ENGINE MECHANICAL

SERVICE DATA

031UF–01

Compression	Pressure at 250 rpm STD	1,200 kPa (12.5 kgf/cm^2, 178 psi) or more
	Minimum	981 kPa (10.0 kgf/cm^2, 142 psi)
	Difference of pressure between each cylinder	98 kPa (1.0 kgf/cm^2, 14 psi) or less
CO/HC		1.5 ± 0.5%
Valve clearance	at cold Intake	0.15 to 0.25 mm (0.006 to 0.010 in.)
	Exhaust	0.25 to 0.35 mm (0.010 to 0.014 in.)
	Valve clearance adjusting shim No. 00	2.000 mm (0.0787 in.)
	02	2.020 mm (0.0795 in.)
	04	2.040 mm (0.0803 in.)
	06	2.060 mm (0.0811 in.)
	08	2.080 mm (0.0819 in.)
	10	2.100 mm (0.0827 in.)
	12	2.120 mm (0.0835 in.)
	14	2.140 mm (0.0843 in.)
	16	2.160 mm (0.0850 in.)
	18	2.180 mm (0.0858 in.)
	20	2.200 mm (0.0866 in.)
	22	2.220 mm (0.0874 in.)
	24	2.240 mm (0.0882 in.)
	26	2.260 mm (0.0890 in.)
	28	2.280 mm (0.0898 in.)
	30	2.300 mm (0.0906 in.)
	32	2.320 mm (0.0913 in.)
	34	2.340 mm (0.0921 in.)
	36	2.360 mm (0.0929 in.)
	38	2.380 mm (0.0937 in.)
	40	2.400 mm (0.0945 in.)
	42	2.420 mm (0.0953 in.)
	44	2.440 mm (0.0961 in.)
	46	2.460 mm (0.0969 in.)
	48	2.480 mm (0.0976 in.)
	50	2.500 mm (0.0984 in.)
	52	2.520 mm (0.0992 in.)
	54	2.540 mm (0.1000 in.)
	56	2.560 mm (0.1008 in.)
	58	2.580 mm (0.1016 in.)
	60	2.600 mm (0.1024 in.)
	62	2.620 mm (0.1031 in.)
	64	2.640 mm (0.1039 in.)
	66	2.660 mm (0.1047 in.)
	68	2.680 mm (0.1055 in.)
	70	2.700 mm (0.1063 in.)
	72	2.720 mm (0.1071 in.)
	74	2.740 mm (0.1079 in.)
	76	2.760 mm (0.1087 in.)
	78	2.780 mm (0.1094 in.)
	80	2.800 mm (0.1102 in.)
Ignition timing		8 to 12° BTDC @ idle
Idle speed		700 to 800 rpm
Timing belt tensioner	Protrusion from housing end	9.5 to 10.5 mm (0.374 to 0.413 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 to 1.4 mm (0.039 to 0.055 in.)
	Valve guide bush bore diameter	STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
		O/S 0.05	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
	Cylinder head set bolt thread inside diameter	STD	9.700 to 9.960 mm (0.3819 to 0.3921 in.)
		Minimum	9.70 mm (0.3819 in.)
Valve guide bush	Inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Outside diameter (for repair part)	STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
		O/S 0.05	10.335 to 10.356 mm (0.4068 to 0.4077 in.)
Valve	Valve overall length	STD Intake	94.80 to 95.30 mm (3.7323 to 3.7520 in.)
		Exhaust	94.85 to 95.35 (3.7342 to 3.7539 in.)
		Minimum Intake	94.55 mm (3.7224 in.)
		Exhaust	94.60 mm (3.7244 in.)
	Valve face angle		44.5°
	Stem diameter	Intake	5.470 to 5.485 mm (0.2154 to 0.2159 in.)
		Exhaust	5.465 to 5.480 mm (0.2152 to 0.2157 in.)
	Stem oil clearance	STD Intake	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
		Exhaust	0.030 to 0.065 mm (0.0012 to 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 compression spring	Deviation	Maximum	2.0 mm (0.079 in.)
	Free length		54.05 to 54.15 mm (2.1279 to 2.1319 in.)
	Installed tension	at 35.04 mm (1.3795 in.)	210 to 226 N (20.8 to 23.0 kgf·cm, 45.9 to 50.7 lbf)
Valve lifter	Lifter diameter		30.966 to 30.978 mm (1.2191 to 2.2196 in.)
	Lifter bore diameter		31.000 to 31.016 mm (1.2205 to 1.2211 in.)
	Oil clearance	STD	0.024 to 0.048 mm (0.0009 to 0.0018 in.)
		Maximum	0.07 mm (0.0028 in.)
Camshaft	Thrust clearance	STD Intake	0.060 to 0.100 mm (0.0024 to 0.0039 in.)
		Exhaust	0.030 to 0.075 mm (0.0012 to 0.0030 in.)
		Maximum Intake	0.13 mm (0.0051 in.)
		Exhaust	0.12 mm (0.0047 in.)
	Journal oil clearance	STD	0.030 to 0.067 mm (0.0012 to 0.0026 in.)
		Maximum	0.100 mm (0.0039 in.)
	Journal diameter	for camshaft bearing	26.954 to 26.970 mm (1.0612 to 1.0618 in.)
		for camshaft timing tube	30.984 to 31.000 mm (1.2198 to 1.2205 in.)
	Circle runout	Maximum	0.08 mm (0.0031 in.)
	Cam lobe height	STD Intake	42.460 to 42.710 mm (1.6717 to 1.6815 in.)
		Exhaust	42.480 to 42.730 mm (1.2483 to 1.6823 in.)
		Minimum Intake	42.46 mm (1.6717 in.)
		Exhaust	42.48 mm (1.6724 in.)
	Camshaft gear backlash	STD	0.020 to 0.200 mm (0.0008 to 0.0079 in.)
		Maximum	0.30 mm (0.0188 in.)
	Camshaft timing gear bolt washer end free distance		18.2 to 18.8 mm (0.712 to 0.740 in.)
Camshaft timing tube	Journal diameter		39.955 to 39.964 mm (1.5730 to 1.5734 in.)
	Journal oil clearance	STD	0.036 to 0.057 mm (0.0014 to 0.0022 in.)
		Maximum	0.075 mm (0.0030 in.)
Cylinder block	Cylinder head surface warpage	Maximum	0.07 mm (0.0028 in.)
	Cylinder bore diameter	STD Mark 1	91.000 to 91.008 mm (3.5827 to 3.5830 in.)
		2	91.008 to 91.021 mm (3.5830 to 3.5835 in.)
		3	91.021 to 91.029 mm (3.5835 to 3.5838 in.)
		Maximum	91.149 mm (3.5885 in.)
	Crankshaft bearing cap bolt tension portion diameter	STD	7.500 to 7.600 mm (0.2953 to 0.2992 in.)
		Minimum	7.20 mm (0.2835 in.)

Piston and piston ring	Piston diameter	STD Mark 1	90.910 to 90.920 mm (3.5791 to 3.5795 in.)
		2	90.920 to 90.928 mm (3.5795 to 3.5798 in.)
		3	90.928 to 90.938 mm (3.5798 to 3.5802 in.)
	Piston oil clearance	STD	0.080 to 0.101 mm (0.0031 to 0.0040 in.)
		Maximum	0.121 mm (0.0048 in.)
	Piston ring groove clearance	No. 1	0.030 to 0.080 mm (0.0012 to 0.0031 in.)
		No. 2	0.020 to 0.060 mm (0.0008 to 0.0024 in.)
	Piston ring end gap	STD No. 1	0.300 to 1.100 mm (0.0118 to 0.0433 in.)
		No. 2	0.400 to 1.200 mm (0.0157 to 0.0472 in.)
		Oil	0.150 to 1.100 mm (0.0059 – 0.0197 in.)
		Maximum No. 1	1.05 mm (0.0413 in.)
		No. 2	1.20 mm (0.0472 in.)
		Oil	1.10 mm (0.0433 in.)
Connecting rod	Thrust clearance	STD	0.160 to 0.290 mm (0.0063 to 0.0138 in.)
		Maximum	0.35 mm (0.0138 in.)
	Connecting rod thickness		22.880 to 22.920 mm (0.9008 to 0.9024 in.)
	Connecting rod oil clearance	STD	0.021 to 0.047 mm (0.0008 to 0.0019 in.)
		Maximum	0.065 mm (0.0026 in.)
	Connecting rod bearing center wall thickness (Reference)		
		Mark 2	1.487 to 1.490 mm (0.0585 to 0.0587 in.)
		3	1.490 to 1.493 mm (0.0587 to 0.0588 in.)
		4	1.493 to 1.496 mm (0.0588 to 0.0589 in.)
		5	1.496 to 1.499 mm (0.0589 to 0.0590 in.)
		6	1.499 to 1.502 mm (0.0590 to 0.0591 in.)
		7	1.502 to 1.505 mm (0.0591 to 0.0593 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.)
	Bush inside diameter		22.005 to 22.014 mm (0.8663 to 0.8667 in.)
	Piston pin diameter		21.997 to 22.006 mm (0.8660 to 0.8664 in.)
	Bush oil clearance	STD	0.005 to 0.011 mm (0.0002 to 0.0004 in)
		Maximum	0.05 mm (0.0020 in.)
	Connecting rod bolt tension portion diameter	STD	7.200 to 7.300 mm (0.2835 to 0.2874 in.)
		Minimum	7.00 mm (0.2756 in.)
Crankshaft	Thrust clearance	STD	0.020 to 0.220 mm (0.0008 to 0.0087 in.)
		Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness		2.440 to 2.490 mm (0.0961 to 0.0980 in.)
	Crankshaft journal bore diameter on cylinder block (with bearing)		66.986 to 67.000 mm (2.6372 to 2.6378 in.)
	Crankshaft journal oil clearance	STD No. 1 and No. 5	0.017 to 0.033 mm (0.0007 to 0.0013 in.)
		Others	0.029 to 0.045 mm (0.0011 to 0.0018 in.)
		Maximum No. 1 and No. 5	0.043 mm (0.0017 in.)
		Others	0.055 mm (0.0022 in.)
	Crankshaft journal diameter		66.988 to 67.000 mm (2.6373 to 2.6378 in.)
	Crankshaft bearing center wall thickness (Reference)		
		No. 1 and No. 5 Mark 3	2.492 to 2.495 mm (0.0981 to 0.0982 in.)
		4	2.495 to 2.498 mm (0.0982 to 0.0983 in.)
		5	2.498 to 2.501 mm (0.0983 to 0.0985 in.)
		6	2.501 to 2.504 mm (0.0985 to 0.0986 in.)
		7	2.504 to 2.507 mm (0.0986 to 0.0987 in.)
		Others Mark 1	2.486 to 2.489 mm (0.0979 to 0.0980 in.)
		2	2.489 to 2.492 mm (0.0980 to 0.0981 in.)
		3	2.492 to 2.495 mm (0.0981 to 0.0982 in.)
		4	2.495 to 2.498 mm (0.0982 to 0.0983 in.)
		5	2.498 to 2.501 mm (0.0983 to 0.0985 in.)
	Crank pin diameter		51.982 to 52.000 mm (2.0465 to 2.0472 in.)
	Circle runout	Maximum	0.08 mm (0.0031 in.)
	Crankshaft 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.)