SECTION CE

TORQUE LOADINGS

THE USE OF ANTI-SEIZE PAST ON TORQUE LOADED ITEMS

Certain of the fastenings listed hereunder must have a suitable anti-seize paste (ie. Poly Butyl Cuprysil (PBC) or Never-seez) applied to threads and/or pressure faces.

Application points are indicated as follows:-

(T) following the fastener description =

Apply to threads

Apply beneath bolt heads

Apply to nut pressure faces

Apply to bolt lands

Apply to washer contact faces

(U) following the fastener description = (N) following the fastener description = (L) following the fastener description = (W) following the fastener description =

Symbols may be shown singly or in combination as appropriate. Where no symbol appears the use of anti-seize paste is either undesirable or unnecessary.

lbf.ft

Nm

CRANKCASE

|  |  |  |
| --- | --- | --- |
| Nuts, main bearing caps (T) (N) | 800 | 1085 |
| Lateral capscrews, main bearing caps (T) | 130 | 176.3 |
| Bolts, tie bar to bearing caps (T) (U) | 124 | 168 |
| Bolts, sump to crankcase (T) | 51 | 69 |
| CRANKSHAFT | | |
| Capscrews, balance weights to crankshaft | 205 | 278 |
| Nuts, drive gear to crankshaft | 48 | 65 |
| Bolts, viscous damper to crankshaft (T) (U) | 205 | 278 |
| Setbolts, free-end stub shaft to crankshaft | 124 | 168 |
| Bolts, flywheel/driving disc to crankshaft (T) (U) | 240 | 325.4 |
| LUBRICATING OIL PUMP | | |
| Bolts, idler spindle to pump housing | 30 | 40.7 |
| Setscrews, locking fixed spindle | 6 | 8.1 |
| Setscrews, pump housing to crankcase | 51 | 69 |
| Nuts, pump housing to crankcase | 51 | 69 |
| Nut M27, driving rotor to spindle | 180 | 244 |

|  |  |  |
| --- | --- | --- |
|  | lbf.ft | Nm |
| ENGINE CAMSHAFT AND WATER PUMP DRIVE | | |
| Bolts, drive gear to camshaft | 60 | 81.4 |
| Waisted bolts, drive-end bearing housing to crankcase | 60 | 81.4 |
| Plain bolts, drive-end bearing housing to crankcase | 30 | 40.7 |
| Setbolts, intermediate bearing housing to crankcase | 30 | 40.7 |
| Setscrew, free-end bearing housing to crankcase | 6 | 8.1 |
| Bolts, tappet housings to crankcase | 30 | 40.7 |
| Lateral bolts, camtrough stiffeners | 124 | 168 |
| Waisted bolt, camshaft locating | 75 | 101.7 |
| Setbolts, water pump drive intermediate bearing housing to tappet housing (16 cylinder engine only) | 30 | 40.7 |
| Capscrew, tappet keys to housings | 9 | 12.2 |

AUXILIARY DRIVE

|  |  |  |
| --- | --- | --- |
| Setscrews, idler gear spindles to crankcase | 15 | 20.3 |
| Setscrews, governor drive housing to stub-shaft | 15 | 20.3 |
| Setscrews, governor drive stub shaft to crankcase | 15 | 20.3 |
| Nuts, fuel-injection pump idler gears to hubs | 60 | 81.4 |
| Setscrews, bevel gears to fuel pump idler gear hubs | 6 | 8.1 |
| CONNECTING RODS | | |
| Bolts, large-end bearing block to forked rod (L) (U) (T) | 0.025 in stretch | (0.635 mm) |
| Setbolts, centre connecting rod, cap to rod (L) (U) (N) (T)  CYLINDER HEADS | 390 | 528.8 |
| Nuts, small, cylinder head to crankcase | | |
| (standard flange cylinder liner) (T)(N)(W)  Nuts, large, cylinder head to crankcase | 340 | 461 |
| (standard flange cylinder liner) (T)(N)(W)  Nuts, small, cylinder head to crankcase | 460 | 623.8 |
| (wide flange cylinder liner) (T)(N)(W)  Nuts, large, cylinder head to crankcase | 400 | 540 |
| (wide flange cylinder liner) (T)(N)(W) | 500 | 675 |
| Fuel injector housing to cylinder head | 100 | 135 |
| Bolts, rocker lever brackets to cylinder head | 30 | 40.7 |
| Bolts, valve gear bridge piece guides to cylinder head | 30 | 40.7 |
| Bolt, air manifold to cylinder head (7) | 40 | 54.2 |

|  |  |  |
| --- | --- | --- |
|  | Ibf.ft | Nm |
| FUEL INJECTION PUMP CAMBOX | | |
| Bolts, fuel-injection pump cambox to crankcase | 30 | 40.7 |
| Nuts, fuel-injection pump cambox to crankcase | 30 | 40.7 |
| \* Setscrew, gear hub to crankshaft | 120 | 165.7 |
| Nuts, fuel-injection pump camshaft gear to hub | 60 | 81.4 |
| Setscrews, free-end coupling to fuel- injection pump camshaft | 6 | 8.1 |
| Nuts, free-end cover to fuel-injection pump cambox | 15 | 20.3 |

NOTE The fuel injection pump camshaft gear hub is expanded hydraulically on to its shaft (see Section GG). The retaining setscrew must not be tightened to its recommended torque until AFTER the gear has been fitted correctly .

Ibf.ft Nm

FUEL INJECTORS

Nut, injector nozzle to nozzle holder 200 271.2

Bolt, injector clamp to cylinder head 130 176.3

FUEL INJECTION PUMPS

Nuts, delivery valve holder to injection pump body 75 101.7

Nuts, fuel-injection pump to cambox 95 128.8

GENERAL TORQUE LOADINGS

The following torque loadings are general for metric coarse threads and do not supersede the figures quoted above.

|  |  |  |
| --- | --- | --- |
| Thread Size (mm) | lbfft | Nm |
| 6 | 6 | 8.1 |
| 8 | 15 | 20.3 |
| 10 | 30 | 41 |
| 12 | 51 | 69 |
| 14 | 82 | 111.2 |
| 16 | 124 | 168.1 |
| 20 | 242 | 328.1 |
| 22 | 322 | 436.6 |
| 24 | 418 | 566.8 |