EXHAUSTER-4·236 ENGINE

Description

The exhauster is a rotary sliding vane pump, with an eccentrically mounted rotor. The unit mounted on the rear of the timing case is driven by the timing gear.

The exhauster body and end covers are of cast iron, and house an aluminium rotor, die-cast on to a steel shaft. The rotor has four equi-spaced slots to accommodate fibre blades.

The shaft runs in a sintered bronze plain bearing in the rear end cover, and a roller race in the drive end cover. Drive end covers with a roller race have two shaft seals which contact a hardened steel collar pressed on to the rotor shaft. The seals are arranged to prevent ingress of air and dirt and leakage of oil from the exhauster.

The shaft drive end is splined to take the drive gear. The drive gear is secured to the front cover by two half-round thrust plates located in a groove around the gear collar and attached to the front cover with four setscrews.

The intake port in the exhauster is pipe connected to the vacuum reservoir. The outlet port formed in the end cover of the exhauster aligns with the aperture in the timing case.

Lubrication is by engine pressure feed, oil entering through a connection in the rear end cover to an annular groove in the bearing housing. The oil passes through a hole in the bearing to oilways in the rotor shaft communicating with the slots in the rotor. The oil passes through the end of the rotor slots to lubricate the drive end roller bearing.

A passage in the drive end cover to the vacuum side of the pump relieves oil pressure on the seal.

Operation

At all speeds the rotor blades are kept in contact with the bore of the body by centrifugal force, assisted by the hydraulic action of the oil beneath the blades. When the rotor turns, the spaces between the blades vary because of the eccentric mounting of the rotor in the exhauster body. As a blade passes the inlet port the space between it and the following blade is increasing and air is drawn from the vacuum reservoir. This air is then compressed and expelled, with the lubricating oil, through the outlet port to the engine timing case.

To Remove

Open and secure bonnet.

Disconnect battery.

Position road wheels on full left hand lock.

Remove left hand front insulation panel.

Disconnect oil and vacuum pipes at the exhauster, plug pipe ends to prevent entry of dirt.

Remove four nuts and spring washers securing exhauster to timing case.

Withdraw the exhauster, complete with drive gear and joint from the timing case studs.

Note: A distance piece and joint normally remain on the studs.

To Dismantle

Note: The drive gear is secured by two half-round thrust plates locating in a groove around the gear collar and attached to the drive end cover with four spring washers and setscrews.

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Progressively unscrew the four setscrews securing the two thrust plates to the drive end cover. Withdraw the drive gear and thrust plates.

Mark the end covers in relation to the body to assist correct re-assembly.

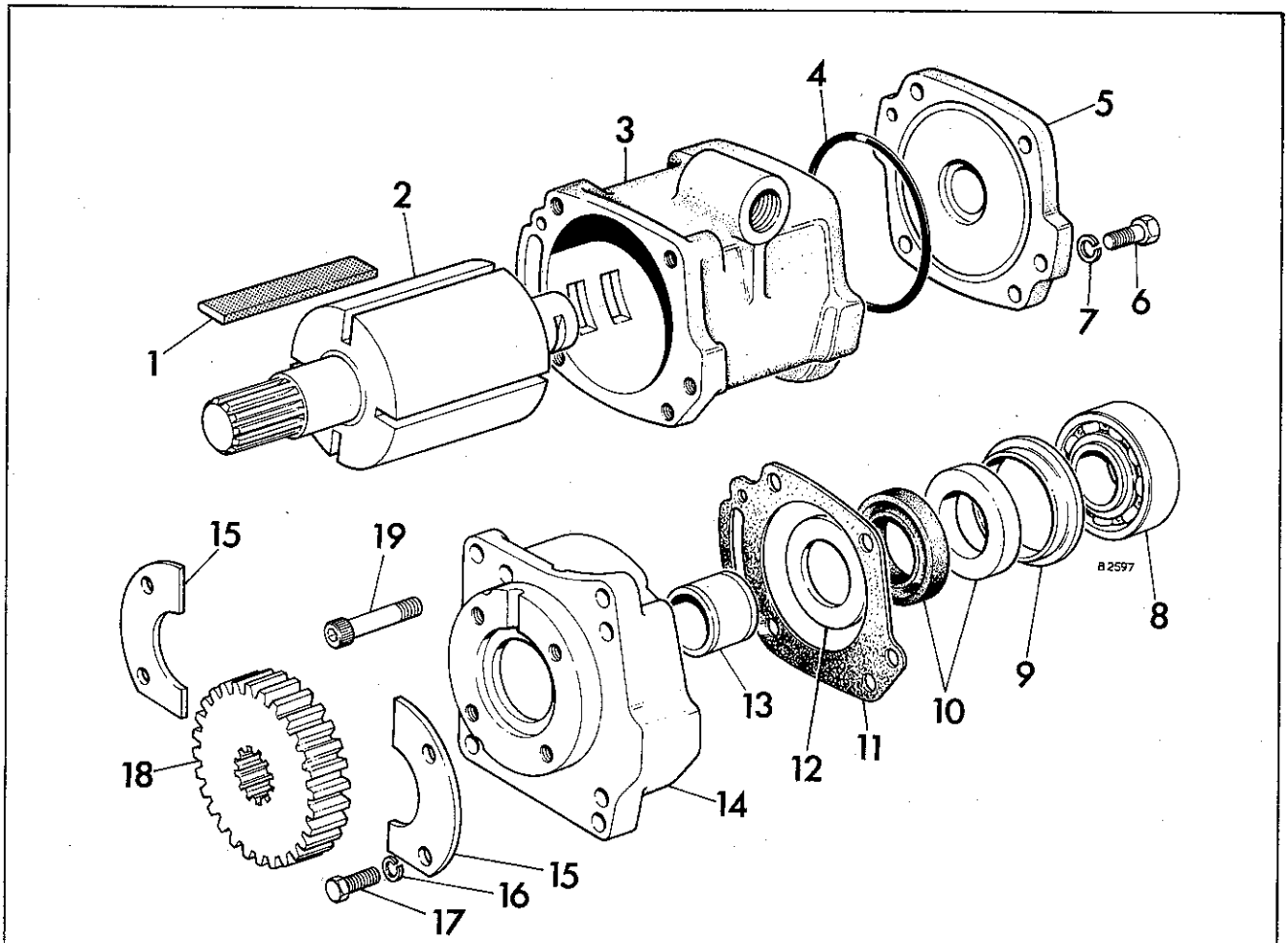
Unscrew four setscrews and spring washers securing rear cover, remove cover and "0" ring.

Mark the blades in relation to the rotor.

Withdraw the rotor and fibre blades from the body.

Unscrew four socket headed screws and remove drive end cover and joint.

Note: Further dismantling of the rotor assembly need be undertaken only if, after inspection, it is found necessary to renew the bearing or shaft collar.



1. ROTOR BLADE
2. ROTOR
3. BODY
4. "O" RING
5. REAR COVER
6. BOLT
7. SPRING WASHER
8. ROLLER BEARING
9. INNER BACK PLATE
10. SEAL
11. JOINT
12. OUTER BACK PLATE
13. SHAFT COLLAR
14. DRIVE END COVER
15. THRUST PLATE
16. SPRING WASHER
17. SETSCREW
18. DRIVE GEAR
19. SOCKET HEADED SCREW

Fig. 1 *Exhauster details*

Inspection and Overhaul

Wash the roller bearing, in thin flushing oil or white spirit and blow dry with compressed air. Spinning the bearing with compressed air should be avoided, otherwise damage to the rollers and race will occur.

Wash the remaining components in cleaning solvent, and clear the rotor and drive end cover oilways with compressed air.

Examine the roller bearing for discolouration, wear, pitting and cracked races. Rotate slowly to examine for roughness. Renew as necessary.

Inspect rotor and shaft for cracks and damage, and the shaft seal collar for wear. Renew as necessary.

Check fit of blades in rotor slots, renew any worn or damaged blades.

Examine the seal(s) carefully to see that the sealing edge is pliable, intact and sharp. Wear or deterioration is caused primarily by dirty oil and grit. Ineffective seals should be renewed.

Examine the body for cracks and damage, and the bore for longitudinal ripples or lines. If these are only slight the body is still serviceable, if excessive the body should be renewed.

Examine the end covers, and renew if cracked or scored.

To Renew Roller Bearing and Shaft Collar

Using a suitable puller withdraw roller bearing inner race and shaft collar.

Light grease the shaft, using a suitable diameter tube press new bearing inner race on to shaft.

Note: There will be a slight clearance between the bearing and the rotor face.

Similarly fit new collar with recessed shoulder against the bearing.

To Renew End Cover Bearing and Seals

Tap end cover face several times on to a wooden block, suitably recessed to accommodate the race. Remove race.

Withdraw inner back plate.

Press outer back plate and seals from cover using a bar or tube 33.34 mm (1-5/16 in) diameter.

Inspect back plates for damage, renew as necessary.

Insert outer back plate, press in new seals as above, replace inner back plate and press race into housing.

To Re-assemble

Lubricate all moving parts with clean engine oil to prevent possible damage when the engine is started and until oil flow commences.

Using a new joint position the drive end cover on the body, align the match marks and secure with four socket head screws.

Place the rotor in the body taking care not to damage the oil seal.

Hold the body, drive end downwards, and replace blades in rotor slots, making sure that marks made during dismantling correspond.

Fit a new "O" ring to the rear end cover, fit the cover to the body, align the match marks and secure with four setscrews and spring washers.

Check that the rotor turns freely.

Position the drive gear on the rotor shaft, locate the two half-round thrust plates in the gear collar groove. Secure the thrust plates to the drive end cover with four setscrews and spring washers.

To Refit

Using a new joint position the exhauster on the timing case studs. Secure with four nuts and spring washers.

Reconnect the oil and vacuum pipes.

Reconnect the battery.

Start the engine and check for oil leaks and operation of exhauster. Stop engine.

Refit left hand front insulation panel.