

YANMAR

SERVICE MANUAL

MARINE DIESEL ENGINE

MODELS

1GM (10L)

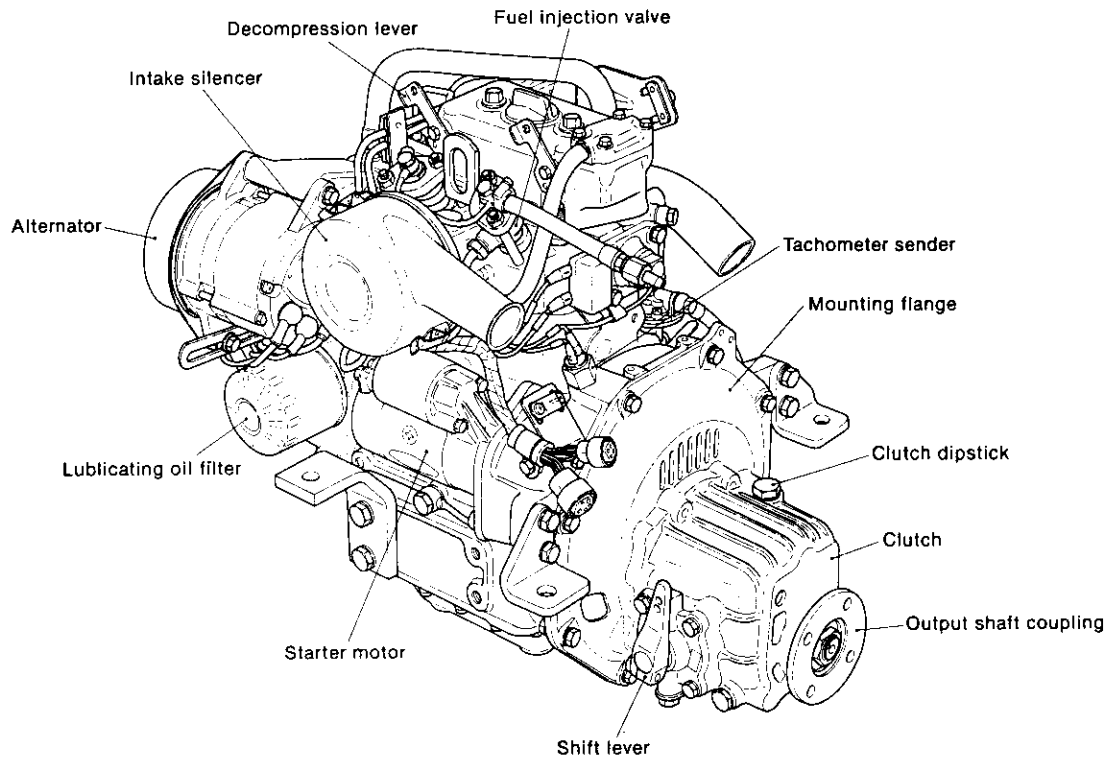
2GM (F)(L)

3GM (D)(F)(L)

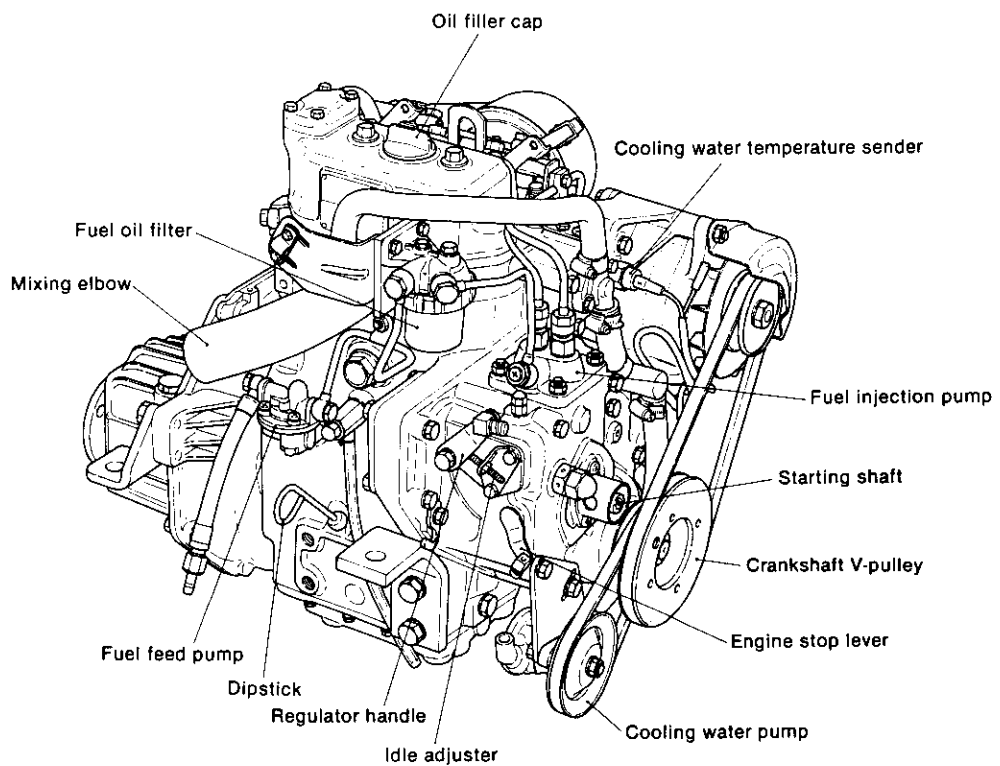
3HM (F)(L)

1-2 2GM

1-2.1 Intake side viewed from stem



1-2.2 Exhaust side viewed from bow



2. Specifications

| Model | | | 1GM | | | 2GM | | | 3GMD | | | 3GM | | | 3HM | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|-----------|---------|-----------|----------|-----------|--|-----------|--------------------------------|-----------|----------|-----------|---------|-----------|--|-----------|----|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|-----------|--|
| Type | | | Vertical 4-cycle water cooled diesel engine | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Combustion chamber | | | Swirl pre-combustion chamber | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Number of cylinders | | | 1 | | | 2 | | | 3 | | | 3 | | | 3 | | | | | | | | | | | | | | | | | |
| Bore × stroke | | | mm | | | 72 × 72 | | | | | | | | | 75 × 85 | | | | | | | | | | | | | | | | | |
| Displacement | | | l | | | 0.293 | | | 0.566 | | | 0.879 | | | 1.126 | | | | | | | | | | | | | | | | | |
| Continuous rating output (DIN6270A) | Output/Crankshaft speed | | HP/rpm | | 6.5/3400 | | | 13/3400 | | | 20/3400 | | | 27/3200 | | | | | | | | | | | | | | | | | | |
| | Brake mean effective pressure | | kg/cm ² | | 5.87 | | | 5.87 | | | 6.02 | | | 6.74 | | | | | | | | | | | | | | | | | | |
| | Piston speed | | m/sec. | | 8.16 | | | | | | | | | 9.07 | | | | | | | | | | | | | | | | | | |
| One hour rating output (DIN6270B) | Output/crankshaft speed | | HP/rpm | | 7.5/3600 | | | 15/3600 | | | 22.5/3600 | | | 30/3400 | | | | | | | | | | | | | | | | | | |
| | Brake mean effective pressure | | kg/cm ² | | 6.40 | | | | | | | | | 7.05 | | | | | | | | | | | | | | | | | | |
| | Piston speed | | m/sec. | | 8.64 | | | | | | | | | 9.63 | | | | | | | | | | | | | | | | | | |
| Compression ratio | | | | | | 23.0 | | | | | | | | | 22.7 | | | | | | | | | | | | | | | | | |
| Fuel injection timing (FID) | | | degree | | bTDC15±1 | | | bTDC15±1 | | | bTDC18±1 | | | bTDC18±1 | | bTDC±21 | | | | | | | | | | | | | | | | |
| Fuel injection pressure | | | kg/cm ² | | 170 | | | | | | | | | 160 | | | | | | | | | | | | | | | | | | |
| Main power take off | | | at Flywheel side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Front power take off | | | at Crankshaft V-pulley side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Direction of rotation | Crankshaft | | Counter-clockwise viewed from stern | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Propeller shaft (A head) | | Clockwise viewed from stern | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cooling system | | | Direct sea water cooling (rubber impeller water pump) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lubrication system | | | Complete enclosed forced lubrication | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Starting system | | | Electric and/or manual | | | | | | | | | | | Electric | | | | | | | | | | | | | | | | | | |
| Clutch | Model | | KM2A | | | | | | KM3A | | | KBW10D | | | KBW10E | | | | | | | | | | | | | | | | | |
| | Type | | Mechanical cone clutch with single stage for both ahead and astern | | | | | | | | | Wet multi-disc mechanical type | | | | | | | | | | | | | | | | | | | | |
| | Reduction ratio (Ahead/Astern) | | 2.21/3.06 | | 2.62/3.06 | | 3.22/3.06 | | 2.21/3.06 | | 2.62/3.06 | | 3.22/3.06 | | 2.36/3.16 | | 2.61/3.16 | | 3.20/3.16 | | 2.14/2.50 | | 2.63/2.50 | | 2.83/2.50 | | 2.14/2.50 | | 2.83/2.50 | | | |
| | Propeller speed DINA rating (Ahead/Astern) | | rpm | | 1540/1113 | | 1298/1113 | | 1055/1113 | | 1540/1113 | | 1298/1113 | | 1055/1113 | | 1441/1076 | | 1303/1076 | | 1062/1076 | | 1591/1360 | | 1292/1360 | | 1200/1360 | | 1498/1280 | | 1129/1280 | |
| | Lubricating oil capacity | | l | | 0.25 | | | | | | | | | 0.3 | | | 0.7 | | | | | | | | | | | | | | | |
| | Clutch weight | | kg | | 9.3 | | | | | | | | | 10.8 | | | 17 | | | 19 | | | | | | | | | | | | |
| Dimensions | Overall length | | mm | | 527 | | | 623 | | | 740 | | | 755 | | | 791 | | | | | | | | | | | | | | | |
| | Overall width | | mm | | 410 | | | 410 | | | 410 | | | 410 | | | 451 | | | | | | | | | | | | | | | |
| | Overall height | | mm | | 485 | | | 495 | | | 495 | | | 502 | | | 612 | | | | | | | | | | | | | | | |
| Lubricating oil capacity (rake angle 8°) | Total | | l | | 1.3 | | | 2.0 | | | 2.7 | | | 5.5 | | | | | | | | | | | | | | | | | | |
| | Effective | | l | | 0.6 | | | 1.3 | | | 1.6 | | | 3.0 | | | | | | | | | | | | | | | | | | |
| Engine weight with clutch (dry) | | | kg | | 70 | | | 100 | | | 130 | | | 130 | | | 158 | | | | | | | | | | | | | | | |