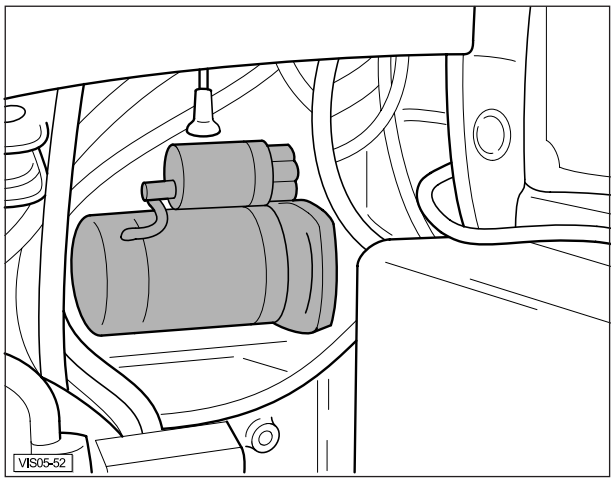

Front side final drives

Position the plugs (1) on the wheel center line. Fill up with oil of the specified type to the level of the holes.
Wait for the oile to stabilize before checking the level. Top up if necessary. Fit the plugs back (1).

## 1000 HOUR MAIN SERVICE

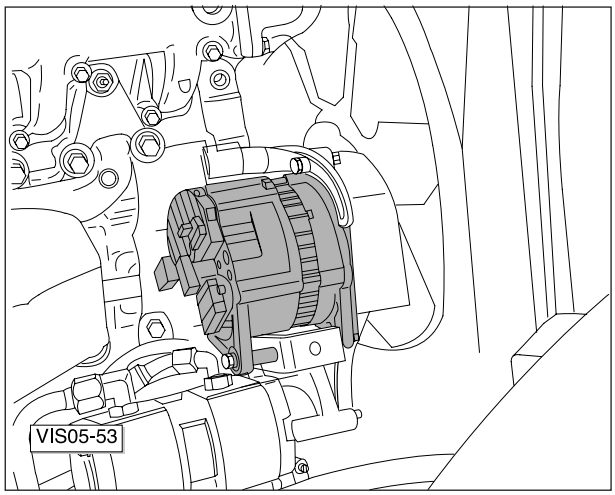
***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

**Starter motor** The starter motor (1) should be thoroughly cleaned at least once a year. Particularly check the condition of the brushes and collector.




### Alternator

Have the condition and operation of the alternator checked by a specialized workshop.



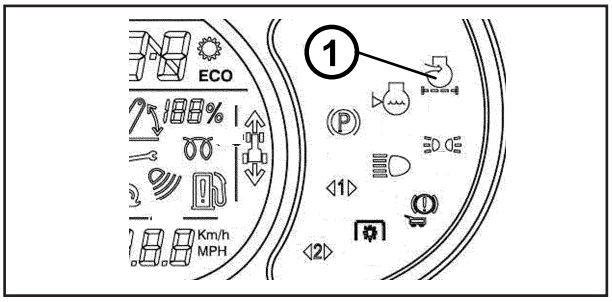
## 1000 HOUR MAIN SERVICE

### Check engine air induction system

Check all hoses for damage and that hose clamps are tight, correct torque = 3.4 Nm.

#### Filter restriction indicator lamp

When the air filter restriction indicator lamp (1) on the instrument cluster illuminates, the primary (outer) filter element needs cleaning. Service the element after the day's work is completed.




*NOTE: If the air filter restriction indicator lamp* illuminates after the primary filter has been serviced, check the following possible causes:*

*A. Secondary (inner) element is dirty.*
*B. Grille screen is dirty.*

*NOTE: If the service lamp of the air filter illuminates and the intake system is clean, you should ask your dealer to check the operation of the transmitter to the restriction indicator lamp.*

***WARNING: Before cleaning the filter with compressed air, wear individual protections, in particular goggles and a mask to protect your airways.***

*IMPORTANT: Dispose of filters correctly in accordance with local regulations. Be responsible for the environment.*

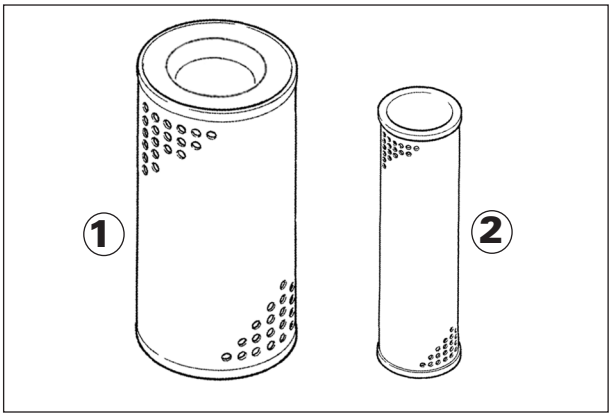
***WARNING: Always stop the engine and remove the ignition key before removing the filter elements.***

The primary (outer) filter is a high capacity filter designed to provide optimum protection to the engine.

The primary filter can be cleaned as required between filter changes.

The secondary (inner) filter gives extra protection to the engine if there is damage to the primary filter.

*IMPORTANT: THE SECONDARY (INNER) FILTER MUST NOT BE CLEANED. REPLACE THE FILTER IF DAMAGED OR DIRTY, OR AT THE THIRD CLEANING OF THE PRIMARY FILTER.*




1. PRIMARY (OUTER) FILTER ELEMENT
2. SECONDARY (INNER) FILTER ELEMENT

*IMPORTANT: Only use approved air filters, these filters have been specifically designed to provide superior engine protection.*

## 1000 HOUR MAIN SERVICE

***CAUTION: If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".***
***WARNING: Always use specific personal safety devices for each operation.***
***WARNING: Maintenance operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.***
***WARNING: Beware of burns caused by hot tractor and engine parts. [4.1.n]***

### Engine air filter service

OPERATION 1

Pull out the yellow tab (1), turn the cover (2) anti-clockwise and remove.

OPERATION 2

Pull out the primary (outer) filter element (3).

OPERATION 3

Pull out the secondary (inner) filter element (4), if it has to be changed.

*IMPORTANT: DO NOT remove the secondary (inner) element unless it has to be changed.*

OPERATION 4

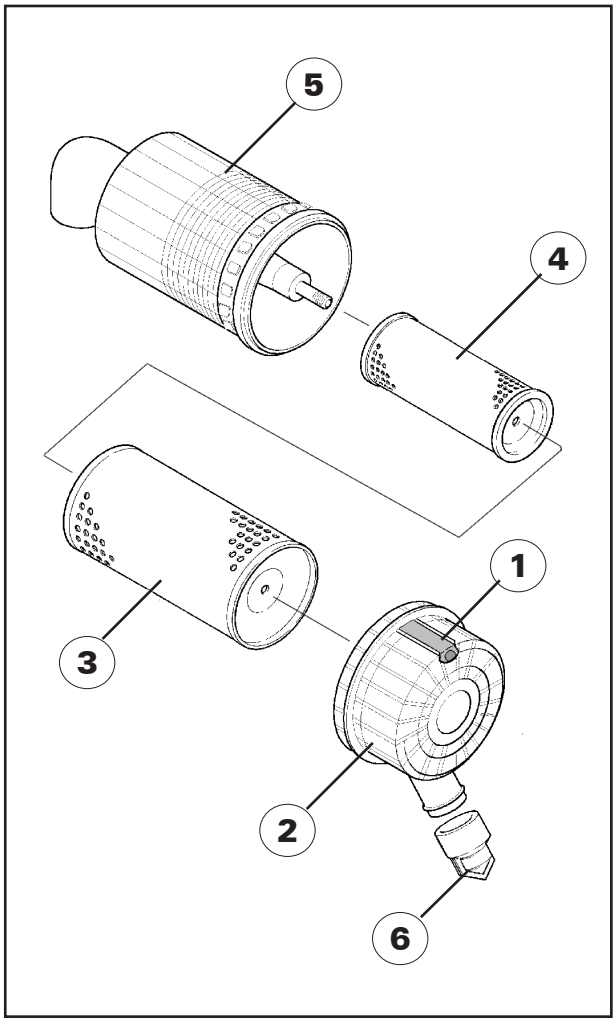
Clean the inside of the filter body (5).

*IMPORTANT: Dispose of filters correctly in accordance with local regulations. Be responsible for the environment.*

OPERATION 5

Install a new secondary (inner) element (4), if necessary or after the third cleaning of the primary filter (3). Apply talcum powder or similar to the inner seal face before installing the filter. Install with closed end outwards.

*NOTE: NEVER use a petroleum base lubricant on the seal area. Petroleum lubricant could "glue" the cover to the element seal and damage the element.*



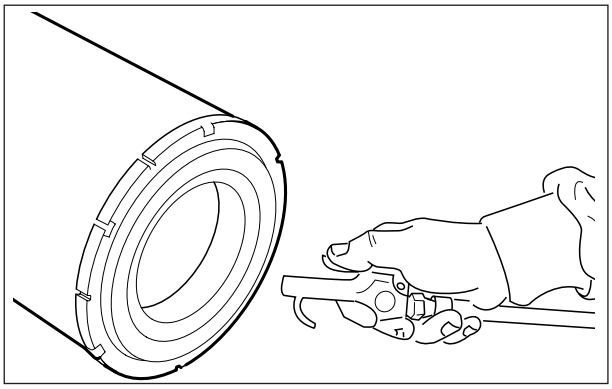

*IMPORTANT: A new rubber dust valve MUST be installed every 1000 hours.*

**WARNING: The internal filter element must not be replaced. NEVER attempt to clean the internal safety element.**

## 1000 HOUR MAIN SERVICE

***WARNING: Before cleaning the filter with compressed air, wear individual protections, in particular goggles and a mask to protect your airways.***

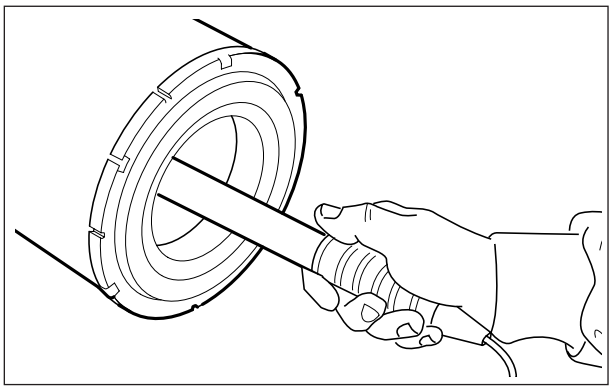
OPERATION 6



If most of the dirt is dry, clean the primary element with compressed air from the inside of the element to the outside.
Keep the air nozzle approximately 130 mm (5 inches) away from the element and move the nozzle up and down while turning the element.

*IMPORTANT: The air pressure must not be more than 207 kPa, 2 bar (30 psi). Use an air hose with a safety ON/OFF control nozzle and always wear face protection.*

OPERATION 7



To check that the clean element is not damaged or perforated, insert a light into the element and turn the element Visually check the rubber gasket for damage. Check the metal cover and filter material for damage. Replace an element that is damaged.

*IMPORTANT: Do not run the engine with the filters removed.*

OPERATION 8

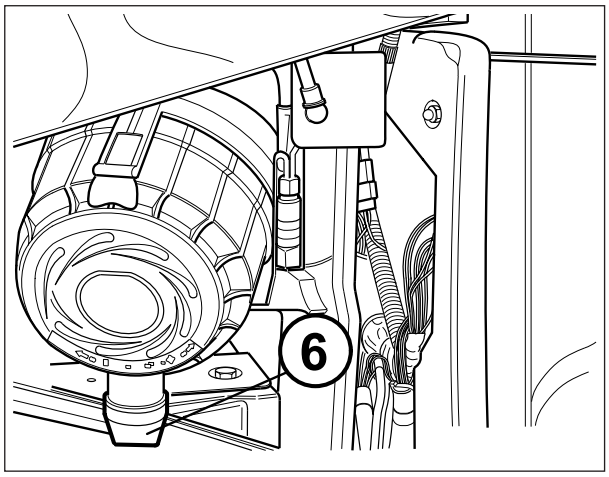
Before installing the primary (outer) element, apply talcum powder or similar to the inner seal face before installing the filter. Install with closed end outwards. Install the primary (outer) element, closed end outwards.

*NOTE: NEVER use a petroleum base lubricant on the seal area. Petroleum lubricant could "glue" the cover to the element seal and damage the element.*

OPERATION 9

Install the air filter cover, turn it clockwise and push on the tab to lock the cover in its position.

OPERATION 10




Replace the rubber dust guard (6) (if equipped).

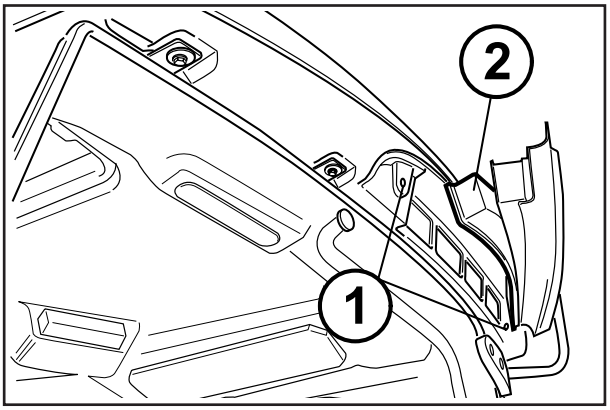
## 1000 HOUR MAIN SERVICE

### Change cab air intake filter

***WARNING: Respiratory protection equipment and protective clothing appropriate to the environment that the filter has been in contact with MUST be used during the cleaning of the filter.***

### Deluxe cab

OPERATION 1




Remove both knobs (1) fixing the cover.

Remove the filter (2) and clean the filter housing.

*IMPORTANT: The old filter MUST be put into a sealed container and disposed of in accordance with local regulations. Be responsible for the environment.*

OPERATION 2

Install the new filter.
Close the cover and fix it with the knobs.

*NOTE: Replace the filter only with original spare parts.*

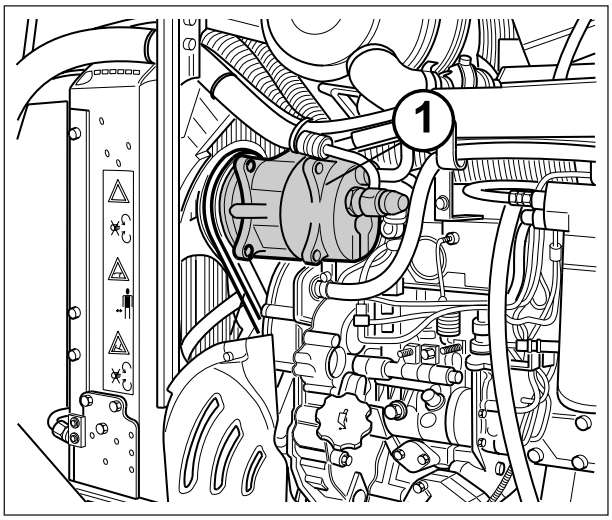
***WARNING: See the procedure to check and clean the cab air intake filter under service operations at 100 hours, the notes for the correct use of the cab filters, and the precautions when using dangerous chemicals.***

### Cab doors

Grease door locks and hinges

### AC Compressor

Have the air conditioning system operation checked. Also check the lubricating oil level in the compressor (1).




**WARNING: To open the bonnet, follow the procedure indicated under "How to open the bonnet".**

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and engine parts. [4.1.n]***

## 2000 HOUR MAIN SERVICE

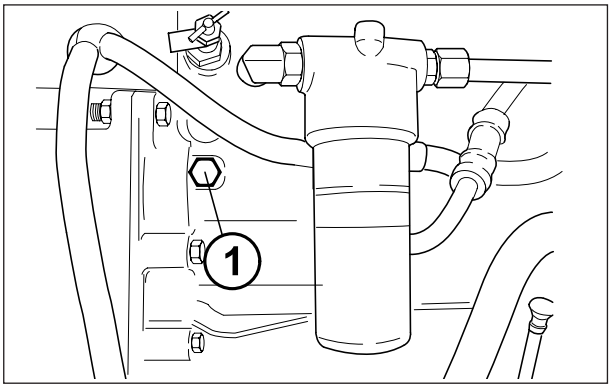
***CAUTION: If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".***
***WARNING: Always use specific personal safety devices for each operation.***
***WARNING: Maintenance operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.***
***WARNING: Beware of burns caused by hot tractor and engine parts. [4.1.n]***

### Engine coolant change

OPERATION 1
Remove the radiator cap slowly (2).

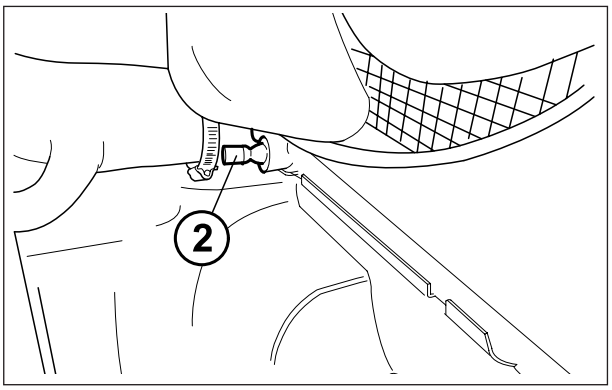
***WARNING: Hot coolant can spray out if the coolant recovery reservoir cap or radiator cap is removed while system is still hot. DO NOT REMOVE THE RADIATOR CAP. To remove the coolant recovery reservoir cap or radiator cap, let system cool, turn cap to first notch, then wait until all pressure is released. Scalding can result from fast removal of radiator cap.***

OPERATION 2

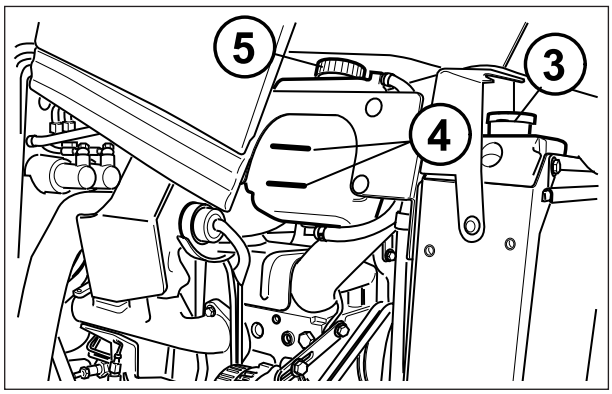



Put a suitable container under the engine block drain plug (1) and remove plug.

OPERATION 3




Put a hose on the radiator drain valve (2) and open the valve (if equipped). Drain coolant into a suitable container. Otherwise, remove the bottom tube from the radiator and connect a hose to drain the coolant into a suitable vessel.




*IMPORTANT: Dispose of drained coolant responsibly. DO NOT pour on the ground or into a drain. Be responsible for the environment.*

OPERATION 4
Close the radiator drain valve (2) (or fit the removed tube back on again) and install the drain plug (1) when the system is empty.
OPERATION 5
Use a good quality radiator cleaner and fill the system. Follow the instructions given with the radiator cleaner to clean the system.
OPERATION 6
Remove the engine block drain plug and open the radiator drain valve (or remove the tube from the bottom). Flush the system with clean water to remove the radiator cleaner solution.

*IMPORTANT: Allow cleaning solution to drain into suitable vessels. Dispose of the cleaning solution responsibly. DO NOT pour on the ground or into a drain. Be responsible for the environment.*

OPERATION 7
Inspect the hoses and fittings for damage and leaks.
OPERATION 8
Install the engine block drain plug, close radiator drain valve (or fit the removed tube back on again) and remove the drain hose.
OPERATION 9
Fill the radiator and coolant recovery reservoir using the following procedure.
- Fit back the plugs 3 and 5.
- Start the engine and run at low idle for approximately 10 minutes.
- Stop the engine and check the coolant level.

Top up, if required, to the MAX mark on the reservoir (4).

## 2000 HOUR MAIN SERVICE

### Precautions against freezing temperatures

The system is filled with a mixture of water and antifreeze. Add the proportion of antifreeze given in the following table.

| Degrees C° | - 8° | - 15° | - 25° | - 35° |
|---|---|---|---|---|
| Percentage of antifreeze per volume % | 20 | 30 | 40 | 50 |

This mixture can be permanently maintained in the circuit for 1 year so long as you have not totalized 1000 hours service during this period. In this case, the mixture must be changed.

Flush out the system whenever you change from using pure water to antifreeze mixtures and vice versa.

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and engine parts. [4.1.n]***

### Fuel system general inspection

Every 2000 hours of operation see your Dealer for an inspection of the fuel system and fuel injection nozzles. Moreover, have the engine checked for tuning-up.

To prevent dirt or water from reaching the injection parts and causing damage and decreased performance, use clean fuel, keep the fuel tank full, drain any water from the fuel primary filter at regular intervals and service the filters.

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot water and engine parts. [4.1.n]***

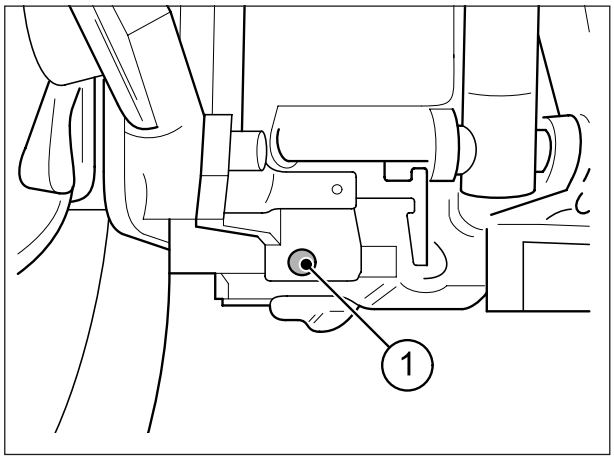
## 2000 HOUR MAIN SERVICE

### Fuel tank

The fuel tank is cleaned by removing the plug (1).

**NOTE :** *Drain off the sludge when the tank is almost empty and only after having placed a suitable vessel under the drain plug.*

*NOTE: Air in the fuel circuit makes it difficult to start the engine. If needed, bleed the circuit as described under fuel filter service in this section.*




***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

## GENERAL MAINTENANCE

***CAUTION: If you need to open the bonnet, follow the procedure indicated under "How to open the bonnet".***
***WARNING: Always use specific personal safety devices for each operation.***
***WARNING: Maintenance operations must be carried out with the engine off. Check that the gear and the parking brake are both engaged and that the ignition key has been removed.***
***WARNING: Beware of burns caused by hot tractor and engine parts. [4.1.n]***

### Brakes

### Bleeding the air from the rear brake circuit

It becomes necessary to bleed the circuit when air enters owing to lack of oil in the relative reservoir or when the brake system is serviced.
This operation should be carried out by specialized personnel. If, however, you decide to do it yourself, proceed in the following way.

1 - Make sure that the reservoir (1) is full.

2 - Thoroughly clean the area around the bleed screw.

3 - Fully depress the left-hand brake pedal.
Meanwhile, unscrew the bleed screw (2) a half-turn and allow any air and oil to flow out. Re-tighten the bleed screw and release the pedal.

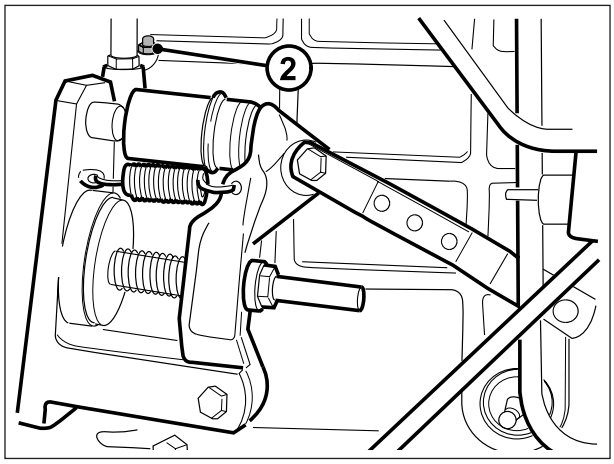
4 - Repeat this operation until bubble-free oil flows from the bleed screw.

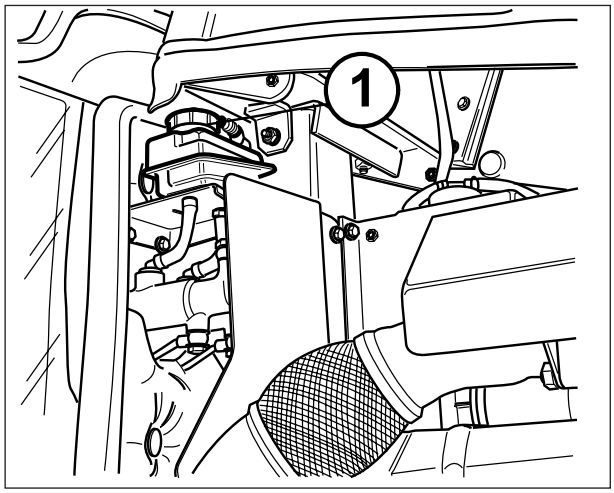
5 - Make sure that the clutch pedal travel is firm and not spongy.

6 - Carry out the operations described above for the right-hand brake pedal.

7 - On completion of bleeding, top up the fluid level in the reservoir (1).

**NOTE:** *Never reuse previously bled oil without having first filtered it.*




***WARNING: When changing or topping up the brake fluid in the reservoir (1), be absolutely sure to use the correct type of fluid as a mineral-based oil is used on these machines. Consult the Lubricant and Fuel chart for the oil type.***

***WARNING: The oil in the brake circuits has been studied to operate at a temperature of 100°C but only if not polluted by other substances, e.g. water in considerable quantities will turn into vapour and prevent the braking system from operating in the correct way. Take the necessary precautions to prevent water from penetrating into the system: protect the front axle and the components in the braking system when the tractor is washed; store oil in sheltered places where water cannot infiltrate. If you think that there is water in the braking system you must contact your dealer's specialized personnel and have it removed. In this case, the rear brake cylinders will have to be demounted and emptied and particularly the brake housing of the front axle which, being the lowest part of the system, is the one most exposed to this type of fault.***

## GENERAL MAINTENANCE

### Bleeding air from the front brake circuit

After having carefully carried out operations 1 to 7 to bleed the rear brakes, proceed in the following way:

1 - Depress both brake pedals at the same time. Use the special coupling lock to keep the pedals together. Unscrew the bleed screw (4) on the on-off valve (3) until bubble-free oil flows out.
Re-tighten the screw and release the pedals.

2 - Depress both pedals at the same time and slacken off the two bleed screws (5) at the rear of the central part of the front axle.
Repeat this operation until bubble-free oil flows out.

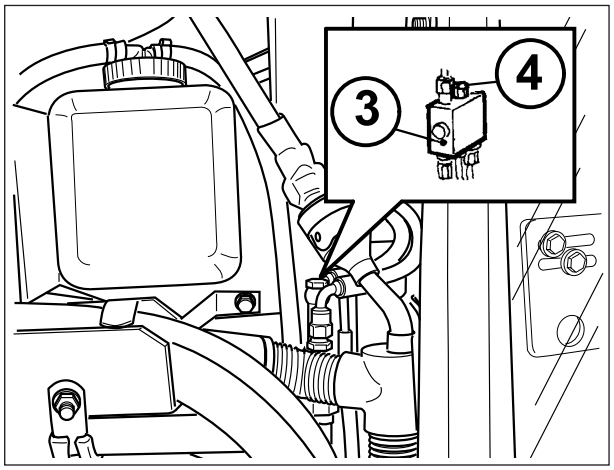
**NOTE:** *if the tractor is equipped with a valve for hydraulic trailer braking, it will also be necessary to bleed off any air in the piloting tube of this valve. A screw on the body of the valve allows this operation to be easily carried out.(6)*

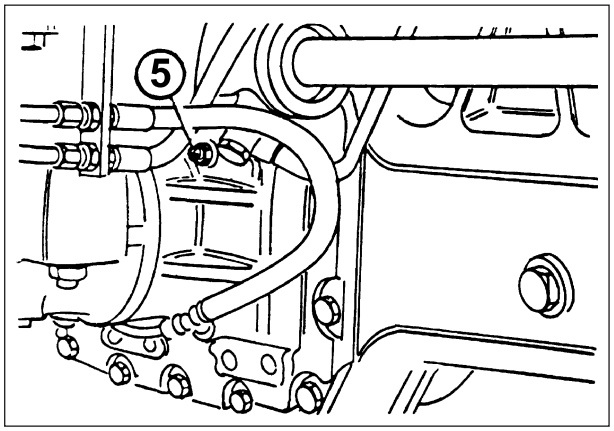
3 - Check free pedal travel and that the front brakes act at the same time. Do this by testing the action on the road.

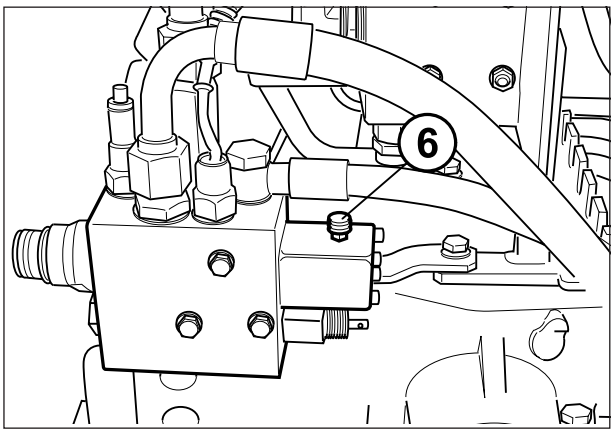
4 - After having done this, top up the level in the reservoir with oil of the prescribed type.

***WARNING: Always keep the brake pedals coupled for on-road driving in order to ensure simultaneous braking on both sides. Never use the brakes independently on public roads.***

***When working on slopes, avoid using the brakes as much as possible. Instead, select a lower gear and use engine braking.***




***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

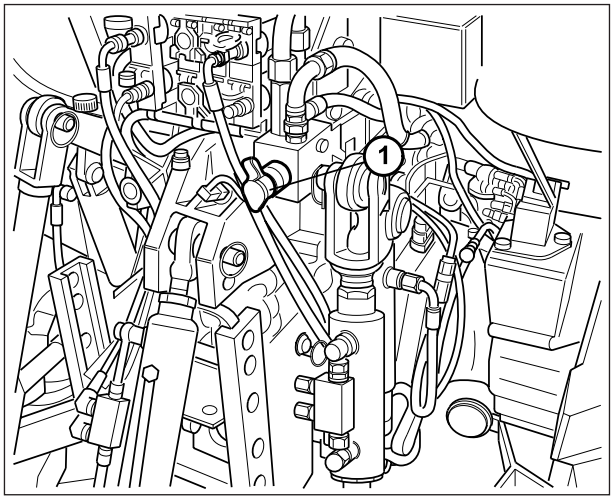
## GENERAL MAINTENANCE

### Hydraulic trailer brakes

To brake the trailer along with the tractor, the flexible tube of the trailer brakes must be connected to the fitting at the rear of the tractor (1). Always make sure that the two parts are clean before you connect them, to ensure that the various components operate in a perfect way.

***WARNING. Trailer brake approved for ITALY. When the tractor is operating, it is absolutely essential to engage the parking brake when either connecting or detaching the tube that links the tube of the trailer braking system to the quick coupling.***

**NOTE:** *Air may enter the hydraulic trailer brake circuit during normal servicing operations such as oil changes, cleaning of oil ducts. Air in the circuit leads to vibrations on the pedal when the brakes are used. Air can be easily bled from the circuit by pulling the parking brake lever and depressing the brake pedal several times.*




***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts. [4.1.n]***

## GENERAL MAINTENANCE

### Air conditioning system (if equipped)

***WARNING: Never attempt to open the air conditioning system. Liquid refrigerant can cause severe and painful frostbite. Contact your dealer, who is experienced in servicing and handling of refrigerants.***

## AIR CONDITIONED CAB

The cab can be fitted with an air conditioning system on request.

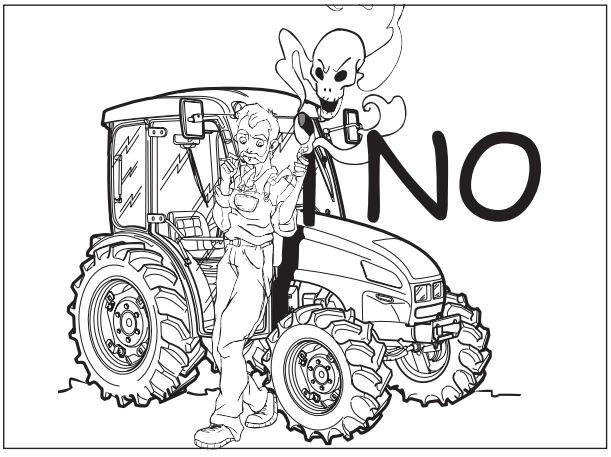
**WARNING: Always use specific personal safety devices for each operation.**

## SAFETY NOTES

The air conditioner is a safe system that is able to ensure lasting and risk-free use. However, it is important to comply with certain simple precautions (listed below) in order to prevent possible accidents.

- Never work on the conditioning system yourselves. Always contact the specialized technicians of the Assistance Service.

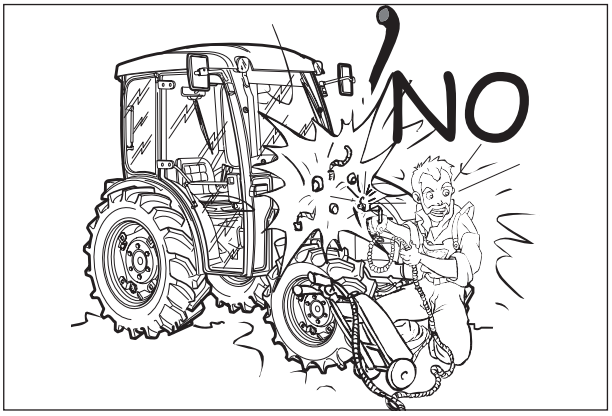

- Keep naked flames well away from the air conditioning system (Fig.5-59b) as leaking coolant could give rise to a deadly gas: phosgene.




- The mixture of oil and coolant in the air conditioning system is under pressure. Never ever loosen any unions or tamper with the pipes. For the same reason, you must never unscrew the compressor's oil level check plug.
- Coolant can freeze the skin and particularly the eyes. Proceed in the following way if accidents occur:

– if coolant has splashed into the eyes, wash them out immediately with a few drops of mineral oil, then continue to wash them with a solution of boric acid and water (one teaspoon of acid in 1/4 of a cup of water) and immediately seek medical help;
– areas frozen by coolant fluid can be treated by progressively warming the injured zone with cold water and then applying a greasy cream. However, always seek medical help if such accidents occur.

- Keep the air conditioning system well away from heat sources as explosions could occur.




### System check

The cab air conditioner is equipped with a system to protect the compressor from high or low refrigerant pressures.

Have your conditioning system checked once a year by specialised personnel at your Dealer's.

***DANGER: Always wear protective clothing in case of leaks. Coolant can injury the eyes. The coolant produces a toxic gas if it contacts a flame.***

# GENERAL MAINTENANCE

## PERIODICAL INSPECTIONS

At least once every three months:

– remove any foreign bodies from between the evaporator and condenser fins;

– check the tension of the compressor belt;

– allow the engine to run at a rate of 1500 rpm. In the meantime keep the dehydrator filter under observation: the glass should be clear, without air bubbles or white liquid.

– check the conditions of the pipes, unions and supporting brackets;

– make sure that the drain pipes are efficient and remove the condensation from the evaporator;

– make sure that the screws and fixing nuts of the pulleys and compressor are well tightened.

– Grease Door Locks and Hinges

## YEARLY MAINTENANCE

Have your Dealer's specialized personnel carry out the following operations at the beginning of the season:

– check the level of the oil in the compressor and top it up if necessary;

– make sure that the system is tight by means of a leak tester and top up the HFC 134a gas if necessary, or

– replace the dehydrator filter only if strictly necessary;

– carry out a functional test on the system.

If the conditioning system remains unused for a long period of time, it must be turned on for a few minutes each month to allow the oil to circulate around the circuit.

## GENERAL CAB MAINTENANCE (ALL VERSIONS)

After servicing the external parts of the cab, proceed with the following inspections:

1. Periodically check to make sure that no water has collected in the zones covered with mats or upholstery.
2. Protect the hinges and locks of the doors, sun roof and openable windows with water-repellent lubricating products.
3. Use special cleaning products to clean the windows, or sulphuric ether, if necessary.
4. Detach the windscreen wiper and sprinkle talcum on the rubber wiper.
5. Leave the doors or sun-roof partially open.

## CAB UPHOLSTERY

***CAUTION: Use water and a neutral detergent to clean the polyurethane cab upholstery or the specific products available on the market for cleaning car interiors. Any commercial product for car upholstery cleaning may be used.***
***Do NOT use any products deriving from hydrocarbons, ketonic or aromatic solvents, or cleaning spirits of any kind.***

## SPECIFICATIONS

Coolant fluid..... R134 A

**Air conditioning system reloading**

- Quantity of gas to be loaded: 1180 g (+/- 25 g)
- Keep the gas unit steady when filling the circuit, in order to allow for a precise reading of the gas weight.
- Operating pressure (20 bar).

***IMPORTANT:*** *This tractor uses a R134A coolant that does not damage the ozone layer. Do not introduce any coolant different from the prescribed one into the air conditioning system. This could jeopardize the cooling power and irremediably damage the system.*

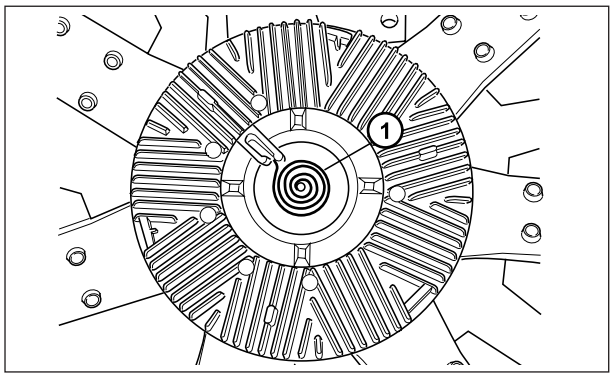
Check the tension of the compressor belt as indicated in the Routine Maintenance at 250 hours.

***DANGER: Wear safety garments and goggles in case of leaks. Coolant can injury the eyes. The coolant produces a toxic gas if it contacts a flame.***

## GENERAL MAINTENANCE

### Viscous fan drive

***WARNING: Always use specific personal safety devices for each operation. Beware of burns caused by hot tractor parts.***




During cleaning and maintenance of the engine and radiator, be careful not to cause damage to the viscous fan drive.

DO NOT restrict the fan blade rotation during engine operation.

DO NOT remove the bi-metal coil (1) on the front of the drive.

Check the fan and drive for external damage or erratic operation. See your dealer if service is required.

### Clean the operator's seat

Before removing stains, use a vacuum cleaner to remove loose dirt.

Find what type and how old the stains are. Some stains can be removed with water or soap solution.

CLEANER FLUID - This type of cleaner can be used for grease or oil stains, follow manufactures instructions.

FOAM CLEANER: This type of cleaner is good for all stains, follow manufactures instructions.

***WARNING: Never use petroleum spirit, naptha or any other volatile material for any cleaning purposes. These materials may be toxic and/or flammable.***

*NOTE: Do not make the material wet or clean with a hard brush. Clean with a damp cloth only. Immediately after the material is clean, dry the material with dry cloth.*

### Inspection and maintenance of safety belts (if equipped).

***WARNING: Securely fasten your seat belt. Your tractor is equipped with a ROPS cab or frame for your protection. The seat belt can help insure your safety if it is used and maintained. Never wear a seat belt loosely or with slack in the belt system. Never wear the belt in a twisted condition or pinched between the seat structural members.***

**WARNING: Always use specific personal safety devices for each operation.**

- Keep sharp edges and items that can cause damage, away from the belt.
- From time to time, check belt, buckles and mounting bolts for damage.
- Replace all parts that are worn or damaged.
- Replace a belt that has cuts that can weaken the belt.
- Check that the bolts are tight on the seat bracket.
- Keep seat belt clean and dry.
- Clean belt only with a soap solution and warm water.
- Do not use bleach or dye on the belt because this can make the belt weak

# PUTTING THE TRACTOR INTO STORAGE

## Preparing for long idle periods

Take the following precautionary measures when your tractor is not going to be used for a long period of time.

To carry out the operations described hereunder, see the sections relative to the maintenance of the various parts. Always use specific personal safety devices for each service operation.

- park the tractor in a dry, sheltered place
- d rain, flush and fill the cooling system with the correct antifreeze mixture to protect the tractor to the lowest anticipated temperature.
- grease all points provided with grease nipples
- clean the fuel filter
- generally clean the tractor, particularly the bodywork components. Protect the painted parts by applying silicone wax and the unpainted metal parts by applying protective lubricant. Park the tractor in a dry, sheltered and possibly ventilated place.
- make sure that all controls are in neutral (including the electric switches and parking brake controls)
- remove the ignition key from the ignition switch
- coat all exposed cylinder rods with grease to prevent rust.
- empty the fuel tank and fill it with new diesel fuel until the maximum level is reached.
- the batteries do not need to be removed from the tractor, except for extended storage (more than 30 days) below freezing temperatures. The batteries must be fully charged to prevent freezing. Disconnect the negative (-) ground cable at the batteries to prevent possible discharge.
- for long idle periods, remove the battery, clean the cover and spread Vaseline on the terminals and terminal caps. Now place the battery in a ventilated place where the temperature is not liable to drop below 10°C and where it is not exposed to direct sunlight Check the battery charge every 30 days.
- check the battery charge with a voltmeter as described in the Electrical system section. Recharge if it is necessary
- store the tractor where there is protection from sunlight. Clean the tyres.
- place stands or other supports under the axles in order to take the weight off the wheels. When the tractor is raised in this way, it is advisable to deflate the tyres. If this is not possible, the tyre pressure must be periodically checked.
- cover the tractor with a tarpaulin (not plastic or waterproof).

## Removing the tractor from storage

***WARNING: At the end of the idle period, when you start the engine again, pay particular attention to the instructions about starting the engine in the Operation chapter.***

To carry out the operations described hereunder, see the sections relative to the maintenance of the various parts. Always use specific personal safety devices for each service operation.

- Open the fuel filter drain plug and remove contaminated fuel. Close the drain plug.
- top up the level of oil in the gearbox.
- check the coolant level in the reservoir and radiator.
- check that the batteries are fully charged.
- connect the ground cable(s) (-) and tighten all terminals.
- check the transmission/hydraulic fluid level and linkages.
- check the front (if equipped) and rear hitch.
- check and adjust the tension on all drive belts.
- inflate the tyres to the correct operating pressures.
- make sure that all shields and guards are in the correct position.
- do not accelerate the engine rapidly, or operate at high RPM immediately after starting.

***WARNING: Before starting the engine, be sure all operating controls are in neutral and the park brake applied. This will eliminate accidental movement of the machine on start-up or power driven equipment.***

***WARNING: Do not operate the engine in a closed building. Proper ventilation is required under all circumstances.***

## Fire prevention

To carry out the operations described hereunder, see the sections relative to the maintenance of the various parts. Always use specific personal safety devices for each service operation.

Fire risks can be minimized by frequent removal of accumulated crop material, trash or debris from the machine.

Remove all crop material, trash or debris at the start of each working day. Take extra care to make sure the engine area and exhaust system are clean.

It is your responsibility to remove and/or clean your machine on a regular basis.

Fire risk can also be minimized by prompt repairing of leaks and cleaning up fuel and oil spills.

Engine fuel is flammable and can cause a fire or an explosion. DO NOT fill the fuel tank or service the fuel system near an naked flame, welding, burning cigars, cigarettes etc.

Sparks or flames can cause the hydrogen gas in a battery to explode. To prevent an explosion, do the following:

- When disconnecting the battery cables, disconnect the negative (-) cable first. When connecting the battery cables, connect the negative (-) cable last.

- DO NOT connect jumper cables to start the engine. The engine can be started ONLY by the ignition procedure described in this manual.

- DO NOT short circuit the battery posts with metal items.

- DO NOT solder or smoke near the battery.

Check the electrical system for loose, tampered with or poorly insulated connections. Repair or replace the loose or damaged parts.

# Section 8
Electrical system

## ELECTRICAL SYSTEM

### Battery

With a maintenance free battery, it is normally not necessary to frequently check the electrolyte and charge levels. It is advisable, however, to periodically check the level of battery acid and to add distilled water if required.
If you need to top up too often, have the battery charging system checked.
Check the level of the electrolyte in each element. If topping up is required, proceed as follows, with the engine stopped, the battery at rest and cold, and the tractor parked on level ground.

1 - Disconnect the terminals (1) and remove the guard (2).
2 - Remove the plugs and check the liquid level.
3 - Slowly pour in the distilled water, until the top edge of the plates is completely covered.
4 - Fit the plugs back and close the battery compartment.

***WARNING: Do not use acid to top up the battery. The electrolyte will boil over. Use only deionised distilled water and top up to a level of 5/6 mm over the battery cells.***

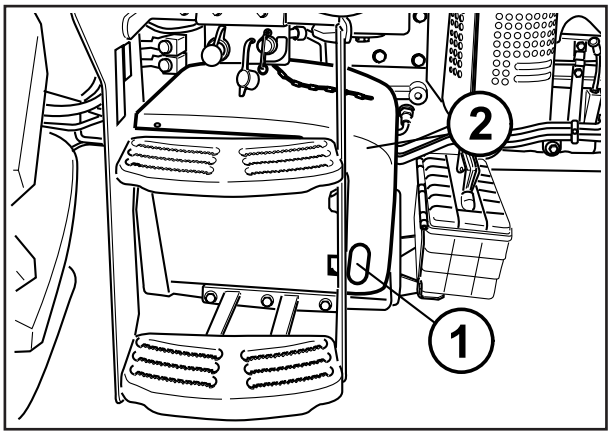
**WARNING:**
Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash your hands after handling these parts.

Check the charge condition with a voltmeter. Do not use quick battery chargers to recharge the batteries.

*NOTE: if the battery must be topped up frequently or tends to discharge, have the electrical system of your tractor checked by your area Dealer's specialised personnel.*

**WARNING: Remember to disconnect the wires before you recharge the battery. It is advisable to remove the battery from its housing and to recharge it well away from the tractor.**

**WARNING:The place in which the battery is recharged must be well ventilated. Do not smoke or produce sparks whilst the battery is being recharged.**

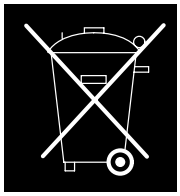



Side battery.
1- Terminal; 2 - Guard.
(X60.50: two batteries).

**WARNING: Always use specific personal safety devices for each operation.**

*NOTE: See the Maintenance section of this manual for a description of the use of the master disconnect switch.*

**CAUTION: Dispose correctly of batteries, piles and accumulators to places and containers provided for separate waste collection according to local rules. DO NOT dispose of them in the environment.**



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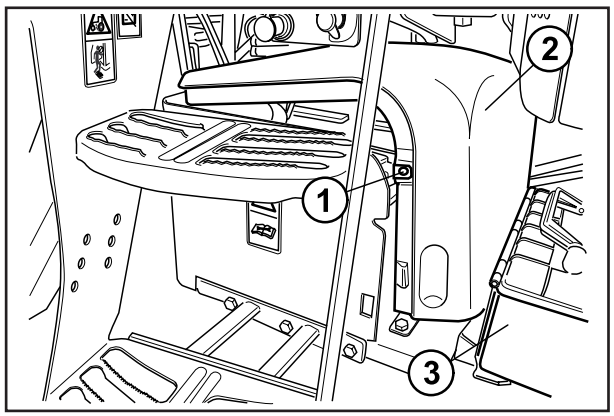
## Removal and installation of batteries

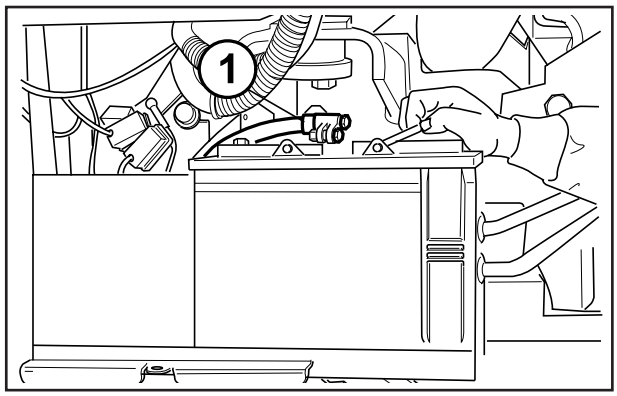
OPERATION 1




Remove the retainer from the battery cover, then the cover.

*NOTE: In a few models, the tool box (3) and relative support must be removed for this operation.*

OPERATION 2




To remove the battery, disconnect the battery cables (1) and remove the battery. When the battery is installed, make sure the cables are connected to the correct terminals. The electrical system is 12 volt, negative ground.

Install the cover back on. Remount the tool box and its bracket, if they were been removed.

*IMPORTANT: Always disconnect the ground cable first and connect the ground cable last to prevent sparks. Do not start or operate the engine with the electrical system not completely connected.*

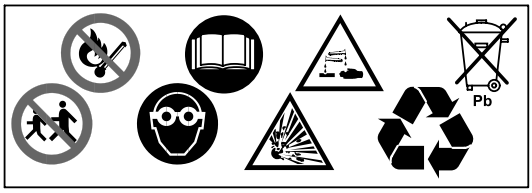
*NOTE: The batteries can be disconnected without affecting any programmed or stored information in the digital instrument cluster. When the batteries are connected again the instrument cluster will remember and use all stored information such as tyre size code number, etc.*

**WARNING: Always use specific personal safety devices for each operation.**

## Recommendations

The following rules must be respected to preserve an efficient battery:

- Keep the battery clean and dry, particularly on top.
- If the battery acid must be topped up, use distilled water only,
- Make sure that the cable terminal nuts are well fixed to the battery terminals.
- Always use a wrench and not pliers to tighten and loosen the terminal nuts.
- Smear terminals with petroleum jelly (not grease) to protect them from oxidation.
- Never let the battery run completely down. If possible, recharge monthly.




***WARNING: Battery electrolyte contains sulfuric acid and can cause serious burns. The following good practices are therefore recommended.***
***- Wear leather heavy-duty gloves and protective clothes. In case of contact with the skin, wash with plenty of water.***
***- Batteries release flammable gases that can cause an explosion.***
***- DO NOT go near the battery with naked flames or cigarettes.***
***- In case of contact with the eyes, first flush with water, then seek medical help.***
***- Keep batteries well out of children's reach.***
***- It contains lead: NEVER dispose of batteries in general waste.***
***- Deliver and dispose of exhausted batteries only in suitable containers provided to this purpose at authorized centres, according to local rules.***

***WARNING: Battery explosion and/or damage to electrical components can result from improper connection of booster batteries or charger. Connect positive to positive and negative to negative. Externally, battery acid can cause burns and blindness, and taken internally is poison.***

## Battery system servicing

Follow these general rules to prevent damage to the electrical system.

- Before working on the electrical system, disconnect the battery cables, ground cable first, or turn off the master switch (if equipped) and remove the key.
- Do not make a reverse battery connection.
- When you use a booster battery for starting, connect negative (-) to negative (-) and positive (+) to positive (+). Use the booster battery connections provided on the tractor (if equipped).
  See Booster Battery Connections in this manual.
- When charging the tractor batteries, use the auxiliary battery connections on the tractor (if equipped). Do not attach directly to the battery terminals. Do not use a battery charging machine for starting the tractor.
- Never try to start the tractor when the battery cables are disconnected.
- When you carry out maintenance on the engine, cover the alternator to prevent foreign material from entering.
- If electric welding is necessary, do the following to protect the electrical components:

  A. Disconnect the battery(s) or turn off the master switch (if equipped).

  B. Disconnect the instrument cluster harness.

  C. Disconnect the Powershift controller (if equipped).

  D. Disconnect the alternator.

  E. Disconnect all ECUs and in particular the engine EDC unit.

  Put the welding equipment ground cable as close as you can to the weld area.

  Do not put the ground cable where the current can flow through bearings or along channels with wiring harnesses.

**WARNING: Always use specific personal safety devices for each operation.**

## When batteries are not in use

When the tractor is not being used for a long time, the batteries should be recharged every six weeks to keep them charged. Storage batteries not in use will slowly discharge. A battery that has discharged can freeze at low ambient temperatures and cause damage to the battery and tractor.

*NOTE: Discarding old batteries can cause an environmental liability. Check with your local environmental or recycling center or your dealer for the correct disposal information.*

## Connection of a booster battery to the positive battery terminal on the tractor

*IMPORTANT: When connecting a booster battery to the tractor positive terminal, make sure the batteries are the same voltage (i.e. 12 Volt) and the electrolyte is at the correct level. DO NOT connect auxiliary battery cables across the terminals of the starter. Always start the engine from the operator's seat.*

***WARNING: Always connect the ground cable last and disconnect the ground cable first so you do not cause a spark at the battery. A spark can cause a battery explosion and cause injury.***

## Procedure

OPERATION 1

Position the machine with the booster battery next to the tractor so that the booster cables can be connected easily. MAKE SURE THE MACHINES ARE NOT TOUCHING.

OPERATION 2
Remove the red cap from the positive terminal (1).

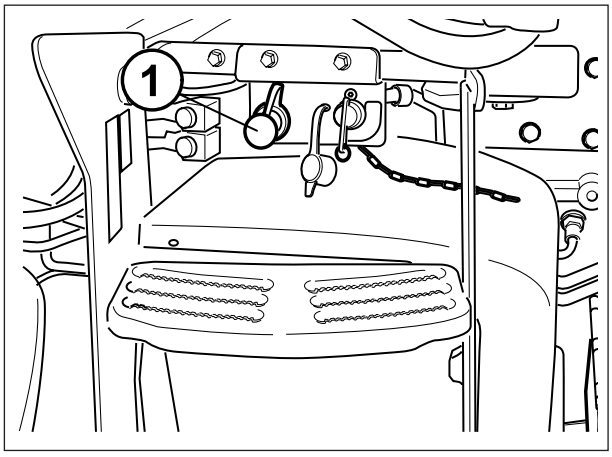
Connect the booster battery positive (+) to the tractor positive terminal (+) and the negative (-) to a good ground on the tractor frame, not to the tractor battery terminal.

OPERATION 3
Start the engine of the machine with the booster battery and run the engine for approximately 2 minutes.

OPERATION 4
Start the tractor engine. See correct procedure in this manual.

OPERATION 5
When the tractor engine has started, disconnect the negative booster cable from the tractor frame and the booster battery negative first, then the positive cable from the tractor terminal and the booster battery.

Install the red cap on the positive terminal after the starting operation has been completed. (The position of the terminal depends on tractor model)




**WARNING: Always use specific personal safety devices for each operation.**

# Electrical system

## Starter motor

The starter motor should be thoroughly cleaned after periods of **1000 hours or** at least **once a year**. Particularly check the condition of the brushes and collector.

## Alternator

The alternator keeps the battery fully charged.
The alternator is a brushless model and requires no special maintenance. However, the following precautions must be observed.

1 - When fitting a battery, make sure that the positive and negative terminals are connected to the same leads as the alternator. If the battery terminals are inverted, you will short circuit the battery through the alternator diodes.

2 - When connecting the battery to a charger, make sure that the positive (+) lead of the charger is connected to the positive of the battery and the negative (-) to the negative. Incorrect connection will damage the diodes and the other circuit components.

3 - Never run the alternator unless it is properly connected.
If the battery is not connected, high voltages can build up inside the alternator that can be extremely dangerous if the output terminal is touched.
Make sure that all connections are firm and tight before carrying out any inspections or tests on the electrical system.

4 - Never short circuit or earth any of the alternator terminals. This could damage the electrical system.

5 - Never invert the alternator connections. The battery and alternator earths must be of the same sign or the alternator diodes will be damaged.

6 - Always disconnect both alternator terminals before undertaking any electric arc welding on the tractor.

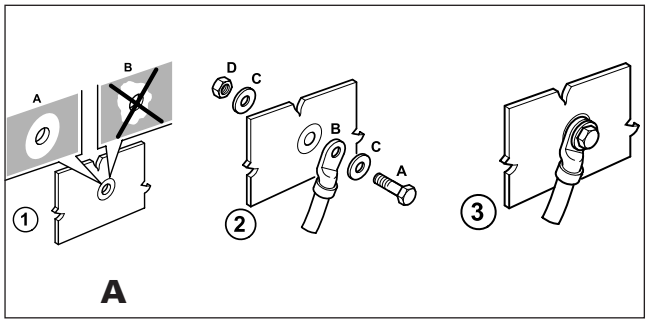
## Electrical system - Warnings

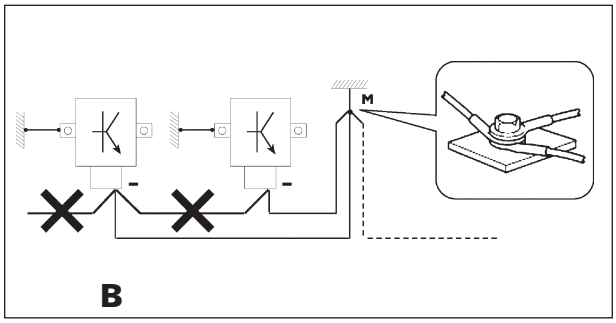
It is absolutely forbidden to make changes or connections to the data interconnecting lines between control units (CAN-BUS lines). They are to be considered as INVIOLABLE. All diagnostic and maintenance operations may only be carried out by authorized technicians, with specific appliances approved by Landini.
Use only fuses with the rated capacity for their specific function. Do not ever use fuses with higher rated capacity.
Replace a blown fuse only after correcting the relative malfunction and turn off any keys and users before replacing.
Please keep in mind that electrical systems made by unqualified persons might severely damage the systems on board the tractor (control units, harnesses, sensors etc.), and jeopardize the riding safety and good operation of the tractor. Such damages ARE NOT COVERED BY OUR CONTRACT WARRANTY.
Never disconnect control unit and sensor connectors while the engine is running and the control units are powered.
Negative conductors connected to a grounding point of the system must be as short as possible and star connected with each other.
As a principle, the grounding connections of the tractor may not be changed.
If the creation of further grounding points is required, the holes already provided on the frame must be used, taking care of the following
- remove lacquer from the frame
- use a suitable highly conductive lacquer between frame and cable terminal
- connect the ground within 5 minutes from lacquer application

THE POINTS PROVIDED FOR ENGINE CONNECTION TO GROUND MUST BE ABSOLUTELY AVOIDED FOR GROUND CONNECTIONS

1 - Ground connection; A. Efficient grounding point; B. Not efficient grounding point;
2 - Cable fastening: A. Screw; B. Cable terminal; C. Washer; D. Nut
3 - Correctly grounded cable.

**WARNING: Always use specific personal safety devices for each operation.**



## FUSE LOCATION AND IDENTIFICATION

The fuses give protection to the electrical circuits of the tractor and cab.

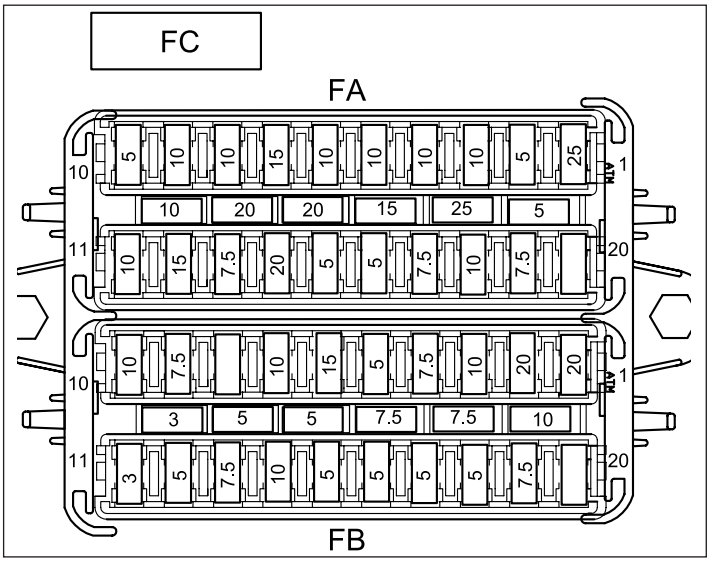
To service the fuses remove the left hand side panel from the front console. To replace a fuse, pull the fuse out of the clips and push a new fuse in.

**NOTE:** *Before replacing a blown fuse with a new, equivalent one, the cause that led to the fault should be ascertained and removed.*

***WARNING: To carry out this operation, engage the first gear, turn off the engine, engage the parking brake and remove the ignition key.***

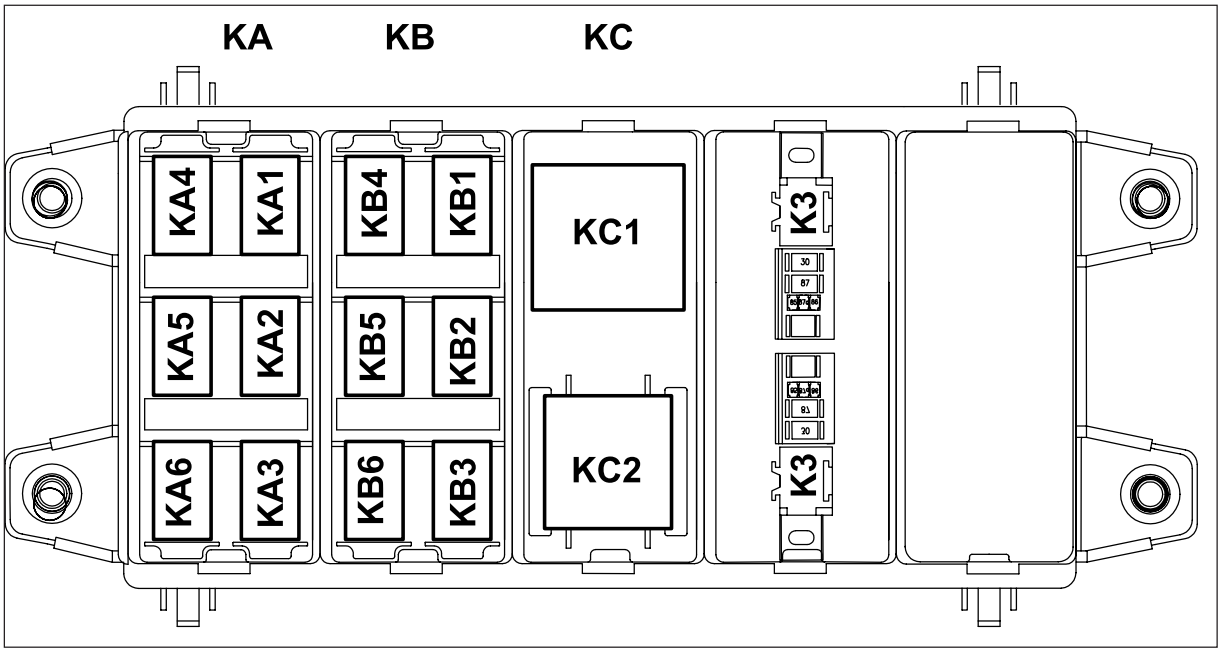
**WARNING: Always use specific personal safety devices for each operation.**

### Fuses on dashboard - View from the front




| Fuse | Function | Amps |
|---|---|---|
| FC | Electric fan supply AC cab | 40 |
| FA1 | Starter motor | 25 |
| FA2 | Ignition key feed line | 5 |
| FA3 | Front external field lights on roof, feed line | 10 |
| FA4 | Front internal roof field light and handgrip switch | 10 |
| FA5 | Rear external field lights on roof and NAO rear 7-pin socket, feed line | 10 |
| FA6 | Feed line for rear internal roof field lights-mudguards | 10 |
| FA7 | Differential lock and brake lights feed line | 15 |
| FA8 | Turn indicators | 10 |
| FA9 | Dipped beams, driving beams, flashing beams, horn feed line, NAO card feed line | 10 |
| FA10 | Feed line to NAO accessories (7-pin socket) | 5 |
| FA11 | Pneumatic seat feed line | 10 |
| FA12 | Emergency switch feed line | 15 |
| FA13 | General side lights | 7.5 |
| FA14 | Direct power supply from battery to 7-pin socket | 20 |
| FA15 | Rh side lights + license plate | 5 |
| FA16 | Lh side lights + license plate, night lighting of controls and console | 5 |
| FA17 | Rotating beacon on cab and trailers, feed line | 7.5 |
| FA18 | Auxiliary socket, dashboard and cab rh lining | 10 |
| FA19 | Front loader feed line (if installed) | 7.5 |
| FA20 | Free | - |
| FB1 | Auxiliary socket, dashboard | 20 |
| FB2 | Auxiliary socket, cab rh lining | 20 |
| FB3 | Cigarette lighter feed line | 10 |
| FB4 | Radio, key-operated feed line | 7.5 |
| FB5 | Direct feed line battery to radio and roof light on cab entry | 5 |
| FB6 | Driving beams feed line | 15 |
| FB7 | Dipped beams feed line | 10 |
| FB8 | Free | - |
| FB9 | Rear windscreen wiper and washer | 7.5 |
| FB10 | Front window wiper and washer | 10 |
| FB11 | DIA1 diagnostic socket and instrument feed line | 3 |
| FB12 | Instrument, buzzer and parking brake coil feed line | 5 |
| FB13 | Feed line to mechanical and electronic engine | 7.5 |
| FB14 | Transmission controller | 7.5 |
| FB15 | Four-wheel drive | 5 |
| FB16 | Front power take-off (on request) | 5 |
| FB17 | Trailer brake and air brakes control (if equipped) | 5 |
| FB18 | Electronic hitch controller | 5 |
| FB19 | Air conditioner compressor | 7.5 |
| FB20 | Free | - |

## Relays on dashboard - View from the front




| Relay | Function | |
|---|---|---|
| KA1 | Starter motor relay | Relay 30A |
| KA2 | Rear field lights on roof, rear fenders, NAO 7-pin socket | Relay 30A |
| KA3 | Differential lock and brake lights, turn indicator lights, headlights, NAO 7-pin socket and air seat | Relay 30A |
| KA4 | Relay for driving beams, dipped beams, rear and front window wiper, rear and front window washer | Relay 30A |
| KA5 | Field lights corner light, on front of roof and front safety handles | Relay 30A |
| KA5 | Instrument, feed line to mechanical and electronic engine, transmission controller, four-wheel drive, front PTO (if equipped), trailer brakes (if equipped) and electronic hitch controller | Relay 30A |
| KA6 | Brake lights control relay | Relay 30A |
| KB1 | Air conditioning safety relay, Deluxe roof and Low Profile roof | Relay 30A |
| KB2 | Differential lock self-retaining relay | Relay 30A |
| KB3 | Driving beam relay | Relay 30A |
| KB4 | Dipped beam relay | Relay 30A |
| KB5 | Rear PTO safety | Relay 30A |
| KB6 | Parking brake microswitch relay for hydraulic and air trailer brake | Relay 30A |
| KC1 | Auxiliary socket on dashboard, auxiliary socket on rh lining and cigarette lighter relay | Relay 70A |
| KC2 | Air conditioning solenoid relay | Relay 40A |
| K2 | Front loader control pre-engineering relay (if provided) | Relay 30A |
| K3 | Front roof field light and handgrip relay | Relay 30A |

**NOTE:** *Before replacing a blown fuse with a new, equivalent one, the cause that led to the fault should be ascertained and removed.*

***WARNING: To carry out this operation, engage the first gear, turn off the engine, engage the parking brake and remove the ignition key.***

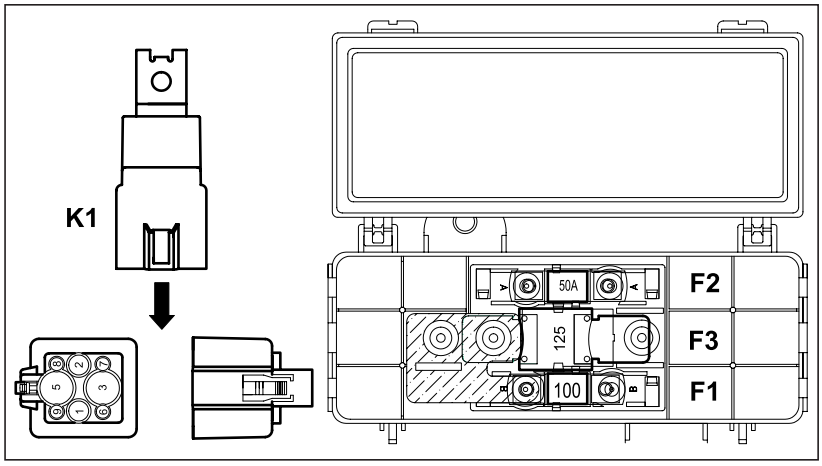
**WARNING: Always use specific personal safety devices for each operation.**

**NOTE:** *Before replacing a blown fuse with a new, equivalent one, the cause that led to the fault should be ascertained and removed.*

***WARNING: To carry out this operation, engage the first gear, turn off the engine, engage the parking brake and remove the ignition key.***

**WARNING: Always use specific personal safety devices for each operation.**

## Battery fuses and relays - Mechanical engine

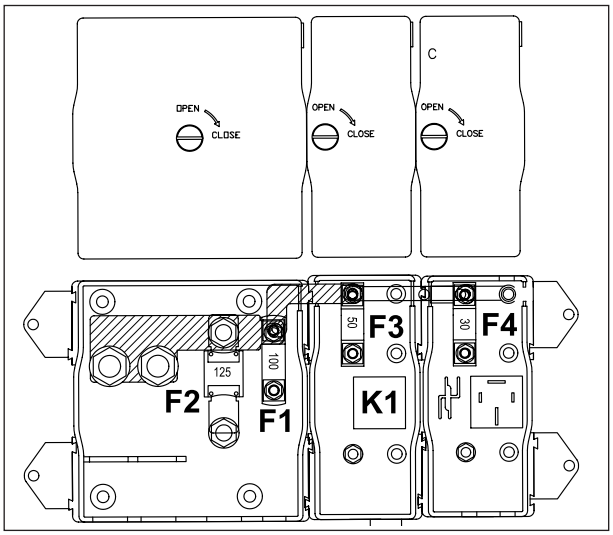



| Fuse | Function | Amps |
|---|---|---|
| F1 | Alternator protection | 100A |
| F2 | Power to cab | 125A |
| F3 | Power to glow plugs (grid heater) | 50A |
| K1 | Glow plug relay - 50A relay | |

## Battery fuses and relays - Electronic engine

| Fuse | Function | Amps |
|---|---|---|
| F1 | Alternator protection | 100 |
| F2 | Power to cab protection | 125 |
| F3 | Grid heater power supply (Glow plugs) | 50 |
| F4 | Engine controller protection | 30 |

| Relay | Function | |
|---|---|---|
| K1 | Glow plug relay | Relay 50A |

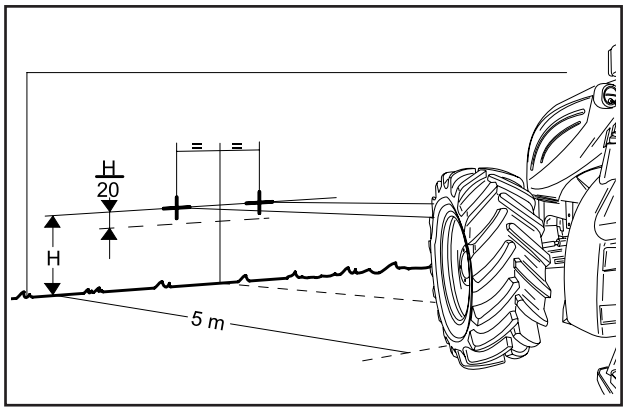


## Headlights

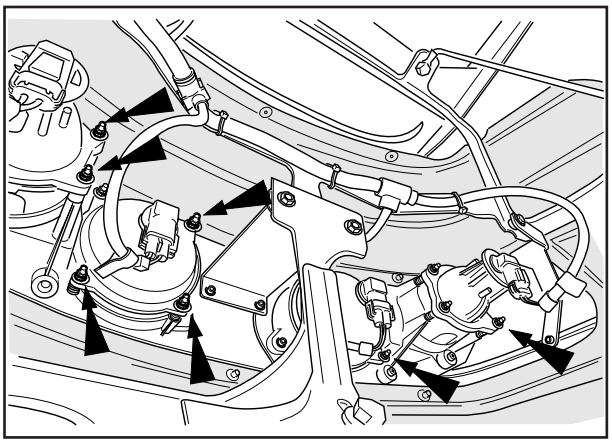
As you can use your tractor on public roads, the lighting must comply with the applicable traffic and road regulations. Periodically check headlight alignment in the following way:

### Checking headlight alignment

- Halt the tractor on level ground facing a shaded wall (preferably white). The tractor must be unloaded and the tyres correctly inflated. Mark two crosses on the wall in front of the tractor headlight centres.
- Reverse the tractor 5 meters (16.4 ft) away from the wall.
- Switch on the main beam.
  The centre of each beam must be vertically aligned with the crosses on the wall.
  A maximum outward divergence of 130 mm (5 in) is acceptable.
- Switch on the dipped beams.
  The line separating the lighted area from the dark area must fall below the crosses and must be separated from their centres by at least 1/20th of the height of the crosses from the ground.
- Adjust the headlight alignment screws to correct alignment as necessary.



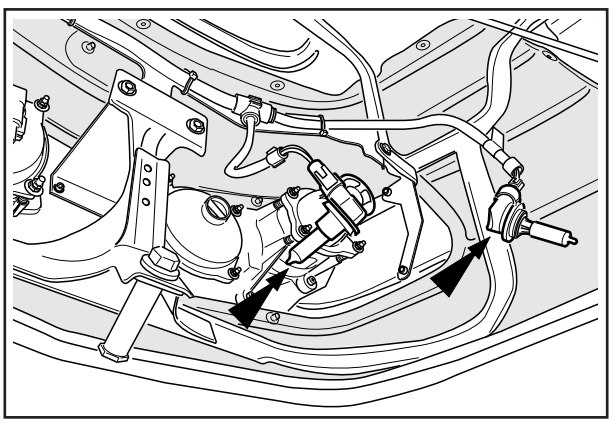

Checking headlight alignment



**WARNING: Always use specific personal safety devices for each operation.**

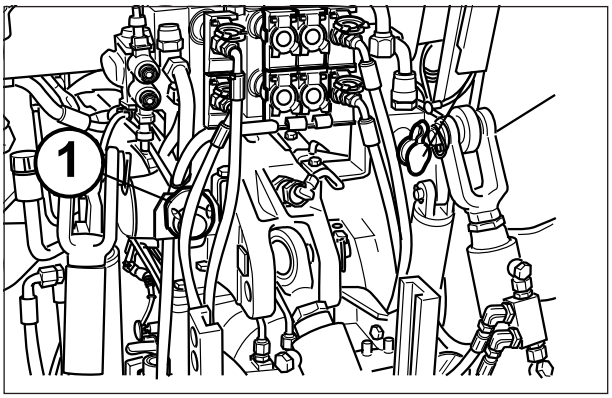
### Replacement of lamps

Turn and remove from its seat the connector of the lamp holder.
Replace the lamp.



## 7-pin power socket for trailer

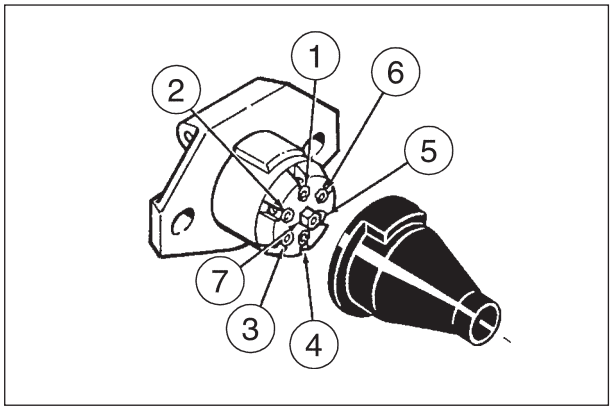
A 7-pole power socket is installed on the rear of the tractor (1). This socket is used to connect the light circuits of the trailer.




**WARNING: Always use specific personal safety devices for each operation.**

## North American Tractors

Connections

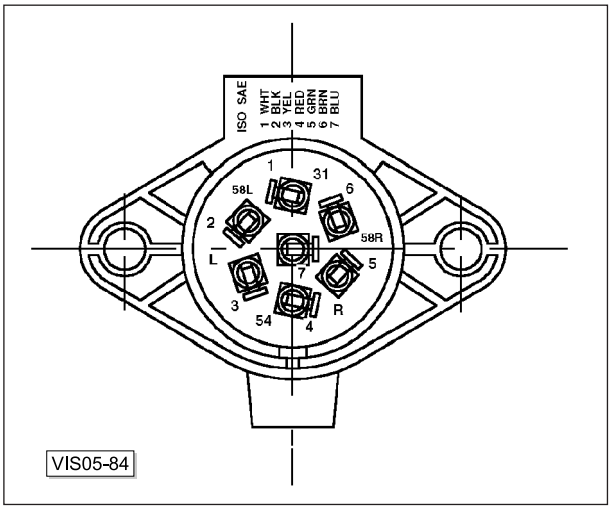



| TERMINAL N. | CIRCUIT (CABLE COLOUR) |
|---|---|
| 1 | GROUND (WHITE) |
| 2 | FIELD LIGHTS (BLACK) |
| 3 | LEFT TURN INDICATOR (YELLOW) |
| 4 | AUXILIARY POWER (RED) |
| 5 | RIGHT TURN INDICATOR (GREEN) |
| 6 | TAIL LAMPS (BROWN) |
| 7 | AUXILIARY POWER (BLUE) |

Pin number 4 and 7 are controlled through the key switch. These circuits are protected by a 30 A fuse. See the Fuse chapter in this manual.

## Rest Of World Tractors

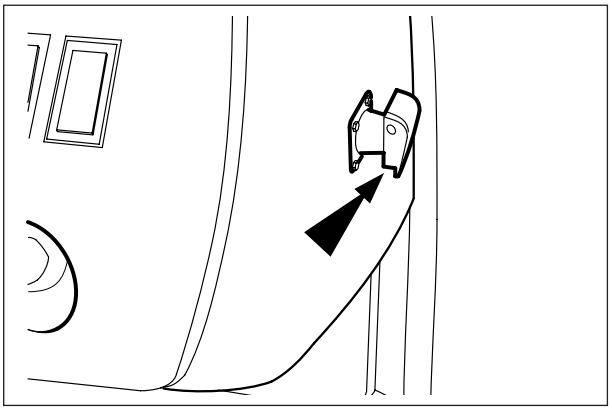
Connections



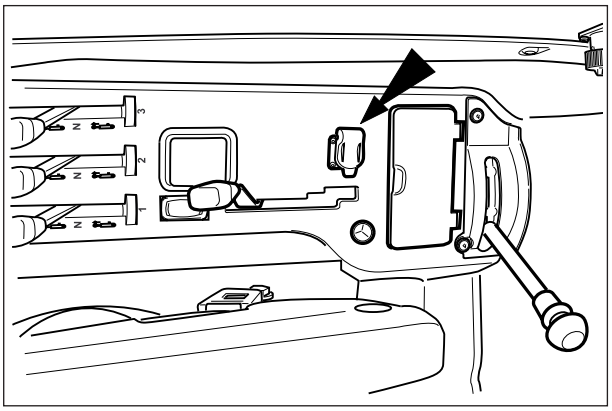

Connections and correspondences for 7-pole power socket according to ISO-SAE standards.

1. Lh turn indicator;
2. Not used (Fog lights - if equipped);
3. Earth;
4. Rh turn indicator;
5. Rh rear marker light;
6. Brake lights;
7. Lh rear marker light.

## Three-pin electrical sockets, 12V



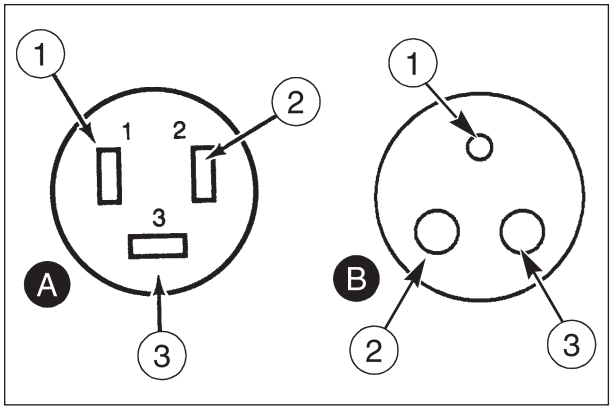
On the right side of the dashboard



On the right-hand console behind the seat.

Two auxiliary electrical power sockets are provided inside the operators compartment for connecting monitors, implement controllers, C.B. radios, and other 12 volt equipment.

*NOTE: The correct 3 pin plug to fit the sockets can be obtained from your dealer.*




FRONT VIEW

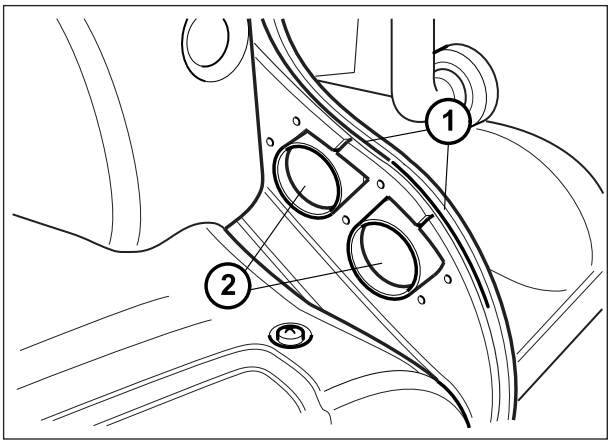
A. NORTH AMERICA B. OTHER COUNTRIES

Connections
1- Positive, key operated - Max. load 5A
2- Positive direct to battery - Max. load 25A
3 - Negative - Ground

**WARNING: Always use specific personal safety devices for each operation.**

## IMPLEMENT CABLE ACCESS

Access is provided for implement cables in the right hand corner of the rear window.




**WARNING: Always use specific personal safety devices for each operation.**

To fit cables:

OPERATION 1

Open the rear window and remove the rubber grommet by pulling upward.

OPERATION 2

Cut the grommet down (1) into the centre of the circle area and then cut out the centre (2) to fit the cable(s).

OPERATION 3

Fit the grommet over the cable(s) and install the grommet and cable(s) into the slots in the cab.

OPERATION 4

Close the rear window.

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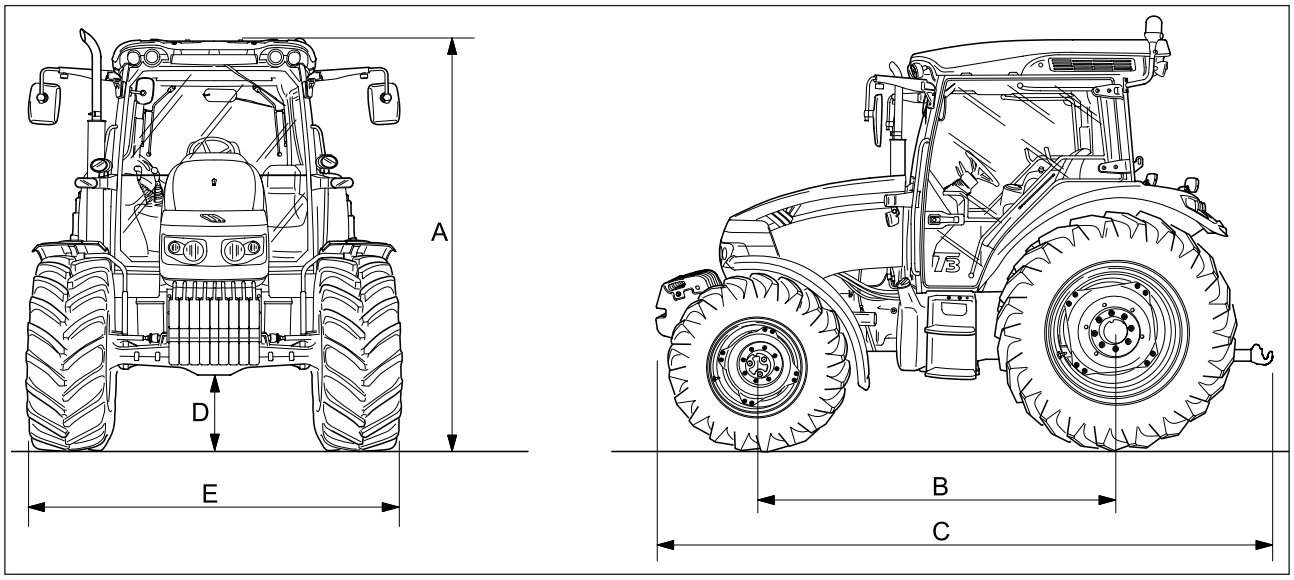
*ARGO TRACTORS constantly updates its range of products and therefore reserves the right to undertake modifications, if appropriate ad necessary, without prior notice.*
*All data and information contained in this publication could be subject to changes.*
*Dimensions and weights are only approximate values and the equipment shown by the pictures could not correspond to standard models.*
*Precise data and information about models and equipment are available at your ARGO TRACTORS Dealer.*

# Section 9
## Technical specifications

# Technical specifications

## APPROXIMATE TRACTOR DIMENSIONS

*IMPORTANT: The dimensions shown on the following pages are only approximate. They depend on many factors, such as tyre size, ballast, amount of fuel, tyre pressure etc.*
*ALL dimensions are in mm.*




## DIMENSIONS in mm

| | De Luxe Cab |
|---|---|
| A - Height at cab roof<br>Height may change according to tyres | 2710 |
| B - Wheelbase | 2440 |
| C - Overall length<br>(Front ballast - Hitch lower links) | 4460 |
| D - Ground clearance (max.)<br>under pick-up hitch | 480<br>345 |
| E - Width<br>- Min. - max., front<br>- Min. - max., rear | <br>1837-2319<br>2092-2492 |
| F - Front and rear track adjustment | See track tables |
| Approximate weight of tractor: kg | 4200 |

The above mentioned dimensions are rough values, as they may change according to tyres.

*NOTE: Overall width of the tractor may change according to the type of axle and to the track width settings.*

*NOTE: (only for EEC Member States): An overall width of 2,500 mm to 3,000 mm (8 to 10 feet) MAY REQUIRE local authorization for use on the highway. An overall width over 3,000 mm (10 feet) a local authorization is MANDATORY.*

## ENGINE

### X60.20

Type ..... 1104D-44TA Turbocharged Aftercooler, direct injection, four-cylinder, four-stroke
ISO max. power rating ..... 92,5 HP / 68 kW
Rated engine speed ..... 2200 rpm
Max. torque ..... 384 Nm
Max. torque rating ..... 1400 rpm

### X60.30

Type ..... 1104D-44TA Turbocharged Aftercooler, direct injection, four-cylinder, four-stroke
ISO max. power rating ..... 102 HP / 74.9 kW
Rated engine speed ..... 2200 rpm
Max. torque ..... 412 Nm
Max. torque rating ..... 1400 rpm

### X60.40

Type ..... 1104D-44TA Turbocharged, direct injection, four-cylinder, four-stroke
ISO max. power rating ..... 110.2 HP / 81 kW
Rated engine speed ..... 2200 rpm
Max. torque ..... 410 Nm
Max. torque rating ..... 1400 rpm

### X60.50

Type ..... 1104D-E44TA Turbocharged, direct injection, four-cylinder, four-stroke
Max. ISO power rating, Dual Power at 2000 rpm ..... 112 HP / 82.1 kW
ISO power rating at 2200 rpm ..... 101.45 HP / 74.6 kW
Max. ISO power rating, Dual Power at PTO with engine at 2200 rpm ..... 121 HP / 89 kW
Rated engine speed ..... 2200 rpm
Max. torque ..... 468Nm (486 Nm Dual Power)
Max. torque rating ..... 1400 rpm

### Air Intake System

Air filter ..... Two dry elements, with dust ejector

### Engine cooling system

Type ..... Pressure system, thermostat controlled bypass, centrifugal type pump
Radiator ..... In-line tube and fin type
Thermostat ..... Starts to open at approximately -85°C (180°F)
Fully open at 92-98 °C (203°F)
Radiator cap pressure ..... 1.03 Bar
Fan Drive Type ..... Viscous

### Engine lubrication system

Oil Pump ..... Gear type
Oil filter ..... Full flow

### Engine fuel system

Fuel injectors ..... Bosch
Fuel primer pump ..... Diaphragm type
Fuel filter type ..... Full flow
Water trap and drain location ..... Bottom of fuel filter
Cold starting aid ..... Thermostarter

# Technical specifications

***CAUTION: The technical specifications given here are only of a general kind. For technical specifications of each market, please refer to the information material supplied by your Dealer.***

## Transmission

## Xtrashift

4-speed gearbox for 3 ranges (Low - Normal - Fast) with electro-hydraulic gearbox with three Powershift ranges under load (available only forward) and with electro-hydraulic reverse shuttle.
It gives a total of 36 FWD + 12 REV speeds.
Park-Lock (on request)

4-speed gearbox for 4 ranges (Low - Normal - Fast and Creeper on request) with electro-hydraulic gearbox with three Powershift ranges under load (available only forward) and with electro-hydraulic reverse shuttle.
It gives a total of 48 FWD + 16 REV speeds.
Park-Lock (on request)

X60.20-X60.30-X60.40 Xtrashift Gearbox
On tractors with mechanically regulated engine, the Overdrive is automatically selected on reaching a 40 kph speed.

X60.50 - Xtrashift Gearbox 40 kph ECO
The transmission controller limits max. speed to 40 kph at 1900 engine RPM, thus obtaining a significant reduction in fuel consumption when transporting and driving on road.

All models - Potentiometer to regulate the engagement speed of electro-hydraulic clutches.

For speed charts, see the Operation section, Gearbox.

## Rear axle

Rear axle with bevel gear pair and epicyclical rear final drives.

Interflange: .....1640mm

Bevel gear pair: .....11/51= 4,6364

Rear final drives: .....6,6

Total reduction ratio: .....30,60024

## Front and Rear Axle ratio

Without creeper .....1,3762
With creeper.....1,3806

## Differential lock

Rear differential lock with electro-hydraulic control and hydraulic engagement.

In all models, the diff lock is disengaged by means of the brake pedals.

Front and rear differential locking takes place at the same time by means of the Twin-Lock system in four-wheel drive tractors.

## Power take off [4.2.d]

Independent mode
PTO engaged through a hydraulic clutch with electro-hydraulic control by means of a button in the cab.
Engagement is modulated by a hydraulic accumulator.
The PTO driveline is stopped through an electro-hydraulically controlled brake by means of the same switch used to control the PTO itself.

Available in the following configurations:
Two speeds:
1st type: 540/540ECO RPM
2nd type: 540/1000 RPM

Three-speed (on request):
3rd type: 540/540ECO/1000 RPM

PTO rated speed - Engine rated speeds for any configurations.

| PTO type | PTO RPM | Engine RPM |
|---|---|---|
| 540<br>540ECO<br>1000 | 540<br>540ECO<br>1000 | 1944<br>1377<br>1917 |

Different PTO output shafts are available, in compliance with A.S.A.E. standards.

- 1 3/8" (34.9 mm) diameter shaft with 6 splines (standard assembly).

- 1 3/8" (34.9 mm) diameter shaft with 21 splines (standard assembly).

Synchronized ground drive PTO mode (optional)
Rotation speed in synchronized mode (PTO driveline turns per rear wheel turn):

• 10.200RPM with PTO at 540 RPM

• 14.2384 RPM with PTO at 540E RPM

• 19.1583 RPM with PTO at 1000 RPM

Engagement and selection of PTO operating mode by a selector lever on the left side of the seat.

## Brakes

## Rear brakes

Multidisc oil-cooled brakes mounted on rear differential half shafts.

Number of friction discs: ..... 12 (6 per side).

Friction material..... .resin-graphite.

Hydraulic control by means of the two pedals on the driver's right: the two pedals can be coupled together by a locking device to provide simultaneous braking action on both sides.
Breaking Booster System.

Parking brake controlled by an independent hand lever and linkage acting directly on the main brakes.

Hydraulic trailer brake mounted on request.

Compressed air trailer brake mounted on request.

## Front brakes for 4WD tractors

Multidisc oil-cooled brakes mounted on front differential half shafts.

Number of friction discs:

All models..... .....4 (2 per side).
Friction material.....resin-graphite.

IBS-Integral Braking System hydraulic control ensuring simultaneous braking along with the rear brakes when the brake pedals are coupled together by means of the relative locking device.

## 4WD front axle

Front axle in spheroidal cast iron pivoting around two central supports.

Electro-hydraulic front drive engagement by means of hydraulic clutch.
Spring-On/Pressure-Off type.

Propeller shaft without universal couplings installed along the longitudinal axis of the tractor.

Transmission through central differential and epicyclic final drives in the wheel hubs.

Max. steering angle .....55°

Front axle with oil-cooled front brakes. The front brakes are the oil-cooled multi-disc type mounted on the live axles of the front differential: 4 discs (2 for each live axle).

Electro-hydraulically controlled "Twin-Lock" differential lock mounted as standard supply. Engagement occurs at the same time the rear differential is engaged. The differential lock is disengaged by means of the brake pedals.

Interflange: ..... 1887

Distance between kingpins .....1530mm

Reduction ratios
Bevel gear pair: .....8/31=3.875
Epicyclic final drives: .....15/15+63=5.2
Total reduction ratio: .....20.15

Transmission ratio between front and rear axles ..... 1.3882

## Track width adjustment

To adjust the track width of the front axle and rear axle, see the tables in the "Operation" chapter.

## Steering components Power steering

Power steering system controlled by the steering wheel.

Telescopic steering wheel adjustable in height and tilt.

Gear pump with a delivery rate of 31 l/min at a 2200 RPM engine rate (see "Description of the Hydraulic Circuit").

Paper filter on the delivery side.

Balanced, double-acting steering cylinder mounted on the axle casing.

Max. working pressure in power steering system.....150 +/- 5 bar

Max. steering angle without brakes, 4WD: .....5200mm

## Hydraulic circuit

Two stage hydraulic gear pump powered directly by the gears of the timing system with 40 micron double paper filter on the intake.

The two pump stages supply:

1st Stage: delivery 29,9 l/min at a 2200 RPM engine rate. 20 micron paper filter on the delivery.
Supplies: - The power steering circuit, max. operating pressure 150 +/- 5 bar.
- The 17-18 bar low pressure circuit including Xtrashift, the four-wheel drive, the hydraulic Power Take-Off, the hydraulic brake of the Power Take-Off, the differential lock and T-tronic (if installed).
- The oil cooling circuit, max. pressure 5 bar.
- The lubricating circuit of the gearbox, max. pressure 1.5 bar.

2nd Stage: flow rate 60 l/min at 2200 RPM engine rate. -
Supplies: - The hydraulic trailer brake, max. operating pressure 130 +/- 10 bar.
- The auxiliary control valves (max. 4), max. operating pressure 180 +/- 5 bar.
- The hydraulic power lift, max. operating pressure 180 +/- 5 bar.

## Electronically controlled power lift

Draft control, position control, "Intermix" combined draft and position control, and float mode.

Monitoring system.....Electronic

Type of control .....Electro-hydraulic

Electronic plant, sensors
and electro-distributor.....BOSCH

Draft control by means of 2 sensors fitted to the lower links of the three point linkage.

Operating voltage rating .....12 Volt

## Three-point linkage [4.2.g]

Class 2 three-point linkage with side stabilizers to limit implement swing.

Adjuster crank on RH vertical link rod. Optional hydraulic adjuster jack.

Adjuster crank of LH link rod with two positions at the lower end: one fixed and the other sliding.

Lower links with quick hitch mechanisms on request.

Top link with quick hitch mechanism, optional hydraulic adjuster jack.

Three point linkage powered by one single-acting hydraulic cylinder, diameter 100 mm, coupled to two auxiliary cylinders mounted as standard.

Max. lifting capacity at ends of articulated rods in horizontal position:

- with 2 auxiliary cylinders, diam. 60 mm (on request) (max. pressure 200 bar) .....5000 Kg.

## Auxiliary control valves

Open center auxiliary control valves with rapid "Push-Pull" attachments.

The auxiliary control valves use the power lift pump, thus the max. operating pressure is 180 bar.

NOTE: Ask your Dealer for complete configurations of auxiliary control valves.

# Technical specifications

## Electrical system

Voltage: 12 V negative ground.

## Battery

Battery for mild climate
X60.20-X60.30-X60.40: 1
X60.50: 2
Maintenance free. Complies with SAE J537 standards.
Technical details:
Voltage .....12 V
Capacity .....100 Ah

Battery for mild climate
X60.20-X60.30-X60.40: 1
X60.50: 2
Maintenance free. Complies with SAE J537 standards.
Technical details:
Voltage .....12 V
Capacity each:.....110 Ah

## Alternator

Type ..... 85 Amp/h

Automatic voltage regulator incorporated.

Remote charge indicator with light.

## Starter motor

Continuous power 2.9 kW (4 HP).
Automatic pinion engagement by means of electromagnet.

## Fuses

See Electrical System.

## 7-pin power socket for trailer lights

For turn indicator lights, brake lights, sidelights of trailer.

## Auxiliary power socket, 3-pin, 12V

For direct power to implement controllers and monitors.

## Cab

Cab and platform tested to OECD international standards.
Noise level complies with EEC standards.
Platform completely supported on Silent Block dampers and cab in pressed structural steel with isothermal blue-tinted glass panes.
Heating, ventilating and air-conditioning systems.
Openable roof with wide visibility in an upward direction.

## Optional extras

- Up to four open center auxiliary control valves with hydraulic hoses and "Push-Pull" couplings. Available in various versions.
- Hydraulic trailer braking system available in two versions: one version for the Italian market and the other for the Export market.
- Pneumatic trailer braking system.
- Two speeds PTO : 540/540ECO RPM PTO as an alternative to the 540/1000 RPM PTO.
- Three-speed hydraulic power take-off, 540/ 540ECO/ 1000 RPM.
- PTO proportional to the ground speed of the tractor to operate self-propelled trailers (on request and depending on the market).
- 1 3/8" (34.9 mm) diameter PTO shaft with 21 splines.
- Front axle ballast weights: max. 7-9 cast iron weights, 45 kgs/100 lbs each.
- Rear-wheel ballast (2 cast iron rings weighing 60 Kg each for each wheel): total weight 240 Kg).
- Seat adjustable as to height and distance from controls.
- Passenger seat.
- Front fenders (depending on the market).
- Supplementary 50 liter capacity tank.
- Three-point linkage with hydraulic RH levelling ram.
- Front PTO with integrated front lift.
- Ejector to expel dirt from the engine air filter connected to the engine exhaust.

## Noise levels as perceived by the operator [4.3]

**THE FOLLOWING TABLES GIVE THE NOISE LEVEL VALUES, MEASURED FROM THE DRIVER'S SEAT IN INSTANTANEOUS CONDITIONS IN COMPLIANCE WITH STANDARDS 2009/76/EC (DBA) - ANNEX II (WITHOUT LOAD) - AND WHEN DRIVING IN COMPLIANCE WITH STANDARD 2009/63/EC (DBA).**

| Tractors with cab | | | | |
|---|---|---|---|---|
| **Model** | **Test report numbers 2003/37 EC** | **Noise level at driver's seat 2009/76/EC - dBA** | | **Noise level at driving by 2009/63/EC dBA** |
| | | **Closed doors** | **Open windows + rear doors** | |
| X60.20 | All models e1*2003/37*0341*05 | 78 | 81 | 83 |
| X60.30 | | 80 | 82 | 84 |
| X60.40 | | 80 | 82 | 84 |
| X60.50 | | 77 | 80 | 83 |

*NOTE: Data supplied by the manufacturer, approval values pending.*

## INFORMATION PAGE ON VIBRATION LEVELS OF THE TRACTOR EXPOSITION TO VIBRATIONS [4.4]

***WARNING: The vibration level transmitted to the body as a whole depends on different parameters, some of them relating to the machine, others to the terrain, others to the type of work and to any connected machine and many specific for the operator. The prevailing parameters are the type of terrain or work surface, the ground speed and the type of work.***

***WARNING:***
***Machine vibrations are transmitted to the operator, who in some cases may undergo risks for his/her health and safety. Therefore you must:***
***- Make sure that the tractor is in good condition and that all routine servicing is correctly and regularly carried out.***
***- Check that the operator's seat and adjustment systems are in good condition, then adjust the seat to the operator's weight and size.***
***- Evaluate the vibration level transmitted to the operator from the tractor or from the tractor-machine assembly and schedule work hours so as to alternate suitable rest periods concerning exposure to vibrations.***

*IMPORTANT: More information on Whole Body Vibration (WBV) on agricultural tractors can be found in more specific publications. In order to correctly estimate values based on your daily work on the tractor, a specific measure instrument is required, such a three-axis accelerometer applied to the seat.*

*NOTE: Visit the dedicated Internet web sites for further information and documentation on risks of whole body vibration.*

In accordance to EU Directive 78/764/EC the following table shows vibration levels measured on seats, in aws.

| Seat type | Vibrations * m/s2 at the (applied test weights) | |
|---|---|---|
| | Light-weight operator | Heavy-weight operator |
| Sears MCS 3000 (Mechanical) | aws* = 1,24m/s2 | aws* = 1,06m/s2 |
| Sears SST 1500 (Air suspension) | aws* = 1,21m/s2 | aws* = 0,96 m/s2 |

* aws = correct weighted value of the vibration acceleration (m/s2)

## ‘CE’ DECLARATION OF CONFORMITY

“ Every tractor is accompanied by a CE Declaration of Conformity to Directive 2006/42/EC that you should receive in original together with the tractor.
This Declaration indicates with which European Directive the machine complies”.

The following picture is a fac-simile copy of such CE Declaration of Conformity.

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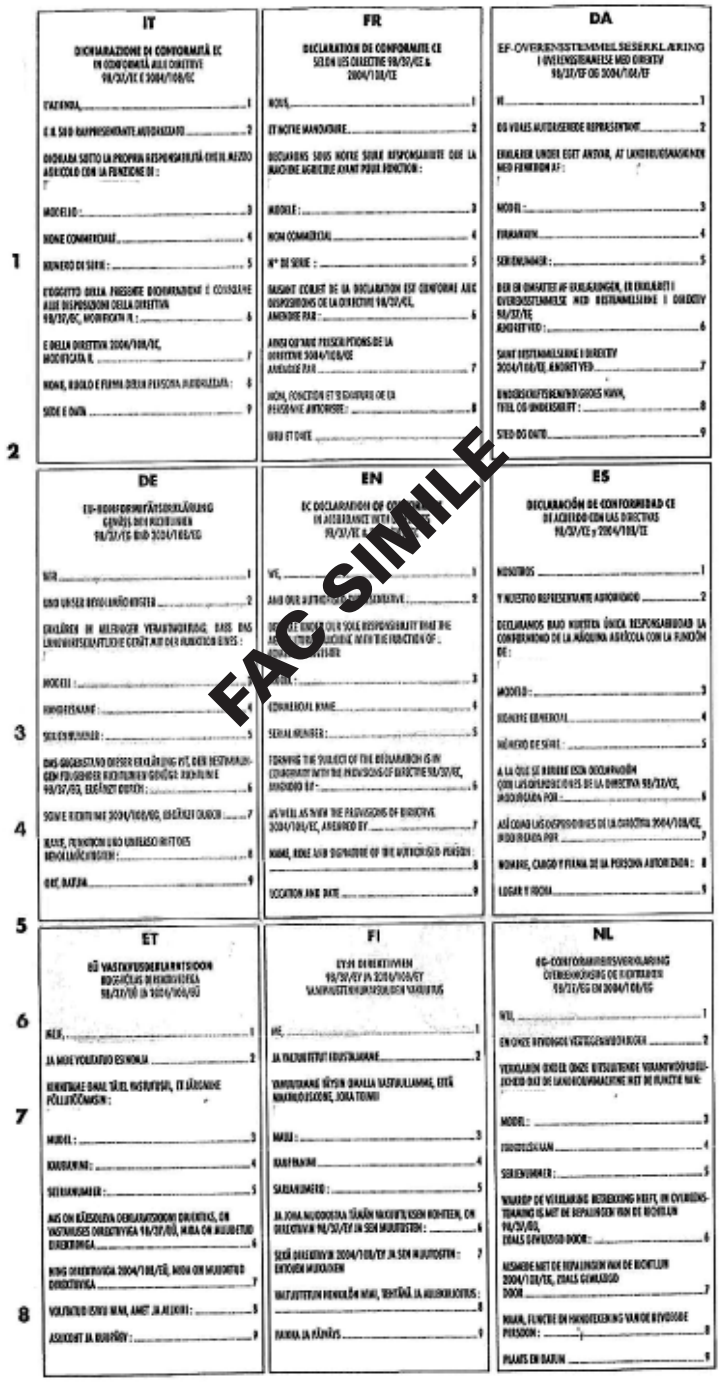


# Technical specifications

## Issue of authorization

To install any type of mounted or semi-mounted equipment not provided for by road traffic laws, it is mandatory to request the express written authorization of the vehicle manufacturer.
We insist at any rate on our recommendation to mount always exclusively CE marked equipment complying with the Machinery Directive 2006/42/EC.

## Weights [4.2.h]

### Maximum weight declared by the manufacturer for road circulation

IMPORTANT: DO NOT exceed the maximum load capacity of the tyres on your tractor. See Loads and Inflation Pressures recommended by tyre manufacturers.

IMPORTANT: DO NOT exceed the local legal limitations of the axle loads and the total weight on the road.

### Maximum permitted tractor operating weight

The MAXIMUM PERMITTED TRACTOR OPERATING WEIGHT includes the tractor, tractor equipment and ballast.

The MAXIMUM PERMITTED AXLE OPERATING WEIGHT includes the tractor, tractor equipment, ballast and three-point hitch mounted equipment.

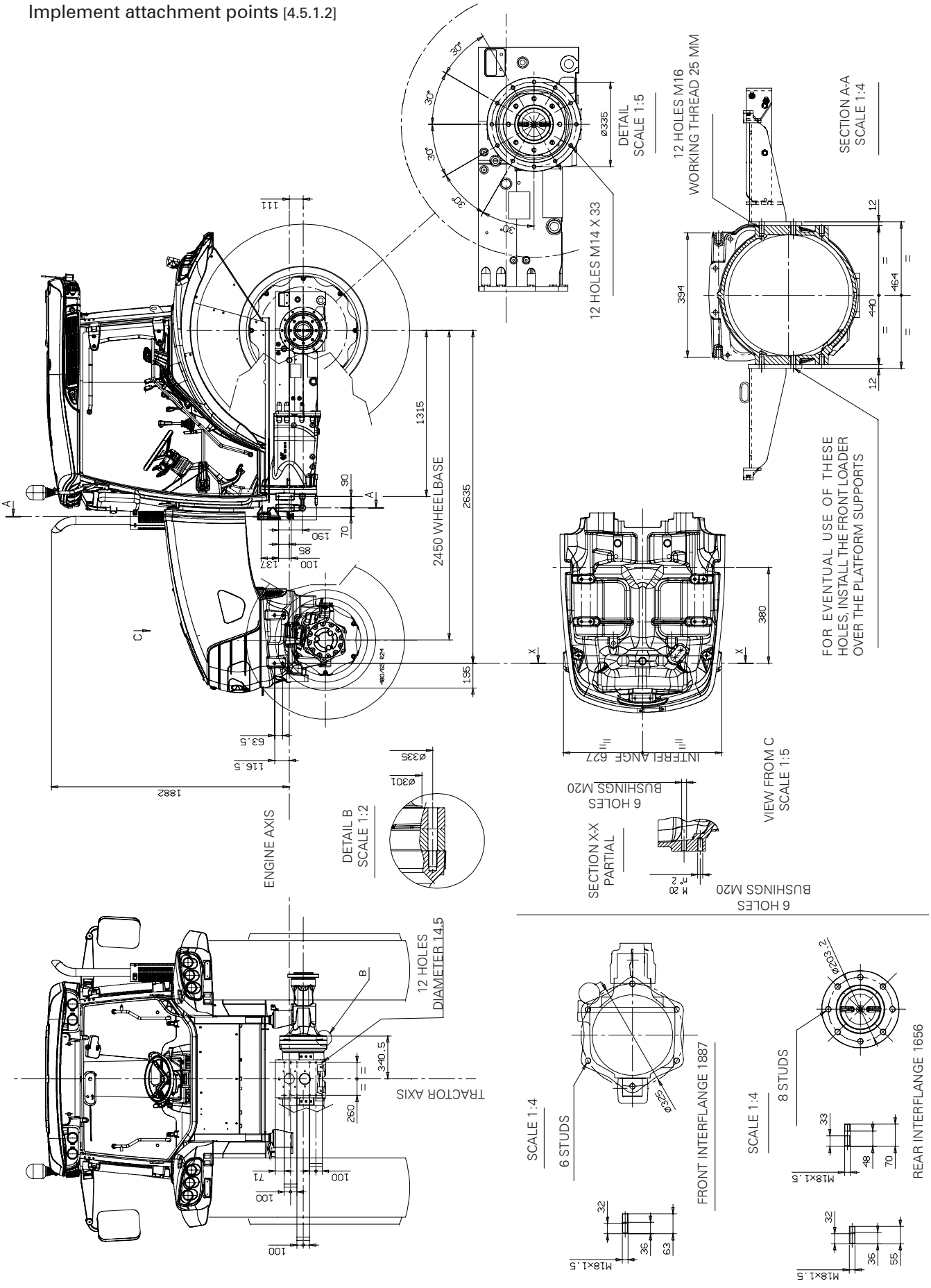
| Model | Front kg | Rear kg | Total kg |
|---|---|---|---|
| X60.20 | 3800 | 5300 | 7800 |
| X60.30 | 3800 | 5300 | 7800 |
| X60.40 | 3800 | 5300 | 7800 |
| X60.50 | 3800 | 5300 | 7800 |

IT IS RECOMMENDED to use the tractor always with a load on front axle over 25% or not under 55% of the total weight.

***CAUTION: Use exclusively the provided hooks to tow the machine.***

***CAUTION: Refer to licensing documents issued by the Ministry of Transport to know data relating to max. vertical and horizontal loads on tow hooks and max. trailer weights.***

Implement attachment points [4.5.1.2]



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## Operator's manual Rex Orchard

| N° | 2010/52/EC | Section |
|---|---|---|
| 4.1 | In particular or in addition to the requirements in standard ISO 3600:1996, the operator's manual shall cover the following: | |
| a | adjustment of the seat and suspension related to the ergonomic position of the operator with respect to the controls and in order to minimise the risks from whole body vibration; | 3 |
| b | use and adjustment of the system for heating, ventilation and air-conditioning, when provided; | 3 |
| c | starting and stopping of the engine; | 2, 5 |
| d | location and method of opening of emergency exits; | 3 |
| e | boarding and leaving the tractor; | 2, 3 |
| f | the hazard area near to the pivot axis of articulated tractors; | NA |
| g | use of special tools, if any are provided; | 2 |
| h | safe methods used for service and maintenance; | 2, 7 |
| i | information about the interval of inspection of hydraulic hoses; | 2 |
| j | instructions about how to tow the tractor; | 5 |
| k | instructions about the safe use of jacks and recommended jacking points; | 2 |
| l | hazards related to batteries and fuel tank; | 2, 7 |
| m | prohibited use of the tractor, where overturning hazards exist with mention that the list is not exhaustive; | 2 |
| n | residual risks, related to hot surfaces, such as filling of oil or coolant in hot engines or transmissions; | 2, 7 |
| o | the level of protection of the Falling Objects Protective Structure, if applicable; | 1, 2 |
| p | the level of protection against hazardous substances, if applicable; | 1, 2, 7 |
| q | the level of protection of the Operators Protection Structure, if applicable; | 1, 2 |
| 4.2 | Attaching, detaching and working with mounted machinery, trailers and interchangeable towed machinery: | |
| a | a warning to strictly follow the instructions outlined in the operator's manual of the mounted or trailed machinery or trailer, and not to operate the combination tractor-machine or tractor-trailer unless all instructions have been followed; | 2 |
| b | a warning to stay clear from the area of the three-point linkage when controlling it; | 2, 5 |
| c | a warning that mounted machinery must be lowered on the ground before leaving the tractor; | 2, 5 |
| d | speed of the power take-off drive shafts in function of the mounted machinery or trailed vehicle; | 4, 5, 9 |
| e | a requirement to use only power take-off drive shafts with adequate guards; | 2, 5 |
| f | information about hydraulic coupling devices and their function; | 5 |
| g | information about the maximum lift capacity of the three-point linkage; | 5, 9 |
| h | information about the determination of the total mass, the axle loads, the tyre load carrying capacity and the necessary minimum ballasting; | 6, 9 |
| i | information about the available trailer braking systems and their compatibility with the trailed vehicles; | 5 |
| j | the maximum vertical load on the rear hitch, related to the rear tyre size and type of hitch; see relevant approval documents | 5 |
| k | information about using implements with power take-off drive shafts and that the technically possible inclination of the shafts depend on the shape and size of the master shield and/or clearance zone, including the specific information required in case of PTO type 3 with reduced dimension; | 2, 5 |
| l | a repeat of the data on the statutory plate about maximum allowed trailed masses; | 5 |
| m | a warning to stay clear from the area between tractor and trailed vehicle. | 2 |

# Contents Directive 2010/52/EC

| N° | 2010/52/EC | Section |
|---|---|---|
| 4.3 | Noise declaration:<br>The operator's manual shall give the value of the noise at the operator's ear, measured according to Directive 2009/76/CE of the European Parliament and of the Council and the noise of the tractor in motion measured according to Annex VI to Directive 2009/63/CE of the European Parliament and of the Council. | 9 |
| 4.4 | Vibration declaration:<br>The operator's manual shall give the value of the vibration level measured according to Council Directive 78/764/EEC; | 9 |
| 4.5 | Relevant operating modes of a tractor that can reasonably be expected and identified as containing particular hazards are the following: | |
| a | work with front-end loader (risk of falling objects); | 2 |
| b | forestry application (risk of falling and/or penetrating objects); | 1, 2 |
| c | work with crop sprayers, mounted or trailed (risk of hazardous substances). | 1, 2 |
| 4.5.1 | Front-end loader: | |
| 4.5.1.1 | The operator's manual shall outline the hazards associated with front-end loader work, and explain how to avoid those hazards. | 2 |
| 4.5.1.2 | The operator's manual shall indicate the fixation points on the body of the tractor where the front-end loader must be installed, together with the size and quality of the hardware to be used. If no such attachment points are foreseen, the operator's manual shall prohibit the installation of a front-end loader. | 9 |
| 4.5.1.3 | Tractors fitted with programmable hydraulic sequencing functions shall provide information on how to connect the loader hydraulics so that this function is inoperable. | NA |
| 4.5.2 | Forestry application: | |
| 4.5.2.1 | In case of use of an agricultural tractor in a forestry application, the identified hazards are the following: | NA |
| a | toppling trees, primarily in case a rear-mounted tree grab-crane is mounted at the rear of the tractor; | NA |
| b | penetrating objects in the operator's enclosure, primarily in case a winch is mounted at the rear of the tractor. | NA |
| 4.5.2.2 | The operator's manual shall provide information about the following: | |
| a | the existence of the hazards described in point 4.5.2.1; | NA |
| b | any optional equipment that might be available to deal with those hazards; | NA |
| c | fixation points on the tractor where protective structures can be fixed, together with the size and quality of the hardware to be used. When no means are foreseen to fit adequate protective structures, this shall be mentioned; | NA |
| d | protective structures may consist of a frame protecting the operating station against toppling trees or (mesh) grids in front of the cab doors, roof and windows; | NA |
| e | the Falling Objects Protection System level, if provided; | NA |
| 4.5.3 | Work with crop sprayers (risk of hazardous substances): | |
| | The protection level against hazardous substances, in accordance with EN 15695-1:2009, must be described in the operator's manual". | 1, 2, 7 |

NA: Not Applicable

**NOTE:** This manual has been published for worldwide circulation. The standard and optional equipment and the availability of individual models may vary from one country to the next. McCormick reserves the right to undertake modifications without prior notice to the design and technical equipment at all times without this resulting in any obligation whatsoever to make such modifications to units already sold. Whilst every effort is made to ensure that the specifications, descriptions, photographs and illustrations in this manual are correct at the time of going to print, these are also subject to change without prior notice. The photographs and illustrations used in this manual may show optional equipment or may not show all standard equipment. Any reproduction or translation, even partial, is forbidden without the written authorization of McCormick.

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