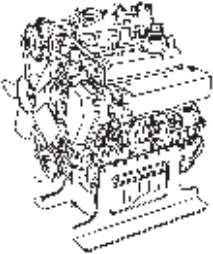
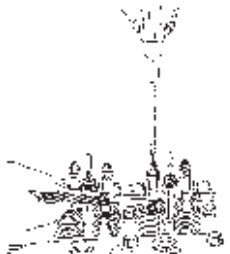
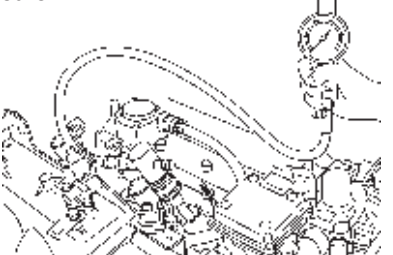

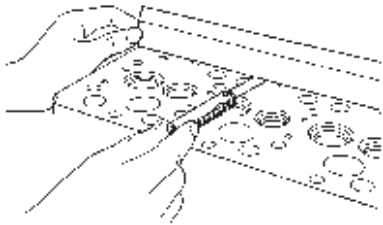
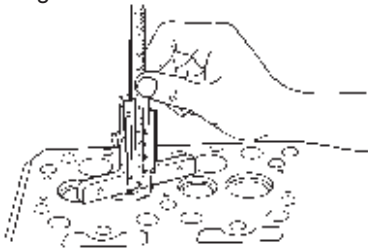

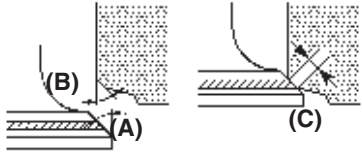
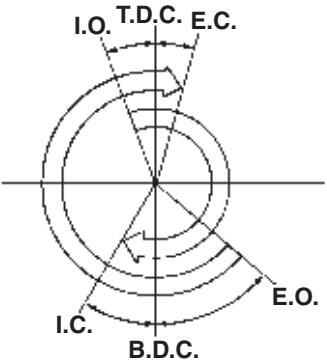
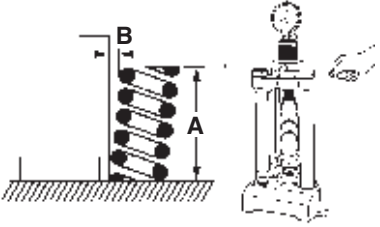
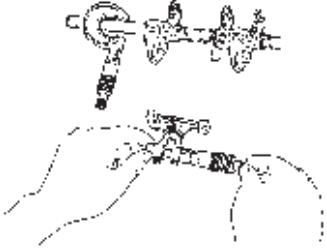
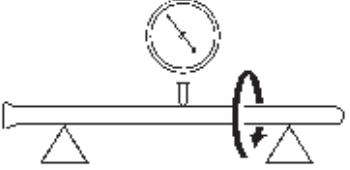
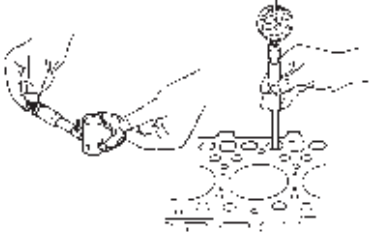


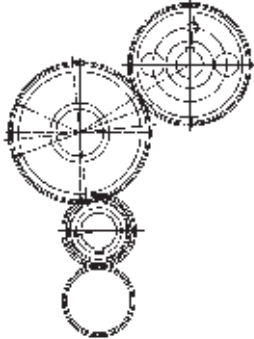
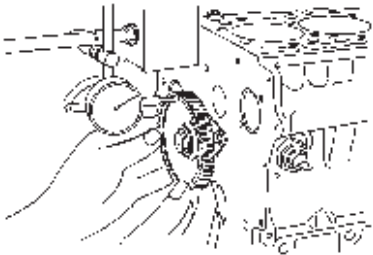

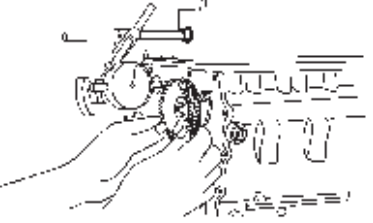
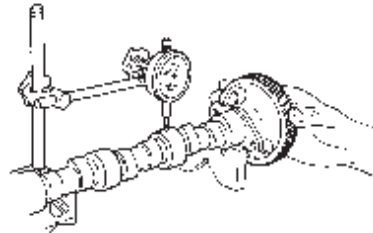
SERVICING SPECIFICATIONS

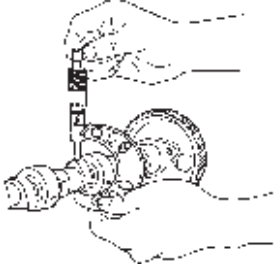

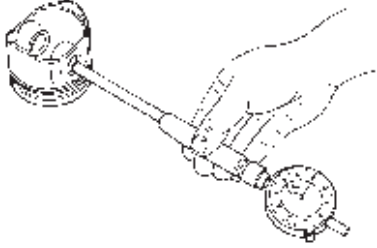
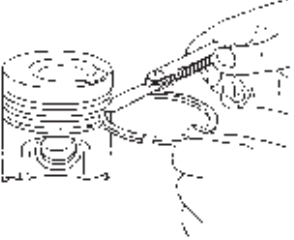

(1) ENGINE BODY


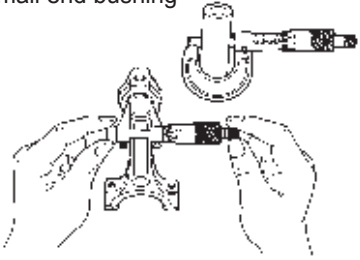
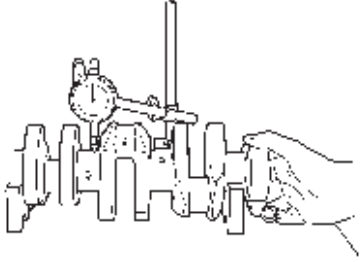

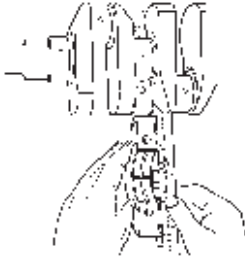
Item	Factory Specification	Allowable Limit
Lubricating oil capacity 	9.5 L 2.5 U.S.gals	—
Valve clearance (When cold) 	0.18 to 0.22 mm 0.0071 to 0.0086 in.	—
Compression pressure 	1.45 MPa 14.8 kgf/cm ² 210 psi	1.16 MPa 11.8 kgf/cm ² 168 psi
Top clearance 	1.39 to 1.69 mm 0.0548 to 0.0665 in.	—


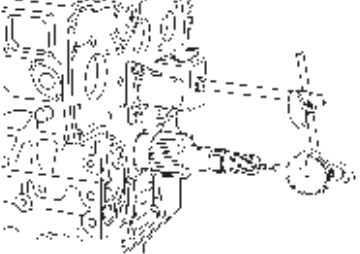
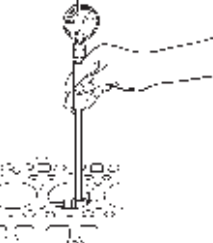
Item		Factory Specification	Allowable Limit
Cylinder head surface 	Flatness	—	0.05 mm / 500 mm 0.002 in. / 19.7 in.
Valve recessing 	Protrusion to Recessing	0.05 mm (Protrusion) to 0.15 mm (Recessing) 0.002 in. (Protrusion) to 0.0059 in. (Recessing)	0.40 mm (Recessing) 0.016 in. (Recessing)
Valve stem to valve guide 	Clearance	0.040 to 0.070 mm 0.0016 to 0.0027 in.	0.10 mm 0.0039 in.
	Valve stem O.D.	7.960 to 7.975 mm 0.3134 to 0.3139 in.	—
	Valve guide I.D.	8.015 to 8.030 mm 0.3156 to 0.3161 in.	—
Valve & valve seat 	Face angle (A) (Intake / Exhaust)	1.0 rad 60°	—
	Seat angle (B) (Intake / Exhaust)	1.0 rad 60°	—
	Seat width (C) (Intake)	2.12 mm 0.0835 in.	—
	Seat width (C) (Exhaust)	2.12 mm 0.0835 in.	—

Item	Factory Specification	Allowable Limit	
Valve timing 	Open (Intake valve)	0.21 rad before T.D.C. 12° before T.D.C.	—
	Close (Intake valve)	0.63 rad after B.D.C. 36° after B.D.C.	—
	Open (Exhaust valve)	0.70 rad before B.D.C. 40° before B.D.C.	—
	Close (Exhaust valve)	0.21 rad after T.D.C. 12° after T.D.C.	—
Valve spring 	Free length (A)	41.7 to 42.2 mm 1.65 to 1.66 in.	41.2 mm 1.62 in.
	Tilt (B)	—	1.0 mm 0.039 in.
	Setting load / Setting length	118 N / 35.0 mm 12.0 kgf / 35.0 mm 26.5 lbf / 1.38 in.	100 N / 35.0 mm 10.2 kgf / 35.0 mm 22.5 lbf / 1.38 in.
Rocker arm shaft to rocker arm 	Clearance	0.016 to 0.045 mm 0.00063 to 0.0017 in.	0.10 mm 0.0039 in.
	Rocker arm shaft O.D.	13.973 to 13.984 mm 0.55012 to 0.55055 in.	—
	Rocker arm I.D.	14.000 to 14.018 mm 0.55119 to 0.55188 in.	—
Push rod 	Alignment	—	0.25 mm 0.0098 in.
Tappet to tappet guide 	Clearance	0.020 to 0.062 mm 0.00079 to 0.0024 in.	0.07 mm 0.003 in.
	Tappet O.D.	23.959 to 23.980 mm 0.94327 to 0.94409 in.	—
	Tappet guide I.D.	24.000 to 24.021 mm 0.94489 to 0.94570 in.	—


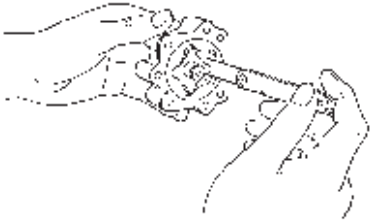
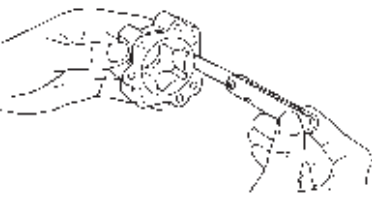
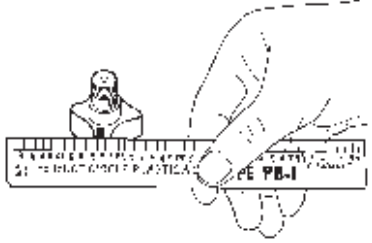
Item		Factory Specification	Allowable Limit
Timing gear 	Backlash (Crank gear to idle gear)	0.04150 to 0.1122 mm 0.001634 to 0.004417 in.	0.15 mm 0.0059 in.
	Backlash (Idle gear to cam gear)	0.04150 to 0.1154 mm 0.001634 to 0.004543 in.	0.15 mm 0.0059 in.
	Backlash (Crank gear to oil pump gear)	0.04150 to 0.1090 mm 0.001634 to 0.004291 in.	0.15 mm 0.0059 in.
Idle gear 	Side clearance	0.15 to 0.25 mm 0.0059 to 0.0098 in.	0.9 mm 0.04 in.
Idle gear shaft to idle gear bushing 	Clearance	0.025 to 0.066 mm 0.00099 to 0.0025 in.	0.10 mm 0.0039 in.
	Idle gear shaft O.D.	37.959 to 37.975 mm 1.4945 to 1.4950 in.	—
	Idle gear bushing I.D.	38.000 to 38.025 mm 1.4961 to 1.4970 in.	—
Camshaft 	Side clearance	0.070 to 0.22 mm 0.0028 to 0.0086 in.	0.30 mm 0.012 in.
Camshaft 	Alignment	—	0.01 mm 0.0004 in.

Item		Factory Specification	Allowable Limit
Cam 	Height (Intake)	33.90 mm 1.335 in.	33.85 mm 1.333 in.
	Height (Exhaust)	33.47 mm 1.318 in.	33.42 mm 1.316 in.
Camshaft journal to cylinder block bore 	Oil clearance	0.050 to 0.091 mm 0.0020 to 0.0035 in.	0.15 mm 0.0059 in.
	Camshaft journal O.D.	39.934 to 39.950 mm 1.5722 to 1.5728 in.	—
	Cylinder block bore I.D.	40.000 to 40.025 mm 1.5748 to 1.5757 in.	—
Piston pin bore 	Piston pin bore I.D.	25.000 to 25.013 mm 0.98426 to 0.98476 in.	25.05 mm 0.9862 in.
Piston ring groove to piston ring 	Clearance (Top ring)	0.040 to 0.080 mm 0.0016 to 0.0031 in.	0.20 mm 0.0079 in.
	Clearance (Second ring)	0.030 to 0.070 mm 0.0012 to 0.0027 in.	0.20 mm 0.0079 in.
	Clearance (Oil ring)	0.020 to 0.19 mm 0.00079 to 0.0074 in.	—
Piston ring 	Ring gap (Top ring)	0.30 to 0.45 mm 0.012 to 0.017 in.	1.25 mm 0.0492 in.
	Ring gap (Second ring)	0.30 to 0.45 mm 0.012 to 0.017 in.	1.25 mm 0.0492 in.
	Ring gap (Oil ring)	0.20 to 0.70 mm 0.0079 to 0.027 in.	1.25 mm 0.0492 in.

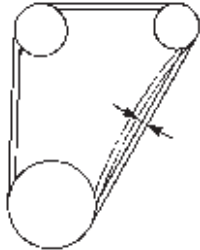
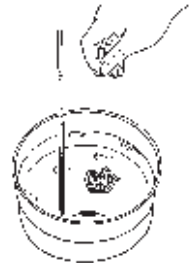

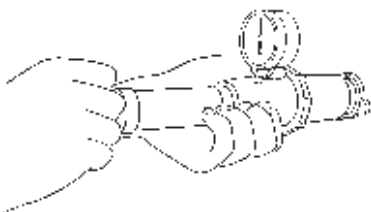
Item		Factory Specification	Allowable Limit
Connecting rod 	Alignment	—	0.05 mm 0.002 in.
Piston pin to small end bushing 	Clearance	0.014 to 0.036 mm 0.00056 to 0.0014 in.	0.15 mm 0.0059 in.
	Piston pin O.D.	25.004 to 25.011 mm 0.98441 to 0.98468 in.	—
	Small end bushing I.D.	25.025 to 25.040 mm 0.98524 to 0.98582 in.	—
Crankshaft 	Alignment	—	0.02 mm 0.0008 in.
Crankshaft journal to crankshaft bearing 1 	Oil clearance	0.040 to 0.118 mm 0.00158 to 0.00464 in.	0.20 mm 0.0079 in.
	Crankshaft journal O.D.	59.921 to 59.940 mm 2.35910 to 2.3598 in.	—
	Crankshaft bearing 1 I.D.	59.980 to 60.039 mm 2.3615 to 2.3637 in.	—
Crankshaft journal to crankshaft bearing 2 	Oil clearance	0.040 to 0.104 mm 0.00157 to 0.00409 in.	0.20 mm 0.0079 in.
	Crankshaft journal O.D.	59.921 to 59.940 mm 2.3591 to 2.3598 in.	—
	Crankshaft bearing 2 I.D.	59.980 to 60.025 mm 2.3615 to 2.3631 in.	—

Item	Factory Specification	Allowable Limit
Crankpin to crankpin bearing 	Oil clearance 0.025 to 0.087 mm 0.00099 to 0.0034 in.	0.20 mm 0.0079 in.
	Crankpin O.D. 46.959 to 46.975 mm 1.8488 to 1.8494 in.	—
	Crankpin bearing I.D. 47.000 to 47.046 mm 1.8504 to 1.8522 in.	—
Crankshaft 	Side clearance 0.15 to 0.35 mm 0.0059 to 0.013 in.	0.5 mm 0.02 in.
Cylinder 	Bore I.D. (Standard size) 88.000 to 88.022 mm 3.4646 to 3.4654 in.	88.170 mm 3.4713 in.
	Bore I.D. (Oversize) 88.250 to 88.272 mm 3.4744 to 3.4752 in.	88.420 mm 3.4811 in.

(2) LUBRICATING SYSTEM

Item		Factory Specification	Allowable Limit
Engine oil pressure 	Engine oil pressure (At idle speed)	More than 70 kPa 0.7 kgf/cm ² 10 psi	50 kPa 0.5 kgf/cm ² 7 psi
	Engine oil pressure (At rated speed)	250 to 440 kPa 2.5 to 4.5 kgf/cm ² 36 to 64 psi	250 kPa 2.5 kgf/cm ² 36 psi
Inner rotor to outer rotor (Oil pump) 	Clearance	0.030 to 0.14 mm 0.0012 to 0.0055 in.	0.2 mm 0.008 in.
Outer rotor to pump body (Oil pump) 	Clearance	0.11 to 0.19 mm 0.0044 to 0.0074 in.	0.25 mm 0.0098 in.
Inner rotor to cover (Oil pump) 	Clearance	0.105 to 0.150 mm 0.00414 to 0.00590 in.	0.2 mm 0.008 in.

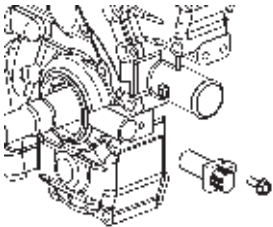
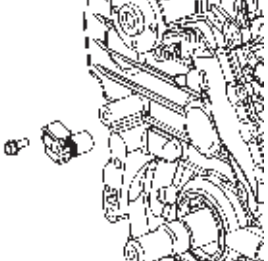
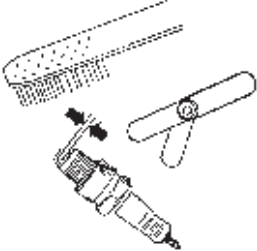
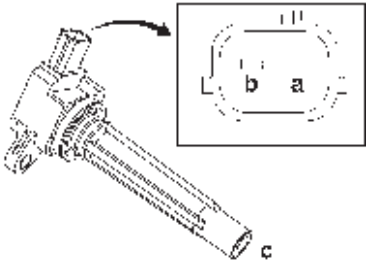
(3) COOLING SYSTEM

Item		Factory Specification	Allowable Limit
Fan belt 	Tension	7.0 to 9.0 mm (0.28 to 0.35 in.) deflection at 98 N (10 kgf, 22 lbf) of force	—
Thermostat 	Valve opening temperature (At beginning)	69.5 to 72.5 °C 157.1 to 162.5 °F	—
	Valve opening temperature (Opened completely)	85 °C 185 °F	—
Radiator 	Water tightness	No water leak at specified pressure	—
Radiator cap 	Pressure falling time	10 seconds or more for pressure falling from 90 to 60 kPa (from 0.9 to 0.6 kgf/cm ² , from 10 to 9 psi)	—

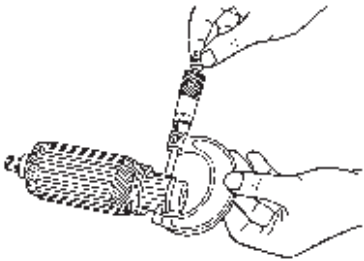
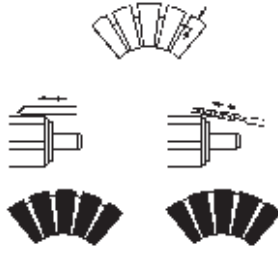
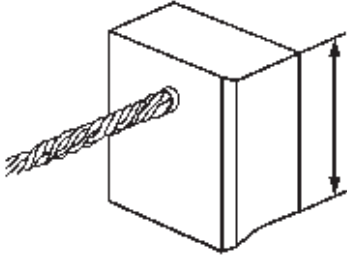
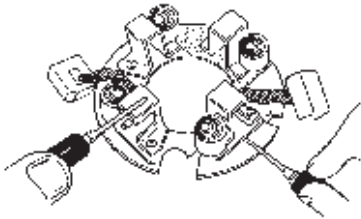
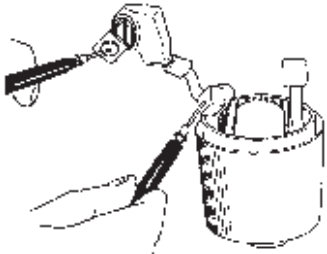
(4) FUEL SYSTEM



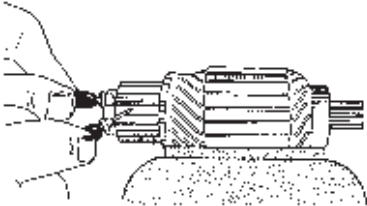
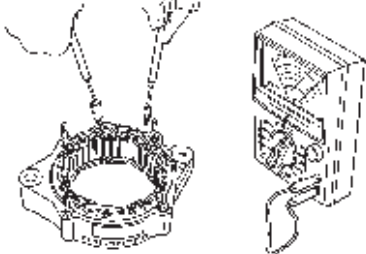
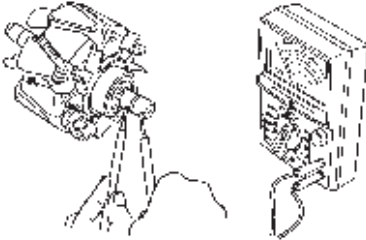
Item		Factory Specification	Allowable Limit
Engine speed	Lo-idling speed	700 min ⁻¹ (rpm) 675 to 725 min ⁻¹ (rpm)	—
Engine speed	Hi-idling speed	2700 min ⁻¹ (rpm) 2675 to 2725 min ⁻¹ (rpm)	—

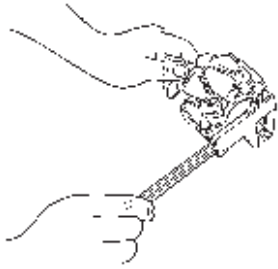
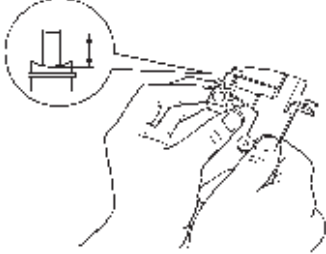
(5) IGNITION SYSTEM

Item	Factory Specification	Allowable Limit	
Crank Sensor 	Resistance A-B	1.85 to 2.45 kΩ at 20 °C (68 °F)	—
Cam Sensor 	Resistance A-B	0.95 to 1.25 kΩ at 20 °C (68 °F)	—
Spark plug gap 		0.70 to 0.80 mm (0.028 to 0.031 in.)	
Ignition coil 	a-b	0.63 to 0.77 Ω at 25 °C (77 °F)	
	a-c	7.29 to 8.91 kΩ at 25 °C (77 °F)	

(6) ELECTRICAL SYSTEM

Item	Factory Specification	Allowable Limit
Starter 	Commutator O.D.	35.0 mm 1.38 in. 34.0 mm 1.34 in.
Starter 	Mica under cut	0.55 to 0.85 mm 0.022 to 0.033 in. 0.20 mm 0.0079 in.
Starter 	Brush length	15.0 mm 0.591 in. 9.0 mm 0.35 in.
Starter 	Brush holder resistance (Brush holder - Holder support)	Infinity —
Starter 	Field coil resistance (Lead - Brush)	Continuity —

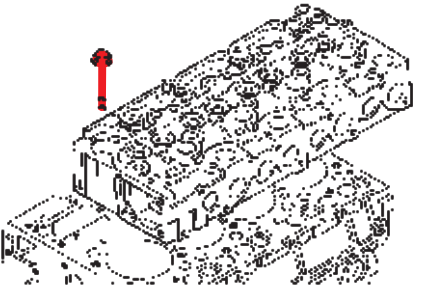
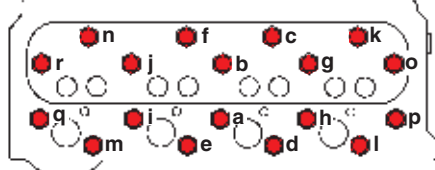
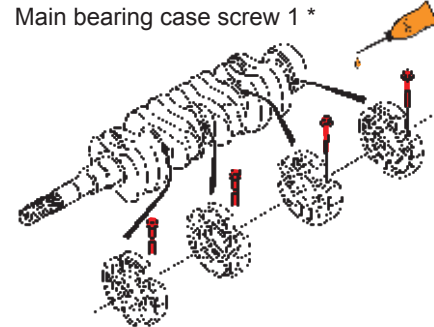
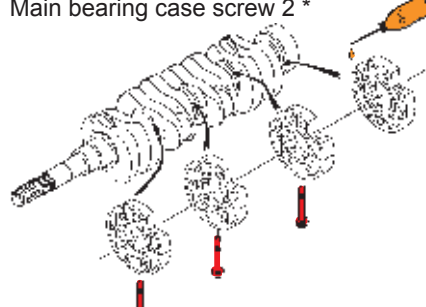
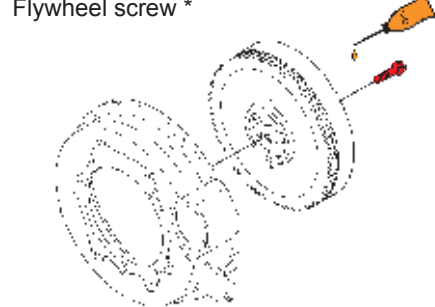
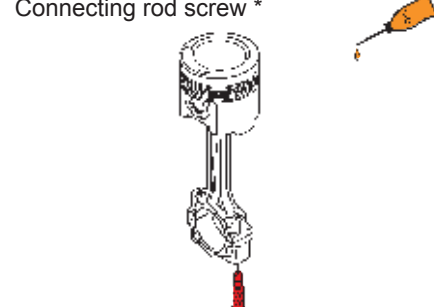

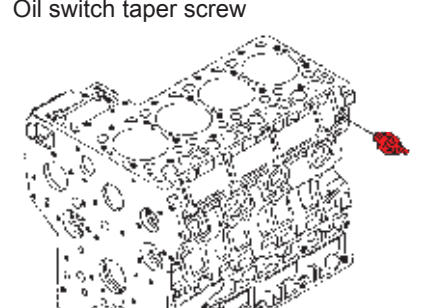
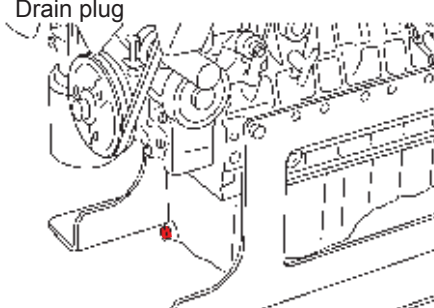
Item	Factory Specification	Allowable Limit
Starter 	Field coil resistance (Brush - Yoke)	Infinity —
Starter 	Armature coil resistance (Commutator - Armature coil core)	Infinity —
Starter 	Armature coil resistance (Segment - Segment)	Continuity —
Alternator 	Stator resistance	Less than 1.0 Ω —
Alternator 	Rotor resistance	2.9 Ω —

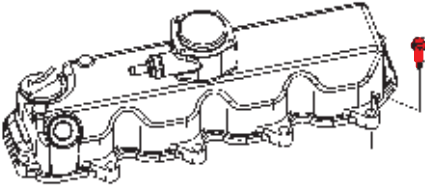

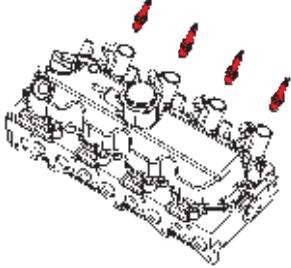
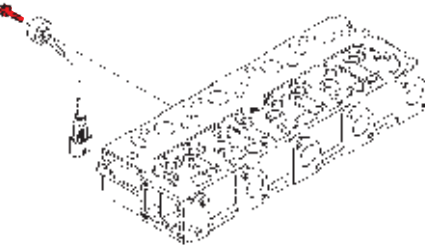
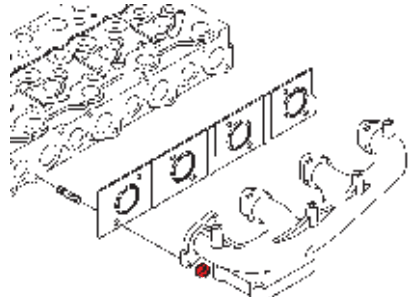
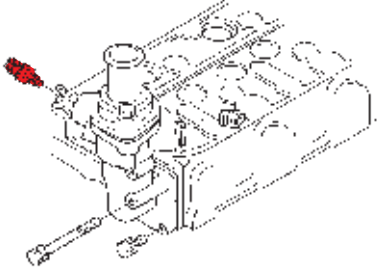
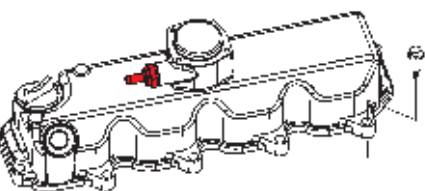
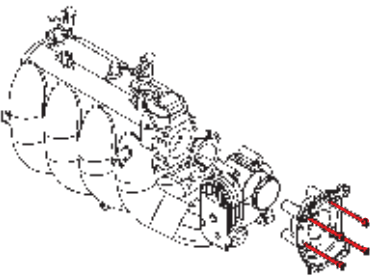
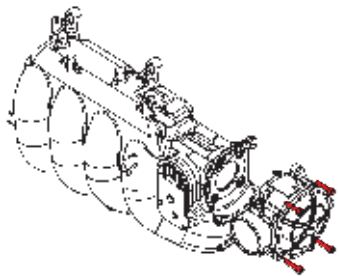
Item		Factory Specification	Allowable Limit
Alternator 	Slip ring O.D.	14.4 mm 0.567 in.	14.0 mm 0.551 in.
Alternator 	Brush length	10.5 mm 0.413 in.	8.4 mm 0.33 in.

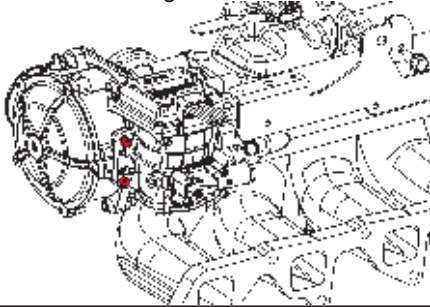
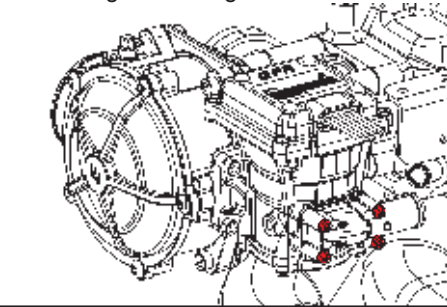
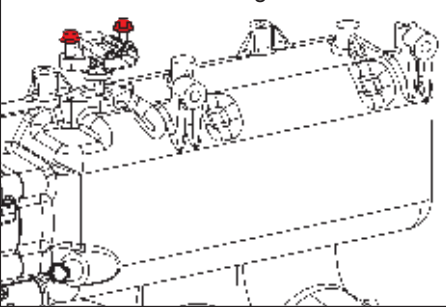
TIGHTENING TORQUES

(1) Special Tightening Torques

For "*" marked screws, bolts and nuts on under table, apply engine oil to their threads and seats before tightening.

<p>Cylinder head screw</p> 	<p>Cylinder head tightening order</p> 	<p>Main bearing case screw 1 *</p> 
<p>All models</p> <p>93.2 to 98.0 N·m 9.50 to 10.0 kgf·m 68.8 to 72.3 lbf·ft</p>	<p>All models</p> <p>4 cylinder model a → r</p>	<p>All models</p> <p>46 to 50 N·m 4.7 to 5.2 kgf·m 34 to 37 lbf·ft</p>
<p>Main bearing case screw 2 *</p> 	<p>Flywheel screw *</p> 	<p>Connecting rod screw *</p> 
<p>All models</p> <p>69 to 73 N·m 7.0 to 7.5 kgf·m 51 to 54 lbf·ft</p>	<p>All models</p> <p>98.1 to 107 N·m 10.0 to 11.0 kgf·m 72.4 to 79.5 lbf·ft</p>	<p>All models</p> <p>41 to 45 N·m 4.1 to 4.6 kgf·m 30 to 33 lbf·ft</p>
<p>Fan drive pulley mounting nut</p> 	<p>Oil switch taper screw</p> 	<p>Drain plug</p> 
<p>All models</p> <p>138 to 156 N·m 14.0 to 16.0 kgf·m 102 to 115 lbf·ft</p>	<p>All models</p> <p>15 to 19 N·m 1.5 to 2.0 kgf·m 11 to 14 lbf·ft</p>	<p>All models</p> <p>33 to 37 N·m 3.3 to 3.8 kgf·m 24 to 27 lbf·ft</p>

<p>Cylinder head cover screw</p> 	<p>All models</p> <p>6.87 to 11.2 N·m 0.700 to 1.15 kgf·m 5.07 to 8.31 lbf·ft</p>
<p>Oil pump drive gear mounting nut</p> 	<p>All models</p> <p>79 to 88 N·m 8.0 to 9.0 kgf·m 58 to 65 lbf·ft</p>
<p>Spark plug</p> 	<p>All models</p> <p>25 to 29 N·m 2.5 to 3.0 kgf·m 18 to 21 lbf·ft</p>
<p>Knock sensor mounting screw</p> 	<p>All models</p> <p>15.0 to 25.0 N·m 1.53 to 2.54 kgf·m 11.1 to 18.4 lbf·ft</p>
<p>Exhaust manifold mounting nut</p> 	<p>All models</p> <p>30 to 34 N·m 3.0 to 3.5 kgf·m 22 to 25 lbf·ft</p>
<p>Water temperature sensor</p> 	<p>All models</p> <p>17 to 19 N·m 1.7 to 2.0 kgf·m 13 to 14 lbf·ft</p>
<p>PCV Valve</p> 	<p>All models</p> <p>16.0 to 24.0 N·m 1.64 to 2.44 kgf·m 11.8 to 17.7 lbf·ft</p>
<p>Throttle body mounting screw</p> 	<p>All models</p> <p>7.0 to 9.0 N·m 0.72 to 0.91 kgf·m 5.2 to 6.6 lbf·ft</p>
<p>Mixer assy mounting screw</p> 	<p>All models</p> <p>7.0 to 9.0 N·m 0.72 to 0.91 kgf·m 5.2 to 6.6 lbf·ft</p>

					
All models	2.8 to 4.0 N·m 0.29 to 0.40 kgf·m 2.1 to 2.9 lbf·ft	All models	1.6 to 2.3 N·m 0.17 to 0.23 kgf·m 1.2 to 1.6 lbf·ft	All models	2.8 to 4.0 N·m 0.29 to 0.40 kgf·m 2.1 to 2.9 lbf·ft

(2) General Tightening Torques

Screw and bolt material grades are shown by numbers punched on the screw and bolt heads.

Prior to tightening, be sure to check out the numbers as shown below.

None or 4 : Standard grade

7 : Special grade

Nominal Diameter	Standard Grade	Special Grade
M6	7.9 to 9.3 N·m 0.80 to 0.95 kgf·m 5.8 to 6.8 lbf·ft	9.81 to 11.2 N·m 1.00 to 1.15 kgf·m 7.24 to 8.31 lbf·ft
M8	18 to 20 N·m 1.8 to 2.1 kgf·m 13 to 15 lbf·ft	24 to 27 N·m 2.4 to 2.8 kgf·m 18 to 20 lbf·ft
M10	40 to 45 N·m 4.0 to 4.6 kgf·m 29 to 33 lbf·ft	49 to 55 N·m 5.0 to 5.7 kgf·m 37 to 41 lbf·ft
M12	63 to 72 N·m 6.4 to 7.4 kgf·m 47 to 53 lbf·ft	78 to 90 N·m 7.9 to 9.2 kgf·m 58 to 66 lbf·ft