Chapter 24F

OIL SUMP, DISMANTLING

Contents

Illustrations

THIS CHAPTER, which is applicable to both the Ghost 48 Mk. 1 and the Ghost 48 Mk. 2, contains instructions for dismantling the oil sump after it has been removed from the engine in accordance with the instructions given in chapter 23. As the oil sumps fitted to the 48 Mk. 1 and 48 Mk. 2 engines are not identical, a separate sequence of operations is detailed for each engine. The general information contained in chapter 22 should be referred to as necessary.

Provision must be made to catch the oil drainage from the filter compartment and the oil passages on the outlet side of the filter when the pressure filter is removed. The cover with its Klingerit washer must be supported during removal as it will be under pressure from the overload spring.

As stated in chapter 22, all adjusting washers should be kept with their respective assemblies; they will facilitate gear meshing and end-float adjustment during reassembly. All sealing washers and rings must be discarded.

GHOST 48 Mk. 1 OIL SUMP

PRESSURE AND SUCTION OIL FILTERS

1. Cut the wire locking the oil thermometer bulb union nut to a lockwire tab situated under one of the pressure filter cover securing nuts; unscrew and remove the oil thermometer bulb from the pressure filter cover.

2. Cut the wire locking the oil priming union to a lockwire tab situated under one of the pressure filter cover securing nuts and unscrew and remove the oil priming union.

3. Remove the six ¼ in. B.S.F. nuts and spring

washers, also the two lockwire tabs which secure the pressure filter cover, and withdraw the filter assembly, Fig. 1.

4. Extract the retaining wire from the upper end of the support tube and remove the end plate with sealing washer, felt filter element, and second sealing washer.

5. Remove the five $\frac{1}{4}$ in. B.S.F. nuts, spring and plain washers which secure the suction filter cover to the oil pump body; remove the cover and withdraw the gauze filter element.

OIL PUMP, METERING PUMP AND RESTRICTOR

1. Unlock and remove the six $\frac{1}{4}$ in. B.S.F. nuts

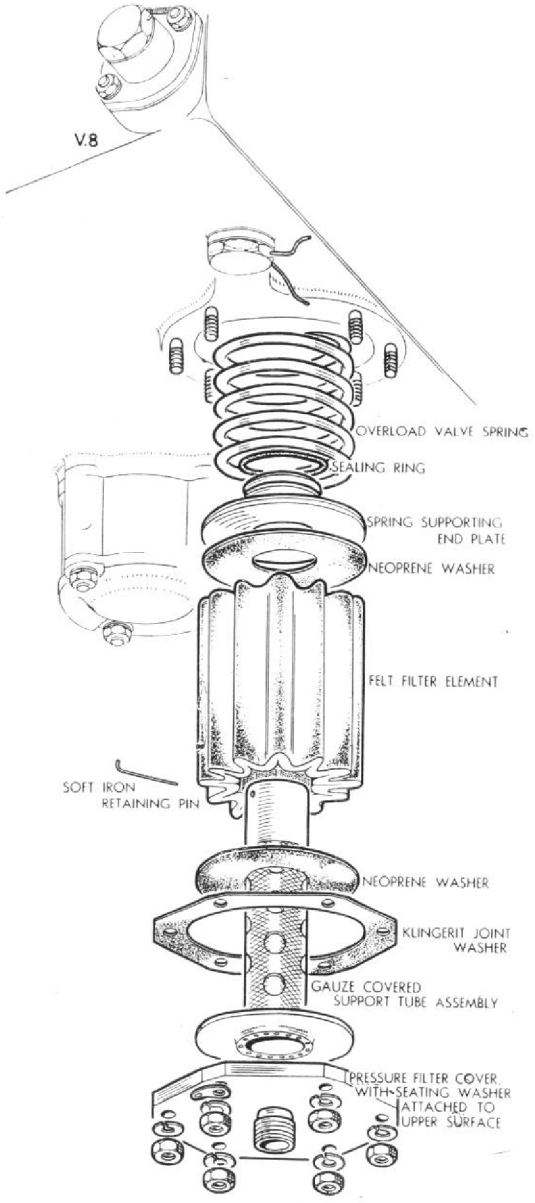


Fig. 1. Oil pressure filter assembly, with mod. 749 embodied.

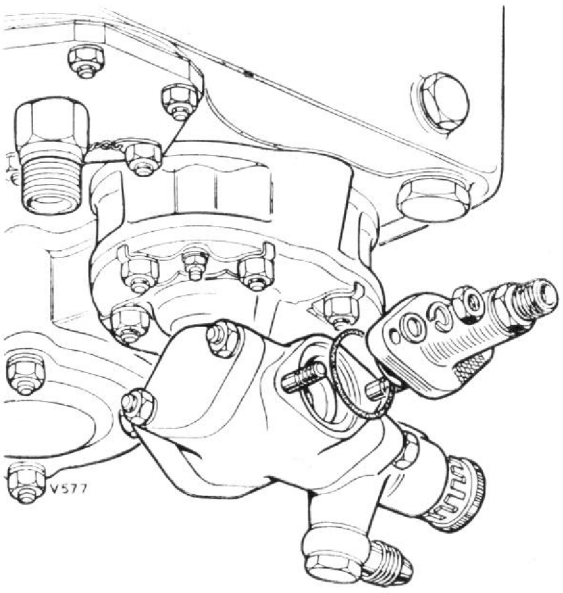


Fig. 2. Metering pump and restrictor.

which secure the pump cover and housing; remove the tab washers and withdraw the oil pump complete with the metering pump.

2. Remove the two 2 B.A. nuts, spring and plain washers and separate the pump cover from the pump body; withdraw the two oil pump gears from the pump body.

3. Remove the two 2 B.A. nuts, spring and plain washers which secure the metering pump to the oil pump cover; remove the metering pump and sealing washer, Fig. 2.

4. Remove the 2 B.A. plain nuts, spring and plain washers from the two studs which secure the restrictor housing to the oil pump cover; remove the restrictor assembly and the sealing ring.

5. Extract the split pin from the inboard end of the assembly and withdraw the restrictor from the housing.

BLANKING COVERS

1. Remove the nuts, spring and plain washers which secure the blanks T.74781 and T.74787 to the sump face and oil pump respectively; remove the oil sealing rings.

OIL LEVEL PLUNGER

1. Turn down the tab of the locking washer on the oil level plunger retaining plug. Remove the plug and tab washer, the sealing ring, plunger and spring.

RELIEF VALVE

1. Cut the locking wire and unscrew and remove

the relief valve cap plug and washer.

2. Remove the two nuts, spring and plain washers that secure the relief valve body to the sump; remove the lockwire tab.

3. Remove the relief valve cap, complete with its stop and locknut, from the housing.

4. Remove the relief valve housing with its spring and ball valve.

5. Remove the spring and ball valve from the body ; discard the sealing ring.

MISCELLANEOUS

1. Carefully withdraw the sight glass and wrap it in cloth to protect it against breakage ; place it in a special container separate from other items.

2. Remove the cooling oil pipe banjo bolt, banjo and washers.

3. Place all loose parts removed in one box and mark the box with the appropriate engine number.

4. Ensure that the rubber sealing strip that is fitted between the bottom wheelcase and the sump securing face has been removed from its groove and discarded.

GHOST 48 Mk. 2 OIL SUMP

METERING PUMP AND OIL PUMP

1. Remove the two plain 2 B.A. nuts and spring washers which secure the metering pump ; remove the metering pump.

2. Remove the seven plain $\frac{1}{4}$ in. B.S.F. nuts, spring and plain washers and the lockwire tab which secure the oil pump to the mounting plate ; withdraw the oil pump unit.

3. Remove the quillshaft and sleeve from the bore of the oil pump drive gear ; remove the circlip from the bore of the sleeve.

4. Unscrew and remove the metering pump oil-feed union with its washer from the oil pump cover.

5. Remove the two plain 2 B.A. nuts, spring and plain washers which secure the oil pump cover to the pump body ; separate the pump cover from the pump body and withdraw the two oil pump gears from the pump body.

BLANKING COVERS

1. Remove the nuts, spring and plain washers which secure the blanks T.77182, T.77183 and T.77184 to the top face of the sump, the circulating pump face and the fuel pump face respectively ; remove the oil sealing rings.

SIGHT GLASS ASSEMBLY AND CUT-OFF VALVE

1. Remove the four $\frac{1}{4}$ in. B.S.F. plain nuts, spring and plain washers which secure the sight glass assembly to the sump ; remove the sight glass assembly.

2. Using Seeger pliers, remove the circlip which secures the retaining cup and sealing ring in the outer end of the sight glass casing; remove the retaining cup, sealing ring and spring.

3. Using extractor T.79040, Fig. 3, remove the sight glass tube, screen, and all rubber seals.

4. Remove the taper pin from the cut-off valve plunger ; unscrew the plunger from the end of the cut-off valve stem and remove the spring and its seating washer.

5. Withdraw the cut-off valve from the housing.

6. Remove all rubber seals.

OIL RESTRICTOR

1. Remove the banjo, the three washers and the oil flow restrictor housing.

2. Remove the retaining

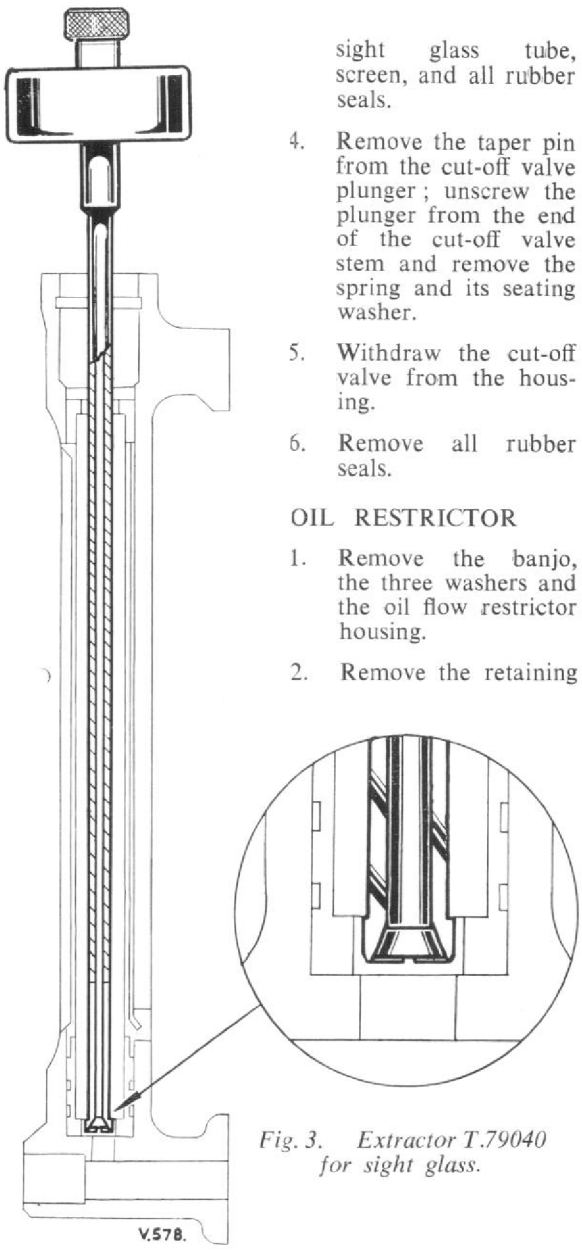


Fig. 3. Extractor T.79040 for sight glass.

screw and oil restrictor from the housing.

PRESSURE AND SUCTION OIL FILTERS

1. Remove the pressure filter in accordance with the instructions given for the 48 Mk. 1 on page 1.

2. Remove the six $\frac{1}{4}$ in. B.S.F. plain nuts, six spring washers, five plain washers and the lockwire tab which secure the suction filter cover to the sump; remove the cover and the sealing ring.

3. Remove the spring and filter.

RELIEF VALVE

1. Remove and dismantle the relief valve by applying the sequence of operations detailed for the 48 Mk. 1 relief valve, page 2.

OIL AND HYDRAULIC PUMPS (PORT) MOUNTING CASING

1. Unlock and remove the plain nuts and tab washers which secure the hydraulic pump gear and housing assembly to the port mounting plate.

2. Remove the hydraulic pump gear and the housing assembly from the casing.

3. Remove the thirteen $\frac{1}{4}$ in. B.S.F. plain nuts, spring and plain washers which secure the mounting casing to the port side of the sump; remove the casing.

4. Remove the oil transfer pipe from the oil pump face of the mounting casing and discard the two sealing washers.

5. Remove the hydraulic pump quill shaft.

HYDRAULIC PUMP ADAPTER

1. Remove the two set screws and the six nuts, spring and plain washers which secure the hydraulic pump adapter to the valve box mounting plate; remove the adapter.

2. Pass the serrated end of the mandrel forming part of locking fixture T.77177, through the fuel pump face orifice and locate the external serrations of the mandrel in the internal serrations of the hydraulic pump gear, as illustrated in Fig. 4.

3. Using slave washers and nuts, secure the bridge of the extractor to two studs on the fuel pump face.

4. Knock the cup washer tabs clear of the ring nut which secures the inner race of the fuel pump driving gear angular contact ball bearing.

5. Using spanner T.71775, remove the ring nut; remove the cup lock washer.

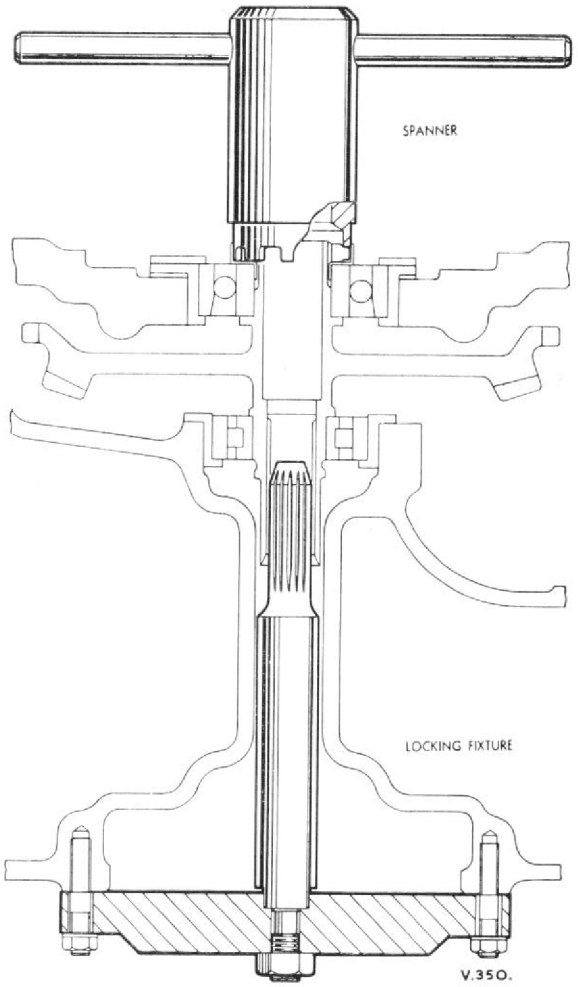


Fig. 4. Locking fixture T.77177 and spanner T.71775 for loosening ring nut on fuel pump driving gear.

6. Remove the slave nuts and washers which secure the bridge of the fixture and withdraw the locking fixture.

7. Unlock and remove the plain nuts and tab washers which secure the hydraulic pump ball bearing retaining plate and the ball bearing assembly.

8. Remove the retaining plate and the ball bearing assembly.

9. Turn down the tabs of the four tab washers and remove the plain nuts and tab washers which secure the circulating pump roller bearing housing retaining plate and roller bearing assembly to the sump.

10. Remove the retaining plate and the roller bearing assembly.

VALVE BOX (STARBOARD) MOUNTING PLATE

1. Turn down the tabs of the four tab washers.

2. Remove the seventeen plain nuts, four tab washers, three packing washers, and thirteen spring and plain washers which secure the valve box mounting plate to the sump.

3. Remove the mounting plate from the sump.

4. Unlock and remove the plain nuts and tab washers which secure the circulating pump gear housing to the rear inside face of the mounting plate.

5. Remove the circulating pump gear and the housing assembly from the mounting plate.

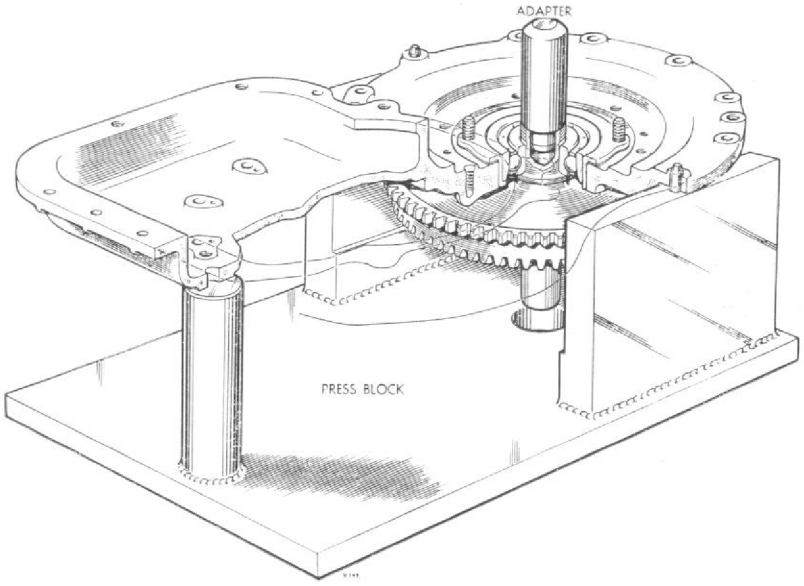


Fig. 5. Press block T.77974 and adapter T.77975 for removing hydraulic pump gear from valve group mounting plate.

6. Remove the bearing retaining plate from the hydraulic pump gear.

7. Position the mounting plate on press block fixture T.77974, Fig. 5, so that the gear spindle is over the hole in the base of the fixture, the mounting plate resting on the two side supporting pedestals of the fixture.

8. Insert the reduced diameter of adapter T.77975 into the bore of the gear and press the gear out of the mounting plate.

9. Knock the tab of the cup locking washer, which locks the ball bearing securing ring nut, clear of the nut.

10. Using spanner T.77175 remove the ring nut.

11. Remove the ball bearing housing from the mounting plate.

12. Remove the circlip which secures the roller bearing to the hydraulic pump quillshaft.

13. Place the hydraulic pump gear housing, flange downwards, on press block T.77977.

14. Using adapter T.77976 press out the outer track of the roller bearing.

HYDRAULIC PUMP/FUEL PUMP DRIVE GEAR

1. Using Seeger pliers, remove the circlip from the hydraulic pump/fuel pump drive gear.

2. Unscrew the centre screw of extractor T.77966 until the jaws of the two claws engage under the inner roller race and the reduced diameter of the centre screw pad fits in the end of the gear, Fig. 6.

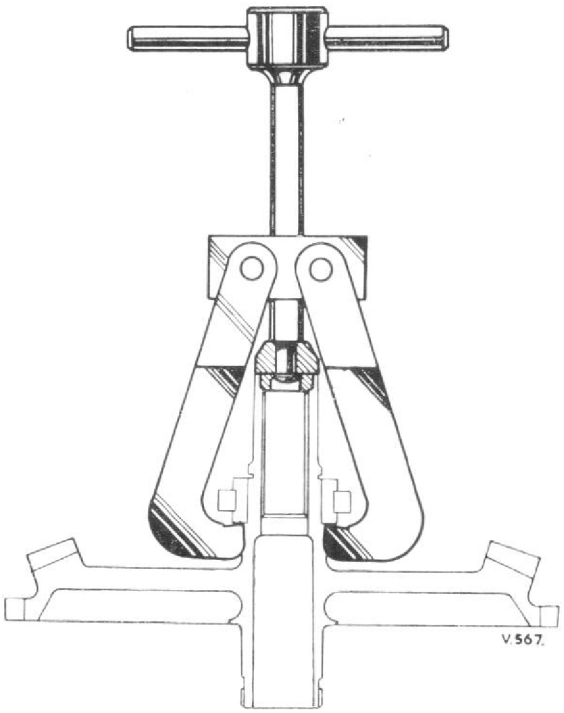


Fig. 6. Extractor T.77966 for removing hydraulic pump/fuel pump inner roller race from gear bearing.

3. Turn the extractor tommy bar in a clockwise direction and extract the inner roller race.

4. Position the gear housing, complete with the gear, gear uppermost, on press block T.77973.

5. Place the centre mandrel of the two-pin adapter T.77972 in the bore of the gear and

the pins through the two holes in the gear webs.

6. Press off the housing complete with the ball bearing ; remove the retaining ring.

7. Position the housing, flange downwards, on press block T.77979 ; using adapter T.77978 press out the ball bearing.

PORT HYDRAULIC PUMP GEAR

1. Using Seeger pliers, remove the circlip from the port hydraulic pump gear.

2. Position the gear assembly, gear uppermost, on press block T.77750.

3. Place the centre mandrel of the three-pin adapter T.77749 in the bore of the gear and the pins through the three holes in the gear web ; press off the ball bearing housing complete with the two ball bearings, Fig. 7.

4. Remove the retaining ring from the housing.

5. Position the housing, flange downwards, on pot fixture T.77752 ; using adapter T.77751 press out the two ball bearings and spacer, Fig. 8.

OIL PUMP DRIVE GEAR

1. Unlock and remove the plain nuts and tab washers which secure the oil pump drive assembly to the port side of the sump.

2. Withdraw the oil pump drive gear assembly from the sump.

3. Remove the retaining ring from the oil pump drive gear.

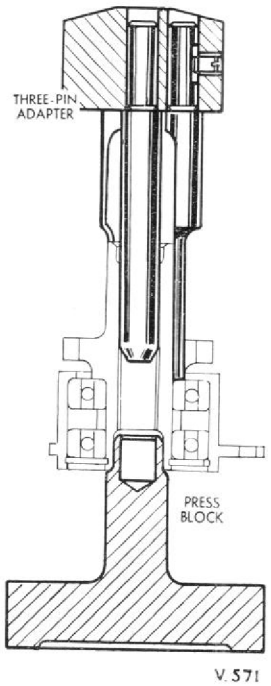


Fig. 7. Three-pin adapter T.77749 and press block T.77750 for removing bearing housing from port hydraulic pump.

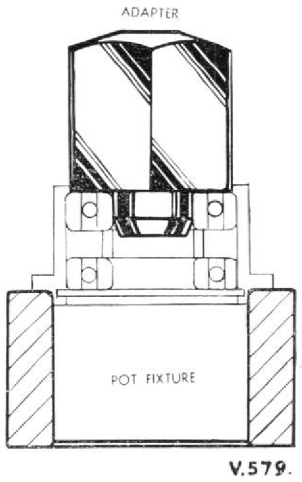


Fig. 8. Pot fixture T.77752 and adapter T.77751 for removing ball bearings and spacer from port hydraulic pump gear housing.

4. Position the gear assembly, gear uppermost, on press block T.77755.

5. Place the centre mandrel of the three-pin adapter T.77754 in the bore of the gear and the pins through the three holes in the gear web ; press off the ball bearings and housing complete.

6. Remove the retaining ring from the housing.

7. Position the housing, flange downwards, on pot fixture T.77757 using adapter T.77756, press out the two ball bearings and spacer.

OIL PUMP IDLER GEAR

1. Unlock and remove the plain nuts and tab washers which secure the oil pump idler gear assembly to the port side of the sump.

2. Withdraw the idler gear assembly from the sump.

3. Using Seeger pliers, remove the circlip from the idler gear.

4. Position the gear assembly, gear uppermost, on press block T.77964.

5. Using three-pin adapter T.77753 in a similar manner to that described in Op. 3 of the instructions for the port hydraulic pump gear, press off the ball bearings and housing complete.

6. Remove the retaining ring from the housing.

7. Position the housing, flange downwards, on pot fixture T.77752 ; using adapter T.77751 press out the two ball bearings and spacer.

VERTICAL ACCESSORY DRIVE GEAR

1. Unlock and remove the plain nuts and tab

washers which secure the vertical accessory drive gear assembly to the sump.

2. Withdraw the vertical accessory drive gear assembly from the sump with its adjusting washer ; remove the adjusting washer but keep it with the assembly.

3. Position the gear assembly, gear downwards, on vice block T.77161 ; using the two socket headed ¼ in. B.S.F. cap screws, secure the two brass segments in position to mesh with, and lock, the bevel gear, Fig. 9.

   The hole for the securing screw in each brass segment is elongated to enable the segments to be fitted snugly to the teeth of the gear ; once fitted they can be left in position but they should be adjusted to suit the gear of each particular assembly.

4. Knock the cup washer tabs clear of the ring nut. Use spanner T.77272 to remove the ring nut and remove the gear from the housing and vice block.

5. Assemble the two sections of the knurled split ring T.77965 around the teeth of the gear, Fig. 10 ; position the reduced diameter of the split ring in press block T.77759.

6. Insert the reduced diameter of adapter T.77758 into the bore of the gear ; press out the gear.

7. Remove the inner race and inner distance piece of the roller bearing from the housing.

8. Position the housing, flange downwards, on pot fixture T.77761 ; using adapter T.77760 press out the angular contact ball bearing, the outer distance piece, and the outer race of the roller bearing, Fig. 11.

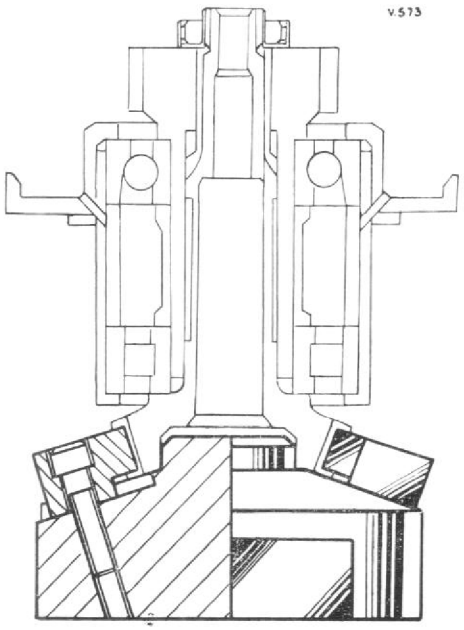


Fig. 9. Vice block T.77161 for removing ring nut from vertical accessory drive gear.

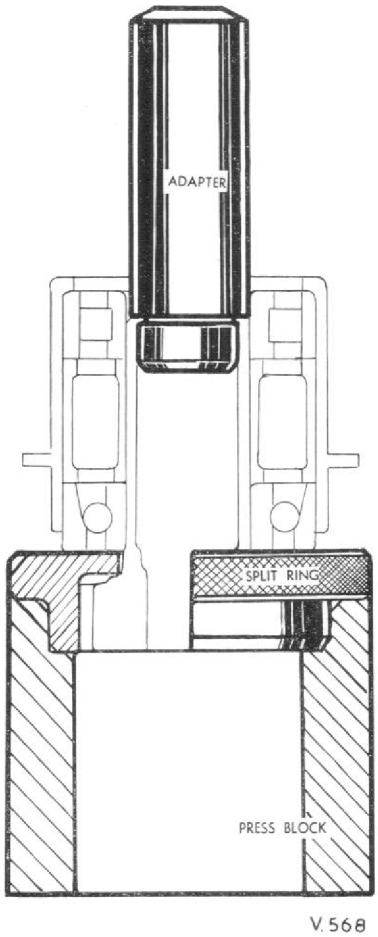


Fig. 10. Split ring T.77965, press block T.77759, and adapter T.77758 for pressing out vertical accessory drive gear from its bearing.

CIRCULATING PUMP DRIVE GEAR

1. Using Seeger pliers, remove the circlip from the circulating pump drive gear.

2. Unscrew the centre screw of extractor T77966 until the jaws of the two claws engage under the inner roller race and the reduced diameter of the centre screw pad fits in the end of the gear.

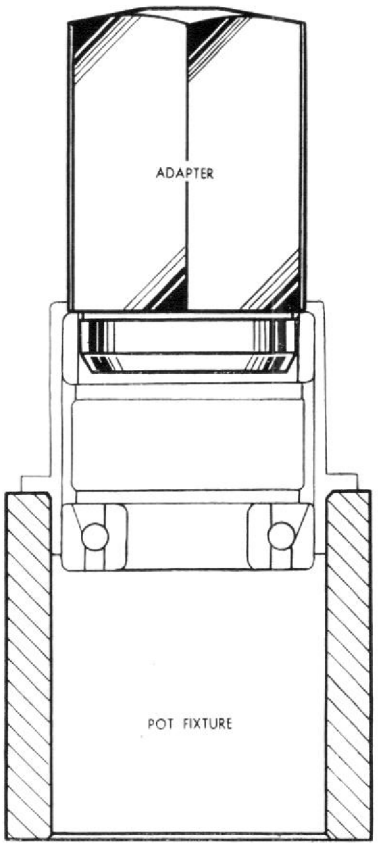
3. Turn the extractor tommy bar in a clockwise direction and extract the inner roller race.

4. Position the gear housing, complete with the gear, gear uppermost, on press block T.77973.

5. Place the centre mandrel of the two-pin adapter T.77972 in the bore of the gear and the pins through the two holes in the gear web.

6. Press off the housing complete with the ball bearing ; remove the retaining ring.

7. Position the housing, flange downwards, on



press block T.77763 and, using adapter T.77762, press out the ball bearing.

MISCELLANEOUS

1. Wrap the sight glass in cloth to protect it from breakage ; place it in a special container separate from other items.

2. Remove the rear bearing cooling oil-feed banjo bolt and washers situated on the rear port side of the sump.

3. Mate the outer races of all roller bearings with their respective inner races.

4. Wrap all ball and roller bearings in grease-proof paper.

5. Place all loose parts in one box and mark the box with the appropriate engine number.

6. Ensure that all rubber sealing strips between joint faces have been removed and discarded.

Fig. 11. Pot fixture T.77761 and adapter T.77760 for pressing out ball bearing, outer distance piece, and outer race from bearing housing.

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