

REAR TRANSMISSION—continued

Op. 160(c) Extra to replace rear axle shaft and large reduction gear (each)

1. Remove rear transmission top cover and drain transmission lubricant.
2. Remove large reduction gear nut and rear axle shaft assembly.
3. Remove large reduction gear and withdraw bearing cone.
4. Replace bearing cone.
5. Remove bearing and oil seal from shaft.
6. Replace bearing and oil seal.
7. Replace shaft and large reduction gear and adjust preload.
8. Replace rear transmission top cover.
9. Fill with lubricant.

Tools used—Tr2/NMD 4220-A1. Reduction gear bearing cone remover.
Tr/MD 4220-B1. Reduction gear bearing cone replacer.
Tr/MD 4221-A1. Axle shaft bearing cone remover.
Tr/MD 4221-B1. Axle shaft bearing cone replacer.
Tr/MD 4235. Preload gauge.
Tr/NMD 4612. Reduction gear nut wrench.
Tr/D 994781. Ram cylinder housing lifting eyebolt.

Note.—For both sides, the above operations are duplicated with the exception of rear transmission top cover, hydraulic pump and pedestal and the draw-bar cradle.

Op. 160(d) Extra to replace axle shaft housing

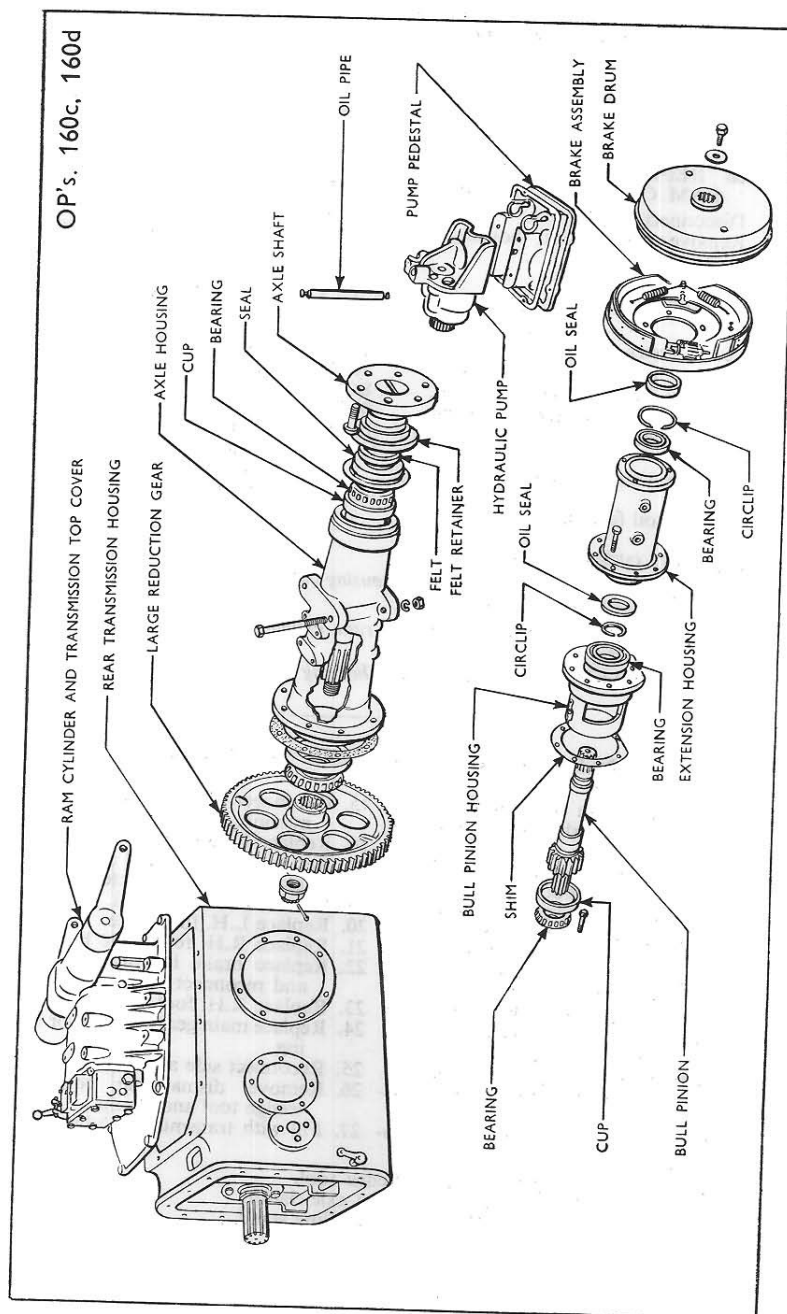
1. Remove rear transmission top cover.
2. Remove large reduction gear and axle shaft.
3. Remove rear axle shaft housing.
4. Remove bearing cups from housing.
5. Replace bearing cups in housing.
6. Replace rear axle shaft housing.
7. Replace axle shaft, large reduction gear and adjust preload.
8. Replace rear transmission top cover.

Tools used—Tr2/MD. 4220-2A2. Bearing cup remover.
Tr/MD 4220/2B2. Bearing cup replacer.
Tr/NMD 4612. Final reduction gear nut wrench.
Tr/D 994781. Ram cylinder housing lifting eyebolt.

Note.—For both sides the above operations are duplicated with the exception of the rear transmission top cover.

ASSOCIATED OPERATIONS

- Domestic** Op. 161. Replace bull pinion (each). (Ops. 160 and 160(a).)
Op. 162. Replace brake extension housing or bull pinion bearings and cups. (Ops. 160, 160(a) and 160(b).)
Op. 163. Replace rear axle shaft and large reduction gear (either). (Ops. 160 and 160(c).)
Op. 164. Replace rear axle shaft housing (either). (Ops. 160 and 160(d).)
- Export** Op. 2219-A. Replace (one) brake extension housing. (Ops. 160, 160(a) and 160(b).)
Op. 4010-A. Replace (either) rear axle shaft housing. (Ops. 160 and 160(a).)
Op. 4010-B. Replace (both) rear axle shaft housings. (Ops. 160 and 160(a).)
Op. 4235-A. Replace (either) rear axle shaft and large reduction gear (Ops. 160 and 160(c).)
Op. 4235-B. Replace both rear axle shafts and large reduction gears. (Ops. 160 and 160(c).)
Op. 4240-A. Replace (each) bull pinion. (Ops. 160 and 160(a).)
Op. 4240-B. Replace bull pinion bearings and cups (each side). (Ops. 160, 160(a) and 160(c).)



REAR TRANSMISSION—continued

Op. 166 REPLACE REAR TRANSMISSION HOUSING TOP COVER OR RAM CYLINDER HOUSING ASSEMBLY

1. Disconnect lifting links.
2. Remove transmission housing top cover.
3. Remove seat.
4. Replace seat.
5. Replace transmission housing top cover.
6. Reconnect lifting links.

Tools used—Tr/D 994781. Ram cylinder housing lifting eyebolt.

Op. 166(a) Extra to replace ram cylinder housing (with H.P.L.)

1. Remove hydraulic control unit.
2. Remove ram cylinder and piston.
3. Remove ram cylinder rear cover.
4. Remove one lift arm and withdraw shaft.
5. Remove crank arm and connecting rod.
6. Remove oil feed pipe.
7. Remove shaft bearings and spacers.
8. Replace ram cylinder and piston.
9. Replace hydraulic control unit.
10. Replace shaft bearings and spacers.
11. Replace shaft, crank arm and connecting rod.
12. Replace lift arm.

ASSOCIATED OPERATIONS

Domestic Op. 167. Replace ram cylinder housing (when H.P.L. is fitted). (Ops. 166 and 166(a).)

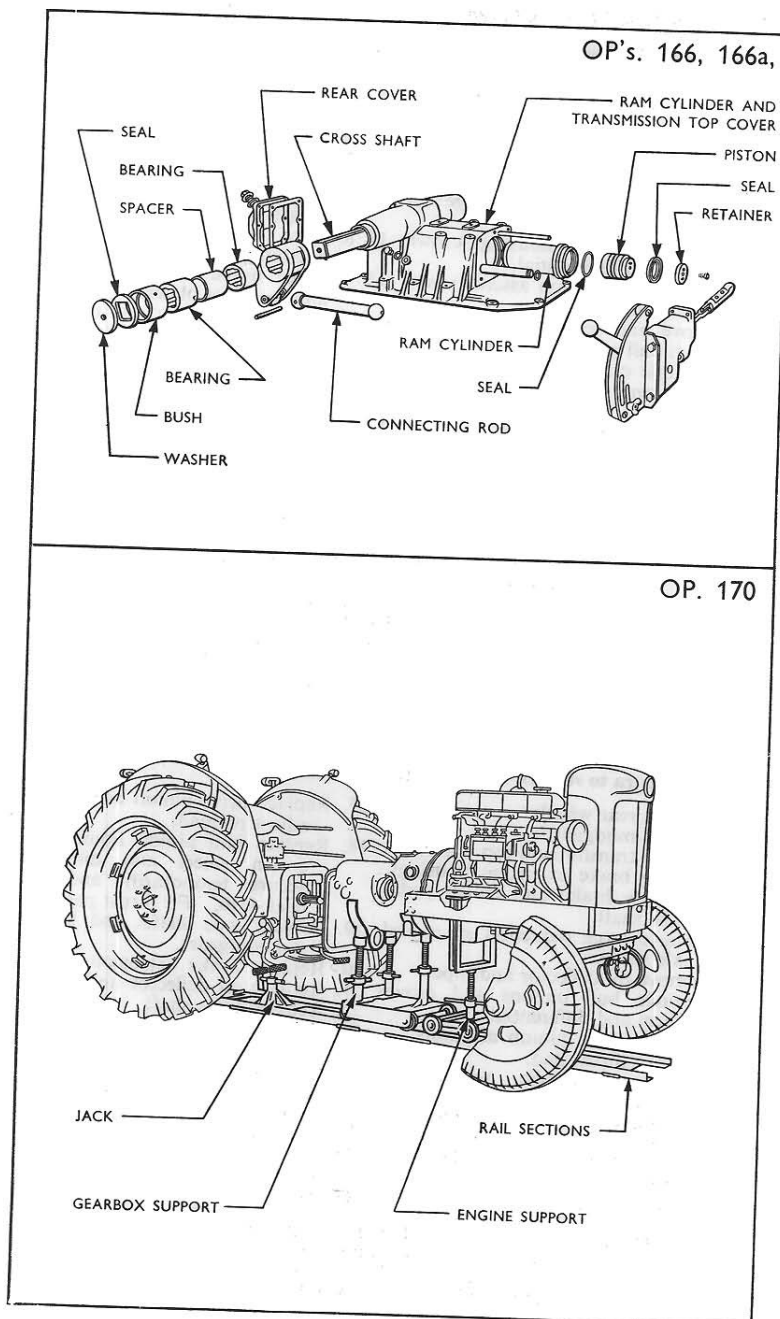
Export Op. 500-A. Replace hydraulic ram cylinder housing. (Ops. 166 and 166(a).)

Op. 4014-B. Replace axle centre housing top cover. (Op. 166.)

Op. 170 DISMANTLE FRONT FROM REAR TRANSMISSION AND RE-ASSEMBLE

1. Drain oil from rear transmission.
2. Install front axle wedge tool and clamp.
3. Disconnect side and tail lamp loom.
4. Remove R.H. foot plate.
5. Disconnect brake cables and remove brake locking lever guide.
6. Remove R.H. foot plate bracket.
7. Remove L.H. foot plate.
8. Disconnect clutch pedal.
9. Remove L.H. foot plate bracket.
10. Release rear end of silencer.
11. Withdraw P.T.O. shaft.
12. Locate dismantling equipment.
13. Remove main gearbox selector housing.
14. Disconnect front from rear transmission.
15. Reconnect front and rear transmission.
16. Replace P.T.O. shaft.
17. Reconnect rear end of silencer.
18. Replace L.H. foot plate bracket.
19. Reconnect clutch pedal.
20. Replace L.H. foot plate.
21. Replace R.H. foot plate bracket.
22. Replace brake locking lever guide and reconnect brake cables.
23. Replace R.H. foot plate.
24. Replace main gearbox selector housing.
25. Reconnect side and tail lamp loom.
26. Remove dismantling equipment, wedge tool and clamp.
27. Fill with transmission lubricant.

Tools used—Tr2/NMD 3004. Wedge tool.
Tr/MD 3000. Front axle clamp.
Tr/NMD 27. Dismantling stand.



REAR TRANSMISSION—continued

Op. 170(a) Extra to replace crown wheel and pinion

1. Remove rear wheels.
2. Remove mudguards.
3. Remove transmission top cover.
4. Remove oil deflector and pipe.
5. Remove both brake extension housings and rear foot plates.
6. Remove axle shafts and large reduction gears.
7. Remove bull pinion housings, crown wheel and differential.
8. Remove drive pinion assembly and dismantle.
9. Remove and replace bearing cups from bull pinions housings.
10. Dismantle crown wheel and differential and remove bearings.
11. Reassemble crown wheel and differential.
12. Replace the drive pinion assembly and adjust preload.
13. Replace bull pinion housings and crown wheel and differential. Secure temporarily and check back-lash.
14. Replace axle shafts and large reduction gears.
15. Replace brake extension housings and rear foot plates.
16. Replace oil deflector and pipe.
17. Replace transmission top cover.
18. Replace mudguards and rear wheels.

Tools used—Tr/NMD 4612
Tr2/MD 4621-AB1.
Tr2/MD 4616-AB2.
TTr/MD 6050.
Tr/MD 4221-A1.
TTr2/VMD 4221-B1.
Tr/MD 4634.
Tr/MD 4610.
Tr/MD 4235.
Tr/MD 4301.
Tr/D 994781.

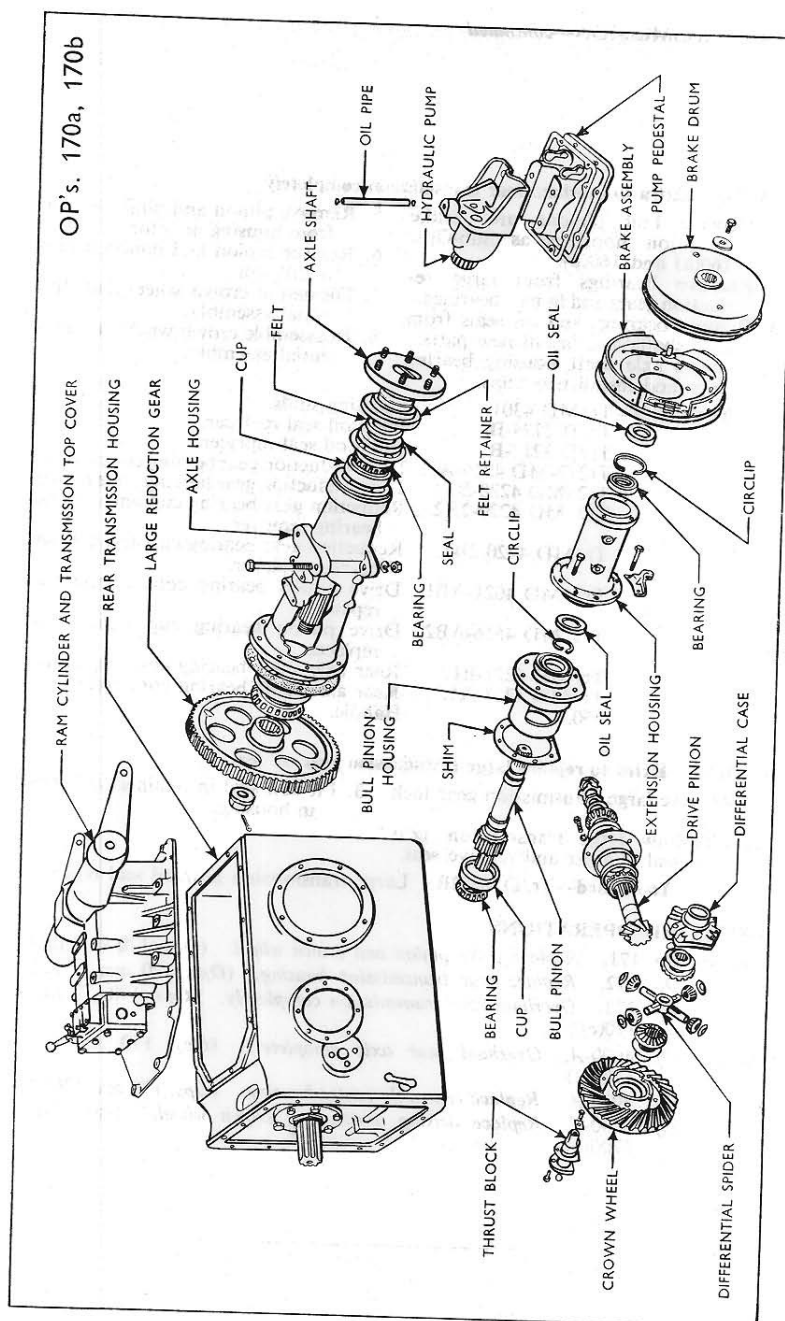
Reduction gear nut wrench.
Drive pinion bearing cone remover and replacer.
Drive pinion bearing cup remover and replacer.
Locating studs.
Rear axle shaft bearing cone remover.
Rear axle shaft bearing cone replacer.
Drive pinion bearing adjusting nut wrench.
Drive pinion spline wrench.
Preload gauge.
Bull pinion housing locating studs.
Ram cylinder housing lifting eyebolt.

Op. 170(b) Extra to replace rear transmission housing

1. Remove rear wheels.
2. Remove mudguards.
3. Remove transmission top cover.
4. Remove brake extension housings.
5. Withdraw brake and clutch pedal cross shaft.
6. Remove large reduction gears and axle shafts.
7. Remove oil deflector and pipe.
8. Remove bull pinions and crown wheel and differential.
9. Remove drive pinion assembly.
10. Remove thrust pad.
11. Remove hydraulic pump and pedestal.
12. Remove P.T.O. shaft assembly.
13. Remove axle housings.
14. Remove drawbar and brackets.
15. Remove lift link brackets.
16. Fit new cross shaft oil seals.
17. Replace drive pinion assembly and adjust preload.
18. Replace bull pinion housings and crown wheel and differential. Secure temporarily and check back-lash. Fit thrust pad.
19. Replace axle shafts and large reduction gears.
20. Replace brake extension housings.
21. Replace oil deflector and pipe.
22. Replace cross shaft.
21. Replace hydraulic pump and pedestal.
22. Replace P.T.O. shaft assembly.
23. Replace transmission top cover.
24. Replace mudguards.
25. Replace rear wheels.
26. Replace drawbar and brackets.
27. Replace lift link brackets.
28. Fill with transmission lubricant.

Tools used—Tr/NMD 4613.
Tr/MD 4235.
Tr/MD 4301.
Tr/D 994781.

Large reduction gear nut wrench.
Preload gauge.
Bull pinion housing locating studs.
Ram cylinder housing lifting eyebolt.



REAR TRANSMISSION—continued

Op. 170(c) Extra to overhaul rear transmission completely

1. Replace bull pinions and brake extension housings as Sub-Ops. 160(a) and 160(b).
2. Remove bearings from large reduction gears and fit new bearings.
3. Remove bearings and oil seals from axle shafts and install new parts.
4. Remove axle shaft housing bearing cups and install new cups.
5. Remove pinion and pinion bearings from housing adaptor.
6. Replace pinion and pinion bearings in adaptor.
7. Dismantle crown wheel and differential assembly.
8. Reassemble crown wheel and differential assembly.

Tools used—Tr/MD 4301. Locating studs.
Tr/D 2773-B. Inner oil seal replacer.
Tr/D 2217-B. Outer oil seal replacer.
Tr2/NMD 4220-A1. Large reduction gear bearing cone remover.
Tr2/MD 4220-B1. Large reduction gear bearing cone replacer.
Tr2/MD 4220-2A2. Reduction gear bearing cup and axle shaft bearing remover.
Tr/MD 4220-2B2. Reduction gear bearing cup and axle shaft bearing replacer.
Tr2/MD 4621-AB1. Drive pinion bearing cone remover and replacer.
Tr2/MD 4616-AB2. Drive pinion bearing cup remover and replacer.
Tr/MD 4221-B1. Rear axle shaft bearing cone replacer.
Tr/MD 4221-A1. Rear axle shaft bearing cone remover.
550. Handle.

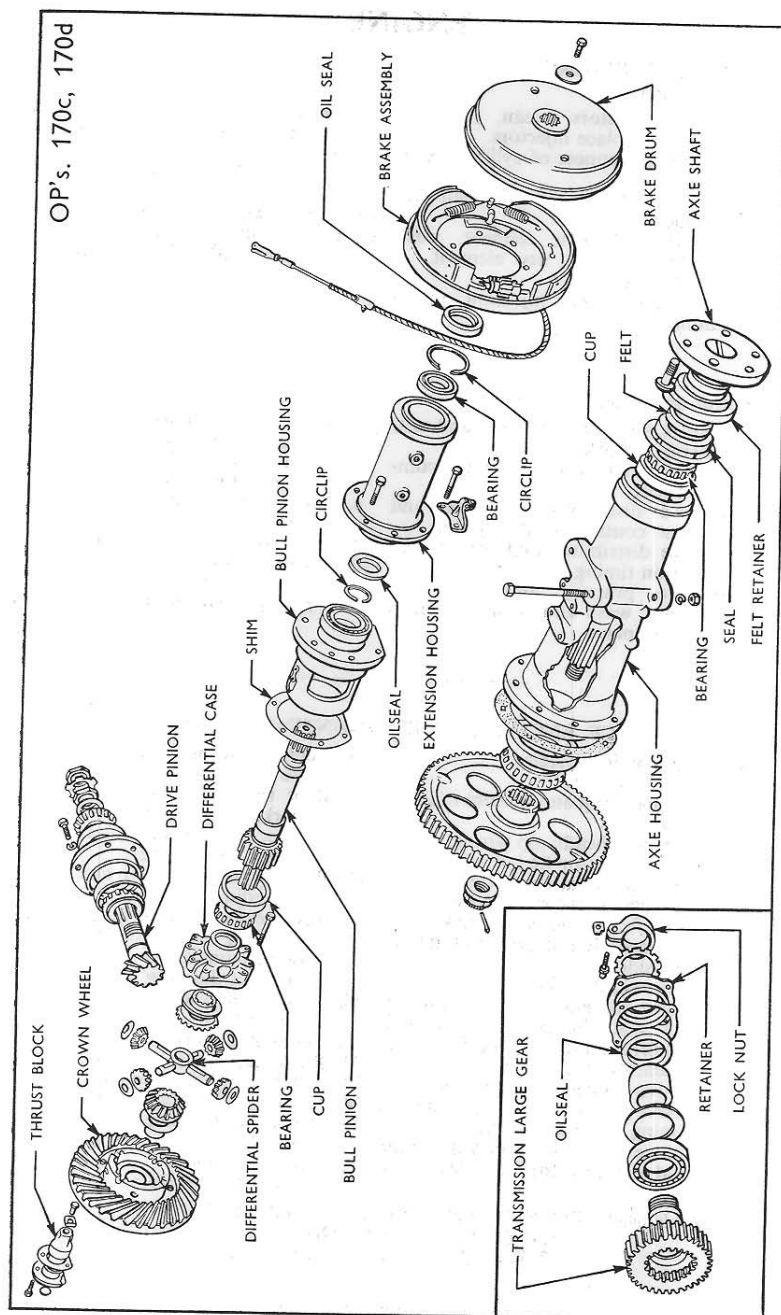
Op. 170(d) Extra to replace large transmission gear oil seal

1. Remove large transmission gear lock nut.
2. Withdraw large transmission gear oil seal retainer and remove seal.
3. Fit new seal in retainer and replace in housing.

Tools used—Tr/D 7052B. Large transmission gear oil seal replacer.

ASSOCIATED OPERATIONS

- Domestic** Op. 171. Replace drive pinion and crown wheel. (Ops. 170 and 170(a).)
Op. 172. Replace rear transmission housing. (Ops. 170 and 170(b).)
Op. 173. Overhaul rear transmission completely. (Ops. 170, 170(b) and 170(c).)
- Export** Op. 4000-A. Overhaul rear axle completely. (Ops. 170, 170(b) and 170(c).)
Op. 4025-A. Replace rear axle centre housing. (Ops. 170 and 170(b).)
Op. 4200-B. Replace driving pinion and crown wheel. (Ops. 170 and 170(a).)



ENGINE

Op. 200 TUNE ENGINE

Diesel engine

1. Remove injectors, clean, test and reset. Replace injectors.
2. Check the evenness of cylinder compressions.
3. Remove fuel pump bowl, clean and replace.
4. Remove fuel filter element, wash container and fit new element.
5. Bleed fuel system.
6. Check and reset injection pump timing.
7. Wash primary air cleaner.
8. Clean rocker cover breather pipe.
9. Remove main air cleaner, wash and refill with clean oil. Replace air cleaner.
10. Adjust valve clearances.
11. Check max. "no load" speed and idling speed. Adjust as required.

or

Petrol and Vap. Oil engine

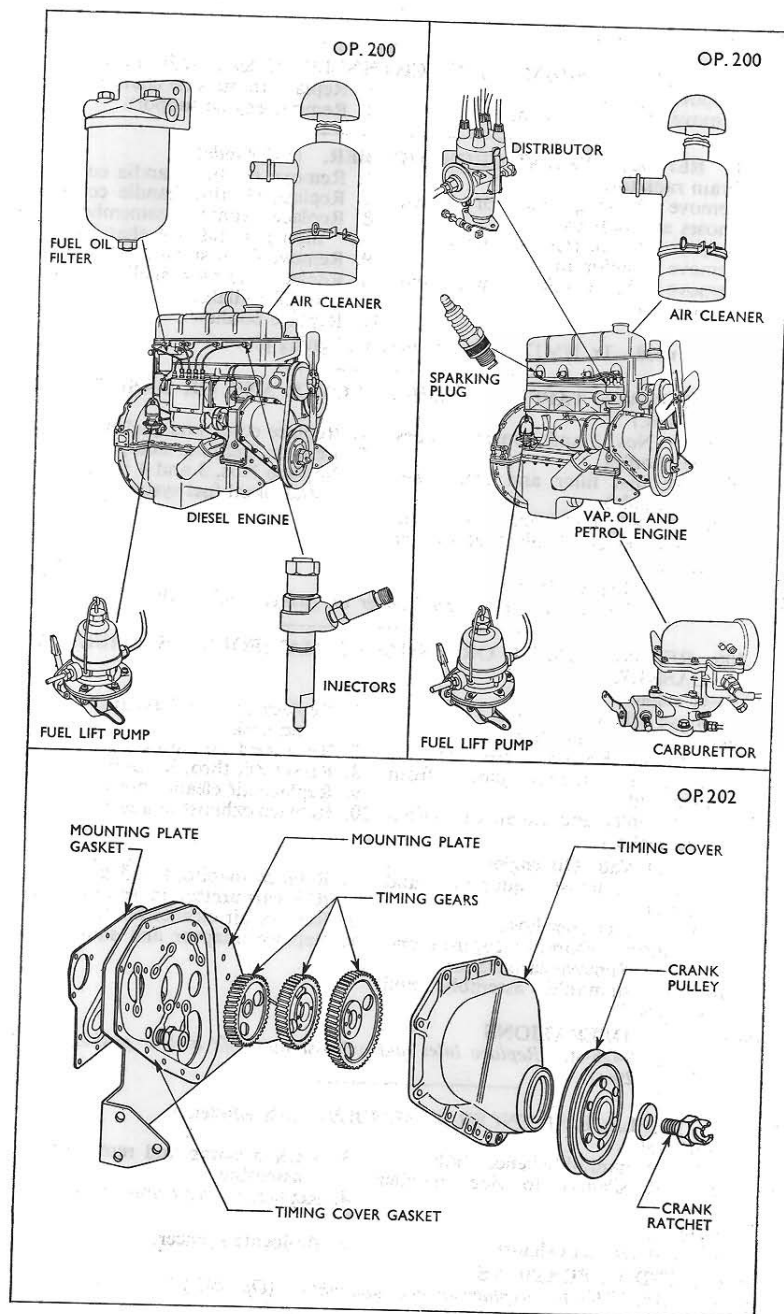
1. Remove spark plugs, clean and test. Replace spark plugs.
2. Check evenness of cylinder compressions.
3. Remove distributor. Hone and adjust contact breaker points.
4. Replace distributor and reset initial ignition timing.
5. Remove primary and main air cleaner, wash and refill with clean oil. Replace.
6. Remove carburettor jets and float. Clean all parts and replace.
7. Clean and check petrol starting carburettor (if fitted).
8. Remove fuel pump bowl, clean and replace.
9. Clean rocker cover breather pipe.
10. Warm engine, adjust valve clearances and carry out final adjustments to carburettor and ignition.

Op. 202 REPLACE ENGINE FRONT MOUNTING PLATE. (All Models.)

1. Drain cooling system.
2. Remove bonnet.
3. Disconnect top and bottom radiator hoses.
4. Disconnect headlamp wiring.
5. Remove radiator tie-bar clip.
6. Disconnect radiator shutter control.
7. Disconnect silencer at rear end.
8. Mount front axle wedge tool.
9. Disconnect radius rod and tap to one side.
10. Disconnect drag link.
11. Support the engine and disconnect the side channels at rear end. Wheel the radiator and front axle assembly clear of tractor.
12. Remove fanbelt and generator.
13. Remove crankshaft ratchet, pulley, timing cover and gears.
14. Remove the front mounting plate and unscrew the oil relief valve
15. Replace the oil relief valve and fit the front mounting plate.
16. Refit the timing gears with timing marks in line. Replace the timing cover and new oil seal, crankshaft pulley and ratchet.
17. Replace the generator and fan belt and adjust tension.
18. Replace the radiator and front axle assembly and reconnect engine side channels.
19. Reconnect the drag link.
20. Replace the radius rod and remove wedge tool.
21. Reconnect silencer.
22. Reconnect radiator shutter control.
23. Replace radiator tie-bar clip.
24. Reconnect headlamp wiring.
25. Reconnect top and bottom radiator hoses.
26. Replace bonnet.
27. Refill cooling system.

Tools used—Tr2/NMD 3004. Front axle wedge tool.
TTr/D 6319. Turning bar.





ENGINE—continued.

Op. 203 REPLACE FRAME SIDE CHANNELS (either). (All Models.)

1. Support engine.
2. Remove frame side channel.
3. Replace frame side channel.
4. Remove engine support.

Op. 204 REPLACE FRONT CROSSMEMBER. (All Models.)

1. Drain radiator.
2. Remove bonnet, radiator shell, hoses and radiator.
3. Support front of tractor suitably.
4. Remove trunnion pin.
5. Remove offside side channel and front crossmember.
6. Remove starting handle coupling.
7. Replace starting handle coupling.
8. Replace front crossmember trunnion pin and side channel.
9. Remove front supports.
10. Replace radiator shell and hoses. Refill radiator.
11. Replace bonnet.

Tool used—Tr/NMD 3006. Trunnion aligning pin.

Op. 205 REPLACE TAPPET CHAMBER COVER AND/OR GASKETS. (All Models.)

1. Remove Nos. 3 and 4 injector pipes (diesel only).
2. Remove fuel filter and feed pipes (diesel only).
3. Remove tappet chamber cover and gasket, clean off block and cover faces.
4. Replace cover and gasket.
5. Replace fuel filter and pipes.
6. Replace Nos. 3 and 4 injector pipes and bleed fuel system.

ASSOCIATED OPERATIONS

Export Op. 6520-A. Replace tappet cover or gasket. (Op. 205.)

Op. 206 REPLACE INLET OR EXHAUST MANIFOLD ASSEMBLY AND GASKETS

Diesel engine

1. Remove exhaust adaptor.
2. Remove air cleaner hose.
3. Disconnect throttle control rod.
4. Disconnect vacuum pipes from manifold.
5. Remove inlet and exhaust manifold and gaskets.
6. Replace inlet and exhaust manifold and gaskets.
7. Reconnect vacuum pipes.
8. Reconnect throttle control rod.
9. Replace air cleaner hose.
10. Replace exhaust adaptor.

Petrol and Vap. Oil engine

1. Remove exhaust adaptor and shutter.
2. Remove air cleaner hose.
3. Disconnect carburettor controls and pipes. Remove carburettor.
4. Remove manifold assembly and gaskets.
5. Replace manifold and gaskets.
6. Refit carburettor, pipes and controls.
7. Replace air cleaner hose.
8. Replace adaptor and shutter.

ASSOCIATED OPERATIONS

Export Op. 9425-A. Replace inlet and exhaust manifold and/or gaskets. (Op. 206.)

Op. 207 REPLACE SILENCER ASSEMBLY. (All Models.)

Horizontal

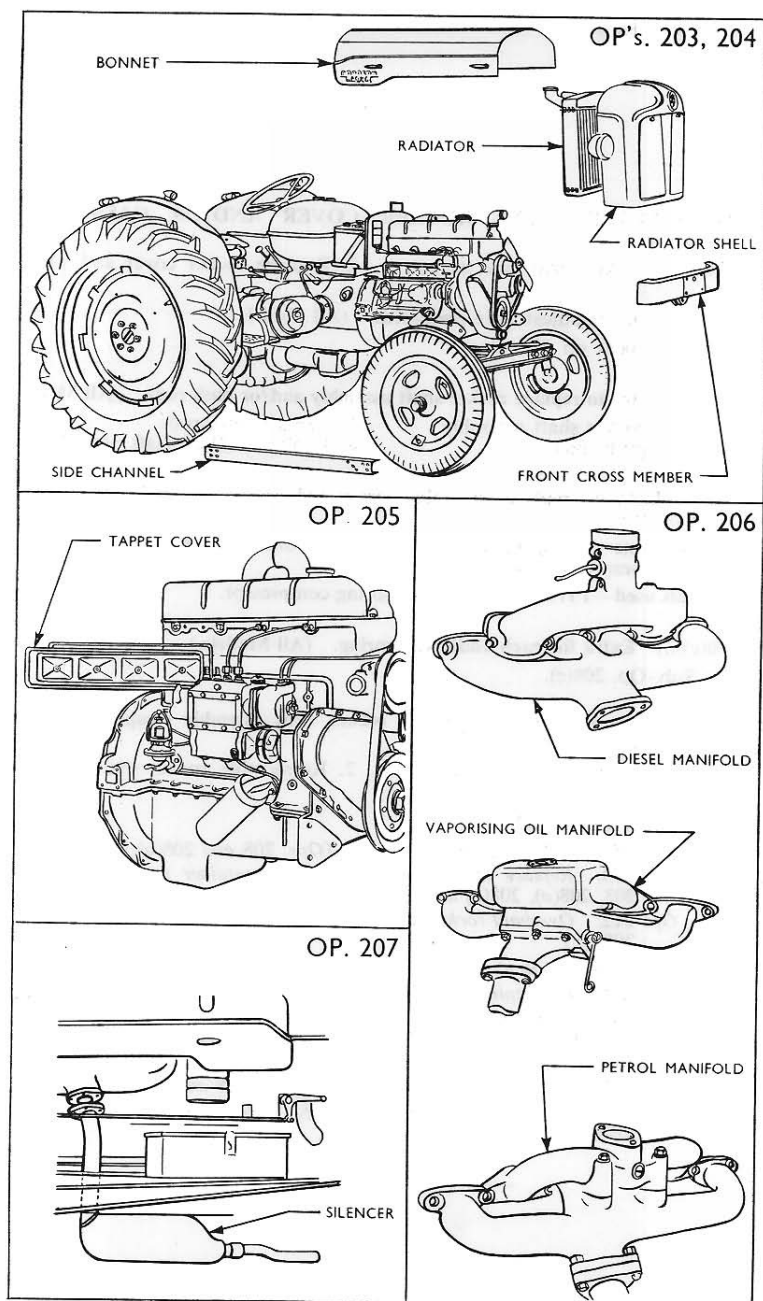
1. Remove manifold-silencer bolts.
2. Remove silencer to side member bolt.
3. Slacken clamp and remove silencer assembly.
4. Replace silencer and fit bolts.

Vertical

1. Lift out vertical exhaust.
2. Re-locate silencer.

ASSOCIATED OPERATIONS

Export Op. 5230-A. Replace silencer assembly. (Op. 207.)



ENGINE—continued

Op. 208 REPLACE VALVE ROCKER COVER AND/OR GASKET. (All Models.)

1. Remove rocker cover and gasket.
2. Replace rocker cover and gasket.

Op. 208(a) Extra to adjust valve clearances. (All Models.)

1. Set clearances on all valves.

Op. 208(b) Extra to replace rocker shaft assembly and/or push rods. (All Models.)

1. Remove rocker shaft assembly.
2. Remove push rods.
3. Replace push rods.
4. Replace rocker shaft assembly.

Op. 208(c) Extra to replace one valve spring and/or retainer and cotters. (All Models.)

1. Remove one valve spring and cotters using compressor tool.
2. Fit one valve spring and cotters.

Tools used—TTr/D 6513. Valve spring compressor.

Op. 208(c)(i.) Extra for each additional spring. (All Models.)

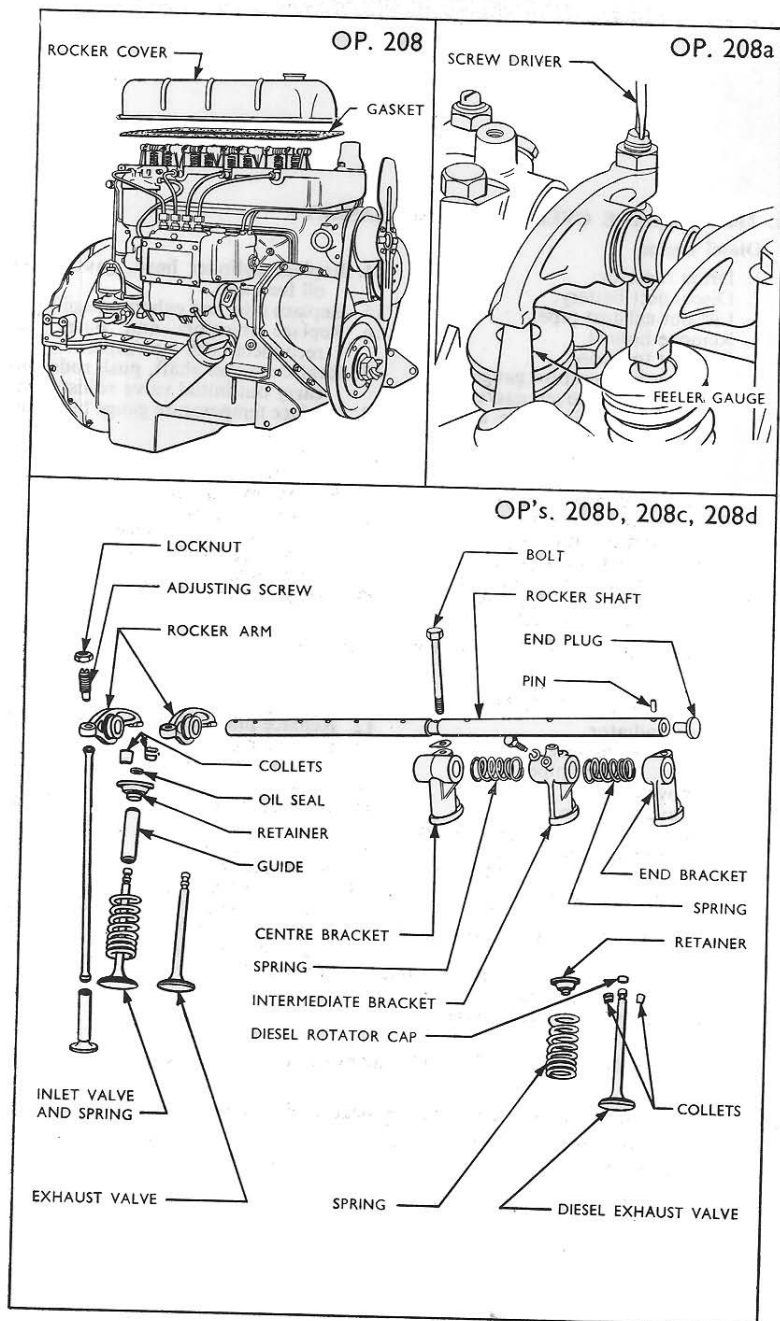
1. As Sub.-Op. 208(c).

Op. 208(d) Extra to replace any or all rocker shaft assembly components. (All Models.)

1. Dismantle rocker shaft assembly.
2. Reassemble rocker shaft assembly.

ASSOCIATED OPERATIONS

- | | |
|-----------------|--|
| Domestic | <i>Op. 209. Adjust valve clearances. (Ops. 208 and 208(a).)</i>
<i>Op. 210. Replace one valve spring and/or retainer and collets. (Ops. 208, 208(a), 208(b) and 208(d).)</i>
<i>Op. 212. Overhaul rocker shaft assembly. (Ops. 208, 208(a), 208(b) and 208(d).)</i> |
| Export | <i>Op. 6449-A. Replace valve rocker cover or gasket. (Op. 208.)</i>
<i>Op. 6459-A. Replace rocker shaft assembly and/or push rods. (Ops. 208, 208(a) and 208(b).)</i>
<i>Op. 6459-B. Overhaul rocker shaft assembly. (Ops. 208, 208(a), 208(b) and 208(d).)</i>
<i>Op. 6505-A. Adjust valve clearances. (Ops. 208 and 208(a).)</i>
<i>Op. 6513-B. Replace one valve spring. (Ops. 208, 208(a), 208(b) and 208(c).)</i> |



ENGINE—continued

Op. 214 REPLACE CYLINDER HEAD GASKET

Diesel engine

1. Drain radiator.
2. Disconnect battery.
3. Lift out exhaust pipe.
4. Remove bonnet.
5. Remove top hose.
6. Unscrew temperature gauge bulb.
7. Remove rocker cover, gasket, rocker shaft, ventilation pipe and push rods.
8. Remove injectors and pipes and disconnect back leak pipe.
9. Remove fuel filter and pipes.
10. Remove air cleaner hose.
11. Disconnect throttle rod.
12. Disconnect suction pipes and remove inlet and exhaust manifold.
13. Remove cylinder head, gasket and rocker shaft oil feed seal.
14. Replace cylinder head, gasket and oil feed seal.
15. Replace inlet and exhaust manifolds.
16. Replace injectors and pipes and reconnect back leak pipe.
17. Replace rocker shaft, push rods and carry out initial valve adjustment.
18. Replace temperature gauge bulb and top hose.
19. Refill radiator.
20. Reconnect battery.
21. Replace exhaust pipe.
22. Bleed fuel system. Run engine and check valve clearances. Replace rocker cover, gasket and ventilation pipe.
23. Replace bonnet.

Tools used—TTr/MD 6050. Cylinder head locating studs.

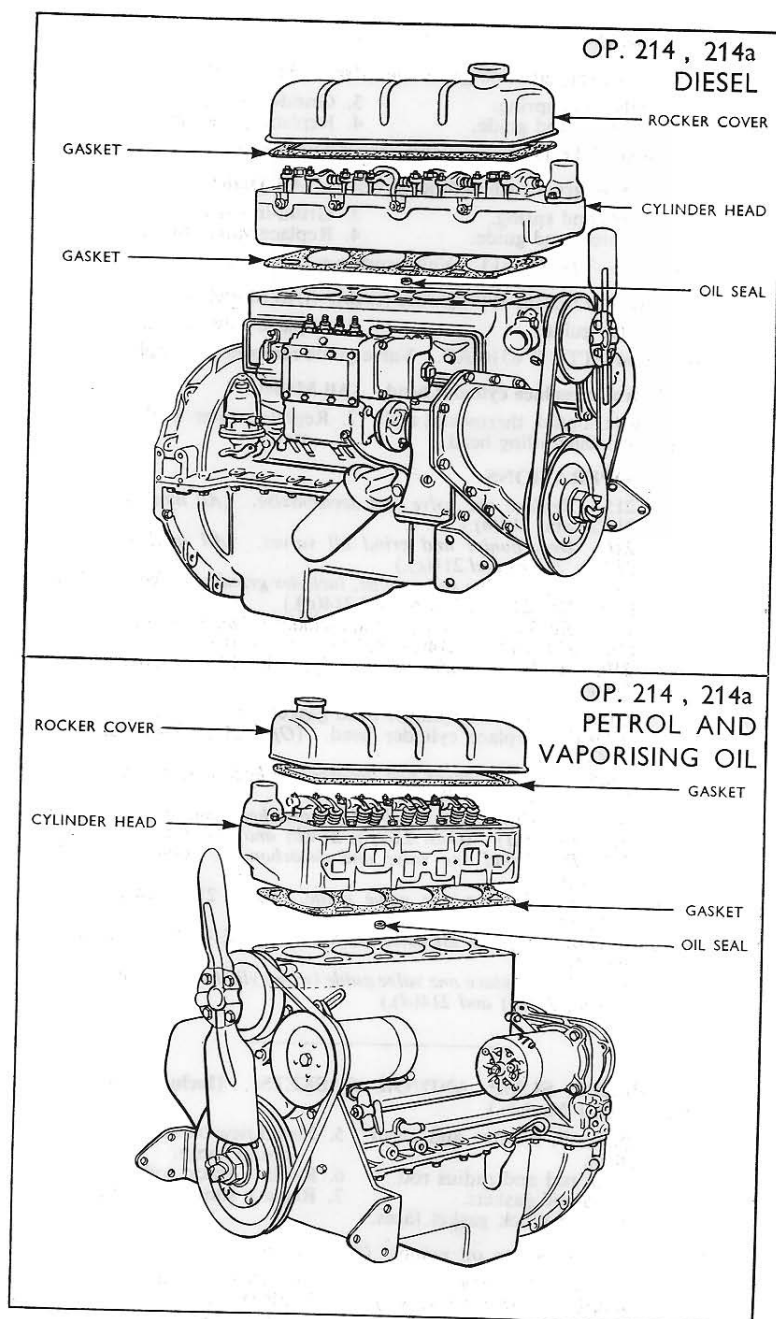
Petrol and Vap. Oil engine

1. Drain radiator.
2. Disconnect battery.
3. Lift out exhaust pipe.
4. Remove bonnet.
5. Remove top hose.
6. Remove temperature gauge bulb.
7. Remove sparking plugs.
8. Remove rocker cover, gasket, rocker shaft, ventilation pipe and push rods.
9. Disconnect inlet and exhaust manifold.
10. Remove cylinder head, gasket and rocker shaft oil seal.
11. Replace cylinder head, gasket and oil fuel seal.
12. Replace inlet and exhaust manifold.
13. Replace rocker shaft, push rods and carry out initial valve adjustment.
14. Replace sparking plugs.
15. Replace temperature gauge bulb and top hose.
16. Refill radiator.
17. Reconnect battery.
18. Replace exhaust pipe.
19. Run engine and check valve clearances. Replace rocker cover gasket and ventilation pipe.
20. Replace bonnet.

Tools used—TTr/MD 6050. Cylinder head locating studs.

Op. 214(a) Extra to decarbonise cylinder head and pistons. (All Models.)

1. Remove carbon from pistons and block face.
2. Remove carbon from cylinder head and valves.



ENGINE—continued

Op. 214(b) Extra to replace and grind one valve. (All Models.)

1. Remove valve and spring.
2. Clean valve stem and guide.
3. Grind-in valve.
4. Replace valve spring.

Tools used—TTr/D 6513. Valve spring compressor.

Op. 214(c) Extra to grind each additional valve. (All Models.)

1. Remove valve and spring.
2. Clean valve stem and guide.
3. Grind-in valve.
4. Replace valve spring.

Tools used—TTr/D 6513. Valve spring compressor.

Op. 214(d) Extra to replace valve guides (each). (All Models.)

1. Remove valve guide.
2. Replace valve guide.

Tools used—TTr/D 6510-AB. Valve guide remover and replacer.

Op. 214(e) Extra to replace cylinder head. (All Models.)

1. Remove water outlet, thermostat and complete dismantling head.
2. Replace water outlet and thermostat.

ASSOCIATED OPERATIONS

- Domestic**
- Op. 215. Replace one valve and decarbonise. (All models.) (Ops. 214, 214(a) and 214(b).)
- Op. 216. Decarbonise and grind all valves. (All models.) (Ops. 214, 214(a), 214(b) and 214(c).)
- Op. 217. Replace one valve guide, includes grinding valve. (All models.) (Ops. 214, 214(a), 214(b) and 214(d).)
- Op. 218. Replace all valve guides, includes grinding valves. (All models.) (Ops. 214, 214(a), 214(b), 214(c) and 214(d).)
- Op. 219. Replace cylinder head. (Ops. 214, 214(b), 214(c), 214(d) and 214(e).)

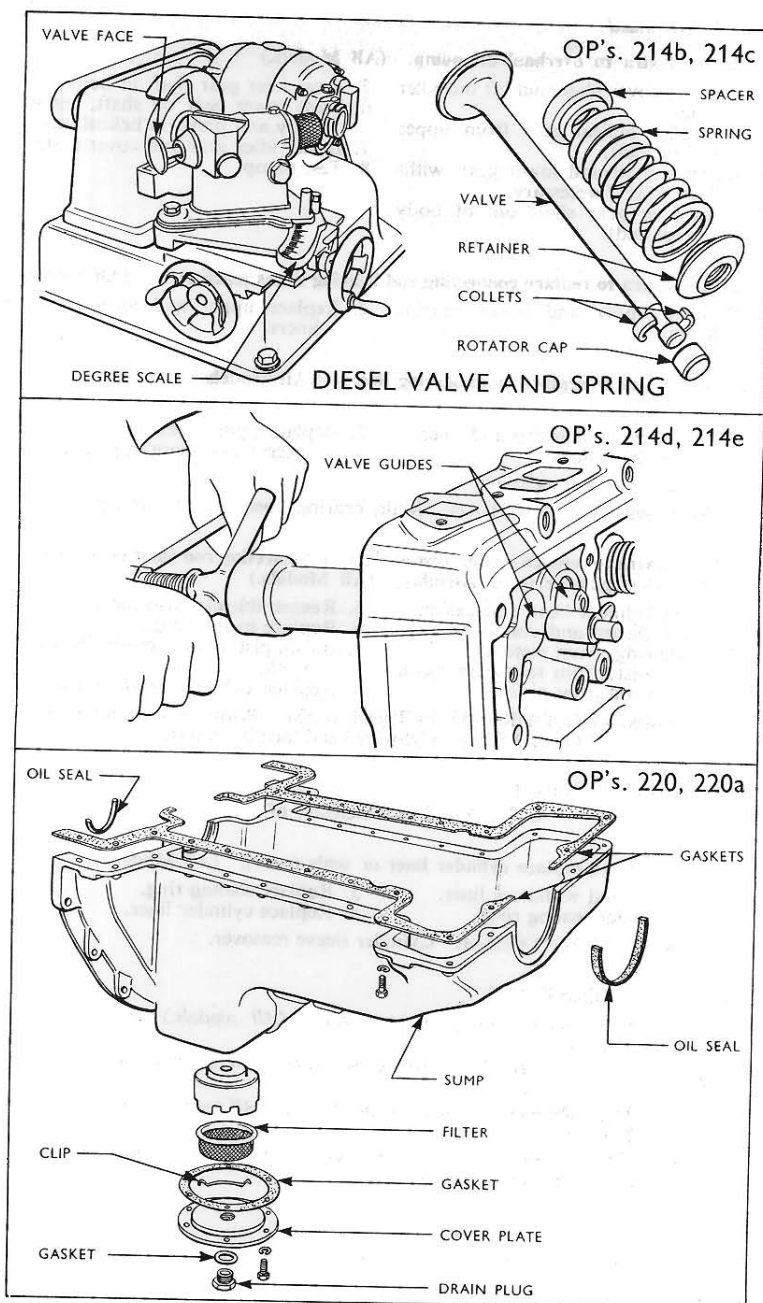
- Export**
- Op. 6050-A. Replace cylinder head gasket. (Op. 214.)
- Op. 6050-B. Replace cylinder head. (Ops. 214, 214(b), 214(c), 214(d) and 214(e).)
- Op. 6505-B. Grind valves and decarbonise head and pistons. (Ops. 214, 214(a), 214(b) and 214(c).)
- Op. 6505-C. Grind valves and decarbonise head and pistons (with cylinder head removed). (Ops. 214(a), 214(b) and 214(c).)
- Op. 6505-D. Grind one valve and decarbonise. (Ops. 214, 214(a) and 214(b).)
- Op. 6510-A. Replace one valve guide. (Ops. 214, 214(a), 214(b) and 214(d).)
- Op. 6510-B. Replace all valve guides. (Ops. 214, 214(a), 214(b), 214(c) and 214(d).)
- Op. 6510-C. Replace one valve guide (with cylinder head removed). (Ops. 214(a), 214(b) and 214(d).)

Op. 220 REPLACE SUMP AND/OR GASKETS. (Includes cleaning sump filter.) (All Models.)

1. Drain engine oil, remove and clean filter screen.
2. Remove track rod and radius rod.
3. Remove sump and gaskets.
4. Clean sump and block gasket faces.
5. Install new oil seals and gaskets and mount sump.
6. Replace track rod and radius rod.
7. Replace sump filter and refill sump.

Op. 220(a) Extra to replace oil pump. (All Models.)

1. Remove oil pump and pipe.
2. Remove distributor (petrol and vap. oil).
3. Replace oil pump and pipe.
4. Replace distributor and retime (petrol and vap. oil).



ENGINE—continued

Op. 220(b) Extra to overhaul oil pump. (All Models.)

1. Remove cover plate and lift out idler gear.
2. Withdraw helical gear from upper end of shaft.
3. Remove shaft and lower gear without draw gear if necessary.
4. Press idler gear shaft out of body (if required).
5. Press idler gear shaft in body.
6. Press lower gear on shaft, enter in body and press on helical gear.
7. Install idler gear and cover plate.
8. Test pump.

Op. 220(c) Extra to replace connecting rod bearing liners (each rod). (All Models.)

1. Remove upper and lower bearing liners.
2. Replace upper and lower bearing liners.

Op. 220(d) Extra to replace main bearing liners. (All Models.)

Front

1. Remove front main cap and liner.
2. Remove upper liner.
3. Replace upper liner.
4. Replace front main cap and liner.

Remainder. Repeat as above.

Tools used—TTr/D 6331-AB. Main bearing liner remover and replacer.

Op. 220(e) Extra to replace piston, piston rings or connecting rod (first one), includes removing cylinder head assembly. (All Models.)

1. Remove cylinder head and gasket.
2. Remove piston and connecting rod.
3. Remove rings from piston.
4. Remove piston pin to separate connecting rod from piston.
5. Reassemble piston to connecting rod.
6. Replace piston rings.
7. Install piston and connecting rod in block.
8. Replace cylinder head and gasket.

Tools used—TTr/DDK 6153 (or Tr/DP 6153). Piston ring compressor.
TTr/MD 6050. Cylinder head locating studs.

Op. 220(e)i. Each additional

As SubOps. 2 to 7 inclusive of 220(e).

Op. 220(f) Extra to replace cylinder liner or seals (each). (All Models.)

1. Install tool and withdraw liner.
2. Remove water sealing ring.
3. Replace sealing ring.
4. Replace cylinder liner.

Tools used—TTr/D 6055-A. Cylinder sleeve remover.

ASSOCIATED OPERATIONS

Domestic Op. 221. Replace oil pump assembly. (All models.) (Ops. 220 and 220(a).)

Op. 222. Replace all connecting rod bearing liners. (All models.) (Ops. 220 and 220(c).)

Op. 223. Replace all main bearing liners. (All models.) (Ops. 220 and 220(d).)

Op. 224. Replace one piston or connecting rod. (All models.) (Ops. 220, 220(e) and 214(a).)