

Main Shaft - End Float Setting

Shaft Setting Procedure

- 1 Lubricate spigot bearing 1 on end of main shaft located in centre of main bearing shaft 2.

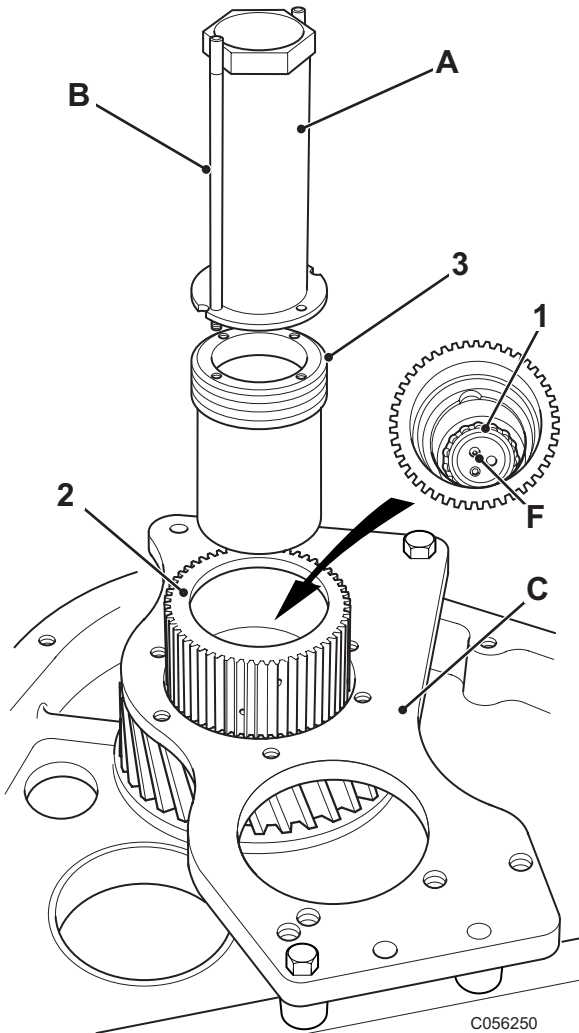


Fig 212.

- 2 Connect Special Tool A 998/11347 to bearing race/support tube 3 using threaded rods B 998/11377. Lower bearing tube into centre of shaft 2, engage threads on tube with those in shaft 2. Gently screw tube into shaft until machined bearing cup in bottom of shaft 3 contacts bearing 1.

- 3 Fit shaft anti-rotation pack D to shaft 2 and secure to base plate C with the six capscrews.
- 4 With the bearing tube just contacting bearing 1 as already described, tube must be locked in position. Install Service Tool Shaft E part no. 998/11378 through tool A ensuring spigot on end of shaft locates in oil drilling F in end of mainshaft. Tool E is then held in place by 10mm threaded rod G part no 998/11379 screwed into tapped hole in mainshaft.

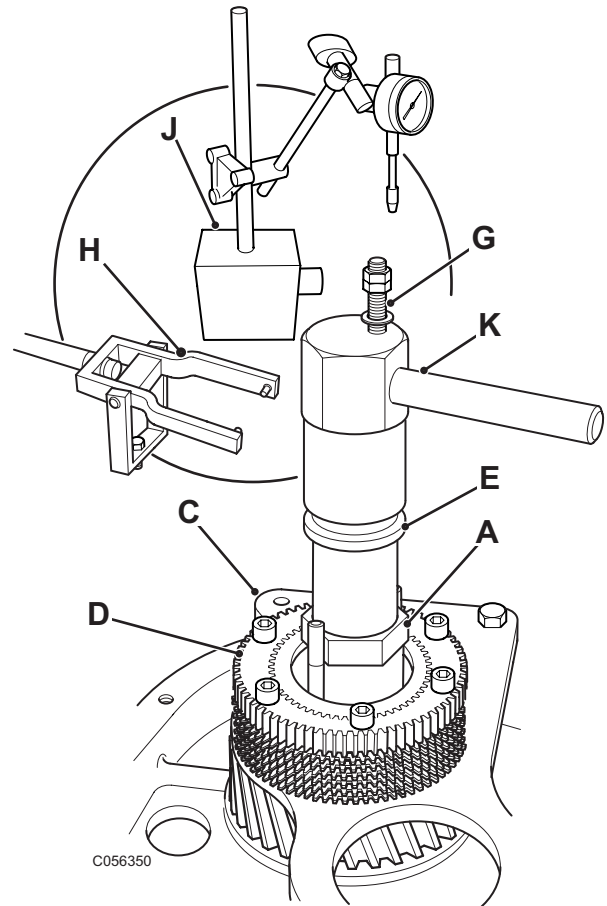


Fig 213.

- 5 Bolt fulcrum plate of torque wrench lever H to base plate C, set torque wrench scale to 80Nm (8.0 kgf/m 59 lbf/ft.) and set it so that it registers as the shaft is pushed down. Attach DTI J to base plate C and position its measuring probe vertically on top of tool column E. With tommy bar K screwed into tapped hole in hexagon on top of column E rotate column

back and forth whilst torque wrench levers shaft down.

- 6 Continue rotating shaft until DTI stabilises, zero gauge, set torque wrench to lift the shaft, continue to rotate the shaft whilst it is lifted. Record end-float. Target reading is 0.01 - 0.11 mm (0.0004 - 0.0040 in).
- 7 If the figure is outside limits, adjust position of bearing tube 3. If the reading is too high tube will require screwing out fractionally. Once adjusted repeat end float measurement.
- 8 When completed carefully remove all end-float measuring apparatus and service tool columns. Unscrew threaded rods B from bearing tube 3 without altering the tubes position.
- 9 To hold bearing tube 3 in place lock washer 4 and four associated capscrews 5 need inserting. Engage ears of washer 4 in semi-circular cutouts D in centre bearing shaft 2. To attempt to align the holes in lock washer 4 with tapped holes in bearing shaft 3, try the washer in all positions. If the tapped holes do not align and the end float setting procedure has recorded a mid range figure, it is possible to tighten or slacken the bearing tube fractionally to achieve alignment. Fit the capscrews 5 and torque tighten to 15 - 18 Nm (1.5 - 1.8 kgf/m., 11 - 13 lbf/ft).

Note: If the bearing tube 3 has been moved to achieve hole alignment then the end-float figure must be re-checked.

- 10 Remove shaft locking pack D and end-float base plate C. Lubricate pilot roller bearing 5 and position in centre of shaft 2.

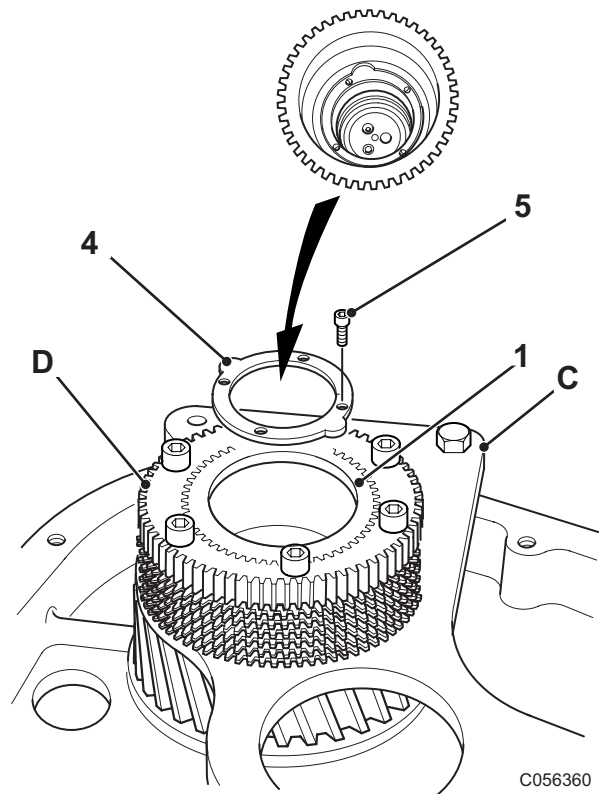


Fig 214.

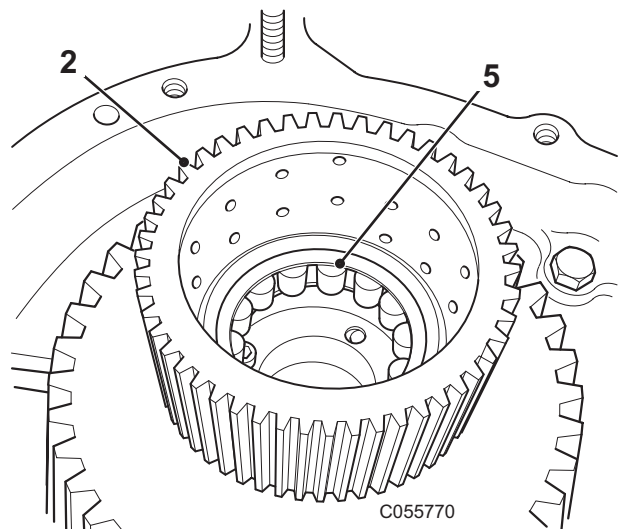


Fig 215.

Idler Shaft - Dismantling and Assembly

Dismantling

Thoroughly inspect bearings **2** and **3** for scoring, wear or damage. Only remove from shaft **1** if they require renewal.

- 1 Position split bearing collets under bearing **2**. Locate shaft in press with bearing collets supported by press frame. Support shaft as bearing is removed.
- 2 Repeat operation with suitable split bearing collets for bearing **3**.

Assembly

Lubricate new bearings **2** and **3** with clean transmission oil prior to assembly.

- 1 Position shaft **1** in press with gear supported by press frame. Select a suitable tube of the correct diameter to press bearing **2** on to shaft down to the shaft shoulder. As the bearing is being pressed on continue to rotate bearing to ensure no distortion of cage is occurring.
- 2 Invert shaft in press and follow same sequence for bearing **3**.

Note: Ensure matched cups of new bearings are retained for assembly into transmission.

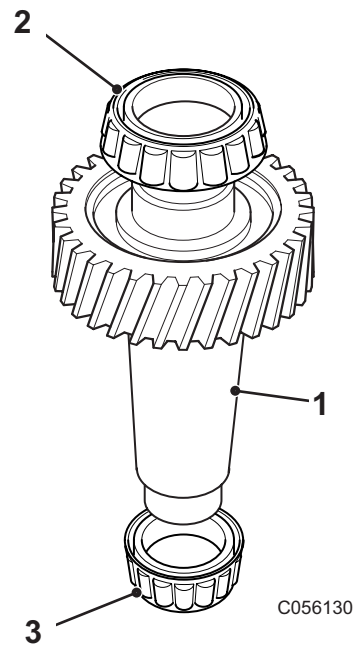


Fig 216.

Gearbox Rear Cover

Assembly

With correct end float shims retained, shafts may need to be lifted clear of case to install cover retaining studs **1**. Access for stud replacement is not possible with the casing and shafts assembled.

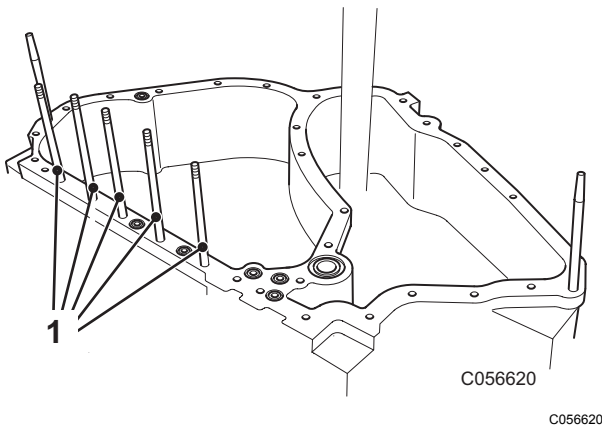


Fig 217.

- 1** Once studs **1** have been installed, the omitted shafts may be positioned into casing.
- 2** Clutch **E** assembled shaft **2** must be installed as follows. With the clutch assembly on the bench use service tool part no 998/M0034 **A** to carefully align clutch plates.

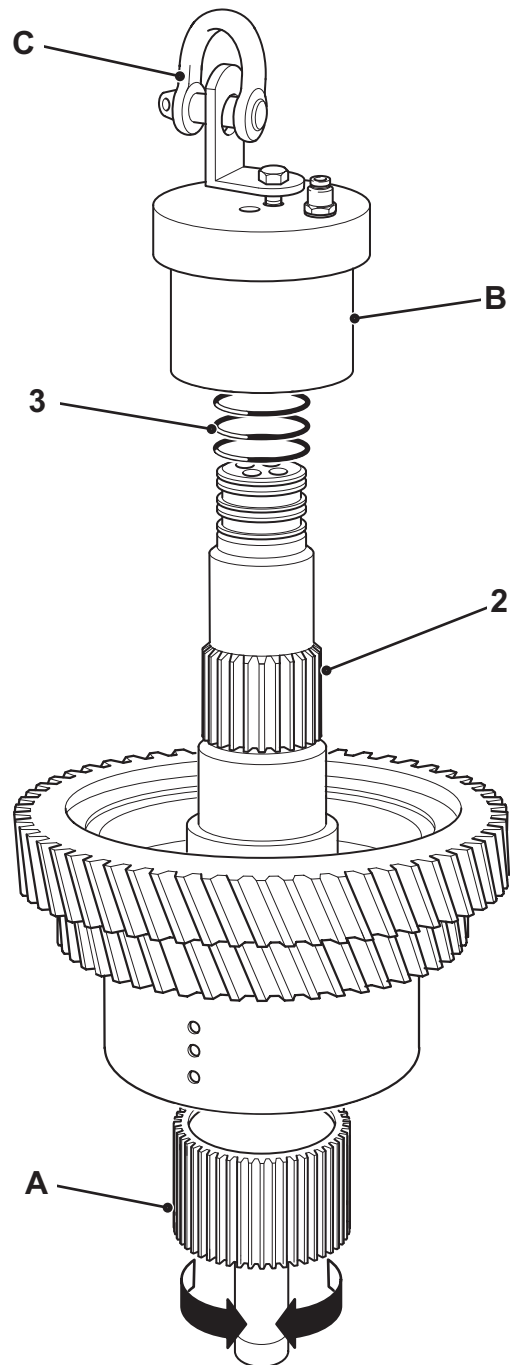


Fig 218.

- 3** With tool **A** still engaged, fit new lubricated 'O' ring seals **3** into the grooves in the top of the clutch shaft.

- 4 Install air feed adapter special tool **B** part no 998/11386 to end of shaft, align fixing bolt hole with the tapped hole in the end of the shaft. The fixing bolt will also retain angle bracket and lifting shackle **C** to top of shaft
- 5 Apply compressed air to the tool via quick release coupling **D**. This will lock the clutch plates in place and plate alignment tool **A** may be removed.

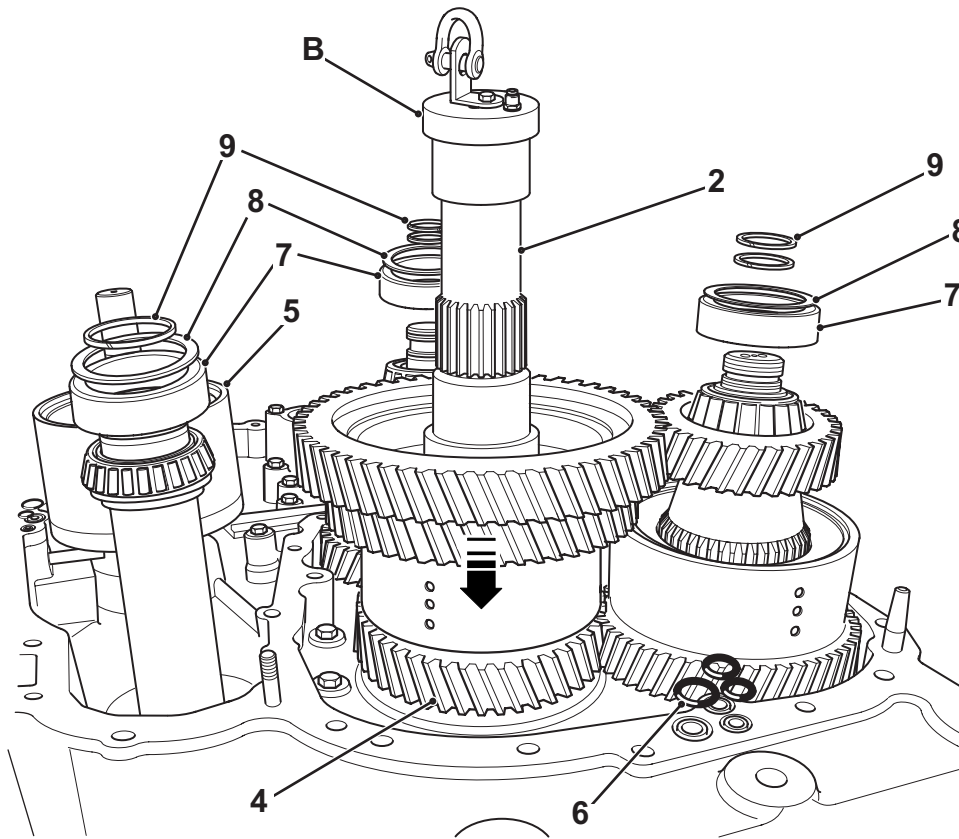


Fig 219.

C055760-C2

- 6 Slowly lower clutch **E** assembly, item **2**, into position taking care to align gear teeth with neighbouring shafts for accurate meshing. Once fitted over splined hub of mainshaft **4**, air pressure in tool **B** may be vented and tool removed.
- 7 Replace Rear P.T.O. clutch **5** and all 'O' ring face seals **6** in mounting flange. Run a continuous bead of JCB Black Gasket B574 around joint flange, do not allow gasket compound to come into contact with 'O' ring seals **6**.
- 8 Replace matched bearing cups **7** and correct shims **8** to support bearings on shafts. Renew PTFE seals **9** as necessary
- 9 To lift casing in a safe horizontal attitude use special spreader bar **C**. Locate dowels correctly as the casing is lowered. With the joint faces together fit 17mm screws **10**. Torque set screws to 56N,m (5.7 kgf/m. 41lbf/ft).

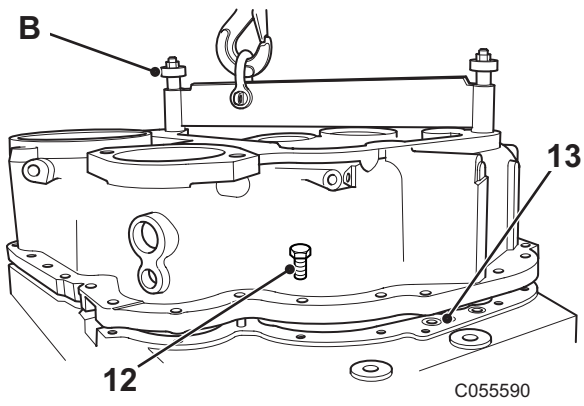


Fig 220.

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Mainshaft

Assembly

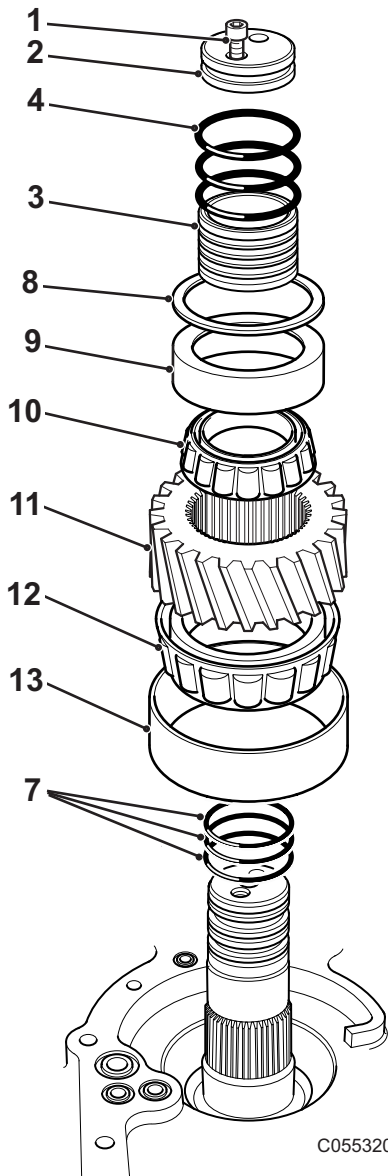


Fig 221.

C055320

- 2 Locate splines of gear 11 onto shaft, followed by new taper bearing cone 10. Position the bearing's matched cup 9 with nominal spacer shim 8.
- 3 'O' ring seals 7 were replaced prior to main shaft being craned into casing using air feed adapter special tool.
- 4 Fit sleeve 4 with new 'O' ring seals 3, followed by retainer cap 2 and its capscrews 1.

- 1 Position new bearing cup 13 matched to taper roller bearing 12 into casing. Press bearing cone 12 onto shaft and down into bearing cup.

Wet Clutch Casing

Removal and Replacement

Removal

With transmission retained on heavy duty manipulator, rotate manipulator so that the front casing of the transmission is uppermost.

With the Wet Clutch components already removed, the drive plate will be seen splined to the transmission wet clutch quill shaft and held in place by a staked ring nut **2**. The torque loading on this nut is very high, the transmission shafts will require locking and a torque multiplier employed to release the nut **2**.

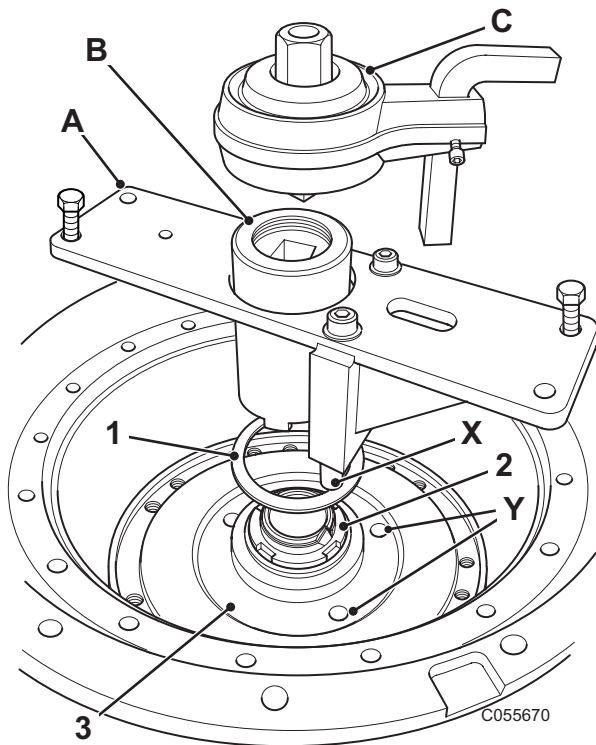


Fig 222.

C055670

- 1 Remove plastic bearing ring **1**.
- 2 With a sharp chisel remove the staking on both sides of ring nut **2** to enable the nut to be removed from quill shaft **6**.

- 3 Fit Special Tool base plate **A** part no. 998/11304 ensuring its dowel pins **X** locate in two of the drillings **Y** in drive plate **3**. Retain top plate of tool **A** to transmission casing with two 17mm screws.
- 4 Position Special Tool ring nut socket **B** 998/11305 through base plate **A** and engage castellations in bottom edge of socket with ring nut **2**.
- 5 Fit torque multiplier **C** 993/45400 to square drive in top of socket **B** and its reaction bar to slot in base plate. Undo nut **2** and discard.
- 6 Remove all Special Tools, lift wet clutch drive plate **3** clear of quill shaft splines.
- 7 With wet clutch drive plate **3** removed, the remaining Verbus rip screws **4** retaining front casing to transmission will be exposed.

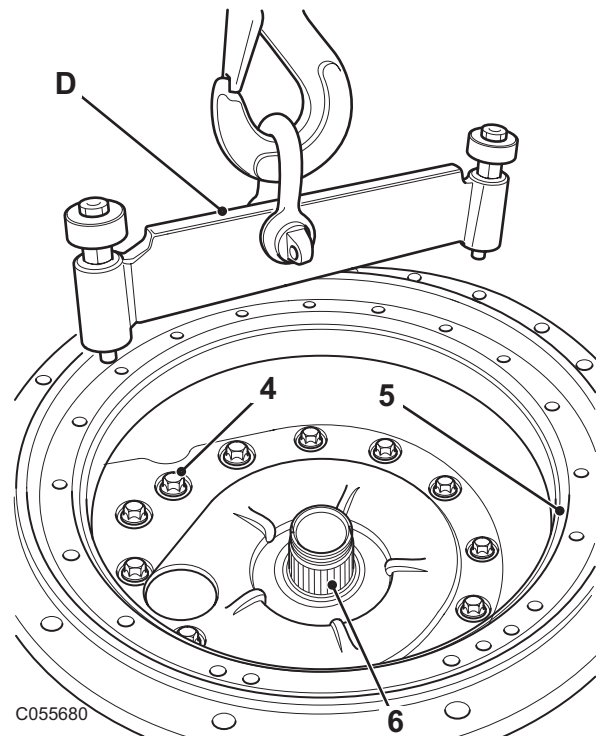


Fig 223.

C055680

- 8 Fit special spreader bar **D** (made locally) to the flange of front casing **5**. Remove all Verbus rip bolts **4** and discard. Some shock loading may be required to

break seal caused by gasket compound used on assembly. Lift casing clear.

Replacement

Note: Replacement is a reverse of dismantling with the following precautions.

- 1 Ensure joint faces of casings are clean, oil free and all dried gasket compound removed. Grease new 'O' rings and fit to gearbox joint flange. Run a bead of JCB Super Black Gasket B574 compound to joint face.

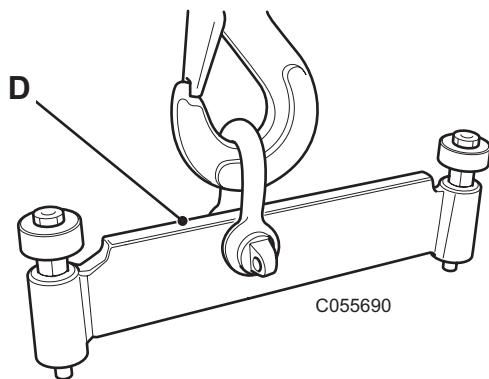


Fig 224.

C055690

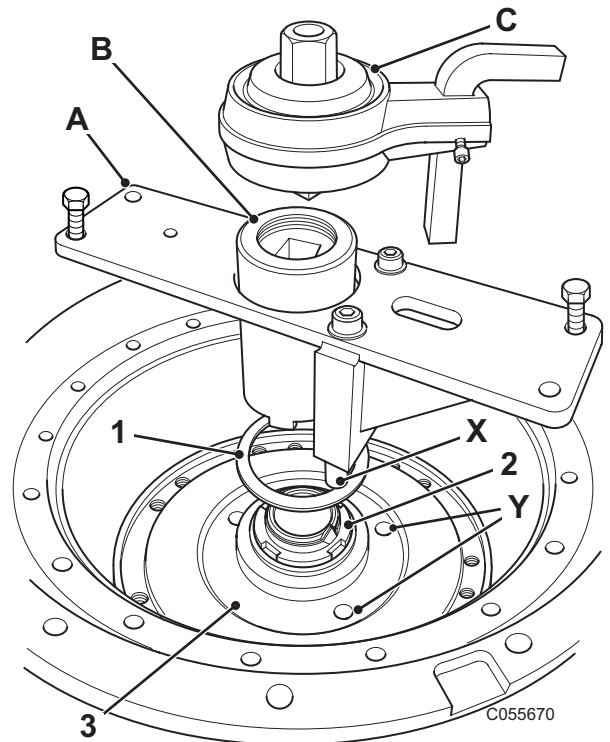


Fig 225.

C055670

- 2 Use spreader bar **D** to lift casing in a horizontal attitude. Position casing over transmission ensuring it is phased correctly. Insert new Verbus rip bolts and progressively torque tighten to 75Nm (7.6 kgf/m., 55 lbf/ft).
- 3 Reposition wet clutch drive plate **3** engaging splines on quill shaft **6**. Run new ring nut **2** down threads of nut.
- 4 Engage spigots **X** on special tool **A** with drillings **Y** in drive plate **3**. Bolt tool **A** to transmission flange and install ring nut socket **B** engaging castellation tabs with ring nut. Tighten ring nut to 1000Nm (102 kgf/m., 737 lbf/ft) using torque multiplier **C**. Stake flange of ring nut **2** into recesses in quill shaft **6**.
- 5 Install new plastic bearing ring **1**.

Wet Clutch Idler Shaft

Removal and Replacement

Note: Prior to installing idler shaft assembly 2, fit bearing cup of shaft 1 to casing otherwise gear 3 will obstruct access to bearing cup bore.

- 1 With the transmission still fitted to the manipulator **A** and the manipulator rotated so that it holds the transmission in a vertical attitude with the front casing uppermost, wet clutch driven P.T.O. Input Shaft 1 may be lifted clear. Put to one side for later inspection for wear or damage.
- 2 Remove capscrew with extended hexagonal spanner **B** as illustrated. Lift shaft 2 from casing and collect remaining components, bearings, gear 3 and bearing end-float spacer from casing.

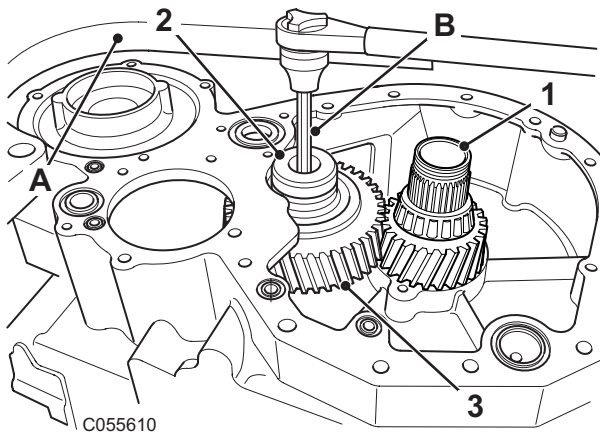


Fig 226.

- 3 Inspect bearings, discard if showing signs of wear or damage. If bearings are unfit for further service remove matched cups from idler gear 3, retain end-float spacer for possible use during rebuild.

Replacement

- 1 Position re-assembled idler gear 3 with its associated lubricated taper roller bearings and end-float spacer in position and over shaft aperture in transmission casing.
- 2 Engage idler gear shaft 2 through assembled gear 3, ensure shaft locates correctly and fully into machined

aperture in casing. Fit capscrew and torque tighten to 95Nm (9.7 kgf/m, 70 lbf/ft).

- 3 Replace P.T.O. drive shaft 1.