Challenger MT525B-535B-545B-555B-565B AutoPower IV Agricultural Tractors

AGCO - SA - Beauvais - France - RC B562 104 539

October 2005
N° 3378498M1
Issue 3
Challenger MT500B US
English

Chapter 2

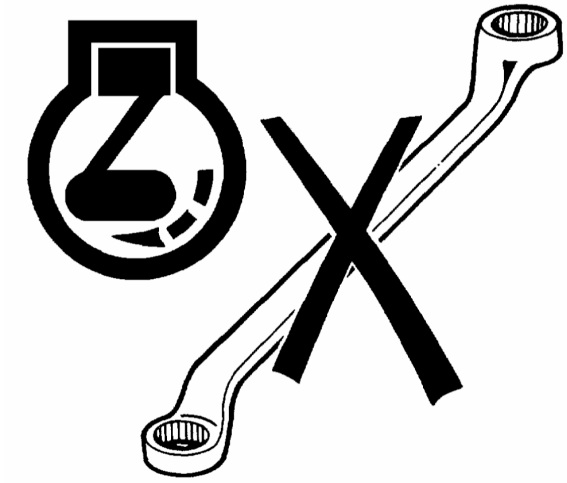
INTRODUCTION - SAFETY INSTRUCTIONS AND WARRANTY

2.14.6 - Protect the environment

- It is illegal to pollute drains, water courses or soil. Use authorized waste disposal facilities, including civic amenity sites and garages providing facilities for disposal of used oil. If in doubt, contact your local authority for advice.

2.15 - SERVICING THE TRACTOR

- **DO NOT SERVICE** the tractor while the engine is running or hot, or if the tractor is in motion (Fig. 7).



Z2-534-05-03

Fig. 7

- Before making adjustments to or servicing the electrical system, disconnect the battery cables, negative (-) cable first.
- To prevent fires or explosions keep open flame away from the battery or cold weather starting aids. To prevent sparks which could cause explosions use jumper cables according to instructions.
- When making repairs or adjustments it is recommended that you consult your Dealer, and have the work carried out by trained personnel.
- The implement and/or tractor must be supported on suitable blocks or stands, **NOT** a hydraulic jack.
- Check all nuts and bolts periodically for tightness, especially wheel hub and rim nuts. Tighten to the prescribed torque values.

2.16 - STARTING

2.16.1 - Warn personnel before starting

Before starting, walk completely around the tractor and any attached equipment. Make sure that no one is under it, on it, or close to it. Tell other workers or people nearby that the tractor is about to start. Do not start the tractor while there are people near the tractor or the trailed implements or equipment.

Ensure that all bystanders, particularly children, are a suitable distance away before starting the engine.

2.16.2 - Mount and dismount safely

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

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

DO NOT use control levers as a hand hold and never step on foot controls when mounting or dismounting.

DO NOT attempt to mount or dismount from a moving tractor. **DO NOT** jump off a tractor other than in an emergency.

2.16.3 - Start safely

WARNING: Before starting the engine make sure there is plenty of ventilation. DO NOT operate the engine in a closed building. The exhaust fumes may cause asphyxiation.

Always start the engine from the driver's seat **with all the transmission levers** and the PTO knob in neutral.

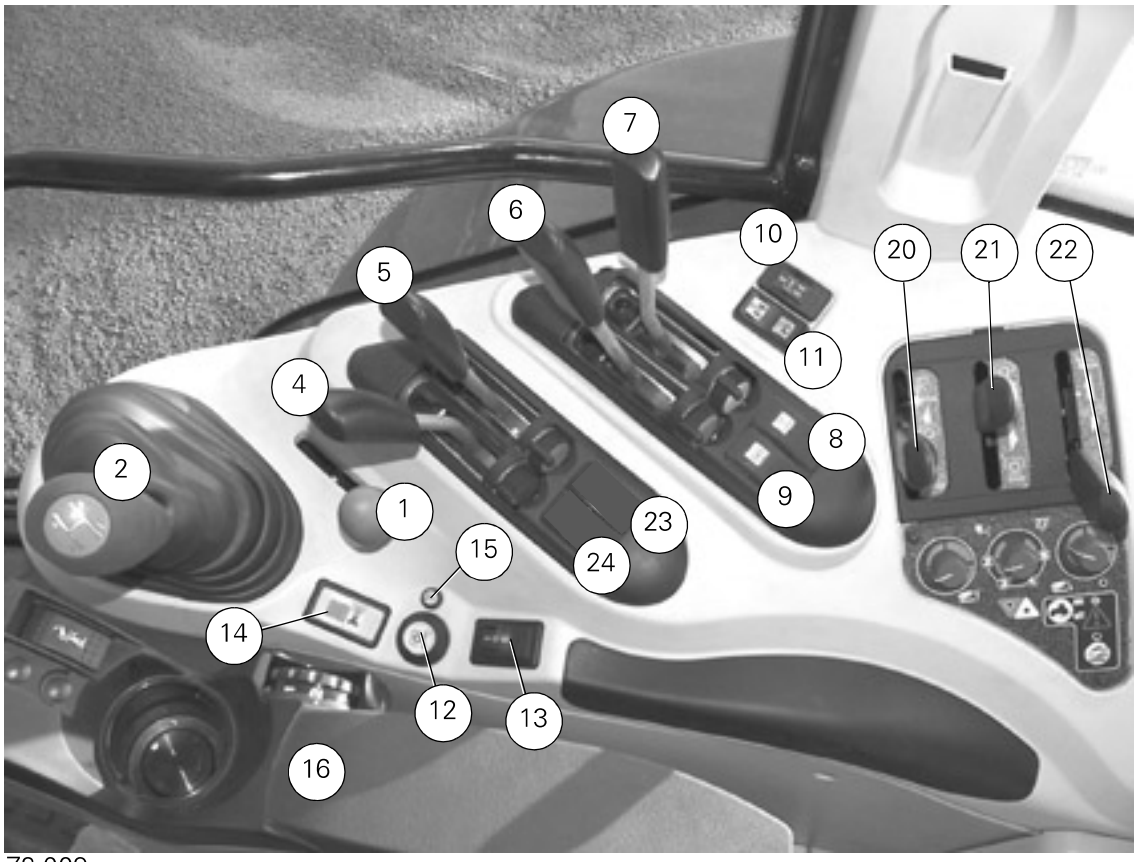
Make sure that the tractor dual brake pedals are locked together at all times unless you are making turns in the field which require independent use of the brakes. Make sure the brakes are properly adjusted so that both brakes engage at the same time.

Adjust the seat, fasten the seat belt, apply the parking brake and put all controls in neutral before starting up.

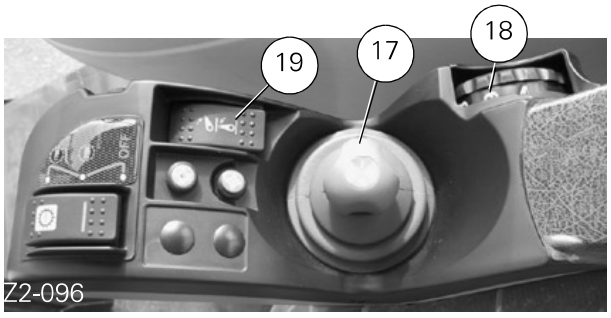
DANGER: Start the engine, with the starter key, from the driver's seat only. DO NOT ATTEMPT to start the engine by shorting across the starter terminals. The machine will start in gear if the neutral start circuit is bypassed. This could cause serious injury or death to anyone in the vicinity of the tractor (Fig. 8).

Chapter 3

INSTRUMENTS AND CONTROLS



Z2-009



Z2-096

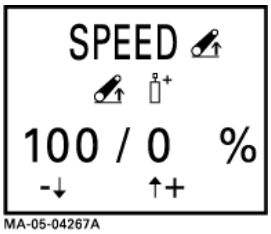
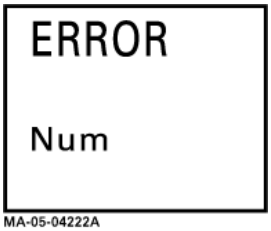
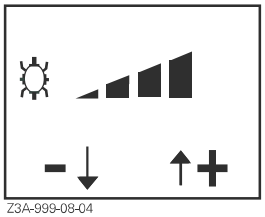
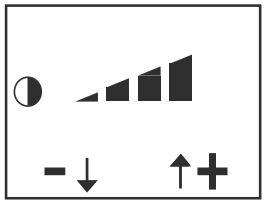
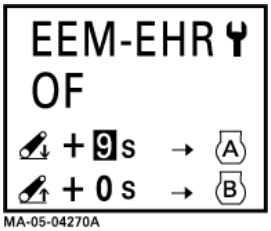
Fig. 12

3.6 - RIGHT-HAND CONSOLE

1. Hand throttle lever.
2. Gear shift lever.
3. Electronic linkage controls.
4. 1st Auxiliary Spool valve lever.
5. 2nd Auxiliary Spool valve lever.
6. 3rd Auxiliary Spool valve lever.
7. 4th auxiliary spool valve lever.
8. Four wheel drive switch.
9. Differential lock switch.
10. Cab suspension switch.
11. Front axle suspension switch.
12. 540/1000 rpm rear PTO ON/OFF switch.
13. Rear PTO switch (ON/OFF/brake).
14. Front PTO switch (if fitted).
15. Rear power take-off selector switch in automatic mode
16. Multi-function armrest.
17. 4-function (separate or combined) control Joystick.
18. Height/depth setting knob.
19. Lift / Lower selector switch with “neutral” position.
20. 540/1000 rpm PTO control lever.
21. Economy PTO control lever (option).
22. Creeper gear control (option).
23. A/B speed switch (engine with electronic fuel injection)
24. +/- engine speed switch after A/B selection (engine with electronic fuel injection).

Chapter 4

OPERATION

Screens	Access	Function
 MA-05-04267A	To display from the previous screen To modify displayed linkage and spool valve flow rate values	**Linkage and EHS valves menu** This menu allows to give priority to the auxiliary spool valves over the linkage, and vice versa. Maximum linkage value: 100 Minimum spool valve value: 0 Minimum linkage value: 20 Maximum spool valve value: 80
 MA-05-04222A	To display from the previous screen	**Error code screen** Displays all tractor error codes. Each error code is displayed for 4 seconds in a loop.
 Z3A-999-08-04	To display from the previous screen To increase or decrease the value	**Brightness screen** Setting screen brightness
 Z3A-1000-08-04	To display from the previous screen To increase or decrease the value	**Contrast screen** Setting screen contrast
 MA-05-04270A	OK Allows to activate the mode or validate the values Used to shift from one line to another Allows to set the seconds value of the displayed time	**Engine speed setting screen (optional)** This menu allows to adjust the engine speed when changing linkage status (work or transport). The operating conditions are: ON mode, PowerShuttle lever out of neutral, tractor moving, When the linkage transport mode is selected, engine speed ratio B is activated after the preset time. When the linkage working mode is selected, engine speed ratio A is activated after the preset time.

IMPORTANT: When stopping the engine, all DOT MATRIX functions shift to OFF position.

Fig 32

4.12.6 - Transport

- Select the minimum position with the knob B (Fig 32).
- Adjust the maximum linkage height according to the transport implement using the height setting knob C. Start from minimum position.
- Move the knob D to "padlock" position.

4.12.7 - Activate transport control system

- The system operates automatically when button F is pressed; indicator light J comes on.
- To deactivate this function, button F must be pressed.

4.12.8 - Quick soil engagement switch

To activate quick soil engagement, move the selector switch E to down position, press and hold button L to activate quick soil engagement.
Release as soon as the plough is engaged into the soil.

4.12.9 - Use when working

- Adjust the maximum high position using knob C.
- Using knob D adjust a maximum linkage lowering speed.
- Choose the implement control mode (Draft, Position or Intermix), according to the implement, the ground conditions and the type of work, by use of the control selector knob B.
- Adjust the working depth using knob A.
- The Lift and Lower indicator lights G and H allow to display the work being carried out.

4.12.10 - Operation at headlands

Put the Lift / Lower selector switch E into the Lift position. The linkage will rise to the preselected maximum lift position C.

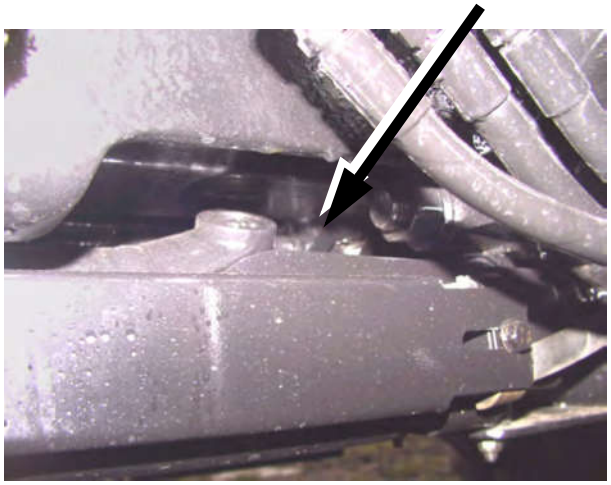
In order to resume work, put the Lift/Lower selector switch E into "Lower". The depth settings previously made will be repeated.

NOTE: A cut-out puts the lift system out of operation when the engine is stopped (ignition switched off), or external controls are used.

The object of this device is to avoid any inadvertent movement of the linkage if settings on the console have been altered whilst the tractor is stationary.
To reactivate the lift system, move switch E to the intermediate position, then to the lift position. The linkage is then reactivated.
Before reactivating the ELC control, ensure that settings A (depth) and C (selection) cannot cause any dangerous movements of the drawbars.

CONTENTS

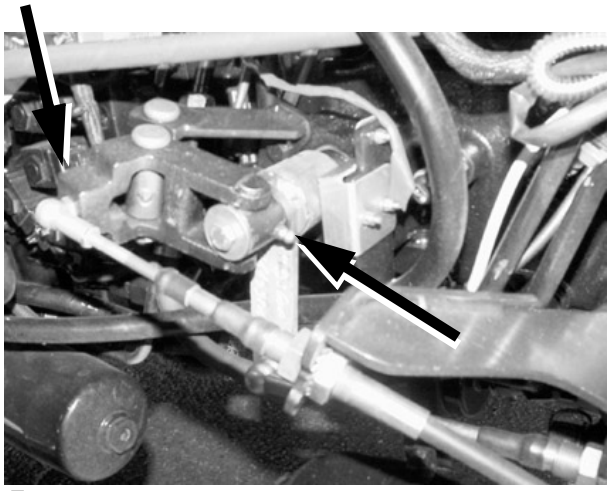
- Four wheel drive drive shaft (rear and front) (1 grease nipple)



MT-261103

Fig. 8

- Gear shift lever joint (2 grease nipples)



Z2-060

Fig. 9

Every 400 hours:

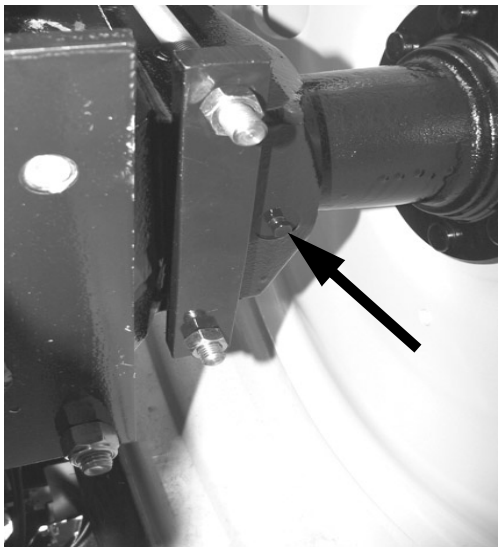
- Cab

Smear the door hinges, the door lock and the window catches with liquid parrafin.

- Rear wheel bearings

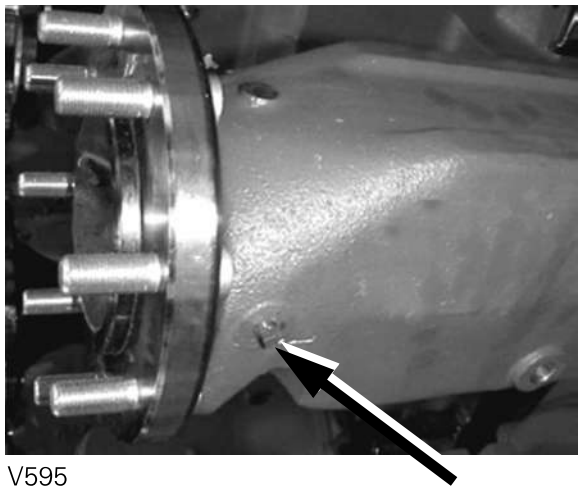
Remove the plugs and fit grease nipples, then lubricate, operating the grease gun only two or three times before refitting the plugs.

NOTE: Too much grease will damage the seal.



Z2-145

Fig. 10



V595

Fig. 11

5

5.16.2 - Drier

Replace the air conditioning receiver drier every 1,200 hours (consult your dealer).

MT-0031103

Fig. 35

5.16.3 - Checking the air conditioning system

Run the engine and operate the air conditioning system for a few moments.

Have your dealer or agent check the system once a year at the start of the summer.

NOTE: In order to keep the system in good condition, we recommend to operate the system for several minutes each week in order to lubricate all the seals.

DANGER: In the event of a leakage, wear safety goggles. Escaping refrigerant gas or liquid can cause severe injuries to eyes. In contact with a flame, R134a refrigerant gives a toxic gas.

WARNING: Do not disconnect any part of the cooling circuit from the air conditioning system. Consult your dealer or agent if a fault occurs.

5.16.4 - Checking the fan belt

(Fig. 36): Examine the fan belt (on a daily basis or whenever refuelling).

Cross cracks (running across the breadth of the belt) are allowed.

Longitudinal cracks (running along the length of the belt) which intersect cross cracks are not allowed.

Replace the belt if it is cracked in an unacceptable way, frayed or if pieces have come off.

5.16.5 - Check belt tension every 400 hours

Adjusting the alternator belt.

The correct arrow value is 13 to 16 mm when pressing the hand on the belt midway between the fan pulley and crankshaft pulley.

A new belt may loosen after operating for approximately half an hour or an hour. Retighten the tensioner to adjust the tension.

Get your dealer or agent to check the alternator every 1,200 hours or once a year.

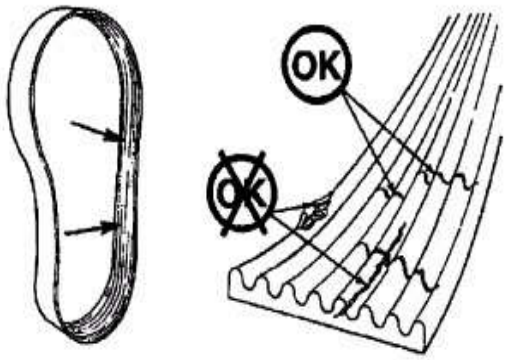
NOTE: A belt tension gauge can be used.

5.16.6 - Replacing the Poly-V belt

- Loosen the alternator attachment screws and raise the tensioner to remove the belt.
- Fit a new belt and retighten the tension to the required value.

NOTE: After the tensioner has been raised to remove/install the belt, check the torque of the tensioner capscrew.

MT-0391103



V685

Fig. 36

5

5.23 - ELECTRICAL EQUIPMENT

The 12 volts circuit is a negative ground system.

5.23.1 - Batteries:

Wipe the battery top and coat the terminals with liquid paraffin every 250 hours.

WARNING: Batteries generate explosive gases. Sparks, flames, lit cigarettes or any flammable source must be kept away. Wear appropriate safety goggles when working near batteries.

5.23.2 - Alternator

Check the fan and alternator belts tension every 400 hours.

Adjusting the alternator belt.

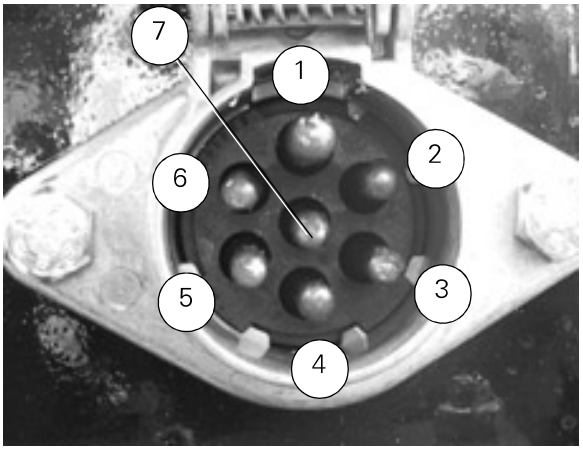
Get your dealer or agent to check the alternator every 1,200 hours or once a year.

IMPORTANT: The alternator wiring must be disconnected before any arc welding is carried out on the tractor or on an implement which is attached to it. Do not disconnect or reconnect the battery cables when the engine is running. Never operate the engine when the cable linking the alternator and battery is disconnected. Do not attempt to connect any additional electrical equipment, as this may damage components of the existing electrical system.

5.23.3 - Trailer socket (ASAE)

Connection (Fig. 49)

1. Ground (white wire)
2. Rear work headlight (grey wire)
3. Left direction indicator and flashing warning light (yellow wire)
4. Open
5. Right direction indicator and flashing warning light (green wire)
6. Tail lights (brown wire)
7. 20 Amp fused, unswitched power (red wire).



V736

Fig. 49

5.29 - SERVICE ADVICE

The following suggestions are not compulsory. You can carry out simple adjustments on your tractor to improve its operation, saving time and avoiding the cost of a service engineer.
Only one adjustment should be carried out at a time; if this adjustment does not improve performance, revert to the initial setting before carrying out the next adjustment.

5.29.1 - Troubleshooting - engine

Difficult starting
External temperature cold
Fuel level insufficient
Air in the fuel system
Compression loss
Injector nozzles clogged
Battery flat
Slow starting
Valve clearance incorrect
Fuel transfer pump faulty
Fuel injection pump faulty
Fuel injection pump misadjusted

Engine overheating
Radiator blocked
Radiator plug faulty
Coolant level low
Fan belt slipping
Radiator hose sagging
Thermostat failed
Water pump faulty
Engine overloaded
Lubricant oil diluted
Heavy load drawn with reduced power

Power loss
Fuel level insufficient
Air in the fuel pipes
Fuel supply pipe blocked
Fuel filter clogged
Injection pump timing delay
Fuel transfer pump faulty
Compression loss
Air purifier clogged
Valves stuck
Valve clearance incorrect
Nozzles faulty
Idle speed too slow for high speed range

Unsteady operation
Injection pump regulator seized up
Compression pressure incorrect
Valve clearance adjustment incorrect
Fuel injectors faulty
Fuel pressure too low
Service temperature too low
Fuel injection pump misadjusted

Excessive exhaust emissions
Engine overloaded
Air purifier clogged
Fuel level in engine excessive
Injector nozzles faulty
Oil in fuel supply

Engine knocking
Engine overloaded
Fuel incorrect
Ignition incorrect
Engine speed too slow

All circuit adjustments must be carried out by a qualified mechanical engineer.

6.6 - POWER TAKE-OFF

Power take-off	Proportional to the engine speed. Hydraulic clutch.
- Interchangeable shaft:	MT525B/545B: 540 rpm engine, shaft Ø35 mm, 6 splines; 1000 rpm engine, shaft Ø35 mm, 21 splines.
- Flanged shaft:	MT525B/565B: 540 rpm engine, shaft Ø35 mm, 6 splines; 1000 rpm engine, shaft Ø35 mm, 21 splines. MT555B/545B: 540 rpm engine speed, shaft Ø35 mm, 6 splines; 1000 rmp engine speed, shaft Ø35 mm, 21 splines; 1000 rmp engine speed, shaft Ø45 mm, 20 splines.
Speed shifting (according to model):	Either by changing shafts, or via lever inside cab.
Economy PTO (optional)	540 and 1,000 rpm can be obtained at engine 1,550 rpm.
Control:	Lever in cab or by lever on rear left-hand side of centre housing.

6.7 - FOUR-WHEEL DRIVE FRONT AXLE

Clutch mechanism:	Electrohydraulic, electrically actuated by push-button on armrest console in the cab.
Differential lock:	Limited slippage rear differential lock, with electrohydraulic control.
Gear ratios:	20.22s (21.33); 20.29s, 20.43s (20.77).

6.8 - HYDRAULIC CIRCUIT (ACCORDING TO MODEL)

6.8.1 - Closed center hydraulic system with flow and pressure control (optional)

• **Primary booster system** (flow rate 164.5 l/mn at 2,200 rpm) supplies:

constant boost pressure (5 bar) from variable displacement pump, lubrication of the gearbox, clutch, cooling system, boost pressure of master cylinders.

• **High pressure system** (max. flow rate 110 l/mn at 2200 rpm depending on model, max. pressure 200 bar) supplies: steering, trailer brake, auxiliary hydraulic and hydraulic linkage.

Filtration:	150 micron suction strainer, located to the left of the transmission housing. External main high-pressure 15 micron filter, to the right of the transmission housing.

6.8.2 - "Twin Flow Load Sensing" system

• A 40l/min. and 56l/min. dual pump system supplies the trumpet lubrication system, steering, trailer brake, linkage and auxiliary hydraulic system.

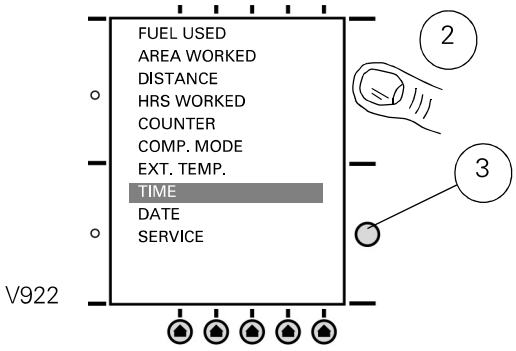
- Priority on 40 l/min system: Spool valves.
- Priority on 56 l/min system: Trailer brake, linkage, auxiliary hydraulics circuit.

Filtration:	150 micron suction strainer, located to the left of the transmission housing. External main high-pressure 15 micron filter, to the right of the transmission housing.

CONTENTS

7.2.9 - Auxiliary functions

- Clock setting (hours, minutes, seconds) (Fig. 12):
- Press the key 2 or 3 to display the list of functions.
- Select **-TIME-** then press 2 or 3 again; the display appears in the selected window and LED 4 or 5 is lit.
- Press on one of the keys ref. 6 corresponding to the figures to modify, then turn the knob 14 to modify these digits one by one.
- Proceed in the same way to update the Date, Month and Year parameters and to store Cost/L. and Cost/Area. Units. Screen contrast (Fig. 13).



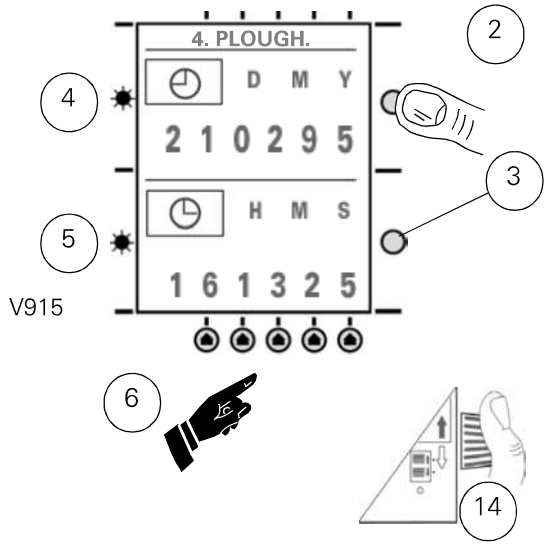


Fig. 12

7.2.10 - Screen contrast

(Fig. 13)

Screen contrast can be modified at any time as follows:

- Press the key 9 until both indicator lights 4 and 5 come on; turn knob 14 to lighten or darken the screen.
- Press key 9 again or any other key to return to normal operation.

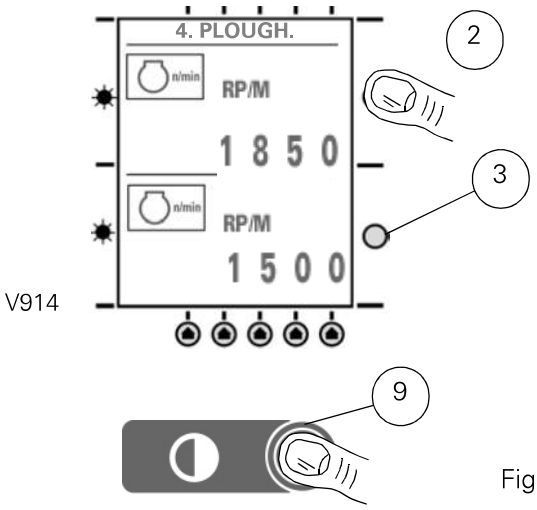
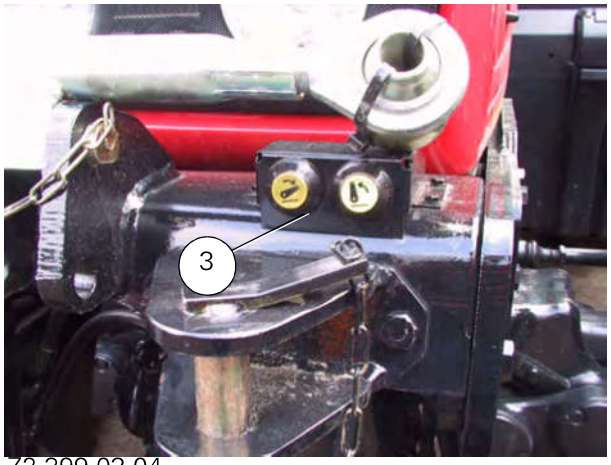


Fig. 13



Z2-399-03-04

Fig. 28

DANGER: Operate the external controls with care, keeping a safe distance from the lift arms.

Apply the following procedure before use:

Before using the external controls, activate the Joystick (indicator light 2 Fig. 27 off) and move the rear linkage switch to neutral or lower position.

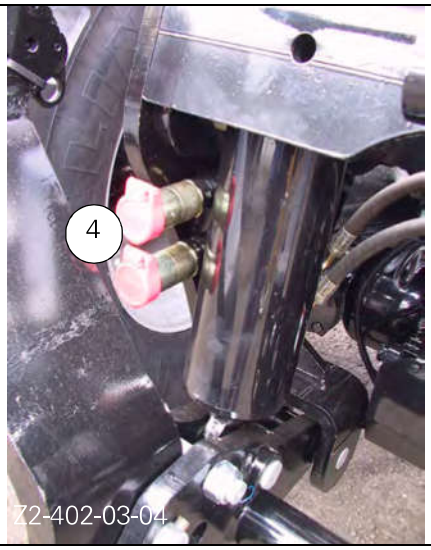
After each use of the external controls the Joystick is locked (indicator light fixed on).

To use the cab controls again, the Joystick must be activated (indicator light off).

NOTE: The external controls do not operate if the Joystick is not activated after starting the tractor.

If they are moved all the same, the linkage switches to safety mode (indicator light flashes) and the engine must be restarted.

The oil outlets 4 (Fig. 29) are controlled by the spool valve control located in the cab, and have the same characteristics as those used at the rear.



Z2-402-03-04

Fig. 29

7.7.3 - Loads allowed on the front axle beam

The load allowed on the tractor is limited by the following two factors:

1. Axle beam
2. Tires

Using a long heavy implement can cause an overload on the front axle.

The loads allowed on the front axle beam should be complied with. To measure the maximum load allowed by the front axle, place the front axle on a scale, lift the front implement and lower the rear implement.

Nominal loads allowed on the front axle (suspended or not) depending on models:

Model	Load
MT 555B / MT 565B	4600 Kg

IMPORTANT: A front implement weighing one ton overloads the axle by more than one ton due to chassis frame overhang (allow on average 1.5 times the weight). The wheelbase length is usually double the implement overhang.

7.7.3.1 - Load allowed by the tires

The load allowed by the tires depends on their inflation pressure, maximum travel speed and the torque to be transmitted. In general, the greater the load the tire must support, the greater its volume should be.

IMPORTANT: This is the most common factor limiting front axle capacity. Tire manufacturers offer charts detailing loads allowed for a tire type depending on operating conditions. Failure to respect these limits can lead to tire damage, an unstable machine, and poorer performance.

Examples for standard agricultural tires:

Dimension Tire	Load on axle beam	Pressure	Speed
14.9R24	3 T	1.4 bar	40 km/h.
480/65R28	4.5 T	1.6 bar	40 km/h.

8.2.12 - Final transmission / hydraulic system oil overheating

Oil level too low. See final transmission / hydraulic system oil instructions in section 5.

Oil too thick or insufficient oil. See final transmission / hydraulic system oil instructions in section 5.

Oil contaminated. See changing final transmission / hydraulic system oil instructions in section 5.

Safety valve setting incorrect. Consult your Dealer.

Valves leaking internally. Consult your Dealer.

Excessive lift arm oscillation - adjust linkage load response for heavier draft - see "Setting linkage load response", section 4.

Coolant by-pass valve blocked in open position. Consult your Dealer.

8.2.13 - Spongy brakes

Air in circuits. Bleed brake circuit. See section 5.

Pressure relief valve failure. Consult your Dealer.