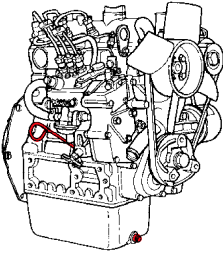
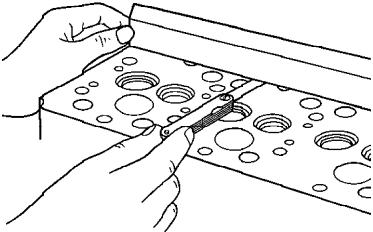
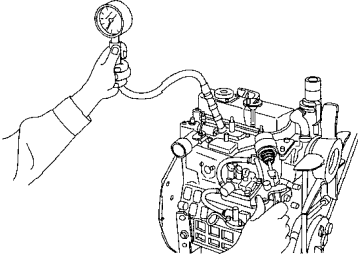
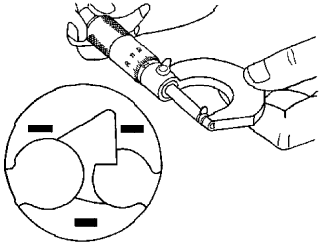
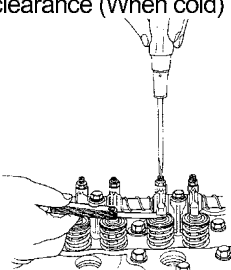
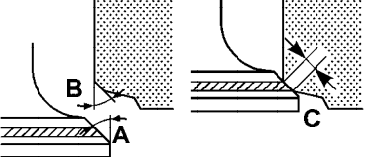
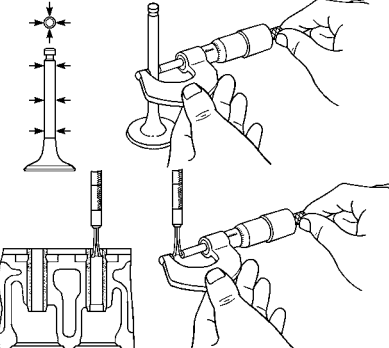
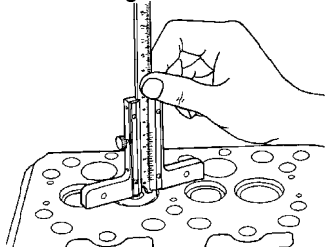
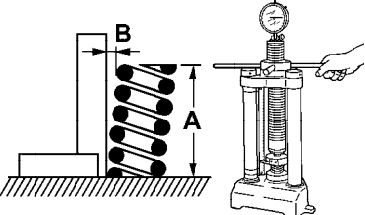
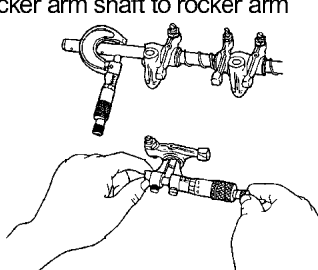
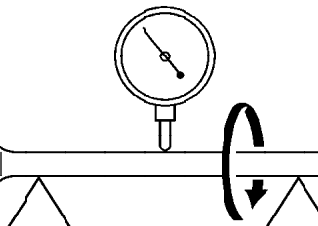
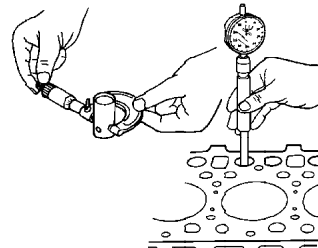
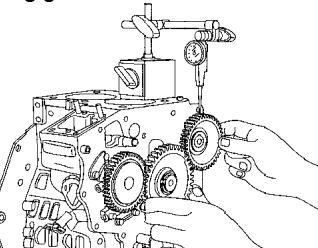
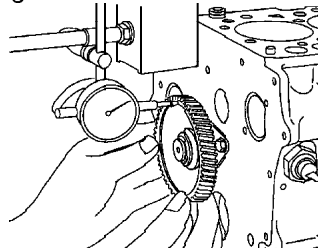
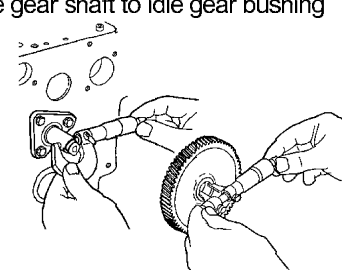
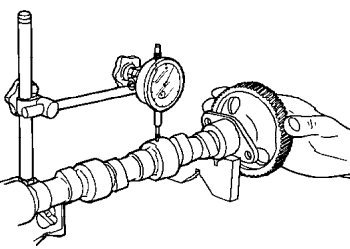
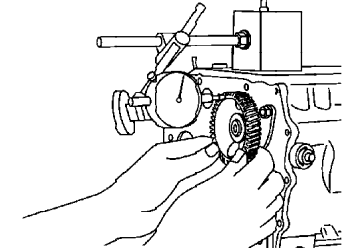
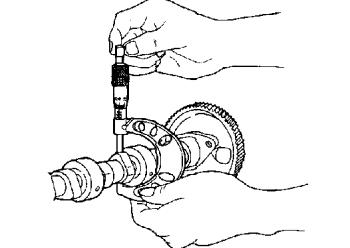
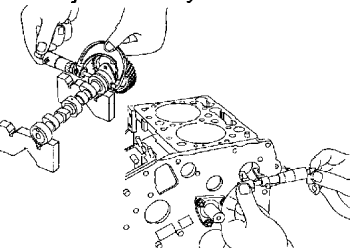


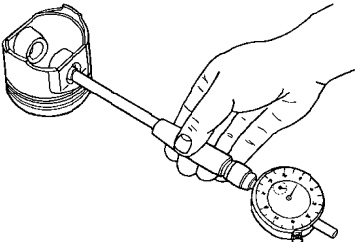
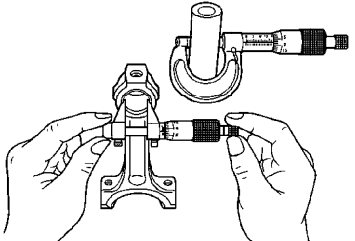
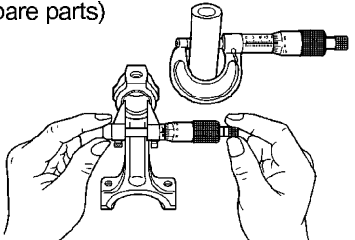
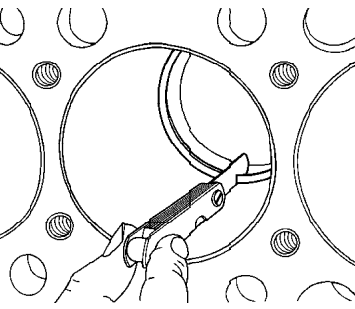
**SERVICING SPECIFICATIONS****(1) ENGINE BODY**

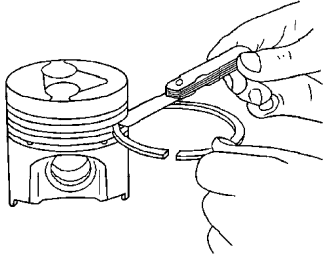
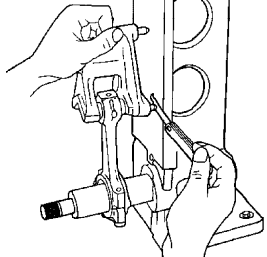
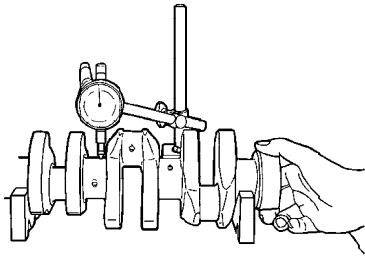
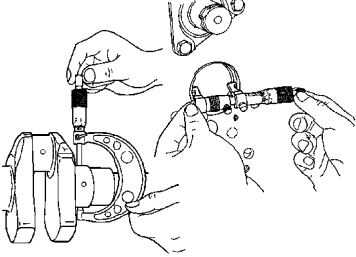
Item		Factory Specification	Allowable Limit	
Lubricating oil capacity 	Oil pan depth 121 mm (4.76 in.)	Z482-E2B	2.5 L 0.66 U.S.gals. 0.55 Imp.gals.	—
		D662-E2B D722-E2B	3.8 L 1.0 U.S.gals. 0.84 Imp.gals.	—
		D782-E2B	3.1 L 0.82 U.S.gals. 0.68 Imp.gals.	—
	Oil pan depth 101 mm (3.98 in.)	Z482-E2B	2.1 L 0.55 U.S.gals. 0.46 Imp.gals.	—
		Z602-E2B	2.5 L 0.66 U.S.gals. 0.55 Imp.gals.	—
		D662-E2B D722-E2B	3.2 L 0.85 U.S.gals. 0.70 Imp.gals.	—
D902-E2B	3.7 L 0.98 U.S.gals. 0.81 Imp.gals.	—		
Cylinder head surface 	Flatness	All models	—	0.05 mm / 500 mm 0.0020 in. / 19.69 in.
Compression pressure 	Z482-E2B D662-E2B D722-E2B D782-E2B	2.84 to 3.24 MPa 29.0 to 33.0 kgf/cm <sup>2</sup> 412 to 469 psi	2.26 MPa 23.0 kgf/cm <sup>2</sup> 327 psi	
	Z602-E2B D902-E2B	3.53 to 4.02 MPa 36.0 to 41.0 kgf/cm <sup>2</sup> 512 to 583 psi	2.55 MPa 26.0 kgf/cm <sup>2</sup> 370 psi	
Top clearance 	All models	0.50 to 0.70 mm 0.0197 to 0.0276 in.	—	

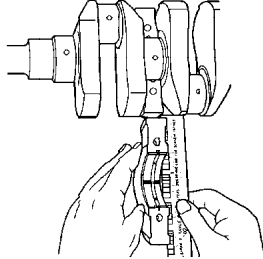
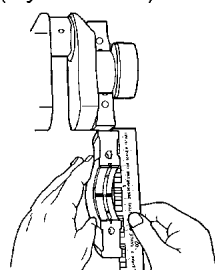
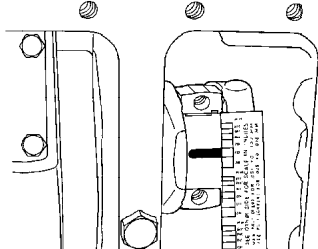
Item		Factory Specification	Allowable Limit	
Valve clearance (When cold) 		All models	0.145 to 0.185 mm 0.00571 to 0.00728 in.	—
Valve & valve seat 	Face angle (A)	All models	0.785 rad. 45°	—
	Seat angle (B)	All models	0.785 rad. 45°	—
	Seat width (C)	All models	2.12 mm 0.0835 in.	—
Valve stem to valve guide 	Clearance	All models	0.030 to 0.057 mm 0.00118 to 0.00224 in.	0.1 mm 0.0039 in.
	Valve stem O.D.	All models	5.968 to 5.980 mm 0.23496 to 0.23543 in.	—
	Valve guide I.D.	All models	6.010 to 6.025 mm 0.23661 to 0.23720 in.	—
Valve recessing 		All models	-0.10 mm (Protrusion) to 0.10 mm (Recessing) -0.0039 in. (Protrusion) to 0.0039 in. (Recessing)	0.3 mm (Recessing) 0.0118 in. (Recessing)
Valve spring 	Free length (A)	All models	31.3 to 31.8 mm 1.232 to 1.252 in.	28.4 mm 1.118 in.
	Tilt (B)	All models	—	1.2 mm 0.047 in.
	Setting load / Setting length	All models	64.7 N / 27.0 mm 6.6 kgf / 27.0 mm 14.6 lbs / 1.063 in.	54.9 N / 27.0 mm 5.6 kgf / 27.0 mm 12.3 lbs / 1.063 in.

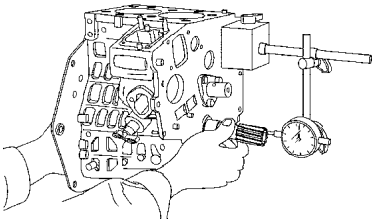
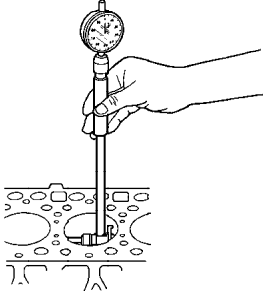
Item		Factory Specification	Allowable Limit
Rocker arm shaft to rocker arm 	Oil clearance	All models 0.016 to 0.045 mm 0.00063 to 0.00177 in.	0.15 mm 0.0059 in.
	Rocker arm shaft O.D.	All models 10.473 to 10.484 mm 0.41232 to 0.41276 in.	—
	Rocker arm I.D.	All models 10.500 to 10.518 mm 0.41339 to 0.41410 in.	—
Push rod 	Alignment	All models —	0.25 mm 0.0098 in.
Tappet to tappet guide 	Oil clearance	All models 0.016 to 0.052 mm 0.00063 to 0.00205 in.	0.10 mm 0.0039 in.
	Tappet O.D.	All models 17.966 to 17.984 mm 0.70732 to 0.70803 in.	—
	Tappet guide I.D.	All models 18.000 to 18.018 mm 0.70866 to 0.70937 in.	—
Timing gear 	Backlash (Crank gear to idle gear)	All models 0.043 to 0.124 mm 0.00169 to 0.00488 in.	0.15 mm 0.0059 in.
	Backlash (Idle gear to cam gear)	All models 0.047 to 0.123 mm 0.00185 to 0.00484 in.	0.15 mm 0.0059 in.
	Backlash (Idle gear to injection pump gear)	All models 0.046 to 0.124 mm 0.00181 to 0.00488 in.	0.15 mm 0.0059 in.
	Backlash (Crank gear to oil pump drive gear)	All models 0.041 to 0.123mm 0.00161 to 0.00484 in.	0.15 mm 0.0059 in.
Idle gear 	Side clearance	All models 0.20 to 0.51 mm 0.0079 to 0.0201 in.	0.8 mm 0.0315 in.

Item			Factory Specification	Allowable Limit
Idle gear shaft to idle gear bushing 	Oil clearance	All models	0.020 to 0.084 mm 0.00079 to 0.00331 in.	0.1 mm 0.0039 in.
	Idle gear shaft O.D.	All models	19.967 to 19.980 mm 0.78610 to 0.78661 in.	—
	Idle gear bushing I.D.	All models	20.000 to 20.051 mm 0.78740 to 0.78941 in.	—
Camshaft 	Alignment	All models	—	0.01 mm 0.0004 in.
Camshaft 	Side clearance	All models	0.15 to 0.13 mm 0.0059 to 0.0122 in.	0.5 mm 0.0197 in.
Cam 	Height (Intake)	All models	26.88 mm 1.0583 in.	26.83 mm 1.0563 in.
	Height (Exhaust)	All models	26.88 mm 1.0583 in.	26.83 mm 1.0563 in.
Camshaft journal to cylinder block bore 	Oil clearance	All models	0.050 to 0.091 mm 0.00197 to 0.00358 in.	0.15 mm 0.0059 in.
	Camshaft journal O.D.	All models	32.934 to 32.950 mm 1.29661 to 1.29724 in.	—
	Cylinder block bore I.D.	All models	33.000 to 33.025 mm 1.29921 to 1.30020 in.	—

Item			Factory Specification	Allowable Limit
Piston pin bore 	Piston pin bore I.D.	All models	20.000 to 20.013 mm 0.78740 to 0.78791 in.	20.05 mm 0.7894 in.
Piston pin to small end bushing 	Oil clearance	All models	0.014 to 0.038 mm 0.00055 to 0.00150 in.	0.10 mm 0.0039 in.
	Piston pin O.D.	All models	20.002 to 20.011 mm 0.78748 to 0.78783 in.	—
	Small end bushing I.D.	All models	20.025 to 20.040 mm 0.78839 to 0.78897 in.	—
Piston pin to small end bushing (Spare parts) 	Oil clearance	All models	0.015 to 0.075 mm 0.00059 to 0.00295 in.	0.15 mm 0.0059 in.
	Small end bushing I.D.	All models	20.026 to 20.077 mm 0.78843 to 0.79043 in.	—
Piston ring 	Ring gap (Top ring)	Z482-E2B D662-E2B D772-E2B	0.15 to 0.30 mm 0.0059 to 0.0118 in.	1.20 mm 0.0472 in.
		D782-E2B	0.25 to 0.40 mm 0.0098 to 0.0157 in.	1.25 mm 0.0492 in.
		Z602-E2B D902-E2B	0.20 to 0.35 mm 0.0079 to 0.0138 in.	1.25 mm 0.0492 in.
	Ring gap (Second ring)	Z482-E2B D662-E2B D722-E2B	0.30 to 0.45 mm 0.0118 to 0.0177 in.	1.20 mm 0.0472 in.
		D782-E2B	0.25 to 0.40 mm 0.0098 to 0.0157 in.	1.25 mm 0.0492 in.
		Z602-E2B D902-E2B	0.35 to 0.50 mm 0.0138 to 0.0197 in.	1.25 mm 0.0492 in.
	Ring gap (Oil ring)	Z482-E2B D662-E2B D722-E2B	0.15 to 0.30 mm 0.0059 to 0.0118 in.	1.20 mm 0.0472 in.
		D782-E2B	0.15 to 0.30 mm 0.0059 to 0.0118 in.	1.25 mm 0.0492 in.
		Z602-E2B D902-E2B	0.20 to 0.35 mm 0.0079 to 0.0138 in.	1.25 mm 0.0492 in.

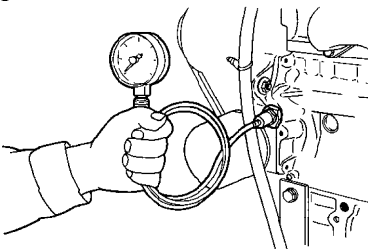
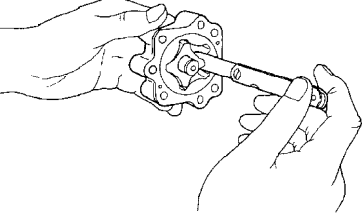
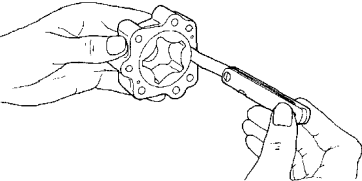
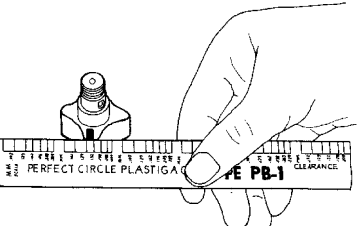
Item		Factory Specification	Allowable Limit	
Piston ring groove to piston ring 	Clearance (Second ring)	Z482-E2B D662-E2B D722-E2B	0.085 to 0.115 mm 0.0033 to 0.0045 in.	0.15 mm 0.0059 in.
		D782-E2B Z602-E2B D902-E2B	0.090 to 0.120 mm 0.00354 to 0.00472 in.	0.15 mm 0.0059 in.
	Clearance (Oil ring)	Z482-E2B D662-E2B D722-E2B	0.020 to 0.060 mm 0.0008 to 0.0024 in.	0.15 mm 0.0059 in.
		D782-E2B Z602-E2B D902-E2B	0.04 to 0.08 mm 0.0016 to 0.0031 in.	0.15 mm 0.0059 in.
Connecting rod 	Alignment	All models	—	0.05 mm 0.0020 in.
Crankshaft 	Alignment	All models	—	0.02 mm 0.0008 in.
Crankshaft journal to crankshaft bearing 1 	Oil clearance	All models	0.034 to 0.106 mm 0.00134 to 0.00417 in.	0.2 mm 0.0079 in.
	Crankshaft journal O.D.	Z482-E2B D662-E2B D722-E2B D782-E2B	39.934 to 39.950 mm 1.57221 to 1.57284 in.	—
		Z602-E2B D902-E2B	43.934 to 43.950 mm 1.72968 to 1.73031 in.	—
	Crankshaft bearing 1 I.D.	Z482-E2B D662-E2B D722-E2B D782-E2B	39.984 to 40.040 mm 1.57417 to 1.57638 in.	—
Z602-E2B D902-E2B		43.984 to 44.040 mm 1.73165 to 1.73386 in.	—	

Item			Factory Specification	Allowable Limit
Crankshaft journal to crankshaft bearing 3 (Intermediate) 	Oil clearance	All models	0.028 to 0.059 mm 0.00110 to 0.00232 in.	0.2 mm 0.0079 in.
	Crankshaft journal O.D.	Z482-E2B D662-E2B D722-E2B D782-E2B	39.934 to 39.950 mm 1.57221 to 1.57284 in.	—
		Z602-E2B D902-E2B	43.934 to 43.950 mm 1.72968 to 1.73031 in.	—
	Crankshaft bearing 3 I.D.	Z482-E2B D662-E2B D722-E2B D782-E2B	39.978 to 39.993 mm 1.57394 to 1.57453 in.	—
		Z602-E2B D902-E2B	43.978 to 43.993 mm 1.73142 to 1.73201 in.	—
Crankshaft journal to crankshaft bearing 2 (Flywheel side) 	Oil clearance	All models	0.028 to 0.059 mm 0.00110 to 0.00232 in.	0.2 mm 0.0079 in.
	Crankshaft journal O.D.	All models	43.934 to 43.950 mm 1.72968 to 1.73031 in.	—
	Crankshaft bearing 2 I.D.	All models	43.978 to 43.993 mm 1.73142 to 1.73201 in.	—
Crankpin to crankpin bearing 	Oil clearance	All models	0.020 to 0.051 mm 0.00079 to 0.00201 in.	0.15 mm 0.0059 in.
	Crankpin O.D.	All models	33.959 to 33.975 mm 1.33697 to 1.33760 in.	—
	Crankpin bearing I.D.	All models	33.995 to 34.010 mm 1.33840 to 1.33898 in.	—

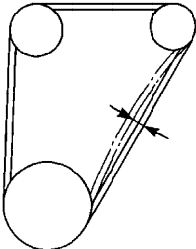
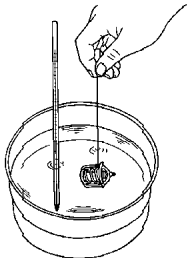
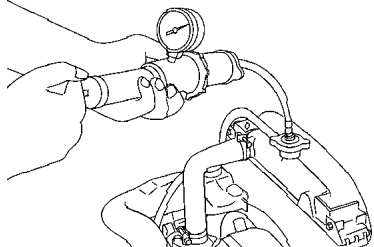
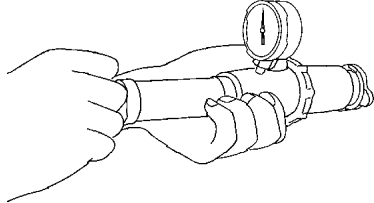
Item			Factory Specification	Allowable Limit
Crankshaft 	Side clearance	All models	0.15 to 0.31 mm 0.0059 to 0.0122 in.	0.5 mm 0.0197 in.
Cylinder 	Bore I.D. (Standard size)	D662-E2B	64.000 to 64.019 mm 2.51968 to 2.52043 in.	64.169 mm 2.52634 in.
		Z482-E2B D722-E2B D782-E2B	67.000 to 67.019 mm 2.63779 to 2.63854 in.	67.169 mm 2.64445 in.
		Z602-E2B D902-E2B	72.000 to 72.019 mm 2.83464 to 2.83539 in.	72.169 mm 2.84130 in.
	Bore I.D. (Oversize)	D662-E2B	64.250 to 64.269 mm 2.52952 to 2.53027 in.	64.419 mm 2.53618 in.
		Z482-E2B D722-E2B D782-E2B	67.250 to 67.269 mm 2.64764 to 2.64839 in.	67.419 mm 2.65429 in.
		Z602-E2B D902-E2B	72.250 to 72.269 mm 2.84449 to 2.84524 in.	72.419 mm 2.85114 in.



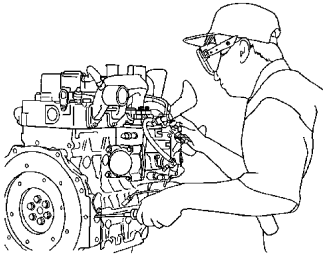
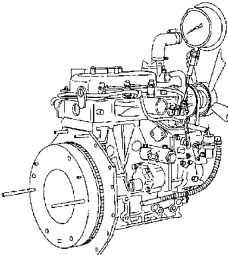
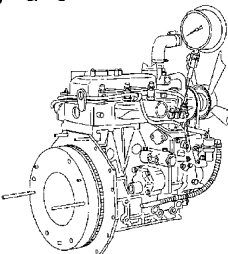
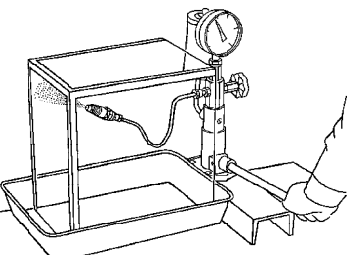
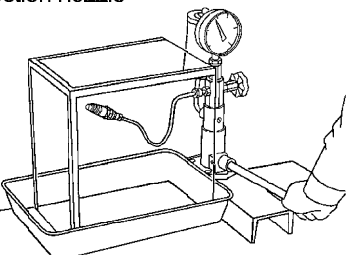
**(2) LUBRICATING SYSTEM**

Item			Factory Specification	Allowable Limit
Engine oil pressure 	Engine oil pressure (At idle speed)	All models	—	49 kPa 0.5 kgf/cm <sup>2</sup> 7 psi
	Engine oil pressure (At rated speed)	All models	196 to 441 kPa 2.0 to 4.5 kgf/cm <sup>2</sup> 28 to 64 psi	147 kPa 1.5 kgf/cm <sup>2</sup> 21 psi
Inner rotor to outer rotor (Oil pump) 	Clearance	All models	0.03 to 0.14 mm 0.0012 to 0.0055 in.	—
Outer rotor to pump body (Oil pump) 	Clearance	All models	0.07 to 0.15 mm 0.0028 to 0.0059 in.	—
Inner rotor to cover (Oil pump) 	Clearance	All models	0.075 to 0.135 mm 0.00295 to 0.00531 in.	—

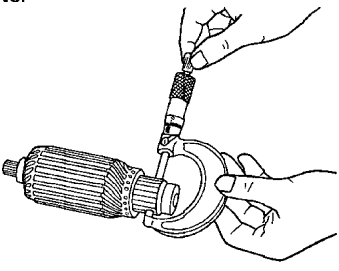
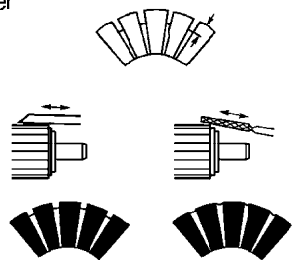
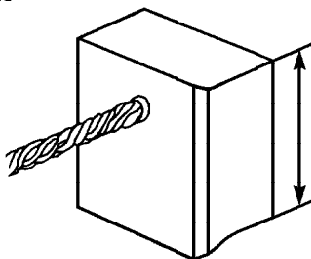
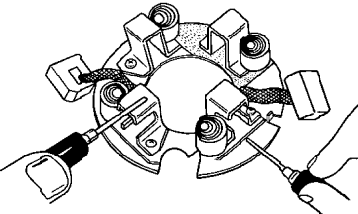
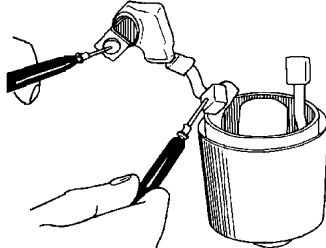
**(3) COOLING SYSTEM**

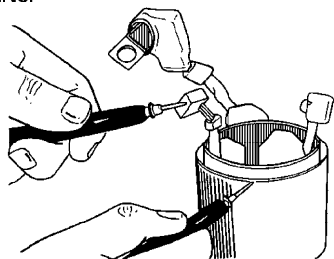
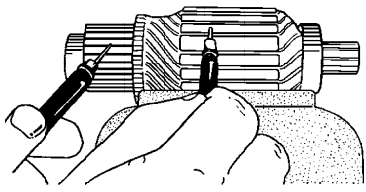
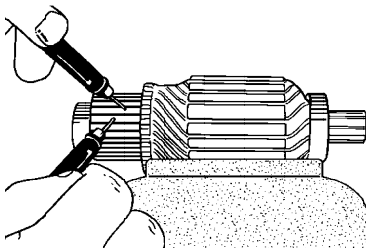
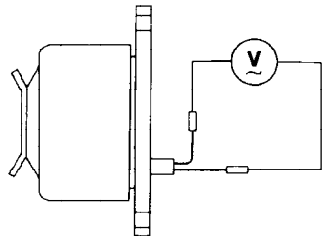
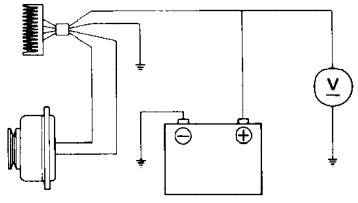
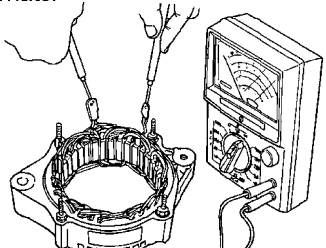
Item			Factory Specification	Allowable Limit
Fan belt 	Tension	All models	7.0 to 9.0 mm (0.28 to 0.35 in.) deflection at 98 N (10 kgf, 22 lbs) of force	—
Thermostat 	Valve opening temperature (At beginning)	All models	69.5 to 72.5 °C 157.1 to 162.5 °F	—
	Valve opening temperature (Opened completely)	All models	85 °C 185 °F	—
Radiator 	Water tightness	All models	No water leak at 157 kPa 1.6 kgf/cm <sup>2</sup> 23 psi	—
Radiator cap 	Pressure falling time	All models	10 seconds or more for pressure falling from 88 to 59 kPa (from 0.9 to 0.6 kgf/cm <sup>2</sup> , from 13 to 9 psi)	—

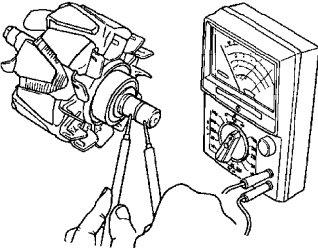
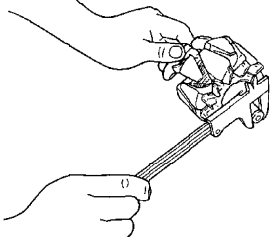
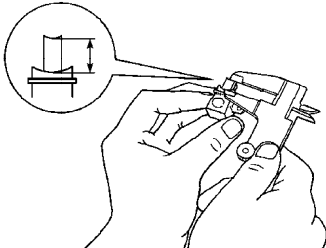
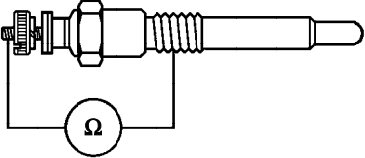
**(4) FUEL SYSTEM**

Item			Factory Specification	Allowable Limit
Injection pump 	Injection timing	Z482-E2B D662-E2B D722-E2B (3600 min <sup>-1</sup> (rpm))	0.33 to 0.37 rad. (19 to 21°) before T.D.C.	—
		D782-E2B (3200 min <sup>-1</sup> (rpm))	0.28 to 0.31 rad. (16 to 18°) before T.D.C.	—
		Z602-E2B D902-E2B (3200 min <sup>-1</sup> (rpm))	0.30 to 0.33 rad. (17 to 19°) before T.D.C.	—
		Z602-E2B D902-E2B (3600 min <sup>-1</sup> (rpm))	0.33 to 0.37 rad. (19 to 21°) before T.D.C.	—
Pump element 	Fuel Tightness	All models	—	13.73 MPa 140 kgf/cm <sup>2</sup> 1991 psi
Delivery valve 	Fuel Tightness	All models	10 seconds 13.73 to 12.75 MPa 140 to 130 kgf/cm <sup>2</sup> 1991 to 1849 psi	5 seconds 13.73 to 12.75 MPa 140 to 130 kgf/cm <sup>2</sup> 1991 to 1849 psi
Injection nozzle 	Injection pressure	All models	13.73 to 14.71 MPa 140 to 150 kgf/cm <sup>2</sup> 1991 to 2133 psi	—
Injection nozzle 	Valve seat tightness	All models	No fuel leak at 12.75 MPa 130 kgf/cm <sup>2</sup> 1849 psi	—

**(5) ELECTRICAL SYSTEM**

Item			Factory Specification	Allowable Limit
Starter 	Commutator O.D.	Electromagnetic drive type	28.0 mm 1.102 in.	27.0 mm 1.063 in.
		Planetary gear reduction type	30.0 mm 1.181 in.	29.0 mm 1.142 in.
	Difference of commutator O.D's	Electromagnetic drive type	Less than 0.05 mm 0.002 in.	0.4 mm 0.016 in.
		Planetary gear reduction type	Less than 0.02 mm 0.0008 in.	0.05 mm 0.0020 in.
Starter 	Mica under cut	All models	0.50 to 0.80 mm 0.0197 to 0.0315 in.	0.20 mm 0.0079 in.
Starter 	Brush length	Electromagnetic drive type	16.0 mm 0.630 in.	10.5 mm 0.413 in.
		Planetary gear reduction type	14.0 mm 0.551 in.	9.0 mm 0.354 in.
Starter 	Brush holder resistance (Brush holder - Holder support)	All models	Infinity	—
Starter 	Field coil resistance (Lead - Brush)	All models	Continuity	—

Item			Factory Specification	Allowable Limit
Starter 	Field coil resistance (Brush - Yoke)	All models	Infinity	—
Starter 	Armature coil resistance (Commutator - Armature coil core)	All models	Infinity	—
Starter 	Armature coil resistance (Segment - Segment)	All models	Continuity	—
Dynamo 	No-load output	All models	AC 20V or more at 5200 min <sup>-1</sup> (rpm)	—
Dynamo 	Regulating voltage	All models	14 to 15 V at 5200 min <sup>-1</sup> (rpm)	—
Alternator 	Stator resistance	All models	Less than 1.0 $\Omega$	—

Item			Factory Specification	Allowable Limit
Alternator 	Rotor resistance	All models	2.9 $\Omega$	—
Alternator 	Slip ring O.D.	All models	14.4 mm 0.567 in.	14.0 mm 0.551 in.
Alternator 	Brush length	All models	10.0 mm 0.3937 in.	8.5 mm 0.3346 in.
Glow plug 	Resistance	All models	Approx. 0.9 $\Omega$	—