

ENGINE MECHANICAL (2UZ-FE)

SS00Q-13

SERVICE DATA

Compression pressure	at 250 rpm STD Minimum Difference of pressure between each cylinder	1,373 kPa (14.0 kgf/cm ² , 199 psi) or more 1,030 kPa (10.5 kgf/cm ² , 149 psi) 98 kPa (1.0 kgf/cm ² , 14 psi) or less
Valve clearance	at cold Intake Exhaust Valve clearance adjusting shim No.00 No.02 No.04 No.06 No.08 No.10 No.12 No.14 No.16 No.18 No.20 No.22 No.24 No.26 No.28 No.30 No.32 No.34 No.36 No.38 No.40 No.42 No.44 No.46 No.48 No.50 No.52 No.54 No.56 No.58 No.60 No.62 No.64 No.66 No.68 No.70 No.72 No.74 No.76 No.78 No.80	0.15 to 0.25 mm (0.006 to 0.010 in.) 0.25 to 0.35 mm (0.010 to 0.014 in.) 2.000 mm (0.0787 in.) 2.020 mm (0.0795 in.) 2.040 mm (0.0803 in.) 2.060 mm (0.0811 in.) 2.080 mm (0.0819 in.) 2.100 mm (0.0827 in.) 2.120 mm (0.0835 in.) 2.140 mm (0.0843 in.) 2.160 mm (0.0850 in.) 2.180 mm (0.0858 in.) 2.200 mm (0.0866 in.) 2.220 mm (0.0874 in.) 2.240 mm (0.0882 in.) 2.260 mm (0.0890 in.) 2.280 mm (0.0898 in.) 2.300 mm (0.0906 in.) 2.320 mm (0.0913 in.) 2.340 mm (0.0921 in.) 2.360 mm (0.0929 in.) 2.380 mm (0.0937 in.) 2.400 mm (0.0945 in.) 2.420 mm (0.0953 in.) 2.440 mm (0.0961 in.) 2.460 mm (0.0969 in.) 2.480 mm (0.0976 in.) 2.500 mm (0.0984 in.) 2.520 mm (0.0992 in.) 2.540 mm (0.1000 in.) 2.560 mm (0.1008 in.) 2.580 mm (0.1016 in.) 2.600 mm (0.1024 in.) 2.620 mm (0.1031 in.) 2.640 mm (0.1039 in.) 2.660 mm (0.1047 in.) 2.680 mm (0.1055 in.) 2.700 mm (0.1063 in.) 2.720 mm (0.1071 in.) 2.740 mm (0.1079 in.) 2.760 mm (0.1087 in.) 2.780 mm (0.1094 in.) 2.800 mm (0.1102 in.)
Ignition timing	w/ Terminals TC and E1 connected of DLC1	5 to 15° BTDC @ idle
Idle speed	–	700 ± 50 rpm
Timing belt tensioner	Protrusion from housing end	10.5 to 11.5 mm (0.413 to 0.453 in.)

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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 bushing 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 bolt thread inside diameter	STD	9.810 to 9.960 mm (0.3862 to 0.3921 in.)
Protrusion height		Minimum	9.700 mm (0.3819 in.)
		Intake	9.2 to 9.8 mm (0.362 to 0.386 in.)
		Exhaust	8.2 to 8.8 mm (0.323 to 0.346 in.)
Valve guide bushing	Inside diameter		5.510 to 5.530 mm (0.2169 to 0.2374 in.)
	Outside diameter (for repair part)	STD	10.333 to 10.344 mm (0.4068 to 0.4072 in.)
		O/S 0.05	10.383 to 10.394 mm (0.4088 to 0.4092 in.)
Valve	Valve overall length	STD Intake	95.05 mm (3.7421 in.)
		Exhaust	95.10 mm (3.7441 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 spring	Deviation	Maximum	2.0 mm (0.079 in.)
	Free length		54.1 mm (2.130 in.)
	Installed tension at 35.0 mm (1.378 in.)		210 to 226 N (21.4 to 23.0 kgf, 47.2 to 50.7 lbf)
Valve lifter	Lifter diameter		30.968 to 30.976 mm (1.2192 to 2.2195 in.)
	Lifter bore diameter		31.000 to 31.016 mm (1.2205 to 1.2211 in.)
	Oil clearance	STD	0.024 to 0.050 mm (0.0009 to 0.0020 in.)
		Maximum	0.07 mm (0.0028 in.)
Camshaft	Thrust clearance	STD Intake	0 to 0.040 mm (0 to 0.0016 in.)
		Exhaust	0.030 to 0.070 mm (0.0011 to 0.0028 in.)
		Maximum Intake	0.12 mm (0.0047 in.)
		Exhaust	0.10 mm (0.0039 in.)
	Journal oil clearance	STD	0.030 to 0.071 mm (0.0012 to 0.0028 in.)
		Maximum	0.10 mm (0.0039 in.)
	Timing tube journal oil clearance	STD	0.036 to 0.057 mm (0.0014 to 0.0022 in.)
		Maximum	0.075 mm (0.0030 in.)
	Journal diameter		26.954 to 26.970 mm (1.0612 to 1.0618 in.)
	Timing tube journal diameter	STD	39.955 to 39.964 mm (1.5730 to 1.5734 in.)
	Circle runout		0.03 mm (0.0012 in.)
	Cam lobe height	STD Intake	42.61 to 42.71 mm (1.6776 to 1.6815 in.)
		Exhaust	42.63 to 42.71 mm (1.6783 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 gear spring end free distance		18.2 to 18.8 mm (0.712 to 0.740 in.)
Manifold	Warpage	Maximum Exhaust	0.10 mm (0.0039 in.)

Cylinder block	Cylinder head surface warpage	Maximum	0.07 mm (0.0028 in.)
	Cylinder bore diameter	STD Mark 2	94.010 to 94.023 mm (3.7012 to 3.7017 in.)
		Maximum STD	94.223 mm (3.7096 in.)
		O/S 050	94.723 mm (3.7292 in.)
	Main bearing cap bolt tension portion diameter	STD	10.760 to 10.970 mm (0.4236 to 0.4319 in.)
		Minimum	10.40 mm (0.4094 in.)
Piston and piston ring	Piston diameter	STD Mark 2	93.912 to 93.940 mm (3.6973 to 3.6984 in.)
		O/S 0.50	94.392 to 94.440 mm (3.7162 to 3.7181 in.)
	Piston oil clearance	STD	0.030 to 0.071 mm (0.0012 to 0.0028 in.)
		Maximum	0.13 mm (0.0051 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 0.400 mm (0.0118 to 0.0157 in.)
		No.2	0.450 to 0.600 mm (0.0177 to 0.0236 in.)
		Oil	0.100 to 0.350 mm (0.0039 to 0.0138 in.)
		Maximum No.1	1.10 mm (0.0433 in.)
		No.2	1.30 mm (0.0512 in.)
		Oil	0.75 mm (0.0295 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	0.059 mm (0.0023 in.)
	Connecting rod bearing center wall thickness (Reference)	Mark 2	1.487 to 1.490 mm (0.0585 to 0.0587 in.)
		Mark 3	1.490 to 1.493 mm (0.0587 to 0.0588 in.)
		Mark 4	1.493 to 1.496 mm (0.0588 to 0.0589 in.)
		Mark 5	1.496 to 1.499 mm (0.0589 to 0.0590 in.)
		Mark 6	1.499 to 1.502 mm (0.0590 to 0.0591 in.)
		Mark 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.)
	Bushing inside diameter		22.005 to 22.014 mm (0.8663 to 0.8667 in.)
	Piston pin diameter		21.997 to 22.009 mm (0.8660 to 0.8664 in.)
	Bushing 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.)
	Main journal bore diameter on cylinder block (with main bearing)		66.986 to 67.000 mm (2.6372 to 2.6378 in.)
	Main journal oil clearance	STD No.1, No.5	0.028 to 0.046 mm (0.0011 to 0.0018 in.)
		others	0.040 to 0.058 mm (0.0016 to 0.0023 in.)
		Maximum	0.065 mm (0.0026 in.)
	Main journal diameter		66.988 to 67.000 mm (2.6373 to 2.6378 in.)

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Crankshaft (cont'd)	Main bearing center wall thickness (Reference)		
	No.1 and No.5	Mark 3	2.487 to 2.490 mm (0.0979 to 0.0980 in.)
		Mark 4	2.490 to 2.493 mm (0.0980 to 0.0981 in.)
		Mark 5	2.493 to 2.496 mm (0.0981 to 0.0983 in.)
		Mark 6	2.496 to 2.499 mm (0.0983 to 0.0984 in.)
		Mark 7	2.499 to 2.502 mm (0.0984 to 0.0985 in.)
	Others	Mark 1	2.481 to 2.484 mm (0.0977 to 0.0978 in.)
		Mark 2	2.484 to 2.487 mm (0.0978 to 0.0979 in.)
		Mark 3	2.487 to 2.490 mm (0.0979 to 0.0980 in.)
		Mark 4	2.490 to 2.493 mm (0.0980 to 0.0981 in.)
		Mark 5	2.493 to 2.496 mm (0.0981 to 0.0983 in.)
	Crank pin diameter		51.982 to 52.000 mm (2.0465 to 2.0472 in.)
	Circle runout	Maximum	0.04 mm (0.0016 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.)