ENGINE MECHANICAL (5VZ–FE)

SS00O–01

SERVICE DATA

Compression pressure		at 250 rpm STD	1,200 kPa (12.2 kgf/cm^2, 174 psi) or more
		Minimum	1,000 kPa (10.2 kgf/cm^2, 145 psi)
	Difference of pressure between each cylinder		100 kPa (1.0 kgf/cm^2, 15 psi) or less
Valve clearance		at cold Intake	0.13 – 0.23 mm (0.006 – 0.009 in.)
		Exhaust	0.27 – 0.37 mm (0.011 – 0.014 in.)
	Adjusting shim for repair part	Mark 2.500	2.500 mm (0.0984 in.)
		Mark 2.550	2.550 mm (0.1004 in.)
		Mark 2.600	2.600 mm (0.1024 in.)
		Mark 2.650	2.650 mm (0.1043 in.)
		Mark 2.700	2.700 mm (0.1063 in.)
		Mark 2.750	2.750 mm (0.1083 in.)
		Mark 2.800	2.800 mm (0.1102 in.)
		Mark 2.850	2.850 mm (0.1122 in.)
		Mark 2.900	2.900 mm (0.1142 in.)
		Mark 2.950	2.950 mm (0.1161 in.)
		Mark 3.000	3.000 mm (0.1181 in.)
		Mark 3.050	3.050 mm (0.1201 in.)
		Mark 3.100	3.100 mm (0.1220 in.)
		Mark 3.150	3.150 mm (0.1240 in.)
		Mark 3.200	3.200 mm (0.1260 in.)
		Mark 3.250	3.250 mm (0.1280 in.)
		Mark 3.300	3.300 mm (0.1299 in.)
Ignition timing	w/ Terminals TE1 and E1 connected of DLC1		8 – 12° BTDC @ idle
Idle speed	–		700 ± 50 rpm
Intake manifold vacuum		at idle speed	60 kPa (450 mmHg, 17.7 in.Hg) or more
Timing belt tensioner	Protrusion from housing side		10.0 – 10.8 mm (0.394 – 0.425 in.)
Cylinder head	Warpage	Maximum	0.10 mm (0.039 in.)
	Valve seat		
	Refacing angle		30°, 45°, 60°
	Contacting angle		45°
	Contacting width		1.0 – 1.4 mm (0.039 – 0.055 in.)
	Valve guide bushing bore diameter	STD	10.985 – 11.027 mm (0.4325 – 0.4341 in.)
		O/S 0.05	11.050 – 11.077 mm (0.4350 – 0.4361 in.)
Valve guide bushing	Inside diameter		6.010 – 6.030 mm (0.2366 – 0.2374 in.)
	Outside diameter for repair part	STD	11.033 – 11.044 mm (0.4344 – 0.4348 in.)
		O/S 0.05	11.083 – 11.094 mm (0.4363 – 0.4368 in.)
Valve	Valve overall length	STD Intake	95.15 mm (3.7461 in.)
		Exhaust	94.90 mm (3.7362 in.)
		Minimum Intake	94.60 mm (3.7244 in.)
		Exhaust	94.40 mm (3.7165 in.)
	Valve face angle		44.5°
	Stem diameter	Intake	5.970 – 5.985 mm (0.2350 – 0.2356 in.)
		Exhaust	5.965 – 5.980 mm (0.2348 – 0.2354 in.)
	Stem oil clearance	STD Intake	0.025 – 0.060 mm (0.0010 – 0.0024 in.)
		Exhaust	0.030 – 0.065 mm (0.0012 – 0.0026 in.)
		Maximum Intake	0.08 mm (0.0031 in.)
		Exhaust	0.10 mm (0.0039 in.)
	Margin thickness	STD	1.0 mm (0.039 in.)
		Minimum	0.5 mm (0.020 in.)

Valve spring	Deviation	Maximum	2.0 mm (0.079 in.)
	Free length		44.78 mm (1.7630 in.)
	Installed tension	at 33.3 mm (1.311 in.)	186 – 206 N (19.0 – 21.0 kgf, 41.9 – 46.3 lbf)
Valve lifter	Lifter diameter		30.966 – 30.976 mm (1.2191 – 2.2195 in.)
	Lifter bore diameter		31.000 – 31.018 mm (1.2205 – 1.2212 in.)
	Oil clearance	STD	0.024 – 0.052 mm (0.0009 – 0.0020 in.)
		Maximum	0.08 mm (0.0031 in.)
Camshaft	Thrust clearance	STD	0.033 – 0.080 mm (0.0013 – 0.0031 in.)
		Maximum	0.12 mm (0.0047 in.)
	Journal oil clearance	STD	0.035 – 0.072 mm (0.0014 – 0.0028 in.)
		Maximum	0.10 mm (0.0039 in.)
	Journal diameter		26.949 – 26.965 mm (1.0610 – 1.0616 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Cam lobe height	STD Intake	42.31 – 42.41 mm (1.6657 – 1.6697 in.)
		Exhaust	41.96 – 42.06 mm (1.6520 – 1.6559 in.)
		Minimum Intake	42.16 mm (1.6598 in.)
		Exhaust	41.81 mm (1.6461 in.)
	Camshaft gear backlash	STD	0.020 – 0.200 mm (0.0008 – 0.0079 in.)
		Maximum	0.30 mm (0.0188 in.)
	Camshaft gear spring end free distance		18.2 – 18.8 mm (0.712 – 0.740 in.)
Air intake chamber	Warpage	Maximum	0.10 mm (0.0039 in.)
Intake air connector	Warpage	Maximum	0.10 mm (0.0039 in.)
Intake manifold	Warpage	Maximum	0.10 mm (0.0039 in.)
Exhaust manifold	Warpage	Maximum	1.00 mm (0.0394 in.)
Cylinder block	Cylinder head surface warpage	Maximum	0.05 mm (0.0020 in.)
	Cylinder bore diameter	STD Mark 1	93.500 – 93.510 mm (3.6811 – 3.6815 in.)
		Mark 2	93.510 – 93.520 mm (3.6815 – 3.6819 in.)
		Mark 3	93.520 – 93.530 mm (3.6819 – 3.6823 in.)
		Maximum STD	93.730 mm (3.6902 in.)
		O/S 0.50	94.230 mm (3.7098 in.)
Piston and piston ring	Piston diameter	STD Mark 1	93.356 – 93.366 mm (3.6754 – 3.6758 in.)
		Mark 2	93.367 – 93.376 mm (3.6759 – 3.6762 in.)
		Mark 3	93.377 – 93.386 mm (3.6763 – 3.6766 in.)
		O/S 0.50	93.856 – 93.886 mm (3.6951 – 3.6963 in.)
	Piston oil clearance	STD	0.134 – 0.154 mm (0.0053 – 0.0060 in.)
		Maximum	0.174 mm (0.0069 in.)
	Piston ring groove clearance	No.1	0.040 – 0.080 mm (0.0016 – 0.0031 in.)
		No.2	0.030 – 0.070 mm (0.0012 – 0.0028 in.)
	Piston ring end gap	STD No.1	0.300 – 0.500 mm (0.0118 – 0.0197 in.)
		No.2	0.400 – 0.600 mm (0.0157 – 0.0236 in.)
		Oil	0.150 – 0.550 mm (0.0059 – 0.0217 in.)
		Maximum No.1	1.100 mm (0.0433 in.)
		No.2	1.200 mm (0.0472 in.)
		Oil	1.150 mm (0.0453 in.)

Connecting rod	Thrust clearance	STD	0.150 – 0.330 mm (0.0059 – 0.0130 in.)
		Maximum	0.380 mm (0.0150 in.)
	Connecting rod bearing center wall thickness		
	Reference	Mark 1	1.484 – 1.488 mm (0.0584 – 0.0586 in.)
		Mark 2	1.488 – 1.492 mm (0.0586 – 0.0587 in.)
		Mark 3	1.492 – 1.496 mm (0.0587 – 0.0589 in.)
	Connecting rod oil clearance	STD	0.024 – 0.053 mm (0.0009 – 0.0021 in.)
		O/S 0.25	0.023 – 0.069 mm (0.0009 – 0.0027 in.)
		Maximum	0.08 mm (0.0031 in.)
	Rod bend	Maximum per 100 mm (3.94 in.)	0.05 mm (0.0020 in.)
	Rod twist	Maximum per 100 mm (3.94 in.)	0.15 mm (0.0059 in.)
	Bushing inside diameter		22.005 – 22.017 mm (0.8663 – 0.8668 in.)
	Piston pin diameter		21.997 – 22.009 mm (0.8660 – 0.8665 in.)
	Bushing oil clearance	STD	0.005 – 0.011 mm (0.0002 – 0.0004 in)
		Maximum	0.05 mm (0.0020 in.)
	Connecting rod bolt outer diameter	STD	7.860 – 8.000 mm (0.3094 – 0.3150 in.)
		Minimum	7.600 mm (0.2992 in.)
Crankshaft	Thrust clearance	STD	0.020 – 0.220 mm (0.0008 – 0.0087 in.)
		Maximum	0.300 mm (0.0118 in.)
	Thrust washer thickness		2.440 – 2.490 mm (0.0961 – 0.0980 in.)
	Main journal oil clearance	No.1 STD	0.020 – 0.038 mm (0.0008 – 0.0015 in.)
		U/S 0.25	0.019 – 0.059 mm (0.0007 – 0.0023 in.)
		Others STD	0.024 – 0.042 mm (0.0009 – 0.0017 in.)
		U/S 0.25	0.023 – 0.063 mm (0.0009 – 0.0025 in.)
		Maximum	0.08 mm (0.0031 in.)
	Main journal diameter	STD	63.985 – 64.000 mm (2.5191 – 2.5197 in.)
		U/S 0.25	63.745 – 63.755 mm (2.5096 – 2.5100 in.)
	Main bearing center wall thickness		
	Reference	No.1 Mark 1	1.991 – 1.994 mm (0.0784 – 0.0785 in.)
		Mark 2	1.994 – 1.997 mm (0.0785 – 0.0786 in.)
		Mark 3	1.997 – 2.000 mm (0.0786 – 0.0787 in.)
		Mark 4	2.000 – 2.003 mm (0.0787 – 0.0789 in.)
		Mark 5	2.003 – 2.006 mm (0.0789 – 0.0790 in.)
		Others Mark 1	1.989 – 1.992 mm (0.0783 – 0.0784 in.)
		Mark 2	1.992 – 1.995 mm (0.0784 – 0.0785 in.)
		Mark 3	1.995 – 1.998 mm (0.0785 – 0.0787 in.)
		Mark 4	1.998 – 2.001 mm (0.0787 – 0.0788 in.)
		Mark 5	2.001 – 2.004 mm (0.0788 – 0.0789 in.)
	Crank pin diameter	STD	54.987 – 55.000 mm (2.1648 – 2.1654 in.)
		U/S 0.25	54.745 – 54.755 mm (2.1553 – 2.1557 in.)
	Circle runout	Maximum	0.06 mm (0.0024 in.)
	Main journal taper and out–of–round	Maximum	0.02 mm (0.0008 in.)
	Crank pin taper and out–of–round	Maximum	0.02 mm (0.0008 in.)