1NZ-FE ENGINE MECHANICAL

SERVICE DATA

Ignition timing	-	8 to 12° BTDC
Engine idle speed	M/T	600 to 700 rpm
	A/T	650 to 750 rpm
Compression	Standard compression pressure	1,471 kPa (15.0 kgf/cm^2, 213 psi)
	Minimum pressure	1,079 kPa (11.0 kgf/cm^2, 156 psi)
	Difference between each cylinder	98 kPa (1.0 kgf/cm^2, 14 psi)
Generator V belt tension	New belt	121 to 143 lbf
	Used belt	55 to 88 lbf
Vane pump V belt tension	New belt	99 to 121 lbf
	Used belt	55 to 77 lbf
Generator V belt deflection	New belt	7.0 to 8.5 mm (0.28 to 0.33 in.)
	Used belt	11.0 to 13.0 mm (0.43 to 0.51 in.)
Vane pump V belt deflection : Pressing force 98 N (10 kgf, 22 lbf)	New belt	8.0 to 10.0 mm (0.31 to 0.39 in.)
	Used belt	11.0 to 13.0 mm (0.43 to 0.51 in.)
Valve clearance (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.)
Chain	Maximum chain elongation	123.2 mm (4.850 in.)
Chain tensioner slipper	Maximum wear	1.0 mm (0.039 in.)
No. 1 chain vibration damper	Maximum wear	1.0 mm (0.039 in.)
Cylinder head for flatness	Maximum warpage : Cylinder block side	0.05 mm (0.0020 in.)
	Maximum warpage : Intake manifold side	0.10 mm (0.0039 in.)
	Maximum warpage : Exhaust manifold side	0.10 mm (0.0039 in.)
Cylinder head set bolt	Standard length	142.8 to 144.2 mm (5.622 to 5.677 in.)
	Maximum length	147.1 mm (5.791 in.)
Cylinder block for flatness	Maximum warpage	0.05 mm (0.0020 in.)
Intake valve	Standard overall length	89.25 mm (3.5138 in.)
	Minimum overall length	88.75 mm (3.4941 in.)
	Standard valve stem diameter	4.970 to 4.985 mm (0.1957 to 0.1963 in.)
	Standard margin thickness	1.0 mm (0.039 in.)
	Minimum margin thickness	0.7 mm (0.028 in.)
Exhaust valve	Standard overall length	87.90 mm (3.4606 in.)
	Minimum overall length	87.40 mm (3.4409 in.)
	Standard valve stem diameter	4.965 to 4.980 mm (0.1955 to 0.1961 in.)
	Standard margin thickness	1.15 mm (0.045 in.)
	Minimum margin thickness	0.7 mm (0.028 in.)
Valve spring	Standard free length	45.05 to 45.15 mm (1.774 to 1.778 in.)
	Maximum deviation	1.6 mm (0.063 in.)
	Maximum angle (reference)	2°
	Standard installed tension	149 to 165 N (15.2 to 16.8 kgf, 33.5 to 37.1 lbf) at 32.5 mm (1.280 in.)
	Maximum workin	286 to 316 N (29.1 to 32.2 kgf, 64.2 to 71.0 lbf) at 23.9 mm (0.941 in.)

Intake valve guide bush	Bush inside diameter	5.010 to 5.030 mm (0.1972 to 0.1980 in.)
	Standard oil clearance : bush and valve	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
	Maximum oil clearance : bush and valve	0.08 mm (0.0032 in.)
	Standard bore diameter (STD) : bush bore diameter of cylinder head	9.685 to 9.706 mm (0.3813 to 0.3821 in.)
	Standard bore diameter (O/S 0.05) : bush bore diameter of cylinder head	9.7355 to 9.756 mm (0.3833 to 0.3841 in.)
	Standard protrusion height	9.0 to 9.4 mm (0.354 to 0.370 in.)
	Standard oil clearance : bush and cylinder head	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
Exhaust valve guide bush	Bush inside diameter	5.010 to 5.030 mm (0.1972 to 0.1980 in.)
	Standard oil clearance	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
	Maximum oil clearance	0.10 mm (0.0039 in.)
	Standard bore diameter (STD) : bush bore diameter of cylinder head	9.685 to 9.706 mm (0.3813 to 0.3821 in.)
	Standard bore diameter (O/S 0.05) : bush bore diameter of cylinder head	9.7355 to 9.756 mm (0.3833 to 0.3841 in.)
	Standard protrusion height	9.0 to 9.4 mm (0.354 to 0.370 in.)
	Standard oil clearance : bush and cylinder head	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
Valve lifter	Standard lifter diameter	30.966 to 30.976 mm (1.2191 to 1.2195 in.)
	Standard lifter bore diameter	31.000 to 31.025 mm (1.2205 to 1.2215 in.)
	Standard oil clearance	0.024 to 0.059 mm (0.0009 to 0.0023 in.)
	Maximum oil clearance	0.1 mm (0.0039 mm)
Camshaft timing gear	Minimum gear diameter (w/ chain)	96.2 mm (3.787 in.)
Camshaft timing sprocket	Minimum gear diameter (w/ chain)	96.2 mm (3.787 in.)
Camshaft	Maximum circle runout	0.03 mm (0.0012 in.)
	Standard cam lobe height	44.617 to 44.717 mm (1.7566 to 1.7605 in.)
	Minimum cam lobe height	44.47 mm (1.7508 in.)
	Standard journal diameter : No. 1 journal	34.449 to 34.465 mm (1.3563 to 1.3569 in.)
	Standard journal diameter : Other journals	22.949 to 22.965 mm (0.9035 to 0.9041 in.)
No. 2 camshaft	Maximum circle runout	0.03 mm (0.0012 in.)
	Standard cam lobe height	44.666 to 44.766 mm (1.7585 to 1.7624 in.)
	Minimum cam lobe height	44.52 mm (1.7528 in.)
	Standard journal diameter : No. 1 journal	34.449 to 34.465 mm (1.3563 to 1.3569 in.)
	Standard journal diameter : Other journals	22.949 to 22.965 mm (0.9035 to 0.9041 in.)
Camshaft thrust clearance	Standard thrust clearance	0.040 to 0.095 mm (0.0016 to 0.0037 in.)
	Maximum thrust clearance	0.11 mm (0.0043 in.)
Camshaft oil clearance	Standard oil clearance	0.040 to 0.095 mm (0.0016 to 0.0037)
	Maximum oil clearance	0.115 mm (0.0045 in.)
Camshaft bearing cap setting ring pin	Standard protrusion height	8.5 to 9.5 mm (0.335 to 0.374 in.)
Union	Standard protrusion : A	29 mm (1.14 in.)
	Standard protrusion B:	44 mm (1.73 in.)
Intake manifold	Maximum warpage	0.10 mm (0.004 in.)
Exhaust manifold	Maximum warpage	0.70 mm (0.028 in.)

Connecting rod thrust clearance	Standard thrust clearance	0.16 to 0.36 mm (0.0063 to 0.0142 in.)
	Maximum thrust clearance	0.36 mm (0.0142 in.)
Connecting rod oil clearance	Standard oil clearance	0.016 to 0.040 mm (0.0006 to 0.0016 in.)
	Maximum oil clearance	0.06 mm (0.0024 i)
Crankshaft oil clearance	Standard oil clearance	0.010 to 0.023 mm (0.0004 to 0.0009 in.)
	Maximum oil clearance	0.07 mm (0.0028 in.)
Cylinder bore	Standard diameter	75.000 to 75.013 mm (2.9528 to 2.9533 in.)
Piston with pin	Standard piston diameter	74.945 to 74.955 mm (2.9506 to 2.9510 in.)
	Standard piston hole diameter at 20° (68°F)	18.013 to 18.016 mm (0.7092 to 0.7093 in.)
	Standard piston pin diameter	18.001 to 18.004 mm (0.7087 to 0.7088 in)
	Standard oil clearance : piston and piston pin	0.009 to 0.015 mm (0.0004 to 0.0006 in.)
	Maximum oil clearance : piston and piston pin	0.050 mm (0.0020 in.)
Piston clearance	Standard oil clearance	0.055 to 0.078 mm (0.0022 to 0.0031 in.)
	Maximum oil clearance	0.08 mm (0.0032 in.)
Connecting rod	Standard connecting rod inside diameter	17.965 to 17.985 mm (0.7073 to 0.7081 in.)
	Maximum misalignment	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
	Maximum twist	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Piston ring	Standard ring groove clearance : No. 1 ring	0.02 to 0.04 mm (0.0008 to 0.0016 in.)
	Standard ring groove clearance : No. 1 ring	0.02 to 0.04 mm (0.0008 to 0.0016 in.)
	Standard ring groove clearance : No. 2 ring	0.01 to 0.03 mm (0.0004 to 0.0012 in.)
	Standard ring groove clearance : Oil ring	0.01 to 0.03 mm (0.0004 to 0.0012 in.)
	Standard end gap : No. 1 ring	0.25 to 0.35 mm (0.0098 to 0.0138 in.)
	Maximum end gap : No. 1 ring	0.91 mm (0.0358 in.)
	Standard end gap : No. 2 ring	0.35 to 0.50 mm (0.0138 to 0.0197 in.)
	Maximum end gap : No. 1 ring	1.06 mm (0.0417 in.)
	Standard end gap : Oil ring	0.10 to 0.35 mm (0.039 to 0.0138 in.)
	Maximum end gap : Oil ring	0.82 mm (0.0323 in.)
Connecting rod bolt	Standard diameter	6.6 to 6.7 mm (0.260 to 0.264 in.)
	Maximum diameter	6.4 mm (0.252 in.)
Crankshaft	Maximum circle runout	0.03 mm (0.0012 in.)
	Standard diameter : main journal	45.988 to 46.000 mm (1.8106 to 1.8110 in.)
	Maximum taper and distortion : main journal	0.02 mm (0.0008 in.)
	Standard diameter : crank pin	39.992 to 40.000 mm (1.5745 to 1.5748 in.)
	Maximum taper and distortion : crank pin	0.2 mm (0.0008 in.)
	Standard sprocket diameter (w/ chain)	51.72 mm (2.0362 in.)
	Minimum sprocket diameter (w/ chain)	50.5 mm (1.988 in.)
Crankshaft bearing cap set bolt	Standard diameter	7.3 to 7.5 mm (0.287 to 0.295 in.)
	Minimum diameter	7.2 mm (0.283 in.)