AUXILIARY DRIVES AND

TRANSMISSION OF OUTPUT DRIVE

The drives for the engine auxiliary components are taken from the phasing gearing and the crankshafts. Gear trains in the phasing gear case drive the pressure oil and scavenge oil pumps, the engine governor and, when fitted, the auxiliary generator and hydraulic control unit clutch pump. The crankshafts provide drives for the camshafts and torsionally flexible drive shafts.

Phasing gear casing drives

The pressure oil and scavenge oil pumps are mounted at the bottom of the phasing gear casing free end case, the pressure pump being sited on 'A' side and the scavenge pump on 'C' side of the engine. 'CA' phasing gear provides the drive for these two pumps through idler gears, and driven gears attached to the pump.

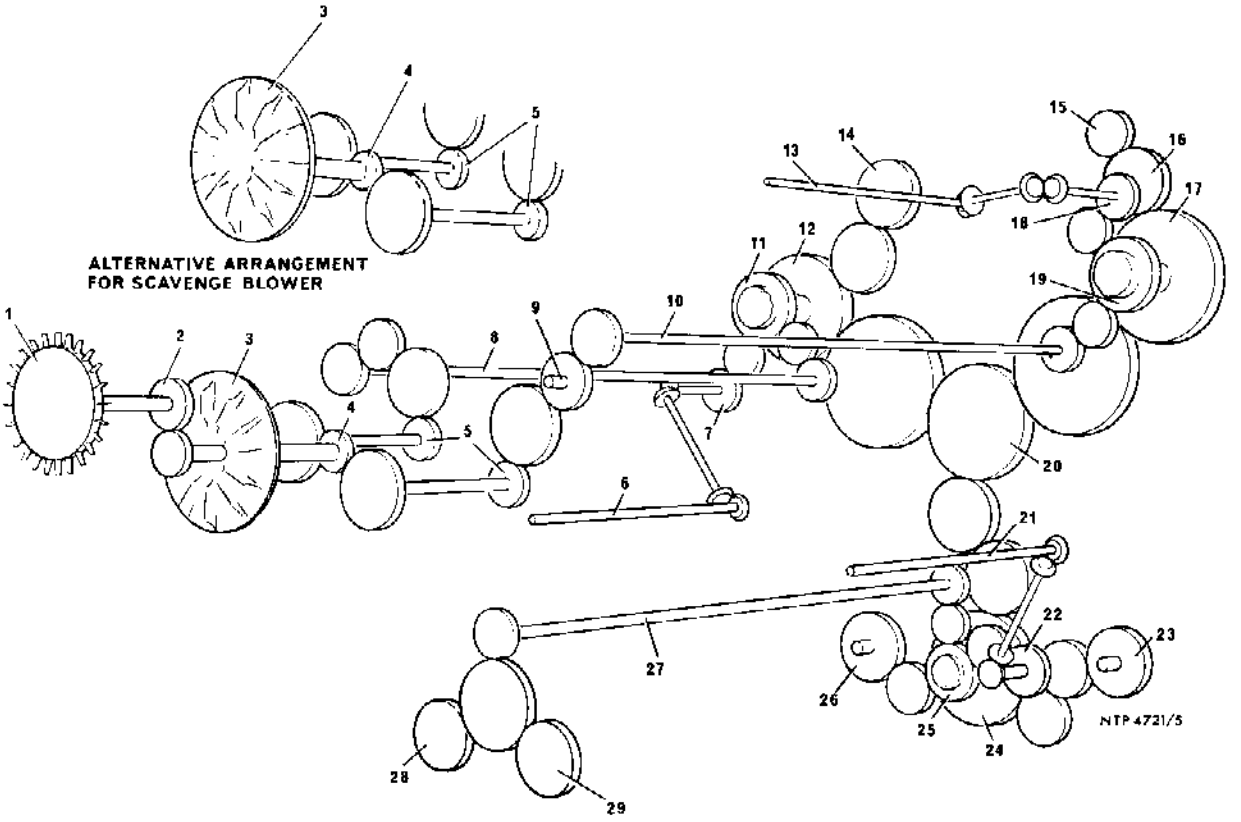
A Napier Bryce governor is used on the Type T18-37K engine, and is directly flange mounted on to the free end face of the phasing gear case at the top on 'A' side. It is driven from 'AB' phasing gear, through an idler gear, driven gear and quill-shaft.

It can be seen from the accompanying illustrations that the 'AB' phasing gear also provides drives for other auxiliary components via the gear train on that side of the phasing gear case and, that 'BC' phasing gear performs a similar service on the other side. These auxiliaries all receive their respective drives in the same manner, quill-shafts being employed to pass the drive from the respective driven gears. The exception to the above statement is in the case of some industrial and rail traction applications when an auxiliary generator is driven from the phasing gear case. On these engines the drive is passed from 'AB' phasing gear, through the gear train driven from that gear to the final gear in the train. The hub of this gear is provided with Barber Colman splines to which a drive flange is secured, the drive is then passed through Hardy Spicer couplings to the auxiliary generator.

Crankcase drives.

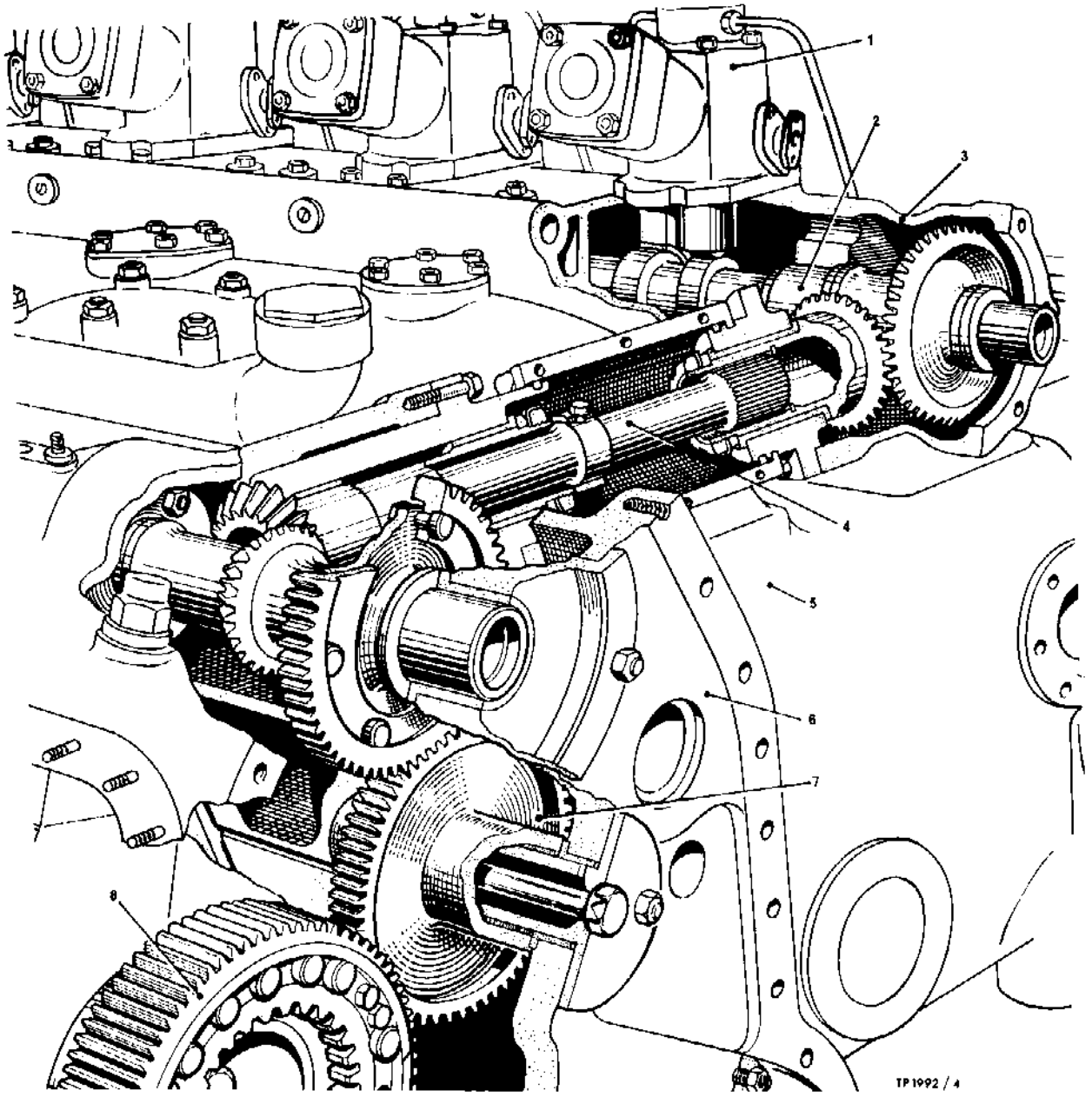
The drive for the turbo - blower gear train is taken through torsionally flexible shafts, running the length of 'AB' and 'BC' crankcases, which are driven through idler gears from the respective crankshaft gears. Similarly, the drive to the auxiliary gear box mounted at the free end of the bottom crankcase is taken through the flexible drive shaft in that crankcase from an idler gear in mesh with 'CA' crankshaft gear.

The camshafts are driven through a train of spur and bevel gears and short quill-shafts by the crankshaft gears. 'AB' crankshaft gear drives 'A' camshaft, 'BC' crankshaft gear - 'B' camshaft and 'CA' crankshaft gear - 'C' camshaft. The quill-shafts have vernier splines at each end, and this provides the means for timing the camshafts. The quill-shafts are locked in the driving position by a collar and locking bolt which, when removed,



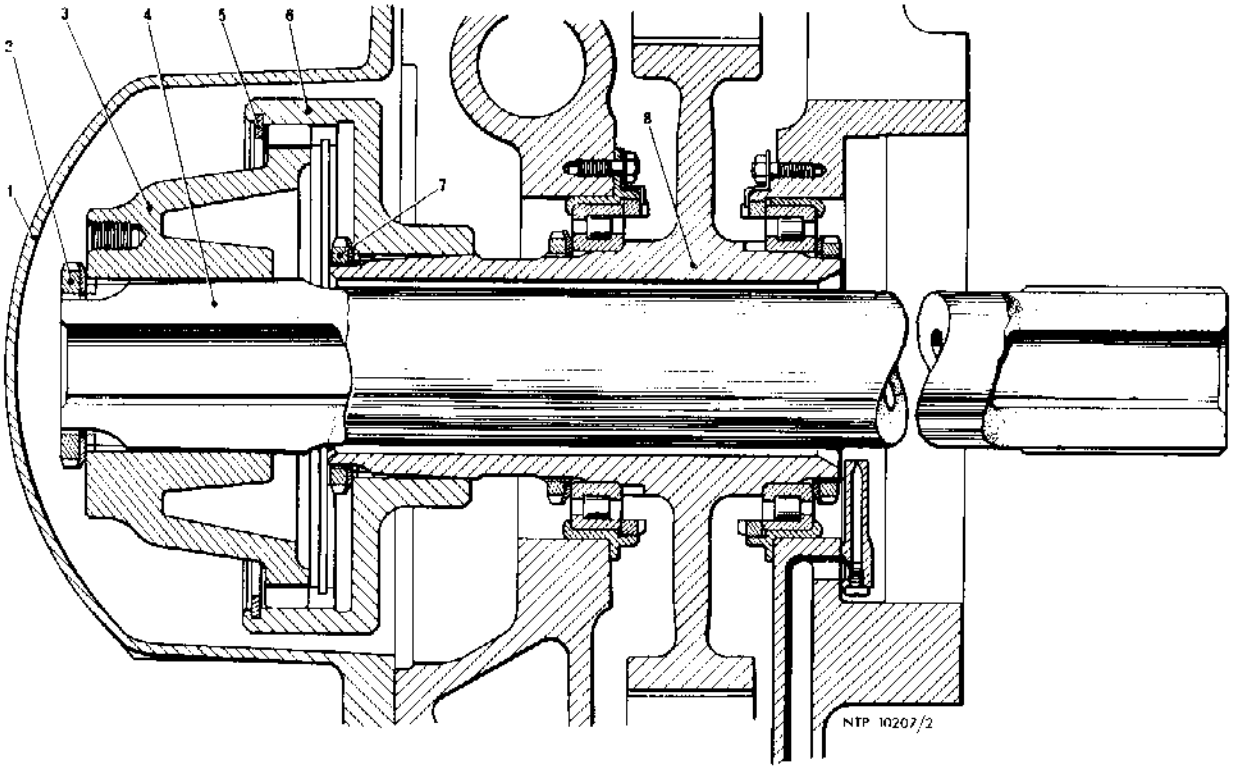
1. Turbine wheel (turbo blower)
2. Turbine drive gear (turbo blower)
3. Blower impeller
4. Impeller drive gear
5. Layshaft gears
6. 'A' camshaft
7. 'A' camshaft drive gear
8. 'AB' flexible drive shaft
9. Metering pump drive
10. 'BC' flexible drive shaft
11. 'AB' crankshaft gear
12. 'AB' crankshaft phasing gear
13. 'B' camshaft
14. Governor drive gear
15. Hydraulic clutch pump drive gear
16. Idler gear
17. 'BC' crankshaft phasing gear
18. 'B' camshaft drive gear
19. 'BC' crankshaft gear
20. Output gear
21. 'C' camshaft
22. 'C' camshaft drive gear
23. Scavenge-oil pump drive gear
24. 'CA' crankshaft phasing gear
25. 'CA' crankshaft gear
26. Pressure-oil pump drive gear
27. 'CA' flexible drive shaft
28. Coolant circulating pump drive gear
29. Raw or sea-water pump drive gear

ENGINE GEAR TRAINS



1. 'B' bank fuel injection pumps
2. 'B' camshaft
3. 'B' camshaft casing
4. 'B' camshaft drive quill shaft
5. 'B' cylinder block
6. 'BC' crankcase
7. Camshaft drive idler gear
8. 'BC' crankshaft gear

CAMSHAFT DRIVE



1. Output shaft free-end cover
2. Ring nut
3. Free-end inner coupling
4. Output shaft
5. Circlip
6. Free end outer coupling gear
7. Ring nut
8. Output gear hub

OUTPUT ARRANGEMENT

enables the quill-shaft to be disengaged from the camshaft drive bevel gear by moving the quill-shaft towards the crankcase. When fully disengaged from the camshaft drive bevel gear, the quill-shaft is also out of mesh with the other bevel gear in the train of gears.

A hand turning gear can be mounted on the damper cover of 'BC' crankshaft and engages with a claw secured to the flange of the crankshaft damper. A centrifugal breather outlet is mounted on 'AB' damper cover and is usually piped to the vicinity of the 'engine' air intake.

Transmission of Output Drives

As previously mentioned various major assemblies can be mounted to the phasing gear case dependent upon the application of the engine.

Bi-directional Gearbox

In marine installations when a bi-directional gearbox is secured to the phasing gear case, the output gear transmits the drive through the gear hub and a gear type coupling to a quill-shaft which is splined to engage with the splines of the clutch drive shaft of the gearbox.