A . Model 6445

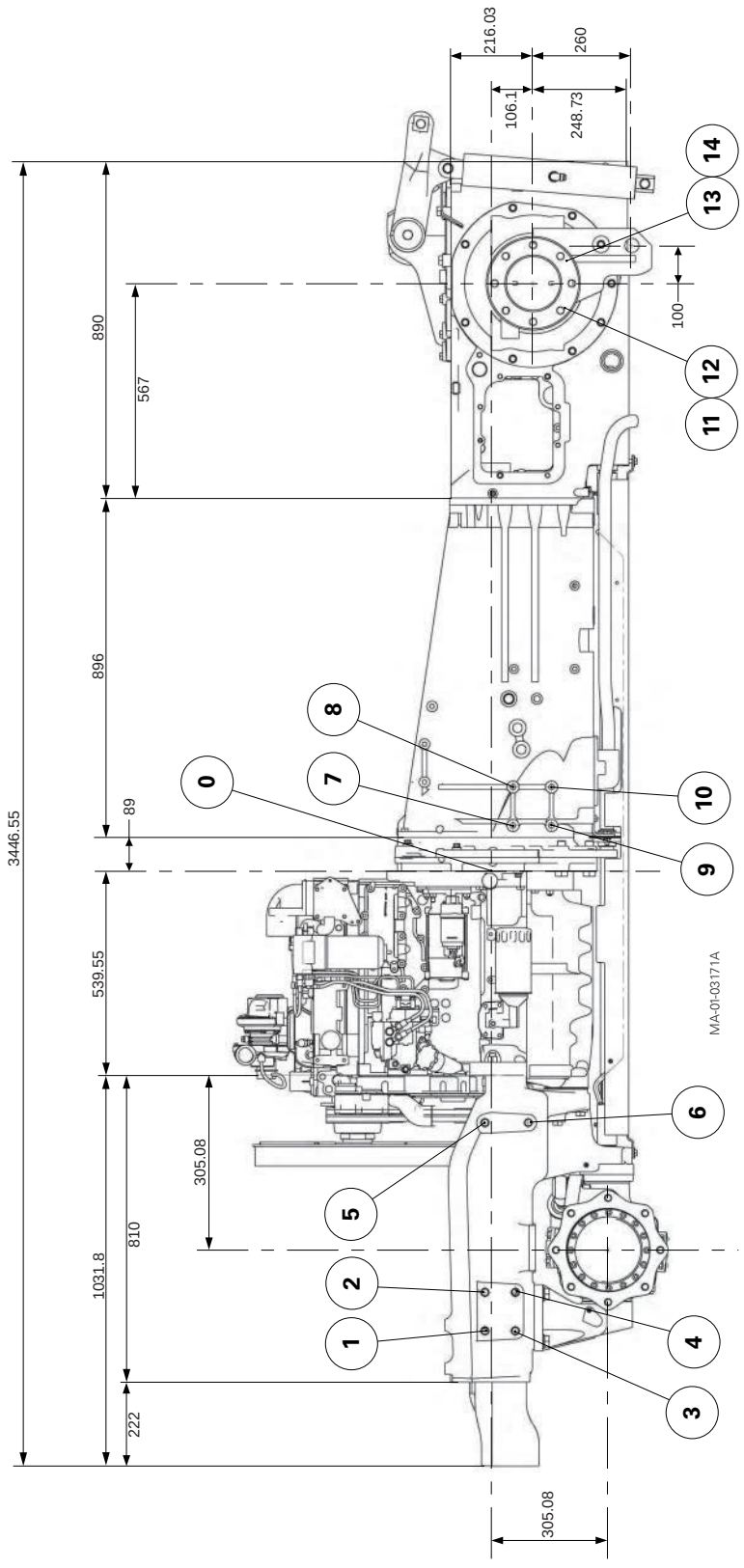
Dynashift

Engine	
Power at 2200 rpm, ISO hp (kW)	90 (67)
Brand	PERKINS
Type	1104C-44T
Number of cylinders/displacement	4 / 4.4 Turbo
Injection pump	Lucas DP 210
Fan	Viscostatic
Intercooler	-
Alternator	80 A
Gearbox	
Gearbox model	GBA20 (4x4)
Clutch/shuttle	Power Shuttle
Type	Dynashift
AutoDrive	optional
Creeper unit 4/1	optional
Creeper unit 14/1	optional
Rear axle	
Axle model	GPA20
Final drives	HD
Axle shaft Ø	76 mm
Straight shaft	-
Flanged shaft	standard
Brake discs per trumpet housing	1
Hand brake discs	3
Differential lock	Dog clutch
Linkage	
Stabilisers	telescopic
Multi-hole drawbar	optional
3-point linkage	Cat. 2, hook or ball type (*)
Clevis hitch	Fast-setting or pin-adjusting scale
Automatic clevis hitch	Fast-setting or pin-adjusting scale
Semi-mounted trailer hitch	Stud or auto-hitch (*)
Swinging drawbar	standard
Roller type swinging drawbar	optional
Power take-off	
Type	Interchangeable / shiftable shaft
540/1000/eco	optional (*)
540/750/1000	-
750/1000	optional (*)
Number of clutch discs	4
PTO brake	hydraulic
Proportional PTO	optional
Automated PTO	optional
Front power take-off	optional

Front axle	
Model	AG 85
Type	fixed or suspended (optional)
Rotational direction	Clockwise
Number of clutch discs	4
Swivelling mudguard (4WD)	optional
2-wheel drive	optional
Front linkage (optional)	2.5 T
Hydraulics	
Open Centre 57 l/min	optional
TFLS 100 l/min	optional
Closed Centre 110 l/min	optional
Closed Centre 150 l/min	-
Orbitrol steering	125 cc
Brake master cylinder	standard
Braking assistance	optional
Trailer brake	optional (*)
Auxiliary spool valves (maximum number)	4 electrohydraulic (2 SMS) or 4 mechanical
Couplers	Decompression
Electronics	
Transmission control	AUTOTRONIC 3
Instrument panel	DCC2
Linkage controller	EHRC
Draft sensors	2
Sensor capacity	4 T (standard) or 6 T (optional)
Datatronic	optional
Dual control (front and rear)	optional
TIC with/without draft sensor	optional
Fieldstar	optional
Cab	
Suspension	optional
Rear-view mirrors	manual (standard) or electric (optional)
Air conditioning	manual (standard) or automatic (optional)
Standard bonnet	Fixed
Bonnet option	Hinged
Standard roof	standard
High-visibility roof	optional
Sloping bonnet	optional
Platform	-
Reference (*): according to country	

B . Attachment points and dimensions

6445/6455/6460/6470 Dynashift



0	Reference point			
	Diameter	X	Y	Z
1	M20	-1214	280.241	20.79
2	M20	-1112.55	280.241	20.79
3	M20	-1214	280.241	-59.21
4	M20	-1112.55	280.241	-59.21
5	M20	-664.55	275.241	20.79
6	M20	-664.55	275.241	-93.21

7	M16	120.4	223	-53
8	M16	222	223	-53
9	M16	120.4	183	-154.6
10	M16	222	183	-154.6
11	20	1487	500.6	-198.1
12	20	1487	600.6	-198.1
13	20	1617	500.6	-198.1
14	20	1617	600.6	-198.1

Fig. 3

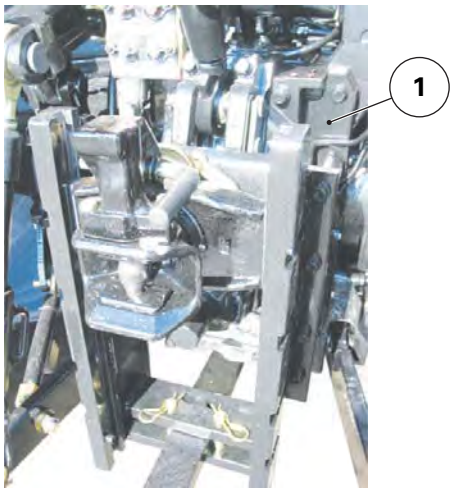
A . General

It is necessary to move the PTO housing (1) backwards (Fig. 1) in order to:

- gain access to the PTO brake hydraulic elements
- work on the PTO gears (all types)
- replace the rear bearing cassette seal (only on tractors fitted with a shiftable or 1000 rpm output shaft PTO).

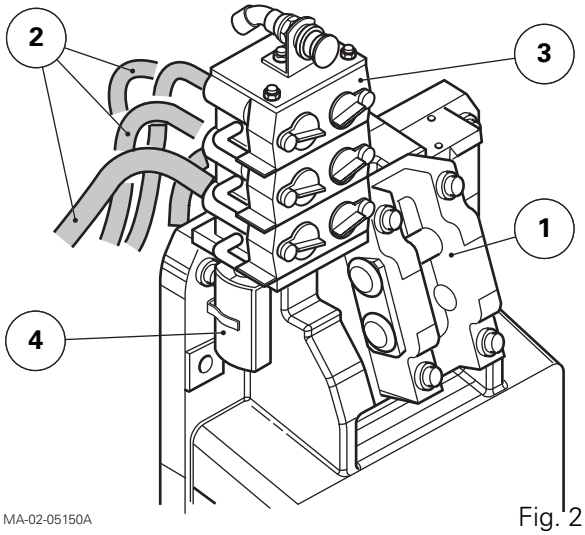
B . Preliminary operations

1. Drain the centre housing.
2. Remove the oil-recovery tank or tanks (4), depending on the hydraulic version, for the hydraulic couplings (3) (Fig. 2).
3. Remove:
   - the 3rd point link
   - the swinging drawbar.
4. Mark the position of the hoses (2). Disconnect them from the hydraulic couplings (3) (Fig. 2).
5. Disconnect the low pressure (17 bar) and lubrication pipes from the PTO clutch, which are located at the rear right-hand side of the PTO housing (1) (Fig. 2).



MA-02-05149A

Fig. 1



MA-02-05150A

Fig. 2

F . Adjusting the Hare / Tortoise range

On the cover (7) (Fig. 11)

58. Place piston (3) in thrust against the bottom of the chamber (Hare position).

59. Position the arm of tool ref. MF462A, in the groove of the piston and place it in contact with face F as shown.

IMPORTANT: *Carefully hold piston (3) in the Hare position with the arm of the tool thrust against face F before manually tightening thumbscrew V of the cursor.*

On the gearbox (Fig. 12)

60. Place the tool on the gearbox housing.

61. Manually hold the ring of the synchromesh against the pinion of 3rd P (Hare position) (Fig. 6) and with the fork pads thrust against the synchromesh ring (on the side of the 3rd gear pinion).

62. Smear the screws of selector S with Loctite 221 or equivalent and adjust them so that face F clears the arm of the tool by a minimum of 0.2 mm. Tighten the screws to 25 - 35 Nm without changing the adjustment.

63. Refit the cover temporarily (see § C). Use a compressed air supply sufficient to move piston (3) into the Tortoise position.

64. Adjust and maintain the pressure to aproximately 3 bar. Through the opening located beneath the gearbox, check the clearance between the Hare / Tortoise fork and the synchromesh ring: max. clearance 1 mm.

65. After checking the clearance, refit the cover permanently (see § C).

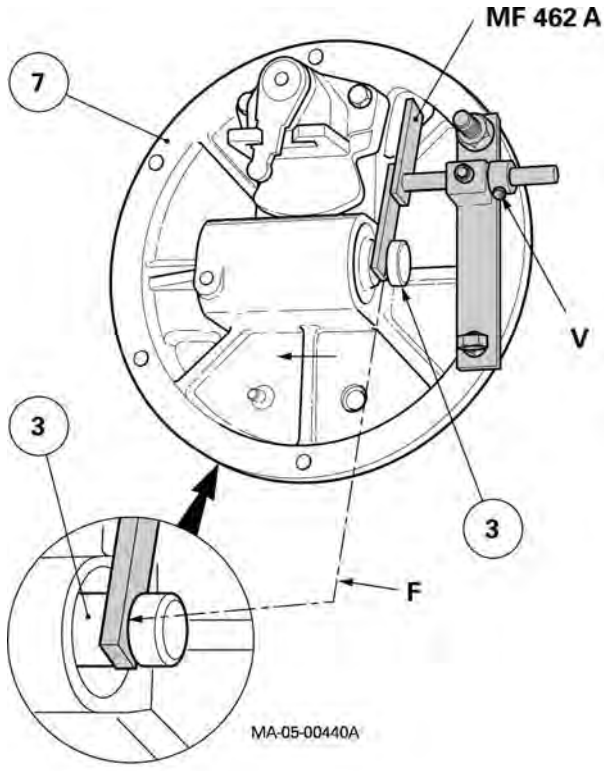


Fig. 11

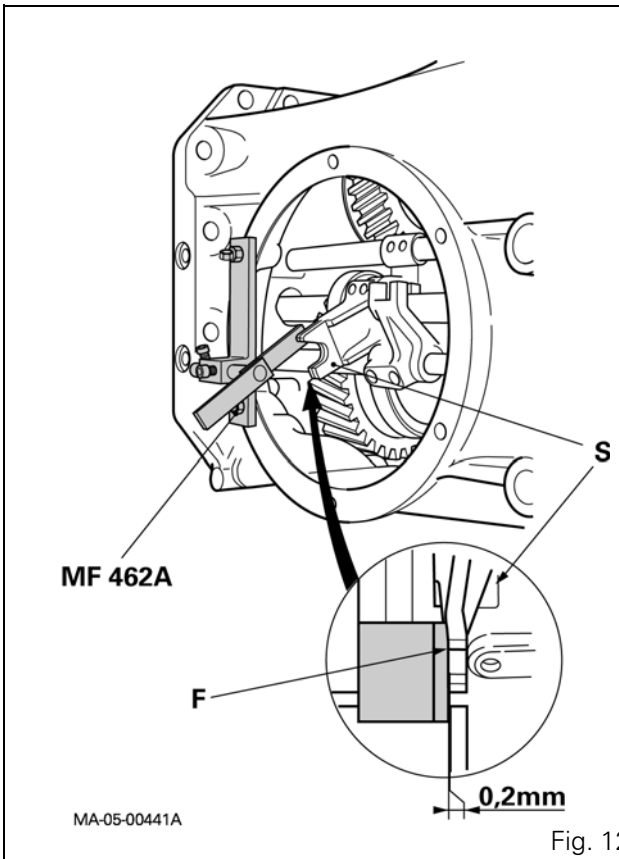


Fig. 12

B . Layout of main components

Parts list (Fig. 1)

(1) Hydraulic pump drive pinion
(2) Centre housing
(3) PTO housing
(4) Bevel gear and differential
(5) Handbrake unit
(6) Creeper unit coupler and fork (if fitted)
(7) PTO clutch
(8) 2 speed PTO (540/1000 rpm pinions) (removable shaft)
(9) 4 WD clutch
(10) 4 WD shaft
(11) Secondary PTO shaft
(12) Interchangeable end fitting (flange shaft with 6, 20 or 21 splines, depending on option)
(13) 540 or 750 rpm driving pinion, optional
(14) 1000 rpm driving pinion
(15) Intermediate housing
(16) Shiftable PTO (540/100 rpm or 750/1000 rpm pinions)
(17) 1000 rpm PTO (1000 rpm pinion)
(18) PTO brake

On cam (22)

31. Fit:
- the friction ring (27) flush with the chamfer of face F of the cam (22) (Fig. 7);
- a new Mecanindus pin (29) in the hole at the front end of the pin (26).

32. Refit the cam and pin.

Check that the cam pivots correctly on its pin.

33. Lightly smear the thread of the special screw (28) with Loctite 242 or equivalent, only if this screw does not have an O'ring.

Tighten the screw (25) to a torque of 25 - 35 Nm.

On the unit (7)

34. Fit (Fig. 8):
- the friction ring (10), using a locally made drift;
- the seal (12) in direct contact with the shoulder of the housing (7), using a suitable locally made fixture.

Grease the lip of the seal (12) with clean transmission oil.

35. Fit the splined pin (11) and cam (31) in the unit (7) (Fig. 8).

36. Lightly smear (Fig. 8):
- the thread of the (Allen) screw (30) with Loctite 242 or equivalent. Moderately tighten the screw;
- the mating face of unit (7) with Loctite 510 or equivalent.

37. Slide the rod (19) in the intermediate housing. Check that it slides freely.

38. Place the unit (7) against the intermediate housing.

Tighten screws (2) to a torque of 25 - 35 Nm.

39. Adjust the angular position of the link (3) on the splined pin (11), using the method described in § D.

40. Place on the link (3), after adjustment:
- the O'ring (1);
- the washer (18).

41. Tighten the screw (17) to a torque of 14 - 20 Nm.

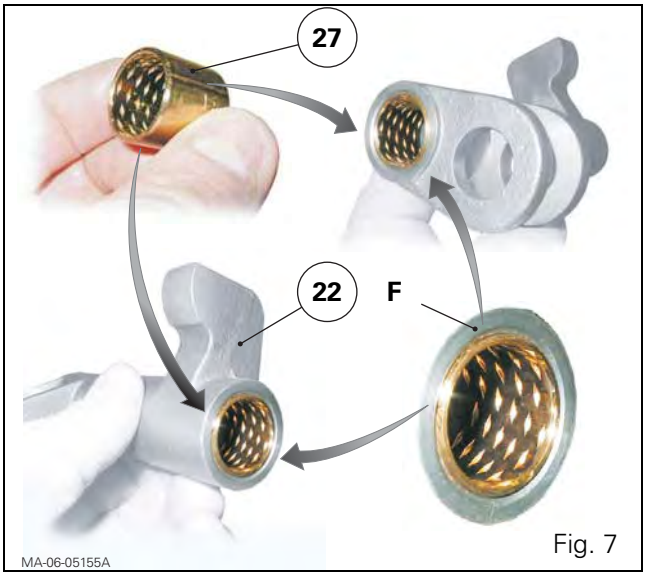


Fig. 7

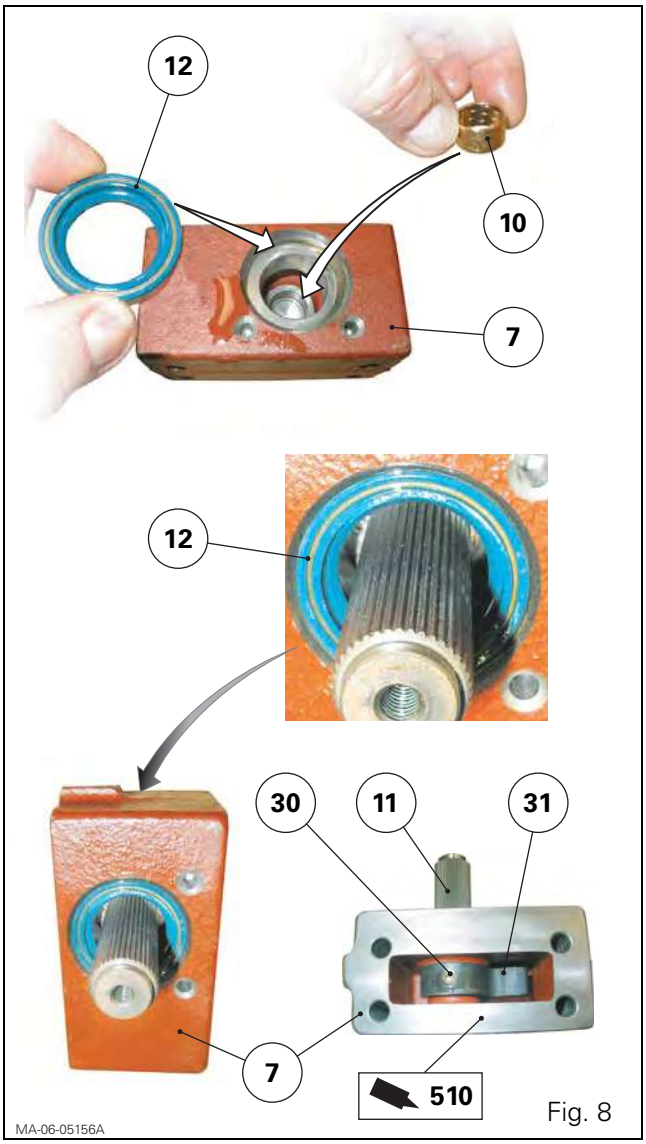


Fig. 8

E . Removing and refitting the front axle beam

Removal

59. Chock the rear wheels and put the handbrake on.
60. Raise the tractor using a jack positioned at the centre of the axle beam.
61. Position a stand under the engine sump.
62. Remove the front wheels.
63. Remove the screws and nuts (14).
64. Take the ball joints (6) out of the steering levers (7).
65. Remove the two stub axles (1) (Fig. 5).
66. Mark and disconnect the hydraulic steering hoses.
67. Remove screws (30), and remove the ram (2) from the axle beam (12).
68. Sling the axle beam (12) (Fig. 6).

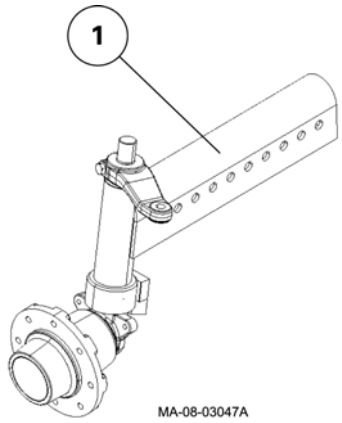


Fig. 5

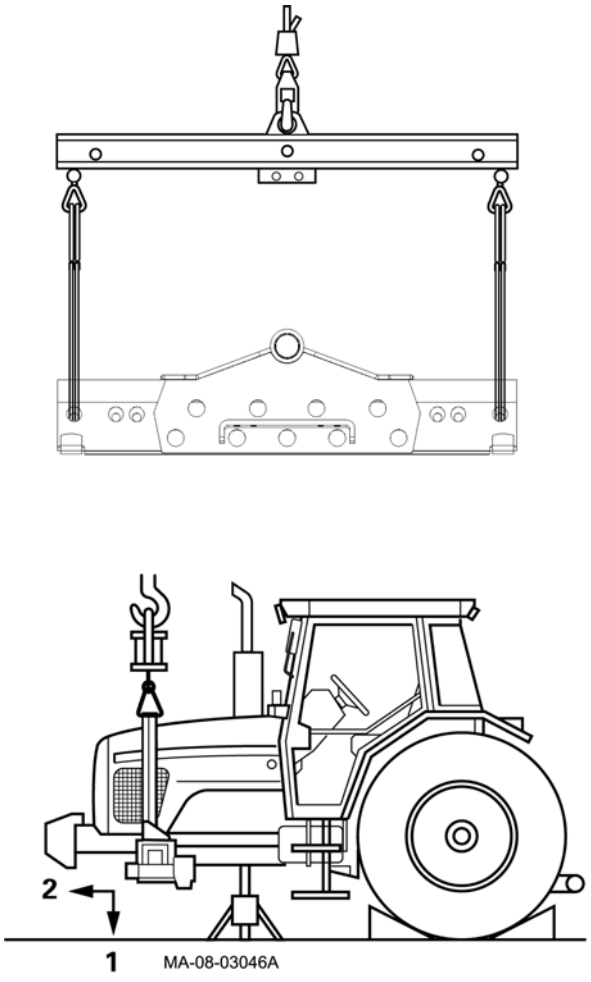


Fig. 6

E . Double circuit master cylinders (with trailer brake)

Operation

Pedals uncoupled (Fig. 9)

The effort applied to a pedal is transmitted by the rod (5) to the piston (4) which moves in the bore of the active master cylinder. The valve (1) closes the supply port. The balancing valve (3) is opened by the piston (4) and valve ball (2). Oil under pressure is directed to the main brake ports (C) and the pressure balancing junction (D).

Via the balancing junction, the pressure closes the valve (3) of the passive master cylinder .

The pressure acting on the piston (4) also makes the piston (6) move, closing the valve (F).

The oil contained in the chamber (E) is channelled by connecting pipes to the chamber (E') and to the port (B') via the open valve (F') of the passive master cylinder.

The valve (F) and piston (6) assembly quickly reaches the stop at the base of the active master cylinder.

In this position only the tractor brake is activated; trailer brake is not activated.

Legend (Fig. 9)

A Trailer brake spool valve control (double circuit)
B Master cylinder level kept constant by the lubricating and booster circuit (Fig. 3)
C Supply to main brake
Pressure balancing junction
A Trailer brake pressure chamber (double circuit)
F valve (double circuit)

Fig. 8

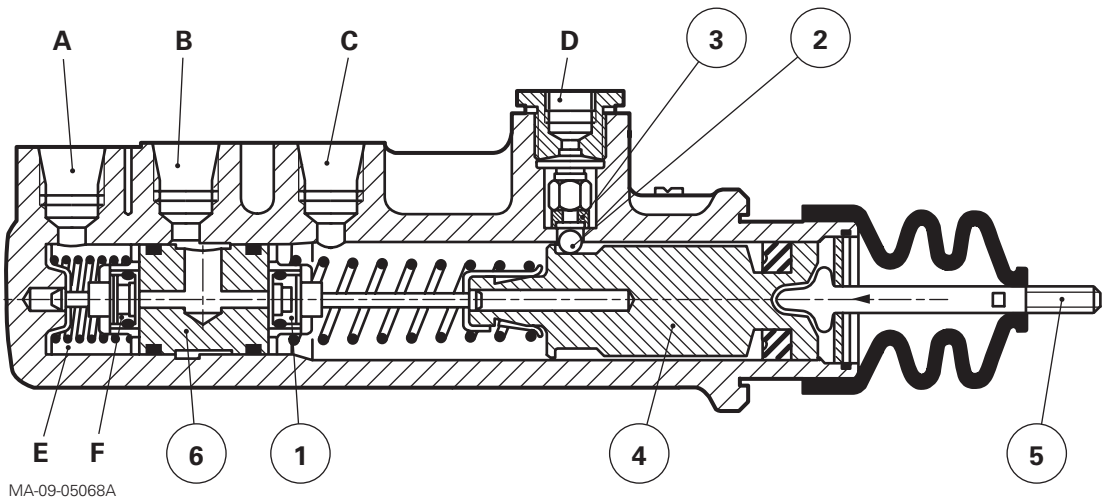


Fig. 9

H . Removing - refitting and disassembling - reassembling the 1.5 bar valve

Removal (Fig. 11)

17. Remove the part(s) that may obstruct work on the valve (1).

18. Mark and disconnect the pipes (5) (6), hoses (7) (8) and unions (2) (3) (4).

19. Remove the housing valve from the gearbox.

Refitting

20. Replace the O'rings if necessary.

21. Refit the valve, unions, hoses and pipes.

22. Replace any part(s) removed at operation 17.

Disassembly

23. Take off circlip (5). Remove the bush (2), spring (3) and valve (4) from the valve body (6).

Reassembly

Reminder (Fig. 12)

The valve (1) consists of several hydraulic parts (valve, spring) listed in the spare parts catalogue.

24. Check that the hydraulic parts are clean.

25. Reassemble the valve, carrying out operation 23 in reverse order.

26. Manually check the free movement of the valve.

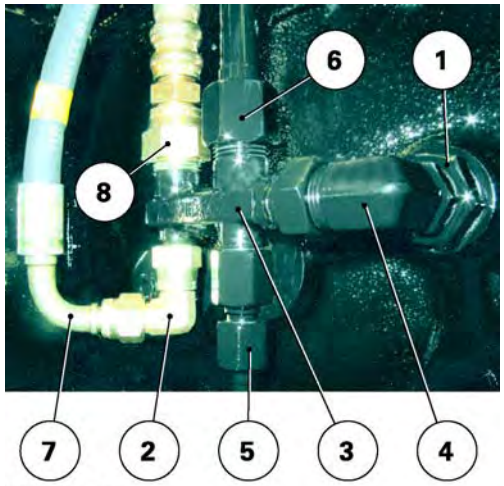


Fig. 11

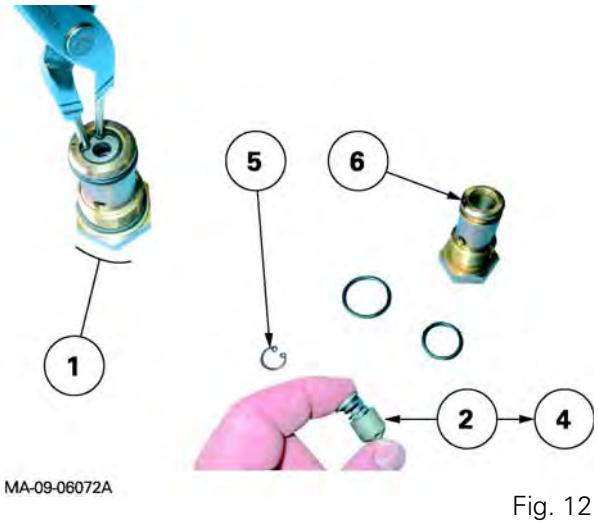


Fig. 12

G . Electrical diagrams

Electrical supplies

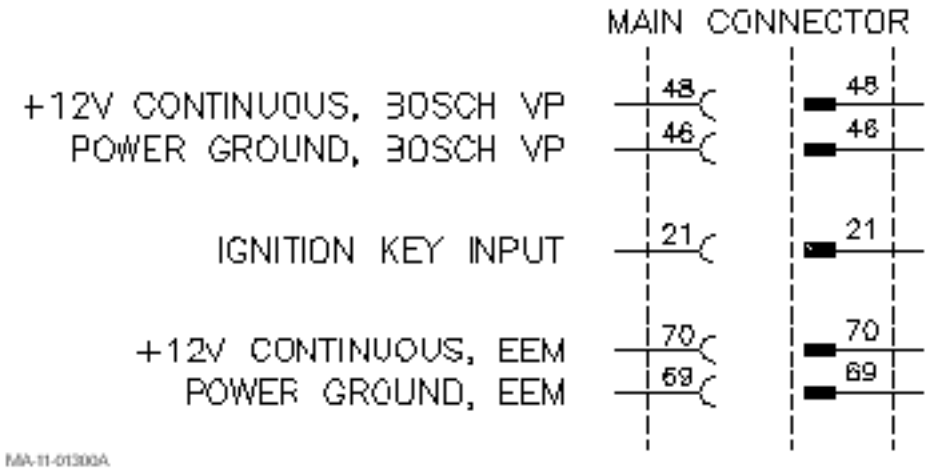


Fig. 3

Speed sensor

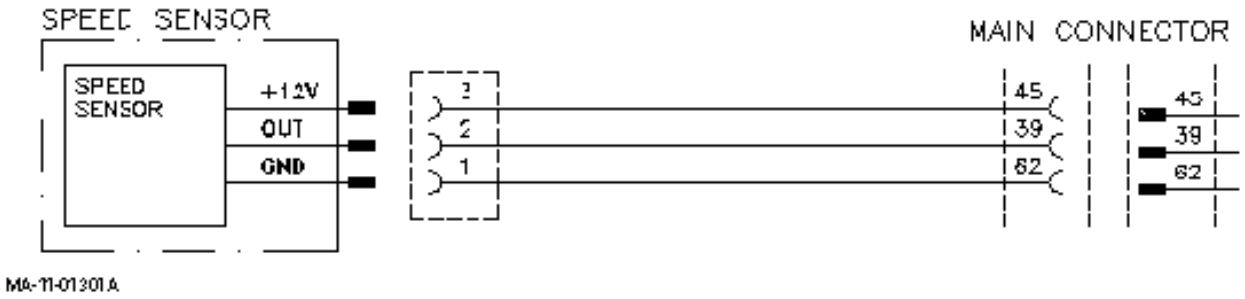


Fig. 4

Turbo Boost pressure sensor

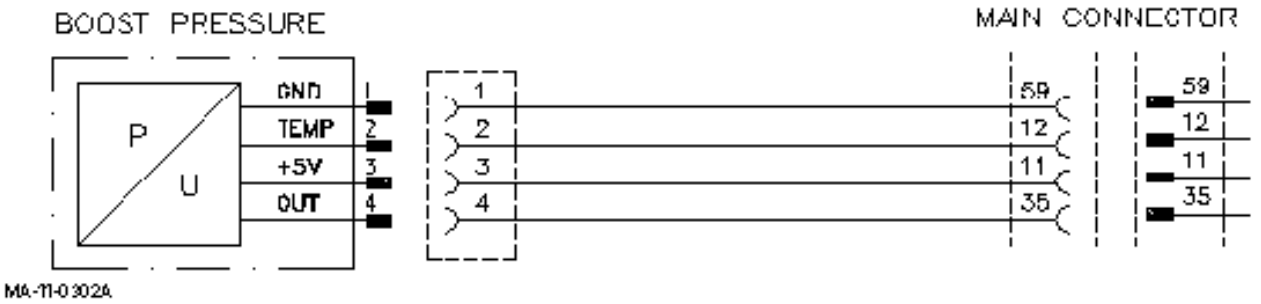


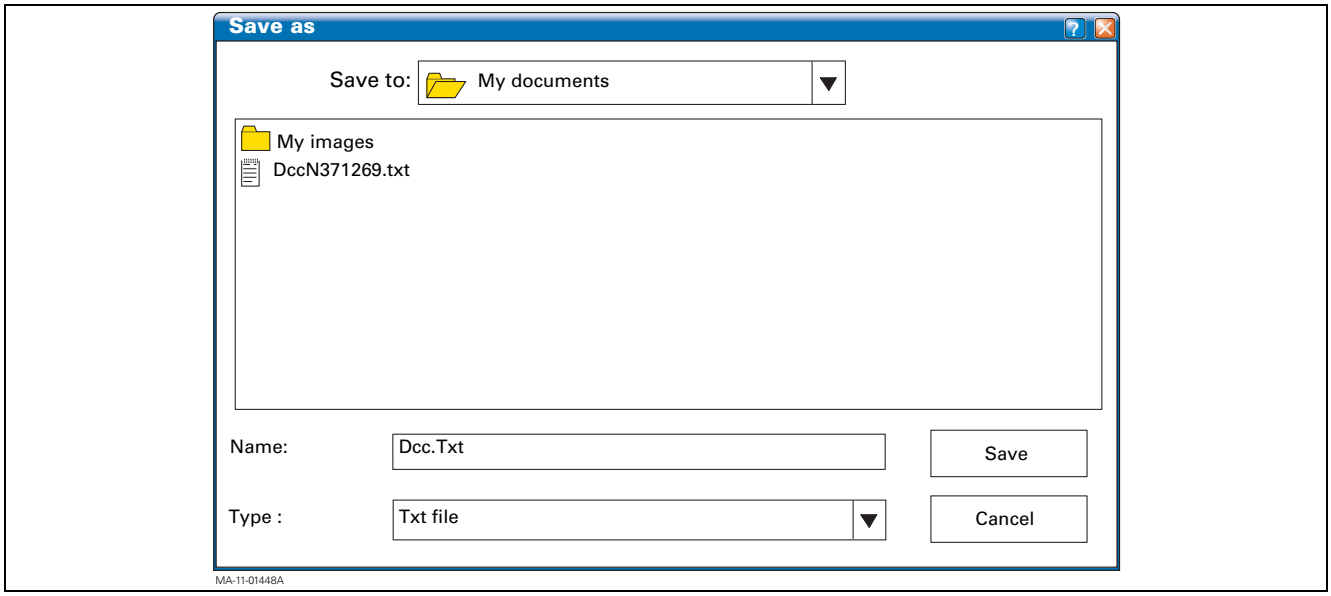
Fig. 5

NOTE: *To view these electrical diagrams in greater detail, see GUF105*

The calculator data can be saved in the form of a text file, which can then be opened with any standard text editor software.

In this manner, the file can be saved, printed out, transferred to the technical inspector who asked for it, etc.

- Click on the "Save" icon
- The following screen is displayed:



- By default, the backup file is named "Dcc.Txt". You can, however, name it as you see fit.
- If you wish, you can change the location to which the backup file is saved.
- Click on "Save".
- Wintest returns to the constants display window.

B . Saving to a file

Calculator data (program, parameters and calibration) can be saved in a single file that can be forwarded to technical support as requested.

This file can be opened only by the factory engineers.

- Double click in the left-hand column of the line of the calculator whose content you wish to save.
  The line turns blue and at the bottom of the left-hand column, Wintest specifies which Autotronic 5 has been selected.
- Next, click on the "Auto5 -> File" icon:

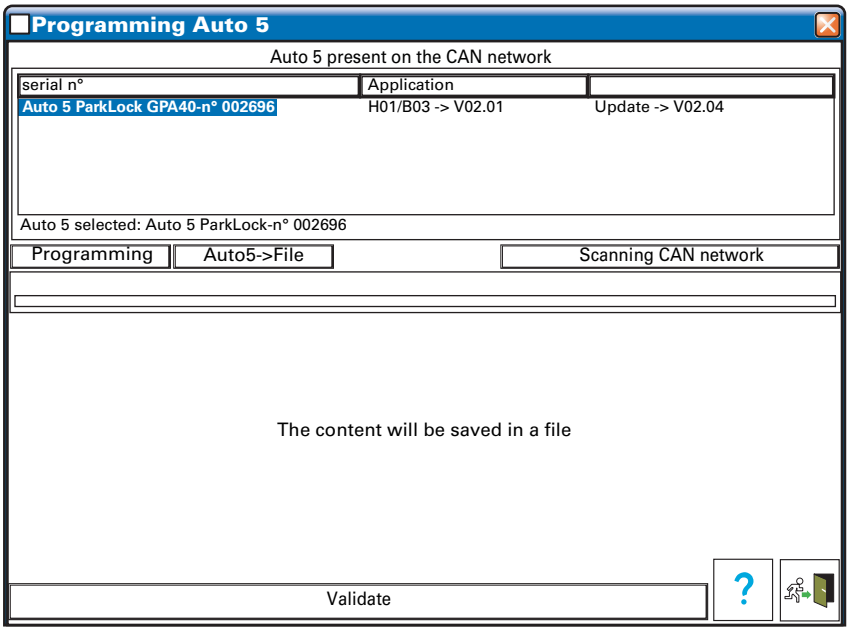
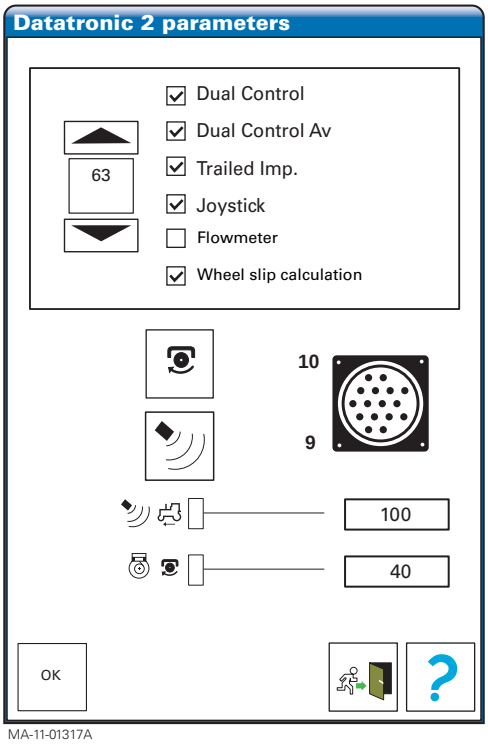


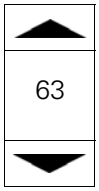
Fig. 3

- Next, click on "Validate".

The following screen is displayed:



Label code:



Code AA (tractor model) found on the tractor's code label

- Select the correct code using the up or down arrow.
- The Datatronic parameter code is composed of 2 digits corresponding to the tractor code or code AA.

☑ Dual Control
☑ Front Dual Control
☑ Trailed Imp.
☑ Joystick
☑ Flowmeter
☑ Wheel slip calculation

Each line corresponds to a tractor option. If the tractor is fitted with the option, click on the box to display the bookmark. If the tractor is not fitted with the option, leave the box empty or click on it to delete the bookmark.

- The flowmeter line appears only when the tractor is fitted with an engine with mechanical injection. If the option is not validated, there is no fuel display on the Datatronic 2.
- The choice of wheel slip calculation is only displayed if the tractor is fitted with a DCC2.

D . Electronic control unit (Fig. 14)

Description

The active suspension system of the axle is controlled electronically by a special control unit with some advanced functions.

Due to the importance of this component for the correct operation of the whole suspension system, it is strongly recommended to carefully follow all the instructions concerning the electronic control unit.

Definitions

Two different operating modes and one calibration mode can be chosen.

- **Blocked position**
  the suspension ram is fully retracted (Closed Axle) and the axle operates without suspension.
- **Automatic Operation**
  the axle is automatically controlled in accordance with a set value (middle position) regardless of the load.
- **Calibration**
  the end stops are calibrated in the control unit.

Control elements

- **Automatic / Blocked position switch**
  - selects automatic mode in middle position T2
  - selects blocked position at ram stop position T1
- **Indicator lights**
  - L1 on = automatic mode
  - L2 on = blocked position mode
  - L1 and L2 flash = required operating mode to be selected
- **Sensor (input)**
  - angle sensor, analog input WS1 to control axle position
- **Solenoid valves (output)**
  - Solenoid valve WV2 is activated to lower the tractor
  - Solenoid valves WV1 and WV2 are activated to raise the tractor

Operating modes

When the system is switched on, a sensor detects the axle position. Depending upon the actual measured value, the electronic system selects the operating mode, which is then displayed along with its respective indicator light.

There are several operating modes:

1. Axle position is within the tolerance limits of active suspension: Automatic Operation
2. Axle position is within the tolerance limits of the retracted suspension: Blocked position
3. If the axle is not any of the positions stated previously, and L1 and L2 flash, the operator must use the switch to select the required operating mode (valves are not activated)

- **Blocked position**
  As soon as the switch is activated in blocked position T1, the tractor lowers, and the light L2 comes on.
  When Blocked Position T1 is activated, the valve WV2 is activated for 15 seconds to release pressure from the ram and from the accumulators.

- **Automatic Operation**
  As soon as the Automatic Operation switch is pressed, indicator light L1 comes on and the axle switches to middle position.
  If after 30 seconds the required value has not been obtained, Automatic mode is deactivated for 30 seconds.
  After 30 seconds the procedure is repeated for 30 seconds.
  After three unsuccessful attempts, the control switches to "Overload" mode, indicator lights L1 and L2 come on and the operator must use the switch to select the required operating mode.
  In order to exit Automatic mode, blocked position can be activated.

57. Check the clutch operation with compressed air (Fig. 29).

58. Fit bearings (65) and (47) on the clutch (5) (Fig. 29) using a press.

IMPORTANT: *Do not forget the washer (66) below the bearing (65) (Fig. 29).*

59. Place the dust seals (18) and (16) on each half-housing.

60. Check the presence of three ball bearings (28) below the ring (24). The ring should turn freely (Fig. 30).

NOTE: *The rotation ring (24) allows the output shaft to turn to facilitate the implement coupling.*

61. Check the fitting for the bolts (27) that retain the ring (24). The bolts are fitted with a spring washer (28) and a large washer (25). Tighten the bolts to 5 Nm (Fig. 30).

62. Fit the bronze collar (21) with a new seal (22) and the spring (23) in its position on the housing. Check that it slides properly in the housing (Fig. 30).

63. Grease the seal plane of the housing to keep the gasket (20) in place (Fig. 31).

64. Place the clutch (5) and the pinion (4) in the rear part of the housing (Fig. 31).

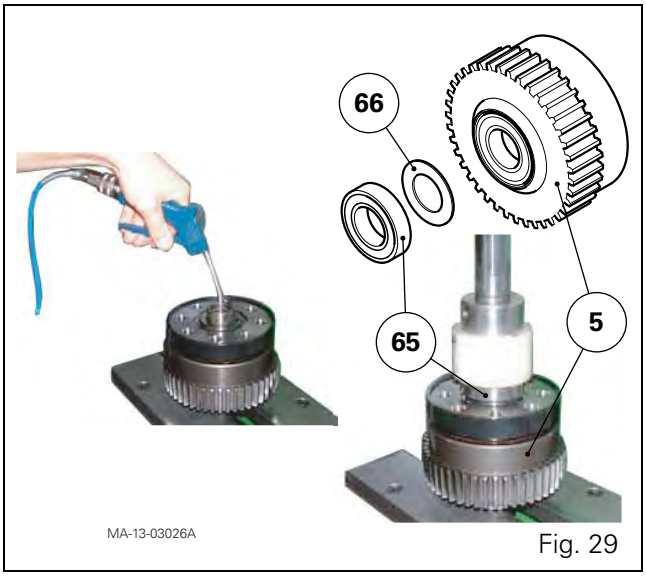


Fig. 29

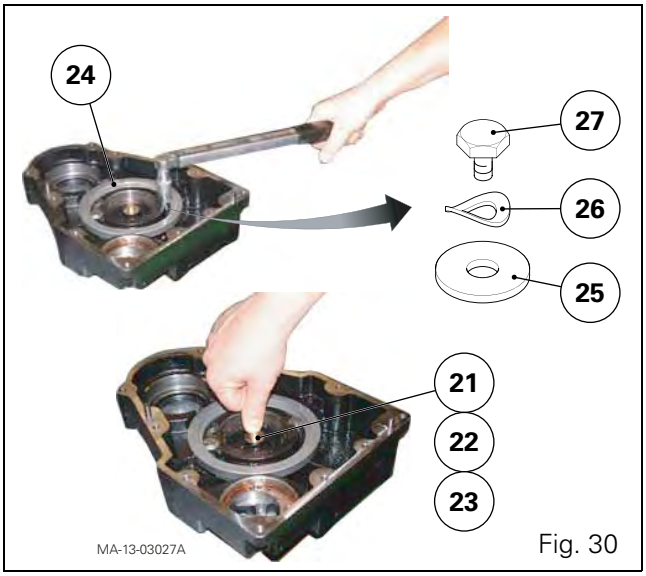


Fig. 30

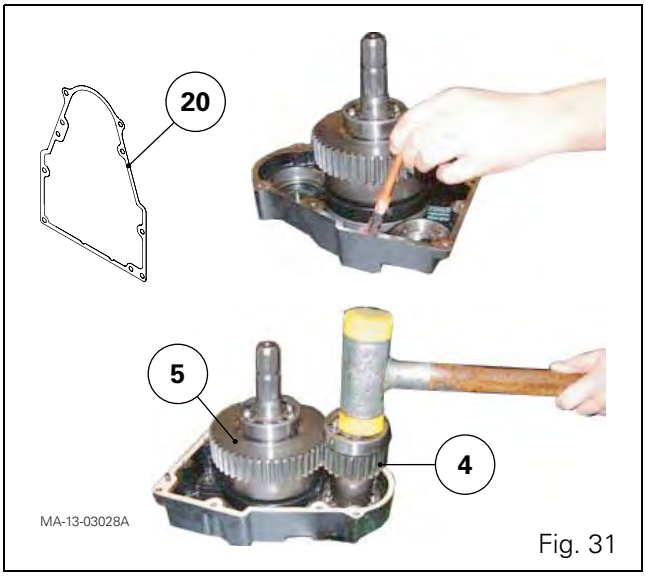


Fig. 31