

|                         |  |
|-------------------------|--|
| Design                  | 1-cylinder 4-stroke engine, water-cooled                             |
| Displacement            | 654 cm <sup>3</sup> (39.91 cu in)                                    |
| Stroke                  | 80 mm (3.15 in)  |
| Bore                    | 102 mm (4.02 in)   |
| Compression ratio       | 11.8:1   |
| Control                 | OHC, 4 valves controlled via rocker arm, chain drive                 |
| Valve diameter, intake  | 40 mm (1.57 in)  |
| Valve diameter, exhaust | 34 mm (1.34 in)  |
| Valve play, cold        | 0.07... 0.13 mm (0.0028... 0.0051 in)                                |
| Crankshaft bearing      | 2 roller bearings  |
| Conrod bearing          | Needle bearing   |
| Piston pin bearing      | Bronze bush  |
| Pistons                 | Forged light alloy   |
| Piston rings            | 1 L-ring, 1 tapered compression piston ring, 1 oil scraper ring      |
| Engine lubrication      | Semi-dry sump lubrication with two rotor pumps                       |
| Primary transmission    | 36:79  |
| Clutch                  | <b>APTC™</b> Antihopping clutch in oil bath / hydraulically operated |
| Gearbox                 | 6-gears, claw-shifted  |
| Transmission ratio      |  |
| 1st gear                | 14:35  |
| 2nd gear                | 16:28  |
| 3rd gear                | 21:28  |
| 4th gear                | 21:23  |
| 5th gear                | 23:22  |
| 6th gear                | 23:20  |

|                          |   |
|--------------------------|---|
| Mixture preparation      | Electronic fuel injection   |
| Ignition                 | Contactless controlled fully electronic ignition with digital ignition adjustment |
| Generator                | 12 V, 224 W   |
| Spark plug               | NGK LKAR 8AI - 9  |
| Spark plug electrode gap | 0.9 mm (0.035 in)   |
| Cooling                  | Water cooling, permanent circulation of coolant by water pump                     |
| Starting aid             | Electric starter, automatic decompressor  |

## Capacity- engine oil

|            |                  |  |                                    |
|------------|------------------|--|------------------------------------|
| Engine oil | 1.70 l (1.8 qt.) | Engine oil (SAE 10W/60) (00062010035) (☛ p. 173) |                                    |
|            |                  | Alternative engine oil                           | Engine oil (SAE 10W/50) (☛ p. 173) |

## Capacity - coolant

|         |                   |   |  |
|---------|-------------------|---|--|
| Coolant | 1.20 l (1.27 qt.) | Coolant (☛ p. 172)                      |  |
|         |                   | Coolant (mixed ready to use) (☛ p. 172) |  |

# TECHNICAL DATA - ENGINE TIGHTENING TORQUES

|   |              |                             |                      |
|---|--------------|-----------------------------|----------------------|
| Oil hole plug                                     | self-tapping | 9 Nm (6.6 lbf ft)           | <b>Loctite® 243™</b> |
| Screw, membrane fixation                          | M3           | 2.5 Nm (1.84 lbf ft)        | <b>Loctite® 243™</b> |
| Hose clamp, intake flange                         | M4           | 1.5 Nm (1.11 lbf ft)        | –                    |
| Oil jet, conrod lubrication                       | M4           | 2 Nm (1.5 lbf ft)           | <b>Loctite® 243™</b> |
| Locking screw for bearing                         | M5           | 6 Nm (4.4 lbf ft)           | <b>Loctite® 243™</b> |
| Screw, breather cover on valve cover              | M5           | 3 Nm (2.2 lbf ft)           | <b>Loctite® 243™</b> |
| Screw, clutch spring                              | M5           | 6 Nm (4.4 lbf ft)           | –                    |
| Screw, cover plate for oil return line            | M5           | 6 Nm (4.4 lbf ft)           | –                    |
| Screw, gear sensor                                | M5           | 5 Nm (3.7 lbf ft)           | <b>Loctite® 243™</b> |
| Screw, oil filter cover                           | M5           | 6 Nm (4.4 lbf ft)           | –                    |
| Screw, oil pump cover                             | M5           | 6 Nm (4.4 lbf ft)           | <b>Loctite® 243™</b> |
| Plug, vacuum connection                           | M6           | 10 Nm (7.4 lbf ft)          | <b>Loctite® 243™</b> |
| Screw, Autodecompression                          | M6           | 3... 4 Nm (2.2... 3 lbf ft) | <b>Loctite® 243™</b> |
| Screw, axial lock of camshaft                     | M6           | 10 Nm (7.4 lbf ft)          | <b>Loctite® 243™</b> |
| Screw, clutch cover                               | M6           | 10 Nm (7.4 lbf ft)          | –                    |
| Screw, clutch slave cylinder                      | M6x20        | 10 Nm (7.4 lbf ft)          | <b>Loctite® 243™</b> |
| Screw, clutch slave cylinder                      | M6x35        | 10 Nm (7.4 lbf ft)          | –                    |
| Screw, cylinder                                   | M6           | 10 Nm (7.4 lbf ft)          | <b>Loctite® 243™</b> |
| Screw, cylinder head                              | M6           | 10 Nm (7.4 lbf ft)          | <b>Loctite® 243™</b> |
| Screw, engine housing                             | M6           | 10 Nm (7.4 lbf ft)          | –                    |
| Screw, generator cover                            | M6           | 10 Nm (7.4 lbf ft)          | –                    |
| Screw, generator cover (chain shaft through-hole) | M6           | 10 Nm (7.4 lbf ft)          | <b>Loctite® 243™</b> |
| Screw, ignition pulse generator                   | M6           | 10 Nm (7.4 lbf ft)          | <b>Loctite® 243™</b> |

# TECHNICAL DATA - ENGINE TIGHTENING TORQUES

|                                     |         |   |                            |
|-------------------------------------|---------|---|----------------------------|
| Screw, locking lever                | M6      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 243™</b>       |
| Screw, rocker arm shaft             | M6      | 12 Nm (8.9 lbf ft)  | –                          |
| Screw, shift drum locating          | M6      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 243™</b>       |
| Screw, shift lever                  | M6      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 222</b>        |
| Screw, starter motor                | M6      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 243™</b>       |
| Screw, stator bracket               | M6      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 243™</b>       |
| Screw, thermostat housing           | M6      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 243™</b>       |
| Screw, timing chain guide rail      | M6      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 243™</b>       |
| Screw, timing chain tensioning rail | M6      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 243™</b>       |
| Screw, valve cover                  | M6      | 10 Nm (7.4 lbf ft)  | –                          |
| Screw, water pump cover             | M6      | 10 Nm (7.4 lbf ft)  | –                          |
| Screw, water pump wheel             | M6      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 243™</b>       |
| Oil jet, piston cooling             | M6x0.75 | 4 Nm (3 lbf ft)   | <b>Loctite® 243™</b>       |
| Plug, crankshaft location           | M8      | 20 Nm (14.8 lbf ft)   | –                          |
| Stud, exhaust flange                | M8      | 10 Nm (7.4 lbf ft)  | <b>Loctite® 243™</b>       |
| Cylinder head screw                 | M10     | Tightening sequence:<br>Tighten diagonally, beginning with the rear screw on the chain shaft.<br>Step 1<br>15 Nm (11.1 lbf ft)<br>Step 2<br>30 Nm (22.1 lbf ft)<br>Step 3<br>45 Nm (33.2 lbf ft)<br>Step 4<br>60 Nm (44.3 lbf ft) | lubricated with engine oil |

# TECHNICAL DATA - ENGINE TIGHTENING TORQUES

|   |           |                      |                      |
|---|-----------|----------------------|----------------------|
| Oil hole plug                               | M10x1     | 15 Nm (11.1 lbf ft)  | <b>Loctite® 243™</b> |
| Plug, drain hole of water pump              | M10x1     | 15 Nm (11.1 lbf ft)  | –                    |
| Plug, oil bore for oil radiator             | M10x1     | 15 Nm (11.1 lbf ft)  | –                    |
| Screw, unlocking of timing chain tensioner  | M10x1     | 10 Nm (7.4 lbf ft)   | –                    |
| Spark plug                                  | M12x1.25  | 17 Nm (12.5 lbf ft)  | –                    |
| Coolant temperature sensor on cylinder head | M12x1.5   | 12 Nm (8.9 lbf ft)   | –                    |
| Oil drain plug with magnet                  | M12x1.5   | 20 Nm (14.8 lbf ft)  | –                    |
| Oil pressure regulator valve plug           | M12x1.5   | 20 Nm (14.8 lbf ft)  | –                    |
| Plug, oil bore                              | M14x1.5   | 15 Nm (11.1 lbf ft)  | <b>Loctite® 243™</b> |
| Engine case stud                            | M16x1.5   | 25 Nm (18.4 lbf ft)  | <b>Loctite® 243™</b> |
| Rotor nut                                   | M18x1.5   | 100 Nm (73.8 lbf ft) | –                    |
| Nut, engine sprocket                        | M20x1.5   | 60 Nm (44.3 lbf ft)  | <b>Loctite® 243™</b> |
| Nut, inner clutch hub                       | M20x1.5   | 100 Nm (73.8 lbf ft) | <b>Loctite® 243™</b> |
| Nut, primary gear                           | M20LHx1.5 | 90 Nm (66.4 lbf ft)  | <b>Loctite® 243™</b> |
| Plug, oil screen                            | M20x1.5   | 15 Nm (11.1 lbf ft)  | –                    |
| Plug, timing chain tensioner                | M20x1.5   | 25 Nm (18.4 lbf ft)  | –                    |
| Plug, oil thermostat                        | M24x1.5   | 15 Nm (11.1 lbf ft)  | –                    |
| Screw in generator cover                    | M24x1.5   | 8 Nm (5.9 lbf ft)    | –                    |