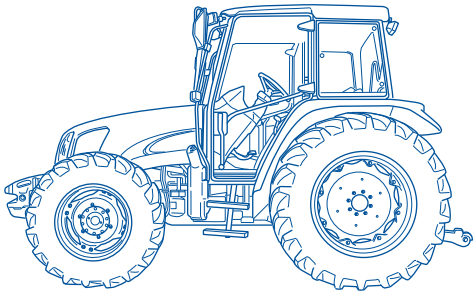
TL 70 / TL 80 / TL 90 / TL 100

NEW HOLLAND

TL70
TL80
TL90
TL100

OPERATOR'S MANUAL



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NEW HOLLAND AGRICULTURE

OPERATOR'S MANUAL

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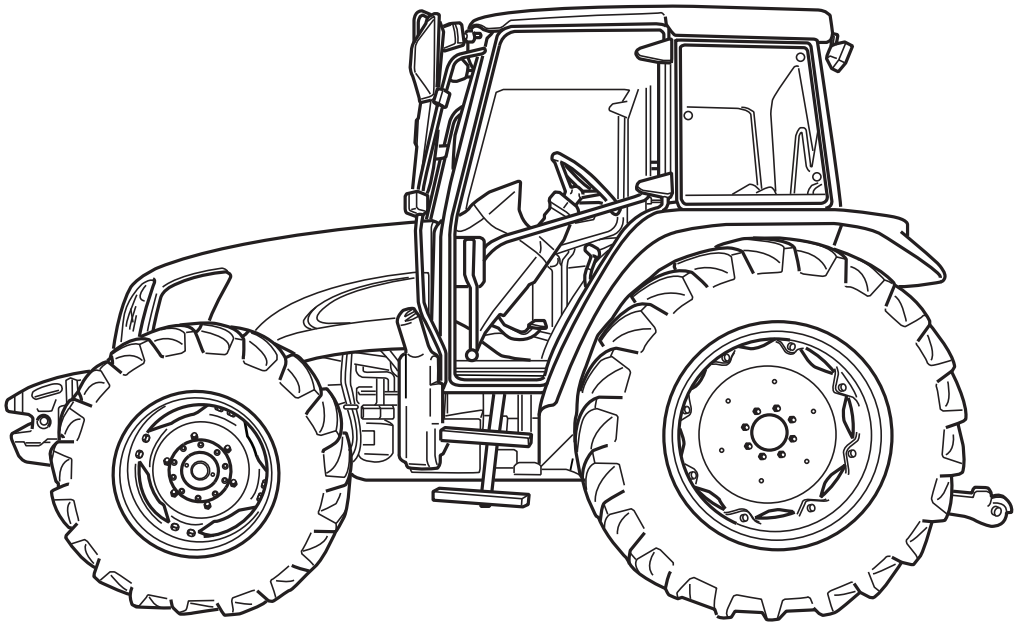

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3rd edition
English 07/02

NEW HOLLAND
AGRICULTURE

COMMUNICATIONS FOR THE USER

GENERAL GUIDELINES

This Use and Maintenance Manual provides a guide for the user with regard to running–in, use and maintenance of the tractor.

Read this manual carefully and keep in a convenient place for future reference. Do not hesitate to contact your local dealer for any queries concerning your tractor. The dealer can provide skilled personnel, trained by the manufacturer, original service parts and all tools and equipment necessary for your service requirements.
The tractor is designed as a power generator and drive–propulsion unit for use in normal and traditional agricultural conditions.

The tractor is also designed to provide maximum performance, economic running and easy use over a wide range of operations. Prior to delivery, all machines are carefully inspected (by both the Manufacturer and your local authorised dealer), to make sure that they reach the user in perfect condition. To maintain the tractor in this condition and ensure trouble–free operation, the routine maintenance described in Section 3 of this manual must be carried out at the specified intervals.

CLEANING THE TRACTOR

Your tractor is an advanced machine, fitted with an electrohydraulic control system. Care must be taken when cleaning the tractor, especially if a pressurized water cleaner is used.

■ Never stand too close to the tractor or direct the water jet on electrical components, seals or intake openings, etc.

■ Never direct jets of cold water at the hot engine or exhaust. See also page 42, Section 3 (RECOMMENDATIONS FOR BODYWORK MAINTENANCE).

SAFETY

Safety precautions for the operator and bystanders are shown on page vi to xii inclusive. Read the safety instructions and follow recommendations and hints **before** starting to use the tractor.

SERVICE AFTER FIRST 50 HOURS WORK

The operations required for the first service are shown at the end of the Manual, immediately prior to the index.

After the first 50 hours of use, return to the dealer with your tractor and this Manual in order to carry out the Manufacturer's checks and to fill in the certificates included on pages 1 and 3). The first sheet (page 1) must be compiled on completion of the service and held by the dealer. The second sheet (page 3) must be kept in the Manual for documentation and reference purposes. **Check that both copies are signed by both yourself and the dealer.**

SPARE PARTS

"Non–original" spare parts have not been tested or authorised by the Manufacturer. Installment and/or use of such products may adversely affect the tractor's design specifications, thereby compromising operational safety. The Manufacturer cannot be held responsible for any damage resulting from the use of "non–original" spare parts".
No modifications may be made to the tractor without written authorisation from the Manufacturer.

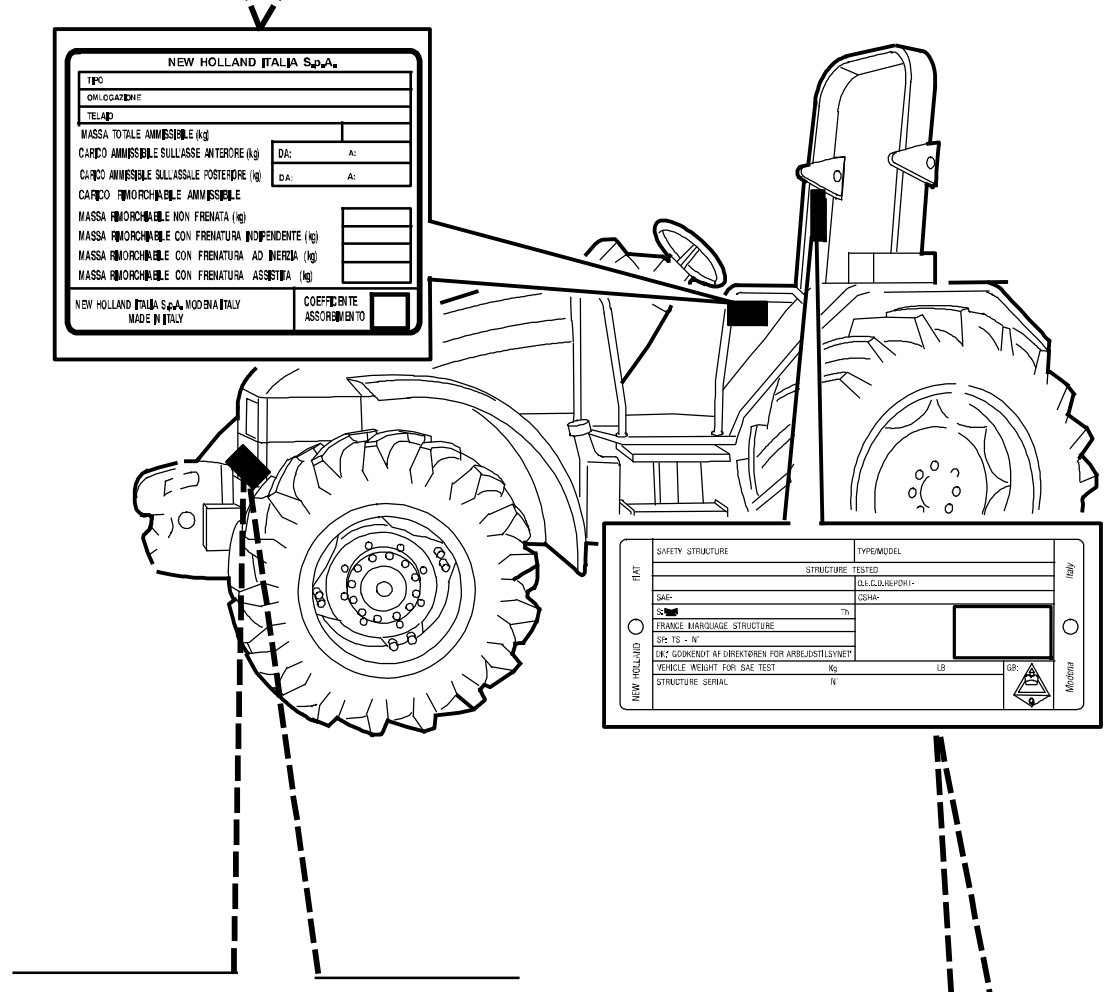
WARRANTY

The tractor is guaranteed in accordance with current legislation in your country and in line with contractual agreements reached with the dealer at the time of sale. However, the warranty is no longer valid if the rules and instructions for the use and maintenance of the tractor, described in this Manual, are not observed.

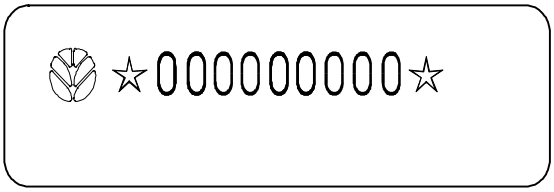
TRACTOR IDENTIFICATION

Serial numbers identify the tractor and its main components. The identification data must be supplied by the dealer for requests for spare parts or service operations. Identification data is of fundamental importance in the event of theft of the tractor. The location of the various identification data is shown below.

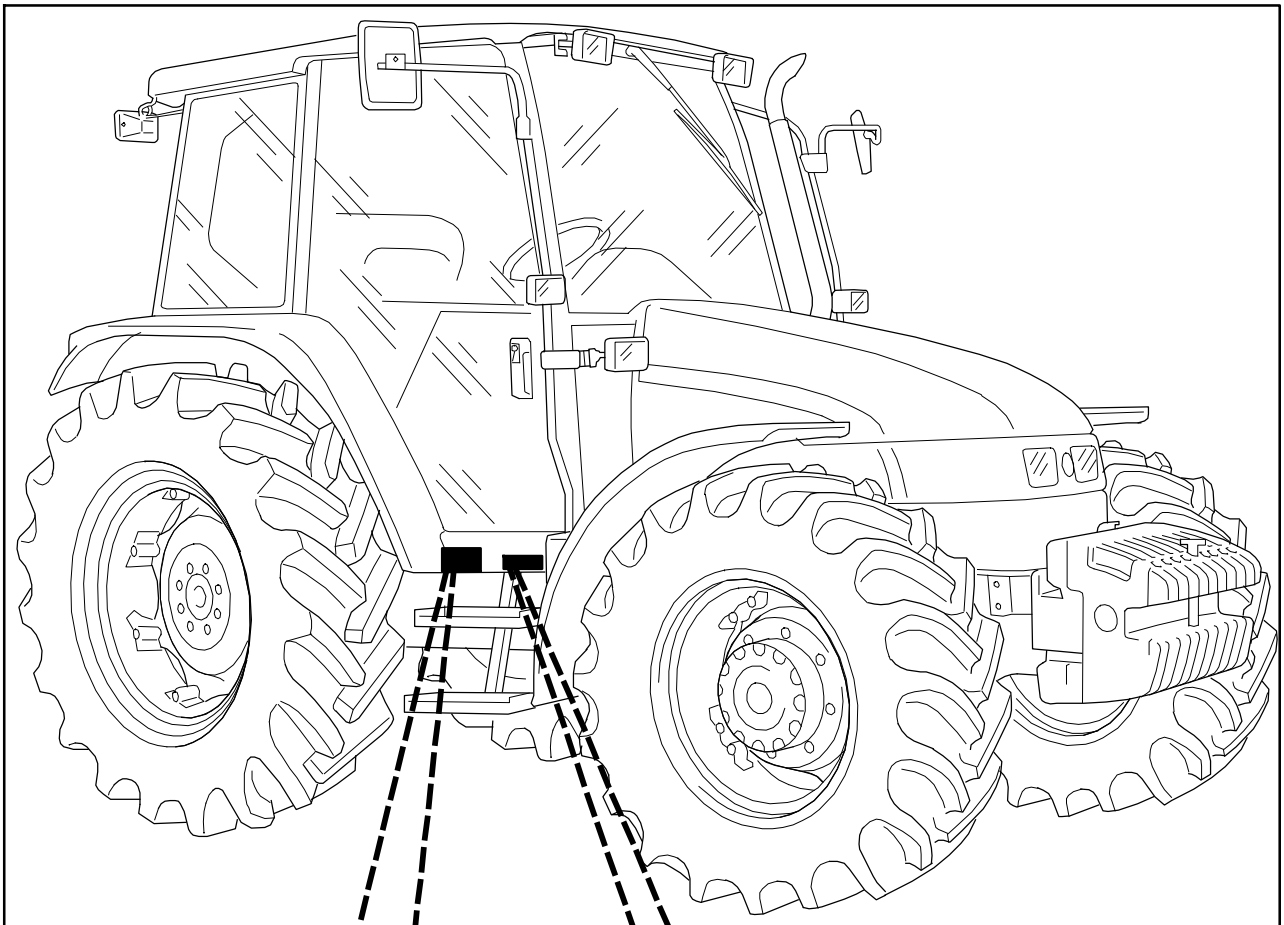
Frame and engine type identification data plate.



Tractor frame number identification data plate (stamped on the axle support under the bonnet).



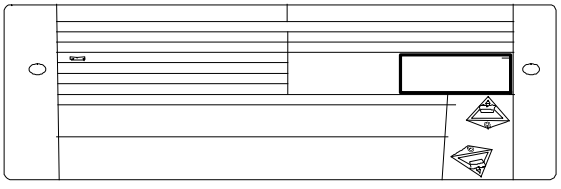
Frame identification data plate.

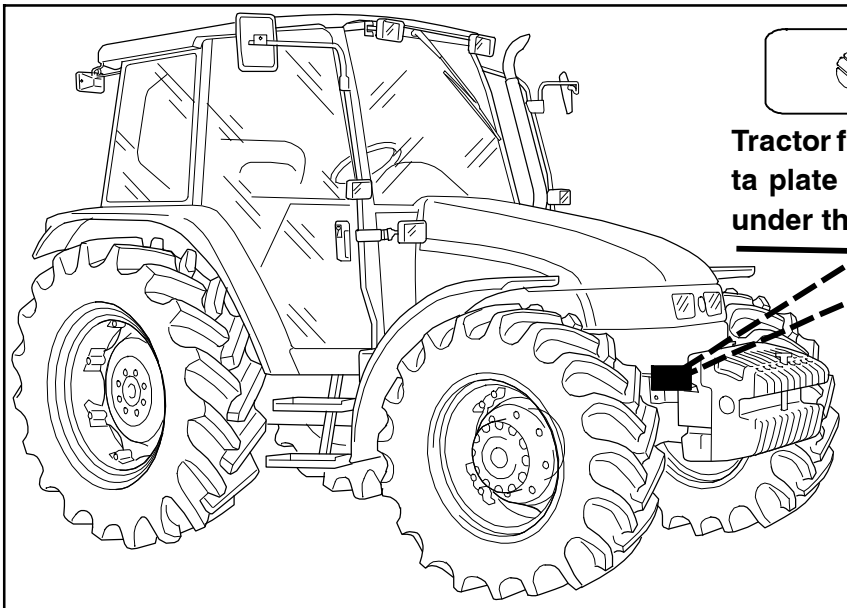


Frame and engine type identification data plate (inside the cab).

NEW HOLLAND ITALIA S.p.A.		
TIPO		
OMLOGAZIONE		
TELAIO		
MASSA TOTALE AMMISSIBILE (kg)		
CARICO AMMISSIBILE SULL'ASSE ANTERORE (kg)	DA:	A:
CARICO AMMISSIBILE SULL'ASSALE POSTERIORE (kg)	DA:	A:
CARICO RIMORCHIABILE AMMISSIBILE		
MASSA RIMORCHIABILE NON FRENATA (kg)		
MASSA RIMORCHIABILE CON FRENATURA INDIPENDENTE (kg)		
MASSA RIMORCHIABILE CON FRENATURA AD INERZIA (kg)		
MASSA RIMORCHIABILE CON FRENATURA ASSISTITA (kg)		
NEW HOLLAND ITALIA S.p.A. MODENA ITALY MADE IN ITALY	COEFFICIENTE ASSORBIMENTO	

Cab identification data plate.





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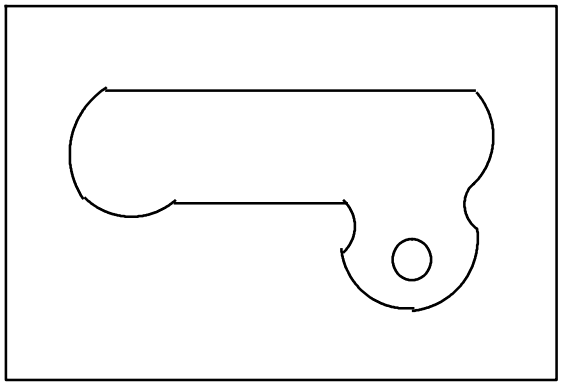
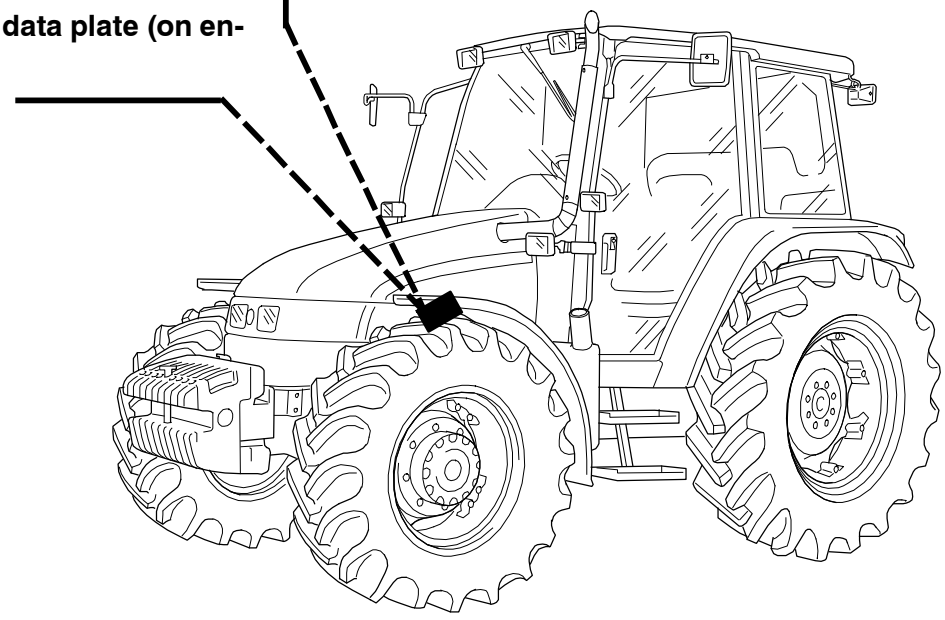
Tractor frame number identification data plate (stamped on the axle support under the bonnet).



Engine identification data plate (on engine body).



IMPORTANT ECOLOGICAL CONSIDERATIONS

Soil, air and water are essential elements for agriculture and for life in general. If local legislation does not control the treatment of certain substances, the production of which is necessitated by advanced technologies, products derived from chemical and petrochemical products must be used and disposed of according to the rules of common sense.

The following recommendations may be of help:

■ Find out what the relevant legislation in your country stipulates.

■ Ask your suppliers of lubricants, oils, fuels, anti-freeze, detergents, etc. for information on the effects of these products on humans and the environment and for instructions concerning their use, storage and disposal. In many cases, local agricultural consultants will be able to provide assistance.

SUGGESTIONS

1. Avoid using unsuitable, pressurised filling systems or fuel cans when filling tanks, as these may cause considerable spillage and leakage of liquids.

2. As a general rule, do not allow liquid fuels, lubricants, acids, solvents, etc., to come into contact with the skin. The majority of these products contain substances that are potential health hazards.

3. Modern lubricants contain additives. Do not burn contaminated fuel oils and/or oils used in conventional heating systems.

4. Avoid spillage when transferring used engine cooling liquids, engine and transmission lubricants, hydraulic oils, brake fluids, etc. Never mix used brake oil with fuel oil, or fuel oil with lubricants. Store safely until suitable disposal can be arranged according to national legislation or local regulations.

5. Modern anti-freeze liquids and solutions. anti-freeze and other additives, must be replaced every two years. They must not be left to be absorbed into the ground, but must be collected and disposed of in a suitable manner.

6. Do not open the air conditioning systems to carry out work. These systems contain gas that must not be released into the atmosphere. Contact your dealer or specialised personnel, who are equipped with the appropriate equipment and are authorised to re-fill the system.

7. Any leakage or defect in the engine cooling or hydraulic systems must be repaired immediately.

8. Do not increase the pressure in pressurised systems, as this may cause component parts to burst.

9. When welding, make sure that hoses are properly protected as sparks or molten material may puncture or weaken the tubes and sleeves, resulting in leakage of oil, cooling liquid, etc.

ALWAYS WORK SAFELY

This warning symbol points out important messages concerning your safety.

Read the following safety regulations carefully and follow the recommendations in order to avoid potential hazards and safeguard your health and safety.

In this manual the symbol is accompanied by the following key–words:

CAUTION – When the warning is to prevent potential damage to the machine, which could also put the operator's safety at risk.

DANGER – Specific warnings concerning potential hazards for operator safety or for other persons directly or indirectly involved.

Failure to observe the instructions preceded by the aforementioned key words (**CAUTION** and **DANGER**) may result in severe or fatal injury to the people involved.

Furthermore, this manual also contains instructions in italics preceded by the terms **NOTE** and **WARNING**, with the following relevance in relation to machine protection:

NOTE – Underlines the correct procedure or technique to be followed by the operator.

WARNING – Informs the operator of the danger of damaging the machine if the specified procedure is not followed.

IMPORTANT WARNINGS

The machine is designed and produced exclusively for agricultural use.

All other use will be considered to be contrary to the use specified by NEW HOLLAND, who cannot be held liable for damage to property or the machine, or for personal injuries which may result.

Persons who risk improper use will therefore assume the responsibility for any consequences arising from such use.

Compliance with the instructions for use, maintenance and repairs described in this manual, are the essential preconditions for the use specified by NEW HOLLAND.

The machine must only be used, serviced or repaired by personnel trained in the relevant working methods and safety regulations and who have been authorised to work on the machine.

The user must also observe the rules concerning general safety and accident prevention, including the Highway Code when driving on public highways.

Any arbitrary modifications made to this machine will release NEW HOLLAND from any liability resulting from damage or injury.

NEW HOLLAND and all distribution organisations, inclusive of, but not restricted to, national, regional or local distributors, cannot be held liable for damage resulting from the malfunction of parts and/or components not approved by NEW HOLLAND.

Under no circumstances will a guarantee be issued for products made or sold by NEW HOLLAND that are damaged as a result of the malfunction of parts and/or components not approved by NEW HOLLAND.

WORKING SAFELY

GENERAL INSTRUCTIONS

■ During the manufacturing of this tractor, every step has been taken to ensure safe operation. However, the best way to avoid accidents is to exercise caution at all times. Once the accident has already happened it is too late to remember what steps should have been taken.

■ Read this manual carefully before starting, using, carrying out maintenance, refuelling or performing any other type of operation on the tractor.

■ The time spent reading this manual will allow you to get to know your tractor, thereby saving time and effort. This will also help prevent accidents from taking place.

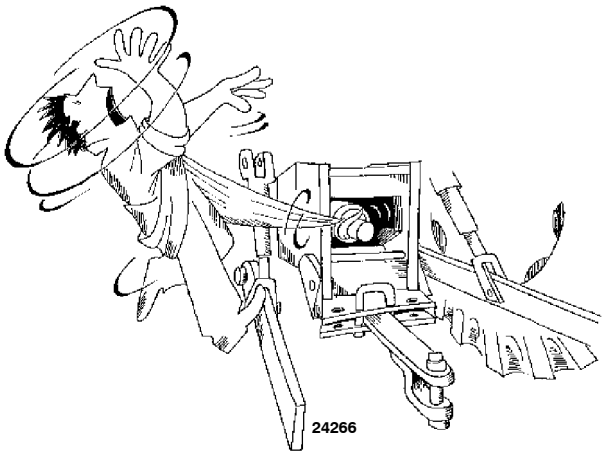
■ Read all the safety decals on the machine and follow the instructions thereon before starting, operating, refuelling or carrying out maintenance on the machine. Promptly replace any decals that are damaged, lost or illegible.
Clean the decals if they are covered by mud or debris.

■ Remember that the tractor is exclusively designed for agricultural use. Any other use will require prior authorisation from NEW HOLLAND.

■ It is advisable to keep a first aid kit on hand.

■ The tractor must only be used by responsible personnel, trained in tractor use and authorised to operate the machine.

■ Do not alter the injection system calibration in an attempt to increase maximum engine speed.



■ Do not wear loose clothing that may be trapped in moving parts.
Check that all rotating parts connected to the power take-off are correctly protected.

■ Do not alter the calibration of the pressure relief valves in the various hydraulic circuits (hydrostatic steering, hydraulic lift, auxiliary distributors, etc.).

■ Avoid using the tractor in unsuitable physical conditions, stop work instead.

■ Enter and leave the tractor using the steps and handles provided. Keep these fittings free of mud and debris.

■ Always operate with the cab or roll bar correctly and securely fitted on the tractor: periodically check that the fittings are not loose and that all parts of the structure are free from any damage and deformation. Do not modify the roll bar by welding parts, drilling holes, etc., as this could adversely affect the rigidity of the structure.

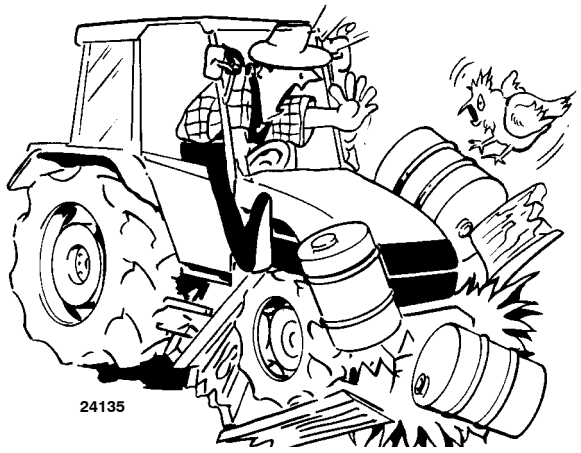
STARTING THE TRACTOR

■ Before starting the engine, check that the handbrake is on and that the gears and power take-off are disengaged, even if the tractor is fitted with a start-up safety device. Never disconnect the start-up safety switch.If the switch does not work correctly, contact your local dealer for eventual repair operations.

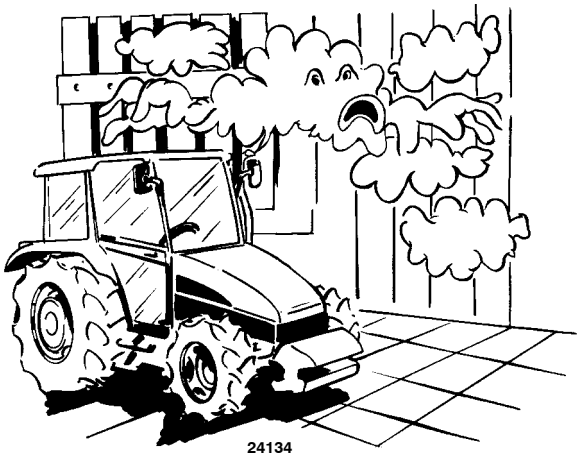
■ Before starting the engine, make sure that all attached implements are lowered to the ground.

■ Before starting the engine, check that all covers and guards are correctly in position (roll bar, bonnet side panels, power take-off guard, front axle transmission shaft cover, etc.).

■ Never start or manoeuvre the tractor unless seated in the driving position.



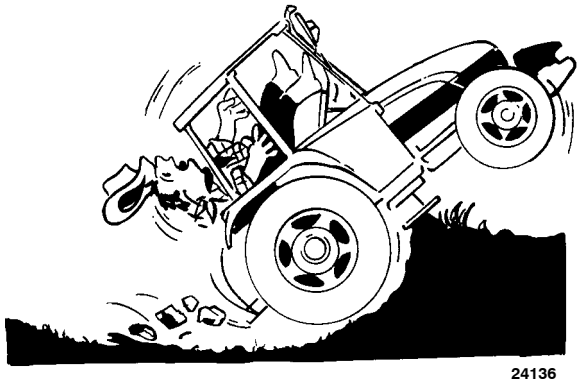
■ Before moving the tractor, always check that the area is free of persons or obstacles.



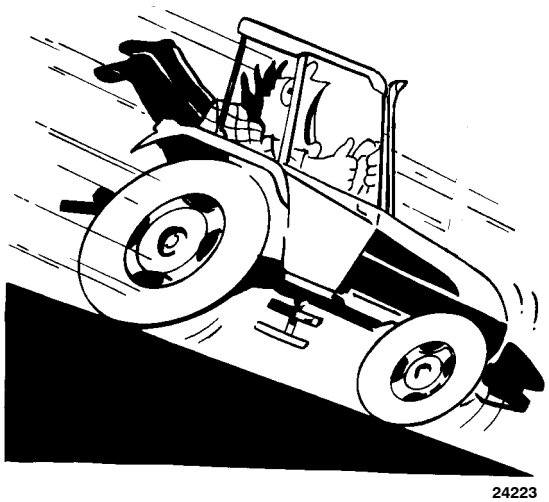
■ Never run the engine in a closed space without ensuring adequate ventilation. Exhaust fumes are damaging to the health and can be lethal.

USING THE TRACTOR

■ Select the most suitable wheel setting for the work in hand, i.e.: the setting that provides the best stability.


24136

■ Engage the clutch slowly: if engaged too quickly, especially when the tractor is getting out of a hole, ditch or operating on muddy ground or steep slopes, the tractor may overturn.
Release the clutch immediately if the front wheels start to lift.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■ When travelling downhill, keep the tractor in gear. Never release the clutch and never leave the gears in neutral.

■ When the tractor is moving, the operator must remain correctly seated in the driving position.

■ Never get on or off the tractor while in movement.

■ When using the brakes, press the pedal down slowly.

■ Avoid curving at high speeds.

■ Always use the tractor at a speed that will guarantee safe operation on the type of land being worked. When working on uneven ground, use maximum care to ensure proper stability.

■ If you have to work with the tractor on a gradient, for example on hillsides, drive at moderate speed especially when taking curves.


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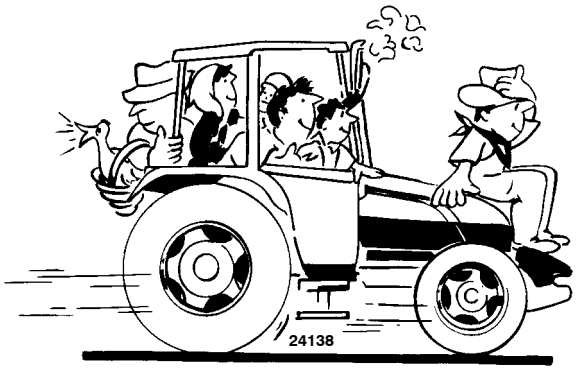
■ Proceed with maximum caution when working with the wheels near the edge of ditches or slopes.

■ When driving on public highways, observe the Highway Code.

■ When driving, do not rest your feet on the brake or clutch pedals.



■ Never carry passengers, not even inside the cab, unless the machine is fitted with an approved extra seat.

■ When driving on roads, connect the brake pedals using the plate provided. Braking when the pedals are not connected could cause the tractor to skid.Avoid excessive wear on the brakes by using engine braking.

TOWING AND TRANSPORT

■ To guarantee tractor stability when moving, adjust the hitching device according to the trailer or implement to be used.

■ Drive slowly when towing extremely heavy loads.

■ For your own safety, do not tow trailers that are not fitted with an independent braking system.

■ If the tractor is used to tow heavy loads, always use the hitching device and never hitch loads onto the lower arms or the top link of the three-point linkage. This may result in tipping or overturning.

■ When towing, do not negotiate curves with the differential lock engaged as this may prevent you from steering the tractor.

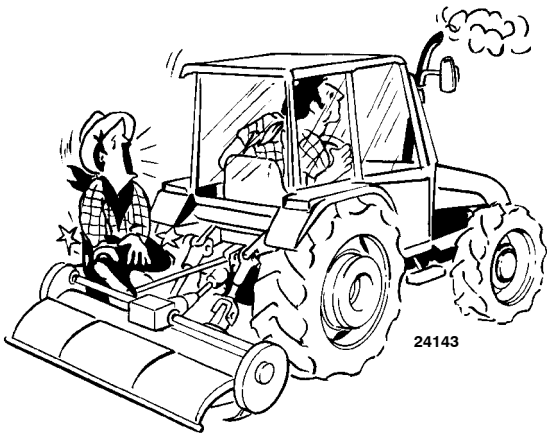
USING IMPLEMENTS AND AGRICULTURAL MACHINERY

■ Do not connect implements or machinery that require more power than can be generated by your tractor model.

■ Never negotiate sharp curves with the power take-off under a heavy load; this may damage the universal joints on the transmission shaft connected to the power take-off.

■ Never stand between the reversing tractor and the implement when hitching.

■ When using implements that require the tractor to be stationary with the engine running, keep the gear and range levers in the neutral position, apply the handbrake and use suitable wheel chocks.



■ Do not operate machines connected to the power take-off without first ensuring that the operating range of the machine is free of bystanders.
Also check that all rotating parts connected to the power take-off shaft are correctly protected.

■ Add rear ballast when using lifting equipment fitted to the front of the tractor.

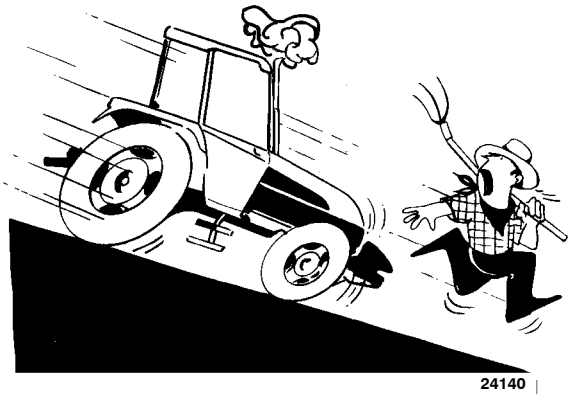
STOPPING THE TRACTOR

■ When the tractor is stationary, never leave connected implements in the raised position. All implements must be lowered before stopping the engine.

■ Before leaving the driving position, move the gear lever to the neutral position, disengage the power take-off, apply the handbrake, stop the engine and engage the central clutch.
Always remove the ignition key from the dashboard when leaving the tractor unattended.

■ Park on flat surfaces, where possible, put the tractor into gear and apply the handbrake. On slopes, in addition to applying the handbrake, put the tractor in first gear when facing uphill and first reverse gear when facing downhill. As an additional safety measure, use wheel chocks (available as an optional);
this procedure is compulsory when parking with a trailer hitched.

CAUTION: *When using the* ***2 Speed Power Shift*** *with the tractor parked* ***and the engine switched off****, the shuttle lever must be moved to the reverse position.*



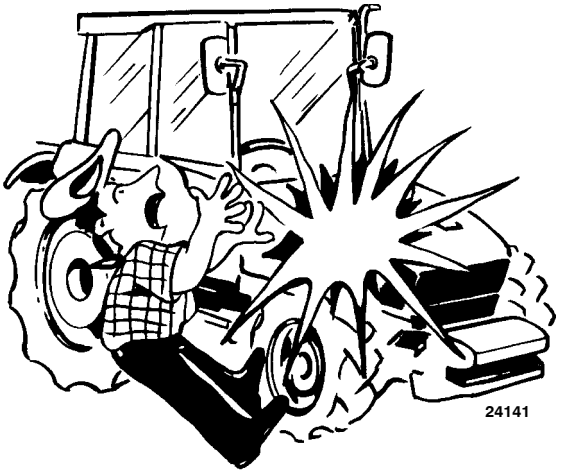
SERVICING THE TRACTOR

CAUTION: *In this manual, some illustrations show panels or covers removed in order to facilitate explanations.*
Never use the tractor without the panels or guards in place.

■ Do not work on the tyres with unsuitable equipment or without the necessary experience. Incorrect tyre fitting may put your safety at risk.
If in doubt, contact skilled personnel.

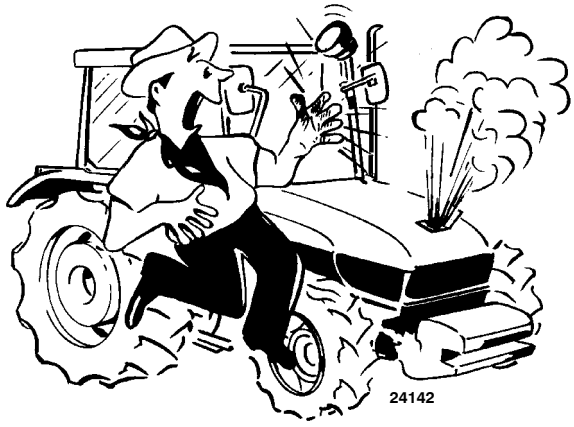
■ When changing or storing tyres, make sure they are stacked correctly and cannot roll or topple over causing personal injury.

■ Before removing any hydraulic lines, check that the system is not pressurized.

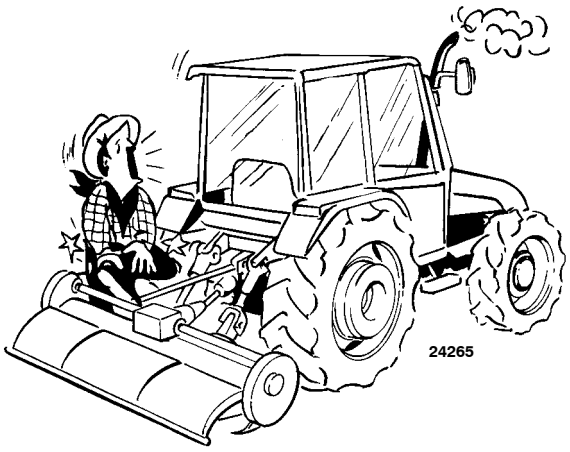


■ Leaks of pressurized oil can cause serious injuries. When looking for leaks use the appropriate safety equipment: screens, safety glasses and gloves.

■ Before touching any electrical components, disconnect the ground lead from the battery.

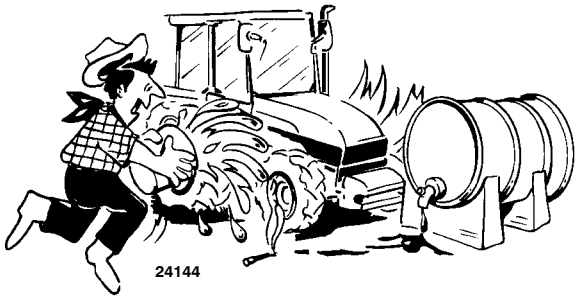


■ Only remove the radiator cap after the engine has been allowed to cool. With the engine switched off, use a cloth to slowly unscrew the cap and release the pressure before completely removing the cap.



■ Before inspecting, cleaning or carrying out maintenance on the tractor (or any implement connected to the tractor), always ensure that the engine is switched off, the gears are in neutral, the brakes are on, the power take-off is disengaged and that all moving parts are stationary.

■ Do not fill up the fuel tank completely if the tractor is to work in extremely sunny conditions, as the fuel may expand and escape. If this occurs, dry up the spillage immediately.



■ Always keep a fire extinguisher at hand.

SAFETY DECALS

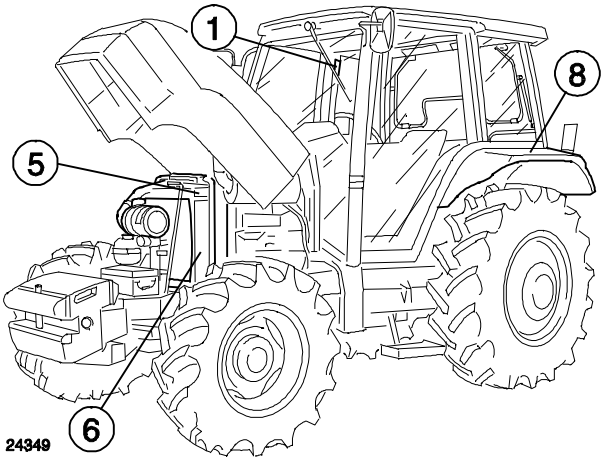
The safety decals on the following pages are positioned on your tractor in the locations shown in the drawings below.

These safety decals are important both for your safety and that of personnel working with you.

We recommend that you study these pages and find the positions of the safety decals on the tractor, checking that their meanings are clear.

Read the instructions below with the tractor drivers that will operate the machine

Keep the safety decals clean and legible. If damaged, order replacements from your dealer.



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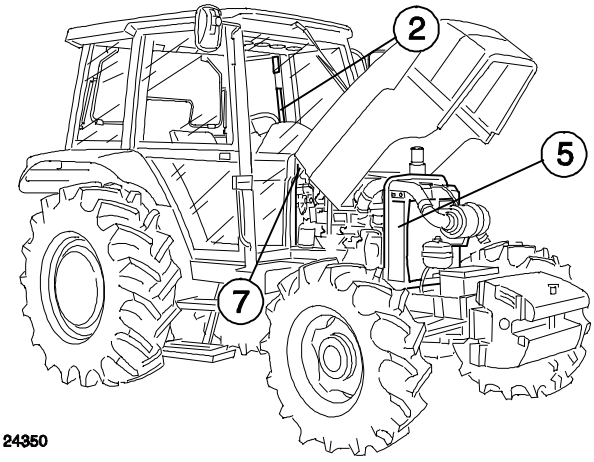

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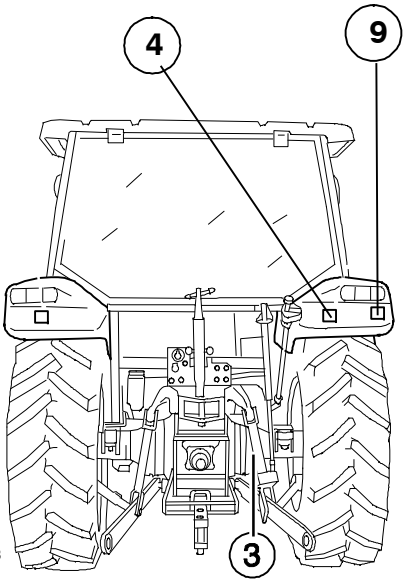

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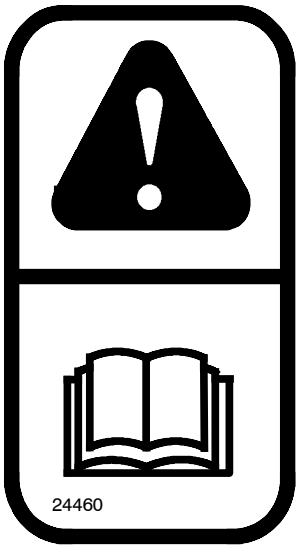
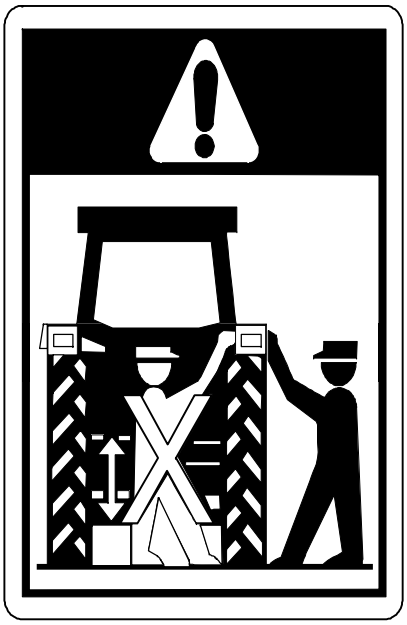


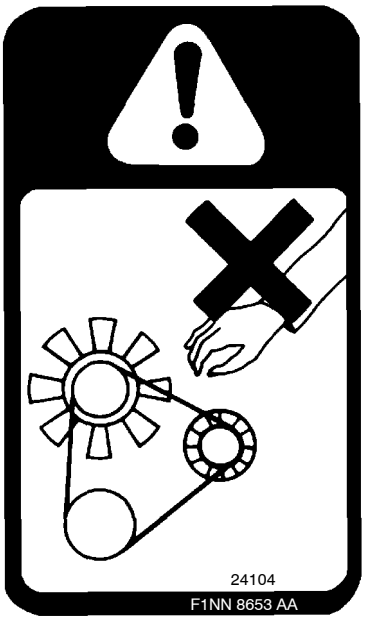
1. Location: on the right-hand upright inside the cab.
Non-compliance with the instructions provided in this manual can lead to serious injury to the operator or bystanders.
Read the instructions on pages vi to xviii.

2. Location: on the left-hand upright inside the cab.
If the tractor should overturn, hold the steering wheel tightly. Do not attempt to jump out of the cab.

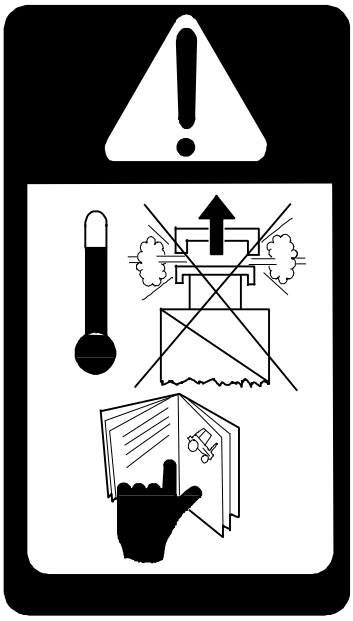
3. Location: on the back of the right-hand final drive housing.
GENERAL WARNING: observe and respect the indications on the safety decals when this symbol is present.



4. Location: on the back of the right-hand mudguard.
To avoid serious injury, do not climb on the implement or between the implement and the tractor when the external hydraulic controls are enabled.

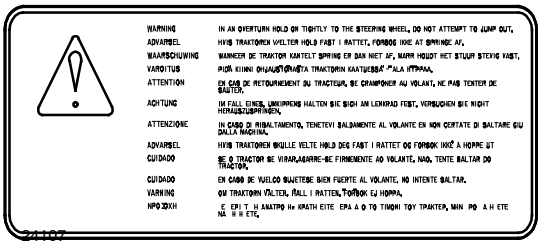


5. Location: left and right-hand sides of the radiator.
To avoid serious injury, keep hands and clothing away from the rotating fan, belts and any other rotating parts.

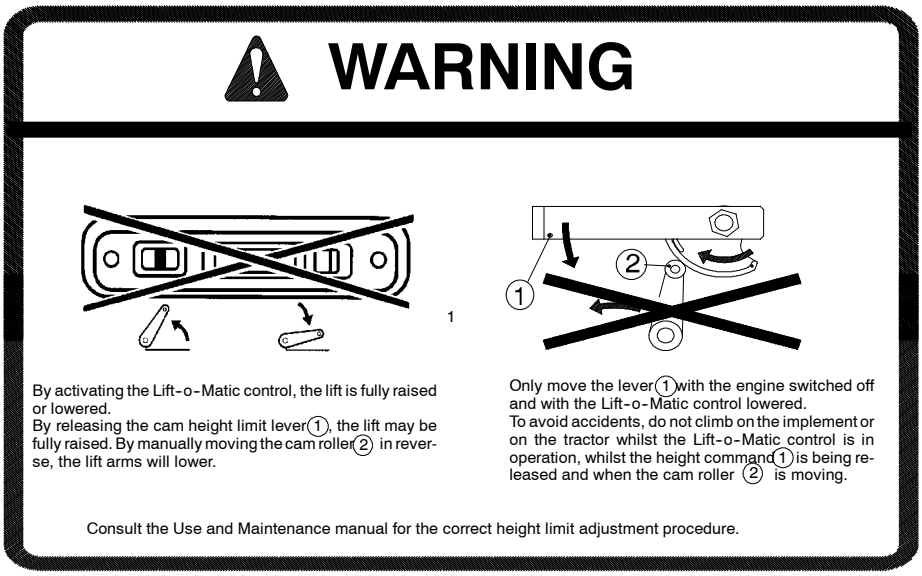


6. Location: left-hand side of the radiator.
WARNING: Pressurized cooling system. Allow to cool then remove cap carefully. Use a cloth to slowly unscrew the cap and release the pressure before completely removing the cap.

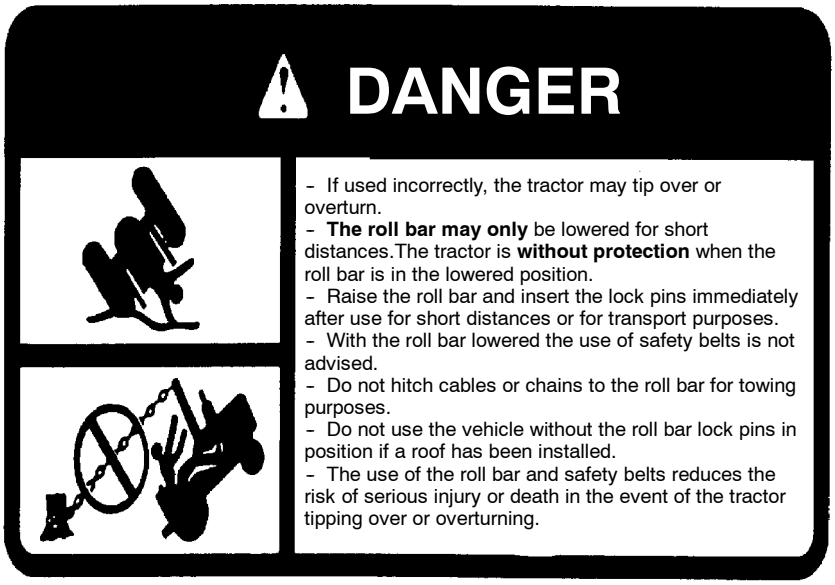
7. Location: inside the bonnet on the right-hand side.
To keep the braking system in good working order, refer to the Use and Maintenance Manual. If the red warning light on the instrument panel illuminates, there is a fault in the braking system.



8. Location: on left-hand mudguard (only for tractors without cabs).
If the tractor should overturn, hold the steering wheel tightly. Do not attempt to jump out of the cab.



9. Location: on the back of the mud flaps on the right-hand mudguard.
Before making adjustments carefully read the correct procedure noted in the Use and Maintenance manual.



10. Location: on the upper part of the roll bar.

STANDARDISED SYMBOLS

For optimal tractor use, the following symbols and definitions have been adopted in compliance with current standardisation procedures. The symbols are followed by a brief explanatory description.


Auxiliary starter device


Alternator charge


Fuel level


Automatic fuel cut-off device


Engine speed (rpm x 100)


Total hours worked


Engine oil pressure


Engine coolant temperature


Lights


Front headlights on full beam


Front headlights dipped


Brake lights (STOP)


Front work lights


Rear work lights


Engine coolant level

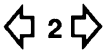

Horn


Radio

KAM Memory


Indicator lights


Indicator lights on first trailer


Indicator lights on second trailer


Windscreen washer/wiper


Rear windscreen washer/wiper


Heated air temperature


Heated fan


Air conditioning temperature


Dry air filter


Parking brake


Rotating beacon on cab roof


Intercooler temperature


Power take-off

N Gears in neutral


Creeper speed


Slow or low speed adjustment


Fast or high speed adjustment


Tractor ground speed


Differential lock


Rear transmission oil temperature


Transmission oil pressure


4WD engaged


4WD disengaged


Caution!


Hazard Lights


Caution! Corrosive substances


Adjustment control


Hydraulic lift - operating in position control


Hydraulic lift - operating in draft control


Accessory power socket


Implement power socket


Hydraulic lift disconnected


% slipping of rear wheels


Caution, under pressure! Open carefully


Arms raised


Arms lowered


Maximum lifting height


Transmission oil filter


Hydraulic jack extended


Hydraulic jack retracted


Hydraulic jack floating


Fault! Refer to Use and Maintenance manual

TRACTOR NOISE LEVEL INFORMATION SHEET

In compliance with **DPR Nº 212 enclosure 8 section II** incorporating **77/311/CEE**, noise levels for tractors fitted with tyres covered by the Use and Maintenance Manual are as specified below.

2/4WD TRACTORS WITH ROLL BARS

Model	Maximum noise level at steering wheel dB (A)	
	18.64 MPH (30 km/h)	24.85 MPH (40 km/h)
TL70 2WD	89.5	-
TL80 2WD	91.5	-
TL90 2WD	91.5	-
TL100 2WD	89.5	-
TL70 4WD	89.5	90.0
TL80 4WD	91.5	91.5
TL90 4WD	91.5	89.5
TL100 4WD	90.0	89.5

2WD TRACTORS WITH CABS

Model	Maximum noise level at steering wheel with cab doors and windows:	
	closed dB (A)	open dB (A)
	18.64 MPH (30 km/h)	18.64 MPH (30 km/h)
TL70	78.0	82.0
TL80	77.5	81.5
TL90	78.0	81.5
TL100	77.5	81.0

4WD TRACTORS WITH CABS

Model	Maximum noise level at steering wheel with cab doors and windows:			
	closed dB (A)		open dB (A)	
	18.64 MPH (30 km/h)	24.85 MPH (40 km/h)	18.64 MPH (30 km/h)	24.85 MPH (40 km/h)
TL70	78.0	77.5	82.0	82.0
TL80	77.5	78.0	82.0	81.5
TL90	78.0	77.5	81.5	82.0
TL100	77.5	78.0	81.5	81.5

WARNING – If the noise level during continuous use reaches or exceeds **85 dB (A)**, the user must adopt suitable precautions, as described in articles **41**, **42**, **43** and **44** of **DL Nº 277** dated **15/08/1991**.

NOTES

SECTION 1

GENERAL INFORMATION, CONTROLS AND INSTRUMENTS

INTRODUCTION

This Use and Maintenance Manual provides information, documents and a practical guide for the user with regard to running-in, use and maintenance of the tractor.

The manual is subdivided into five sections as shown on the “Contents” page. The general index is at the end of the manual.

Read and refer to this manual carefully, and always keep it in a convenient place so that you can refer to it whenever necessary.

If you have any doubts in the future about tractor use, contact your dealer.

The dealer can provide skilled personnel, original spare parts and the necessary equipment to carry out your service requirements.

All the data provided in this manual is subject to product modifications. Weights and measures are to be considered approximate figures and the illustrations do not necessarily show tractors with standard fittings.

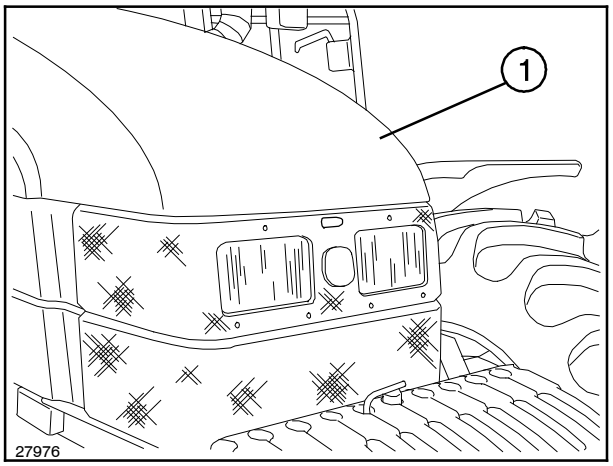
For precise information on specific tractor models and versions, please contact your authorized dealer.

The manufacturer is engaged in a continuous process of product development and improvement and therefore reserves the right to change the specifications, components and prices of the product itself at any time, without prior notice.

In this manual, the “left-hand” and “right-hand” parts of the tractor are as seen from the driver’s seat facing forward.

All necessary precautions to guarantee the safety of the operator or bystanders are listed and described in the «Working safely» section, at the start of the manual. Read and follow this information **BEFORE** using the tractor.

SAFETY COVERS AND GUARDS



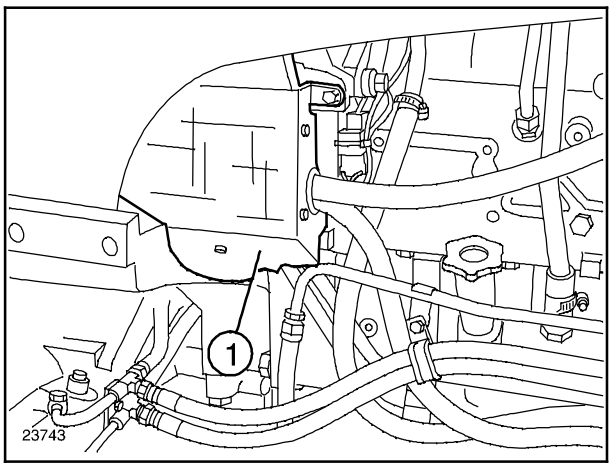
1

The tractor is fitted with covers and guards for the personal safety of the operator and others when working.

CAUTION: *Before starting the engine or using the tractor, check that all covers and guards are correctly in position.*

BONNET - Fig. 1

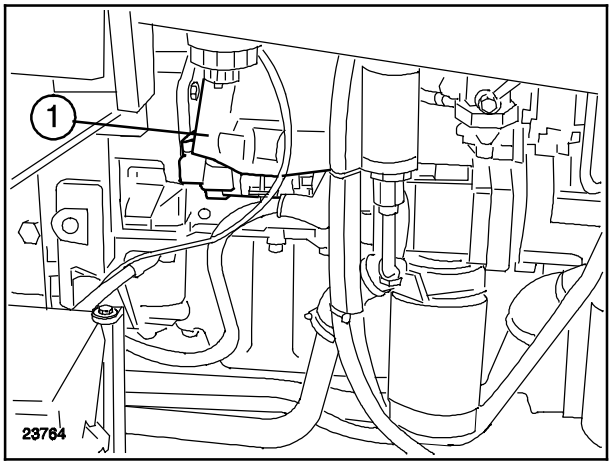
The bonnet (**1**) covers the engine's moving parts. It must be closed before the engine is started and the tractor is used.



2

FAN COVER - Fig. 2

Both sides of the fan have covers (**1**). The cover shown in the drawing protects the left-hand side of the fan.



3

STARTER MOTOR COVER - Fig. 3

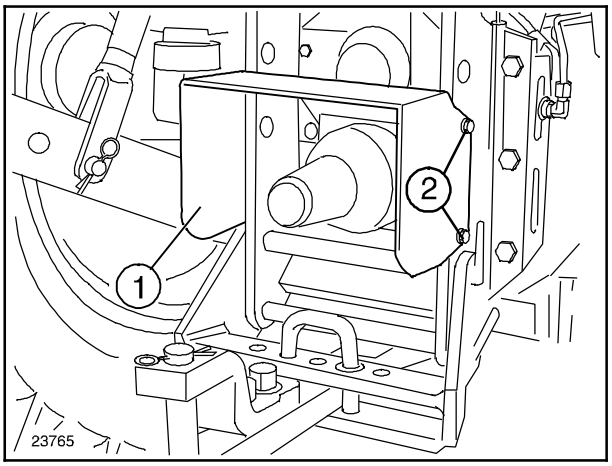
Cover (**1**) protects the electromagnetic contacts of the starter motor from accidental contact. It must always be in place when the batteries are connected to the electrical system.

Cover (**1**) protects the battery from possible damage and the electrical connections from possible accidental contact.

POWER TAKE-OFF GUARD - Fig. 4

The guard (**1**) protects the power take-off shaft.
To facilitate replacing the shaft, loosen screws (**2**) and remove the guard.

CAUTION: *The guard must never be removed when the tractor is in use and must never be modified.*

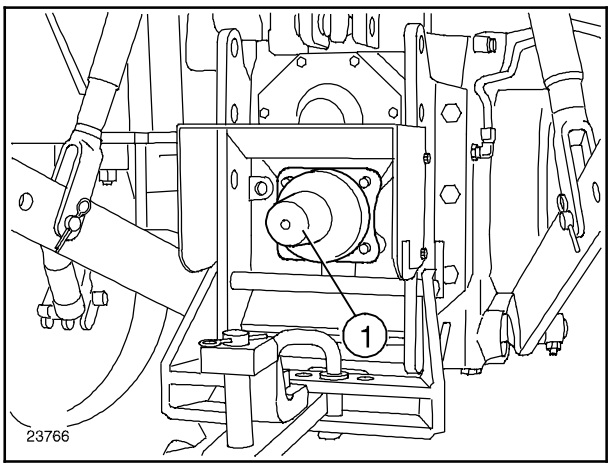


4

POWER TAKE-OFF SHAFT COVER - Fig. 5

Cover (**1**) must always be fitted on the power take-off shaft when it is not connected to the implement or machine in use.
Replace it correctly when not in use.

CAUTION: *Check that all guards and covers are fitted correctly before using the tractor.*



5

CONTROLS AND INSTRUMENTS - POSITION AND FUNCTION

The position and function of the controls and instruments on your tractor are described in the following pages.

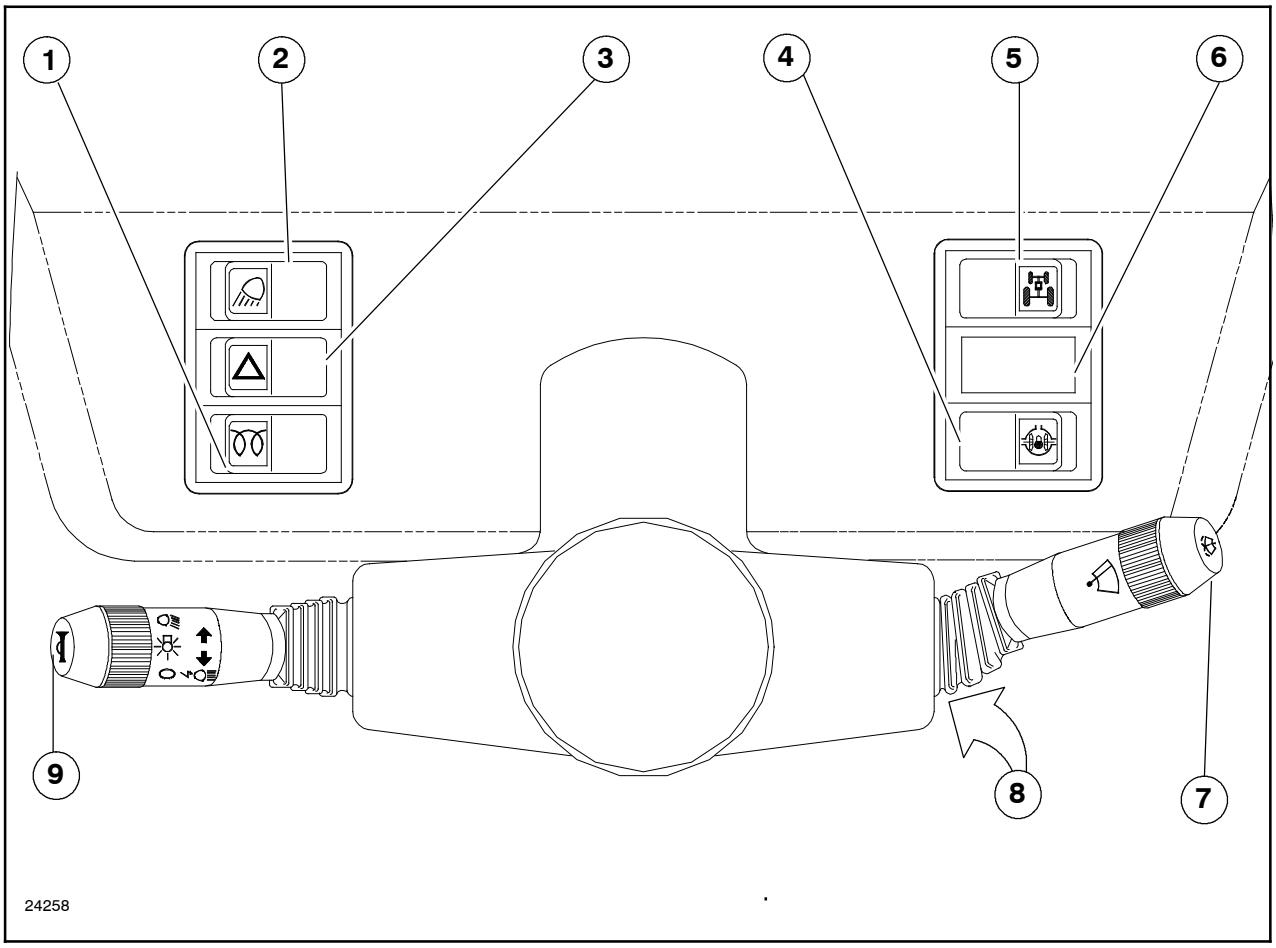
The controls have been sub-divided into groups and are described as follows:

- Instrument panel controls (control panel).
- Cab controls.
- Operating controls, right-hand side.
- Left-hand side controls.
- Pedal and foot plate controls.

IMPORTANT: *This section of the manual is intended to provide the general information required by the operator to locate and identify the function of individual controls, but does not describe their use in detail. For this information, read Section 2 of the manual carefully, relating to "Instructions for use" of controls and instrument readings, before starting and using the tractor.*

CAUTION: *Do not use the tractor if you are not fully acquainted with the position and operation of all the tractor controls.*

Dashboard controls



6

Control Panel

1. Thermostart or Start – Pilot.

2. Work light switch (only for models with a cab).

3. Hazard warning light switch.

4. Differential lock switch.

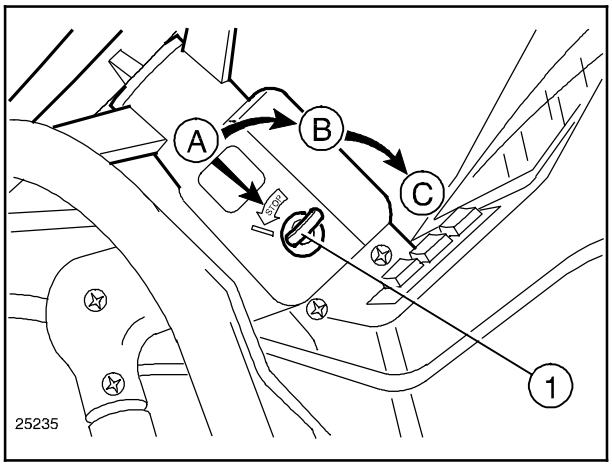
5. Four–wheel drive switch.

6. Not used.

7. Windscreen wiper/washer control lever (only for models with De Luxe cab).

8. Starter switch.

9. Light control lever with direction indicators incorporated.



7

STARTER SWITCH - Fig. 7

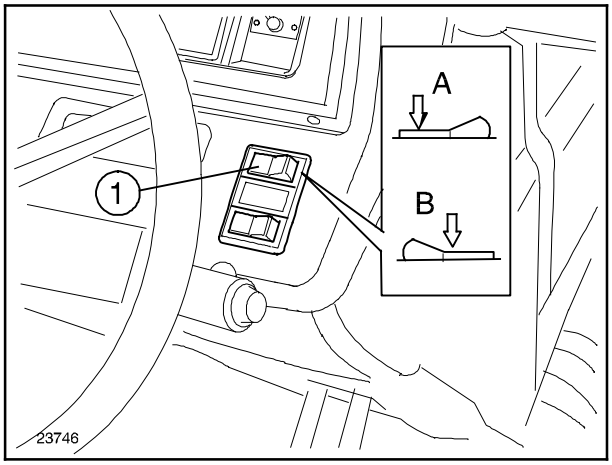
To operate the four switch functions, turn the key (**1**) through the following positions:

A. No power supply to any of the circuits (key can be removed). Engine stopped: automatic activation of fuel injection cut-off.

B. Stand-by for engine start up. Operation of panel lights and instruments. Power supplied to various circuits.

C. Engine start up: if released, the key returns automatically to position (**B**).

NOTE: *for further details, see page 2-3.*

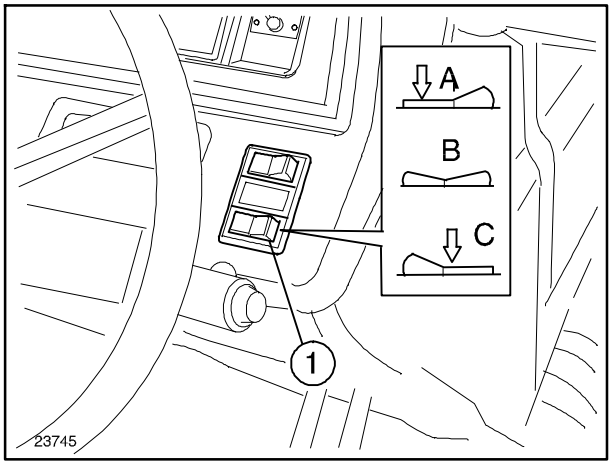


8

FOUR-WHEEL DRIVE SWITCH - Fig. 8

Press the switch to position (**B**) to engage four-wheel drive, or to position (**A**) to disengage.
Engagement is electro-hydraulically operated.

NOTE: *for further details, see page 2-47.*



9

DIFFERENTIAL LOCK SWITCH - Fig. 9

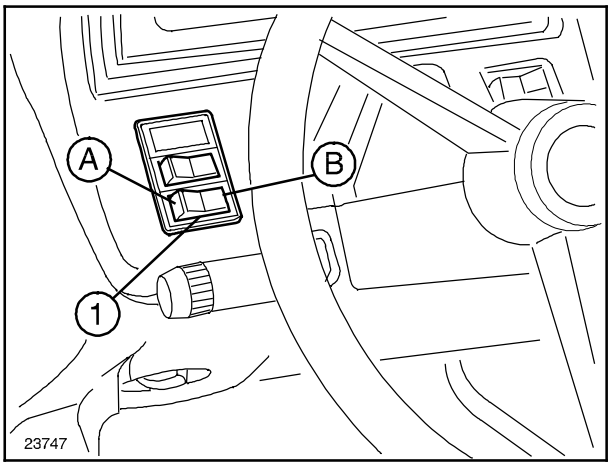
The differential lock control is electro-hydraulically operated and has three settings:

- Switch in position **A** = lock disengaged;
- Switch in position **B** = presetting for differential lock engagement;
- Switch in position **C** = differential lock engaged. The lock is released even when only one brake pedal is pressed, or by returning the switch to position (**A**).

NOTE: *for further details, see page 2-49.*

THERMOSTART OR START-PILOT SWITCH - Fig. 10

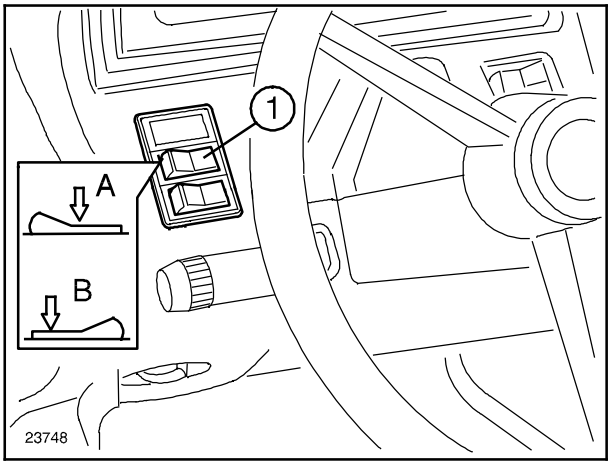
Press switch (**1**) to position **A** to operate the auxiliary starting system.
When the switch is released, it returns automatically to position **B**.
See instructions for starting at low temperatures, page 2-3.



10

HAZARD WARNING LIGHT SWITCH - Fig. 11

Press switch (**1**) to the red section to turn on the flashing hazard lights; when pressed, the switch also flashes.
The panel light flashes at the same time as the direction indicators.



11

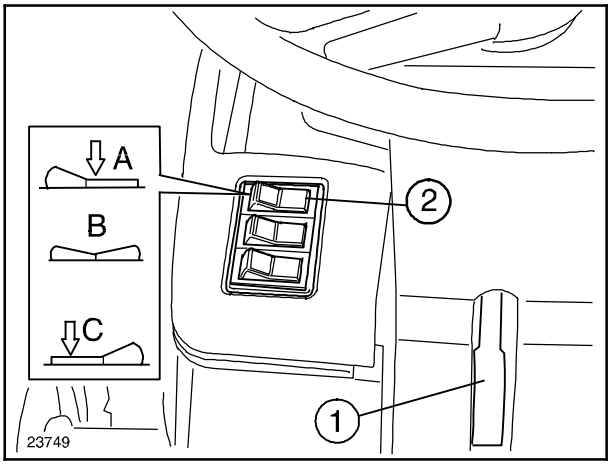
STEERING WHEEL POSITION LEVER - Fig. 12

Pull lever (**1**, fig. 12) to release the steering wheel lock. Move the steering wheel up or down to find the best position for comfortable and safe driving.

AUXILIARY LAMP CONTROL SWITCH - Fig. 12

There are three settings for the switch (**2**):

- pressed to position **A** = lights OFF;
- held in position **B** = rear lamps on;
- pressed to position **C** = front and rear lamps on.



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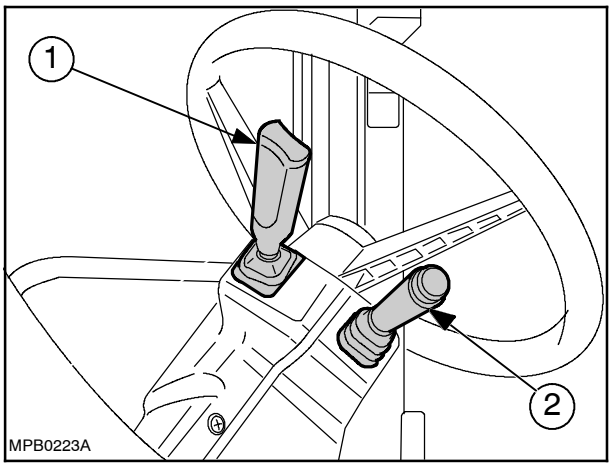


13

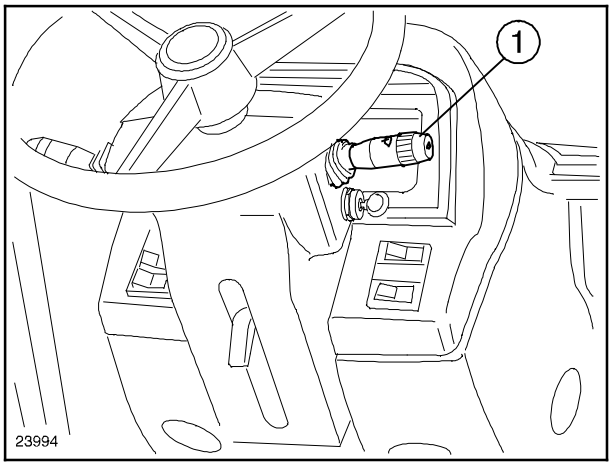
LIGHT CONTROL LEVER / POWER SHUTTLE - Fig. 13

(**1**) Power Shuttle control lever (see page 2-36).

(**2**) Light cluster.

The lever operates the external lights, the horn and the direction indicators.
The external lights will only work with the starter key in position (**B**, Fig. 7)

For further details see page 2-9.



14

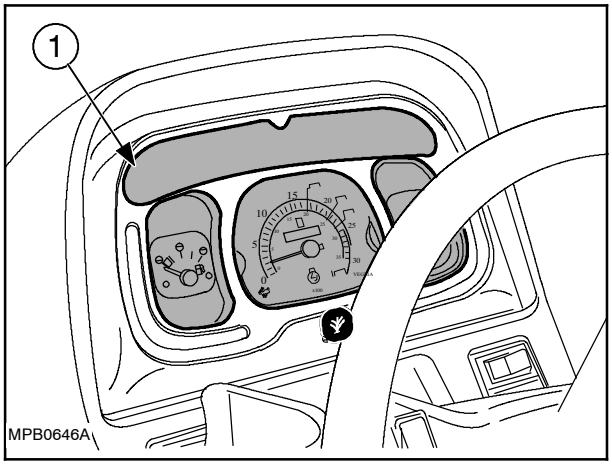
CONTROL LEVER - Fig. 13

WINDSCREEN WIPER/WASHER CONTROL LEVER (ONLY FOR MODELS WITH DE LUXE CAB) - Fig. 14

Only works with the starter key in position (**B**, Fig. 7).

Lever (**1**) controls the front windscreen wiper and the windscreen washer.

For further details see page 2-127.



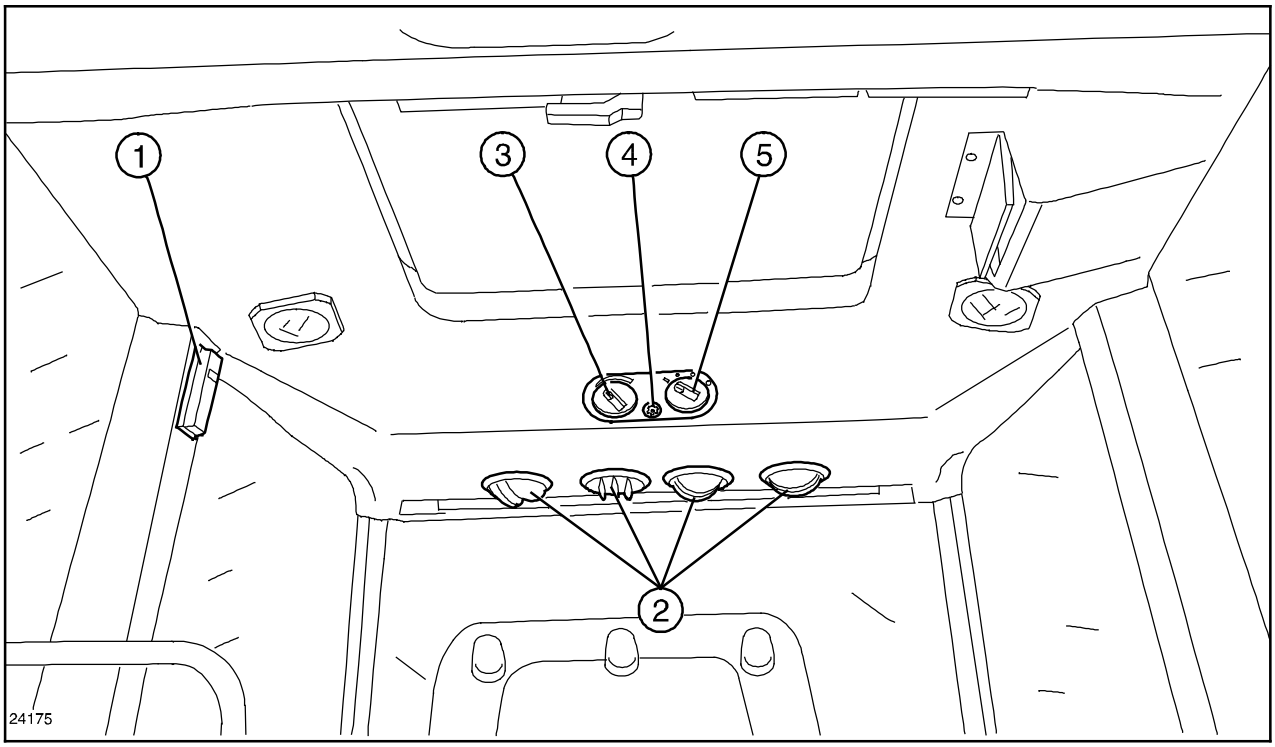
15

MULTIPLE DISPLAY INSTRUMENT PANEL - Fig. 15

Instrument panel (**1**) has a series of lights which provide information on the performance of your tractor.

For further details see page 2-5.

Cab controls



16

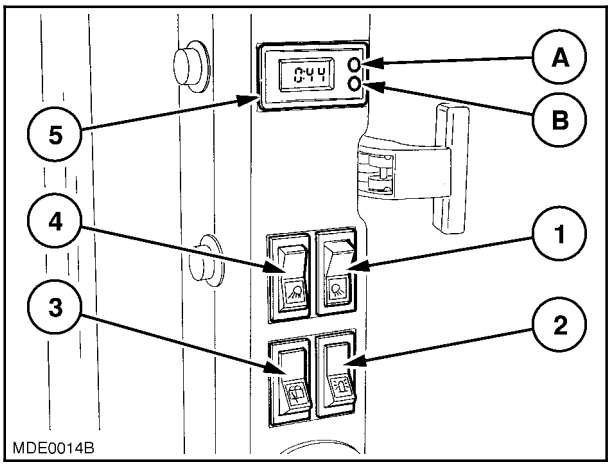
Controls on upper part of cab

1. Cab interior light.
2. Adjustable air vents.
3. Heater control.
6. Air conditioning ON/OFF switch.
7. Electric fan speed control.

CONTROLS ON RIGHT-HAND CAB UPRIGHT - Fig. 17

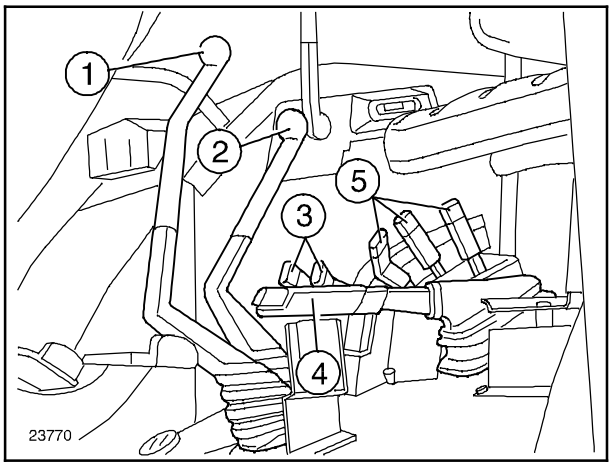
1. Rear work lights control switch.
2. Rotating beacom control switch.
3. Rear windscreen wiper/washer switch.
4. Front work lights control switch.
5. Digital clock. Use the sharpened end of a pencil to set the time: (**A**) for hours; (**B**) for minutes.

NOTE: *The cab controls are described in detail from page 2-124 to 2-132.*

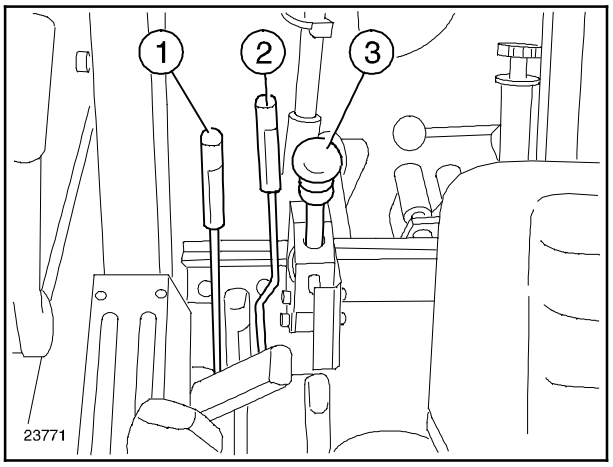


17

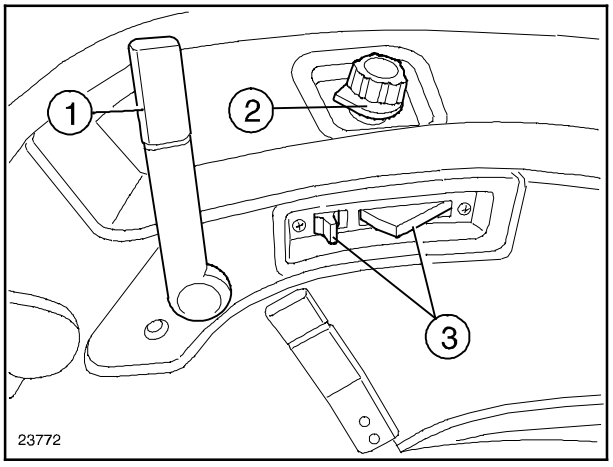
RIGHT-HAND SIDE OPERATING CONTROLS



18



19



20

PLATFORM CONTROLS

Fig. 18

1. Main gear shift lever (see page 2-14 and 2-17).

2. Range lever (see page 2-14 and 2-17).

3. Hydraulic lift operating levers (see page 2-62).

4. Handbrake lever with release pushbutton (see INSTRUCTIONS FOR USE page 2-4):
- up = brake on;
- horizontal = brake off.

5. Remote control valve levers (see page 2-90).

Fig. 19

1. Standard power take-off operation selector lever (see page 2-52 and 2-53).

2. Creeper control lever (see page 2-20).

3. Power take-off speed selector lever (see page 2-56).

CONTROLS ON FENDER

Fig. 20

1. Hand throttle lever:
- pushed fully forward = maximum engine speed;
- pulled fully back = minimum engine speed.

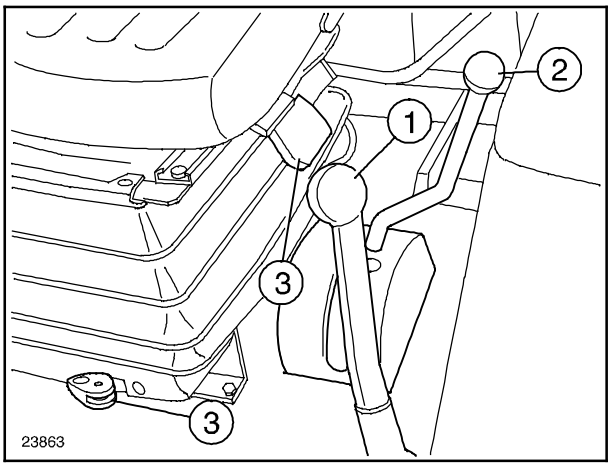
2. Independent electro-hydraulic power take-off control knob (optional), page 2-54).

3. Fast hydraulic lift up/down control (LIFT-O-MATIC), see page 2-62).

LEFT-HAND SIDE OPERATING CONTROLS

SEAT AND PLATFORM CONTROLS - Fig. 21

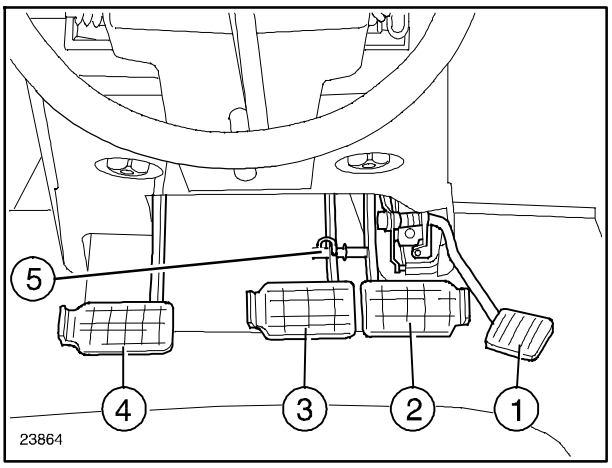
1. Shuttle or Overdrive lever (optional), page 2-17).
2. Power take-off clutch control lever, see page 2-52).
3. Seat adjustment controls, see pages from 2-120).



21

PEDAL CONTROLS - Fig. 22

1. Accelerator pedal.
2. Right brake control pedal.
3. Left brake pedal.
4. Transmission clutch pedal.
5. Brake pedal lock pin.

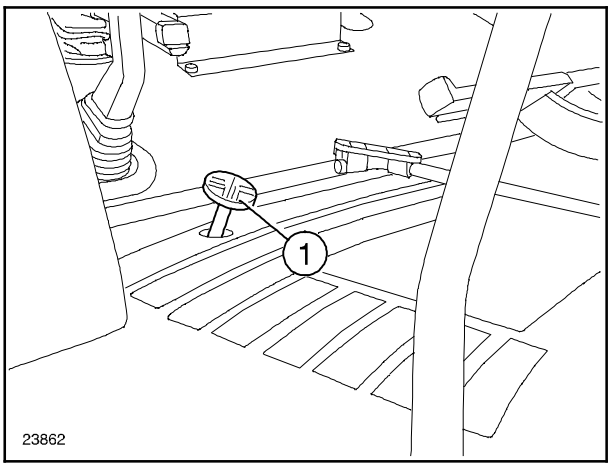


22

CAUTION: *When travelling on roads, always connect the brake pedals with pin (**5**). Braking when the pedals are not connected could cause the tractor to skid.*

PEDAL CONTROLS - Fig. 23

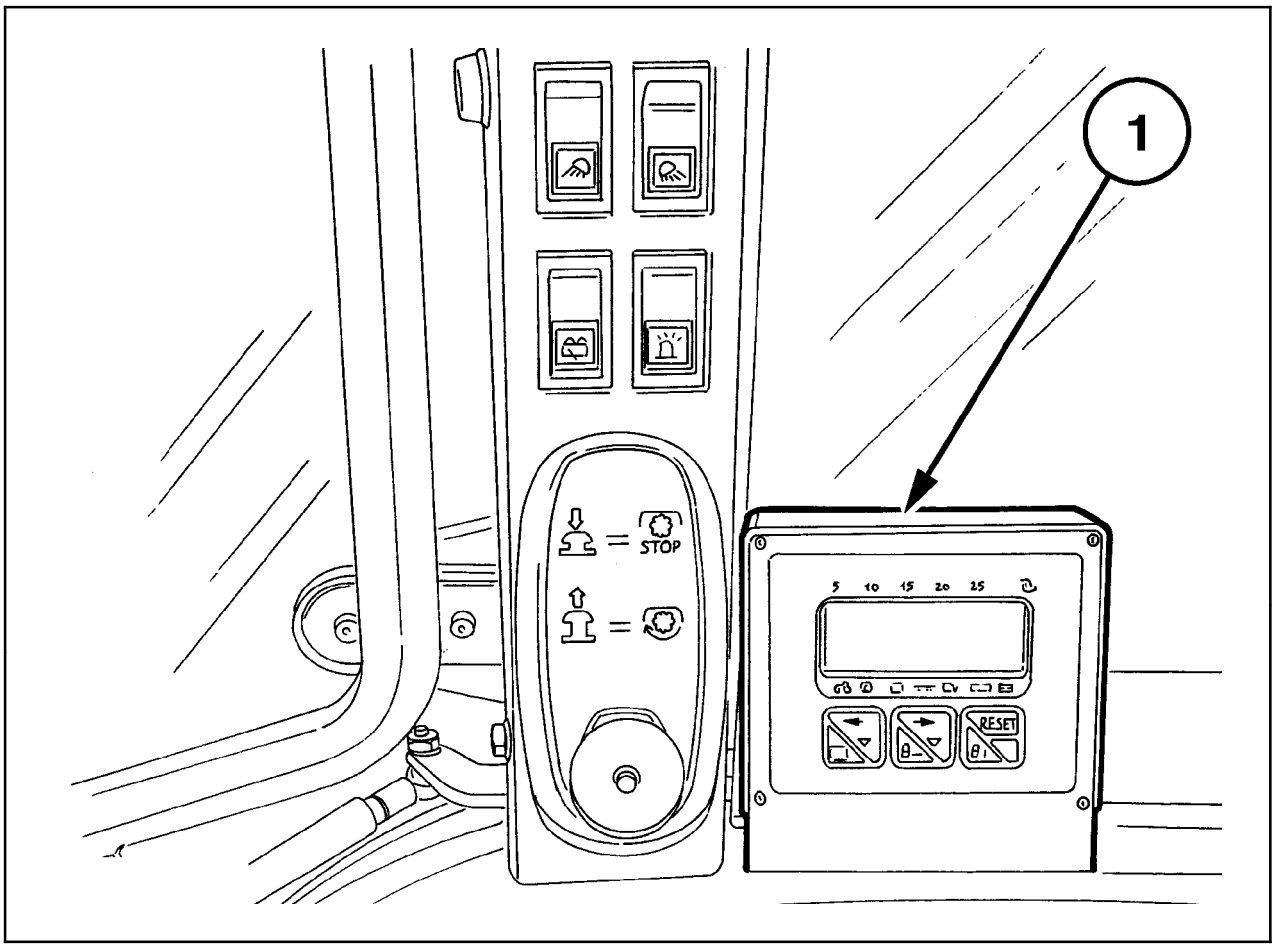
1. Rear mechanical differential lock pedal.



23

DIGITAL DISPLAY

(OPTIONAL)



24

Digital display (**1**) gives the operator important information about the operating performance of the tractor.

The information provided by the instrument is based on data received from the sensors connected to specific parts of the tractor.

NOTE- *The items listed opposite are described in detail in Section 2, "INSTRUCTIONS FOR USE".*

The following information can be displayed:

2. Tractor speed in km/h or mph.

3. Power take-off speed in rpm.

4. Total area worked in hectares or acres.

5. Distance covered by tractor in km or miles.

6. Area worked in one hour measured in hectares or acres.

7. Operation of battery charging system.

TOWING THE TRACTOR

TOWING THE TRACTOR

NOTE: *The tractor must only be towed for short distances, for example from inside a building to the outside. It must never be towed for long distances on the road in heavy traffic.*

NOTE: *To transport the tractor, load it complete with its four tyres onto a truck.*

Should it be necessary to tow the tractor, use a strong chain. Tow the tractor from the rear, using only the drawbar, the rear tow hitch or the three–point linkage device.
Tow the tractor from the front using the tow pin on the front support.
Have an operator steer and brake the tractor.

To avoid damaging the transmission or other components that turn but are not lubricated during towing, observe the following:

1. Only tow for short distances;
2. do not exceed 4.97 mph (8 km/h);
3. If possible, run the engine to provide lubrication and power steering.

CAUTION: *Never use ropes or cables to tow the tractor. If a cable or rope breaks or slips, it may cause serious injury.*
When using a chain, connect the link so that it will drop down in the event of the chain slipping.

CAUTION: *Do not tow the tractor faster than 4.97 mph (8 km/h). Steering is much slower and steering wheel effort is much greater.*

LOADING THE TRACTOR ONTO A TRANSPORTER

CARRYING THE TRACTOR ON A TRANSPORTER

Load the tractor complete with all four wheels onto the vehicle or trailer platform.

Secure the tractor on the transporter with suitable chains.

Secure the front of the tractor using the towing hitch.

Secure the rear of the tractor using the tow bar or tow bar supports.

IMPORTANT: *Do not hook or connect chains around the front axle transmission shaft, the power steering cylinders, the front axle itself or other parts of the tractor which could be damaged either by the chains or excessive strain.*

IMPORTANT: *On models TL90 and TL100 cover the silencer outlet to prevent the turbocharger from turning in the wind and damaging the bearings.*
The turbocharger turbine must be prevented from rotating freely with the engine off, as the shaft bearings will not be lubricated.

CHECKS BEFORE USING THE TRACTOR

Before using the tractor, check that you are familiar with the position and function of all the tractor controls.

Ensure that the maintenance and lubrication operations described in Section 3 of this manual are fully carried out.
After daily maintenance, carry out a visual inspection of the outside of the tractor, paying particular attention to the following points:

1. signs of cracking on the fan belt;
2. Accumulation of dirt around the engine;
3. signs of leaks or damaged components connected to pressure lines, sleeves and connectors;
4. damaged tyres;
5. loose fasteners;
6. accumulation of dirt or leaks on the hydraulic pump and connected parts.

Always carry out any necessary repairs before using the tractor again.

SECTION 2

OPERATION

BEFORE USING THE TRACTOR

Read this section of the operator's manual carefully before using the tractor. This is particularly important if the tractor is to be used correctly as it contains all the information required on the layout and use of the tractor controls.

Even if you already have experience in using other makes of tractor, this section of the manual especially must be studied carefully and thoroughly.

After reading this section in full, ensure that you are fully familiar with the layout and use of the controls. Ensure too that you know the specifications of the tractors in question.

Never start the engine and tractor if you have not already familiarised yourself with all the controls.

Finding out once the tractor is moving may be too late.
If you have any doubts about any functional aspect of the tractor, contact your dealer.

Particular attention needs to be paid to the tractor's running–in period, to obtain the best operating reliability and service life for which it is designed and built.

With regard to the reliability and service life of your tractor, study Section 3 carefully.

Section 3 contains details of all the lubrication and general maintenance operations to be carried out on the tractor.

Tractor data and specifications are noted in Section 5.

OPERATING INSTRUCTIONS

CAUTION: *Before starting the engine and moving the tractor, follow the instructions noted below:*

- *Do not start or operate the tractor in an enclosed area.*
- *Before starting the engine, check that all controls are in neutral.*
- *All controls must be operated only from the driver's seat.*
- *Stop the engine before carrying out any service or maintenance operations on the tractor.*
- *Use the steps provided for entering and leaving the tractor.*
- *Keep the guards properly fitted.*
- *When moving on the roads, signal your intention to stop, turn or slow down.*
- *Use the appropriate warning devices to indicate a slow-moving vehicle.*

STARTING THE ENGINE

a. If the tractor has not been used for some time, or if started up for the first time at a low surrounding temperature, actuate the fuel pump starting lever around twenty times.

b. Depress the clutch pedal to turn off the starting safety device switch.

c. Move the throttle lever to approximately the half-way position.

d. Turn the ignition key to position ***C*** (fig.1, page 2-3). Release the key as soon as the engine starts.

HOW TO START AND STOP

STARTING WITH LOW EXTERNAL TEMPERATURES

CAUTION: *When the outside temperature is low and the engine is cold, cover the radiator before starting so that the engine coolant can quickly reach the correct temperature. Then remove the cover. Also note the following warnings:*

- *to avoid running down the battery, any single engine starting attempt should not last longer than 15 seconds; if, however, the engine fires but does not start, continue the attempt up to a maximum of 30 seconds.*
- *wait for at least one minute between each attempt to start the engine;*
- *to avoid excessively running down the battery, do not make more than six attempts to start the engine.*

STARTING WITH THERMOSTART

Start as follows:

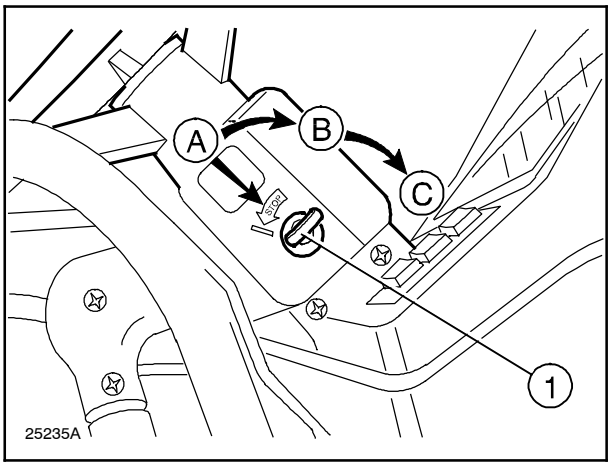
— carry out operations **a**, **b**, **c**, as described on page 2.

— Turn the ignition key (**1**) fig. 1 to position **B**.

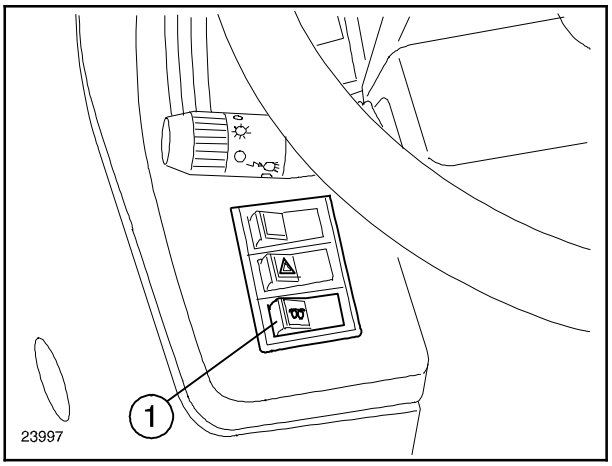
— Turn on thermostart by pressing switch (**1**) fig. 2 and keep it pressed for 25 seconds.

— Move the ignition key to position (**C**) while continuing to hold down switch (**1**) fig. 2 until the engine starts.

— When the engine starts, release both the key and the switch. If, after two or three attempts the engine has not started, and black smoke is noted coming from the exhaust, start the engine without using thermostart.



1



2

TRACTORS FITTED WITH START-PILOT

The Start-pilot only operates when the electric starter motor is rotating. Start as follows:

— Carry out operations **a**, **b**, **c**, as described above.

— Turn the ignition key to position (**C**) fig. 1.

— Turn on the Start-pilot by pressing switch (**1**) fig. 2.

— When the engine starts, release both the key and the switch.

***CAUTION*:** *Only use the start pilot when strictly necessary (temperature below 5 °F (-15 °C)).*
When the start pilot is used, the engine should start first time; if it does not, you are advised not to repeat the operation but to contact your dealer.

CAUTION: *When starting the engine after extended periods of non-use, avoid using the hydraulic system immediately. As all the moving parts need to be lubricated properly before they are subjected to full load.*
Especially when the external temperature approaches 32 °F (0 °C), run the engine at 1300 to 1500 rpm for approximately 5 minutes in order to heat the oil in the rear transmission to working temperature.

CAUTION: *Before accelerating or starting TL90 and TL100 turbo tractor models, let the engine idle at 1,000 rpm for 30 seconds to ensure that the turbocharger is fully lubricated.*

CAUTION: *If one of the warning lights illuminates to signal a fault, check and repair the faulty part.*
If the warning light continues to signal a fault, have the machine checked by your dealer.

CAUTION: *To prevent separation of the paraffin components in the diesel fuel, when the external temperature falls below 32 °F (0 °C), leading to a reduction in fluidity and consequent fuel supply problems (especially when starting the engine),* ***mix the diesel with antifreeze*** *or a similar product) in the proportions stated on the container.*

The antifreeze must be mixed with the diesel fuel before there is any sign of paraffin separation; adding it later will have no effect on an engine if the cold has already caused the engine to stop running or prevent it being started.

Put the antifreeze in the tank first, followed by the diesel fuel.

The antifreeze will ensure that there is an optimum fuel supply to the engine without reducing performance, even where the external temperature drops below -4 °F (-20 °C).

STARTING THE TRACTOR

— Press the transmission clutch pedal and move the gear lever and range lever to the desired position (see pages 2-14 and 2-17).

— Accelerate the engine.

— Lower the handbrake and engage the clutch, slowly releasing the pedal.

WARNING: *to extend the service life of the tyres and the transmission components, it is advisable not to use the tractor continuously at full power when working at speeds of less than 4.34 mph (7 km/h), particularly where the tractor is excessively ballasted.*
It is not advisable to ballast the tractor too heavily when towing heavy loads and travelling at low speeds. Follow the instructions given in the chapter on ballast and hitch components.

STOPPING THE TRACTOR

— Reduce engine speed.

— Press the transmission clutch pedal and apply the brakes.

When the tractor is stationary, move the main shift and range gear levers to neutral, release the clutch pedal and engage the handbrake.

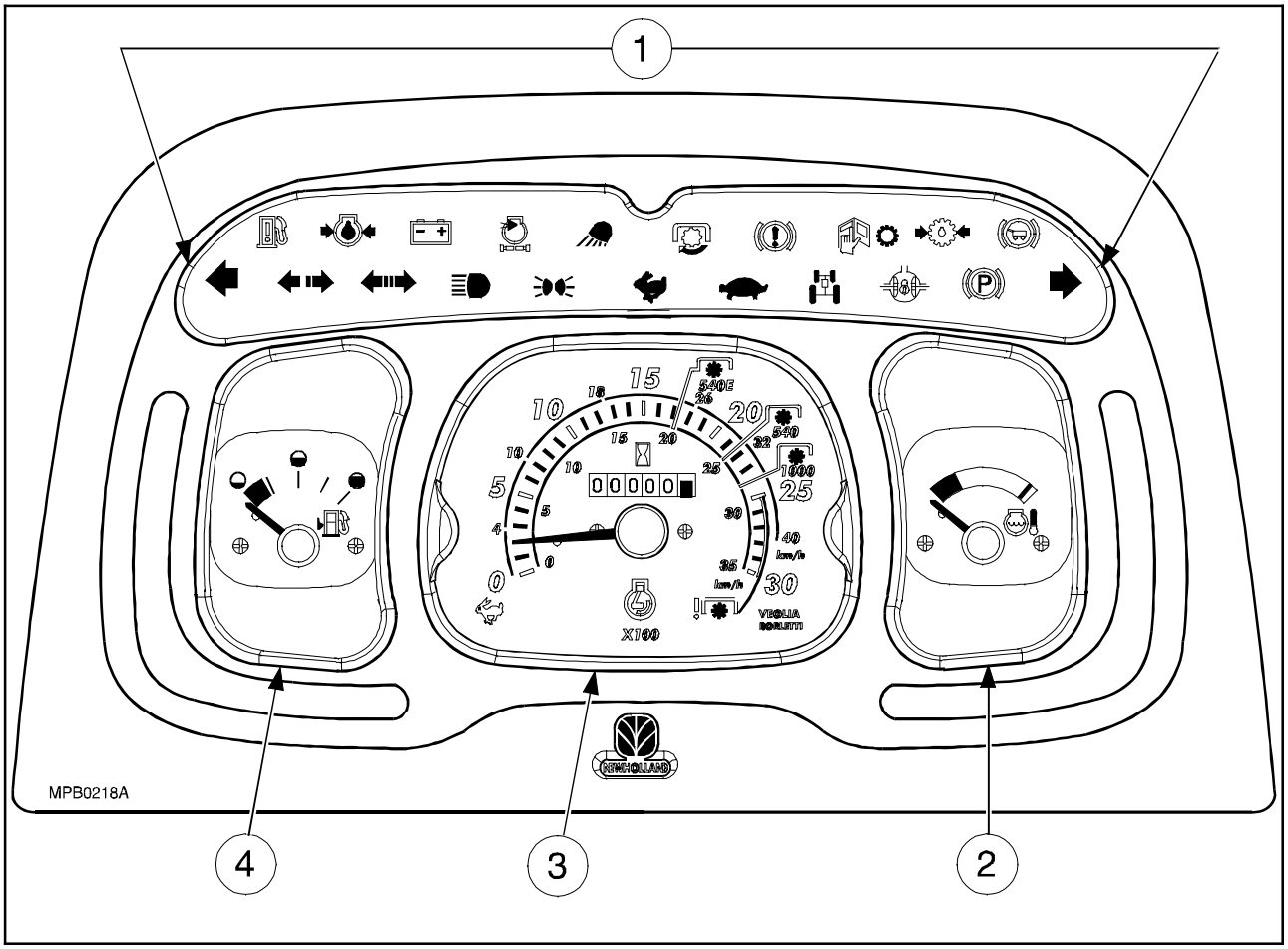
HANDBRAKE with buzzer alarm

- Standard with Power Shuttle.
- **Key not inserted (OFF):** independently of the operator's position or the PTO status, when the handbrake is not applied the alarm will sound for 10 seconds, or until the handbrake is applied.
- **Key inserted (ON):** if the operator leaves the driving position without having applied the handbrake or with the PTO engaged, the alarm will sound for 10 seconds or until the handbrake is applied or the operator returns to the driving position.

STOPPING THE ENGINE

CAUTION: *On models TL90 and TL100 models, before stopping the engine, let it idle at 1,000 rpm for at least three minutes.*

— turn the ignition key to the **STOP** position (**A** fig. 1, page 2-3).



3

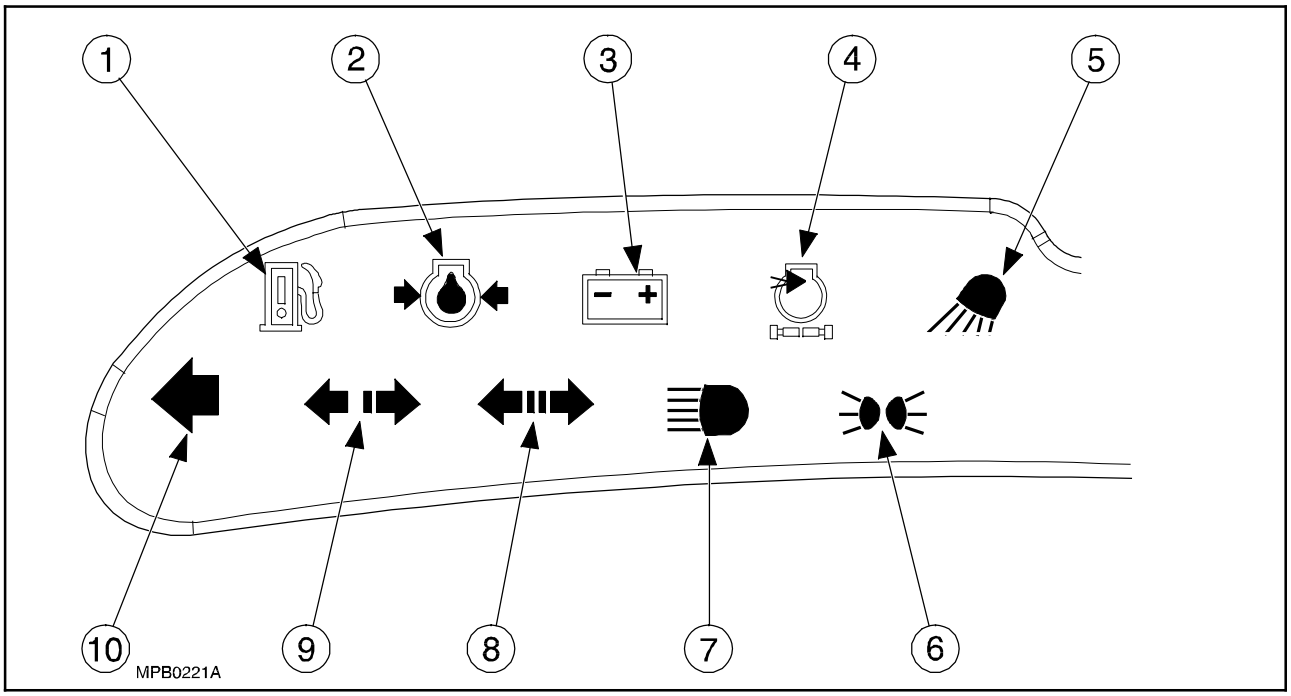
INSTRUMENT PANEL

1. Function indicators.

2. Engine coolant temperature gauge.

3. Speedometer/tachometer.

4. Fuel gauge.



4

1. **Water in fuel indicator** (red).

The light illuminates to indicate that the fuel filter is clogged. Clean the filter, as described in operation 7 page 3-11.

2. **Low engine lubricating oil pressure indicator** (red).

The light should go out a few seconds after the engine is started.
If it stays on when the engine is running, switch it off and look for the cause of the problem. If the light remains on, particularly when the tractor is moving, contact your dealer. When the engine is warmed up and running at minimum revs, with the tractor stationary, the light may illuminate, even if no faults are present.

3. **Battery charging system malfunction light** (red).

It should go out once the engine starts.

4. **Dry air filter clogged warning light** (yellow).

The light comes on when the air filter cartridge is partially or totally clogged.
Turn the engine off and clean the cartridge as described in operation 5 page 3-10.

5. **Work lights indicator** (yellow).

Lights up when the working lights are switched on (cab models only).

6. **Side lights indicator** (green).

Lights up when the sidelights are switched on.

7. **Full-beam indicator** (blue).

The light comes on when the headlights are on full beam.

8. **Second trailer turn indicator lights** (green).

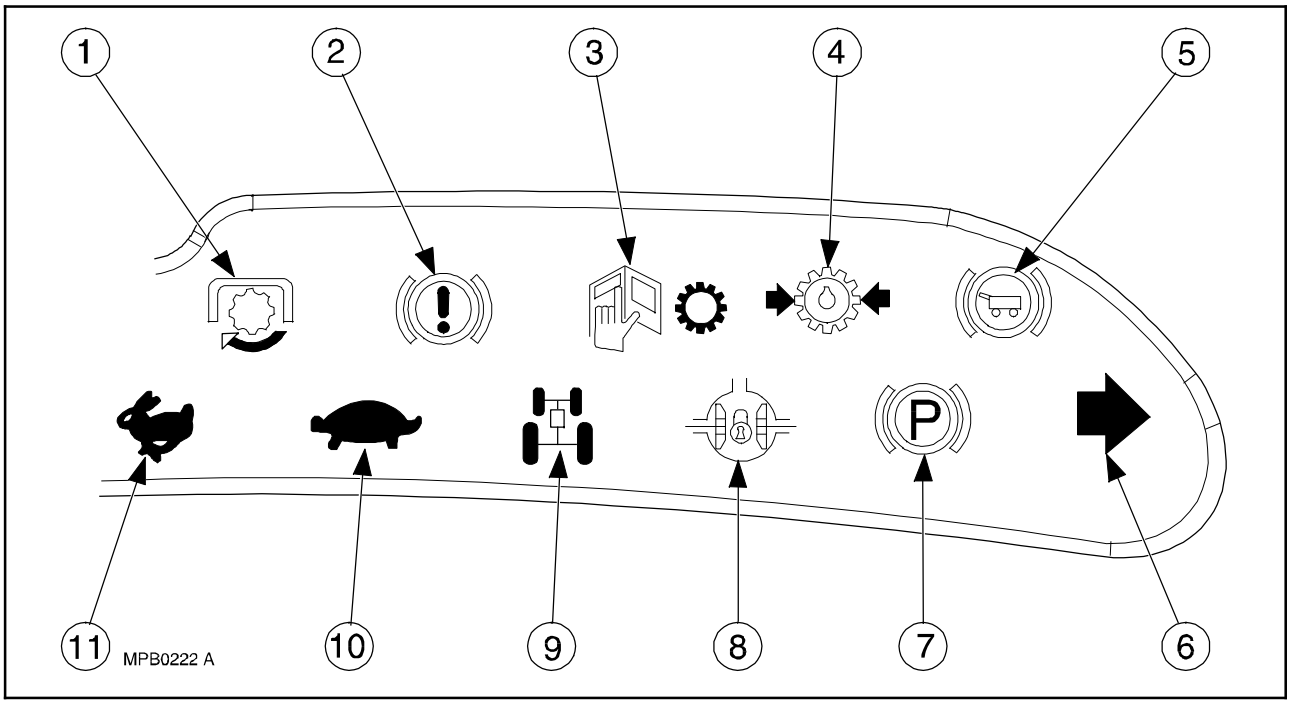
Flashes at the same time as the tractor turn indicators, if connected.

9. **First trailer turn indicator lights** (green).

Flashes at the same time as the tractor turn indicators, if connected.

10. **Tractor left turn indicator** (green).

Flashes at the same time as the tractor left turn indicators.



5

1. **Power take-off engaged light** (yellow).

Illuminates to indicate that the power take-off is engaged, with the engine running.

2. **Brake fluid level low warning light** (red).

Comes on when the fluid drops below “MIN” level. Check periodically that the light is working properly. With the ignition key turned to the first position, and by pressing on the lid of the brake fluid reservoir; the light should come on.

3. **Power Shuttle fault code indicator** (red).

4. **2 Speed Power Shift rear transmission oil pressure low warning light** (red).

The light should go out a few seconds after the engine is started. If it does not, particularly when the tractor is moving, contact your dealer for advice from specialized personnel. With the engine running at minimum revs and the tractor stationary, the light may come on without indicating a problem.

5. **Trailer brake ON light** (red).

Comes on, with the engine running, when the brakes are applied with the tractor brakes coupled together for road driving. The light comes on whenever the handbrake is on or when the brake fluid pressure is low

6. **Tractor right turn indicator** (green).

Flashes at the same time as the right-hand turn indicators.

7. **Handbrake ON light** (red).

With the ignition key turned on, the light comes on when the handbrake is applied.

8. **Differential lock ON light** (yellow).

Comes on to indicate that the differential lock is engaged.

9. **Four-wheel drive engaged light** (green).

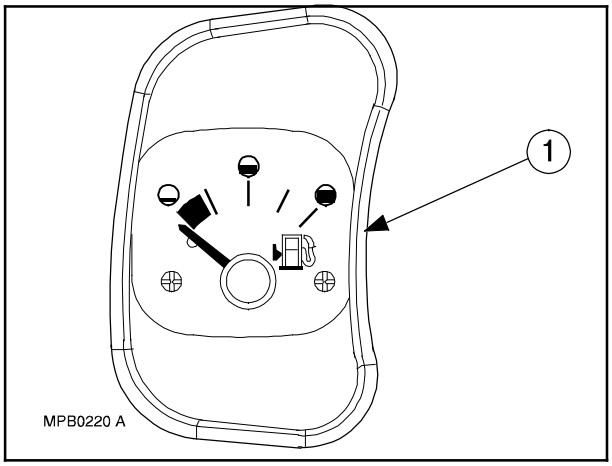
Comes on whenever the front wheel drive is engaged.

10. **Low gear ranges ON light** (yellow).

Illuminates when the low gear function is selected (transmission with 2 Speed Power Shift).

11. **High gear ranges ON light** (green).

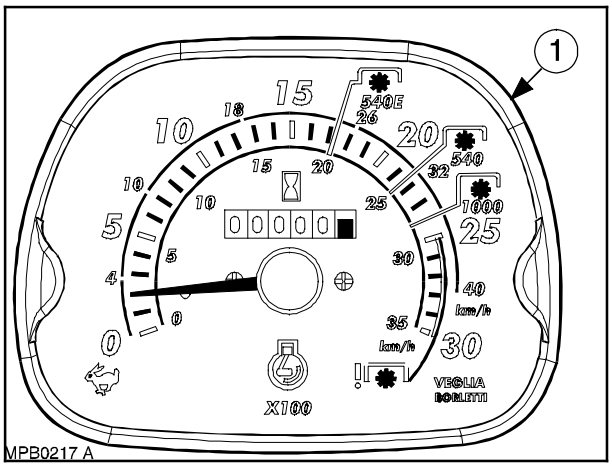
Illuminates when the high gear function is selected (transmission with 2 Speed Power Shift).



6

1. Fuel gauge fig. 6.

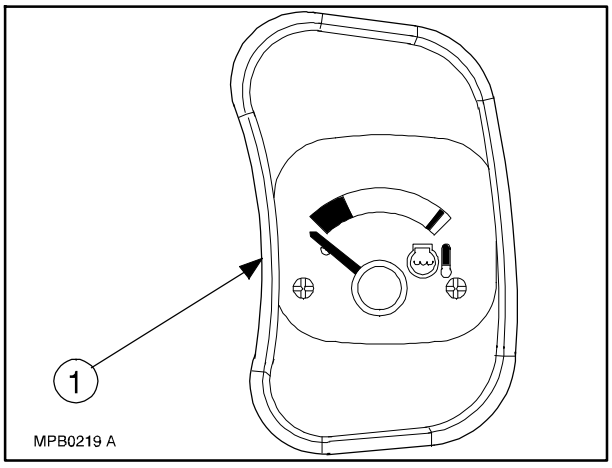
It shows the fuel level in the tank separately.
When the tank is full, the needle is at the extreme right.
When the fuel level falls below 1/4, the needle moves into the red area.



7

1. Speedometer/tachometer fig. 7.

This shows engine rpm and total time to a maximum of six digits: the figures on the black background total the working hours and those on the red background (to the extreme right) tenths of an hour.
The green and blue sectors show the engine rpm reached at standard power take-off speeds of 540, 540E and 1,000 rpm.



8

1. Engine coolant temperature gauge fig. 8.

- Green area = normal temperature.
- White area = temperature too low.
- Red area = engine overheating.

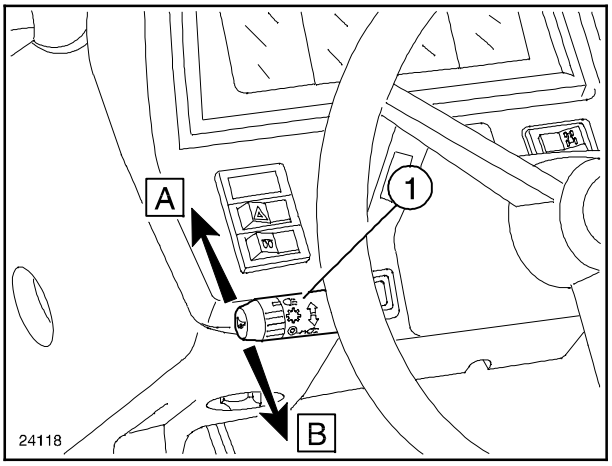
In this case, slow the engine to minimum revs (do not stop it) and, if the light stays on, have the cooling system checked.

LIGHT CLUSTER

The light control stem controls the horn, the turn indicators, headlight full beam flasher, and switching from dipped to full beam front headlights.

Direction indicators

To indicate turning to the right, push the stem (**1**) fig. 9 forward to position **A**.
To indicate turning to the left, pull the stem back to position **B**.



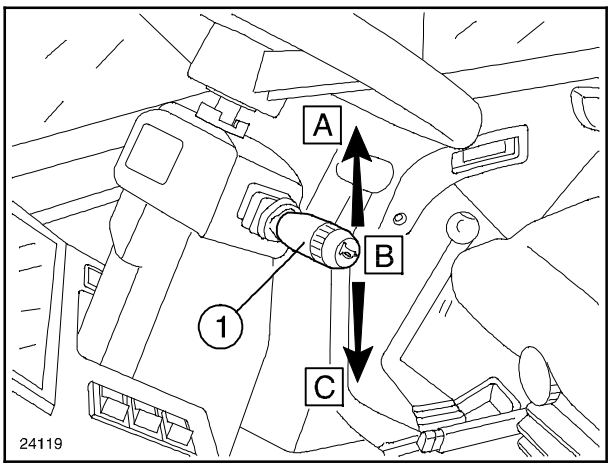
9

Flashing the front headlights

With the lights off or dipped, push the stem up until it engages in position **A** fig. 10 to flash full beam lights. When the lever is released, it automatically returns to its original position.
NOTE: *The stem light switch (**2**) fig. 11 will only operate with ignition key in position **B** fig. 1, page 2-3.*

Side lights

With stem (**1**) fig. 10 in position **B** rotate indicator (**1**) fig. 11 on knob (**2**) to face symbol (**3**), which shows side light symbol.



10

Dipped beam headlights

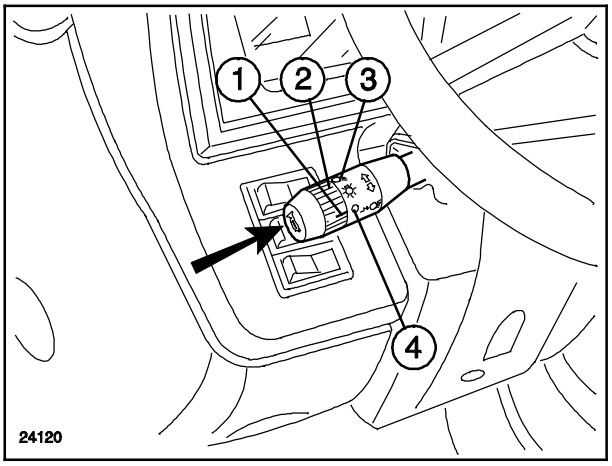
With stem (**1**) fig. 10 in position **B** fig. 10 rotate indicator (**1**) fig. 11 on knob (**2**) fig. 11 to face symbol (**3**) fig. 11 which shows the dipped light symbol.

Full beam headlights

Move stem (**1**) fig. 10 down to position **C** and position the indicator (**1**) fig. 11 on knob (**2**) to face symbol (**3**) fig. 11 which shows the full beam symbol.

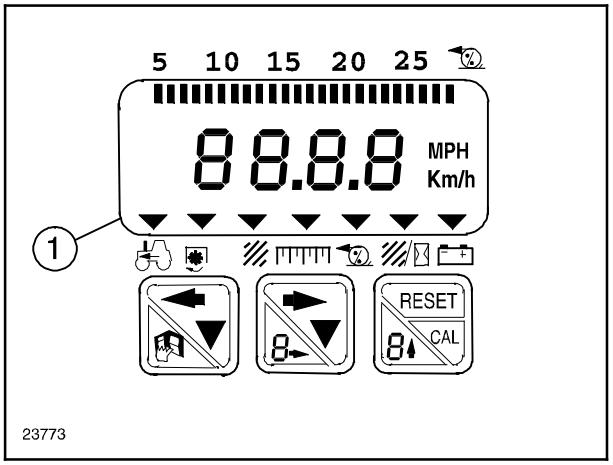
Horn

Press the end of control (**2**) on the stem as shown by the arrow in fig.13.
NOTE: *when indicator (**1**) fig. 11 on knob (**2**) is facing symbol (**4**) all the lights are off. Only the direction indicators and horn remain operative.*

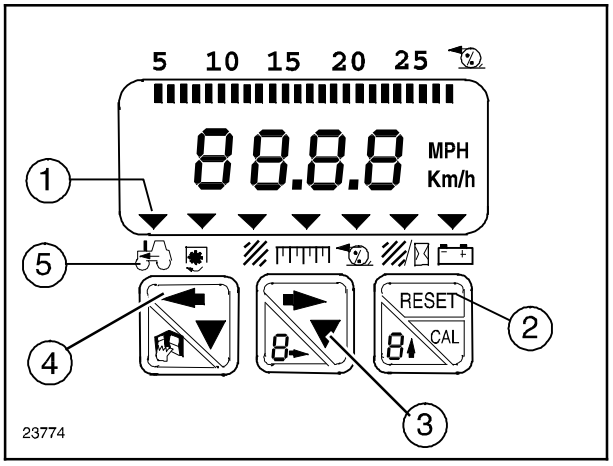


11

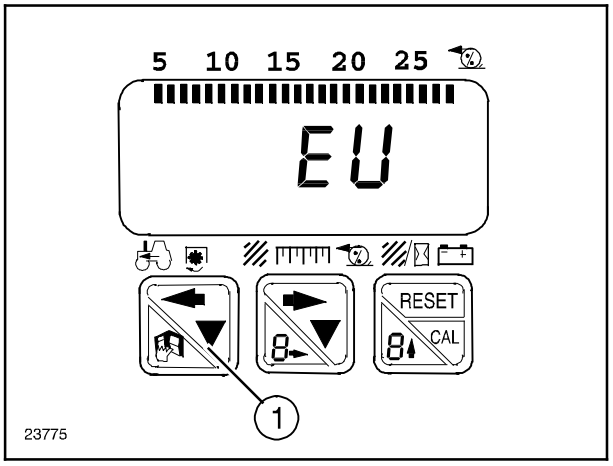
DIGITAL DISPLAY (OPTIONAL)



12



13



14

Operation

The instrument has a liquid crystal display (**1**) fig. 12 which displays seven functions.

When the ignition key is turned to the first position, the instrument will light up and automatically carry out a test to check that it is working properly.

When the tractor is started, the tractor speed is automatically displayed by indicator (**1**) fig. 13 opposite symbol (**5**) fig. 13.

Use keys (**3**) and (**4**) fig. 13 to select the various functions, whenever one of the keys is pressed, indicator (**1**) fig. 13 moves to that function.

Press **RESET** key (**2**) fig. 13 for over 3 seconds to reset the "total area worked" and "distance in km covered with equipment down" data.

NOTE: *To zero-set the "total area worked" and "distance in km covered with equipment down" data, the instrument must be in normal operating mode.*

By pressing key (**1**) fig. 14 for more than 3 seconds calls up the menu; the first function displayed will be the unit of measurement, with the following message: "**EU**" fig. 14, for metric (European) units of measurement or "**USA**" for imperial (United States and British) units of measurement.

To move from one unit of measurement to the other, simply press the **RESET** key (**2**) fig. 13.

INSTRUMENT CALIBRATION

In order to make sure that instrument provides correct data readings it will need to be calibrated. This will compensate the effects of possible variations of the tyre load ratio (as a result of using different types of tyres or varying operative weights, etc.).

Manual calibration

To calibrate the instrument, follow the instructions below:

- press button (**1**) fig. 17 for more than 3 seconds, until "**EU**" fig. 15 appears;

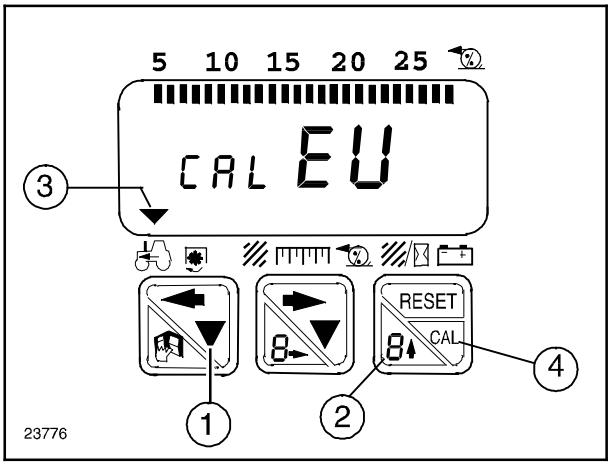
- if "**USA**" appears, press and release key (**2**) fig. 15 quickly to change to "**EU**";

- press key (**1**) fig. 15 again to display "**CAL**" fig. 15 with the indicator illuminated in position (**3**) fig. 15;

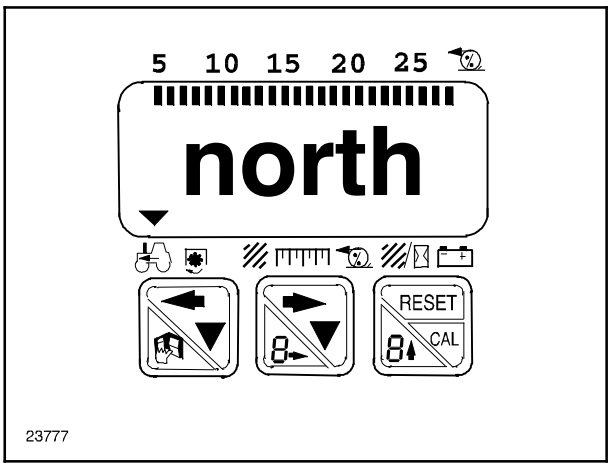
- on the ground, mark a course 3937 in. **(100 meters)**, long and move the tractor along it at a speed of between 2.48 and 6.21 mph (**4** and **10 km/h)**; at the start of the course, without stopping the tractor press key (**4**) on CAL and then release it.
  The instrument will display "**north**";

- after travelling the 3937 in. **(100 m)** course, and before stopping the tractor, press key (**4**) for more than 3 seconds.
  The display will show the calculation constant value.

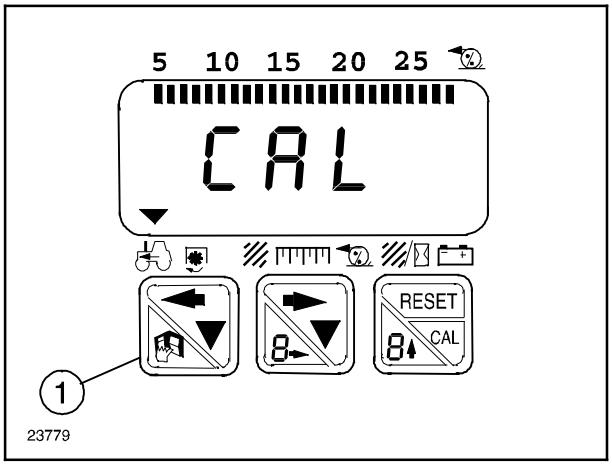
Press key (**1**) fig. 15 for more than 3 seconds to return to the normal instrument operation (tractor speed) and save the data.



15



16

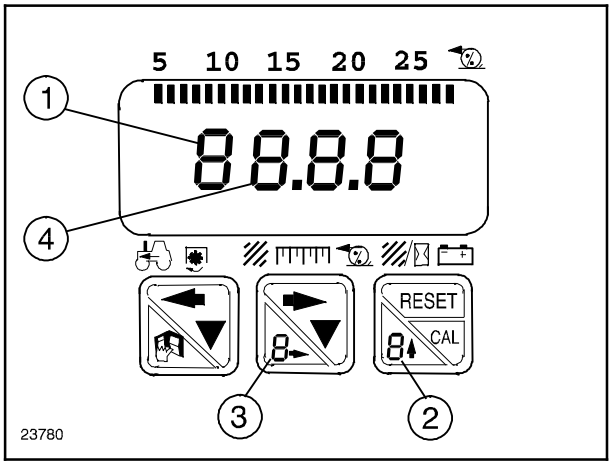


17

ENTERING THE IMPLEMENT WIDTH

For the instrument to calculate the area actually worked, the width of the implement must be entered before work commences.
It is not possible to enter widths of over 3897 in. (99 meters).
Proceed as follows to enter the implement width.

Press key (**1**) for over 3 seconds to call up the operating system.

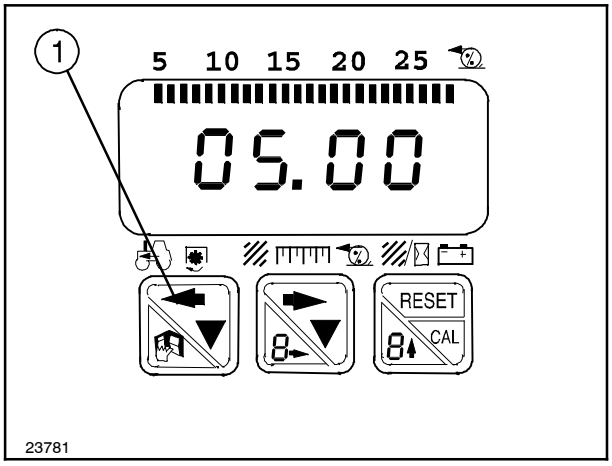


18

Press key (**1**) fig. 17 again to pass to the implement width function. "**0**" or the previously set value will flash on the display.

Press key (**3**) fig. 18 to make the first figure (**1**) fig. 18 flash, and then change the value by pressing key (**2**) fig. 18.

Press key (**3**) again to make the second figure (**4**) flash and then change the value by pressing key (**2**).



19

Proceed in the same way to change the other figures.

The figure on the display fig. 19, "**05.00**" indicates 196.85 in. (5 meters).

Press key (**1**) fig. 19 for more than 3 seconds to return to the normal instrument operation (tractor speed) and save the data.

NOTE: *the data needs to be changed whenever equipment of a different size from the previous one is used.*

TRACTOR SPEED

The instrument displays the tractor speed when it is started and in normal operation.

POWER TAKE-OFF SPEED

To display the PTO speedmove indicator (**7**) fig. 22 to symbol (**3**) fig. 20 by pressing keys (**3**) or (**4**) fig. 21.

TOTAL AREA WORKED IN HECTARES/ ACRES

To display the data, move indicator (**7**) fig. 20 to symbol (**5**) fig. 20 by pressing key (**3**) or (**4**) Fig. 21. For metric measurements (**hectares**) the instrument must be set to "**EU**" as previously described. If set to "**USA**", the value displayed is in **acres**.

DISTANCE TRAVELLED IN KM (ODOMETER)

To display the data, move indicator (**7**) fig. 20 to symbol (**6**) fig. 20 by pressing key (**3**) or (**4**) fig. 21. For metric measurements (**km**) the instrument must be set to "**EU**" as previously described. If set to "**USA**", the value displayed is in **miles**.

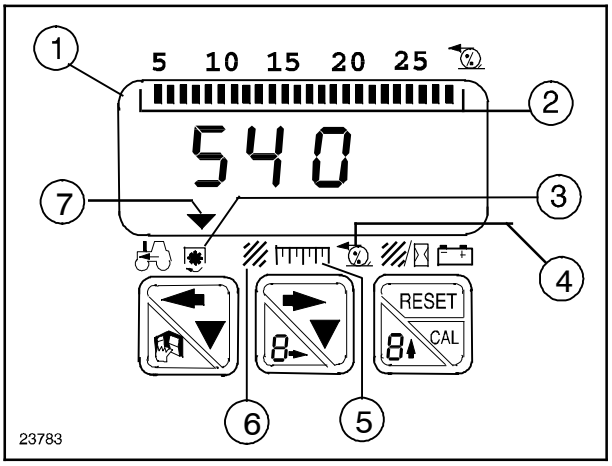
TOTAL AREA WORKED IN HECTARES/ ACRES IN ONE HOUR

To display the data, move indicator (**7**) fig. 20 to symbol (**1**) fig. 21 by pressing key (**3**) or (**4**) fig. 21. For metric measurements (**hectares**) the instrument must be set to "**EU**" as previously described. If set to "**USA**", the value displayed is in **acres**.

NOTE: *the instrument also memorizes decimal figures after the point, both for the total area worked and for the distance travelled. To memorize the data stop the tractor, without switching off the engine.*

BATTERY

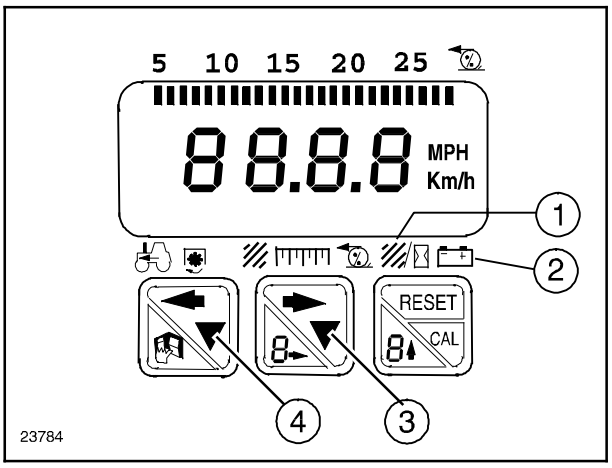
Move indicator (**7**) fig. 20 to face symbol (**2**) fig. 21 to check the battery charge level (values given on page 3-36).



20

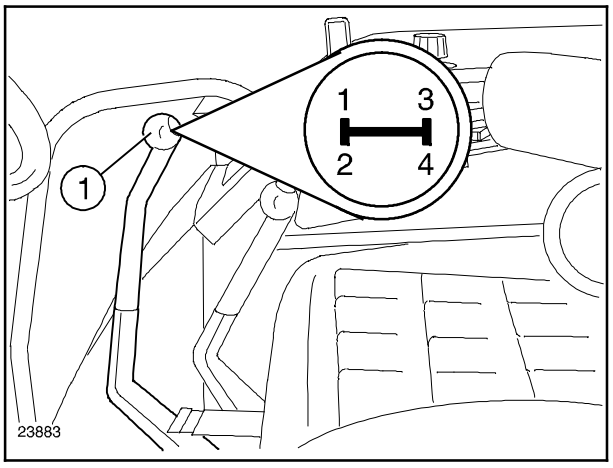
SLIP CONTROL

In order to use this function the **Radar** must be installed (optional).
To show slipping on the display (**1**) fig. 20, position the index (**7**) fig. 20, on symbol (**4**) fig. 20 using key (**3**) or (**4**) fig. 21.
As well as showing the slipping percentage on the display in a numerical value, the graph bars (**2**) fig. 20 illuminate to correspond with the percentage.



21

TRANSMISSION WITH RANGE GEAR - 18.64 mph (30 km/h) (12 FORWARD GEARS + 4 REVERSE GEARS - SYNCRO COMMAND)



22

CAUTION: *With the engine running and only one gear lever in neutral, the tractor could be engaged and start moving if the lever is accidentally operated, which may lead to possible accidents. To avoidthis hazard, move both levers to neutral, lower any implements and apply the handbrake before leaving the tractor.*

The transmission and range gear are separately controlled by two levers.

The gear lever (**1**) fig. 22 selects four gear ratios (**1**, **2**, **3**, **4**).

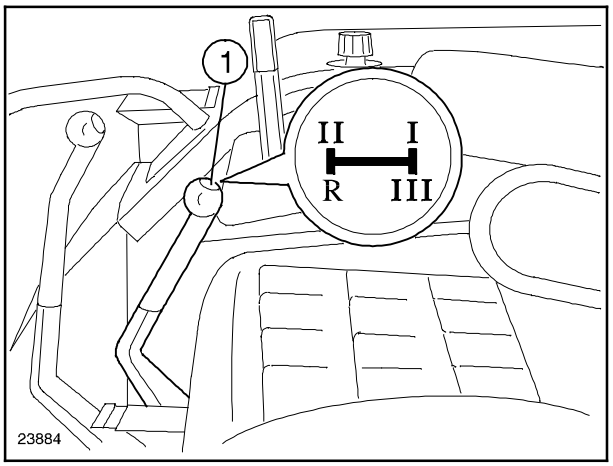
The range lever (**1**) fig. 23 provides three forward gear ranges and one reverse range **R** for each gear ratio.

There are **twelve** forward and **four** reverse gears.

To change from a medium gear to a lower or higher one, stop the tractor, move the range lever to the right and shift it forwards for lower gears or backwards for higher gears.

To engage reverse **R**, stop the tractor and move the range lever to the left and then shift back.

To change from one speed to another in the same range, shift the main shift lever after releasing the clutch (the tractor does not have to be halted as the gears are syncro-engaged).



23

Range lever positions - Fig. 23

— **I** = low

— **II** = medium

— **III** = high

— **R** = reverse

MODEL TL 70 - SPEED AT MAXIMUM POWER

Transmission and range gear 18.64 mph (30 km/h) version (12 forward gears + 4 reverse gears - Synchro Command)

Speed in forward gears

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	16.9-30 480/70R-30	14.9-30 420/70R-30
I	1	1.8 (1.1)	1.8 (1.1)	1.8 (1.1)	1.7 (1.0)
	2	2.8 (1.7)	2.7 (1.7)	2.6 (1.6)	2.5 (1.5
	3	3.8 (2.4)	3.9 (2.4)	3.8 (2.4)	3.6 (2.4)
	4	5.4 (3.4)	5.6 (3.5)	5.4 (3.4)	5.2 (3.2)
II	1	4.2 (2.6)	4.3 (2.7)	4.2 (2.6)	4.0 (2.5)
	2	6.1 (3.8)	6.3 (3.9)	6.1 (3.8)	5.9 (3.7)
	3	8.8 (5.5)	9.1 (5.7)	8.8 (5.5)	8.5 (5.3)
	4	12.6 (7.8)	13.0 (8.1)	12.7 (7.9)	12.1 (7.5)
III	1	9.9 (6.2)	10.2 (6.3)	9.9 (6.2)	9.5 (5.9)
	2	14.3 (8.9)	14.8 (9.2)	14.4 (9.0)	13.8 (8.6)
	3	20.7 (12.9)	21.4 (13.3)	20.8 (12.9)	19.2 (11.9)
	4	29.6 (18.4)	30.7 (19.1)	29.8 (18.5	28.5 (17.7
R	1	4.7 (2.9)	4.8 (3.0)	4.7 (2.9)	4.5 (2.8)
	2	6.8 (4.2)	7.0 (4.4)	6.8 (4.2)	6.5 (4.0
	3	9.8 (6.1)	10.1 (6.3)	9.8 (6.1)	9.4 (5.8)
	4	14.0 (8.7)	14.5 (9.0)	14.1 (8.8)	13.5 (8.4)

Model TL80 - SPEED AT MAXIMUM POWER

Transmission and range gear 18.64 mph (30 km/h) version

(12 forward gears + 4 reverse gears - Synchro Command)

Speed in forward gears

RANGE	GEAR	REAR TYRES mph (km/h)			
		16.9-30 480/70R-30	18.4-30 520/70R-30	13.6-38	16.9-34 480/70R-34 540/65R-34
I	1	1.7 (1.0)	1.7 (1.0)	1.8 (1.1)	1.8 (1.1)
	2	2.4 (1.5)	2.5 (1.6)	2.6 (1.6)	2.6 (1.6)
	3	3.5 (2.2)	3.6 (2.2)	3.7 (2.3)	3.8 (2.4)
	4	5.0 (3.1)	5.2 (3.2)	5.4 (3.4)	5.4 (3.4)
II	1	3.9 (2.4)	4.1 (2.6)	4.2 (2.6)	4.2 (2.6)
	2	5.7 (3.54)	5.9 (3.7)	6.1 (3.8)	6.1 (3.8)
	3	8.2 (5.1)	8.5 (5.3)	8.7 (5.4)	8.8 (5.5)
	4	11.8 (7.3)	12.2 (7.6)	12.5 (7.8)	12.6 (7.8)
III	1	9.2 (5.7)	9.6 (6.0)	9.8 (6.1)	9.9 (6.2)
	2	13.4 (8.3)	13.9 (8.6)	14.3 (8.9)	14.4 (9.0)
	3	19.3 (12.0)	20.0 (12.4)	20.6 (12.8)	20.7)12.9
	4	27.7)17.2	28.7 (17.8)	29.5 (18.3)	29.7 (18.5)
R	1	4.1 (2.6)	4.2 (2.6)	4.3 (2.7)	4.4 (2.7)
	2	5.9 (3.7)	6.1 (3.8)	6.3 (3.9)	6.4 (4.0)
	3	8.6 (5.3)	8.6 (5.3)	9.1 (5.7)	9.2 (5.7)
	4	12.3 (7.6)	12.7 (7.9)	13.0 (8.1)	13.1 (8.1)

TRANSMISSION WITH RANGE GEAR AND SHUTTLE - 18.64 MPH (30 KM/H) (12 forward gears + 12 reverse gears - Syncro Shuttle)

CAUTION: *With the engine running and only one gear lever in neutral, the tractor could be engaged and start moving if the lever is accidentally operated, which may lead to possible accidents. To avoid this hazard, move both levers to neutral, lower any implements and apply the handbrake before leaving the tractor.*

The transmission, range gear and shuttle are independently controlled by three levers.

The gear lever (**1**) fig. 24 selects four gear ratios (**1**, **2**, **3**, **4**).

The range lever (**1**) fig. 25 provides three forward ranges:

— **I** = low;

— **II** = medium;

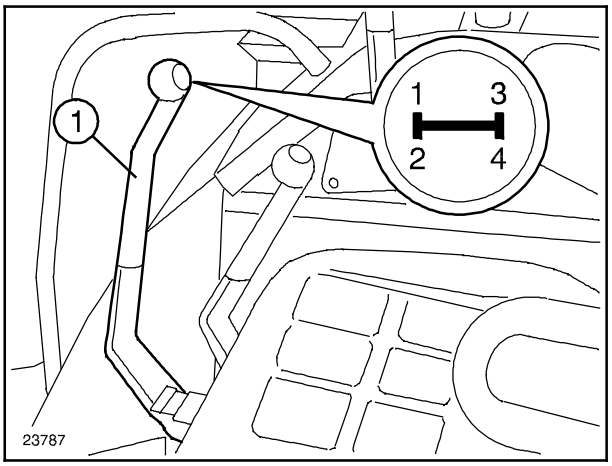
— **III** = high.

There are **twelve** forward and **twelve** reverse gears.

To change from a medium gear to a lower or higher one, stop the tractor, move the range lever to the right and shift it forwards for lower gears or backwards for higher gears.

To change from one speed to another in the same range (including reverse), shift the main shift lever after disengaging the clutch (the tractor does not have to be halted as the gears are syncro-engaged).

To reverse the direction of travel, slow the tractor almost to a halt, shift the shuttle lever (**1**) fig. 26 first to the right, in the direction of the arrow, then backwards (**A**) to obtain reverse gears or forwards (**B**) to disengage the shuttle and obtain forward gears (the tractor does not have to be halted as the gears are syncro-engaged).



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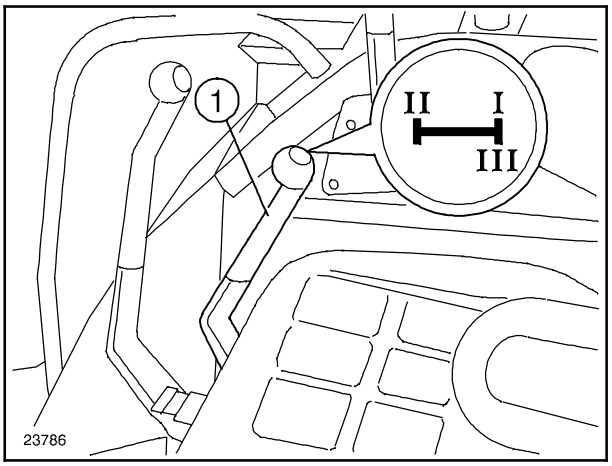

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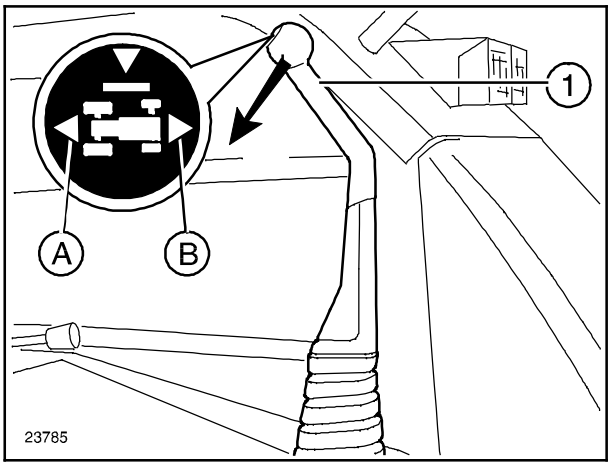

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Models TL70 - SPEED AT MAXIMUM POWER

Shuttle transmission 18.64 mph (30 km/h) version (12 forward gears + 12 reverse gears - Syncro Shuttle)

Forward speed

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	16.9-30 480/70R-30	14.9-30 420/70R-30
I	1	1.8 (1.1	1.9 (1.2)	1.8 (1.1)	1.7 (1.1)
	2	2.6 (1.6)	2.7 (1.7)	2.6 (1.6)	2.5 (1.6)
	3	3.8 (2.4)	3.9 (2.4)	3.8 (2.4)	3.6 (2.2)
	4	5.4 (3.3)	5.6 (3.5)	5.4 (3.3)	5.2 (3.2)
II	1	4.2 (2.6)	4.3 (2.7)	4.2 (2.6)	4.0 (2.5)
	2	6.1 (3.8)	6.3 (3.9)	6.1 (3.8)	5.9 (3.7)
	3	8.8 (5.5)	9.1 (5.7)	8.8 (5.5)	8.5 (5.3)
	4	12.6 (7.8)	13.0 (8.1)	12.7 (7.9)	12.1 (7.5)
III	1	9.9 (6.2)	10.2 (6.3)	9.9 (6.2)	9.5 (5.9)
	2	14.3 (8.9)	14.9 (9.3)	14.4 (9.0)	13.8 (8.6)
	3	20.7 (12.9)	21.4 (13.3)	20.8 (12.9)	19.9 (12.4)
	4	29.6 (18.4)	30.7 (19.1)	29.8 (18.5)	28.5 (17.7)

Reverse speed

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	16.9-30 480/70R-30	14.9-30 420/70R-30
I	1	1.8 (1.1)	1.8 (1.1)	1.8 (1.1)	1.7 (1.1)
	2	2.6 (1.6)	2.6 (1.6)	2.6 (1.6)	2.5 (1.6)
	3	3.7 (2.3)	3.8 (2.4)	3.7 (2.3)	3.5 (2.2)
	4	5.3 (3.3)	5.4 (3.4)	5.3 (3.3)	5.1 (3.2)
II	1	4.1 (2.6)	4.3 (2.7)	4.1 (2.6)	4.0 (2.5)
	2	6.0 (3.7)	6.1 (3.8)	6.0 (3.7)	5.8 (3.6)
	3	8.6 (5.3)	8.9 (5.5)	8.7 (5.4)	8.3 (5.2)
	4	12.3 (7.6)	12.8 (8.0)	12.4 (7.7)	11.9 (7.4)
III	1	9.7 (6.0)	10.0 (6.2)	9.7 (6.0)	9.3 (5.8)
	2	14.1 (8.8)	14.6 (9.1)	14.2 (8.8)	13.5 (8.4)
	3	20.3 (12.6)	21.0 (13.1)	20.4 (12.7)	19.5 (12.1)
	4	29.0 (18.0)	30.1 (18.7)	29.2 (18.1)	28.0 (17.4)

Models TL80, TL90 and TL 100 - SPEED AT MAXIMUM POWER

Transmission with shuttle 18.64 mph (30 km/h) version (12F + 12R - Syncro Shuttle)
(1) only model TL80 (2) only models TL90 and TL100

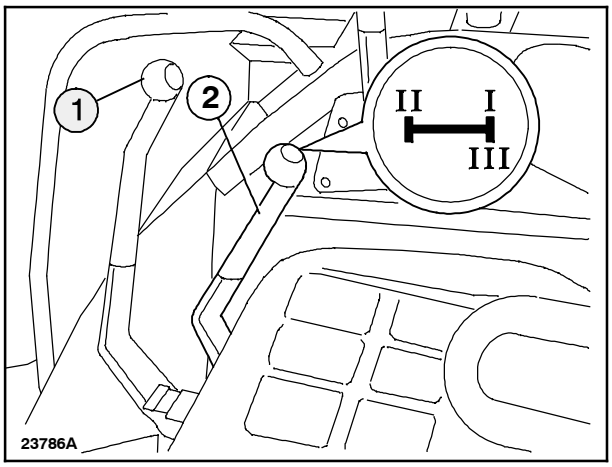
Forward speed

RANGE	GEAR	REAR TYRES mph (km/h)				
		520/70R-30 18.4-30	13.6-38	16.9-34 480/70R-34 540/65R-34	16.9-30 (1) 480/70R-30 (1)	18.4-34 (2) 520/70R-34 (2) 600/65R-34 (2)
I	1	1.7 (1.1)	1.8 (1.1)	1.8 (1.1)	1.7 (1.1)	1.6 (1.1)
	2	2.5 (1.6)	2.6 (1.6)	2.6 (1.6)	2.4 (1.5)	2.7 (1.7)
	3	3.6 (2.2)	3.7 (2.3)	3.8 (2.4)	3.5 (2.2)	3.9 (2.4)
	4	5.2 (3.2)	5.4 (3.4)	5.4 (3.4)	5.0 (3.1)	5.6 (3.5)
II	1	4.1 (2.6)	4.1 (2.6)	4.2 (2.6)	3.9 (2.4)	4.3 (2.7)
	2	5.9 (3.7)	6.1 (3.8)	6.1 (3.8)	5.7 (3.5)	6.3 (3.9)
	3	8.5 (5.3)	8.7 (5.4)	8.8 (5.5)	8.2 (5.1)	9.1 (5.7)
	4	12.2 (7.6)	12.5 (7.8)	12.6 (7.8)	11.7 (7.3)	13.0 (8.1)
III	1	9.6 (6.0)	9.8 (6.1)	9.9 (6.2)	9.2 (5.7)	10.2 (6.3)
	2	13.9 (8.6)	14.3 (8.9)	14.3 (8.9)	13.4 (8.3)	14.9 (9.3)
	3	20.0 (12.4)	20.6 (12.8)	20.7 (12.9)	19.3 (12.0)	21.4 (13.3)
	4	28.7 (17.8)	29.5 (18.3)	29.7 (18.5)	27.7 (17.2)	30.7 (19.1)

Reverse speed

RANGE	GEAR	REAR TYRES mph (km/h)				
		520/70R-30 18.4-30	13.6-38	16.9-34 480/70R-34 540/65R-34	16.9-30 (1) 480/70R-30 (1)	18.4-34 (2) 520/70R-34 (2) 600/65R-34 (3)
I	1	1.7 (1.1)	1.8 (1.1)	1.8 (1.1)	1.6 (1.0)	1.8 (1.1)
	2	2.5 (1.6)	2.5 (1.6)	2.6 (1.6)	2.4 (1.5)	2.6 (1.6)
	3	3.6 (2.2)	3.7 (2.3)	3.7 (2.3)	3.4 (2.1)	3.8 (2.4)
	4	5.1 (3.2)	5.3 (3.3)	5.2 (3.2)	4.9 (3.0)	5.5 (3.4)
II	1	4.0 (2.5)	4.1 (2.6)	4.1 (2.6)	3.8 (2.4)	4.3 (2.7)
	2	5.8 (3.6)	5.9 (3.7)	6.0 (3.7)	5.6 (3.5)	6.1 (3.8)
	3	8.3 (5.2)	8.6 (5.3)	8.6 (5.3)	11.5 (7.2)	8.9 (5.5)
	4	11.9 (7.4)	12.3 (7.6)	12.4 (7.7)	11.5 (7.2)	12.8 (8.0)
III	1	9.4 (5.8)	9.6 (6.0)	9.7 (6.0)	9.0 (5.6)	10.2 (6.3)
	2	13.6 (8.5)	14.0 (8.7)	14.1 (8.8)	13.1 (8.1)	14.6 (9.1)
	3	19.6 (12.5)	20.2 (12.6)	20.3 (12.6)	19.0 (11.8)	21.0 (13.1)
	4	28.1 (17.5)	28.9 (18.0)	29.1 (18.1)	27.1 (16.8)	30.1 (18.7)

TRANSMISSION WITH CREEPER AND SHUTTLE - 18.64 mph (30 km/h) (20 forward gears + 12 reverse gears - Syncro Shuttle)



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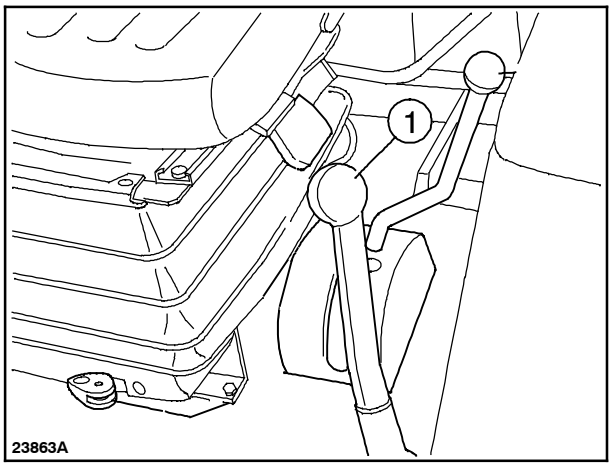

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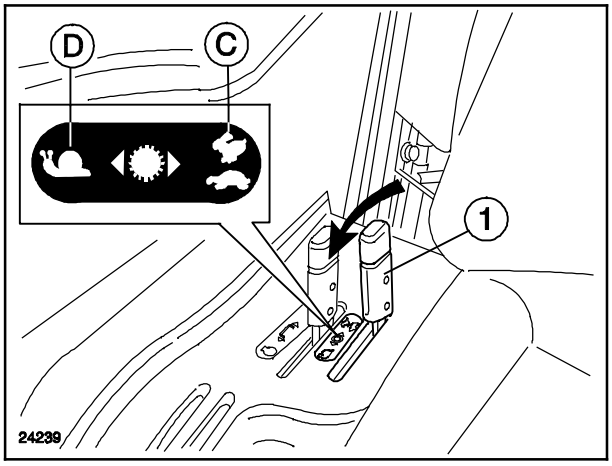


29

Operation of the gear (**1**), the range gear (**2**) fig. 27 and the shuttle (**1**) fig. 28 levers are identical in operation to the transmission described on page 2-17.

An additional creeper lever (**1**) fig. 29 is used to select the creeper gear which is effective or low and medium ranges to provide 8 additional forward speeds.

The creeper operates only in low (**I**) fig. 27 and medium (**II**) ranges.

There is a mechanical interlock that prevents engagement of creeper lever (**1**) fig. 29 in position **D** with the range lever (**1**) fig. 27 in position (**III**) (high range) and vice versa.

CREEPER LEVER - Fig. 29

By moving the lever forwards to position **D**, or backwards to position **C**, the creeper lever (**1**) fig. 29 selects between reduced or normal gears.

Combined use of the two levers (**1**) and (**2**) figs. 27 and (**1**) fig. 29 provides 20 forward and 12 reverse gears.

Creeper lever positions

- Lever **1** forwards (position **D**) = creeper gear engaged and effective in low or medium ranges.

- Lever **1** backwards (position **C**) = creeper gear disengaged, allowing selection of low, medium or high ranges.

WARNING: *before engaging the creeper, lever (**1**) fig. 29 in position **D**, ensure that the range lever (**2**) fig. 27 is not in position (**III**).*

Models TL70 - SPEED AT MAXIMUM POWER

Creeper transmission 18.64 mph (30 km/h) version (20 forward gears + 12 reverse gears - Syncro Shuttle)

Forward gears

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	420/70R-30 14.9-30	480/70R-30 16.9-30
	1	0.3 (0.20)	0.3 (0.20)	0.3 (0.20)	0.3 (0.20)
	2	0.5 (0.3)	0.5 (0.3)	0.5 (0.3)	0.5 (0.3)
	3	0.7 (0.4)	0.7 (0.4)	0.7 (0.4)	0.7 (0.4)
	4	1.0 (0.6)	1.0 (0.6)	0.9 (0.6)	1.0 (0.6)
	1	0.8 (0.5)	0.8 (0.5)	0.7 (0.4)	0.8 (0.5)
	2	1.1 (0.7)	1.1 (0.7)	1.0 (0.6)	1.1 (0.7)
	3	1.6 (1.0)	1.6 (1.0)	1.5 (0.9)	1.6 (1.0)
	4	2.3 (1.4)	2.4 (1.5)	2.2 (1.4)	2.3 (1.4)
I	1	1.8 (1.1)	1.9 (1.2)	1.7 (1.1)	1.8 (1.1)
	2	2.6 (1.6)	2.7 (1.7)	2.5 (1.6)	2.6 (1.6)
	3	3.8 (2.4)	3.9 (2.4)	3.6 (2.2)	3.8 (2.4)
	4	5.4 (3.4)	5.6 (3.5)	5.2 (3.2)	5.4 (3.4)
II	1	4.2 (2.6)	4.3 (2.7)	4.0 (2.5)	4.2 (2.6)
	2	6.1 (3.8)	6.3 (3.9)	5.9 (3.7)	6.1 (3.8)
	3	8.8 (5.5)	9.1 (5.7)	8.5 (5.3)	8.8 (5.5)
	4	12.6 (7.8)	13.0 (8.1)	12.1 (7.5)	12.7 (7.9)
III	1	9.9 (6.1)	10.2 (6.3)	9.5 (5.9)	9.9 (6.2)
	2	14.3 (8.9)	14.9 (9.3)	13.8 (8.6)	14.4 (9.0)
	3	20.7 (12.9)	21.4 (13.3)	19.9 (12.4)	20.8 (12.9)
	4	29.6 (18.4)	30.7 (19.1)	28.5 (17.7)	29.8 (18.5)

Reverse gears

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	420/70R-30 14.9-30	480/70R-30 16.9-30
I	1	1.7 (1.1)	1.8 (1.1)	1.6 (1.0)	1.7 (1.1)
	2	2.5 (1.6)	2.6 (1.6)	2.4 (1.5)	2.5 (1.6)
	3	3.6 (2.2)	3.7 (2.3)	3.4 (2.1)	3.6 (2.2)
	4	5.1 (3.2)	5.3 (3.3)	4.9 (3.0)	5.2 (3.2)
II	1	4.0 (2.5)	4.1 (2.6)	3.8 (2.4)	4.0 (2.5)
	2	5.8 (3.6)	6.0 (3.7)	5.5 (3.4)	5.8 (3.6)
	3	8.3 (5.2)	8.6 (5.3)	8.0 (5.0)	8.4 (5.2)
	4	11.9 (7.4)	12.4 (7.7)	11.5 (7.2)	12.0 (7.5)
III	1	9.4 (5.8)	9.7 (6.0)	9.0 (5.6)	9.4 (5.8)
	2	13.6 (8.5)	14.1 (8.8)	13.1 (8.1)	13.7 (8.5)
	3	19.6 (12.2)	20.3 (12.6)	18.9 (11.7)	19.8 (12.3)
	4	28.1 (17.5)	29.1 (18.1)	27.1 (16.8)	28.3 (17.6)

Models TL80, TL90 and TL100 - SPEED AT MAXIMUM POWER

Transmission with creeper unit 18.64 (30 km/h) version (20F+12R - Syncro Shuttle)

(1) only model TL80 (2) only models TL90 and TL100

Forward speed

RANGE	GEAR	REAR TYRES km/h (mph)				
		520/70R-30 18.4-30	13.6-38	16.9-30 (1) 480/70R-30 (1)	480/70R-34 540/65R-34 16.9-34	18.4-34 (2) 520/70R-34 (2) 600/70R-34 (3)
	1	0.3 (0.2)	0.3 (0.2)	0.3 (0.2)	0.3 (0.2)	0.3 (0.2)
	2	0.5 (0.3)	0.5 (0.3)	0.4 (0.2)	0.4 (0.2)	0.5 (0.3)
	3	0.7 (0.4)	0.7 (0.4)	0.6 (0.4)	0.7 (0.4)	0.7 (0.4)
	4	0.9 (0.6)	1.0 (0.6)	0.9 (0.6)	1.0 (0.6)	1.0 (0.6)
	1	0.7 (0.4)	0.8 (0.5)	0.7 (0.4)	0.8 (0.5)	0.8 (0.5)
	2	1.1 (0.7)	1.1 (0.7)	1.0 (0.6)	1.1 (0.7)	1.1 (0.7)
	3	1.5 (0.9)	1.6 (1.0)	1.5 (0.9)	1.5 (0.9)	1.6 (0.2)
	4	2.2 (1.4)	2.3 (1.4)	2.1 (1.3)	2.3 (1.4)	2.4 (1.5)
I	1	1.7 (1.1)	1.9 (1.2)	1.7 (1.1)	1.8 (1.1)	1.9 (1.2)
	2	2.5 (1.6)	2.6 (1.6)	2.4 (1.5)	2.6 (1.6)	2.7 (1.7)
	3	3.6 (2.2)	3.7 (2.3)	3.5 (2.2)	3.8 (2.4)	3.9 (2.4)
	4	5.2 (3.2)	5.4 (3.4)	5.0 (3.1)	6.0 (3.7)	5.6 (3.5)
II	1	4.1 (2.6)	4.2 (2.6)	3.9 (2.4)	4.2 (2.6)	4.3 (2.7)
	2	5.9 (3.7)	6.1 (3.8)	5.7 (3.5)	6.1 (3.8)	6.3 (3.9)
	3	8.5 (5.3)	8.7 (5.4)	8.2 (5.1)	8.8 (5.5)	9.1 (5.7)
	4	12.2 (7.6)	12.5 (7.8)	11.8 (7.3)	12.6 (7.8)	13.0 (8.1)
III	1	9.6 (6.0)	9.8 (6.1)	9.2 (5.7)	9.9 (6.2)	10.2 (6.3)
	2	13.9 (8.6)	14.3 (8.9)	13.4 (8.3)	14.4 (9.0)	14.9 (9.3)
	3	20.0 (12.4)	20.6 (12.8)	19.3 (12.0)	20.7 (12.9)	21.4 (13.3)
	4	28.7 (17.8)	29.5 (18.3)	27.7 (17.2)	29.7 (18.5)	30.7 (19.1)

Reverse speed

RANGE	GEAR	REAR TYRES km/h (mph)				
		520/70R-30 18.4-30	13.6-38	16.9-30 (1) 480/70R-30 (1)	480/70R-34 540/65R-34 16.9-34	18.4-34 (2) 520/70R-34 (2) 600/70R-34 (3)
I	1	1.7 (1.1)	1.7 (1.1)	1.6 (1.0)	1.7 (1.1)	1.8 (1.1)
	2	2.4 (1.5)	2.5 (1.6)	2.3 (1.4)	2.5 (1.6)	2.6 (1.6)
	3	3.5 (2.2)	3.6 (2.2)	3.3 (2.1)	3.6 (2.2)	3.7 (2.3)
	4	5.0 (3.1)	5.1 (3.2)	4.8 (3.0)	5.1 (3.2)	5.3 (3.3)
II	1	3.9 (2.4)	4.0 (2.5)	3.7 (2.3)	4.0 (2.5)	4.1 (2.6)
	2	5.6 (3.5)	5.8 (3.6)	5.4 (3.4)	5.8 (3.6)	6.0 (3.7)
	3	8.1 (5.0)	8.3 (5.2)	7.8 (4.9)	8.4 (5.2)	8.6 (5.3)
	4	11.6 (7.2)	11.9 (7.4)	11.2 (7.0)	12.0 (7.5)	12.4 (7.7)
III	1	9.1 (5.7)	9.3 (5.8)	8.8 (5.5)	9.4 (5.8)	9.7 (6.0)
	2	13.2 (8.2)	13.6 (8.5)	12.7 (7.9)	13.6 (8.5)	14.1 (8.8)
	3	19.0 (11.8)	19.6 (12.2)	18.4 (11.4)	19.7 (12.2)	20.3 (12.6)
	4	27.3 (17.0)	28.0 (17.4)	26.3 (16.3)	28.2 (17.5)	29.1 (18.1)

TRANSMISSION WITH CREEPER AND SHUTTLE - 24.85 mph (40 km/h) (20 FORWARD GEARS + 12 REVERSE GEARS - SYNCRO SHUTTLE)

The 24.85 mph (40 km/h) transmission version with 20 forward gears and 12 reverse gears is only available for four-wheel drive Models

This version has the following front and rear axle pinion set to provide speeds up to 24.85 mph (40 km/h):

- Models TL70:
  FRONT **11/29** REAR **11/43**

- Model TL80:
  FRONT **11/31** REAR **11/43**

- Models TL90 and TL100:
  FRONT **11/39** REAR **11/43**

The transmission controls and operation are the same as for the 18.64 mph (30 km/h) version described on pages 2-14, 2-17 and 2-20.

As a consequence of the use of the high pinion set, the synchronised power take-off has a different ratio between the wheel speed and the take-off shaft speed.

The new ratios using the high pinion set, in power take-off revolutions per **single revolution of the rear wheels**, are shown below:

- Models TL70:
  6.73 revs .... (takeoff 540 rpm)
  8.59 revs .... (take off 750 rpm)
  11.51 revs ... (take-off 1000 rpm)

- Models 75, 85, TL90 and TL100
  7.25 revs .... (take-off 540 rpm)
  9.36 revs .... (take-off 750 rpm)
  12.4 revs .... (take-off 1000 rpm)

Engaging electro-hydraulic front wheel drive

As braking is improved when using front wheel drive, this function is automatically engaged by means of an electro-hydraulic system.

This also means that all four tyres grip simultaneously when braking, thus reducing the stopping distance.

To this end, simultaneously actuating both brake pedals automatically engages the front-wheel drive.

When the brakes are used, the front-wheel drive indicator light (amber) on the instrument panel illuminates to show that the drive is engaged.

NOTE: *for instructions regarding correct use of four-wheel drive, see page 2-47 in this section.*

CAUTION: *if the light does not come on, contact your New Holland dealer in order to identify the fault.*

WARNING: *If the tyres are changed, make sure that the new equipment bears the "A8" code on the side.*

Models TL70 4WD - SPEED AT MAXIMUM POWER

Creeper transmission 24.85 mph (40 km/h) version (20 forward gears + 12 reverse gears - Syncro Shuttle)

Forward speed

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	420/70R-30 14.9-30	480/70R-30 16.9-30
	2	0.6 (0.4)	0.6 (0.4)	0.6 (0.4)	0.6 (0.4)
	3	0.8 (0.5)	0.9 (0.6)	0.8 (0.5)	0.8 (0.5)
	4	1.2 (0.7)	1.2 (0.7)	1.2 (0.7)	1.2 (0.7)
	1	0.9 (0.6)	1.0 (0.6)	0.9 (0.6)	0.9 (0.6)
	2	1.4 (0.9)	1.4 (0.9)	1.3 (0.8)	1.4 (0.9)
	3	1.9 (1.2)	2.0 (1.2)	1.9 (1.2)	2.0 (1.2)
	4	2.8 (1.7)	2.9 (1.8)	2.7 (1.7)	2.8 (1.7)
I	1	2.2 (1.4)	2.3 (1.4)	2.1 (1.3)	2.2 (1.4)
	2	3.2 (2.0)	3.3 (2.1)	3.1 (1.9)	3.2 (2.0)
	3	4.6 (2.9)	4.8 (3.0)	4.4 (2.7)	4.6 (2.9)
	4	6.6 (4.1)	6.8 (4.2)	6.3 (3.9)	6.6 (4.1)
II	1	5.1 (3.2)	5.3 (3.3)	4.9 (3.0)	5.2 (3.2)
	2	7.4 (4.6)	7.7 (4.8)	7.2 (4.5)	7.5 (4.7)
	3	10.7 (6.7)	11.6 (7.2)	10.3 (6.4)	10.8 (6.7)
	4	15.4 (9.6)	15.9 (9.9)	14.8 (9.2)	15.5 (9.6)
III	1	12.1 (7.5)	12.5 (7.8)	11.6 (7.2)	12.1 (7.5)
	2	17.5 (10.9)	18.2 (11.3)	16.9 (10.5)	17.7 (11.0)
	3	25.3 (15.7)	26.2 (16.3)	24.3 (15.1)	25.4 (15.8)
	4	36.2 (22.5)	37.5 (23.3)	34.9 (21.7)	36.5 (22.7)

Reverse gears

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	420/70R-30 14.9-30	480/70R-30 16.9-30
I	1	2.1 (1.3)	2.2 (1.4)	2.0 (1.2)	2.1 (1.3)
	2	3.0 (1.9)	3.1 (1.9)	2.9 (1.8)	3.1 (1.9)
	3	4.4 (2.7)	4.5 (2.8)	4.2 (2.6)	4.4 (2.7)
	4	6.2 (3.9)	6.5 (4.0)	6.0 (3.7)	6.3 (3.9)
II	1	4.9 (3.0)	5.0 (3.1)	4.7 (2.9)	4.9 (3.0)
	2	7.0 (4.3)	7.3 (4.5)	6.8 (4.2)	7.1 (4.4)
	3	10.2 (6.3)	10.6 (6.6)	9.8 (6.1)	10.3 (6.4)
	4	14.6 (9.1)	15.1 (9.4)	14.1 (8.8)	14.7 (9.1)
III	1	11.5 (7.1)	11.9 (7.4)	11.0 (6.8)	11.5 (7.1)
	2	16.7 (10.4)	17.2 (10.7)	16.0 (9.9)	16.8 (10.4)
	3	24.0 (14.9)	24.9 (15.5)	23.1 (14.3)	24.2 (15.0)
	4	34.4 (21.4)	35.6 (22.1)	33.1 (20.6)	34.6 (21.5)

Models TL80, TL90 and TL100 - SPEED AT MAXIMUM POWER
Transmission with creeper unit 24.85 mph (40 km/h) version (20F +12R - Syncro Shuttle)
(1) only model TL80 (2) only models TL90 and TL100

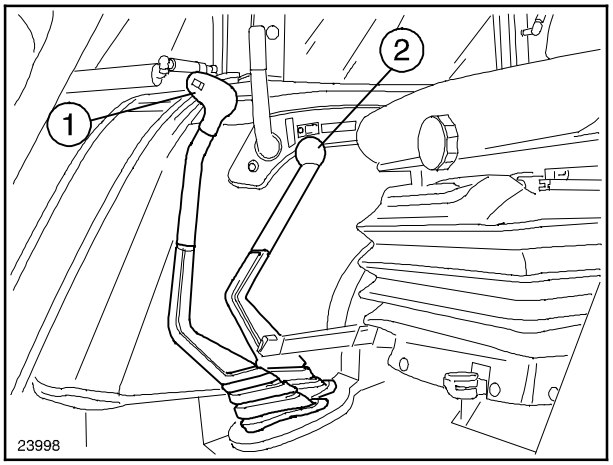
Forward speed

RANGE	GEAR	REAR TYRES km/h (mph)				
		520/70R-30 18.4-30	13.6-38	16.9-30 (1) 480/70R-30 (1)	480/70R-34 540/65R-34 16.9-34	18.4-34 (2) 520/70R-34 (2) 600/70R-34 (3)
	1	0.4 (0.2)	0.4 (0.2)	0.4 (0.2)	0.4 (0.2)	0.4 (0.2)
	2	0.6 (0.4)	0.6 (0.4)	0.5 (0.3)	0.6 (0.4)	0.6 (0.4)
	3	0.8 (0.5)	0.8 (0.5)	0.8 (0.5)	0.8 (0.5)	0.9 (0.6)
	4	1.1 (0.7)	1.2 (0.7)	1.1 (0.7)	1.2 (0.7)	1.2 (0.7)
	1	0.9 (0.6)	0.9 (0.6)	0.9 (0.6)	0.9 (0.6)	1.0 (0.6)
	2	1.3 (0.8)	1.3 (0.8)	1.3 (0.8)	1.4 (0.9)	1.4 (0.9)
	3	1.9 (1.2)	1.9 (1.2)	1.8 (1.1)	1.9 (1.2)	2.0 (1.2)
	4	2.7 (1.7)	2.8 (1.7)	2.6 (1.6)	2.8 (1.7)	2.9 (1.8)
I	1	2.1 (1.3)	2.2 (1.3)	2.1 (1.3)	2.2 (1.4)	2.3 (1.4)
	2	3.1 (1.9)	3.2 (2.0)	3.0 (1.9)	3.2 (2.0)	3.3 (2.1)
	3	4.5 (2.8)	4.6 (2.9)	4.3 (2.7)	4.6 (2.9)	4.8 (3.0)
	4	6.4 (4.0)	6.5 (4.0)	6.2 (3.9)	6.6 (4.1)	6.8 (4.2)
II	1	5.0 (3.1)	5.1 (3.2)	4.8 (3.0)	5.1 (3.2)	5.3 (3.3)
	2	7.2 (4.5)	7.4 (4.6)	7.0 (4.3)	7.4 (4.6)	7.7 (4.8)
	3	10.4 (6.5)	10.7 (6.6)	10.3 (6.4)	10.8 (6.7)	11.1 (6.9)
	4	14.9 (9.3)	15.3 (9.5)	14.4 (8.9)	15.4 (9.6)	15.9 (9.9)
III	1	11.7 (7.3)	12.0 (7.5)	11.3 (7.0)	12.1 (7.5)	12.5 (7.8)
	2	17.0 (10.6)	17.4 (10.8)	16.4 (10.2)	17.6 (10.9)	18.2 (11.3)
	3	24.5 (15.2)	25.2 (15.7)	23.6 (14.7)	25.3 (15.7)	26.2 (16.3)
	4	35.1 (21.8)	36.0 (22.4)	33.9 (21.1)	36.3 (22.6)	37.5 (23.3)

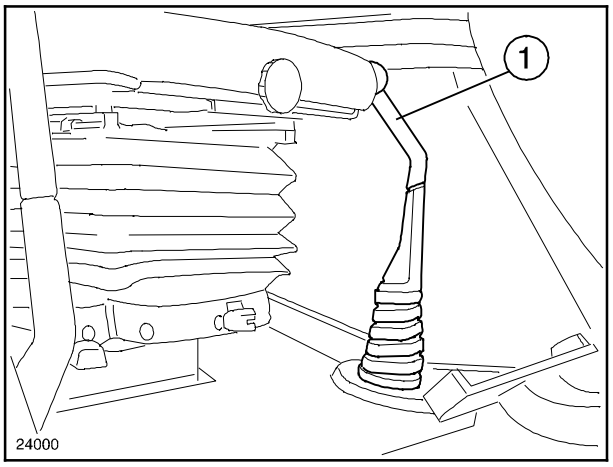
Reverse speed

RANGE	GEAR	REAR TYRES km/h (mph)				
		520/70R-30 18.4-30	13.6-38	16.9-30 (1) 480/70R-30 (1)	480/70R-34 540/65R-34 16.9-34	18.4-34 (2) 520/70R-34 (2) 600/70R-34 (3)
I	1	2.0 (1.2)	2.1 (1.3)	1.9 (1.2)	2.1 (1.3)	2.2 (1.4)
	2	2.9 (1.8)	3.0 (1.9)	2.8 (1.7)	3.0 (1.9)	3.1 (1.9)
	3	4.2 (2.6)	4.3 (2.7)	4.1 (2.5)	4.4 (2.7)	4.5 (2.8)
	4	6.1 (3.8)	6.2 (3.9)	5.8 (3.6)	6.3 (3.9)	6.5 (4.0)
II	1	4.7 (2.9)	4.8 (3.0)	4.6 (2.9)	4.9 (3.0)	5.0 (3.1)
	2	6.8 (4.2)	7.0 (4.3)	6.6 (4.1)	7.0 (4.3)	7.3 (4.5)
	3	9.9 (6.2)	10.1 (6.3)	9.5 (5.9)	10.2 (6.3)	10.6 (6.6)
	4	14.2 (8.8)	14.5 (9.0)	13.7 (8.5)	14.6 (9.1)	15.1 (9.4)
III	1	11.1 (6.9)	11.4 (7.1)	10.7 (6.6)	11.5 (7.1)	11.9 (7.4)
	2	16.1 (10.0)	16.6 (10.3)	15.6 (9.7)	16.7 (10.4)	17.2 (10.7)
	3	23.3 (14.5)	23.9 (14.9)	22.4 (13.9)	24.1 (15.0)	24.9 (15.5)
	4	33.3 (20.7)	34.2 (21.3)	32.1 (19.9)	34.5 (21.4)	35.6 (22.1)

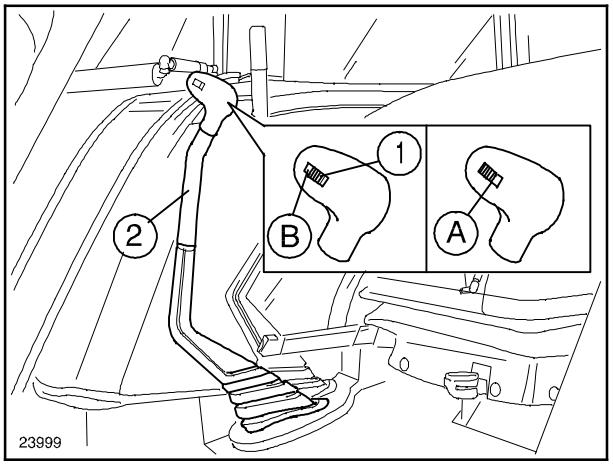
2 SPEED POWER SHIFT TRANSMISSION - 18.64 or 24.85 mph (30 or 40 km/h) (24 FORWARD GEARS + 12 REVERSE GEARS - 2 SPEED POWER SHIFT)



30



31



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The main shift (**1**) fig. 31, and range gear (**2**) fig. 30 levers are identical in operation to the 12 +12 Syncro Shuttle command transmission, described on page 2-17.

However, the main shift lever (**1**) in fig. 30, incorporates the 2 Speed Power Shift selector switch (**1**) fig. 32 to duplicate the forward gears to provide 24 speeds.

It is therefore possible to change from **HIGH** to **LOW**, or vice versa, by moving the switch (**1**) fig. 32 without pressing the clutch pedal as the 2 Speed Power Shift is engaged by means of hydraulic clutches.

With shuttle lever (**1**) fig. 31 in reverse gear position, **HIGH** is automatically locked out, reducing the number of reverse gear speeds to 12.

NOTE: *to reverse the direction of travel, proceed as described on page 2-17 (shuttle transmission chapter).*

CAUTION: when parking, with engine stopped, it is mandatory to set the shuttle control lever (**1**) fig. 31 in reverse position.

2 Speed Power Shift selector switch - Fig. 32

To select **LOW** or **HIGH**, move switch (**1**) located on the knob of lever (**2**) backwards or forwards as appropriate:

- Switch (**1**) in position **A** fully forward = operation in **LOW** range.
- Switch (**1**) in position **B** fully backward = operation in **HIGH** range.

Model TL70 - SPEED AT MAXIMUM POWER
Hydraulic 2 Speed Power Shift transmission 18.64 mph (30 km/h) version
(24 forward gears + 12 reverse gears - 2 Speed Power Shift)

Forward speed

RANGE	GEAR	REAR TYRES mph (km/h)							
		12.4-36		13.6-36		14.9-30 420/70R-30		16.9-30 480/70R-30	
		LOW	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**
I	1	1.6 (0.9)	1.8 (1.1)	1.6 (0.9)	1.9 (1.2)	1.5 (0.9)	1.7 (1.1)	1.6 (0.9)	1.8 (1.1)
	2	2.3 (1.4)	2.6 (1.6)	2.4 (1.5)	2.7 (1.7)	2.2 (1.4)	2.5 (1.6)	2.3 (1.4)	2.6 (1.6)
	3	3.3 (2.1)	3.8 (2.4)	3.4 (2.1)	3.9 (2.4)	3.2 (2.0)	3.6 (2.2)	3.3 (2.1)	3.8 (2.4)
	4	4.7 (2.9)	5.4 (3.4)	4.9 (3.0)	5.6 (3.5)	4.6 (2.9)	5.2 (3.2)	4.8 (3.0)	5.4 (3.4)
II	1	3.7 (2.3)	4.2 (2.6)	3.8 (2.4)	4.3 (2.7)	3.5 (2.2)	4.0 (2.5)	3.7 (2.3)	4.2 (2.6)
	2	5.3 (3.3)	6.1 (3.8)	5.5 (3.4)	6.3 (3.9)	5.1 (3.2)	5.9 (3.7)	5.4 (3.4)	6.1 (3.8)
	3	7.7 (4.8)	8.8 (5.5)	8.0 (5.0)	9.1 (5.7)	7.4 (4.6)	8.5 (5.3)	7.8 (4.9)	8.4 (5.2)
	4	11.0 (6.8)	12.6 (7.8)	11.4 (7.1)	13.0 (8.1)	10.6 (6.6)	12.1 (7.5)	11.1 (6.9)	12.6 (7.8)
III	1	8.7 (5.4)	9.9 (6.2)	9.0 (5.6)	10.2 (6.3)	8.3 (5.2)	9.5 (5.9)	8.7 (5.4)	9.9 (6.2)
	2	12.6 (7.8)	14.3 (8.9)	13.1 (8.1)	14.9 (9.3)	12.1 (7.5)	13.8 (8.6)	12.7 (7.9)	14.4 (9.0)
	3	18.1 (11.2)	20.7 (12.9)	18.8 (11.7)	21.4 (13.3)	17.5 (10.9)	19.9 (12.4)	18.3 (11.4)	20.8 (17.4)
	4	26.0 (12.8)	29.6 (18.4)	26.9 (16.7	30.7 (19.1)	25.1 (15.6)	28.5 (17.7)	26.2 (16.3)	29.8 (19.5)

Reverse speed

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	14.9-30 420/70R-30	16.9-30 480/70R-30
I	1	1.8 (1.1)	1.8 (1.1)	1.7 (1.1)	1.8 (1.1)
	2	2.6 (1.6)	2.7 (1.7)	2.5 (1.6)	2.6 (1.6)
	3	3.7 (2.3)	3.8 (2.4)	3.6 (2.2)	3.7 (2.3)
	4	5.3 (3.3)	5.5 (3.4)	5.1 (3.2)	5.3 (3.3)
II	1	4.1 (2.6)	4.3 (2.7)	4.0 (2.5)	4.2 (2.6)
	2	6.0 (3.7)	6.2 (3.9)	5.8 (3.6)	6.0 (3.7)
	3	8.6 (5.3)	9.0 (5.6)	8.3 (5.2)	8.7 (5.4)
	4	12.4 (7.7)	12.8 (8.0)	11.9 (7.4)	12.5 (7.8)
III	1	9.7 (6.0)	10.0 (6.2)	9.4 (5.8)	9.8 (6.1)
	2	14.1 (8.8)	14.6 (9.1)	13.6 (8.5)	14.2 (8.8)
	3	20.3 (12.6)	21.1 (13.1)	19.6 (12.2)	20.5 (12.7)
	4	29.1 (18.1)	30.2 (18.8)	28.1 (17.5)	29.3 (18.2)

Models TL80, TL90 and TL100 - SPEED AT MAXIMUM POWER

Hydraulic 2 Speed Power Shift transmission 18.64 mph (30 km/h) version

(24 forward gears + 12 reverse gears - 2 Speed Power Shift) (1) only model TL80

Forward speed

RANGE	GEAR	REAR TYRES mph (km/h)							
		18.4-30 520/70-30		13.6-38		16.9-30 (1) 480/70R-30 (1)		16.9-34 480/70R-34 540/65R-34	
		LOW	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**
I	1	1.5 (0.9)	1.7 (1.1)	1.6 (1.0)	1.8 (1.1)	1.5 (0.9)	1.7 (1.1)	1.6 (1.0)	1.8 (1.1)
	2	2.2 (1.4)	2.5 (1.6)	2.3 (1.4)	2.6 (1.6)	2.1 (1.3)	2.4 (1.5)	2.3 (1.4)	2.6 (1.6)
	3	3.2 (2.0)	3.6 (2.2)	3.3 (2.1)	3.7 (2.3)	3.1 (1.9)	3.5 (2.2)	3.3 (2.1)	3.8 (2.4)
	4	4.6 (2.9)	5.2 (3.2)	4.7 (2.9)	5.3 (3.3)	4.4 (2.7)	5.0 (3.1)	4.7 (2.9)	5.4 (3.4)
II	1	3.6 (2.2)	4.1 (2.6)	3.7 (2.3)	4.2 (2.6)	3.4 (2.1)	3.9 (2.4)	3.7 (2.3)	4.2 (2.6)
	2	5.2 (3.2)	5.9 (3.7)	5.3 (3.3)	6.1 (3.8)	5.0 (3.1)	5.7 (3.5)	5.4 (3.4)	6.1 (3.8)
	3	7.5 (4.7)	8.5 (5.3)	7.7 (4.8)	8.7 (5.4)	7.2 (4.5)	8.2 (5.1)	7.7 (4.8)	8.8 (5.5)
	4	10.7 (6.6)	12.2 (7.6)	11.0 (6.8)	12.5 (7.8)	10.3 (6.4)	11.8 (7.3)	11.1 (6.9)	12.6 (7.8)
III	1	8.3 (5.2)	9.6 (6.0)	8.6 (5.3)	9.8 (6.1)	8.1 (5.0)	9.2 (5.7)	8.7 (5.4)	9.9 (6.1)
	2	12.2 (7.6)	13.9 (8.6)	12.5 (7.8)	14.3 (8.9)	11.8 (7.3)	13.4 (8.3)	12.6 (7.8)	14.4 (8.0)
	3	17.6 (10.9)	20.0 (12.4)	18.1 (11.3)	20.6 (12.8)	17.0 (10.6)	19.3 (12.0)	18.2 (11.3)	20.6 (12.8)
	4	25.2 (15.7)	28.7 (17.8)	25.9 (16.1)	29.5 (18.3)	24.3 (15.1)	27.7 (17.3)	26.1 (16.2)	29.7 (18.5)

Reverse speed

RANGE	GEAR	REAR TYRES mph (km/h)			
		18.4-30 520/70-30	13.6-38	16.9-30 (1) 480/70R-30 (1)	16.9-34 480/70R-34 540/65R-34
I	1	1.7 (1.1)	1.8 (1.1)	1.7 (1.1)	1.8 (1.1)
	2	2.5 (1.6)	2.6 (1.6)	2.4 (1.5)	2.6 (1.6)
	3	3.6 (2.2)	3.7 (2.3)	3.5 (2.2)	3.7 (2.3)
	4	5.3 (3.3)	5.3 (3.3)	5.0 (3.1)	5.3 (3.3)
II	1	4.0 (2.5)	4.1 (2.6)	3.9 (2.4)	4.1 (2.6)
	2	5.8 (3.6)	6.0 (3.7)	5.6 (3.5)	6.0 (3.7)
	3	8.4 (5.2)	8.6 (5.3)	8.1 (5.0)	8.7 (5.4)
	4	12.0 (7.5)	12.3 (7.6)	11.6 (7.2)	12.4 (7.7)
III	1	9.4 (5.8)	9.6 (6.0)	9.1 (5.7)	8.7 (5.4)
	2	13.7 (8.5)	14.0 (8.7)	13.2 (8.2)	14.1 (8.8)
	3	19.7 (12.2)	20.2 (12.6)	19.0 (11.8)	20.4 (12.7)
	4	28.2 (17.5)	29.0 (18.0)	27.2 (16.9)	29.2 (18.1)

Model TL70 4WD - SPEED AT MAXIMUM POWER

Hydraulic 2 Speed Power Shift transmission 24.85 mph (40 km/h) version
(24 forward gears + 12 reverse gears - 2 Speed Power Shift)

Forward speed

RANGE	GEAR	REAR TYRES mph (km/h)							
		12.4-36		13.6-36		14.9-30 420/70R-30		16.9-30 480/70R-30	
		LOW	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**
I	1	1.8 (1.1)	21.1 (13.1)	1.9 (1.2)	2.2 (1.4)	1.7 (1.1)	2.0 (1.2)	1.8 (1.1)	2.1 (1.3)
	2	2.6 (1.6)	3.1 (1.9)	2.7 (1.7)	3.2 (2.0)	2.5 (1.6)	3.0 (1.9)	2.6 (1.0)	3.1 (1.9)
	3	3.8 (2.4)	4.4 (2.7)	3.9 (2.4)	4.6 (2.9)	3.6 (2.2)	4.3 (2.7)	3.8 (2.4)	4.5 (2.8)
	4	5.4 (3.4)	6.3 (3.9)	5.6 (3.5)	6.6 (4.1)	5.2 (3.2)	6.1 (3.8)	5.4 (3.4)	6.4 (4.0)
II	1	4.2 (2.6)	4.9 (3.0)	4.3 (2.7)	5.1 (3.2)	4.0 (2.5)	4.8 (3.0)	4.2 (2.6)	5.0 (3.1)
	2	6.1 (3.8)	7.2 (4.5)	6.3 (3.9)	7.5 (4.7)	5.9 (3.7)	6.9 (4.3)	6.1 (3.8)	7.2 (4.5)
	3	8.8 (5.5)	10.4 (6.5)	9.1 (5.7)	10.7 (6.6)	8.5 (5.3)	10.0 (6.2)	8.8 (5.5)	10.4 (6.5)
	4	12.6 (7.8)	14.8 (9.2)	13.0 (8.1)	15.4 (9.6)	12.1 (7.5)	14.3 (8.9)	12.7 (7.9)	15.0 (9.3)
III	1	9.9 (6.7)	11.6 (7.2)	10.2 (6.3)	12.1 (7.5)	9.5 (5.9)	11.2 (7.0)	9.9 (6.2)	11.7 (7.3)
	2	14.3 (8.9)	16.9 (10.5)	14.9 (9.3)	17.5 (10.9)	13.8 (8.6)	16.3 (10.1)	14.4 (9.0)	17.0 (10.6)
	3	20.7 (12.9)	24.4 (15.2)	21.4 (13.3)	25.3 (15.7)	19.9 (12.4)	23.5 (14.6)	20.8 (12.9)	24.6 (15.3)
	4	29.6 (18.4)	34.9 (21.7)	30.7 (19.1)	36.2 (22.5)	28.5 (17.7)	33.7 (20.9)	29.8 (18.5)	35.2 (21.9)

Reverse speed

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	14.9-30 420/70R-30	16.9-30 480/70R-30
I	1	1.8 (1.1)	1.8 (1.1)	1.7 (1.1)	1.8 (1.1)
	2	2.6 (1.6)	2.7 (1.7)	2.5 (1.6)	2.6 (1.6)
	3	3.7 (2.3)	3.8 (2.4)	3.6 (2.2)	3.7 (2.3)
	4	5.3 (3.3)	5.5 (3.4)	5.1 (3.2)	5.3 (3.3)
II	1	4.1 (2.6)	4.3 (2.7)	4.0 (2.5)	4.2 (2.6)
	2	6.0 (3.7)	6.2 (3.9)	5.8 (3.6)	6.0 (3.7)
	3	8.6 (5.3)	9.0 (5.6)	8.3 (5.2)	8.7 (5.4)
	4	12.4 (7.7)	12.8 (8.0)	11.9 (7.4)	12.5 (7.8)
III	1	9.7 (6.0)	10.0 (6.2)	9.4 (5.8)	9.8 (6.1)
	2	14.1 (8.8)	14.6 (9.1)	13.6 (8.5)	14.2 (8.8)
	3	20.3 (12.6)	21.1 (13.1)	19.6 (12.2)	20.5 (12.7)
	4	29.1 (18.1)	30.2 (18.8)	28.1 (17.5)	29.3 (1.0)

Models TL80, TL90 and TL100 4WD - SPEED AT MAXIMUM POWER

Hydraulic 2 Speed Power Shift transmission 24.85 mph (40 km/h) version
(24 forward gears + 12 reverse gears - 2 Speed Power Shift)
(1) only model TL80

Forward speed

RANGE	GEAR	REAR TYRES mph (km/h)							
		18.4-30 520/70-30		13.6-38		16.9-30 (1) 480/70R-30 (1)		16.9-34 480/70R-34 540/65R-34	
		LOW	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**
I	1	1.7 (1.1)	2.1 (1.3)	1.8 (1.1)	2.1 (1.3)	1.7 (1.1)	2.0 (1.2)	1.8 (1.1)	2.1 (1.3)
	2	2.5 (1.6)	2.9 (1.8)	2.5 (1.6)	3.0 (1.9)	2.4 (1.5)	2.8 (1.7)	2.6 (1.6)	3.0 (1.9)
	3	3.6 (2.2)	4.3 (2.7)	3.7 (2.3)	4.4 (2.7)	3.5 (2.2)	4.1 (2.6)	3.8 (2.4)	4.4 (2.7)
	4	5.2 (3.2)	6.2 (3.9)	5.4 (3.4)	6.3 (3.9)	5.0 (3.1)	5.9 (3.7)	5.4 (3.4)	6.3 (3.9)
II	1	4.1 (2.6)	4.8 (3.0)	4.2 (2.6)	4.9 (3.0)	3.9 (2.4)	4.6 (2.9)	4.2 (2.6)	5.0 (3.1)
	2	5.8 (3.6)	6.8 (4.2)	5.9 (3.7)	7.0 (4.3)	5.8 (3.6)	6.6 (4.1)	6.0 (3.7)	7.1 (4.4)
	3	8.5 (5.3)	10.0 (6.2)	8.7 (5.4)	10.3 (6.4)	8.2 (5.1)	9.7 (6.0)	8.8 (5.5)	10.4 (6.5)
	4	12.2 (7.6)	14.4 (9.0)	12.5 (7.8)	14.5 (9.0)	11.8 (7.3)	13.9 (8.6)	12.6 (7.8)	14.9 (9.3)
III	1	9.6 (6.0)	11.3 (7.0)	9.8 (6.1)	11.6 (7.2)	9.2 (5.7)	10.9 (6.8)	9.9 (6.2)	11.6 (7.2)
	2	13.6 (8.5)	16.0 (9.9)	14.0 (8.7)	16.5 (10.3)	13.1 (8.1)	15.5 (9.6)	14.1 (8.8)	16.6 (10.3)
	3	20.2 (1.1)	23.6 (14.7)	20.6 (12.8)	24.3 (15.1)	19.3 (12.0)	19.3 (12.0)	20.7 (12.9)	24.5 (15.2)
	4	28.7 (17.8)	33.9 (21.1)	29.5 (18.3)	34.8 (21.6)	27.7 (17.2)	32.7 (20.3)	29.7 (18.5)	35.0 (21.7)

Reverse speed

RANGE	GEAR	REAR TYRES mph (km/h)			
		520/70-30 18.4-30	13.6-38	16.9-30 (1) 480/70R-30 (1)	16.9-34 480/70R-34 540/65R-34
I	1	1.7 (1.1)	1.8 (1.1)	1.7 (1.1)	1.8 (1.1)
	2	2.5 (1.6)	2.6 (1.6)	2.4 (1.5)	2.6 (1.6)
	3	3.6 (2.2)	3.7 (2.3)	3.5 (2.2)	3.7 (2.3)
	4	5.1 (3.2)	5.3 (3.3)	5.0 (3.1)	5.3 (3.3)
II	1	4.0 (2.5)	4.1 (2.6)	3.9 (2.4)	4.1 (2.6)
	2	5.8 (3.6)	6.0 (3.7)	5.6 (3.5)	6.0 (3.7)
	3	8.4 (5.2)	8.6 (5.3)	8.1 (5.0)	8.7 (5.4)
	4	12.0 (7.5)	12.3 (7.6)	11.6 (7.2)	12.4 (7.7)
III	1	9.4 (5.8)	9.7 (6.0)	9.1 (5.7)	9.7 (6.0)
	2	13.7 (8.5)	14.0 (8.7)	13.2 (8.2)	14.1 (8.8)
	3	19.7 (12.2)	20.2 (12.6)	19.0 (11.8)	20.4 (14.9)
	4	28.2 (17.5)	29.0 (18.0)	27.2 (16.9)	29.2 (18.1)

Model TL90, TL100 4WD - SPEED AT MAXIMUM POWER

Hydraulic 2 Speed Power Shift transmission 18.64 or 24.85 mph (30 or 40 km/h) version (24 forward gears + 12 reverse gears - 2 Speed Power Shift)

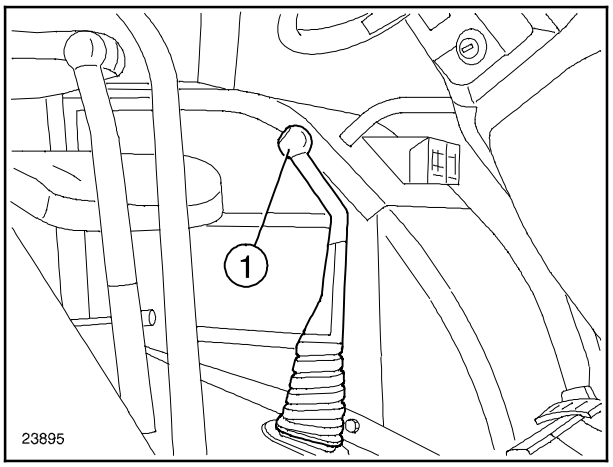
Forward speed

RANGE	GEAR	REAR TYRES mph (km/h)			
		18.4-34 520/70R-34 600/65R-34			
		18.64 mph (30 km/h)		24.85 mph (40 km/h)	
		LOW	**HIGH**	**LOW**	**HIGH**
I	1	1.6 (1.0)	1.9 (1.2)	1.9 (1.2)	2.2 (1.4)
	2	2.4 (1.5)	2.7 (1.7)	2.7 (1.7)	3.2 (2.0)
	3	3.4 (2.1)	3.9 (2.4)	3.9 (2.4)	4.6 (2.9)
	4	4.9 (3.0)	5.6 (3.5)	5.6 (3.5)	6.6 (4.1)
II	1	3.8 (2.4)	4.3 (2.7)	4.3 (2.7)	5.1 (3.2)
	2	5.5 (3.4)	6.3 (3.9)	6.3 (3.9)	7.4 (4.6)
	3	8.0 (5.0)	9.1 (5.7)	9.1 (5.7)	10.7 (6.6)
	4	11.4 (7.1)	13.0 (8.1)	13.0 (8.1)	15.4 (9.6)
III	1	9.0 (5.6)	10.2 (6.3)	10.2 (6.3)	12.1 (7.5)
	2	13.0 (8.1)	14.9 (9.3)	14.9 (9.3)	17.5 (10.9)
	3	18.8 (11.7)	21.4 (13.3)	21.4 (13.3)	25.3 (15.7)
	4	26.9 (16.7)	30.7 (19.1)	30.7 (19.1)	36.2 (22.5)

Reverse speed

RANGE	GEAR	REAR TYRES km/h (mph)
		18.4-34 520/70R-34 600/65R-34
I	1	1.8 (1.1)
	2	2.7 (1.7)
	3	3.8 (2.4)
	4	5.5 (3.4)
II	1	4.3 (2.7)
	2	6.2 (3.9)
	3	8.9 (5.5)
	4	12.8 (8.0)
III	1	10.1 (6.3)
	2	14.6 (9.1)
	3	21.1 (13.1)
	4	30.2 (18.8)

TRANSMISSION WITH OVERDRIVE - 24.85 mph (40 km/h) (20 forward gears + 8 reverse gears - SPLIT COMMAND)



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CAUTION: *With the engine running and only one gear lever in neutral, the tractor could be engaged and start moving if the lever is accidentally operated, which may lead to possible accidents. To avoid this hazard, move both levers to neutral, lower any implements and apply the handbrake before leaving the tractor.*

The main shift and range gear levers are operated in the same way as the 12 + 4 Synchro Command transmission, described on page 14 in this section.

Overdrive lever (**1**) fig. 33 operation provides an additional 8 forward and 4 reverse speeds.

OVERDRIVE LEVER - Fig. 33

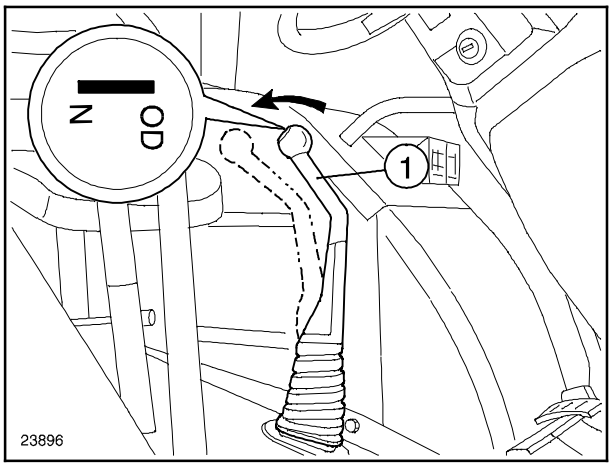
Gears with overdrive allow the user greater speed of movement particularly when transporting or travelling on roads, thus improving tractor productivity.

The increase in speed is achieved by the use of additional high ratio gears, located between the clutch and the 12-speed gearbox that enable the tractor's speed to be increased in the medium and high ranges and in reverse.

Therefore, higher or lower speed can be selected in all gears in the medium and high ranges, depending on whether the overdrive or normal drive is engaged.The overdrive function provides 20 forward and 8 reverse gears.

The overdrive is synchro-engaged.

To engage overdrive, release the clutch and shift lever (**1**) forwards, as shown in the drawing.



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Overdrive lever positions - Fig. 34

- Lever (**1**) forward (**OD** position) = **Overdrive engaged**
- Lever (**1**) backward (**N** position) = **Overdrive disengaged**

CAUTION: *overdrive cannot be used in combination with the low range. If you should accidentally try to engage it with the range lever in the low range, a mechanical interlock system will disengage the range lever, reminding the operator that this combination is not possible.*

Models TL70 4WD - SPEED AT MAXIMUM POWER

Overdrive transmission 24.85 mph (40 km/h) version (20 forward gears + 8 reverse gears - Split Command)

F = Forward gears **R = Reverse gears**

RANGE	GEAR	REAR TYRES mph (km/h)							
		12.4-36		13.6-36		14.9-30 420/70R-30		16.9-30 480/70R-30	
		F	**R**	**F**	**R**	**F**	**R**	**F**	**R**
I	1	1.8 (1.1)	-	1.9 (1.2)	-	1.7 (1.1)	-	1.8 (1.1)	-
	2	2.6 (1.6)	-	2.7 (1.7)	-	2.5 (1.6)	-	2.6 (1.6)	-
	3	3.8 (2.4)	-	3.9 (2.4)	-	3.6 (2.2)	-	3.8 (2.4)	-
	4	5.4 (3.4)	-	5.6 (3.5)	-	5.2 (3.2)	-	5.4 (3.4)	-
II	1	4.2 (2.6)	4.7 (2.9)	4.3 (2.7)	4.8 (3.0)	4.0 (2.5)	4.5 (2.8)	4.2 (2.6)	4.7 (2.9)
	1 OD	4.9 (3.0)	5.5 (3.4)	5.1 (3.2)	5.7 (3.5)	4.7 (2.9)	5.3 (3.3)	5.0 (3.1)	5.5 (3.4)
	2	6.1 (3.8)	6.8 (4.2)	6.3 (3.9)	7.0 (4.4)	5.9 (3.7)	6.5 (4.0)	6.1 (3.8)	6.8 (4.2)
	2 OD	7.1 (4.4)	8.0 (5.0)	7.4 (4.6)	8.3 (5.2)	6.9 (4.3)	7.6 (4.7)	7.2 (4.5)	8.0 (5.0)
	3	8.8 (5.5)	9.8 (6.1)	9.1 (5.7)	10.1 (6.3)	8.4 (5.2)	9.4 (5.8)	8.8 (5.5)	9.9 (6.1)
	3 OD	10.3 (6.4)	11.5 (7.2)	10.7 (6.6)	11.9 (7.4)	9.9 (6.1)	11.1 (6.9)	10.4 (6.5)	11.6 (7.2)
	4	12.6 (7.8)	14.0 (8.7)	13.0 (8.1)	14.5 (8.0)	12.1 (7.5)	13.5 (8.4)	12.7 (7.9)	14.1 (8.8)
	4 OD	14.8 (9.2)	16.4 (10.2)	15.3 (9.5)	17.0 (10.6)	14.2 (8.8)	15.8 (9.8)	14.9 (9.3)	16.6 (10.3)
III	1	9.9 (6.1)	-	10.2 (6.3)	-	9.6 (6.0)	-	9.9 (6.2)	-
	1 OD	11.6 (7.2)	-	12.0 (7.5)	-	11.2 (7.0)	-	11.7 (7.3)	-
	2	14.3 (8.9)	-	14.9 (9.3)	-	13.8 (8.6)	-	14.4 (9.0)	-
	2 OD	16.8 (10.4)	-	17.3 (10.8)	-	16.2 (10.1)	-	17.0 (10.6)	-
	3	20.6 (12.8)	-	21.4 (13.3)	-	19.9 (12.4)	-	20.8 (12.9)	-
	3 OD	24.3 (15.1)	-	25.1 (15.6)	-	23.4 (14.5)	-	24.4 (15.2)	-
	4	29.6 (18.4)	-	30.7 (19.1)	-	28.5 (17.7)	-	29.8 (18.5)	-
	4 OD	34.8 (21.6)	-	36.0 (22.4)	-	33.5 (20.8)	-	35.0 (21.7)	-

Model TL80 4WD - SPEED AT MAXIMUM POWER

Overdrive transmission 24.85 mph (40 km/h) version (20 forward gears + 8 reverse gears - Split Command)

F = Forward gears **R = Reverse gears**

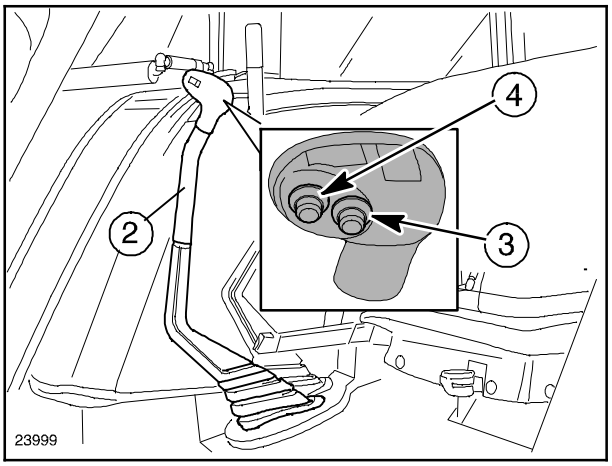
RANGE	GEAR	REAR TYRES (km/h)							
		18.4-30 520/70-30		13.6-38		16.9-30 480/70R-30		16.9-34 480/70R-34 540/65R-34	
		F	**R**	**F**	**R**	**F**	**R**	**F**	**R**
I	1	1.7 (1.1)	-	1.8 (1.1)	-	1.7 (1.1)	-	1.8 (1.1)	-
	2	2.5 (1.6)	-	2.6 (1.6)	-	2.4 (1.5)	-	2.6 (1.6)	-
	3	3.6 (2.2)	-	3.7 (2.3)	-	3.5 (2.2)	-	3.8 (2.4)	-
	4	5.2 (3.2)	-	5.4 (3.4)	-	5.0 (3.1)	-	5.4 (3.4)	-
II	1	4.1 (2.6)	4.5 (2.8)	4.2 (2.6)	4.6 (2.9)	3.9 (2.4)	4.4 (2.7)	4.2 (2.6)	4.7 (2.9)
	1 OD	4.8 (3.0)	5.3 (3.3)	4.9 (3.0)	5.5 (3.4)	4.6 (2.9)	5.1 (3.2)	4.9 (3.0)	5.5 (3.4)
	2	5.9 (3.7)	6.6 (4.1)	6.1 (3.8)	6.8 (4.2)	5.7 (3.5)	6.3 (3.9)	6.1 (3.8)	6.8 (4.2)
	2 OD	6.9 (4.3)	7.7 (4.8)	7.1 (4.4)	7.9 (4.9)	6.7 (4.2)	7.4 (4.6)	7.2 (4.5)	8.0 (5.0)
	3	8.5 (5.3)	9.5 (5.9)	8.7 (5.4)	9.7 (6.0)	8.2 (5.1)	9.1 (5.7)	8.8 (5.5)	9.8 (6.1)
	3 OD	10.0 (6.2)	11.1 (6.9)	10.3 (6.4)	11.4 (7.1)	9.6 (6.0)	10.7 (6.7)	10.3 (6.4)	11.5 (7.1)
	4	12.2 (7.6)	13.6 (8.5)	12.5 (7.8)	14.0 (8.7)	11.8 (7.3)	13.1 (8.1)	12.6 (7.8)	14.0 (8.7)
	4 OD	14.3 (8.9)	15.9 (9.9)	14.7 (9.1)	16.4 (10.2)	13.8 (8.6)	15.4 (9.6)	14.8 (9.2)	16.5 (10.3)
III	1	9.6 (6.0)	-	9.8 (6.1)	-	9.2 (5.7)	-	9.9 (6.2)	-
	1 OD	11.2 (7.0)	-	11.5 (7.1)	-	10.8 (6.7)	-	11.6 (7.2)	-
	2	13.9 (8.6)	-	14.3 (8.9)	-	13.4 (8.3)	-	14.4 (9.0)	-
	2 OD	16.3 (10.1)	-	16.8 (10.4)	-	15.7 (9.8)	-	16.9 (10.5)	-
	3	20.0 (12.4)	-	20.6 (12.8)	-	19.3 (12.0)	-	20.7 (12.9)	-
	3 OD	23.5 (14.6)	-	24.2 (15.0)	-	22.7 (14.1)	-	24.3 (15.1)	-
	4	28.7 (17.8)	-	29.5 (18.3)	-	27.7 (17.2)	-	29.7 (18.5)	-
	4 OD	33.8 (21.0)	-	34.6 (21.5)	-	32.5 (20.2)	-	34.8 (21.6)	-

TRANSMISSION WITH ELECTRO-HYDRAULIC 2 SPEED POWER SHIFT / POWER-SHUTTLE 18.64/24.85 mph (30/40 km/h) (24 F + 24 R)

NOTE: *In order to start the engine, move the lever (**1**) fig. 37 to the neutral position and press the transmission/engine clutch pedal fully down.*

The gear and range gear levers operate in the same way as the 12+12 transmission described on page 2-17.

The gear lever (**2**) in fig. 35, is also equipped with 2 **HIGH-LOW** control pushbuttons (**3** and **4**) fig. 35, enabling the forward gears to be doubled to a total of 24 forward gears and 24 reverse gears. It is therefore possible to change from **HIGH** to **LOW**, or vice versa, without pressing the clutch pedal.



35

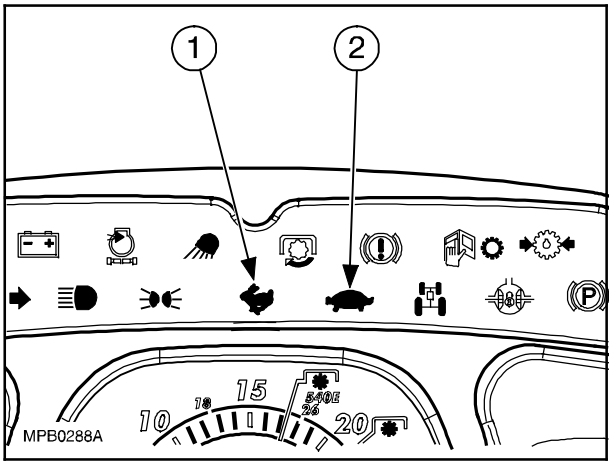
CAUTION: *When the tractor is parked and the engine is switched off, the parking brake **must** be applied. If the operator leaves the driving position without having applied the handbrake, an alarm is activated. If parking on a steep slope it is advised to use wheel chocks.*

2 SPEED POWER SHIFT SELECTOR SWITCH - Fig. 35

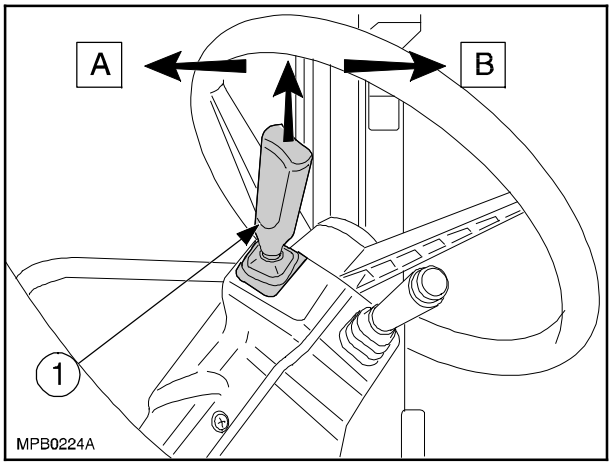
To select the **LOW** or **HIGH** position, use the buttons (**3** and **4**) fig. 35.

- button (**3**) = **LOW** range selection, the indicator (**2**) fig. 36 illuminates (tortoise symbol);

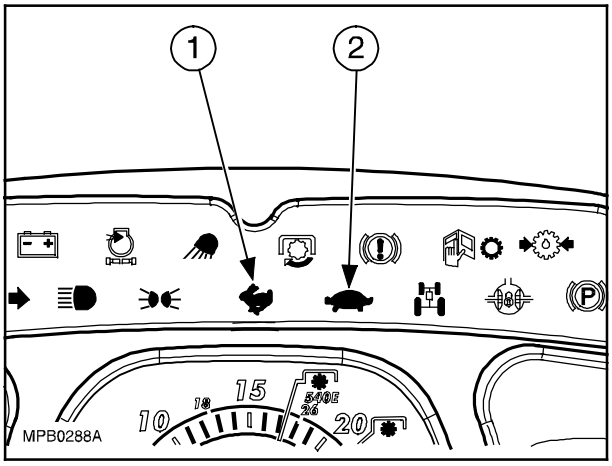
- button (**4**) = **HIGH** range selection, the indicator (**1**) fig. 36 illuminates (hare symbol).



36



37



38

ELECTROHYDRAULIC POWER SHUTTLE CONTROL LEVER (1) - Fig. 37

The shuttle lever (**1**), located to the left of the steering wheel, is used to select forward or reverse drive when a gear ratio is engaged.

To select the drive direction, lift the lever and move it forward for forward drive, or backward for reverse drive. Drive direction can be selected without pressing down the clutch pedal.

To change the drive direction keep the lever raised and move it either forwards or backwards. Drive direction can be changed without pressing down the clutch pedal.

Operation

With the tractor moving it is possible to invert the drive direction without stopping and without pressing down the clutch pedal.

If proceeding forwards in the **HIGH** range, and the shuttle lever (**1**) fig. 37 is moved to the reverse position, when the tractor starts reversing the indicator (**2**) fig. 38 will illuminate to signal the shift to the **LOW** range.

When the shuttle lever (**1**) fig. 37 is returned to the forward drive position, the indicator (**1**) fig. 38 will illuminate and indicator (**2**) fig. 38 will flash to signal the automatic shift from the **LOW** range, to the previously set **HIGH** range. On completion of the operation, indicator (**1**) will switch off and indicator (**2**) will remain illuminated to signal that the HIGH range is being used.

NOTE: *In order to start the engine, move the shuttle control lever (**1**) fig. 37 to the central neutral position and fully press down the clutch pedal.*

NOTE: *When working in the **LOW** ranges, only indicator (**1**) fig.will illuminate when drive direction is changed 38.*

CAUTION: *In order to use the Power Shuttle lever (**1**) it is essential that the operator is correctly seated in the driving position.*

NOTE: *Before using the tractor at temperatures below -4 °F (-18 °C) start the engine and leave to idle at a speed of 1300 to 1500 rpm for approximately 5 minutes. This will allow the gear oil to reach working temperature.*

2 SPEED POWER SHIFT CLUTCH CALIBRATION

In order to maintain the hydraulic system in optimal conditions, clutch calibration must be carried out periodically, and after the following replacement operations;

- control unit replacement;
- solenoid valve replacement.

Carry out calibration operations according to the instructions listed below:

1. park the tractor in an obstacle-free area, switch off the engine and apply the handbrake;

2. remove the left-hand side panel on the dashboard;

3. find the black connector (**2**) fig. 39 and connect the calibration instrument (**1**) fig. 39;

4. keep push buttons (**2** and **3**) fig. 40 pressed down and start the engine;

5. after a few seconds, the display (**1**) fig. 40 will show the message **H1**, followed by "**CALIBR**".

CAUTION: *Before starting the engine, move the shuttle lever to the neutral position and make sure that there are no bystanders or objects in the vicinity of the tractor.*

6. take the engine to 1200 to 1400 rpm, apply the handbrake, engage the first gear, select the third range, move forward (**A**) or backwards (**B**) using the shuttle lever (**1**) fig. 41 then release the clutch pedal (the operation must be carried out whilst seated in the driving position);

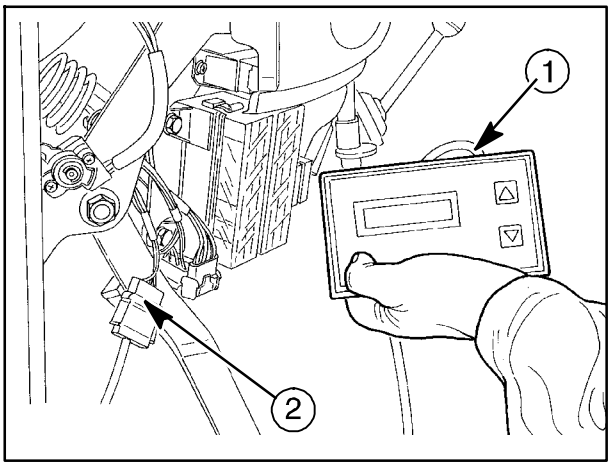
7. release buttons (**2** and **3**), fig. 40 and, after a few seconds, the display (**1**) will show the transmission oil temperature (e.g.: 93.2 °F (34 °C);

8. press the button (**3**) fig. 40 with the arrow pointing downwards, the display will show the message "clutch **A**", press the button again and the display will show **AUX ON** followed by a number that will increase rapidly. When the number stops and begins to flash, the clutch **A** is calibrated. Release the button.

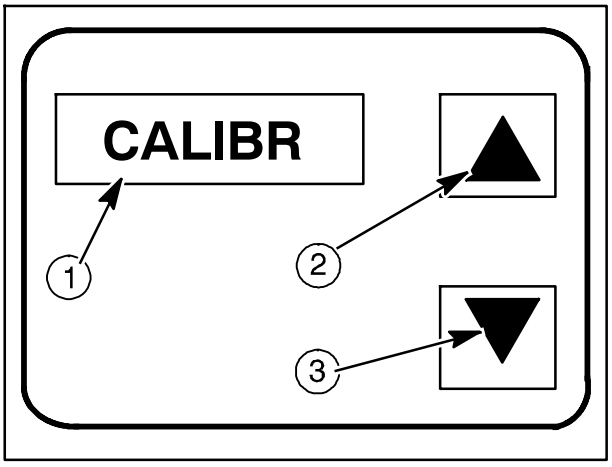
NOTE: *If, during calibration operations, the instrument detects a fault, the display (**1**) fig. 40 will show a number, preceded by the letter "**U**"; consult the table on page 2-39.*

On completion of calibration operations, switch off the engine in order to store the new transmission control values.

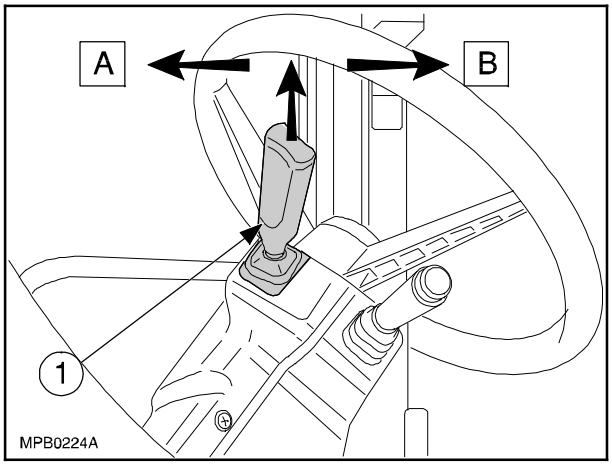
NOTE: *To calibrate clutches **B**, **C** and **D** proceed as described in point **8.** using the button (**2**) fig. 40 with the arrow pointing upwards.*



39



40

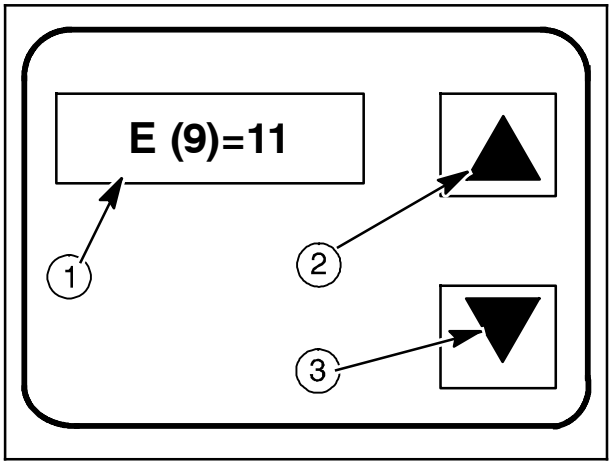


41

FAULT CODE DISPLAY

Any eventual errors stored by the electronic control unit during tractor use can be checked using the instrument. To display the codes, follow the instructions noted below;

- connect the instrument as described on page 2-37;
- move the shuttle lever (**1**) fig. 41 to the reverse drive position;
- press, and hold down, the button (**2**) with the arrow pointing upwards;
- turn the starter key to the second position (ready for starting), the display (**1**), will show a numerical code (fault code). Now release the push button.



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By pressing the push button (**2**) with the arrow pointing upwards again, any other errors detected during tractor use can be checked. The instrument will display up to a maximum of 9 faults.

Press, and hold down, the push button (**3**) with the arrow pointing downwards for at least 5 seconds in order to delete the data stored in the control unit. Work with the tractor, checking operation as described previously. If the instrument shows the same faults that were previously deleted or new faults, contact NEW HOLLAND specialised personnel.

FAULT CODES DESCRIPTION

CODE	FAULT	RECOVERY
11	Tension too low at clutch pedal potentiometer	Machine locked. Contact the specialised New Holland staff.
12	Tension too high at clutch pedal potentiometer	Machine locked. Contact the specialised New Holland staff.
13	High and Low speed pushbuttons pressed simultaneously	Fault automatically cancelled when problem solved
14	“Tension too high at G” gear switch	Fault manually cancelled
15	“Tension too low at G” gear switch	Fault manually cancelled
16	“Tension too high at R1” range switch	Fault manually cancelled
17	“Tension too low at R1” range switch	Fault manually cancelled
18	“Tension too high at R2” range switch	Fault manually cancelled
19	“Tension too low at R2” range switch	Fault manually cancelled
21	Wiring fault. Open circuit	Fault manually cancelled
* 22	Short circuit on clutch A solenoid valve	Fault manually cancelled
* 23	Short circuit on clutch B solenoid valve	Fault manually cancelled
24	Clutches not calibrated	Fault manually cancelled
25	Engine rpm too high	Fault manually cancelled
26	Clutch D not calibrated	Fault automatically cancelled when problem solved
27	Clutch C not calibrated	Fault automatically cancelled when problem solved
28	Clutch B not calibrated	Fault automatically cancelled when problem solved
29	Clutch A not calibrated	Fault automatically cancelled when problem solved
* 31	Short circuit on clutch C solenoid valve	Fault manually cancelled
* 32	Short circuit on clutch D solenoid valve	Fault manually cancelled
* 33	No pressure on clutch A solenoid valve	Machine locked. Contact the specialised New Holland staff.
34	Wheel speed too low	
35	Wheel speed too high	
36	Engine rpm too low	

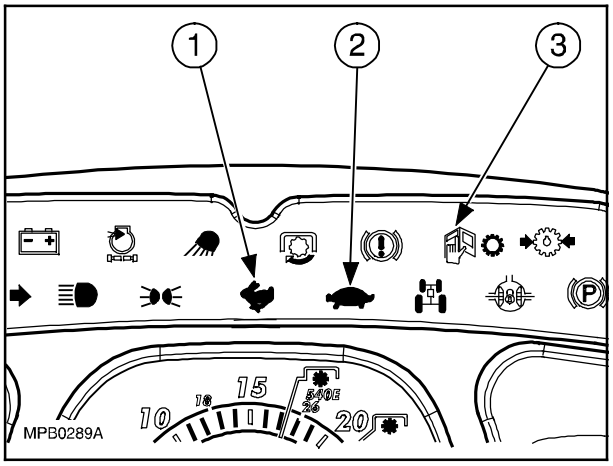
FAULT CODES DESCRIPTION

37	Circuit open on clutch pedal switch / position over 15%	Machine locked. Contact the specialised New Holland staff.
* 38	Solenoid valve or clutch B driver in short circuit	Fault manually cancelled
* 39	Circuit open on clutch B solenoid valve or short circuit to ground	Fault manually cancelled
* 41	Circuit open on clutch A solenoid valve or short circuit to ground	Fault manually cancelled
* 42	Solenoid valve or clutch A driver in short circuit to +12V	Fault manually cancelled
* 43	No clutch B pressure	Machine locked. Contact the specialised New Holland staff.
47	Setting too high on clutch pedal switch	Fault manually cancelled
48	Setting too low on clutch pedal switch	Fault manually cancelled
49	Wheel speed sensor too low	Fault manually cancelled
51	Temperature transmitter open	Fault automatically cancelled when problem solved
52	Short circuit on temperature transmitter	Fault automatically cancelled when problem solved
° 53	5V sensors power supply voltage too high	Fault manually cancelled
° 54	5V sensors power supply voltage too low	Fault manually cancelled
55	Tension too high at Shuttle lever forward gear switch	Fault manually cancelled
56	Tension too low at Shuttle lever forward gear switch	Fault manually cancelled
57	Tension too high at Shuttle lever reverse gear switch	Fault manually cancelled
58	Tension too low at Shuttle lever reverse gear switch	Fault manually cancelled
59	Shuttle lever switches fault	Machine locked. Contact the specialised New Holland staff.
65	Circuit open on clutch C solenoid valve or short circuit to ground	Fault manually cancelled
66	Circuit open on clutch D solenoid valve or short circuit to ground	Fault manually cancelled
67	Solenoid valve or clutch D driver in short circuit to +12V	Fault manually cancelled
68	Solenoid valve or clutch C driver in short circuit to +12V	Fault manually cancelled
69	Wheel speed sensor tension too low	

FAULT CODES DESCRIPTION

73	12 V supply voltage too high	Fault automatically cancelled when problem solved
74	12 V supply voltage too low	Fault automatically cancelled when problem solved
76	ECM recall fault	Fault manually cancelled
77	ECM tension too high (ref. 8V)	Fault manually cancelled
78	ECM tension too low (ref. 8V)	Fault manually cancelled
81	Pressure switch circuit open on clutch “A”	Fault manually cancelled
82	Short circuit on pressure switch “A”	Fault manually cancelled
83	Pressure switch circuit open on clutch “B”	Fault manually cancelled
84	Short circuit on pressure switch “B”	Fault manually cancelled

ECM = electronic control module



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2 SPEED POWER SHIFT/POWER-SHUTTLE TRANSMISSION DISABLED INDICATOR (24+24 TRANSMISSIONS)

The transmission can be disabled in three different ways:

1. initial test;

2. temporary transmission disable;

3. permanent transmission disable.

Initial test

During the tractor starting phase, the control unit may detect conditions that could prevent operation, e.g.:

- excessive oil viscosity at low temperatures;
- hydraulic or mechanical problems.

In the event of low oil temperature as a result of cold weather, the control unit automatic test may continue for several seconds, causing indicators (**1**) and (**2**) fig. 45 to flash simultaneously.

In these conditions, wait until the control unit automatic test terminates and allow the engine to idle until the oil reaches working temperature.If conditions are acceptable, the two indicators (**1**) and (**2**) will stop flashing and indicator (**3**) will switch off.

Fault code **71** may be displayed. (The reverse gear may be unavailable).

POWER-SHUTTLE FAULTS CODE

In the event of a fault, any eventual anomalous conditions are indicated by the illumination of an indicator lamp (**1**) fig. 44.

The indicator (**1**) identifies the error code in six phases:

1) 5 flashes in rapid succession to indicate imminent transmission of the error code;

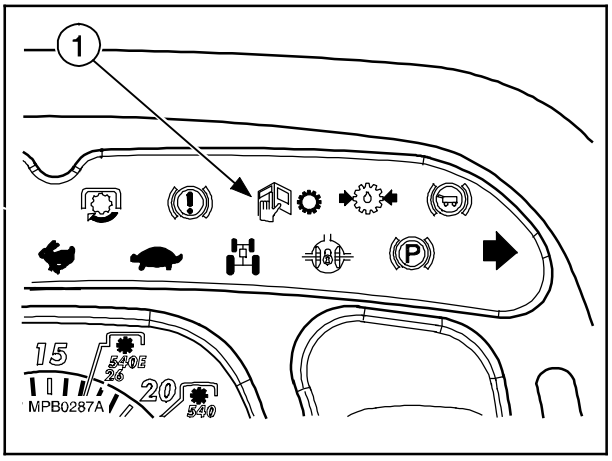
6) 2 second pause;

3) n... flashes to indicate the first figure of the fault code;

4) 1 second pause;

5) n... flashes to indicate the *second figure* of the fault code;

6) 3 second pause.

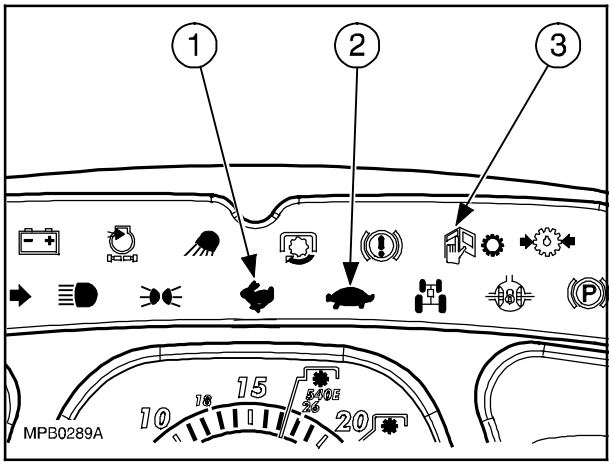


44

- Example of the interpretation of fault code number 21 -

1^ phase	2nd phase	3rd phase	4th phase	5th phase	6th phase
●●●●●	pause	●●	pause	●	pause
code transmission warning	2s	first figure 2	1s	second figure 1	3s
		fault code composition 21			

CAUTION: *The system indicates eventual fault codes according to the degree of gravity.*
If a fault occurs that compromises system operation, this fault code will take priority over the indication of other codes, which will be stored in the system.
Once the fault has been repaired, the system will then display any other error codes that are active.



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2 SPEED POWER SHIFT/POWER-SHUTTLE TRANSMISSION DISABLED INDICATOR (24+24 transmissions)

The transmission can be disabled in three different ways:

1. Initial test;

2. Temporary transmission disable;

3. Permanent transmission disable.

Initial test

During the tractor starting phase, the control unit may detect conditions that could prevent operation, e.g.:

- excessive oil viscosity at low temperatures;
- hydraulic or mechanical problems.

In the event of low oil temperature due to climatic conditions, the control unit automatic test may continue for several seconds, causing indicators (**1**) and (**2**) to flash simultaneously).

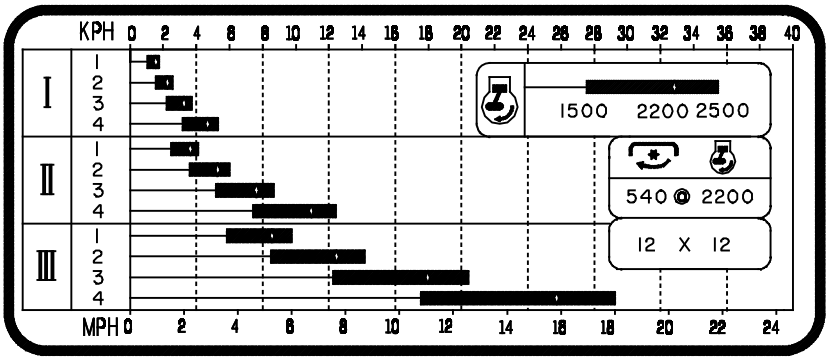
In these conditions, wait until the control unit automatic test terminates and allow the engine to idle until the oil reaches working temperature. If conditions are acceptable, the two indicators (**1**) and (**2**) will stop flashing and indicator (**3**) will switch off.

Fault code **71** may be displayed (the reverse gear may be unavailable).

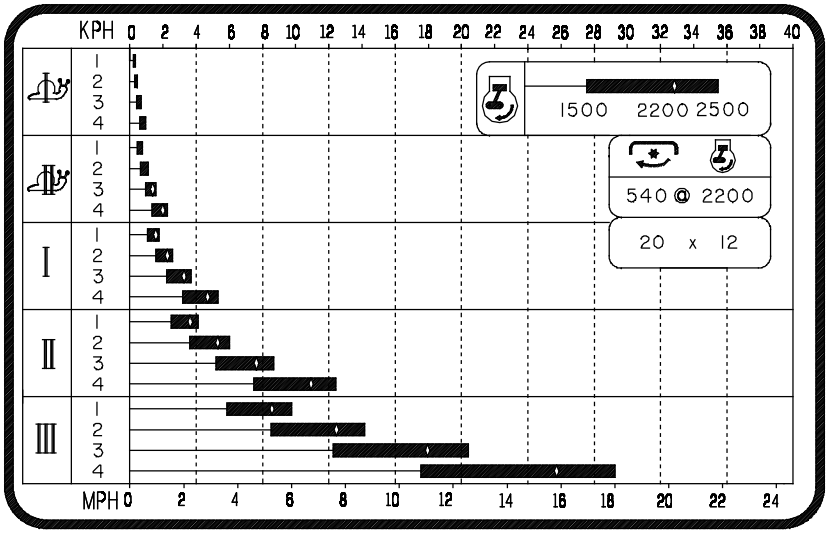
GROUND SPEED DECALS

A decal similar to one of those shown in figure is affixed to the front corner of the right-hand window or, if your tractor is fitted with a roll bar, on the right-hand mudguard.

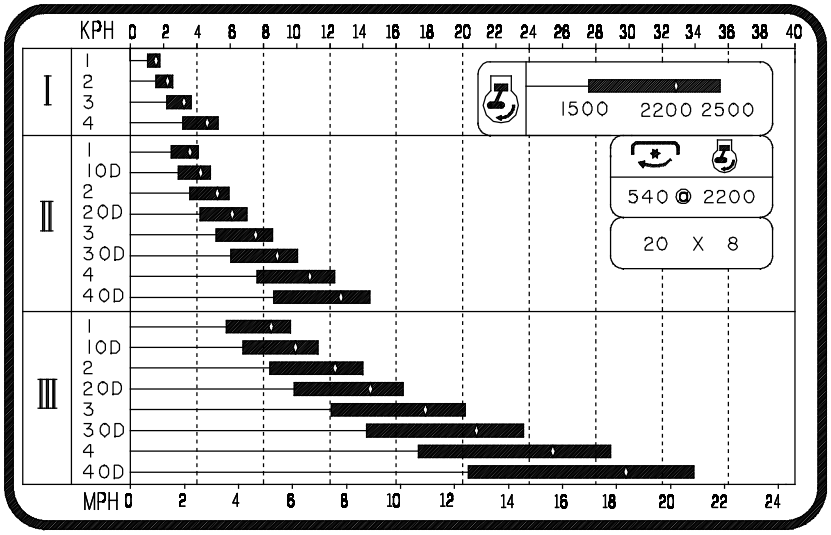
The decals illustrate the tractor ground speed in all ratios at three alternative engine speeds: 1500 rpm, 2200 rpm (the engine speed at which the 540 rev/min PTO speed is obtained) depicted by a white dot in the centre of each black block on the decal, and 2500 rpm which is the rated engine speed.



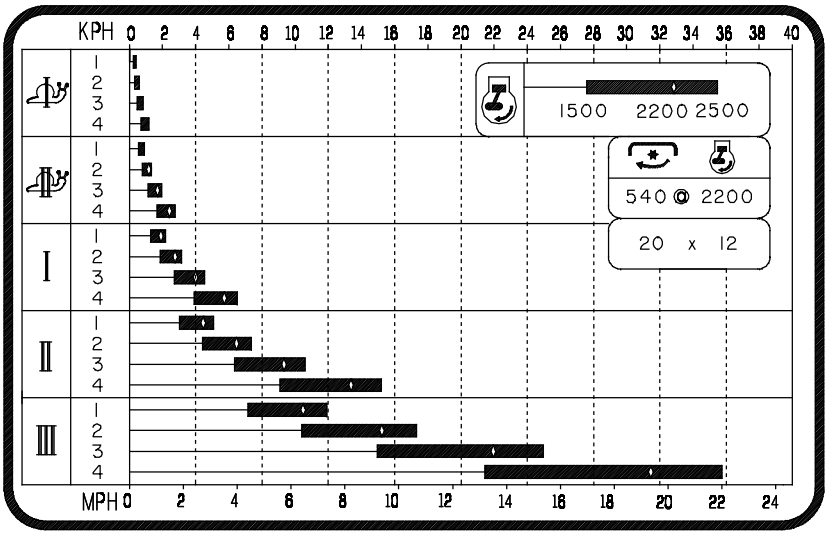
Transmission with range gear and shuttle 18.64 mph (30 km/h) version (12 forward gears + 12 reverse gears - Syncro Shuttle)



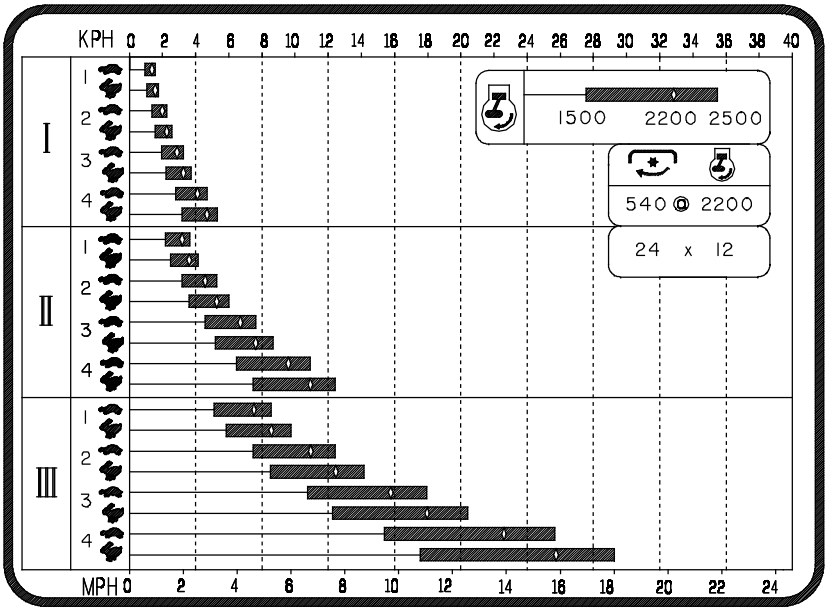
Transmission with creeper and shuttle 18.64 mph (30 km/h) version (20 forward gears + 12 reverse gears - Syncro Shuttle)



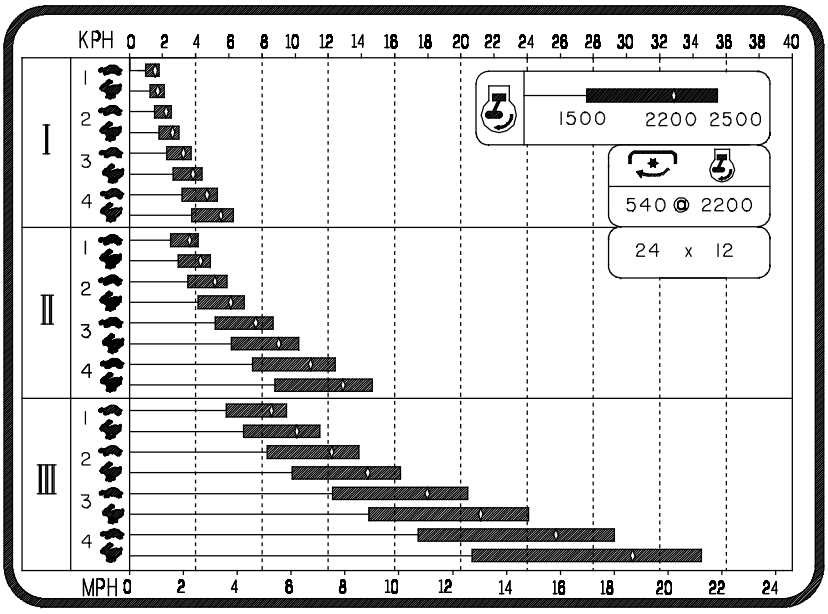
Transmission with Overdrive 24.85 mph (40 km/h) version (20 forward gears + 8 reverse gears - Split Command)



Transmission with creeper and shuttle 24.85 mph (40 km/h) version (20 forward gears + 12 reverse gears - Syncro Shuttle)



Transmission with hydraulic 2 Speed Power Shift 18.64 mph (30 km/h) version (24 forward gears + 12 reverse gears - 2 Speed Power Shift)

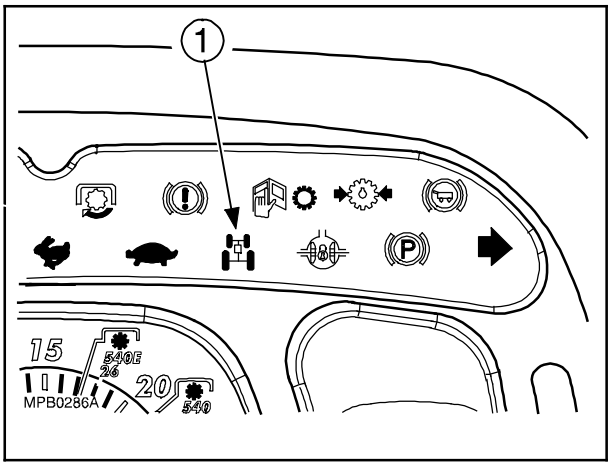


Transmission with hydraulic 2 Speed Power Shift 24.85 mph (40 km/h) version (24 forward gears + 12 reverse gears - 2 Speed Power Shift)

ELECTRO-HYDRAULICALLY OPERATED FOUR-WHEEL DRIVE

USING FOUR-WHEEL DRIVE

Front-wheel drive can increase the tractor's grip on the surface; the benefits of this are particularly noticeable when working on uneven, muddy or slippy ground, on ploughed ground or in difficult conditions.



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CAUTION: *do not use front wheel drive on hard surfaces to prevent premature wear to the front tyres. Abnormal tyre wear can also be caused by incorrect tyre pressures.*

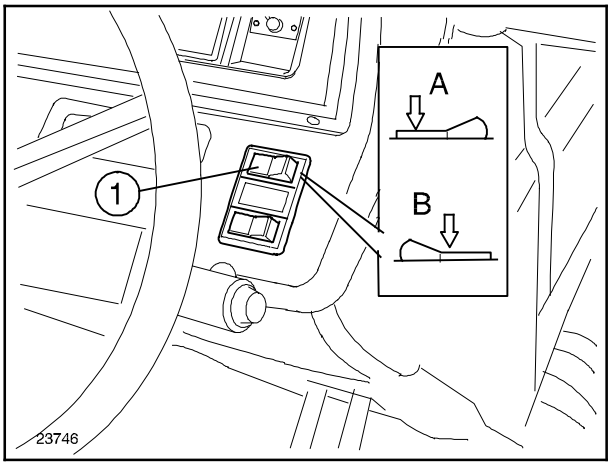
Manual operation

Engage front-wheel drive by pressing switch (**1**) fig. 47 in position **B**.
In this position, the front-wheel drive will stay permanently on.
To disengage it, press the switch again, to position **A**.

Automatic operation

Front-wheel drive cuts in automatically, even when switch (**1**) is in position **A**, if the brake pedals are pressed; it is disengaged when they are released.

The indicator light (**1**) fig. 46 on the control panel illuminates.

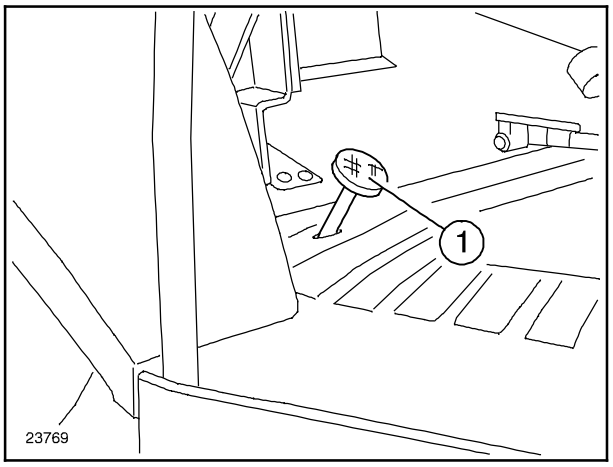


47

CAUTION: *four-wheel drive is automatically engaged only by simultaneously operating both brake pedals.*

REAR DIFFERENTIAL LOCK

(STANDARD MECHANICAL CONTROL)



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DIFFERENTIAL LOCK CONTROL - Fig. 48

The differential allows the drive wheels to rotate at different speeds when the tractor is turning.

The differential has a locking device, controlled by pedal (**1**) fig. 48. It is advisable to lock the differential in the following situations:

— when ploughing, to prevent the wheel that is not in the furrow from slipping;

— when one of the drive wheels is on uneven, muddy or slippery ground and tends to slip.

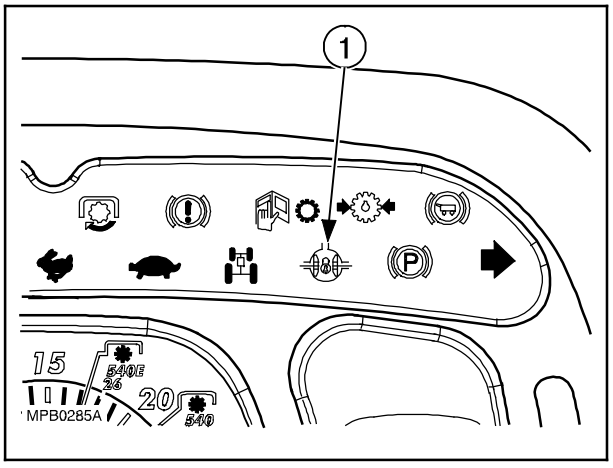
To lock the differential, reduce tractor speed and press pedal (**1**) fig. 48. The differential will remain locked.

Press the brake pedal to release the lock.

CAUTION: *do not keep the differential locked unnecessarily as this wastes power and can cause damaging stresses in the transmission system, tyre wear and steering problems.*

FRONT AND REAR DIFFERENTIAL LOCK

(ELECTRO-HYDRAULICALLY CONTROLLED, OPTIONAL FOR 4WD 40 km/h MODELS)



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ELECTRO-HYDRAULIC CONTROL BUTTON FOR DIFFERENTIAL LOCK - Fig. 50

The differential allows the drive wheels to rotate at different speeds when the tractor is turning.

The differential has an electrohydraulically controlled locking device, actuated by switch (**1**) fig. 50 page 2-49.

The light (**1**) on the instrument panel comes on to show it is engaged, fig. 49.

DIFFERENTIAL LOCK OPERATION

It is advisable to lock the differential in the following situations:

— when ploughing, to prevent the wheel that is not in the furrow from slipping;

— when one of the drive wheels is on uneven, muddy or slippery ground and tends to slip.

To release the differential, reduce tractor speed and press switch (**1**) to position **A**, fig. 50.

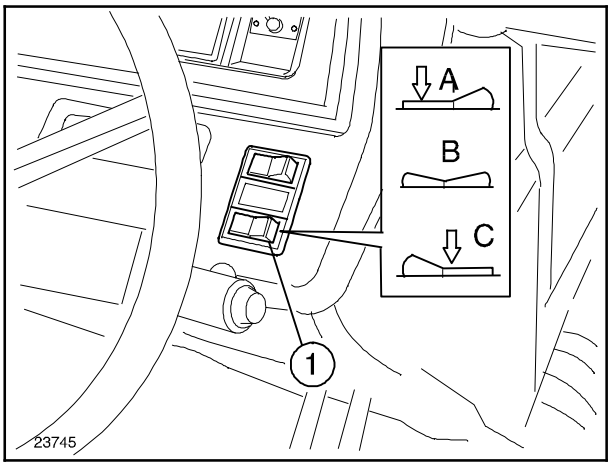
The differential lock switch (**1**) fig. 50 has three positions:

position **A** = differential lock disengaged;

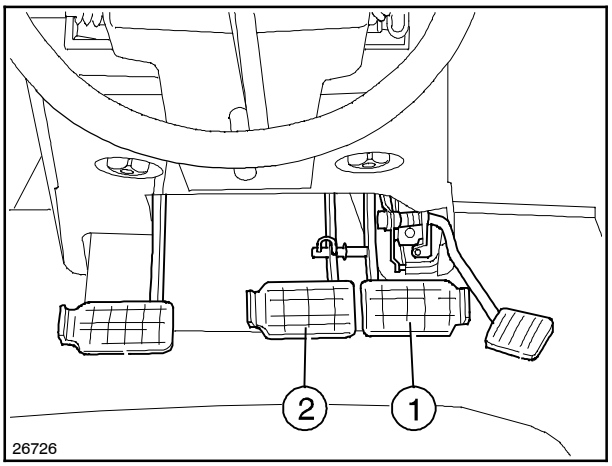
position **B** = preset for differential locking engagement;

position **C** = differential lock engaged:
the differential lock is released pressing the brake pedals (**1** and **2**) fig. 51 or by returning the switch to position **A**. To engage the lock again, press switch (**1**) fig. 50 to position **C**.
When the push button is released, it returns to position **B**.

CAUTION: *Only lock the differential in the event of one of the two wheels slipping excessively. Do not keep the differential locked unnecessarily; as this wastes power and can cause damaging stresses in the transmission system, tyre wear and steering problems.*

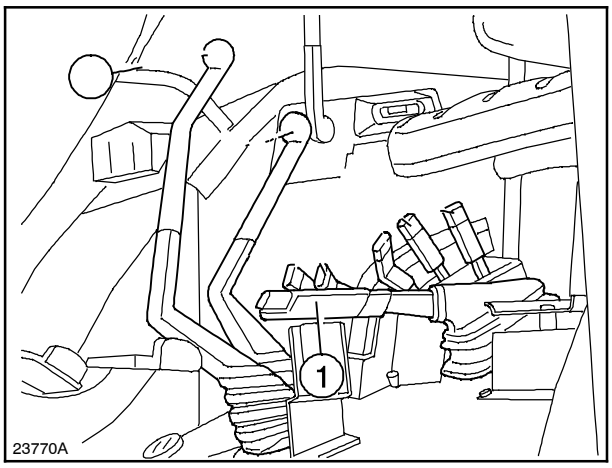


50



51

BRAKE



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HANDBRAKE - Fig. 52

The handbrake lever is located to the right of the driving position.

To apply the handbrake, press the red button on the end of the lever (**1**) and pull upwards. The handbrake should lock on the third catch of the ratchet.

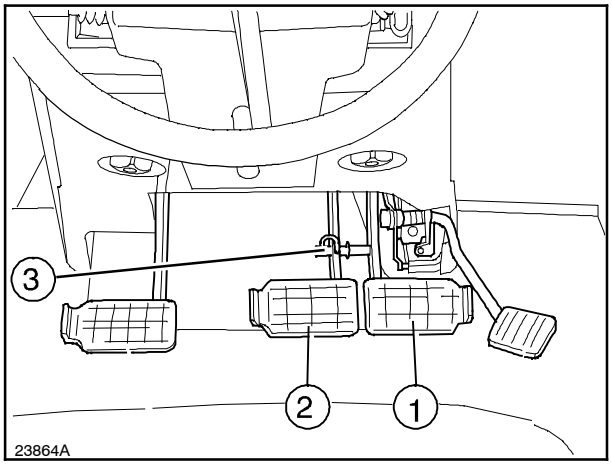
If the handbrake exceeds the third catch it will need to be adjusted, as described on page 3-24.

To release the handbrake, pull the lever slightly upwards, press the red button and then fully lower.

CAUTION: *When leaving the tractor switch off the engine and apply the handbrake. If the operator leaves the driving position without having carried out the aforementioned operations, an alarm is activated. The alarm will only be interrupted when the operations have been carried out.*

BRAKE PEDALS - Fig. 53

CAUTION: *On four-wheel drive models, front axle transmission is automatically engaged when the brakes are applied on all four wheels.*
Braking power is notably increased with the automatic engagement of four-wheel drive, therefore care must be taken when braking sharply.



53

The brakes are controlled by pedals (**1**) and (**2**); they can also be separately controlled, in order to facilitate turning in tight spaces, or coupled for normal tractor braking.

CAUTION: *Always connect the brakes with the safety pin provided (**3**), as shown in the drawing, when on roads and when towing trailers with hydraulically operated brakes.*

POWER TAKE-OFF

When not using the power take-off, always keep safety cover (**1**) fig. 54 fitted over the splined output shaft.

CAUTION: *when the power take-off is not being used or when, with an implement connected to the power take off shaft, it has been switched off by means of the selection lever, ensure that the control lever or the control knob are disengaged. When the power take-off is not connected to an implement, keep the control handle in the disengaged position.*

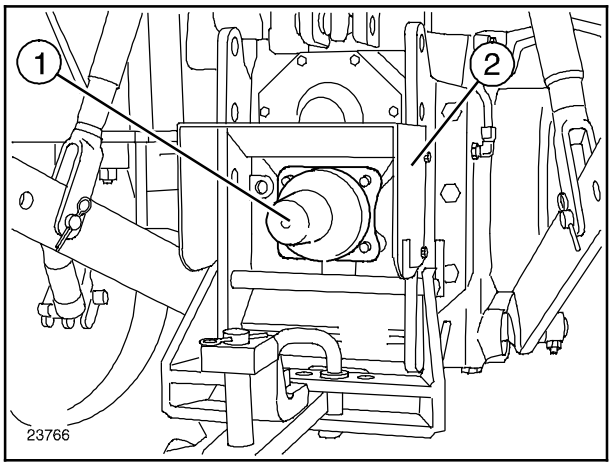
CAUTION: *When using the power take-off, and especially when changing speeds, always make sure that the tractor is fitted with the correct shaft for the speed selected.*
When using any implement requiring a speed of 540 rpm, never select 1,000 rpm, and vice versa.

DANGER: *never climb onto guard (**2**) fig. 54 when the power take-off is operating.*

GENERAL INSTRUCTIONS

The power take-off fitted on your tractor is used to transfer power from the engine directly to the implement.It can be controlled directly by the engine, or directly by the tractor's transmission drive gears.

All tractors are fitted as standard with synchronised power take-off with mechanically or electrohydraulically controlled engage/disengage.



54

The power take-off is available in the following versions:

Standard versions:

- models TL70 TL80 TL80 one speed: 540 rpm mechanical;
- models TL100 one speed: 540 rpm electrohydraulic;

Optional:

- models TL70 TL80 TL80: one speed, 540 rpm with electrohydraulic control;
- two speeds, 540/750 rpm with mechanical control;
- three speeds, 540/750/1000 rpm with mechanical or electrohydraulic control.

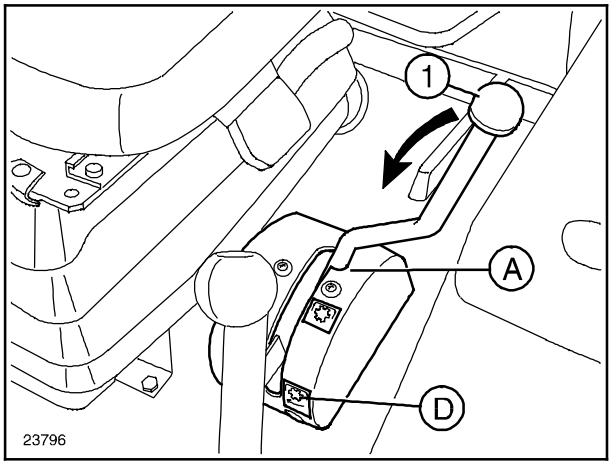
CAUTION: *before operating any implement driven by the power take-off, check that the safety clutch (if fitted) on the machine transmission shaft is working properly, i.e.: it slips if overloaded.*

CAUTION: *Never operate the implement connected to the power take-off at a higher speed than specified.*

DANGER: *Always make sure that the drive shaft plastic guards are in perfect condition.*

DANGER: *Always switch the engine off when working on implements connected to the power take-off*.

POWER TAKE-OFF OPERATION



55

Independent power take-off operated by the engine (mechanical control) - Figs. 55 and 56

To operate the power take-off, proceed as follows:

- disengage the power take-off clutch by shifting lever (**1**) fig. 55 to position **A**;
- after a few seconds, shift operation selector lever (**1**) fig. 56 to position **B**;
- engage the clutch slowly by shifting lever (**1**) fig. 55 to position **D** so as to start the splined output shaft moving. Engagement is shown by the illumination of indicator (**12**) on page 2-5.

In this case, operation is totally independent of the tractor ground speed, and you can therefore:

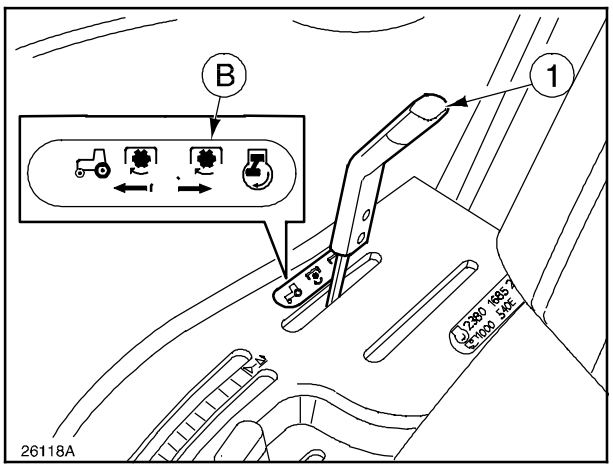
- halt the tractor without stopping the power take-off;
- stop the power take-off without halting the tractor (by disengaging the power take-off clutch).

The shaft rotates clockwise, as seen from behind the tractor.

To disengage the power take-off, shift selection lever (**1**) fig. 55 to position **A**.

WARNING: *when the power take-off is not in use, keep clutch control lever (**1**) fig. 55 in disengaged position **A**.*

DANGER: *Always make sure that the plastic guards on the drive shaft connected to the power take-off are in perfect condition.*



56

Power take-off synchronised with gear change (mechanically controlled) - Figs. 57 and 58

To operate the power take-off, proceed as follows:

- hold the clutch lever (**1**) fig. 57 in position **A**;
- fully depress the clutch pedal;
- after a few seconds, shift operation selector lever (**1**) fig. 58 to position **C** and release the clutch pedal.

In this case, the power take-off receives power directly from the transmission: when the tractor is stationary, the synchronised power take-off does not turn; reverse the direction of rotation of the output shaft by moving from forward gear to reverse.

In any gear, the number of revolutions of the splined output shaft **for one revolution of the rear wheels is as follows:**

540 rpm **Power take-off**:

- Model TL70

  18.64 mph (30 km/h) **8.2**

  4WD 24.85 mph (40 km/h) **6.73**

- models TL80, TL90 and TL100

  18.64 mph (30 km/h) **8.9**

  4WD 24.85 mph (40 km/h) **7.25**

750 rpm **Power take-off**:

- Model TL70

  18.64 mph (30 km/h) **10.51**

  4WD 24.85 mph (40 km/h) **8.59**

- models TL80, TL90 and TL100

  18.64 mph (30 km/h) **11.4**

  4WD 24.85 mph (40 km/h) **9.36**

1000 rpm **Power take-off**:

- Model TL70

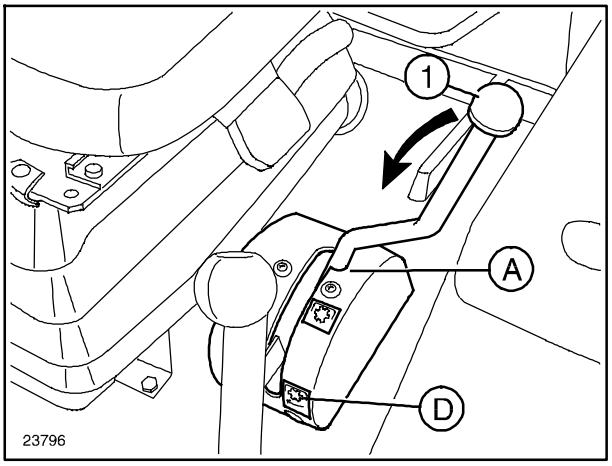
  18.64 mph (30 km/h) **14.1**

  4WD 24.85 mph (40 km/h) **11.51**

- models TL80, TL90 and TL100

  18.64 mph (30 km/h) **15.2**

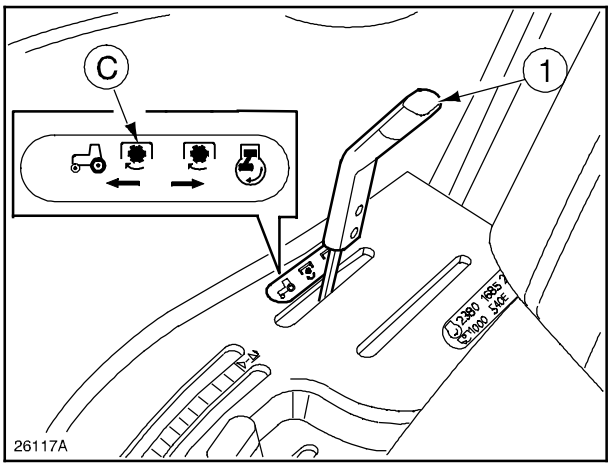
  4WD 24.85 mph (40 km/h) **12.4**



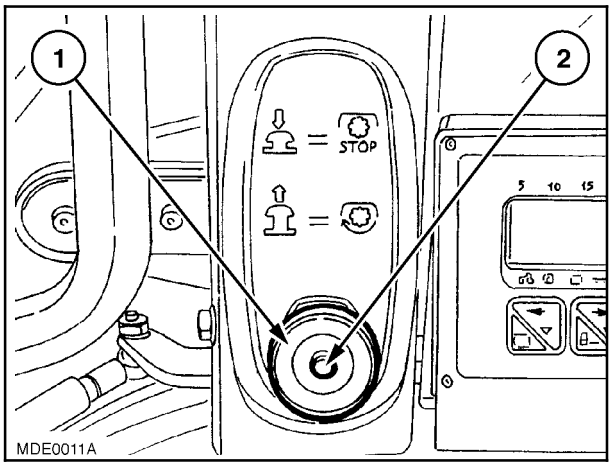
57

CAUTION: *Avoid engaging the synchronised power take-off when the tractor is moving.*
When using a trailer with a drive axle, it is advised to select the 1,000 rpm power take-off.

WARNING: *when the power take-off is not in use, keep clutch control lever (**1**) fig. 57 in position **A**.*



58



59

Independent electro-hydraulically controlled power take-off

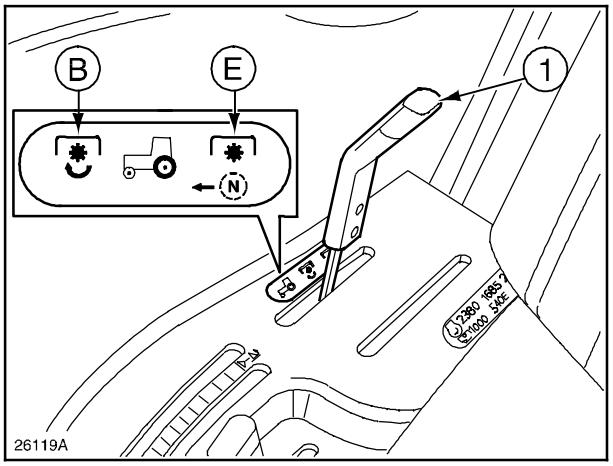
To operate the power take-off, proceed as follows:

- with knob (**1**) fig. 59 pressed down, select the required operation by moving lever (**1**) fig. 48 to position **E**;
- after a few seconds, press the button (**2**) fig. 59 on knob (**1**) fig. 59 and pull the knob upwards. Engagement is shown by the illumination of the relevant indicator on the instrument panel.

To disengage the power take-off, press button (**2**) fig. 59.

NOTE: *the power take-off disengages automatically when the engine is switched off.*

CAUTION: *before carrying out operations on a machine driven by the power take-off, disengage the PTO as previously described.*



60

Synchronised power take-off operation, with electro-hydraulically engaged independent power take-off

To operate the power take-off, proceed as follows:

- keep knob (**1**) fig. 59 in the **disengaged position**;
- fully depress the clutch pedal;
- after a few seconds, shift operation selector lever (**1**) fig. 60 to position **B** and release the clutch pedal.

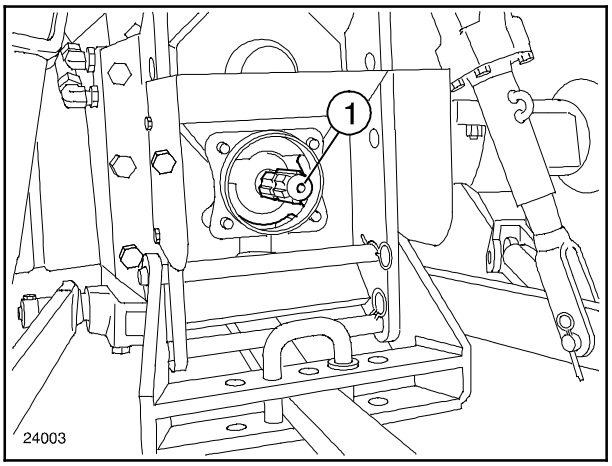
In this case, the power take-off receives power directly from the transmission: when the tractor is stationary, the synchronised power take-off does not turn; reverse the direction of rotation of the output shaft by moving from forward gear to reverse.

POWER TAKE-OFF SPEED

540 rpm power take-off

The 540 rpm power take-off is available with mechanical (standard) or electro-hydraulic operation (optional for models fitted with cabs).

The six-splined output shaft (**1**) fig. 61 is 1 $^3/_8$" in diameter.



61

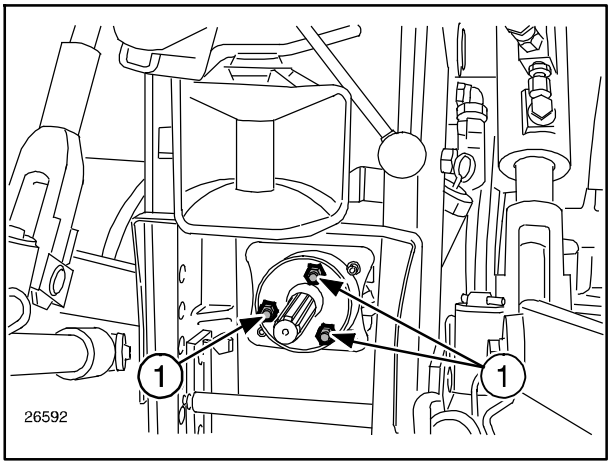
540/750 rpm power take-off

The mechanical version is only available as an option.
The six-splined output shaft (**1**) fig. 50 is 1 $^3/_8$" in diameter, the same as the 540 rpm power take-off.

To obtain a speed of 540 or 750 rpm, use speed selection lever (**1**) fig. 64 as described on page 2-56.

540/750/1000 rpm power take-off

This model is available with mechanical operation (or electro-hydraulic operation only for tractors without cabs or with De Luxe cabs). It has two interchangeable output shafts (**1**) fig. 63 one 1 $^3/_8$" diameter with six grooves for speeds of 540 and 750 rpm and one 1 $^3/_8$" diameter with twenty-one grooves for speeds of 1000 rpm. To replace the output shaft, remove the circlip (**2**) fig. 63 for electrohydraulic power take-off, or remove the bolts (**1**) fig. 62 for mechanical power take-off.



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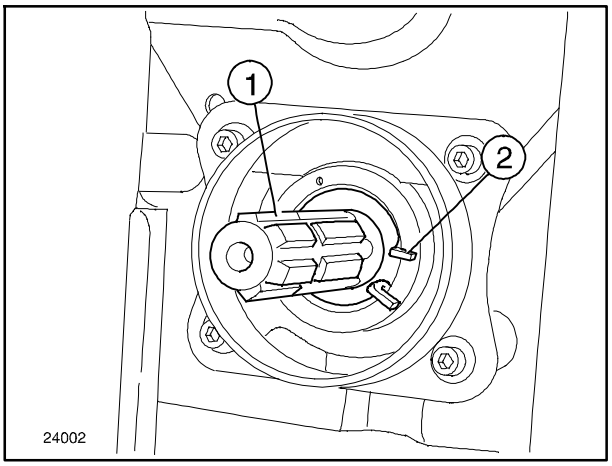
CAUTION: *Only use the power take-off at 1000 rpm after having fitted the 1 $^3/_8$" twenty-one splined output shaft, included in the accessories kit.*

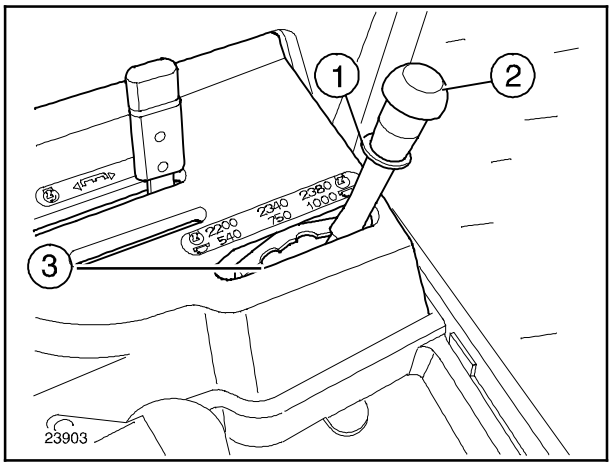
Power take-off speeds:

- 540 rpm with engine at: 2199 rpm
  614 rpm with engine at: 2500 rpm
- 750 rpm with engine at: 2382 rpm
  787 rpm with engine at: 2500 rpm
  (*) 540 rpm with engine at: 1715 rpm
- 1000 rpm with engine at: 2381 rpm
  1050 rpm with engine at: 2500 rpm

NOTE - *(*) with the power take-off speed selection lever set to 750 rpm, 540 rpm can also be obtained on the output shaft with the engine at 1715 rpm.*



63



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POWER TAKE-OFF SPEED SELECTION

Power take-off speed selection lever

To select power take-off speeds, proceed as described below:

- pull the stop button upward (**1**) fig. 64;

- position the lever (**2**) fig. 64 to the appropriate position on speed selector (**3**) fig. 64 according to the pre-set speed.

Model TL70

TRACTOR SPEEDS IN FORWARD GEAR WITH POWER TAKE-OFF OPERATING AT STANDARD SPEEDS

Transmission and range gear 30 km/h version (18.6 mph) in forward gear (12 forward gears + 4 reverse gears - Syncro Command

Power take-off at 540 rpm, with engine at 2,199 rpm.

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	14.9-30 420/70R-30	16.9-30 480/70R-30
		540			
I	1	1.6 (1.0)	1.6 (1.0)	1.5 (0.9)	1.6 (1.0)
	2	2.5 (1.6)	2.4 (1.5)	2.2 (1.4)	2.3 (1.4)
	3	3.3 (2.1)	3.4 (2.1)	3.2 (2.0)	3.3 (2.1)
	4	4.7 (2.9)	4.9 (3.0)	4.5 (2.8)	4.7 (2.9)
II	1	3.7 (2.3)	3.8 (2.4)	3.5 (2.2)	3.7 (2.3)
	2	5.4 (3.4)	5.5 (3.4)	5.2 (3.2)	5.4 (3.4)
	3	7.7 (4.8)	8.0 (5.0)	7.5 (4.7)	7.7 (4.8)
	4	11.1 (6.9)	11.4 (7.1)	10.6 (6.6)	11.2 (7.0)
III	1	8.7 (5.4)	9.6 (6.0)	8.3 (5.2)	8.7 (5.4)
	2	12.6 (7.8)	13.0 (8.1)	12.1 (7.5)	12.7 (7.9)
	3	18.2 (11.3)	18.8 (11.7)	16.8 (10.4)	18.3 (11.4)
	4	26.0 (16.2)	27.0 (16.8)	25.1 (15.6)	26.2 (16.3)

PTO 750 rpm, and engine at 2,382 rpm; 1,000 rpm, and engine at 2,381 rpm.

RANGE	GEAR	REAR TYRES mph (km/h)			
		12.4-36	13.6-36	14.9-30 420/70R-30	16.9-30 480/70R-30
		750 e 1000			
I	1	1.7 (1.0)	1.7 (1.0)	1.6 (0.2)	1.7 (1.0)
	2	2.7 (1.7)	2.6 (1.6)	2.4 (1.5)	2.5 (1.5)
	3	3.6 (2.2)	3.7 (2.3)	3.4 (2.1)	3.6 (2.2)
	4	5.1 (3.2)	5.3 (3.3)	5.0 (3.1)	5.1 (3.2)
II	1	4.0 (2.4)	4.1 (2.6)	3.8 (2.4)	4.0 (2.4)
	2	5.8 (3.6)	6.0 (3.7)	5.6 (3.5)	5.8 (3.6)
	3	8.4 (5.2)	8.7 (5.4)	8.1 (5.0)	8.4 (5.2)
	4	12.0 (7.4)	12.4 (7.7)	11.5 (7.2)	12.1 (7.5)
III	1	9.4 (5.8)	10.4 (6.4)	9.0 (5.6)	9.4 (5.8)
	2	13.6 (8.5)	14.1 (8.8)	13.1 (8.1)	13.7 (8.5)
	3	19.7 (12.2)	20.4 (12.6)	18.3 (11.3)	19.8 (12.3)
	4	28.2 (17.5)	29.2 (18.1)	27.2 (16.9)	28.4 (17.6)

Model TL70 4WD

TRACTOR SPEEDS IN FORWARD GEAR WITH POWER TAKE-OFF OPERATING AT STANDARD SPEEDS

Transmission with 2 Speed Power Shift 24.85 mph (40 km/h) version in forward gear (24 forward gears + 12 reverse gears - 2 Speed Power Shift)

Power take-off at 540 rpm, with engine at 2,199 rpm.

RANGE	GEAR	REAR TYRES mph (km/h)							
		12.4-36		13.6-36		14.9-30 420/70R-30		16.9-30 480/70R-30	
		540							
		LOW	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**
I	1	1.6 (1.0)	1.8 (1.1)	1.7 (1.1)	1.9 (1.2)	1.5 (0.9)	1.8 (1.1)	1.6 (1.0)	1.8 (1.1)
	2	2.3 (1.4)	2.7 (1.7)	2.4 (1.5)	2.8 (1.7)	2.2 (1.4)	2.6 (1.6)	2.3 (1.4)	2.7 (1.7)
	3	3.3 (2.1)	3.9 (2.4)	3.4 (2.1)	4.0 (2.5)	3.2 (2.0)	3.8 (2.4)	3.3 (2.1)	4.0 (2.5)
	4	4.7 (2.9)	5.5 (3.4)	4.9 (3.0)	5.8 (3.6)	4.6 (2.9)	5.4 (3.4)	4.7 (2.9)	5.6 (3.5)
II	1	3.7 (2.3)	4.3 (2.7)	3.8 (2.4)	4.5 (2.8)	3.5 (2.2)	4.2 (2.6)	3.7 (2.3)	4.4 (2.7)
	2	5.4 (3.4)	6.3 (3.9)	5.5 (3.4)	6.6 (4.1)	5.2 (3.2)	6.1 (3.8)	5.4 (3.4)	6.3 (3.9)
	3	7.7 (4.8)	9.1 (5.7)	8.0 (5.0)	9.4 (5.8)	7.5 (4.7)	8.8 (5.5)	7.7 (4.8)	9.1 (5.7)
	4	11.1 (6.9)	13.0 (8.1)	11.4 (7.1)	13.5 (8.4)	10.6 (6.6)	12.6 (7.8)	11.2 (7.0)	13.2 (8.7)
III	1	8.7 (5.4)	10.2 (6.3)	9.0 (5.6)	10.6 (6.6)	8.3 (5.2)	9.8 (6.1)	8.7 (5.4)	10.3 (6.4)
	2	12.5 (7.8)	14.9 (9.3)	13.1 (8.1)	15.4 (9.6)	12.1 (7.5)	14.3 (8.9)	12.7 (7.9)	15.0 (9.3)
	3	18.2 (11.3)	21.5 (13.4)	18.8 (11.7)	22.2 (13.8)	17.5 (10.9)	20.7 (12.9)	18.3 (11.4)	21.6 (13.4)
	4	26.0 (16.2)	30.7 (14.1)	27.0 (16.8)	31.8 (19.8)	25.1 (15.6)	29.6 (18.4)	26.2 (16.3)	31.0 (19.3)

PTOat 750 rpm, and engine at 2,382 rpm; 1,000 rpm, and engine at 2,381 rpm.

RANGE	GEAR	REAR TYRES mph (km/h)							
		12.4-36		13.6-36		14.9-30 420/70R-30		16.9-30 480/70R-30	
		750 e 1000							
		LOW	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**
I	1	1.7 (1.1)	2.0 (1.2)	1.8 (1.1)	2.1 (1.3)	1.6 (1.0)	1.9 (1.2)	1.7 (1.1)	2.0 (1.3)
	2	2.5 (1.6)	3.0 (1.9)	2.6 (1.6)	3.0 (1.9)	2.4 (1.5)	2.9 (1.8)	2.5 (1.6)	3.0 (1.9)
	3	3.6 (2.2)	4.2 (2.6)	3.7 (2.3)	4.4 (2.7)	3.4 (2.1)	4.1 (2.6)	3.6 (2.2)	4.3 (2.7)
	4	5.1 (3.2)	6.0 (3.7)	5.3 (3.3)	6.3 (3.9)	4.9 (3.0)	5.8 (3.6)	5.1 (3.2)	6.1 (3.8)
II	1	4.0 (2.5)	4.7 (2.9)	4.1 (2.6)	4.9 (3.0)	3.8 (2.4)	4.6 (2.9)	4.0 (2.5)	4.8 (3.0)
	2	5.8 (3.6)	6.9 (4.3)	6.0 (3.7)	7.1 (4.4)	5.6 (3.5)	6.6 (4.1)	5.8 (3.6)	6.9 (4.3)
	3	8.4 (5.2)	9.9 (6.1)	8.7 (5.4)	10.9 (6.8)	8.1 (5.0)	9.5 (5.9)	8.4 (5.2)	9.1 (5.7)
	4	12.0 (7.5)	14.1 (8.8)	12.4 (7.7)	14.7 (9.1)	11.5 (7.2)	13.6 (8.5)	12.1 (7.5)	14.3 (8.9)
III	1	9.4 (5.8)	11.1 (6.9)	9.7 (6.0)	11.5 (7.2)	9.0 (5.6)	10.1 (6.3)	9.4 (5.8)	11.1 (6.9)
	2	13.6 (8.5)	16.0 (9.9)	14.2 (8.8)	16.7 (10.4)	13.1 (8.1)	15.5 (9.6)	13.7 (8.5)	16.1 (10.0)
	3	19.7 (12.2)	23.2 (14.4)	20.4 (12.7)	24.1 (15.0)	19.0 (11.8)	22.3 (13.9)	19.8 (12.3)	23.4 (14.5)
	4	28.2 (17.5)	33.2 (20.6)	29.2 (18.1)	34.5 (21.4)	27.1 (16.8)	32.1 (19.9)	28.4 (17.6)	33.5 (20.8)

Model TL80, TL90 and TL100
TRACTOR SPEEDS IN FORWARD GEAR WITH POWER TAKE-OFF OPERATING AT STANDARD SPEEDS

(*) only Model TL80

Transmission and range gear 18.64 mph (30 km/h) version only model TL80 (12 forward gears + 4 reverse gears - Syncro Command),
Transmission and shuttle 18.64 mph (30 km/h) version (12 forward gears + 12 reverse gears - Syncro Shuttle)

Power take-off at 540 rpm, with engine at 2199 rpm.

RANGE	GEAR	REAR TYRES mph (km/h)			
		16.9-30 (*) 480/70R-30 (*)	18.4-30 520/70R-30	13.6-38	16.9-34 480/70R-34 540/65R-34
		540			
I	1	1.5 (0.9)	1.5 (0.9)	1.6 (1.0)	1.6 (1.0)
	2	2.1 (1.3)	2.2 (1.4)	2.3 (1.4)	2.3 (1.4)
	3	3.1 (1.9)	3.2 (2.0)	3.3 (2.1)	3.3 (2.1)
	4	4.4 (2.7)	4.6 (2.9)	4.7 (2.9)	4.7 (2.9)
II	1	3.4 (2.1)	3.6 (2.2)	3.7 (2.3)	3.7 (2.3)
	2	5.0 (3.1)	5.2 (3.2)	5.4 (3.4)	5.4 (3.4)
	3	7.2 (4.5)	7.5 (4.7)	7.7 (4.8)	7.7 (4.8)
	4	10.4 (6.5)	10.7 (6.7)	10.1 (6.3)	11.1 (6.9)
III	1	8.1 (5.0)	8.4 (5.2)	8.6 (5.3)	8.7 (5.4)
	2	11.8 (7.3)	12.2 (7.6)	12.6 (7.8)	12.7 (7.9)
	3	17.0 (10.6)	17.6 (10.9)	18.1 (11.2)	18.2 (11.3)
	4	24.4 (15.2)	25.2 (15.7)	25.9 (16.1)	26.1 (16.2)

PTO 750 rpm, and engine at 2,382 rpm; 1,000 rpm, and engine at 2,381 rpm.

RANGE	GEAR	REAR TYRES mph (km/h)			
		16.9-30 (*) 480/70R-30 (*)	18.4-30 520/70R-30	13.6-38	16.9-34 480/70R-34 540/65R-34
		750 e 1000			
I	1	1.6 (1.0)	1.6 (1.0)	1.7 (1.1)	1.7 (1.1)
	2	2.3 (1.4)	2.4 (1.5)	2.5 (1.6)	2.5 (1.6)
	3	3.3 (2.1)	3.4 (2.1)	3.5 (2.1)	3.6 (2.2)
	4	4.8 (3.0)	5.0 (3.1)	5.1 (3.2)	5.1 (3.2)
II	1	3.7 (2.3)	3.9 (2.4)	4.0 (2.5)	4.0 (2.5)
	2	5.4 (3.4)	5.6 (3.4)	5.8 (3.6)	5.8 (3.6)
	3	7.8 (4.8)	8.1 (5.0)	8.3 (5.1)	8.4 (5.2)
	4	11.2 (6.9)	11.6 (7.2)	11.9 (7.3)	12.0 (7.4)
III	1	8.8 (5.4)	9.1 (5.7)	9.3 (5.7)	9.4 (5.8)
	2	12.8 (7.9)	13.2 (8.2)	13.6 (8.5)	13.7 (8.5)
	3	18.4 (11.4)	19.1 (11.9)	19.6 (12.1)	19.7 (12.2)
	4	26.4 (16.4)	27.3 (17.0)	28.1 (17.4)	28.4 (17.6)

MODELS TL90 TL100

TRACTOR SPEEDS IN FORWARD GEAR WITH POWER TAKE-OFF OPERATING AT STANDARD SPEEDS

Power take-off at 540 rpm, with engine at 2,199 / 750 rpm, with engine at 2,382 rpm. and 1,000 rpm, with engine at 2,381 rpm.

Shuttle transmission 18.65 mph (30 km/h) version in forward gear (12 forward gears + 12 reverse gears - Synchro Command

RANGE	GEAR	REAR TYRES mph (km/h)	
		18.4-34 520/70-34 600/65R-34	
		540	**750 e 100**
I	1	1.6 (0.2)	1.8 (1.1)
	2	2.4 (1.5)	2.6 (1.6)
	3	3.4 (2.1)	3.7 (2.3)
	4	4.9 (3.0)	5.3 (3.3)
II	1	3.8 (2.4)	4.1 (2.6)
	2	5.5 (3.4)	6.0 (3.7)
	3	8.0 (5.0)	8.7 (5.4)
	4	11.5 (7.2)	12.4 (7.7)
III	1	9.0 (5.6)	9.7 (6.0)
	2	13.1 (8.1)	14.1 (8.8)
	3	18.8 (11.7)	20.4 (12.7)
	4	27.0 (12.9)	29.2 (18.1)

Transmission with 2 Speed Power Shift 24.85 mph (40 km/h) version in forward gear (24 forward gears + 12 reverse gears - 2 Speed Power Shift)

RANGE	GEAR	REAR TYRES mph (km/h)			
		18.4-34 520/70-34 600/65R-34			
		540		**750 e 1000**	
		LOW	**HIGH**	**LOW**	**HIGH**
I	1	1.7 (1.0)	1.9 (1.2)	1.8 (1.1)	2.1 (1.3)
	2	2.4 (1.5)	2.8 (1.7)	2.6 (1.6)	3.0 (1.9)
	3	3.4 (2.1)	4.0 (2.5)	3.7 (2.3)	4.4 (2.7)
	4	4.9 (3.0)	5.8 (3.6)	5.3 (3.3)	6.3 (3.9)
II	1	3.8 (2.4)	4.5 (2.8)	4.1 (2.6)	4.9 (3.0)
	2	5.5 (3.4)	6.5 (4.0)	6.0 (3.7)	7.0 (4.3)
	3	8.0 (5.0)	9.4 (5.8)	8.7 (5.4)	10.2 (6.3)
	4	9.1 (5.7)	13.5 (8.4)	12.4 (7.7)	14.7 (9.1)
III	1	9.0 (5.6)	10.6 (6.6)	9.7 (6.0)	11.5 (7.2)
	2	13.1 (8.1)	15.4 (9.6)	14.2 (8.8)	16.7 (10.4)
	3	18.8 (11.7)	22.3 (13.9)	20.4 (12.7)	24.1 (15.0)
	4	27.0 (16.8)	31.8 (19.8)	29.2 (18.1)	34.5 (21.4)

Models TL80, TL90 and TL100 4WD

TRACTOR SPEEDS IN FORWARD GEAR WITH POWER TAKE-OFF OPERATING AT STANDARD SPEEDS

Transmission with 2 Speed Power Shift version 40 km/h (24.8 mph) in forward gear

(24 forward gears + 12 reverse gears - 2 Speed Power Shift) -

(*) only TL80 model

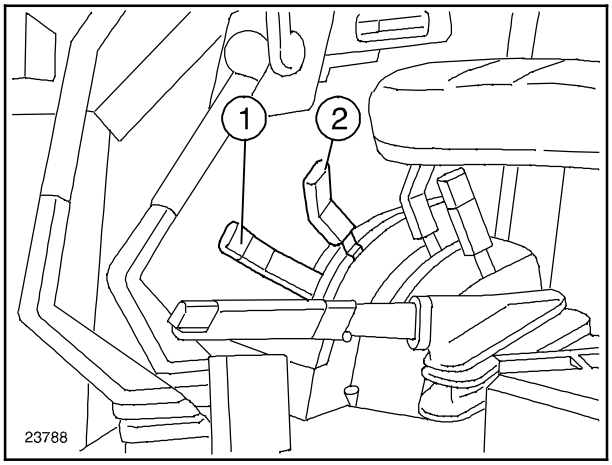
Power take-off at 540 rpm, with engine at 2199 rpm.

RANGE	GEAR	REAR TYRES mph (km/h)							
		520/70-30 18.4-30		13.6-38		16.9-30 (*) 480/70R-30 (*)		16.9-34 480/70R-34 540/65R-34	
		540							
		LOW	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**
I	1	1.5 (0.9)	1.8 (1.1)	1.6 (1.0)	1.8 (1.1)	1.5 (0.9)	1.7 (1.1)	1.5 (0.9)	1.9 (1.2)
	2	2.2 (1.4)	2.6 (1.6)	2.2 (1.4)	2.6 (1.6)	2.1 (1.3)	2.5 (1.6)	2.2 (1.4)	2.6 (1.6)
	3	3.2 (2.0)	3.8 (2.4)	3.3 (2.1)	3.9 (2.4)	3.1 (1.9)	3.6 (2.2)	3.3 (2.1)	3.9 (2.4)
	4	4.6 (2.9)	5.4 (3.4)	4.7 (2.9)	5.6 (3.5)	4.4 (2.7)	5.2 (3.2)	4.7 (2.9)	5.6 (3.5)
II	1	3.6 (2.2)	4.2 (2.6)	3.7 (2.3)	4.3 (2.7)	3.4 (2.1)	4.0 (2.5)	3.7 (2.3)	4.4 (2.7)
	2	5.1 (3.2)	6.0 (3.7)	5.2 (3.2)	6.2 (3.9)	4.9 (3.0)	5.8 (3.6)	5.3 (3.3)	6.2 (3.9)
	3	7.5 (4.7)	8.8 (5.5)	7.7 (4.8)	9.1 (5.7)	7.2 (4.5)	8.5 (5.3)	7.7 (4.8)	9.1 (5.7)
	4	10.7 (6.6)	12.6 (7.8)	11.0 (6.8)	13.0 (8.1)	10.3 (6.4)	12.2 (7.6)	11.1 (6.9)	13.1 (8.1)
III	1	8.4 (5.2)	9.9 (6.2)	8.6 (5.3)	10.2 (6.3)	8.1 (5.0)	9.6 (6.0)	8.7 (5.4)	10.3 (6.4)
	2	11.9 (7.4)	14.1 (8.8)	12.3 (7.6)	14.5 (9.0)	11.5 (7.2)	13.6 (8.5)	12.4 (7.7)	14.6 (9.1)
	3	17.6 (10.9)	20.8 (12.9)	18.1 (11.2)	21.4 (13.3)	17.0 (10.6)	20.1 (12.5)	18.2 (11.3)	21.5 (13.4)
	4	25.2 (15.7)	29.8 (18.5)	25.9 (16.1)	30.6 (19.0)	24.4 (15.2)	28.8 (17.9)	26.1 (16.2)	30.8 (19.1)

PTO at 750 rpm, and engine at 2382 rpm; 1000 rpm, and engine at 2381 rpm.

RANGE	GEAR	REAR TYRES mph (km/h)							
		520/70-30 18.4-30		13.6-38		16.9-30 (*) 480/70R-30 (*)		16.9-34 480/70R-34 540/65R-34	
		750 and 1000							
		LOW	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**	**LOW**	**HIGH**
I	1	1.6 (1.0)	2.0 (1.2)	1.7 (1.1)	2.0 (1.2)	1.6 (1.0)	1.9 (1.2)	1.7 (1.1)	2.0 (1.2)
	2	2.4 (1.5)	2.7 (1.7)	2.4 (1.5)	2.8 (1.7)	2.2 (1.4)	2.7 (1.7)	2.4 (1.5)	2.9 (1.8)
	3	3.3 (2.1)	3.9 (2.4)	3.6 (2.2)	4.2 (2.6)	3.3 (2.1)	3.9 (2.4)	3.6 (2.2)	4.2 (2.6)
	4	4.8 (3.0)	5.7 (3.5)	5.1 (3.2)	6.0 (3.7)	4.8 (3.0)	5.7 (3.5)	5.1 (3.2)	5.8 (3.6)
II	1	3.7 (2.3)	4.6 (2.9)	4.0 (2.5)	4.7 (2.9)	3.7 (2.3)	4.4 (2.7)	4.0 (2.5)	4.7 (2.9)
	2	5.5 (3.4)	6.5 (4.0)	5.6 (3.5)	6.7 (4.2)	5.3 (3.3)	6.3 (3.9)	5.7 (3.5)	6.7 (4.2)
	3	8.1 (5.0)	9.6 (6.0)	8.3 (5.2)	9.8 (6.1)	7.8 (4.9)	9.2 (5.7)	8.4 (5.2)	9.9 (6.1)
	4	11.2 (7.0)	13.7 (8.5)	11.9 (7.4)	14.1 (8.8)	11.2 (7.0)	13.2 (8.2)	12.0 (7.5)	14.2 (8.8)
III	1	9.1 (5.7)	10.7 (6.6)	9.4 (5.8)	11.0 (6.8)	8.8 (5.5)	10.4 (6.5)	9.4 (5.8)	11.1 (6.9)
	2	12.9 (8.0)	15.3 (9.5)	13.3 (8.3)	15.7 (9.8)	12.5 (7.8)	14.7 (9.1)	13.4 (8.3)	15.8 (9.8)
	3	19.1 (11.9)	22.5 (14.0)	19.6 (12.2)	23.1 (14.4)	18.4 (11.4)	21.7 (13.5)	19.7 (12.2)	23.3 (14.5)
	4	27.3 (17.0)	32.2 (20.0)	28.1 (17.5)	33.1 (20.6)	26.4 (16.4)	31.1 (19.3)	28.3 (17.6)	33.1 (20.6)

HYDRAULIC LIFT



65

The hydraulic lift system uses the transmission oil, which is supplied by a gear pump driven by the engine timing gears.

The lift, which can sense the forces on the lower arms via a torsion bar, enables the following operations to be performed:

— position control;

— draft control;

— float mode;

— mixed position and draft control.

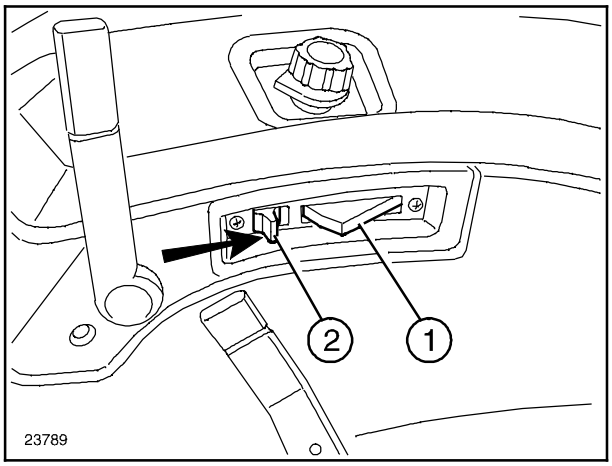
By combined use of levers (**1**) and (**2**) fig. 65, the most suitable type of operation for the job in hand can be selected.

LIFT-O-MATIC. Lift arms fully raised and lowered pushbutton - Fig. 66

1. DOWN button

2. UP button

To lower the implement, press the button (**1**) fig. 66 fully down, the lift arms will lower to the limit pre-set by means of the position lever (**1**) fig. 65.



66

To raise the implement, press the button (**2**) fig. 66 backwards, as shown by the arrow in the drawing, in order to release the button (**1**). The lift arms will fully raise.

CAUTION: *When working with mounted implements connected to the power take-off that use the Lift-O-Matic control, adjust the vertical tie rods to maximum length, in order to avoid damaging the transmission shaft when raising with the Lift-O-Matic device.*

LIFT ground control lever - Fig. 67

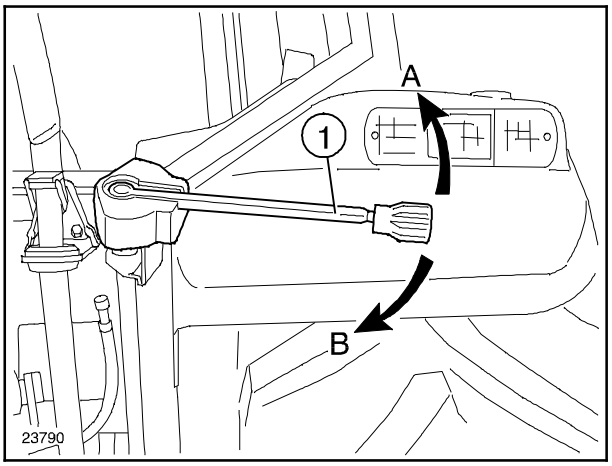
When working from outside the tractor, use position control lever (**1**) fig. 67 after having extracted it from the housing, as shown in the drawing.

- upwards in direction **A** = arms DOWN;
- downwards in direction **B** = arms UP.

WARNING: *Before leaving the driving position to work with lever (**1**), proceed as follows:*

- *apply the handbrake;*
- *move the gear and range levers to the neutral position;*
- *disengage the PTO;*
- *slow the engine to idling speed;*
- *move the position control lever (**1**) fig. 69 fully forward.*

DANGER: *when using lever **1**, make sure that no-one (including yourself) is within the operating range of the implement connected to the lift.*



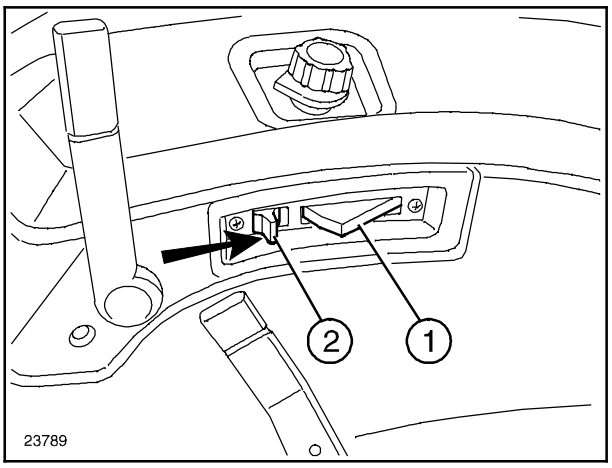
67

POSITION CONTROL

— Move the draft control lever (**2**) fig. 69 fully forward.

— Set the position of the implement, either in or above the ground surface, move lever (**1**) fig. 69 forward to lower the implement and backward to raise. The movement of the implement will be proportional to the movement of the lever.

— Push the button (**2**) fig. 68 in the direction of the arrow to raise the implement at the headland, and fully press down the Lift-O-Matic button (**1**) fig. 68 to lower the implement when re-starting work or when necessary, without using the lift control levers.

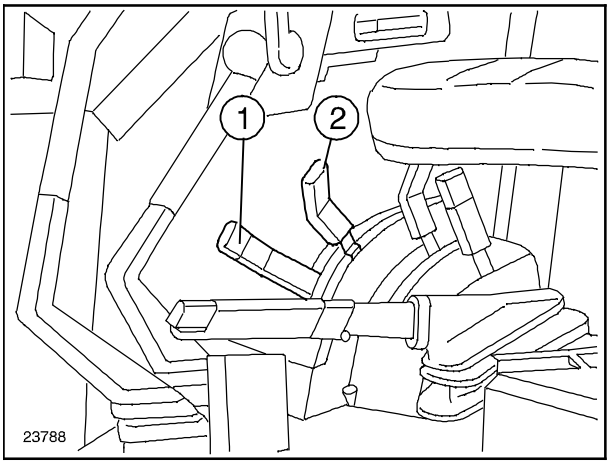


68

DRAFT CONTROL

— Move the position control lever (**1**) fig. 69 fully forward.

— Set the desired implement depth by gradually moving the draft control lever (**2**) fig. 69. The depth reached by the implement is proportional to the traction power which, in turn, is determined by the consistency of the ground.In these conditions, the lift will automatically maintain the traction power required from the tractor at a constant level.

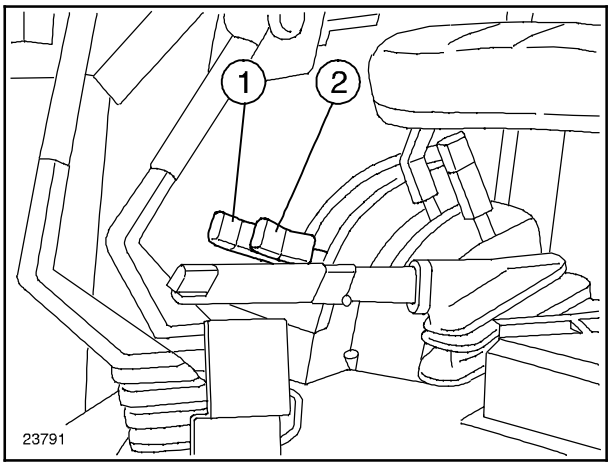


69

FLOAT FUNCTION

— to operate the lift in float mode, i.e.: with free arm movement for the full length of travel, move both levers (**1**) and (**2**) fig. 70 fully forward.

— The lift should only be used to lower and raise the implement at the headland; to carry out this operation, use only buttons (**1**) and (**2**) fig. 66 as described on page 2-62.



70

MIXED POSITION AND DRAFT CONTROL

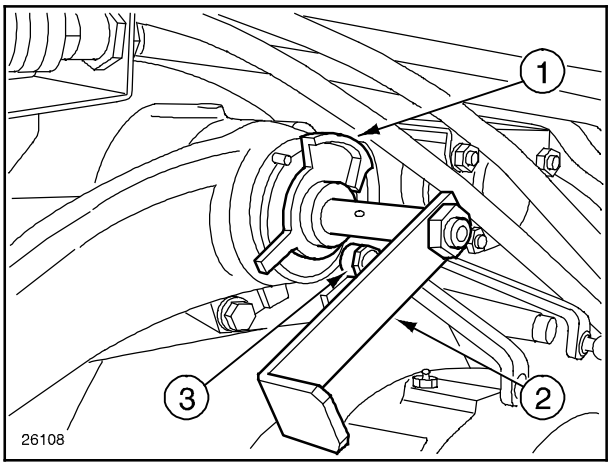
— Set the desired implement depth in the same manner as described for draft control.

— when the implement is at the required depth, gradually move the position control lever (**1**) fig. 70, backwards, until the lift arms begin to rise.
The lift operates in draft control but, at the same time, prevents the implement from going too deep if less ground resistance is encountered, which could result in unsuitable soil being brought to the surface.

— to raise and lower the implement at the headland, use only buttons (**1**) and (**2**) fig. 68.

NOTE: *Do not use levers (**1**) and (**2**) fig. 70 to raise and lower implements, as this will change the previously set operating conditions. Exclusively use the Lift-O-Matic controls (**1**) and (**2**) fig. 68.*

DANGER: *Height limit adjustment should never be carried out using the lever (**2**) fig. 71. If the required position is not reached, repeat operations from **1** to **8** as described.*
*It is absolutely forbidden to use the lever (**2**) fig. 71 to move the lift arms upwards.*



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LIFT ARM HEIGHT LIMIT ADJUSTMENT - Fig. 71

Adjust the height limit of lift arm travel as follows:

1. connect the implement to the lift arm swivel bushings;
2. bring engine speed to 1,200 to 1,500 rpm.;
3. press the pushbutton (**1**) fig. 68 on the lift-o-matic to the fully down position;
4. move levers (**1**) and (**2**) fig. 70 fully forward;
5. using position control lever, raise the implement to the desired height;
6. **switch the engine off**;
7. move the locking lever (**2**) downwards and turn the sector (**1**) until it makes contact with the roller (**3**)
8. on termination of adjustment operations, lock the sector (**1**) by moving the locking lever (**2**) upwards.

ELECTRONIC LIFT CONTROLS

INTRODUCTION

The electronically controlled hydraulic lift offers considerable advantages over conventional mechanical systems because of its high precision, sensitivity and the use of microprocessor logic.

The electronic control system provides three different work modes:

- position control;
- draft control;
- float function.

Unlike a conventional hydraulic lift, which is fitted with complicated lever mechanisms, the electronically controlled hydraulic lift is equipped with electronic sensors that transmit variations in conditions to the electronic control unit, which hydraulically operates the lift arms.

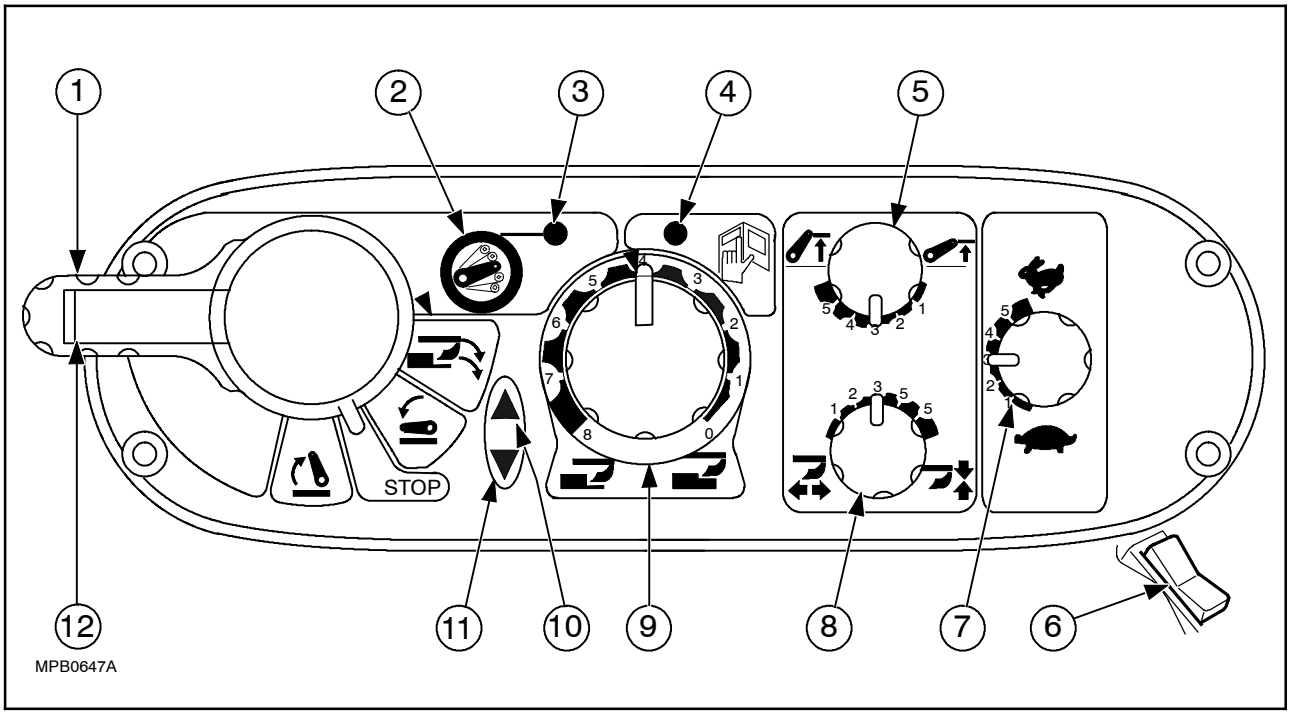
WORKING SAFELY

- Before operating the control unit controls, make sure that they are adjusted to the desired settings.
- Never leave the implement in the raised position when the tractor is stationary.
- With the tractor stationary and the engine running, the external controls located on the mudguards remain enabled.
  Take care not to operate the controls inadvertently.
- The control unit is provided with a self–testing system, signalling if there are any faults in the control system. To identify possible faults, see page 62.

CAUTION: *To avoid damaging the electronic components, follow the instructions noted below when carrying out arc welding on tractors fitted with electronic lifts or on connected implements.*

- When possible, disconnect the implement or the part that needs welding from the tractor.
- Disconnect the two battery cables from the terminals.
- Connect the welding machine ground clamp as close as possible to the area where welding is to take place.
- If welding is to be carried out within **1 meter** of the control unit, the unit must first be removed.
- Whilst welding, make sure that the cables do not pass above or near electrical or electronic leads.

ELECTRONIC LIFT CONTROLS



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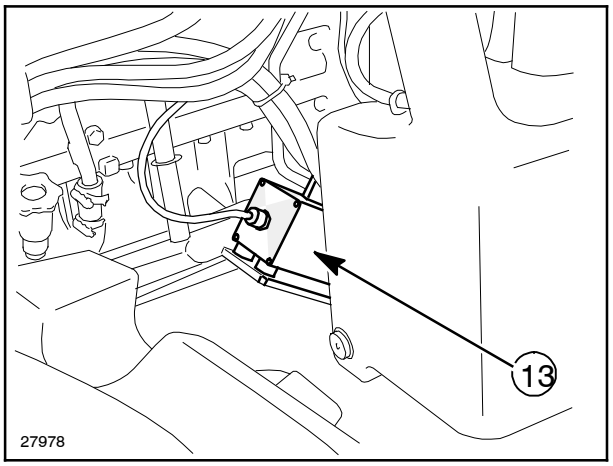
1 Raise and lower control lever (four positions).
2 Damping function ON switch.
3 Damping function ON indicator.
4 Troubleshooting indicator.
5 Lift arms raise speed adjustment knob.
6 Automatic slip control switch (optional).
7 Lift arms descent speed adjustment knob.
8 Position/draft sensitivity adjustment lever.
9 Working depth adjustment knob.
10 Arms raised indicator.
11 Arms lowered indicator.
12 Lever (**1**) raised position lock push button (STOP).



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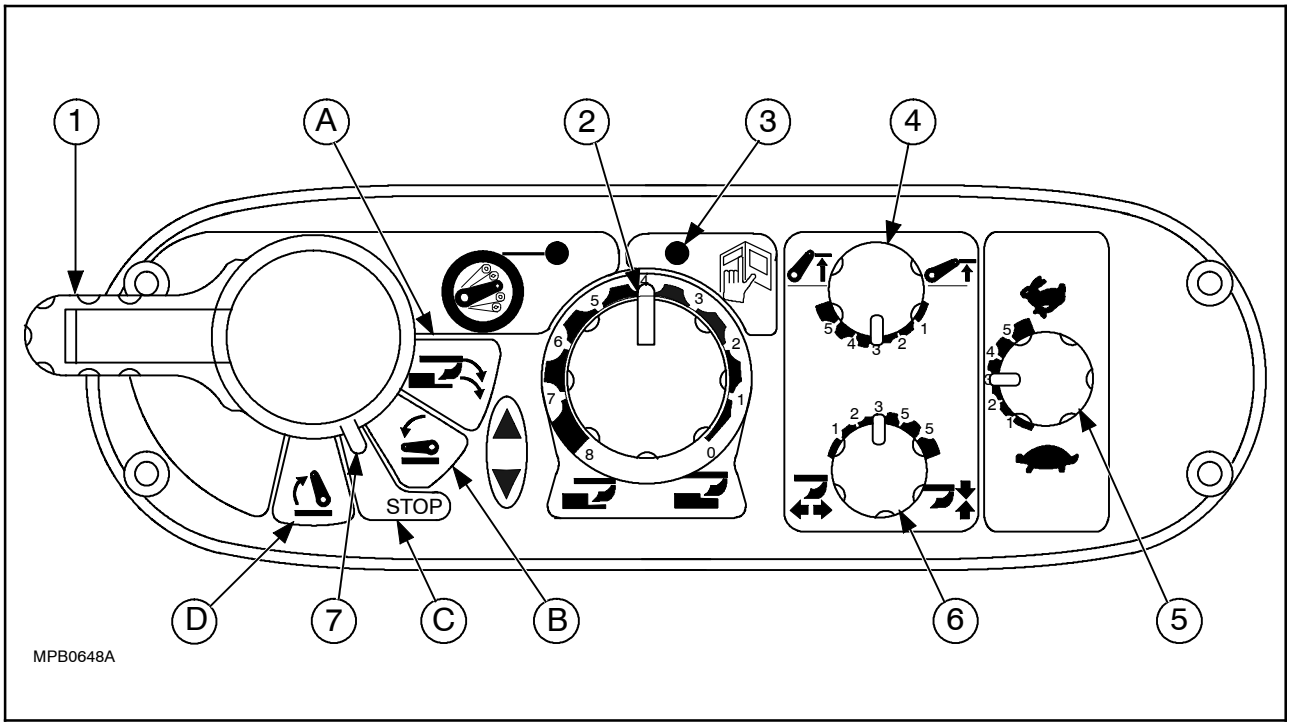
13 Radar.

WARNING: *To avoid possible damages to the eyes, refrain from looking into the area of the radar sensor.*

CAUTION: *For ensuring a correct working of the radar detecting system, make s periodical check on the radar: it should not accumulate earth nor ather materials that could alter the measurements.*



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INTERNAL CONTROLS FUNCTION

(1) Raise and lower control lever.

The lever has four positions:

A rapid ground entry. When released in this position, the lever automatically returns to position (**B**).

B Lift arms lowered.

C STOP.

D Lift arms raised (the transit lock is engaged in this position).

(2) Working depth knob.

- Turn clockwise, towards the **0** for minimum working depth.
- Turn counter-clockwise, towards the **9** for maximum working depth.

(3) Faults codes indicator.

See page 2-72.

(4) Lift arms upper limit adjustment lever.

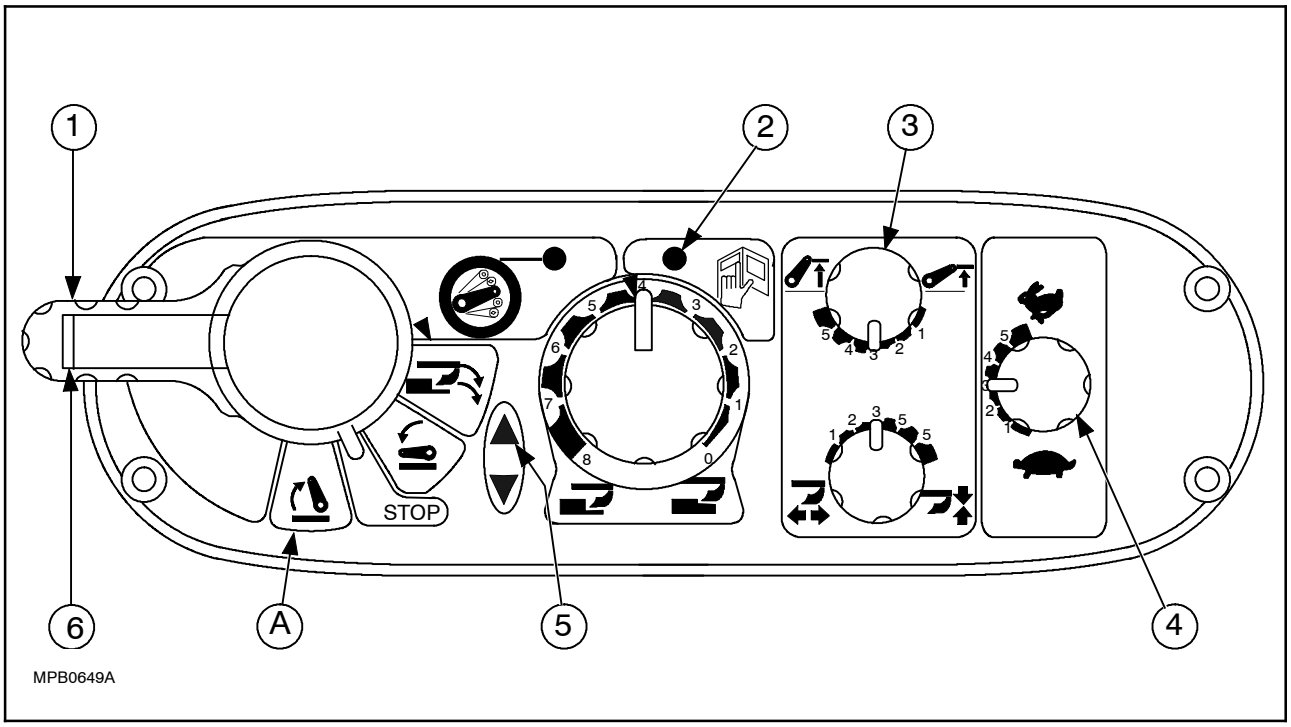
- Turn to the right, towards **1** for lift arms minimum upward travel.
- Turn to the left, towards **5** for lift arms maximum upward travel.

(5) Lift arms descent speed adjustment lever.

- Turn upwards, towards the hare symbol **5** for maximum lift arms descent speed.
- Turn downwards, towards the snail symbol **1** for minimum lift arms descent speed.

(6) Mixed position/draft lever.

- Turn counter-clockwise, towards **1**, to work in controlled position.
- Turn clockwise, towards **5**, to work in controlled draft.



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OPERATION

For correct electronic lift use, follow the indications noted below.

When the engine is started, indicator (**2**) will illuminate, showing that the lift internal controls are deactivated for safety reasons. The external controls on the rear mudguards remain active.

With the implement connected, get into the tractor and check that the alternator lamp is switched off. Set the upper lift limit with knob (**3**) and move the lift control lever (**1**) to the lifting position (**A**) to re-activate the internal cab controls (indicator (**2**) will switch off and indicator (**5**) will illuminate).

NOTE: *If lever (**1**) is already in lifting position* (**A**)*, it must be moved to the neutral position (central STOP position) and then to the lifting position* (**A**)*.*

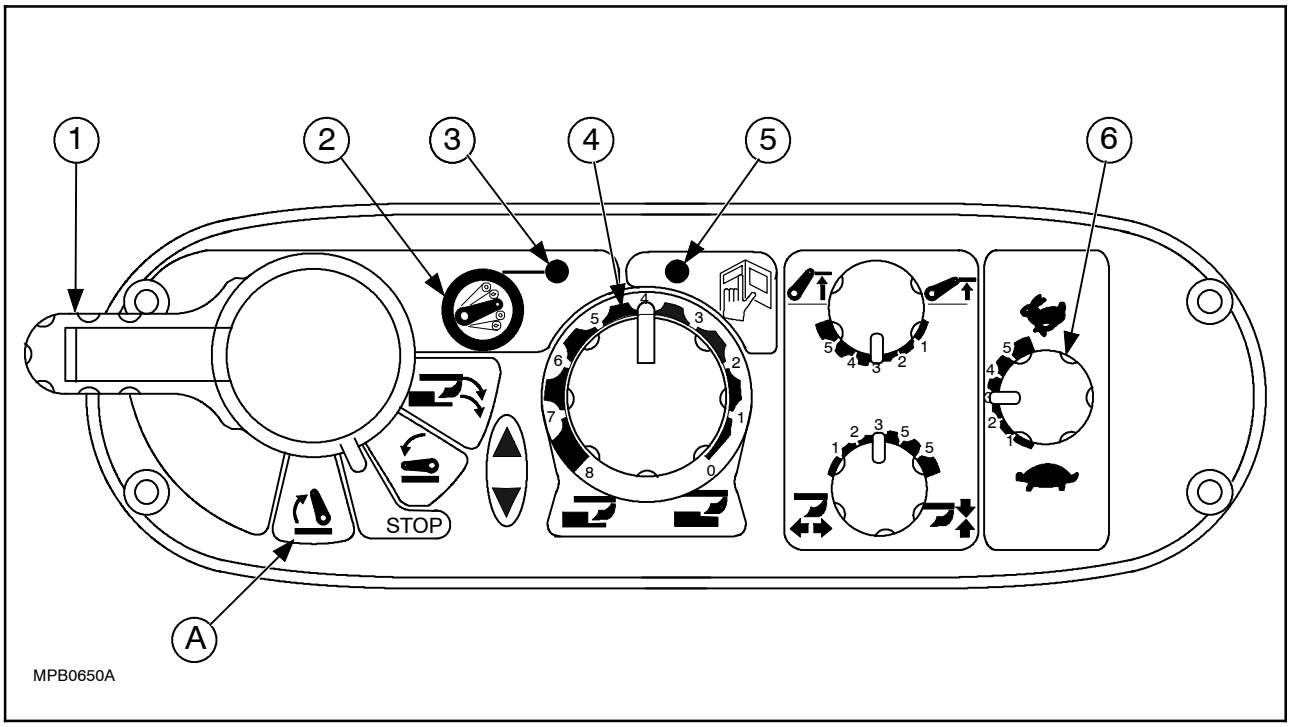
WARNING: *for safety reasons, when the first lowering or raising command is given, the lifting speed of the horizontal arms is controlled by the electronic control unit. The normal lowering/raising speed will only be provided after the lift horizontal arms have reached the limit previously set by means of lever (3) or if a raising and then a lowering movement was previously performed.*

TRANSIT SAFETY

To activate the transit safety function, proceed as follows:

- before activating the function, raise the implement by shifting lever (**1**) to the raising position (**A**);
- block the lever in the raising position by pushing the locking push button (**6**) forwards;
- turn the arm descent speed adjustment knob (**4**) fully counter-clockwise and lock in the raising position.

With the **transit safety** function activated, the lift will maintain the previously set position without changing.



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SWING DAMPING

This device restrains the swinging action present on the front axle during transit, caused by the implement mounted on the tractor.

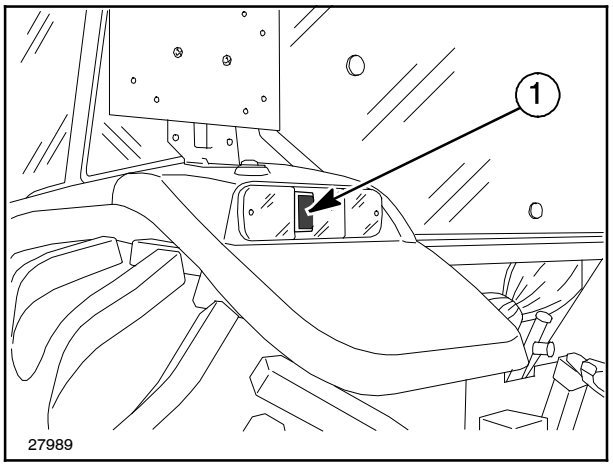
To activate the device, move lever (**1**) to raising position (**A**), and press switch (**2**).
Indicator (**3**) lights up to show that the function is activated.

The swing damping system is active when in transit with a raised implement attached. The device is activated at speeds above 4.97 mph (8 km/h).

If this activation speed does not correspond with your requirements, it can be modified as follows:

- turn working depth knob (**4**) fully to the right;
- turn the arms descent speed knob (**6**) fully counter–clockwise (minimum descent speed).
- move the tractor to the required setting speed.
- once this speed has been reached, shift the position lever (**1**) from the (**STOP**) position to the lifting position (**A**) **four times in 3 seconds**.

If the adjustment operation has been carried out correctly, the indicator (**5**) will flash, instantly memorizing the new swing damping “device activation speed”.



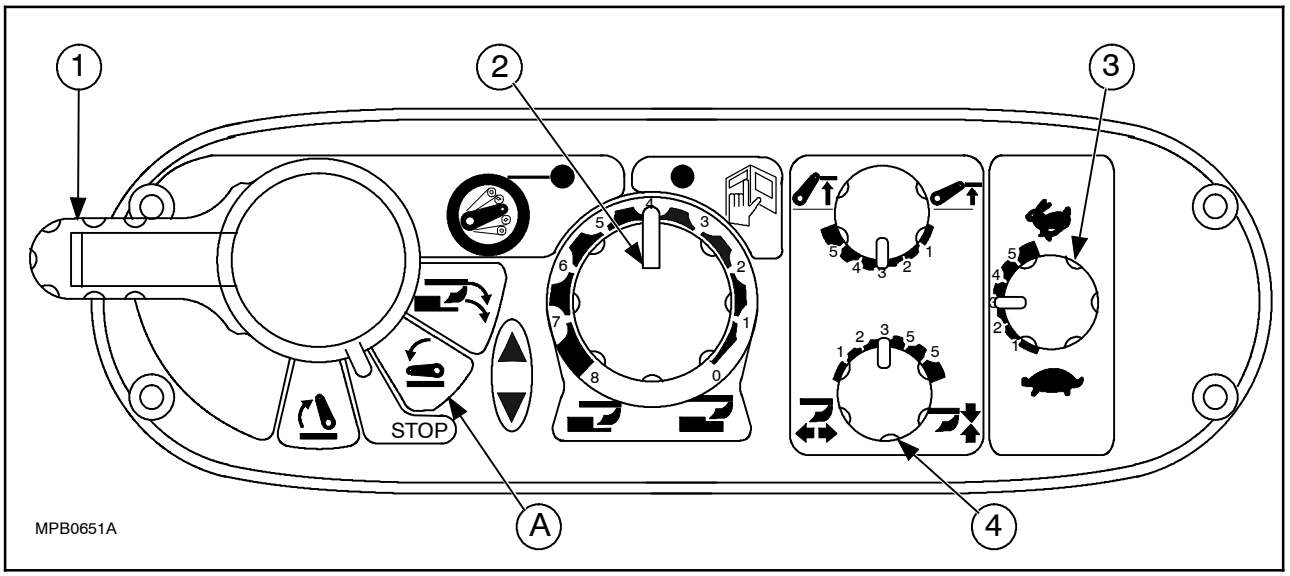
77

LIFT USE

The lift can be used in three different ways:

- position control;
- draft control;
- float mode.

***DANGER**: when using the external push buttons (**1**) fig. 77 on the mudguards, make sure that no-one (including yourself) is within the operating range of the implement connected to the lift.*



78

DRAFT CONTROL

Turn the position/draft mix knob (**4**) fully counter-clockwise.

Move lever (**1**) to the lowering position (**A**) and adjust to the required working depth using knob (**2**), turning counter-clockwise to lower or clockwise to raise.

Use lever (**1**) to raise and lower the implement at each headland, or when necessary, without using the adjusting knob.

With the implement in the ground, if there is an excessive variation in the working depth, this variation can be reduced by gradually turning the draft control knob (**4**) clockwise.

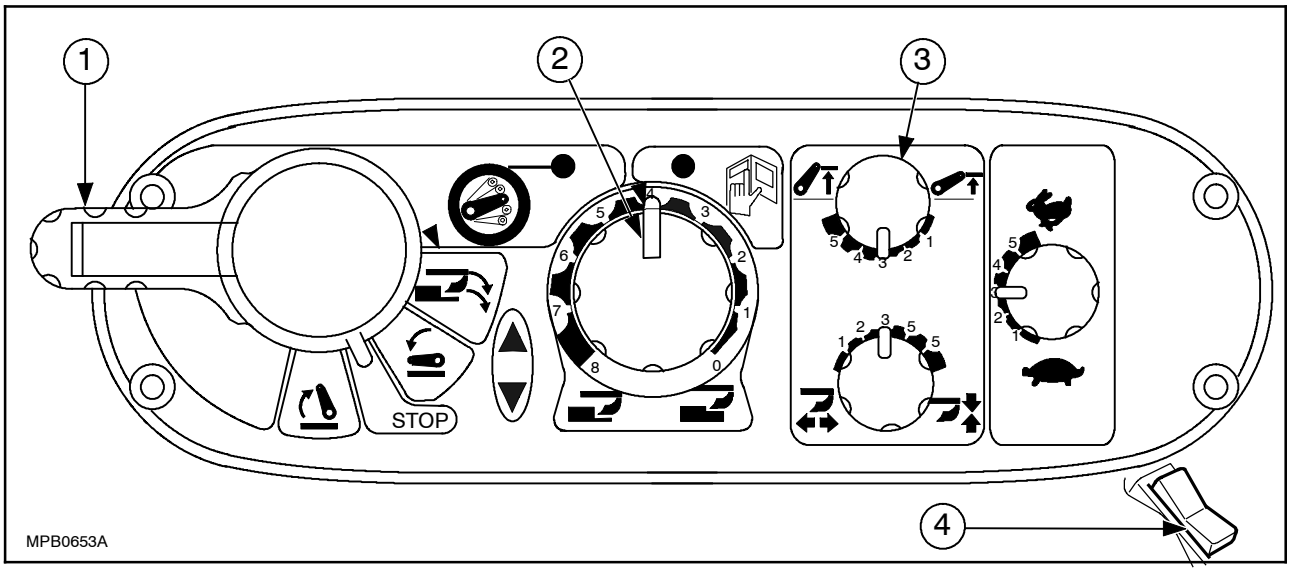
***NOTE:** with the implement connected, before starting work adjust the maximum lifting limit, as described on page 2-64.*

POSITION CONTROL

Turn the position/draft mix knob (**4**) fully clockwise;

Lower the implement using lever (**1**) and adjust the descent speed using knob (**3**) then set the required working depth by means of knob (**2**).

***NOTE:** to lower and raise the implement at each headland, use only lever (**1**) in order to maintain the previously set adjustments.*



79

AUTOMATIC SLIP CONTROL

When working in draft control, especially with particularly hard and non–uniform ground, it is advised to use the **automatic slipping control function**.

This electronic system allows the working depth to be adjusted in relation to the wheel slipping on the ground.

To activate the function, press switch (**4**).

With the slipping function activated, the radar (**11**) page 2–66 positioned under the platform on the right–hand side of the tractor, reads the real transit speed and makes a comparison with the theoretical speed given by the Pick–up inside the transmission. If the two speeds are not the same, this means that the wheels are slipping.

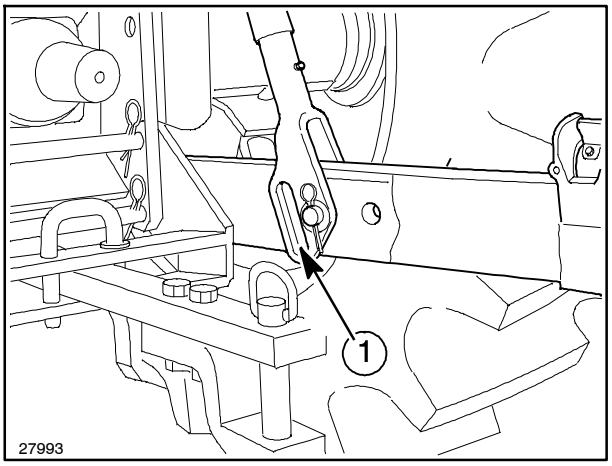
When slipping becomes excessive, the control unit automatically partially raises the implement in order to eliminate the slipping action.

FLOAT MODE

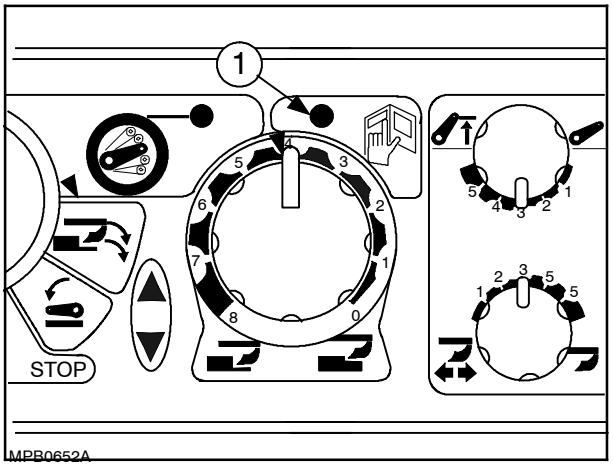
In order to use the lift in the float function, i.e. no swinging restrictions on the full travel of the arms, turn the knob (**2**) fully counter–clockwise.

WARNING: *when working with float position, with implements attached, connected to the power take–off and using the lift, the upward travel of the arms must be limited by means of lever (**3**) fig. 71 page 2–64 to avoid damaging the universal joint.*

The vertical rods must also be connected to the lower arms by inserting the pins in the slots (1) fig. 80, thereby allowing free movement of the implement.



80



81

FAULTS CODE INDICATOR - Fig. 81

If electrical or electronic faults occur, the illuminated indicator (**1**) underlines the fault code by means of a system of indicator flashes.

FAULT CODE DECODIFICATION

In order to read the fault code, close attention must be paid to the number of indicator flashes (**1**) and the order in which these flashes are transmitted.

In order to read the fault code, proceed as follows:

1st phase: before transmitting the code, the control unit carries out a 2 second (approx.) pause;

2nd phase: after the pause, the first digit of the code is transmitted by means of a certain number of flashes in rapid succession;

3rd phase: after the transmission of the first digit, the control unit carries out another 2 second (approx.) pause;

4th phase: after the pause, the second digit of the code is transmitted by means of a certain number of flashes in rapid succession;

The control unit only indicates one code at a time, giving priority to the most serious faults.

In order to check whether other fault codes are in progress, the fault must be eliminated so that the control unit may pass on to the successive code.

CAUTION: *in the event of a fault that disables the lift controls, the corresponding code will be given priority over any other codes that were previously issued.*

- Example - Interpretation of fault code number 24 -

1^ phase	2nd phase	3rd phase	4th phase
pause	●●	pause	●●● ●
2s	first figure 2	1s	second figure 4
	fault code composition 24		

FAULT CODES LIST

SERIOUS FAULTS

11. Intake solenoid valve.

12. Discharge solenoid valve.

13. Short circuit.

14. Circuit open.

15. External push buttons.

16. Supply voltage.

17. Battery.

18. Lift arms raise and lower control lever.

MEDIUM LEVEL FAULTS

22. Position sensor.

23. Working depth adjustment potentiometer.

24. Arms upper limit setting potentiometer.

MINOR FAULTS

31. Right-hand draft sensor.

32. Left-hand draft sensor.

33. Battery (voltage less than 11.5 V).

34. Lowering potentiometer.

36. Mixed position/draft control potentiometer.

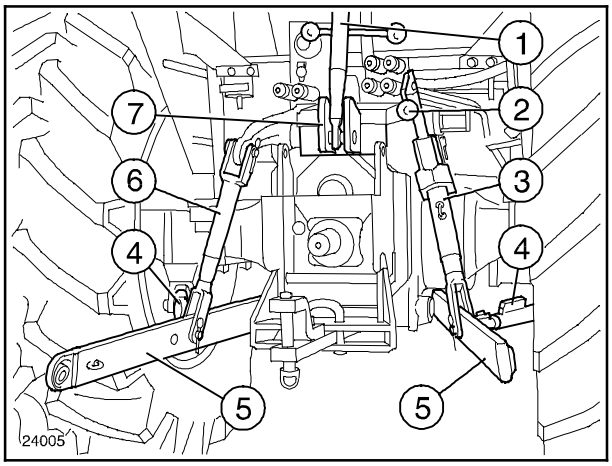
37. Hydraulic control valve fault.

41. Radar signal (fault only indicated with the slipping control on).

42. Transmission signal (fault only indicated with the slipping control on).

THREE-POINT LINKAGE

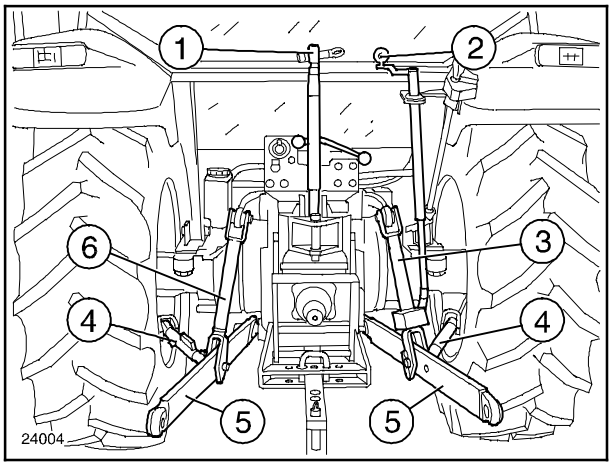
NOTE: *The three-point linkage on all models is a 2nd category device.*



82

Tractors without cabs - Fig. 82

1. Adjustable length top link.
2. Right-hand lift rod adjuster, with retaining spring.
3. Right-hand lift rod.
4. Telescopic stabiliser struts.
5. Lower arms.
6. Left hand lift rod.
7. Top link support bracket.



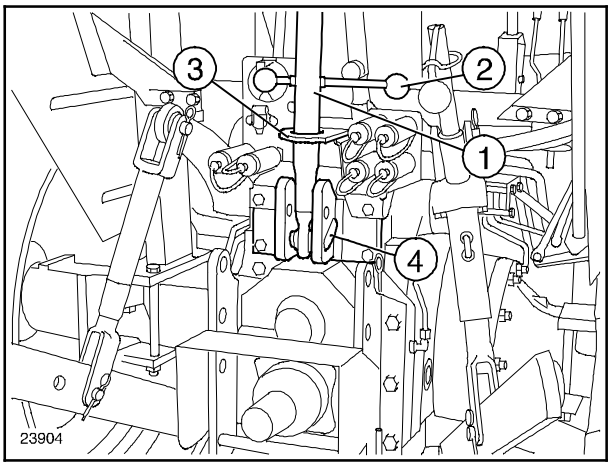
83

Tractors with cabs - Fig. 83

1. Adjustable length top link.
2. Right-hand lift rod adjuster, with retaining spring.
3. Right-hand lift rod.
4. Telescopic stabiliser struts.
5. Lower arms.
6. Left hand lift rod.

Adjustable top link - Fig. 84

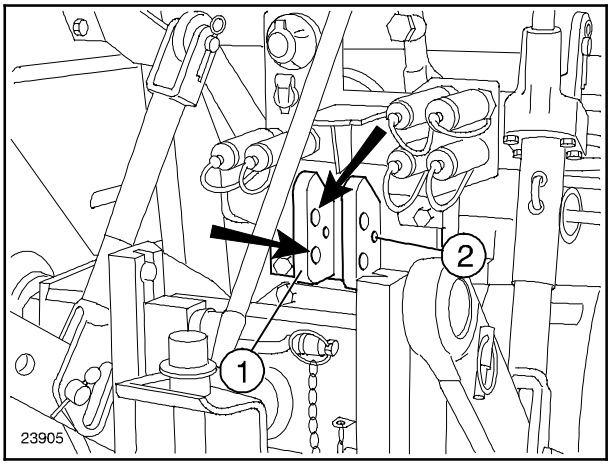
The top link (**1**) can be connected to the support bracket by means of the two holes. Select the more suitable hole for attaching the implement.
To adjust the top link length, rotate the sleeve using lever (**2**). The top link must not exceed a maximum length of 34.25 in (870 mm).
when not in use, remove the top link or secure it with the catch **3**.



84

Top link attachment bracket - Fig. 85

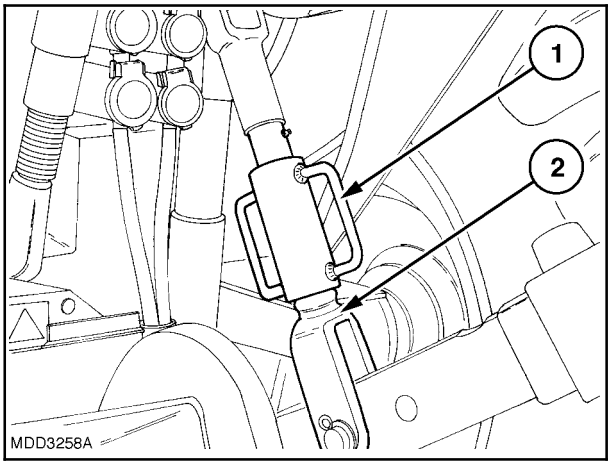
NOTE: *When inserting the top link retaining pin (**4**) fig. 84 position it so that the safety pin enters in hole (**2**) fig. 85.*



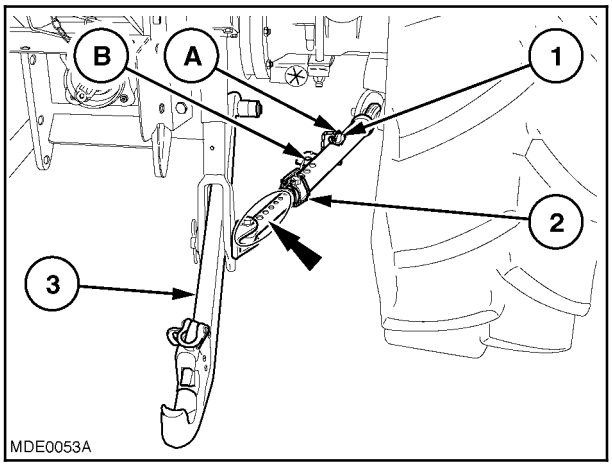
85

Left-hand vertical tie rod - Fig. 86

Adjust the length of the lift rod (**2**) by screwing the sleeve in or out (**1**). Adjust the length of the lift rod as necessary to set the implement in its working position parallel to the ground.



86



87

Lateral stabiliser struts - Fig. 87

To adjust the length of the struts, proceed as follows:

With the implement connected:

— remove the pin (**1**) and insert in hole (**B**) to obtain unrestricted lateral movement of the lift arms (**3**);

— adjust the opening width of the arms (**3**) by positioning the pin (**2**) in one of the holes on the sleeve.

Without the implement:

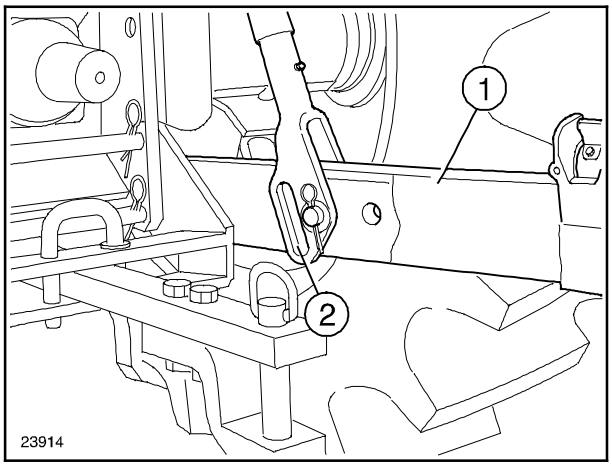
— Extract the pin (**1**) from hole (**B**), move the sliding lever fully back against the strut support, and insert in the hole (**A**);

— with the arms lowered, adjust the opening so that the lift rods are in the vertical position and secure with pin (**2**) in one of the free hole on the sleeve.

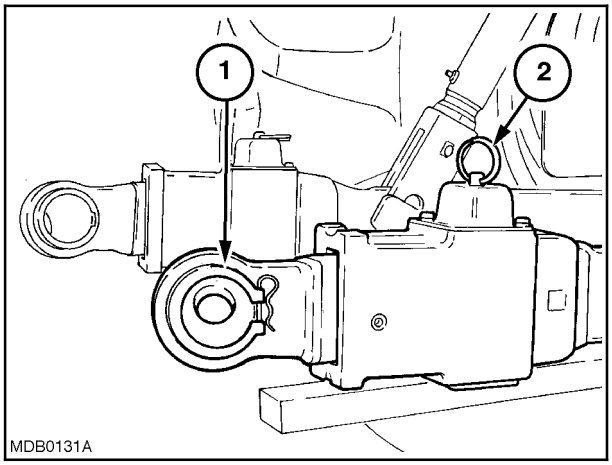
NOTE: *Lit in the fully raised position, the lateral swing on the arms is reduced to the minimum.*

NOTE**:** *With an implement connected, keep the pin (**1**) in hole (**B**). Adjust the lateral adjustment struts fig. 87, so that the lower arms (**1**) fig. 88, do not swing for more than 12 cm in each direction.*

NOTE**:** *a certain freedom of lateral movement of the link arms (**1**) fig. 88 by fitting the attaching pins to the slotted holes (**2**) fig. 88.*



88



89

Lower arms with telescopic ends (optional) - Fig. 89

To facilitate implement hitching operations, proceed as follows:

— reverse the tractor near to the implement;

— pull towards the hitch pin (**2**) to release the sliding ends (**1**);

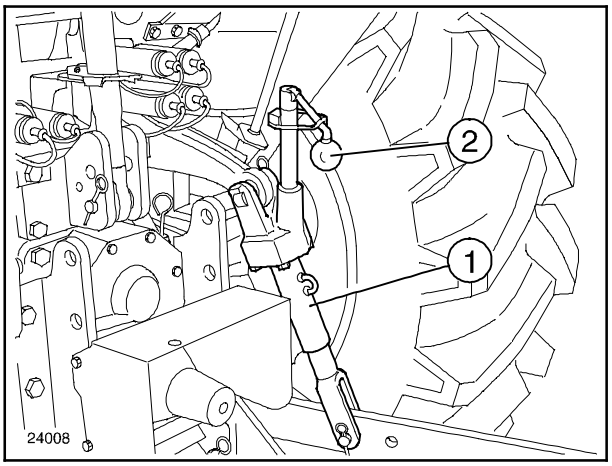
— extract the ends (**1**) from the seats and hitch to the implement;

— reverse the tractor: the telescopic ends slide back into the seats and the catches (**2**) will automatically close.

Standard right-hand vertical lift rod adjustment - Fig. 90

The right-hand lift rod (**1**) è can be adjusted by means of a knob (**2**) that can also be operated from the driving position (standard for all models).

NOTE: *Adjust the length of the rods so that the implement is positioned parallel to the ground.*

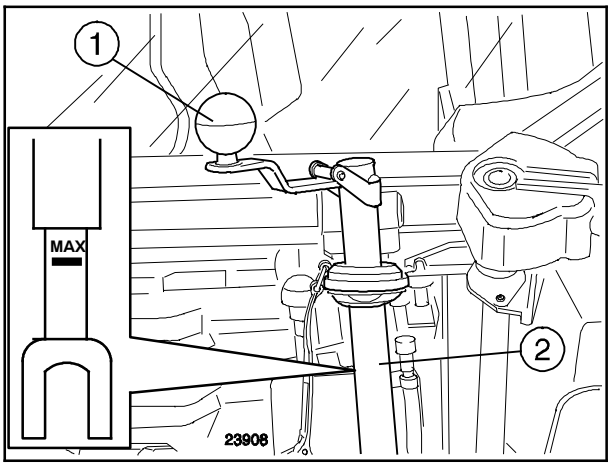


90

Right-hand vertical lift rod adjustment (on-board adjustment, models with cabs) - Fig. 91

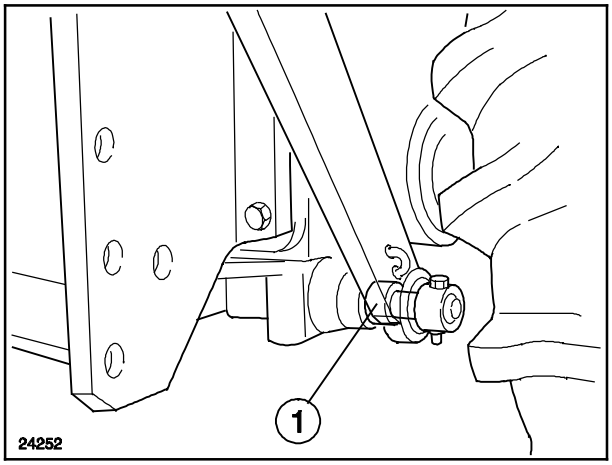
The right-hand lift rod (**1**) fig. 90 can be adjusted by means of a knob (**1**) fig. 91 that can also be operated from the driving position (optional).

WARNING - *When the length of the vertical lift rods need to be adjusted, make sure the lower rod does not come too far out of its seat.*
*The weight of the implement could cause the rod to come out of the sleeve (**2**) fig. 91.*
*The length limit is shown by word **MAX**, which corresponds to a max. extension notch on the lift rod.*



91

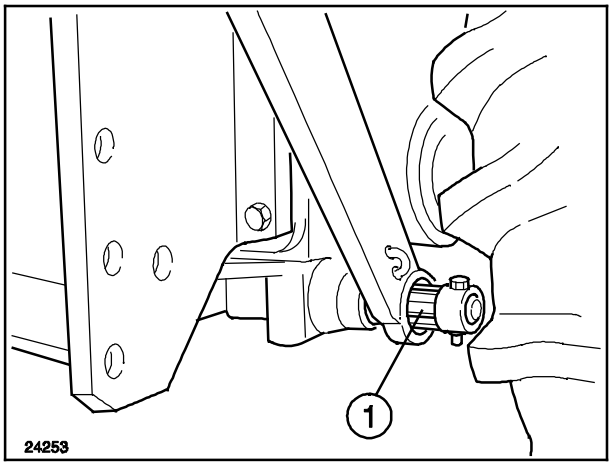
LOWER ARM MOUNTING POSITION



92

For light work - Fig. 92

When operating the tractor in draft or mixed control, fit the lower arms (**5**) figs. 82 and 83 page 64 with spacers (**1**) inside the arms for greater lift sensitivity when working with light implements.



93

Normal and heavy work - Fig. 93

When operating the tractor in draft or mixed control, fit the spacers (**1**) outside the lower arms for normal or heavy work.

This position, which reduces lift sensitivity, enables improved tractor use.

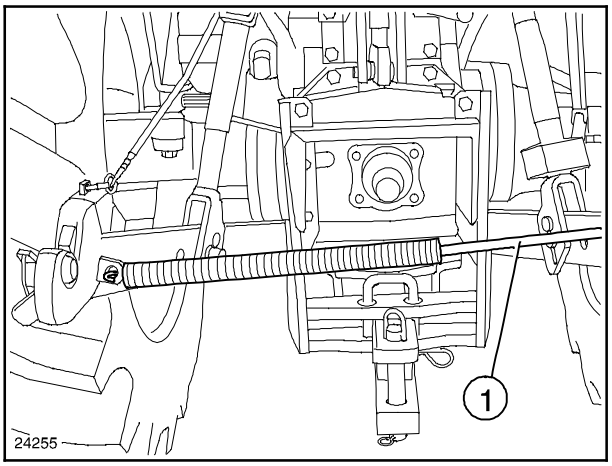
The drawings show the most suitable positions for the above operations.

QUICK FIT IMPLEMENT LINKAGE

HITCHING THE IMPLEMENT

With the lower arms fully lowered, adjust the length of the control cables (**1**) Fig. 96, so that they do not drag on the ground when attached to the tractor. Correctly adjust the distance between the lower arm hook ends by tightening or loosening the spacer spring rod (**1**) Fig. 94.

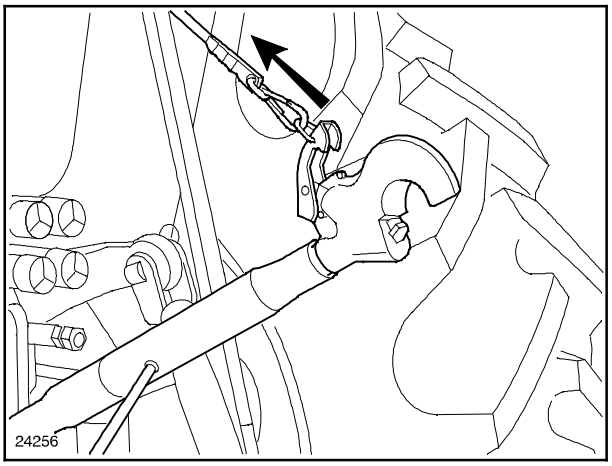
Fit the conical pick-up profiles (**2**) fig. 96 on the implement hitch pins.



94

Reverse the tractor and place in position in relation to the implement, then raise the lower arms and the implement will be hitched automatically. The hook ends (**3**) should engage in the locked position, as shown in fig. 96.
If using 1st category implements, fit the reducer bushes on the implement hitch pins.

CAUTION: *Before lifting the implement, make sure that the two hook ends (**3**) fig. 96 have engaged in the locked position.*

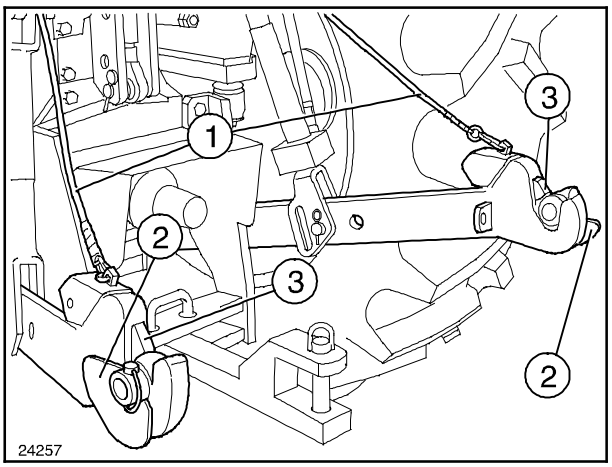


95

Release the end of the top link by pulling back the control cable, as shown in fig. 95, and hook onto the implement.

Adjust the length of the top link by tightening or loosening the threaded sleeve.

WARNING: *Do not unscrew the sleeve any further when the top link length is already at 31.49 in. (800 mm).*



96

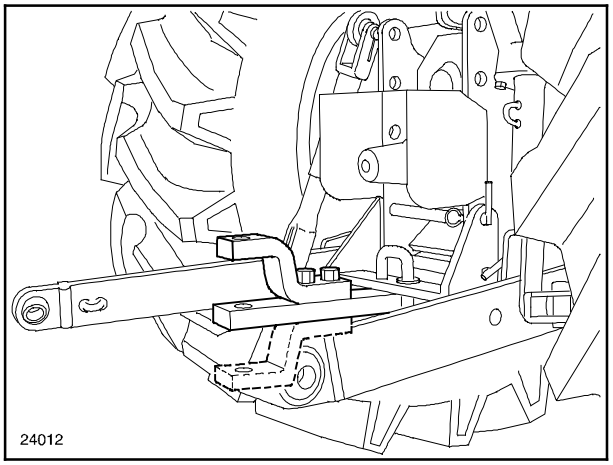
UNHITCHING THE IMPLEMENT

Rest the implement on the ground and make sure that it is stable.
Disconnect the top link by lifting and then pulling the control cable.
Slightly raise the implement, then release the hook ends by pulling the control cables (**1**) fig. 96 directly from the driving position.
Lower the lower arms until the hooks are released.

TOWING EQUIPMENT

CAUTION: *The towing equipment should be selected on the basis of the type of trailer or implement to be towed and should comply with current legislation.*

- *The ease of handling and driving safety of the tractor depend on correct towing adjustment.*
- *If the towing device is fitted high, the towing capacity is increased, but there is a risk that the tractor will tip back. Therefore ensure that the trailer shaft is not at too great an upwards angle.*
- *When using four-wheel drive, the towing bracket should be in the lower position with the shaft almost horizontal.*
- *Avoid towing excessively heavy trailers or loads.*
- *Never start suddenly, as this also considerably increases the risk of tipping backwards.*
- *Always brake the trailer first, then the tractor.*



97

SWINGING DRAWBAR ON SECTOR - Figs. 97 and 98

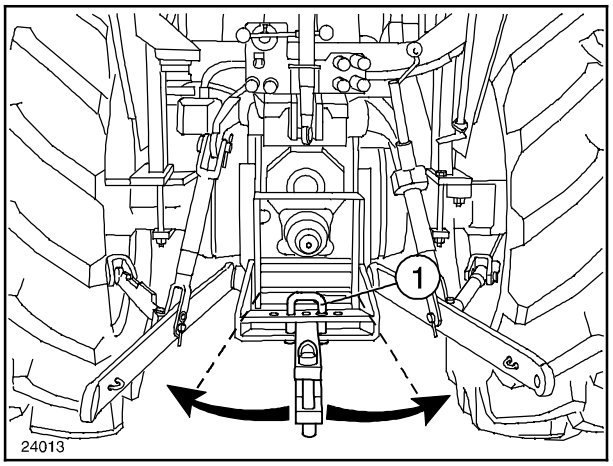
Use the swinging drawbar for implements, agricultural machinery and trailers with two axles.

Do not use for single-axle trailers as they apply excessive weight to the bar, which will risk tipping the tractor.

The horizontal range of the bar is extremely useful for implements or machines requiring free lateral movement, e.g.: harvesters/balers.

The device can be supplied:

- with suitable brackets to fit a rigid or Rockinger towing hook;
- with a bracket designed only to fit the towbar.



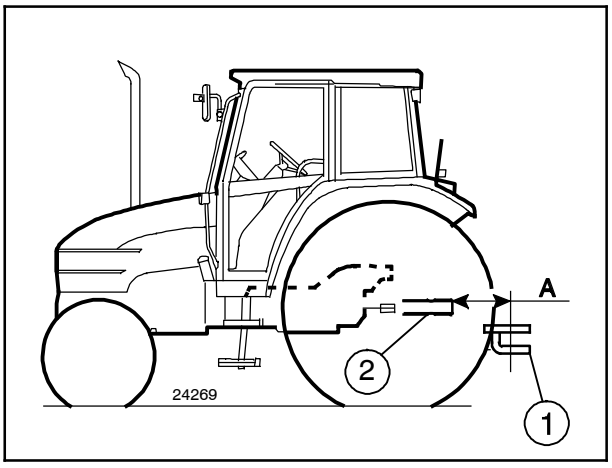
98

The following adjustments can be made to the bar:

- height adjustment by fitting the bracket above or below the bar, fig. 97;
- prevention of lateral swing by inserting the bracket (**1**) fig. 98.

By carrying out the adjustments previously described, distance **A** between the swinging drawbar bracket (**1**), and the PTO shaft (**2**), is between a minimum of 11.69 in. (297 mm) and a maximum of 17.91 in. (455 mm).

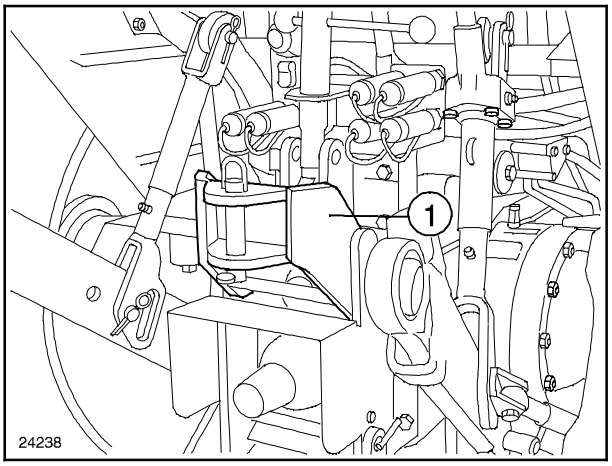
To correctly connect the implement on the PTO, position the towing bracket facing downward fig. 97.



99

HEIGHT ADJUSTABLE RIGID HITCH - Figs. 100 and 101

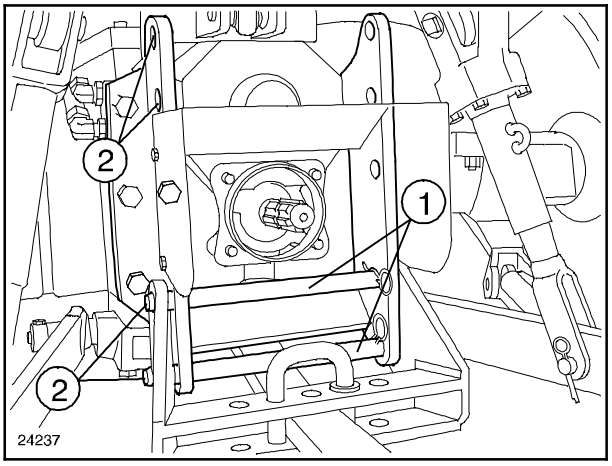
The rigid hitch (**1**) fig. 100 allows all types of trailers to be towed, including one-axle trailers.



100

It is height adjustable for a total of six positions.

It can also be fitted together with the tow bar.
Fix the hitch (**2**) Fig. 101 to the holes by means of the pins (**1**) Fig. 101.



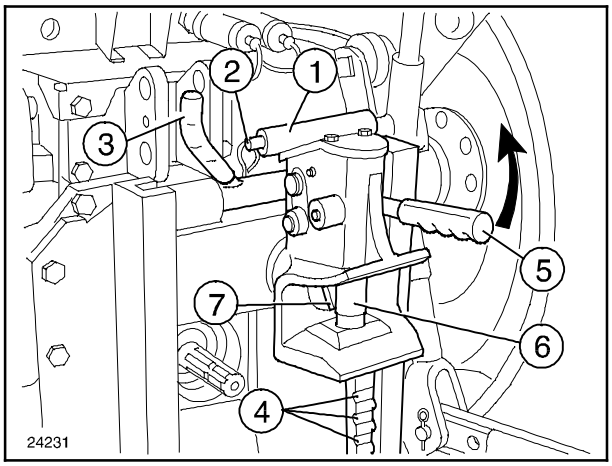
101

WARNING: *Use the front towing fork for possible emergency trailer manoeuvres or for towing the tractor.*

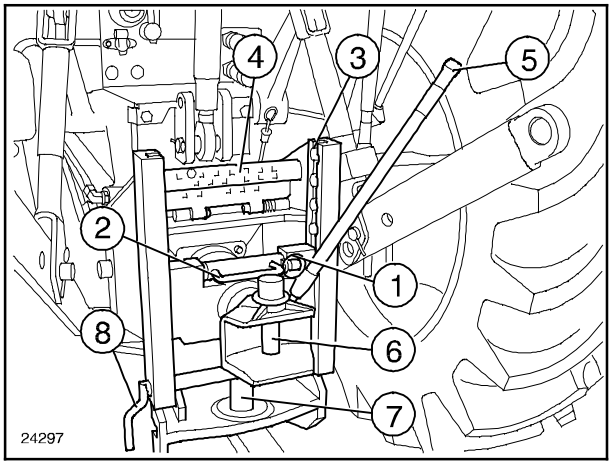
C CATEGORY HITCH - Fig. 102

This device is height adjustable and can also be fitted together with the tow bar.
To adjust the height, proceed as follows:

- grip the handle (**1**) with the right hand and press button (**2**);
- with the left hand, turn the handle (**3**) down to the horizontal position to release the hitch, and position at the required height;
- slightly before reaching the required position, press button (**2**) again, turn handle (**3**) to the vertical position, so that the hitch locks into one of the grooves (**4**).



102



103

CAUTION: *The trailer must not be connected with the hitch free on the power take-off or on the lower stop pins. The hitch must always be in the secured position in the relevant grooves.*

To hitch the trailer, proceed as follows:

- turn handle (**5**) upwards to the vertical position to raise the hitch pin (**6**);
- get on the tractor, engage reverse gear and back-up until lever (**7**) is in line with the trailer drawbar, so that the hitch pin (**6**) is automatically released;

On completion of this operation, lever (**5**) should be in the horizontal position and pin (**6**) should be inserted in the trailer hitch.

C CATEGORY HITCH - Fig. 103

This device is height adjustable and can also be fitted together with the tow bar.
To adjust, proceed as follows:

- extract the safety pin (**1**);
- turn handle (**2**) upwards and position the hitch at the desired height;
- fix in one of the grooves (**3**) turning the handle (**2**) downwards;
- re-insert the safety pin and pull down the guard (**4**).

To remove the hitch pin (**6**), pull up the lever (**5**) and extract.

HITCH FOR HALF-TRAILERS - Fig. 103

Supplied together with the towbar.

Half-trailers are hitched to pin (**7**) fixed on the towbar bracket.

WARNING: *After having connected the trailer to the pin, remember to refit the safety pin (**8**).*

HYDRAULICALLY OPERATED TOWING HITCH WITH MECHANICALLY CONTROLLED LIFT

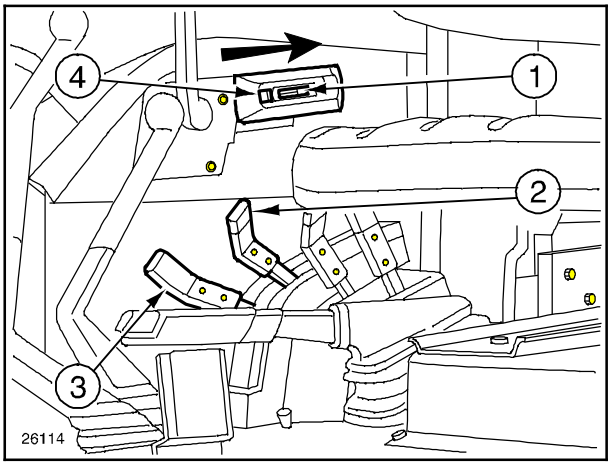
This device makes it possible to tow implements, agricultural machinery and trailers fitted with drawbar hitching equipment. All hitching and releasing operations can be carried out directly from the driving position.

Hitching a trailer

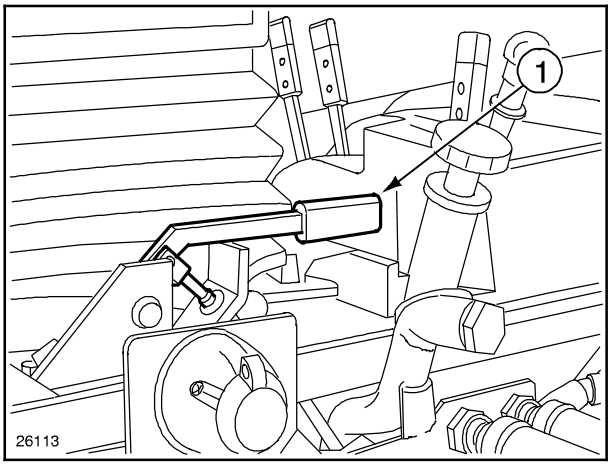
To lower the towing hitch and connect the implement, proceed as follows:

- from the driver's seat, pull the position control lever (**3**) fig. 104 fully back and the draft control lever (**2**) fig. 104 fully forward;
- press button (**1**) fig. 104 on the Lift - O - Matic;
- pull the lever (**1**) fig. 105 upwards to release the support plate and move the lift lowering control lever (**3**) fig. 104 gradually forwards, until the required position has been reached;
- release the lever (**1**) fig. 105;
- reverse the tractor and place in position in relation to the trailer;
- raise the towing hitch by moving the position control lever (**3**) fig. 104 backwards; hitching is automatic and anchoring hooks (**1**) and (**4**) fig. 106 can be heard to click on to the respective pins (**2**) and (**3**) fig. 106;
- once hitching is completed, move the position control lever (**3**) fig. 104 slightly forwards, so that the weight on the hitch is sustained by anchoring hooks (**1**) and (**4**) fig. 106;
- pull the button (**4**) fig. 104 in the direction of the arrow to avoid accidentally lowering the hitch and making contact with lever (**3**) fig. 104.

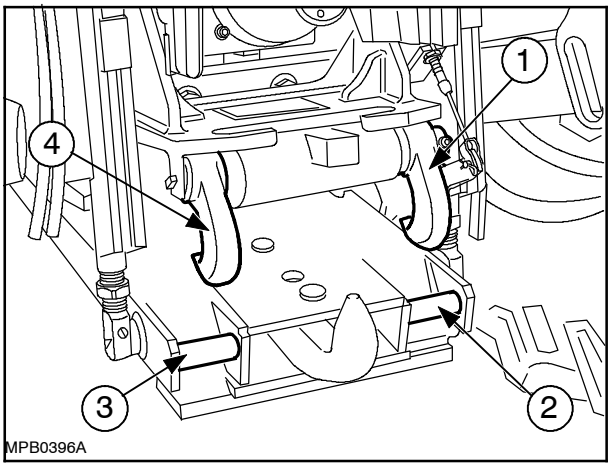
CAUTION: *Before starting, check to see that the anchoring hooks (**1**) and (**4**) fig. 106 have engaged in the locked position.*



104



105



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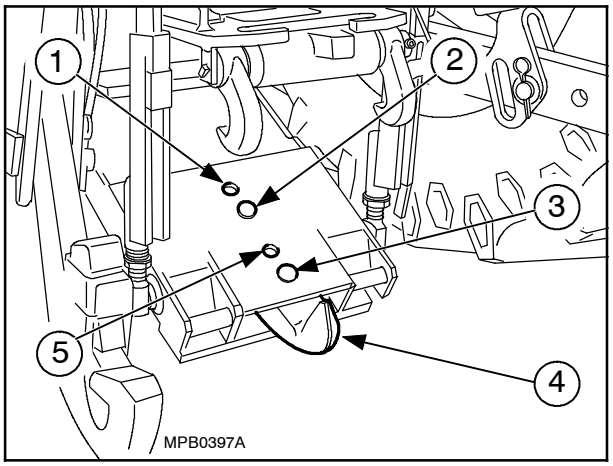


107

Unhitching a trailer

To unhitch the trailer or implement, proceed as follows:

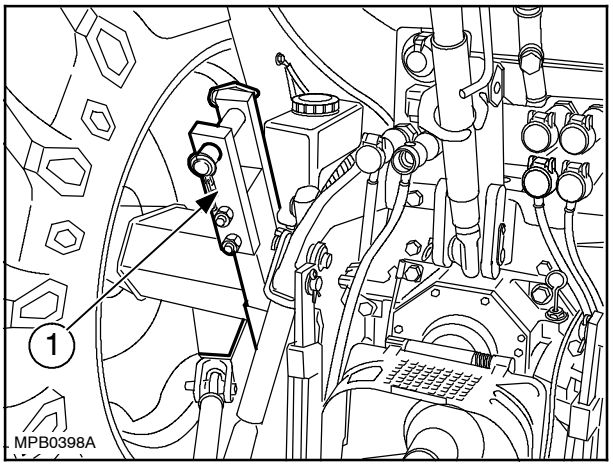
- park the tractor on a level surface;
- press the pushbutton (**1**) fig. 104 on the Lift - O - Matic;
- move the lift position control lever (**3**) fully back to release the weight on the anchoring hooks (**1**) and (**4**) fig. 106;
- pull up lever (**1**) fig. 105 and move position control lever (**3**) fig. 104 gradually forwards to lower the towing hitch.

To switch from the hook-hitching system to the tow bar, proceed as follows:

- lower the towing hitch, as previously described;
- remove securing pins (**2**) and (**3**) fig. 107;
- extract the hitch (**4**) fig. 107, and fit the bar (**1**) fig. 108, re-inserting the securing pins in the holes.

The tow bar can be positioned at two different distances from the PTO, securing it in the pair of holes (**1**) - (**5**) or (**2**) - (**3**) fig. 107.

When towing equipment that exerts high static loads (two-wheeled trailers, etc. always use the tow bar in the least protruding position.



108

WARNING: *Never raise or lower the hitch with the tow bar connected to a trailer.*

CAUTION: *When towing implements make sure that the total weight on the front axle does not exceed the maximum permissible static load (see page 2-118) or the rear tyres load capacity (see tyre loading index and inflation pressures, page 2-106, 2-108 and 2-109).*

HYDRAULICALLY OPERATED TOWING HITCH WITH ELECTRONICALLY CONTROLLED LIFT

Hitching a trailer

To lower the towing hitch and connect the implement, proceed as follows:

- from the driver's seat, carry out the following operations:

- turn the cursor (**3**) and the knob (**2**) fig. 109 to the value of eight on the numerical scale;

- pull the lever (**1**) fig. 110 upwards to release the support plate and, using the lift control lever (**1**) fig. 109, lower the arms until the required position has been reached;

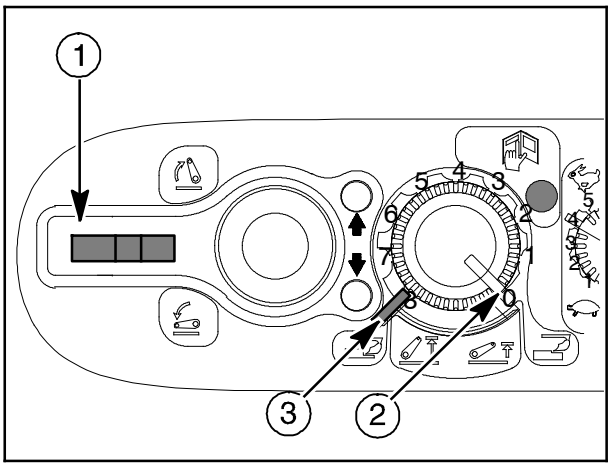
- release the lever (**1**) fig. 110;

- reverse the tractor and place in position in relation to the trailer;

- raise the towing hitch using lever (**1**) fig. 109, hitching is automatic and anchoring hooks (**1**) and (**4**) fig. 111 can be heard to click on to the respective pins (**2**) and (**3**) fig. 111;

- once hitching is completed, lower with lever (**1**) fig. 109 so that the weight on the towing hitch is sustained by anchoring hooks (**1**) and (**4**) fig. 111;

CAUTION: *Lit before starting, check to see that the anchoring hooks (**1**) and (**4**) fig. 111 have engaged in the locked position.*



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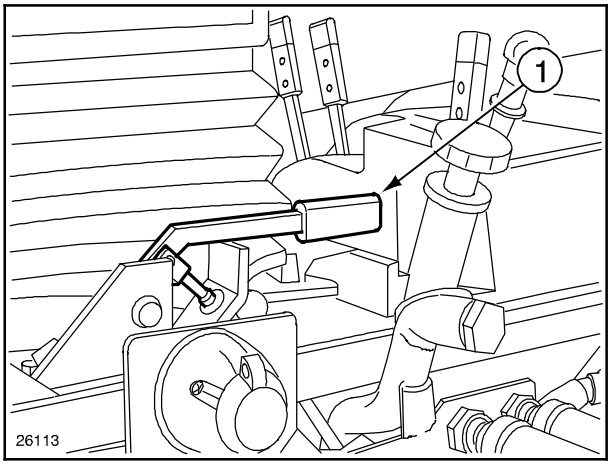

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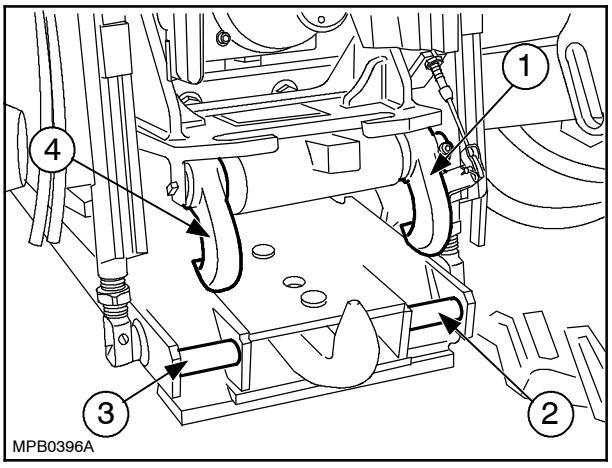

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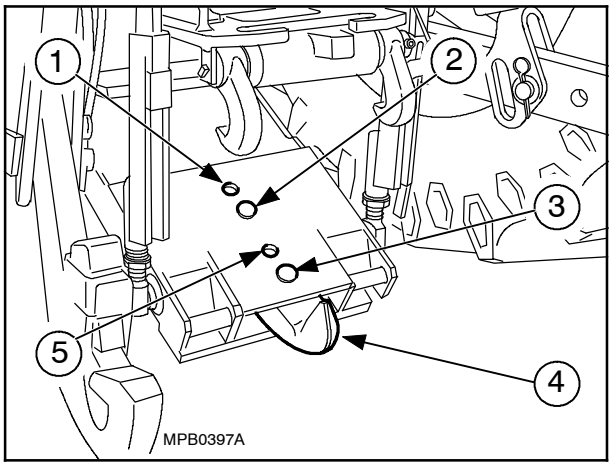


112

Unhitching a trailer

To unhitch the trailer or implement, proceed as follows:

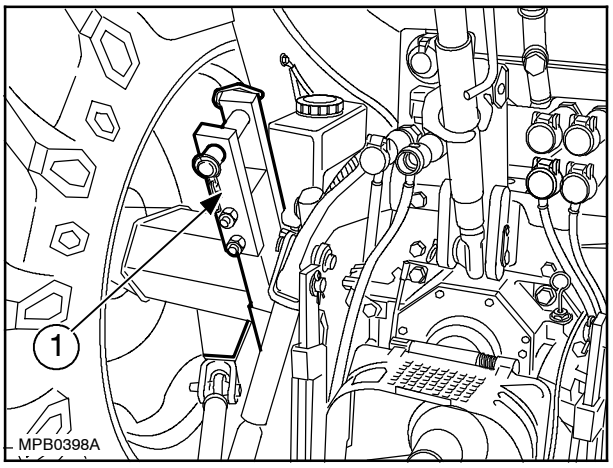
- park the tractor on a level surface;
- raise the trailer to release the weight on the anchoring hooks (**1**) and (**4**) fig. 111;
- pull up lever (**1**) fig. 110 and gradually lower the lever (**1**) fig. 109 to lower the towing hitch and to unhitch the trailer.

To switch from the hook-hitching system to the tow bar, proceed as follows:

- lower the towing hitch, as previously described;
- remove securing pins (**2**) and (**3**) fig. 112;
- extract the hitch (**1**) fig. 113, and fit the bar (**2**) fig. 113, re-inserting the securing pins in the holes.

The tow bar can be positioned at two different distances from the PTO, securing it in the pair of holes (**1**) - (**5**) or (**2**) - (**3**) fig. 112.

When towing equipment that exerts high static loads (two-wheeled trailers, etc. always use the tow bar in the least protruding position.



113

CAUTION: *When towing implements make sure that the total weight on the front axle does not exceed the maximum permissible static load (see page 2-118) or the rear tyres load capacity (see tyre loading index and inflation pressures, page 2-106, 2-108 and 2-109).*

WARNING: *never raise or lower the hitch with the tow bar connected to a trailer.*

FOLD-DOWN ROLL BAR

As an optional, the roll bar can be folded down when working in areas with limited headroom.

WARNING: *Unless strictly necessary,* always *work with the roll bar in the raised position, as shown in fig.*

CAUTION: *If used incorrectly, the tractor may tip over.*

The roll bar can only be lowered in areas with low headroom.

When the tractor is used with the roll bar in the lowered position, the driver is unprotected. Always raise the roll bar after terminating work in areas with low headroom.

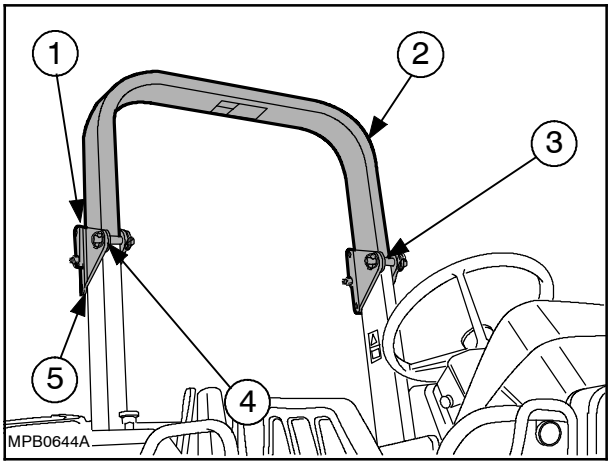
When installed, always use the safety belt when the roll bar is raised.

Never use the safety belt when the roll bar is in the lowered position.

To lower the roll bar, proceed as follows:

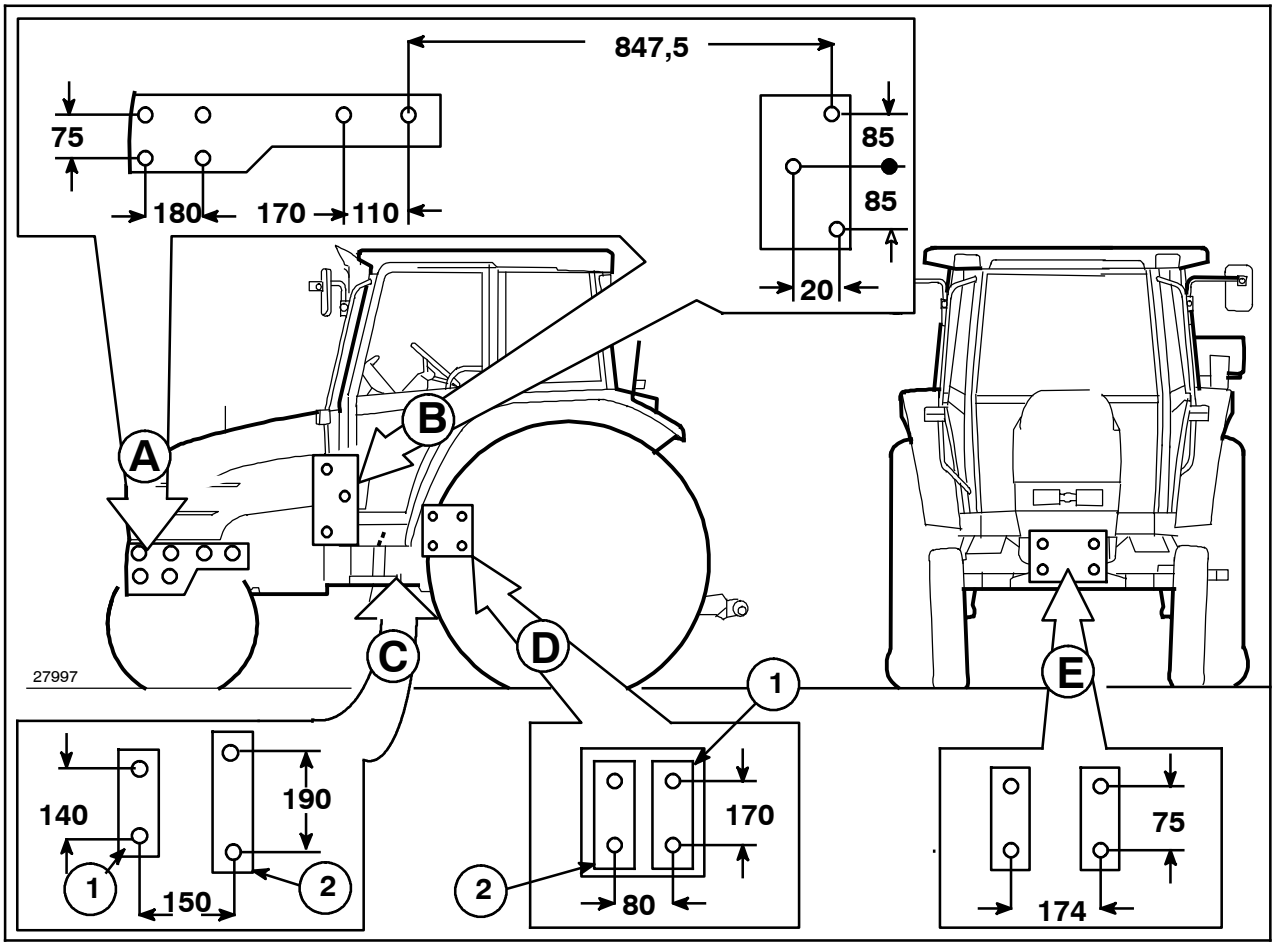
- unhook the pins (**3**) and extract the safety bolts (**4**) on both sides;
- fold the roll bar backwards (**2**);
- allow the holes (**1**) and (**5**) to match, and insert the pins (**4**) in order to secure the roll bar in the folded position.

CAUTION: *Never attach chains or towing cables to the roll bar as this will cause the tractor to tip upwards.*
Always use the relevant towing equipment fitted on the tractor.



114

THREE POINT LINKAGE POINTS



115

Both sides of the tractor are equipped with threaded holes for connecting implements and auxiliary equipment.

The figure shows the free fixing holes on the left hand side of the tractor **A**, **B** and **D** which are identical and symmetrical to the fixing holes on the right hand side.

The holes **C**, are located beneath the clutch box, and holes **E** are in front of it.

Holes			mm
A	**N° 6**	M 20 x 2.5	41 (1.61)
B	**N° 3**	M 20 x 2.5	41 (1.61)
C1	**N° 2**	M 12 x 1.25	20 (0.79)
C2	**N° 2**	M 16 x 1.5	30 (1.18)
D1	**N° 2**	M 16 x 1.5	27 (1.06)
D2	**N° 2**	M 12 x 1.5	20 (0.79)
E	**N° 4**	M 20 x 2.5	41 (1.61)

REMOTE CONTROL AUXILIARY CONTROL VALVES

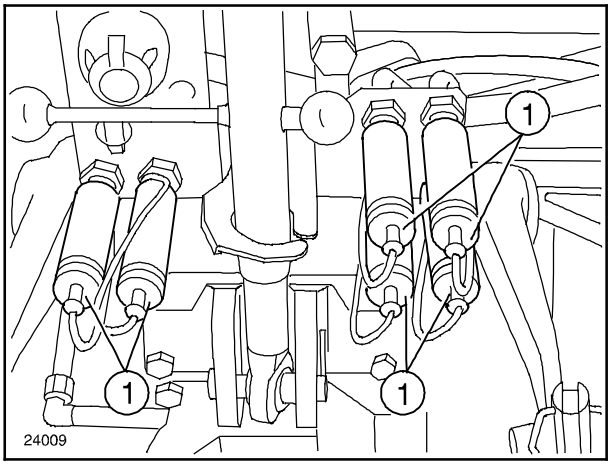
QUICK-FIT COUPLERS - Fig. 116

One, two or three control valves using the same oil as the hydraulic lift circuit to which they are connected can be fitted to your tractor for remote control of single-acting and double-acting cylinders.
Each valve has two 1/2" quick-fitting female "Push-Pull" couplers which can be connected to pressurized male couplers, available as an optional. You can thus connect the control cylinder lines with just one hand.

Push them in to fit them and pull them out to release them from the female couplers, but only after first:

- stopping the engine;
- lowering any implements connected to the lift;
- thoroughly cleaning the two mating parts.

WARNING: *when the female couplers are not being used, protect them with the plastic caps (**1**) fig. 116.*



116

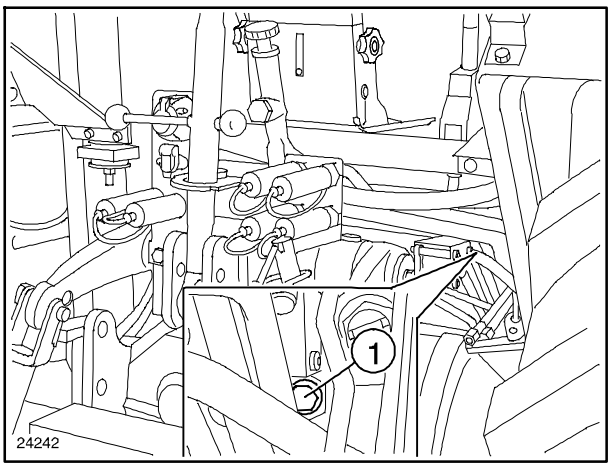
SINGLE/DOUBLE -ACTING SWITCHING - Fig. 117

To switch the control valves to:

- **single-acting**, loosen the screw **1** fig. 117 near the control valve lever pivot, until it stops.
- **Double-acting**, fully tighten the screw **1** fig. 117

When using single-acting, in order to quickly identify the coupler to which the implement is to be connected, actuate the valve lever and observe the two lines to which the couplers are connected: the line carrying the oil should move.

For greater safety, check that the line to which the implement is connected using single-acting, is the line on the valve body connected furthest from the change-over screw.



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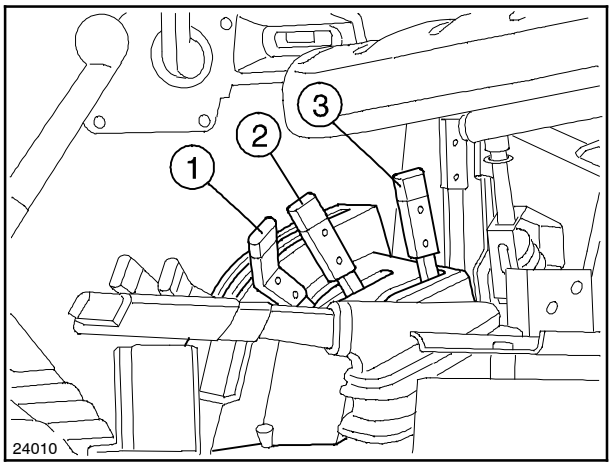

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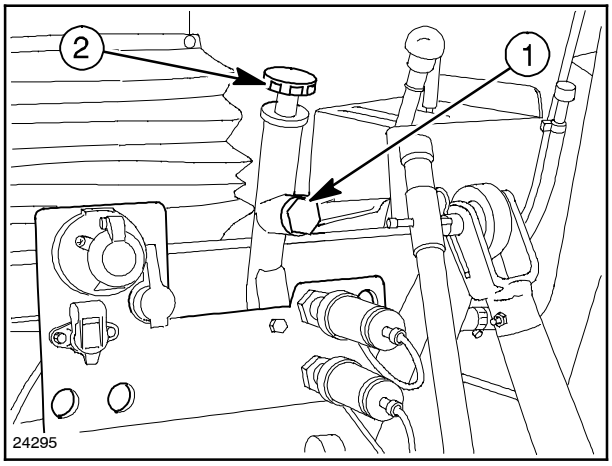


119

1, 2, 3. Control valve levers for single or double-acting cylinders - Fig. 118

The control levers can be in two positions, as well as the central neutral position:

— forward = down;

— backward = up.

CONTROL VALVES WITH AUTOMATIC RELEASE

Automatic release valves are provided with a mechanical detent, which holds the control lever in the up, or down position, as well as an automatic lever release mechanism when the implement reaches the travel limit.

When a single-acting valve is used, the automatic release mechanism works only when lifting.

When the implement has reached the desired position, disconnect the valve lever from the detent by hand, moving it to its neutral position.

CONTROL VALVES WITH FLOAT SETTING

The tractor can be fitted with float setting valves for implements that require this function.

To select the float setting, push the relevant valve lever fully forward, past the first detent, and then push fully forward.
A mechanical detent will keep the lever engaged in the float setting.
To release the control lever from the float setting, pull upward to return it to the neutral position.

AUXILIARY IMPLEMENTS OIL RAPID DRAINAGE POINT - Fig. 119

For implements fitted with their own hydraulic motor, the oil drainage pipe will need to be connected to the union (**1**). Before starting the hydraulic motor, make sure that the cap (**2**) is securely closed.

WARNING: *when released, all levers automatically return to the neutral position, locking the implement in position.*

CAUTION: *Leaks of pressurized hydraulic fluid can penetrate the skin and cause severe injuries:*

- ***Never*** *use hands to locate a leak - use cardboard or paper.*
- *Switch off the engine and discharge the pressure before connecting or disconnecting pressurized lines.*
- *Tighten all connectors before starting the engine or pressurising the hydraulic system.*

If fluid penetrates the skin, seek medical assistance immediately to prevent serious injury.

DE LUXE REMOTE CONTROL AUXILIARY CONTROL VALVES

QUICK-FIT COUPLERS - Fig. 120

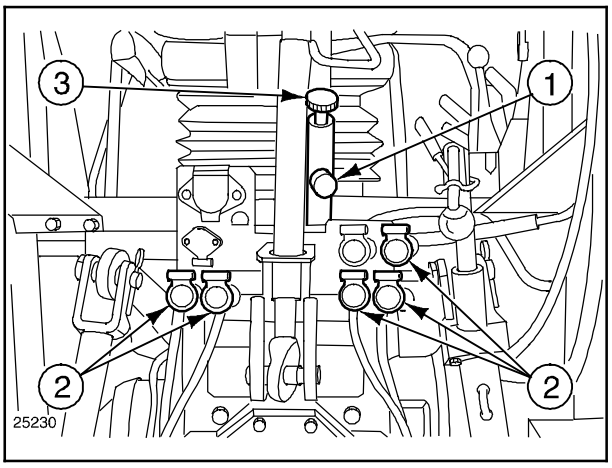
Up to three closed center-type control valves, using the same oil as the hydraulic lift circuit to which they are connected, can be fitted to your tractor for remote control of single-acting and double-acting cylinders.

The control valve body is provided with a command that allows the quantity of oil arriving from the coupler to be varied, and a screw to regulate the pressure of the hydraulic system valve for the automatic release of the control levers.
Each valve has two 1/2" quick-fitting female "Push-Pull" couplers which can be connected to pressurized male couplers, available as an optional. You can thus connect the control cylinder lines with just one hand.

Push them in to fit them and pull them out to release them from the female couplers, but only after first:

- stopping the engine;
- lowering any implements connected to the lift;
- thoroughly cleaning the two mating parts.

WARNING: *when the female couplers are not being used, protect them with the plastic caps (**2**) fig. 120.*



120

NOTE: *Each knob is marked by a coloured sticker corresponding to the colour of the decal placed next to the levers and the quick-fit couplers, to ensure correct lever identification and matching between the lever, quick-fit coupler and oil flow regulation knob.*

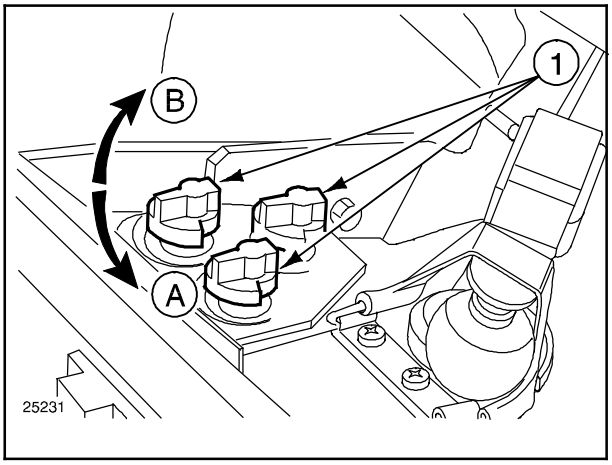
REGULATING THE OIL FLOW - Fig. 121

The oil flow to the quick-fit couplers can be varied using the knobs (**1**) located on the right-hand mudguard, as follows:

- turn the knob (**1**) to the left (direction **B**, tortoise symbol below) to reduce the oil flow to the quick-fit couplers;

- turn the knob (**1**) to the right (direction **A**, hare symbol below) to increase the oil flow to the quick-fit couplers.

The lever is automatically released when the implement reaches the end of travel in either direction.



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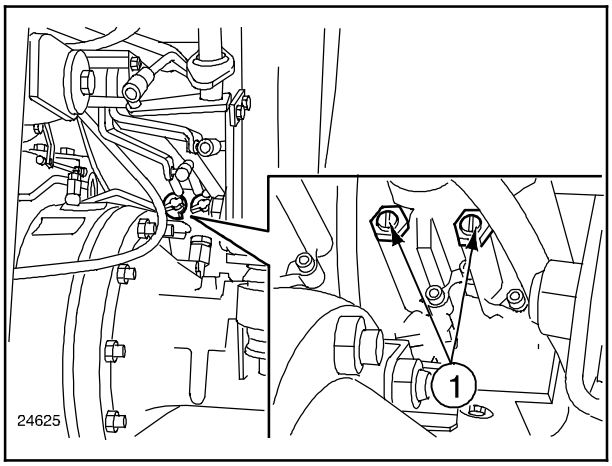


122

REGULATING THE SYSTEM PRESSURE (AUTOMATIC RELEASE)

All the levers are restrained by a mechanical detent; when the implement reaches the desired position, either raised or lowered, release the lever by hand to allow it to return to the neutral position.
Screw (**1**) on the valve body is for varying the detent pressure to obtain automatic release of the control levers to neutral.

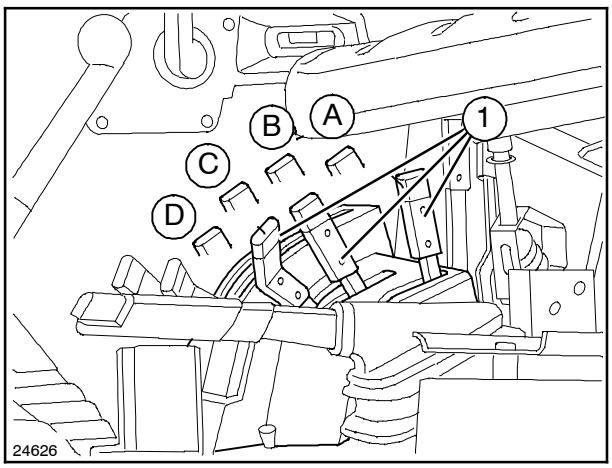
AUXILIARY IMPLEMENTS OIL RAPID DRAINAGE POINT - Fig. 120, Page 2-91

For implements fitted with their own hydraulic motor, the oil drainage pipe will need to be connected to the union (**1**). Before starting the hydraulic motor, make sure that the cap (**3**) is securely closed.

CAUTION: *Leaks of pressurized hydraulic fluid can penetrate the skin and cause severe injuries.*

- ***Never use hands*** *to locate a leak - use cardboard or paper.*
- *Switch off the engine and discharge the pressure before connecting or disconnecting pressurized lines.*
- *Tighten all connectors before starting the engine or pressurising the hydraulic system.*

If fluid penetrates the skin, seek medical assistance immediately to prevent serious injury.



123

CONTROL VALVE LEVERS FOR SINGLE OR DOUBLE ACTING CYLINDERS - Fig. 123

The lever has four positions:

— position **A** = Lever (**1**) back (implement lifts);
— position **B** = Neutral position;
— position **C** = Lever (**1**) forward (implement lowers);
— position **B** = Lever (**1**) fully forward in float setting. In this position the cylinder can extend or retract, allowing the implement to follow the land contours.

JOYSTICK FOR AUXILIARY CONTROL VALVES (optional)

The joystick control is only fitted in the presence of two (or more) control valves, allowing valves N° (1) and (2) fig. 126 to be used at the same time.

The joystick has four positions: raise, neutral, lower and float. The positions are shown on a sticker located on the support (see detail in figure 124).

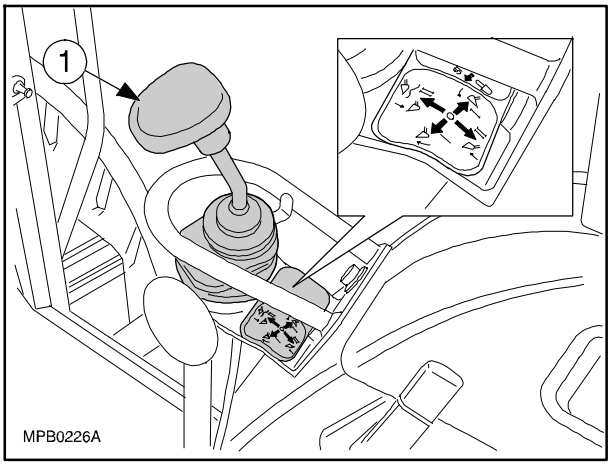
NOTE: *to use the joystick, disengage the safety lock by pulling out lever (**2**) fig. 125.*
With lever (**1**) fig. 124 positioned centrally, move the lever back to raise the implement connected to control valve N° (**2**) fig. 126 or forward to lower. To set float control, push the lever fully forward beyond the lower position.

NOTE: *Float control is only possible with control valve N° (**2**) fig. 126.*

Move lever (**1**) fig. 124 to the right to lower the implement connected to control valve N° (**1**) fig. 126 or to the left to raise.

The joystick enables the simultaneous use of two valves by switching the lever between the N° (**1**) position and the valve N° (**2**) position fig. 126. This function is useful when working with loaders, fertiliser spreaders, combined seed drills/fertiliser spreaders, etc.

NOTE: *Do not hold the lever at either the extended or retracted position when the control valve has reached the travel limit, as this will result in the system operating at maximum pressure. If allowed to continue for long periods of time the oil will overheat, which may lead to problems with hydraulic and drive line components.*



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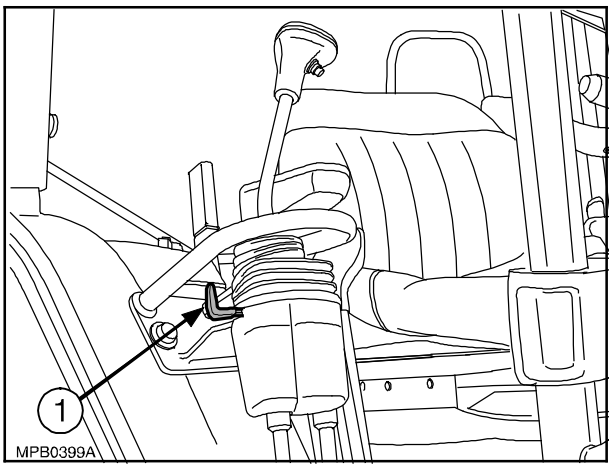

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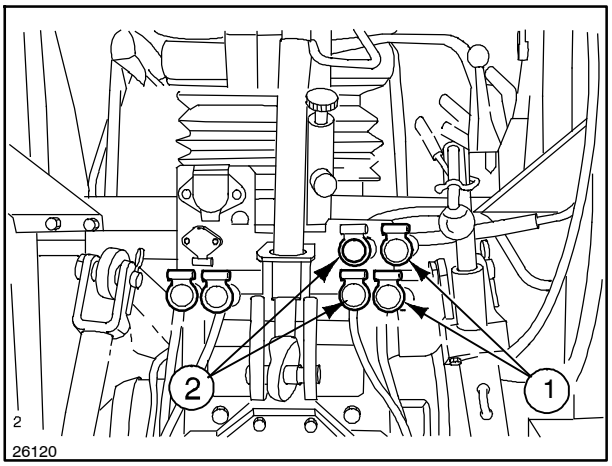
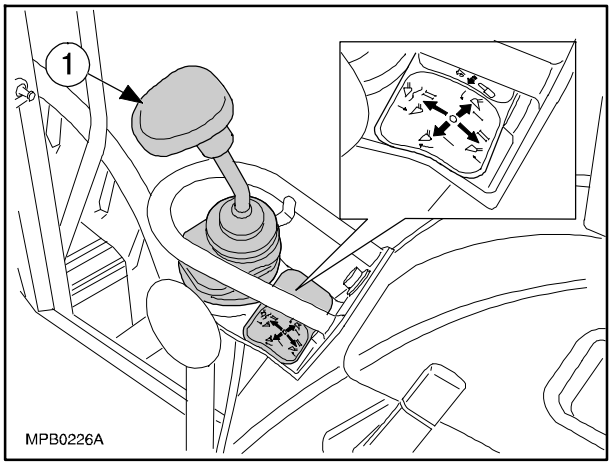


126

Control valve with float setting

A detent holds the control valve lever in the lowering position so that the implement can follow the contours of the land. To reselect the neutral position the lever must be disengaged manually.

NOTE: *When the joystick (**1**) fig. 124 is not being used, push in the safety lock (**2**) fig. 125 to lock the lever in position, so as to prevent it from being operated accidentally.*



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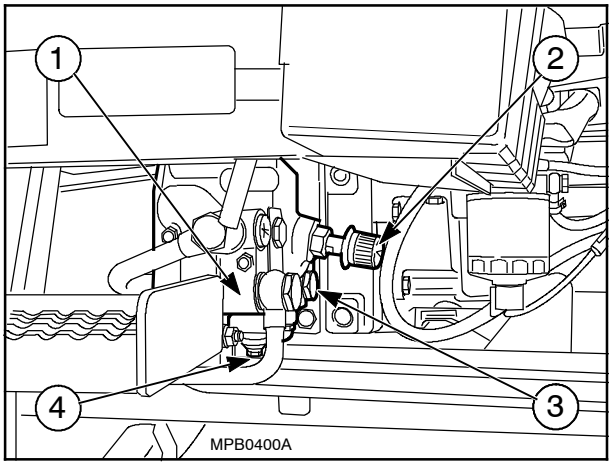


128

LATERAL AUXILIARY CONTROL VALVES - Fig. 128

Two control valves (**1**) and (**3**) without couplers, using the same oil as the hydraulic lift circuit to which they are connected, can be fitted to your tractor for remote control of single-acting and double-acting cylinders.

The control valves are located on the right-hand side of the tractor (under the cab) and are controlled by the joystick (**1**) fig. 127.

Single/double-acting switching - Fig. 128

To switch the control valves to:

- **single-acting**, loosen the screw (**4**) near the control valve lever pivot, until it stops;
- **double-acting**, fully tighten the screw (**4**).

Flow regulator - Fig. 128

Using knob (**2**) the flow rate of control valve (**3**) can be adjusted:

- by turning the knob fully clockwise, the flow rate can be reduced to a minimum of approx. 10 l/min;
- turn the knob fully counter-clockwise, to use the full flow rate, if the control valve is used independently.

When control valve (**1**) is used independently it can use the full available flow rate.
When both control valves are used, by means of knob (**2**) the flow rate can be adjusted on control valve (**3**); the remainder will be directed to the control valve (**1**) or to the rear, to the control valves and the hydraulic lift.

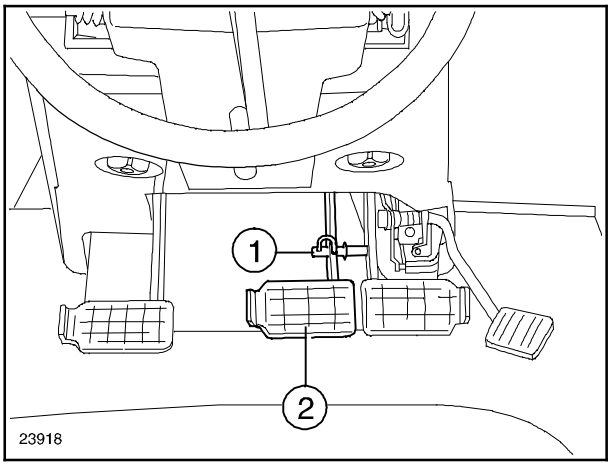
Control valve with automatic release and float setting

The control valve (**1**) fig. 128 is provided with automatic release; control valve (**2**) fig. 128 is always provided with float setting. Operation is described on page 2-90.

CONTROL VALVE FOR TRAILER HYDRAULIC BRAKES
(not available on all markets)

CAUTION: *To use the hydraulic trailer braking system correctly, follow the instructions below. In addition to the correct operation of the braking system, these instructions will also help to avoid hazard situations, which may cause injuries to persons or damage to property.*

DANGER: *To brake both the tractor and the trailer simultaneously, always connect the pedals with pin (**1**) fig. 129, as required when driving on roads.*



129

The trailer hydraulic brake control valve is controlled by oil from the tractor brake hydrostatic circuit, pressurized by means of the brake pedals (**2**). The trailer brakes work with the same oil as the hydraulic lift circuit.

TRACTOR-TRAILER COUPLING

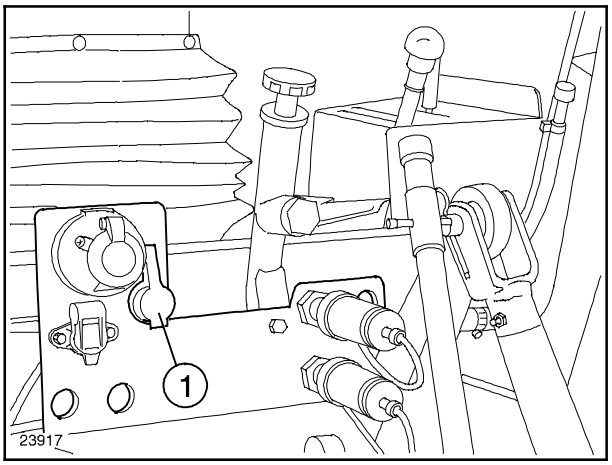
First hitch the trailer towing bracket and then, with the engine switched off, connect the trailer brake line to the coupler (**1**) fig. 130 on the tractor.

CAUTION: *Lit before connecting the trailer, check that the handbrake is on and the tractor is in gear.*

STARTING THE TRACTOR

Start the engine and press the brake pedals to reduce the time taken to release the trailer brake.
Once the indicator light (**1**) has switched off, as illustrated on page 2-96 in this section, the tractor can be moved.

WARNING: *before moving the tractor, make sure that the red warning light (**1**) fig. 131 page 82 on the instrument panel is OFF. If the light does not switch off after the brake pedals have been pressed, have the system checked by your dealer. The light comes on because there is insufficient pressure to release the trailer parking brake.*



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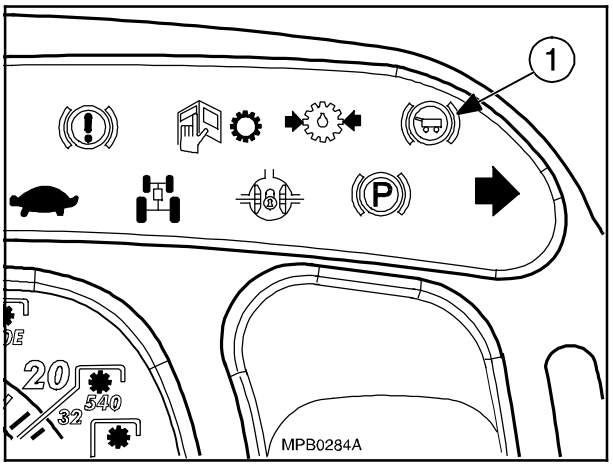


131

STOPPING THE TRACTOR

When stopping the tractor with a trailer connected and the engine running, move the gear lever (**1**) and the range lever (**2**) Fig. 132 to the neutral position before leaving the tractor. At this point, apply the handbrake lever (**3**) fig. 132 to engage the trailer parking brake.

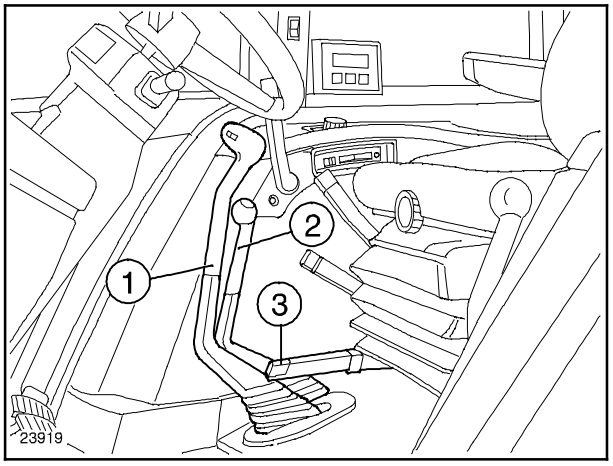
DANGER: *When the tractor is stationary, apply the handbrake and wait for at least* ***10 seconds*** *before switching off the engine, to ensure that the trailer parking brake is engaged.*

UNHITCHING A TRAILER FROM THE TRACTOR

To disconnect the trailer from your tractor, follow the instructions set out below:

- stop the tractor as described above;
- switch off the engine, observing the instructions above;
- disconnect the trailer brake line from the tractor.

If the trailer is on a slope, chock the wheels for greater safety.



132

WARNING: *Should the engine be accidentally switched off when operating with a trailer attached, the red warning light (**1**) fig. 131 on the instrument panel will illuminate, indicating that the trailer parking brake has engaged automatically. To release, follow the instructions in the paragraph entitled* ***starting the tractor****.*

CAUTION: *In the event of irregularities in the operation of the braking system, contact your local dealer immediately in order to have the problem fixed.*

WHEEL TRACK ADJUSTMENT

FRONT WHEEL TRACKS, 2WD

To adjust the front wheel track, proceed as follows:

- raise the front of the tractor using a jack positioned at the centre of the axle;
- release the sliding ends by loosening the two retention screws (**1**) and (**2**) fig. 133 two on each side (tightening torque: 220 Nm - 22.5 kgm);
- adjust the length of the steering struts connected to the two wheels by loosening the fixing screws (**3**) fig. 134 (tightening torque: 39 N·m - 4 kgm);
- seven possible wheel tracks are provided, as shown on page 2-98 fig. 135.

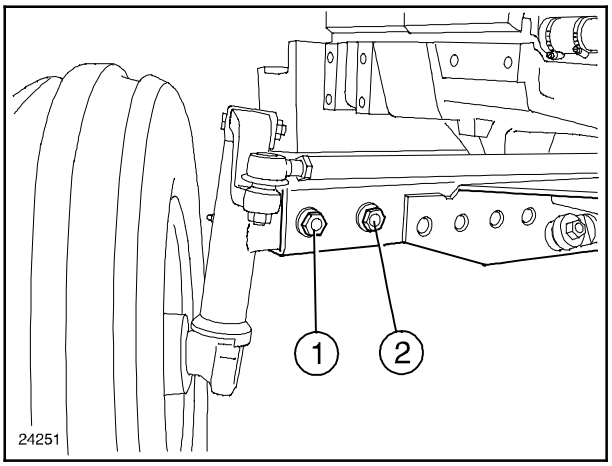
A larger track (maximum track) can be obtained by reversing the wheels on their hubs.

Only use the maximum track when absolutely necessary.

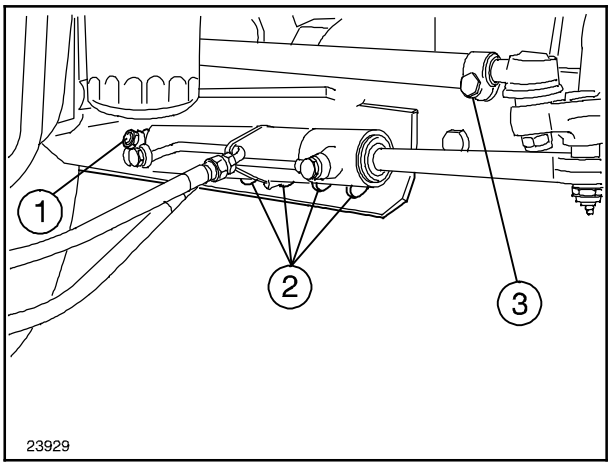
The tightening torque of the wheel-hub locknuts is 115 Nm (11.7 kgm).

WARNING: *Lit as the tractor is fitted with hydrostatic steering, proceed as described above for the left-hand wheel. For the right-hand wheel, after having released the sliding end of the axle, the internal angle of the hydraulic cylinder must be suitably adjusted. Proceed as follows:*

- *loosen the cylinder hose connectors;*
- *make sure the screw* (**3**) remains loose;
- *insert the angle adjuster pin (**1**) fig. 134 in one of the corresponding holes (**2**) fig. 134.*
- *tighten the nut on the pin (tightening torque: 294 Nm - 30 kgm).*
- *tighten the screw* (**3**) *fig. 134 (tightening torque 39 Nm - 4 kgm).*
- *make sure that the hoses are not twisted and tighten the connectors.*

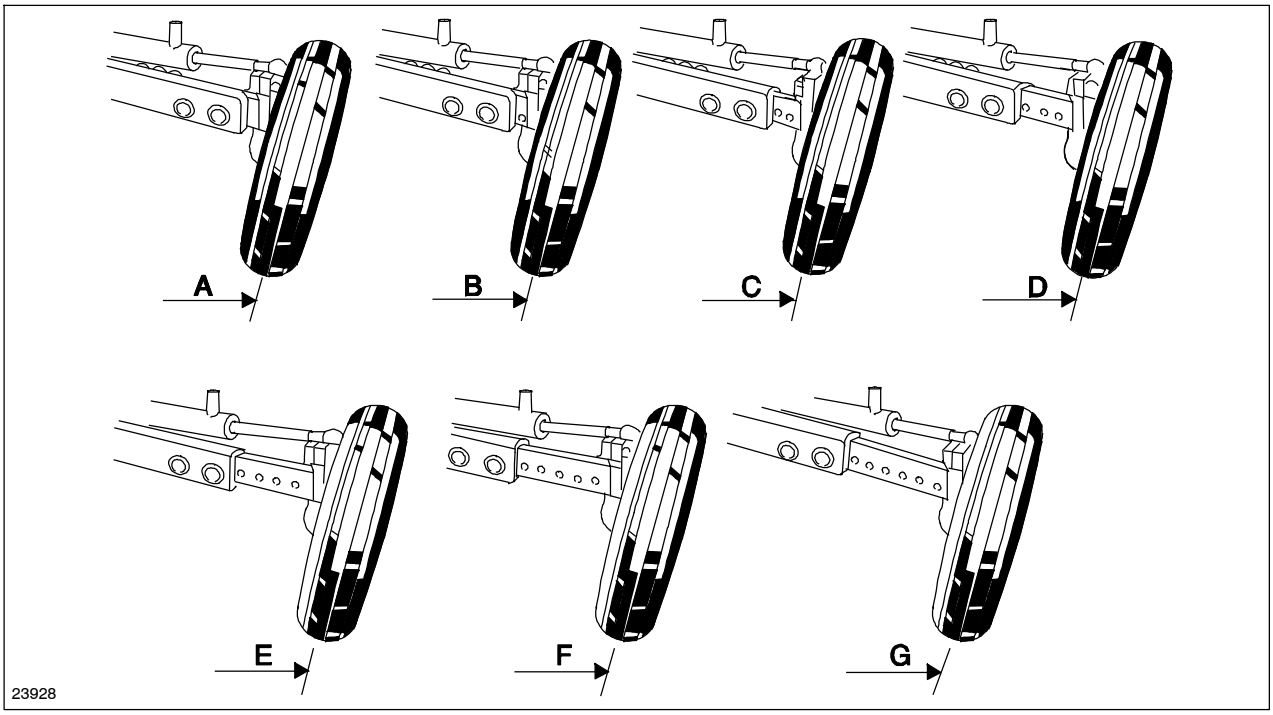


133



134

Front 2WD wheel tracks diagram



135

Models	Tyres	Std. wheel track	Wheel tracks mm (inches)							
			A	B	C	D	E	F	G	H
TL70	6..00-16	1507 (59.33)	1407 (55.39)	1507 (59.33)	1607 (63.27)	1707 (67.20)	1807 (71.14)	1907 (75.08)	2007 (79.02)	2175 (85.63)
	7.50-16	1524 (60)	1424 (56.06)	1524 (60)	1624 (63.94)	1724 (67.87)	1824 (71.81)	1924 (79.68)	2024 (79.68)	2157 (84.92)
TL80 TL90 TL100	7.50-16									
	7.50-18									
	7.50-20									
	9.00-16	1615 (63.58)	1515 (59.65)	1615 (63.58)	1715 (67.52)	1815 (71.46)	1915 (73.39)	2015 (79.33)	2115 (83.27)	-
	10.00-16									

9.00 -16 and 10.00 -16 tyres are fitted with the rim facing outwards. For all other tyres, the maximum track **H** can be obtained by turning the rim to face outwards, as shown in the table.

WHEEL TRACK ADJUSTMENT FRONT 2WD AND REAR 2/4WD

The front wheels can be fitted with the concave surface of the disk facing inwards or outwards (see figure 136).
Each of these two disk positions provides a different track, as shown on pages 2-101 and 2-102, fig. 140 and 141.

When adjusting the wheel track, ensure that the points of the tyre treads are still facing in the direction of forward travel, indicated by an arrow on the tyre walls.

Always check that the front and rear wheels are symmetrically aligned in relation to the longitudinal axis of the tractor.

4WD front wheels

The tightening torque is 255 Nm (26 kgm) for the hub disk locknuts, and (26 kgm), 245 Nm (25 kgm) for the rim disk locknuts.

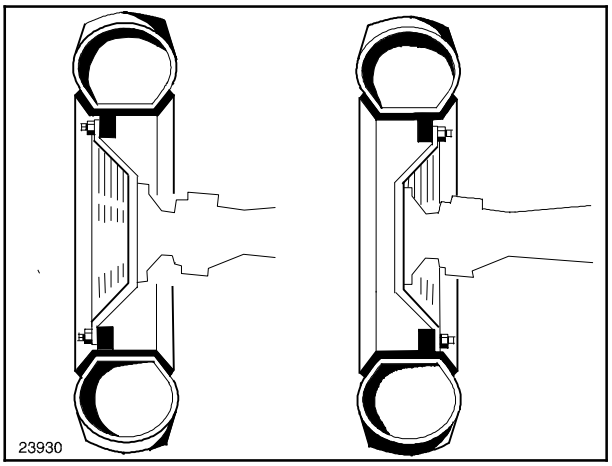
2/4WD rear wheels

The tightening torque is 255 Nm (26 kgm) for the hub disk locknuts, and 245 Nm (25 kgm) for the rim disk locknuts).

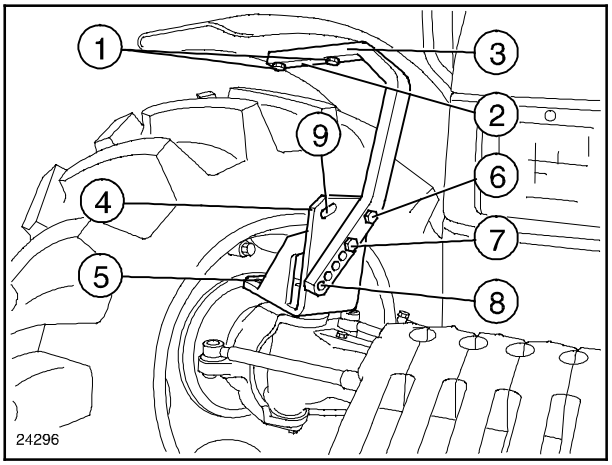
Always make sure that the front and rear wheels are symmetrically aligned in relation to the longitudinal axis of the tractor.

WARNING: *Select the appropriate rear track before changing the front track.*

DANGER: *When removing the wheels, proceed with extreme caution. Use a suitable hoist and specified equipment to move heavy parts.*



136



137

4WD FRONT MUDGUARDS - Fig. 137 (optional)

The following adjustments can be made to the front mudguards to suit the tyres and track settings:

Horizontal position:

- loosen screws (**1**) and attach to the holes (**2**) on the support (**3**);

or:

- fix base (**4**) on support (**3**) to holes (**5**).

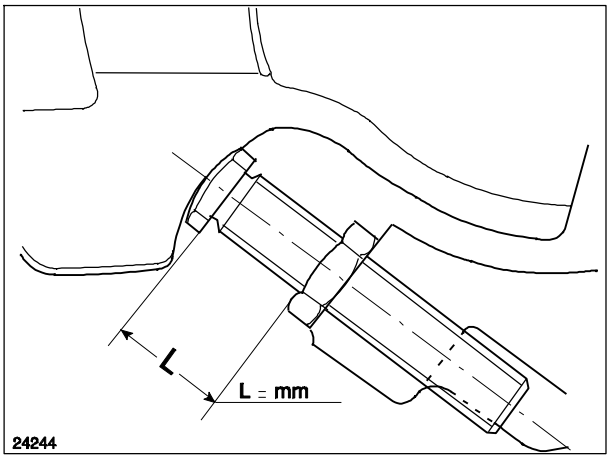
Vertical position:

- loosen screws (**6**) and (**7**) and adjust the height, attaching the mudguard to the holes (**8**).

Rotation:

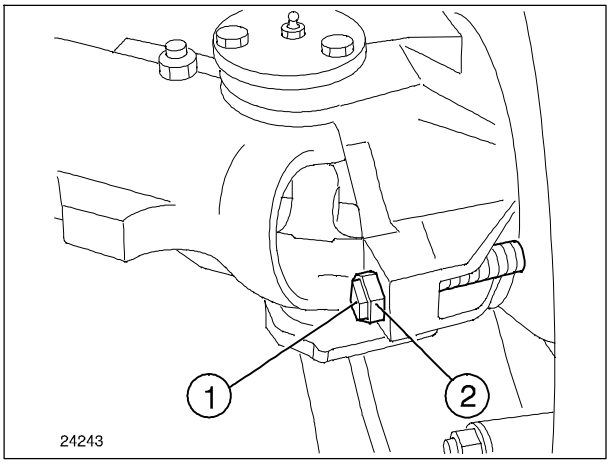
- loosen screw (**7**), remove screw (**6**) and insert in one of the two slots (**9**).

STEERING ANGLE ADJUSTMENT



138

NOTE: *After adjusting the steering angle, make sure that when the wheels are fully locked, there is at least a 0.78 in (20 mm) clearance between the tractor body and the tyre or the mudguard (if fitted).*



139

After adjusting the steering angle, make sure that when the wheels are fully locked, there is at least a 0.78 in. (20 mm) clearance between the tyre or the mudguard and the tractor body, e.g.: deep ploughing when entering and leaving the furrow.

To avoid this problem the axle is provided with a steering angle limiting screw (**1**) that can be adjusted to adapt the steering angle to the track being used.

To adjust the steering angle, proceed as follows:

- turn the wheels;
- adjust the protrusion of screw (**1**) as indicated in the table;
- tighten the screw (**1**) with the lock nut (**2**).

To obtain the optimum steering angle, refer to the tables below.

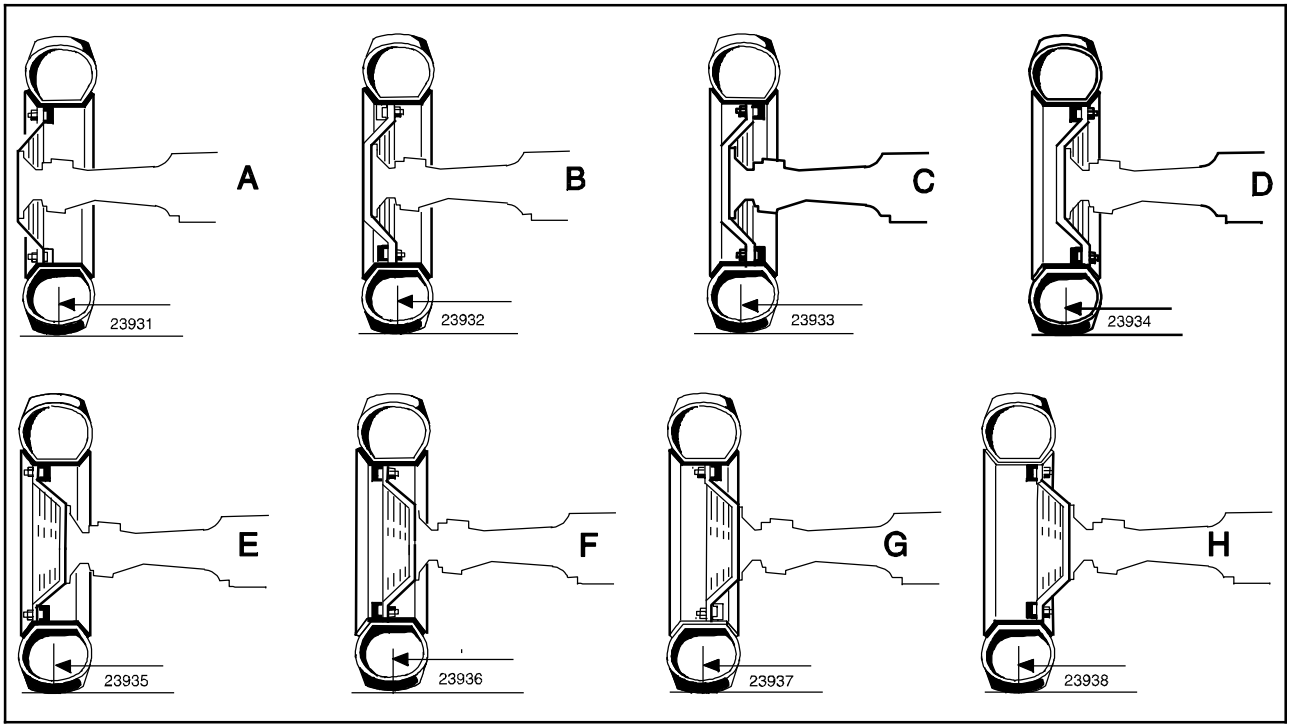
Steering angles (models TL70 and TL80 4WD)

Steering angles	L	
	mm	inches
25°	57	2.24
30°	47	1.85
35°	37	1.46
40°	28	1.10
45°	19	0.75
50°	9	0.35
55°	0	0

Steering angles (models TL90 and TL100 4WD)

Steering angles	L	
	mm	inches
25°	63	2.48
30°	53	2.09
35°	42	1.65
40°	32	1.26
45°	21	0.83
50°	11	0.43
55°	0	0

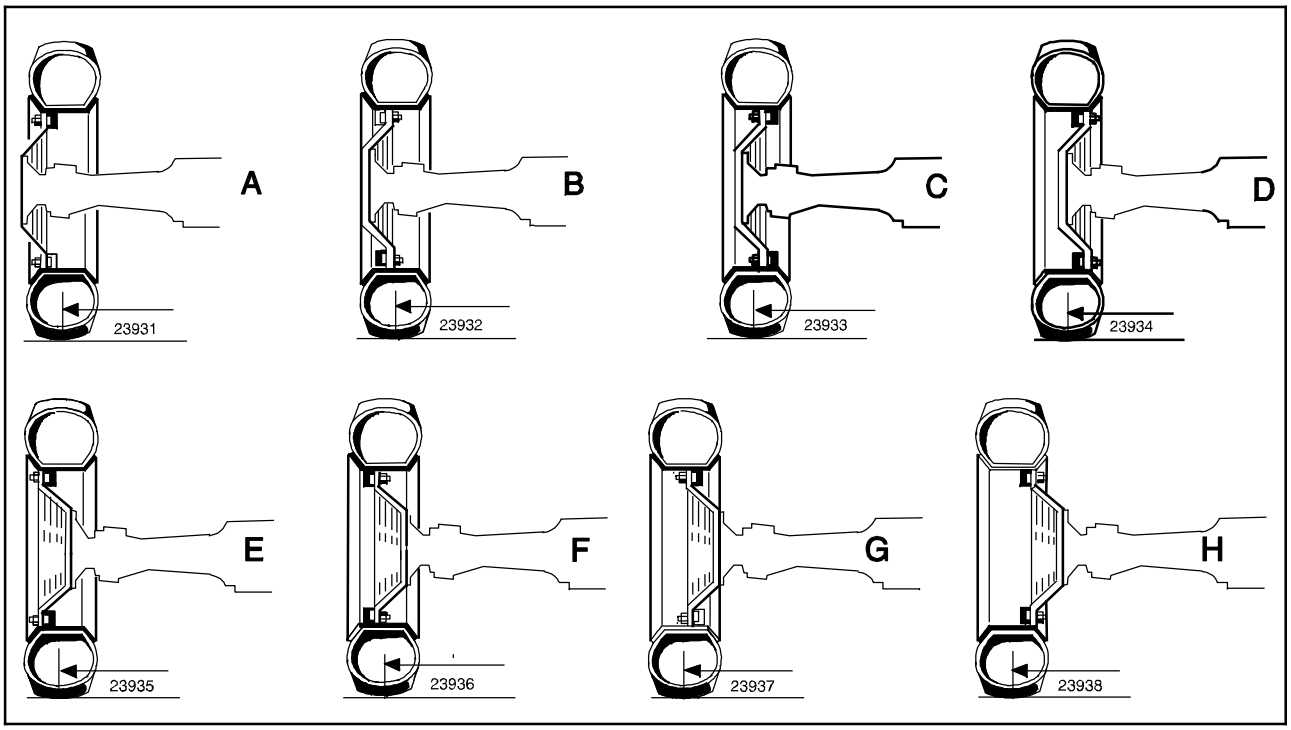
FRONT 4WD WHEEL TRACKS DIAGRAM



140

Models	Tyres	Std. Wheel track	Wheel track mm (inches)							
			A	B	C	D	E	F	G	H
TL70	11.2R-24	1613 (63.50)	1305 (51.38)	1412 (55.59)	1506 (59.29)	1613 (63.50)	1705 (67.13)	1812 (71.34)	1906 (75.04)	2104 (82.83)
	360/70R-20	1445 (56.89) (56.89)	1445 (56.89)	1545 (60.83)	1643 (64.69)	1743 (68.62)	1577 (62.09)	1677 (66.02)	1775 (69.88)	1875 (73.82)
TL70 TL80	12.4R-24	1613 (63.50)	1305 (51.38)	1412 (55.59)	1506 (59.29)	1613 (63.50)	1705 (67.13)	1812 (71.34)	1906 (75.04)	2104 (82.83)
	360/70R-24									
TL80	11.2R-28	1614 (63.54)	1301 (51.22)	1409 (55.47)	1506 (59.29)	1614 (63.54)	1701 (66.97)	1809 (71.22)	1907 (75.08)	2014 (79.29)
	380/70R-24	1613 (63.50)	1304 (51.34)	1411 (55.55)	1505 (59.25)	1613 (63.50)	1704 (67.09)	1811 (71.30)	1905 (75.00)	2013 (79.25)
	13.6-24									
TL80 TL90	11.2R-24	1613 (63.50)	1305 (51.38)	1412 (55.59)	1506 (59.29)	1613 (63.50)	1705 (67.13)	1812 (71.34)	1906 (75.04)	2104 (82.83)
TL90 TL100	380/70R-24	1715 (67.52)	1405 (55.31)	1514 (59.61)	1608 (63.31)	1715 (67.52)	1805 (71.06)	1913 (75.31)	2007 (79.02)	2115 (83.27)
	440/65R-24									
	13.6R-24									
	11.2R-28	1716 (67.56)	1403 (55.24)	1511 (59.49)	1609 (63.35)	1716 (67.56)	1803 (70.98)	1911 (75.23)	2009 (79.09)	2116 (83.31)
	12.4R-24	1715 (67.52)	1406 (55.35)	1513 (59.57)	1608 (63.31)	1715 (67.52)	1806 (71.10)	1914 (75.35)	2008 (79.06)	2115 (83.27)
	360/70-24									
	420/70R-24	1607 (63.27)	1405 (55.31)	1513 (59.57)	1607 (63.27)	1714 (67.48)	1805 (71.06)	1913 (75.31)	2007 (79.02)	2124 (83.62)
	480/65R-24									
	14.9R-24									

REAR 2/4WD WHEEL TRACKS 4WD



141

Models	Tyres	Std. Wheel track	Wheel track mm (inches)							
			A	B	C	D	E	F	G	H
TL70	14.9R-30	1628 (64.09)	-	1517 (59.72)	-	1628 (64.09)	1730 (68.11)	1928 (75.91)	1830 (72.05)	2028 (79.84)
	420/70R-30									
	480/70R-30			1528 (60.16)						
	16.9R-30									
	12.4R-36	1522 (59.92)	-	-	1522 (59.92	1635 (64.37)	1725 (67.91)	1893 (74.53)	1922 (75.67)	1935 (76.18)
	13.6R-36			1438 (56.61)						
TL80	16.9R-30	1628 (64.09)	-	1628 (64.09)	-	1728 (68.03)	1830 (72.05)	2028 (79.84)	1930 (75.98)	2128 (83.78)
TL80	540/65R-34	1732 (68.19)	-	1632 (64.25)	-	1732 (68.19)	1830 (72.05)	2032 (80.00)	1930 (75.98)	2132 (83.94)
	480/70R-34	1632 (64.25)								
	16.9R-34									
TL90	13.6R-38	1612 (63.46)	1434 (56.46)	1545 (60.83)	1612 (63.46)	1726 (67.95)	1834 (72.20)	1947 (76.65)	2012 (79.21)	2126 (83.70)
TL100	18.4R-30	1622 (63.86)	-	-	1622 (63.86)	1735 (68.31)	1825 (71.85)	1993 (78.46)	2022 (79.61)	2135 (84.06)
	520/70R-30	1735 (68.31)								
TL100	15.5R-38	1734 (68.27)	-	1634 (64.33)	1530 (60.24)	1734 (68.27)	1830 (72.05)	2034 (80.08)	1930 (75.98)	2134 (84.02)
	520/70R-34	1732 (68.19)	-	1632 (64.25)	-	1732 (68.19)	1830 (72.05)	2032 (80.00)	1930 (75.98)	2132 (83.94)

TYRES

USE, MAINTENANCE AND REPLACEMENT

■ When changing tyres, select suitable tyres for the actual tractor use, taking account of the recommended combinations on pages 2-110 and 2-111.

■ Do not exceed the permitted load indicated on the tyres.

■ Do not exceed the speeds shown on the tyres, as this both overheats and causes premature tyre wear.

■ Do not fit used tyres when the previous use is unknown.
Ask the manufacturer or a tyre specialist for advice.

■ After fitting tyres, check that the wheel nuts are tight after **62.13 miles (100 km)** or **3 hours** in operation.
Following this, check the tightness on a regular basis.

■ Do not stand tyres on hydrocarbons (oil, diesel, grease, etc.)

■ The tyres fitted on the tractor must be checked periodically, with special care given to:

- the tread, which should wear uniformly;
- the walls, which must not have cracks, bulges or abrasions.

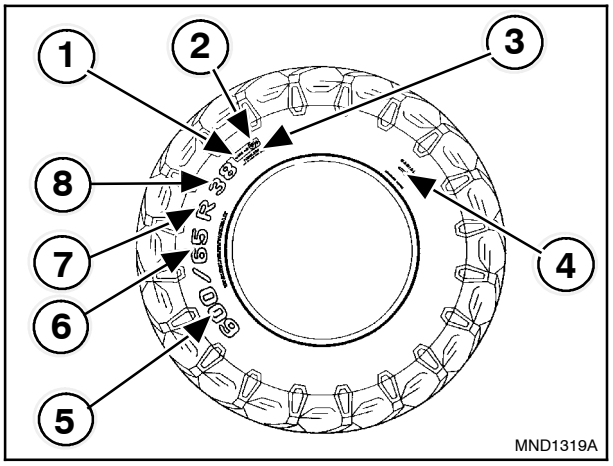
■ Have the tyres checked by a specialist if one or more of the problems mentioned above should occur.

■ Consult an expert if a tyre is subject to violent shocks, even if there are no visible signs of damage.

■ Tyres age, even if used infrequently or not at all. Cracks on the walls, sometimes accompanied by bulges, are a sign of ageing.

■ Tyres fitted on tractors which are not used for extended periods tend to age more rapidly than those used more frequently. In this event, it is advisable to raise the tractor from the ground and protect the tyres from direct sunlight.

WARNING: *Tyres must be changed by skilled personnel, with the correct tools and technical know-how.If tyres are replaced by unskilled personnel, serious physical injuries may result, the tyres may be damaged and the wheel rim may be distorted.*



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Legend fig. 142

To indicate, dimensions, structure and specifications of use of a tyre, the manufacturers have internationally adopted standard abbreviations and numbers.

The drawing shows an example of the marking on a tyre used for agricultural work.

Example of initial **600/65 R 38**.

1	157 154	Load capacity index.
2	A8 B	Speed code. Maximum speed in relation to load corresponding to load index (IC) see page
3	TUBELESS	Tyre without inner tube. Tyres with inner tubes are marked **TUBE TYPE** or left blank.
4	→	The arrow shows the direction of tyre travel.
5	**600**	Nominal cross-section width in mm.
6	**65**	Ratio between height and width of cross-section.
7	**R**	Indicates the radial structure. On a conventional tyre, the R is replaced by a hyphen (-).
8	**38**	Rim keying diameter.

Another example of the marking on a tyre: example **(7.50-16 8 PR)**

7.50	Nominal width of cross-section in inches.
-	Conventional structure.
16	Rim keying diameter.
8 PR	Tyre resistance index or tyre ply number. (This code is normally marked on conventional tyres, whereas radial tyres are marked with the loading capacity).

Correspondence between tyres of different sizes.

Standard series		Metric series /85		Metric series /70		Metric series /65	
STD. MEAS	R.I	STD. /85	R.I	STD. /70	R.I	STD. /65	R.I
7.00–16	365			260/70 R16	360		
7.50–16	375			280/70 R16	375	320/65 R16	385
7.50–18	405			280/7 R18	400	320/65 R18	405
9.5 R20	445			300/70 R20	445		
11.2 R 20	465	280/85 R20	465	320/70 R20	465		
12.4 R 20	490	320/85 R20	490	360/70 R20 380/70 R20	490 510	420/65 R20	490
11.2 R24	515	280/85 R24	515	320/70 R24	515		
12.4 R24	540	320/85 R24	540	360/70 R24	540	420/65 R24	540
13.6 R24	560	340/85 R24	560	380/70 R24	560	440/65 R24	560
14.9 R24	590	380/85 R24	590	420/70 R24	590	480/65 R24	590
16.9 R24	620	420/85 R24	620	480/70 R24	620	540/65 R24	620
16.9 R26	645	420/85 R26	645	480/70 R26	645	540/65 R26	645
11.2 R 28	565	280/85 R28	565	320/70 R28	565		
12.4 R28	590	320/85 R28	590	360/70 R28	590	420/65 R28	590
13.6 R28	610	340/85 R28	610	380/70 R28	610	440/65 R28	610
14.9 R28	640	380/85 R28	640	420/70 R28	640	480/65 R28	640
16.9 R28	670	420/85 R28	670	480/70 R28	670	540/65 R28	670
14.9 R30	665	380/85 R30	665	420/70 R30	665	480/95 R30	665
16.9 R30	695	420/85 R30	695	480/70 R30	695	540/65 R30 600/65R28	695 695
18.4 R30	720	460/85 R30	720	520/70 R30	720	600/65 R30	720
16.9 R34	745	420/85 R34	745	480/70 R34	745	540/65 R34	745
18.4 R34	770	460/85 R34	770	520/70 R34	770	600/65 R34	770
13.6 R38	740	340/85 R38	740	380/70 R38	740		
14.9 R38	765	38/85 R38	765	420/70 R38	765		
16.9 R38	795	420/85 R38	795	480/70 R38	795	540/65 R38	795
18.4 R38	820	420/85 R38	820	520/70 R38	820	600/65 R38	820
20.8 R38	855	520/85 R38	855	580/70 R38	855	650/65 R38	855
18.4 R42	870	460/85 R42	855	520/70 R42	855	600/65 R42	870
20.8 R42	905	520/85 R42	905	580/70 R42 710/70 R38	905 905	650/65 R42	905

LOADING INFORMATION

The loading index (IC) is a numerical index indicating the maximum permissible load on the tyre, for the speed indicated by the relevant speed code, under the conditions specified by the manufacturer.

Loading information per wheel							
IC	*kg*	***IC***	*kg*	***IC***	*kg*	***IC***	*kg*
100	800	**120**	1.400	**140**	2.500	**160**	4.500
101	825	**121**	1.450	**141**	2.575	**161**	4.625
102	850	**122**	1.500	**142**	2.650	**162**	4.750
103	875	**123**	1.550	**143**	2.725	**163**	4.875
104	900	**124**	1.600	**144**	2.800	**164**	5.000
105	925	**125**	1.650	**145**	2.900	**165**	5.150
106	950	**126**	1.700	**146**	3.000	**166**	5.300
107	975	**127**	1.750	**147**	3.075	**167**	5.450
108	1.000	**128**	1.800	**148**	3.150	**168**	5.600
109	1.030	**129**	1.850	**149**	3.250	**169**	5.800
110	1.060	**130**	1.900	**150**	3.350	**170**	6.000
111	1.090	**131**	1.950	**151**	3.450	**171**	6.150
112	1.120	**132**	2.000	**152**	3.550	**172**	6.300
113	1.150	**133**	2.060	**153**	3.650	**173**	6.500
114	1.180	**134**	2.120	**154**	3.750	**174**	6.700
115	1.215	**135**	2.180	**155**	3.875	**175**	6.900
116	1.250	**136**	2.240	**156**	4.000	**176**	7.100
117	1.285	**137**	2.300	**157**	4.125	**177**	7.300
118	1.320	**138**	2.360	**158**	4.250	**178**	7.500
119	1.360	**139**	2.430	**159**	4.375	**179**	7.750

SPEED CODE

The speed code indicates the speed at which the tyre can transport a load corresponding to its loading index, under the conditions specified by the manufacturer:

Speed code		
SYMBOL	***kph***	***mph***
A1	5	8.05
A2	10	16.10
A3	15	24.15
A4	20	32.20
A5	25	40.25
A6	30	48.30
A7	35	56.35
A8	40	64.40
B	50	80.50
C	60	96.60
D	65	104.65

WARNING: *respecting the limits in the tables will ensure that the tyres both perform well and are long-lasting.*
Overloading tyres substantially reduces their service life.

NOTE: *the values in these tables are also marked on the walls of the tyres.*

INFLATION PRESSURES

For safe and long-lasting tyre use, the following instructions must be closely observed.

■ Use the correct pressures for each axle and for the type of use planned.

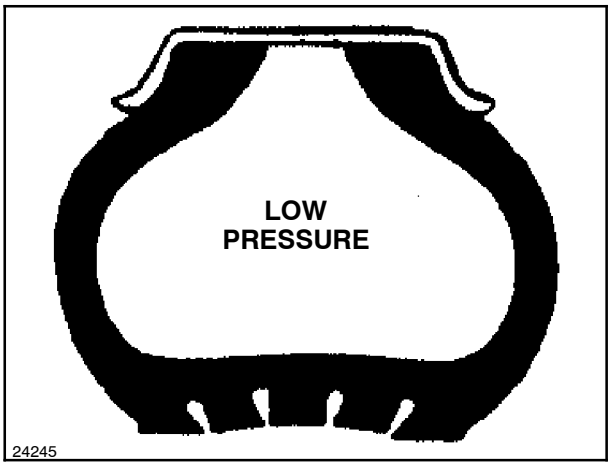
■ Make sure that tyre pressures are not lower than the correct values, to prevent overheating which may lead to;

- tyre wear;
- bead wear;
- internal damage;
- irregular wear and short service life.

■ Do not over-inflate the tyres, as this may lead to damage in the event of impact and, in extreme conditions, the tyre rim may be deformed or the tyre may burst.

■ Check tyre pressures at least every two weeks, especially when liquid ballast is used.
Tyre pressures should only be checked when the tyres are cold as pressures are higher when the tyres are hot from use.
Tyres should be considered to be cold when they have not been used for a period of one hour, or have not covered more than two to three kilometres.
Never reduce tyre pressures when the tyres are hot.

■ When checking tyre pressures, keep the body away from the valve mechanism or cap.



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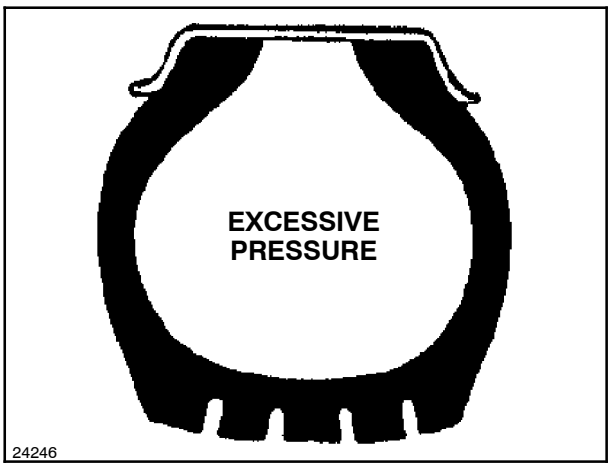

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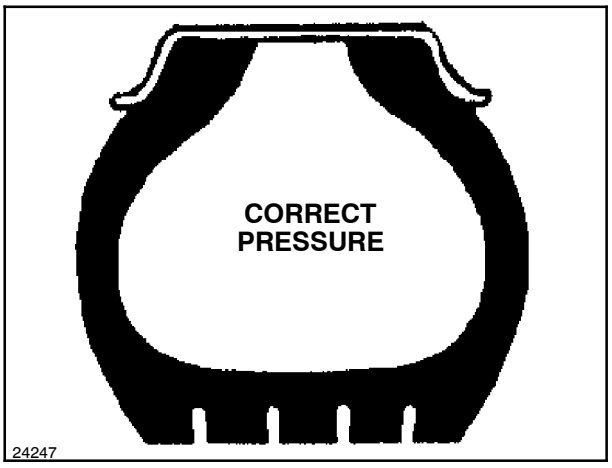

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TYRE DATA AND PRESSURES

2WD FRONT TYRES (X) = AVAILABLE (NA) = NOT AVAILABLE

Tyres	PR	Rim	Models			
	8		TL70	TL80	TL90	TL100
6.00-16	X	W4.5-16	X	NA	NA	NA
7.50-16	X	W5.50-16	X	X	X	X
9.00-16	X	W8.00-16	NA	X	X	X
10.00-16	X		NA	X	X	X
7.50-18	X	W5.50-18	NA	X	X	X
7.50-20	X	W5.50-20	NA	X	X	X

2WD/4WD REAR TYRES

Tyres	Rim	Speed code	MAX pressure (BAR)	Models			
				TL70	TL80	TL90	TL100
14.9R-30	W12-28	A8	1.6	X	NA	NA	NA
12.4R-36	W11-36	A8	1.6	X	NA	NA	NA
13.6R-36		A8	1.6	X	NA	NA	NA
16.9R-30	DWW14-30	A8	1.6	X	X	X	NA
480/70R-30		A8	1.6	X	NA	NA	NA
420/70R-30	DWW13-30	A8	1.6	X	NA	NA	NA
18.4R-30	W15-30	A8	1.6	NA	X	X	NA
520/70R-30		A8	1.6	NA	X	X	X
13.6R-38	DWW12-38	A8	1.6	NA	X	X	X
16.9R-34	DWW15-34	A8	1.6	NA	X	X	X
480/70R-34		A8	1.6	NA	X	X	X
540/65R-34		A8	1.2	NA	X	X	X
18.4R-34	DWW15-34	A8	1.6	NA	NA	X	X
520/70R-34	DWW16-34	A8	1.6	NA	NA	X	X
600/65R-34		A8	1.2	NA	NA	X	X

4WD FRONT TYRES MODELS TL70

Tyres	Rim	Speed code	Loading index	MAX pressure (BAR)
12.4R-20	W9-20	A8	116	1.6 (23.2)
11.2R-24	W10-24	A8	114	1.6 (23.2)
12.4R-24		A8	119	1.6 (23.2)
320/70R-24		A8	116	1.6 (23.2)
360/70R-20	W9-20	A8	120	1.6 (23.2)

4WD FRONT TYRES MODELS TL80, TL90 AND TL100

(1) Only models TL90 and TL100 **(2)** Only models TL80 and TL90

Tyres	Rim	Speed code	Loading index	MAX pressure (BAR)
11.2R-28	W10-28	A8	116	1.6 (23.2)
13.6R-24	W12-24	A8	121	1.6 (23.2)
380/70R-24		A8	125	1.6 (23.2)
440/65R-24		A8 B	122 119	1.4 (20.3)
360/70R-24	W10-24	A8	122	1.6 (23.2)
420/70R-24 (1)	W12-24	A8	130	1.6 (23.2)
480/65R-24 (1)		A8	127	1.2 (17.4)
14.9R-24 (1)		A8	135	1.6 (23.2)
12.4R-24 (2)	W10-24	A8	119	1.6 (23.2)
11.2R-24 (2)	W10-24	A8	114	1.6 (23.2)

TYRE COMBINATIONS

RECOMMENDED COMBINATIONS FOR 2WD MODELS

(X) = AVAILABLE **(NA) = NOT AVAILABLE**

Front tyres	Rear tyres	Models			
		TL70	TL80	TL90	TL100
6.00-16	14.9R-30	X	NA	NA	NA
6.00-16	420/70R-30	X	NA	NA	NA
7.50-16	16.9R-30	X	X	NA	NA
7.50-16	480/70R-30	X	NA	NA	NA
7.50-16	12.4R-36	X	NA	NA	NA
7.50-16	13.6R-36	X	NA	NA	NA
7.50-20	18.4R-34	NA	NA	X	X
7.50-20	16.9R-34	NA	X	X	NA
9.00-16	18.4R-30	NA	X	NA	NA
7.50-16	16.9R-34	NA	X	NA	NA
7.50-18	13.6R-38	NA	X	X	X
7.50-16	18.4R-30	NA	X	X	NA
9.00-16	520/70R-30	NA	X	X	X
9.00-16	540/65R-34	NA	X	X	X
9.00-16	480/70R-34	NA	X	X	X
10.00-16	18.4R-34	NA	NA	X	X
10.00-16	520/70R-34	NA	NA	X	X
10.00-16	480/70R-34	NA	X	X	X
10.00-16	540/65R-34	NA	X	X	X
10.00-16	600/65R-34	NA	NA	X	X

SPECIFIED COMBINATIONS FOR 4WD MODELS

(X) = AVAILABLE (NA) = NOT AVAILABLE

NOTE - **(*)** Grass-land version combination.

Front tyres	Rear tyres	Models			
		TL70	TL80	TL90	TL100
12.4 R-20	14.9R-30	X	NA	NA	NA
11.2R-24	12.4R-36	X	NA	NA	NA
11.2R-24	16.9R-30	X	X	X	NA
12.4 R-24	13.6R-36	X	NA	NA	NA
14.9LR-20 (*)	16.9R-30 (*)	X	NA	NA	NA
360/70 R-20	420/70 R-30	X	NA	NA	NA
320/70 R-24	480/70R-30	X	NA	NA	NA
12.4R-24	18.4R-30	NA	X	X	NA
13.6R-24	16.9R-34	NA	X	X	X
11.2R-28	13.6R-38	NA	X	X	X
11.2R-28	16.9R-34	NA	X	X	NA
425/75 R-20 (*)	18.4R-30 (*)	NA	X	X	X
360/70 R-24	520/70 R-30	NA	X	X	X
380/70 R-24	480/70 R-34	NA	X	X	X
440/65 R-24	540/65 R-34	NA	X	X	X
14.9R-24	18.4R-34	NA	NA	X	X
420/70R-24	520/70R34	NA	NA	X	X
480/65R-24	600/65R-34	NA	NA	X	X

TYRE INFLATION PRESSURES FOR FOUR-WHEEL DRIVE MODELS

NOTE- The inflation pressures are expressed in bar (kg/cm^2)

MODELS TL70 **ND** = Not available

Tyre combinations		Tyre pressures 30/40 km/h (18.6 and 24.8 mph)							
Front	Rear	PIRELLI		GOOD YEAR		MICHELIN		KLEBER	
		Front	Rear	Front	Rear	Front	Rear	Front	Rear
12.4 R-20	14.9R-30	1.8 (26.1)	1.2 (17.4)	1.4 (20.3)	1.4 (20.3)	NA		1.4 (20.3)	1.4 (20.3)
11.2R-24	12.4R-36	1.4 (20.3)	1.4 (20.3)	NA		1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)
11.2R-24	16.9R-30	NA		1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)
12.4 R-24	13.6R-36	1.4 (20.3)	1.4 (20.3)	NA		NA		1.0 (14.5)	1.4 (20.3)
14.9LR-20	16.9R-30	NA		NA		NA		1.8 (26.1)	1.2 (17.4)
320/70R-24	480/70R-30	1.2 (17.4)	1.2 (17.4)	1.2 (17.4)	1.2 (17.4)	NA		1.2 (17.4)	1.2 (17.4)
360/70R-20	420/70R-30	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.2 (17.4)	NA		NA	

TYRE INFLATION PRESSURES FOR FOUR-WHEEL DRIVE MODELS

MODEL TL80 CV

NA = Not available

Tyre combinations		Tyre pressures 30 km/h (18.6 mph)							
Rear	Front	PIRELLI		GOOD YEAR		MICHELIN		KLEBER	
		Front	Rear	Front	Rear	Front	Rear	Front	Rear
11.2R-24	16.9R-30	2.0 (29.0)	1.0 (14.5)	1.5 (21.8)	1.4 (20.3)	1.5 (21.8)	1.4 (20.3)	1.5 (21.8)	1.5 (21.8)
12.4R-24	18.4R-30	NA		1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)
13.6R-24	16.9R-34	1.6 (23.2)	1.4 (20.3)	1.2 (17.4)	1.6 (23.2)	1.2 (17.4)	1.2 (17.4)	1.4 (20.3)	1.4 (20.3)
11.2R-28	13.6R-38	1.4 (20.3)	1.4 (20.3)	NA		1.2 (17.4)	1.4 (20.3)	NA	
11.2R-28	16.9R-34	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	NA	
425/75 R-20	18.4R-30	NA		NA		1.4 (20.3)	1.2 (17.4)	NA	
360/70 R-24	520/70 R-30	1.4 (20.3)	1.2 (17.4)	1.4 (20.3)	1.2 (17.4)	NA		NA	
380/70 R-24	480/70 R-34	1.2 (17.4)	1.2 (17.4)	1.2 (17.4)	1.2 (17.4)	NA		1.2 (17.4)	1.2 (17.4)
440/65 R-24	540/65 R-34	NA		1.0 (14.5)	1.0 (14.5)	1.2 (17.4)	1.2 (17.4)	NA	
Tyre combinations		**Tyre pressures 40 km/h (24.8 mph)**							
11.2R-24	16.9R-30	1.8 (26.1)	1.2 (17.4)	NA		1.5 (21.8)	1.4 (20.3)	1.5 (21.8)	1.5 (21.8)
12.4R-24	18.4R-30	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	NA		1.4 (20.3)	1.4 (20.3)
13.6R-24	16.9R-34	1.4 (20.3)	1.4 (20.3)	NA		NA		1.2 (17.4)	1.6 (23.2)
11.2R-28	13.6R-38	1.0 (14.5)	1.6 (23.2)	NA		NA		NA	
11.2R-28	16.9R-34	1.4 (20.3)	1.4 (20.3)	NA		NA		NA	
425/75 R-20	18.4R-30	NA		NA		1.4 (20.3)	1.2 (17.4)	NA	
360/70 R-24	520/70 R-30	1.0 (14.5)	1.6 (23.2)	1.4 (20.3)	1.2 (17.4)	NA		NA	
380/70 R-24	480/70 R-34	1.2 (17.4)	1.6 (23.2)	1.2 (17.4)	1.2 (17.4)	NA		NA	
440/65 R-24	540/65 R-34	NA		1.0 (14.5)	1.0 (14.5)	NA		NA	

MODELS TL90 AND TL100

(*) Only for model **TL90** **ND** = Not available

Tyre combinations		Tyre pressures 30/40 km/h (18.6 and 24.8 mph)							
Front	Rear	PIRELLI		GOOD YEAR		MICHELIN		KLEBER	
		Front	Rear	Front	Rear	Front	Rear	Front	Rear
425/75R-20	18.4R-30	NA		NA		1.6 (23.2)	1.0 (14.5)	NA	
12.4R-24 (*)	18.4R-30 (*)	NA		2.0 (29.0)	1.2 (17.4)	1.4 (20.3)	1.4 (20.3)	1.6 (23.2)	1.6 (23.2)
13.6R-24	16.9R-34	1.8 (26.1)	1.2 (17.4)	1.5 (21.8)	1.5 (21.8)	1.4 (20.3)	1.4 (20.3)	1.6 (23.2)	1.6 (23.2)
11.2R-28	13.6R-38	1.2 (17.4)	1.6 (23.2)	1.2 (17.4)	1.6 (23.2)	1.4 (20.3)	1.4 (20.3)	NA	
11.2R-28	16.9R-34	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.0 (14.5)	1.6 (23.2)
360/70 R-24	520/70 R-30	1.6 (23.2)	1.2 (17.4)	1.4 (20.3)	1.2 (17.4)	NA		NA	
380/70 R-24	480/70 R-34	1.2 (17.4)	1.4 (20.3)	1.2 (17.4)	1.4 (20.3)	NA		NA	
440/65 R-24	540/65 R-34	NA		1.0 (14.5)	1.0 (14.5)	1.2 (17.4)	1.2 (17.4)	NA	
420/70 R-24	520/70 R-34	1.2 (17.4)	1.2 (17.4)	1.2 (17.4)	1.2 (17.4)	NA		1.2 (17.4)	1.2 (17.4)
480/65 R-24	600/65 R-34	NA		1.0 (14.5)	1.0 (14.5)	1.2 (17.4)	1.2 (17.4)	NA	
14.9R-24	18.4R-34	1.6 (23.2)	1.2 (17.4)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)	1.4 (20.3)

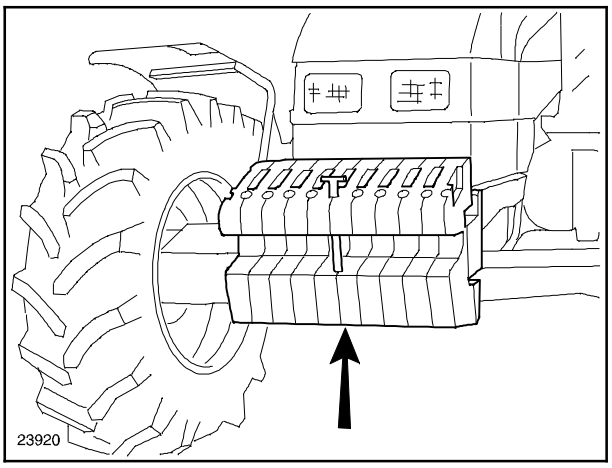
BALLAST

METAL BALLAST

If the tractor requires high traction power, the drive wheels may slip due to insufficient grip on the ground, causing loss of power and speed, increased fuel consumption and premature tyre wear. We therefore advise fitting cast-iron rings as ballast on the drive wheels, or ballasting wheels with cast iron disks or water according to the instructions on pages 2-116 and 2-117. When using very long and heavy implements, which could affect the longitudinal stability of the tractor, ballast the front axle by fitting the appropriate cast-iron counterweights.

Front axle ballasting - Fig. 146

6 or **10** cast iron counterweights with handles, weighing 88 lb (**40 kg**) each, plus 176 lb (**80 kg**) for each support, for a total of 705 lb (**320 kg**) or 1058 lb (**480 kg**).



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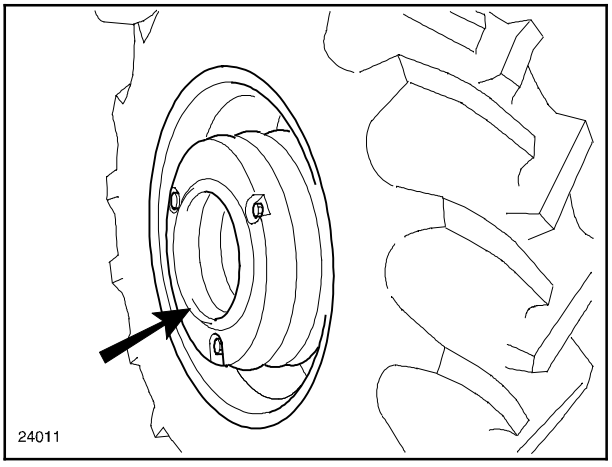
Rear wheels ballast - Fig. 147

With cast iron rings, **4** or **6** rings weighing 111 lb (**50 kg**) each, for a total of 442 lb (**200 kg**) or 663 lb (**300 kg**).



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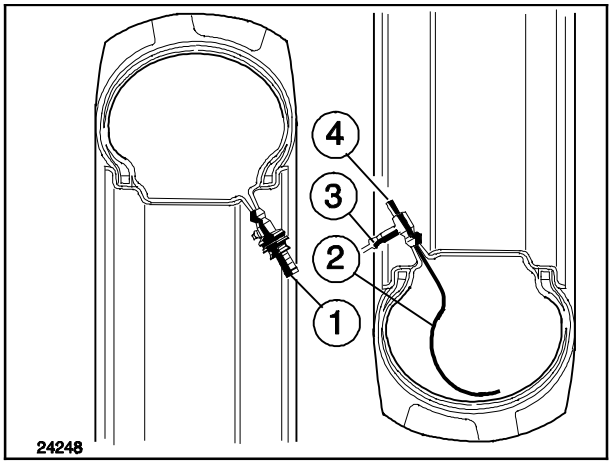
LIQUID BALLAST



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WATER INLET AND OUTLET CONNECTORS - Fig. 148

1. Water inlet point.
2. Water drainage pipe.
3. Airline connector.
4. Water drainage pipe.

Water can be used to ballast the rear tyres if there is no danger of freezing.

FILLING THE TYRES WITH WATER:

- raise the wheel from the ground and position the inflation valve at the highest point;
- loosen the inner element on the valve and wait for the tyre to deflate;
- lower the wheel until the tyre is approx. 30% flat to prevent the weight of the water damaging the inner tube;
- screw the NEW HOLLAND connector (no. **291885**) onto the valve and attach the water pipe to the connector (**1**), remembering to detach the pipe to release air when the tyre begins to inflate;
- when water escapes from the connector (**1**) the tyre is 75% full.
  If you want to introduce less water, or achieve a lower weight, position the wheel so that the valve is lower;
- remove the connector (**1**), tighten the tyre valve and inflate to the specified pressure.

CAUTION: *Lit the water pressure must never exceed 4 bar (kg/cm^2).*

DRAINING WATER FROM THE TYRES:

- raise the wheel from the ground and position the inflation valve at the lowest point;
- loosen the valve seal and drain off the water;
- screw the NEW HOLLAND connector (no. **291886**) onto the valve, tubes (**2**) and (**4**) will make contact with the inner tube;
- introduce pressurized air through connector (**3**), the remaining water will be drained through holes (**2**) and (**4**);
- remove the connector and replace, together with the valve seal, then inflate the tyre to the specified pressure.

4WD front tyres

Tyres	Water (1)	
	kg (litres)	lb
12.4R-20	120	265
11.2-24	90	198
12.4-24	115	253
360/70R-24	100	220
360/70R-20	90	198
11.2-28	100	220
13.6-24	120	264
380/70R-24	130	286
440/65R-24	150	330
320/70R-24	70	154
420/70R-24	166	365
480/65R-24	175	385
14.9-24	150	330

4WD rear tyres

Tyres	Water (1)	
	kg (litres)	lb
14.9-30	205	451
12.4-36	150	330
13.6-36	180	396
16.9-30	250	551
420/70R-30	200	440
480/70R-30	255	562
18.4-30	320	705
520/70R-30	320	705
13.6-38	190	418
16.9-34	280	617
480/70R-34	285	628
540/65R-34	310	683
520/70R-34	350	771
600/65R-34	400	881
18.4-34	360	793

FILLING WITH WATER

The quantity of water required for each tyre is only approximate.

(1) The quantities of water required for each tyre shown in the table may differ, depending on the tyre manufacturer.

FILLING TYRES WITH ANTIFREEZE SOLUTIONS

In order to prevent freezing water from damaging the tyres, instead of using pure water, use a solution of neutralised calcium chloride (in flakes).

Prepare the solution by placing the water in a container and gradually pouring in the calcium chloride, whilst continually mixing.

The quantities of water and chloride required to make sufficient antifreeze to fill each tyre to 75% are shown in the tables on the following page.

DANGER: *Never proceed in reverse order. Pouring water into chloride can be dangerous.*

CAUTION: *Contact the tyre manufacturer for information concerning the correct tyre filling procedure.*

FILLING 4WD FRONT TYRES WITH ANTIFREEZE SOLUTION

The figures given in the table below are indicative, as they may vary according to the make of tyres being used. It is advised to contact skilled personnel.

TYRE DIMENSIONS	Highest minimum temperatures, 0 °C									
	-5° (23 °F)		-10° (14 °F)		-15° (5 °F)		-20° (-4 °F)		-25° (-13 °F)	
	Water kg (litres) (lb)	Calcium chloride kg (lb)	Water kg (litres) (lb)	Calcium chloride kg (lb)	Water kg (litres) (lb)	Calcium chloride kg (lb)	Water kg (litres) (lb)	Calcium chloride kg (lb)	Water kg (litres) (lb)	Calcium chloride kg (lb)
12.4R-20	82 (181)	9 (20)	78 (172)	16 (35)	76 (168)	21 (46)	75 (165)	26 (57)	73 (161)	29 (64)
11.2-24	86 (190)	10 (22)	83 (183)	17 (37)	87 (192)	22 (48)	79 (174)	27 (59)	77 (170)	31 (68)
12.4-24	110 (243)	12 (27)	106 (234)	22 (48)	104 (230)	28 (62)	101 (223)	34 (75)	100 (221)	39 (86)
320/70R-20	67 (148)	8 (18)	64 (141)	13 (28)	63 (139)	18 (39)	61 (134)	21 (46)	60 (132)	24 (53)
360/70R-24	96 (212)	11 (24)	92 (203)	19 (42)	90 (199)	25 (55)	88 (194)	30 (66)	86 (190)	34 (75)
360/70R-20	86 (190)	10 (22)	82 (181)	17 (38)	81 (179)	22 (48)	79 (174)	27 (59)	77 (170)	31 (68)
11.2-28	96 (213)	11 (24)	92 (203)	19 (42)	90 (199)	25 (55)	88 (194)	30 (66)	86 (190)	34 (75)
13.6-24	115 (254)	13 (29)	110 (243)	23 (51)	108 (238)	30 (66)	106 (234)	41 (90)	103 (227)	41 (90)
380/70R-24	125 (276)	14 (31)	120 (265)	25 (55)	117 (258)	32 (70)	114 (252)	39 (86)	112 (247)	44 (97)
440/65R-24	144 (318)	16 (35)	138 (304)	28 (62)	135 (298)	37 (81)	132 (291)	45 (99)	129 (285)	51 (112)
420/70R-24	159 (352)	18 (40)	152 (335)	31 (68)	149 (329)	41 (90)	146 (322)	49 (108)	142 (313)	56 (123)
480/65R-24	168 (371)	19 (42)	161 (336)	53 (117)	158 (349)	44 (97)	154 (340)	53 (117)	151 (333)	60 (132)
14.9-24	144 (318)	16 (35)	138 (304)	28 (62)	135 (298)	37 (81)	132 (291)	45 (99)	129 (285)	51 (112)

FILLING 4WD FRONT TYRES WITH ANTIFREEZE SOLUTION

The figures given in the table below are indicative, as they may vary according to the make of tyres being used. It is advised to contact skilled personnel.

TYRE DIMEN-SIONS	Minimum temperatures above °C									
	-5°		-10°		-15°		-20°		-25°	
	Water kg (litres)	Calcium chloride kg	Water kg (litres)	Calcium chloride kg	Water kg (litres)	Calcium chloride kg	Water kg (litres)	Calcium chloride kg	Water kg (litres)	Calcium chloride kg
14.9-30	197 (434)	23 (51)	189 (417)	39 (86)	185 (408)	52 (115)	180 (397)	62 (137)	176 (388)	70 (154)
12.4-36	144 (318)	16 (35)	138 (304)	28 (62)	135 (298)	37 (82)	132 (291)	45 (99)	129 (284)	51 (112)
13.6-36	173 (381)	20 (44)	166 (366)	34 (75)	162 (357)	45 (99)	158 (348)	54 (119)	155 (342)	61 (135)
16.9-30	240 (529)	28 (62)	230 (507)	48 (106)	225 (496)	63 (139)	220 (485)	75 (165)	215 (474)	85 (187)
420/70R-30	192 (432)	22 (49)	184 (406)	38 (84)	180 (397)	50 (110)	176 (388)	60 (132)	172 (379)	68 (150)
480/70R-30	245 (540)	28 (62)	235 (518)	48 (106)	162 (357)	48 (230)	230 (507)	77 (170)	224 (494)	87 (192)
18.4-30	307 (677)	35 (77)	294 (648)	61 (135)	288 (635)	80 (176)	282 (622)	96 (212)	275 (606)	109 (240)
520/70R-30	307 (677)	35 (77)	294 (648)	61 (135)	288 (635)	80 (176)	282 (622)	96 (212)	275 (606)	109 (240)
13.6-38	182 (401)	21 (46)	175 (386)	36 (79)	171 (377)	48 (106)	167 (368)	57 (126)	163 (359)	65 (143)
16.9-34	269 (593)	31 (68)	258 (569)	53 (117)	252 (556)	70 (154)	246 (542)	84 (185)	241 (531)	95 (209)
480/70R-34	274 (604)	31 (68)	262 (578)	54 (119)	257 (567)	71 (157)	251 (553)	86 (190)	245 (540)	97 (214)
540/65R-34	298 (657)	34 (75)	285 (628)	59 (130)	279 (615)	78 (172)	273 (602)	93 (205)	267 (589)	105 (232)
520/70R-34	336 (741)	38 (84)	322 (710)	66 (146)	315 (695)	87 (192)	308 (679)	105 (232)	301 (664)	119 (262)
600/65R-34	384 (847)	44 (97)	368 (811)	76 (168)	360 (794)	100 (221)	352 (776)	120 (265)	344 (759)	136 (300)
18.4-34	345 (761)	39 (86)	331 (730)	68 (150)	324 (714)	90 (198)	316 (697)	108 (238)	309 (681)	122 (269)

MAXIMUM PERMITTED WEIGHTS

Correct static weight distribution guarantees maximum tractor efficiency and productivity, and extends the service life of the tractor components.

CAUTION: *The total weight of the tractor, including all types of ballast and the weight of mounted implements, must not exceed the limits noted in the table below.*

Working with excessive ballast on the tractor may cause:

- reduction in available power to operate the implement connected, leading to reduced productivity;
- increased fuel consumption;
- premature tyre wear;
- excessive compacting of the ground;
- damaging overload of the transmission components, leading to an increase in running costs.

When using the tractor in the field, it is extremely important to have the maximum power available for using implements; therefore avoid losing power through excessive ballast.

Permitted maximum weights without limits

Model	Max. Weight on the road kg (lb)	Maximum permissible axle weight		
		Front axle 2WD kg (lb)	Front axle 4WD kg (lb)	Rear axle (o) kg (lb)
TL70	5200 (11464)	2200 (4850)	2400 (5291)	4000 (8818)
TL80	5500 (12125)	2200 (4850)	2400 (5291)	4600 (10141)
TL90	6000 (13228)	2200 (4850)	2900 (6393)	4600 (10141)
TL100	6000 (13228)	2200 (4850)	2850 (6283)	4600 (10141)

(o) Permissible static weights given for the rear axle are for tractors with ballast, including mounted implements raised off the ground.

Maximum permissible axle weights with limits

Model	km/h max. (mph)	Max. weight on the road kg (lb)	Front axle 2WD (*) (A) kg (lb)	Front axl 4WD (*) (B) kg (lb)	Rear axle (o) kg (lb)
TL70	8 (5.0)	5200 (11464)	3300 (7275)	4000 (8818)	4000 (8818)
TL80		5500 (12125)	3300 (7275)	4000 (8818)	4600 (10141)
TL90		5800 (12786)	3300 (7275)	4500 (9920)	4600 (10141)
TL100		6000 (13228)	3300 (7275)	4500 (9920)	4600 (10141)

(*) The permissible static weights given for the front axle of both 2WD and 4WD models are for tractors fitted with a front loader.

(A) The maximum permitted weights shown are for wheel tracks less than 1700 mm.

(B) The maximum permitted weights shown are for wheel tracks between 1420 to 1850 mm for models TL70 and TL80 or 1515 to 1930 mm for models TL90 and TL100.

WARNING: *Do not use ballast systems other than those indicated.*
Do not ballast the tractor unnecessarily: not only is it superfluous, it may also damage the tractor.

WARNING: *With mounted implements fitted to the rear of the tractor, it is good practice to fit a minimum* ***20%*** *extra weight on the front axle.*

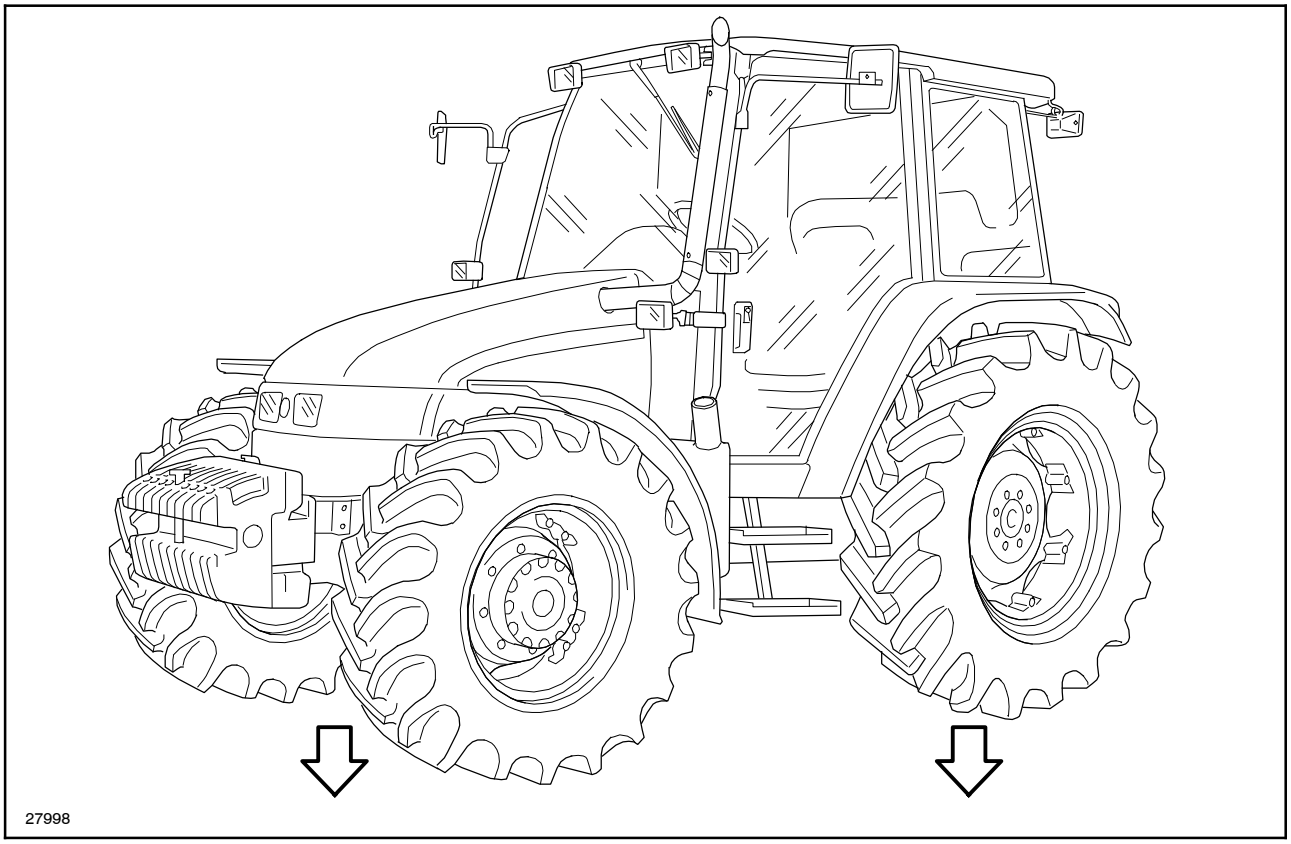
STATIC WEIGHT DISTRIBUTION ON THE TRACTOR – Fig. 149

Fitting implements on the front and back of the tractor alters the weight distribution on the axles.

Add or remove ballast from the tractor once it is fully equipped, until a balanced static weight distribution is achieved for the type of implement in use. Take care not to exceed the maximum operating weights shown on a page 2–118.

The weight distribution percentages given for four–wheel drive models are only ***guidelines*** and relate to the total weight of the fully equipped tractor, complete with ballast.

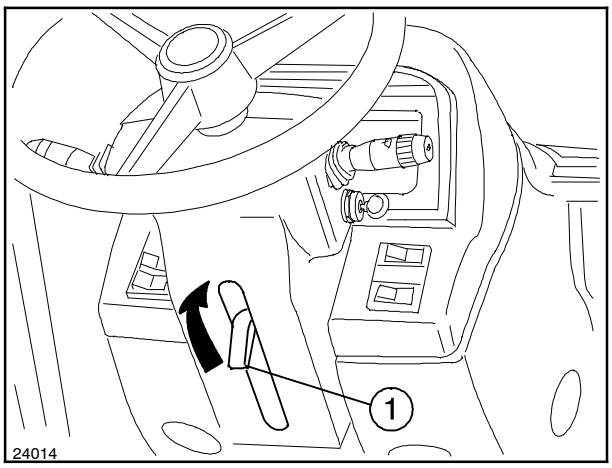
FOUR WHEEL DRIVE MODELS



149

FRONT AXLE
35%

REAR AXLE
65%



150

STEERING WHEEL ADJUSTMENT - Fig. 150

The steering wheel is fitted with a lever for position adjustment.

To adjust the position, use the lever **1** (fig. 150). Then push the lever down to lock the steering wheel in position.

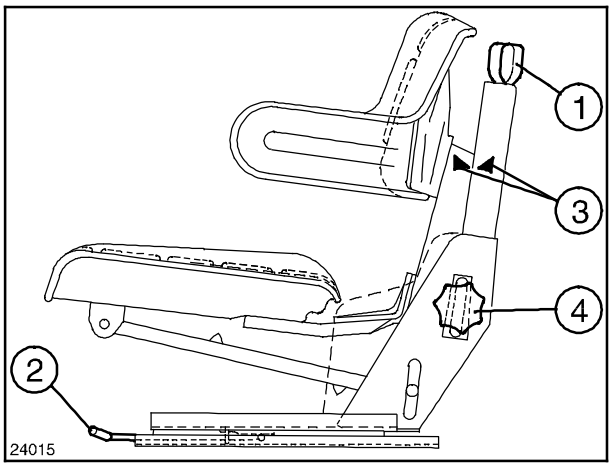
1. Steering wheel position adjustment lever

- Lever down, steering wheel locked in position;
- Lever up, steering wheel released.

SEAT ADJUSTMENT

We advise you to adjust the seat for safe driving, even under difficult conditions. To avoid danger, follow the instructions below.

- do not adjust the seat when the tractor is moving;
- the driver's seat must only be fitted and repaired by skilled personnel;
- periodically check that the securing screws are tight and that the adjustment controls are working correctly in order to ensure safety and stability when working.



151

Seat (standard version) - Fig. 151

The driver's seat has adjusters for its suspension, height and distance from the controls.

You can therefore select the most suitable position for driving, and even change it while working.

- To move the seat forward or backward, pull the lever (**2**) to the side.
- After moving the seat, release the lever and check that the seat is locked in the correct position.

SEAT SUSPENSION ADJUSTMENT KNOB

To adjust the seat correctly, turn knob (**1**) clockwise or counter-clockwise, whilst seated in the driving position, until the arrows (**3**) on the seat are at the height shown in the drawing.

SEAT HEIGHT ADJUSTMENT

To adjust the seat height, loosen the knobs (**4**) (one on each side) and position the seat at the required height.

STANDARD SEAT FOR MODELS WITH CAB - Fig. 152

Seat suspension adjustment knob

To correctly adjust the suspension, turn the knob (**1**) clockwise or counter-clockwise, until your weight value appears in the inspection window indicated by the arrow in the drawing.

Seat height adjustment

To move the seat upwards, raise with one hand and move to one of the three positions indicated in the drawing (you will hear the seat click into position).

To move the seat to a lower position, fully raise then allow to lower.

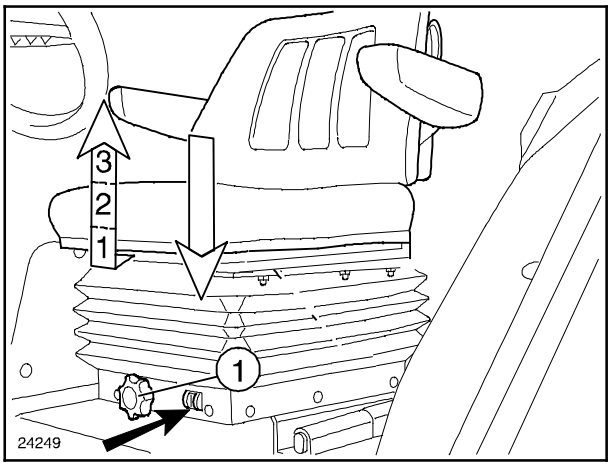
Backrest inclination adjustment

To adjust the angle of the backrest raise knob (**3**). A pocket for storing documents is provided on the back of the seat.

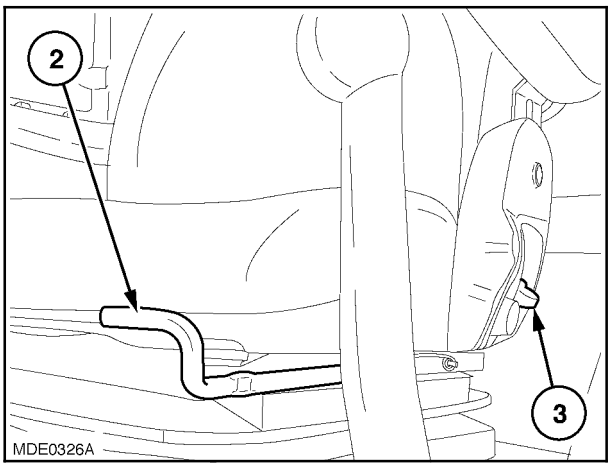
Adjustment of distance from control panel

From the driver's seat, pull the lever (**2**) sideways and move the seat forwards or backwards.

After moving the seat, release the lever and check that the seat is locked in the correct position.



152



153

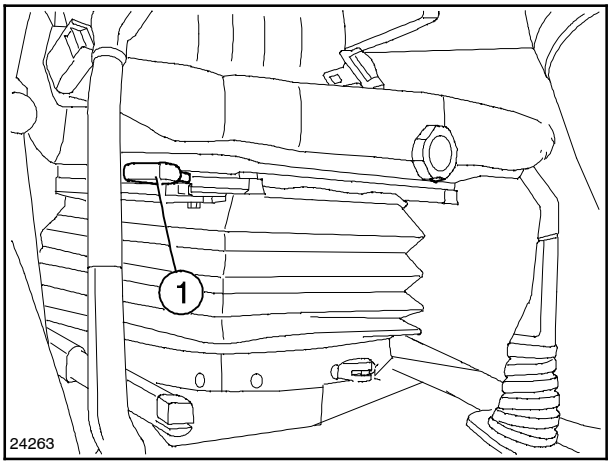
PNEUMATICALLY SUSPENDED SEAT (optional) - Figs. 154, 155 and 156

The driver's seat has adjusters to regulate the following functions.

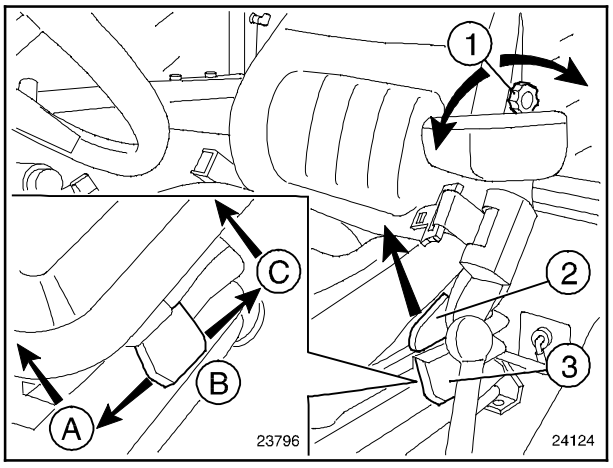
You can therefore select the most suitable position for driving, and even change it while working.

Seat distance from controls adjustment lever - Fig. 154

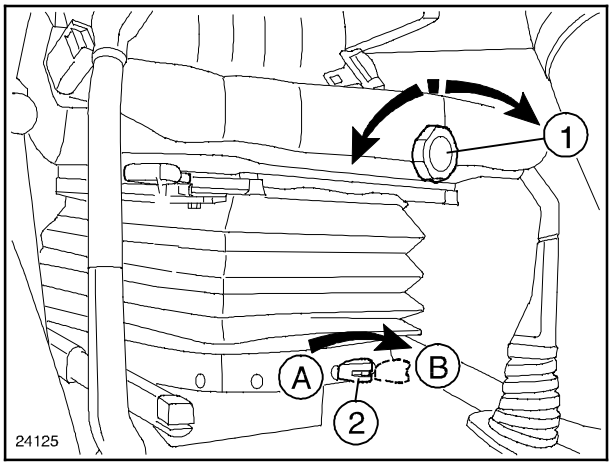
- Pull lever (**1**) upwards to move the seat forwards or backwards.
- After moving the seat, release the lever and check that the seat is locked in the correct position.



154



155



156

Cradle anatomical adjustment knob - Fig. 156

To adjust the cradle cushion to your requirements, turn the knob (**1**) clockwise or counter-clockwise.

Knob for anatomical adjustment of backrest and seat - Fig. 155

To anatomically adjust the shape of the backrest and seat, turn the knob (**1**) clockwise or counter-clockwise.

Backrest angle handle - Fig. 155

To adjust the backrest tilt pull handle (**2**) upwards, fig. 155.

Seat pneumatic suspension and height adjustment handle - Fig. 155

To correctly adjust the seat suspension proceed as follows:

- pull the handle (**3**) upwards to deflate the pneumatic cushion;
- from the driver's seat, pull the handle (**3**) upwards to activate the compressor then release.

The compressor stops automatically when the pneumatic cushion reaches your weight.

From the driver's seat, use the same handle (**3**) to adjust the height of the seat, proceeding as follows:

- low position = push the handle (**3**) forward to position **A** and pull upwards;
- intermediate position = pull the handle (**3**) upwards and hold in position **B**;
- high position = push the handle (**3**) back to position **C** and pull upwards.

The seat will automatically position at the required height, without varying the suspension set previously.

Longitudinal adjustment lever - Fig. 156

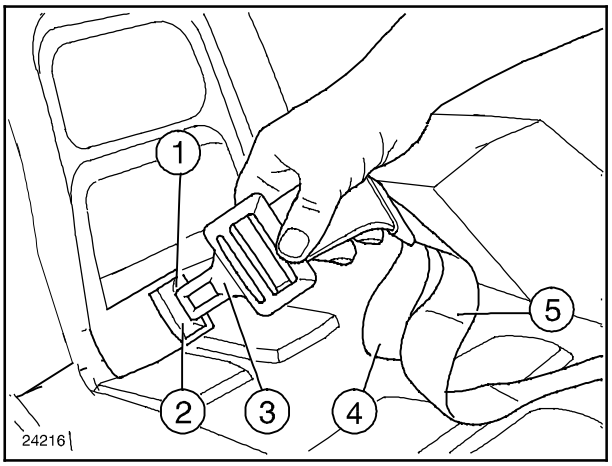
Longitudinal suspension is particularly useful when working on bumpy ground, where a rigid seat structure may prove to be uncomfortable.

- lever (**2**) in position **A** = free longitudinal suspension;
- lever (**2**) in position **B** = longitudinal suspension locked in position.

SEAT BELTS

The seat belts are available (on request) in two versions:

- without inertia reel for standard seats;
- with inertia reel for Deluxe seats and pneumatic suspension seats.



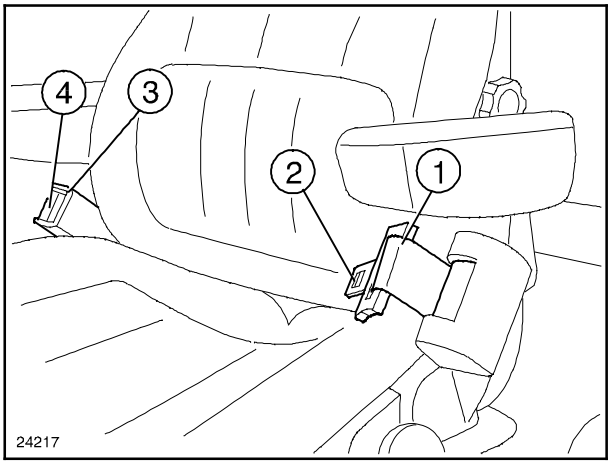
157

SEAT BELTS WITHOUT INERTIA REEL - Fig. 157

To fasten the safety belt insert the tongue (**3**) on the buckle in the slot (**1**).

To release the safety belt, press the button (**2**) and extract the buckle.

Adjust the length of the safety belt by pulling strap (**4**) to loosen, and strap (**5**) to tighten.



158

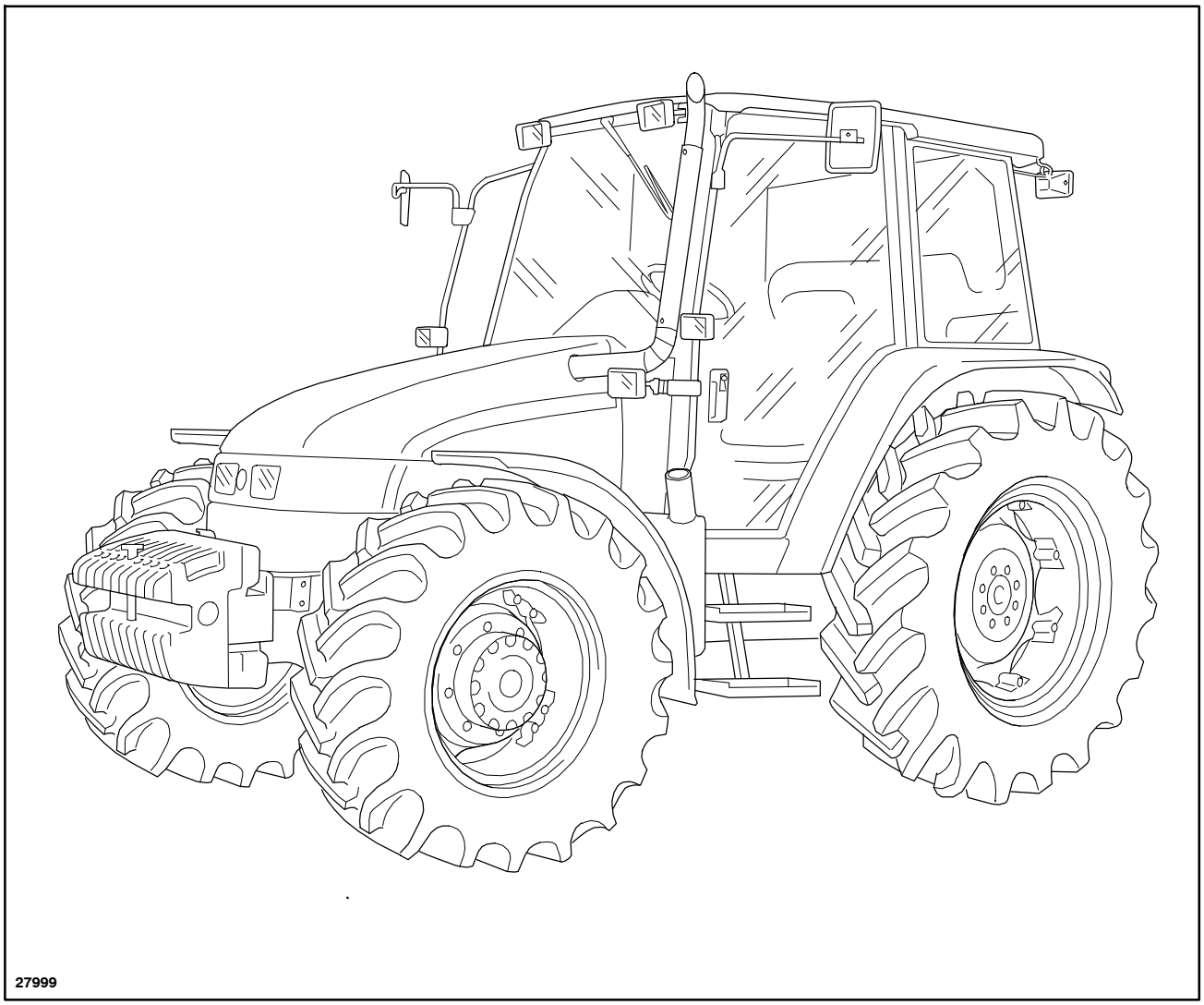
SEAT BELTS WITH INERTIA REEL - Fig. 158

To fasten the belt (**1**) pull the buckle out of the inertia reel and insert the tongue (**2**) in the slot (**3**).

NOTE - *The belt adjusts automatically to the driver's body.*

To release, press the button (**4**) and release the belt. The belt reels in automatically.

CAB



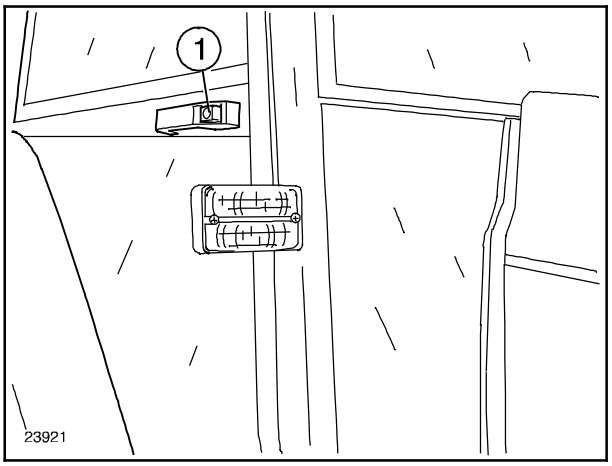
159

This section of the manual deals only with the use of the heated and ventilated cab.

DOORS

Opening the door from the outside - Fig. 160

With the door unlocked, press button (**1**) and pull the door towards you.



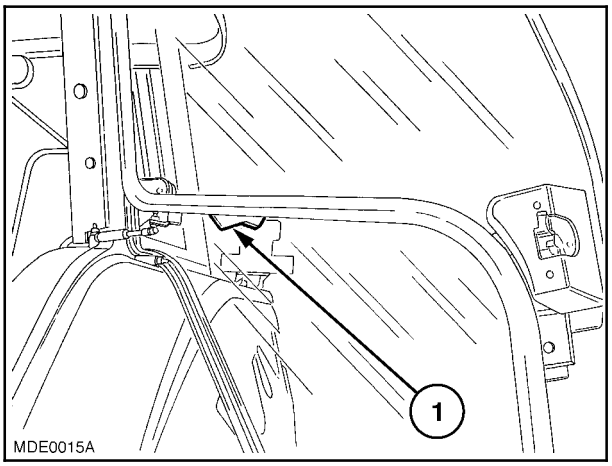
160

Locking the door from the outside - Fig. 160

The doors both have locks, which can be locked with a key, and the cab can therefore be closed from either the left or the right hand side.

Opening the door from the inside - Fig. 161

Press lever (**1**).



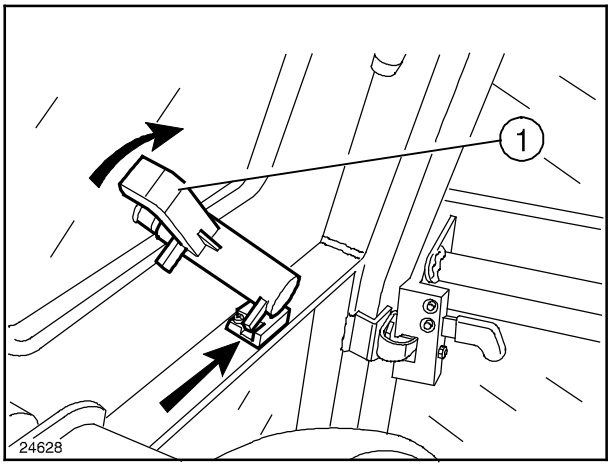
161

Locking the door from the inside - Fig. 161

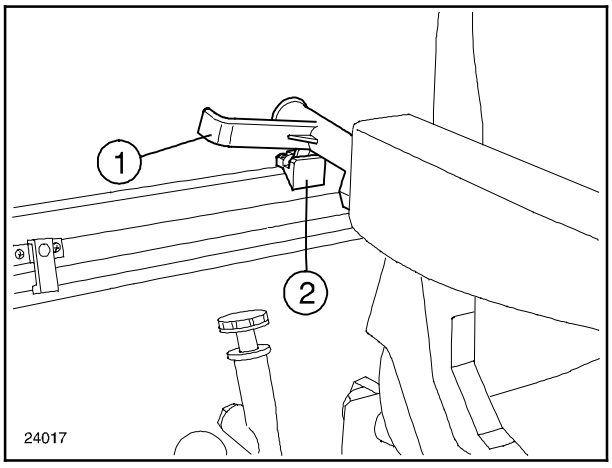
Push lever (**1**) downwards.
It is held in position by a mechanical catch, which prevents the door being opened from the outside.

FRONT WINDSCREEN - Fig. 162

To open, pull handles (**1**) upwards and push forward. The windscreen is held open by struts or can be held slightly open by lever (**1**) fixed in the anchor point as illustrated.



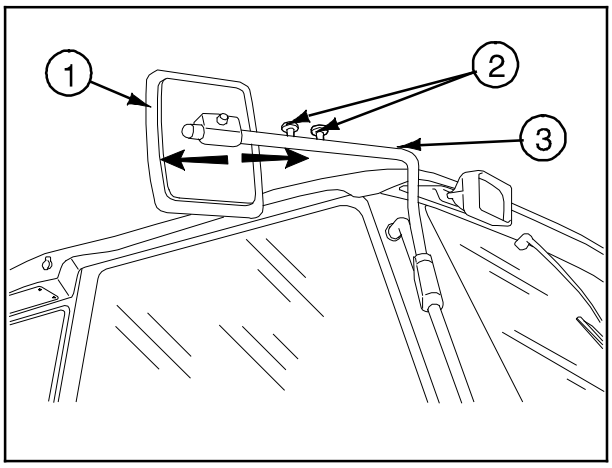
162



163

REAR WINDOW - Fig. 163

To open, pull handle (**1**) upwards and push forward. The window is held open by struts or can be held slightly open by lever (**1**) fixed in the anchor point (**2**) as illustrated.



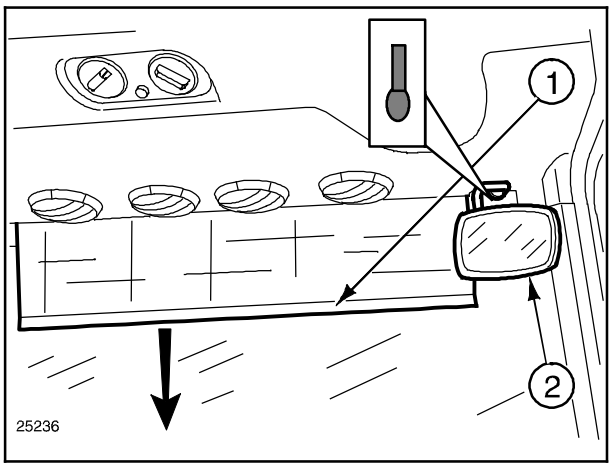
164

EXTERNAL REAR VIEW MIRROR (1) - Fig. 164

To adjust the mirror, proceed as follows:

- turn the support arm (**3**) to adjust the angle of vision;
- loosen screws (**2**) in order to move the mirror along the length of the support arm (**3**);

***NOTE**: the mirror (**1**) can be adjusted to any required angle.*



165

SUNSHIELD (1) - Fig. 165

To open the sunshield, pull downwards as shown by the arrow in the illustration.

To close the sunshield, press the pushbutton on the right-hand side and push upwards, as illustrated.

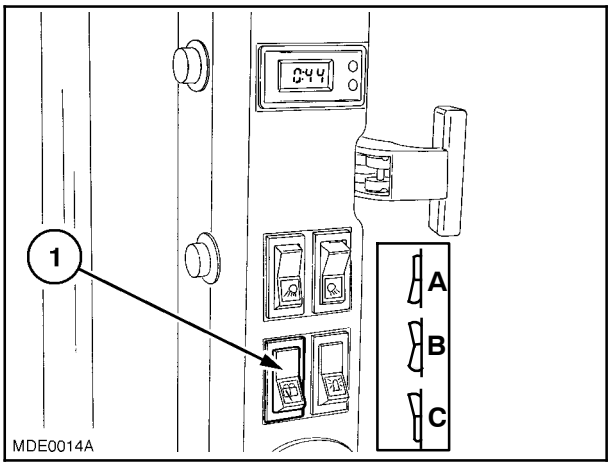
INTERNAL REAR VIEW MIRROR (2) - Fig. 165

The mirror can be adjusted by rotating it on the support bracket to the required position.

REAR SCREEN WASH/WIPER - Fig. 166

Operates with the ignition key in position (**B**) page 2-3.
The rear window wiper is controlled by switch (**1**) fig. 166 and has three settings:

- Position **A** = off.
- Position **B** = wiper on.
- Position **C** = wiper and washer on; when released the switch returns automatically to position **B.**



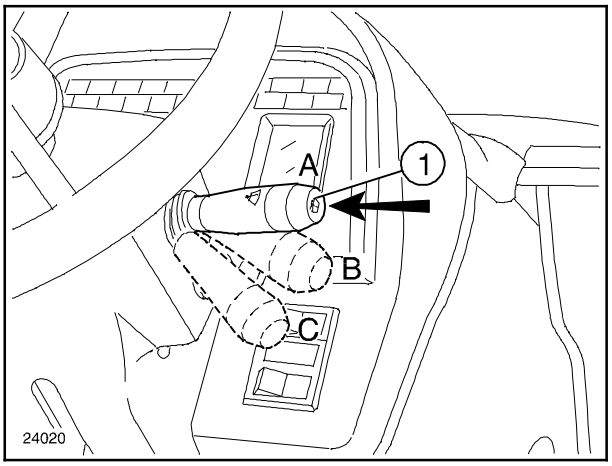
166

FRONT WINDSCREEN WASH AND WIPER LEVER - Fig. 167

(Operates with the ignition key in position (**B**) page 2-3.

- Position **A** = off.
- Position **B** = standard speed.
- Position **C** = fast speed.

Press on the end of the lever as shown by the arrow to operate the windscreen washer.



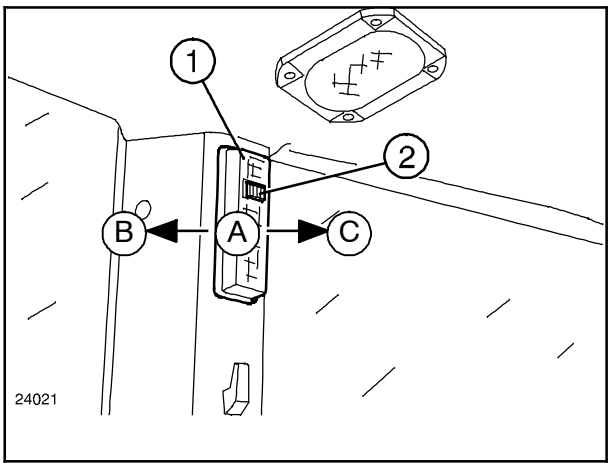
167

INTERIOR CAB LIGHT - Fig. 168

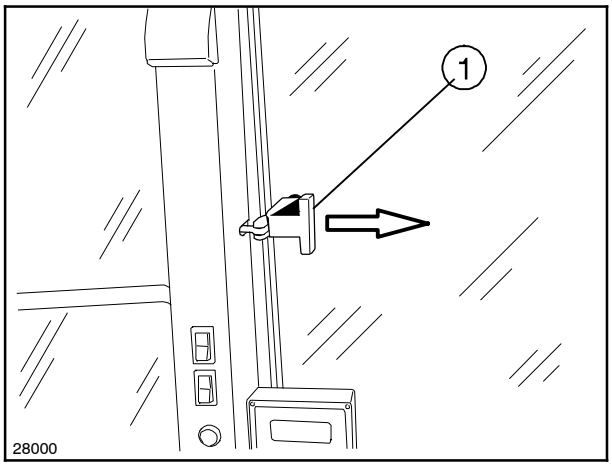
The cab light (**1**) operates with the ignition key in position (**B**) page 2-3.

The lamp has 3 positions;

- Position **A** = off.
- Position **B** = on.
- Position **C** = door operated - light on with door open only;



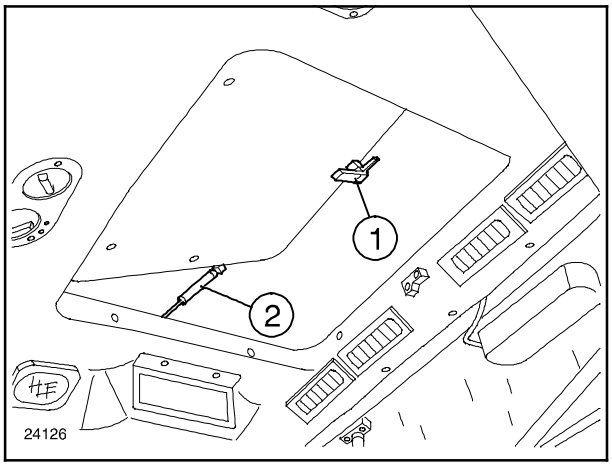
168



169

SIDE WINDOW - Fig. 169

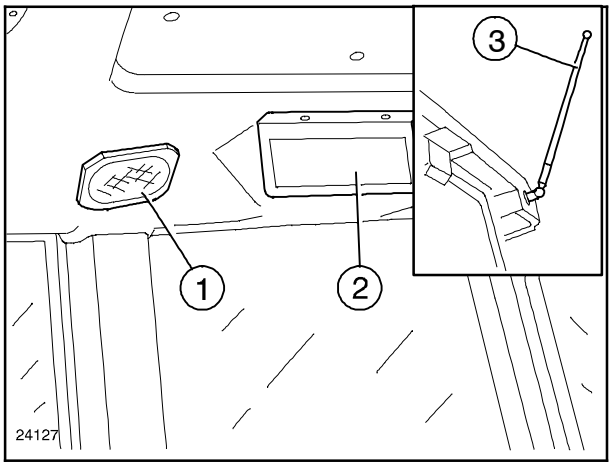
In order to open the side window, pull the handle (**1**) in the direction indicated by the arrow and push outwards.



170

ROOF HATCH - Fig. 170

To open the roof hatch, turn handle (**1**) and push upwards. Struts (**2**) will hold the hatch open.



171

RADIO FITTING - Fig. 171 (optional)

To add to driver comfort, the cab can be fitted for radio installation.

The kit comprises :

- two stereo speakers (**1**);
- housing (**2**) for the radio;
- aerial (**3**) and the relative connections.

VENTILATION

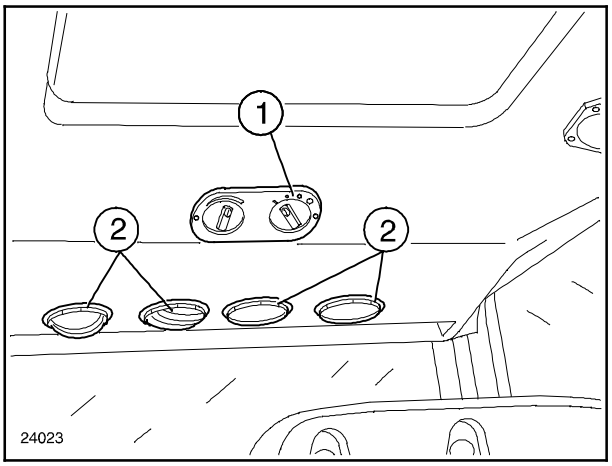
Actuate ventilation with switch (**1**) fig. 172, and direct the air flow by adjusting front swivel vents (**2**) fig. 172.

Air can be taken from outside or inside the cab by adjusting the lateral air re-circulation vents (**1**) fig. 173, which have two positions.

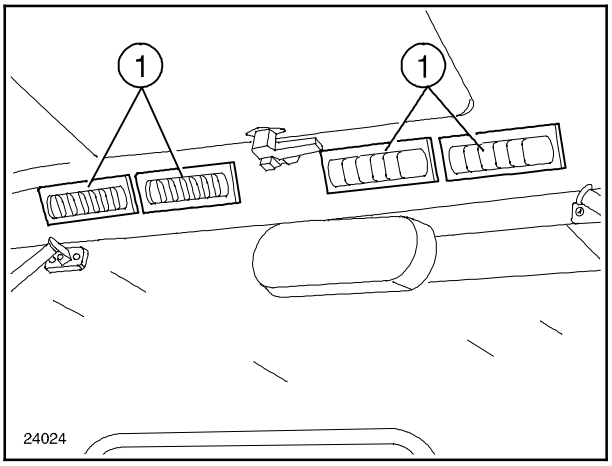
- vents closed: air comes from outside via the side filters.
- vents open: a larger quantity of air comes from inside via the vents themselves.

Fresh air drawn into the cab from outside is always filtered.

When the electric fan is operating and with the doors, re-circulation vents and windows closed, the pressure inside the cab is higher than the pressure outside, and consequently air can only enter the cab via the side filters.



172



173

NOTE: *to increase cab pressure, air must only come from the outside (air re-circulation jets **1** fig. 173 closed).*

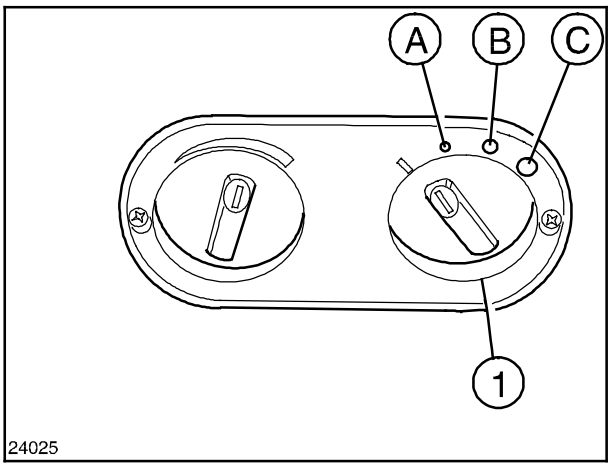
Electric fan

Electric fan switch (**1**) figs. 172 and 174 is powered when the ignition key, page 2-3 is in position B.

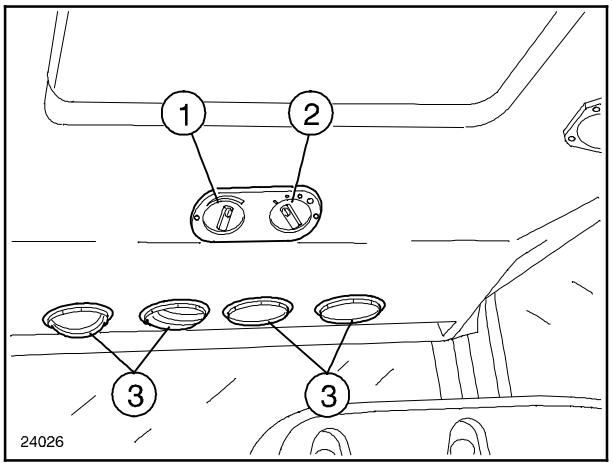
A. Low speed.

B. Medium speed.

C. High speed.



174



175

HEATING - Fig. 175

You can adjust the hot air temperature using control (**1**) fig. 175 by reducing or increasing the circulation of coolant from the engine and, with electric fan (**2**) you can change the quantity of coolant entering the cab through vents (**3**) and (**1**).

To adjust the hot air temperature use the control knob (**1**).

Turn the knob to the left (counter-clockwise) to interrupt hot air circulation in the cab.

NOTE - *the total capacity of the cooling system (including the cab heating system) is 4.22 gall. (16 litres).*
The mixture specifications are shown on page 3-50.

Temperature control knob

- Fully counter-clockwise = minimum temperature.
- Fully clockwise = maximum temperature.

AIR FILTERS

DANGER: *remember that the cab air filters do not generally protect against pesticides. Therefore complete protection against these products can only be achieved by the adoption of additional specific safety measures for the individual product. These precautions must be taken for all filter types, observing both the instructions for use and maintenance regulations. Active carbon filters are available on request, providing greater protection against the harmful effect of pesticides. However, even the use of active carbon filters does not remove the need for the specific personal precautions required for the use of individual products.*
These filters should only be fitted when working with pesticides and replaced with the normal paper filters at the end of work*.*
Do not use these filters during other work, as dust will accumulate and clog the filters*.*
When replacing the active carbon filters at the end of work, return them to the original package, making sure they are carefully sealed. Observe the instructions on the package, ***the filters last for approximately 60 hours of work. They must, however, be replaced each year****. If, when working with pesticides, toxic odours are noted, stop work immediately and check the condition of the filters, replacing if necessary.* ***Old filters must neither be washed or cleaned with compressed air.***
Discarded filters must not be thrown away. Take old filters to authorised collection points.

CAB AIR CONDITIONING SYSTEM

This section of the manual describes the operation and use of the Supercomfort cab, which is fitted with an air conditioning system.

This system, in addition to ensuring optimum temperature inside the cab, reduces air humidity, which might otherwise be a nuisance to the operator and compromise tractor handling safety.

The cab is also fitted with windows, which reduce the effects of the sun's rays inside the cab - something that, in hot weather, creates particularly unpleasant conditions for the operator.

SAFETY RULES

The air conditioning system is safe and can be used continuously without any risk. However, it is important to observe a few simple precautions, listed below, to avoid any risk of accidents.

■ It is advised never to personally attempt to adjust the system; any repair work should be carried out by the experienced technicians of the NEW HOLLAND Service Network.

■ Never allow naked flames near the air conditioning system, as if the refrigerant is leaking, a lethal gas phosgene ***could be produced***.

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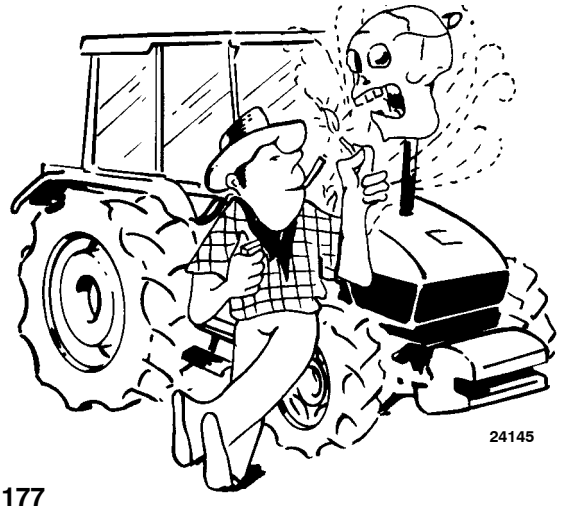
■ The oil and coolant mixture is pressurised inside the air conditioning system. The loosening of any connections or handling of lines is therefore strictly forbidden. For the same reason, never unscrew the compressor oil level inspection cap for any reason.



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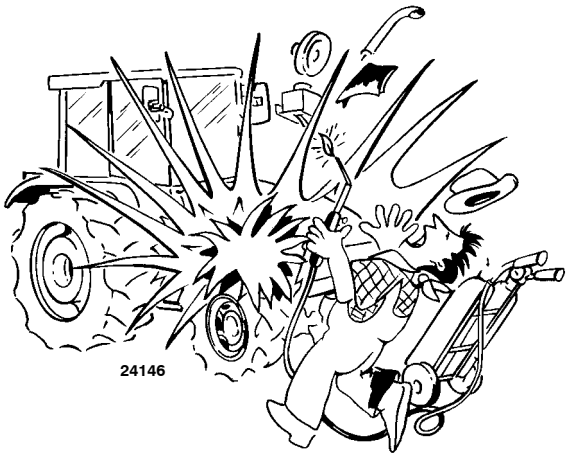
■ Coolant can freeze the skin and, above all, the eyes.
If an accident should occur, proceed as follows:

- if coolant comes into contact with the eyes, wash immediately with a few drops of mineral oil, then continue washing thoroughly with a solution of boric acid and water (one teaspoon of acid in $^1/_4$ of a cup of water) and consult a doctor at once;
- freezing caused by coolant can be treated by gradually unfreezing the injured zone with cold water and then applying a grease based cream. Consult a doctor promptly.

■ Do not allow the air conditioning system to approach any heat source, in order to prevent an explosion risk.



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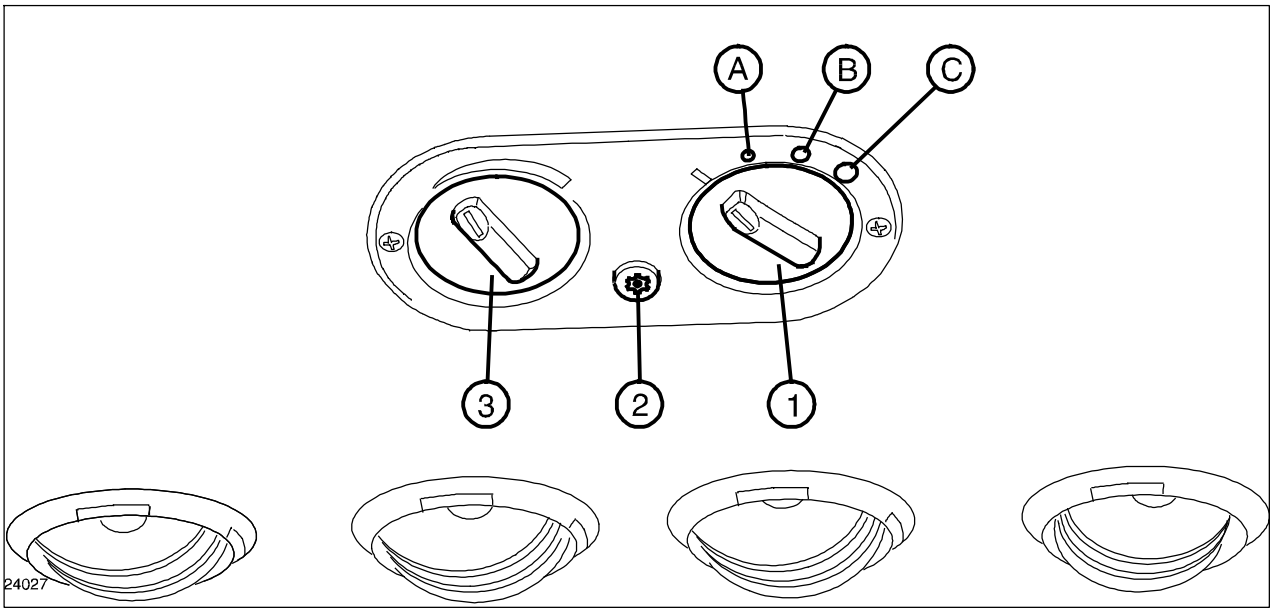
CAB AIR CONDITIONING SYSTEM



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AIR CONDITIONING AND TEMPERATURE CONTROL

Air conditioning ON/OFF and regulation push button

The system operates with the ignition key switched on.

With the electric fan knob (**1**) in positions **A** - **B** or **C**, press pushbutton (**2**) to switch on the air conditioning.

Heater control

For maximum temperature, turn the knob (**3**) clockwise (fully to the right. To shut off the water supply to the heater and switch off the heater, turn the knob (**3**) fully counter-clockwise.

Three-speed electric fan control (1).

The fan operates with the ignition key in the starting position.

A. Low speed.

B. Medium speed.

C. High speed.

NOTE - *for cab pressurisation see the heading* ***Ventilation*** *on page 2-129 in this section.*

AIR CONDITIONING SYSTEM - INSTRUCTIONS FOR USE

The air conditioning system provides dehumidified cool air or dehumidified hot air.
It is operated as follows

CAUTION *- when the engine is not running the air conditioner will not work because the compressor is driven by the engine.*

STARTING

With the engine running and the electric fan on, press button (**2**) page 2-132 to start the air conditioning system.

CAUTION *- always switch the electric fan on before the air conditioning.*
The air conditioning cannot work when the electric fan is off.

After running for a few minutes, the inspection glass on the top of the dehydrating filter should be clear and not contain any bubbles. If this is not the case, stop the system and contact your dealer.

ADJUSTMENT

For a correctly air conditioned cab, always open the re-circulation vents when the air conditioning is running and keep the doors, roof and rear window closed. If you wish to lower the temperature in the cab and at the same time lower the air humidity, turn knob (**3**), page 2-132, counter-clockwise until the desired temperature is obtained.

CAUTION - *before starting the engine, check that the air conditioning is off.*

NOTE - *when working in very dusty environments, the cab pressure may have to be increased to prevent dust from entering the cab; you are also advised to close the re-circulation vents.*

If, on the other hand, you want only the dehumidification function of the air conditioning system to work, without lowering the air temperature, turn control (**3**) page 2-132 clockwise to reach the desired temperature.

To restore the temperature in the cab after a prolonged halt in the sun, start the tractor, switch on the air conditioning and after about a minute open the rear fanlight or the roof to let the hot air escape.

STOPPING

Before stopping the engine, always turn off the air conditioning by pressing button (**2**) and moving electric fan control (**1**) to the off position.

REGULAR INSPECTIONS

At least once every three months.

- eliminate any foreign matter from the condenser and evaporator fins;
- check the tension of the compressor belt;
- run the engine at 1,500 rpm and check the dehydration filter inspection glass: it should be transparent and not contain any air bubbles or white liquid.
- check the condition of the tubing, connections and mounting of brackets;
- check that the discharge pipes are working properly and remove any condensation from the evaporator;
- check that the fixing screws and nuts, pulleys and compressor are correctly tightened.

MAINTENANCE

During long periods of inactivity, run the air conditioning system for a few minutes every month to circulate the oil in the system and keep the grommets in good condition.

Only run the system when the engine is warm and the temperature inside the cab has reached 68 °C.

ANNUAL MAINTENANCE

At the beginning of the working season, have the following operations carried out by the specialized staff of the New Holland service network:

- check the oil level in the compressor, fill-up if necessary;
- check the sealing on the system with a leakage detector, fill-up with HFC 134a gas, or:
- replace the dehydrator filter, only if absolutely necessary;
- a functional check of the overall system.

GENERAL CAB MAINTENANCE (ALL VERSIONS)

After completing external cab maintenance, as described on page 3-45 carry out the following inspections:

1. check from time to time that there is no leftover water in areas covered with mats or padding.
2. Protect the hinges and locks on the doors, roof and opening windows with lubricants and water-repellents.
3. Use suitable detergents or, if necessary, sulphuric ether to clean the windows.
4. Remove the windscreen wiper blade and sprinkle talc on the rubber.
5. Leave the doors or roof hatch partially open.

SPECIFICATIONS

Coolant . . . . . **HFC 134 a**

- Quantity . . . . . 3.52 lb (1.6 kg)

Compressor . . . . . SANDEN SD - 7H15

- Number of cylinders 7
- Capacity . . . . . 155 cm^3
- Oil type . . . . . SANDEN SP20
- Oil quantity . . . . . 0.39 lb (180 g)

Thermal potential at an ambient temperature of . . . . . 95 °F (35 °C) 4500 kcal/h

Air flow with electric fan on speed 3 . . . . . 7.5 ÷ 8.5 m^3/min

NOTES

NOTES

SECTION 3

LUBRICATION AND MAINTENANCE

INTRODUCTION

This section gives full details of the maintenance procedures required to keep the tractor in conditions of maximum efficiency. The lubrication and maintenance table on pages 5 and 6 can be used for rapid reference for this purpose. All operations are numbered to facilitate use.

In addition to the normal maintenance operations listed, the following parts must be checked during flexible maintenance or during the first 50 hours of operation:

- Tightness of wheel nuts;
- Oil levels in hub and front axle casing – 4WD models only.

WARNING: *Park the tractor on level ground and, where possible, ensure all hydraulic cylinders are fully extended before checking oil levels*

SAFETY PRECAUTIONS

Read and follow all the safety precautions listed under the "Tractor maintenance" heading in the General Information section.

NOTE: *Dispose of all used fluids and filters in the correct manner.*

CAUTION: *Do not carry out any inspections, lubrication, maintenance or adjustments on the tractor with the engine running.*

HOW TO PREVENT CONTAMINATION OF THE SYSTEM

To avoid contamination when changing oil, filters, etc, always clean the area around the fill points, inspection and drain plugs, dipsticks and filters. Before connecting external cylinders, make sure that the oil inside is clean, that it has not deteriorated after prolonged storage and that it is of the type specified. To prevent dirt entering, clean the lubricating nipples before lubrication. Clean excess grease from the nipples after lubrication.

MAINTENANCE INTERVALS

The intervals suggested in the lubrication and maintenance table are to be followed under normal working conditions.

Intervals should be in line with working and environmental conditions. The intervals should be shortened in adverse working conditions (wet, mud, sand, high dust levels).

LUBRICATION AND MAINTENANCE TABLE – Pages 5 and 6

The table lists the intervals at which routine checks, lubrication, maintenance and/or adjustments should be carried out. Use the table as a quick reference when carrying out maintenance on the tractor. The operations follow the order on the table.

RUNNING-IN PERIOD

During the running-in period (approximately 50 hours of work), in addition to carrying out the operations indicated in this section every "10 service hours" and for the first 50 hours, we recommend the following:

- run the engine for a few minutes at low revs and let it idle after every cold start;
- do not let the engine run at minimum revs for a long time;
- do not use the tractor continually for heavy work;
- follow the recommendations mentioned above after replacement of major parts.

CAUTION: *After the first 50 hours of work, replace the oil in the sump (Operation No. 28) together with the relevant filter (Operation No. 33) and the oil filter cartridge on the lift (Operation No. 31) and – where fitted – the hydrostatic steering filter (Operation No. 32).*

CAUTION: *The operations described in this section, carried out at the prescribed intervals, will ensure regular tractor operation. Remember, however, to carry out inspections and adjustments as and when experience and common sense dictates, (frequency can vary depending on working and environmental conditions).*

TRACTOR REFUELLING

WARNING: *When using diesel fuel, pay attention to the following:*
Do not smoke when near diesel fuel. Under no circumstances must petrol, alcohol, or a mixture of diesel or alcohol be added to the diesel, as it increases the risk of fire or explosion considerably. In a closed container, such as a jerry can, they are more explosive than pure petrol. Do not use these mixtures. Furthermore, a mixture of diesel and alcohol is not recommended as it does not lubricate the fuel injection system adequately. Clean the area around the fill point and keep it clean. Fill the tank at the end of every day to reduce overnight condensation. Never remove the cap or add fuel when the engine is running. While the tank is being filled, keep control of the filler nozzle. Do not fill the tank completely. Leave room for an increase in volume.If the original tank cap is lost, replace it with a genuine cap and screw it on tight. Mop up any fuel spillage immediately.

FUEL SPECIFICATIONS

The quality of fuel used is an important factor for the engine's subsequent performance and satisfactory service life. Fuel must be clean, properly refined and must not corrode the fuel system parts. Ensure that good quality fuel is used from a reliable source.

FUEL STORAGE

Take all necessary precautions to ensure that stored fuel is not contaminated by dirt, water or any other substance.

- Store fuel in black iron drums, not zinc drums as the coating reacts with the fuel and forms compounds that contaminate the injection pump and injectors.
- Protect the storage drums from direct sunlight and tilt them slightly so that sediment inside can be removed through the outlet pipe.
- To facilitate removal of damp and sediment, fit a drainage plug at the lowest point on the opposite end to the outlet pipe.
- If the fuel is not filtered from the storage drum, use a funnel with a fine mesh filter when pouring the fuel into the tractor tank.
- Organise fuel supplies so that summer fuel is not kept for too long and then used in winter.

REFUELLING

Before refuelling, clean the area around the tank fill point to prevent foreign matter entering the tank. After refuelling replace the cap and tighten it fully.

NOTE: *The fuel tank holds 30.37 gall. (115 litres) (models TL70, TL80) or 35.66 gall. (135 litres) (models TL90, TL100).*

NOTE: *If the fuel tank cap should be lost or damaged, replace it with an original spare part.*

MISCELLANEOUS CHECKS

Check the following components regularly and, if any faults are detected, contact your local dealer and replace the damaged parts as necessary:

- steering linkage ball joints: check that there is no play in the ball joints and that the conical ends are securely in place; also check no grease is escaping from the protective hoods to the ball joints, and that the hoods are in good condition and show no signs of cracks;
- hydrostatic steering cylinder lines: the lines must not show any signs of crimping, cracking or swelling of the external sheath and likewise there must be no traces of oil between the pipe and the connector;
- handbrake lever: check that the ratchet locks securely.

WARNING LIGHTS

Your tractor is fitted with warning lights to inform you of the operational condition of your tractor. Some of these signal faults which should be corrected immediately, e.g.: level of engine oil, brake fluid, coolant, windscreen wash liquid, air filter clogging, etc.

FUEL INJECTION PUMP

During the warranty period, any work carried out on the injection pump must be carried out exclusively by your ***local dealer's specialised personnel***. If the seal on the fuel pump is removed ***the manufacturers*** cannot be held responsible under the terms of the warranty.

ENVIRONMENTAL CONSIDERATIONS

When it is necessary to refill the fuel tank, or top up or change the oil, never forget to place a container under the component to collect any spillage. The products used are pollutants and we must therefore prevent them from contaminating the environment in which we live.

ENGINE COOLING SYSTEM

It is advisable to change the coolant every two years, even if the total working time of 1200 hours has not been reached.

ACTIVE CARBON FILTERS

NOTE: If active carbon air filters are used when working with pesticides, carefully read the instructions shown on page 2- 130.

RADIATOR

If the cooling circuit is to work properly, it is important that the radiator fins are not clogged.
Clean them regularly, even several times a day if the environment in which you are working is particularly dusty.

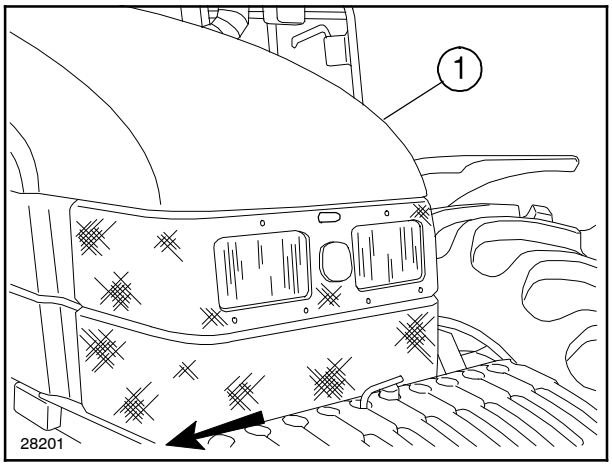
TYRES

Always fit and remove tyres in perfectly clean conditions. Avoid working in soil.To help when fitting and removing tyres, never use grease as possible, opting instead for soap and water.
When fitting a new or used tyre, inflate to 50.76 psi (3.5 bar) to ensure the correct positioning of the bead. Then inflate the tyre to its service pressure.

TYRE PRESSURES

The recommended tyre pressures are shown in the tables on pages 2–111 and 2–112.
Remember that the values given may differ depending on the following factors: tyres different from those fitted by the manufacturer, tractor ballast type, different conditions of use, etc. The tyre manufacturer should be able to help you decide on the most suitable pressures.
Do not forget to check the tyre working pressures regularly. The frequency of such inspection will vary depending on operational and climatic conditions.

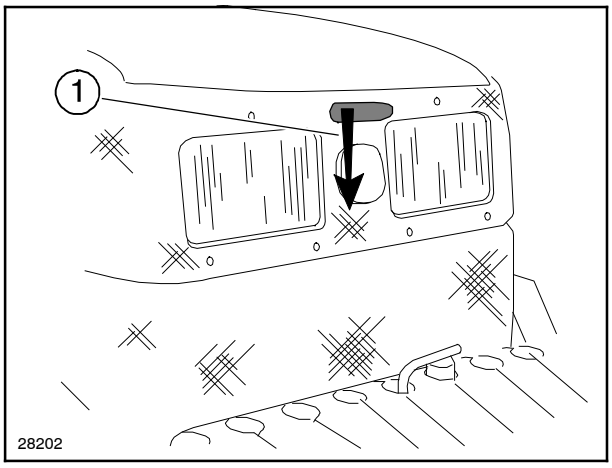
ACCESS FOR INSPECTION AND MAINTENANCE



1

INTRODUCTION

To access the engine components and carry out inspection, lubrication and maintenance operations, the bonnet must be opened.
The following instructions describe the required procedure.



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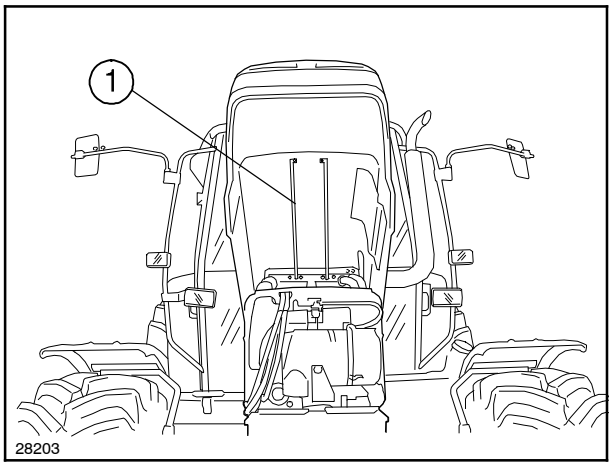
HOOD

The hood is hinged at the rear to allow easy and safe access to the various engine components.
Two gas springs (**1**) fig. hold the engine bonnet in one of the two possible positions.



3

OPENING THE BONNET

Pull the lever downwards (**1**) fig. 3, lift from the front, as indicated by the arrow in fig. 1 and allow the hood to raise.
The gas springs (**1**) fig. 3 will maintain the hood in the raised position.

NOTE: *To close the bonnet, simply pull it down and press the top lightly to ensure it engages.*

LUBRICATION AND MAINTENANCE TABLE

The numbers in the second column are with reference to the operations and illustrations in the following pages of this section.

Hours of work	Op. No.	Maintenance operation	Functional check	Fill–up level	Clean	Greasing	Adjust	Change	Page
Flexible maintenance	1	Adjust engine clutch					●		3–7
	2	Adjust fan belts					●		3–8
	3	Adjust compressor belt					●		3–9
With warning light ON	4	Outlet valve, dry air filter			●				3–9
	5	Main cartridge, dry air filter			●				3–10
	6	Brake fluid reservoir	●	●					3–11
	7	Fuel sediment filter (condensation drain)			●				3–11
Every 10 hours	8	Oil sump	●	●					3–12
	9	Battery	●	●					3–13
	10	Hydrostatic steering reservoir	●	●					3–14
	11	Radiator expansion tank	●	●					3–14
	12	Windscreen washer bottle	●	●					3–15
	13	Cab air filters			●				3–15
	14	Condenser			●				3–15
	15	Air–conditioning and dehydration filter	●						3–16
Every 50 hours	16	Rear wheel hubs				●			3–16
	17	Lift and linkage				●			3–17
	18	Tow hitch				●			3–17
	19	Hydraulically operated towing hitch				●			3–17
	20	Steering cylinders, 4WD				●			3–18
	21/22	Front axle pivots 4WD				●			3–18
	23	Steering cylinder 2WD				●			3–19
	24	Steering cylinder and rod on right–hand side 2WD				●			3–19
	25	Stub axles 2WD				●			3–19
	26	Front axle pivot 2WD				●			3–20
	27	Fuel filter (condensation drain)			●				3–20

Hours of work	Op. No.	Maintenance operation	Functional check	Fill-up level	Clean	Greasing	Adjust	Change	Page
Every 300 hours	28	Oil sump						●	3-21
	29	Fuel filter						●	3-21
	30	Fuel pump filter			●				3-21
	31	Oil filter, lift						●	3-22
	32	Oil filter, hydrostatic steering and auxiliary services						●	3-22
	33	Engine oil filter						●	3-22
	34	Hydrostatic steering oil filter (separate tank)			●				3-23
	35	Dry air filter (external cartridge)			●				3-23
	36	Rear transmission and lift	●	●					3-23
	37	Front axle housing	●	●					3-24
	38	Transmission handbrake	●				●		3-24
	39	Front axle lateral hubs	●	●					3-24
	40	Front wheels 2WD				●			3-25
	41	Stub axles 4WD				●			3-25
Every 900 hours	42	Engine valves	●				●		3-25
Every 1200 hours or annualy	43	Cab air filters						●	3-26
	44	Dry air filter (cartridges: internal and external)						●	3-26
	45	Fuel tank			●				3-26
	46	Hydrostatic steering oil (independent tank)						●	3-27
	47	Drive shaft sleeve for live front axle connection	●					●	3-27
Every 1200 hours or every 2 years	48	Fuel injectors	●				●		3-28
	49	Front axle housing oil, 4WD						●	3-28
	50	Front axle lateral hubs oil, 4WD						●	3-28
	51	Engine cooling system			●			●	3-29
	52	Rear transmission and hydraulic oil						●	3-31
General maintenance	Bleed fuel system								3-32
	Bleed brake system								3-33
	Electrical								3-36
	Notes on bodywork maintenance								3-45
	Tractor storage								3-46
	Lubricants table								3-47

FLEXIBLE MAINTENANCE

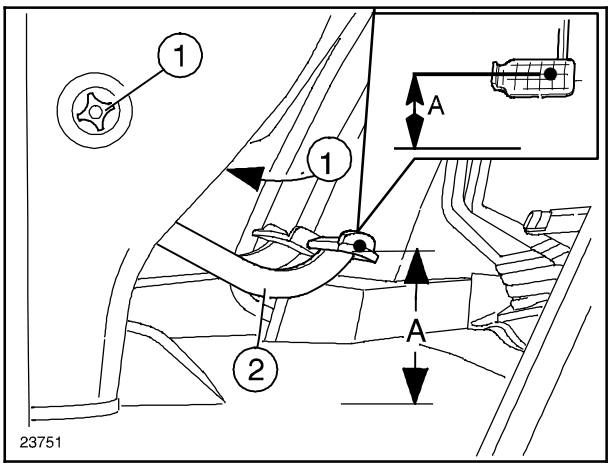
OPERATION 1

ENGINE/GEARBOX CLUTCH ADJUSTMENT - Figs. 1 and 2

If the pedal position becomes uncomfortable (too high) or it will not reach its upper rest position (to prevent the clutch slipping), check that distance **A** on pedal (**2**) fig. 1 is 7.28 in (185 mm) from the platform (for tractors without cabs, or 6.37 in (162 mm) for tractors with cabs; if not, adjust the control as follows:

- unscrew the knobs (**1**) fig. 1 and remove the cover to access the adjusting parts;
- loosen the locknut (**1**) fig. 2 and screw the nut (**2**) fig. 2 counter-clockwise;
- check that the distance **A** is correct;
- tighten the locknut (**1**) fig. 2;
- re-check that pedal travel is as specified.

IMPORTANT: *The distance must be measured from the center of the pedal, as shown in detail in the drawing.*



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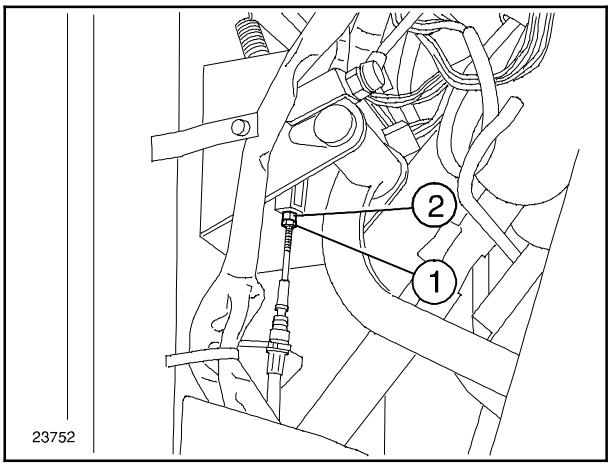

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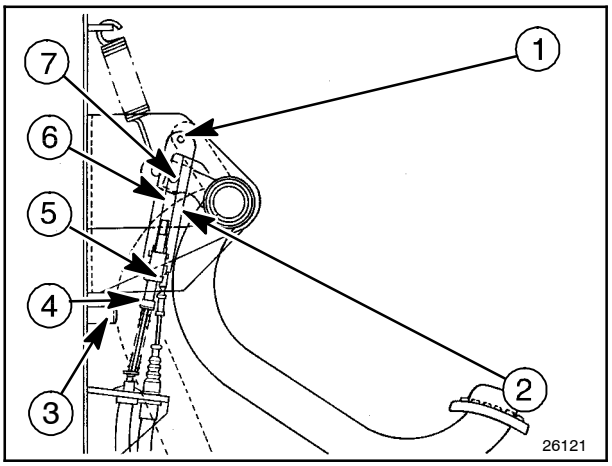
ENGINE/GEARBOX CLUTCH ADJUSTMENT FOR TRACTORS WITH 2 SPEED POWER SHIFT - Fig. 3

After adjusting the idle pedal travel adjust the 2 Speed Power Shift valve stem travel as follows:



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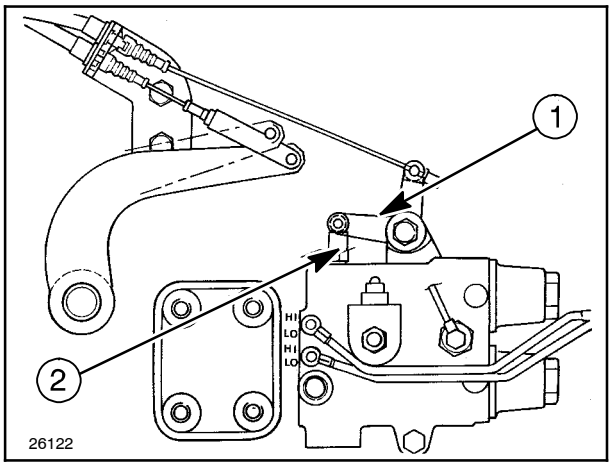


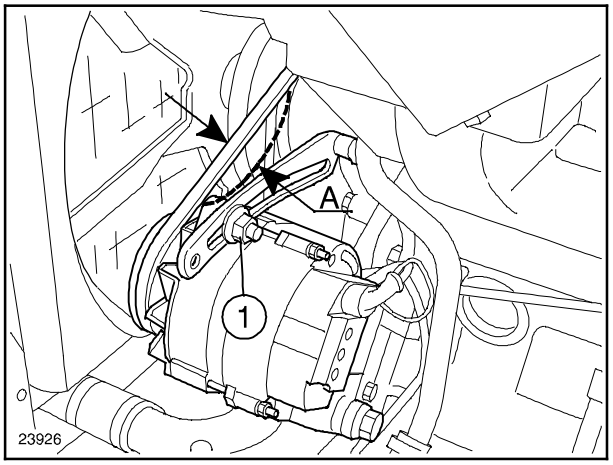
4

clutch adjustment (continued)

- push the engine/gearbox clutch pedal fully down, to the stop position (**3**) fig. 3;
- insert a lever in hole (**1**) fig. 3 and pull bracket (**2**) fig. 3 upwards to bring pin (**2**) to its stroke limit position 4;
- loosen the locknut (**5**) in fig. 3.
- tighten or loosen the adjuster (**4**) fig. 3 until the clearance between pin (**7**) and slot (**6**) in fig. 3 is between 0.01 to 0.03 in (0.5 to 0.75 mm);
- tighten the locknut (**5**) fig. 3.

WARNING - *On tractors with 2 Speed Power Shift transmissions, for adjustments to the distributor control pedal and lever (**1**) fig. 4 it is advised to contact your local dealer.*

OPERATION 2



5

FAN BELT (VERSION WITHOUT CAB AND WITH NON-AIR CONDITIONED CAB) - Fig. 5

Check that belt tension (**A**) is 0.39 to 0.43 in (10 to 11 mm) with a load of 78 to 98 N (8 to 10 kg).

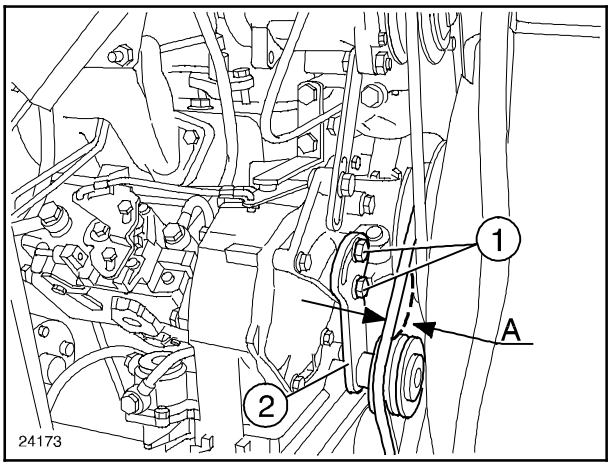
To adjust, loosen the screw (**1**) fig. 5 and adjust the tension to the values noted above.

NOTE: *If belts are cracked or require frequent adjustment, they must be replaced.*

FAN BELT (CAB WITH AIR CONDITIONING) - Fig. 6

Check that belt tension (**A**) is 0.39 in (10 mm) with a load of 60 to 75 N (6 to 8 kg), measured as shown in the figure.
To adjust, loosen the nuts (**1**) and adjust the belt tensioner (**2**) fig. 6.

NOTE: *If belts are cracked or require frequent adjustment, replace.*



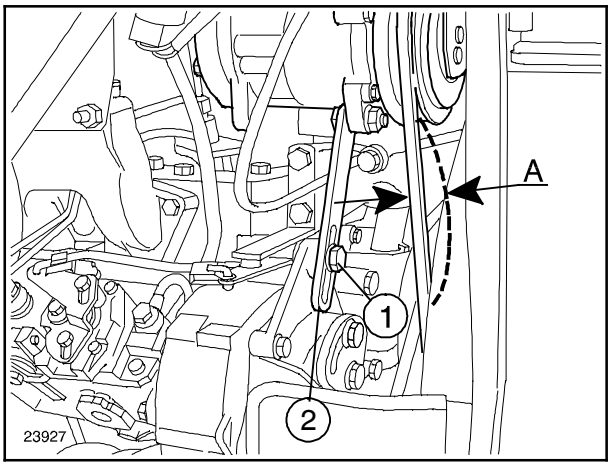
6

OPERATION 3

COMPRESSOR BELT - Fig. 7

Check that belt tension (**A**) is 0.47 to 0.51 in. (12 to 13 mm) with a load of 78 to 98 N (8 to 10 kg), measured as shown in the figure.
To adjust, loosen the screw (**1**) and adjust the belt tensioner (**2**).

NOTE: *If belts are cracked or require frequent adjustment, replace.*



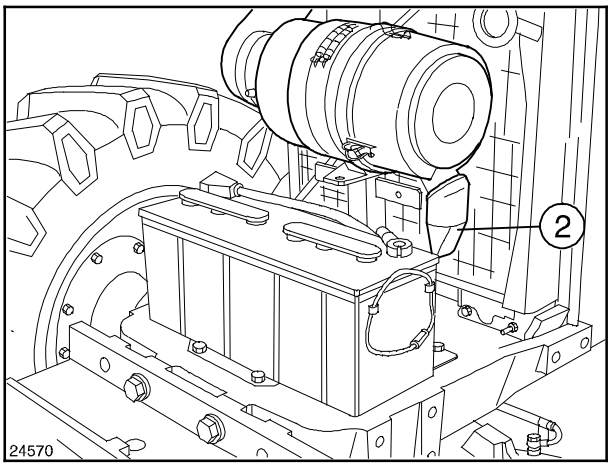
7

WHEN AN INDICATOR LIGHT ILLUMINATES ON THE DASHBOARD

OPERATION 4

AIR FILTER VALVE - Fig. 8

Check if the outlet valve (**2**) is clogged by pressing the rubber end cap.



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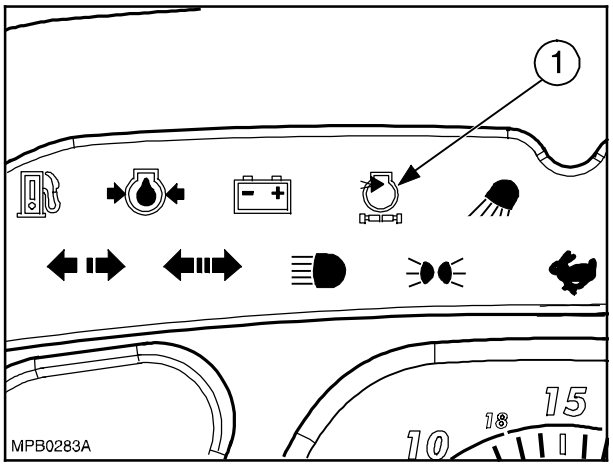


9

DRY AIR FILTER MAINTENANCE

NOTE: *When the red indicator light (**1**) Fig. 9 illuminates on the control panel, check for filter clogging. Replace the external cartridge every year or when cracks appear (visible by placing a light inside). Do not wash or blow into the inside of the safety cartridge, replace together with the external cartridge*.

OPERATION 5

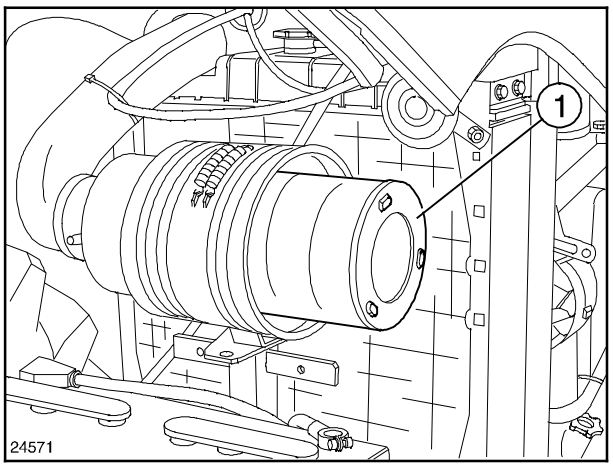
DRY AIR FILTER MAIN CARTRIDGE - Fig. 10

When the red indicator illuminates on the control panel, remove the cover, extract the external cartridge (**1**) and clean as follows;

- with a jet of compressed air at a pressure of less than 85.57 psi (5.9 bar) from the inside towards the outside;

or:

- with water and a non-foaming detergent, rinse with a water jet at a pressure of less than 42.06 psi (2.9 bar) and dry with dry air at a temperature of less than 122 °F (50 °C).



10

Never clean the cartridge by tapping on a hard surface, but tap the ends on the palm of the hand.

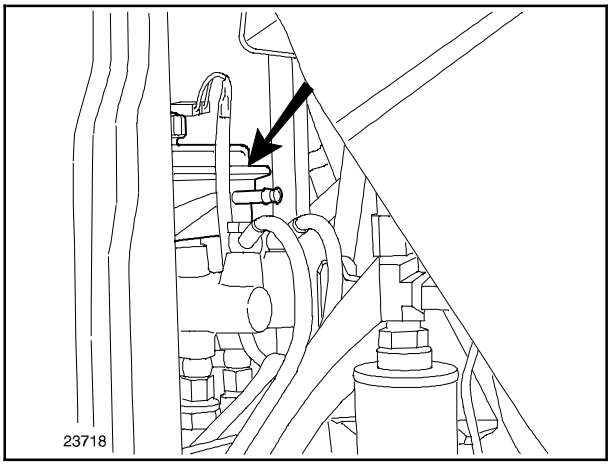
Clean the inside parts of the container carefully with a damp cloth.

OPERATION 6

BRAKE FLUID LEVEL - Fig. 11

Check that the fluid level never drops below the point marked by the arrow on the reservoir.

WARNING: *Illumination of the red warning light on the control panel, indicates that the oil level in the reservoir is below the "**MIN**". Eliminate the cause of the problem and fill-up with oil. At the end of the operation, bleed the circuit as described on page 3-33. If the light remains illuminated, contact your local dealer.*



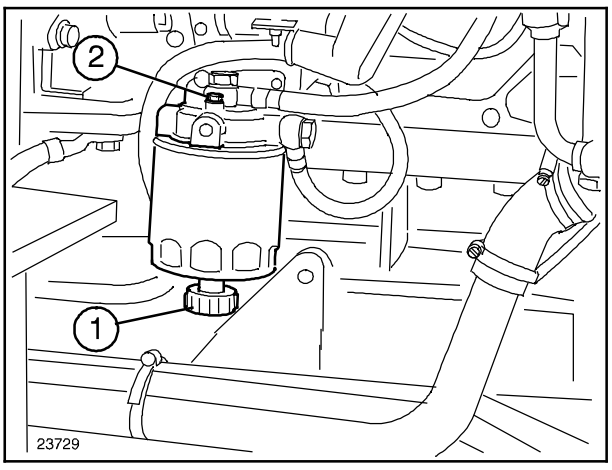
11

NOTE: *Periodically check the indicator efficiency. By pressing the blue push button on the cover, if all is working correctly, indicator lamp 14, page 2-5 should illuminate.*

OPERATION 7

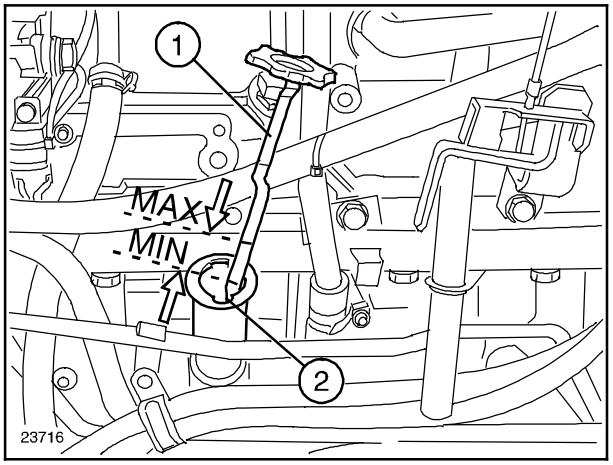
FUEL SEDIMENT FILTER - Fig. 12

With the fuel tanks completely full, unscrew the lower screw (**1**) until all the water has drained out.
To complete the drainage operation, unscrew the upper screw (**2**). Tighten screw (**1**) and, when only oil (without air bubbles) comes out of the hole, tighten screw (**2**).



12

EVERY 10 HOURS



13

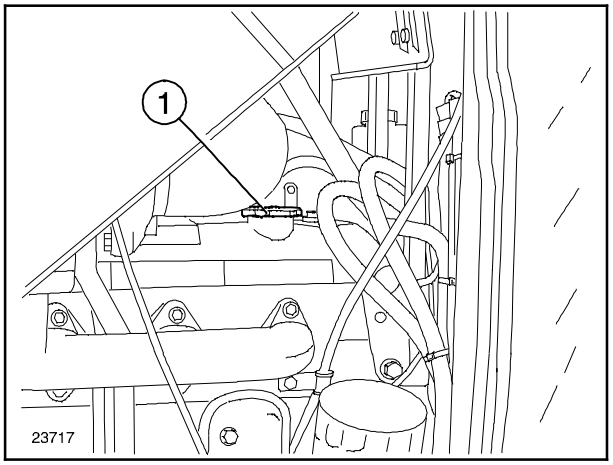
OPERATION 8

OIL SUMP LEVEL - Figs. 13 and 14

Check the level with the engine on a flat surface with the engine switched off. Allow at least five minutes for the oil to settle in the sump:

- Remove dipstick (**1**) fig. 13, clean it with a cloth and replace it in its hole.

- Remove the dipstick again and check that the oil level is between the "**MIN** and **MAX**" marks.



14

- If necessary, add oil through fill points (**2**) fig. 13 or (**1**) fig. 14 until the correct level is reached.

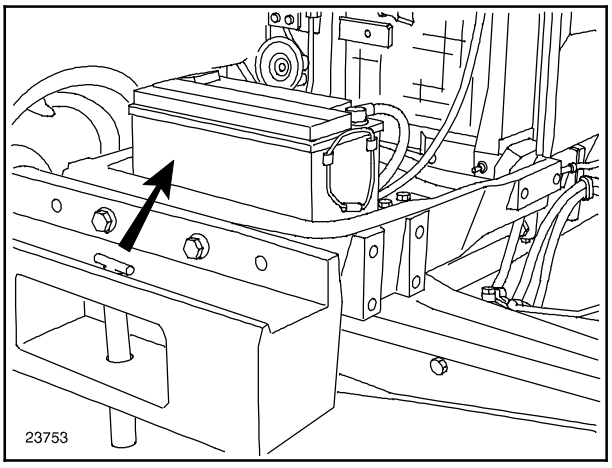
NOTE: *A red warning light on the panel shows when the oil level is low.*

CAUTION: *Never run the engine when the oil level is below the "**MIN**" mark.*

OPERATION 9

BATTERY CAPACITY 100 Ah - Fig. 15

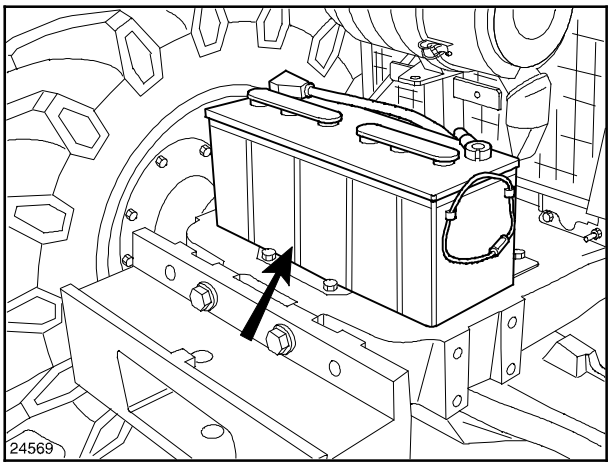
NOTE: *The 100 Ah capacity battery is located inside the front axle support, fig. 15.*
To access the battery, lift the bonnet as described on page 4 of this section.



15

BATTERY CAPACITY 132 Ah - Fig. 16

NOTE: *The 132 Ah capacity battery is located on top of the front axle support, fig. 16.*
To access the battery, lift the bonnet as described on page 4 of this section.



16

BATTERY BELOW PLATFORM VARIANT (not available on all versions) - Figs. 17 and 18

It is located below the platform on the right.

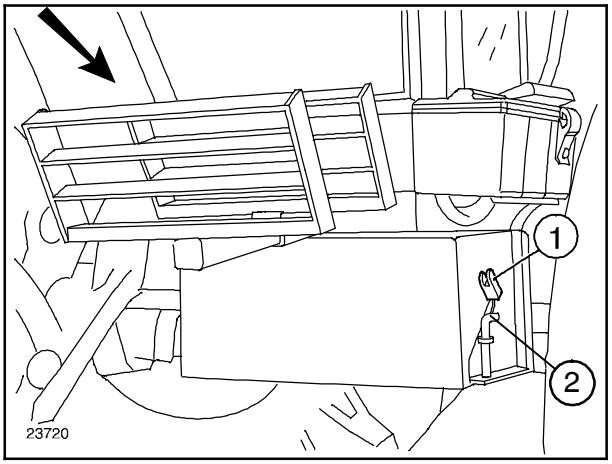
To access the battery, proceed as follows:

- lift the steps as shown in fig. 17 and hold them in place using the pin provided;
- release the retention levers (**1**), one on each side, remove the protective cover and check the battery level.

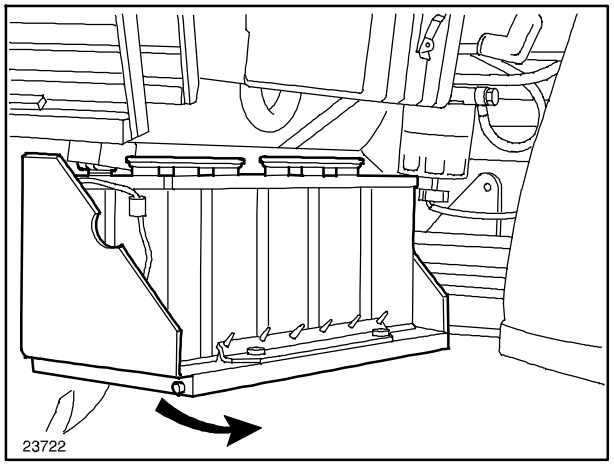
Check that the battery is working properly as described on page 36 of this section**.**

NOTE: *The electrolyte level must be checked with the engine shut off, the tractor on a flat surface and the battery cold.*

NOTE: *Check that the clamps are securely attached to the terminals.*
If the battery needs to be topped up frequently or tends to run down, have the electrical system checked by your New Holland Dealer.



17



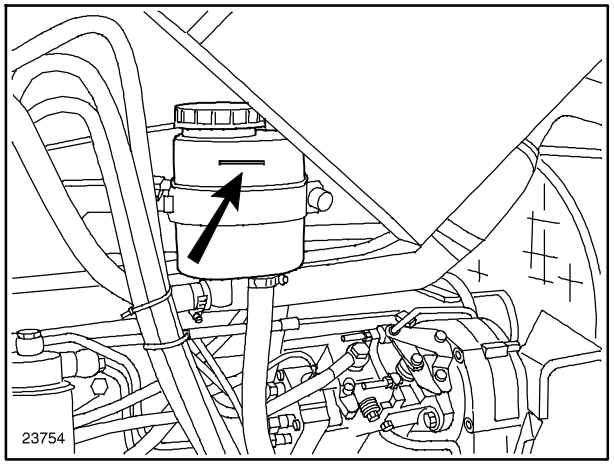
18

Battery under platform (cont.)

If the fluid needs to be topped up, proceed as follows:

- remove pin (**2**) fig. 17 page 13;
- swing the battery housing outwards, as shown in fig 18.

NOTE: *Top up the fluid level as described on page 3-36 in this section.*



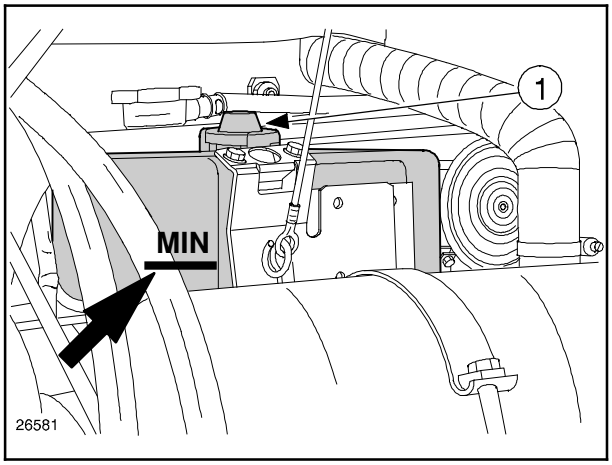
19

OPERATION 10

HYDROSTATIC STEERING TANK 2WD MODEL - Fig. 19

Check the oil level and top up as necessary.

NOTE: *The independent tank for the hydrostatic steering circuit is only fitted on models with 12 forward gears and 4 reverse gears, 12 forward gears and 12 reverse gears, 20 forward gears and 12 reverse gears and mechanically controlled PTO.*



20

OPERATION 11

RADIATOR EXPANSION TANK - Fig. 20

The level must always be above the "**MIN**" mark shown in the figure.

If necessary top up through fill point (**1**).

OPERATION 12

WINDSCREEN WASHER BOTTLE - Fig. 21

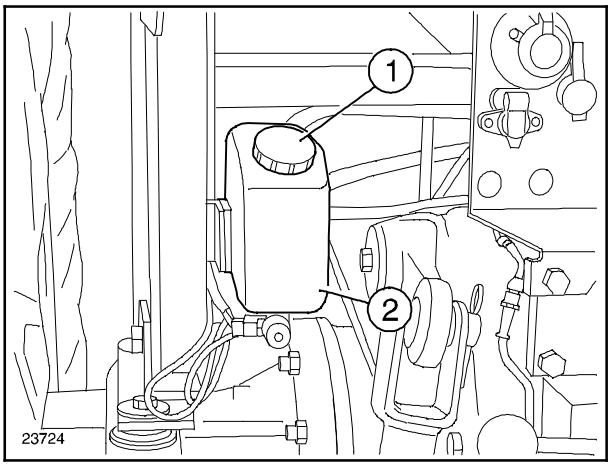
To add liquid to the windscreen washer bottle:

1. remove filler cap (**1**);

2. add washing liquid to fill bottle (**2**);

3. replace the cap.

WARNING: *In winter use water mixed with an anti-freeze product.*



21

OPERATION 13

CAB AIR FILTERS - Fig. 22

Unscrew the cover retaining knobs (**1**), extract cartridges (**2**) (one on each side) and clean:

- by tapping gently on a flat surface with the outward-facing part downwards;

or:

- with a jet of compressed air at a pressure of less than 100.08 psi (6.9 bar);

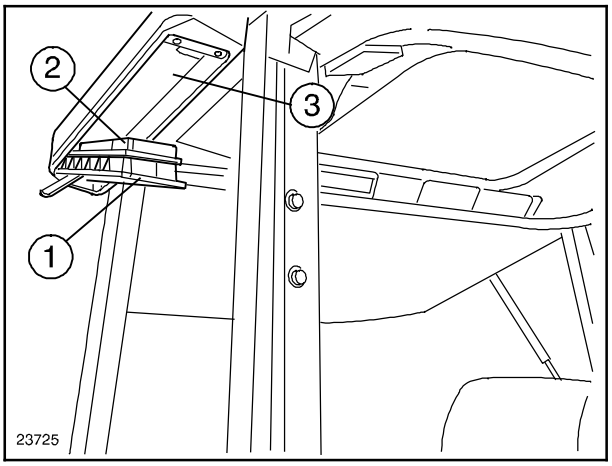
or:

- by immersing the filters in a solution of water and non-foaming detergent for 15 minutes;

or:

- Rinsing with a jet of water at less than 34.81 psi (2.7 bar) and drying with dry, non-compressed air.

Clean filter seats (**3**) with a cloth. When refitting the cartridges, the arrow on the label must face the inside of the cab.

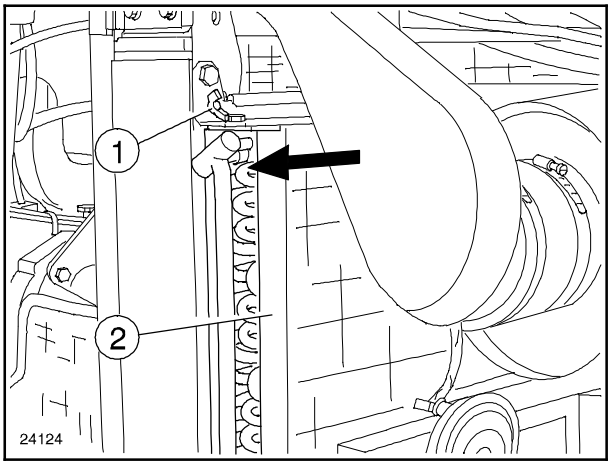


22

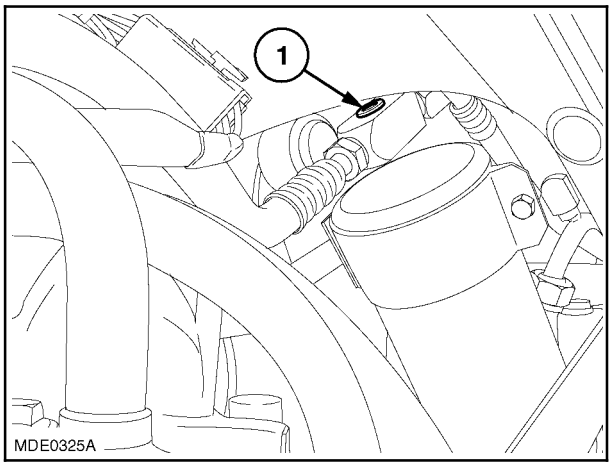
OPERATION 14

CONDENSER - Fig. 23

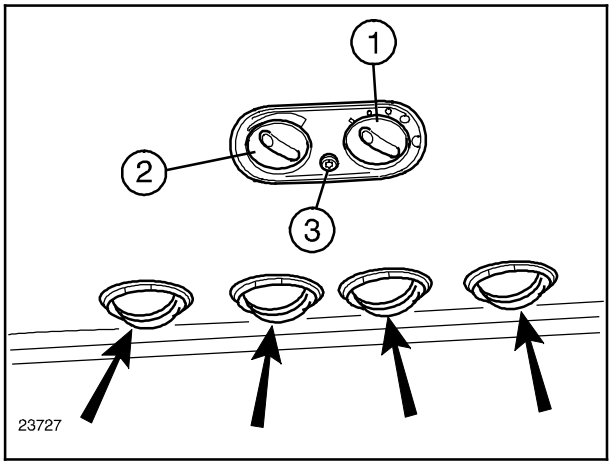
Slacken retaining screw (**1**) on the condenser (**2**), unscrew in the direction of the arrow and clean off any dirt accumulated between the cooling fins. Check that they are not deformed and, if necessary, restore them to proper working condition.



23



24



25

OPERATION 15

DEHYDRATION FILTER FOR CAB AIR CONDITIONING SYSTEM - Figs. 24 and 25

At the start of the period of use, check that the filter is working properly as follows:

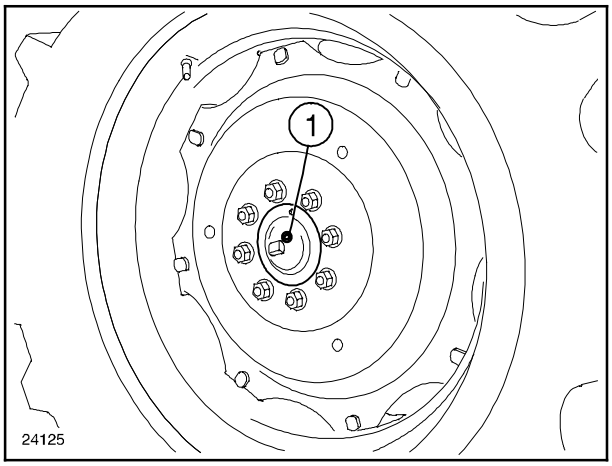
- press button (**3**) fig. 25 to switch on the air-conditioning;
- turn temperature control knob (**2**) fig. 25 fully counter-clockwise;
- turn electric fan control (**1**) fig. 25 to the first low-speed setting;
- place a thermometer next to the vents shown in the figure, and check that the temperature measured is around 59 °F (15 °C) less than the external temperature.

or:

- check, with the air-conditioning on, that inspection glass (**1**) fig. 24, on top of filter, is transparent; if white liquid or air bubbles can be seen, the filter needs to be replaced.

NOTE: *The filter must always be replaced when work is carried out on the air conditioning system. Also, take this opportunity to check the oil level in the compressor.*

EVERY 50 HOURS



26

OPERATION 16

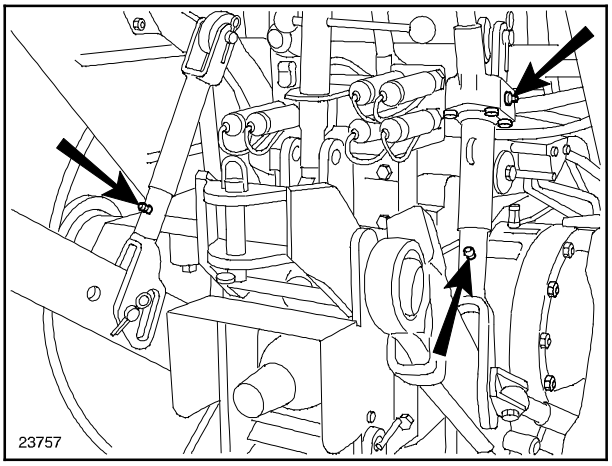
REAR WHEEL HUBS - Fig. 26

Check regularly that when AMBRA GR9 grease is pumped in via lubricating nipple (**1**) (one on each side), grease escapes from the internal guard. To fill the grease chamber between the wheel hub and the reducer housing uniformly, the wheel must be turned. When working in particularly dusty or boggy environments, the operation must be carried out frequently to expel any dust or water that has entered.

OPERATION 17

LIFT AND LINKAGE - Fig. 27

Using a grease gun, pump AMBRA GR9 grease into the three greasing points shown.

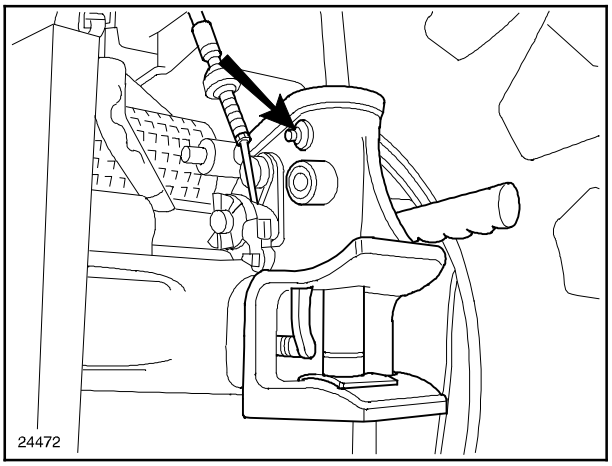


27

OPERATION 18

TOWING HITCH - Fig. 28

Using a grease gun, pump AMBRA GR9 grease into the lubricating nipple shown.

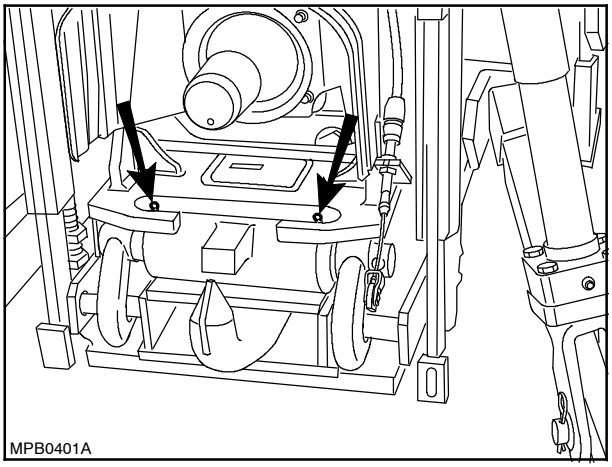


28

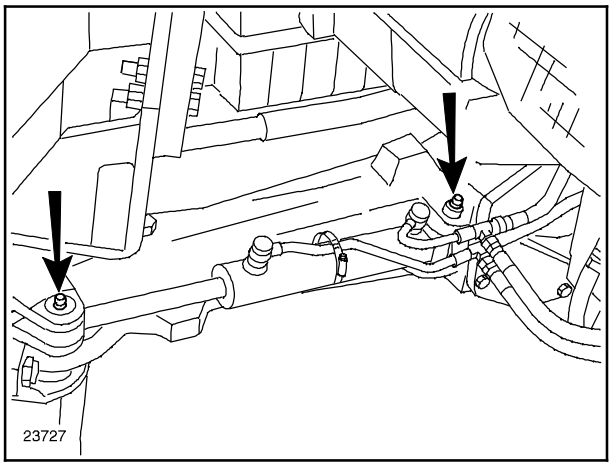
OPERATION 19

HYDRAULICALLY OPERATED TOWING HITCH - Fig. 29

Using a grease gun, pump AMBRA GR9 grease into the lubricating nipple shown.



29

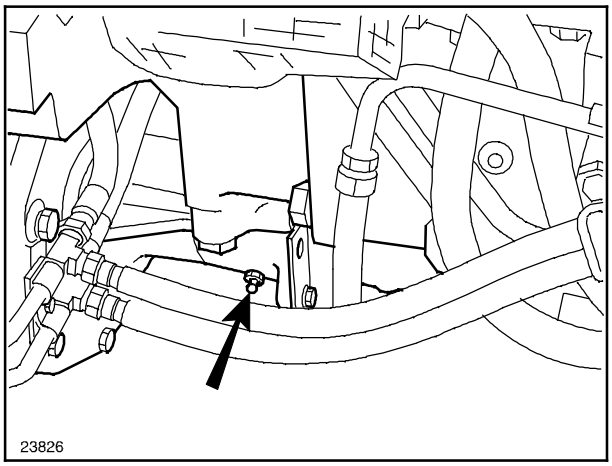


30

OPERATION 20

STEERING CYLINDERS 4WD - Fig. 30

Using a grease gun, pump AMBRA GR9 grease into the two lubricating nipples shown.

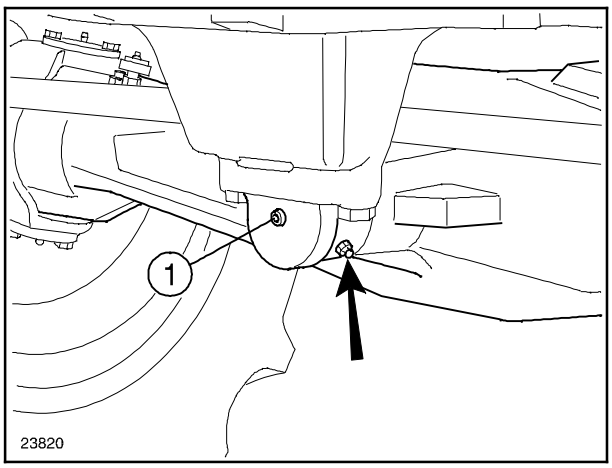


31

OPERATION 21

FRONT AXLE REAR PIVOT 4WD - Fig. 31

Using a grease gun, pump AMBRA GR9 grease into the lubricating nipple shown.



32

OPERATION 22

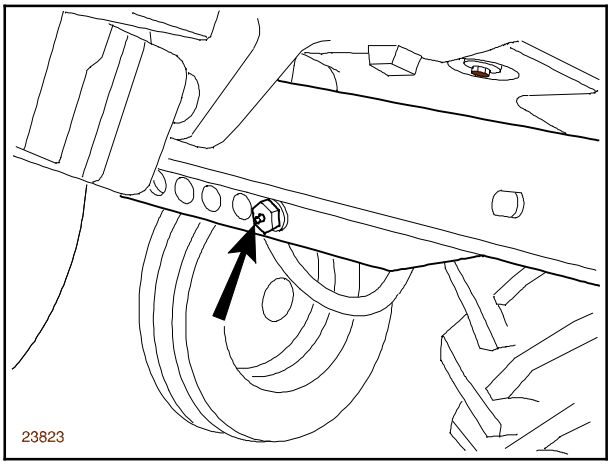
FRONT AXLE FRONT PIVOT 4WD - Fig. 32

Using a grease gun, pump AMBRA GR9 grease into the lubricating nipple until grease escapes through outlet (**1**).

OPERATION 23

STEERING CYLINDER 2WD - Fig. 33 and 34

Using a grease gun, pump AMBRA GR9 grease into the lubricating nipple shown.

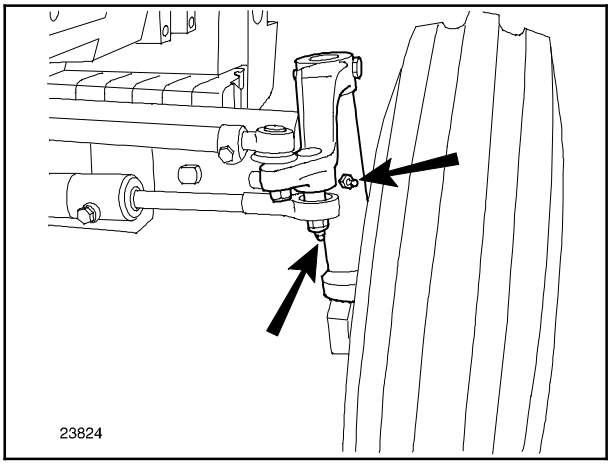


33

OPERATION 24

STEERING CYLINDER AND RIGHT-HAND STUB AXLE 2WD - Fig. 34

Using a grease gun, pump AMBRA GR9 grease into the two lubricating nipples shown.

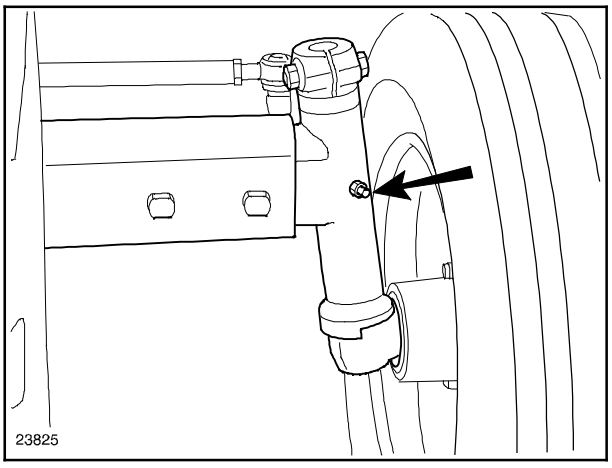


34

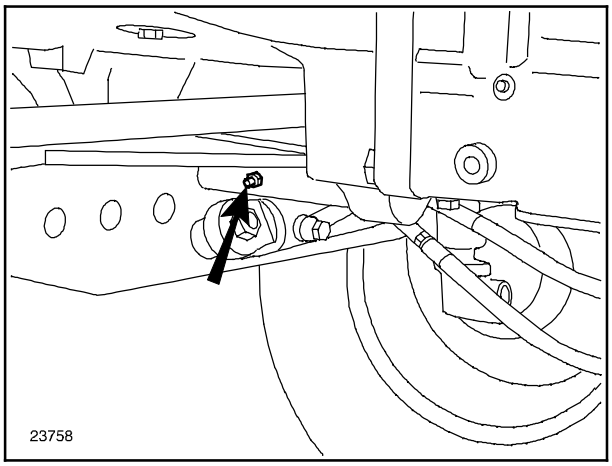
OPERATION 25

LEFT-HAND STUB AXLE 2WD - Fig. 35

Using a grease gun, pump AMBRA GR9 grease into the lubricating nipple shown.



35

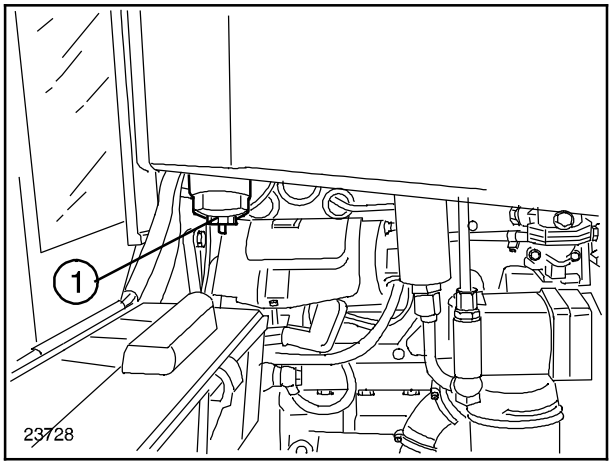


36

OPERATION 26

FRONT AXLE PIVOT 2WD - Fig. 36

Using a grease gun, pump AMBRA GR9 grease into the lubricating nipple shown.



37

OPERATION 27

FUEL FILTER - Fig. 37

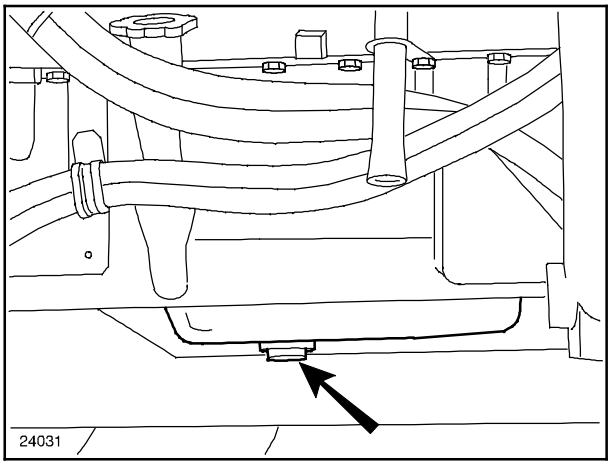
Remove condensation by unscrewing by 3/4 turns screw (**1**) and operating the fuel pump lever.

EVERY 300 HOURS OF WORK

OPERATION 28

OIL SUMP - Fig. 38

Drain via the sump plug shown and fill using fill point (**2**) fig. 13 or (**1**) fig. 14 page 3-12.

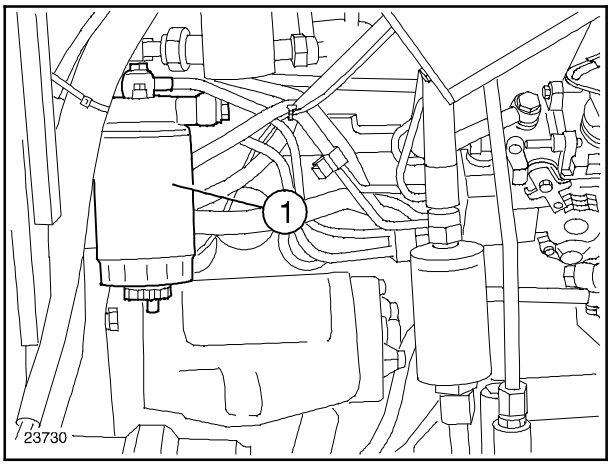


38

OPERATION 29

FUEL FILTER - Fig. 39

Unscrew the filter cartridge (**1**) by hand and replace. Bleed off the air, as described on page 3-32 in this section.

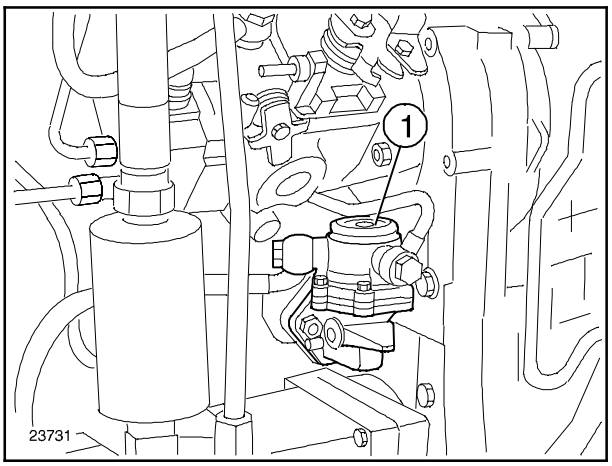


39

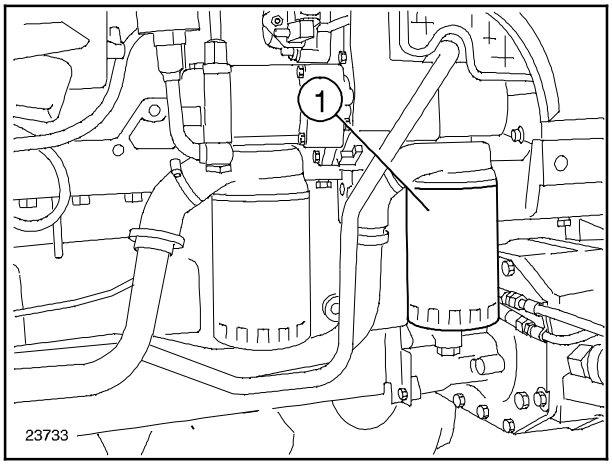
OPERATION 30

FUEL PUMP FILTER - Fig. 40

Remove cover (**1**) and clean the internal filter.



40

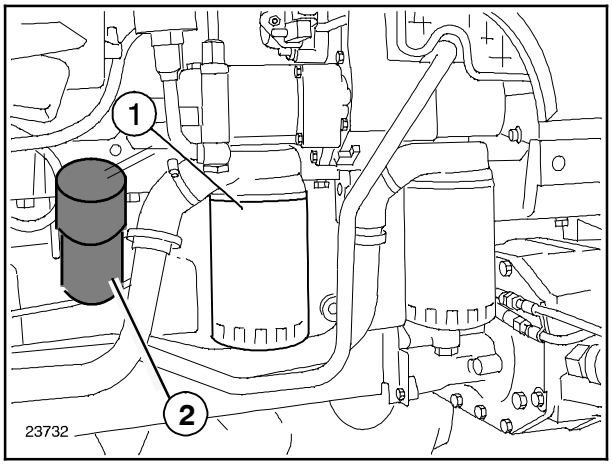


41

OPERATION 31

HYDRAULIC LIFT OIL FILTER - Fig. 41

Replace filter (**1**) and oil the seal; screw on and tighten the cartridge $^3/_4$ of a turn by hand. Top up the oil level, without using old oil (see Op. No. 36 fig. 46).



42

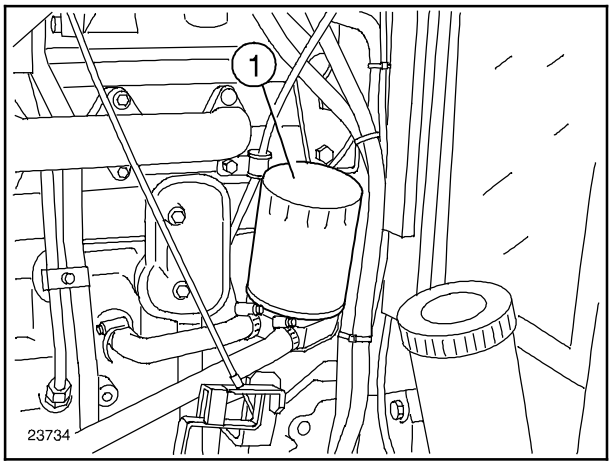
OPERATION 32

HYDROSTATIC STEERING AND AUXILIARY SYSTEMS FILTER - Fig. 42

Replace filter (**1**): oil the seal, screw on and tighten the cartridge $^3/_4$ of a turn by hand. Top up the oil level, without using old oil (see Op. No. 36 fig. 46).

OIL FILTER - MODELS WITH POWER SHUTTLE/2 SPEED POWER SHIFT - Fig. 42

Change the oil inside the container (**2**), right-hand side. Before re-positioning the container, oil the seals and screw on by hand for $^3/_4$ of a turn. Top up the oil level, without using old oil (see Op. No. 36 fig. 46).



43

OPERATION 33

ENGINE OIL FILTER - Fig. 43

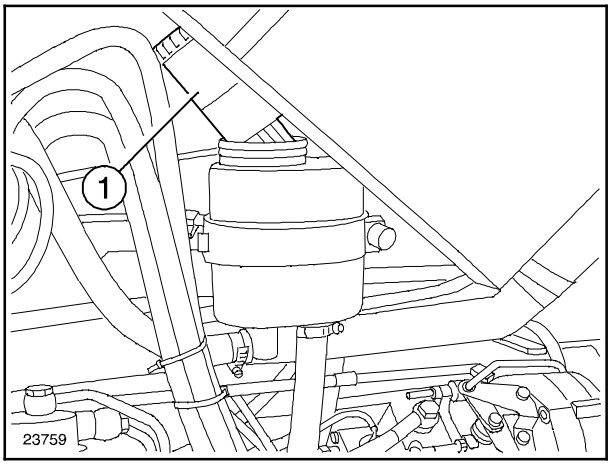
Replace filter (**1**): oil the seal, screw on and tighten the cartridge $^3/_4$ of a turn by hand. Top up the oil level, without using old oil (see Op. No. 8 page 3-12).

OPERATION 34

HYDROSTATIC STEERING - Fig. 46

Remove filter (**1**) (press downwards and shift sideways) and wash in mineral oil together with the filler cap.

NOTE: *For oil grades, see the table on page 3-47 in this section.*

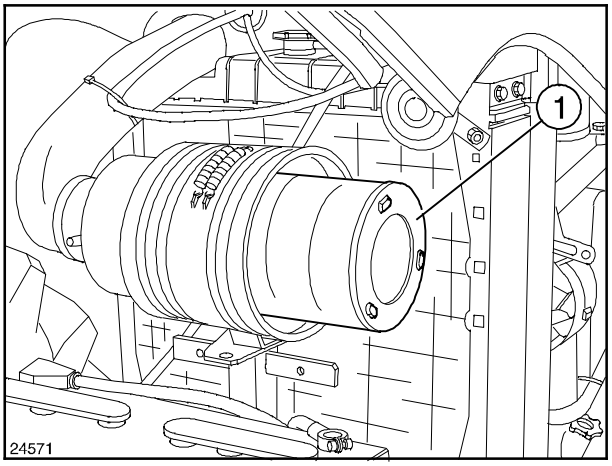


44

OPERATION 35

DRY AIR FILTER, EXTERNAL CARTRIDGE - Fig. 45

Remove the cover, take out external cartridge (**1**) and clean as described in operation 5, page 10 of this section.



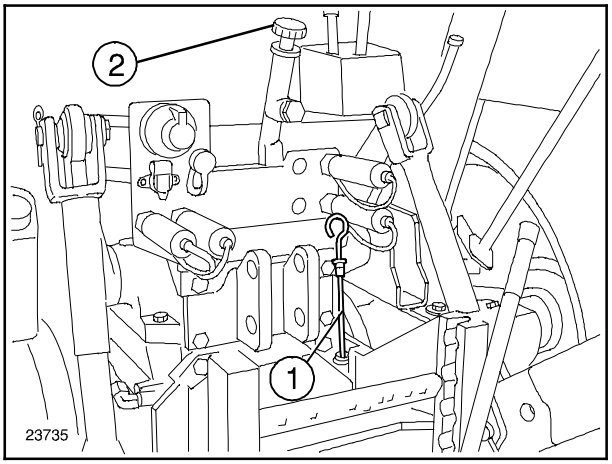
45

OPERATION 36

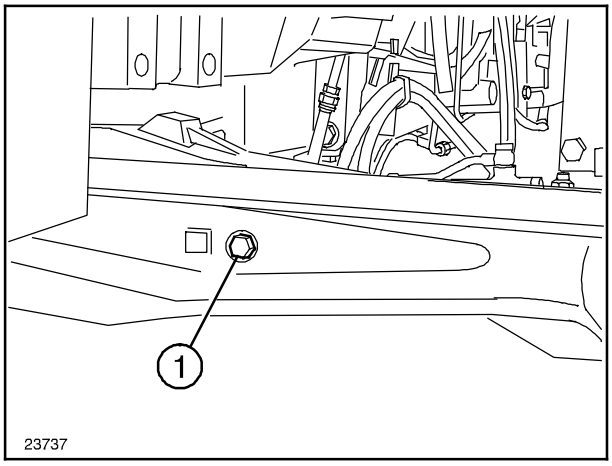
TRANSMISSION AND LIFT - Fig. 46

With the tractor on a level surface, the engine shut off and the link arms lowered, check that the oil level reaches the "**MAX**" mark on dipstick (**1**).
If necessary, add oil by removing cap (**2**) and filling through the fill point.

NOTE: *For oil grades, see the table on page 3-47 in this section.*



46



47

OPERATION 37

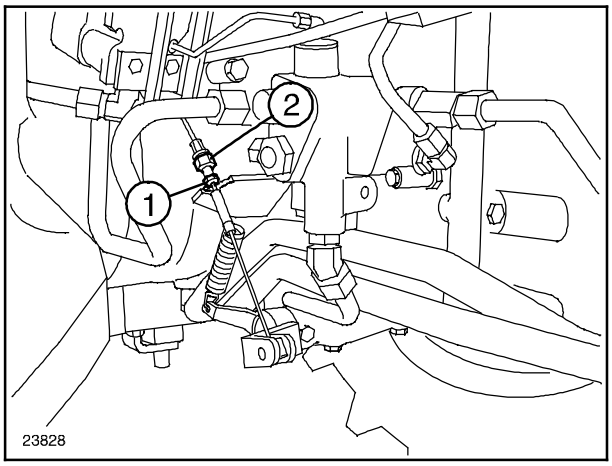
FRONT AXLE HOUSING 4WD - Fig. 47

Check the oil level as follows:

- park the tractor on a flat surface;
- remove plug (**1**), oil flows out of the plug hole.

If necessary, to up through the plug hole (**1**) until oil comes out.

NOTE: *For oil grades, see the topping-up table on page 3-47 in this section.*

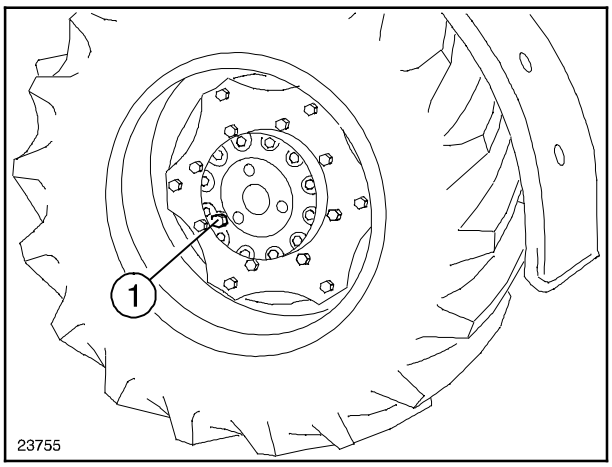


48

OPERATION 38

TRANSMISSION HANDBRAKE - Fig. 48

The handbrake should catch on the sixth or seventh click on the ratchet; if not, slacken nut (**1**)**,** unscrew adjuster nut (**2**) until it catches on the 6th to 7th click. After adjusting, tighten locknut (**1**).



49

OPERATION 39

FRONT AXLE FINAL DRIVES 4WD - Fig. 49

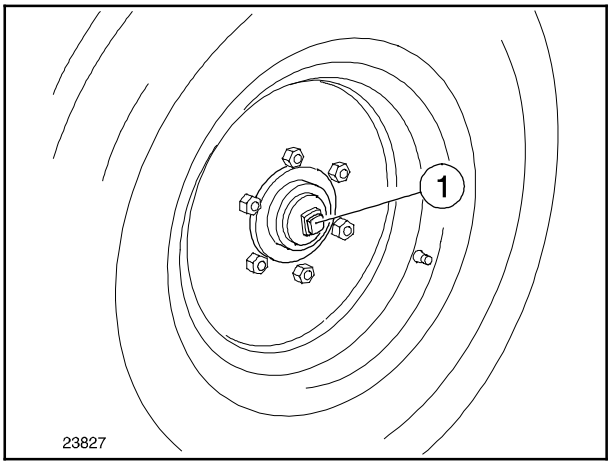
Check oil level by moving plug **1** to a horizontal position. If oil does not escape, top up through the hole.

NOTE: *For oil grades, see the table on page 3-47 in this section.*

OPERATION 40

2WD FRONT WHEELS - Fig. 50

Remove covers **1** from the hubs, fill them with AMBRA GR9 grease and replace.

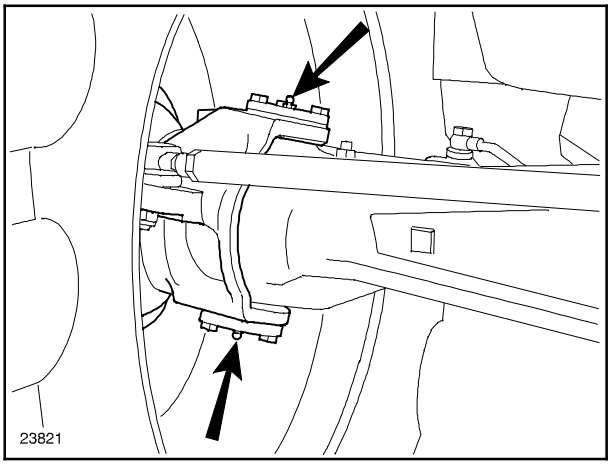


50

OPERATION 41

FRONT AXLE SWIVEL BEARINGS 4WD - Fig. 51

At least twice a year, pump AMBRA GR9 grease into the two lubricating nipples shown (two on each side).



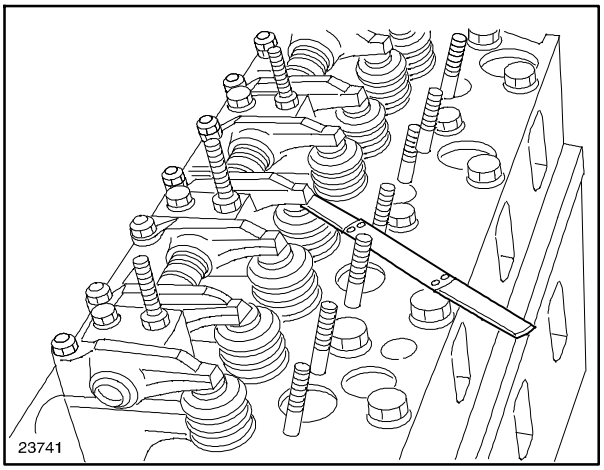
51

EVERY 900 HOURS OF WORK

OPERATION 42

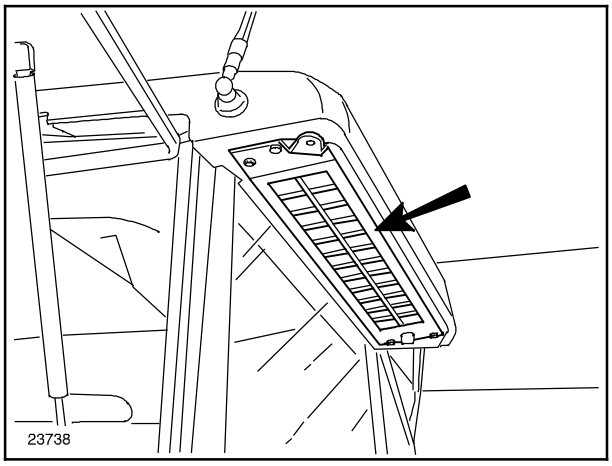
ENGINE VALVES - Fig. 52

Contact your authorized dealer to check the clearance between the valves and the rocker arms (0.012 ± 0.002 in. (mm 0.30 ± 0.05) for the intake and outlet valves). The inspection must be carried out when the engine is cold.



52

EVERY 1200 HOURS OR EVERY YEAR

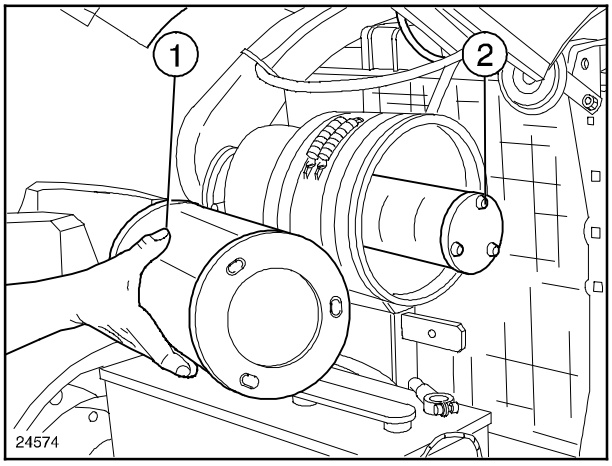


53

OPERATION 43

CAB AIR FILTERS - Fig. 53

Remove the grilles shown, one on each side, and replace the filter cartridges.

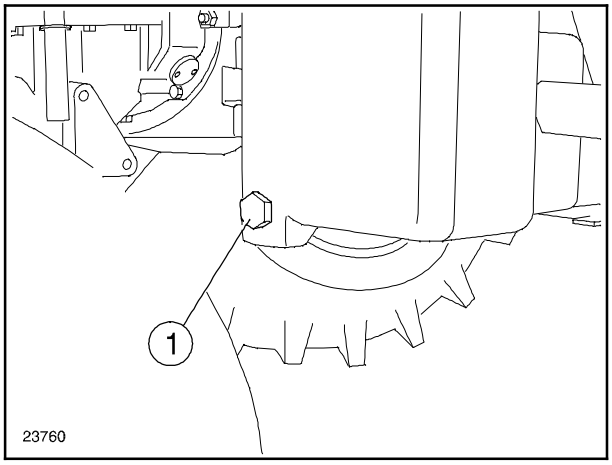


54

OPERATION 44

DRY AIR FILTER - Fig. 54

Replace the external cartridge (**1**), together with the internal cartridge (**2**).



55

OPERATION 45

FUEL TANK - Fig. 55

With the tractor on a level surface and the engine off, drain the fuel as described below:

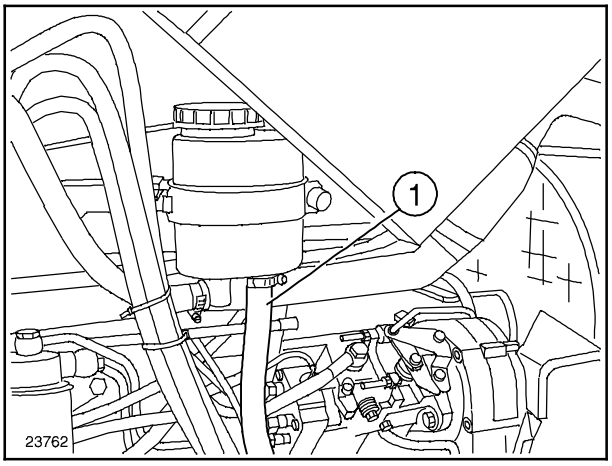
- place a container under the tank;
- remove plug (**1**) and drain the fuel to remove any impurities in the tank.

Refill the tank with clean fuel and drain the system as described on page 3-32 in this section.

OPERATION 46

DRAINING THE HYDROSTATIC STEERING OIL - 2WD MODELS - Fig. 56

Place a container under the reservoir, remove tube (**1**) and drain the oil.
Refit the tube and clean the internal filter before filling with new oil.



56

NOTE: *The independent reservoir for the hydrostatic steering circuit is fitted only on models with 12 forward gears and 4 reverse gears, 12 forward gears and 12 reverse gears or 20 forward gears and 12 reverse gears equipped with mechanically controlled PTO.*

NOTE: *For oil grades, see the topping-up table on page 3-47 in this section.*

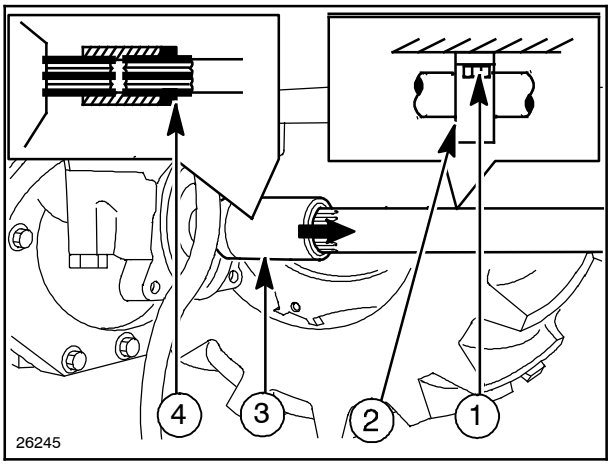
OPERATION 47

DRIVE SHAFT SLEEVE FOR LIVE FRONT AXLE CONNECTION - Fig. 57

Check as follows:

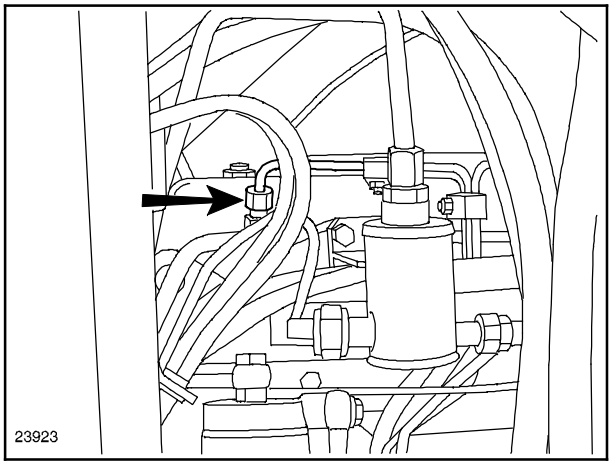
- disassemble the front axle drive shaft guard;
- loosen screws (**1**), to disconnect the support (**2**) from the drive housing;
- remove circlip (**4**);
- move the sleeve (**3**) as shown by the arrow, lower the drive shaft until the sleeve can be removed and check that the inner groove does not show signs of excessive wear.

WARNING: *if the sleeve inner groove should prove excessively worn, refer to your New Holland dealer for a possible replacement.*



57

EVERY 1200 HOURS OR EVERY 2 YEARS



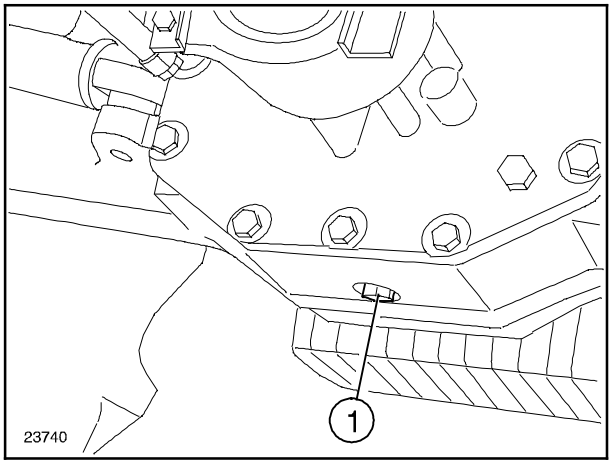
58

OPERATION 48

INJECTORS - Fig. 58

Have your local dealer check the pressure settings (see page 5-4). To remove the injectors from the engine, detach the lines and remove the connectors.
NOTE: *Before loosening or disconnecting any part of the injection system, thoroughly clean the area in which you are going to work.*

NOTE: *Cover all injector lines and apertures to prevent any dirt from entering.*



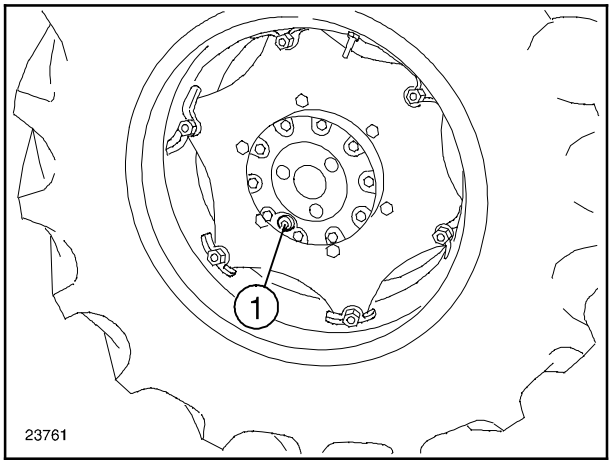
59

OPERATION 49

FRONT AXLE HOUSING - 4WD - Fig. 59

Place a container under the axle housing, unscrew plug (**1**), let all the oil drain out and fill with new oil through plug hole (**1**) operation 37 fig. 47.

NOTE: *For oil grades, see the table on page 3-47 in this section.*



60

OPERATION 50

DRAINING THE OIL FROM THE FRONT AXLE FINAL DRIVES - 4WD - Fig. 60

Position plug (**1**) at its lowest point, place a container under the plug hole and drain the oil.
Return the plug hole to a horizontal position and fill with new oil.

NOTE: *For oil grades, see the table on page 3-47 in this section.*

OPERATION 51

FLUSHING THE COOLING SYSTEM - Figs. 61, 62 and 63

The system uses a mixture of water and ***«AMBRA AGRIFLU liquid»***. This liquid has anti-oxidant, anti-corrosive, anti-foaming and anti-crusting properties; it is also non-freezing up to temperatures of:

Degrees °F (°C)	17.6 (-8)	5 (-15)	-13 (-25)	-22 (-30)
% by volume of **«AMBRA AGRIFLU »**	20	30	40	50

Filling the circuit when you buy the tractor will guarantee the system against minimum temperatures above those shown on the plate attached to the bonnet.

This mixture can be kept unchanged for a period of ***2 years*** provided that during this time the tractor has not been used for more than ***1200 hours***, in total, in which case it must be replaced when the system is flushed

In emergencies, to prevent overheating in the event of leaks, fill the system by pouring water into the radiator fill point (**1**) fig. 63.
After filling, run the engine for a short period to let the two fluids mix thoroughly

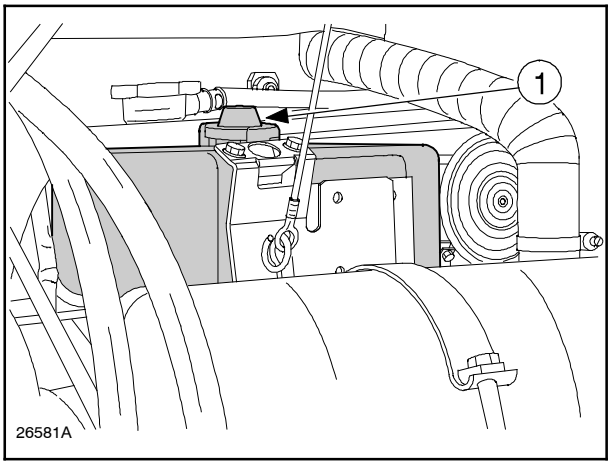
WARNING: *Repair any damage and top up the mixture as soon as possible, referring to the table above.*

FLUSHING THE SYSTEM (MODELS WITHOUT CABS)

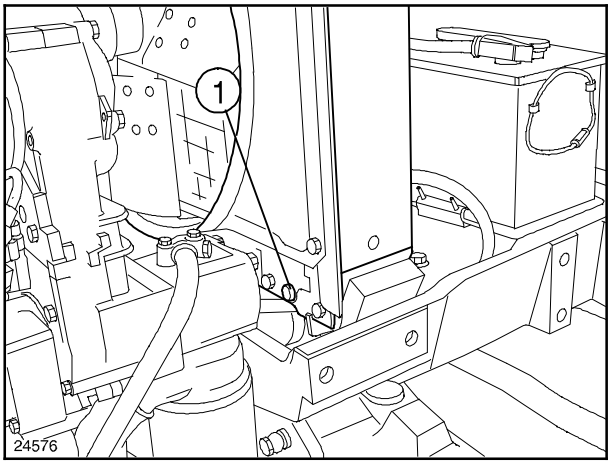
Flush at least every **1200 hours** of work or every **2 years** and whenever switching from or to the anti-freeze mixture

Proceed as follows:

— Remove expansion tank cap (**1**) fig. 61, remove radiator plug (**1**) fig. 62 and drain the water while the engine is hot;



61



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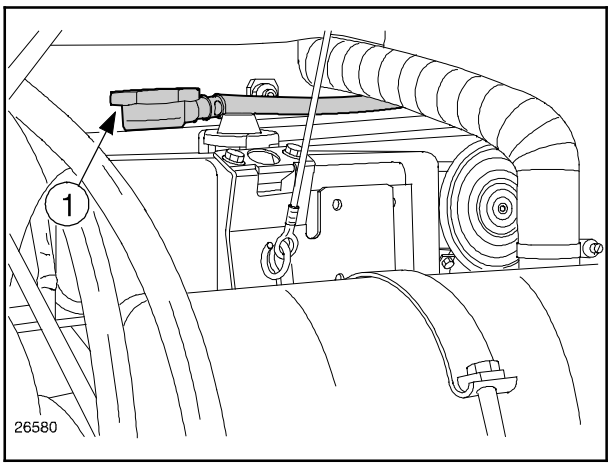


63

— once the engine is cold, fill the radiator with a filtered solution of Solvay soda and water at a ratio of 8.8 oz. ***(250 grams)*** of soda to 2.70 US gall. (***10 litres***) of water;

— run the tractor for approximately one hour and then drain the flushing solution;

— wait for the engine to cool down slightly, then circulate pure water by pouring it into the radiator and leaving it to drain from radiator plug (**1**) fig. 64.

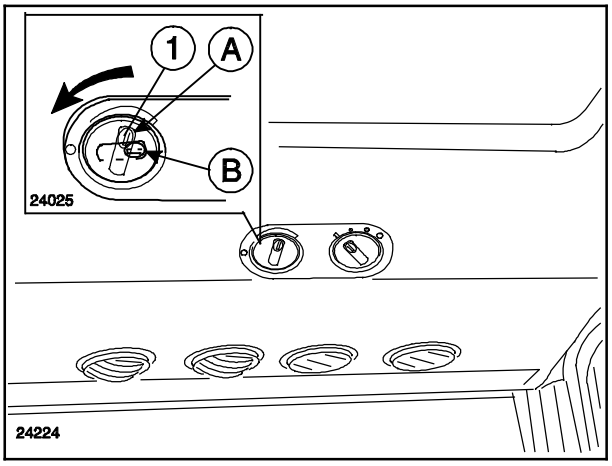
— Replace the radiator plug, fill with water, run the engine for a few minutes and drain the system;

— leave the engine to cool and top up to the normal level.

CAUTION: *The engine must be switched off when draining water from the system.*

THERMOSTAT

A thermostat has been fitted in the cooling system that prevents water from circulating in the radiator until the water has reached a suitable temperature to allow correct engine operation (approx. 185 °F (85 °C).
If doubts arise concerning thermostat operation, remove the part and have it checked by skilled personnel.



64

FLUSHING THE HEATING SYSTEM (MODELS WITH CABS)

The heating system uses fluid from the engine cooling system drawn off between the engine and the radiator.

Flush the system as described for models without a cab, bearing in mind that the system can be completely drained by turning temperature adjustment control (**1**) fig. 64 to vertical position **A**.

Fill the engine cooling system and cab heating system as follows:

— fill the radiator with a mixture of water and "***AMBRA AGRIFLU***" liquid and screw on the radiator cap;

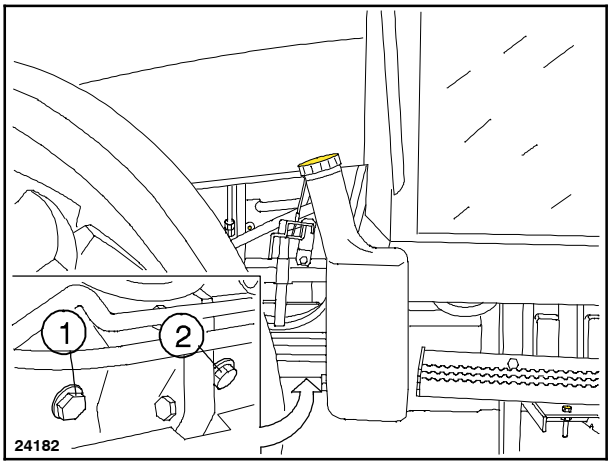
— Turn heating control knob (**1**) to red, in horizontal position **B**), start the engine and run it for approx. 5÷10 minutes (this operation is necessary to preheat the liquid in the engine cooling system);

— remove the upper radiator plug, open the heater cock by turning the knob (**1**) to the vertical position, and allow the engine to run at maximum speed for approximately five minutes;

— fill the radiator with the engine running at high revs until it is completely full, and fit the cap.

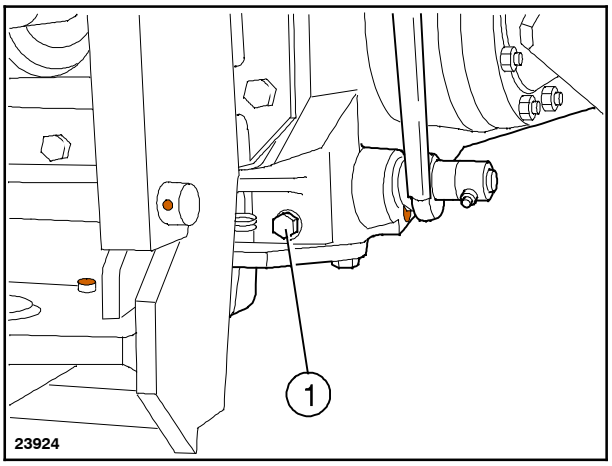
OPERATION 52

DRAINING TRANSMISSION AND HYDRAULIC LIFT OIL - Figs. 65, 66 and 67



65

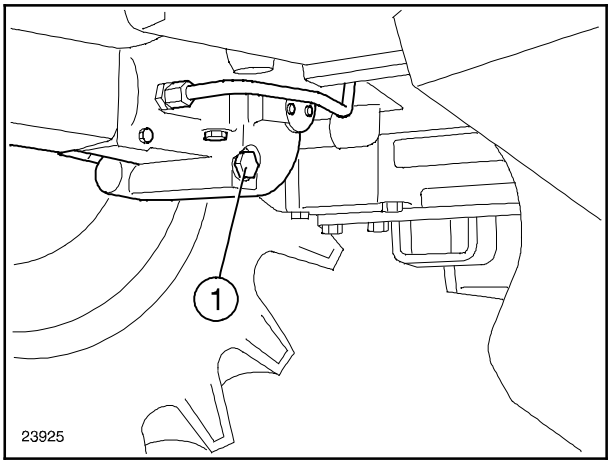
Transmission housing
Place a container under the left side of the housing, close to the fuel tank, and drain the oil via plug holes (**1** and **2**) fig. 65.



66

Lift torsion bar
Place a container under the final drive housing and drain oil via plug hole (**1**) fig. 66.

Drive gear, 4-wheel drive
Place a container under the final drive housing and drain oil via plug hole (**1**) fig. 67.

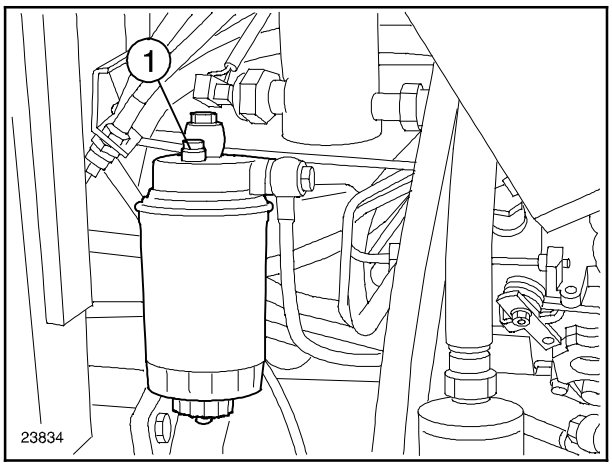


67

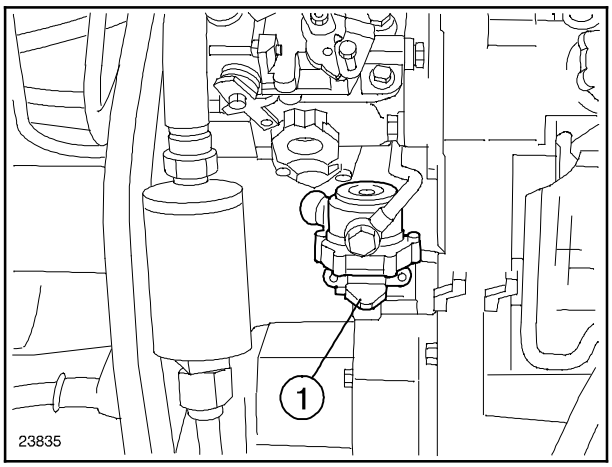
Oil filters
Replace the lift oil filter cartridge (Op. 31) and, where fitted, cartridge (**1**) on the hydrostatic steering and auxiliary systems filter (Op. 32).
When you have drained the oil, replace and tighten the plugs and fill with new oil via fill point (**1**), Op. 6.

NOTE: *For oil grades, see the topping-up table on page 3-47.*

GENERAL MAINTENANCE



68



69

BLEEDING THE FUEL SYSTEM

Bleeding procedure - Figs. 68 and 69

During long periods when the tractor is not used, when the filter and fuel lines are removed or when the fuel tank is empty, air may enter the fuel system.

The presence of air makes it difficult to start the engine, which will require bleeding as follows;

1. Unscrew the bleed plug (**1**) fig. 68 by two turns.
2. Move the lever (**1**) fig. 69 until fuel without air bubbles spurts out of the bleed hole.
3. Tighten the plug (**1**) fig. 68.
4. After tightening the bleed plug (**1**) fig. 68, move lever (**1**) fig. 69 again a few times.
5. Turn the starter key to position **C** see page 2-3 and, as soon as the engine starts, release the key.

NOTE: *If the engine does not start, repeat operations 1 to 5. If the engine still fails to start, contact your local dealer.*

NOTE: *The engine is fitted with a rotary injection pump with internal components that must be protected from rusting if not used for over a month. Therefore, before stopping the tractor,* ***mix PROT 10 W/M*** *oil into the fuel in the tank in a proportion of 10% and run the engine for approximately half an hour.*

BLEEDING THE BRAKE FLUID CIRCUIT

Air must be bled out whenever carrying out work on the brake hydraulic system.
If braking problems are detected, refer to specialised personnel or carry out the circuit bleeding operation, closely observing the following instructions:

— thoroughly clean the external parts of the unit around the bleed screws and the cover of the hydraulic fluid reservoir;

— check that the right (**1**) and the left (**2**) fig. 70 brake reservoirs are full both before and during the bleed operations;

— fully press down the left brake pedal, **slowly**, so that the oil is under pressure;

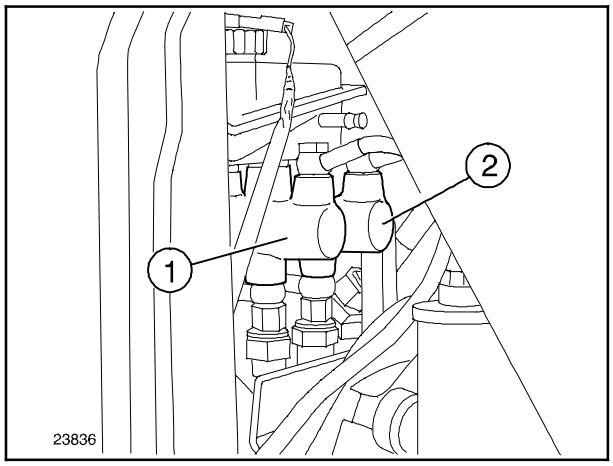
— keeping the pedal pressed down, loosen the bleed screw (**1**) fig. 71, by half a turn and allow the oil/air bubbles to come out;

— tighten the screw (**1**) fig. 71 and repeat the aforementioned operations until only oil (without air bubbles) comes out;

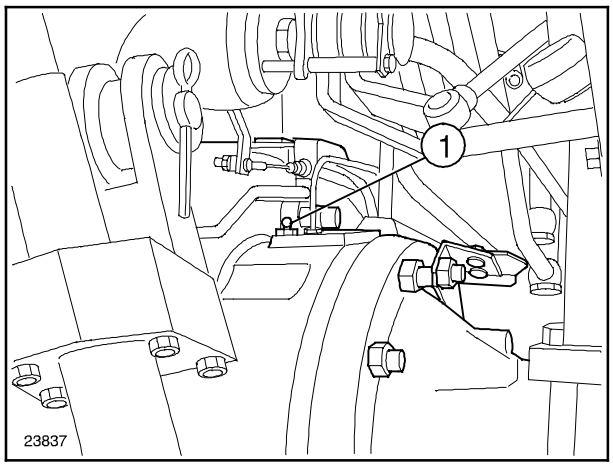
— press the brake pedal again to put the circuit under pressure, i.e.: when the pedal travel returns to normal;

— repeat the aforementioned operations for the right-hand part of the braking circuit;

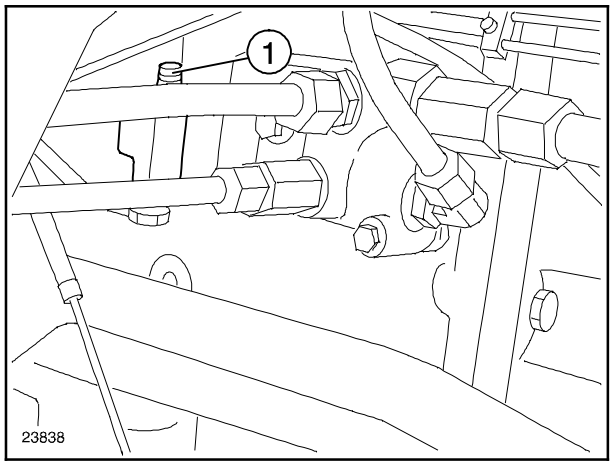
— on completion of this procedure, fill up the reservoir with oil.



70



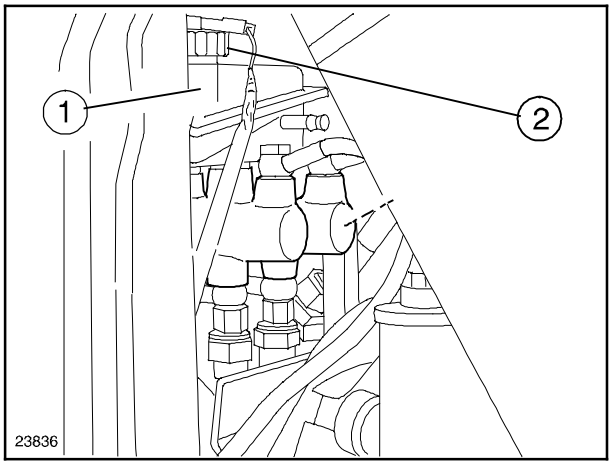
71



72

TRAILER BRAKE VALVE - Fig. 72

CAUTION: *On tractors with a hydraulic trailer brake valve, first bleed the air from screw (**1**) fig. 71 and then from screw (**1**) fig. 72.*



73

BLEEDING THE BRAKE FLUID CIRCUIT ON 4WD MODELS WITH FRONT BRAKES

Air must be bled out whenever carrying out work on the brake hydraulic system.
If braking problems are detected, refer to specialised personnel or carry out the circuit bleeding operation, closely observing the following instructions:

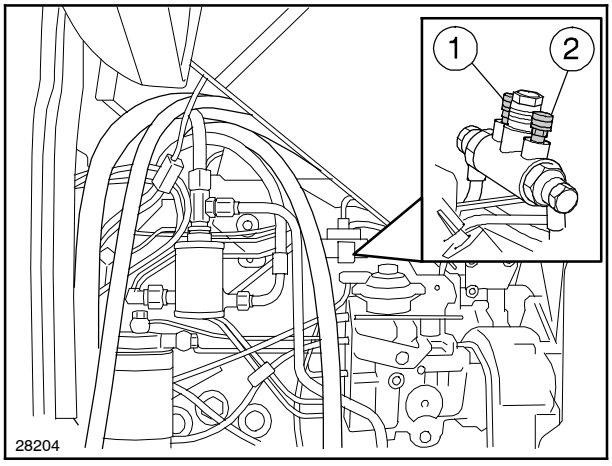
— after having completed the rear brake bleed procedure, thoroughly clean the external parts of the unit around the bleed screws (**1** and **2**) fig. 74 and the cover of the hydraulic fluid reservoir (**2**) fig. 73;

— check that the right (**1**) fig. 73 brake reservoir is full both before and during the bleed operations;

— fully press down the left brake pedal, **slowly**, so that the oil is under pressure;

— keeping the pedal pressed down, loosen the bleed screw (**1**) fig. 74, by half a turn and allow the oil/air bubbles to come out;

— tighten the screw (**1**) fig. 74 and repeat the aforementioned operations until only oil (without air bubbles) comes out;



74

— press the brake pedal again to put the circuit under pressure, i.e.: when the pedal travel returns to normal;

— repeat the aforementioned operations for the brake circuit screw (**2**);

— on completion of this procedure, fill up the reservoir with oil;

brake bleeding operations (cont.)

— remove the plug (**1**) fig. 75;

— fully press down the brake pedals, **slowly**, so that the oil is under pressure;

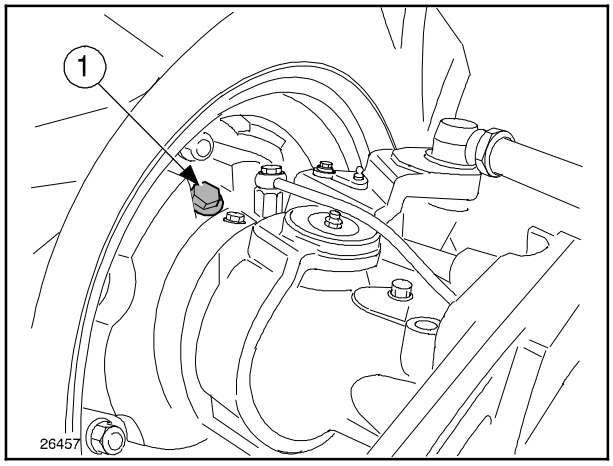
— keeping both pedals pressed down, loosen the bleed screw (**1**) fig. 76 – located inside the front final drive – by half a turn and allow the oil/air bubbles to come out;

— tighten the screw (**1**) fig. 76 and repeat the aforementioned operations until only oil (without air bubbles) comes out;

— press the brake pedal again to put the circuit under pressure, i.e.: when the pedal travel returns to normal;

— repeat the aforementioned operations for the right–hand part of the braking circuit;

— on completion of this procedure, fill up the reservoir with oil and tighten the plugs (**1**) fig. 75.



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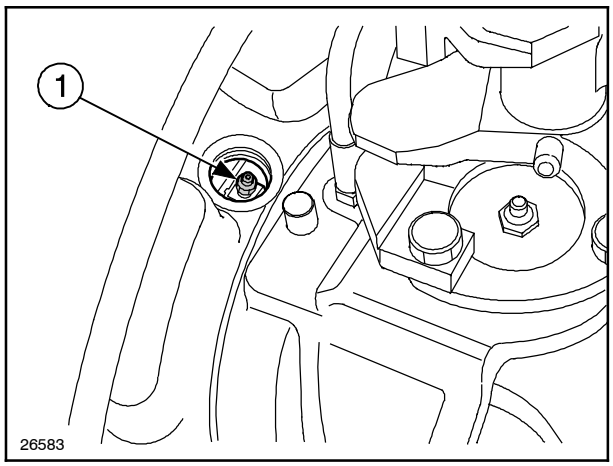
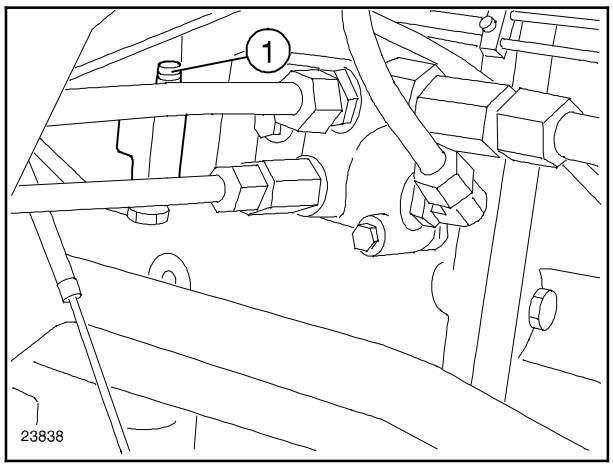


76

NOTE: *To match the front brake bleed screw (**1**) fig. 76 with the front side final drive plug (**1**) fig. 75 place the latter in the vertical position.*

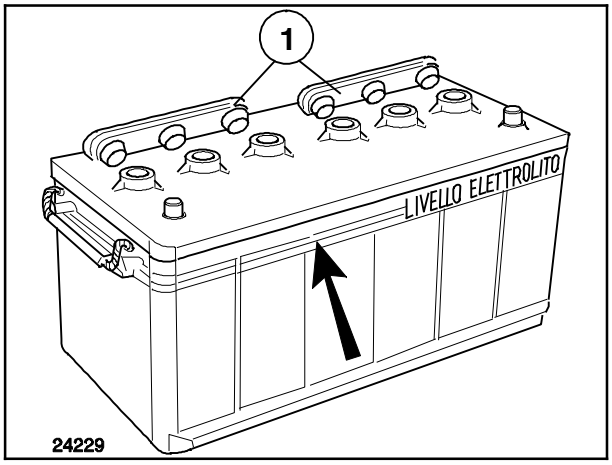
TRAILER BRAKE VALVE – Fig. 77

CAUTION: *On tractors with a hydraulic trailer brake valve, after having bled the air from both the rear and front brakes, bleed the trailer brake valve by means of the screw (**1**).*



77

ELECTRICAL SYSTEM



78

BATTERY - Fig. 78

The tractors are fitted with maintenance-free batteries.

Keep the top part clean and dry.
Check that the level of electrolyte reaches the top mark and never falls below the lower mark.
If necessary lift covers (**1**) and add distilled water.

CAUTION: *Never fill up the battery with SULPHURIC ACID.*

Never use rapid "boost" battery chargers to recharge the battery.

Check the charge with a digital voltmeter in the following way:

— connect the voltmeter to the two battery terminals, matching the symbols (negative with negative and positive with positive) and read the value on the instrument;

— compare the figure with the values on the table to establish the battery charge.

Voltage (V)	Charge level
12.66	100%
12.45	75%
12.30	50%
12.00	25%

If the voltage is around 12.30 V, immediately recharge the battery with a current equivalent to ***1/10*** of the capacity in ***Ah*** (a ***50 Ah*** battery is to be charged to ***5 Amp***).

NOTE: *If the battery frequently requires topping up or tends to run down, have the electrical system on the tractor checked by your local dealer.*

CAUTION: *before recharging the battery, always disconnect the cables. The battery should be removed from its seat and recharged at a safe distance from the tractor.*

DANGER: *During recharging operations keep the area well ventilated. Keep flames/ sparks well away and do not smoke.*

NOTE: *Batteries and storage batteries contain components that may be damaging to the environment if incorrectly disposed of after use.*
New Holland strongly advise that all "dry" batteries, used in electrical or electronic systems, are returned to your local New Holland dealer. The dealer will dispose of (or recycle) the batteries correctly. This procedure is requested by law in certain countries.

NOTE: *If an old battery needs to be replaced with a new one, proceed as follows:*

— *first disconnect the lead end marked with a negative sign (-), then the lead end with the positive sign;*

— *fit the new battery in the seat, without over-tightening the retaining screws;*

— *clean the lead ends and connect to the battery terminals, ensuring that the (-) negative terminal is connected last;*

— *fully tighten the lead ends on the terminals and smear them with petroleum jelly.*

ADVICE ON STARTING THE ENGINE WITH FLAT OR NO BATTERY

To prevent damage to the alternator and its incorporated voltage regulator follow the procedure below.

When ***the tractor battery is partially discharged***, and an auxiliary battery has to be used to start the engine, connect the battery to the tractor battery ensuring that ***the terminal symbols match*** (positive to positive and negative to negative).
This rule must also be observed when recharging the battery externally.

If the engine requires starting with a ***totally flat battery*** or when the tractor ***does not have a battery***, remember that:

— ***it is not possible*** to jump start the tractor by towing, as the electro–magnetically operated injection pump cut–off device will prevent the engine from starting;

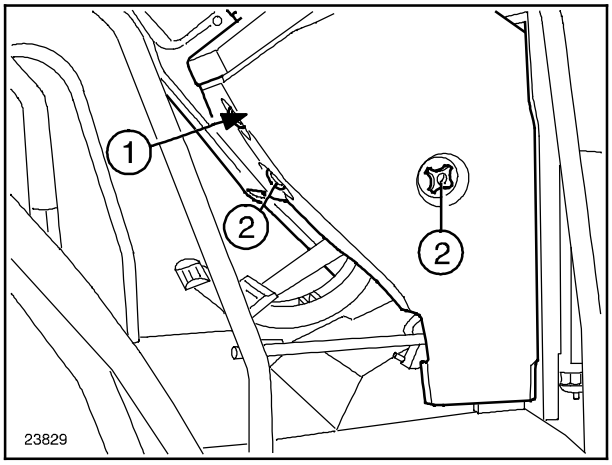
— ***it is possible*** to start the tractor with an auxiliary battery after having first disconnected plug ***D***+, terminal ***B***+ and the condenser, ***but to no avail*** given that the engine will stop as soon as the external battery supply to the electromagnetic cut–off device is interrupted;

— ***avoid*** starting the engine with an auxiliary battery whilst plug ***D***+, terminal ***B***+ and the condenser are connected to the alternator;

— ***however, it is necessary*** to connect a 12 V battery, capable of starting the tractor, and then to replace it with the battery that is to be fitted on the tractor.

Under normal conditions, the engine must never run without plug ***D***+, terminal ***B***+ and the condenser disconnected from the alternator.

FUSES AND RELAYS



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FUSE AND RELAY BOX - Fig. 79

The fuse box is located under the instrument panel on the right-hand side of the tractor.
To access the box, unscrew retaining nuts (**2**) and remove the cover (**1**).

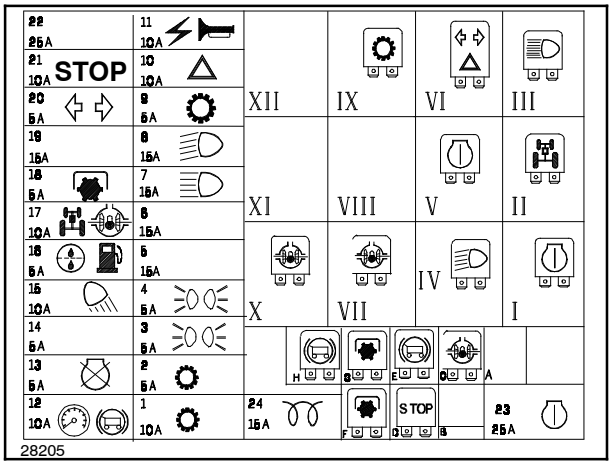
MAXI FUSE BOX

The maxi fuses are provided to protect the main fuse box and electrical circuits. The failure of several electrical circuits, may signify a blown maxi fuse.

To check or change a Maxi fuse, open the bonnet; the fuses are located on the front right-hand side.

MODELS WITHOUT CABS		
	MAXI FUSE PROTECTION	**A**
1	40A power socket.	40
2	Fuses 3, 4, 7, 8, 9, 10, 11.	40
3	Fuses 1, 2, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24 and starter circuit.	50
4	Not used.	-

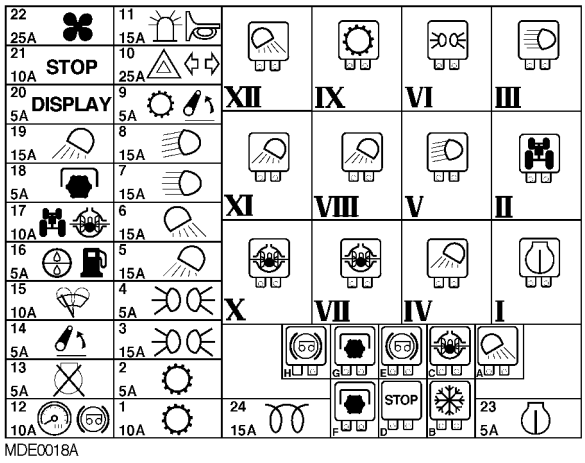
MODELS WITH CABS		
	MAXI FUSE PROTECTION	**A**
1	40A power socket.	40
2	Fuses 3, 4, 7, 8, 9, 10, 11.	40
3	Fuses 1, 2, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24 and starter circuit.	50
4	Fuses 5, 6, 19, 25, 26 (Work lights).	50



80

DANGER: *If electrical system relays need to be changed, check that correct spare parts are used and that they are fitted in the correct positions.*

The use of structurally or functionally different relays - even if interchangeable - could seriously compromise tractor control with dangerous results.



81

FUSE AND RELAY LAYOUT IN MODELS WITHOUT A CAB - Fig. 80

I. 70A engine start-up relay.
II. Electrohydraulic 4WD. Relay circuit.
III. Full beam headlights relay.
IV. Reserve.
V. Dipped beam headlights relay.
VI. Electronic flashing light.
VII. Differential lock and brake lights. circuit relay.
VIII. Not used.
IX. 2 Speed Power Shift circuit relay.
X. Differential lock circuit relay.
XI. Not used.
XII. Not used.
A Not used.
B. Not used.
C. Differential lock circuit relay.
D. Brake lights circuit relay.
E. Trailer brake circuit relay.
F/G. Electrohydraulic PTO circuit relay.
H. Trailer brake circuit relay.

FUSE AND RELAY LAYOUT IN MODELS WITH A CAB - Fig. 81

I. 70A engine start-up relay.
II. Electrohydraulic 4WD. relay circuit.
III. Full beam headlights relay.
IV. Reserve
V Dipped beam headlights relay.
VI. Side/tail lights circuit relay.
VII. Differential lock and brake lights circuit relay
VIII. Front/upper work lights relay.
IX. 2 Speed Power Shift circuit relay.
X. Differential lock circuit relay.
XI Front/lower work lights circuit relay.
XII. Rear work lights circuit relay.
A. Not used.
B. Conditioner circuit relay.
C. Differential lock circuit relay.
D. Brake lights circuit relay.
E. Trailer brake circuit relay.
F. Electrohydraulic PTO circuit relay.
G. Electrohydraulic PTO circuit relay.
H. Trailer brake circuit relay.

FUSES AND RELAY

Location of fuses and relays for standard version models without cab

Fuses	*Amps.*	*PROTECTED CIRCUITS*
1	–	Reserve.
2	5	2 Speed Power Shift circuit.
3	5	Front right-hand and rear left-hand side lights.
4	5	Front left-hand and rear left-hand side lights, controls and instruments lighting.
5	15	Grille front work lights.
6	–	Not used.
7	15	Full beam headlights.
8	15	Dipped beam headlights.
9	–	Reserve.
10	15	Hazard Lights.
11	15	Horn, power socket.
12	10	+ instruments, seat safety circuit, trailer brake.
13	5	Engine cut-out electromagnets.
14	–	Not used.
15	10	Rear work light.
16	5	Sediment filter circuit.
17	10	4WD circuit, differential lock.
18	5	Rear power take-off circuit.
19	–	Not used.
20	10	Direction indicators.
21	10	Brake lights.
22	–	Not used.
23	5	Starter safety circuit.
24	15	Thermostart.

FUSES

Fuses layout for models without cabs with Power Shuttle

Fuses	*Amps.*	*PROTECTED CIRCUITS*
1	10	Power Shuttle circuit, (+ key).
2	5	Power Shuttle circuit, (+ key).
3	5	Front right-hand and rear left-hand side lights.
4	5	Front left-hand and rear left-hand side lights, controls and instruments lighting.
5	15	Grille front work lights.
6	-	Not used.
7	15	Full beam headlights.
8	15	Dipped beam headlights.
9	5	Power Shuttle circuit, (+ battery).
10	15	Hazard Lights.
11	15	Horn, 8A power socket, buzzer.
12	10	+ instruments, seat safety circuit, trailer brake.
13	5	Engine cut-out electromagnets.
14	-	Not used.
15	10	Rear work light.
16	5	Sediment filter circuit.
17	10	4WD circuit, differential lock.
18	5	Rear power take-off circuit.
19	-	Not used.
20	10	Direction indicators.
21	10	Brake lights.
22	-	Not used.
23	5	Starter safety circuit.
24	15	Thermostart.

FUSES AND RELAY

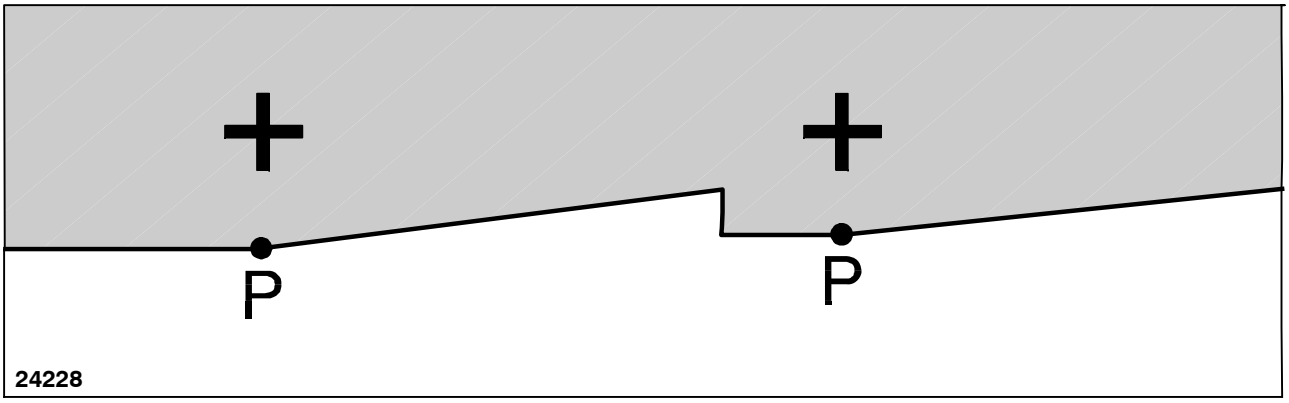
Location of fuses and relays for standard version models with cab

Fuses	*Amps.*	*PROTECTED CIRCUITS*
1	-	Reserve.
2	5	2 Speed Power Shift circuit.
3	15	Front right-hand and rear left-hand side lights.
4	5	Front left-hand and rear left-hand side lights, controls and instruments lighting.
5	15	Lower front work lights.
6	15	Rear work lights.
7	15	Full beam headlights.
8	15	Dipped beam headlights.
9	5	Electronic lift circuit.
10	25	Direction indicators and hazard lights.
11	15	Horn, 8A power socket, cigar lighter and rotating beacon.
12	10	+ instruments, trailer brake circuit, seat safety circuit.
13	5	Engine cut-out electromagnets.
14	5	Electronic lift circuit, (+ key).
15	10	Rear and windscreen wipers, windscreen and rear window wiper pump.
16	5	Sediment filter circuit, air conditioning compressor circuit.
17	10	4WD circuit, brake lights, differential lock.
18	5	Rear power take-off circuit.
19	15	Upper front work lights.
20	5	Digital instrument circuit.
21	10	Brake lights, seat.
22	25	Fan unit, radio.
23	5	Starter safety circuit.
24	15	Thermostart.

FUSES

Fuses layout for models with cabs with Power Shuttle

Fuses	*Amps.*	*PROTECTED CIRCUITS*
1	10	Power Shuttle circuit, (+ key).
2	5	Power Shuttle circuit, (+ key).
3	15	Front right-hand and rear left-hand side lights.
4	5	Front left-hand and rear left-hand side lights, controls and instruments lighting.
5	15	Lower front work lights.
6	15	Rear work lights.
7	15	Full beam headlights.
8	15	Dipped beam headlights.
9	5	Electronic lift circuit and Power Shuttle, (+ battery).
10	25	Direction indicators and hazard lights.
11	15	Horn, 8A power socket, cigar lighter, buzzer, overhead lighting, radio and rotating beacon.
12	10	+ instruments, trailer brake circuit, seat safety circuit.
13	5	Engine cut-out electromagnets.
14	5	Electronic lift circuit, (+ key).
15	10	Rear and windscreen wipers, windscreen and rear window wiper pump.
16	5	Sediment filter circuit, air conditioning compressor circuit.
17	10	4WD circuit, brake lights, differential lock.
18	5	Rear power take-off circuit.
19	15	Upper front work lights.
20	5	Digital instrument circuit.
21	10	Brake lights, seat.
22	25	Fan unit, radio.
23	5	Starter safety circuit.
24	15	Thermostart.



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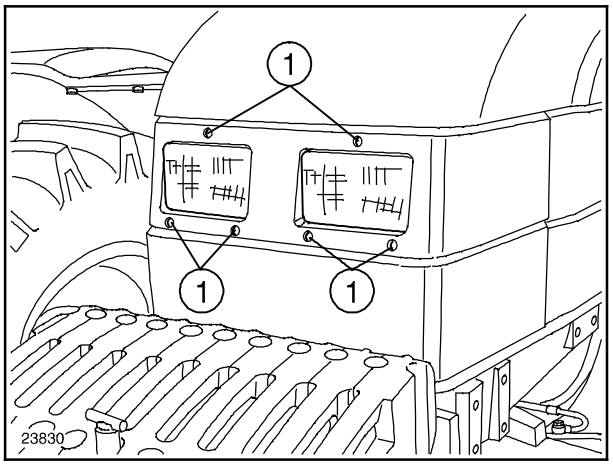


83

FRONT HEAD LIGHT ADJUSTMENT - Figs. 82 and 83

Adjust the front lights as follows:

— unload the tractor and inflate the tyres to the specified pressure on level ground in front of – if possible – a shaded white wall.

— Mark two crosses on the wall corresponding to the middle of the headlamps.

— Reverse the tractor about 196.85 in. (5 metres) and turn the beam on full.

— Points **P – P** should be 1.96 in. (**5 cm**) below the crosses.

— To adjust the light beams, adjust screws (**1**).

Replace bulbs which have blown by bulbs of the same power (55/60 W).

REPLACING THE FRONT HEADLAMP BULBS - Fig. 84

WARNING: *When handling halogen bulbs, only touch the metal parts, never the bulb.*

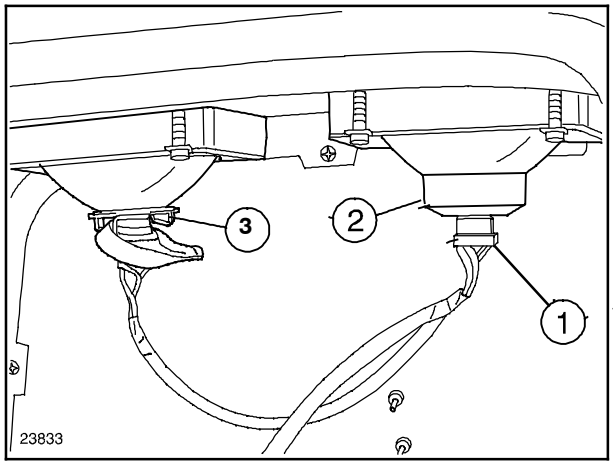
If the bulb comes into contact with your finger, it will reduce the intensity of the light emitted and adversely affect the service life.

In the event of contact, clean the bulb with a cloth soaked in alcohol and leave to dry.

Replace blown bulbs as follows:

1. unscrew connector (**1**);
2. remove rubber protector (**2**);
3. unclip retaining spring (**3**) and unscrew counter-clockwise.

Replace the old bulb with a new halogen bulb of the same power (55 to 60 W).



84

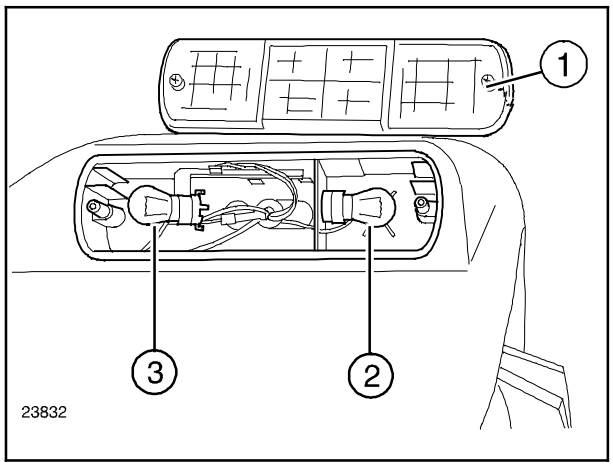
REPLACING THE REAR SIDE, STOP AND INDICATOR LIGHT BULBS - Fig. 85

Remove the transparent cover (**1**), press the bulb in and twist counter-clockwise to remove.
Replace it with a small bulb of the same power:

2. Indicator light - 21W;

3. Brake lights and sidelights - double filament, 21W/5W.

NOTE: *The transparent orange cover must be fitted facing the outside of the mudguard.*



85

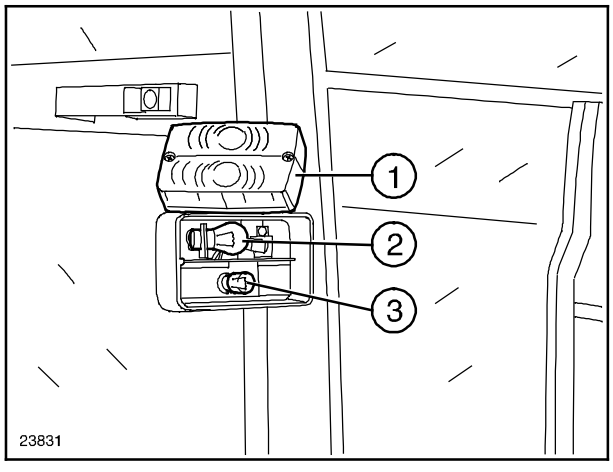
REPLACING THE FRONT SIDE, AND INDICATOR LIGHT BULBS - Fig. 86

Remove the transparent cover (**1**), press the bulb in and twist counter-clockwise to remove.
Replace it with a bulb of the same power:

2. Indicator light - 21W;

3. Sidelights - 5W.

NOTE: *The transparent orange cover must be fitted facing upwards.*



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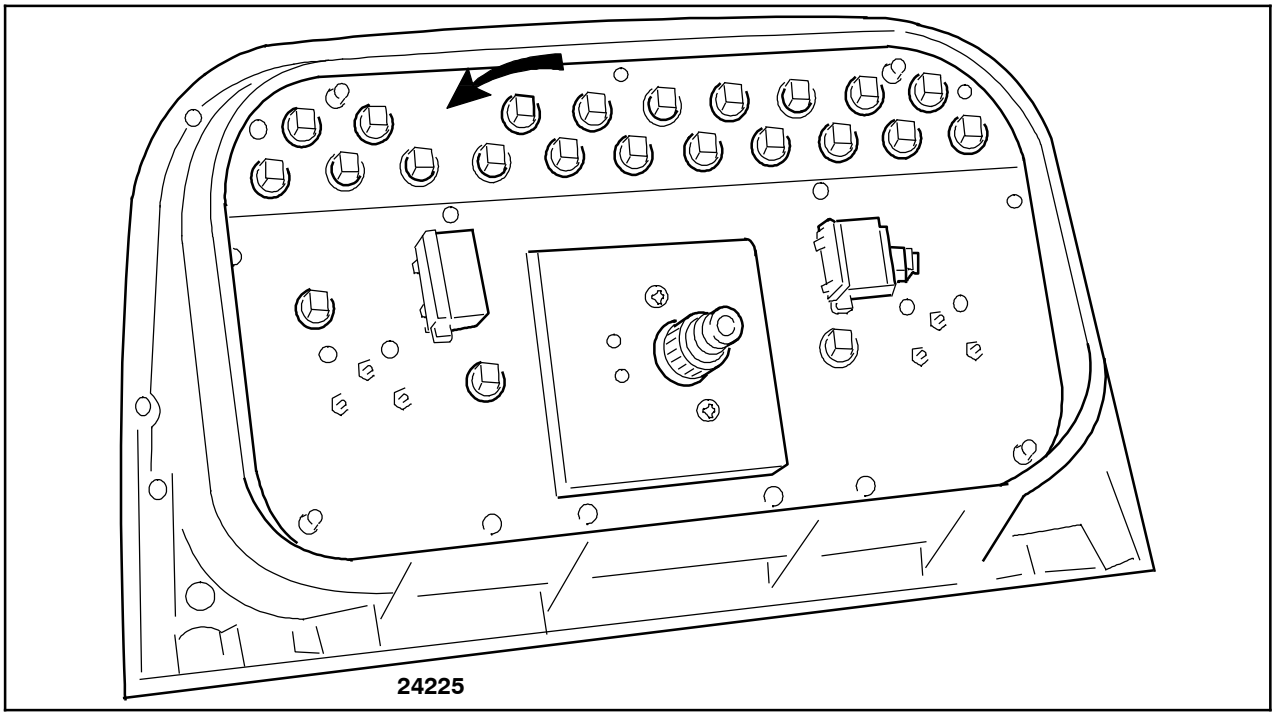

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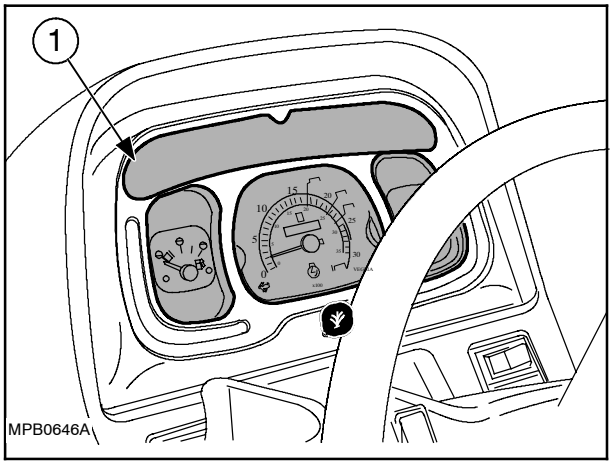

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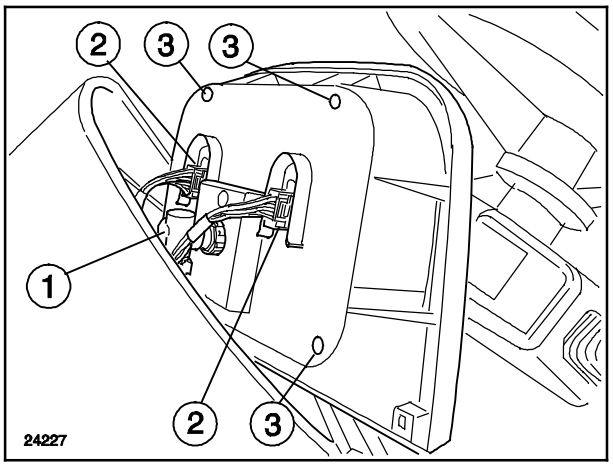


89

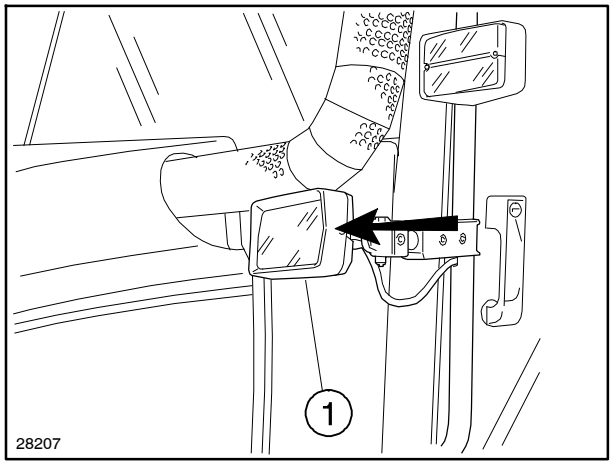
REPLACING THE MULTI-PURPOSE WARNING LIGHTS ON THE INSTRUMENT PANEL

Replace indicator lights as follows:

- unscrew the two screws (**1**) fig. 88;
- remove the instrument panel from its seat and disconnect terminal (**1**) fig. 89 from the tachometer;
- disconnect connectors (**2**) and remove the instrument;
- unscrew the protective shield retaining screws (**3**);
- Unscrew the defective light, fig. 87, counter-clockwise by $^1/_4$ of a turn, remove and replace with a 2 W bulb, (3 W alternator charge indicator).

LOWER CAB WORK LIGHTS (1) - Fig. 90

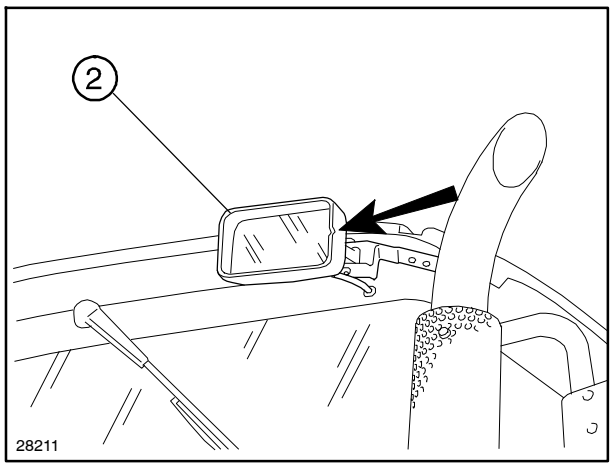
On request, two front work lamps can be fitted on the cab handrails.



90

UPPER CAB WORK LIGHTS (2) - Fig. 91

On request, four work lamps can be fitted on the cab (two on the front and two on the rear).

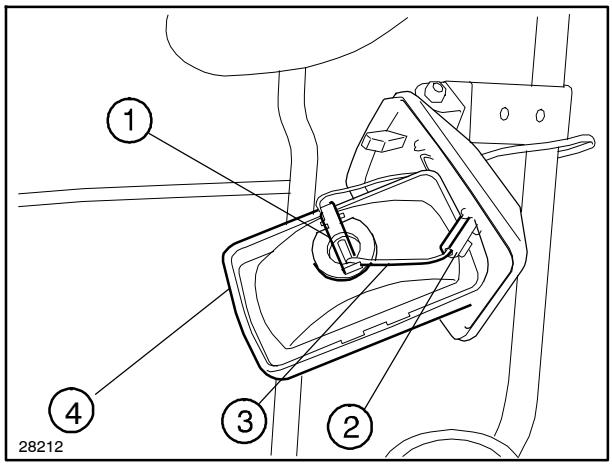


91

WORK LIGHT BULB REPLACEMENT (1) AND (2) Figs. 90 and 91

Unscrew the screws indicated by the arrows and extract the lamp (**4**). To replace the lamp bulb, proceed as follows:

- open the plastic cover (**2**) fig. 92;
- disconnect wire (**3**) fig. 92;
- remove the retaining spring (**1**) fig. 92 and extract the lamp from the housing. Replace with a new bulb of the same power.



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RECOMMENDATIONS FOR BODYWORK MAINTENANCE

Protection against atmospheric agents

Over the years, New Holland have introduced a series of measures to protect the tractor from the deterioration and corrosion which can be caused by various external elements, such as those listed below:

— salinity and atmospheric humidity;

— atmospheric pollution (industrial areas);

— abrasive action of solid substances;

— use of the tractor in the presence of aggressive chemical and/or organic substances;

— physical damage such as dents, abrasions or deep scratches.

The technical response to these problems was:

— highly corrosion–resistant zinc plating;

— paint systems and paints which help the tractor resist corrosion and abrasion;

— application of suitable hardened plastic coatings at points which are particularly vulnerable to corrosion (edges, projections and sheet–metal welded joints);

Unfortunately, external agents act in various ways according to environmental conditions and tractor use. However, if the user takes enough care, the tractor can be maintained better and for longer.

The following information is provided to help achieve this aim.

Bodywork and cab

Where there are abrasions or deep scratches, which expose the underlying metal, they need to be retouched immediately with original products as follows:

— rub down the area thoroughly;

— apply the primer;

— leave to dry and then down lightly;

— apply the paint;

— lastly, polish.

Maintenance of the paintwork is normally carried out by washing, at intervals that depend on the conditions of use and the environment. In areas prone to atmospheric pollution and coastal zones, washing should be carried out more frequently, whereas if organic or chemical substances are present, wash ***immediately*** after the tractor is used. Use a low–pressure water spray, sponge down with a solution of (2 to 4% of shampoo in water), rinsing the sponge frequently. Rinse the tractor thoroughly and dry, if possible, with a jet of air. Avoid washing the tractor after it has been standing in the sun and when the engine is still hot in order to protect the shine on the paint. It is good practice to protect the paint by polishing it with specialised products (silicone waxes) from time to time and, when the paint starts to dull, you can use wax polish which has a slight abrasive action.

NOTE: *When washing your tractor, never directly apply jets of water on the following parts: alternator, starter motor, air filter, connectors and other electrical components.*

CAB MAINTENANCE

After carrying out the external maintenance of the cab, proceed as follows:

1. Periodically check that no water remains in areas covered with mats or padding.

2. Protect the hinges and locks on the doors, roof and opening windows with lubricants and water repellents.

3. Clean the windows with suitable detergents. If necessary, use sulphuric ether.

4. Remove the windscreen wiper blade and sprinkle talcum powder on the rubber surfaces.

5. Leave the doors or roof hatch partially open.

TRACTOR STORAGE

Take the following precautions if your tractor is going to remain unused for a prolonged period.

- The engine is fitted with a rotary injection pump; follow the instructions provided on page 3-32 in this section.

- Protect the engine as follows:

1. For storage periods of approx. one month: no steps are necessary if the engine oil has not yet exceeded 100 hours of work. Otherwise, proceed as described in the paragraph below.
2. For storage periods of over one month, drain the oil from the engine while hot, fill up the reservoir with ***AMBRA SUPER GOLD*** *oil* and run the engine for a few minutes at medium rpm.
3. Remove the external air filter cartridge and clean according to the instructions provided in this section.
4. Do not drain off the engine cooling system. During winter periods, make sure that the proportions of the water/***AMBRA AGRIFLU*** fluid (supplied with the tractor) are as specified. To this end, follow the instructions on page 3-29 in this section.

- Clean the tractor and especially the bodywork. Protect painted parts by applying silicone wax, and unpainted metal parts with protective lubricants; always keep the tractor in a covered, dry and, if possible, ventilated place.

- Check that all controls are left in neutral (including electrical switches and the parking brake control).

- Do not leave the ignition key in the switch.

- Ensure that the operating cylinder rods (hydrostatic steering, lift, etc) are closed up to protect them.

- Fill the fuel tank with diesel fuel.

- For tractors fitted with cabs, see page 3-45 in this section.

- Remove the battery, clean the cover and smear the terminals and lead ends with petroleum jelly; next, place the battery in a ventilated spot not exposed to temperatures less than 50 °F (10 °C) and away from direct sunlight;

- Check the battery charge condition using a voltmeter as described on page 36 in this section.

- Fit stands or other suitable supports under the axles to raise the wheels off the ground. While the tractor is in a raised position, we recommend you let the air out of the tyres. Otherwise, raise the tractor and check the tyre pressure from time to time.

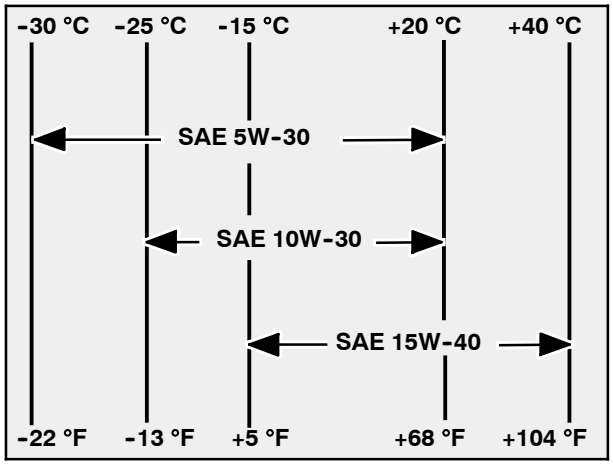
- Cover the tractor with a non-plastic non-waterproof sheet.

WARNING: *When the engine is to be re-started at the end of the storage period, closely follow the instructions shown on page 2-2 relating to starting the engine.*

FILLING AND TOPPING-UP OPERATIONS

COMPONENT TO BE FILLED OR TOPPED UP	QUANTITY dm^3 litres (gal.)	RECOMMENDED NEW HOLLAND PRODUCTS	NEW HOLLAND SPECIFICATION	INTERNATIONAL SPECIFICATION
Cooling system : without cab: . . . . . . with cab:	 14 (3.70) 16 (4.23)	Water & liquid **AMBRA AGRIFLU 50% + 50%**	NH 900 A	-
Windscreen washer bottle	2 (0.53)	Water & cleaning liquid	-	-
Fuel tank models TL70, TL80 . . models TL90, TL100	 115 (30.38) 135 (35.66)	Decanted,filtered diesel fuel	-	-
Engine sump: without filter: . . . . . with filter:	 8.9 (2.35) 9.5 (2.51)	Oil **AMBRA SUPER GOLD 15W - 40** or **10W - 30**	NH 330G (SAE 15W-40) NH 324G (SAE 10W-30)	API CF-4/SG CCMC D4 MIL-L-2104E
Brake control circuit without front brakes . .	 0.4 (0.11)	Oil **AMBRA BRAKE LHM**	NH 610 A	ISO 7308
Hydrostatic steering circuit	2 (0.53)	Oil **AMBRA MULTI G**	NH 410 B	API GL4 ISO 32/46 SAE 10W-30
Front axle: axle housing : model TL70 . . . . . . models TL80, TL90 and TL100 . . . . . . final drives (each): model TL70 . . . . . . models TL80, TL90 and TL100	 4.5 (1.19) 7.0 (1.85) 0.8 (0.21) 1.25 (0.33)			
Rear axle (bevel drive, final drives and brakes), transmission, hydraulic lift, power take-off and hydrostatic steering: model TL70 . . . . . . models TL80, TL90 and TL100	 49 (12.94) 55 (14.53)			
Front wheel hubs	-	Grease **AMBRA GR9**	NH 710 A	NLGI 2
Grease fittings	-			

Refer to the chart on the right when selecting the oil grade for your tractor engine.



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NOTE: *In areas where prolonged periods of extreme temperatures are encountered, local lubricant practices are acceptable; such as the use of SAE 5W in extreme low temperatures or SAE 50 in extreme high temperatures.*

Sulphur in Fuel

The engine oil change period is shown in section 3. However, locally available fuel may have a high sulphur content, in which case the engine oil change period (as noted in this Section) should be adjusted as follows:

Sulphur Content %	Oil change period
less than 0.5	normal
0.5 to 1.0	half–normal
above 1.0	one quarter normal

The use of fuel with a sulphur content above 1.3% is not recommended.

NOTES

SECTION 4

TROUBLESHOOTING

LOCATING AND IDENTIFYING PROBLEMS

INTRODUCTION

The following information is intended as a guide to assist in identifying and correcting possible tractor malfunctions and fault conditions.

PROBLEM CODES – AREAS AFFECTED		
The following information lists problems, which could arise, the reasons for them and appropriate corrective action. The areas affected are dealt with in the following order:		
Engine	Hydraulic System	Brakes
Electrical	Hydraulic Lift	Cab

ENGINE

PROBLEM	POSSIBLE CAUSE	SOLUTION
The engine will not start or is difficult to start	Incorrect starting procedure	See starting procedure
	Fuel level low or empty	Check fuel level
	Air in fuel system	Bleed fuel system
	Engine oil viscosity not right	Use oil of right viscosity
	Fuel not suitable for ambient temperature	Use correct type of fuel for temperature conditions
	Fuel system contaminated	Clean system
	Fuel filter clogged	Replace filter element
	Fuel injector fault	Contact your dealer
The engine does not run properly and/or cuts out	Fuel system contaminated	Clean system
	Fuel injector fault	Contact your dealer
Engine does not reach maximum power	Engine overload	Change to lower gear or reduce load
	Air filter clogged	Carry out maintenance on air filter
	Incorrect fuel type	Use the right fuel
	Low engine operating temperature	Check thermostat
	Fuel injector fault	Have your dealer check the injectors
	Implement incorrectly set	See equipment manual

ENGINE

PROBLEM	POSSIBLE CAUSE	SOLUTION
Engine does not reach maximum power (cont.)	Implement incorrectly set	See equipment manual
	Improper valve clearance	Check and adjust
	Idling speed. too low	Contact your dealer
Abnormal engine knocking	Oil level low	Top up fluid level
	Oil pressure low	Contact your dealer
Low engine operating temperature	Thermostat malfunction	Replace thermostat
Oil pressure low	Oil level low	Add oil as required
	Oil grade or viscosity wrong	Drain and refill with oil of correct grade and viscosity
Excessive oil consumption	Oil level too high	Reduce oil level
	Oil viscosity wrong	Use oil of correct viscosity
	Oil leaking	Repair leaks
	Breather pipe filter clogged	Replace breather pipe filter
Engine overheating	Radiator core clogged	Clean
	Engine overload	Change to lower gear or reduce load
	Engine oil level low	Top up fluid level
	Coolant level low	Top up fluid level in expansion tank. Check system for leaks
	Radiator cap defective	Replace cap
	Fan belt slipping or worn	Check tensioning device. If necessary, replace the belt

ENGINE

PROBLEM	POSSIBLE CAUSE	SOLUTION
Engine overheating	Cooling system clogged	Flush cooling system
	Thermostat malfunction	Check thermostat
	Hoses leaking	Tighten hose connectors
	Temperature indicator or gauge malfunction	Contact your dealer
Excessive fuel consumption	Incorrect fuel type	Use right fuel type
	Air filter dirty or clogged	Carry out maintenance on air filter
	Engine overload	Change to lower gear or reduce load
	Improper valve clearance	Check and adjust
	Equipment wrongly adjusted	Refer to equipment manual for correct operation
	Engine temperature too low	Check thermostat
	Excessive ballast	Adjust ballast to correct weight
	Fuel injection nozzles clogged	Have your dealer service the injectors

ELECTRICAL SYSTEM

PROBLEM	POSSIBLE CAUSE	SOLUTION
The electrical system does not work	Battery terminals loose or corroded	Clean and tighten terminals
	Battery	Check that battery charge is at least 12.6 volts. Check electrolyte level and specific gravity
Low starter motor speed and difficulty in starting engine	Connections loose or corroded	Clean and tighten loose connections
	Battery	Check that battery charge is at least 12.6 volts. Check electrolyte level and specific gravity
	Engine oil viscosity wrong	Use oil of viscosity specified for temperature conditions
Starter motor does not work	Gear lever engaged	Move gear lever to neutral
	Connections loose or corroded	Clean and tighten loose connections
	Batteries totally flat	Charge or replace batteries
Battery charge light stays on when engine is running	Engine idling speed is low	Increase idling speed
	Alternatorbelt loose	Check belttensioning device
	Battery fault	Check that battery charge is at least 12.6 volts. Check electrolyte level and specific gravity
	Alternator fault	Have the alternator checked by your dealer
Batteries not charging	Terminals loose or corroded	Clean and tighten terminals
	Battery	Check that battery charge is at least 12.6 volts. Check electrolyte level and specific gravity
	Belt loose or worn	Check belttensioning device. If necessary, replace the belt.
The battery charge light flashes to indicate excessive charge voltage	Alternator fault	Have the alternator checked by your dealer

HYDRAULIC SYSTEM

PROBLEM	POSSIBLE CAUSE	SOLUTION
The hydraulic system is not working properly	Oil level low	Top up system
	Hydraulic filter clogged	Replace hydraulic filter
	Hydraulic system fault	Contact your dealer
Hydraulic fluid overheating	Fluid level too high or low	Top up fluid level
	Fluid filter element clogged	Replace filter
	Incorrect flow regulation	Set to lower capacity
Hoses not joined together properly	Wrong male seals	Replace couplers with standard ISO–1/2″ connectors, available from your dealer
Automatic control valve pin release mechanism triggered too soon	Automatic release pressure incorrectly set	Adjust automatic release pressure setting
Remote control does not work	Hoses not connected correctly	Connect hoses correctly
	Check oil flow in half couplers	Actuate control levers. If problem persists, replace male couplers
	System overload	Reduce load or use a suitable cylinder

HYDRAULIC LIFT AND THREE POINT LINKAGE

PROBLEM	POSSIBLE CAUSE	SOLUTION
The linkage does not move when the control lever is actuated	Linkage cylinder tubes not connected correctly	Connect linkage cylinder tubes correctly
	Linkage overload	Reduce load
Linkage does not lift fully	Link arm top limiter incorrectly set	Adjust link arm top limiter
The linkage lowers slowly	Lowering speed control incorrectly set	Have valves checked
The hydraulic lift operates slowly in draft control	Combined draft/position control incorrectly set	Adjust combined draft/position control
	Lowering speed too slow	Have valves checked
	Implement not working properly	Adjust implement settings
The hydraulic lift operates too fast in draft control	Combined draft/position control incorrectly set	Have valves checked
Electronically controlled hydraulic lift fault code signal		Contact your dealer

BRAKES

PROBLEM	POSSIBLE CAUSE	SOLUTION
Pedals soft when engine off	Air in braking system	Contact your dealer
Pedal depresses fully with engine off	Brake piston seals leaking	Contact your dealer
	Brake discs worn	Contact your dealer
	Brake release leaking	Contact your dealer
	Brake valve(s) leaking	Contact your dealer
Excessive pedal travel or resistance with engine running	Brake valve(s) leaking	Contact your dealer
	Air in braking system	Contact your dealer
	Brake piston seals leaking	Contact your dealer
	Brake release leaking	Contact your dealer

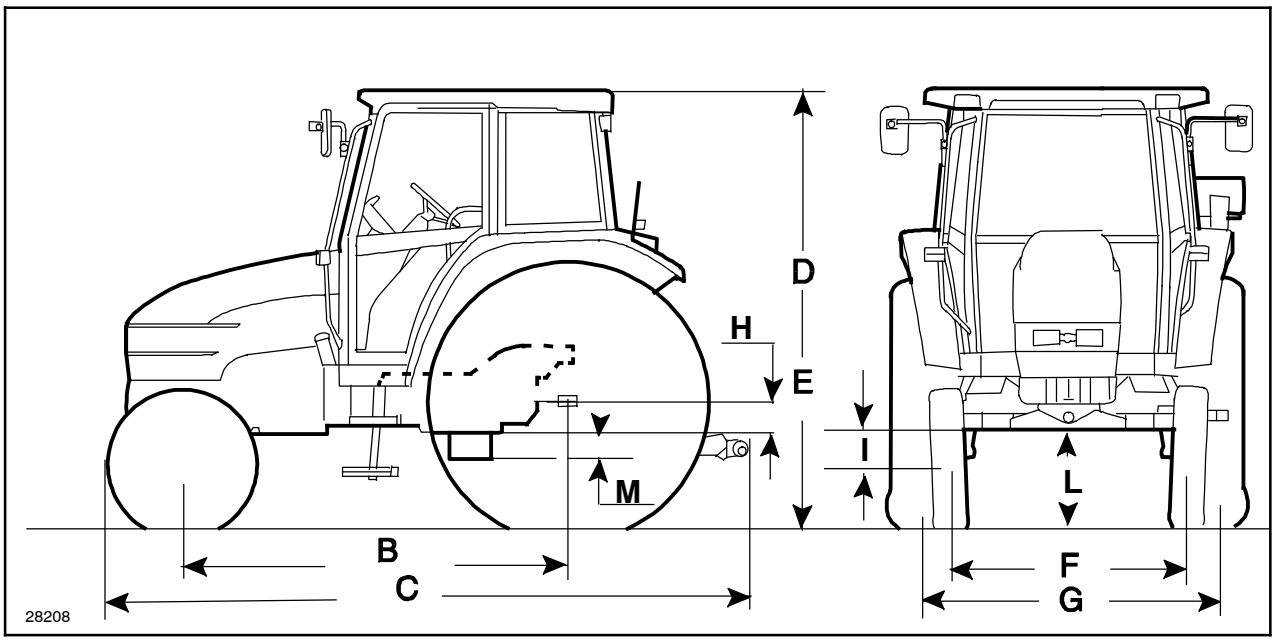
CAB

PROBLEM	POSSIBLE CAUSE	SOLUTION
Dust in cab	Filter seal ineffective	Check condition of filter seal
	Filter clogged	Clean or replace filter
	Filter defective	Replace filter
	Excessive draught	Block draughts
Inadequate air circulation	Filter clogged or air circulation filter clogged	Clean or replace filter(s))
	Heater or humidifier radiator core clogged	Contact your dealer
Air–conditioning not cooling properly	Condenser clogged	Clean the radiator, oil exchanger and condenser
	Refrigerant low	Check the glass port to see if there are bubbles visible. Contact your dealer
	Compressor belt slips or is damaged	Check the automatic belt–tensioning device and the state of the belt
	Heating on	Turn the temperature control fully anti–clockwise for maximum cooling.

SECTION 5
SPECIFICATIONS AND DATA

The data on the following pages is provided for your information and guidance. For further details concerning your tractor, contact your dealer.

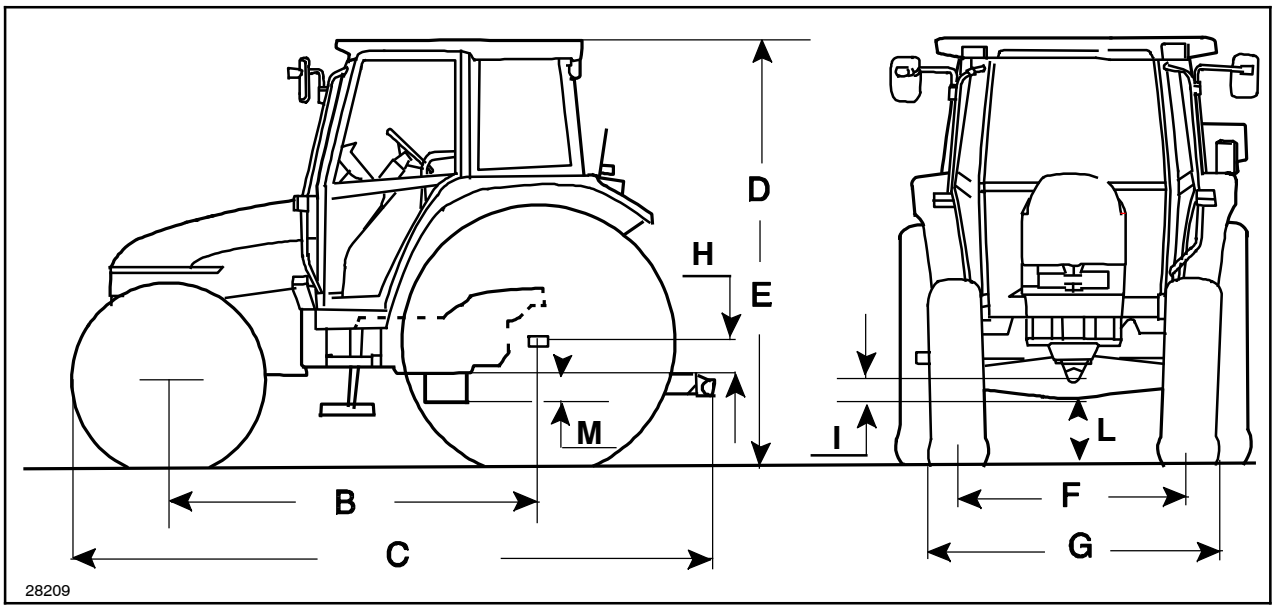
2WD MODEL DIMENSIONS WITH STANDARD TYRES



1

Dimensions mm (in.)	TL70	TL80	TL90	TL100
B	2342 (92.20)			
C	3910 (153.94)			
D (cab)	2773 (109.17)			
E (frame)	2729 (107.44)			
F	1401 ÷ 2170 (55.16 ÷ 85.43)			
G	1420 ÷ 2204 (55.91 ÷ 86.77)			
H	159 (6.26)			
I	107 (4.21)			
L	300 (11.81)			
M	87 (3.43)			

4WD MODEL DIMENSIONS WITH STANDARD TYRES



2

Dimensions mm (in.)	TL70 4WD	TL80 4WD	TL90 4WD	TL100 4WD
B	2314 (91.10)			
C	4066 (160.08)			
D (cab)	2773 (109.73)			
E (frame)	2729 (107.44)			
F	1301 ÷ 2166 (51.22 ÷ 85.28)			
G	1420 ÷ 2204 (55.91 ÷ 86.77)			
H	159 (6.26)			
I	115 (4.53)		133 (5.24)	
L	480 (18.90)			
M	87 (3.43)			

STANDARD TYRE COMBINATIONS

	TL70		Model		TL90		TL100	
	2WD	4WD	2WD	4WD	2WD	4WD	2WD	4WD
Front	10.00-16	12.4R-24	10.00-16	380/70R-24	10.00-16	440/65R24	10.00-16	480/65R-24
Rear	13.6R-36		480/70R-34		540/65R-34		600/65R-34	

WEIGHTS

Model	TL70		TL80		TL90		TL100	
	2WD	4WD	2WD	4WD	2WD	4WD	2WD	4WD
Without ballast: kg (lbs)								
without cab	2700 (5952)	3090 (6812)	2900 (6393)	3200 (7055)	3100 (6834)	3400 (7496)	3100 (6834)	3400 (7496)
with cab	2900 (6393)	3200 (7055)	3100 (6834)	3400 (7496)	3300 (7275)	3600 (7937)	3600 (7937)	3600 (7937)
Fully ballasted: kg (lbs)								
without cab	3510 (7738)	3900 (8598)	3710 (8179)	4010 (8841)	3910 (8620)	4210 (8282)	3910 (8620)	4210 (9282)
with cab	3710 (8179)	4010 (8841)	3910 (8620)	4210 (9282)	4110 (9061)	4410 (9722)	4410 (9722)	4410 (9722)

ENGINE

Model	TL70	Model	TL90	TL100
Engine type ..... with clutch: -12"	IVECO			
	8045.06R.215	8045.05R.215	8045.25.205	8045.25K.215
Injection pump	BOSCH			
4-stroke diesel direct injection:				
- naturally aspirated	YES	YES	-	-
- turbo-charged	-	-	YES	YES
Number of cylinders	4	4	4	4
Bore and stroke .... in. (mm)	100 X 115 (3.9 X 4.5)	104 X 115 (4.1 X 4.5)	104 X 115 (4.1 X 4.5)	104 X 115 (4.1 X 4.5)
Total displacement . cm^3 cubic (inches)	3613 (220)	3908 (238)	3908 (238)	3908 (238)
Compression Ratio	17	17	16,5	16,5
Engine max. power DGM/DIN: ..... kW ..... Hp	47,8 65	56 75	63 85	70 95
Corresponding rpm ..... rpm	2500	2500	2500	2500
Maximum torque rpm .... rpm	1400	1400	1500	1500
Dynamic equaliser with counter-rotation masses .	YES	YES	YES	YES

Timing

With overhead valves	Timing data
Inlet:	
– start before TDC	12°
– end after BDC.	31°
Exhaust:	
– start before BDC	50°
– end after TDC.	16°
Valve clearance, timing inspection: mm	0.018 (0,45)
Valve clearance, engine cold:	
– inlet and exhaust mm	0.012 ± 0.002 (0,30 ± 0,05)

FUEL SUPPLY

Double–diaphragm fuel pump
on injection pump supply line.

Rotary injection pump
with centrifugal speed governor,
operating at all speeds and incorporating
automatic advance ..... BOSCH VE–type

Fuel filtering:

- mesh filter in the fuel pump;
- replaceable cartridge filter on the injection pump feed line with water separator.

Fuel sediment filter (optional).

Double cartridge dry air filter, with centrifugal pre–filter and automatic dust extractor.
On request: air filter with self–cleaning device (Donaspin).

Engine injection pump:	TL70	Model	TL90	TL100
Before TDC. of cylinder No. 1 during compression stroke	4° ± 1°		7° ± 0.5°	7° ± 1°

Fuel injectors:	TL70	Model	TL90	TL100
– order of injection	1–3–2–4			
– number of injection nozzles:	4	4	3	3
– calibration: bar (psi) kg/cm^2	230 to 238 (3336 to 3452) 235 to 243		260 to 272 (3771 to 3945) 265 to 277	230 to 238 (3336 to 3452) 235 to 243

Lubrication

Pressurised, by gear pump. Oil filtration: pressurised through pump intake mesh and replaceable cartridge filter on engine intake. Lubrication pressure with engine hot and at max. revs: . . 42.06 to 56.57 psi (bar 2.9 to 3.9)

Engine oil cooled by a heat exchanger using engine coolant.

Cooling

Water, pressurised circulation by centrifugal pump.

Radiator with 3 lines of vertical copper pipes for TL70 and TL80 models, or 4 lines of vertical copper pipes for TL90 and TL100 models.

Cooling fan fitted on same shaft as water pump.

Water circulation from engine to radiator thermostatically controlled.

TRANSMISSION

Clutch

Dry 12” double-plate, with separate controls: pedal operation for gearbox and hand lever for power take-off. Disk material:

- TL70 Model: organic (standard) or cerametallic (optional)
- models Models: cerametallic (standard)
- Power take-off clutch: organic

Gears

Permanently engaged helical mesh with 4 gear ratios.

Full syncromesh for all gears.

Range gear cascade connection with three forward gear ranges and one reverse gear range.

<table>
<tr><th rowspan="2">Model</th><th colspan="4">18.64 mph (30 km/h) gear and mechanical PTO</th></tr>
<tr><th>12x4</th><th>12x12</th><th>20x12</th><th>24x12</th></tr>
<tr><td>TL70
Model</td><td rowspan="2">Standard</td><td colspan="3" rowspan="2">Optional</td></tr>
<tr><td>TL90</td><td>Not available</td><td>Standard</td><td colspan="2">Optional</td></tr>
</table>

<table>
<tr><th rowspan="2">Model</th><th colspan="3">18.64 mph (30 km/h) gear and electrohydraulic PTO</th></tr>
<tr><th>12x12</th><th>20x12</th><th>24x12</th></tr>
<tr><td>TL70
Model</td><td colspan="3">Optional</td></tr>
<tr><td>TL90
TL100</td><td>Standard</td><td colspan="2">Optional</td></tr>
</table>

Model	24.85 mph (40 km/h) gear and electrohydraulic PTO		
	20x8	24x12	24x24
TL70 4WD	Optional		
TL80 4WD			
TL90 4WD			
TL100 4WD			

NOTE: *40 km/h transmissions are only available for four-wheel drive models. The 24 forward gears and 24 reverse gears function is only available with the POWER SHUTTLE.*

Rear transmission

9/43 bevel gear pair ratios and differential with pedal controlled locking device and automatic release. Epicyclic final drives.

PTO

Fully independent, in three versions: 540 rpm, 540, 750 and 1000 rpm with engine at:

- 2199 rpm (Power take-off 540 rpm)
- 2382 rpm (Power take-off 750 rpm)
- 2381 rpm (Power take-off 1000 rpm)

Synchronised with gearbox (see page 42).

Manual control: clutch control lever, take-off engage lever and speed selector lever.

Direction of rotation with tractor seen from behind: clockwise.

HYDRAULIC LIFT

Operates in:

- draft control;
- position control;
- mixed position and draft control;
- float mode.

Draft control is through the link arms by means of a torsion bar.

The link-arms are raised and lowered using a pushbutton-operated device (Lift -o- Matic)

HYDRAULIC LIFT OIL PUMP

Oil supply is from the transmission by gear pump operated directly by the engine:

- NEW HOLLAND, type ..... C 31 or. C 42
- BOSCH, type 0 510 725 085
- SAUER, type ..... 550 / 1 / 34385
- pump speed with engine at maximum power: ..... rpm 2328
- corresponding nominal capacity: dm^3/min (l/min): C 31 pump (standard model TL70) 34.5
- C 42 pump (standard models TL70 and TL80) – (on request, models TL70, TL80 and TL90) 44.5
- BOSCH and SAUER pumps (standard model. TL100) – (on request, models TL70, TL80 and TL90) . 60
- pressure relief valve setting: ..... bar (psi) 2756 (190)

Maximum weight limits

With vertical rods pivoting in rear hole of horizontal arms and top hole of top link attachment bracket:

- at link ends of horizontal arms: ..... 7357 lbs (kg 3340)
  models TL70 and TL80 (with additional jack) ..... 9802 lbs (kg 4450)
  models TL90 and TL100 (with two additional jacks) ..... 11145 lbs (kg 5060)

- with centreof gravity at 610 mm from link ends: ..... 7070 lbs (kg 3210)
  models TL70 and TL80 (with additional jack) ..... 8161 lbs (kg 3705)
  models TL90 and TL100 (with two additional jacks) ..... 8954 lbs (kg 4065)

Three point linkage

2nd category three-point linkage device.

Stabiliser devices:

- stabilisers (standard).

Link arms with rapid attachment (optional).

Single or double-acting rear remote control valves: up to three, one with float and automatic release.

Front axle

Central pivoting, telescopic, inverted “U” structure.

Track adjustment: by extending the axle.

FRONT WHEELS 2WD

Rims with integral sheet metal wheel disks.

FRONT WHEELS, 4WD

Wheels in two parts: sheet-metal wheel disk and tyre rim.
Track adjustment: variable fitting of rims to disks and wheel hubs.

REAR WHEELS

Wheels in two parts: sheet-metal wheel disk and tyre rim.
Track adjustment: variable fitting of rims to disks and wheel hubs.

NOTE: Tyre specifications are shown on page 2-101 to page 2-117.

STEERING

Hydrostatic control, independent circuit.
Metal cartridge oil filter, fitted in oil reservoir.

Gear pump operated directly by the engine, through timing gears:

- pump type: ..... NEW HOLLAND A 31 XRP
- pump speed with engine at maximum power: ..... rpm 2328
- corresponding capacity ..... dm^3/min 32.7
  - adjusted capacity: dm^3/min ..... 17 to 21
- pressure relief valve calibration:
  Models 2WD (all models) and TL70 4WD ..... psi (bar) 2103 (145)
  Models TL80, TL90 and TL100 4WD ..... psi (bar) 2466 (170)

Minimum turning radius, two-wheel drive models:

- not brake assisted ..... in. (m) 0.1496 (3.8)
- brake assisted ..... in. (m) 1.1338 (3.4)

4WD FRONT AXLE

Central pivoting axle and coaxial transmission shaft on the longitudinal axis of the tractor. No universal joints on transmission shaft. Differential with two planetary pinions.

Bevel gear pair ratios:

- model TL70 4WD 9/29
- models TL80 4WD 10/35
- models TL90 and TL100 4WD 9/39

Minimum turning radius not brake assisted, four-wheel drive disengaged, four-wheel drive models:

models TL70 and TL80

- not brake assisted ..... in. (m) 0.1535 (3.9)
- brake assisted ..... in. (m) 0.1377 (3.5)

models TL90 and TL100

- not brake assisted ..... in. (m) 0.1614 (4.1)
- brake assisted ..... in. (m) 0.1377 (3.5)

REAR SERVICE BRAKES

Oil-immersed disk brakes, fitted on differential axle shafts.
Hydrostatically operated with independent hydraulic circuits for right and left-hand brakes, operated by separate pedals.
Pedals are connected for simultaneous braking when driving on roads.

FRONT SERVICE BRAKES

Disk brake, hydrostatically controlled, mounted on front final drives.
Pedals are connected for simultaneous braking.

PARKING BRAKE ON TRANSMISSION

Disk brake, fully independent, mounted beneath gearbox and connected to pinion shaft. Mechanically operated by lever.

BODYWORK AND DRIVING POSITION

- With roll bar

Platform, instrument panel and mudguards form a single, modular structure, suspended on 4 silent blocks.
Pre-lined sheet metal mudguards with partially shaped galvanised layer.
Mounting structure for roll bar.
Fuel tank located on left-hand side under the platform.
Bonnet opens towards rear and is held open by gas shock absorbers.

- With cab

Mudguards and cab form a single integrated structure. Fuel tank located on left-hand side under the cab module.
Bonnet opens towards rear and is held open by gas shock absorbers.

Seat

Padded, with parallelogram suspension, adjustable springing and position.

TOWING DEVICES

- Cross member with attachment holes.
- Rear swinging drawbar.
- Rear height-adjustable rigid hook.
- Rockinger «type rear towing hook».
- Towing hook for half-trailers.
- Front manoeuvring hook.

ELECTRICAL SYSTEM

Voltage ..... V 12

Alternator

Max. power with engine running at 2500 rpm, approx. ..... W 540
Incorporated electronic voltage regulator.

Battery

- 12 V; capacity or 100/132 Ah, sealed, maintenance-free.

Starter motor

Power: 3.5 kW (4.8 Hp), electromagnet operated.

Lights

Two asymmetrical front headlamps using 55 W bulbs (white or yellow).

Two front light clusters including:

- side lights (5 W light bulb) with white transparent cover;
- direction indicator (21 W light bulb) with orange transparent cover.

Two rear light clusters including:

- side lights (5 W light bulb) with red transparent cover;
- direction indicator (21 W light bulb) with orange transparent cover;
- brake light (21 W light bulb) with red transparent cover;
- number plate light.

Red rear reflectors.

Instruments and accessories

- Multiple function instrument panel (see page 20).
- 7-pin DIN power socket.
- 25 A power socket.
- 8 A rear single pole power socket.
- Thermostart or start-pilot.
- Flashing hazard-warning light indicator for tractor and trailer.
- Work lamps (55 W bulb).

NOTES

INSPECTIONS AND/OR OPERATIONS TO BE CARRIED OUT

NON FUNCTIONAL INSPECTIONS/ OPERATIONS

1. Tyre inflation pressures and wear ..... ☐
2. Air filter cartridge and hoses ..... ☐
3. Cooling system hoses ..... ☐
4. Specific gravity and level of coolant (specific gravity 1.071 to 1.083 a 16 °C) ... ☐
5. Replace fuel filter, clean and bleed air from fuel system ..... ☐
6. Fan/alternator/compressor belt ..... ☐
7. Replace engine oil and filter ..... ☐
8. Replace hydraulic oil filter ..... ☐
9. Rear transmission casing oil level ..... ☐
10. Top up lubrication nipples and lubricate joints ..... ☐
11. Tighten nuts and bolts on wheel disks ..... ☐
12. Tighten nuts and bolts on wheel rims ..... ☐
13. Tighten bolts on front ballast ..... ☐
14. Front wheel toe-in and steering limits ..... ☐
15. Battery leads and relative fittings ..... ☐
16. Windscreen wiper and washing liquid level ☐
17. Clean the cab air filter ..... ☐
18. Seat operation ..... ☐
19. Exhaust pipe mounting 40 Nm (4.1 kgm) .. ☐

OPERATIONAL INSPECTIONS

1. Lights and internal instruments ..... ☐
2. Oil and liquid leaks ..... ☐
3. Maximum and minimum idling speeds and engine cut-off ..... ☐
4. Power take-off and brakes ..... ☐
5. Hydraulic system:
   - Draft control operation ..... ☐
   - Position control operation ..... ☐
   - Auxiliary control valves ..... ☐
   - Auxiliary control valves delivery control .... ☐
   - System pressure ..... ☐

FUNCTIONAL INSPECTIONS

1. Engine, accelerator and speed governor ... ☐
2. Gearbox ..... ☐
3. Steering operates correctly ..... ☐
4. Differential lock and 4WD engage/disengage ..... ☐
5. Brake operation ..... ☐
6. Optional equipment and accessories ..... ☐

INSPECTIONS OF SAFETY EQUIPMENT

1. Safety belts (optional) ..... ☐
2. Torque cab mounting nuts ..... ☐
3. Power take-off electrical safety devices engaged ..... ☐
4. Handbrake operation and adjustment ..... ☐
5. Safety guards and covers ..... ☐

Inspections and operations carried out

Tractor model ..... **Serial No.:** .....

Customer's signature	**Date**	**Dealer's signature**	**Date**

INSPECTIONS AND/OR OPERATIONS TO BE CARRIED OUT

NON FUNCTIONAL INSPECTIONS/ OPERATIONS

1. Tyre inflation pressures and wear ☐
2. Air filter cartridge and hoses ☐
3. Cooling system hoses ☐
4. Specific gravity and level of coolant (specific gravity 1.071 to 1.083 a 16 °C) ☐
5. Replace fuel filter, clean and bleed air from fuel system ☐
6. Fan/alternator/compressor belt ☐
7. Replace engine oil and filter ☐
8. Replace hydraulic oil filter ☐
9. Rear transmission casing oil level ☐
10. Top up lubrication nipples and lubricate joints ☐
11. Tighten nuts and bolts on wheel disks ☐
12. Tighten nuts and bolts on wheel rims ☐
13. Tighten bolts on front ballast ☐
14. Front wheel toe-in and steering limits ☐
15. Battery leads and relative fittings ☐
16. Windscreen wiper and washing liquid level ☐
17. Clean the cab air filter ☐
18. Seat operation ☐
19. Exhaust pipe mounting 40 Nm (4.1 kgm) ☐

OPERATIONAL INSPECTIONS

1. Lights and internal instruments ☐
2. Oil and liquid leaks ☐
3. Maximum and minimum idling speeds and engine cut-off ☐
4. Power take-off and brakes ☐
5. Hydraulic system:
   - Draft control operation ☐
   - Position control operation ☐
   - Auxiliary control valves ☐
   - Auxiliary control valves delivery control ☐
   - System pressure ☐

FUNCTIONAL INSPECTIONS

1. Engine, accelerator and speed governor ☐
2. Gearbox ☐
3. Steering operates correctly ☐
4. Differential lock and 4WD engage/disengage ☐
5. Brake operation ☐
6. Optional equipment and accessories ☐

INSPECTIONS OF SAFETY EQUIPMENT

1. Safety belts (optional) ☐
2. Torque cab mounting nuts ☐
3. Power take-off electrical safety devices engaged ☐
4. Handbrake operation and adjustment ☐
5. Safety guards and covers ☐

Inspections and operations carried out

Tractor model ..... **Serial No.:** .....

Customer's signature	**Date**	**Dealer's signature**	**Date**

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Always work safely, ... **viii**

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