

**MF3400 F**  
**Workshop Manual**  
**1857 664 M1**

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## HOW THE MANUAL IS STRUCTURED

- SECTION 00** Contains the general safety rules, information on how to use and update the manual, the symbols used, the products required, the standard tightening torques and a conversion table for units of measurement.
- SECTION 10** Contains technical descriptions and information regarding the mechanical and hydraulic operation of machine components, the designations of the various components, hydraulic diagrams and general technical data.
- SECTION 20** Contains information on the tractor's electrical and electronic systems, the procedures for putting into service, the list of alarms and a guide to the use of the software required for tractor and engine configuration and access to diagnostic codes.
- SECTION 30** Contains the methods, checks and adjustments regarding the external components; the operations dealt with in this section do not require removal of the various assemblies that form the tractor frame and cab.
- SECTION 40** Contains information and diagrams regarding the machine's electrical and electronic systems.

### ATTENTION!

This manual does not contain the engine.

For these sections refer to the follow manuals:

|                   |              |            |
|-------------------|--------------|------------|
| Engine 1000/3/4/6 | 307.1103.1.5 | Italian    |
|                   | 307.1103.5.5 | German     |
|                   | 307.1103.3.5 | English    |
|                   | 307.1103.2.5 | French     |
|                   | 307.1103.4.5 | Spanish    |
|                   | 307.1103.7.5 | Portuguese |

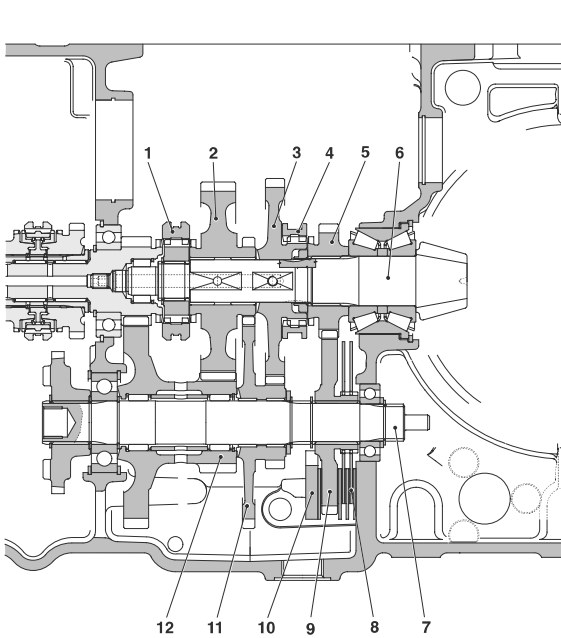
# SECTION 10

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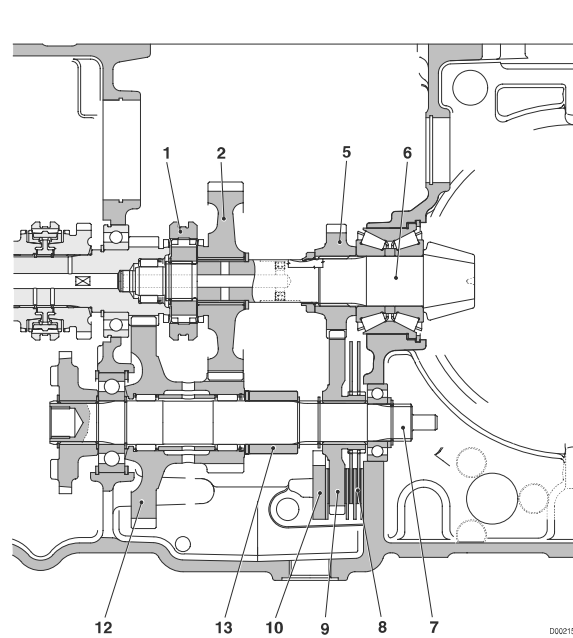
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## 1.7 RANGE AND PARKING BRAKE ASSEMBLY

3-RANGE VERSION



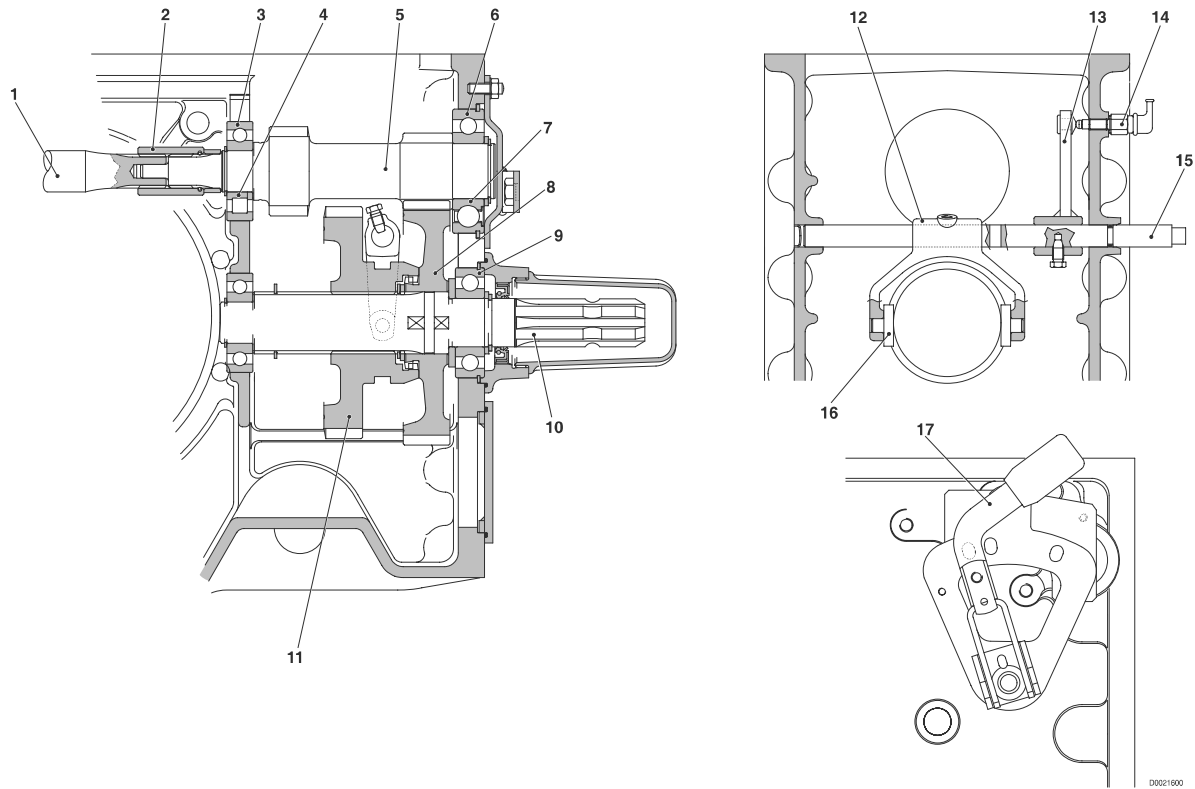
2-RANGE VERSION



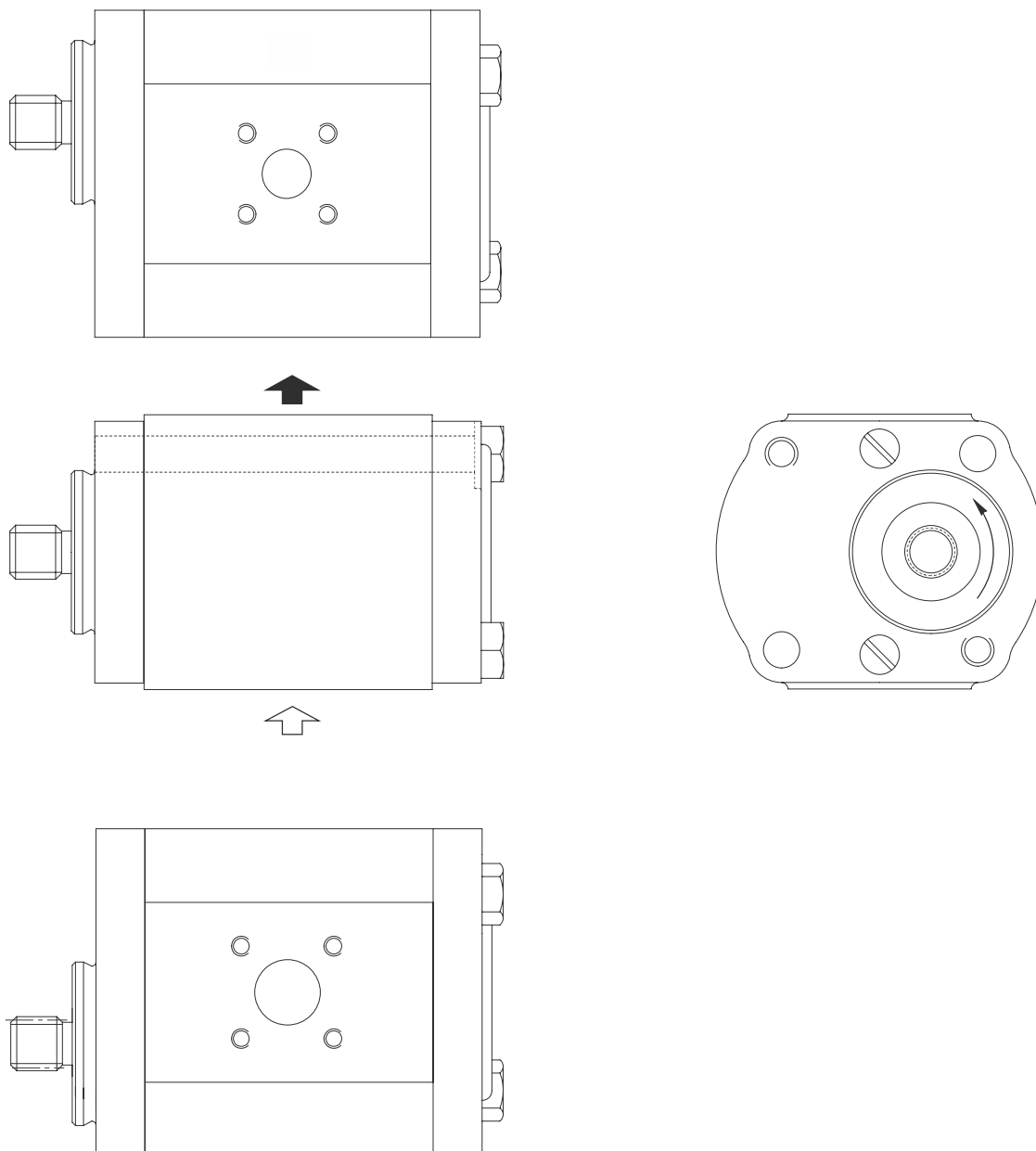
D0021510

- |                                                         |                                                        |
|---------------------------------------------------------|--------------------------------------------------------|
| 1 - High-medium speed range engagement sleeve           | 8 - Parking brake discs                                |
| 2 - Medium speed range driven gear                      | 9 - Driven gear for four-wheel drive and parking brake |
| 3 - Low speed range driven gear                         | 10 - Reaction plate                                    |
| 4 - Low speed range engagement sleeve                   | 11 - Low speed range idler gear                        |
| 5 - Driving gear for four-wheel drive and parking brake | 12 - Medium speed range idler gear                     |
| 6 - Pinion                                              | 13 - Spacer                                            |
| 7 - Four-wheel drive/parking brake shaft                |                                                        |

2.2 2-SPEED PTO



- |                            |                            |                            |                            |
|----------------------------|----------------------------|----------------------------|----------------------------|
| 1 - PTO input shaft        | 6 - Bearing (55-70 HP)     | 11 - Selector gear         | 16 - Shoe                  |
| 2 - Sleeve                 | 7 - Bearing (75-90-100 HP) | 12 - Selection fork        | 17 - Speed selection lever |
| 3 - Bearing (55-70 HP)     | 8 - Driven gear            | 13 - Lever                 |                            |
| 4 - Bearing (75-90-100 HP) | 9 - Bearing                | 14 - Selected speed sensor |                            |
| 5 - Drive shaft            | 10 - Output shaft          | 15 - Speed selection rod   |                            |

**4.5 STEERING CIRCUIT GEAR PUMP**

D0021760

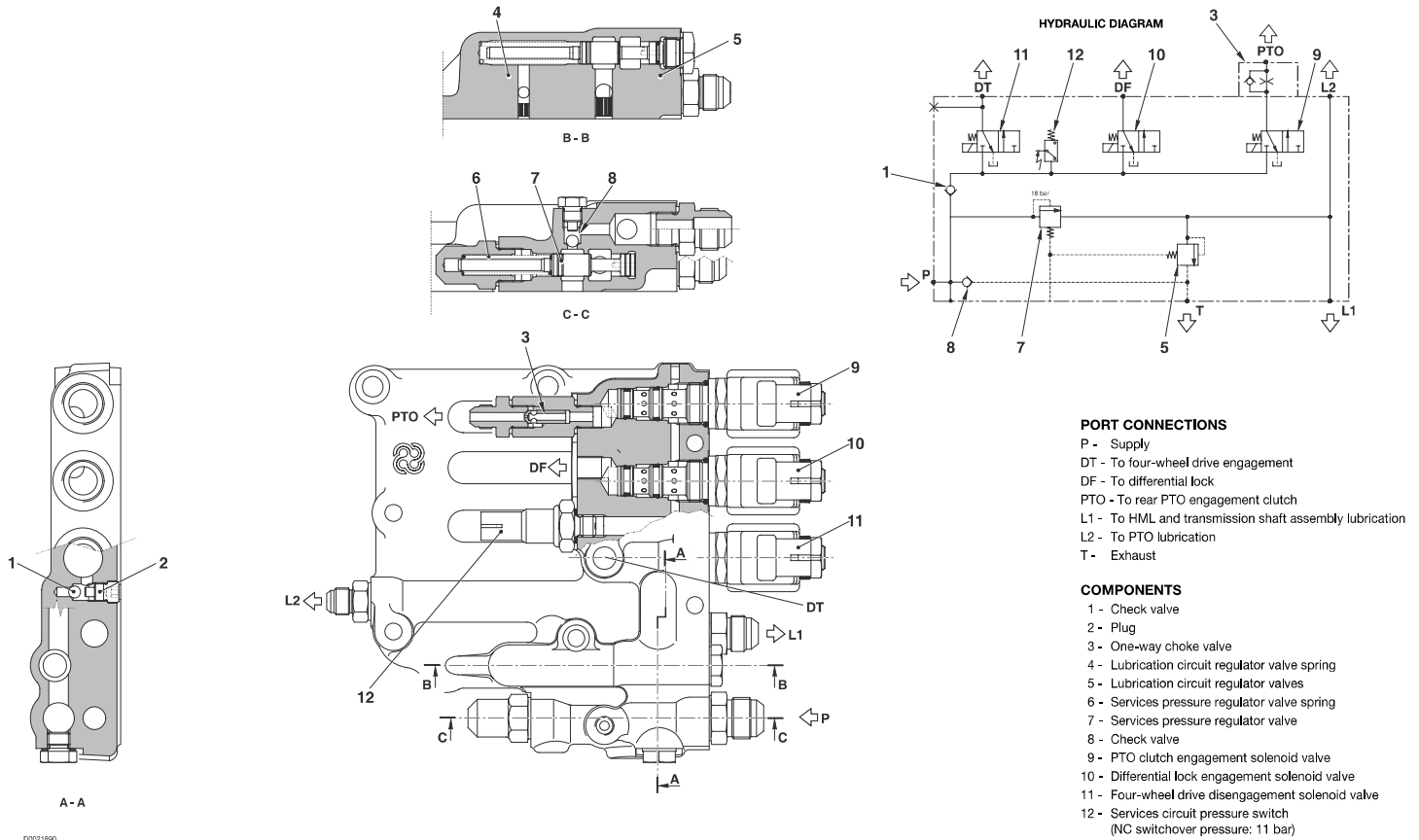
**CHARACTERISTICS**

Displacement: 11 cc/rev

Maximum operating pressure: 155 bar

Maximum flow rate: 26.2ℓ /min at 2200 rpm

## 4.11 SERVICES SOLENOID VALVE ASSEMBLY



# 1. DIAGNOSIS TOOLS

## 1.1 ALL ROUND TESTER

In order to be able to troubleshoot correctly, commission the tractor and check the electrical components of the lift and engine systems work properly, the Technician has an instrument called the All Round Tester (hereinafter ART).

Using the ART, the technician can:

- display errors (faults) that have occurred;
- carry out sensor calibration or setting procedures;
- display data monitored by the various electronic control units (e.g. status of sensors) by which systems are managed.

The exchange of data between the ART and the control units occurs by way of a diagnosis socket incorporated into the wiring harnesses of the tractor.

Accordingly, the ART comes with different types of interface cables for the different models and versions of tractor being serviced, which must be used as indicated in the relative workshop manuals or on the CD supplied with the kit.

### 1.1.1 DESCRIPTION OF THE KIT

The ART is supplied to Authorised Workshops in a carrying case containing:



| Pos | Code            | Description                                                                     | Qty |
|-----|-----------------|---------------------------------------------------------------------------------|-----|
|     | 5.9030.730.6/30 | Case, complete                                                                  | 1   |
| 1   | 5.9030.630.0    | All Round Tester                                                                | 1   |
| 2   | 5.9030.681.3    | Rear hydraulic lift diagnosis cable - BOSCH EHR4                                | 1   |
|     |                 | Engine electronic rpm control diagnosis and programming cable - type 1          | 1   |
|     |                 | SBA system diagnosis cable - type 1                                             | 1   |
| 3   | 5.9030.681.7    | Adapter cable for radar connector                                               | 1   |
| 4   | 5.9030.681.5    | Adapter cable for wheel speed sensor connector                                  | 1   |
| 5   | 5.9030.681.4    | Cable for diagnostic socket                                                     | 1   |
| 6   | 0.011.6178.4    | Adapter cable for connection to armrest diagnosis socket                        | 1   |
| 7   | 0.011.5445.4    | Cable for connection to engine-transmission-lift control units diagnosis socket | 1   |
| 8   | 0.010.2145.2    | EPROM box                                                                       | 1   |
| 9   | 307.1056.8/60   | CD ROM                                                                          | 1   |

## 3.2 ELECTRONIC LIFT CONTROL UNIT

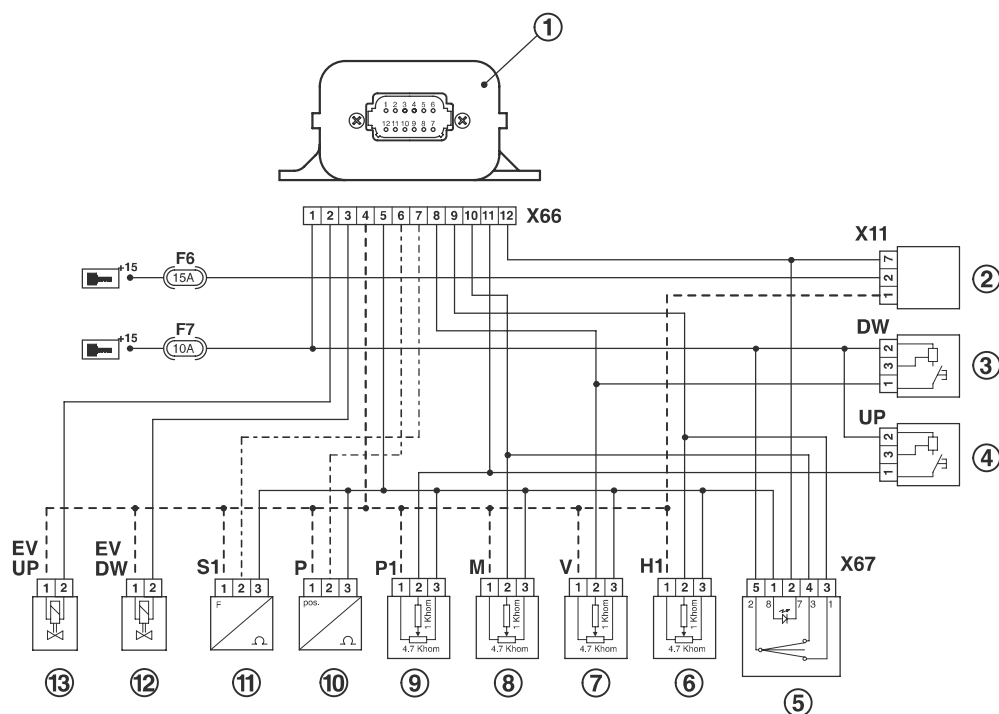
The electronic system controls the lift in accordance with the commands received and the operating mode selected by the operator using the control panel on the right-hand side of the driving seat.

The operator can select different control types:

- position control
- draft control.

The system compares the command given by the operator with the signals received from the position sensor and draft sensor and executes the command by operating a control valve equipped with two proportional solenoid valves.

The control valve directs oil at high pressure to a hydraulic cylinder that raises or lowers the implement connected to the lift. For more detailed information on the operation of the power lift, see the use and maintenance manual for the specific tractor.



D0022090

- |                                  |                                             |
|----------------------------------|---------------------------------------------|
| 1 - Lift control unit            | 8 - Draft/position adjustment potentiometer |
| 2 - Diagnostic socket            | 9 - Position adjustment potentiometer       |
| 3 - Lift down button on mudguard | 10 - Position sensor                        |
| 4 - Lift up button on mudguard   | 11 - Draft sensor                           |
| 5 - Lift up / down switch        | 12 - Lift Down solenoid valve               |
| 6 - Maximum height potentiometer | 13 - Lift Up solenoid valve                 |
| 7 - Lowering speed potentiometer |                                             |

## 4. COMMISSIONING THE TRACTOR

## 4.2 RENEWAL OF ENGINE CONTROL UNIT

- 4 - From the "CONFIGURATION" menu, press "4" to bring up the "IDLING SPEED CALIBRATION" menu.

|   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|--|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   |  | C | O | N | F | I | G | U | R | A | T | I | O | N |
|   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1 |  | E | N | G | I | N | E |   | T | Y | P | E |   |   |
|   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2 |  | H | A | N | D |   | T | H | R | O | T | . | C | A |
|   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3 |  | A | C | C | . |   | P | E | D | A | L |   | C | A |
|   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 4 |  | I | D | L | E |   | S | P | E | E | D |   | C | A |
|   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |  |   |   |   |   | S | E | L | E | C | T | _ |   |   |
|   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |  |   |   |   |   | E | E | X | I | T |   |   |   |   |

- 5 - Make sure that all the electric services (lights, etc.) and hydraulic services (PTO, etc.) are turned off and that the throttle lever is on minimum.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   |   |   | I | D | L | E |   | S | P | E | E | D |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| - |   | D | E | A | C | T | I | V | A | T | E |   |   |   |
|   |   | C | O | N | T | R | O | L |   | V | A | L | U | E |
| - |   | S | W | I | T | C | H |   | O | F | F |   | C | A |
|   |   | V | E | N | T | I | L | A | T | I | O | N |   |   |
| - |   | E | N | G | I | N | E |   | O | I | L |   | T | E |
|   |   | 7 | 0 | / | 7 | 8 |   |   |   |   |   |   |   |   |
| C |   | C | O | N | F | I | R | M |   |   |   |   |   |   |
| - | - | - | - | M | O | N | I | T | O | R | - | - | - | - |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   | E | N | G | I | N | E |   | R | P | M |   | 6 | 5 |
|   |   | R | P | M |   | D | I | F | F | . |   |   | 8 | 5 |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   | E | E | X | I | T |   |   |   |   |

- 6 - Accelerate the engine a few times, then leave it idling and, when the "SPEED DELTA" value falls under "40", press "C" to confirm.

### NOTE.

The "SPEED DELTA" value **must** be less than 40.  
The lower the selected value the more regular engine operation will be at idling speed.

- 7 - Press "E" three times to go back to the main menu then configure for the HML unit (see paragraph 4.2.5).

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   |   |   | I | D | L | E |   | S | P | E | E | D |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| - |   | D | E | A | C | T | I | V | A | T | E |   |   |   |
|   |   | C | O | N | T | R | O | L |   | V | A | L | U | E |
| - |   | S | W | I | T | C | H |   | O | F | F |   | C | A |
|   |   | V | E | N | T | I | L | A | T | I | O | N |   |   |
| - |   | E | N | G | I | N | E |   | O | I | L |   | T | E |
|   |   | 7 | 0 | / | 7 | 8 |   |   |   |   |   |   |   |   |
| C |   | C | O | N | F | I | R | M |   |   |   |   |   |   |
| - | - | - | - | M | O | N | I | T | O | R | - | - | - | - |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   | E | N | G | I | N | E |   | R | P | M |   | 6 | 5 |
|   |   | R | P | M |   | D | I | F | F | . |   |   | 8 | 5 |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   | P | A | R | A | M | E | T | E | R |
|   |   |   |   |   |   | P | R | O | G | R | A | M | M | E |
|   |   |   |   |   |   | E | E | X | I | T |   |   |   |   |

## 5. ALARMS

This chapter contains a list of all the alarms that can be detected by the tractor's electronic control units.

### 5.1 ENGINE CONTROL UNIT ALARMS

The engine control unit signals any malfunctioning of the components it governs to the operator with the “MEM” warning light on the dashboard.

Faults are indicated using a system of coded flash sequences that simply identify the device affected without specifying the nature of the fault.

For a more detailed analysis of the fault detected, connect the ART to the diagnosis socket and refer to menu “4.2 ALARM LOG.

#### 5.1.1 LIST OF ALARMS DISPLAYED ON THE INSTRUMENT PANEL (MEM WARNING LIGHT)

| Flashes | Device affected               | Alarm description                                                                        | System reaction                                                                                       |
|---------|-------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 1       | Overspeed alarm               | The control unit has detected that the engine has exceeded 3200 rpm.                     | The control unit stops the engine                                                                     |
| 2       | Actuator                      | The control unit detects a problem with the actuator                                     | The control unit stops the engine                                                                     |
| 3       | Pedal throttle                | The control unit detects a problem with the accelerator pedal                            | The control unit stops the engine                                                                     |
| 4       | Engine speed sensor (pick-up) | The control unit detects a problem with the engine speed sensor (pick-up)                | The control unit stops the engine                                                                     |
| 5       | EEPROM                        | The control unit detects a problem with the EEPROM                                       | The engine continues to operate but with the default settings                                         |
| 6       | Wheel speed sensor            | The control unit detects a problem with the wheel speed sensor                           | The engine works properly, but its top speed is limited to 1500 rpm                                   |
| 7       | Belt alarm                    | Alarm available but not utilized                                                         |                                                                                                       |
| 8       | Hand throttle                 | The control unit detects a problem with the hand throttle                                | The engine works properly                                                                             |
| 9       | HML and PTO solenoid valves   | The control unit detects a problem with the solenoid valves of the HML unit and rear PTO | The engine works properly. The M speed is selected and it is not possible to change to L or H speeds. |

#### 5.1.2 LIST OF ALARMS DISPLAYED ON THE INSTRUMENT PANEL (PRE-HEATING INDICATOR LIGHT)

| Flashes | Alarm description                                                                         |
|---------|-------------------------------------------------------------------------------------------|
| 2       | The control unit detects that the pre-heating device is on, even though it shouldn't be.  |
| 3       | The control unit detects that the pre-heating device is not on, even though it should be. |

## Handgas N.C.

### DESCRIPTION

The control unit detects that the hand throttle potentiometer is disconnected.

### ECU RESPONSE

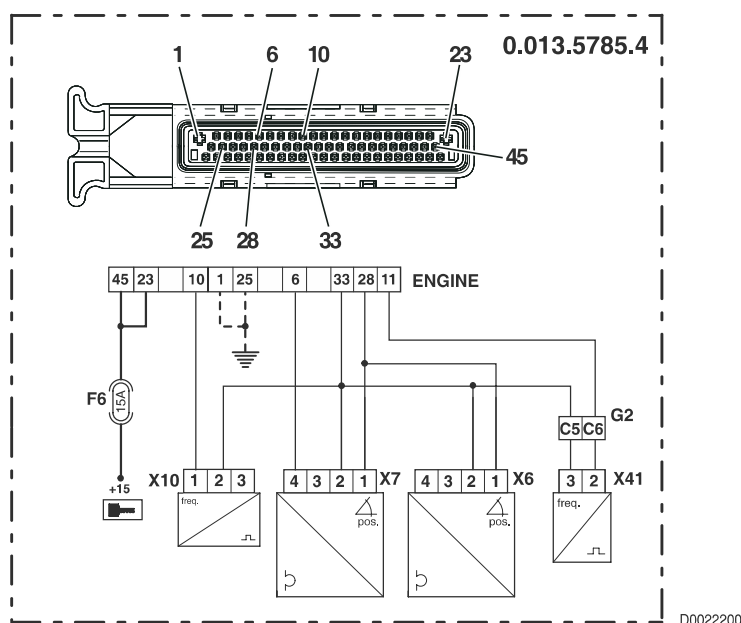
The engine continues to operate but the hand throttle does not work.

### CHECK

#### NOTE

If there are also the “RPM.Sensor O.C.”, “RPM.Sensor O.C.”, “Accel.Pedal O.C.” and “SpeedSensor O.C.” alarms, the problem is to be found in a break in the cable leaving pin 33 of the “ENGINE” connector. Further confirmation of this fault could be the impossibility of changing the speed of the HML unit, if this is fitted.

- Check that the contacts on the “X7” connector of the hand throttle potentiometer and “ENGINE” on the engine control unit are not oxidized and are firmly secured.
- With the starter key in the “I” (ON) position, check that the hand throttle potentiometer is correctly supplied (voltage between pin 1 (positive) and pin 2 (negative) of connector “X7” of approximately 5 V).
- With the starter key in the “O” (OFF) position, connect a test meter to pin 4 of connector “X7” and to pin 6 of the “ENGINE” connector and measure the resistance to verify that there is electrical continuity (test meter reading: 0 Ohm).
- Check the hand throttle potentiometer works properly (for the technical details see unit 40).
- Clear all alarms, turn the starter key first to “O” (OFF) and then back to the “I” (ON) position again, and if the alarm is still present, the control unit must be renewed.



## Temp.sensor N.C.

### DESCRIPTION

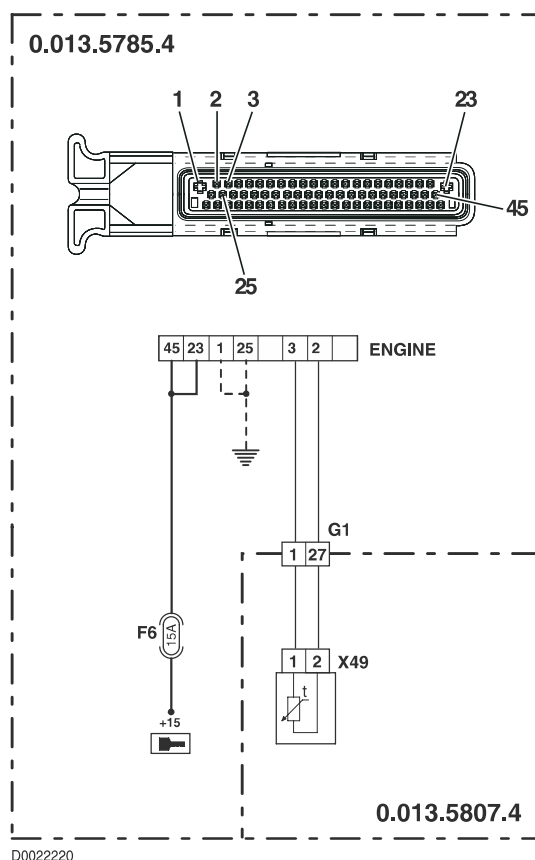
The control unit detects that the coolant temperature sensor is disconnected.

### ECU RESPONSE

The pre-heating system is always turned on when the engine is started.

### CHECK

- Check that the "X49" connectors of the engine temperature sensor and "ENGINE" on the engine control unit are not oxidized and are firmly secured.
- With the starter key in the "O" (OFF) position, connect a test meter to pin 1 of connector "X49" and to pin 3 of the "ENGINE" connector and measure the resistance to verify that there is electrical continuity (test meter reading: 0 Ohm).
- With the starter key in the "O" (OFF) position, connect a test meter to pin 2 of connector "X49" and to pin 2 of the "ENGINE" connector and measure the resistance to verify that there is electrical continuity (test meter reading: 0 Ohm).
- Verify the correct operation of the sensor (for technical details, see section 40).
- Clear all alarms, turn the starter key first to "O" (OFF) and then back to the "I" (ON) position again, and if the alarm is still present, the control unit must be renewed.

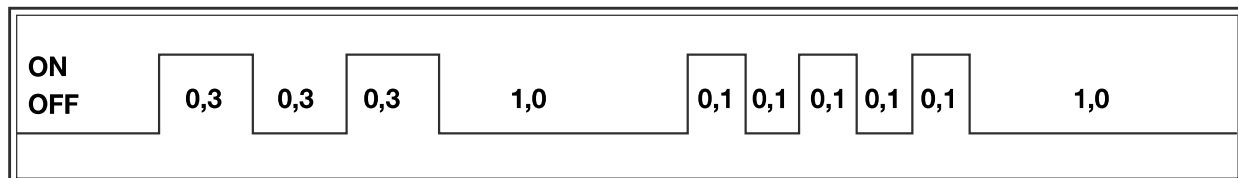


## 5.2 LIFT CONTROL UNIT ALARMS

The lift control unit warns the operator of any malfunction in monitored components by way of an indicator light located in the lift control button on the right-hand side of the driving seat.

Faults are indicated using a system of coded flash sequences that identify the component and type of fault exactly.

### 5.2.1 LIST OF ALARMS BY FLASH SEQUENCE ON LIFT CONTROL BUTTON



| Flashes | Display on ART  | Alarm description                                                                       | System reaction                                                                        | Page |
|---------|-----------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------|
| 11      | EVUP DISCONN.   | The control unit detects that the solenoid valve governing lifting is disconnected.     | The lift does not work in automatic mode.                                              | 69   |
| 12      | EVUP C.C.       | The control unit detects that the solenoid valve governing lifting is short-circuited.  | The lift does not work in automatic mode.                                              | 68   |
| 13      | EVDW DISCONN.   | The control unit detects that the solenoid valve governing lowering is disconnected.    | The lift does not work in automatic mode.                                              | 67   |
| 14      | EVDW C.C.       | The control unit detects that the solenoid valve governing lowering is short-circuited. | The lift does not work in automatic mode.                                              | 66   |
| 15      | EPROM CHECK     | The control unit detects a fault with the EPROM                                         | The lift shuts down completely                                                         | 65   |
| 21      | POS.SENS.C.C.   | The control unit detects that the position sensor is short circuited.                   | The lift does not work in automatic mode.                                              | 71   |
| 22      | POS.SENS.DIS.   | The control unit detects that the position sensor is disconnected.                      | The lift does not work in automatic mode.                                              | 72   |
| 23      | GEN.FAIL.CPU    | The control unit detects a fault with the electronic control unit.                      | The lift does not work in automatic mode.                                              | 65   |
| 41      | DRAFT SENS N.C. | The control unit detects that the draft sensor is disconnected.                         | The lift does not work in draft control mode.                                          | 64   |
| 42      | DRAFT SENS C.C. | The control unit detects that the draft sensor is short circuited.                      | The lift does not work in draft control mode.                                          | 63   |
| 45      | EEPROM CHECK    | The control unit detects a fault with the EEPROM                                        | The lift works correctly but the operating parameters go back to the standard version. | 65   |
| 50      | NO V. SENSOR    | The control unit detects that the sensor supply voltage is not correct.                 | The lift does not work in automatic mode.                                              | 70   |

## POS.SENS.C.C.

### DESCRIPTION

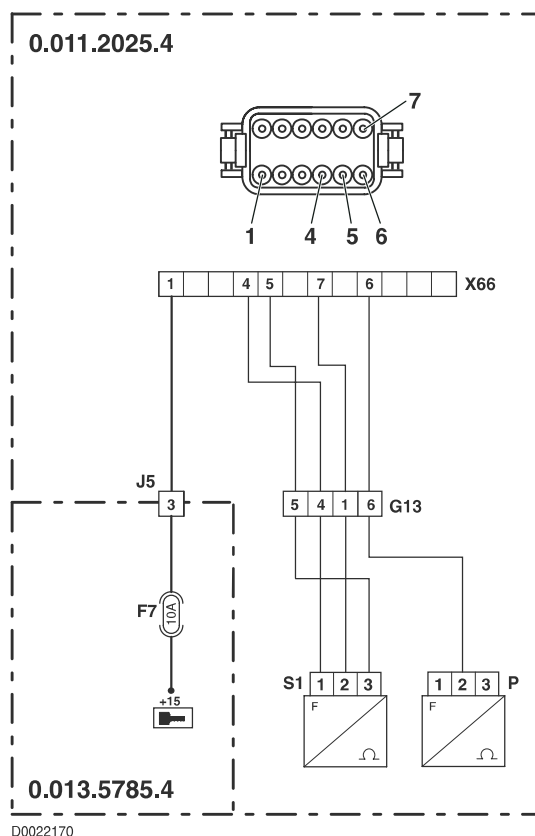
The control unit detects that the position sensor is short circuited.

### ECU RESPONSE

The lift does not work in automatic mode.

### CHECK

- Check that the contacts on the “P” connector of the position sensor and “X66” on the lift control unit are not oxidized and are firmly secured.
- With the starter key in the “I” (ON) position, check that the position sensor is correctly supplied (voltage between pin 3 (positive) and pin 1 (negative) of connector “S1” of approximately 10 V).
- With the starter key in the “I” (ON) position, connect a test meter to pin 2 of connector “P” and to chassis earth, and verify that there are no short circuits to a positive supply (meter reading: 0V).
- Verify the correct operation of the sensor (for the technical details, see unit 40)
- Clear all alarms, turn the starter key first to “O” (OFF) and then back to the “I” (ON) position again, and if the alarm is still present, the control unit must be renewed.



On this screen you can check the buttons and solenoid valves comprising the HML system work properly.

- **UP PB:** button used to increase the range.  
On pressing this button, the test meter shows **ON**.  
On releasing this button, the test meter shows **OFF**.
- **DOWN PB:** button used to decrease the range.  
On pressing this button, the test meter shows **ON**.  
On releasing this button, the test meter shows **OFF**.
- **H SV:** H range solenoid valve.  
Pressing **1** on the test meter energizes or de-energizes the solenoid valve.  
When the solenoid valve is energized, the voltage is displayed.  
When the solenoid valve is de-energized, 0 mA is displayed.
- **L SV:** L range solenoid valve.  
Pressing **2** on the test meter energizes or de-energizes the solenoid valve.  
When the solenoid valve is energized, the voltage is displayed.  
When the solenoid valve is de-energized, 0 mA is displayed.
- **M LAMP:** indicator lamp signalling M range operation.  
Pressing **3** on the test meter turns the indicator lamp on and off (**OFF - ON**).

Press **E** to exit.

[illegible]

**7. PTO**

- 1 - **CALIBRATION:** to access the PTO system configuration menu.
- 2 - **TESTS:** to check the PTO system works properly.
- 3 - **MONITOR:** to access the control menu for the PTO system parameters.

Press the button corresponding to the required menu or press **E** to exit.

[illegible]

## 7.1 CALIBRATION

To calibrate the PTO release position, refer to the tractor's use and maintenance manual.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | S | e | n | s | o | r | s |   |   |   |   |
| = | = | = | = | = | = | = | = | = | = | = | = | = | = | = | = |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| P | o | s | i | t | . | . | . | . | . | . | . | . | x | x | x |
| D | r | a | f | t | . | . | . | . | . | . | . | . | x | x | x |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| P | O | S | I | T |   | I | N |   | T | R | A | S | P | . |   |
| L | O | C | K | P | O | S | . | . | . | . | . | . | x | x | x |
| X | P | O | S | I | M | . | . | . | . | . | . | . | x | x | x |
| X | S | P | E | E | D | 2 | . | . | . | . | . | . | x | x | x |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| = | = | = | = | = | = | = | = | = | = | = | = | = | = | = | = |
|   |   |   | E |   | E | X | I | T |   |   |   |   |   |   |   |

3.1 SENSORS

- **Posit:** displays the value read by the position sensor (from 0 to 100).
- **Draft:** displays the value read by the draft sensor (from 0 to 1000).
- **LOCKPOS:** displays the lift position value when the lift was locked (from 0 to 1000).
- **XPOSIM:** displays the maximum height set with the potentiometer (from 0 to 1000).
- **XSPEED2:** displays the value read by the position sensor (from 0 to 1000).

Press  to exit.

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|   |   | P | O | W | E | R |   | S | U | P | P | L | Y |   |   |
| = | = | = | = | = | = | = | = | = | = | = | = | = | = | = | = |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| + | 1 | 0 | v |   | o | u | t | m | V |   |   | x | x | x | x |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| = | = | = | = | = | = | = | = | = | = | = | = | = | = | = | = |
|   |   |   | E |   | E | X | I | T |   |   |   |   |   |   |   |

3.2 VOLTAGES

- **+10V:** output voltage (between 0 and 10000 mV).

Press  to exit.

# WHEELS

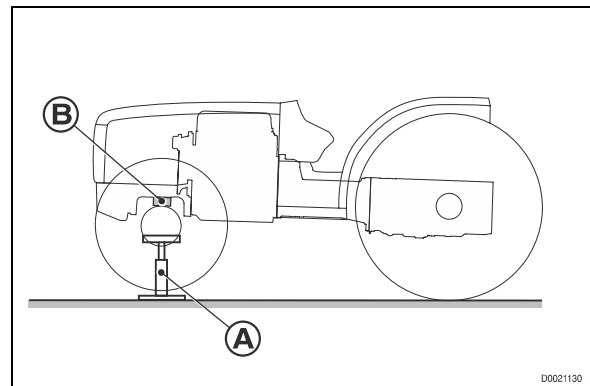
## FRONT WHEELS

### Removal

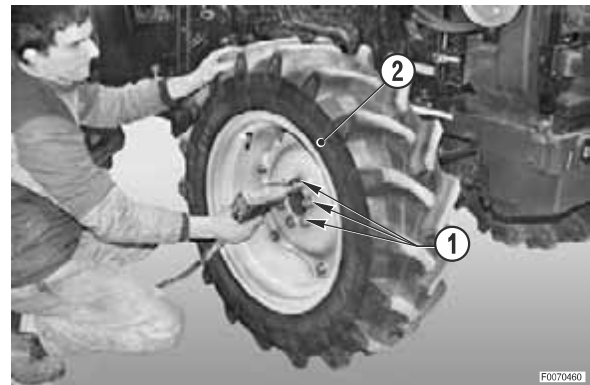


Remove the key from the starter switch and apply the parking brake.

- 1 - Raise the tractor and position two stands “A” under the front axle.
  - ★ Drive safety wedges “B” between the axle and the front support.



- 2 - Remove all the bolts (1) except one for safety.
- 3 - Remove the wheel (2).
- 4 - Repeat the above operations for the other wheel.

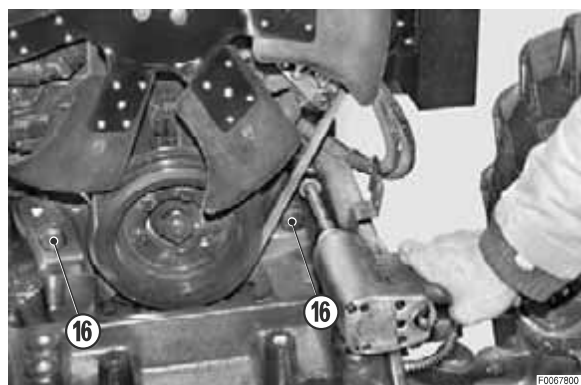


### Refitting

- Refitting is the reverse of removal

## FRONT SUPPORT

- 15 - Remove all four upper bolts (16), plus the two lower bolts on the right and the lower bolt on the left.

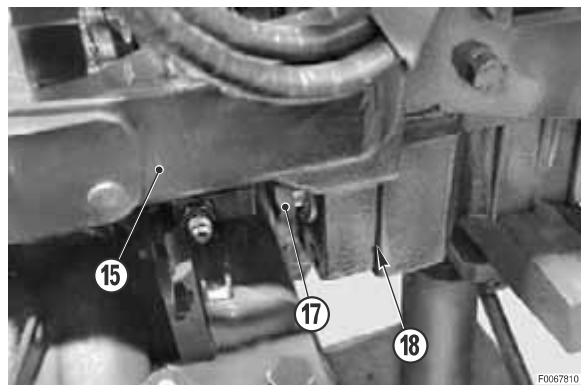


- 16 - Slacken off the bolt (17) as much as possible, move the support (15) forwards and then fully remove the bolt (17).

- ★ Recover the spacers (18) installed between the front support and the engine sump, making a note of their positions.
- ★ Keep the right and left shims separate.



- 17 - Remove the complete front support (15).



## Refitting

- Refitting is the reverse of removal

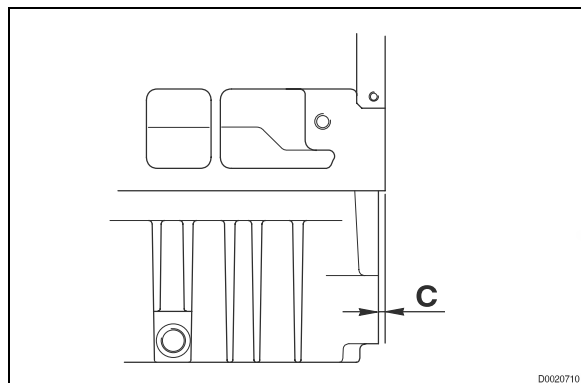


 Bolts:  $240 \pm 12$  Nm ( $177 \pm 9$  lb.ft.)



- ★ If the engine or engine sump are to be renewed, or if the shims have got mixed up or lost, recalculate the shim thicknesses as follows:

- 1 - Before installing the front support, rest a straight-edge across the engine block face and, using a feeler gauge, measure the clearance “C” between this face and contact face of the sump pan.
- 2 - Form a shim pack to obtain alignment within the tolerance limits of  $\pm 0.1$  (0.004 in.).
- 3 - Tighten down the support bolts gradually in a crosswise pattern.

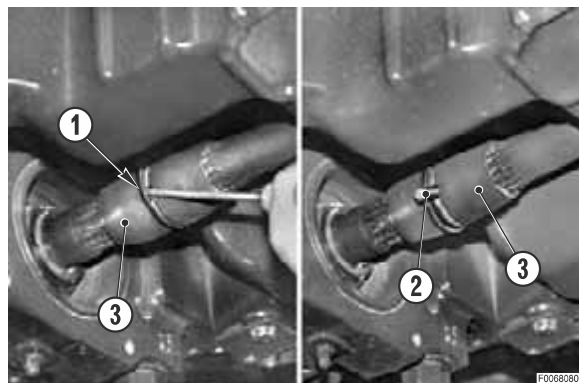


## FRONT AXLE DRIVE SHAFT

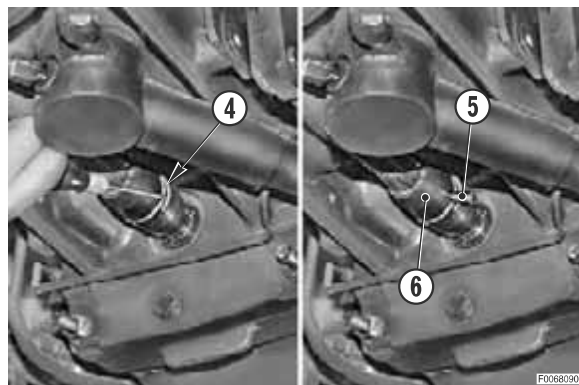
### Removal

**!** Disconnect the lead from the negative terminal (–) of the battery and apply the parking brake.

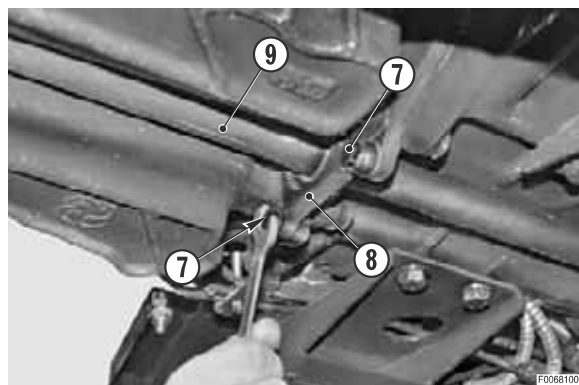
- 1 - Remove the circlip (1) from its seating, drive out the pin (2) and slide the front drive coupling (3) towards the rear of the tractor.



- 2 - Remove the circlip (4) from its seating, drive out the pin (5) and slide the rear drive coupling (6) towards the front of the tractor.



- 3 - Remove the bolts (7) securing the shaft support (8) and remove the complete shaft (9).



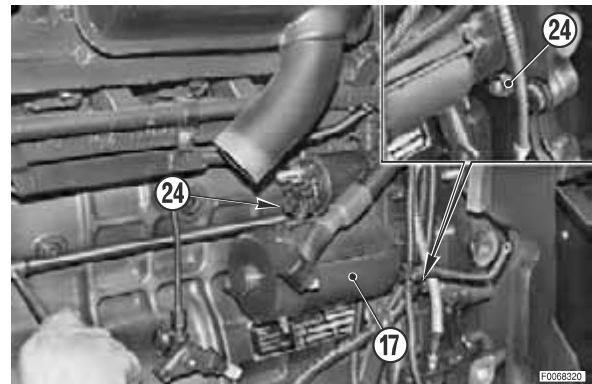
### Refitting

- Refitting is the reverse of removal
- ★ To facilitate engagement of the sleeve couplings on the pinions, insert and secure the rear sleeve first and then the front sleeve.  
In case of difficulty inserting the front sleeve coupling, slightly raise the front of the tractor so that the wheels can turn.

## STARTER MOTOR

---

- 13 - Remove the two nuts (24) and remove the starter motor (17).



### Refitting

- Refitting is the reverse of removal

✳ 1

 M16 bolts: 173±8.5 Nm (127.5±6.3 lb.ft.)  
M14 bolts: 120±6 Nm (88.5±4.4 lb.ft.)

✳ 2

 Nut: 16 to 20 Nm (11.8–14.8 lb.ft.)

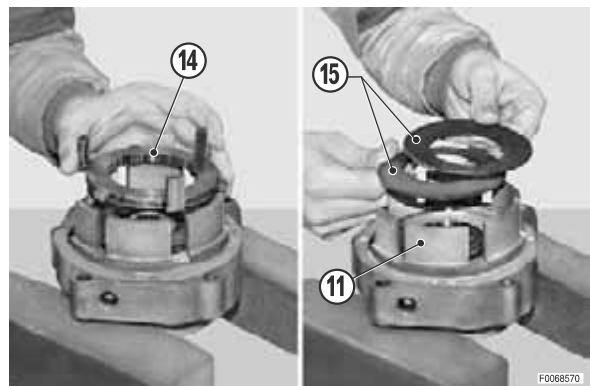
✳ 3

 Extension: 16 to 20 Nm (11.8–14.8 lb.ft.)

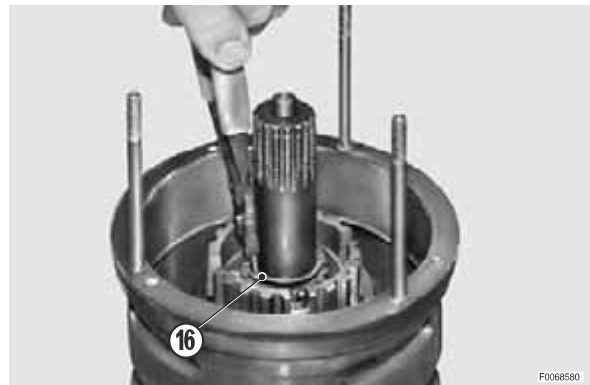
✳ 4

 Bolt: 1 to 1.3 Nm (0.7–0.9 lb.ft.)

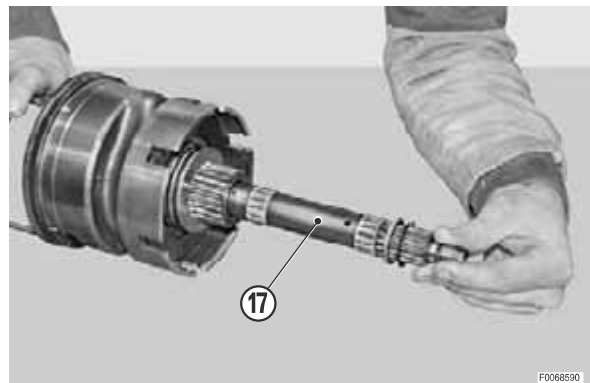
- 9 - Remove the retaining plate (14) and the Belleville springs (15) from the “M” clutch housing (11).



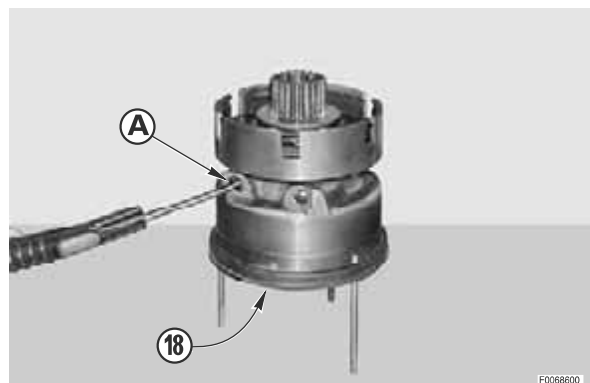
- 10 - Remove the circlip (16).



- 11 - Withdraw the HML unit output shaft (17).

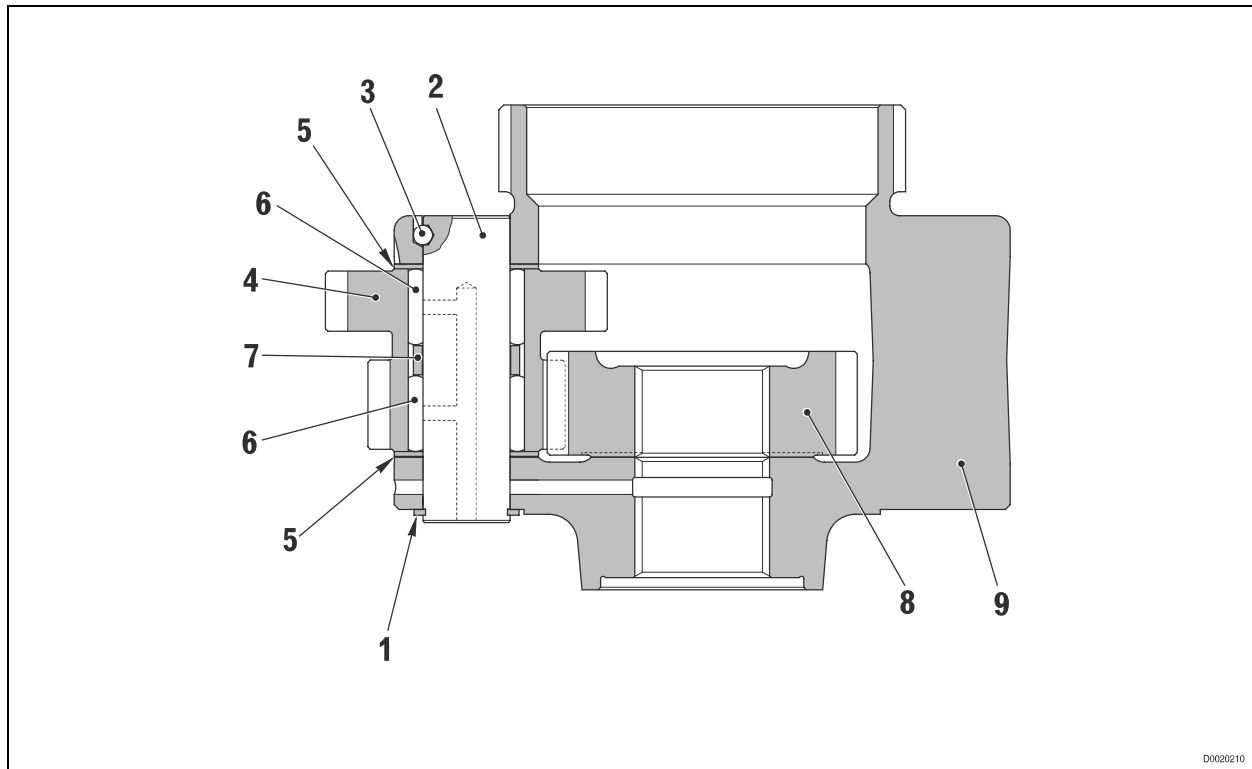


- 12 - Blow compressed air at low pressure through hole “A” to drive out the “M” range piston (18).

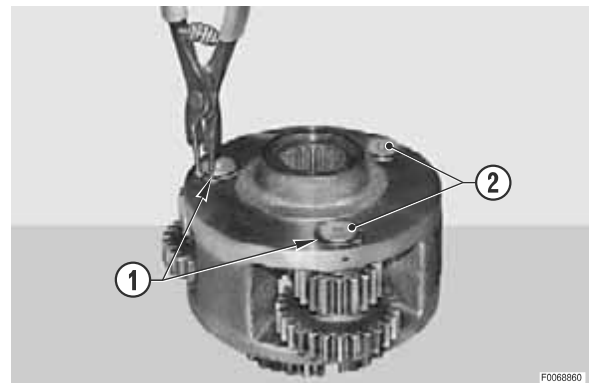


## PLANET CARRIER ASSEMBLY

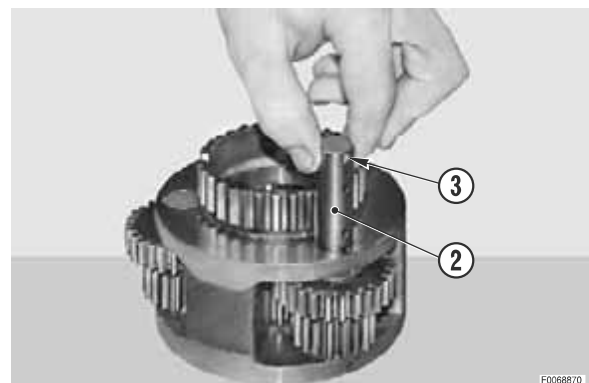
### Disassembly



1 - Remove the circlips (1) securing the pins (2).



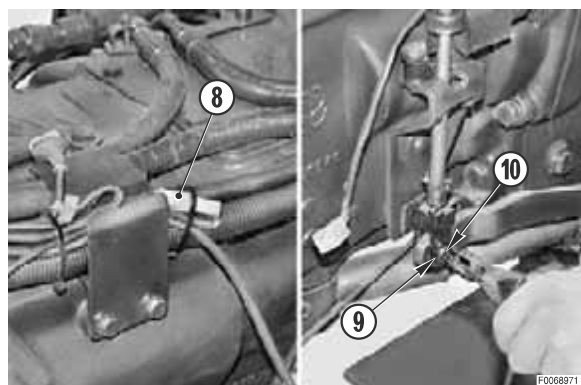
2 - Drive out the pins (2) and recover the ball (3).



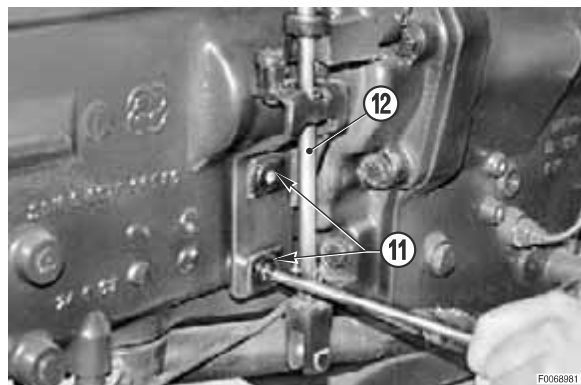
- **For all versions**

7 - Disconnect the connector (8) of the parking brake sensor.

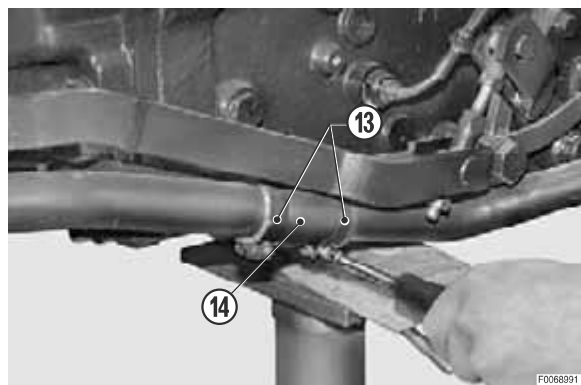
8 - Remove the circlip (9) and remove the pin (10).



9 - Remove the screws (11) and remove the parking brake control rod (12).

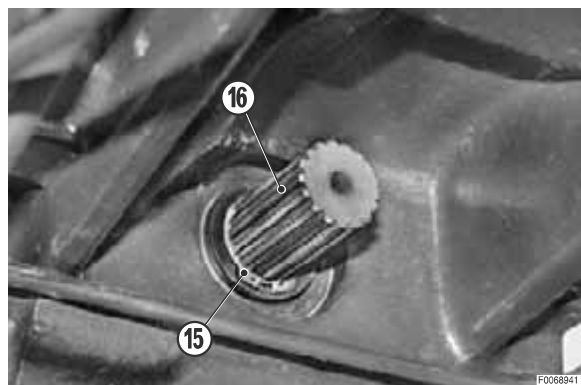


10 - Loosen the clips (13) and move the hose (14) towards the rear of the transmission.



- **For versions with hydraulic 4WD control only**

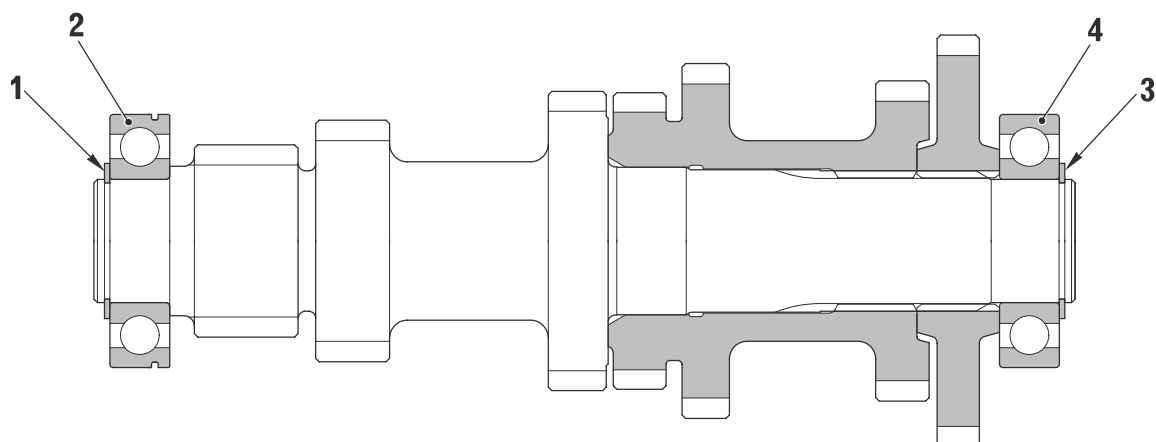
11 - Remove the circlip (15) from the 4WD drive output shaft (16) from the transmission.



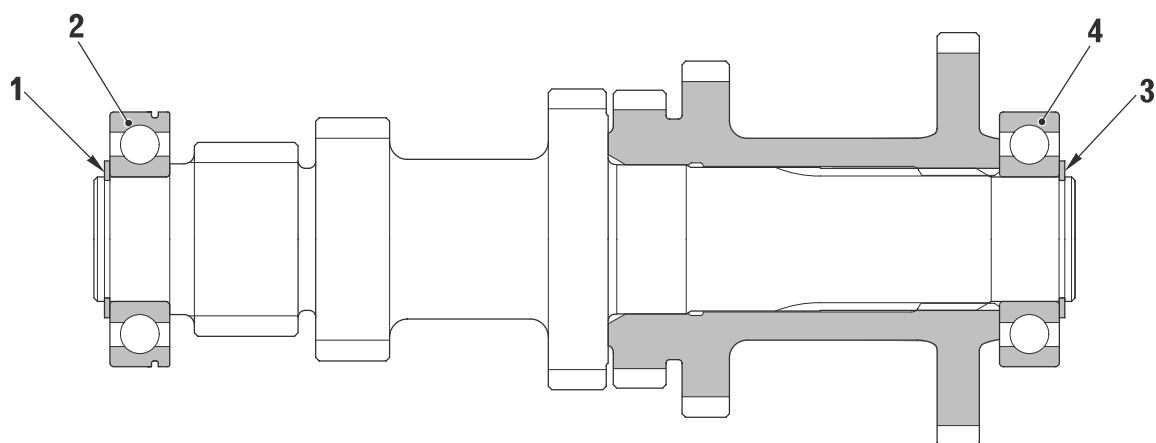
## PRIMARY SHAFT

### Disassembly

#### VERSIONS WITH UNDERDRIVE SHAFT



#### VERSIONS WITHOUT UNDERDRIVE SHAFT



D0020490

1 - Remove the circlip (1) and remove the bearing (2).



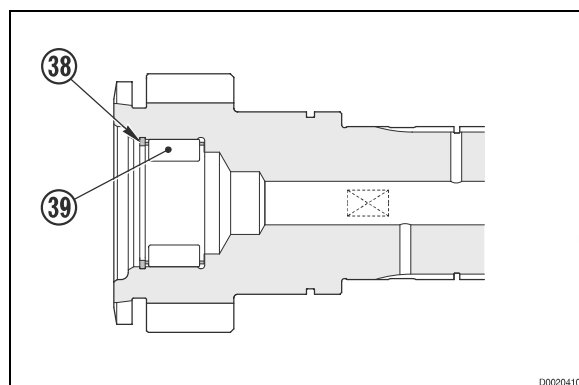
F0069160

## Assembly

### • For versions without HML only

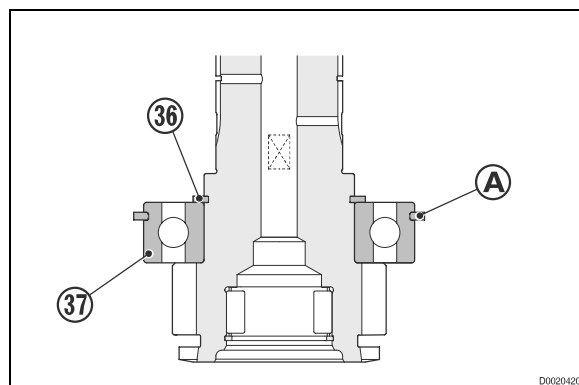
- 1 - Fit the roller cage (39) and secure in position with the circlip (38).

 Roller cage: oil



- 2 - Using a press, install the bearing (37) and secure it in position with the circlip (36).

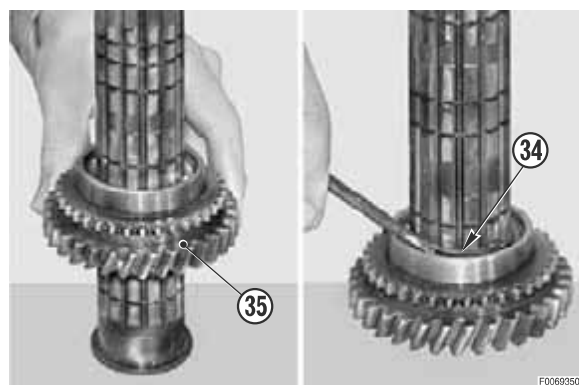
- ★ Take care to install the bearing (37) the right way round.
- ★ If a new bearing is installed, remove the old thrust washer "A" as the new bearing will come equipped its own thrust washer.



### • For all versions

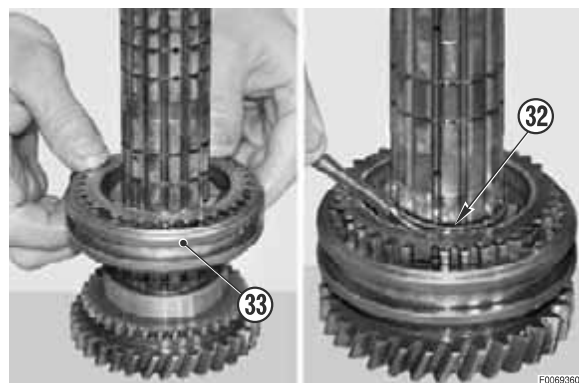
- 3 - Install the 5th speed driven gear (35) and secure it in position with the circlip (34).

- ★ Renew the circlip (34) on reassembly.



- 4 - Install the 4th/5th speed synchronizer (33) and secure it in position with the circlip (32).

- ★ Renew the circlip (32) on reassembly.



CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: [www.heydownloads.com](http://www.heydownloads.com) by clicking the link below

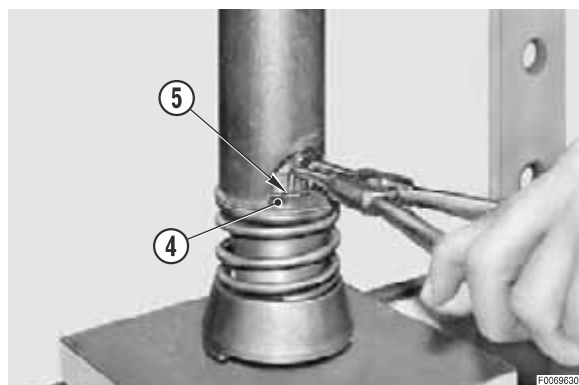


- Please note: If there is no response to **CLICKING** the link, please download this PDF first and then click on it.

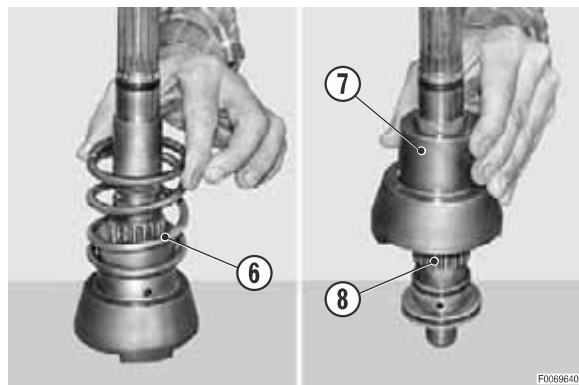
CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- 3 - Using a suitable tool and a press, press lightly on the disc (4) and remove the circlip (5) and the disc (4).

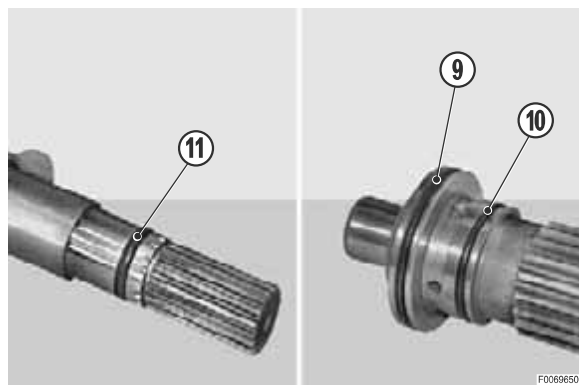
★ Take care not to apply too much pressure to the disc (4) to avoid bending it.



- 4 - Remove the spring (6) and separate the sleeve (7) from the shaft (8).



- 5 - Remove the O-rings (9), (10) and (11).



### Assembly

- To assemble, follow the disassembly steps in reverse order.

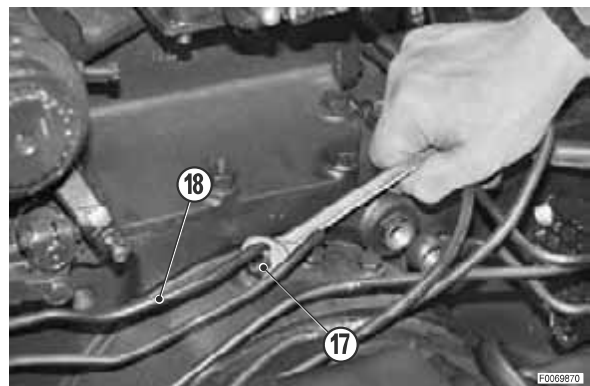


 Oil seals: grease

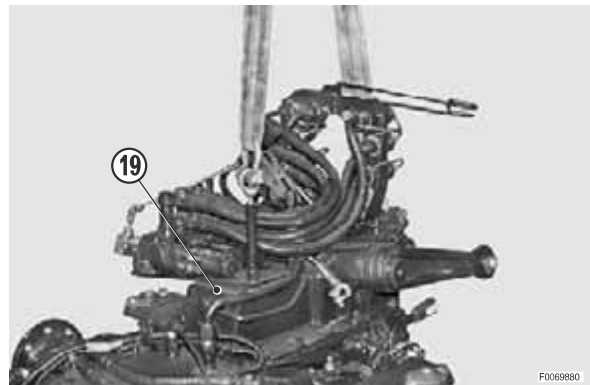


 O-rings (9) and (10): grease

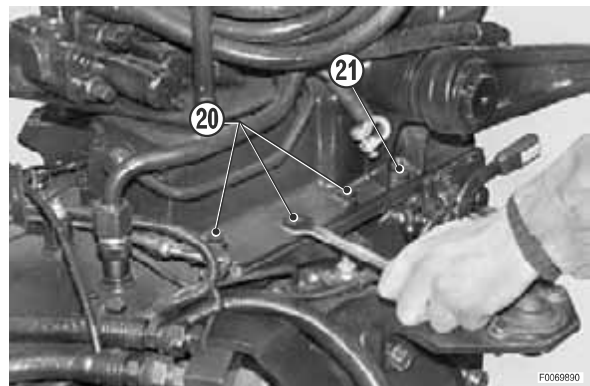
- 13 - Loosen fully the union (17) and disconnect the right brake bleed pipe (18).  
★ Plug the hole to prevent the entry of impurities.



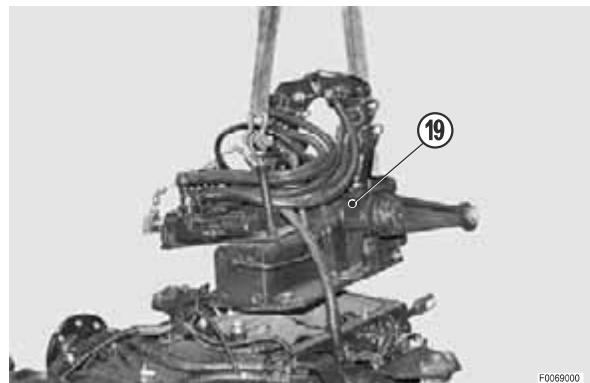
- 14 - Attach the lift cover (19) to a hoist and take up the slack in the lifting rope.



- 15 - Remove all nine bolts (20) and the three nuts (21).



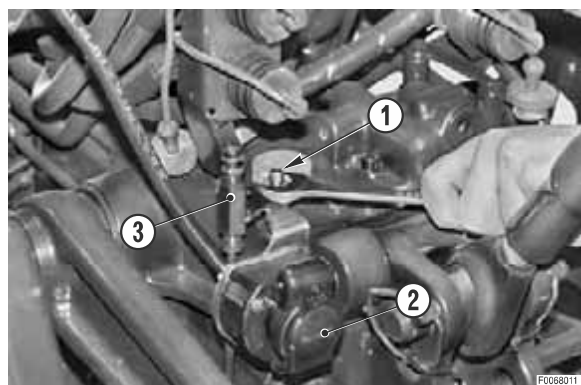
- 16 - Remove the complete lift assembly (19).



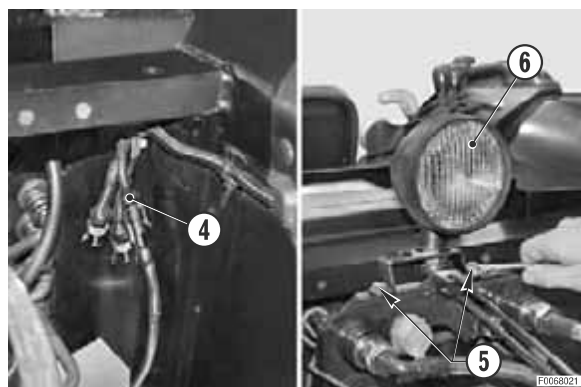
## HYDRAULIC LIFT CONTROL VALVE

### Removal

- 1 - Remove the nut (1) and disconnect the trailer socket (2) and the brake bleed pipe (3).



- 2 - Disconnect the worklight connector (4).
- 3 - Remove the screws (5) and remove the worklight (6).

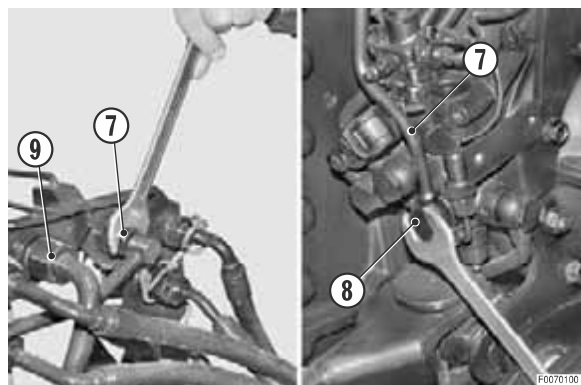


- **For versions with hydraulic trailer braking only**

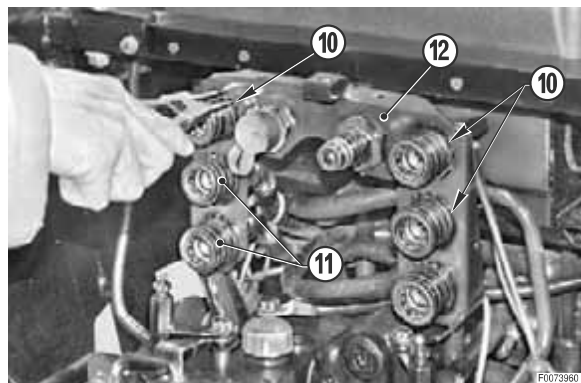
- 4 - Disconnect trailer braking pipe (7).
- 5 - Remove the union (8) and remove the pipe (7).

- **For all versions**

- 6 - Disconnect the free drain pipe (9).



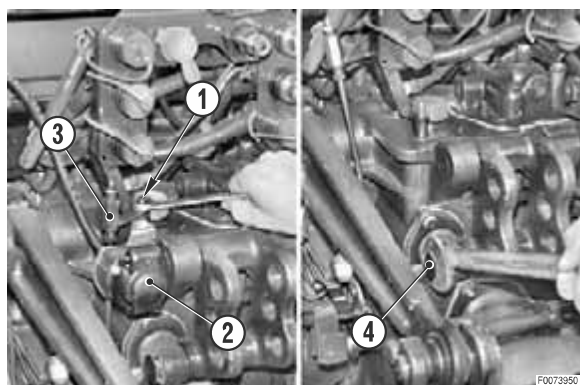
- 7 - Remove the 5 circlips (10) and disconnect the pipes (11) from the support (12).



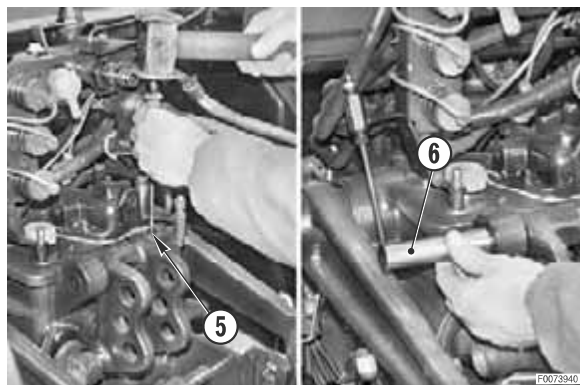
## MECHANICAL DRAFT SENSOR

### Removal

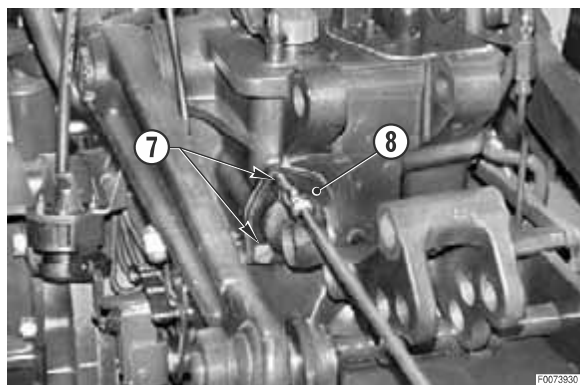
- 1 - Remove the nut (1) and move the trailer socket (2) and the brake bleed union (3) to one side.
- 2 - Remove the pin (4).



- 3 - Drive out the pin (5) and remove the pivot pin (6).



- 4 - Remove the screws (7) and remove the draft sensor (8).

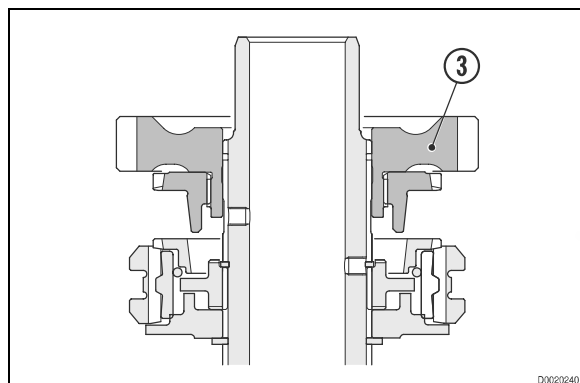


### Refitting

- Refitting is the reverse of removal



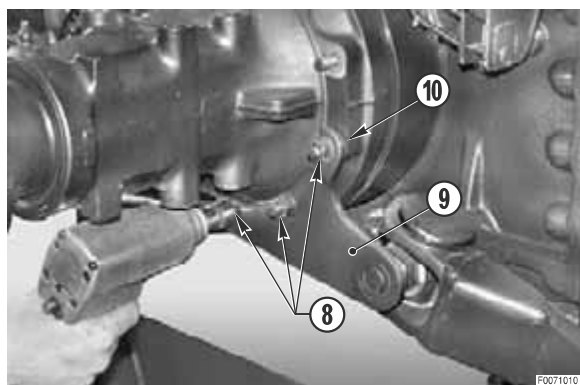
 Mating face: Silastic 738



- 7 - Remove the three nuts (8) and remove the bracket (9).

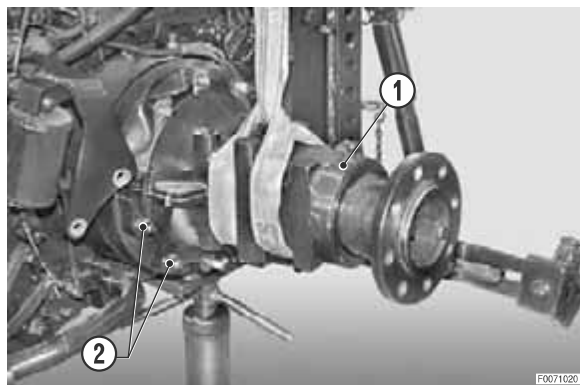


- ★ Recover the washers (10).

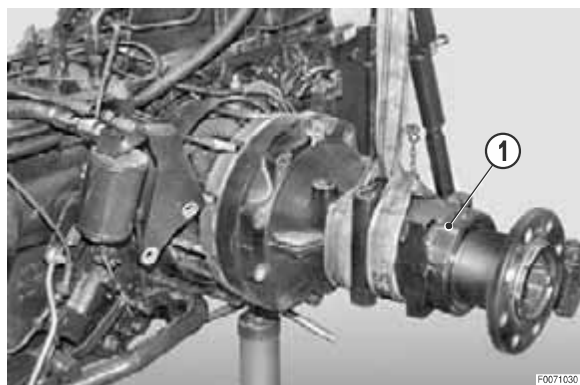


### Removal of the complete rear axle

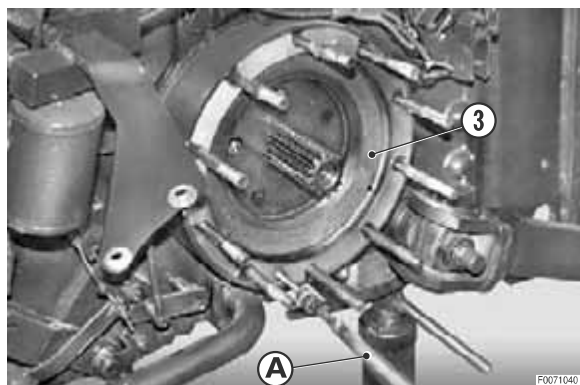
- 1 - Attach the rear axle (1) to a hoist and take up the slack in the lifting rope.



- 2 - Remove the nuts (2) and remove the complete rear axle assembly (1).



- 3 - If the brake flange (3) remains in its seating in the transmission casing, remove it using a slide hammer puller "A".



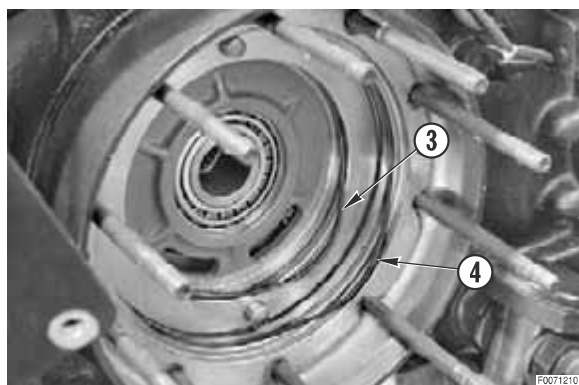


2

- ★ To facilitate installation of the O-rings (3) and (4), stretch them slightly various points all around the circumference so that they are held in place in their seating.



Seals: brake fluid

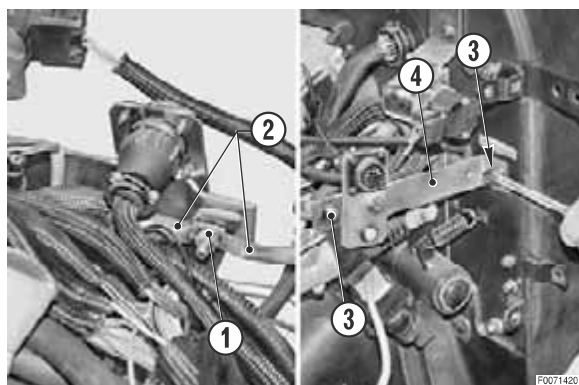


## BRAKE CYLINDERS

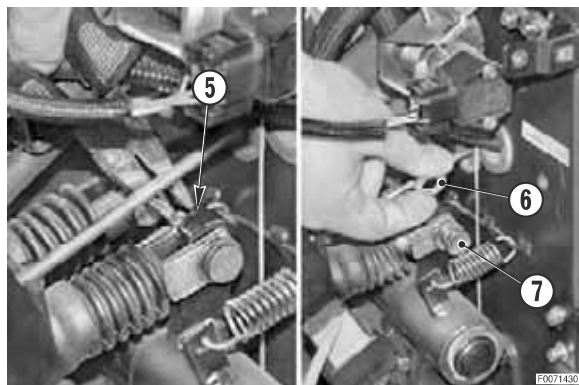
### Removal

**!** Disconnect the lead from the negative terminal (–) of the battery and apply the parking brake.

- 1 - Remove the instrument panel.  
(For details, see "INSTRUMENT PANEL").
- 2 - Drain all the fluid from the brake fluid reservoir.
- 3 - Remove the nut (1) and disconnect the earth lead (2).
- 4 - Remove the screws (3) and remove the bracket (4).

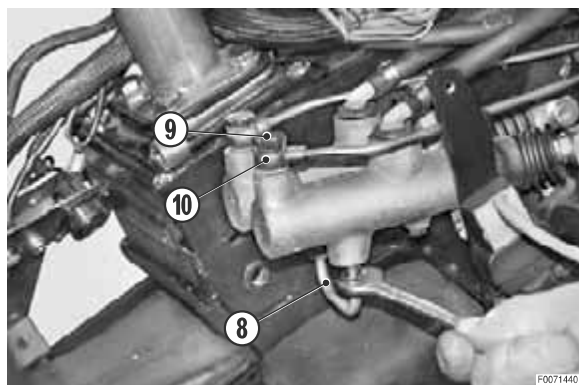


- 5 - Remove the cotter pin (5) and remove washer (6) and pin (7).



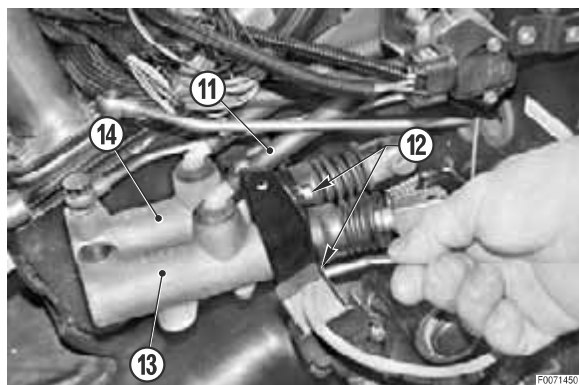
- 6 - Remove the compensation pipe (8), remove the union (9) and disconnect the pipe (10).

★ Renew the copper washers on reassembly.



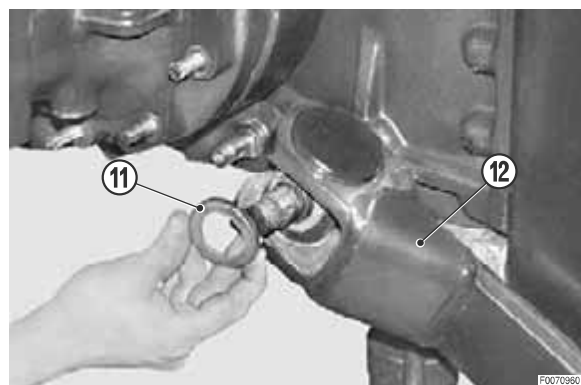
- 7 - Disconnect the pipe (11), remove the screws (12) and remove brake cylinder (13).

- 8 - Repeat steps 5, 6, and 7 for the left brake cylinder (14).



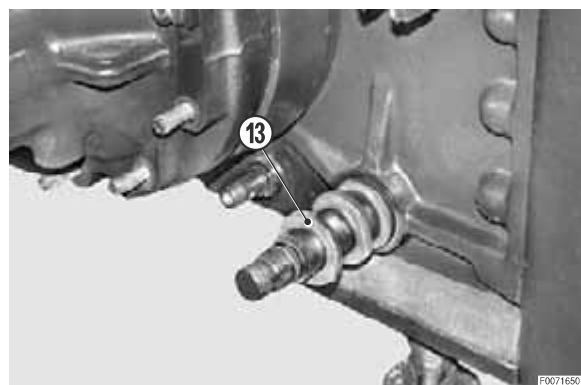
### 3-POINT LINKAGE

6 - Remove the washer (11) and the lever (12).



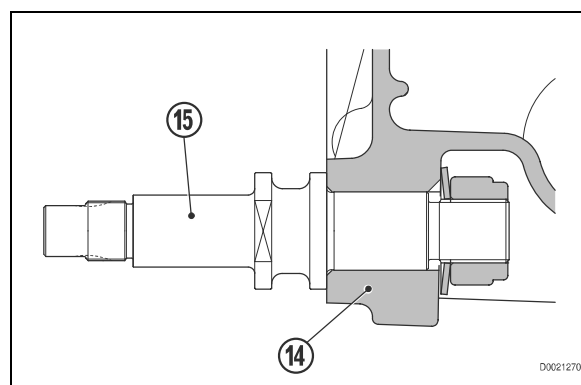
7 - Remove the washer (13).

8 - Repeat the procedure on the opposite side.



- **Only if necessary**

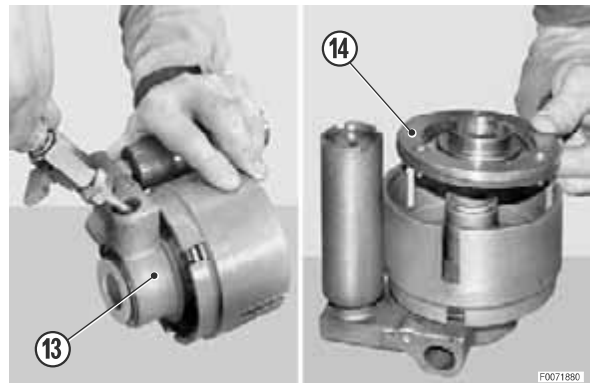
9 - Loosen the nut (14) and remove the pin (15).



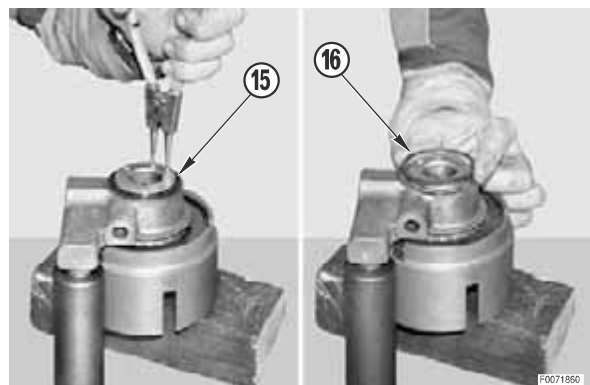
8 - Remove the disc (12) and the spring (10).



9 - Blow compressed air at low pressure through the hole in the side of the clutch housing (13) to expel the piston (14).



10 - Remove the circlip (15) and remove the shim (16).



11 - Remove the clutch assembly (13) from the clutch housing (9).



## RANGE GEARBOX AND REAR DIFFERENTIAL ASSEMBLY

### COMPLETE ASSEMBLY

#### Disassembly

- 1 - Remove the platform.  
(For details, see: "PLATFORM").
- 2 - Separate the gearbox and shuttle assembly from the transmission. (For details, see: "GEARBOX AND SHUTTLE ASSEMBLY").
- 3 - Remove the lift assembly.  
(For details, see: "HYDRAULIC LIFT (VERSION WITH MECHANICAL GOVERNOR)").
- 4 - Remove the rear PTO clutch.  
For details, see: "REAR PTO".
- 5 - Only if the power take-off for the hydraulic pumps is to be overhauled, remove the hydraulic pumps.  
(For details, see: "HYDRAULIC PUMPS").

- 6 - Remove the left rear axle.  
(For details, see: "REAR AXLE").
- 7 - Remove the service valves assembly.  
(For details, see: "SERVICE VALVES ASSEMBLY").
- 8 - Only if the 4WD shaft and groundspeed PTO are to be overhauled, remove the groundspeed PTO drive shaft. (For details, see: "REAR PTO" and the 4WD engagement control (for details, see "FOUR-WHEEL DRIVE ENGAGEMENT CONTROL").

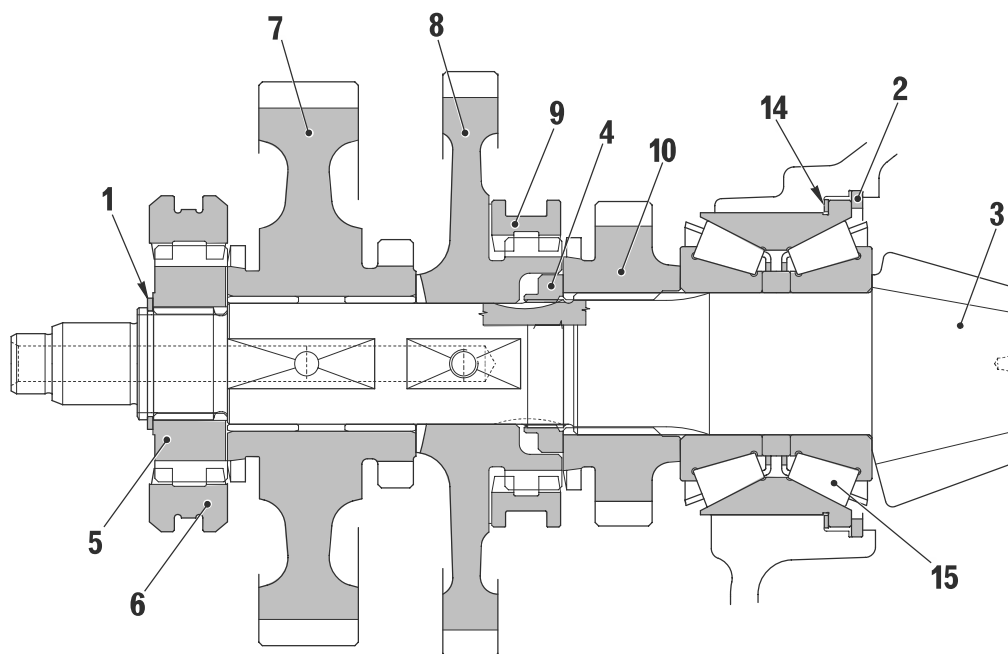
#### Assembly

- Assembly is the reverse of disassembly.

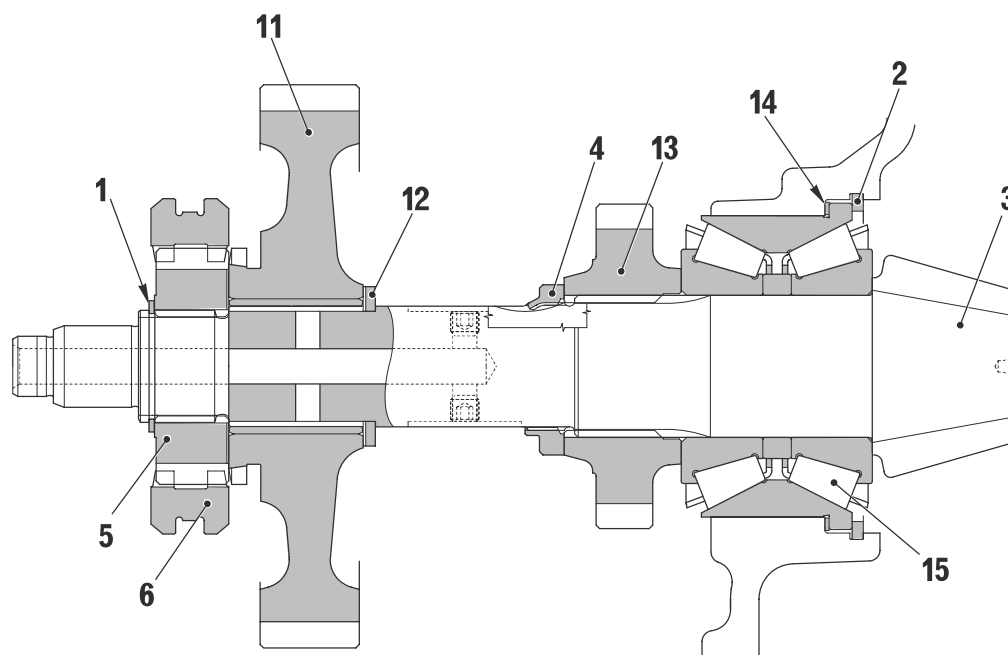
## PINION

### Disassembly

#### 3 RANGES VERSION

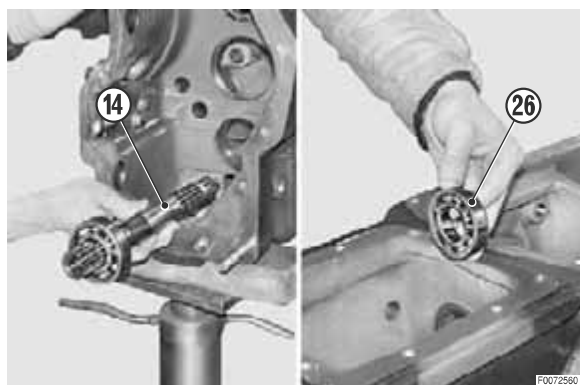


#### 2 RANGES VERSION

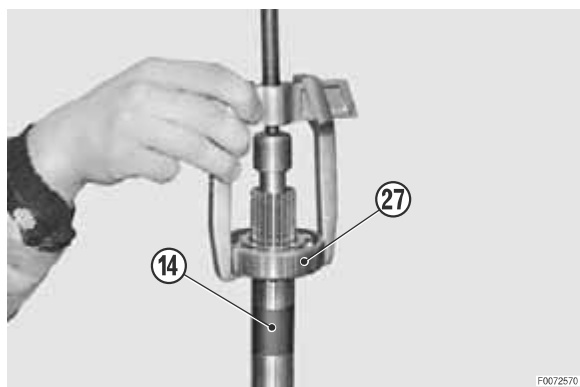


D0021400

- 13 - Finally the remove the shaft (14) and remove the bearing (26) from the transmission casing.



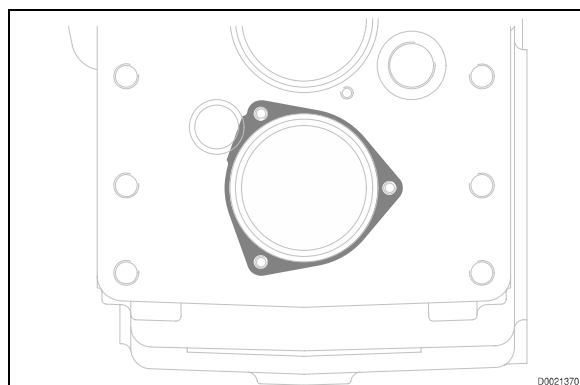
- 14 - Remove the bearing (27) from the shaft (14).



### Assembly

- To assemble, follow the disassembly steps in reverse order.

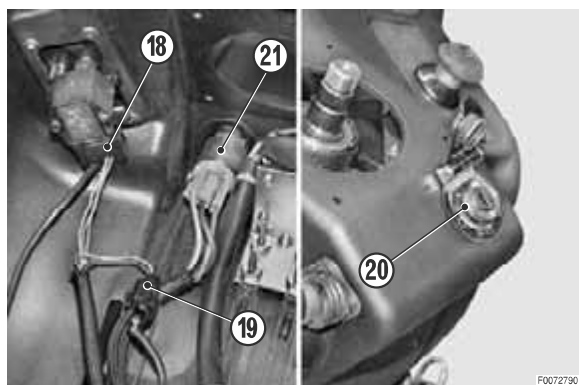
✱ 1



✱ 2

 Roller cages: transmission oil

- 10 - Disconnect the connectors (18) and (19).
- 11 - Remove the ringnut (20) and disconnect the starter switch (21).



- 12 - Disconnect the lights switch connector (22).



### Refitting

- Refitting is the reverse of removal

## EPICYCLIC REDUCTION UNIT

### Removal

**!** Disconnect the lead from the negative terminal (–) of the battery and apply the parking brake.

- 1 - Remove the wheel on the appropriate side.  
(For details, see: "WHEELS").
- 2 - Remove the plug (1) and drain off all the oil from the steering knuckle housing (2).

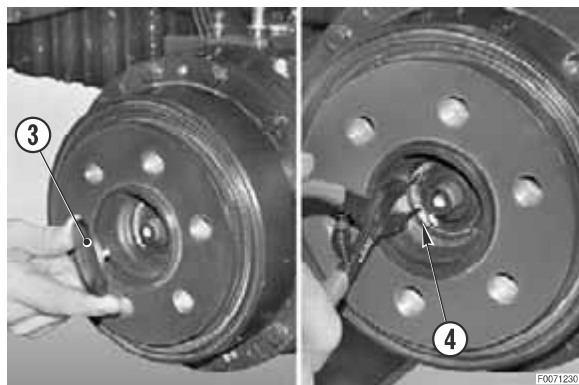
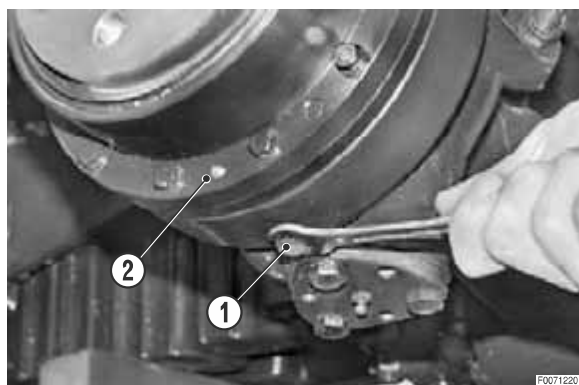
⊠ 1

★ Renew the copper washers on reassembly.

 Final drive reduction unit: approx. 1.5 ℓ

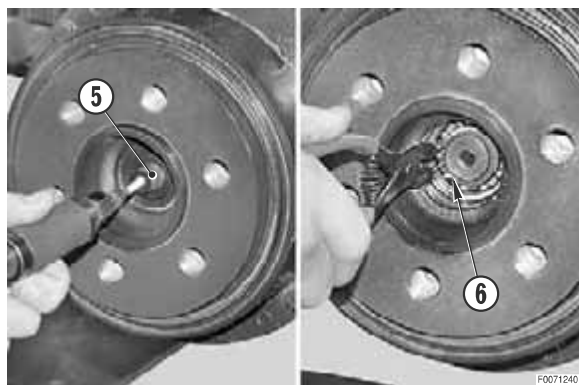
- 3 - Unscrew and remove the cover (3).

- 4 - Remove the circlip (4).



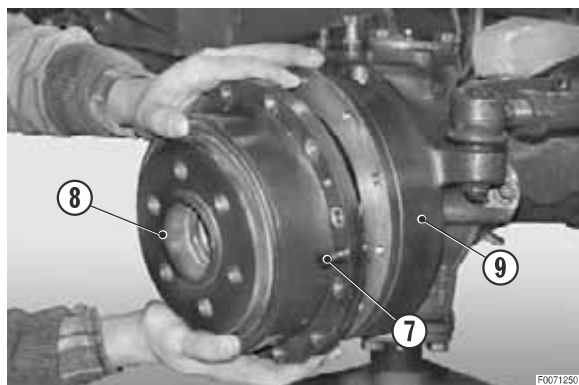
- 5 - Use a slide hammer puller to remove the cover (5).

- 6 - Remove the circlip (6).



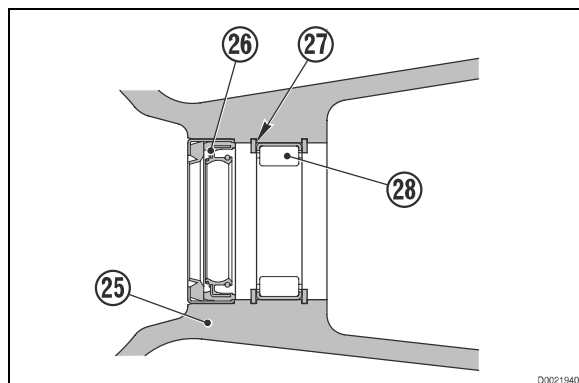
- 7 - Remove all the screws (7) and, using two screws (7) as pullers, separate the epicyclic reduction unit (8) from the steering knuckle housing (9).

⊠ 2



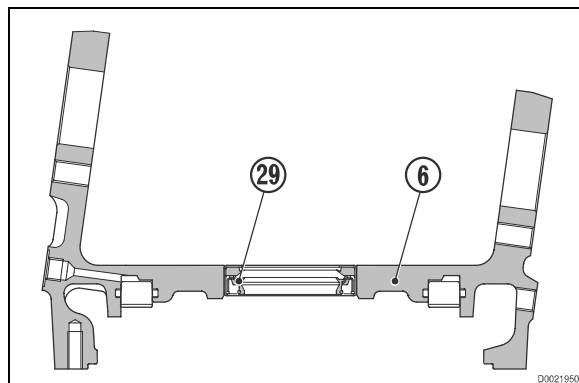
- 17 - Remove the oil seal (26), the circlip (27) and the roller bearing (28) from the axle housing (25).

❖ 3



- 18 - Remove the steering knuckle housing (6) and the oil seal (29).

★ Note which way round the oil seal is installed.



## Refitting

- Refitting is the reverse of removal

❖ 1

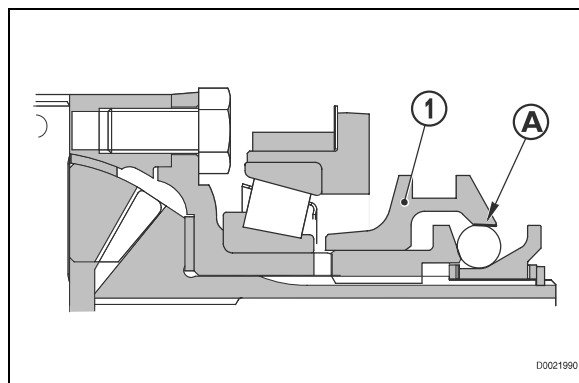
 Nut: 98±5 Nm (72.2±3.7 lb.ft.)

- ★ If the slot does not line up with the hole in the pin, tighten the nut further until they are aligned.

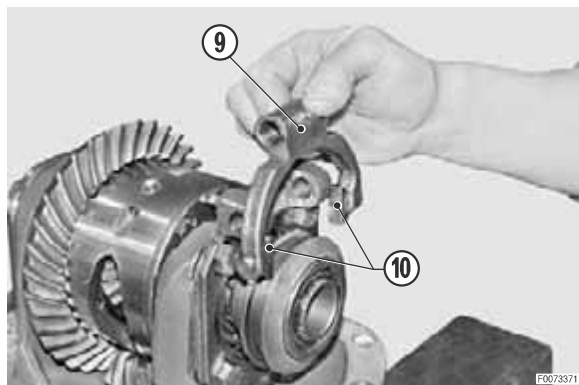
❖ 2

- ★ Only if the bearings (20) and (23) or the steering knuckle housing (6) or the axle housing (25) are renewed, adjust the bearing preload. (For details, see "Adjusting the bearings preload" in this chapter).

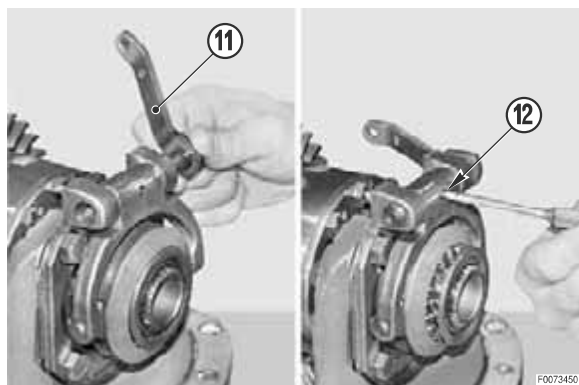
- 6 - With the sleeve (1) moved towards the differential, check that the flat part "A" of the sleeve (1) is positioned on the balls (3) as shown in the figure.
- 7 - If not, repeat the procedure described in points 5 and 6 until the condition described above is obtained.



- 8 - Fit the selector fork (9) complete with the shoes (10).

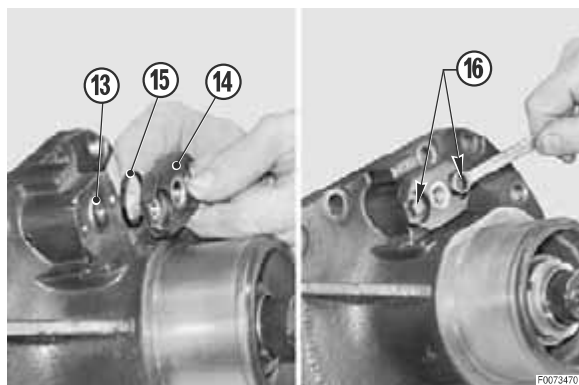


- 9 - Fit the lever (11) and secure with the spring pin (12).



- 10 - Fit the control piston (13), the cover (14) and its O-ring (15) and tighten the screws (16).

 O-rings: oil



- 11 - Calculate the thickness “**P**” of the shim pack (16) to be installed under the spacer (17) using the following formula, rounding the value down to the nearest 0.05 mm.

“**P**” = Thickness of installed shims installed  
– play measured

**Example 1:** (measured play = 0.17 mm)

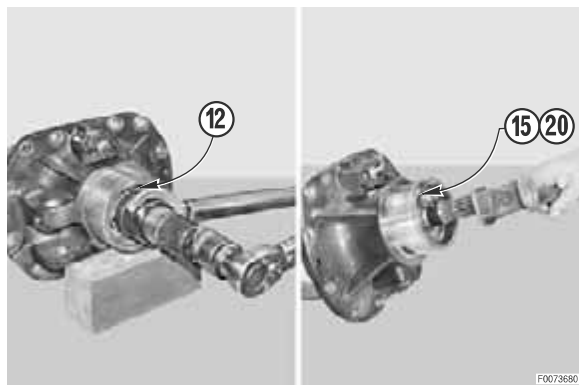
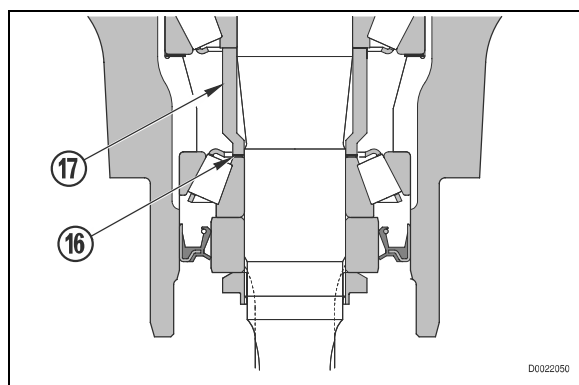
**P** =  $0.80 - 0.17 = 0.63$  mm  
which rounds down to 0.60 mm

**Example 2:** (measured play = 0.13 mm)

**P** =  $0.80 - 0.13 = 0.67$  mm  
which rounds down to 0.65 mm

- 12 - Remove the ringnut (12) and withdraw the pinion assembly, the spacer (15) and the inner ring of the bearing (20).

★ Loosen the ringnut by turning it clockwise.

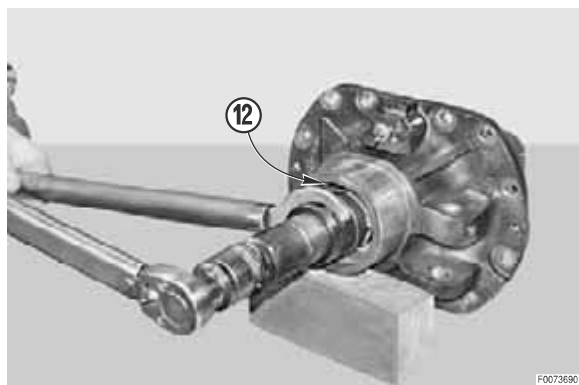


- 13 - Alter the shim pack (16) to the thickness “**P**” calculated in point 11 and refit the pinion as described in points 7 - 8 and 9.

★ While tightening the ringnut, rotate the pinion to ensure the bearings (18) and (20) run smoothly.

- 14 - Rotate the pinion both directions and lightly tap it to help seat the bearings (18) and (20) and check as described in point 10 that there is no pinion end float.

- 15 - If there is end float, repeat the procedures described in points 11, 12 and 13.



# SECTION 40

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## 2.1 INDEX BY PART DESCRIPTION

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|----------------------------------------------|-----------------|----------------------------------|-----------|---------------------|
| Front PTO switch                             | 2.7659.252.0    | 33                               | X31       | 17 - 18             |
| Front remote control valve                   |                 |                                  | X27       | 7-8                 |
| Front sidelight and direction indicator (lh) | 2.8019.960.0    |                                  | X60       | 5-6                 |
| Front sidelight and direction indicator (rh) | 2.8019.970.0    |                                  | X59       | 5-6                 |
| Front worklight (lh)                         | 2.8029.770.0/30 |                                  | X54       | 5-6                 |
| Front worklight (rh)                         | 2.8029.760.0/30 |                                  | X56       | 5-6                 |
| Fuel level sensor                            | 2.7059.983.0/10 |                                  | X53       | 9-10                |
| Groundspeed PTO switch indicator light       | 2.7659.096.0/10 |                                  | X17       | 17 - 18             |
| Groundspeed PTO engagement sensor            | 2.7659.131.0    | 21                               | S         | 17 - 18             |
| H gear control solenoid valve                | 2.3729.240.0/30 | 1                                | H         | 13 - 14             |
| Hand throttle position sensor                | 2.7099.740.0/10 | 19                               | X7        | 4                   |
| Handbrake switch                             | 2.7659.237.0    | 14                               | X40       | 11 - 12             |
| Hazard lights control unit                   | 2.8639.007.0    |                                  | X26       | 5 - 6               |
| Hazard warning lights switch                 | 2.7659.110.0    | 29                               | X32       | 5 - 6               |
| HML control unit                             | 0.010.8869.4/20 |                                  | X68       | 14                  |
| HML pushbutton                               | 2.7659.183.0    | 24                               | X22       | 13 - 14             |
| Horn                                         | 2.8419.007.0    |                                  | X52       | 5-6                 |
| L gear control solenoid valve                | 2.3729.240.0/30 | 2                                | L         | 13 - 14             |
| Lift control unit                            | 0.011.2992.4/20 |                                  | X66       | 15-16               |
| Lift Down solenoid valve                     | 2.3729.320.0    | 37                               | EV DW     | 15-16               |
| Lift draft sensor                            | 0.011.2164.0/10 | 26                               | S1        | 15-16               |
| Lift position potentiometer                  | 0.011.2990.0    |                                  | P1        | 15-16               |
| Lift Up solenoid valve                       | 2.3729.320.0    | 37                               | EV UP     | 15 - 16             |
| Lift Up/Down switch                          | 0.011.7720.0/10 | 34                               | X67       | 15-16               |
| Lights selector switch                       | 0.010.1173.4/30 |                                  | X24       | 5 - 6 - 7 - 8       |
| Lower links solenoid valve                   |                 |                                  | X18       | 7-8                 |
| Max. lift height potentiometer               | 0.011.2990.0    |                                  | H1        | 15-16               |
| Memory pushbutton                            | 2.7659.203.0    | 25                               | X8        | 4                   |
| Number plate light                           | 2.8029.240.0/10 |                                  | X12       | 5 - 6               |
| Outlet socket                                |                 |                                  | X19       | 7 - 8               |
| Outlet socket (rotating beacon)              | 0.008.1550.0    |                                  | X58       | 7-8                 |
| Preheater power relay                        | 2.7659.240.0/10 | 38                               | RL4       | 2-3                 |
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| Preheating device (55-75 CV)                 | 0.013.3450.4/10 |                                  | X62       | 2-3                 |
| Preheating device (70-90-100 CV)             | 2.7659.225.0    |                                  | X62       | 2-3                 |
| Preheating pushbutton                        | 2.7659.250.0    | 36                               | X33       | 2 - 3               |
| Preheating relay                             |                 |                                  | RL1       | 2                   |
| PTO control solenoid valve (PTO)             | 2.3729.240.0/30 | 5                                | X35       | 17 - 18             |

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## 2.3 CONNECTOR INDEX

| Connector  | Type | Wiring code  | Connection wiring or component code | Component description                      | Notes               |
|------------|------|--------------|-------------------------------------|--------------------------------------------|---------------------|
| <b>X38</b> | 4    | 0.013.5549.4 | 2.7659.096.0/10                     | 4WD switch (mechanical engagement version) | Mechanical governor |
|            |      | 0.013.5785.4 |                                     |                                            | Electronic governor |
| <b>X39</b> | 3    | 0.013.5549.4 |                                     | Trailer braking low pressure switch        | Mechanical governor |
|            |      | 0.013.5785.4 |                                     |                                            | Electronic governor |
| <b>X40</b> |      | 0.013.5549.4 | 2.7659.237.0                        | Handbrake switch                           | Mechanical governor |
|            |      | 0.013.5785.4 |                                     |                                            | Electronic governor |
| <b>X41</b> |      | 0.013.5549.4 |                                     | Not utilised                               | Mechanical governor |
|            |      | 0.013.5785.4 | 0.008.1646.0                        | Wheel speed sensor                         | Electronic governor |
| <b>X42</b> |      | 0.011.7711.3 | 2.7099.750.0/10                     | Services circuit alarm pressure switch     |                     |
| <b>X43</b> |      | 0.013.5806.4 |                                     | Brake fluid level sensor                   | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X46</b> |      | 0.013.5806.4 | 2.7099.940.0                        | Engine oil pressure switch                 | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X48</b> |      | 0.013.5806.4 | 2.7099.640.0/10                     | Engine temperature sensor (for instrument) | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X49</b> |      | 0.013.5806.4 | 2.7099.800.0                        | Engine temperature sensor (for preheating) | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X50</b> | 3    | 0.013.5806.4 | 2.3729.320.0                        | Front PTO solenoid valve                   | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X51</b> |      | 0.013.5806.4 | 2.7099.320.0/10                     | Air cleaner clogged sensor                 | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X52</b> |      | 0.013.5806.4 | 2.8419.007.0                        | Horn                                       | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X53</b> | 4    | 0.013.5806.4 | 2.7059.983.0/10                     | Fuel level sensor                          | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X54</b> | 8    | 0.013.5806.4 | 2.8029.770.0/30                     | Front worklight (lh)                       | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X55</b> | 4    | 0.013.5806.4 |                                     | Auxiliary fuel tank pump (not utilised)    | 75 - 90 - 100 CV    |
|            |      | 0.013.5807.4 |                                     |                                            | 55 - 70 CV          |
| <b>X56</b> | 8    | 0.013.5806.4 | 2.8029.760.0/30                     | Front worklight (rh)                       | 75 - 90 - 100 CV    |
| <b>X56</b> | 8    | 0.013.5807.4 | 2.8029.760.0/30                     | Front worklight (rh)                       | 55 - 70 CV          |

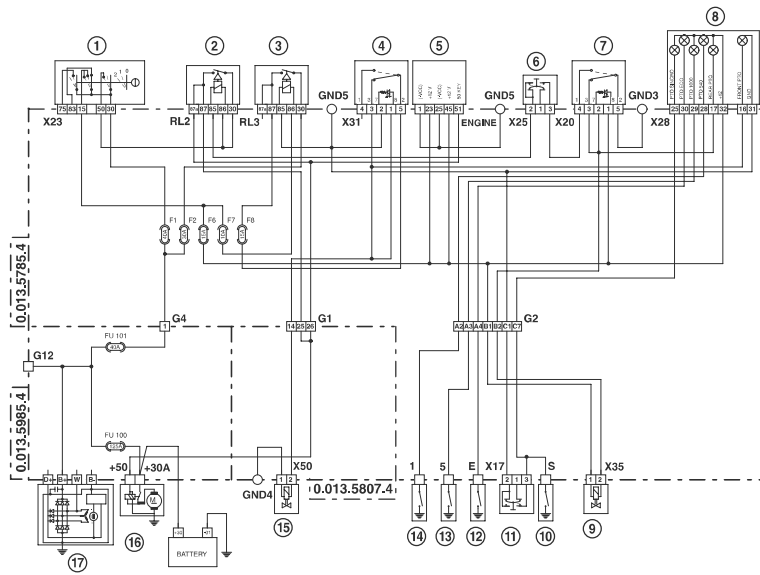
### 3. COMPONENTS

### 3.3 PINOUTS AND DESCRIPTIONS OF ELECTRONIC CONTROL UNITS

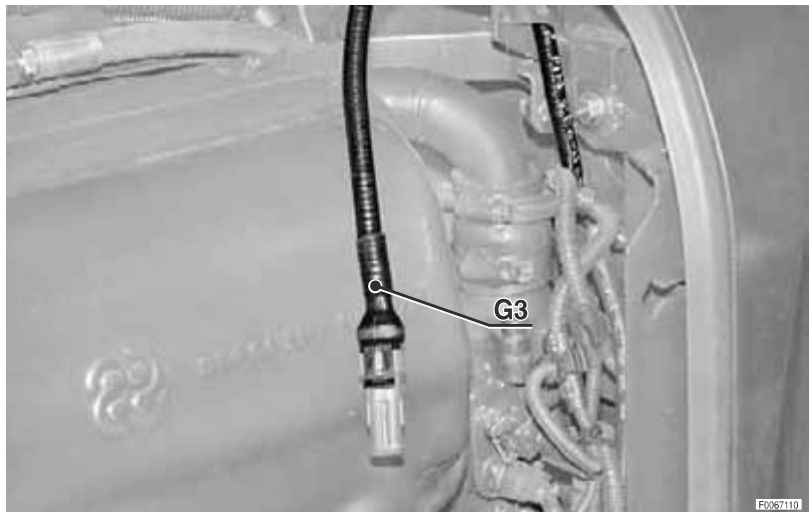
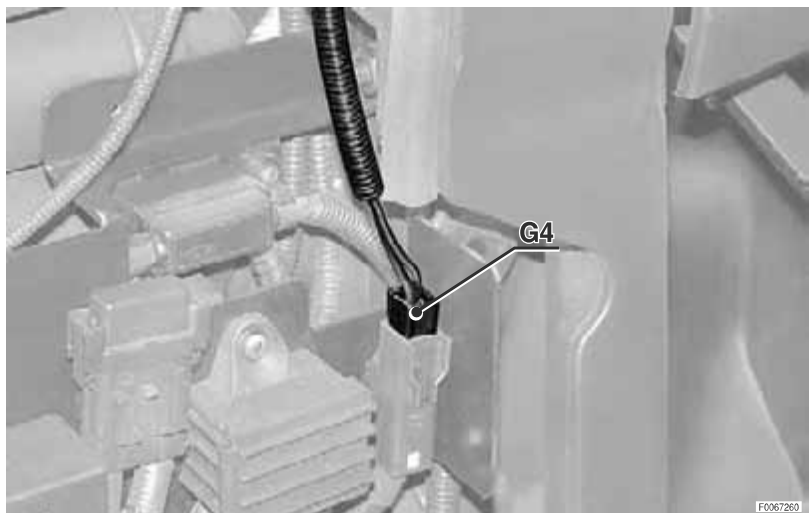
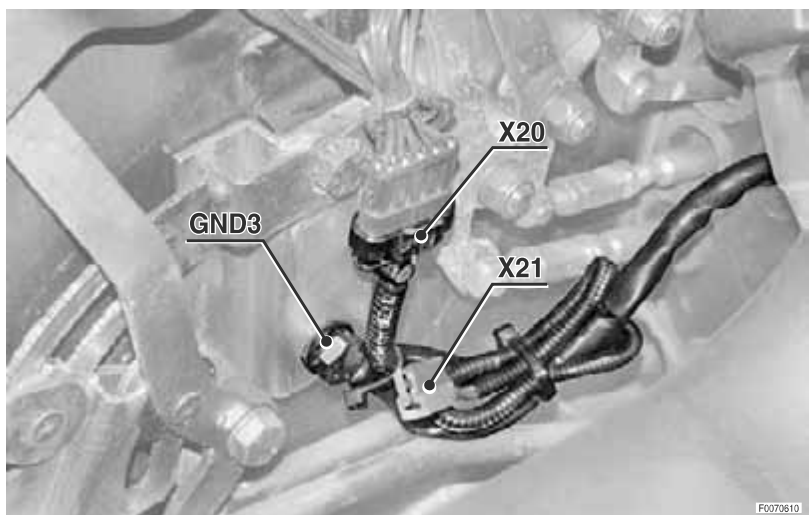
| Pin | Volts. | Abbreviation | Description                           |
|-----|--------|--------------|---------------------------------------|
| 31  |        |              | Not utilised                          |
| 32  |        |              | Not utilised                          |
| 33  | 0V     |              | Power (-), sensors                    |
| 34  |        |              | Not utilised                          |
| 35  |        |              | Not utilised                          |
| 36  |        |              | Not utilised                          |
| 37  | 0V     |              | Not utilised                          |
| 38  |        |              | Not utilised                          |
| 39  |        |              | Not utilised                          |
| 40  |        |              | Not utilised                          |
| 41  |        |              | Not utilised                          |
| 42  |        |              | Not utilised                          |
| 43  |        |              | Not utilised                          |
| 44  | +12V   |              | Battery positive                      |
| 45  | +12V   |              | Battery positive                      |
| 46  |        |              | Power (+), actuator                   |
| 47  |        |              | Power (-), actuator                   |
| 48  |        |              | Not utilised                          |
| 49  |        |              | Input, glowplug on check signal       |
| 50  |        |              | Not utilised                          |
| 51  |        |              | Input, engine start signal            |
| 52  | +12V   |              | Power (+) common, "H" & "L" solenoids |
| 53  |        |              | Power (-), "H" range solenoid         |
| 54  |        |              | Power (-), "L" range solenoid         |
| 55  |        |              | Not utilised                          |
| 56  |        |              | Power (-), glowplugs relay            |
| 57  |        |              | Power (-), preheating indicator light |
| 58  |        |              | Not utilised                          |
| 59  |        |              | Not utilised                          |
| 60  |        |              | Power (-), "M" range solenoid         |
| 61  |        |              | Power (-), "HOLD" indicator light     |
| 62  |        |              | Range upshift pushbutton signal       |
| 63  |        |              | Range downshift pushbutton signal     |
| 64  |        |              | Not utilised                          |
| 65  |        |              | Input, preheating signal              |
| 66  |        |              | Not utilised                          |
| 67  |        |              | "HOLD" button signal                  |
| 68  |        |              | Not utilised                          |



## 4.17 FRONT AND REAR PTOS (ELECTRONIC GOVERNOR VERSION)



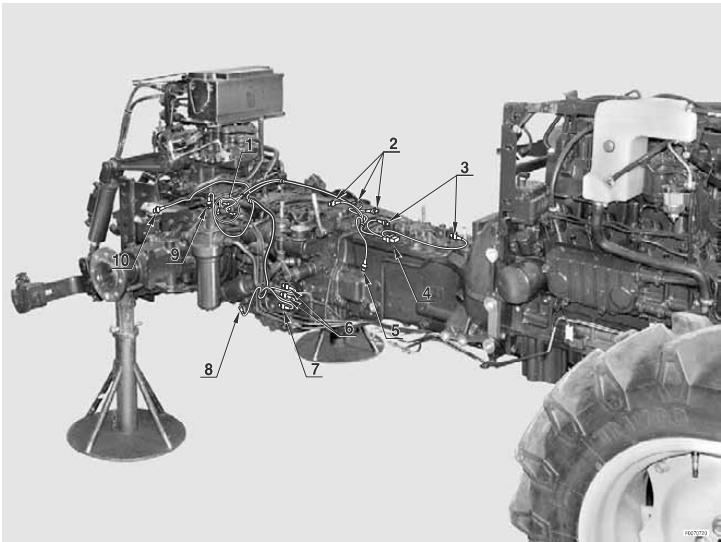
- |                                    |                                           |
|------------------------------------|-------------------------------------------|
| 1 Starter switch                   | 10 Groundspeed PTO engagement sensor      |
| 2 Relay RL2                        | 11 Groundspeed PTO switch indicator light |
| 3 Relay RL3                        | 12 750 rpm PTO engagement sensor (ECO)    |
| 4 Front PTO switch                 | 13 540 rpm PTO engagement sensor          |
| 5 Engine control unit              | 14 1000 rpm PTO engagement sensor         |
| 6 Start enable switch              | 15 Front PTO solenoid valve               |
| 7 Rear PTO switch                  | 16 Starter motor                          |
| 8 Analogue instrument panel        | 17 Alternator                             |
| 9 PTO control solenoid valve (PTO) |                                           |

**19****20****21**

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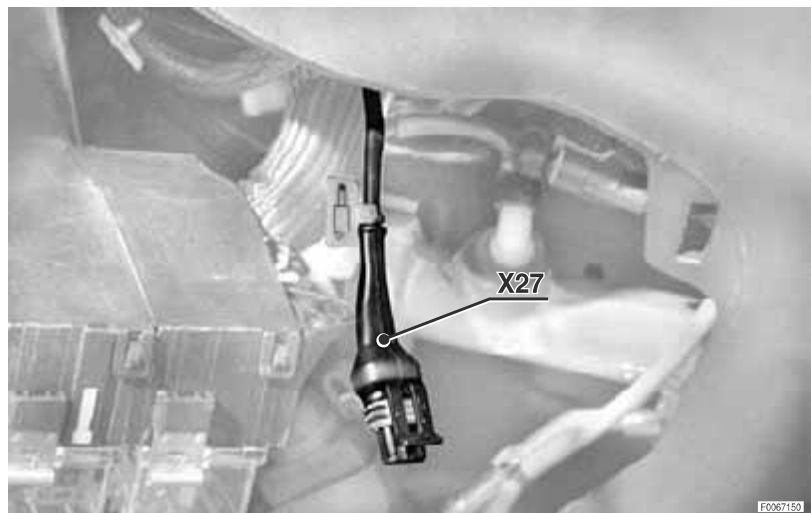
CENTRAL WIRING (VERSION WITH MECHANICAL GOVERNOR)



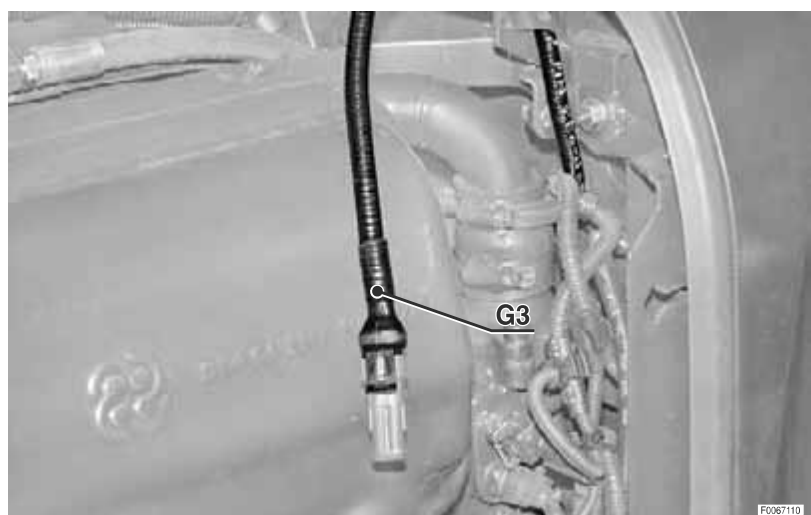
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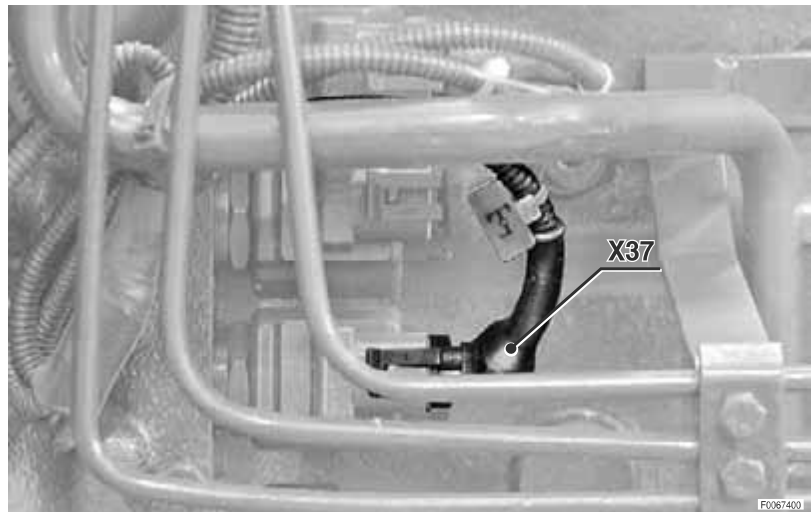
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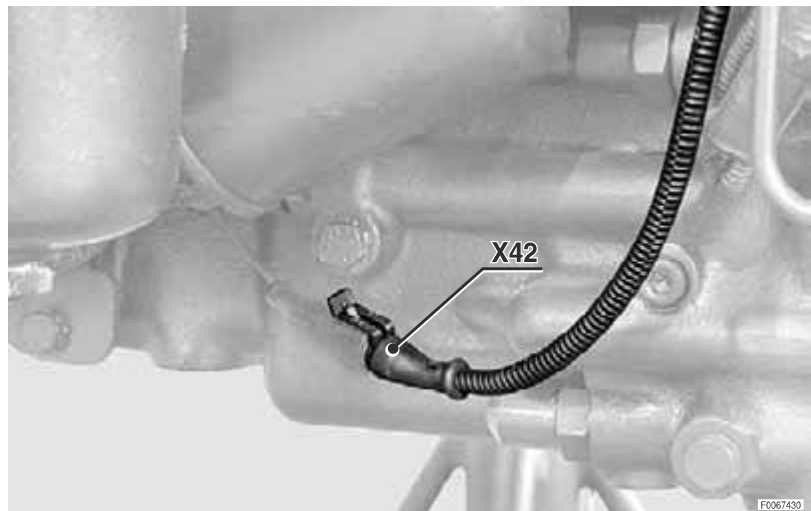
21



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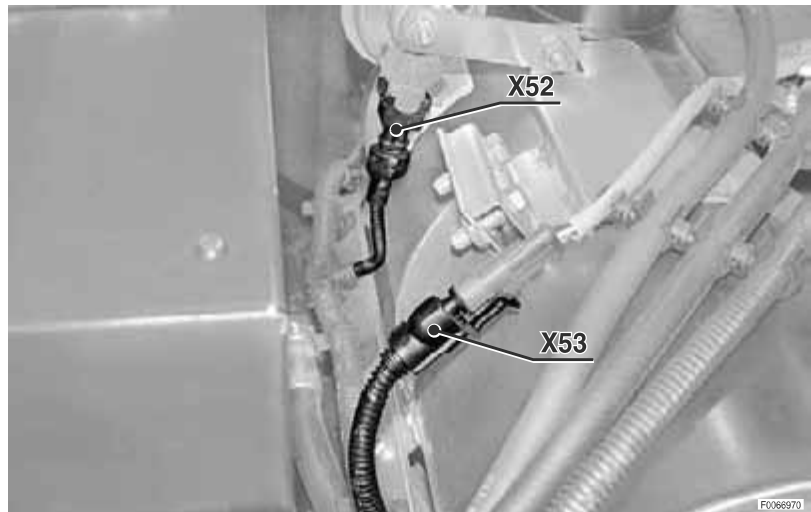
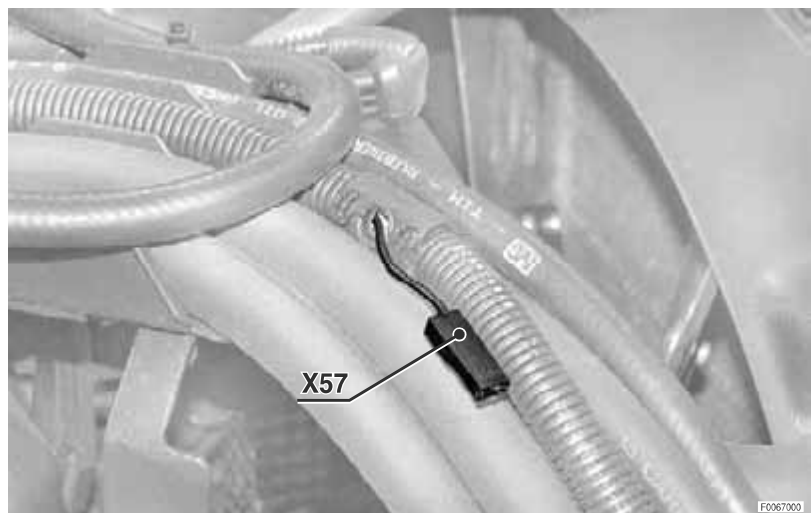
8



9



## CONNECTORS LOCATION

**1****2****3**

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