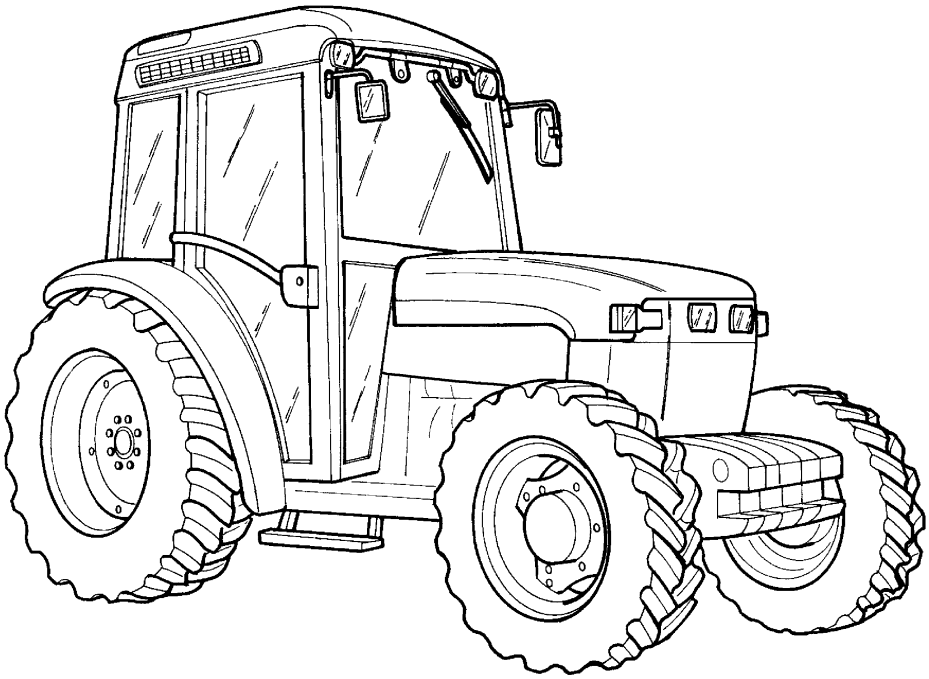
NEW HOLLAND



TN75FA – TN85FA – TN95FA TRACTORS
SERVICE MANUAL

SECTIONS

T E C H N I C A L S U P P O R T

FUEL SYSTEM DATA

Turbocharger (Mod. TN85FA and TN95FA):	
- GARRETT type	TA 25
Injection pump	rotating distributor with speed governor and advance regulator incorporated
BOSCH pump:	
- Mod. TN75FA	VE 4/11 F 1150 - 504054476
- Mod. TN85FA	VE 4/11 F 1150 - 504054478
- Mod. TN95FA	VE 4/11 F 1150 - 504054479
Direction of rotation	anticlockwise
Injection order	1-3-4-2

Fuel injectors:	
BOSCH type	500307714
- Nozzle holder type	4791124
- Nozzle type	DLLA 132S 1320 - 99469341
Number of nozzle holes	5
Nozzle hole diameter	0,23
Pressure setting	3770 to 3944 psi (260 to 272 bar)
Delivery lines for BOSCH pump	
- type	99449006
- Pipe dimensions	6 x 1.75 x 530

ROCKER ARM - VALVE DATA	in. (mm)
Diameter of shaft bores in rocker arms	0.7092 to 0.7099 (18.016 to 18.034)
Diameter of rocker arm shaft	0.7079 to 0.7086 (17.982 to 18.000)
Rocker shaft to rocker arm bore clearance	0.0006 to 0.0020 (0.016 to 0.052)
Maximum permitted wear clearance	0.0059 (0.15)
Rocker arm spacing springs:	
- free length	2.3425 (59.5)
- length under load of 46 to 52 N (4.7 to 5.3 kg)	1.7322 (44)
Valve clearance for timing check	0.0177 (0.45)
Valve clearance for normal running (engine cold):	
- inlet valve	0.0118 ± 0.001 (0.30 ± 0.05)
- exhaust valve	0.0118 ± 0.001 (0.30 ± 0.05)
Cam lift:	
- inlet valve	0.2232 (5.67)
- exhaust valve	0.2342 (5.95)

MAIN DATA FOR EQUALIZER WITH ROTATING COUNTERWEIGHTS (Fig. 76)	in. (mm)
Bushing (28) interference fit in seat on gear unit (26)	0.0024 to 0.0055 (0.063 to 0.140)
Clearance between intermediate gear journal (27) and bushing (28)	0.0019 to 0.0039 (0.050 to 0.100)
Interference between bushings and support seats (20)	0.0024 to 0.0055 (0.063 to 0.140)
Clearance between gear unit shaft (22) and relative bushings	0.0019 to 0.0039 (0.050 to 0.100)
Clearance between sides of sleeve grooves (17), drive gear unit connection (22) and rotating weight gear unit (13)	0.0014 to 0.0041 (0.038 to 0.106)
Interference between front bush (16) and seat on casing (12)	0.0024 to 0.0055 (0.063 to 0.140)
Clearance between rotating weight shaft (13) and front bush (16)	0.0019 to 0.0039 (0.050 to 0.100)
Interference between rotating masses rear bush (13) and seat on support (7)	0.0014 to 0.0039 (0.037 to 0.101)
Clearance between shaft (13) and rear bush	0.0005 to 0.0024 (0.013 to 0.061)
Interference between bushings and relative seats on weights (6)	0.0015 to 0.0039 (0.040 to 0.100)
Clearance between rotating weight axis (5) and relative bushings	0.0007 to 0.0028 (0.020 to 0.073)
Interference between intermediate gear bush (10) and relative seat on rotating masses casing (12)	0.0014 to 0.0039 (0.037 to 0.101)
Clearance between intermediate gear shaft (10) and relative bush	0.0005 to 0.0024 (0.013 to 0.061)
Clearance between the teeth and the coupled wheels	0.0031 (0.080)

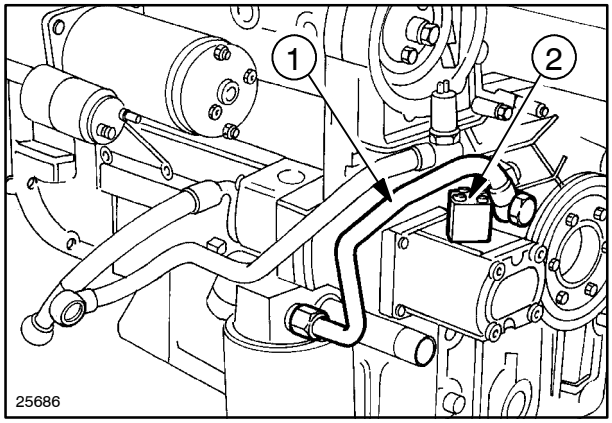
ENGINE TROUBLESHOOTING

(cont)

Problems	Possible causes	Solutions
	8. Fuel supply pump damaged.	Replace fuel supply pump.
	9. Incorrect valve - rocker arm clearances.	Adjust the clearance between the rocker arms and the valves.
	10. Cylinder compression low.	Test compression and overhaul engine if necessary.
	11. Air filter clogged.	Clean filter unit and replace filter element if necessary.
	12. Tie-rod in linkage between accelerator and injection pump incorrectly adjusted.	Adjust to correct length.
	13. Fast idling speed screw on injection pump incorrectly adjusted.	Adjust fast idling speed screw.
Engine produces abnormal knocking noises.	**1.** Injectors partially obstructed or damaged.	Clean and overhaul injectors and adjust pressure setting.
	2. Impurities accumulating in fuel lines.	Clean fuel lines and replace severely dented pipes; clean injection pump if necessary.
	3. Injection pump timing incorrect.	Adjust injection pump timing.
	4. Crankshaft knocking due to excessive play in one or more main or big-end bearings or excessive endfloat.	Re-grind crankshaft journals and crankpins. Fit oversize shell bearings and thrust washers.
	5. Crankshaft out of balance.	Check crankshaft alignment and balance; replace if necessary.
	6. Flywheel bolts loose.	Replace any bolts that have worked loose and tighten all bolts to the specified preliminary and angular torque values.
	7. Connecting rod axes not parallel.	Straighten connecting rods, check axes parallelism; replace con rods if necessary.
	8. Pistons knock due to excessive wear.	Rebore cylinder liners and fit oversize pistons.
	9. Noise caused by excessive play of gudgeon pins in small-end and piston bushings. Loose fit of small-end bushing.	Fit oversize gudgeon pin, rebore piston seats and small-end bushings. Replace with new bushings.
	10. Excessive tappet / valve noise.	Check for broken springs or excessive play between valve stems and guides, cam followers and bores; adjust valve clearances.

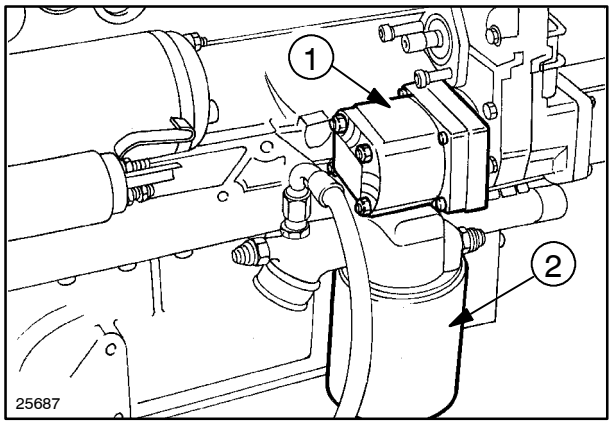
(continued)

20. Disconnect the piping (1) from the filter, unscrew the bolts securing the pressure relief valve assembly (2) and remove it.



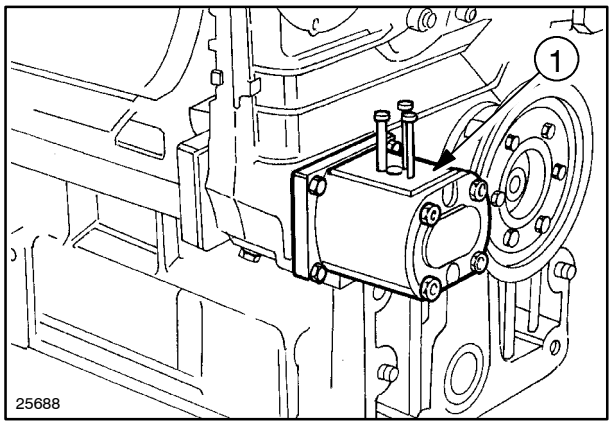
44

21. Take out the retaining bolts and detach the hydraulic pump (1) along with the oil filter (2).



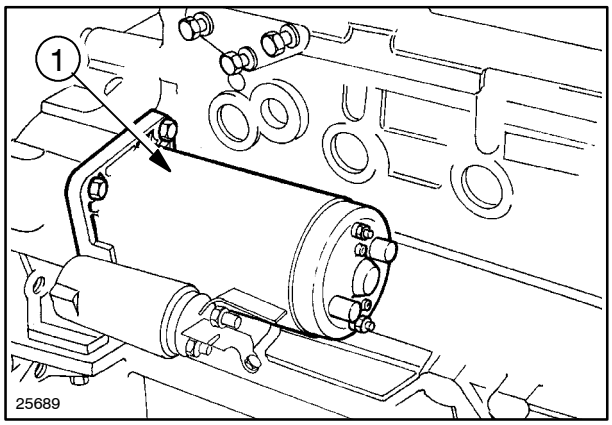
45

22. Take out the retaining bolts and remove the lift hydraulic pump (1).



46

23. Take out the retaining bolts and remove the starter motor (1).



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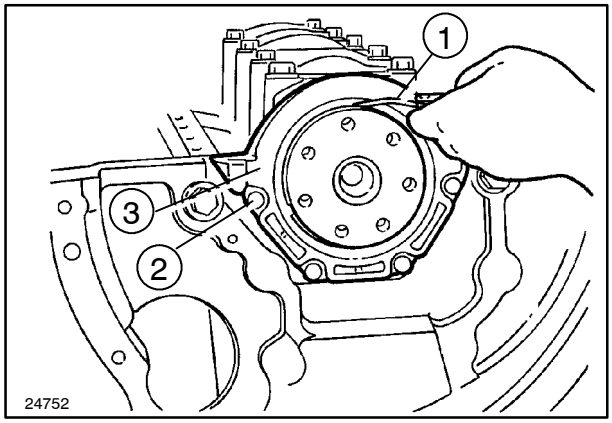
MOUNTING THE REAR COVER WITH SEAL AND ENGINE FLYWHEEL
(Disassembly operation 53)

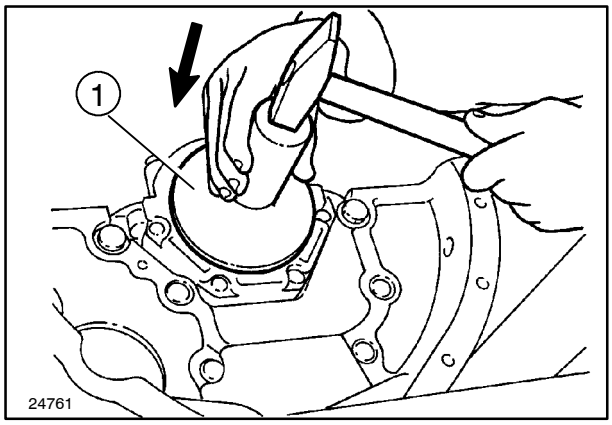
Proceed as follows.

- Fit the rear oil seal carrier (3) with the outer seal. Tighten the retaining bolts (2) to the torque specified on page 20. Using a feeler gauge (1), check that the crankshaft flange is coaxial with the carrier.



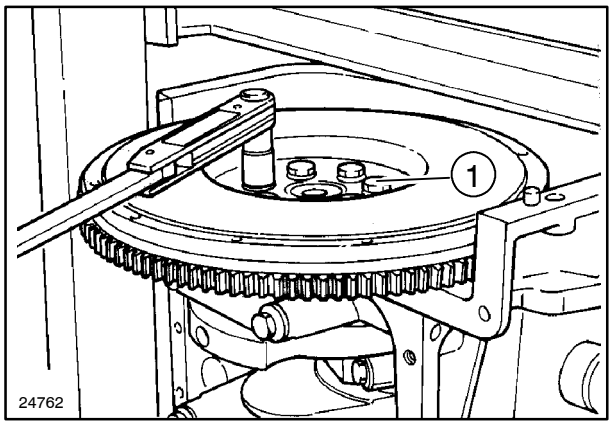
85

- Fit the inner rear oil seal using tool **50139** (1) and hand grip.



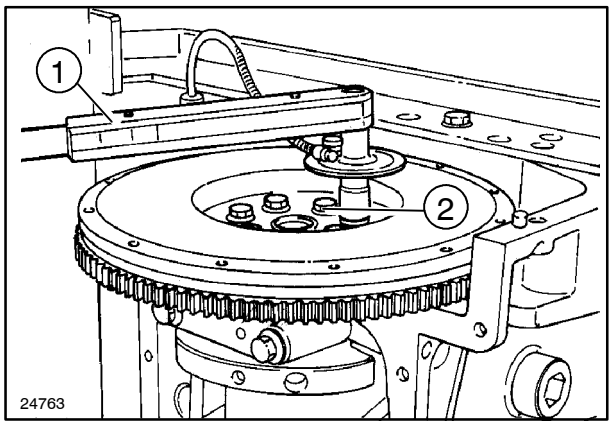
86

- Fit the flywheel and tighten the retaining bolts (1) to a torque of 40 Nm (4.1 kgm).



87

- Using tool **380000304** (1), tighten each flywheel bolt (2) through a further 60°.



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Engine flywheel

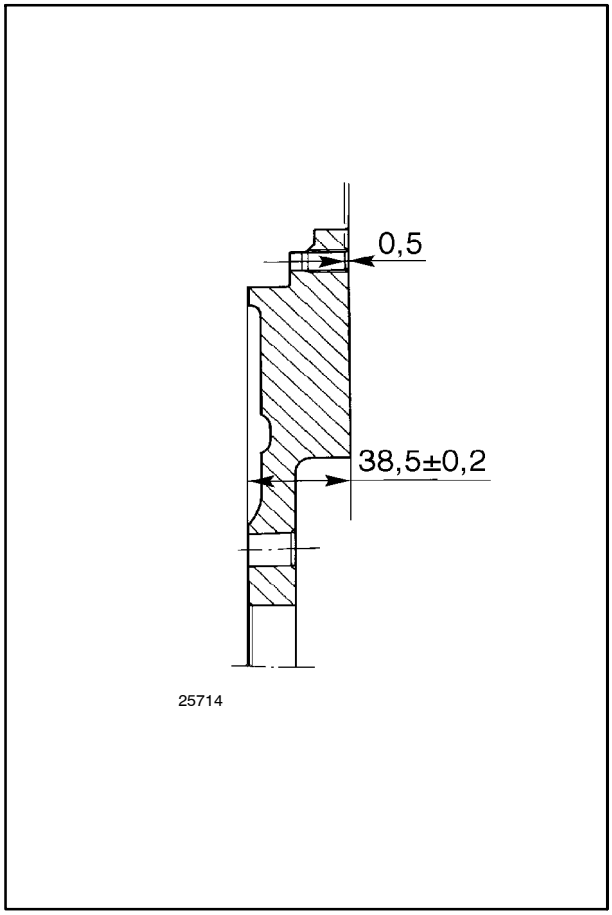
The flywheel is fixed to the crankshaft flange by means of self-locking bolts. The starter ring gear is force-fitted after pre-heating to the register on the engine side of the flywheel.

If the ring gear is to be replaced, heat in oil to 176° to 194 °F (80° to 90 °C) before fitting, and position with the bevel on the teeth facing inward towards the starter motor.

The flywheel mounting holes are offset so that the flywheel can only be mounted in one position.

When overhauling the engine flywheel, it is possible to reface the friction surface, lowering it by at most 1 mm from the nominal 1.5157 ± 0.0078 mm (38.5 ± 0.2 mm).

Once terminated, the external refacing will need to be re-set to 0.0196 in. (0.5 mm), as shown in Figure 115.

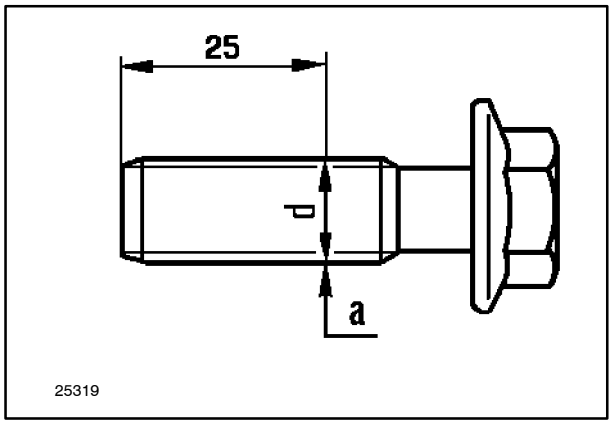


115

- lubricate the engine flywheel retaining bolts (3, fig. 3) with engine oil, and tighten them to the prescribed torque using a torque wrench (see page 20).

Flywheel bolts (3, fig. 3)

If the bolts are to be re-used, check that diameter **d** (measured in area a shown in the figure) is greater than 0.4527 in. (11.5 mm); if not, use new bolts.



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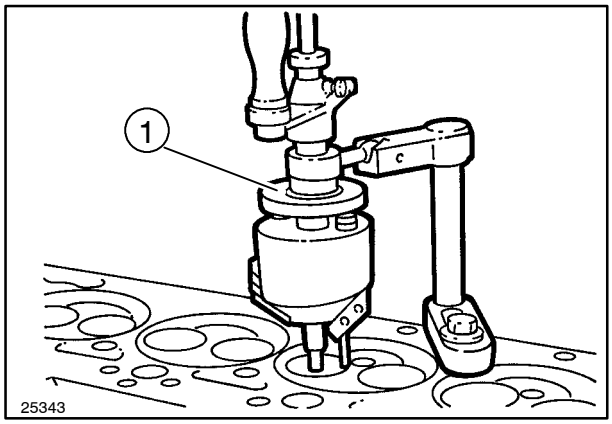
VALVE SEATS IN CYLINDER HEAD - Re-grinding

CAUTION

Handle all parts carefully.
Do not put your hands or fingers between parts.
Wear the prescribed safety clothing, including goggles, gloves and safety footwear.

11. If the valve seats need regrinding to improve valve sealing, use the universal valve grinder (1) and remove as little material as possible.



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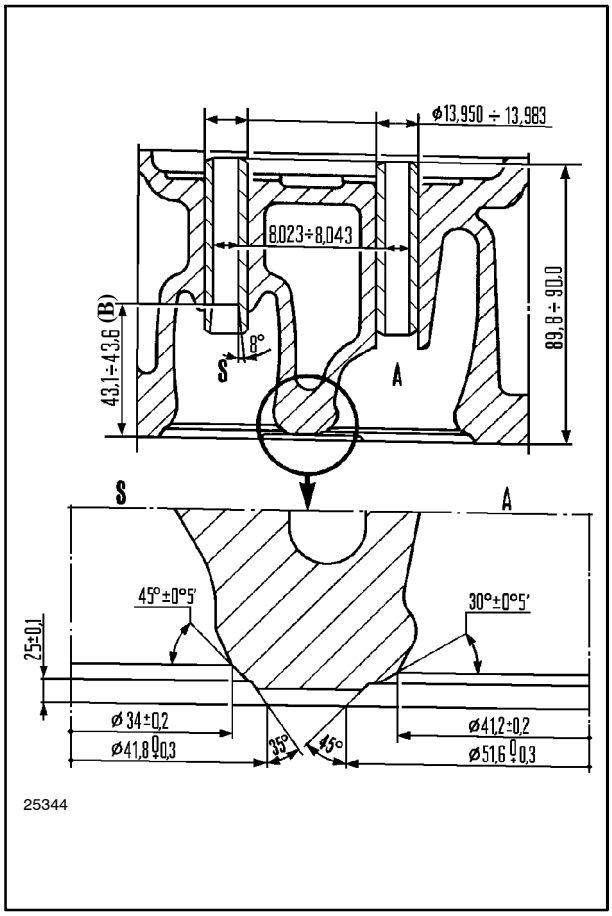
Dimensions (mm) of valve seats and valve guides.

A. Intake.

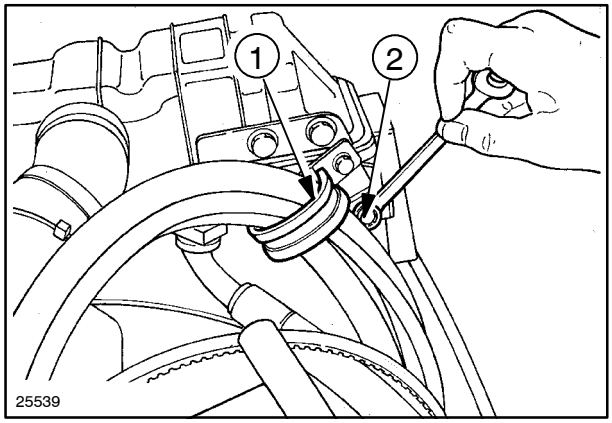
B. Depth of taper.

S. Exhaust.



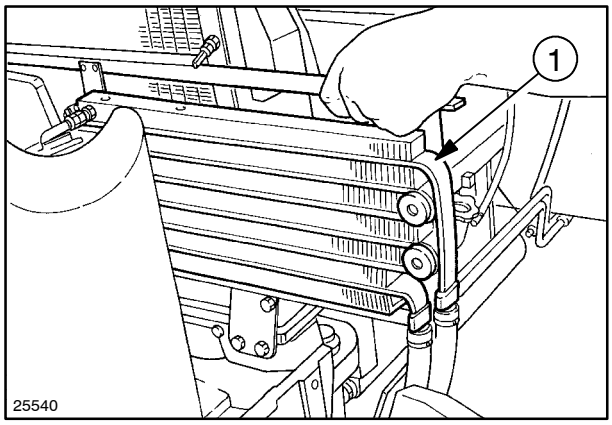
142

8. Unscrew the bolt (2) securing the bracket (1) for the pipes governing the steering and brakes on the front axle. Do this on the bottom of the radiator too.
9. Disconnect the electrical connections from the horn and from the fuel level sensor on the front tank.



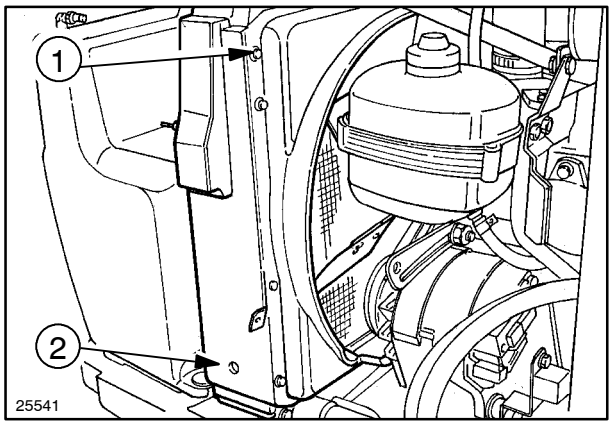
168

10. Extract the gearbox-transmission oil cooler (1) from its supporting bracket.



169

11. Take out the retaining bolts and remove the conveyor (1).
12. Unscrew the bolts securing the radiator (2) and remove it, retrieving the flexible buffers.



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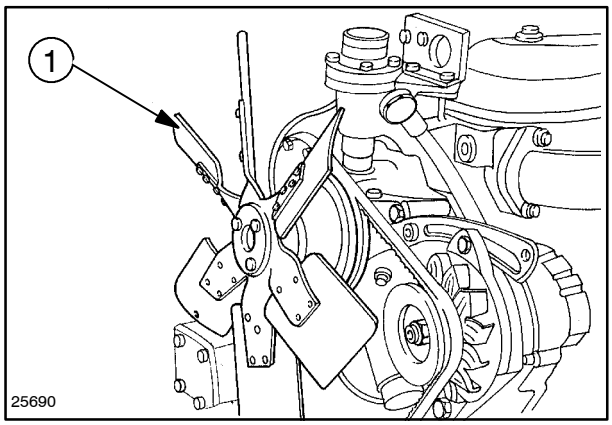
13. Unscrew the retaining bolts and remove the fan (1) and the spacer.



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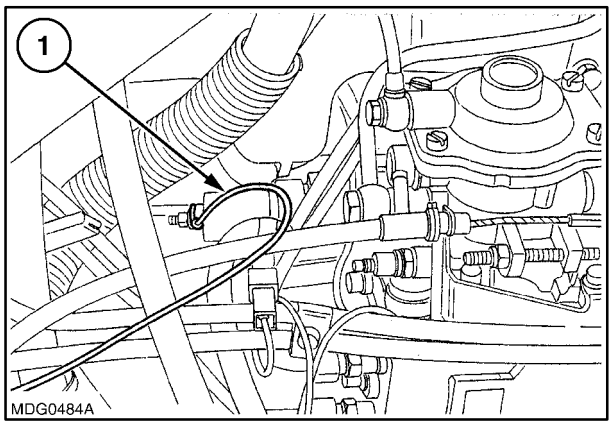
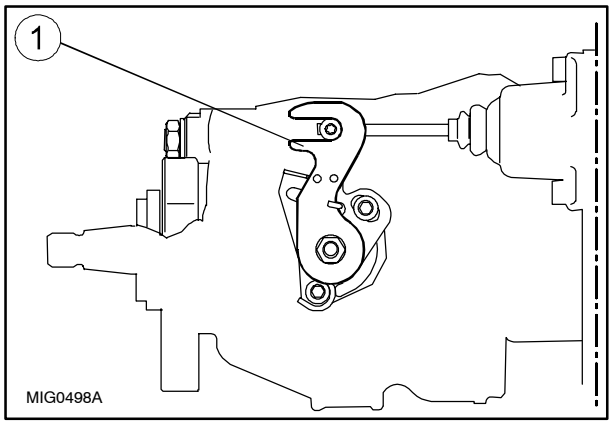
BOSCH INJECTION PUMP
Timing

13. Using an external cable, supply 12 V to the thermometric circuit breaker cutting out starting advance according to temperature (KSB) (1), connecting the positive pole on the connection and negative on the pump housing.



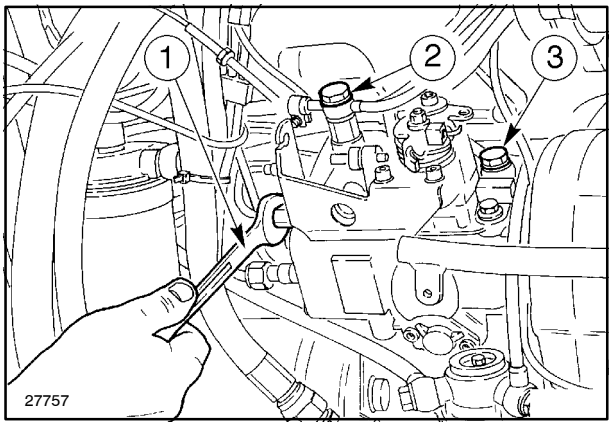
204

14. Make sure that the fork (1) of the device (KSB) is free to move.



205

15. Unscrew the unions of the fuel supply lines (1), detaching them from the injection pump.
If necessary, disconnect the injection pump supply and return lines (2 and 3) and, for mod. TN85FA and TN95FA, the pipe connecting the LDA device to the intake manifold.



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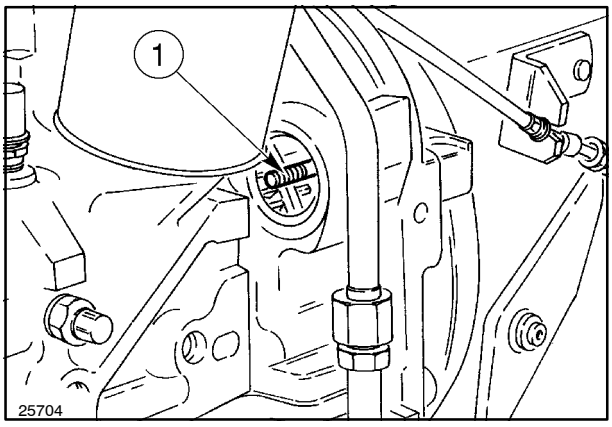
16. Remove the flywheel inspection cover (1) and the tappets cover.
17. Rotate the crankshaft to bring cylinder no. 1 to T.D.C. and make sure the valves are closed (compression stroke).



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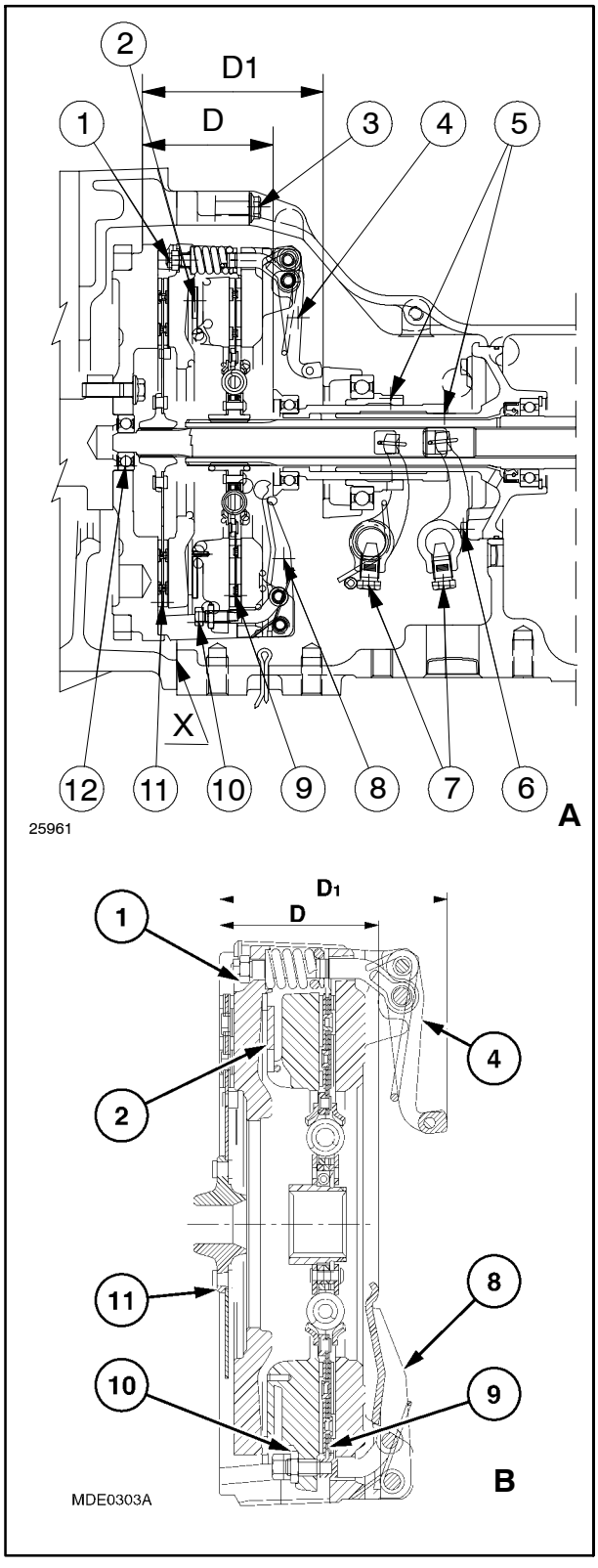
Longitudinal section of LUK 11”/11” clutch

1. PTO clutch release lever adjuster.
2. Belleville Spring.
3. Bolts and nuts securing clutch casing to the engine.
4. Power take-off clutch disengagement levers.
5. Release sleeves for main and PTO clutch, complete with thrust bearings.
6. Nuts for sleeve cover studs.
7. Fork lever retaining bolts.
8. Main transmission clutch release levers.
9. Main transmission clutch plate.
10. Main transmission clutch release lever adjuster.
11. Power take-off clutch disk.
12. Bearing on flywheel.
A. Clutch for mod. TN95FA.
B. Clutch for mod. TN75FA and TN85FA.

D= 3.8385 in. (97.5 mm). Nominal distance of release levers (8) from clutch contact surface on flywheel.

D_1 = 5.4921 in. (139.5 mm). Nominal distance of release levers (4) from clutch contact surface on flywheel.

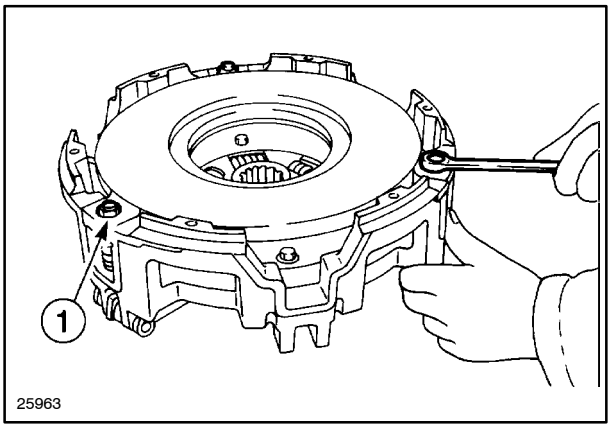
NOTE: *When assembling apply sealing compound on surfaces marked with an* ***X*** *as shown in Section 21, Chapter 1, page 34.*



1

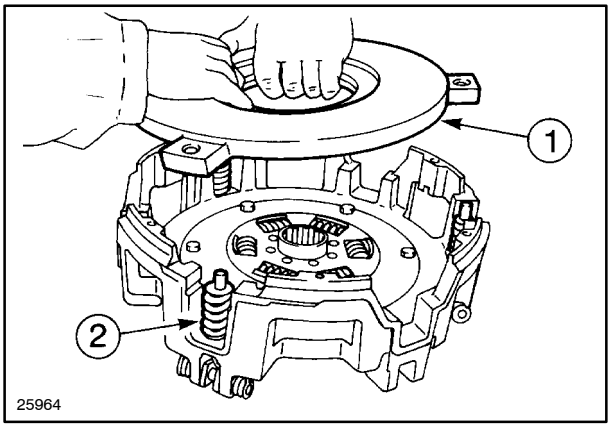
11" SINGLE DISK CLUTCH
(Version with Power-Shuttle)
Test bench overhaul (Op. 18 110 30)

1. Unscrew the three clutch lever adjustment nuts (1).



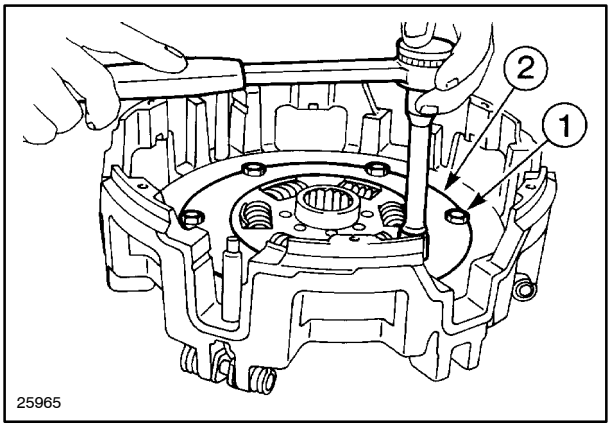
31

2. Remove the pressure plate (1) with the coil springs (2) on the levers.



32

3. Unscrew the six retaining bolts (1) of the Power Shuttle gear control disk and remove (2).



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For assembly operations proceed as follows:

⚠ CAUTION ⚠

Always use appropriate tools to align fixing holes. NEVER USE FINGERS OR HANDS.

— Refit the Power Shuttle gear control disk in the clutch housing.
— Install the pressure plates and secure to the spring coils.
— Tighten the lever adjustment nuts.

SECTION 21 - TRANSMISSIONS

Chapter 1 - Mechanical transmission

CONTENTS

21 000 - MAIN DATA - TIGHTENING TORQUES - SECTION VIEWS - TOOLS - DESCRIPTION AND OPERATION - FAULT DIAGNOSIS

REVERSER DATA

Type	mechanical type with spur gearing, located between the main clutch and the gearbox
Control	hand lever located on left-hand side of the operator

CREEPER UNIT DATA

Type	Ordinary gear train with spur gearing, located between the main clutch and the gearbox, up stream from the reverser. Providing 28 forward gears and 16 reverse gears
Control	hand lever located on left-hand side of operator

TRANSMISSION AND RANGE GEAR DATA

Gearbox	4 speed, constant-mesh, with synchronisers on all gears
Gearing type	helical
Reducer	ordinary gear train with 4 ranges for a total of 16 speeds.
- gearing type	spur
Gearbox and range gear operating system	independent, by means of lever located on right-hand side of operator

(continued)

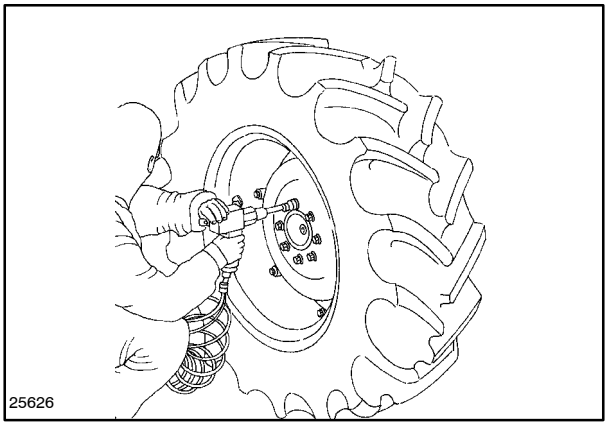
REAR TRANSMISSION-GEARBOX CASING
Removal-Installation (Op. 21 118 10 - 21 118 12)

CAUTION

Lift and handle all heavy parts using suitable lifting equipment.
Make sure that the units or parts are supported by means of suitable slings and hooks. Check that no one is in the vicinity of the load to be lifted.

To be able to detach the rear transmission-gearbox you need to remove the cab, operating as described in Section 90 Chapter 1, then proceed as follows.

1. Place stands under the rear transmission and remove the rear wheels.



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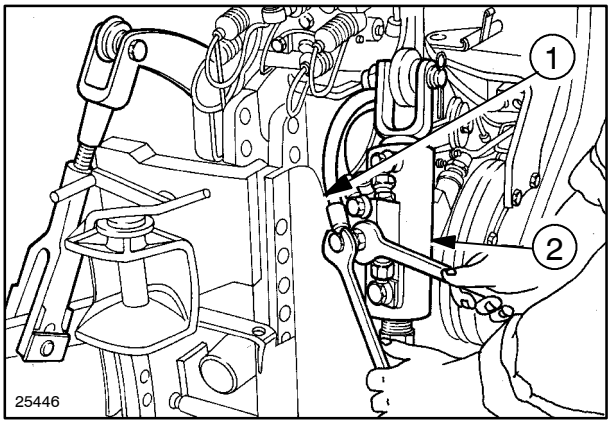
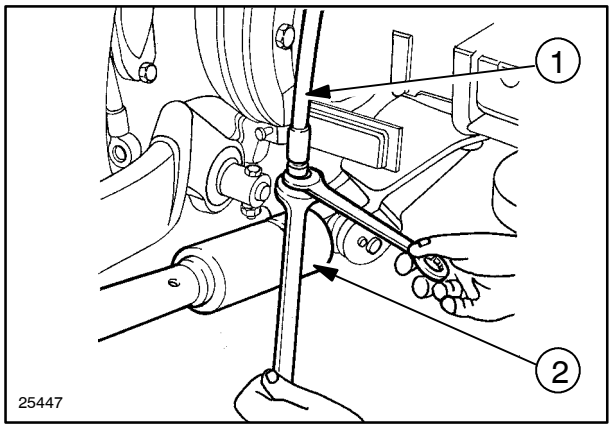
2. Remove the top link of the third point.

3. Disconnect the control pipes (1) of the vertical hydraulic rod (2) (if applicable), extract the split pins and remove the vertical rods (2 and 3) from the lift arms.



11

4. Disconnect the control pipe (1) of the hydraulic stabilizer strut (2) (if applicable) on both sides.



12

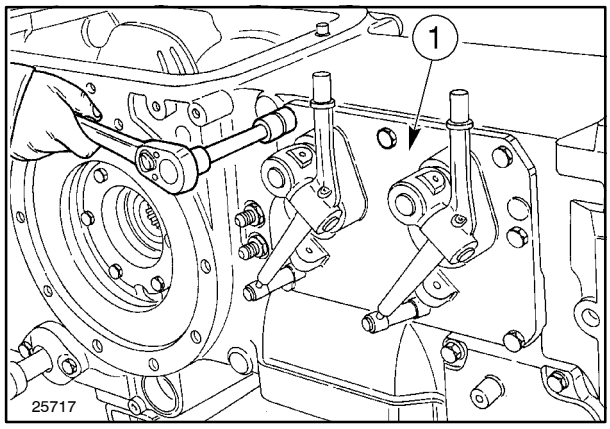
GEARBOX TRANSMISSION CASING
Disassembly-Assembly (Op. 21 118 85)

⚠ CAUTION ⚠

Handle all parts carefully.
Do not put your hands or fingers between parts.
Wear the prescribed safety clothing, including goggles, gloves and safety footwear.

Proceed as follows.

1. Fix the gearbox -transmission casing to the rotating stand **380000301** using brackets **50157** (see pages 4 and 5).
2. Remove the drive gear casing, following the instructions in Sect. 23.
3. Unscrew the retaining bolts and remove the cover (1) with the levers governing the gearbox and gear unit.
4. Remove the PTO shaft following the instructions given in Sect. 31.



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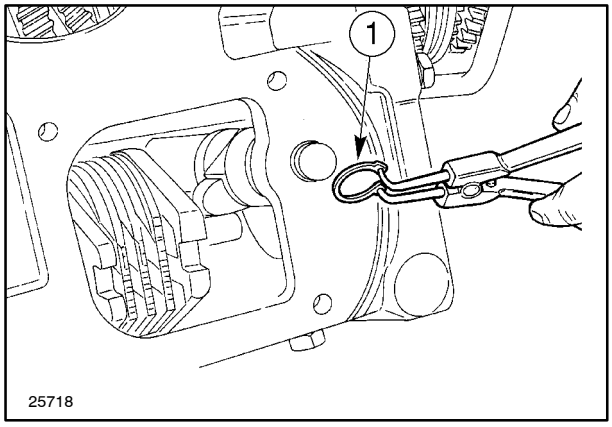
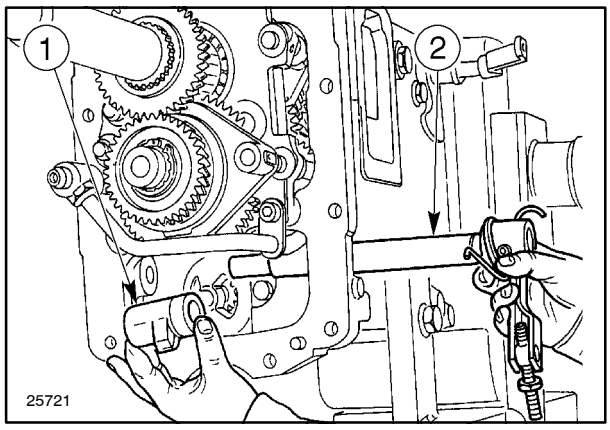
5. Remove the parking brake casing cover and extract the circlip (1) that secures the parking brake control lever.



53

6. Extract the parking brake control lever (2) and retrieve the sleeve-cam (1).



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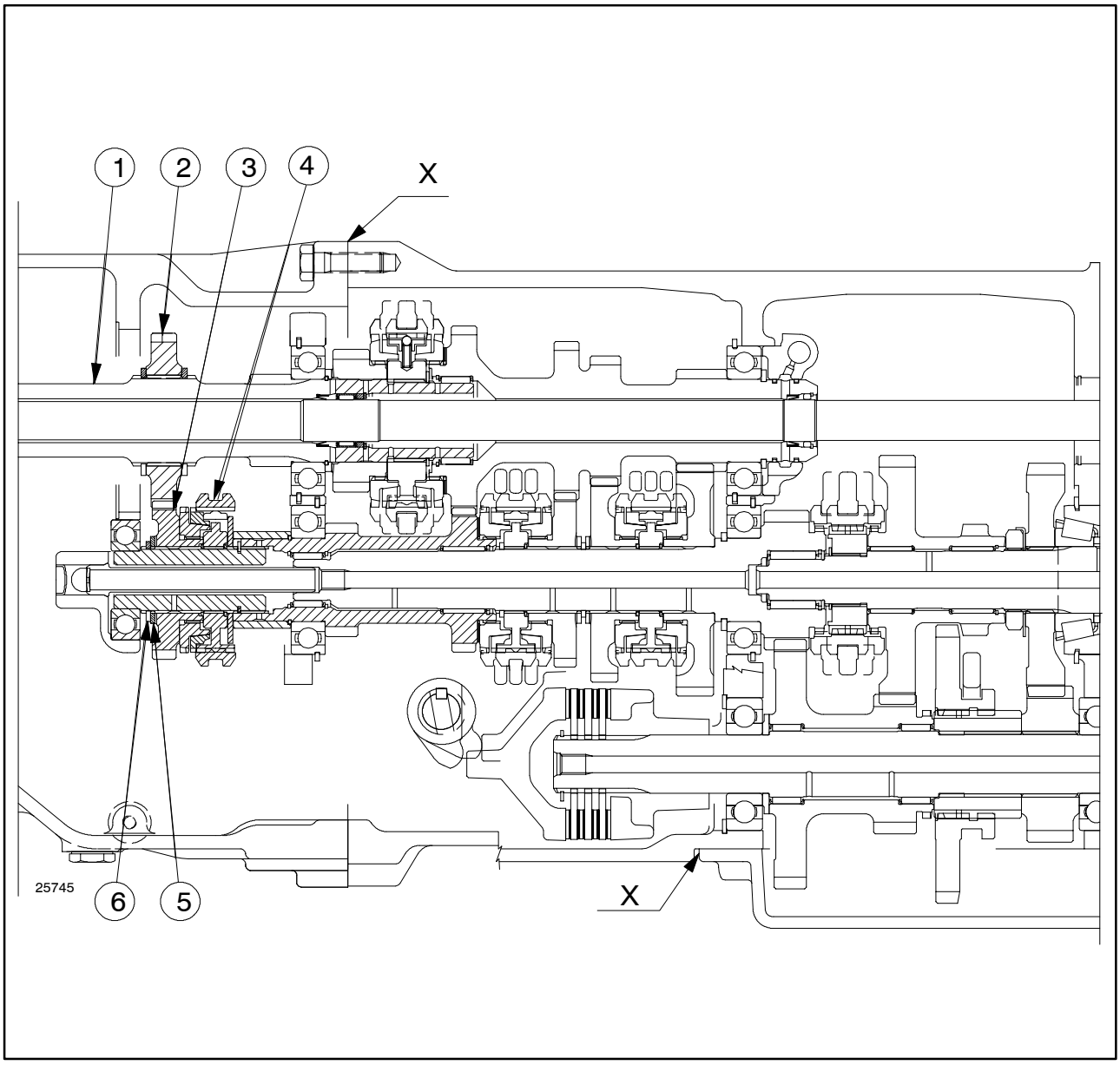


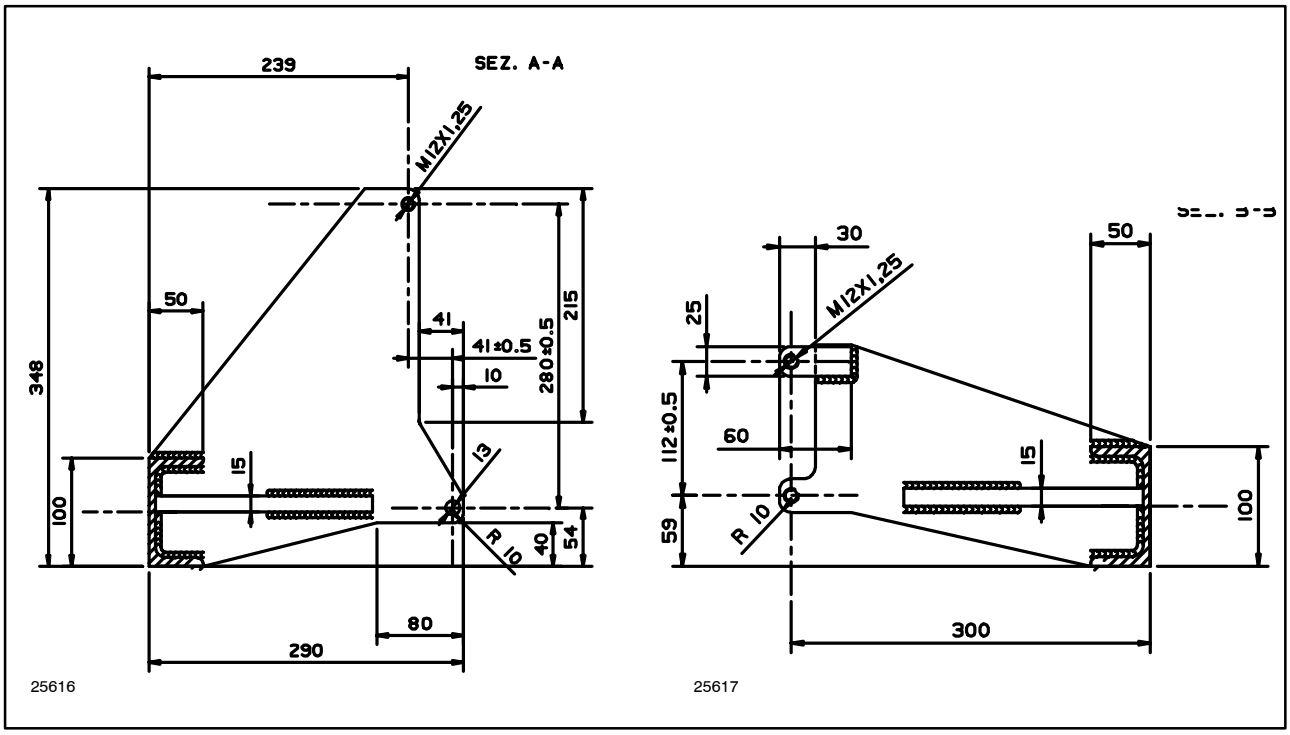
1

Longitudinal cross-sectional view of gearbox, gear range and splitter.

1. Gearbox driving shaft.
2. Splitter device driving gear.
3. Splitter device driven gear.
4. Splitter device control synchroniser.
5. Thrust washer.
6. Circlip.

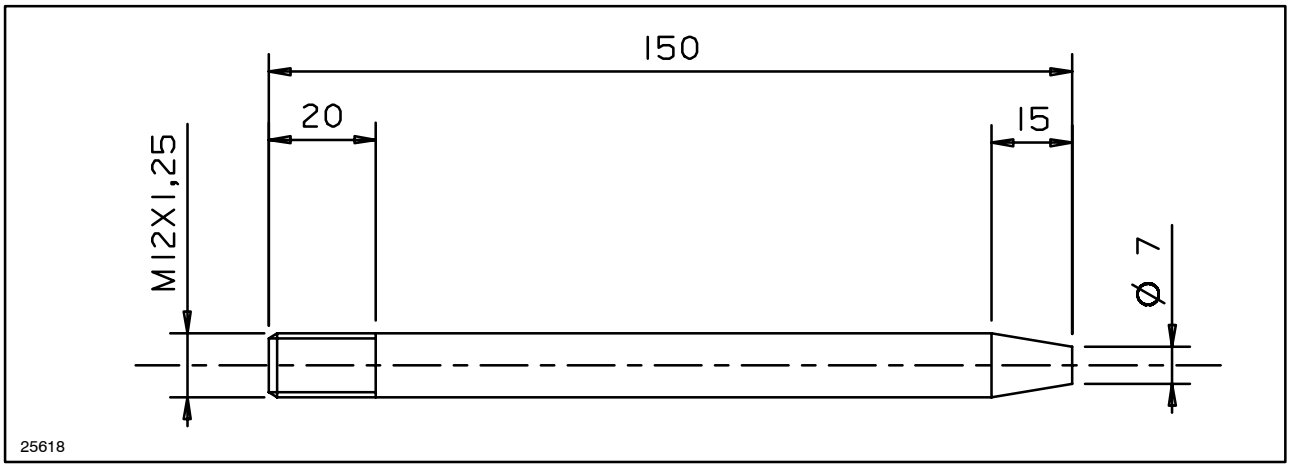
Note - On assembly apply a bead of sealing compound to the surfaces **X** as indicated in Chapter 1.

Attention - For missing data see Chapter 1, page 6.



3

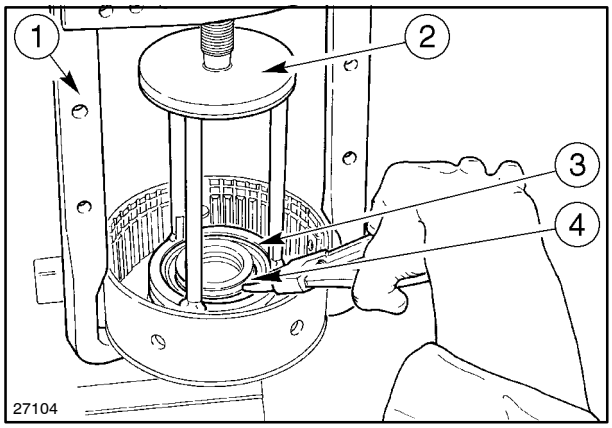
Bracket to be made for gearbox overhaul on rotating stand
(Mark parts with No. 50157 - Measurements in mm).
Make in Aq 42 material.



4

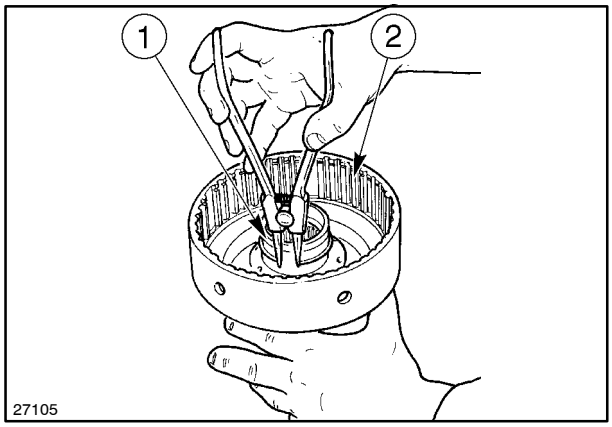
Guide pin for re-fitting the gearbox in the casing
(Mark part with no. 50158 - Measurements in mm)
Make in C 40 material.

13. Using an extractor (1) and tool **380000291** (2) compress the Belleville washers (3), remove the stop ring (4) and recover the washers and piston.



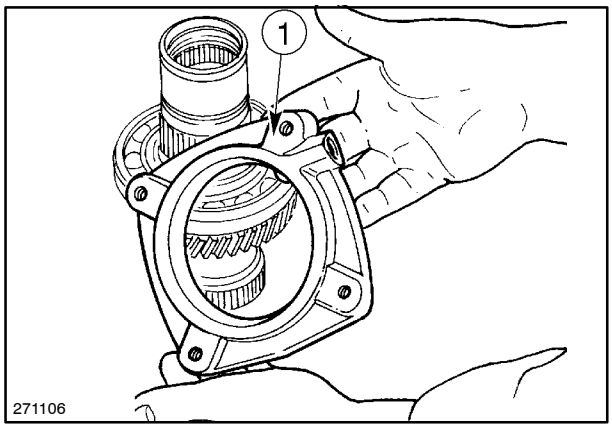
29

14. Remove the stop ring (1) and extract the clutch body (2).



30

15. Remove the front bearing support (1).



31

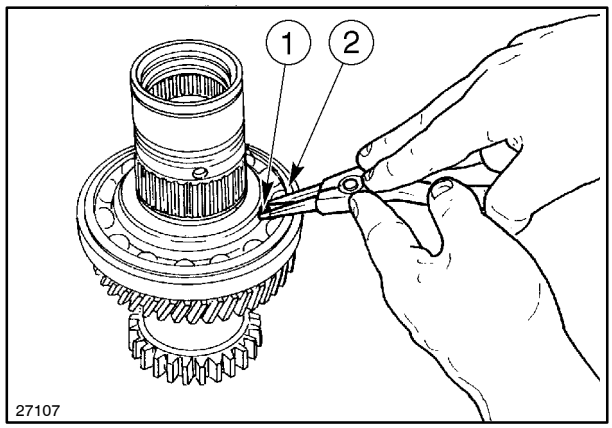
16. Remove the circlip (1, fig. 32) and the bearing (2, fig. 32).

17. To refit the clutch casing, proceed as follows.

⚠ CAUTION ⚠

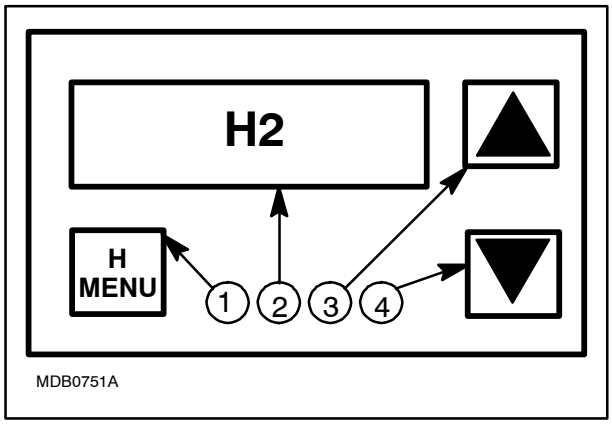
Always use appropriate tools to align fixing holes. NEVER USE FINGERS OR HANDS.

- For the correct orientation of the various parts, refer to the illustrations on pages 6, 7, 8.
- Respect the tightening torques prescribed on page 3.



32

H2 - CLUTCHES A (LO) and B (HI) CALIBRATION VALUES DISPLAY)



52

Select the **H2** menu, as described on page 24.

This menu is used to display the calibration values correctly saved in the ECU.

The calibration values, in milliAmpere, are shown on the display (2).

Initially, the display shows the calibration value of clutch A (LO).

Use push-button (3) to select clutch B (HI and Reverse) and push-button (4) for clutch A (LO).

The calibration values are in milliAmpere with 3 digits and are used one at a time:

A = xxxmA

or

B = yyymA

where xxx and yyy are the 2 calibration values in milliAmpere (mA).

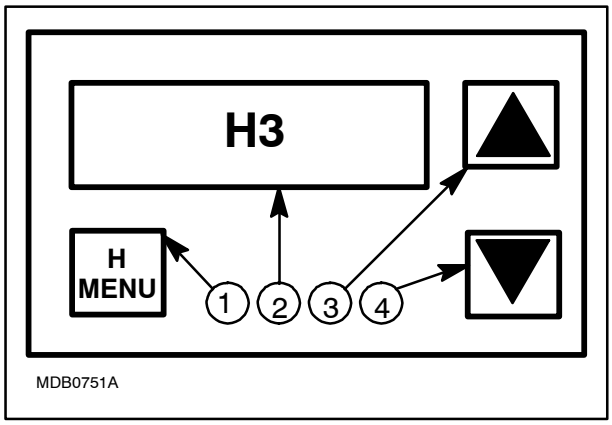
The prescribed calibration values are:

Clutch A **230 to 480** mA

Clutch B **230 to 480** mA.

Switch off the engine by turning the switch (1, fig. 55) to A (OFF).

H3 - SYSTEM CONFIGURATION



53

This section is used to read or modify ECU configuration. The configuration is saved in the Non-Volatile Memory (NVM) and is automatically registered the first time the tractor is used.

However, for maintenance purposes, this menu allows the configuration saved in the NVM to be viewed and manually modified.

- Select the **H3** menu, as described on page 24, the display (2) shows the configuration in use.
- **NONE** = Only occurs if the module has not yet been used: after an EEPROM delete operation (H8).
- **PSHUTTLE** = Power Shuttle Transmission (8 + 8) and (16 + 16).
- **HI - LO** = Power Shuttle Transmission with Dual Command (2 Speed Power Shift) function (32 + 16).
- **HI - LO CR** = Power Shuttle Transmission with Dual Command (2 Speed Power Shift) and Creeper function (44 + 16).

NOTE: *In the event of one or more synchroniser switch faults, the display (2, fig. 74) may show* ***Pos = Unkn****, even if the synchroniser moves and engages correctly. In this case, the alarm lamp transmits the pushbutton fault code.*

HE - GEAR CHANGE ADJUSTMENTS

This program defines the gear change speed threshold.

Gear changes carried out above this value use a faster engagement table than that used for gear changes under this value.

- Select the **HE** menu, as described on page 24.
- 3 values can be selected;

LOW (approx. 2.98 mph (4.8 km/h))

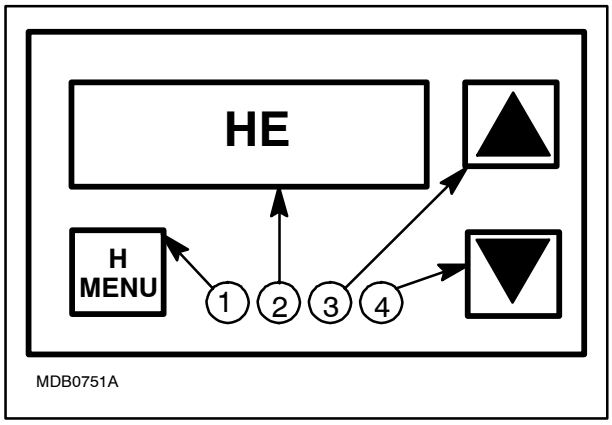
MID (approx. 3.97 mph (6.4 km/h))

HIGH (approx. 8.01 mph (12.9 km/h))

- The menu displays the selected threshold, e.g.:

WST = HIGH

- Use pushbuttons ▲ ▼ (3 and 4) to modify the selected value.
- Switch off the engine by turning (1, fig. 72) to A (OFF).

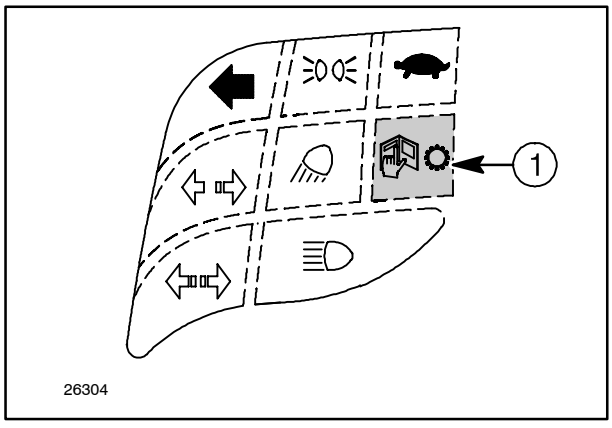


75

HF - FAULTS STORED IN THE NON-VOLATILE STORAGE OF THE ECU

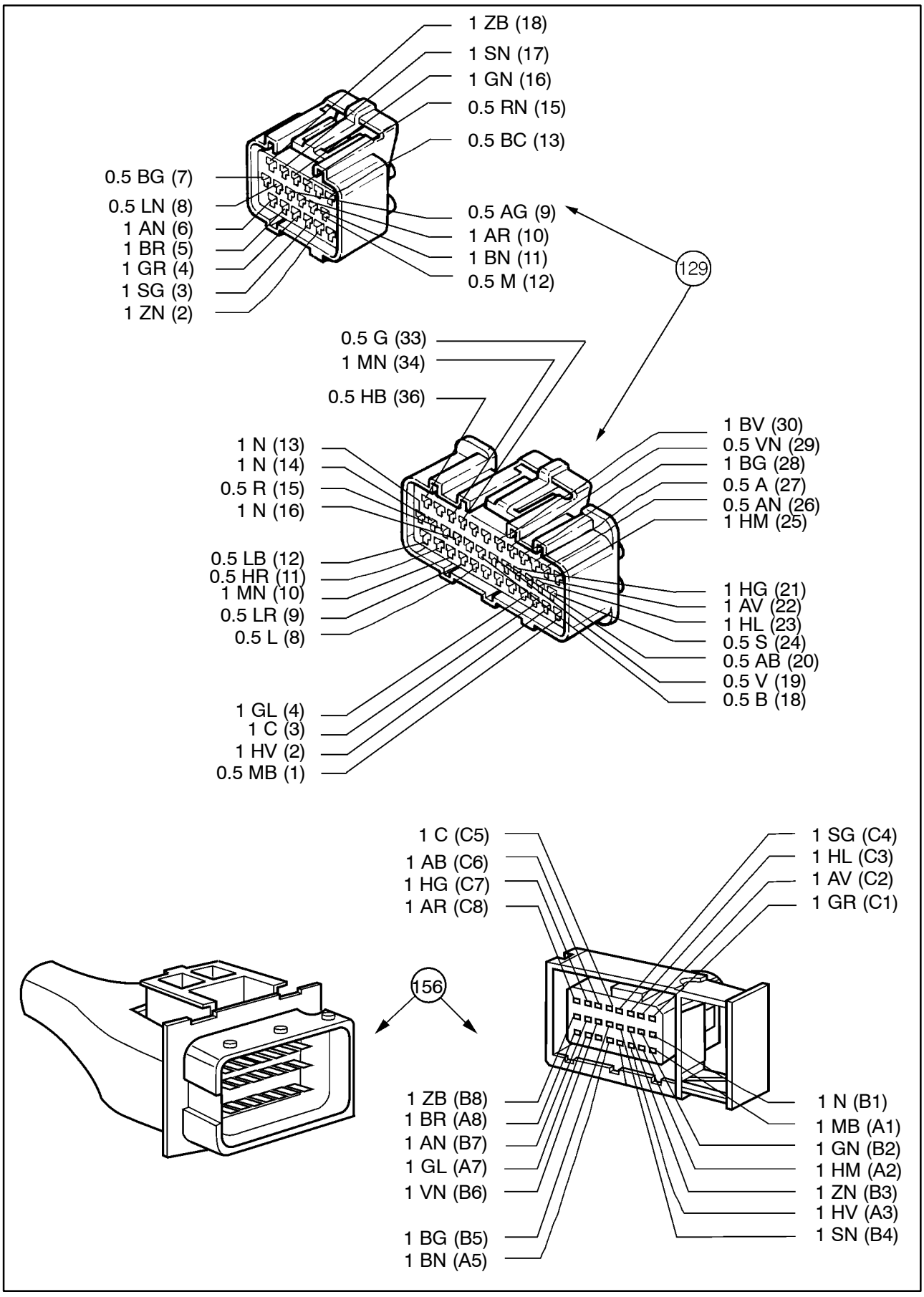
When a fault is detected it is stored in the ECU non-volatile memory and signalled by the indicator lamp (1).

- Select the **HF** menu, as described on page 24.

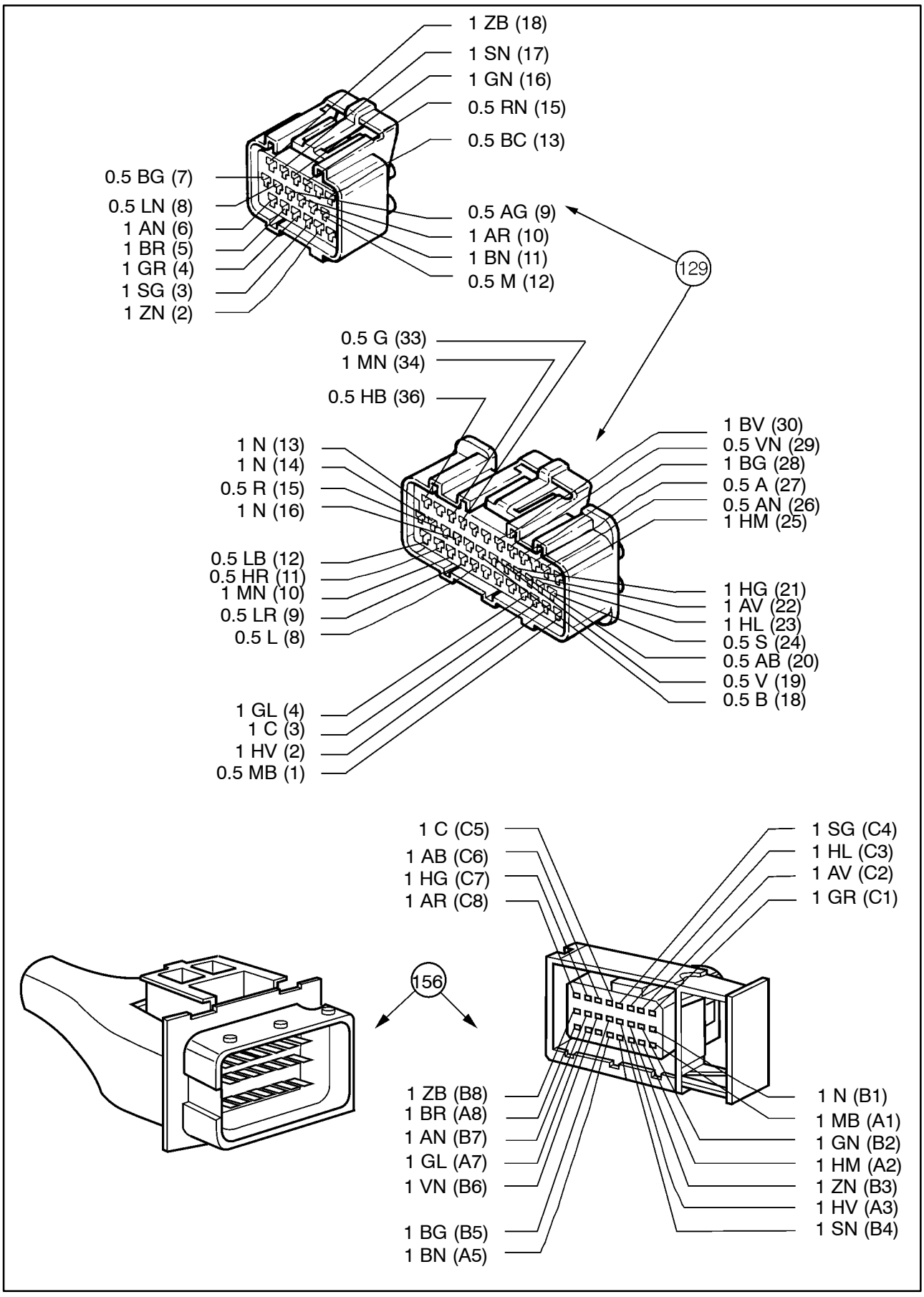


76

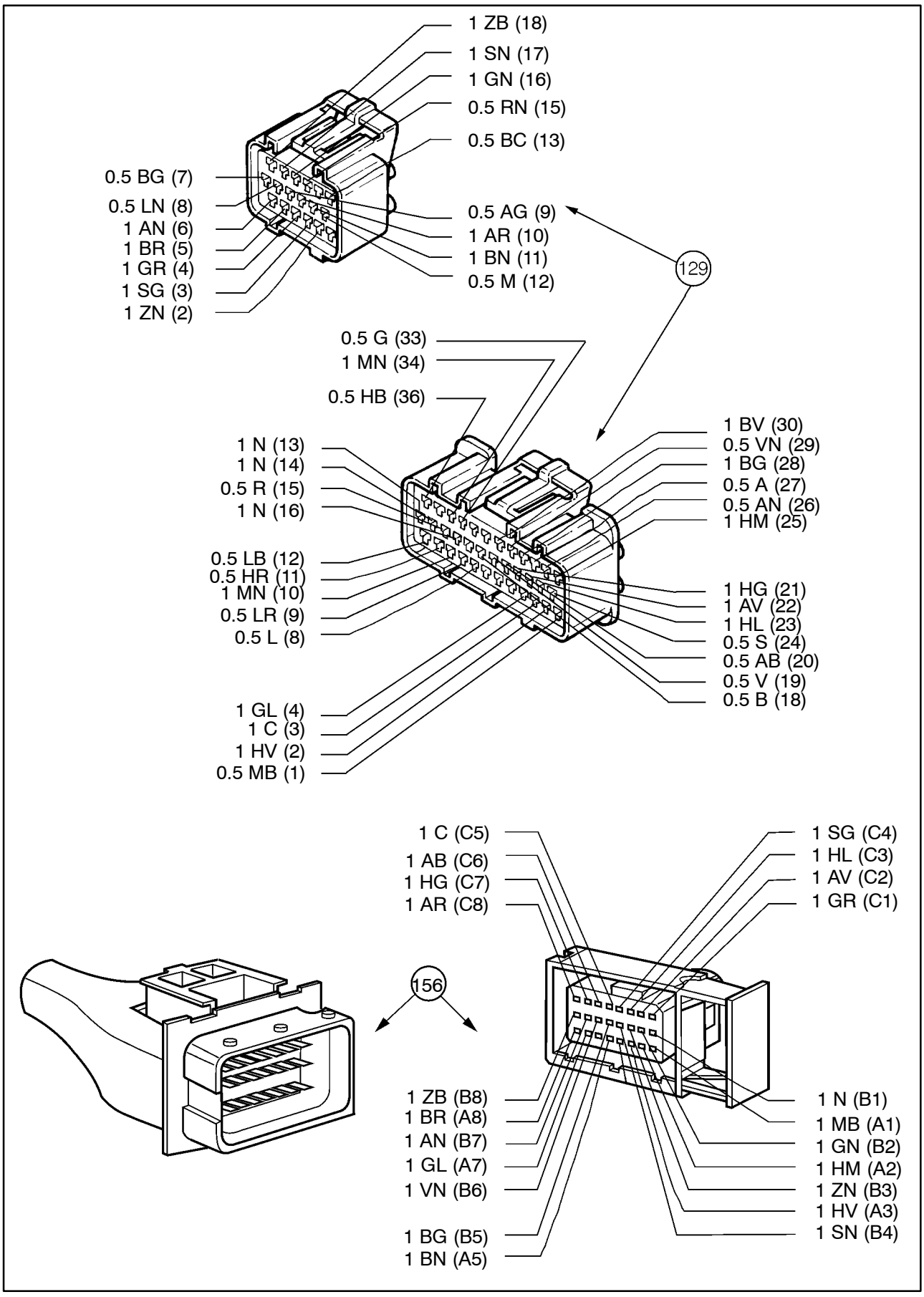
FAULT CODE 15



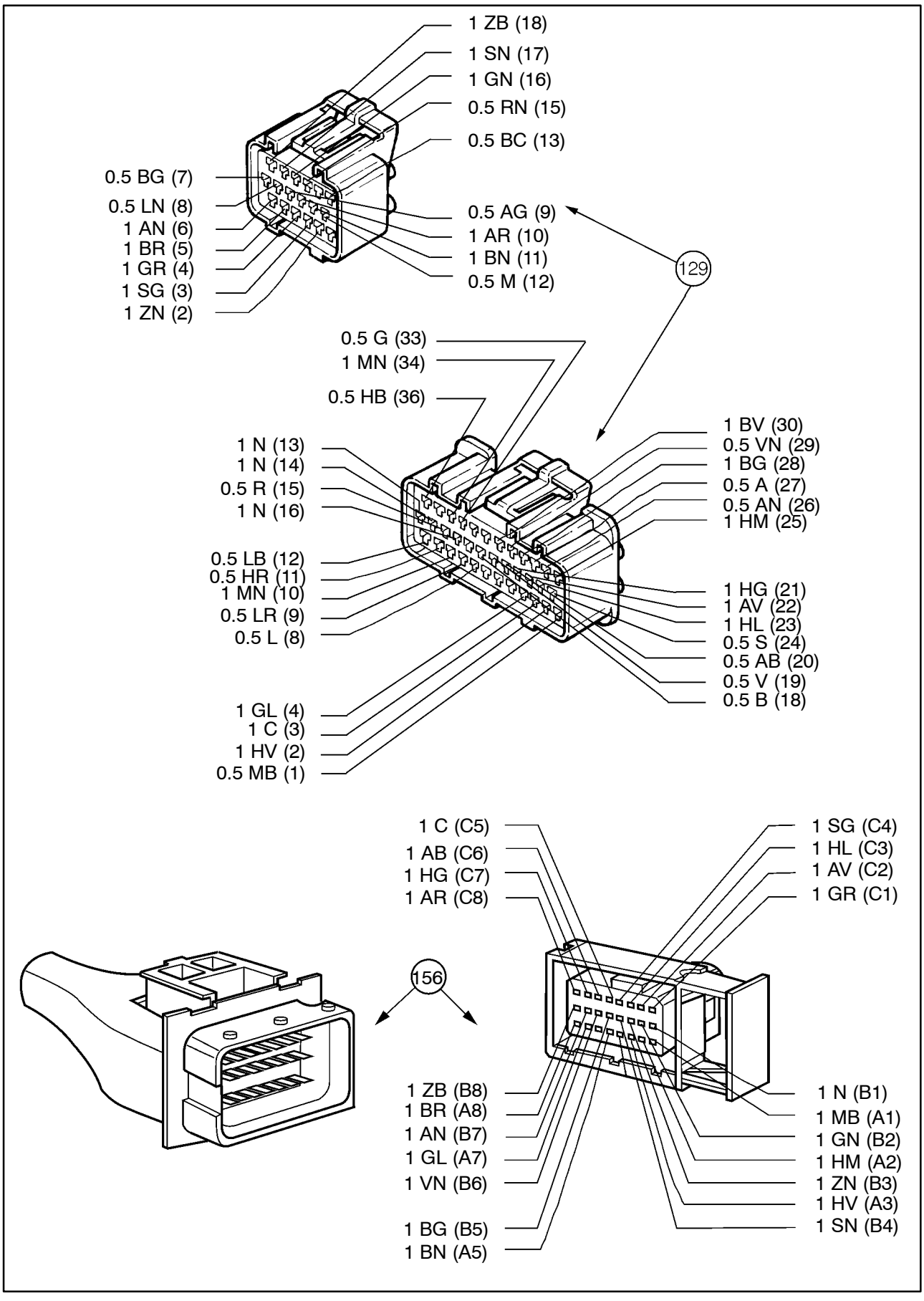
FAULT CODE 22



FAULT CODE 32



FAULT CODE 39



FAULT CODE 48

The double switch (1) on the clutch pedal is not correctly positioned/adjusted.

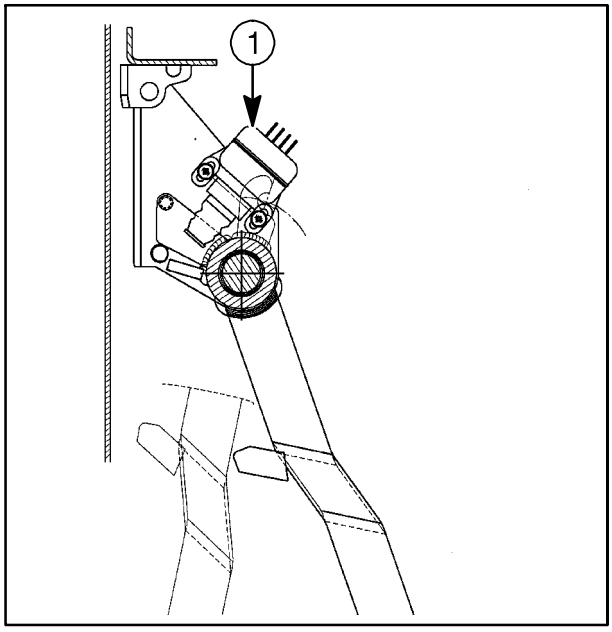
The tractor runs but by pressing the clutch pedal the hydraulic clutch solenoid valves may remain powered-up.

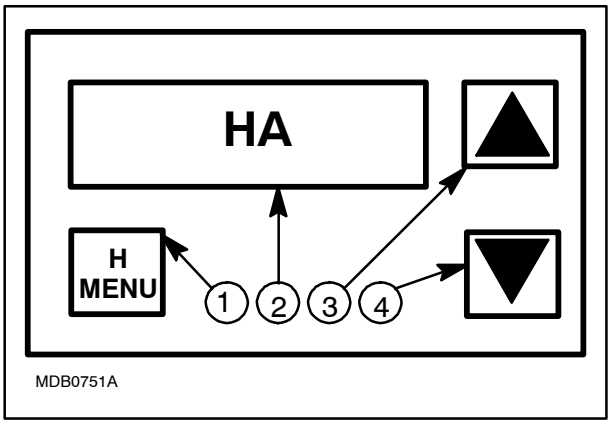
Connect tool **380000282** to the diagnosis socket (black), press the H MENU key and turn the starter switch to the ON position, then select the HA MENU.
Move the Shuttle lever to forward gear.
Press and release the clutch pedal, the percentage value displayed is ~ 100 with the "ON" message.
By slowly pressing the clutch pedal, does the message switch from "ON" to "OFF" in correspondence to a percentage value of 5 to 8?

NO → Remove the left-hand panel under the dashboard.
Position the double switch on the relative slots, so that the message switches between "ON" and "OFF" in correspondence to a set value (5 to 8%).

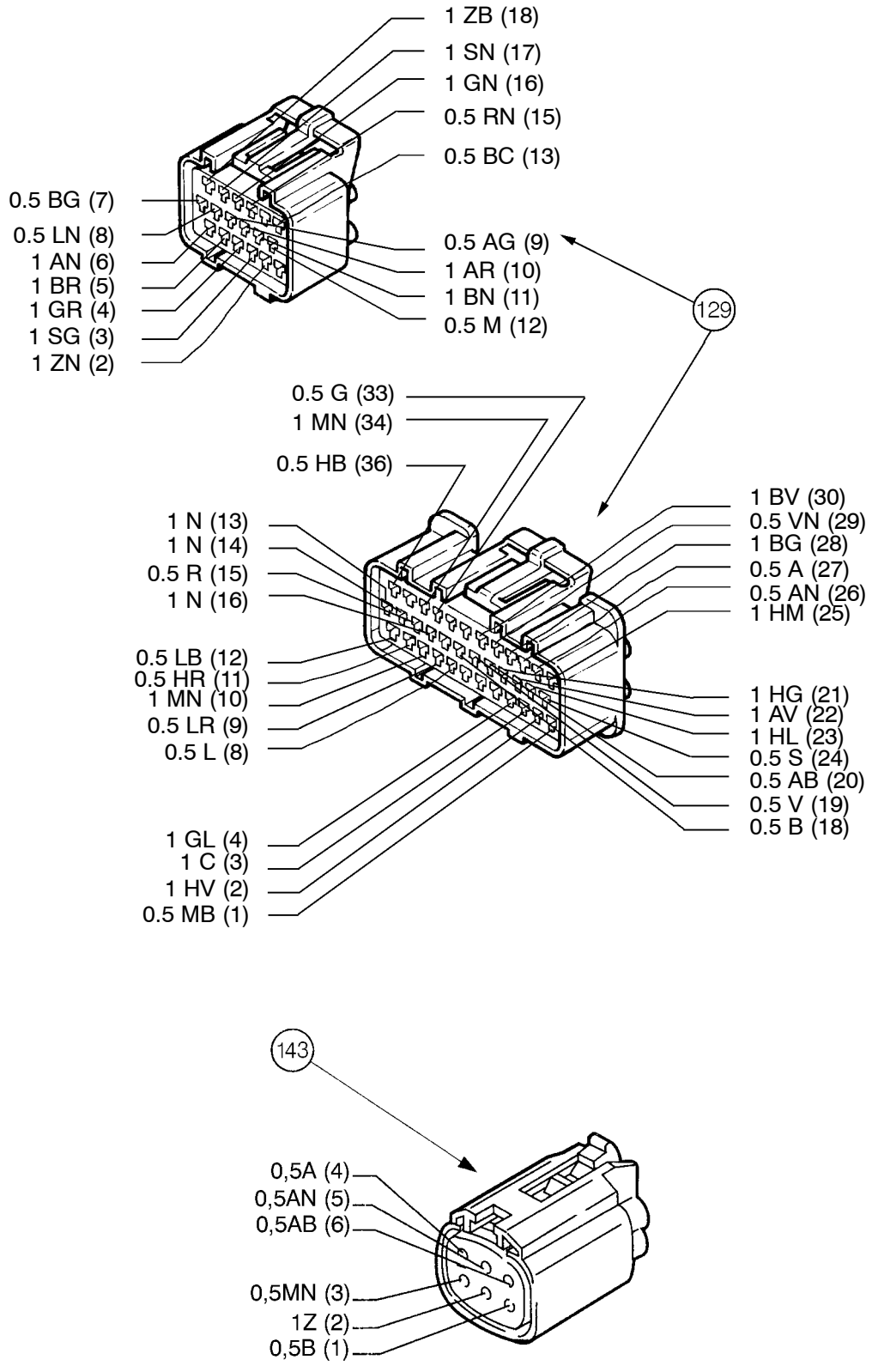
YES

Replace the ECU.





FAULT CODE 56



FAULT CODE 65

The wiring on the solenoid valve (5, Section 21, Chapter 3, page 9) of the HI and LO forward gears synchroniser position control is interrupted or in short to ground, or the solenoid valve is faulty.

The tractor can be moved in LO forward gear and reverse proceeding as follows:
stop the engine;
start the engine and wait for ~ 30 seconds until the two HI and LO lamps on the control panel stop flashing.

Turn the starter key to the OFF position.
Remove the rear left-hand wheel and the solenoid valve unit guard.
Is connection (67) on the HI and LO forward gear synchroniser position control solenoid valve connected?

NO → Connect the connection.

YES

Disconnect connection (67) on the solenoid valve.
Using a digital tester, measure the electrical resistance of the solenoid valve coil.
Is the resistance ~ 7.5 Ω?

NO → Replace the solenoid valve if interrupted.

YES

Disconnect the control panel and the connections (129) on the ECU.
Is wire (GN) on pin CN1-16 on connections (129) or wire (GR) on pin CN1-4 in short to ground?

NO → Is there electrical continuity between pin CN1-16 (GN) on connections (129) and connection (67) on the solenoid valve?

NO → Check the wiring and eliminate the cause of the open circuit.

YES

YES

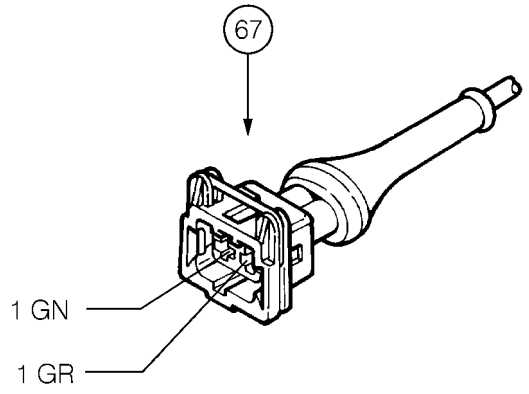
Check the wiring between the solenoid valve connection (67), pins (B2) (GN) and (C1) (GR) on connection (156) and pins CN1-16 (GN) and CN1-4 (GR) on connections (129).
Eliminate the cause of the short to ground.

YES → Is there electrical continuity between pin CN1-4 (GR) on connections (129) and connection (67) on the solenoid valve?

NO → Check the wiring and eliminate the cause of the open circuit.

YES

Replace the ECU.



FAULT CODE 73

The supply voltage on the ECU exceeds +18V.

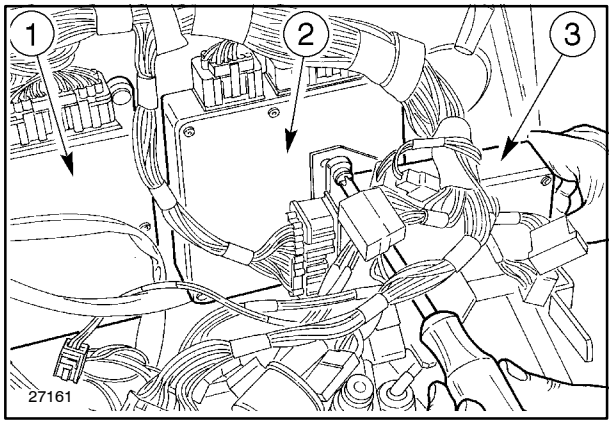
The tractor is not operative.

Turn the starter key to the OFF position.
Start the engine and accelerate to 1200 rpm.
Using a digital tester, measure the battery voltage.
Is the voltage ~ 14V?

NO → Check the recharging system and replace the alternator if the voltage is much higher than +14 V.

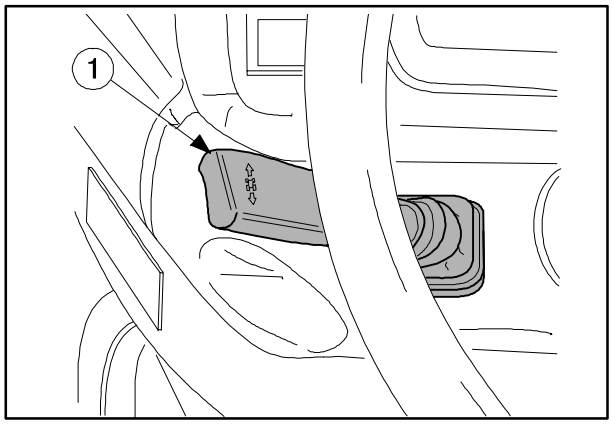
YES ↓

Replace the ECU (2).



SHIFT FROM (HIGH) FORWARD TO REVERSE GEAR

If the tractor has the forward gears (HIGH) engaged and the Power Shuttle (reverser) control lever (1) is moved back (selecting reverse gears) the indicator (1, fig. 84) will light up.



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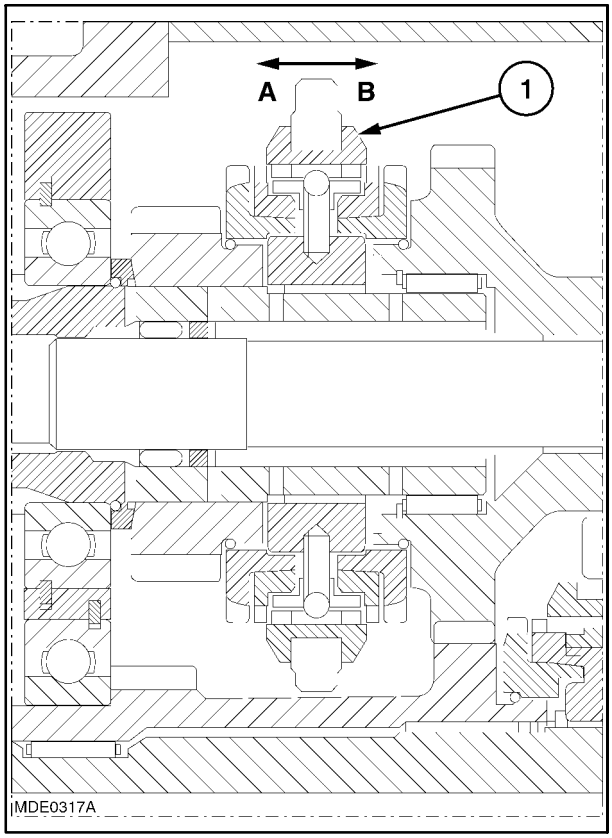
The synchroniser (1) goes from position (B = forward gears engaged) to position (A = reverse gears engaged).



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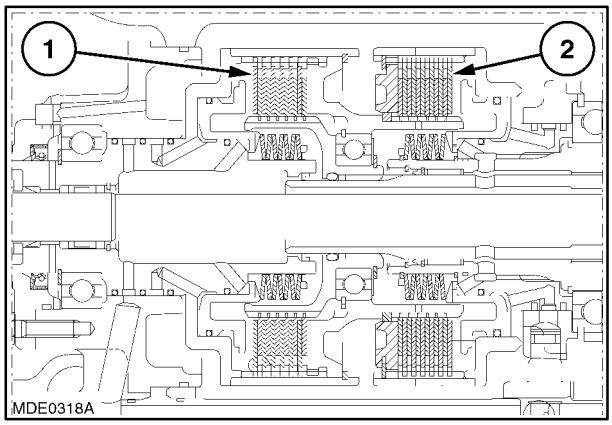
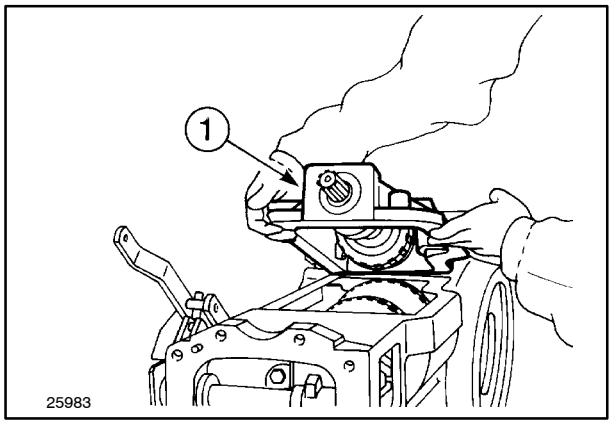
The (HIGH) forward gear and reverse gear clutch (1) remains engaged all the time in both selections.



87

8. Disconnect the battery negative lead.



12

To refit, proceed as follows.

- Respect the tightening torques prescribed on page 2.
- Carefully clean the contact surfaces.
- Apply the sealing compound (approx. 0.0787 in. (2 mm) in thickness), as shown in Section 27, Chapter 1. Fit the drive gear housing on the transmission gearbox.
- Re-fit the two speed sensors, securing in position with the two retaining bolts.
- Refit the sensors cover.
- Refit the transmission oil drainage plug.
- Refit the rear sleeve and replace the snap ring.
- Reassemble the rear guard and tighten the bolts.
- Refill the rear transmission gearbox (for products and quantities, see Section 00, page 6).
- Connect the battery negative cable.

FIRST START-UP

The first start-up procedure must be carried out in the following cases.

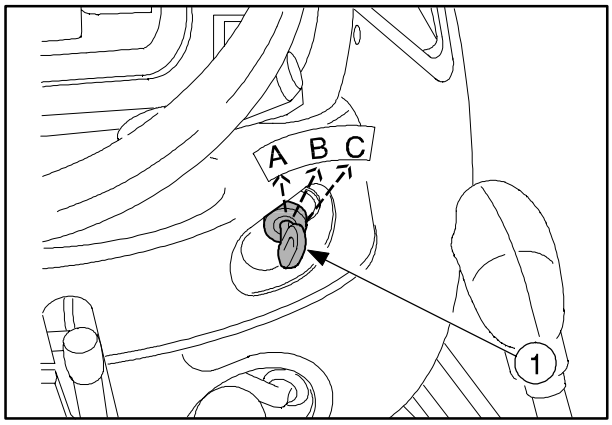
- At the end of the production line.
- Following ECU replacement.
- Following erasure of the Non-Volatile memory (NVM) (see H8 MENU).
- Following manual configuration (see H3 MENU).

1. Turn switch (1) to B (ON) without switching on the engine.

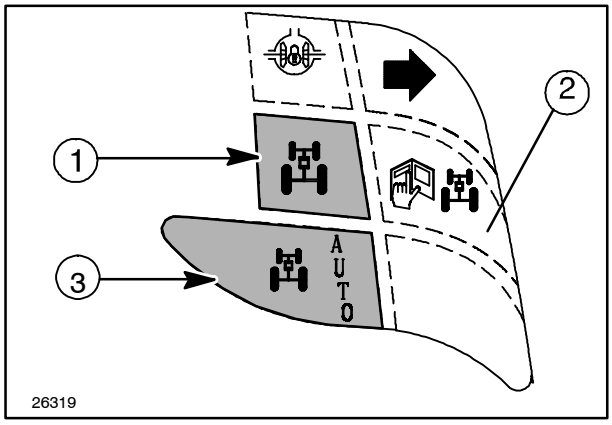
2. Indicators (1, 2 and 3) will be illuminated (non-flashing), after a while indicator (2) will flash to repeat the recognised configuration code - i.e.: rapid flashing, followed by:

1 flash	Only 4WD present.
2 flashes	Both 4WD and front PTO are present (not available)

3. Turn the key (1, fig. 34) to OFF for a few seconds: the configuration is now saved in the Non-Volatile memory (NVM).



34



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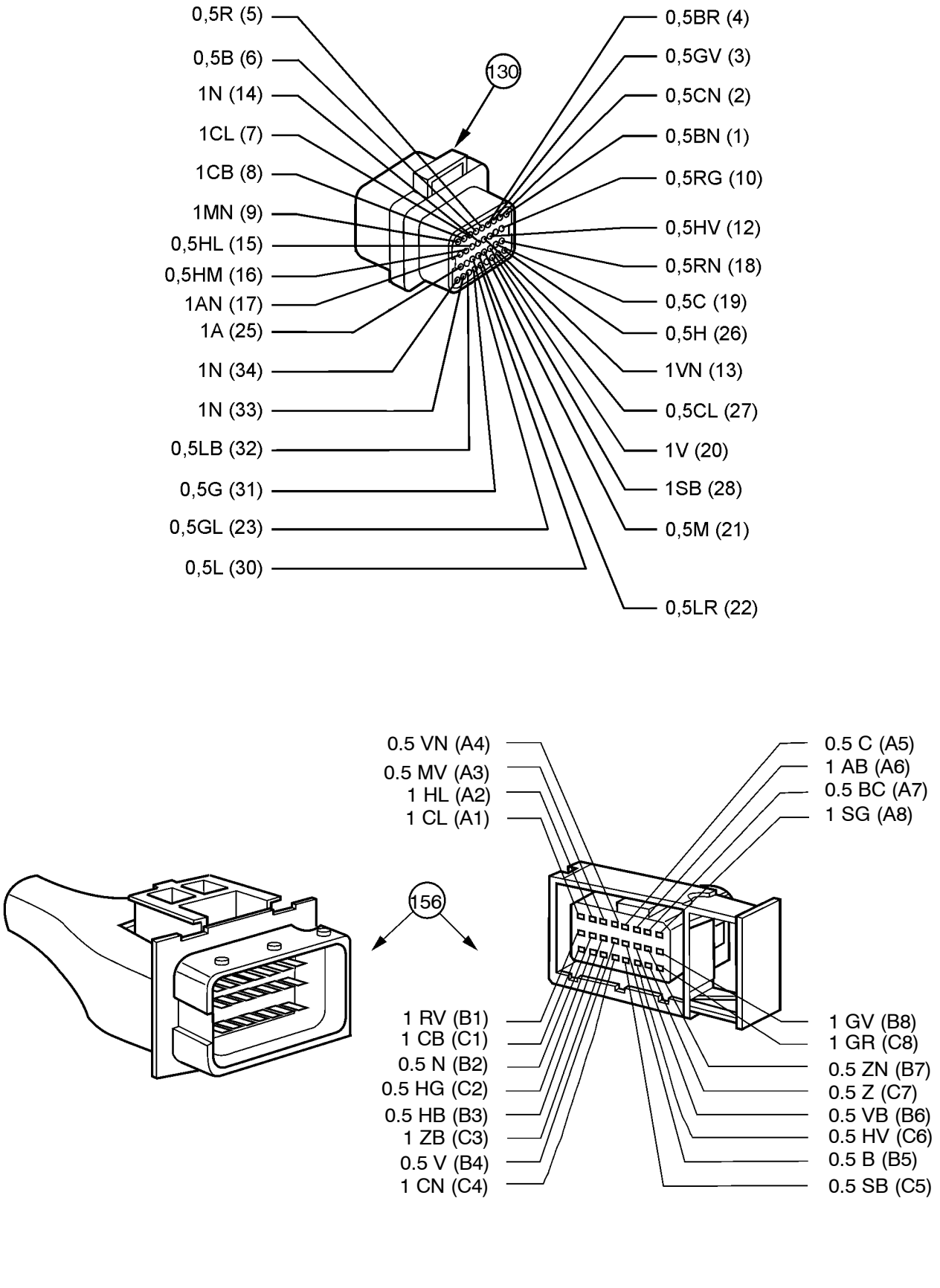
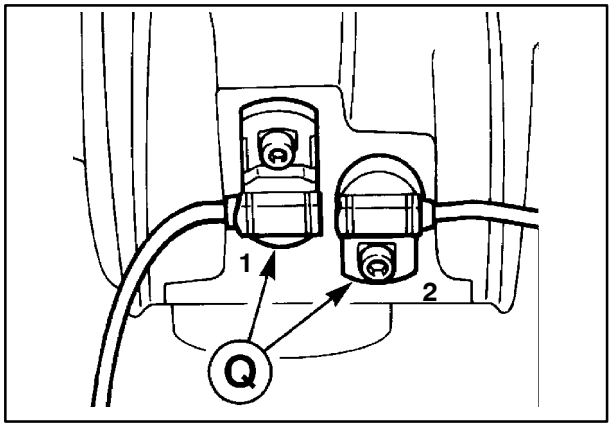
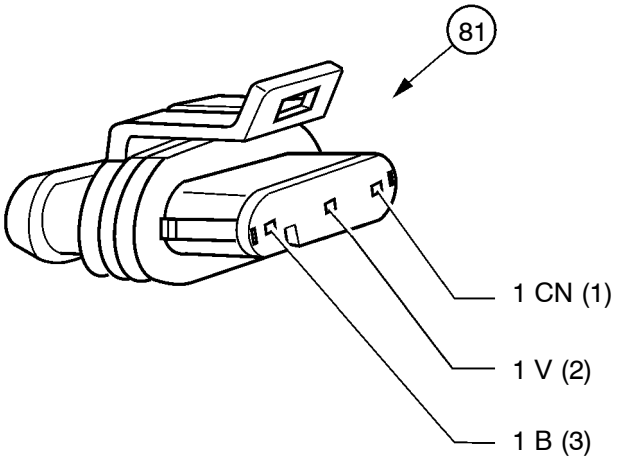
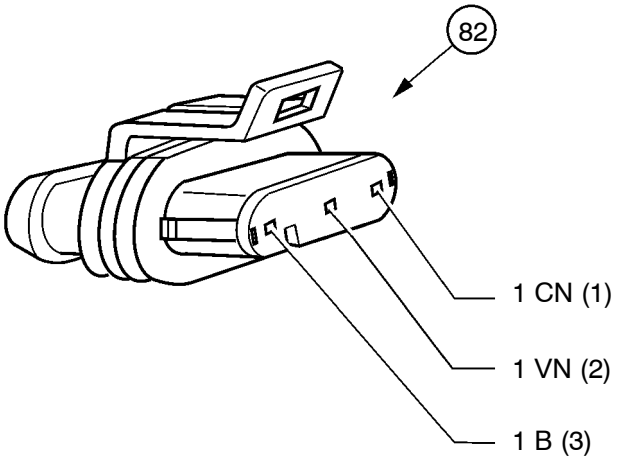
FAULT CODE 21



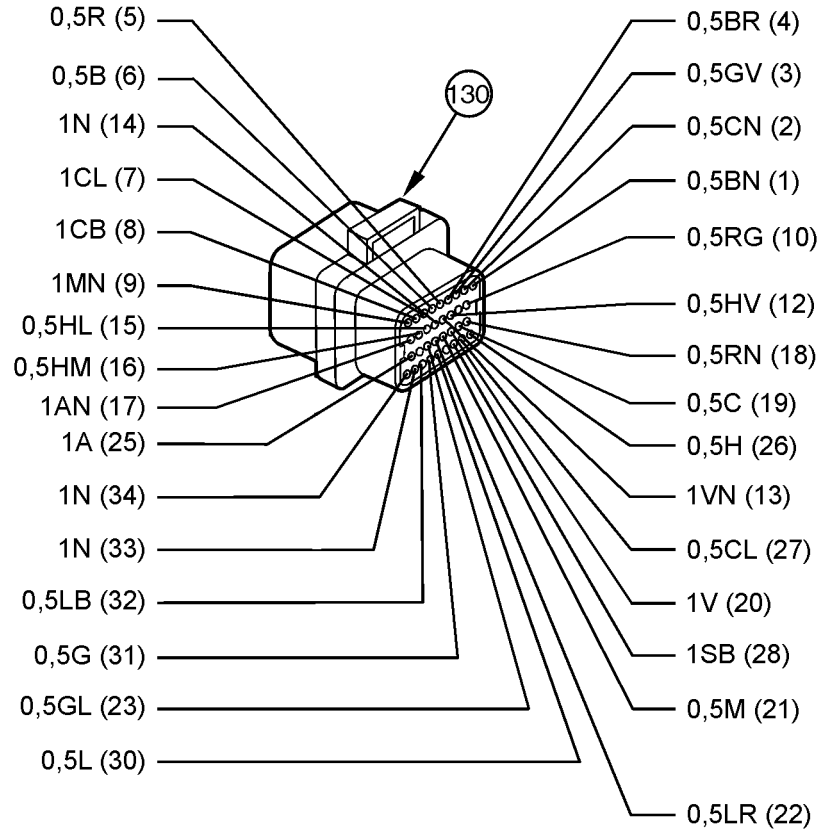
FAULT CODE 27

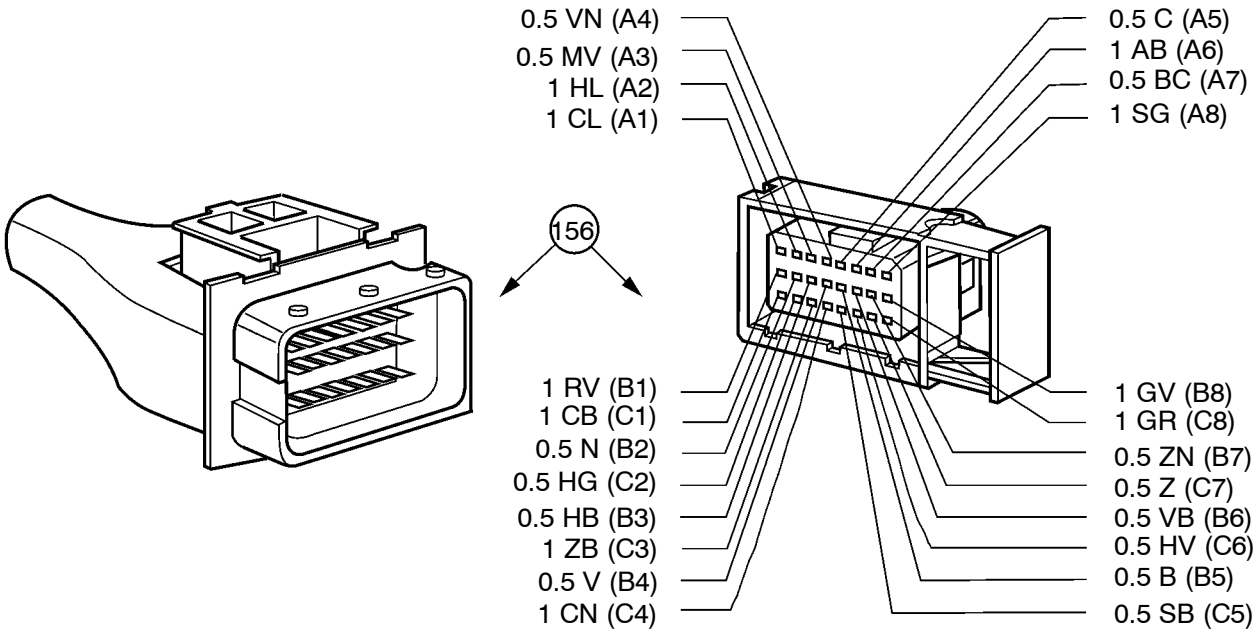


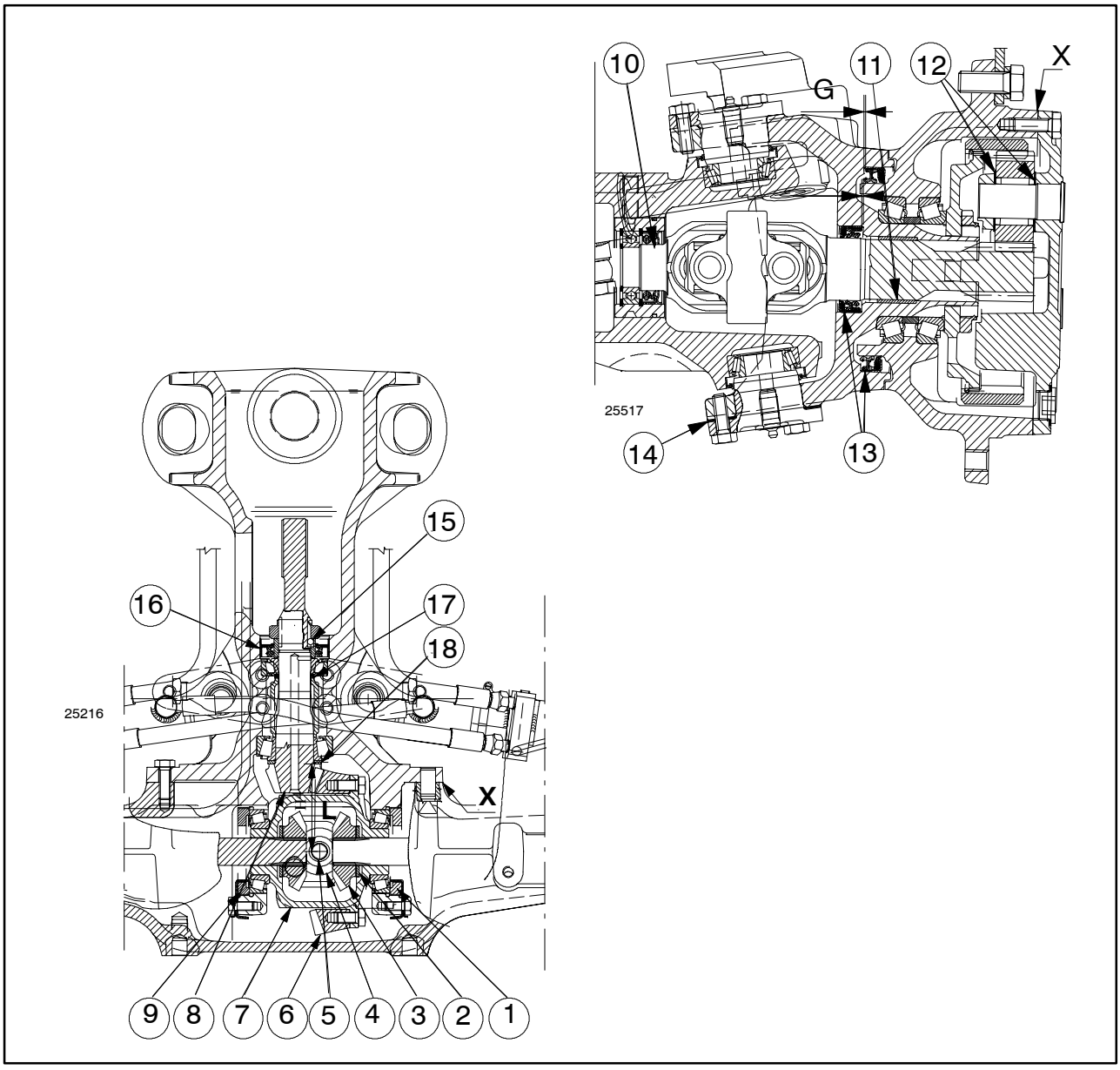




FAULT CODE 42







4

Cross-sectional views of front axle

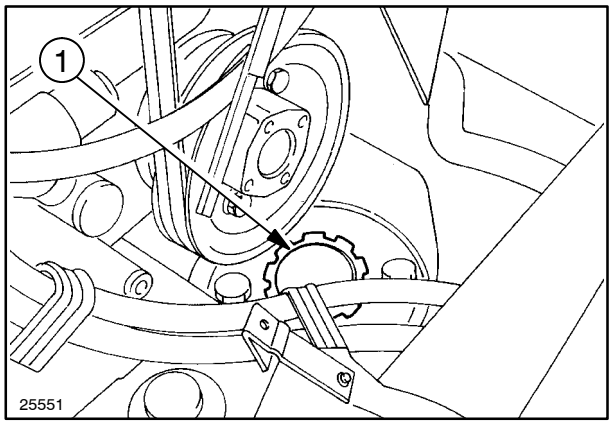
G = 0.0196 to 0.0393 in. (0.5 to 1 mm). Gasket (13) assembly clearance in seat.

H_4 = 3.7401 in. (95 mm). Nominal distance between crown wheel axis and greater diameter of the pinion.

1. Crown wheel bearing adjustment ring nut.
2. Side gear thrust washers.
3. Side gear.
4. Side pinion.
5. Cross pin for side pinions.
6. Bevel crown wheel.
7. Differential casing.
8. Bevel pinion.
9. Crown wheel bearing adjustment ring nut.
10. Axle shaft.
11. Axle shaft bush (10).
12. Epicyclic reduction unit driven gear shims.
13. Seal.
14. Steering knuckle adjustment plates.
15. Ball joint.
16. Seal.
17. Bevel pinion bearing adjustment spacer.
18. Bevel pinion position adjustment spacer.

Note - On assembly apply a bead of sealing compound to the surfaces **X** as indicated on page 32.

22. Unscrew and remove the front-upper pivot bearing retaining ring nut/cover (1).

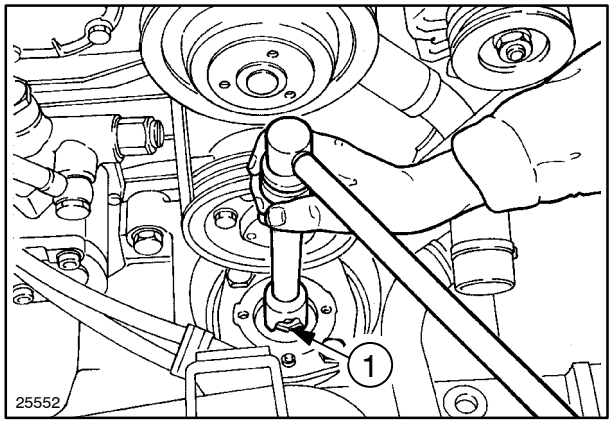


29

23. Remove the split pin and unscrew the pivot front-upper pin locknut (1).

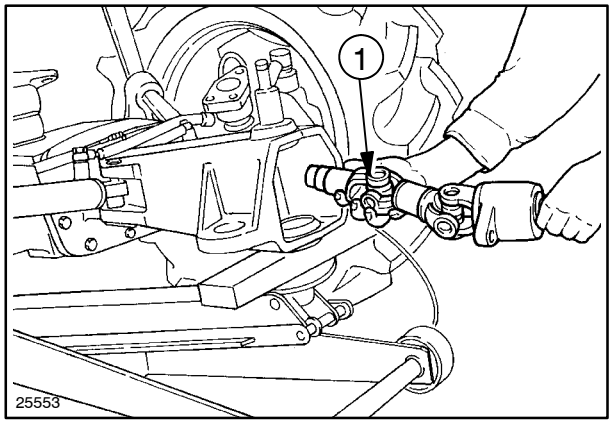
24. Remove bracket **380001613** (1, fig. 22).

25. Raise the tractor from the front and remove the front axle.



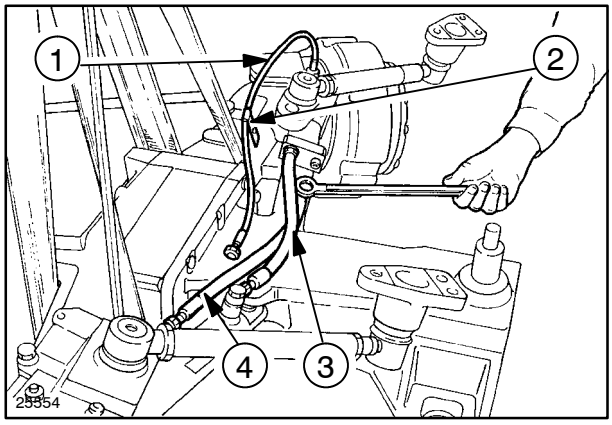
30

26. Working through the opening, unscrew the ring nut that secures the universal joint (1) to the pinion.



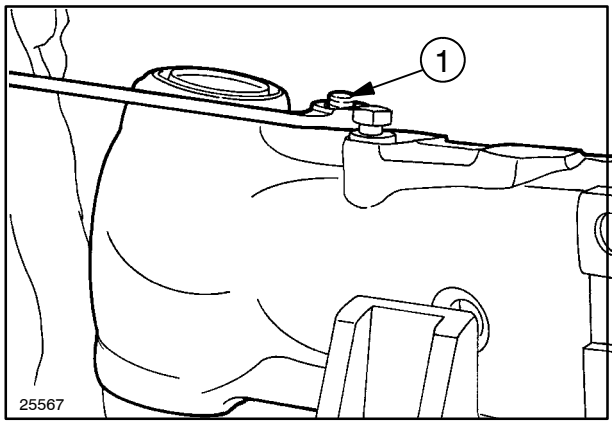
31

27. Disconnect the brake piping (1) from the central union, unscrew the bolts securing the bracket (2) and disconnect the pipes (3 and 4) from the steering cylinders.



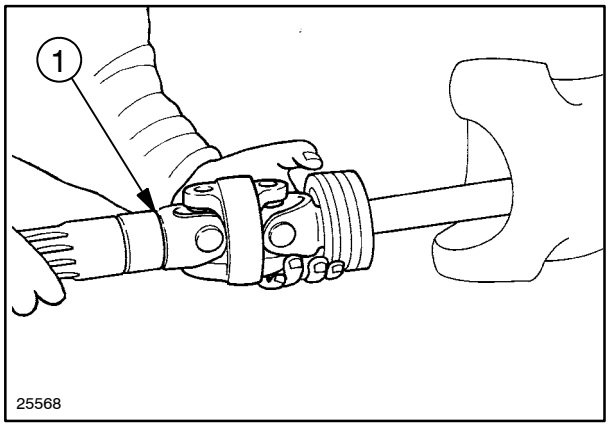
32

9. Loosen the axle-shaft retaining bolt (1).



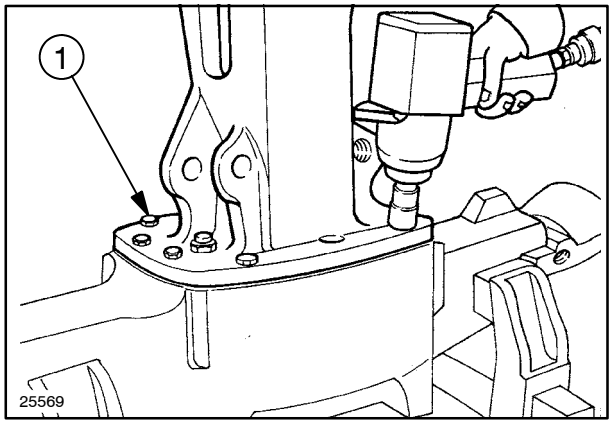
64

10. Extract the axle-shaft (1) complete with the universal joint and bearing housing bush.



65

11. Remove the retaining bolts (1) holding the bevel drive-differential housing to the axle casing, inserting two guide pins into the bores.



66

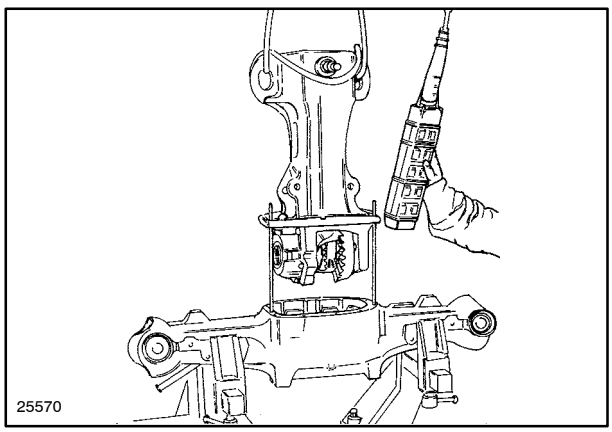
12. Connect the bevel drive-differential housing to the hoist and detach from the axle casing.

13. To refit the bevel drive-differential housing to the axle casing, proceed as follows.

⚠ CAUTION ⚠

Always use appropriate tools to align fixing holes. NEVER USE FINGERS OR HANDS.

- Refer to the illustrations on pages 7 and 8 for the positioning of the various parts.
- Respect the tightening torque values prescribed on page 3.



67

S = Sp - {(Gm - 0.18) x 1.35}

where:

Sp = thickness of test shim installed in the bevel drive-differential housing;

Gm = average backlash measured between the sides of the teeth of the bevel drive.

If the backlash measured is less than the prescribed value, it will be necessary to fit a thicker adjustment shim (8, page 8) the value being given by:

S = Sp + {(0.18 - Gm) x 1.35}

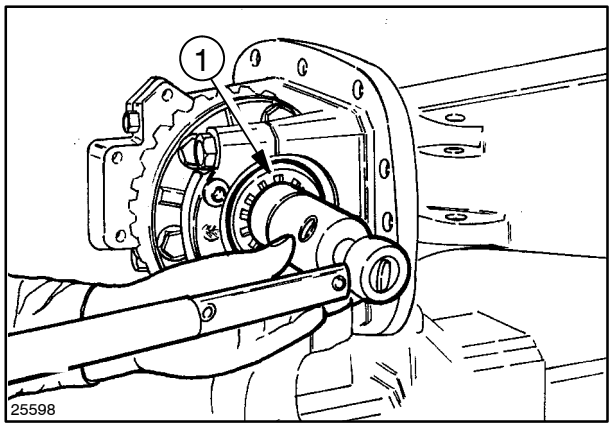
where:

Sp = thickness of test shim installed in the bevel drive-differential housing;

Gm = average backlash measured between the sides of the teeth of the bevel drive

31. Install a shim (8, page 8) of the calculated thickness and with a 1/100 scale dial gauge positioned perpendicular to the outside edge of one of the crown wheel teeth, check that the backlash between the pinion and the crown wheel is within the prescribed tolerance limits 0.0059 to 0.0078 in. (0.15 to 0.20 mm).

32. Using wrench **380000252** (1) turn the adjustment ring nut and



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check, using torque wrench **380001633** (2), that the rolling resistance torque of the crown wheel and pinion bearings, as measured in the same conditions used to check only the pinion, is:

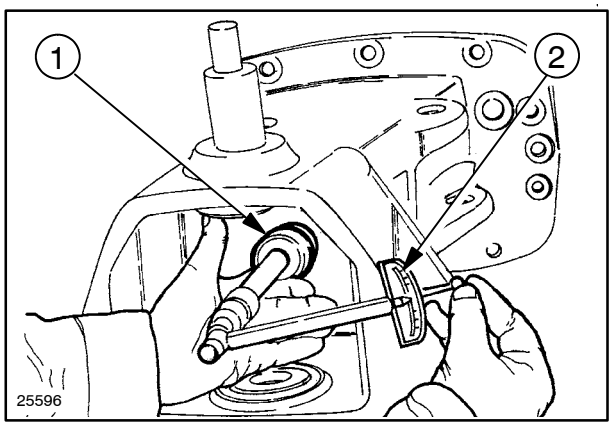
$A_2 = A_1$ + 1 to 1.5 Nm (0.10 to 0.15 kgm)

where:

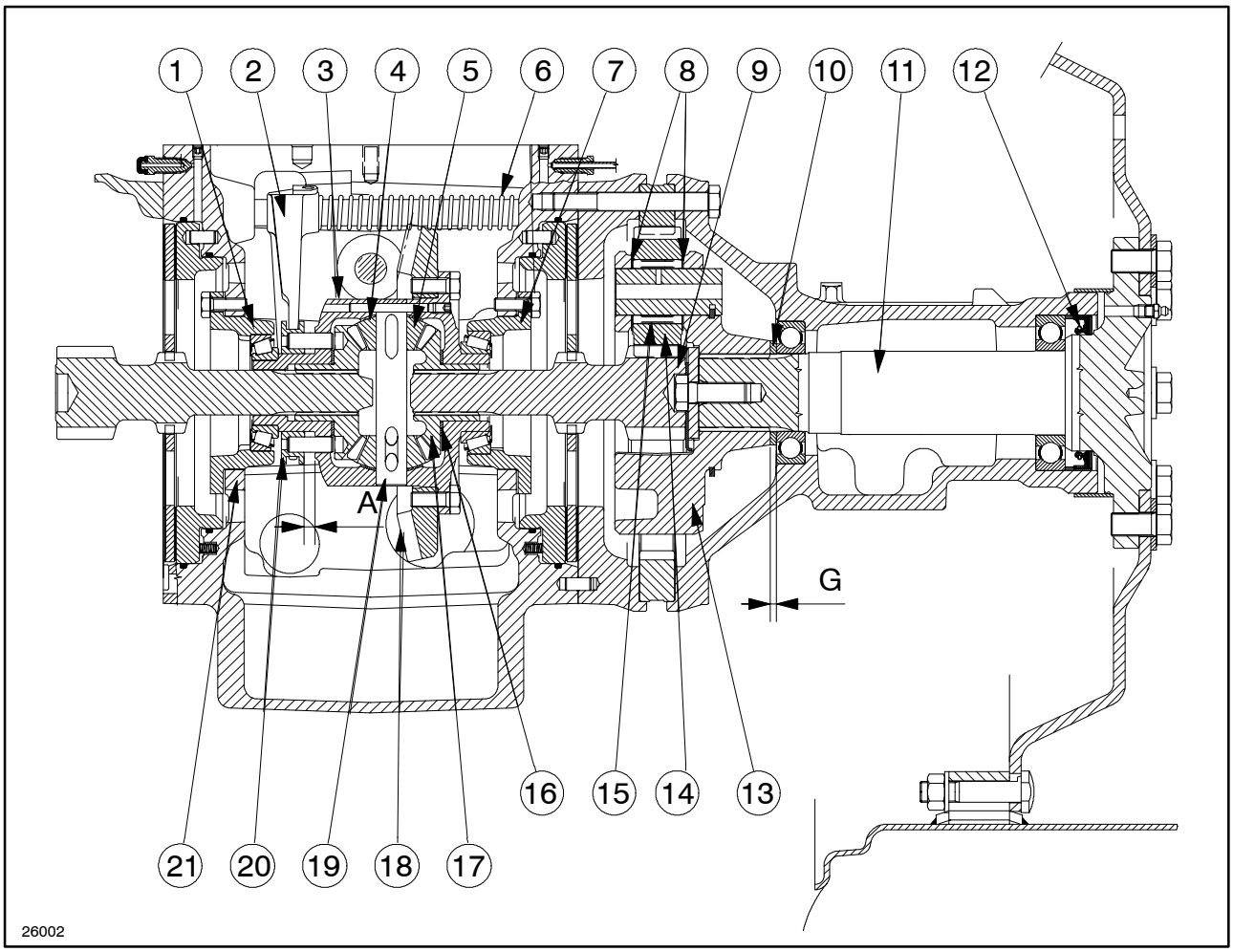
A_2 = pinion-crown wheel rolling resistance torque;

A_1 = rolling resistance torque of pinion only as previously measured;

0.1 to 1.5 Nm (0.10 to 0.15 kgm) = rolling resistance torque of crown wheel only measured at the end of the pinion, using wrench **380001623** (1) and torque wrench **380001633** (2).



95



7

Sectional view of transmission

A. 0.3188 to 0.3228 in. (8.1 to 8.2 mm). Differential lock engage sleeve travel.
G. 0.0078 to 0.0157 in. (0.2 to 0.4 mm). Final drive planet pinion support end float.
1. Bevel crown wheel bearing support.
2. Differential lock fork.
3. Differential casing.
4. Shim ring.
5. Side pinion.
6. Differential lock spring.
7. Bevel crown wheel bearing support.
8. Shim rings.
9. Differential output axle shaft.
10. Side pinion casing support (13) end float adjuster shim.
11. Wheel axle shaft.
12. Seal.
13. Final drive side pinion support.
14. Final drive side pinion.
15. Bearing.
16. Side gear clearance adjuster ring.
17. Side gear.
18. Ring bevel gear.
19. Side pinion pin (5).
20. Differential lock engagement sleeve.
21. Adjuster rings for bearings and coupling clearance between ring bevel gear and pinion.

DESCRIPTION AND OPERATION

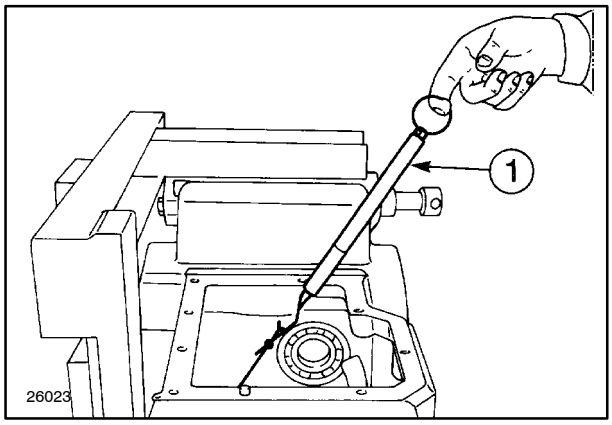
The rear transmission transmits drive from the gearbox to the lateral final drives by means of the bevel gear pair. The bevel gear pair is of the helical tooth type and is supported by taper-roller bearings.

The differential has two side pinions and is fitted with a mechanically or hydraulically operated differential lock.

Final drives are of the pinion type and are controlled by the bevel gear pair output half-shafts, the same shafts that control the footbrakes.

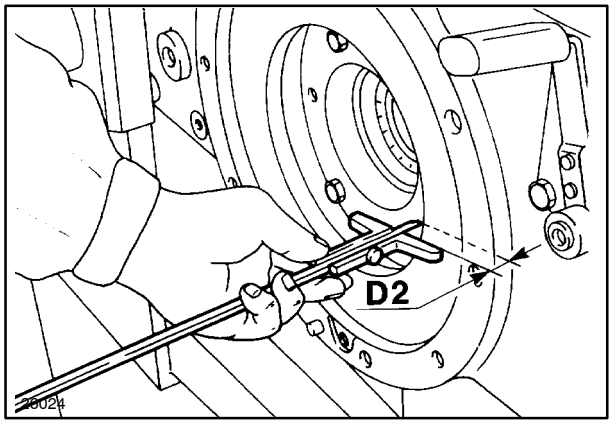
This torque can be measured with a dynamometer (1) and cord wrapped around the mid-upper gear drive and corresponds to a force on the dynamometer for the single pinion, added to the values shown on the table:

ROLLING CROWN				
9/40	9/38	11/39	11/36	11/32
2.86 to 4.41 (1.3 to 2.0 kg) 12.7 to 19.6 N		3.52 to 5.51 (1.6 to 2.5 kg) 15.7 to 24.5 N		4.19 to 6.61 (1.9 to 3.0 kg) 18.6 to 29.4 N



29

6. Use a depth gauge to measure the distance (D_2) between the transmission-gearbox and the outer face of the RH support, near the two notches, and calculate the arithmetic mean of the two measured values.



30

7. Use a depth gauge to measure the distance (D_3) between the transmission-gearbox and the RH support seat, near the two notches, and calculate the arithmetic mean of the two measured values.

8. The total thickness of the shims to be inserted under the RH and LH supports is given by:

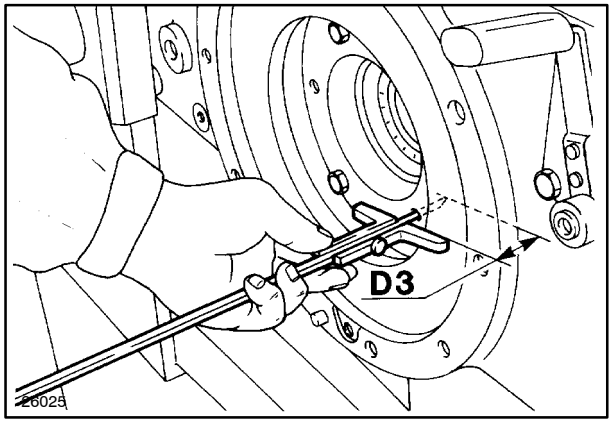
$$S = D_3 - D_1 - D_2 + 0.05$$

where:

S = total thickness to be inserted (excluding the test shim).

D_3, D_2 and D_1 = distances measured.

0.0019 in (0.05 mm) = oversizing required to reduce the preloading on the bearings generated by the support retaining bolts. If necessary, round off (S) to the nearest 0.0019 in. (0.05 mm).



31

DATA

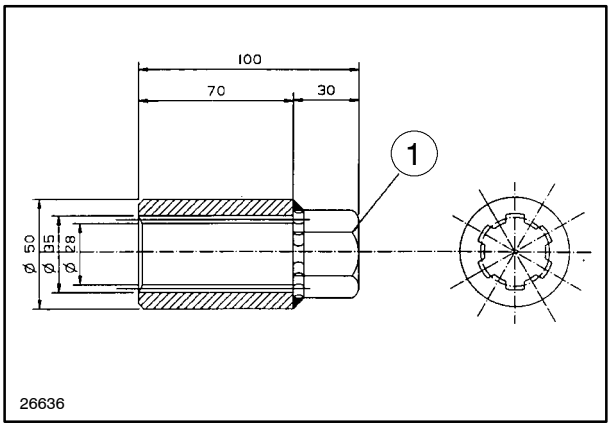
(cont)

		TN75FA	TN85FA-TN95FA
Diameter of driven shaft at grooved terminal:			
- 540 rpm	rev/min	$1^3/_8$" (6 grooves)	
- 540E rpm	rev/min	$1^3/_8$" (6 grooves)	
- 1000 rpm	rev/min	$1^3/_8$" (21 grooves)	
External diameter of driven gear support bushings	in. (mm)	1.8080 to 1.8090 (45.925 to 45.950)	
Internal diameter of driven gears	in. (mm)	1.8129 to 1.8139 (46.050 to 46.075)	
Clearance between driven gears	in. (mm)	0.0039 to 0.0059 (0.100 to 0.150)	
Diameter of driven shaft at front and central bushings	in. (mm)	1.4947 to 1.4957 (37.966 to 37.991)	
Diameter of driven shaft at rear bushing	in. (mm)	1.3766 to 1.3775 (34.966 to 34.991)	
Internal diameter of front and central bushings	in. (mm)	1.4960 to 1.4975 (38.000 to 38.039)	
Internal diameter of rear bushing	in. (mm)	1.3385 to 1.3401 (34.000 to 34.039)	
Clearance between shaft and front and central bushings	in. (mm)	0.0003 to 0.0028 (0.009 to 0.073)	
Clearance between shaft and rear bushing	in. (mm)	0.0003 to 0.0028 (0.009 to 0.073)	

TOOLS

Warning - The operations described in this section can only be carried out with **ESSENTIAL** tools indicated by an **(X)**.
To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.

380000233	Drift for PTO driving shaft needle bearing.
380001611	Grooved guide for synchronized PTO shaft hub installation.
X 380001609	Drift for PTO driving shaft needle bearing.
X 380001610	Hand grip (with **380001609**).
X 380001620	Power take-off drive shaft seal splining tool (with **380001610**).



1

Tool to be made to remove-install the PTO shaft (Mark tool with no. 50159 - Measurements in mm)
Make using C40 material -(1) 36 Hex wrench

SECTION 33 - BRAKES

Chapter 1 - Brakes

CONTENTS

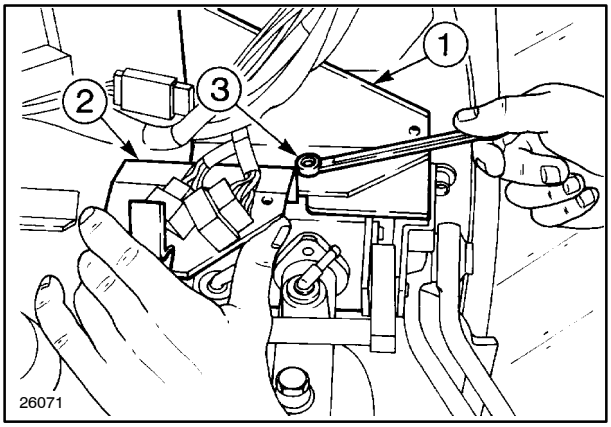
33 000 - MAIN DATA - TIGHTENING TORQUES - TOOLS - SECTION VIEWS - DESCRIPTION AND OPERATION - FAULT DIAGNOSIS

DATA

Type:		
- service brake		with oil bath disk, acting on differential drive shafts
- parking brake		with oil bath disks, engaging a gear on the bevel pinion shaft
Operation:		
- service brake		hydrostatic, with independent pedals (connected by means of a pin)
- parking brake		mechanical, by means of a hand lever
Service brake disk material		sintered
Parking brake disk material		steel
Parking brake mobile sectors material		sintered or organic agglomerate
Disk thickness:		
- service brake	in. (mm)	0.3937 (10)
- wear limit	in. (mm)	0.3385 (8.6)
- parking brake	in. (mm)	0.1555 to 0.1594 (3.95 to 4.05)

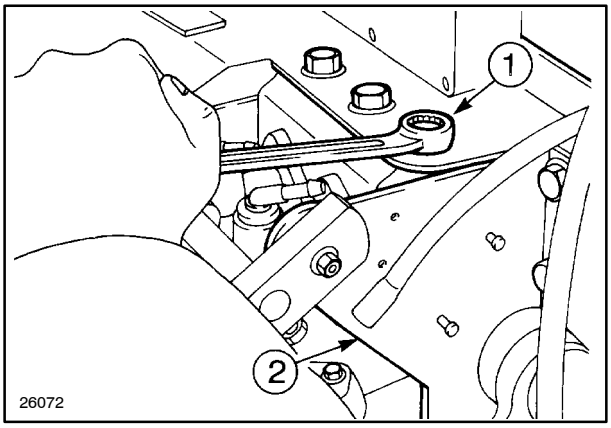
(continued)

10. Unscrew the retaining bolts that secure the relay to the brake pedals support bracket (2), loosen the brake levers/cab front brake pump retaining bolts and remove the bracket (1) that supports the electrohydraulic 4WD engagement control unit by unscrewing the bolts (3).



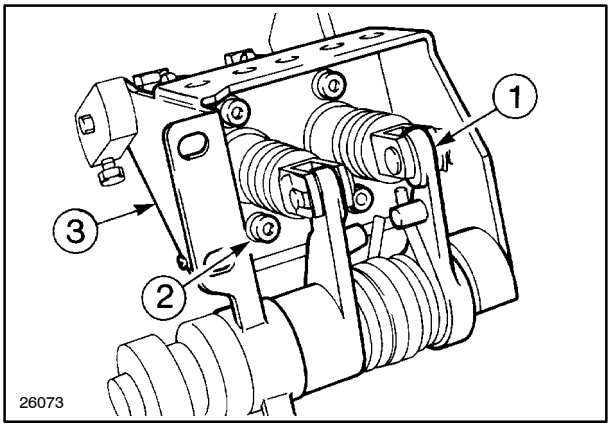
18

11. Unscrew the three retaining bolts (1) located under the electrohydraulic 4WD engagement control unit and remove the pump support bracket (2), complete with pump and brake pedals.



19

12. Disconnect the levers on the brake pedals (1), using the springs to remove the pins. Remove the bolts (2) securing the pump to the bracket (3) and remove the brake pump.



20

13. To refit the brake control hydraulic pump unit, proceed as follows.

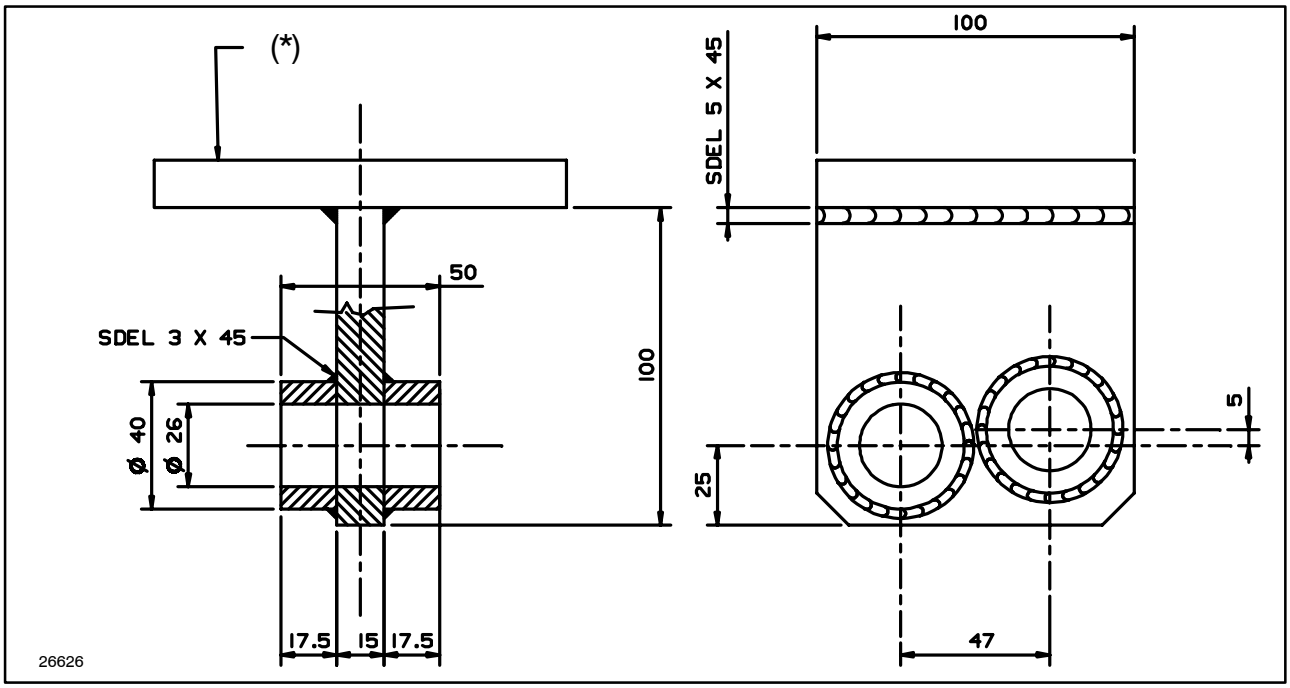
⚠ CAUTION ⚠

Always use appropriate tools to align fixing holes. NEVER USE FINGERS OR HANDS.

HYDRAULIC LIFT TOOLS

Warning - The operations described in this section can only be carried out with **ESSENTIAL** tools indicated by an **(X)**.
To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.

380000227	Hydraulic lift lifting hook.
380000301	Rotating stand for overhaul operations.
X 380001627	Ring for fitting piston with lift seals.
X 380001628	Punch for fitting lift arm shaft seal.
X 380000261	Punch for fitting needle bearings on control valve block control lever bushing.
X 380000260	Punch for fitting needle bearings on lower draft control lever.
X 380000260	Punch for fitting needle bearings on lower draft control lever.
X 380000260	Punch for fitting needle bearings on lower draft control lever.
X 380000230	Wrench for cylinder safety valve setting ring nut.
X 380000231	Wrench for lift pressure relief valve setting ring nut.
X 380001629	Guard for fitting seal on arm descent speed control pin.
380000240	Universal pressure control kit.
380000215	Hand pump for valve calibration.
X 380000218	Union for cylinder safety valve calibration.
X 380000217	Union for lift pressure relief valve calibration.
X 380000274	Union for checking control valve seal.
X 380000275	Guard for pilot valve seal.
X 380001630	Draft control setting tool.
X 380001631	Position and draft control setting tool.



2

Bracket to be made for hook 380000224 or for overhauling lift to rotating stand (mark tool No. 50155 - measurements in mm).

Make in Aq 42 material - (*) Area for fixing bore to rotating stand.

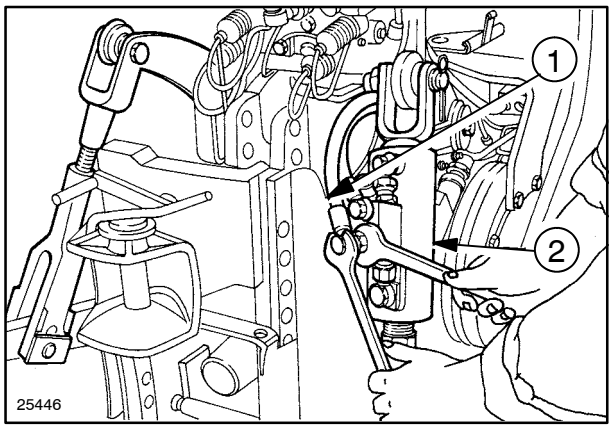
REAR HYDRAULIC LIFT
Removal-Installation (Op. 35 110 30)

DANGER

Lift and handle all heavy parts using suitable lifting equipment.
Make sure that assemblies or parts are supported by means of suitable slings and hooks. Check that no one is in the vicinity of the load to be lifted.

To be able to disconnect the hydraulic lift from the rear transmission casing it is necessary to remove the cab as described in Chapter 1 of Section 90 then proceed as follows.

1. Remove the top link of the third point.
2. Detach the control pipes (1) of the hydraulic vertical tie-rod (2) (if applicable), extract the split pins and detach the vertical tie-rods from the lift arms.



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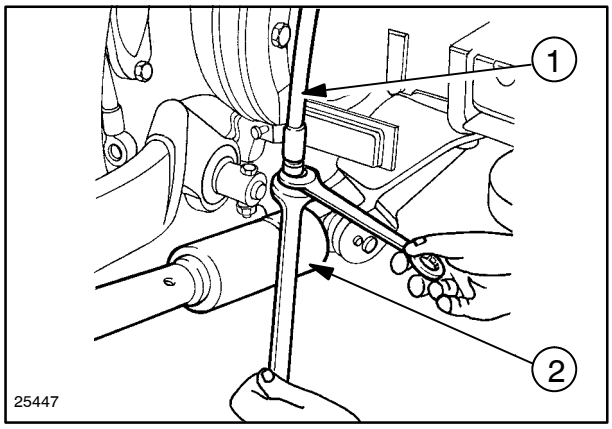
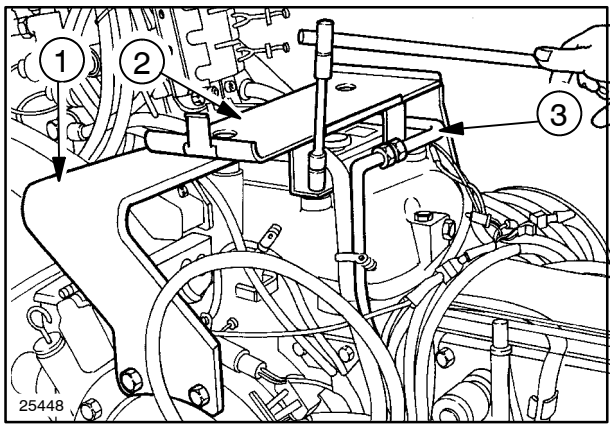
3. Disconnect the control pipes (1) of the hydraulic stabilizer strut (2) (if applicable) on both sides.



14

4. Unscrew the relevant retaining bolts and remove the battery supports (1, 2 and 3).

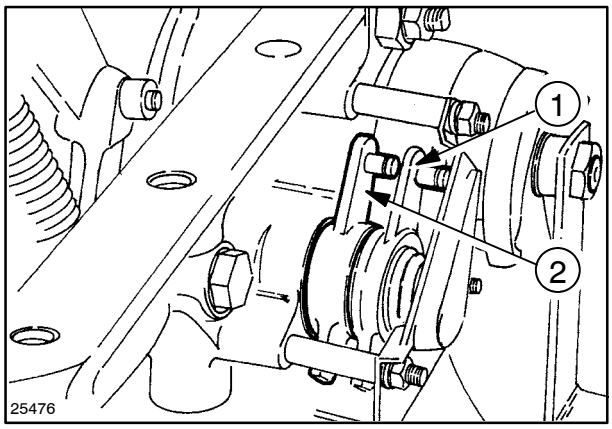


15

Adjusting draft control

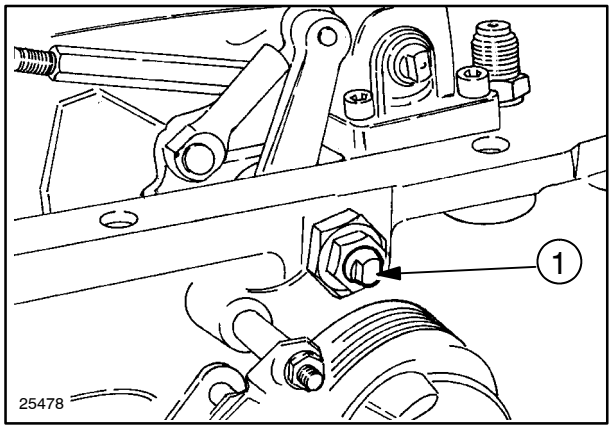
Proceed as follows.

49. Move the external position control (1) and draft control (2) levers completely backwards against the spacer.



56

50. Make sure that the milling on the eccentric pin (1) is in the vertical position.



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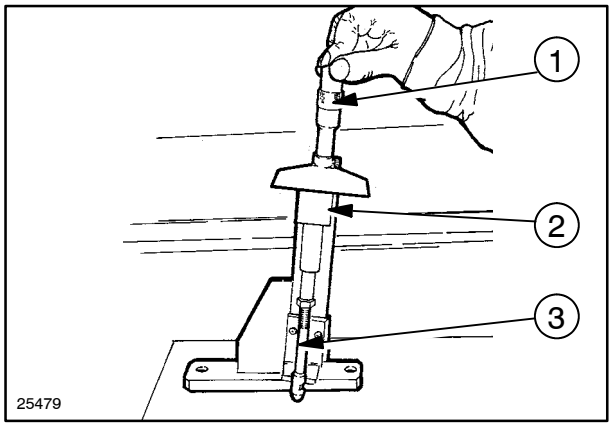
51. Place the tool **380001630** (2), complete with the end section (2) and the draft transmission rod, on a reference plane. Adjust the end section (3) until the rod on tool (1) is aligned with the tool, providing a micrometer (1) reading of 0.



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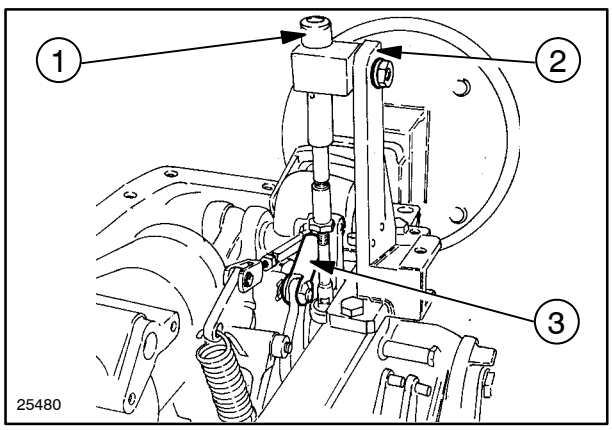
52. Position the tool (2) on the lift body, secure it with two screws and fully tighten the screw (1).



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SECTION 35 - HYDRAULIC SYSTEMS

Chapter 2 - Open centre system auxiliary control valves

CONTENTS

35 000 - MAIN DATA - TORQUE SETTINGS - TOOLS - SECTIONAL VIEWS - DESCRIPTION AND OPERATION

DATA

Filter	full-flow, with replaceable paper cartridge, (common to the hydraulic lift circuit)
Pump	gear pump (common to the hydraulic lift circuit, see Chap. 5)
Auxiliary control valves	
Location	valve stack up to a maximum of 5 control valves 3 of which attached to the lift housing and 2 on the support fitted on the right-hand side of the engine
Control	by hand levers
Pressure relief valve setting psi (bar)	2755 to 2827 (190 to 195)
Type	convertible for operation of single or double-acting actuators, convertible for operation of single or double-acting actuators and with automatic detent release, convertible for operation of double-acting actuators with float control and automatic detent release, convertible for operation of double-acting actuators with float control.

TOOLS

Warning - The operations described in this section must only be performed with the **ESSENTIAL** tools marked with an **X**. To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.

List of specific tools required for the various operations described in this Section.

380000240	Universal pressure testing kit.
380000241	Seal guard for Kontak control valve check valve.
X 380000701	Tool for flow control valve adjustment.

AUXILIARY CONTROL VALVES, ASSEMBLY REMOVED

Disassembly-Assembly (Op. 35 204 46) with the unit removed

⚠ CAUTION ⚠

Handle all parts carefully.
Do not put your hands or fingers between parts.
Wear the prescribed safety clothing, including goggles, gloves and safety footwear.

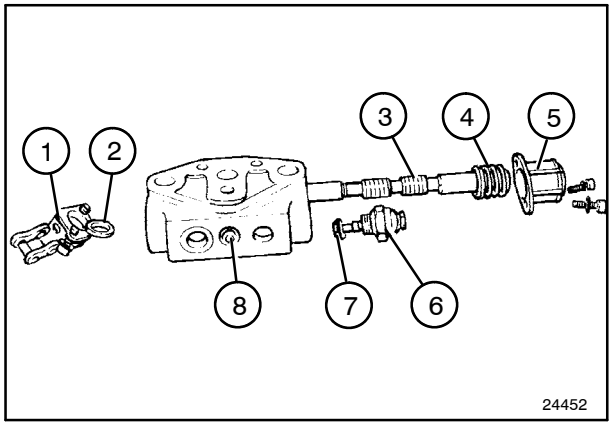
⚠ CAUTION ⚠

Always use appropriate tools to align fixing holes.
NEVER USE YOUR FINGERS OR HANDS.

Convertible single/double acting auxiliary control valve.

Disassemble the auxiliary control valve into its component parts, referring to the cross-sectional views on page 3 and the following instructions:

1. Remove the cover (5), recover the spring (4) and the relative spring cup.
2. Extract the control valve stem (3).
3. Remove the control lever support (1) and recover the seal (2).
4. Remove the plug (6) and recover the single/double action switching valve (7).
5. Remove the valve housing (8) and recover the check valve and relative spring.
6. Check the condition of the seals before assembly.



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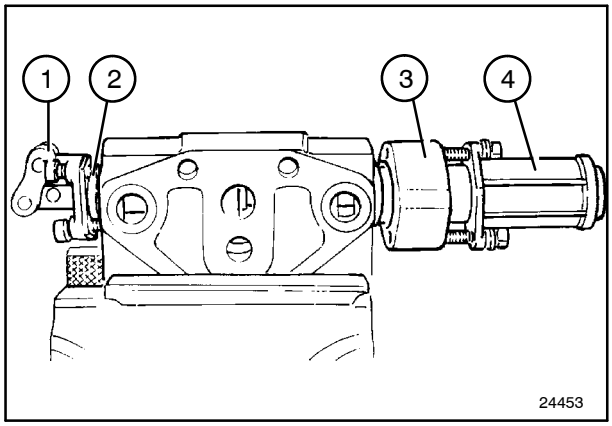
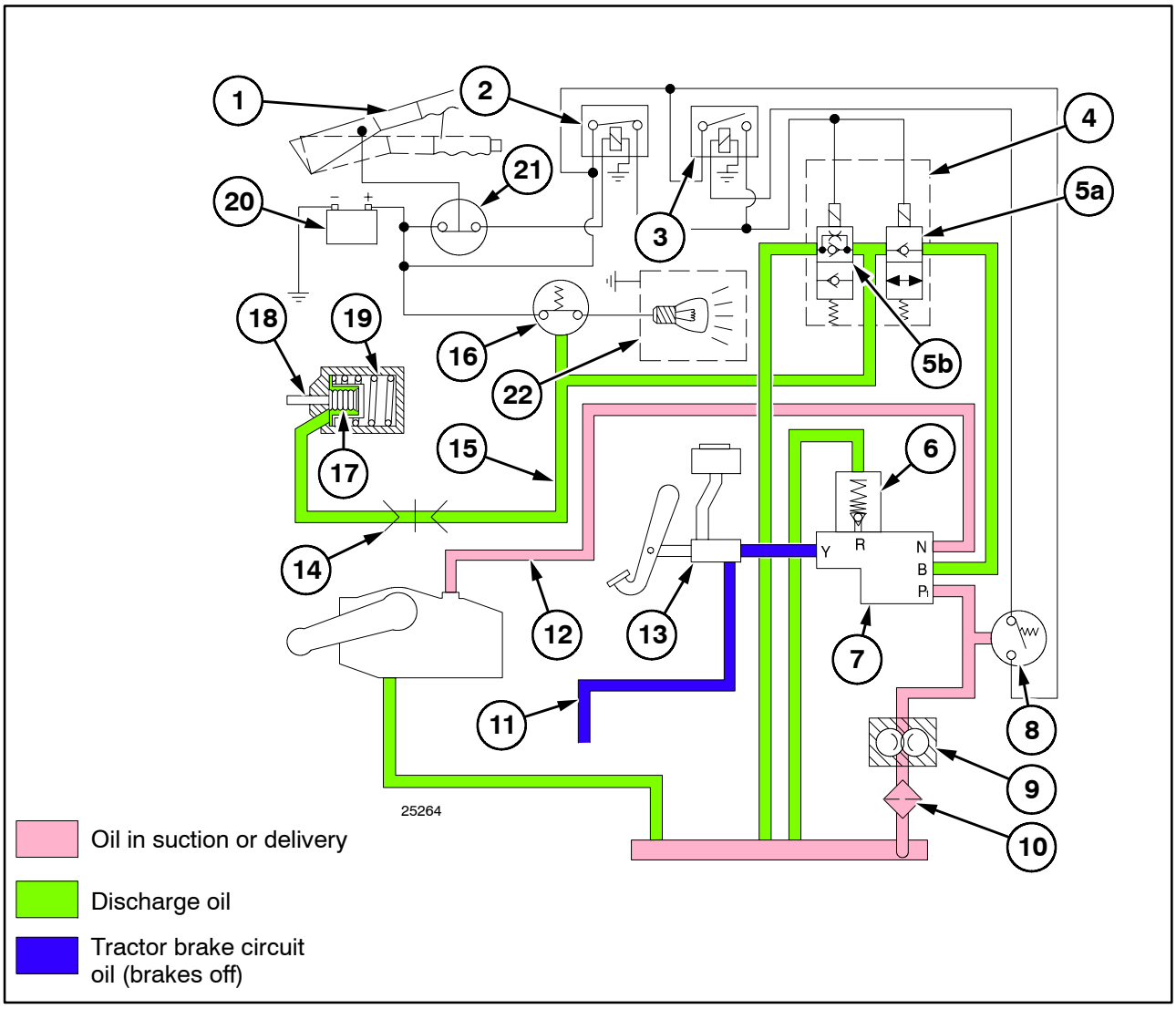
Single/double-acting auxiliary control valve with float control and automatic detent release.

Disassemble the auxiliary control valve into its component parts, referring to the cross-sectional views on page 3 and the following instructions:

1. Unscrew the retaining screws, recover the cover (4) and the spacer (3).
2. Unscrew the retaining screws, recover the control lever support (1) and relative seal (2).



22



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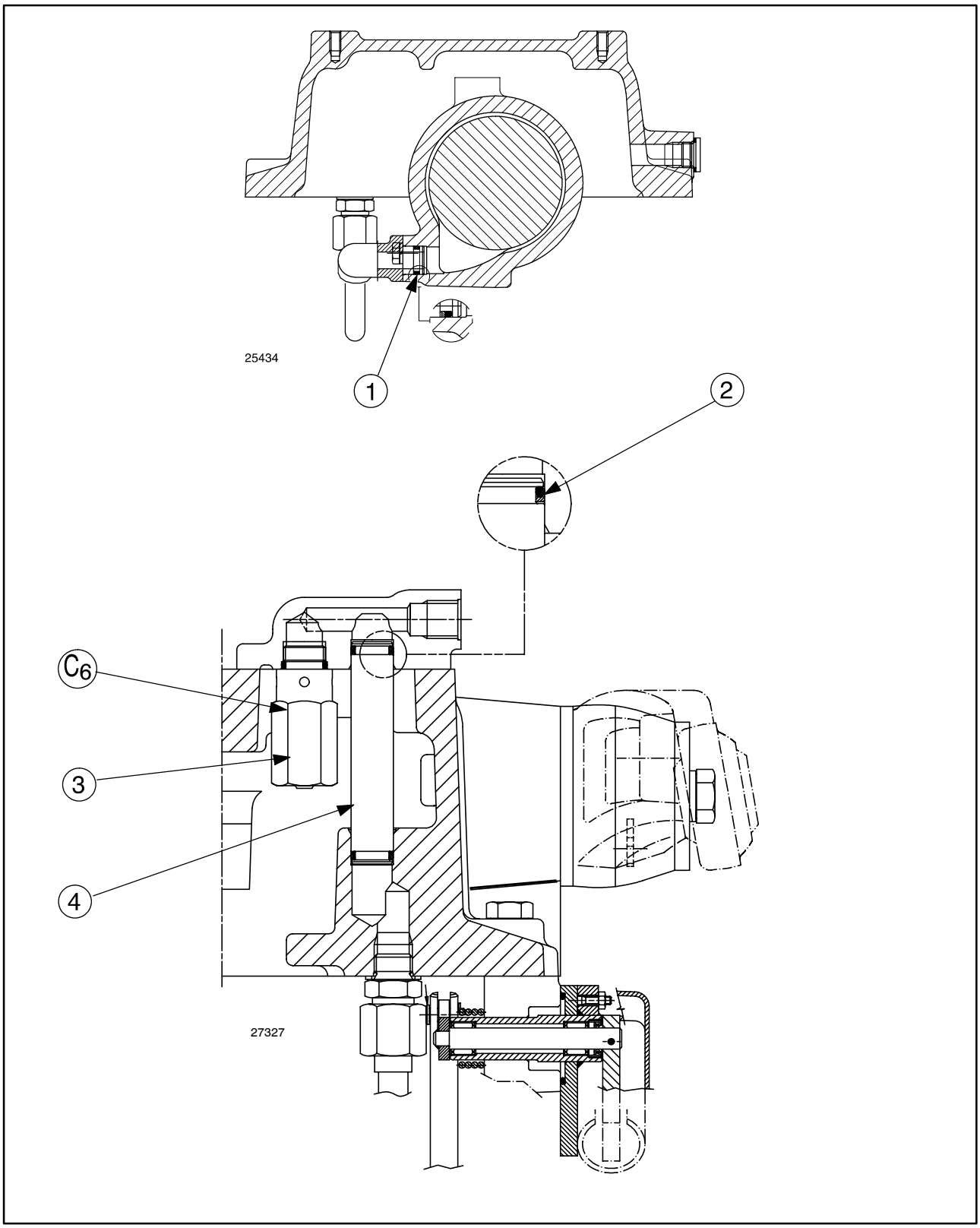
ELECTRO-HYDRAULIC OPERATION OF TRAILER BRAKE VALVE (ITALIA VERSION)

Engine running and parking brake engaged.

1. Parking brake control lever - 2. Relay - parking brake warning light circuit - 3. Relay - trailer brake circuit - 4. Trailer brake control solenoid valves - 5a. Delivery solenoid valve (normally open) - 5b. Discharge solenoid valve (normally closed) - 6. Trailer brake release pressure control valve - 7. Trailer brake valve (see pages 2 and 3) - 8. Trailer brake circuit safety switch - 9. Hydraulic pump - 10. Filter - 11. Brake control line - 12. Delivery lines to auxiliary control valve and hydraulic lift - 13. Brake pump - 14. Tractor-trailer coupling - 15. Trailer brake line - 16. Trailer brake "ON" indicator switch - 17 and 19. Springs - 18. Trailer brake control pin - 20. Battery - 21. Parking brake "ON" indicator switch - 22. Trailer brake "ON" warning light.

On applying the parking brake (1), switch (21) is closed. This allows electrical current to energise relay (2), which closes the circuit to the solenoid valves (5a and 5b), thereby closing the former and opening the latter. In this condition, the oil in the trailer brake and line (15), under the action of spring (19), is discharged through solenoid valve (5b), and the braking action is obtained mechanically by the pressure of spring (19) on piston (18). The pressure drop caused by the oil discharging allows switch (16) to close and thereby allow current to reach and illuminate warning light (22) on the control panel.

Warning - After applying the parking brake, wait approximately 10 seconds before shutting off the engine, in order to allow all the oil to be discharged from the trailer brake cylinder and thus obtaining optimum braking.

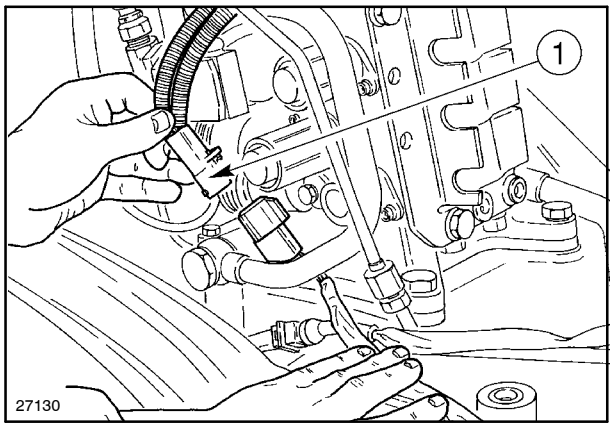


5

Longitudinal and cross-sectional views of lift

1. Seal and back up ring.
2. Seal and back up ring.
3. Cylinder safety valve.
4. Cylinder oil delivery union.

5. Disconnect the connector (1) of the power cable of the hydraulic control valve solenoid valves.



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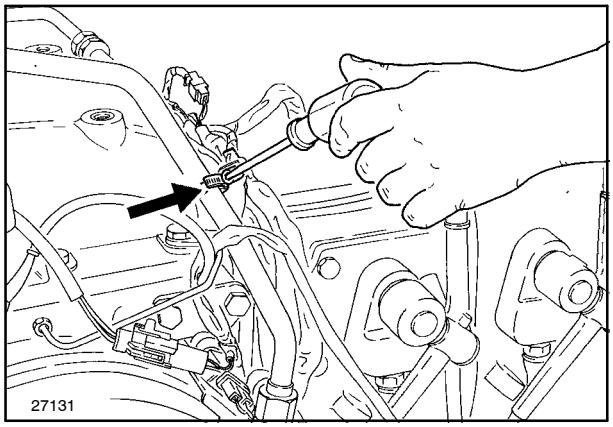
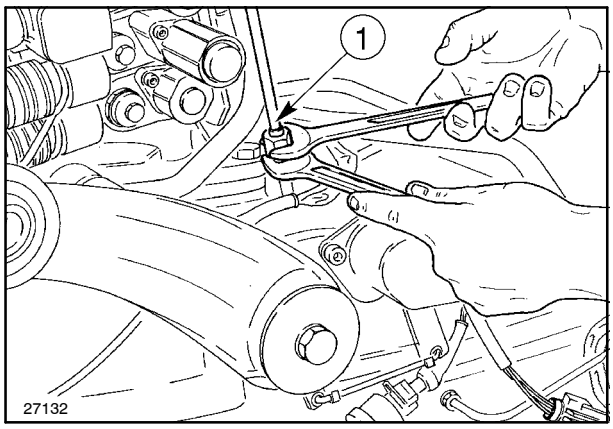
6. Detach the clamp supporting the electric cables.



13

7. Disconnect the control pipe (1) supplying the load maintaining valve.



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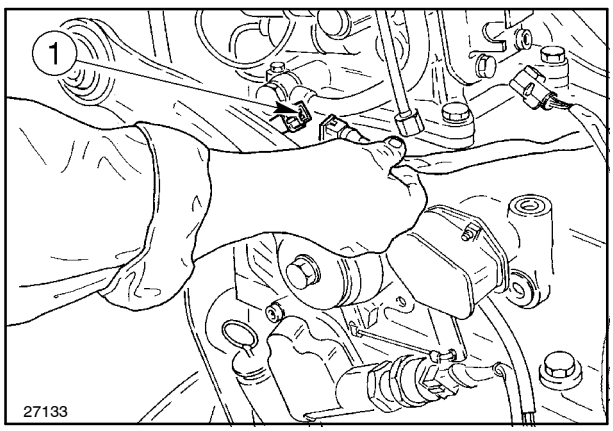
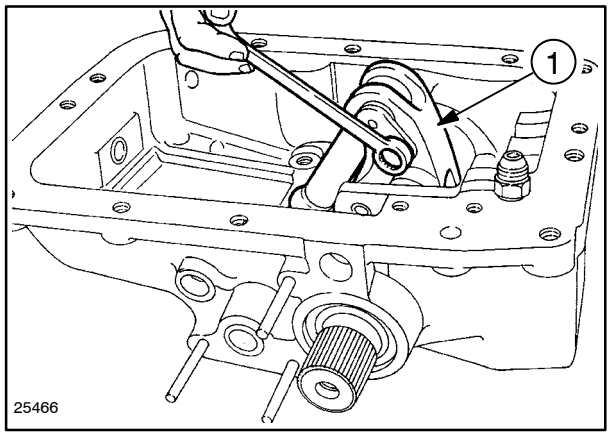
8. Disconnect the connector (1) of the electric cable of the PTO speed sensor pick-up, draft sensor and position sensor.



15

8. Straighten the securing ring and unscrew the internal arm (9) ring-cam retaining bolt.



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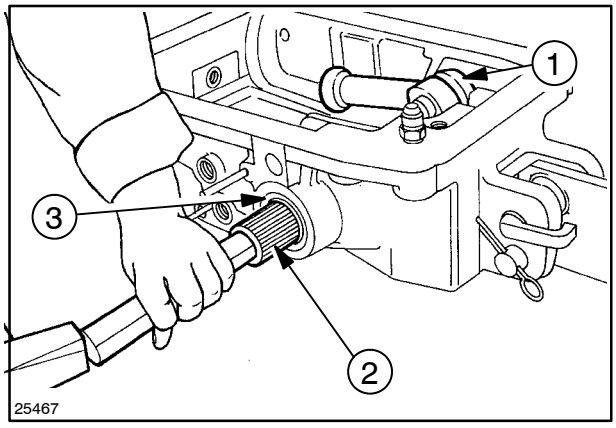
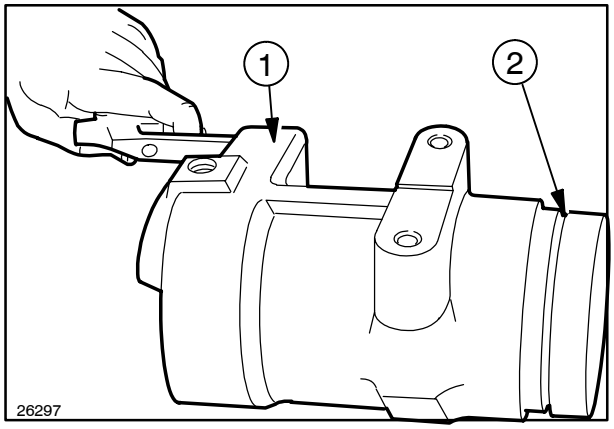
9. Using a brass drift, strike the end of the shaft (2), extract the shaft and the internal arm (1), the ring-cam and the seal (3).



55

10. Use compressed air to remove the piston (2) from its cylinder (1).



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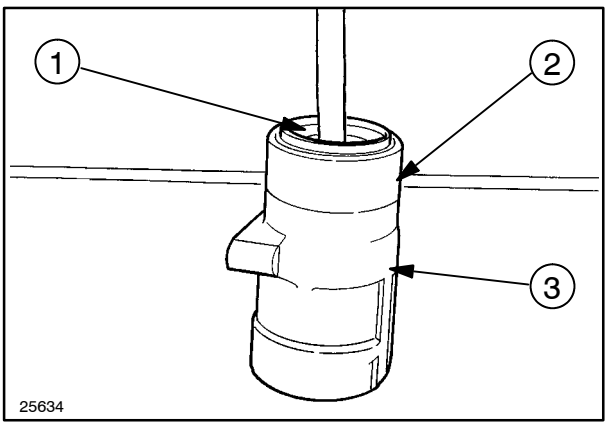
11. Using tool **380001627** (2) insert the piston (1) in the cylinder (3).



57

- Turn switch (1) to A to stop the engine.

NOTE: *The functional software is always disabled when the CDU is connected to the diagnosis connection, unless otherwise specifically noted. Consult the description of the individual HH menus in order to understand why the functional software is disabled.*

The CDU **380000282** gives access to the following menus:

H1 REAR LIFT RAISING AND LOWERING SOLENOID VALVES CALIBRATION.

H2 REAR LIFT CURRENT CALIBRATION VALUES DISPLAY (EDC).

H3 ECU CONFIGURATION AND MODIFICATION DISPLAY.

H4 SOFTWARE REVISION AND DISPLAY.

H5 SWITCHES DIAGNOSTICS.

H6 DRAFT SENSORS VALUES AND DISPLAY (LVDT).

H8 DELETING DATA FROM THE NON-VOLATILE MEMORY (EEPROM).

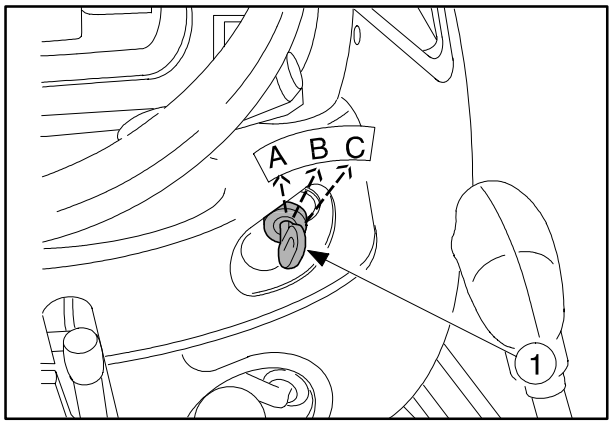
H9 VOLTMETER DISPLAY.

HA LIFTING ARMS POSITION DISPLAY.

HB FRONT LIFT POSITION DISPLAY.

HF ACCESS TO FAULTS IN THE NVM.

NOTE: *The tractor can only be used in the H6, H9, HA and HB menus.*



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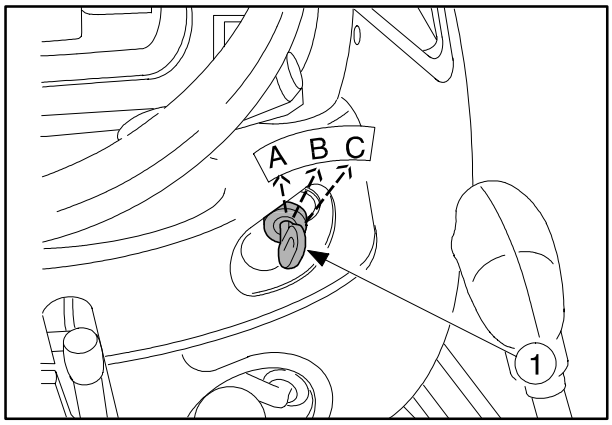
FIRST START-UP

The first start-up procedure must be carried out in the following cases.

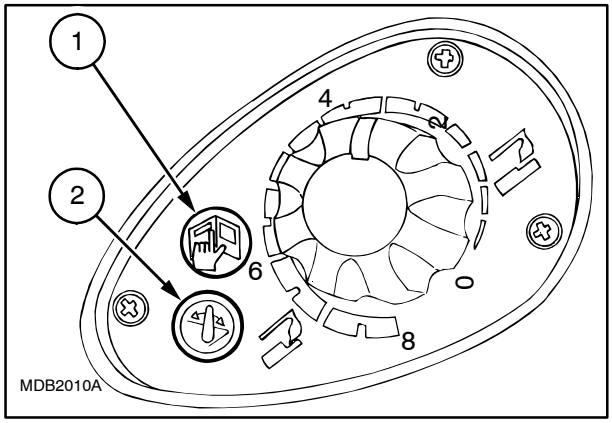
- At the end of the production line.
- Following ECU replacement.
- Following erasure of the Non-Volatile memory (NVM) (see H8 MENU).
- Following manual configuration (see H3 MENU).
- Turn switch (1) to B (ON) without switching on the engine.
- Indicator (1) will be illuminated (non-flashing), after a while indicator (1) will flash to repeat the recognised configuration code - i.e.: rapid flashing, followed by:

1 flash	Only front lift present.
2 flashes	Both Rear lift and Differential lock present.
3 flashes	Rear lift, Front lift and Differential lock present.

- Turn the key (1, fig. 111) to OFF for a few seconds: the configuration is now saved in the Non-Volatile memory (NVM).



111



112

FAULT CODE 16

The wiring on the draft sensor (1) is disconnected or in short to ground or the sensor is faulty.

The rear lift (EDC) does not work, but allows the implement hitch to be caught by means of the mixed control potentiometer in “position” control.

Turn the starter key to the OFF position.
Remove the rear right-hand wheel.
Is the draft sensor or wiring and connection damaged or disconnected?

NO → Disconnect the draft sensor connection.
Are pins (2 or 3) on connection (39) of the draft sensor in short?

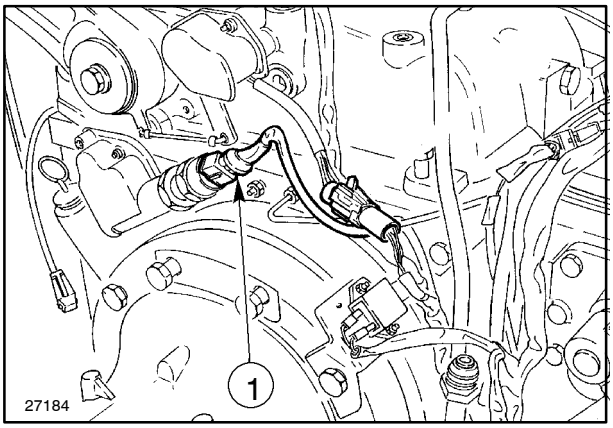
NO → Disconnect the control panel.
Is there electrical continuity on the following wires between connection (39) and connection (127) (ECU):
(39) pin (1) (VB) and pin CN2-29 (VB) (127);
(39) pin (2) (ZN) and pin CN2-24 (ZN) (127);
(39) pin (3) (Z) and pin CN2-35 (Z) (127)?

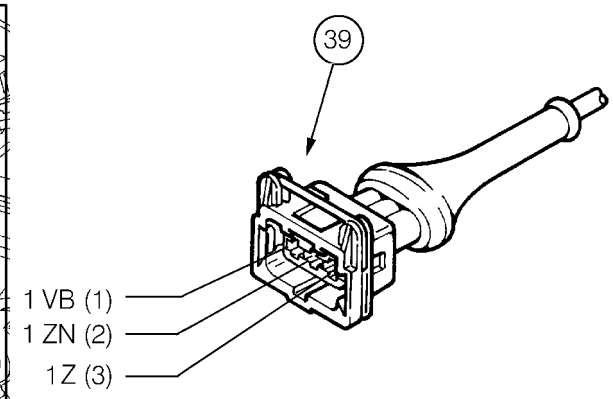
NO → Check the wiring, the connection (156) and eliminate the cause of the open circuit.
Does the fault persist?

YES → Replace the ECU.

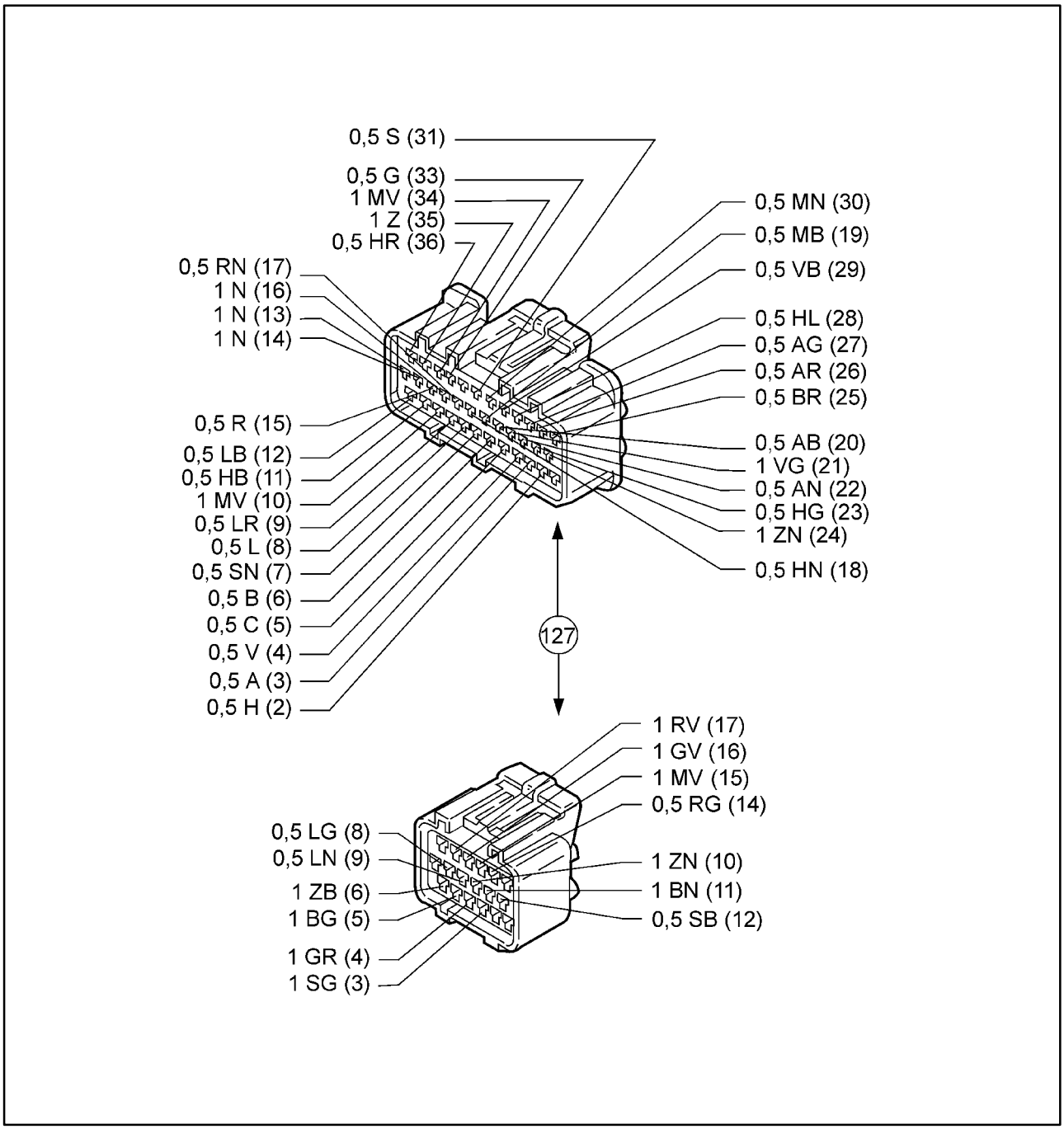
YES → Check the wiring and eliminate the cause of the short circuit.
Does the fault persist?

YES → Connect the connection.
or
Repair and/or replace the wiring.





FAULT CODE 25



FAULT CODE 34

The wiring on the lowering limit potentiometer (3) is disconnected or in short to ground or the potentiometer is faulty.

The rear lift (EDC) does not work, but allows the implement hitch to be caught by means of the lowering limit potentiometer at the maximum value

Turn the starter key to the OFF position.
Remove the lift control panel.
Are wires and the relative connections connected?

NO → Connect wires or connections.

YES

Remove the control panel and the connections (127) on the ECU.
Is there electrical continuity between pin (5) (AN) on connection (33) of the lift control panel and CN2-22 (AN) on connection (127)?

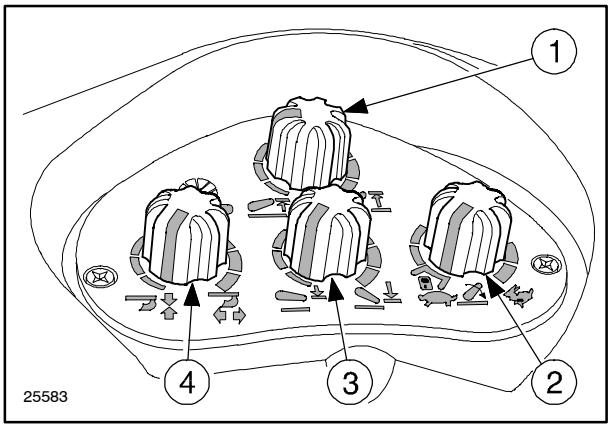
NO → Check the wiring and eliminate the cause of the open circuit.

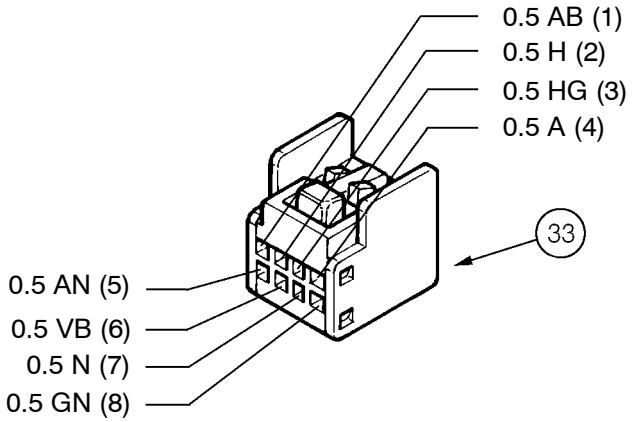
YES

Replace the lift control panel.
Does the fault persist?

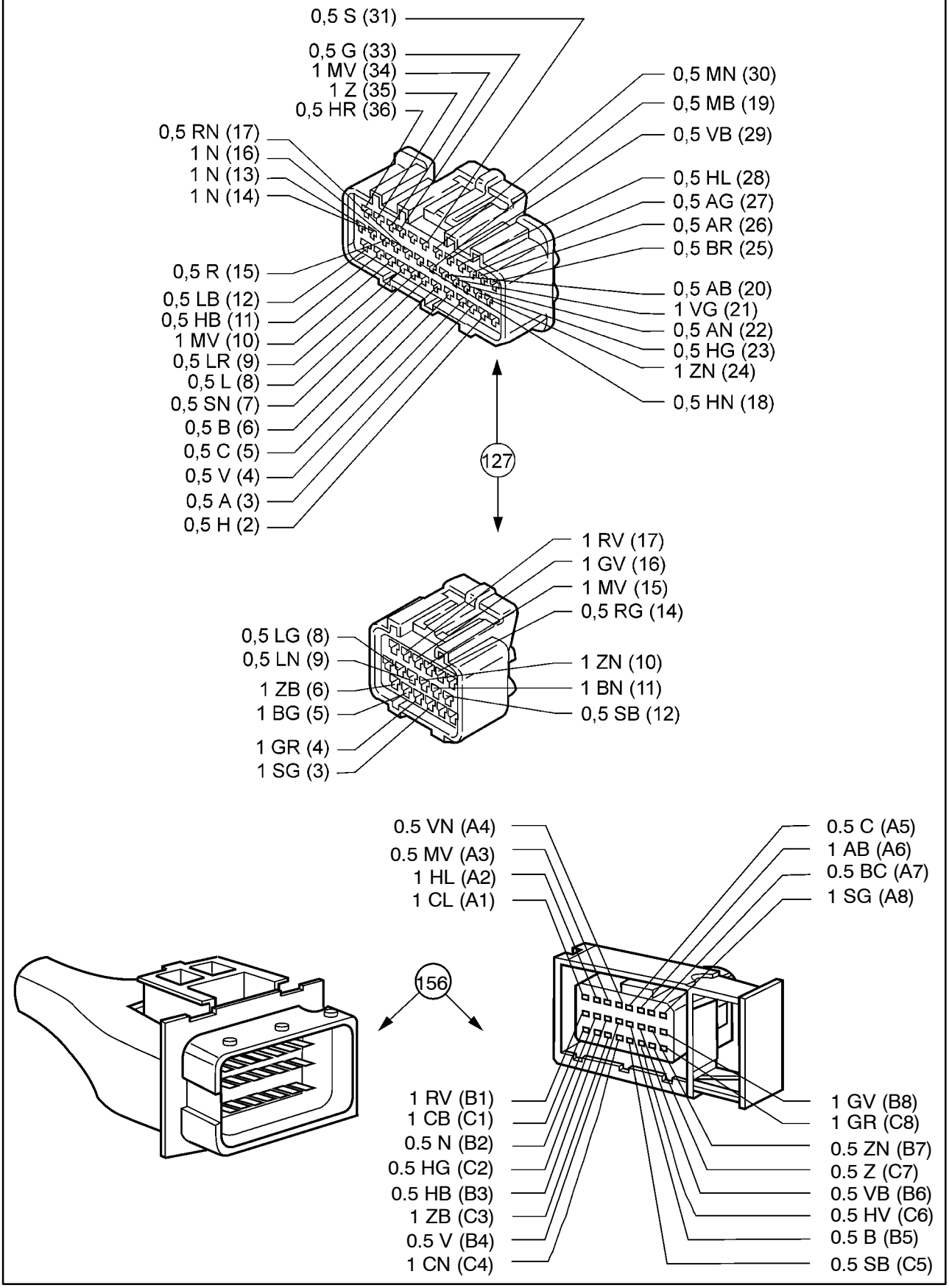
YES

Replace the ECU.





FAULT CODE 42



FAULT CODE 53

The power supply voltage on the sensors (+5V) is too high.

The rear lift (EDC) does not work, but it can be operated by means of the lift external switches.

Turn the starter key to the OFF position.
Remove the control panel and the connections (127) on the ECU.
Turn the starter key to the ON position.
Between pin CN2-20 (AB) on connection (127) (wiring side) and ground, is the reading ~ 12V?

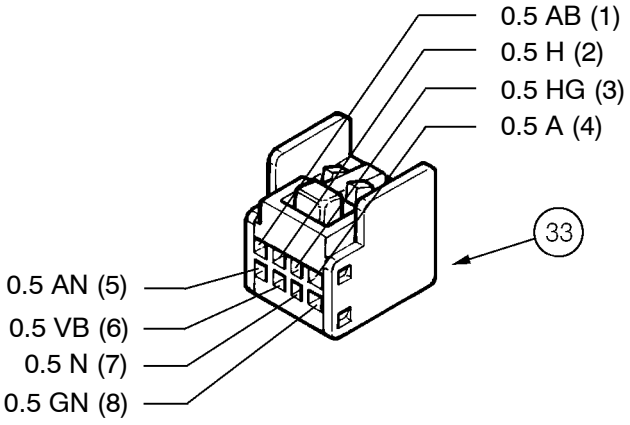
NO → Turn the starter key to the OFF position.
Replace the ECU.

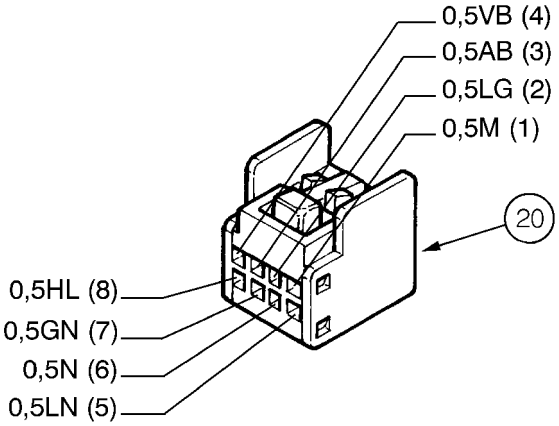
YES ↓

Turn the starter key to the OFF position.
Check the wiring between: pin CN2-20 (AB), pin (A6) (AB) on connection (156) and the lift arm position potentiometer.
Eliminate the cause of the short circuit to +12V.
Does the fault persist?

YES ↓

Check the wiring between: pin CN2-20 (AB), pin (3) (AB) on connection (20) on the working depth potentiometer and pin (1) (AB) on connection (33) of the lift control panel.
Eliminate the cause of the short circuit to +12V.





FAULT CODE 67

The ECU power supply voltage is too low.

The rear lift (EDC) does not work.

Is the battery voltage ~ +12V?

NO → Recharge and/or replace the battery or check the recharging system.

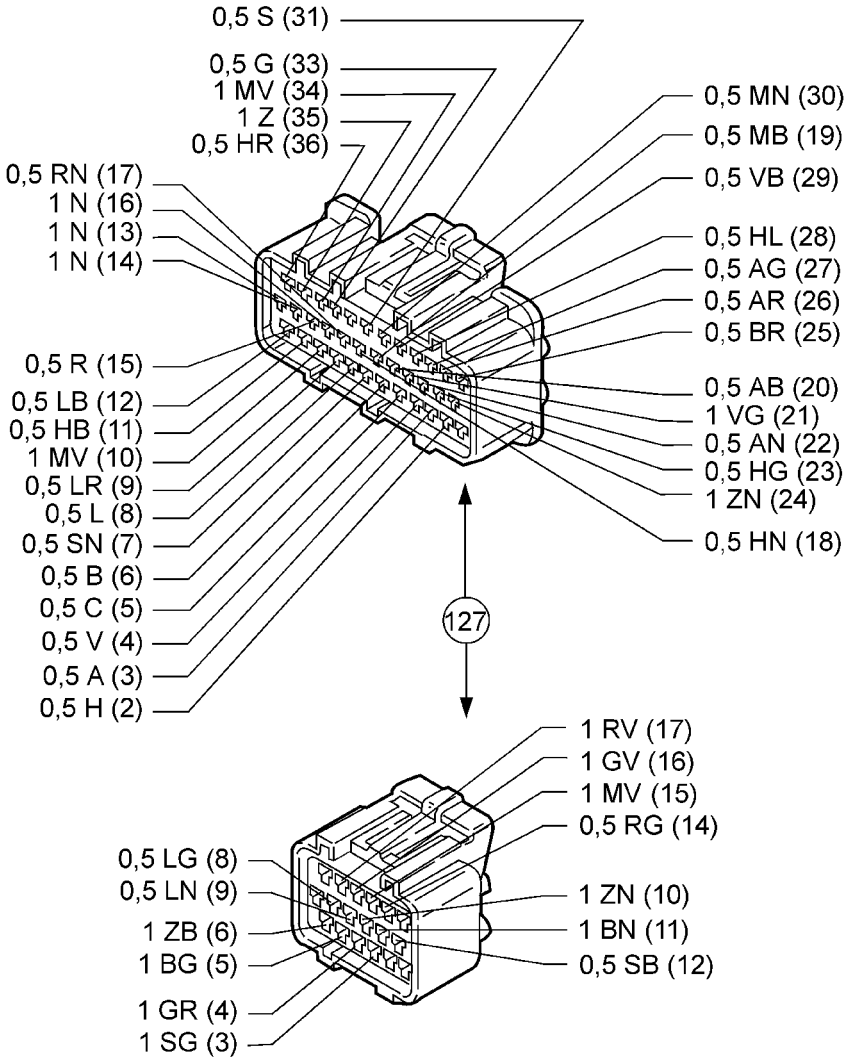
YES

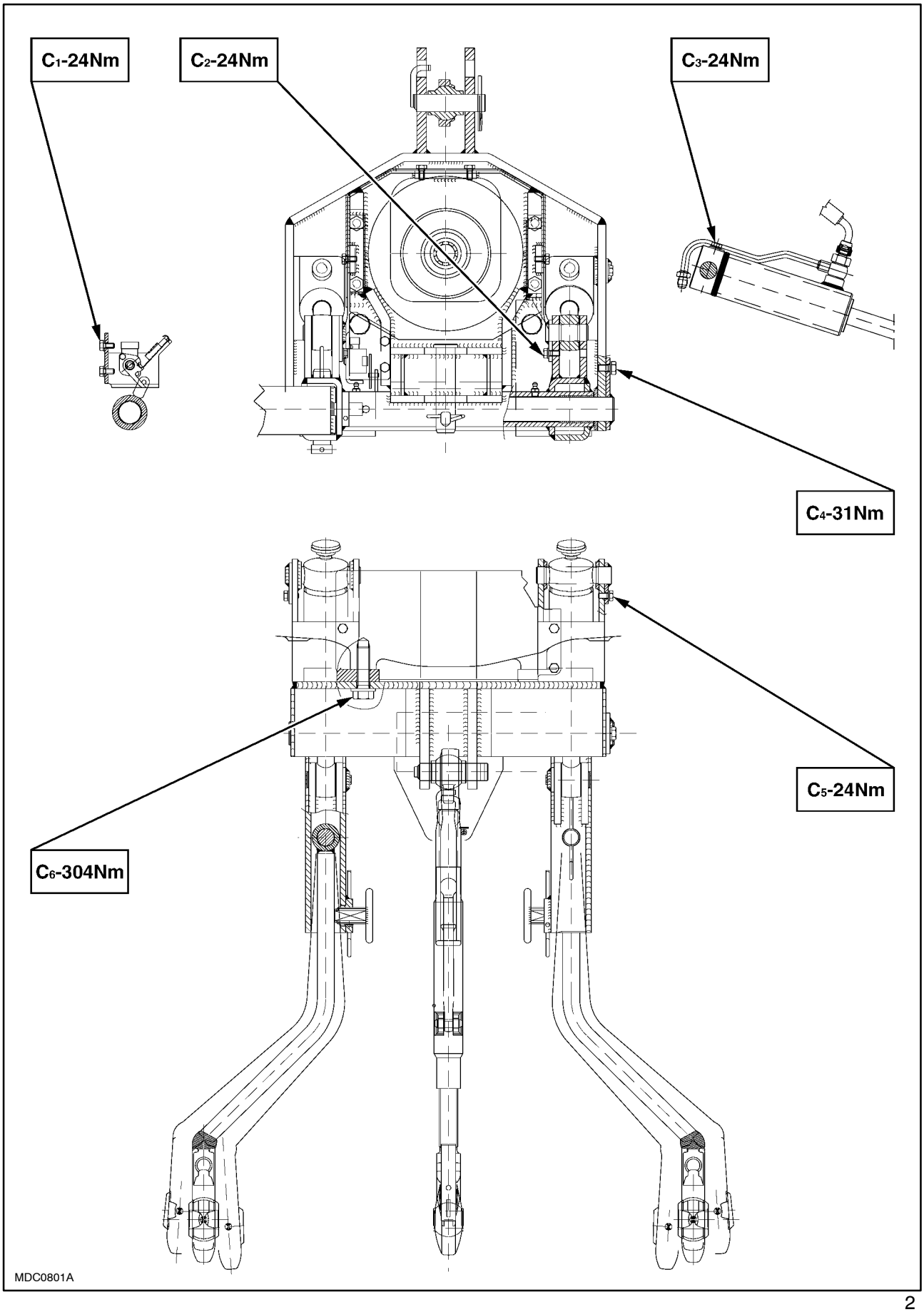
Turn the starter key to the OFF position.
Remove the control panel and the connections (127) on the ECU.
Turn the starter key to the ON position.
Using a digital tester, measure the voltage on pin CN2-10 (MV) on connection (127).
Is the value > 10V?

NO → Check the power supply wiring on the ECU and eliminate the cause of the drop in voltage.

YES

Replace the ECU.





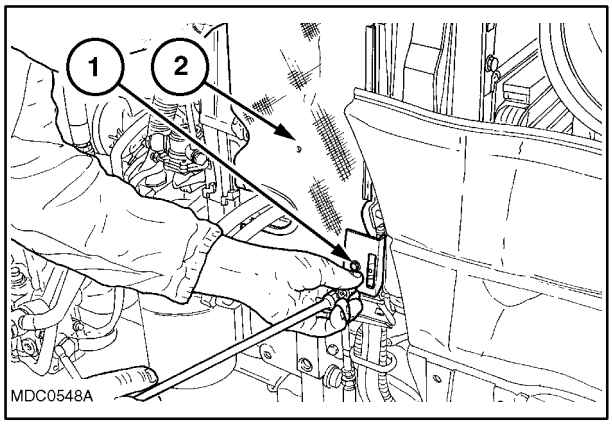
2

FRONT LIFT TROUBLESHOOTING

(cont)

Problems	Possible Causes	Solutions
The lift is unable to keep the load raised (with the engine running, the load moves up and down rhythmically; with the engine turned off, the load lowers).	1. Faulty seal on check valve (8, fig. 19).	Dismantle, check and replace the parts concerned, if necessary.
	2. Oil leakage through solenoid valve (2).	Clean or replace the solenoid valve.
	3. Oil leaking past the lift cylinder seal or the seals on the cylinder oil delivery fitting.	Replace seals.
	4. Defective seal or maximum pressure valve set to very low value (1).	Check calibration and adjust or replace if necessary.
The pressure relief valve cuts in when the lift arms reach the completely raised position.	1. Calibration data incompatibility of front lift potentiometer.	Carry out lift arm calibration operations correctly.
Lift has poor lifting capacity.	1. Pressure relief valve (1) set incorrectly.	Replace the valve.
	2. System safety valve on pump not calibrated.	Replace the valve.
	3. Poor pump efficiency (generally combined with a considerable increase in lift time).	Overhaul or replace pump.
The lift arms do not fully raise or lower.	1. Calibration data lost or incorrect.	Repeat the lift arms calibration operation.
Miscellaneous faults.	1. For various reasons.	See faults codes.

4. Remove the retaining bolts (1) and disassemble the right-hand safety grill (2).



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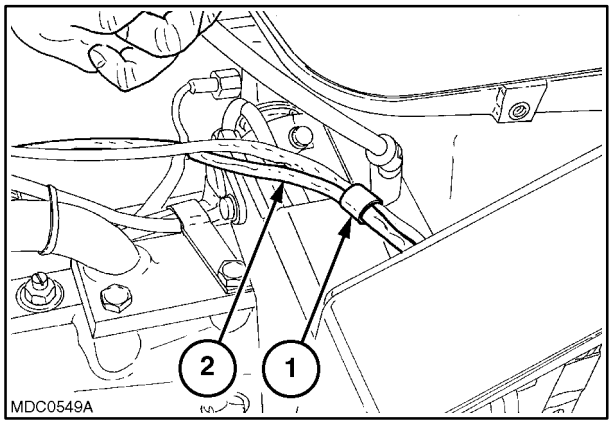
5. Remove the retaining brackets (1) and the electric cable clamps (2) that supply the electromagnetic coupling and the front lift arms position sensor, from the power steering piping.



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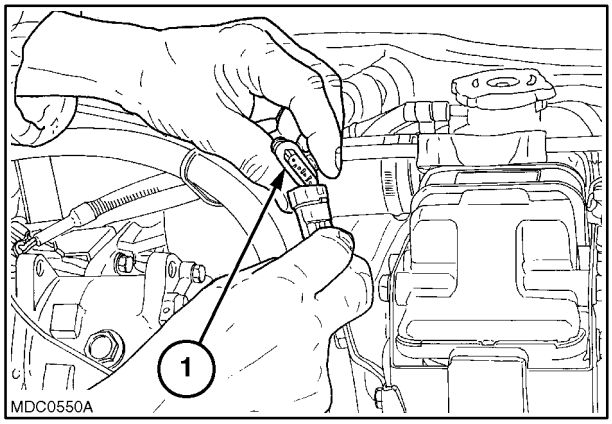
6. Disconnect the electrical connection (1) on the electromagnetic coupling.



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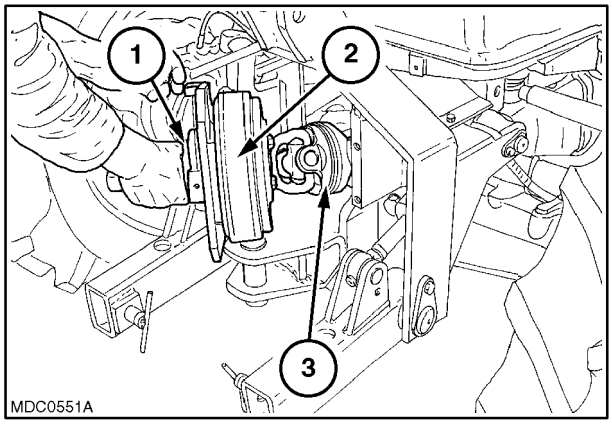
7. Unscrew the four retaining bolts and remove the front power take-off (1) complete with electromagnetic coupler (2) and universal joint (3).



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- To exit from this menu without modifying the configuration mode, press the HMENU key (1), the display (2) shows:

  HH MENU

To change the configuration mode, proceed as follows.

- Use key (3) to change the mode displayed: each time the key is pressed, the display (2) changes, passing from the **NONE** mode to **4WD-PTO** to **4WD** and then to **NONE** mode once more.
- When the required mode is displayed, press and hold down key ▼ (4) for at least 5 seconds.
- Whilst key▼ (4) is pressed, the display (2) carries out a countdown of the remaining time, at 1 second pauses, starting from:

  STORE 5s

  STORE 4s

  STORE 3s

  STORE 2s

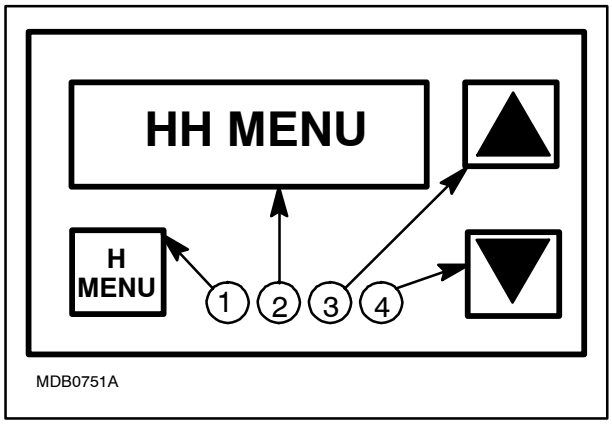
  STORE 1s

- After 5 seconds, the display (2) shows:

  STORED

- Release key (4)

NOTE: *If key ▼ (4) is released whilst the display (2) is carrying out the countdown, the display returns to the mode selected.*



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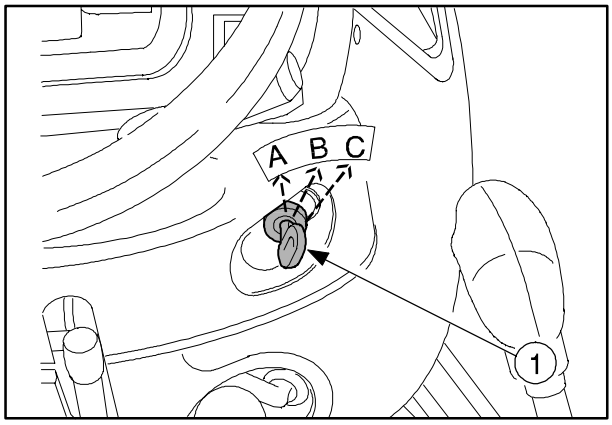
- Switch off the engine by turning switch (1) to A (OFF), this allows the new configuration to be saved.

NOTE: *Selecting the **NONE** mode results in ECU auto-reconfiguration at the next start up. Follow the instructions shown on page 47 to ensure correct configuration.*
Even if any of the available modes can be selected, incorrect mode selection can lead to an illuminated indicator fault or inefficient tractor operation.



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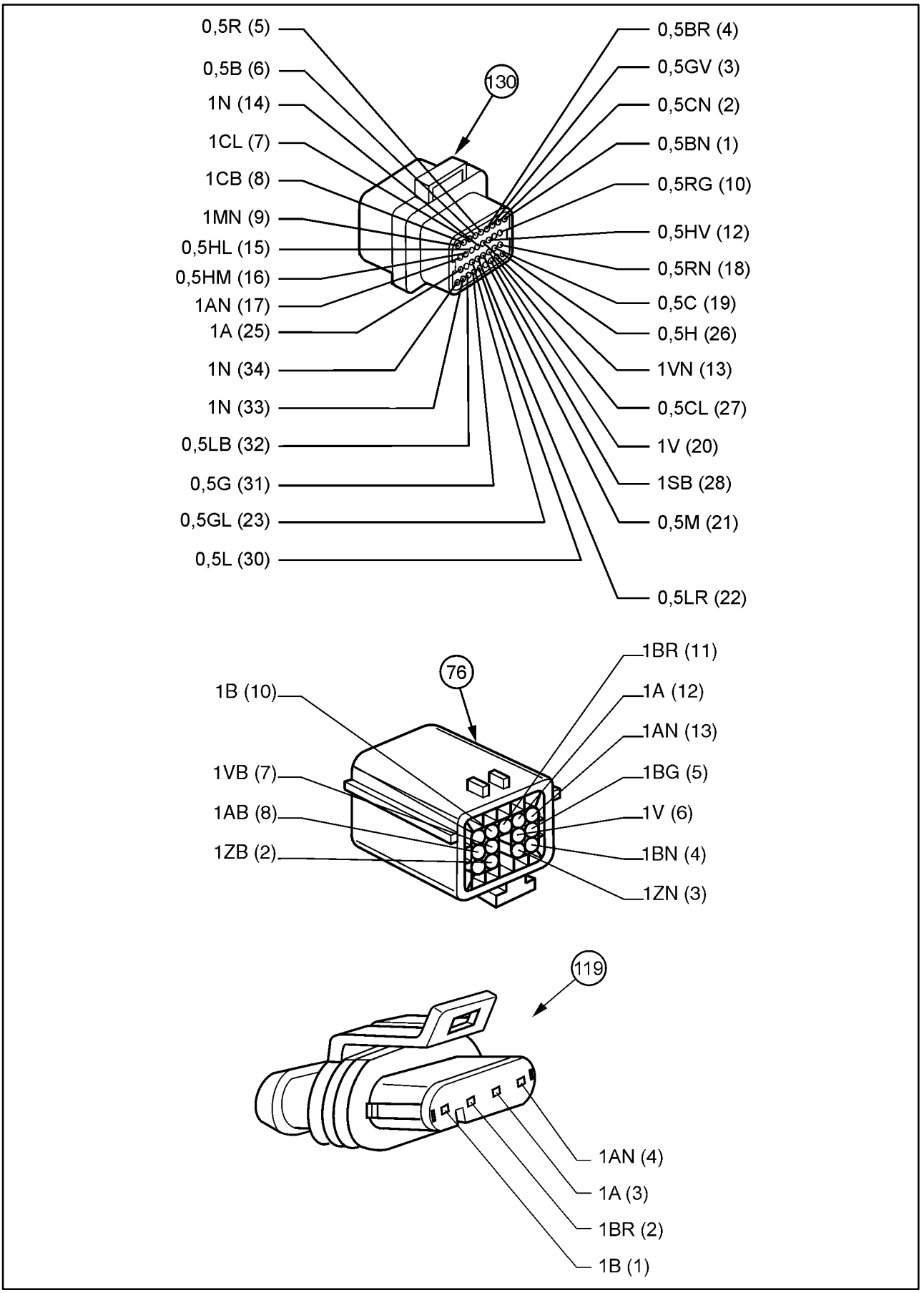
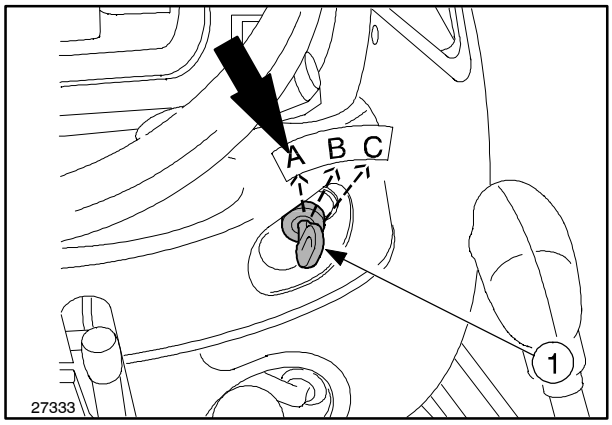
FAULT CODE 16



CONNECTION BETWEEN THE CALIBRATION AND DIAGNOSTIC INSTRUMENT 380000282 TO THE DIAGNOSTIC CONNECTOR

Connect the instrument to the diagnosis socket as described below.

1. Turn the switch (1) to position A (OFF).



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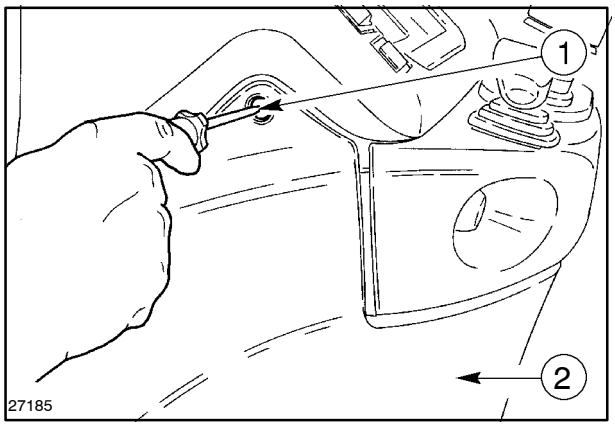
2. Unscrew the bolts (1) and remove the guard (2) on the left-hand side of the dashboard.



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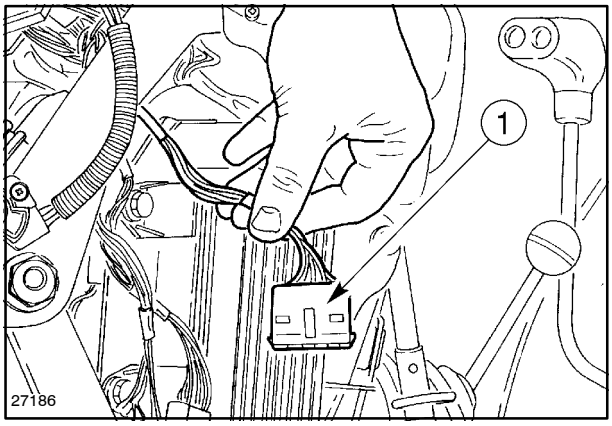
3. Connect the diagnostic instrument **380000282** to the white diagnostic connector (1).



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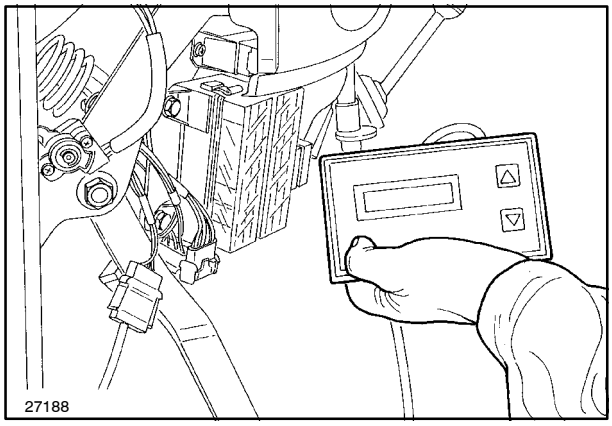
4. Connect the diagnostic instrument **380000282**.



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Channel	Description	Unit of measurement	Value
1	Sensors power supply (5V)	Counts (ADC)	650 to 720
2	Control unit supply voltage (12VF)	Counts (ADC)	380 to 800
3	Control unit supply voltage (12VD)	Counts (ADC)	380 to 800
4	Draft sensor supply (8V)	Counts (ADC)	750 to 850
5	Front lift raising coil current	Counts (ADC)	0 to 1023
6	Front lift lowering coil current	Counts (ADC)	0 to 1023
7	Front lift max. raising potentiometer voltage	Counts (ADC)	90 to 650
8	Front lift working depth potentiometer voltage	Counts (ADC)	90 to 650
9	Differential lock coil current	Counts (ADC)	0 to 950
10	Rear lift raising coil current	Counts (ADC)	0 to 650
11	Rear lift lowering coil current	Counts (ADC)	0 to 650
12	Wheel speed sensor frequency	Hz	≥ 0
13	Raising arms position potentiometer voltage	Counts (ADC)	50 to 650
14	Work position setting potentiometer voltage	Counts (ADC)	100 to 750
15	Descent speed potentiometer voltage	Counts (ADC)	100 to 700
16	Max. raise potentiometer voltage	Counts (ADC)	100 to 700
17	Mixed control potentiometer voltage	Counts (ADC)	100 to 700
18	Lowering limit potentiometer voltage	Counts (ADC)	100 to 750
19	Draft sensor voltage (LVDT)	Counts (ADC)	120 to 800
20	Engine r.p.m.	rev/min	0 to 3000
21	Front lift position potentiometer voltage	Counts (ADC)	50 to 650

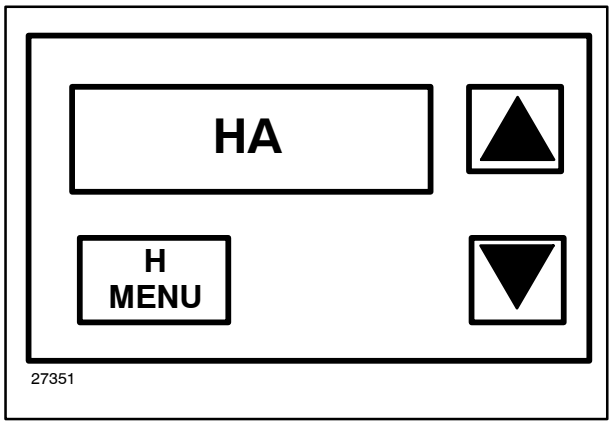
ADC = Analog/digital converter.

HA - REAR LIFT ARMS POSITION DISPLAY

The **HA** menu (on the **380000282** device) displays the **%** value of the pre-defined max. raising limit with the working depth control.

The rear lift (EDC) can be used in this mode.

- Select the **HA** menu, as described on page 67.



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FAULT CODE 48

Fault on the front lift rapid up/down switch (1) or wiring.
The front lift does not work.

Turn the starter key to the OFF position.
Disconnect connection (94) on the up/down switch and, using a digital tester, check the switch.
Does it work?

NO → Replace the switch.

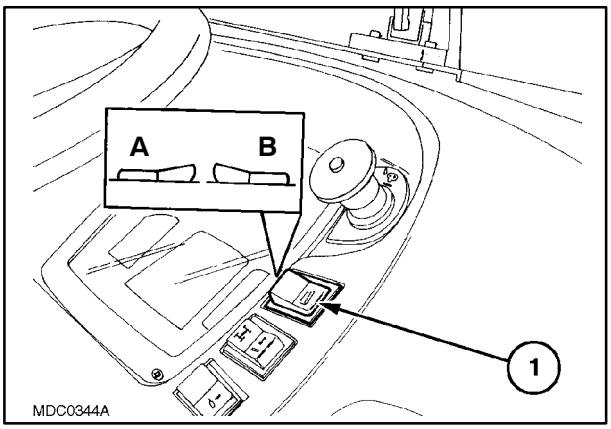
YES

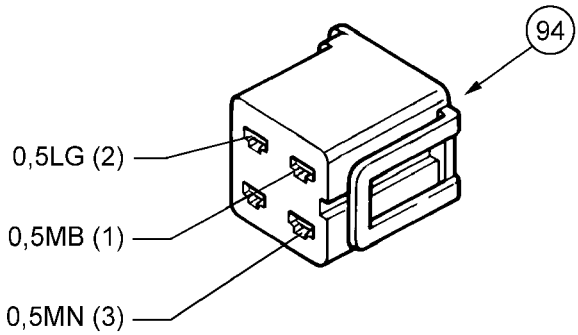
Remove the control panel and the connections (127) on the ECU.
Turn the starter key to the ON position.
Is there a +12V reading between pin CN2-6 (B) or pin CN2-5 (C) on connection (127) and ground?

NO → Replace the ECU.

YES

Check the wiring between connection (127) and the switch and eliminate the cause of the short to +12V.





FAULT CODE 57

The wiring on the position potentiometer (167) of the front lift arms is disconnected or in short to ground.
The front lift does not work.

Turn the starter key to the OFF position.
Remove the potentiometer support.
Disconnect connection (167) on the potentiometer.
Are the wiring and the potentiometer damaged?

NO

YES

Repair or replace the electrical harness.
Replace the potentiometer if damaged.

Calibration must be carried out after this operation.

Using a digital tester, check the potentiometer.
Is the electrical resistance between pins (2) (VB) and (1) (V) 3 to 4 kΩ?

NO

Replace the potentiometer if interrupted.

YES

Is wire (VB) on the potentiometer wiring in short to ground?

NO

YES

Check the wire on the potentiometer and eliminate the cause of the short to ground.

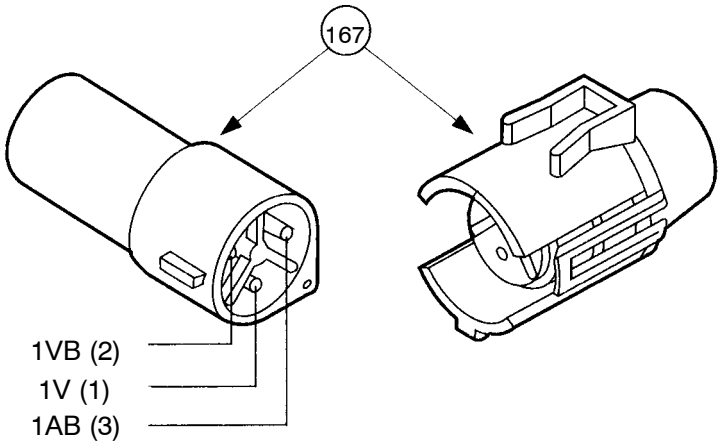
Remove the control panel and the ECU connection (127).
Is there electrical continuity on the following wires between the potentiometer and connection (127):
pin (3) (AB) and pin CN2-20 (AB) on (127);
pin (2) (V) and pin CN2-4 (V) on (127);
pin (1) (VB) and pin CN2-29 (VB) on (127)?

NO

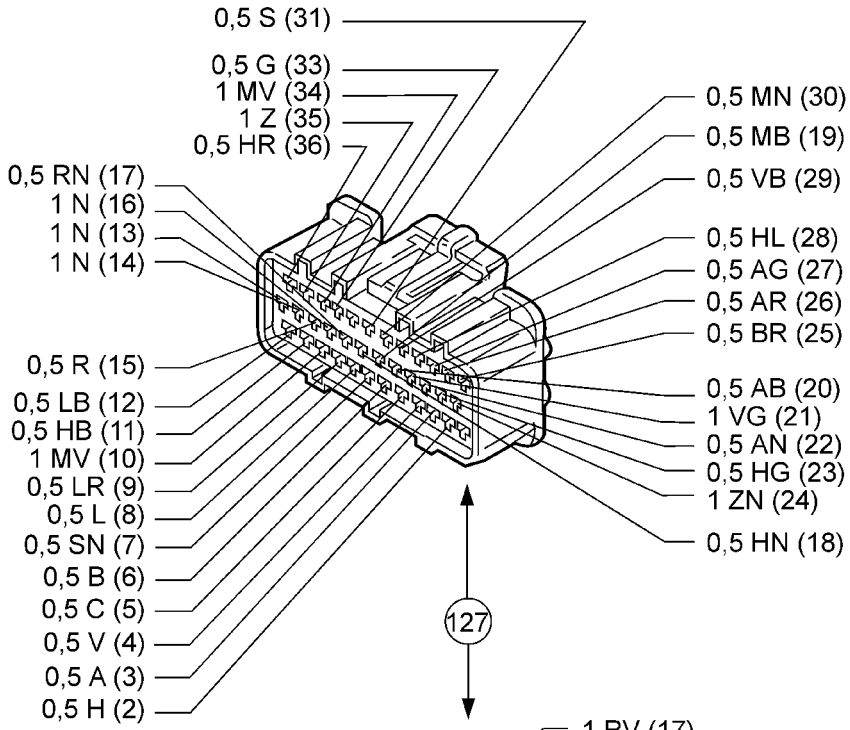
YES

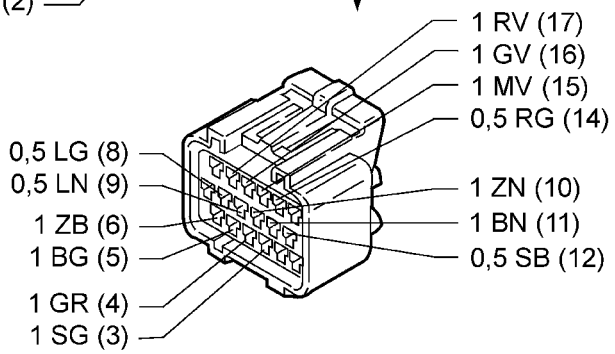
Replace the ECU.

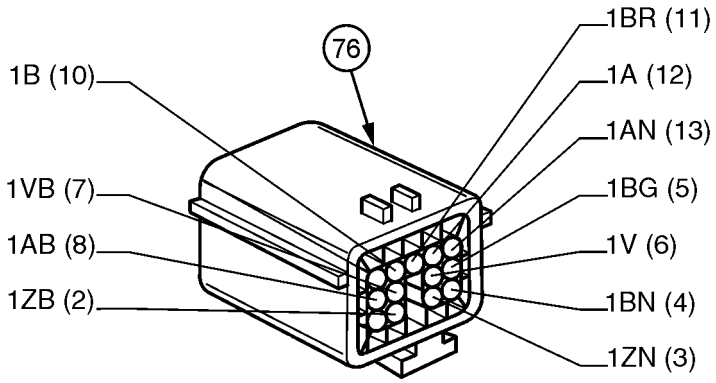
Check the wire on the potentiometer and eliminate the cause of the short to ground.



FAULT CODE 71



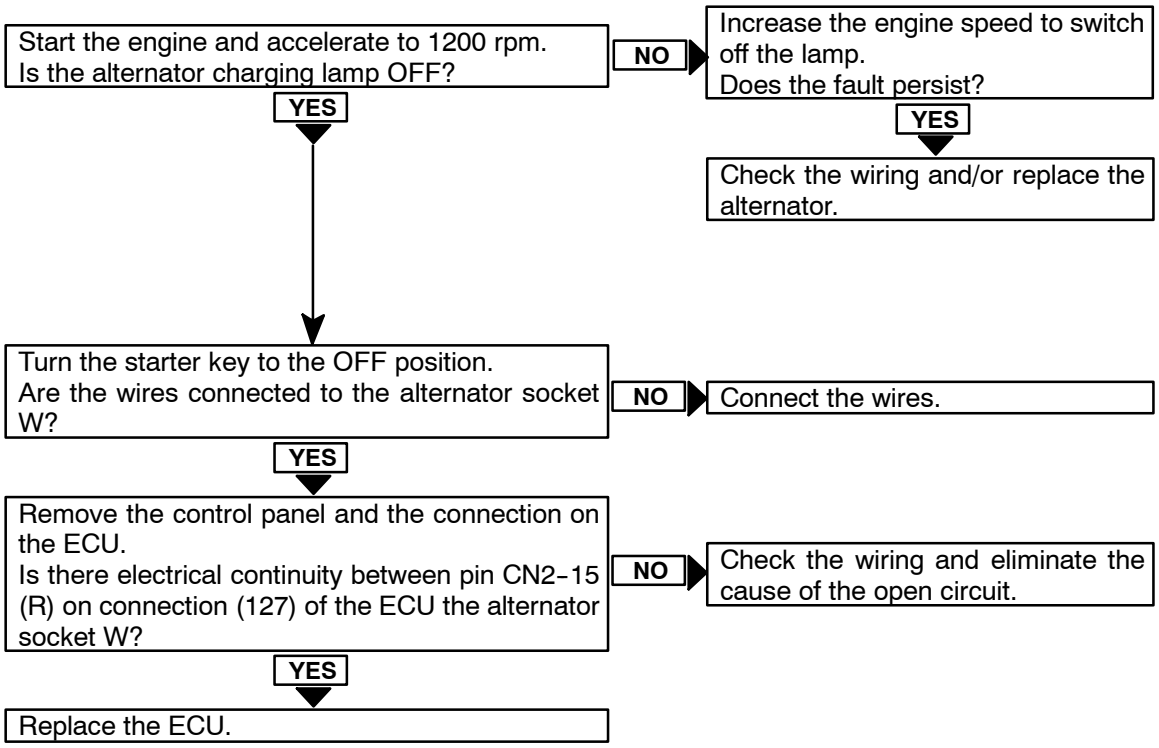


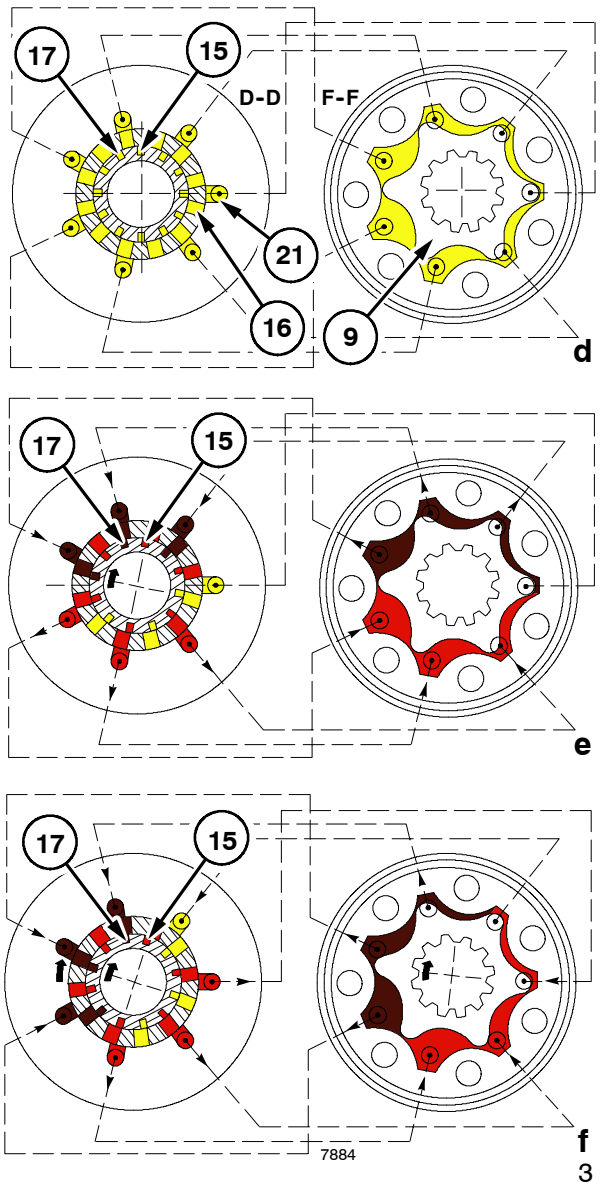


FAULT CODE 79

The engine speed signal from the alternator is not read by the ECU.

This fault is displayed during lift arms calibration, preventing the operation from being carried out.





3

Left-hand steering control
(B, L-ht, fig. 2)

By turning the steering wheel in an anticlockwise direction, the movement of the parts is inverted, the delivery grooves (17, sect. E-E, fig. 1) direct the oil to the ducts (20), and control the left-hand turning action.

Emergency hydraulic control
(C, Er-ht, El-ht, fig. 2)

In the event of feed faults, steering is still possible by turning the steering wheel. The valve (5) remains in the same position as with normal control and the rotor works in the same way as a hand pump, directing the oil to the control circuit. The non-return valve (4) opens and cuts off the feed pump, allowing the oil to flow directly from the rotor reservoir.
The valve (23) remains closed in order to prevent oil leaks from faulty connecting pipes between the hydraulic pump and the hydrostatic steering unit.

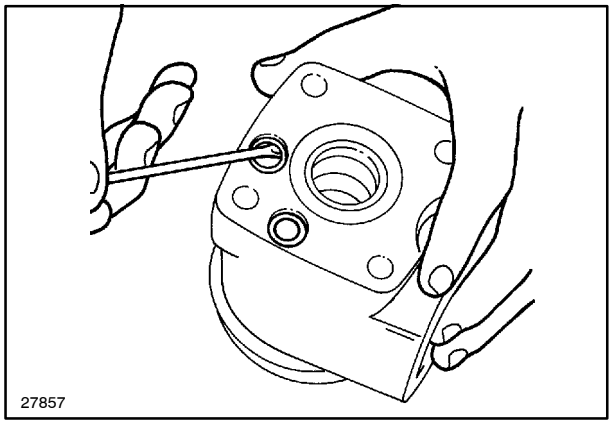
Cylinder safety valve and backflow valve
(see, fig. 2)

The safety valves (33), when open, discharge the pressure created by the piston (H) on one of the cylinder chambers as a result of the strong external stress on the wheels. At the same time, the lack of pressure in the opposite chamber is compensated by the flow of oil from the open backflow valve (34). Pressure on one of the cylinder chambers caused by weak external stress, insufficient to open the cylinder safety valve, is discharged by means of normal control valve leakage, whereas the lack of pressure in the opposite chamber is compensated by the backflow valve (34), as shown in fig. 2. This valve, as well as eliminating continuous steering corrections, prevents vibrations on front wheels (shimmy), hydraulic circuit failure and steering rod distortion.

Power steering operation circuit sectional views (*see fig. 1)

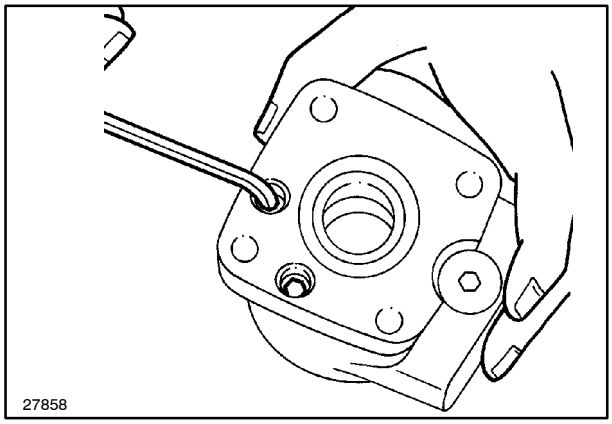
A. Neutral position operation diagram.
B. Right-hand turn (R-ht) and left-hand turn (L-ht) operation diagram.
C. Emergency right-hand turn (Er-ht) and emergency left-hand turn (El-ht) operation diagram.
d. Operation diagram for sections D-D and E-E in neutral conditions*.
D. DANFOSS OSPC control valve.
e, f. Operation diagrams for sections D-D and E-E in two successive right-hand turn phases*.
F. Filter.
H. Control cylinder.
M. Pump delivery.
N. Backflow valves (34) operation diagram with control valve (D) in neutral and cylinder (H) piston under external stress (indicated by the black arrow).
P. Pump.
R. Flow control.
S. Discharge to gearbox.
V. Steering wheel.
Z. Resonance attenuator filter.
4. Non-return valve.
5. Rotating valve.
6. Valve seat sleeve (5).
9. Rotor.
13 and 14. Oil flow ducts in the neutral position.
15. Delivery grooves (no. 6) to the compartments on the rotor in the suction phase.
16. Ducts (n.12) alternately connecting with the grooves (15 and 17).
17. Delivery grooves (n.6) to the cylinder connecting with the compartments on the rotor in the delivery phase and the ducts (18 and 20)*.
19. Discharge grooves (n.6) to the cylinder connecting with the ducts (18 and 20)*.
21. Ducts connecting the holes (16) with the compartments on the rotor in suction delivery phases.
23. Non-return valve.
24. Pressure relief valve (setting: page 2).
26. Left-hand cylinder chamber connecting duct.
27. Right-hand cylinder chamber connecting duct.
33. Cylinder safety valve (setting: page 2).
34. Backflow valve.

18. Remove the seal washers.



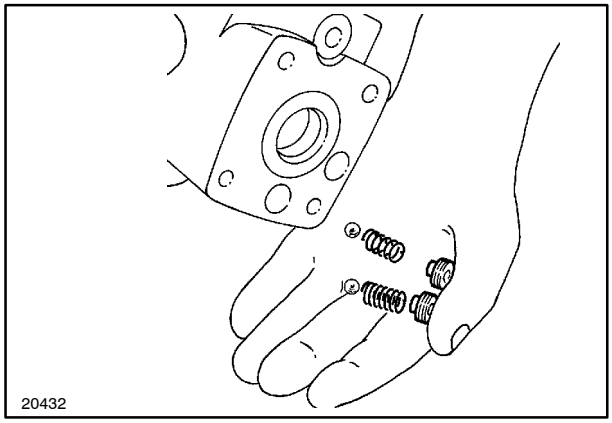
31

19. Using a 0.2362 in. (6 mm) Allen wrench, remove the calibration adjuster screws on the cylinder safety valve.



32

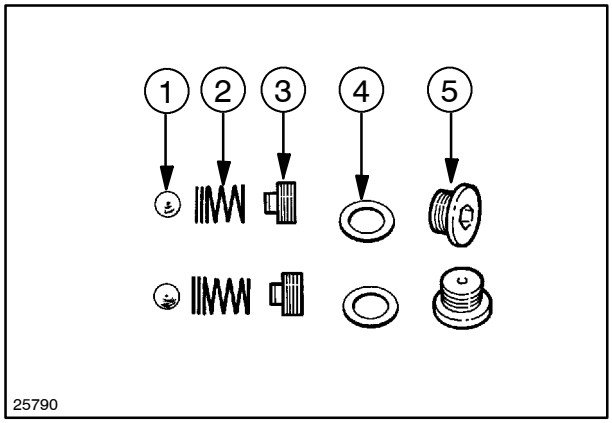
20. Turn the control valve body over, extract the springs and the balls from the two cylinder safety valves.



33

Cylinder safety valves components (order of disassembly–assembly).

1. Cylinder safety valve ball.
2. Pressure spring.
3. Calibration adjuster screw.
4. Seal.
5. Blanking plug.



34

OP. 41 204 38
HYDROSTATIC STEERING CONTROL VALVE

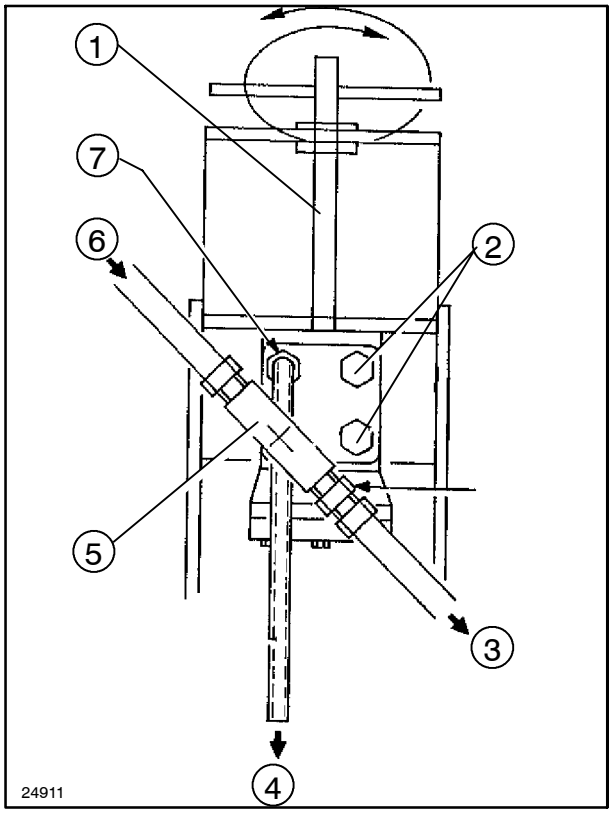
Bench testing

A - CHECKING ROTATING VALVE WEAR

1. Make the connections shown in the diagram in fig. 76 and complete the circuit as in fig. 76. Using the splined drive shaft (1, fig. 77) hold the power steering control valve in the steering position (right or left.
2. Using the handwheel (5), increase the circuit pressure to approach the pressure relief valve setting (page 2), without allowing the valve to intervene.
3. Apply a torque wrench (2) to the drive shaft (1) and tighten to a setting of approx. 34 Nm (3.5 Kgm), check that the rotating valve takes more than ten seconds to complete one full rotation. If less than ten seconds, replace the complete control valve.

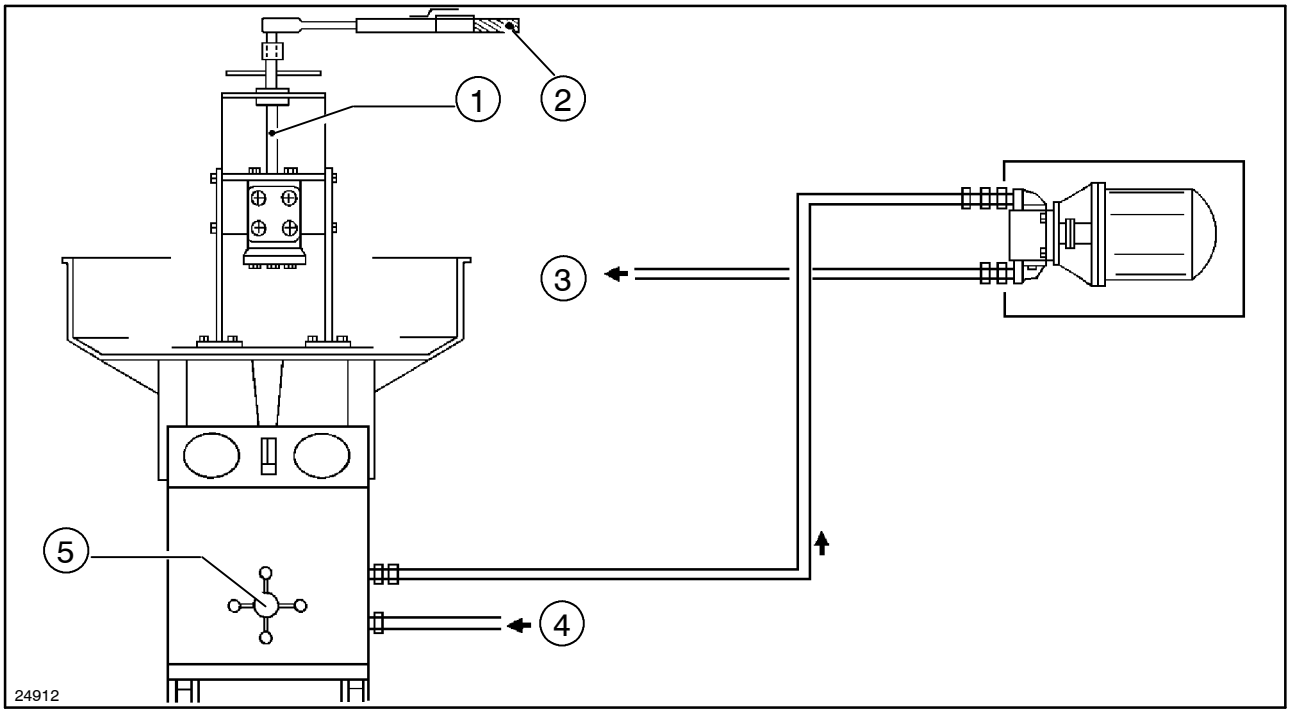
Test Conditions.

Oil type ..... IDRAULICAR AP51
Oil viscosity ..... SAE 20 W
Oil temperature ..... 140 °F (60 °C)
Hydraulic pump capacity ..... dm^3/min
..... (litres/min) 12
Electric motor speed ..... 1450 rpm



76

1. Splined control shaft - 2. Plug G 1/2" - 3. To the restriction - 4. Exhaust - 5. Three-way coupling G 1/2" - 6. From delivery line - 7. Discharge coupling G 1/2".

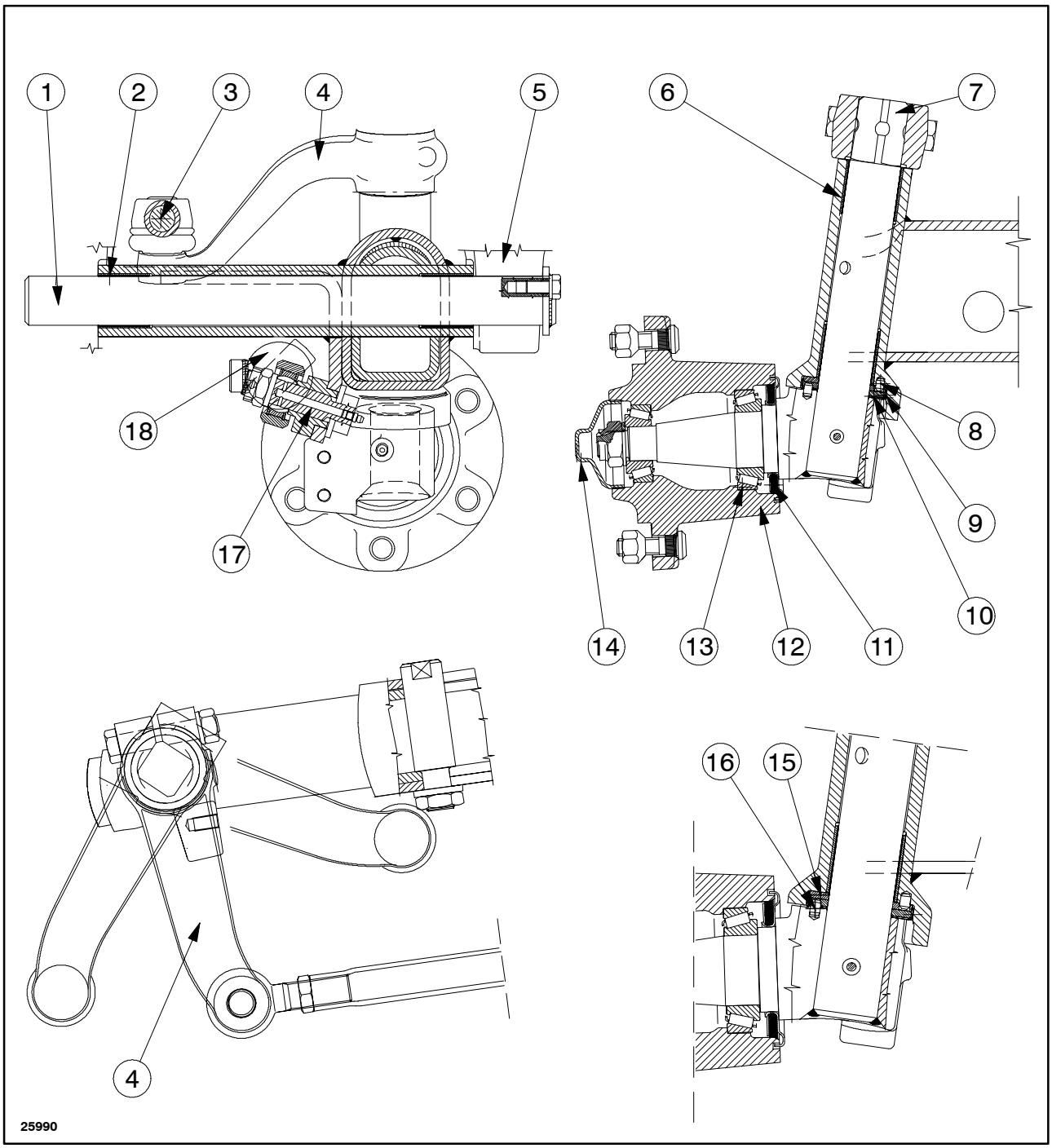


77

Installation diagram of equipment for testing the rotating valve, seals and for pressure relief valve calibration.

1. Splined control shaft.
2. Torque wrench.
3. Delivery.
4. Restriction.
5. Pressure adjustment handwheel.

CROSS-SECTIONAL VIEWS

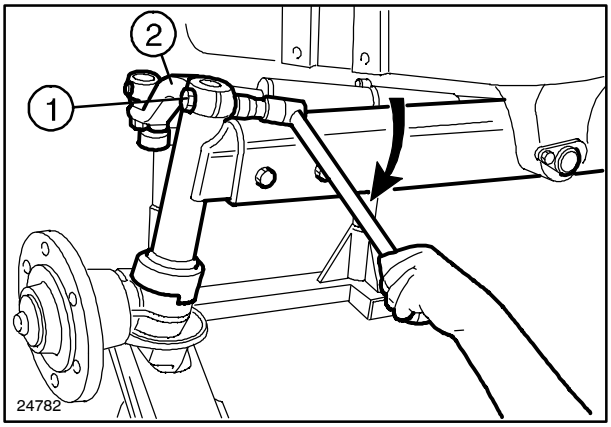


2

Sectional views of the stub axle, articulation pin and front axle

1. Axle articulation pin
2. Axle articulation bushings
3. Steering transverse tie rod
4. Stub axle pin control lever
5. Axle support
6. Bushings
7. Stub axle pin
8. Support ring grub screw (13)
9. Cap
10. Bronze thrust ring
11. Seal
12. Wheel hub
13. Tapered roller bearing for wheel
14. Cover for bearing greasing and adjustment
15. Steel thrust ring
16. Grub screw for cap (11) and thrust washer (12)
17. Control cylinder fulcrum pin (18)
18. Control cylinder installation position

5. Position a hydraulic jack under the stub axle and unscrew the bolt (1) securing the control lever (2) to the stub axle pin.



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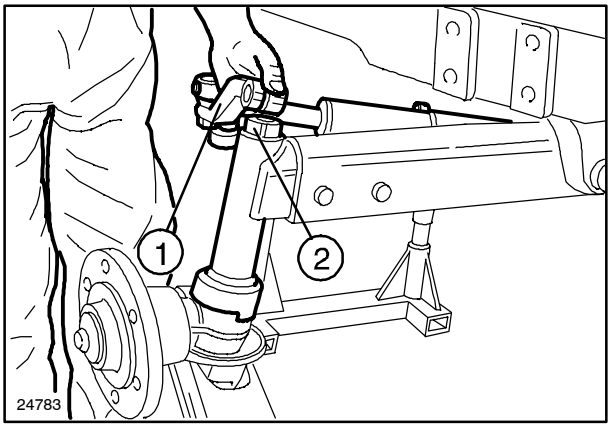
6. Extract the control lever (1) from the stub axle pin (2).



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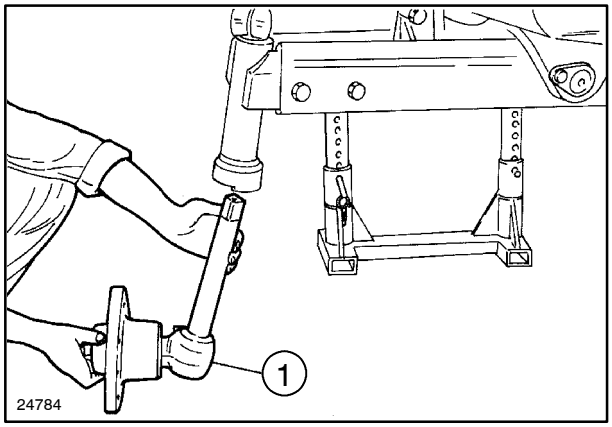
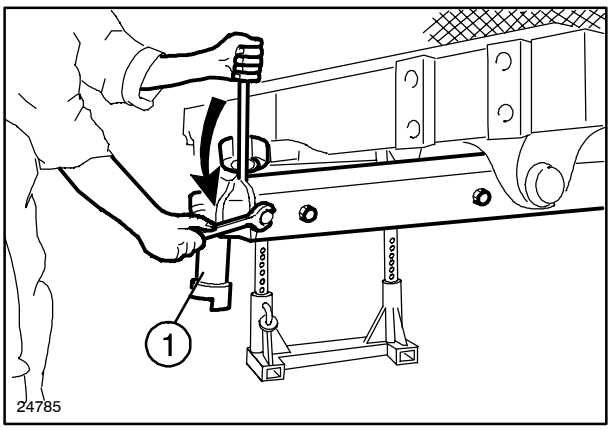
7. Lower the hydraulic jack and remove the stub axle (1).



31

8. Unscrew the bolts securing the axle end (1).



32

Thermostatic expansion valve

This valve serves to reduce the pressure of the liquid refrigerant from the condenser so that the refrigerant entering the evaporator can evaporate and thus take heat from the air which is to be cooled.

The expansion valve has two main functions:

— metering: the calibrated bore (6, fig. 5) inside the valve body creates a difference in the pressure of the refrigerant between the inlet (4) (liquid state) and the outlet (7) (mixed liquid/vapour state); the calibrated bore (6) also serves to atomise the refrigerant to facilitate subsequent evaporation;
— modulation: inside the valve body a thermostatic sensor controls the valve aperture so that the right quantity of refrigerant enters the evaporator to ensure complete evaporation.

If the thermostatic sensor (2, fig. 5) detects an increase in the temperature of the refrigerant at the evaporator outlet, the flow of refrigerant is increased.

If the temperature in the cab drops or the compressor starts to operate at a higher capacity (due to an increase in engine speed), the flow rate into the evaporator is reduced.

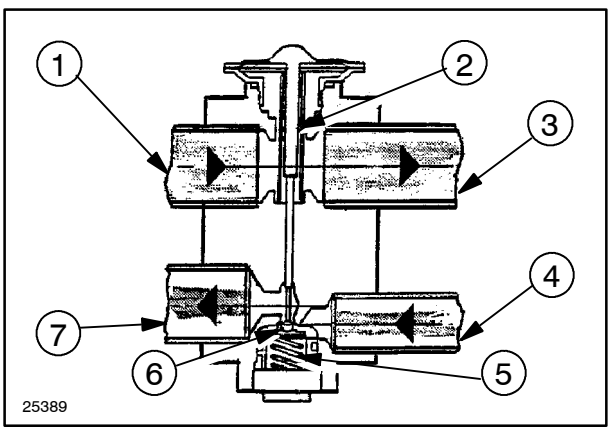
The expansion valve is installed on the evaporator inlet fitting (7), and as the internal refrigerant flow control system is completely automatic, it requires no special maintenance.

To perform functional testing, with the system is fully charged, check that the system operating pressures are those indicated on page 3.

Note – In the event of malfunction, replace the valve.

Expansion valve block.

1. From the evaporator outlet.
2. Thermostatic sensor.
3. To compressor suction inlet.
4. From filter/dryer.
5. Spring.
6. Calibrated orifice and ball.
7. To evaporator inlet.



5

sed, apart from cocks (9 and 18) and the cock fitted on the pipe (16).

38. Check that all the evacuation/charging station cocks are closed, apart from cock (27, fig.13).

39. Check that the stations are switched off with switches (5 and 19) in position "0".

40. Using figure 12 for reference, turn switch (5) to position "2" HEATING CYLINDER to switch on the refrigerant heater installed on the cylinder (19), to facilitate the transfer of refrigerant to cylinder (31, fig. 13) of the evacuation/charging station.

41. On completion of the refrigerant transfer operation, close all the cocks with the exception of cock (9, fig. 12) and switch off the station by turning switch (5) to position "0".

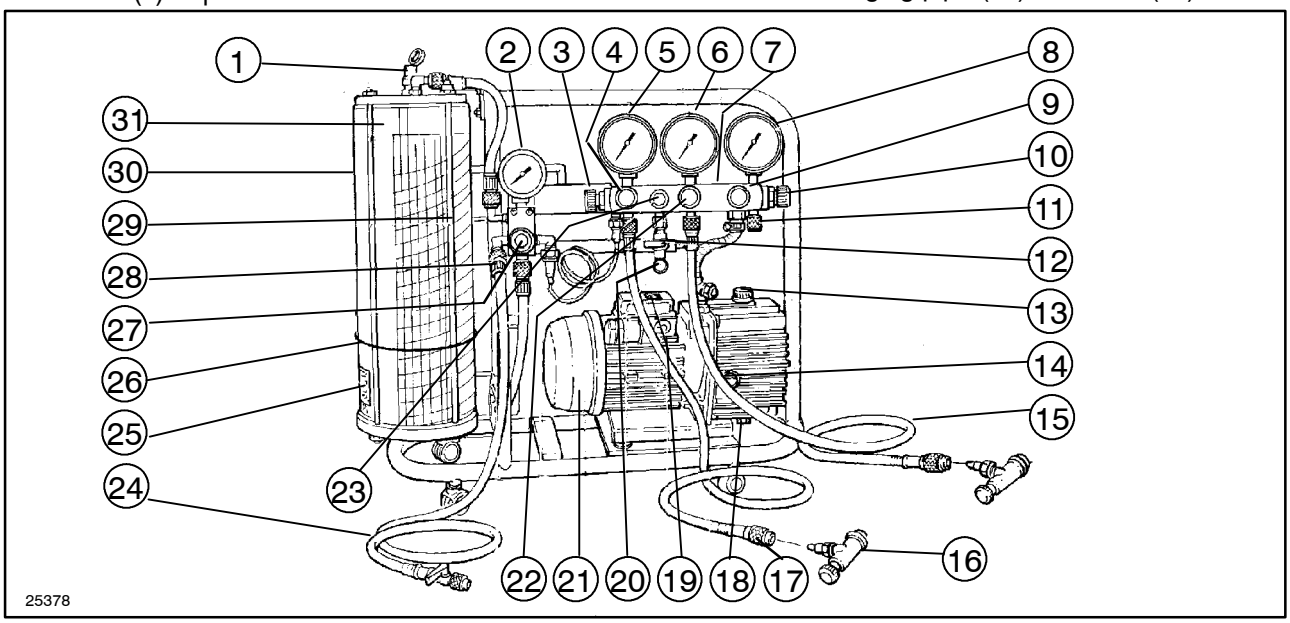
42. Check the quantity of refrigerant in the graduated cylinder (31, fig.13).

43. Bearing in mind that the amount of refrigerant to add to the air-conditioning system is stated in the note on page 22, calculate the amount of refrigerant fluid to add to the cylinder (31) to obtain the right quantity to add.

44. Transfer refrigerant from the external cylinder to the graduated cylinder (31) proceeding as follows.

45. Connect the yellow pipe (24) to connector (28) and to the external cylinder containing the refrigerant (upside down if not equipped with an outlet valve).

46. Open the cock on the external cylinder, the cock on the charging pipe (24) and cock (27).



13

Evacuation/charging station.

1. Safety valve.
2. Cylinder pressure gauge.
3. Refrigerant charging cock.
4. Low pressure side cock (LOW).
5. Low pressure gauge.
6. High pressure gauge (red).
7. 5-way pressure gauge manifold.
8. Vacuum meter.
9. Vacuum test cock (VAC).
10. Vacuum meter test cock.
11. Vacuum meter safety valve.
12. Oil charging cock.
13. Oil filler cap.
14. Sight glass.
15. Red service pipe for connection to compressor (discharge side).
16. Quick-fit cocks.
17. Blue service pipe for connection to compressor (suction side).
18. Oil drain plug.
19. On/Off switch (I), heater (II).
20. Oil meter connector.
21. Vacuum pump.
22. High pressure side cock (HIGH).
23. Sight glass.
24. Yellow service pipe.
25. Cylinder heater.
26. External ring.
27. Refrigerant transfer cock (REF).
28. Refrigerant transfer connector.
29. Glass rod.
30. Outer casing (Plexiglass).
31. Refrigerant charging cylinder.

MAINTENANCE OF THE AIR CONDITIONING SYSTEM

At the start of the season in which it will be used, check the efficiency and operation of the system.

If the system has been out of use and charged for a prolonged period, oil may have flowed out of the compressor to other parts of the system and consequently this oil must be returned to the compressor.

For this purpose, start the engine and run at 1500 rpm for around 10 minutes.

Set the cab ventilation fan to maximum speed. Press the push-button (2, fig. 11) to switch on the air conditioning.

Check that the relative temperatures of the external ambient air and the air flowing out of the vents inside the cab correspond to the values indicated in the table on page 25.

If the temperature values are correct, the system is perfectly efficient and only requires a visual inspection of the main components:

1) COMPRESSOR: check the mountings, the tension of the drive belt and the oil level.

2) CONDENSER: check the mounting and that the fins are free of excessive deposits. Straighten any bent fins using the comb tool **380000312**.

Note - Carry out the same checks on the EVAPORATOR (9) and the CONDENSER (5).

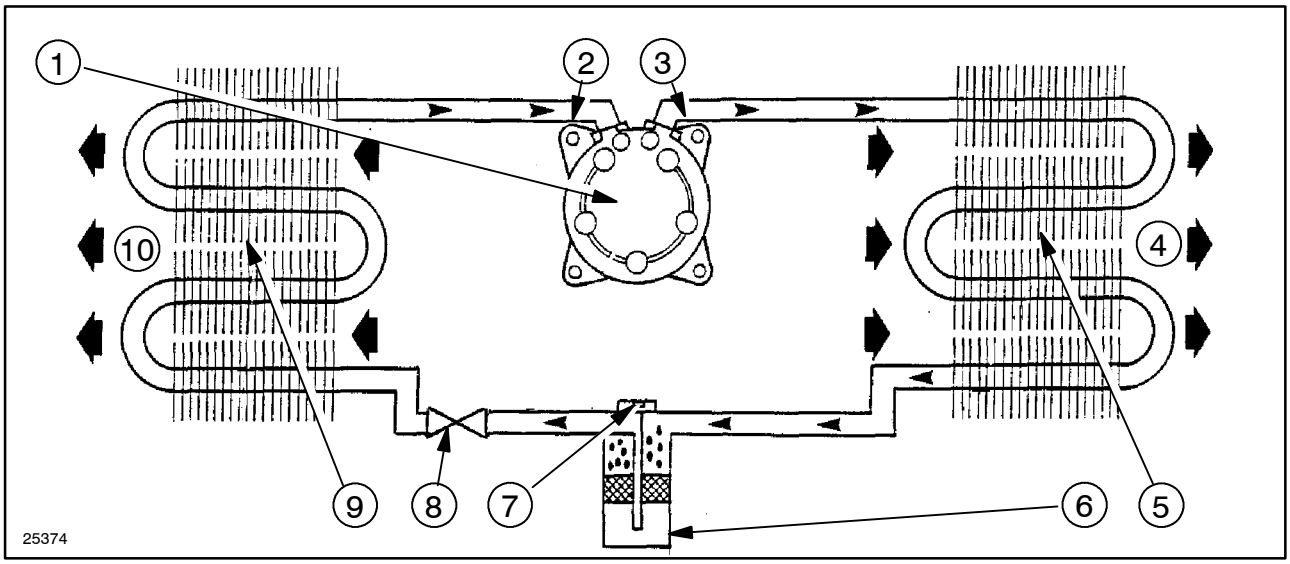
---

3) FILTER/DRYER: the sight glass on the receiver-drier can provide useful information about system operation, as described on page 23. Replace the receiver-drier after the system has been repaired on two occasions.

4) EXPANSION VALVE: this valve does not require maintenance; in the event of malfunction contact specialised personnel of the NEW HOLLAND service network.

If the temperature of the air at the vent outlets does not conform to the indications given in the table on page 25 proceed with the system troubleshooting operations described on page 27.

Caution - If any of the system components need to be replaced, follow the recovery, recycling and charging operations described from page 18 to page 23.

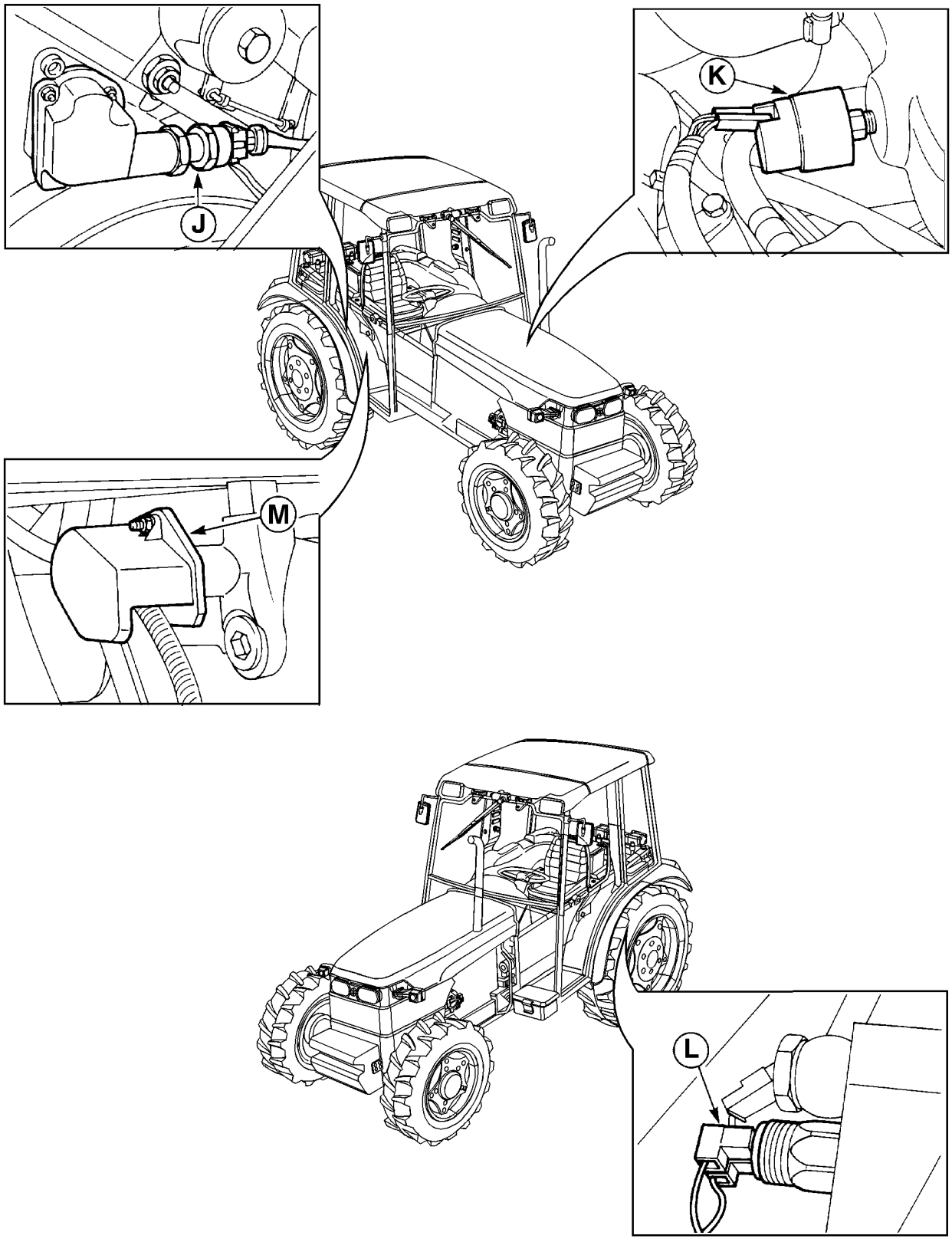


23

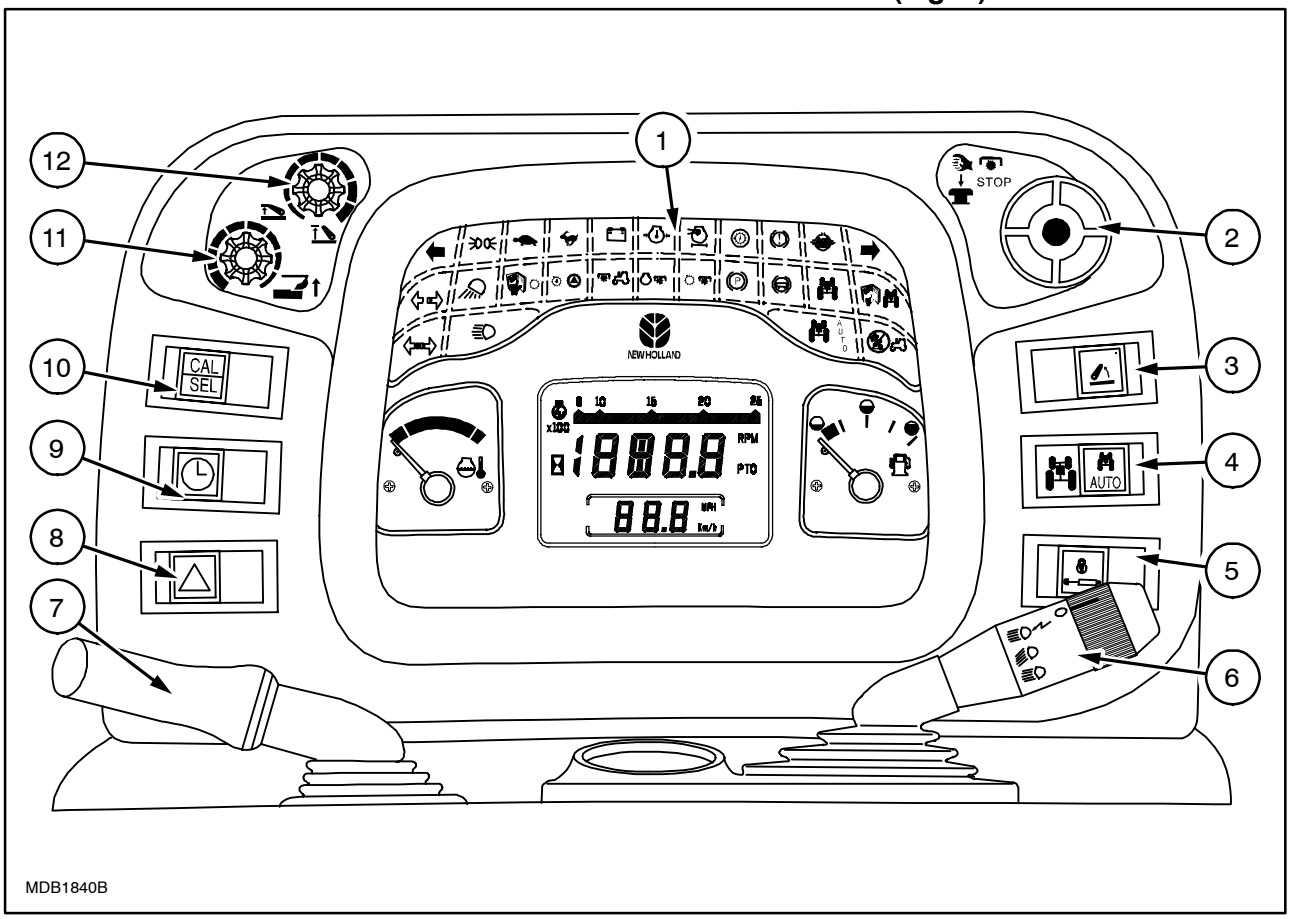
Schematic diagram of the air conditioning system.

1. Compressor.
2. Inlet pipe (low pressure).
3. Outlet pipe (high pressure).
4. Hot air.
5. Condenser.
6. Filter/dryer.
7. Sight glass.
8. Inlet valve with thermostatic sensor.
9. Evaporator.
10. Cool, dehumidified air.

TRANSMITTERS, SENSORS AND SWITCHES



DIGITAL INSTRUMENT CONTROL PANEL (Fig. 2)



2

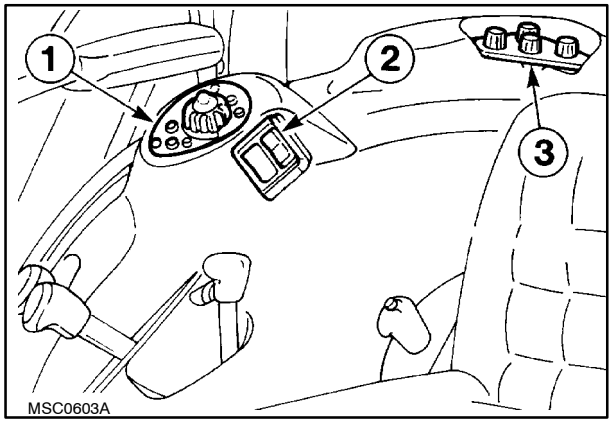
The instruments and switches on the digital control panel (Fig. 2), are as follows:

1. panel with central digital instrument;
2. front power take-off control button;
3. front arms raise control button;
4. automatic four wheel drive mode switch;
5. rear horizontal arms anti-swing tie rods adjustment control pushbutton;
6. light control lever with direction indicators and horn incorporated;
7. Power Shuttle control lever;
8. flashing hazard warning lights switch;
9. clock adjustment switch;
10. digital instrument function select switch;
11. electronic lift working depth adjustment knob;
12. front lifting arms upper limit adjustment knob.

CONTROLS ON RIGHT-HAND MUDGUARD (VERSION WITH ELECTRONICALLY CONTROLLED LIFT)

The controls on this version, as shown in fig. 32, provide:

- lower arms raising/lowering adjustment knob (1);
- LIFT-O-MATIC switch (2);
- electronic lift controls (3).



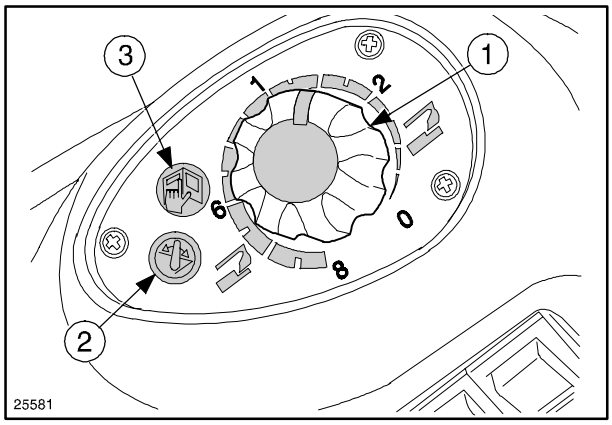
32

Lower arms raising/lowering adjustment knob (Fig. 33)

Arm raising and lowering is carried out by means of the knob (1); turn clockwise to raise the arms and anticlockwise to lower.

To the left of the up/down control (1) there are two indicator lights (2 and 3):

- the indicator (2) shows that the lift is momentarily disabled, i.e. that the position of knob (1) does not correspond to the position of the lower arms, so the implement can be neither raised or lowered. The external controls can be used to vary the position of the implement.
- indicator (3) indicates a fault.



33

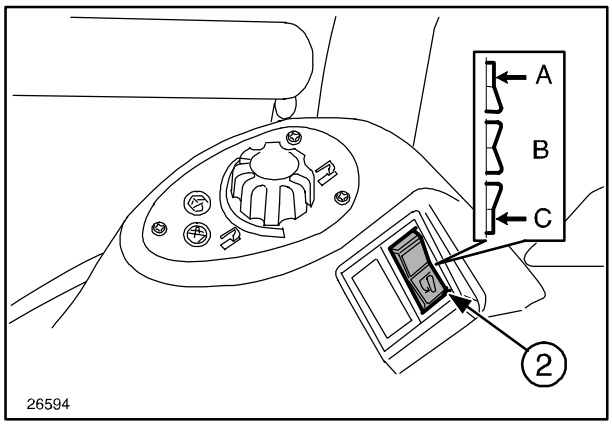
LIFT-O-MATIC switch (Fig. 34)

The LIFT-O-MATIC switch (2) has three positions:

- up (position **A**);
- work (position **B**);
- rapid ground entry (position **C**).

Position C should be used at each headland to increase the speed with which the implement enters the ground; when released the button will automatically return to work position B.

NOTE: *By pressing button (2) to the UP position, the differential lock (if selected) will automatically disengage; if the button is pressed to the work position, the differential lock will engage.*



34

SYSTEM TESTING

STARTING SYSTEM TEST ON TRACTOR

To troubleshoot the starting system simply and rapidly with conclusive results, use a battery/starter tester (high discharge rate tester) with incorporated 0 to 20 V voltmeter and 0 to 500 A ammeter.

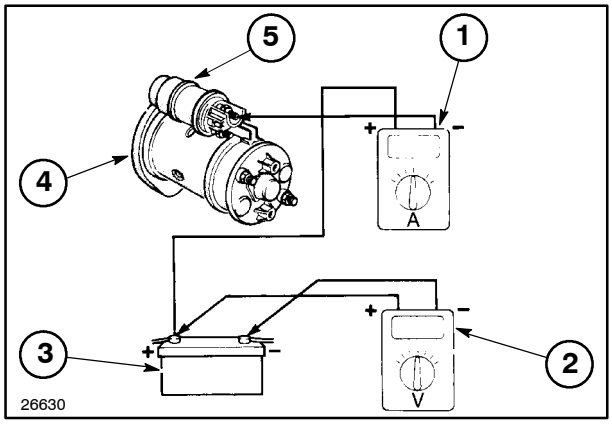
When using testing devices, follow test procedures recommended by the manufacturer. If testing devices are not available, carry out the following procedure using a standard 0 to 20 V voltmeter and a 0 to 500 A ammeter to check correct starter motor operation, without removing it from the engine.

Before the test:

- Check that the battery is fully charged.
- Check the condition of all the starting system wiring (no damaged or frayed wires, no loose connections).
- Check that the engine has not seized.

CURRENT ABSORBED ON THE STARTER MOTOR CIRCUIT (Fig. 4)

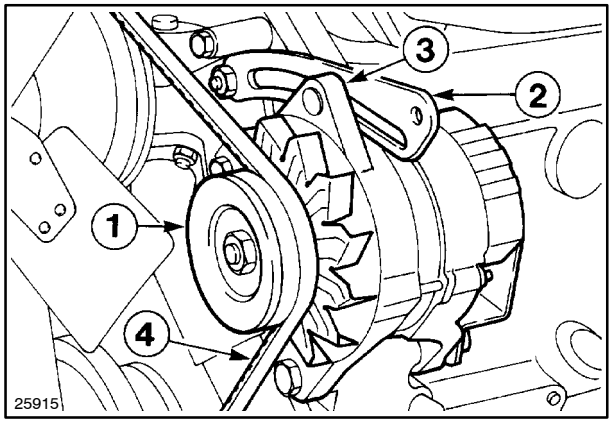
1. Disconnect the battery (3) ground cable (negative).
2. Disconnect the positive battery cable from the starter electromagnet (5). Connect the positive lead of an ammeter (1) to the positive battery terminal and the negative lead to the electromagnet input terminal (5).
3. Reconnect the ground wire (negative) to the battery negative terminal (3).
4. Connect the positive lead on the voltmeter (2) to the battery positive terminal and the negative lead to the battery negative terminal.



4

Belt for models without air conditioning (Fig. 3).

- loosen the nut (3) that fastens the alternator to the tensioner bracket (2).
- with a lever, move the alternator (1) on the tensioner bracket (2) to reach correct belt tension and tighten the securing nut (3) to 55 Nm.



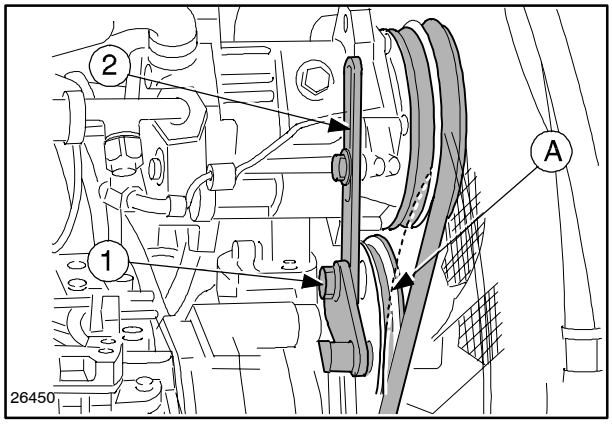
3

Belt for models without air conditioning

1. Alternator
2. Belt tensioner
3. Belt retaining nut
4. Belt

Belt for models with air conditioning (Fig. 4).

- loosen the belt tensioner (1) retaining nut (2).
- move the belt tensioner arm (2) on the bracket until the correct tension on the belt is reached, then tighten the retaining nut (1) to a torque value of 55 Nm.



4

Belt for models with air conditioning

1. Belt retaining nut
2. Belt tensioner
A. Belt shape when tensioned

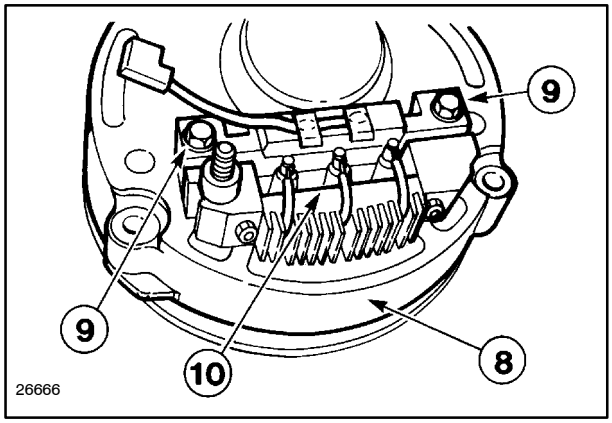
Correct deflection values, measured by applying the following loads to the middle of the belt:

	Model without cab, or with cab without air conditioning	**Model with cab, with air conditioner**
Load (N)	78 to 98	147
Deflection (mm)	10 to 11	16

NOTE: *If belts are cracked or require frequent adjustment, they must be replaced.*

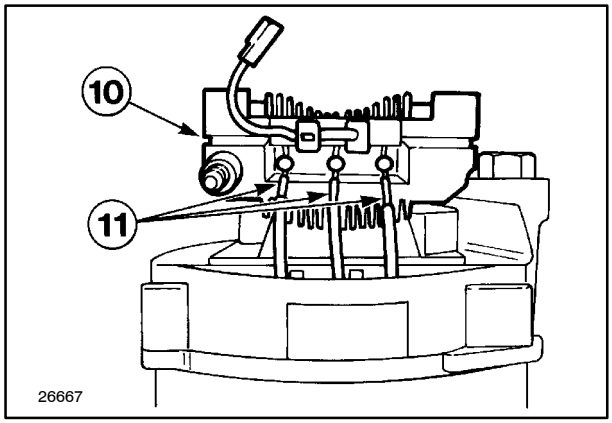
Unscrew the screws (9) securing the rectifier bridge (10) to the rear support plate (8) (Fig. 29).

The rectifier bridge must not be disassembled, as the spare part is provided complete.



29

Separate the rectifier bridge (10) from the rear support-plate and unweld the stator winding terminals (11) (Fig. 30).



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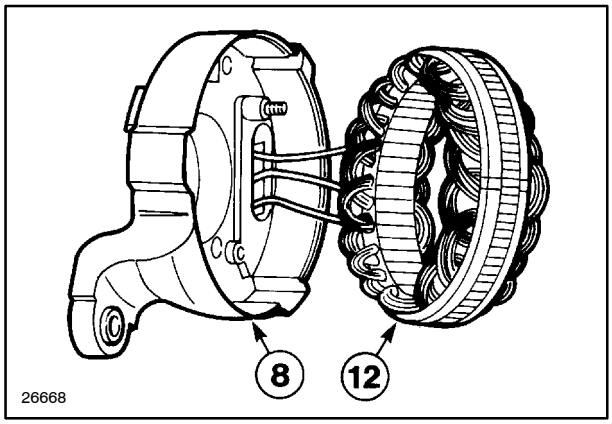
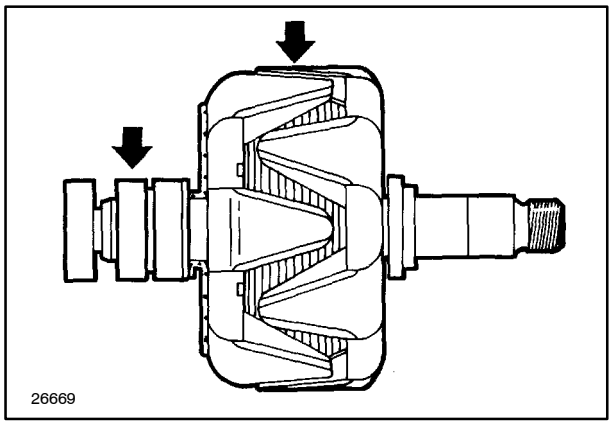
Separate the stator (12) and the terminals (11) from the rear support plate (8) (Fig. 31).



31

INDUCTOR WINDING INSULATION TEST

Place both points of an ohmmeter (regulated on a Ω x 1 scale) in contact respectively with a slip ring and the rotor casing (see arrows). The instrument should show infinite resistance. If this is not the case, replace the rotor (Fig. 32).



32

ELECTRICAL CIRCUIT COMPONENTS

1 Steering sensor
2 Front LH headlamp
3 Front RH headlamp
4 RH front direction indicator and side light
5 Horn
6 Engine cutout electromagnet
7 Trailer brake safety pressure switch
9 Starter motor
10 Air conditioning system compressor
11 40A power socket (North America version)
12 Thermostarter
13 Brake fluid level switch
14 Brake lights switches
15 Cigar lighter connection
16 Cooling - heating unit fan motor
17 Fan control unit lamp
18 Air conditioner switch
20 Rear electronic lift indicator lights and working depth adjustment control panel
21 Rotating beacon power socket
22 RH front auxiliary work light
23 Windscreen wiper motor
24 Heating unit heating elements
25 Cab overhead lighting
27 Heater/fan unit connection
28 Air conditioner relay
29 Connection for fan and conditioner pressure switch
30 Conditioner thermostat
31 Fan/air-conditioner selector
32 RH rear auxiliary work light
33 Rear electronic lift control panel
34 8A power socket
35 Rear windscreen wiper motor
36 LH front auxiliary work light
37 RH tail light
38 Electronic lift up/down switch on RH mudguard

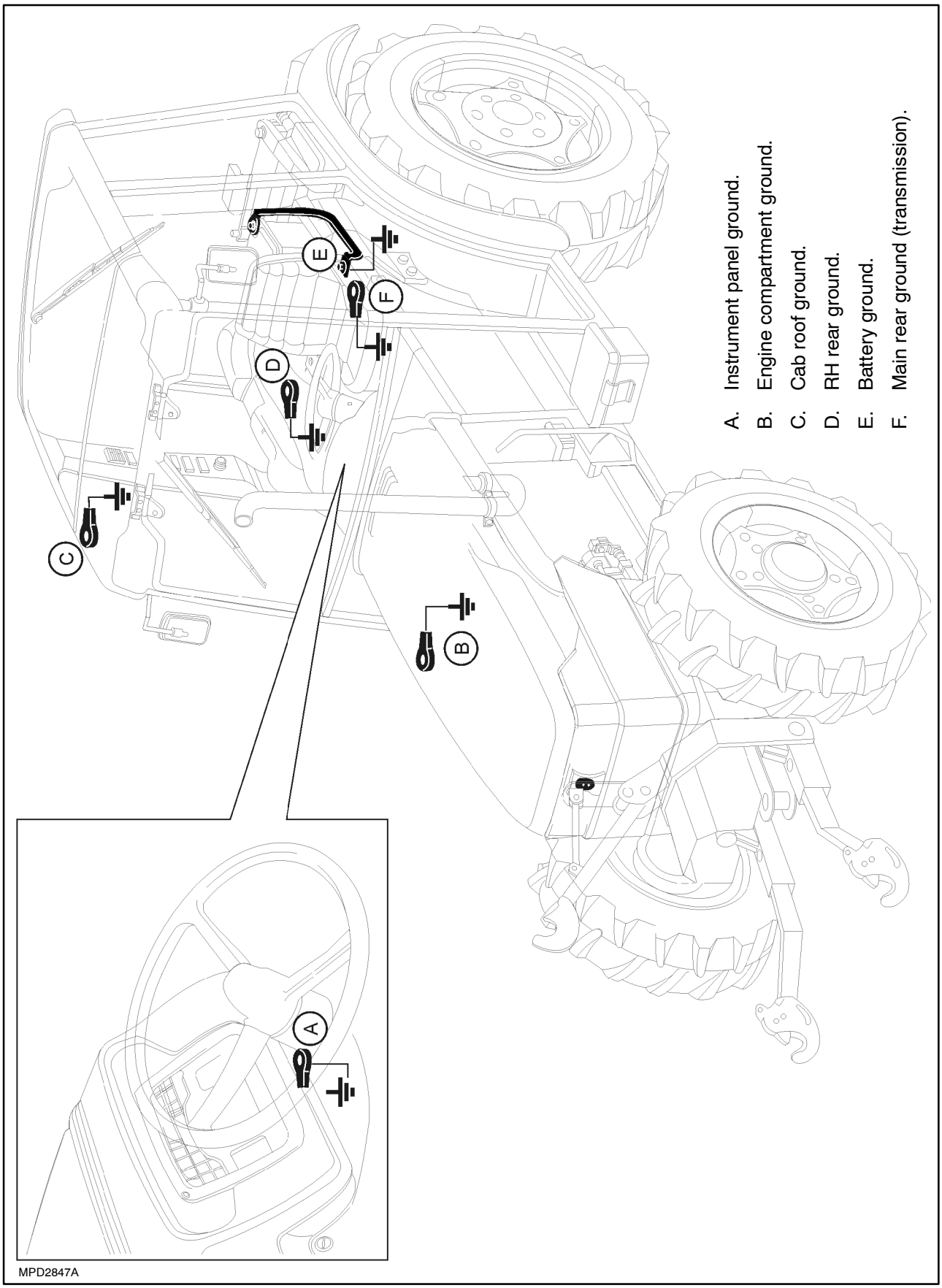
Main fusebox

A4 version tractors, page 14		
Valves	***Amp.***	***PROTECTED CIRCUITS***
1	5	Front right-hand and rear left-hand side lights, side lights panel indicator.
2	5	Front left-hand and rear right-hand side lights, control instrument panel light.
3	15	ISO side lights, or 7-pin work light (North America).
4	15	Full beam headlights.
5	15	Dipped beam headlights.
6	5	+ Instrument common.
7	10	Differential lock circuit.
8	10	8A power socket circuit and digital display.
9	25	Direction indicator and hazard lights.
10	10	Horn, full beam flasher and seat safety circuit.
11	5	Engine start safety circuit.
12	5	Engine cut-out electromagnet.
13	5	Power Shuttle circuit.
14	10	Power Shuttle circuit.
15	15	Seat and cab users relay circuit.
16	10	Trailer brake and hydraulic adjustment circuit.
17	-	Not used.
18	-	Not used.
19	10	Brake lights circuit.
20	15	Thermostarter circuit.
21	-	Not used.
22	-	Not used.
23	-	Not used.
24	-	Not used.
25	5	Electronic control unit power supply circuit (battery +).
26	-	Not used.
27	-	Not used.
28	-	Not used.

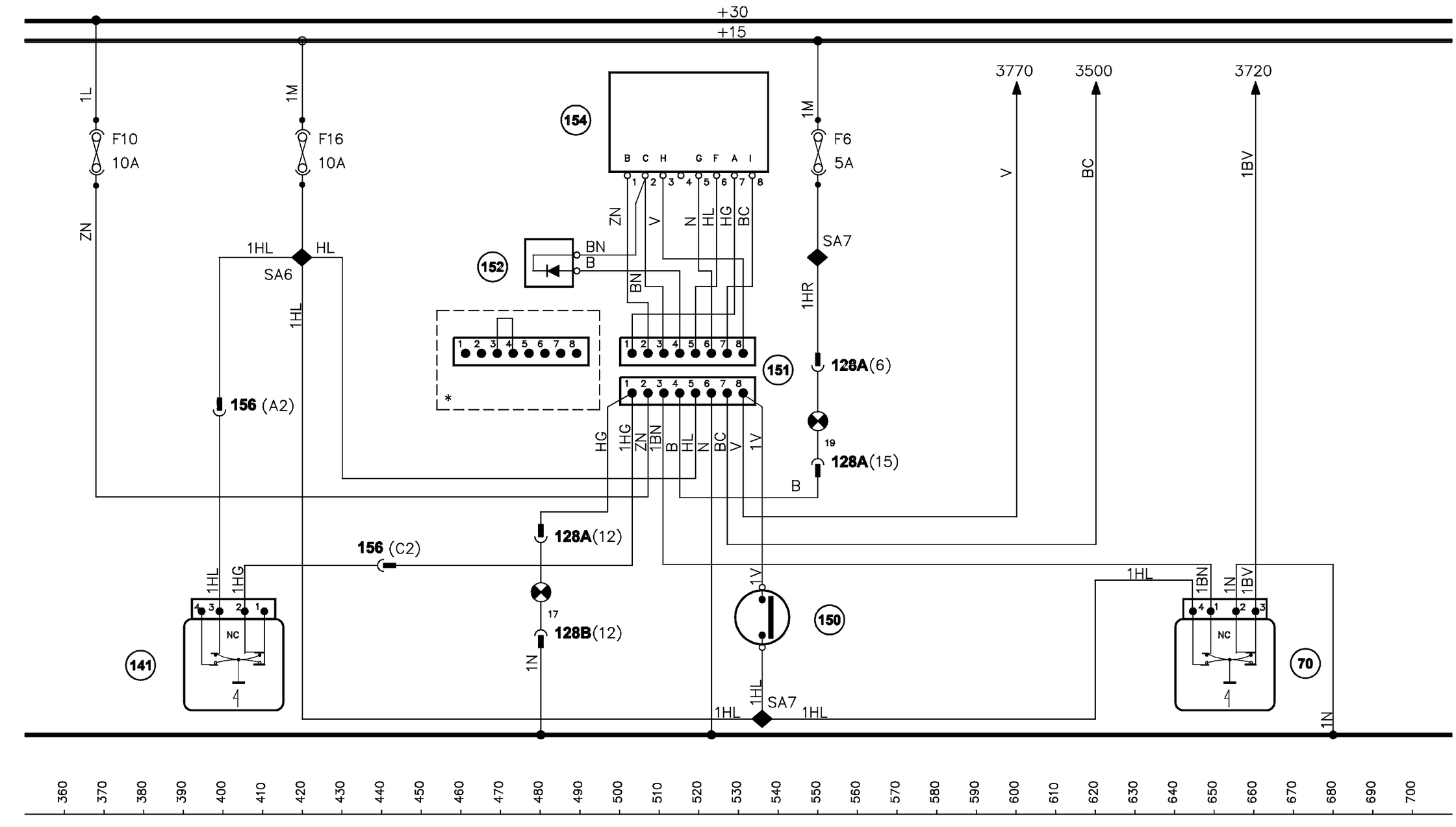
Maxi fuse protection

Valves	***Amp.***	***PROTECTED CIRCUITS***
1	50	Cab circuit.
2	30 40	ISO power socket. North America power socket.
3	30	Cab circuit.

GROUND LOCATION POINTS

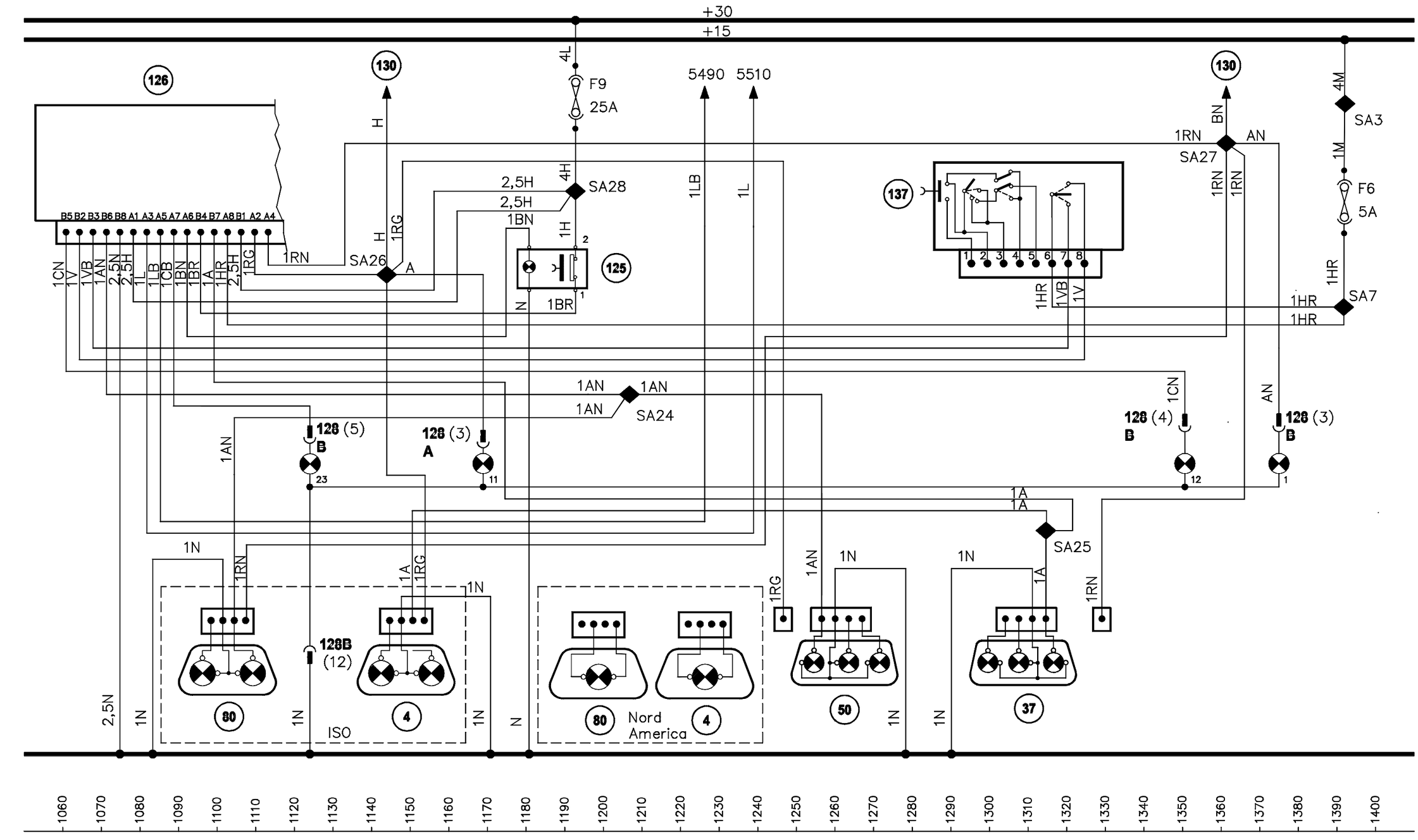


OPERATOR SAFETY CIRCUIT - DIAGRAM B

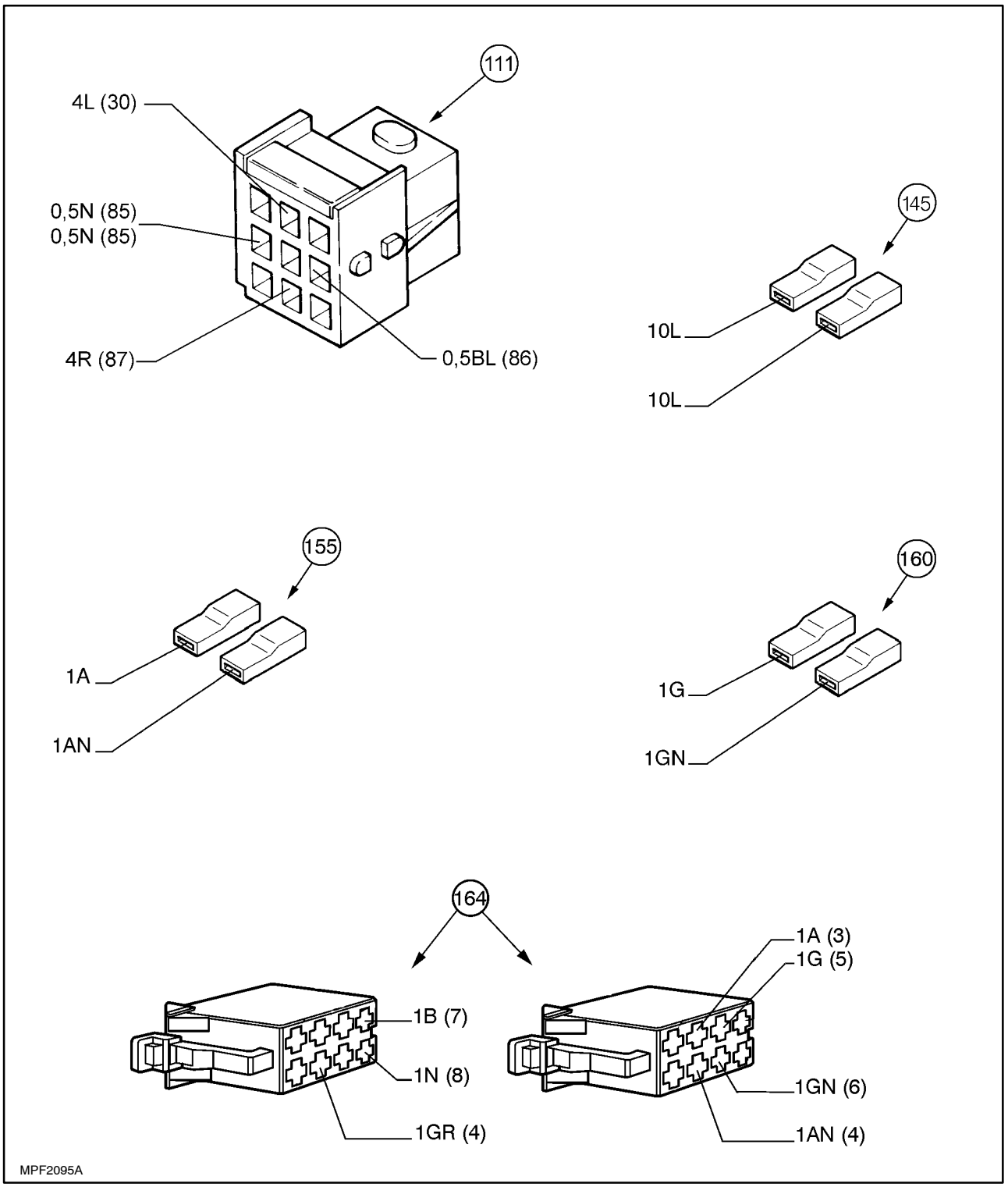


MPF1958A

DIRECTION INDICATOR AND HAZARD LIGHTS CIRCUIT - DIAGRAM D



MPF1960A


111
4L (30)
0,5N (85)
0,5N (85)
4R (87)
0,5BL (86)
145
10L
10L
155
1A
1AN
160
1G
1GN
164
1B (7)
1N (8)
1GR (4)
1A (3)
1G (5)
1GN (6)
1AN (4)
MPF2095A

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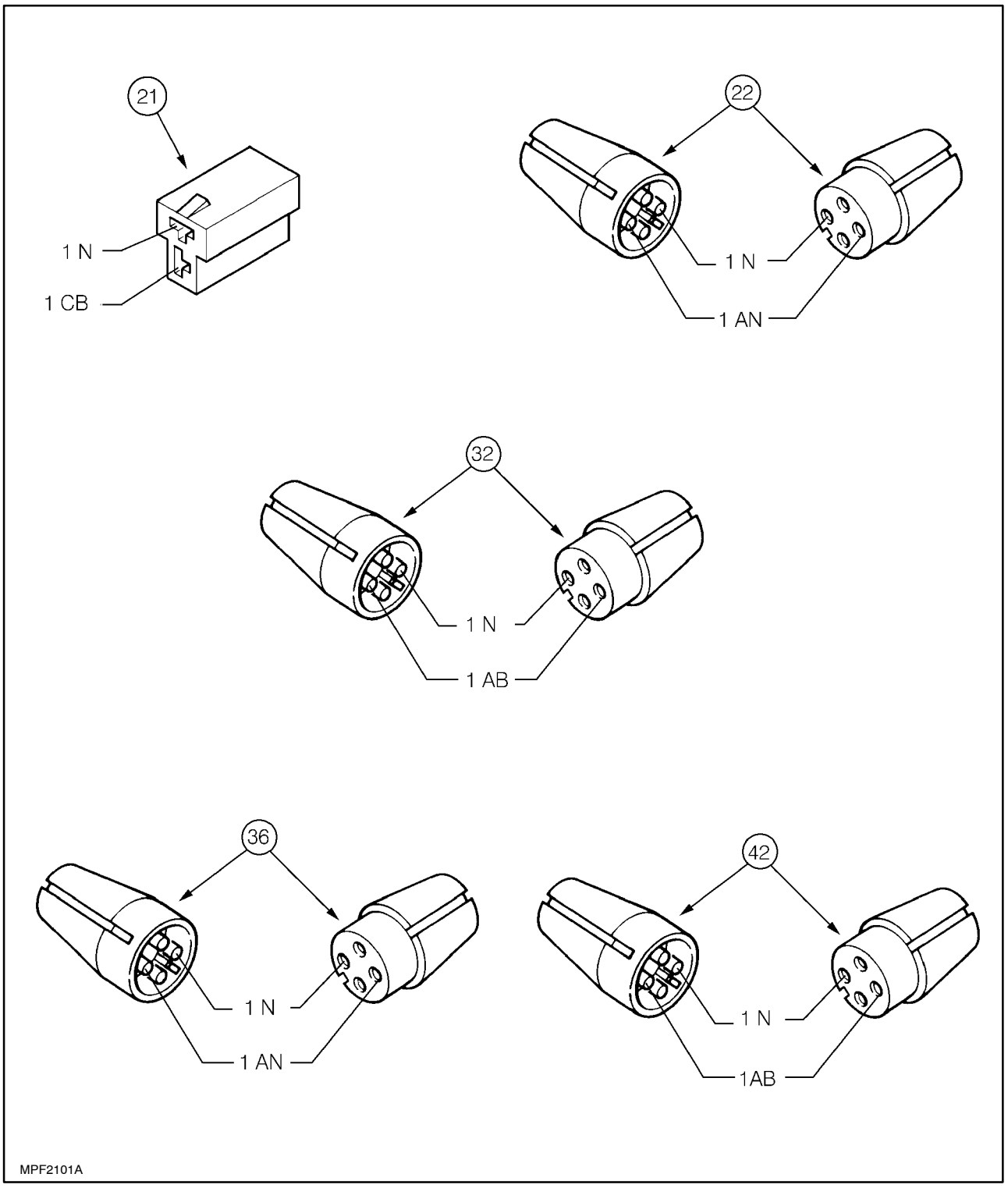

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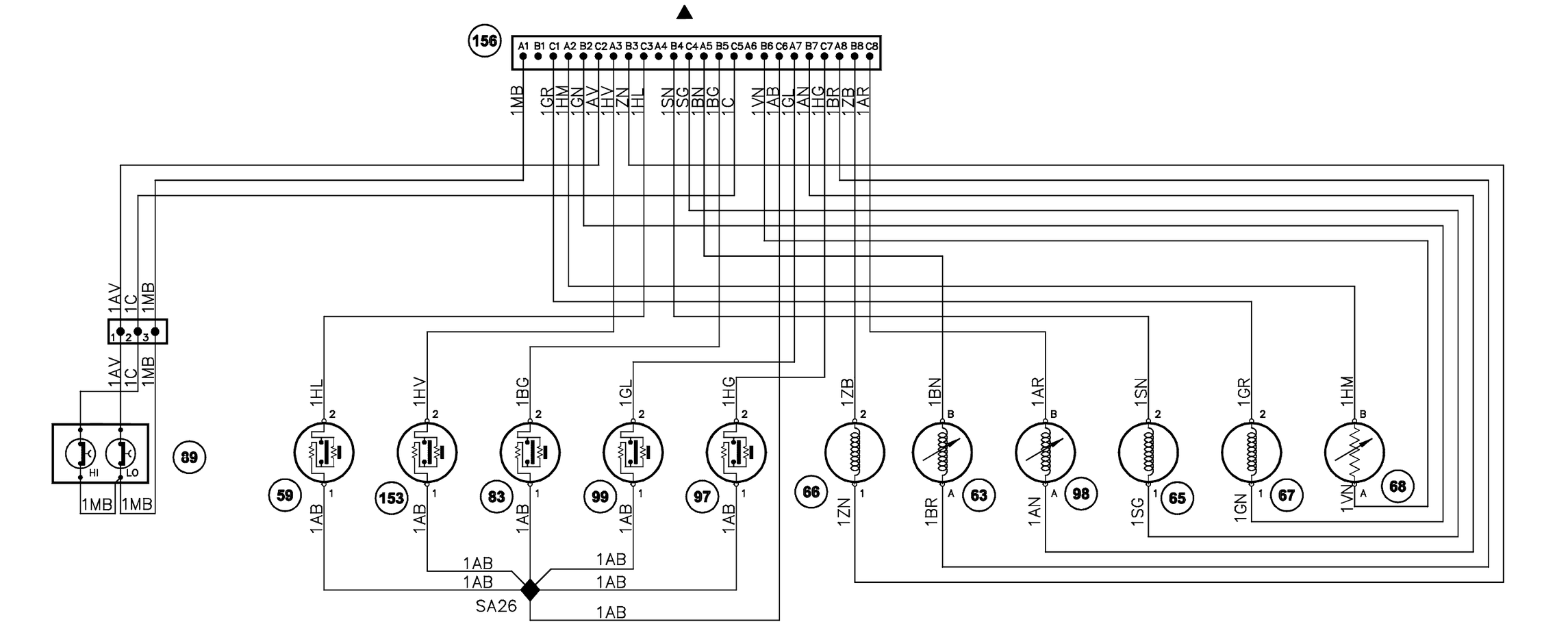
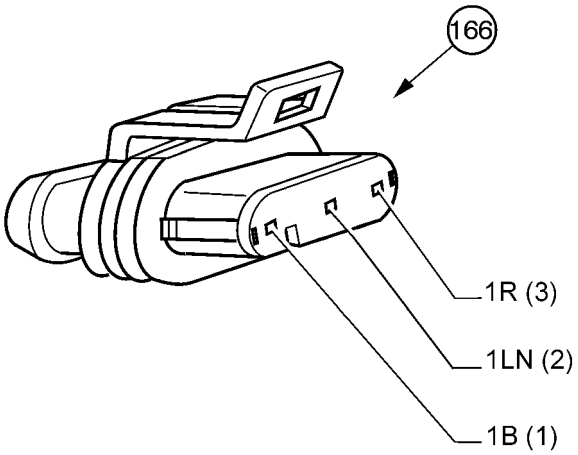
POWER SHUTTLE CIRCUIT (TRANSMISSION SIDE) - DIAGRAM I/1



2810 2820 2830 2840 2850 2860 2870 2880 2890 2900 2910 2920 2930 2940 2950 2960 2970 2980 2990 3000 3010 3020 3030 3040 3050 3060 3070 3080 3090 3100 3110 3120 3130 3140 3150

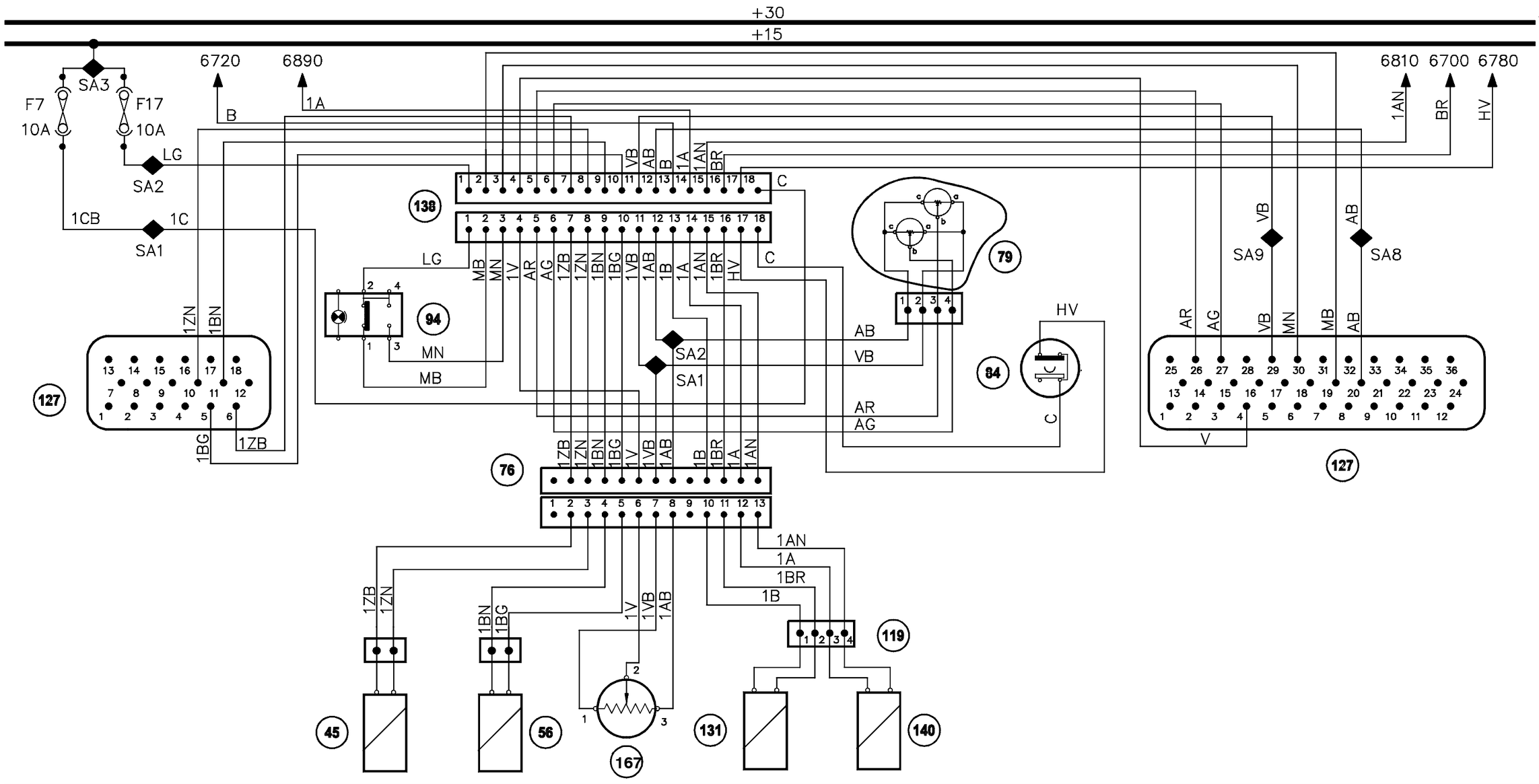
MPF1965A



MPF2115A

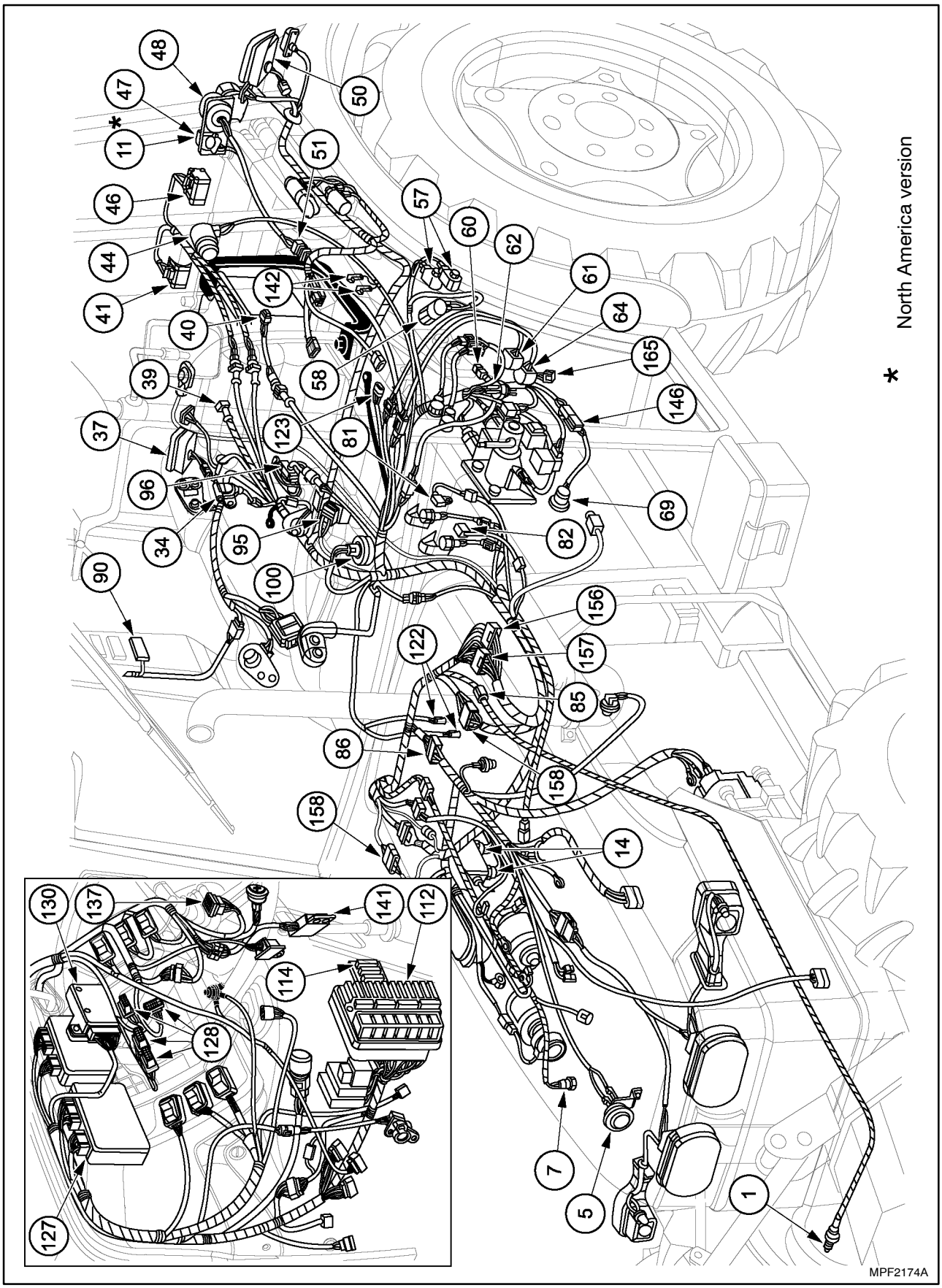
64

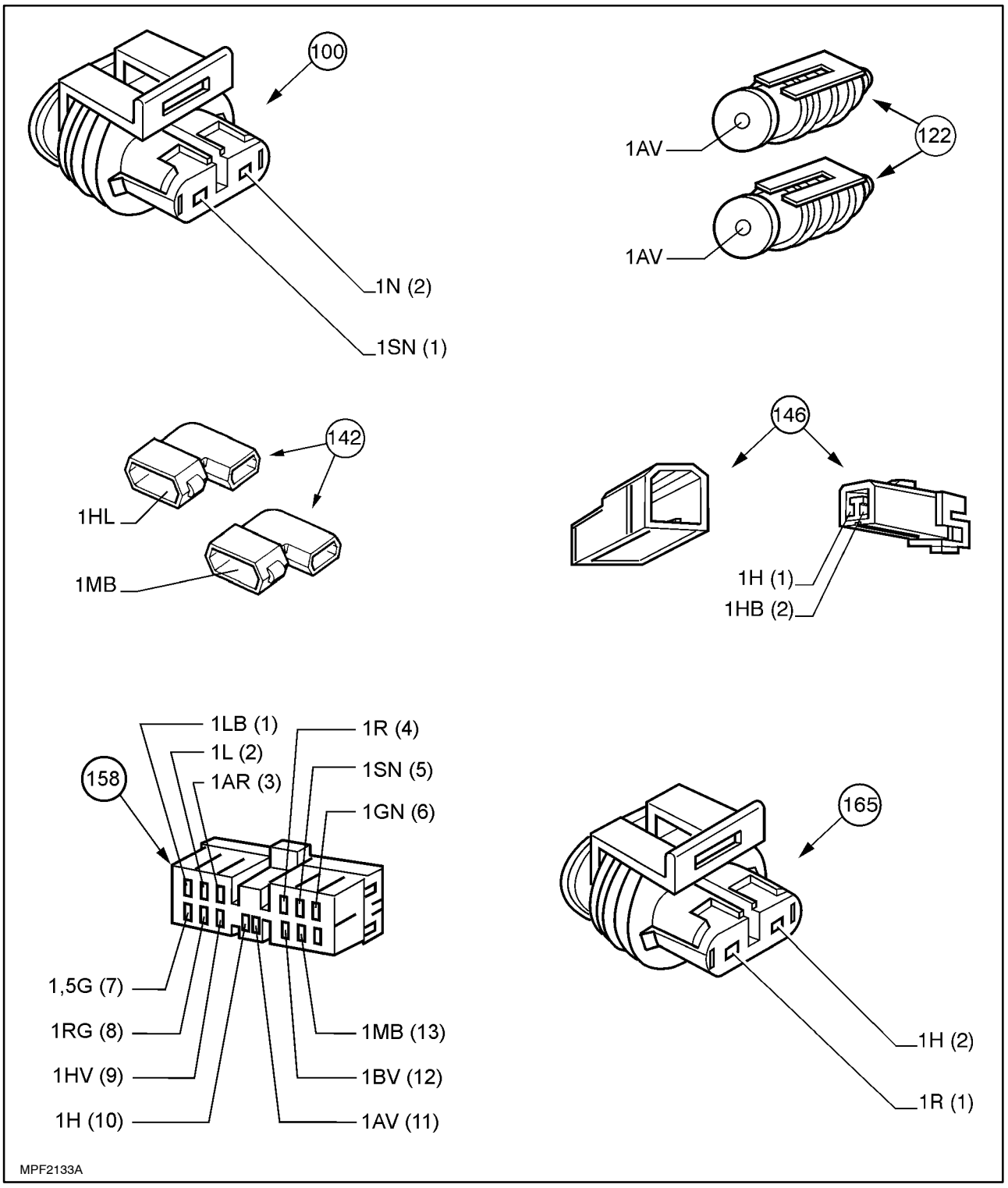
FRONT PTO AND LIFT CIRCUIT (VERSION WITH MECHANICAL REAR LIFT) - DIAGRAM L



MPF1968A

WIRING DIAGRAMS N/1 - N/2 - O - P - Q - R




100
1N (2)
1SN (1)
1AV
122
1AV
142
1HL
1MB
146
1H (1)
1HB (2)
158
1LB (1)
1L (2)
1AR (3)
1R (4)
1SN (5)
1GN (6)
1,5G (7)
1RG (8)
1HV (9)
1H (10)
1MB (13)
1BV (12)
1AV (11)
165
1H (2)
1R (1)
MPF2133A

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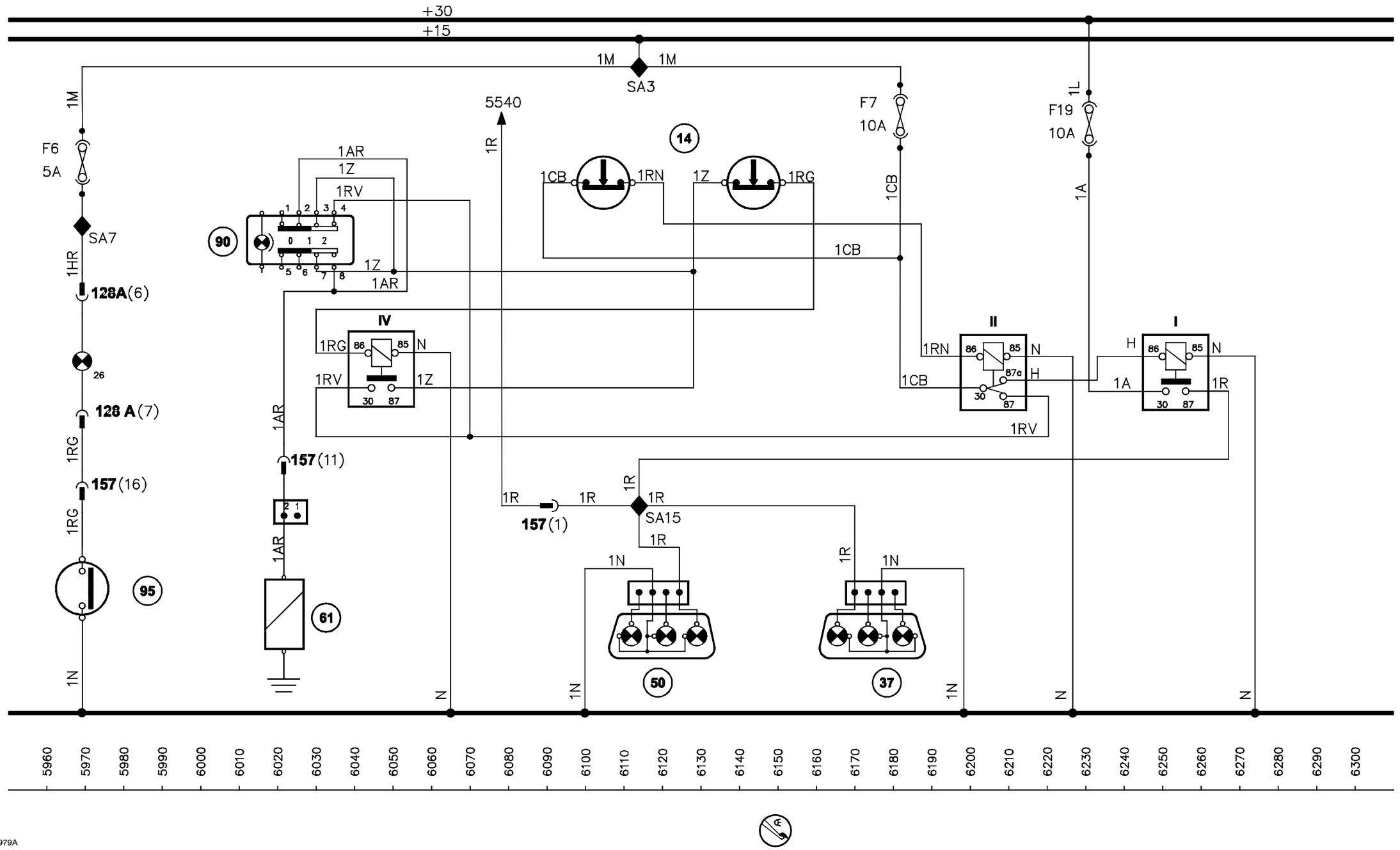
DIFFERENTIAL LOCK AND BRAKE LIGHTS CIRCUIT (VERSION WITH ELECTROHYDRAULIC FOUR-WHEEL DRIVE) - DIAGRAM Q



MPF1979A