2GR-FE ENGINE MECHANICAL

SERVICE DATA

Ignition timing	Terminals TC and CG of DLC3 connected	8 to 12° BTDC at idle (Transmission in neutral)
	Terminals TC and CG of DLC3 disconnected	7 to 24° BTDC at idle (Transmission in neutral)
Idle speed		600 to 700 rpm (Transmission in neutral)
Compression	Compression pressure	1.3 MPa (13 kgf/cm^2, 189 psi) or more
	Minimum pressure	0.98 MPa (10 kgf/cm^2, 142 psi)
	Difference between each cylinder	0.1 MPa (1.0 kgf/cm^2, 15 psi) or less
Cylinder head set bolt		
Outside diameter	Standard	10.85 to 11.00 mm (0.4272 to 0.4331 in.)
	Minimum	10.70 mm (0.4213 in.)
Chain		
Elongation	Maximum	136.9 mm (5.390 in.)
No. 2 chain		
Elongation	Maximum	137.6 mm (5.417 in.)
Crankshaft timing gear		
Diameter (with chain)	Minimum	61.4 mm (2.417 in.)
Idle sprocket		
Diameter (with chain)	Minimum	61.4 mm (2.417 in.)
Idle gear shaft		
Idle gear shaft diameter		22.987 to 23.000 mm (0.9050 to 0.9055 in.)
Idle gear inside diameter		23.020 to 23.030 mm (0.9063 to 0.9067 in.)
Oil clearance	Standard	0.020 to 0.043 mm (0.0008 to 0.0017 in.)
	Maximum	0.093 mm (0.0037 in.)
Chain tensioner assembly No. 2		
Worn depth	Maximum	0.9 mm (0.035 in.)
Chain tensioner assembly No. 3		
Worn depth	Maximum	0.9 mm (0.035 in.)
Chain tensioner slipper		
Worn depth	Maximum	1.0 mm (0.039 in.)
Chain vibration damper No. 1		
Worn depth	Maximum	1.0 mm (0.039 in.)
Chain vibration damper No. 2		
Worn depth	Maximum	1.0 mm (0.039 in.)
Cylinder head sub-assembly		
	Cylinder head lower	0.05 mm (0.0020 in.)
	Intake	0.08 mm (0.0031 in.)
	Exhaust	0.08 mm (0.0031 in.)
Warpage	Maximum	0.10 mm (0.0039 in.)
Intake valve		
Valve stem diameter		5.470 to 5.485 mm (0.2154 to 0.2159 in.)
Margin thickness	Standard	1.0 mm (0.039 in.)
	Minimum	0.5 mm (0.0197 in.)
Overall length	Standard	105.85 mm (4.1673 in.)
	Minimum	105.35 mm (4.1476 in.)
Exhaust valve		
Valve stem diameter		5.465 to 5.480 mm (0.2151 to 0.2157 in.)

Margin thickness	Standard	1.0 mm (0.039 in.)
	Minimum	0.5 mm (0.0197 in.)
Overall length	Standard	110.40 mm (4.3464 in.)
	Minimum	109.90 mm (4.3268 in.)
Inner compression spring		
Free length		45.46 mm (1.7898 in.)
Deviation	Maximum	1.0 mm (0.039 in.)
Angle (reference)	Maximum	2°
Intake valve guide bush		
Inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
Oil clearance	Standard	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
	Maximum	0.08 mm (0.0032 in.)
Bush bore diameter	Use STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	Use O/S 0.05	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
Protrusion height		9.30 to 9.70 mm (0.3661 to 0.3819 in.)
Exhaust valve guide bush		
Inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
Oil clearance	Standard	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
	Maximum	0.10 mm (0.0039 in.)
Bush bore diameter	Use STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	Use O/S 0.05	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
Protrusion height		9.30 to 9.70 mm (0.3661 to 0.3819 in.)
No. 1 camshaft		
Journal diameter	No. 1 journal	35.946 to 35.960 mm (1.4152 to 1.4157 in.)
	Other journals	25.959 to 25.975 mm (1.0220 to 1.0226 in.)
Circuit runout	Maximum	0.04 mm (0.0016 in.)
Cam lobe height	Standard	44.316 to 44.416 mm (1.7447 to 1.7487 in.)
	Maximum	44.166 mm (1.7388 in.)
Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
	Other journals	0.025 to 0.062 mm (0.00098 to 0.0024 in.)
	Maximum No. 1 journal	0.10 mm (0.0039 in.)
	Other journals	0.09 mm (0.0035 in.)
Thrust clearance	Standard	0.08 to 0.13 mm (0.0031 to 0.0051 in.)
	Maximum	0.15 mm (0.006 in.)
No. 2 camshaft		
Journal diameter	No. 1 journal	35.946 to 35.960 mm (1.4152 to 1.4157 in.)
	Other journals	25.959 to 25.975 mm (1.0220 to 1.0226 in.)
Circuit runout	Maximum	0.04 mm (0.0016 in.)
Cam lobe height	Standard	44.262 to 44.362 mm (1.7426 to 1.7465 in.)
	Maximum	44.112 mm (1.7367 in.)
Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
	Other journals	0.025 to 0.062 mm (0.00098 to 0.0024 in.)
	Maximum No. 1 journal	0.10 mm (0.0039 in.)
	Other journals	0.09 mm (0.0035 in.)
Thrust clearance	Standard	0.08 to 0.13 mm (0.0031 to 0.0051 in.)
	Maximum	0.15 mm (0.006 in.)
No. 3 camshaft		
Journal diameter	No. 1 journal	35.946 to 35.960 mm (1.4152 to 1.4157 in.)
	Other journals	25.959 to 25.975 mm (1.0220 to 1.0226 in.)
Circuit runout	Maximum	0.04 mm (0.0016 in.)

Cam lobe height	Standard	44.316 to 44.416 mm (1.7447 to 1.7487 in.)
	Maximum	44.166 mm (1.7388 in.)
Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
	Other journals	0.025 to 0.062 mm (0.00098 to 0.0024 in.)
	Maximum No. 1 journal	0.10 mm (0.0039 in.)
	Other journals	0.09 mm (0.0035 in.)
Thrust clearance	Standard	0.08 to 0.13 mm (0.0031 to 0.0051 in.)
	Maximum	0.15 mm (0.006 in.)
No. 4 camshaft		
Journal diameter	No. 1 journal	35.946 to 35.960 mm (1.4152 to 1.4157 in.)
	Other journals	25.959 to 25.975 mm (1.0220 to 1.0226 in.)
Circuit runout	Maximum	0.04 mm (0.0016 in.)
Cam lobe height	Standard	44.262 to 44.362 mm (1.7426 to 1.7465 in.)
	Maximum	44.112 mm (1.7367 in.)
Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
	Other journals	0.025 to 0.062 mm (0.00098 to 0.0024 in.)
	Maximum No. 1 journal	0.10 mm (0.0039 in.)
	Other journals	0.09 mm (0.0035 in.)
Thrust clearance	Standard	0.08 to 0.13 mm (0.0031 to 0.0051 in.)
	Maximum	0.15 mm (0.006 in.)
Ring pin for cylinder head sub-assembly		
Protrusion height		2.5 to 3.5 mm (0.098 to 0.138 in.)
Straight pin for cylinder head sub-assembly		
Protrusion height		17.5 to 19.5 mm (0.689 to 0.768 in.)
Connecting rod thrust clearance	Standard	0.15 to 0.40 mm (0.0059 to 0.0157 in.)
	Maximum	0.50 mm (0.020 in.)
Connecting rod oil clearance	Standard	0.045 to 0.067 mm (0.0018 to 0.0026 in.)
	Maximum	0.070 mm (0.0028 in.)
Crankshaft thrust clearance	Standard	0.04 to 0.24 mm (0.0016 to 0.0094 in.)
	Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness	2.43 to 2.48 mm (0.0957 to 0.0976 in.)
Cylinder block warpage	Maximum	0.07 mm (0.0028 in.)
Cylinder bore diameter	Standard	94.000 to 94.012 mm (3.7008 to 3.7013 in.)
	Maximum	94.200 mm (3.7087 in.)
Piston diameter		
	Distance	9.8 mm (0.3858 in.)
	Standard	93.960 to 93.980 mm (3.6992 to 3.7000 in.)
	Maximum	93.830 mm (3.6941 in.)
Oil clearance	Standard	0.020 to 0.052 mm (0.0008 to 0.0020 in.)
	Maximum	0.060 mm (0.0024 in.)
Connecting rod out-of alignment	Maximum	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Connecting rod twist	Maximum	0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
Piston pin hole inside diameter		22.001 to 22.010 mm (0.8662 to 0.8665 in.)
Piston pin diameter		21.997 to 22.006 mm (0.8660 to 0.8664 in.)
Oil clearance	Standard	0.001 to 0.007 mm (0.00004 to 0.00028 in.)
	Maximum	0.015 mm (0.0006 in.)
Connecting rod bushing inside diameter		22.005 to 22.014 mm (0.8663 to 0.8667 in.)
Oil clearance	Standard	0.005 to 0.011 mm (0.0002 to 0.0004 in.)
	Maximum	0.030 mm (0.0012 in.)

Piston ring groove clearance	No. 1	0.020 to 0.070 mm (0.0008 to 0.0028 in.)
	No. 2	0.020 to 0.060 mm (0.0008 to 0.0024 in.)
	Oil	0.070 to 0.150 mm (0.0028 to 0.0059 in.)
Piston ring end gap	Standard No. 1	0.25 to 0.35 mm (0.0098 to 0.0138 in.)
	No. 2	0.50 to 0.60 mm (0.0197 to 0.0236 in.)
	Oil (Side rail)	0.10 to 0.40 mm (0.0039 to 0.0157 in.)
	Maximum No. 1	0.50 mm (0.0197 in.)
	No. 2	0.85 mm (0.0335 in.)
	Oil (Side rail)	0.60 mm (0.0236 in.)
Connecting rod bolt diameter	Standard	7.2 to 7.3 mm (0.284 to 0.287 in.)
	Minimum	7.0 mm (0.276 in.)
Crankshaft bearing cap set bolt diameter	Standard	10.8 to 11.0 mm (0.4252 to 0.4331 in.)
	Maximum	10.7 mm (0.4213 in.)
Crankshaft circle runout	Maximum	0.06 mm (0.0024 in.)
Main journal diameter		60.988 to 61.000 mm (2.4011 to 2.4016 in.)
Main journal taper and out-of-round	Maximum	0.02 mm (0.0008 in.)
Crank pin diameter		52.992 to 53.000 mm (2.0863 to 2.0866 in.)
Crank pin taper and out-of-round	Maximum	0.02 mm (0.0008 in.)
Crankshaft oil clearance	Standard	0.026 to 0.047 mm (0.0010 to 0.0019 in.)
	Maximum	0.050 mm (0.0020 in.)
Straight pin for cylinder block sub-assembly		
Protrusion height	Pin A	23 mm (0.906 in.)
	Pin B	6 mm (0.236 in.)
	Pin C	11 mm (0.433 in.)
	Pin D	9 mm (0.354 in.)