# 3A03 Splitting the tractor between the engine and the gearbox (3000)

CONTENTS

# Splitting the tractor - Dynashift

## A. Removal

1. Disconnect the two front differential lock (4WD) control hoses. Plug the pipe connections.
2. Remove the guard and the 4WD transmission shaft.
3. Remove the sheet metal panels.
4. Disconnect the earth cables only from the batteries.
5. Remove the hood rear bracket.
6. Disconnect and plug :
   - the two orbitrol steering ram hoses (mark their position).
   - the two air conditioning plugs and the bracket (if fitted).
   - the fuel return hose.
   - the two cooler hoses on the 17 bar valve (mark the positions).
   - the accelerator control on the injection pump.
   - the flowmeter harness (if fitted).
   - the main harness connections above the engine.
   - the heater hoses on the thermostat block to the engine front and to the water pump. Plug the connections to avoid draining the cooling system completely).
   - the 7.5 and 10 amp fuse harness (to release this, slightly slacken the straight rod above the radiator).
   - the fuel supply hose.
7. Immobilise the tractor :
   - apply the handbrake.
   - fit wedges between the frame and the front axle (Fig.1).
8. Support the tractor under the gearbox using a suitable stand.
9. Support the tractor under the sump using a suitable trolley jack.
10. Remove the tool box.
11. Remove the bolts attaching the engine to the gearbox.
12. Separate the gearbox from the engine.

***Note: As a safety measure, remove the front weights.***

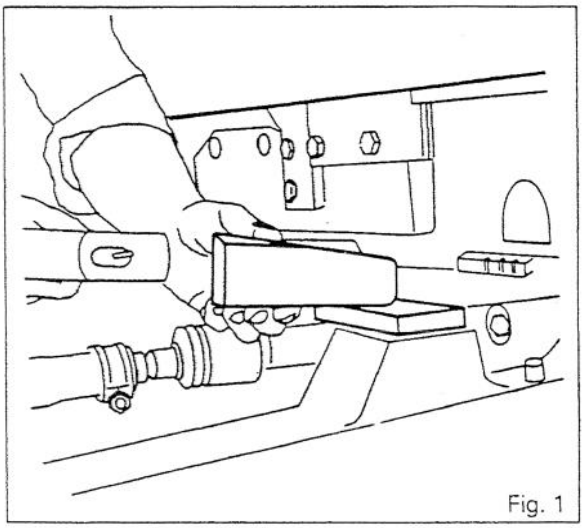


Fig. 1

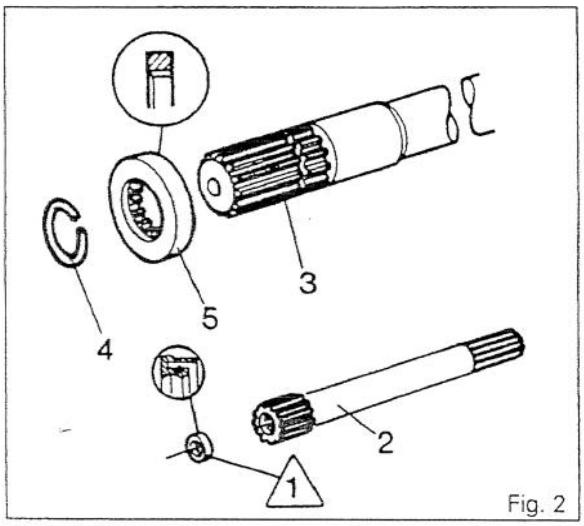



Fig. 2

## B. Refitment

13. Screw two dowel pins (made locally) into diametrically opposite positions on the gearbox.
14. Replace the seal **/1** on the input shaft **(2)** (Fig.2).
    a) withdraw the PTO shaft **(3)**.
    b) extract the seal **/1**.
    c) replace the PTO shaft.
    d) remove the circlip **(4)** and the washer **(5)**.
    e) protect the splined end of the shaft **(3)**.
    f) fit a new seal **/1** using service tool 3376803 M1 (see 3A04)
    g) remove the protection from the splines.
    h) refit the washer **(5)** and the circlip **(4)**.
15. Lightly grease the gearbox input shaft splines with molybdenum disulphide grease.
16. Check that the two dowel pins are fitted on the engine.
17. Fit the engine to the gearbox by turning the flywheel ring gear with a screwdriver.
18. Fit the attaching bolts. Coat the bolts with Loctite 270. Tighten to the torque indicated in section 3A04.
19. Carry out procedures 4 to 9 in reverse.
20. Carry out procedure 10 in reverse.
21. Top up the cooling system.
22. Carry out procedures 1 and 2 in reverse (4WD).
23. Start the engine.
24. Check the accelerator control and fuel cut-off setting.
25. Check:
    - the hydraulic circuits for leaks.
    - the operation of the electrical circuits.
26. Refit the sheet metal panels.
27. Road test the tractor.

## B. Refitment

15. Fit the spring washer **(4)** and the release bearing **(7)** into the carrier **(2)** (Fig.3).
16. Fit the cover **(3)**, the stop bolt **(6)** (Fig. 3) into the release bearing carrier notch. Press on the spring washer and place pin **/1** its bend pointed downwards (Fig. 1 and 3). Check the free rotation and radial movement of the release bearing.
17. Position service tool 3376802 M2 between the end of the release bearing carrier **(2)** and the seal carrier **(5)** (Fig. 3).
18. Screw two dowel pins into diametrically opposed positions on the gearbox.
19. **Replace the seal /1\ on the input shaft (2) (Fig.4).**
    a) withdraw the PTO shaft **(3)**.
    b) extract the seal **/1**.
    c) replace the PTO shaft **(3)**.
    d) remove the circlip **(4)** and the washer **(5)**.
    e) protect the splined end of the shaft **(3)**.
    f) lubricate and fit a new seal **/1** using service tool 3376803 M1.
    g) remove the protection from the splines.
    h) refit the washer **(5)** and the circlip **(4)**.
20. Lightly grease the gearbox input shaft splines (using molybdenum disulphide grease).
21. Check that the two dowel pins are fitted on the engine.
22. Fit the engine to the gearbox by turning the flywheel ring gear with a screwdriver.
    ***Note : During assembly, the release bearing must be heard to engage in the clutch cover plate. Remove the service tool through the inspection hole (Fig.3).***
    Check that the clip is correctly positioned on the cover plate.
    Remove the two dowel pins.
23. Clean the bolts attaching the engine to the gearbox and coat them with **Loctite 270** before fitting. See Section C for tightening torques.
24. Carry out procedures 6 to 12 in reverse.
25. Top up the cooling system.
26. Refit the guard and transmission shaft (4WD).
27. Reconnect the two front wheel differential lock control hoses (4WD)
28. Start the engine.
29. Check the accelerator control setting.

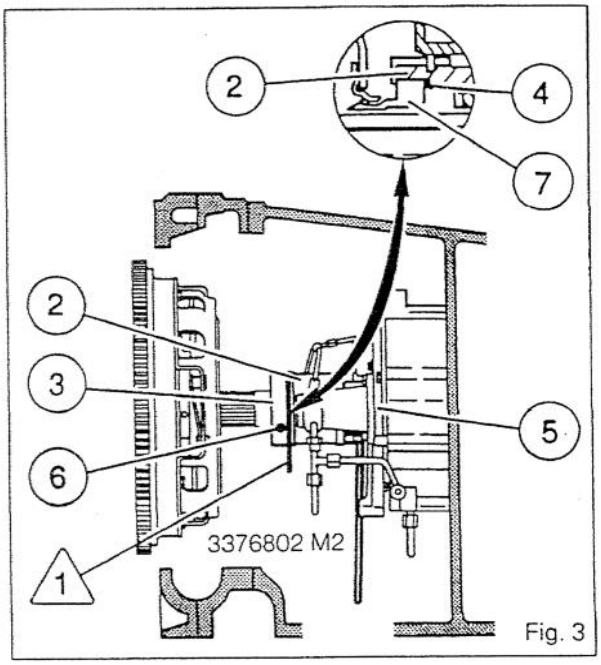


Fig. 3

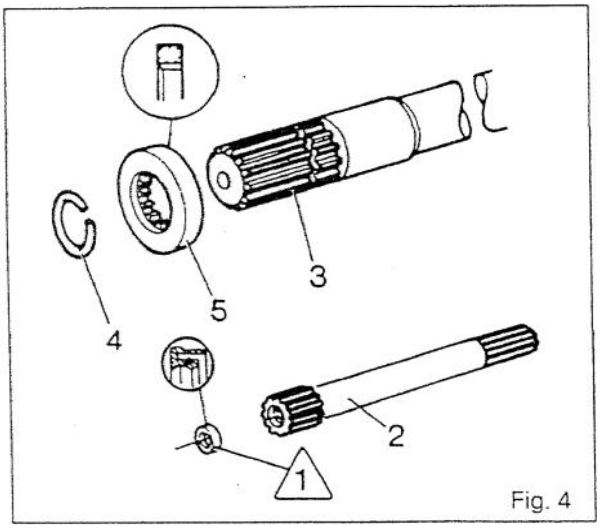


Fig. 4

30. Check:
    - all hoses and pipes for leaks
    - that the electrical circuits are working.
31. Refit the inspection plate under the clutch housing.
32. Refit the sheet metal panels.
33. Road test the tractor.

## C. Attaching engine adaptor plate/Gearbox spacer

Tightening torques (Nm)

| | | | |
|---|---|---|---|
| **(1)** | 120-160 | **(8)** | 600-800 |
| **(2)** | 300-400 | **(9)** | 600-800 |
| **(3)** | 120-160 | **(10)** | 300-400 |
| **(4)** | 120-160 | **(11)** | 120-160 |
| **(5)** | 300-400 | **(12)** | 120-160 |
| **(6)** | 600-800 | **(13)** | 300-400 |
| **(7)** | 600-800 | **(14)** | 300-400 |

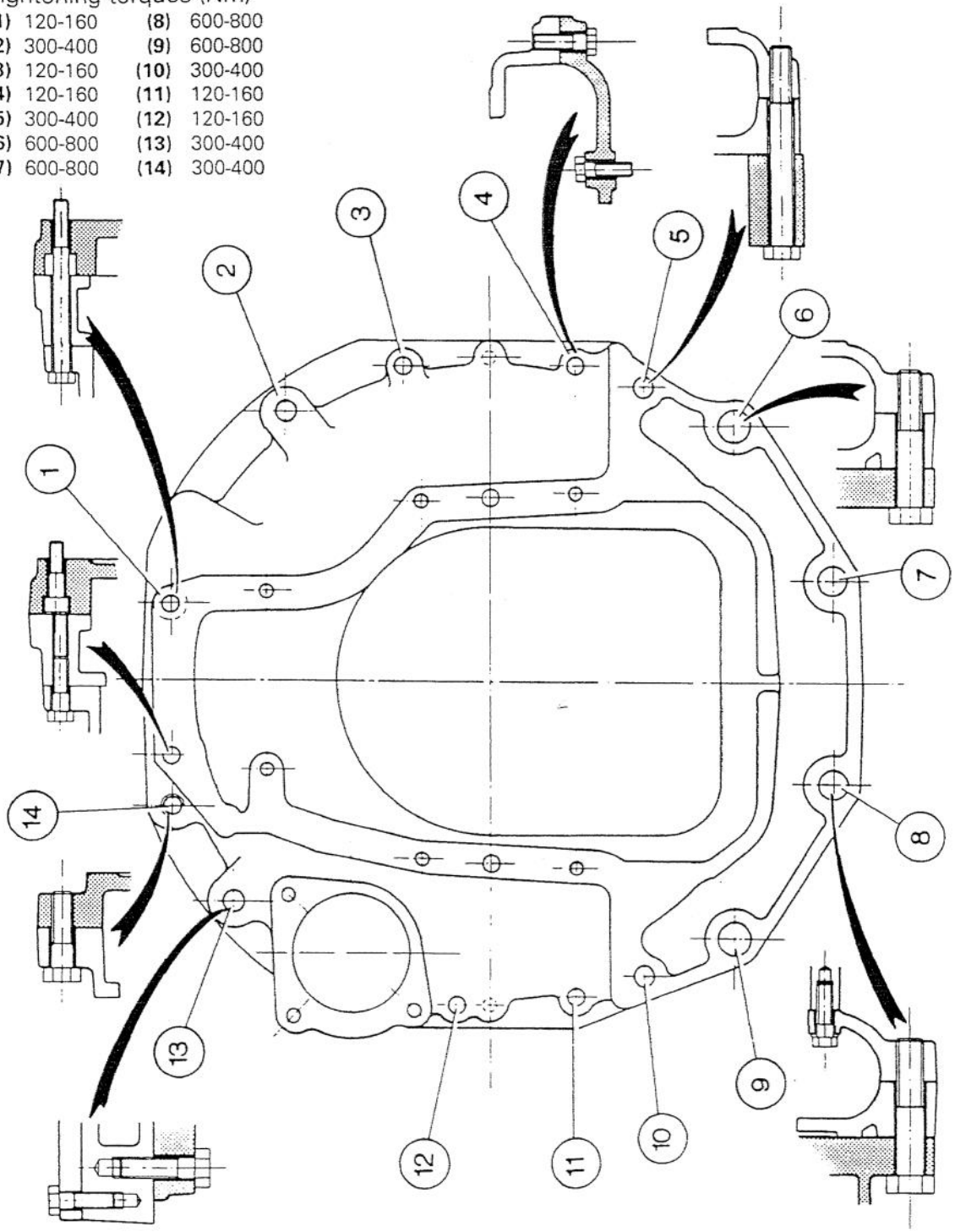



Fig. 5

# 3 A04 Splitting the tractor between the engine and the gearbox

*Pull-type clutch (3100)*

CONTENTS

3A04.2

# Splitting the tractor - Dynashift

## A. Removal

***Note: Plug or cover disconnected hydraulic pipe connections to prevent leaks and the ingress of foreign matter.***

1. Disconnect the two front differential lock (4WD) control hoses.
2. Remove the guard and the 4WD transmission shaft.
3. Remove the inspection plate under the clutch housing.
4. **Remove the pin /1\ connecting the release bearing carrier (2) and the cover (3) (Fig.1).**
5. Remove the sheet metal panels.
6. Remove the battery cover.
7. Disconnect the earth cables only from the batteries.
8. Remove the hood rear bracket.
9. Disconnect :

- the two Orbitrol steering ram hoses (**mark their position**).
- the two air conditioning couplers and the bracket (if fitted). Protect both couplers using the plugs kit 3376935 M91.
- the fuel return hose.
- the two cooler hoses on the 17 bar valve (**mark the positions**).
- the throttle control on the injection pump.
- the flowmeter harness (if fitted).
- the main wiring harness connections above the engine.
- the heater hoses on the thermostat block to the front of the engine and on the water pump. (Plug the connections to avoid draining the cooling system completely).
- the 7.5 and 10 amp fuse harness. To release this, slightly slacken the straight rod above the radiator.
- the fuel supply hose.

10. Immobilise the tractor.

Apply the handbrake.

Fit wedges between the frame and the front axle (Fig.2).

11. Support the tractor under the gearbox using a suitable stand.

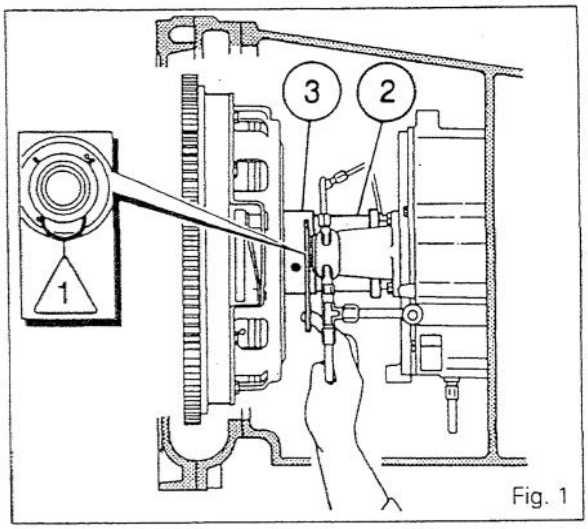


Fig. 1

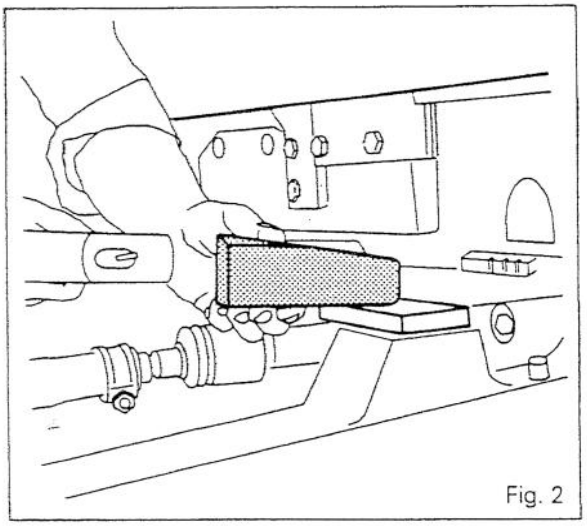


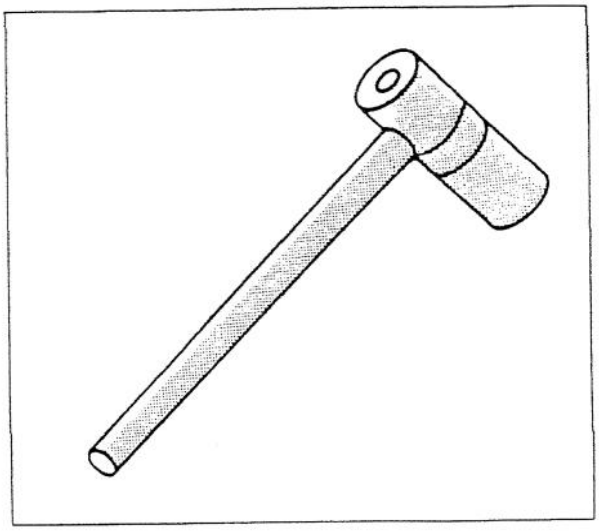
Fig. 2

12. Support the tractor under the sump using a suitable trolley jack.
13. Slacken the bolts attaching the engine to the gearbox.
14. Separate the gearbox from the engine

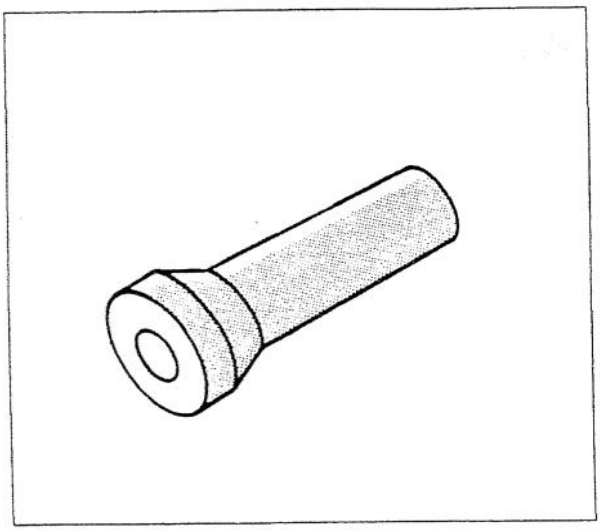
***Note: As a safety measure, remove the front weights.***

## D. Service tools

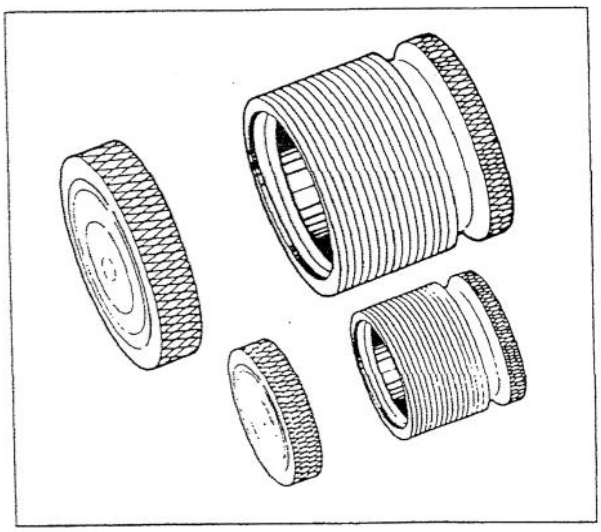
**3376802 M2**
Tool to connect engine and gearbox



**3376803 M1**
Input shaft seal fitting tool



**3376935 M91**
Plugs kit for air conditioning couplers



# 5 L02 Spacer

CONTENTS

# Gearbox - Dynashift

## A. Spacer (4 cyl. engine - 1004)

A spacer is fitted between the gearbox and the engine on tractors of the MF 3075 Dynashift type (1004 engine). Internally, the spacer is attached by means of studs of different lengths which are screwed into the gearbox housing (Fig. 1).

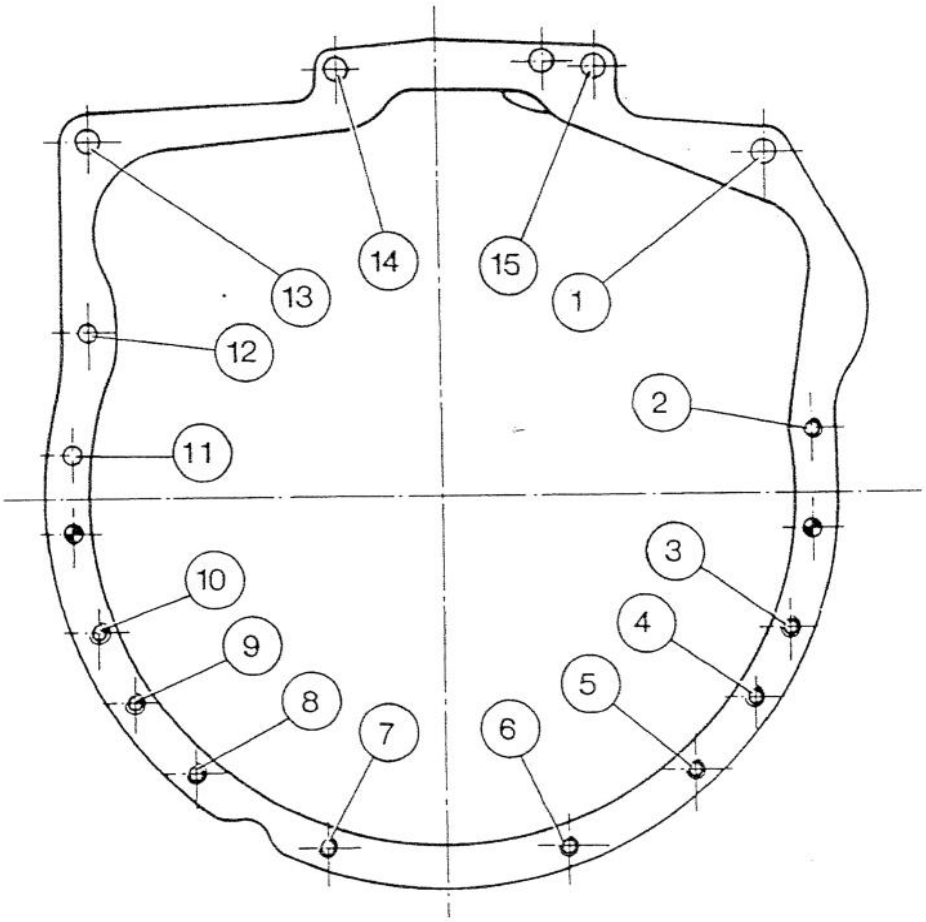
### Disassembly

1. Split the tractor between the engine and the gearbox (see Section 3 A03).
2. Remove the spacer.
3. If necessary, extract the studs from the gearbox.

### Reassembly

4. Cleaning the mating faces on the spacer and gearbox.
5. If they were removed, coat the studs with Loctite 270. Screw and lock into their correct locations according to their lengths, as shown in Fig. 1.
6. Recouple the tractor between the engine and the gearbox (see Section 3 A03).

Tightening torque
**(1)** to **(15)** = 100 - 130 Nm




**Length of studs**
(3) = 145
(5) (8) = 155
(6) (7) = 130

Fig. 1

## B. Spacer (6 cyl. engine - 1006)

### Disassembly

1. Split the tractor between the engine and the gearbox (see Section 3 A03 or 3 A04 according to the type).
2. Remove the tool box.
3. Remove two spacer attaching bolts on the gearbox.
4. Screw two guide studs in their place (locally manufactured).
5. Remove the 13 bolts and the spacer.
6. Remove the locating pins.

### Reassembly

7. Cleaning the mating faces on the spacer and gearbox.
8. Reinstall the locating pins.
9. Repeat procedure 4 and carry out procedure in reverse order.
10. Remove the guide studs. Fit and tighten the 15 bolts to a torque of 100 - 130 Nm.
    ***Note: Make sure that the countersunk head screw /13\ is positioned in the correct hole (Fig. 2).***
11. Carry out procedures 1 and 2 in reverse order.

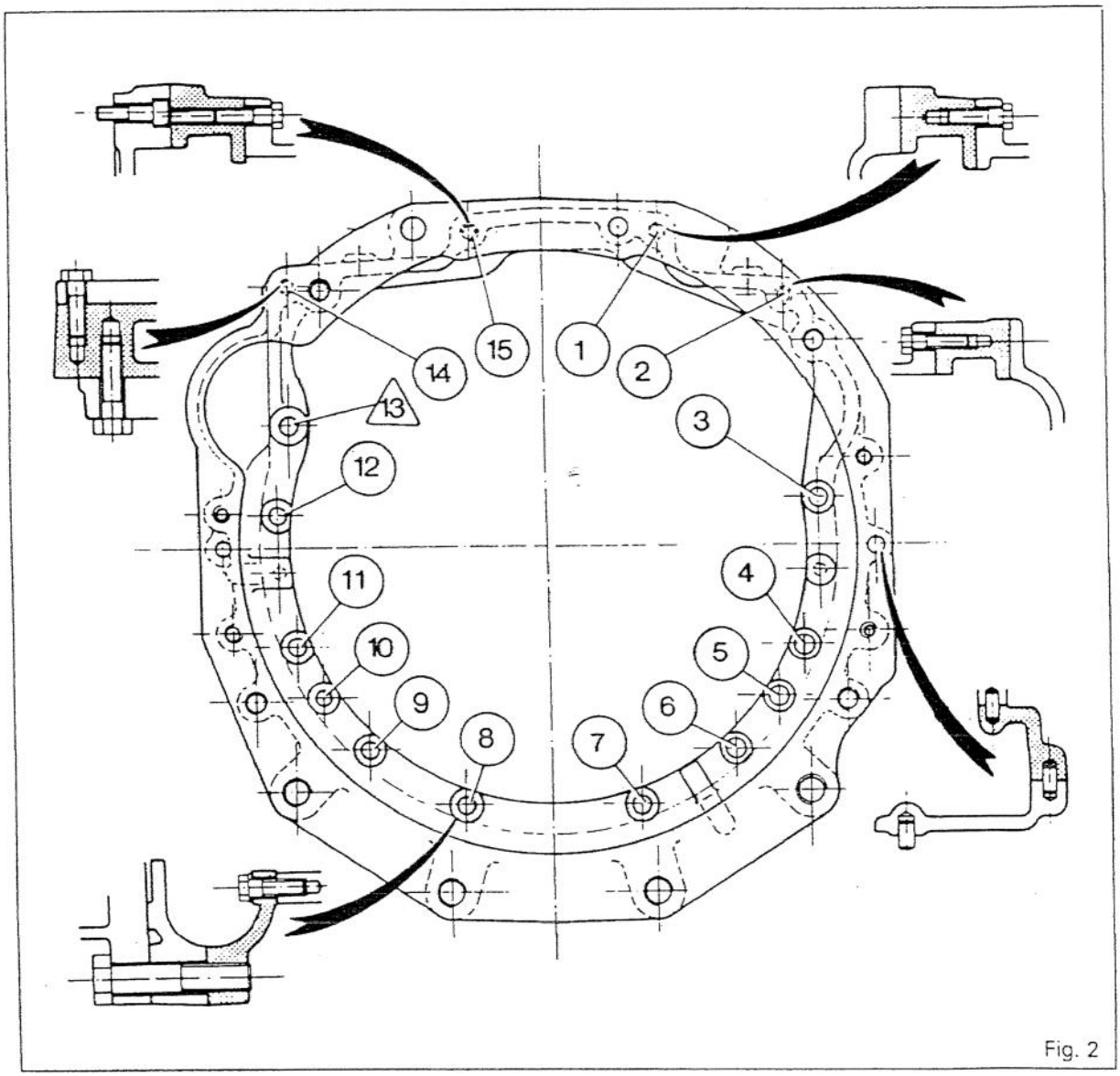



Fig. 2

# 5 N01 Dynashift transmission assembly

CONTENTS

5N01.2

# Gearbox - Dynashift

## A. Description

The general configuration of the Dynashift transmission is similar to the Speedshift transmission (see Section 5 A01) except for:

- Input unit: This features the Dynashift function and the reversing gear function.
  **The Dynashift** system replaces the Speedshift and provides four gearbox input ratios in place of the two for Speedshift.
  **The reverse shuttle** is located in the rear enclosure of the gearbox. Its design is identical to that of the Speedshift version except that it is installed on two taper roller bearings instead of on two ball bearings.
- Clutch: This is identical to the clutch for the Speedshift version but its control is different and ensured by a slave cylinder with two pistons.
  The control system is pushed for the 3000 models and pulled for the 3100 models in the same way as in the Speedshift version.

## B. Gearbox assembly

### Main gearbox

The main gearbox has eight basic speeds. It consists of a train of four gears to which a set of two gears is added so that a slow (Tortoise) range and a fast (Hare) range can be obtained. All the gears are in constant mesh and the speeds are selected by synchromesh units. These eight speeds can be selected with a single lever.

### Reverse gear assembly

This consists of an assembly of two gears placed in front of the main gearbox, fitted on a hollow shaft, and a third gear fitted on the main gearbox mainshaft.
A compound gear cluster located between the hollow shaft and the mainshaft allows the direction of rotation of the mainshaft to be reversed.

### Creeper gear unit

This is identical to that in the Speedshift version (see Section 5 A01).

### Lubrication (Fig. 2)

Lubrication is ensured by means of the 1.5 bar valve located on the left-hand side of the gearbox. The oil flow circulates through the Dynashift assembly, the reverse shuttle and the layshaft bearings as well as in the gears, bearings and bushes of the mainshaft and output shaft.
The lubricating efficiency is improved by the fact that the end of the reverse shaft is engaged in the layshaft and the deflector **(50)** is installed.
The Dynashift planet gears are splash lubricated.

List of parts

**(1)** Bearing cone
**(2)** Bearing cup
**(3)** Adjusting shims
**/4** Thickness shim
**(5)** Circlip
**(6)** Washer
**(7)** 1st drive gear
**(8)** Bush
**(9)** 1st gear synchro cone
**(10)** 1st gear synchro ring
**(11)** 1st and 2nd gear synchro
**(12)** 2nd gear synchro ring
**(13)** 2nd gear synchro cone
**(14)** 2nd drive gear
**(15)** Circlip
**(16)** Bearing cup
**(17)** Bearing cone
**(18)** 4th drive gear
**(19)** Circlip
**(20)** 4th gear synchro cone
**(21)** 4th gear synchro ring
**(22)** Washer
**(23)** 3rd and 4th gear synchro
**(24)** Needle roller bearing
**(25)** 3rd gear synchro ring
**(26)** Circlip
**(27)** Thrust washer
**(28)** Combined bearing
**(29)** 3rd drive gear (Hare)
**(30)** Combined bearing
**(31)** Hare / Tortoise synchro
**(32)** Thrust washer
**(33)** Tortoise synchro ring
**(34)** Retaining ring
**(35)** Bush
**(36)** Tortoise gear
**(37)** Bearing cup
**[38]** Adjusting shims
**(39)** Bearing cone
**(40)** Bearing cone
**(41)** Bolt
**[42]** Adjusting shims
**/43** Thickness shim
**(44)** Output shaft
**(45)** Circlip
**(46)** Lock plate
**[47]** Adjusting shims
**(48)** Bearing cup
**(49)** Circlip
**(50)** Oil deflector
**[51]** Adjusting shims
**(53)** Bearing cone
**(54)** Layshaft
**(55)** 3rd driven gear
**(56)** 4th driven gear
**(57)** Spacer
**[58]** Shims
**(59)** 2nd driven gear
**(60)** 1st driven gear
**(61)** Circlip
**(62)** Needle roller bearing
**(63)** Bearing cone
**(64)** Bearing cup
**(65)** Housing
**(66)** Reverse gear unit
**(67)** Input gear
**(68)** Nut
**(69)** Mainshaft
**(70)** Retaining ring
**(71)** Oil feed pipe
**(72)** Spring
**(73)** Tortoise synchro cone
**(74)** Hare synchro ring
**(75)** Hare synchro cone
**(76)** 3rd gear synchro ring

# 5 P01 Push-type clutch

CONTENTS

# Gearbox - Dynashift

## General

### Description

This is a diaphragm push-type clutch. The master cylinder, which is of identical design to that on the 3600 tractor, is supplied and kept at a constant level by the low-pressure hydraulic system. Drive is obtained via the disc **(6)** which engages with the splined gearbox input shaft in rotation.

### Construction

The clutch control system on tractors equipped with a Dynashift gearbox consists of:

- a slave cylinder **(24)** centred by spacer **(9)**
- two pistons **/23** housed in the slave cylinder
- a release bearing carrier **(26)** centred in the slave cylinder
- a release bearing assembly **(25)** which snaps into place on the bearing carrier.

Each piston **/23** is supported by two guide rings **/28** and tight sealing is provided by a bush **/29** and O-ring **/29A** and a scraper ring **/27**.

## Operation

The force exerted on the pedal and transmitted by the control rod acts on the master cylinder. The quantity of oil displaced by the master cylinder piston enters via the upper hole (large diameter) in the slave cylinder **(24)** and causes the release bearing carrier **(26)** and the release bearing **(25)** to move forwards. The release bearing compresses the diaphragm of the clutch cover plate **(7)**, and this releases the pressure on the clutch cover plate and frees the disc **(6)**.

### Clutch engagement

When the clutch pedal is released, the pressure drops in the slave cylinder. The diaphragm pushes the release bearing carrier back and the pressure plate is moved forwards. The disc **(6)** is then locked between the pressure plate and the engine flywheel and drives the gearbox input shaft.

### Specifications

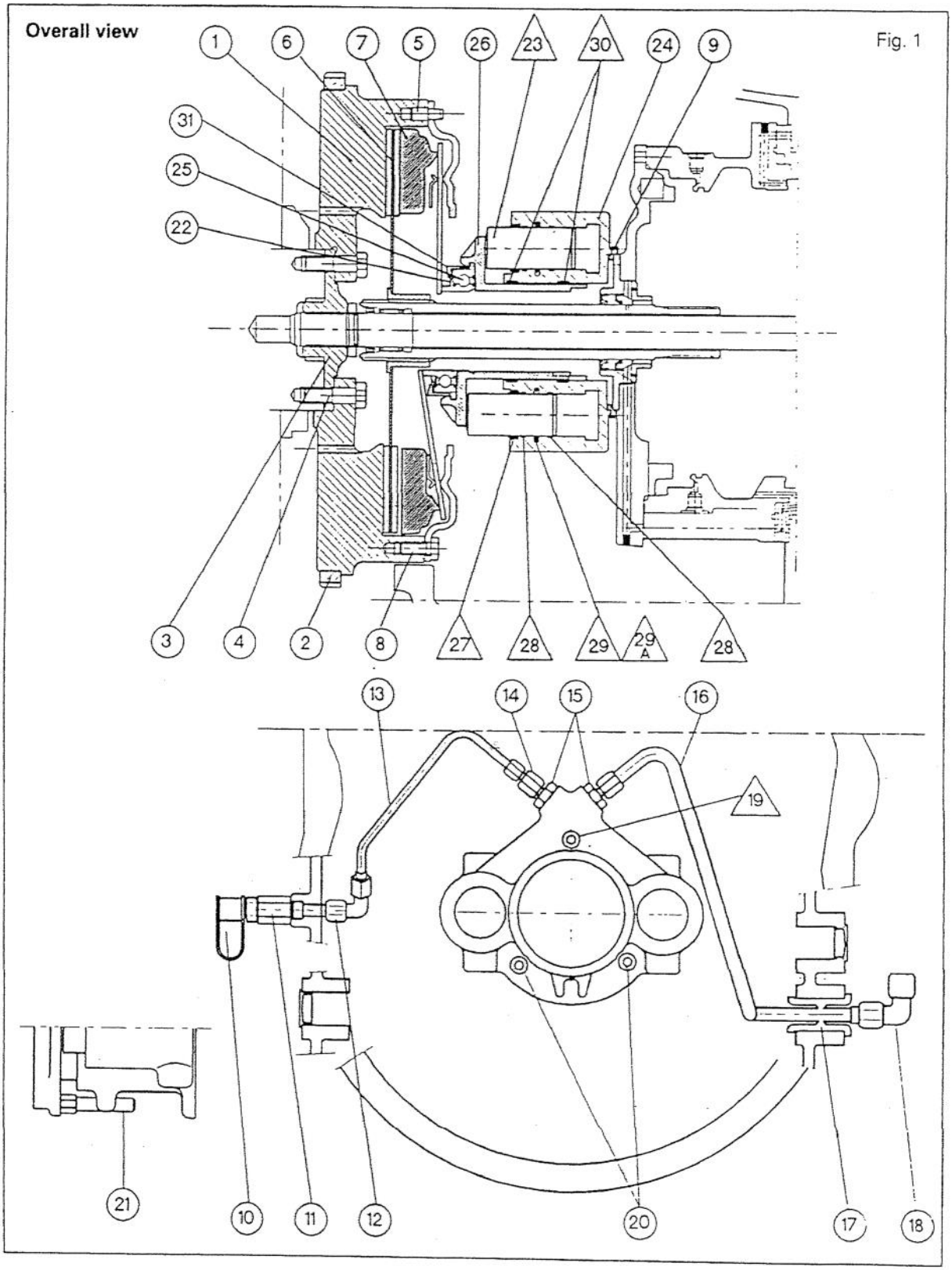
| | | |
|---|---|---|
| Clutch control | : | push-type |
| Plate load | : | 1,100 kg |
| Number of vanes | : | 6 |
| Type of vane | : | non-progressive |
| Disc diameter | : | 330 mm |
| Friction linings | : | cerametallic |

### List of parts

**(1)** Engine flywheel
**(2)** Flywheel ring gear
**(3)** PTO shaft drive hub
**(4)** Engine flywheel attaching bolts
**(5)** Dowel pins
**(6)** Disc
**(7)** Clutch cover plate
**(8)** Clutch cover plate attaching bolts
**(9)** Spacer
**(10)** Bleed point
**(11)** Grommet
**(12)** 90° union
**(13)** Bleed pipe
**(14)** Straight union
**(15)** Straight union
**(16)** Supply pipe
**(17)** Grommet
**(18)** 90° union
**/19** Slave cylinder attaching bolt
**(20)** Slave cylinder attaching bolt
**(21)** Pin
**(22)** Spring washer
**/23** Pistons
**(24)** Slave cylinder
**(25)** Clutch release bearing
**(26)** Release bearing carrier
**/27** Scraper ring
**/28** Guide rings
**/29** Sealing bush
**/29A** O-ring
**/30** Guide rings
**(31)** Flexible retainer

**Overall view**

Fig. 1



# Gearbox - Dynashift

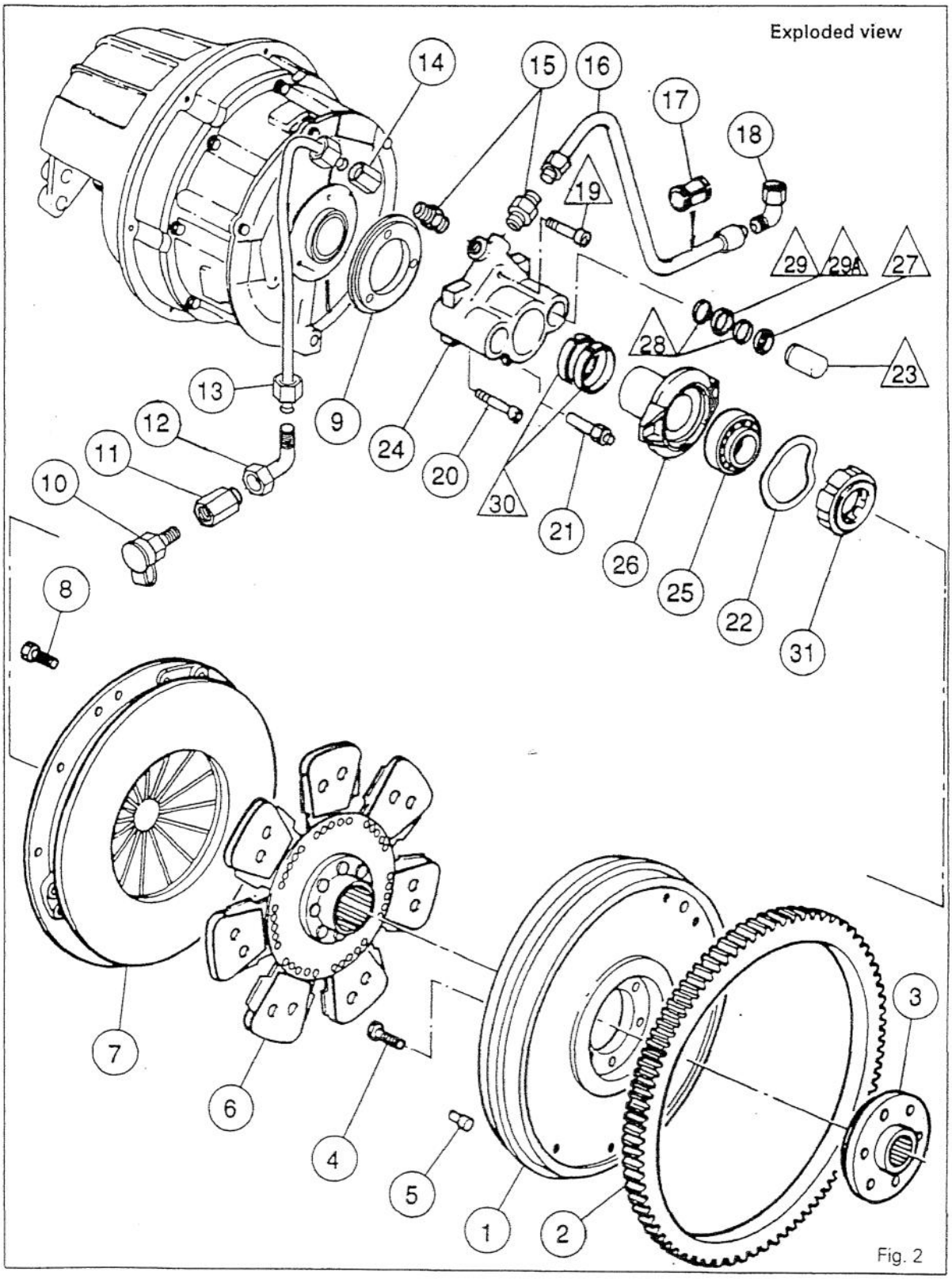



Fig. 2

## A. Clutch cover plate

### Disassembly

1. Split the tractor between the engine and the gearbox (see Section 3 A03).
2. Position the centring tool MF 457 (Fig. 3) to retain the cover plate and disc assembly.
3. Gradually loosen the bolts **(8)** attaching the cover plate **(7)** to the engine flywheel (1).
4. Remove the cover plate and the disc **(6)**.
5. Remove the two dowel pins **(5)** from the flywheel.

### Reassembly

6. Remove dust and clean the engine flywheel with a solvent.
7. Check the flywheel friction surface.
   ***Note: If the friction surface of the engine flywheel (1) is scored, it can be skimmed (see part B, operation 6).***
8. Lightly grease the splines on the power take-off shaft hub in the engine flywheel (GN + Molykote type grease).
9. Reinstall the two dowel pins **(5)**.
10. Using the centring tool MF 457, centre the clutch disc **(6)** on the engine flywheel. The longest section of the hub must be facing the diaphragm.
11. Refit the clutch cover plate.
12. Gradually tighten the attaching bolts **(8)** to a torque of 50 - 70 Nm.
13. Remove the centring tool MF 457.
14. Recouple the tractor between the engine and the gearbox (see Section 3 A03).

## B. Engine flywheel

### Disassembly

1. Split the tractor between the engine and the gearbox (see Section 3 A03).
2. Remove the engine clutch. Carry out procedures 2 to 5, in part A.
3. Immobilise the engine flywheel **(1)**.
4. Take out the six bolts **(4)** attaching the engine flywheel to the crankshaft.
5. Remove the engine flywheel and the PTO shaft hub **(3)**.

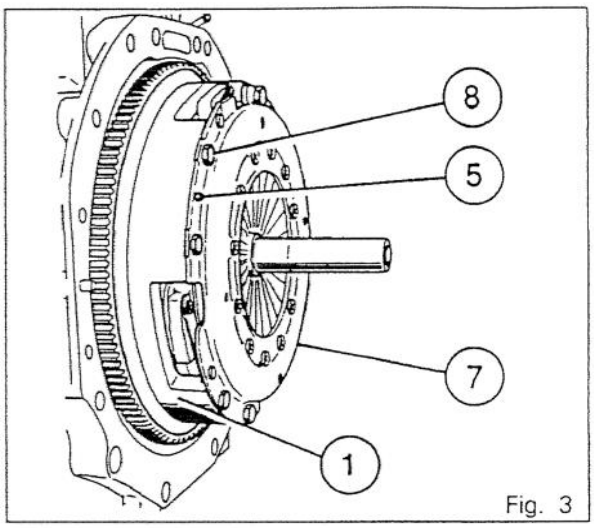


Fig. 3

### Reassembly

6. If the friction surface on the engine flywheel is scored it can be skimmed.
   Skimming of the friction surface should be performed as required (removal : 1.5 mm max. - surface condition : 2.5 micrometres max.).

   ***Important : On the flywheel, the clutch cover plate attaching face must be reduced by the same value, as well as the length of the dowel pins (if incorrect).***
   ***Check that the tapped holes for the bolts (8) attaching the mechanism onto the flywheel are deep enough. If they are not, they must be tapped.***
   ***After reworking, grease the flywheel.***
   ***Do not install a progressive clutch disc.***
   ***If skimming is performed, place two spacers (9) between the seal holders and the slave cylinder (24).***
   ***Replace bolts (19) and (20) with bolts that are 35 mm and 55 mm long, 8 dia. pitch 125, grade 10-9.***
7. Screw the two dowel pins into the flywheel attaching holes.
8. Refit the engine flywheel and the hub **(3)**.
9. Coat the bolts **(4)** with Loctite 241.
10. Reinstall the six bolts **(4)** and tighten them to a torque of 110 - 140 Nm. Free the engine flywheel.
11. Refit the engine clutch, carrying out procedures 6 to 13 (in part A).
12. Recouple the tractor between the engine and the gearbox (see Section 3 A03).

**Thank you very much for your reading.**

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