SERVICE SPECIFICATIONS

SERVICE DATA

EG0C6-1X

Compression pressure	At 250 rpm	STD	3,138 kPa (32.0 kgf/cm², 455 psi) or more
		Minimum	1,961 kPa (20.0 kgf/cm², 284 psi)
	Difference of pressure between each cylinder		490 kPa (5.0 kgf/cm², 71 psi) or less
Valve clearance	at cold	Intake	0.20 — 0.30 mm (0.008 — 0.012 in.)
		Exhaust	0.40 — 0.50 mm (0.016 — 0.020 in.)
	Adjusting shim thickness (for repair part)	No.01	2.50 mm (0.0984 in.)
		No.42	2.55 mm (0.1004 in.)
		No.06	2.60 mm (0.1024 in.)
		No.43	2.65 mm (0.1043 in.)
		No.11	2.70 mm (0.1063 in.)
		No.44	2.75 mm (0.1083 in.)
		No.16	2.80 mm (0.1102 in.)
		No.45	2.85 mm (0.1122 in.)
		No.21	2.90 mm (0.1142 in.)
		No.46	2.95 mm (0.1161 in.)
		No.26	3.00 mm (0.1181 in.)
		No.47	3.05 mm (0.1201 in.)
		No.31	3.10 mm (0.1220 in.)
		No.48	3.15 mm (0.1240 in.)
		No.36	3.20 mm (0.1260 in.)
		No.49	3.25 mm (0.1280 in.)
		No.41	3.30 mm (0.1299 in.)
Injection timing	Plunger stroke	w/ ACSD (2L Europe)	0.44 — 0.56 mm (0.0173 — 0.0220 in.)
		w/ ACSD (3L Europe & Others)	0.54 — 0.66 mm (0.0213 — 0.0260 in.)
		w/o ACSD	0.84 — 0.96 mm (0.0331 — 0.0378 in.)
Idle speed		M/T	650 — 750 rpm
		A/T	750 — 850 rpm
Maximum speed		2L (Europe, Israel and Ukraina)	5,020 — 5,280 rpm
		2L (Hong Kong, Singapore, Malaysia and LY General)	4,570 — 4,830 rpm
		2L (Others)	4,770 — 5,030 rpm
		3L (Europe)	4,670 — 4,930 rpm
		3L (Hong Kong, Singapore, Malaysia and LY General)	4,270 — 4,530 rpm
		3L (Others)	4,470 — 4,730 rpm
A/C idle-up speed	—		900 — 1,000 rpm
VSV for intake shutter (LJ)		at 20°C (68°F)	37 — 44 Ω
Idler pulley tension spring	Free length		44.4 — 45.4 mm (1.748 — 1.787 in.)
	Installed load at 52.1 mm (2.051 in.)		53 — 59 N (5.42 — 5.98 kgf, 11.9 — 13.2 lbf)

Cylinder head	Warpage	Maximum	0.20 mm (0.0079 in.)
	Valve seat		
	Refacing angle	Intake	20°, 45°, 70°
		Exhaust	20°, 45°, 75°
	Contacting angle		45°
	Contacting width	Intake	1.5 – 1.9 mm (0.059 – 0.075 in.)
		Exhaust	1.8 – 2.2 mm (0.071 – 0.087 in.)
	Cylinder head bolt thread inside diameter	STD	11.800 – 12.000 mm (0.4646 – 0.4724 in.)
		Minimum	11.60 mm (0.4567 in.)
	Cylinder head gasket thickness	Mark B	1.40 –1.50 mm (0.0551 – 0.0591 in.)
		Mark D	1.50 –1.60 mm (0.0591 – 0.0630 in.)
		Mark F	1.60 –1.70 mm (0.0630 – 0.0669 in.)
Valve guide bushing	Inside diameter		8.010 – 8.030 mm (0.3154 – 0.3161 in.)
	Outside diameter for repair part	STD	13.040 – 13.051 mm (0.5134 – 0.5138 in.)
		O/S 0.05	13.090 – 13.101 mm (0.5154 – 0.5158 in.)
Valve	Valve overall length	STD Intake	103.29 – 103.69 mm (4.0665 – 4.0823 in.)
		Exhaust	103.14 – 103.54 mm (4.0606 – 4.0764 in.)
		Minimum Intake	102.79 mm (4.0468 in.)
		Exhaust	102.64 mm (4.0409 in.)
	Valve face angle		44.5°
	Stem diameter	Intake	7.975 – 7.990 mm (0.3140 – 0.3146 in.)
		Exhaust	7.960 – 7.975 mm (0.3134 – 0.3140 in.)
	Stem oil clearance	STD Intake	0.020 – 0.055 mm (0.0008 – 0.0022 in.)
		Exhaust	0.035 – 0.070 mm (0.0014 – 0.0028 in.)
		Maximum Intake	0.08 mm (0.0031 in.)
		Exhaust	0.10 mm (0.0039 in.)
	Margin thickness	STD Intake	1.6 mm (0.063 in.)
		Exhaust	1.7 mm (0.067 in.)
		Minimum Intake	1.1 mm (0.043 in.)
		Exhaust	1.2 mm (0.047 in.)
Valve spring	Deviation	Maximum	2.0 mm (0.079 in.)
	Free length	Type A	46.20 mm (1.8189 in.)
		Type B	48.54 mm (1.9110 in.)
	Installed tension at 37.0 mm (1.457 in.)		301 – 332 N (30.7 – 33.9 kgf, 67.7 – 74.7 lbf)
Valve lifter	Valve lifter inside diameter		40.892 – 40.902 mm (1.6099 – 1.6103 in.)
	Cylinder head lifter bore diameter		40.960 – 40.980 mm (1.6126 – 1.6134 in.)
	Oil clearance	STD	0.058 – 0.088 mm (0.0023 – 0.0035 in.)
		Maximum	0.10 mm (0.0039 in.)
Manifold	Warpage	Maximum	0.40 mm (0.0157 in.)

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Camshaft	Circle runout	Maximum	0.10 mm (0.0039 in.)
	Cam lobe height		
	2L	STD Intake	53.850 — 53.870 mm (2.1201 — 2.1209 in.)
		Exhaust	54.990 — 55.010 mm (2.1650 — 2.1657 in.)
		Minimum Intake	53.35 mm (2.1004 in.)
		Exhaust	54.49 mm (2.1453 in.)
	3L	STD Intake	54.290 — 54.310 mm (2.1374 — 2.1382 in.)
		Exhaust	54.990 — 55.010 mm (2.1650 — 2.1657 in.)
		Minimum Intake	53.79 mm (2.1777 in.)
		Exhaust	53.49 mm (2.1453 in.)
	Journal diameter	STD No.1	34.969 — 34.985 mm (1.3767 — 1.3774 in.)
		Others	27.969 — 27.985 mm (1.1011 — 1.1018 in.)
		U/S 0.125 No.1	34.844 — 34.860 mm (1.3718 — 1.3724 in.)
		Others	27.844 — 27.860 mm (1.0962 — 1.0968 in.)
		U/S 0.250 No.1	34.719 — 34.735 mm (1.3669 — 1.3675 in.)
		Others	27.719 — 27.735 mm (1.0913 — 1.0919 in.)
	Journal oil clearance	STD	0.022 — 0.074 mm (0.0009 — 0.0029 in.)
		Maximum	0.10 mm (0.0039 in.)
	Thrust clearance	STD	0.080 — 0.280 mm (0.0031 — 0.0110 in.)
		Maximum	0.35 mm (0.0138 in.)
Combustion chamber	Protrusion		± 0.03 mm (0.0012 in.)
	Shim thickness		0.03 mm (0.0012 in.)
Connecting rod	Thrust clearance	STD	0.080 — 0.300 mm (0.0031 — 0.0118 in.)
		Maximum	0.35 mm (0.0138 in.)
	Connecting rod oil clearance		
	2L	STD STD	0.036 — 0.064 mm (0.0014 — 0.0025 in.)
		U/S 0.25, 0.50	0.023 — 0.073 mm (0.0009 — 0.0029 in.)
		Maximum	0.10 mm (0.0039 in.)
	3L	STD STD	0.036 — 0.064 mm (0.0014 — 0.0025 in.)
		U/S 0.25, 0.50	0.033 — 0.079 mm (0.0013 — 0.0031 in.)
		Maximum	0.10 mm (0.0039 in.)
	Connecting rod bearing center wall thickness		
	Reference	STD Mark 1	1.478 — 1.482 mm (0.0582 — 0.0583 in.)
		Mark 2	1.482 — 1.486 mm (0.0583 — 0.0585 in.)
		Mark 3	1.486 — 1.490 mm (0.0585 — 0.0587 in.)
	Rod out—of—alignment		
		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	2L	27.008 — 27.020 mm (1.0633 — 1.0638 in.)
		3L	29.008 — 29.020 mm (1.1420 — 1.1425 in.)
	Piston pin diameter	2L	27.000 — 27.012 mm (1.0630 — 1.0635 in.)
		3L	29.000 — 29.012 mm (1.1417 — 1.1422 in.)
	Bushing oil clearance	STD	0.004 — 0.012 mm (0.0002 — 0.0005 in)
		Maximum	0.05 mm (0.0020 in.)
	Connecting rod bolt tension portion diameter	STD	8.400 — 8.600 mm (0.3307 — 0.3386 in.)
		Minimum	8.20 mm (0.3228 in.)

Cylinder block	Cylinder head surface warpage	Maximum	0.20 mm (0.0079 in.)
	Cylinder bore diameter		
	2L	STD Mark 1	92.000 — 92.010 mm (3.6220 — 3.6224 in.)
		Mark 2	92.010 — 92.020 mm (3.6224 — 3.6228 in.)
		Mark 3	92.020 — 92.030 mm (3.6228 — 3.6232 in.)
		Maximum STD	92.23 mm (3.6311 in.)
		O/S 0.50	92.73 mm (3.6508 in.)
		O/S 0.75	92.98 mm (3.6606 in.)
		O/S 1.00	93.23 mm (3.6704 in.)
	3L	STD Mark 1	96.000 — 96.010 mm (3.7795 — 3.7799 in.)
		Mark 2	96.010 — 96.020 mm (3.7799 — 3.7803 in.)
		Mark 3	96.020 — 96.030 mm (3.7803 — 3.7807 in.)
		Maximum STD	96.23 mm (3.7886 in.)
		O/S 0.50	96.73 mm (3.8083 in.)
Piston and piston ring	Piston diameter		
	2L	STD Mark 1	91.940 — 91.950 mm (3.6197 — 3.6201 in.)
		Mark 2	91.950 — 91.960 mm (3.6201 — 3.6205 in.)
		Mark 3	91.960 — 91.970 mm (3.6205 — 3.6209 in.)
		O/S 0.50	92.440 — 92.470 mm (3.6394 — 3.6405 in.)
		O/S 0.75	92.640 — 92.720 mm (3.6472 — 3.6504 in.)
		O/S 1.00	92.940 — 92.970 mm (3.6591 — 3.6602 in.)
	3L	STD Mark 1	95.940 — 95.950 mm (3.7772 — 3.7776 in.)
		Mark 2	95.950 — 95.960 mm (3.7776 — 3.7779 in.)
		Mark 3	95.960 — 95.970 mm (3.7779 — 3.7783 in.)
		O/S 0.50	96.440 — 96.470 mm (3.7968 — 3.7980 in.)
	Piston oil clearance	STD	0.050 — 0.070 mm (0.0020 — 0.0028 in.)
		Maximum	0.14 mm (0.0055 in.)
	Piston ring groove clearance	STD No.1	0.031 — 0.079 mm (0.0012 — 0.0031 in.)
		No.2	0.060 — 0.105 mm (0.0024 — 0.0041 in.)
		Oil	0.030 — 0.070 mm (0.0012 — 0.0028 in.)
		Maximum	0.20 mm (0.0079 in.)
	Piston ring end gap	STD No.1	0.350 — 0.590 mm (0.0138 — 0.0232 in.)
		No.2	0.400 — 0.720 mm (0.0157 — 0.0283 in.)
		Oil	0.200 — 0.520 mm (0.0079 — 0.0205 in.)
		Maximum No.1	1.29 mm (0.0508 in.)
		No.2	1.42 mm (0.0559 in.)
		Oil	1.22 mm (0.0480 in.)
	Piston protrusion from cylinder block		0.68 — 0.97 mm (0.0268 — 0.0382 in.)

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Crankshaft	Thrust clearance	STD	0.040 – 0.250 mm (0.0016 – 0.0098 in.)
		Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness	STD	2.430 – 2.480 mm (0.0957 – 0.0976 in.)
		O/S 0.125	2.493 – 2.543 mm (0.0981 – 0.1001 in.)
		O/S 0.250	2.555 – 2.605 mm (0.1006 – 0.1026 in.)
	Main journal oil clearance	STD STD	0.034 – 0.065 mm (0.0013 – 0.0026 in.)
		U/S 0.25, 0.50	0.033 – 0.079 mm (0.0013 – 0.0031 in.)
		Maximum	0.10 mm (0.0039 in.)
	Main journal diameter	STD	61.985 – 62.000 mm (2.4403 – 2.4409 in.)
		U/S 0.25	61.745 – 61.755 mm (2.4309 – 2.4413 in.)
		U/S 0.50	61.495 – 61.505 mm (2.4211 – 2.4215 in.)
	Main bearing center wall thickness		
	Reference	STD Mark 1	1.979 – 1.983 mm (0.0779 – 0.0781 in.)
		Mark 2	1.983 – 1.987 mm (0.0781 – 0.0782 in.)
		Mark 3	1.987 – 1.991 mm (0.0782 – 0.0784 in.)
	Crank pin diameter		
	2L	STD	52.988 – 53.000 mm (2.0861 – 2.0866 in.)
		U/S 0.25	52.745 – 52.755 mm (2.0766 – 2.0770 in.)
		U/S 0.50	52.495 – 52.505 mm (2.0667 – 2.0671 in.)
	3L	STD	54.988 – 55.000 mm (2.1649 – 2.1654 in.)
		U/S 0.25	54.745 – 54.755 mm (2.1553 – 2.1557 in.)
		U/S 0.50	54.495 – 54.505 mm (2.1455 – 2.1459 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.)

TORQUE SPECIFICATION

EGDO6-1X

Part tightened		N·m	kgf·cm	ft·lbf
Injection pump x Timing belt case		20.5	210	15
Injection pump x Injection pump stay		18	185	13
Injection pipe x Injection pump		24.5	250	18
Plug bolt x Distributive head plug on injection pump		17	170	12
Intake flange x Intake manifold		12	120	9
No.2 idler pulley x Cylinder block		44	450	33
Injection pump drive pulley x Injection pump		64	650	47
Camshaft timing pulley x Camshaft		98	1,000	72
No.1 idler pulley x Cylinder block	12 mm head	19	195	14
	14 mm head	44	450	33
Cylinder head x Cylinder block	1st	78	800	58
	2nd	Turn 90°	Turn 90°	Turn 90°
	3rd	Turn 90°	Turn 90°	Turn 90°
Cylinder head cover x Cylinder head		12	120	9
No.2 cylinder head cover x Cylinder head cover		12	120	9
Exhaust manifold x Cylinder head		52	530	38
Exhaust manifold heat insulator x Exhaust manifold		12	120	9
Exhaust manifold heat insulator x Oil filter bracket		19	195	14
Intake manifold x Cylinder head		24	240	17
Engine hanger x Cylinder head	LH	59	600	43
	RH (Reference)	37	380	27

Water outlet housing x Cylinder head		19	195	14
No.2 timing belt cover x Cylinder head		18	185	13
Glow plug x Cylinder head		13	130	9
Camshaft oil seal retainer x Cylinder head		18	185	13
Camshaft bearing cap x Cylinder head		25	255	18
Crankshaft pulley x Crankshaft		235	2,400	173
Main bearing cap x Cylinder block		103	1,050	76
Connecting rod cap x Connecting rod	1st	54	550	40
	2nd	Turn 90°	Turn 90°	Turn 90°
Rear oil seal retainer x Cylinder block		13	130	9
Union for alternator hose x Cylinder		32	330	24
Fan belt adjusting bar x Cylinder block		45	460	33
Engine mounting bracket x Cylinder block		39	400	29
Alternator bracket x Cylinder block		39	400	29
Rear end plate x Cylinder block		12	120	9
Flywheel x Crankshaft	M/T	123	1,250	90
Drive plate x Crankshaft	A/T	98	1,000	72