SERVICE SPECIFICATIONS

SERVICE DATA

EG0VT-04

Tune—up	Engine oil API grade		SG or better
	Battery specific gravity		1.25 — 1.27
			(when fully charged at 20°C (68°F))
	High—tension cord resistance	Limit	25 kΩ per cord
	Spark plug (Recommended spark plug)	ND	K16R—U
		NGK	BKR5EYA
	Spark plug (Correct electrode gap)		0.8 mm (0.031 in.)
	Alternator drive belt tension		
	New belt		11 — 15 mm (0.43 — 0.59 in.)
	Used belt		15 — 20 mm (0.59 — 0.79 in.)
	Alternator drive belt tension with SST		
	New belt		33 — 57 kgf
	Used belt		15 — 35 kgf
	Valve clearance (Cold)	Intake	mm (0.006 — 0.010 in.)
		Exhaust	0.25 — 0.35 mm (0.010 — 0.014 in.)
	Ignition timing		3° BTDC @ idle
	Idle speed		650 ± 50 rpm
	Idle CO concentration (General)		1.5 ± 0.5 %
	Fast idle speed (G.C.C.)		900 rpm
	Fast Idle speed (Others)		1,200 rpm
	DP setting speed		1,500 rpm
	TP setting speed		1,200 rpm
Compression pressure	at 250 rpm — STD	1FZ—FE	1,176 kPa (12.0 kgf/cm², 171 psi) or more
		1FZ—F (Low octane model)	900 kPa (9.2 kgf/cm², 131 psi) or more
		(Others)	1,030 kPa (10.5 kgf/cm², 149 psi) or more
	at 250 rpm — Limit	1FZ—FE	882 kPa (9.0 kgf/cm², 128 psi)
		1FZ—F	785 kPa (8.0 kgf/cm², 114 psi)
	Difference of pressure betweeneach cylinder		98 kPa (1.0 lgf/cm², 14 psi) or less
Intake manifold vacuum	at idle speed		63 kPa (473 mmHg, 18.6 in.Hg)
Cylinder head	Warpage — Cylinder block side (Limit)		0.15 mm (0.0059 in.)
	Warpage — Manifold side (Limit)		0.10 mm (0.0039 in.)
	Valve seat — Refacing angle (Intake)		30°, 45°, 75°
	Valve seat — Refacing angle (Exhaust)		45°, 75°
	Valve seat — Contacting angle		45°
	Valve seat — Contacting width (Intake)		1.2 — 1.6 mm (0.047 — 0.063 in.)
	Valve seat — Contacting width (Exhaust)		1.0 — 1.4 mm (0.039 — 0.055 in.)
	Cylinder head bolt outside diametr	STD	10.85 — 11.00 mm (0.4272 — 0.4331 in.)
		Limit	10.6 mm (0.417 in.)
Valve guide bushing	Inside diameter		7.010 — 7.030 mm (0.2760 — 0.2768 in.)
	Outside diameter (for repair part)	STD	11.492 — 11.513 mm (0.4524 — 0.4533 in.)
		O/S 0.05	11.542 — 11.563 mm (0.4544 — 0.4552 in.)
	Protrusion height		8.2 — 8.6 mm (0.323 — 0.339 in.)
	Replacing temperature (Cylinder head side)		80 — 100°C (176 —212°F)

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Valve	Valve overall length 1FZ–FE		
		STD (Intake)	98.4 mm (3.874 in.)
		(Exhaust)	97.9 mm (3.854 in.)
		Limit (Intake)	97.9 mm (3.854 in.)
		(Exhaust)	97.4 mm (3.835 in.)
	Valve overall length 1FZ–F		
		STD (Intake)	98.7 mm (3.886 in.)
		(Exhaust)	98.1 mm (3.862 in.)
		Limit (Intake)	98.2 mm (3.866 in.)
		(Exhaust)	97.6 mm (3.843 in.)
	Valve face angl		44.5°
	Stem diameter	(Intake)	6.970 – 6.985 mm (0.2744 – 0.2750 in.)
		(Exhaust)	6.965 – 6.980 mm (0.2742 – 0.2748 in.)
	Stem oil clearance	STD (Intake)	0.025 – 0.060 mm (0.0010 – 0.0024 in.)
		(Exhaust)	0.030 – 0.065 mm (0.0012 – 0.0026 in.)
		Limit (Intake)	0.08 mm (0.0031 in.)
		(Exhaust)	0.10 mm (0.0039 in.)
	Margin thickness 1FZ–FE		
		STD	1.2 mm (0.047 in.)
		Limit	1.0 mm (0.039 in.)
	Margin thickness 1FZ–F		
		STD (Intake)	1.5 mm (0.059 in.)
		(Exhaust)	1.4 mm (0.055 in.)
		Limit	1.0 mm (0.039 in.)
Valve spring	Deviation	Limit	2.0 mm (0.079 in.)
	Free length		43.94 – 45.06 mm (1.7299 – 1.7740 in.)
	Installed tension at 36.5 mm (1.437 in.)		214 – 238 N (21.8 – 24.2 kgf, 48.1 – 53.4 lbf)
Valve lifter	Lifter diameter		33.966 – 33.976 mm (1.3372 – 1.3376 in.)
	Lifter bore diameter		34.000 – 34.021 mm (1.3386 – 1.3394 in.)
	Oil clearance	STD	0.024 – 0.055 mm (0.0009 – 0.0022 in.)
		Limit	0.07 mm (0.0028 in.)
Manifold	Warpage	Limit	0.30 mm (0.0118 in.)
Air intake chamber	Warpage	Limit	0.30 mm (0.0118 in.)
Camshaft	Thrust clearance	STD	0.030 – 0.080 mm (0.0012 – 0.0031 in.)
		Limit	0.10 mm (0.0039 in.)
	Journal oil clearance	STD	0.0025 – 0.062 mm (0.0010 – 0.0024 in.)
		Limit	0.10 mm (0.0039 in.)
	Journal diameter		26.959 – 26.975 mm (1.0614 – 1.0620 in.)
	Circle rounout	Limit	0.06 mm (0.0024 in.)
	Cam lobe height	STD	50.61 – 50.71 mm (1.9925 – 1.9965 in.)
		Limit	50.51 mm (1.9886 in.)
	Camshaft gear backlash	STD	0.020 – 0.200 mm (0.0008 – 0.0079 in.)
		Limit	0.30 mm (0.0188 in.)
	Camshaft gear spring end free distance		18.2 – 18.8 mm (0.717 – 0.740 in.)
Spark plug tube	Protrusion		45.5 mm (1.791 in.)

Oil pump drive shaft gear	Thrust clearance	STD	0.050 – 0.150 mm (0.0020 – 0.0059 in.)
		Limit	0.30 mm (0.0118 in.)
Chain and timing gear	Chain elongation at 16 links	Limit	146.6 mm (5.772 in.)
	Crankshaft timing gear wear (w/ chain)	Limit	126.0 mm (4.961 in.)
	Camshaft timing gear wear (w/ chain)	Limit	65.4 mm (2.575 in.)
Chain tensioner slipper and vibration damper	Wear	Limit	1.0 mm (0.039 in.)
Cylinder block	Cylinder head surface warpage	Limit	0.05 mm (0.0020 in.)
	Cylinder bore diameter	STD (Mark 1)	100.000 – 100.010 mm (3.9370 – 3.9374 in.)
		(Mark 2)	100.010 – 100.020 mm (3.9374 – 3.9378 in.)
		(Mark 3)	100.020 – 100.030 mm (3.9378 – 3.9382 in.)
		Limit (STD)	100.23 mm (3.9461 in.)
		(O/S 0.50)	100.73 mm (3.9658 in.)
	Main bearing bolt outside diameter	STD	10.85 – 11.00 mm (0.4271 – 0.4331 in.)
		Limit	10.6 mm (0.417 in.)
Piston and piston ring	Piston diameter	STD (Mark 1)	99.950 – 99.960 mm (3.9350 – 3.9354 in.)
		(Mark 2)	99.960 – 99.970 mm (3.9354 – 3.9358 in.)
		(Mark 3)	99.970 – 99.980 mm (3.9358 – 3.9362 in.)
		O/S 0.50	100.450 – 100.480 mm (3.9547 – 3.9559 in.)
		1.00	100.950 – 100.980 mm (3.9744 – 3.9756 in.)
	Piston oil clearance	STD	0.040 – 0.060 mm (0.0016 – 0.0024 in.)
	Piston ring groove clearance	No.1	0.040 – 0.080 mm (0.0016 – 0.0031 in.)
		No.2	0.030 – 0.070 mm (0.0012 – 0.0028 in.)
	Piston ring end gap	STD (No.1)	0.300 – 0.520 mm (0.0118 – 0.0205 in.)
		(No.2)	0.450 – 0.670 mm (0.0177 – 0.0264 in.)
		(Oil)	0.150 – 0.520 mm (0.0059 – 0.0205 in.)
		Limit (No.1)	1.12 mm (0.0441 in.)
		(No.2)	1.17 mm (0.0461 in.)
		(Oil)	1.12 mm (0.0441 in.)
	Piston pin installing temperature		80 – 90°C (176 – 194°F)

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Connecting rod	Thrust clearance	STD	0.160 – 0.262 mm (0.0063 – 0.0103 in.)
		Limit	0.362 mm (0.0143 in.)
	Connecting rod bearing center wall thickness		
		STD (Mark 2)	2.489 – 2.492 mm (0.0980 – 0.0981 in.)
		STD (Mark 3)	2.492 – 2.495 mm (0.0981 – 0.0982 in.)
		STD (Mark 4)	2.495 – 2.498 mm (0.0982 – 0.0983 in.)
		STD (Mark 5)	2.498 – 2.501 mm (0.0983 – 0.0985 in.)
		STD (Mark 6)	2.501 – 2.504 mm (0.0985 – 0.0986 in.)
	Connecting rod oil clearance		
		STD (STD)	0.032 – 0.050 mm (0.0013 – 0.0020 in.)
		(U/S 0.25)	0.033 – 0.073 mm (0.0013 – 0.0029 in.)
		Limit	0.10 mm (0.0039 in.)
	Rod bending Limit per 100 mm (3.94 in.)		0.05 mm (0.0020 in.)
	Rod twist Limit per 100 mm (3.94 in.)		0.15 mm (0.0059 in.)
	Bushing inside diameter		26.008 – 26.020 mm (1.0239 – 1.0244 in.)
	Piston pin diameter		26.000 – 26.012 mm (1.0236 – 1.0241 in.)
	Piston pin oil clearance	STD	0.004 – 0.012 mm (0.0002 – 0.0005 in.)
		Limit	0.05 mm (0.0020 in.)
	Connecting rod bolt outside diameter	STD	8.40 – 8.60 mm (0.3307 – 0.3386 in.)
		Limit	8.0 mm (0.315 in.)
Crankshaft	Thrust clearance	STD	0.020 – 0.0220 mm (0.0008 – 0.0087 in.)
		Limit	0.30 mm (0.0118 in.)
	Thrust washer thickness	(STD)	2.440 – 2.490 mm (0.0961 – 0.0980 in.)
		(O/S 0.125)	2.503 – 2.553 mm (0.0985 – 0.1005 in.)
		(O/S 0.250)	2.565 – 2.615 mm (0.1010 – 0.1030 in.)
	Main journal oil clearance	STD (STD)	0.042 – 0.060 mm (0.0017 – 0.0024 in.)
		(U/S 0.25)	0.041 – 0.081 mm (0.0016 – 0.0032 in.)
		Limit	0.10 mm (0.0039 in.)
	Main journal diameter	STD	68.982 – 69.000 mm (2.7158 – 2.7165 in.)
		U/S 0.25	68.745 – 68.755 mm (2.7065 – 2.7069 in.)
	Main bearing center wall thickness		
		STD (Mark 2)	2.489 – 2.492 mm (0.0980 – 0.0981 in.)
		STD (Mark 3)	2.492 – 2.495 mm (0.0981 – 0.0982 in.)
		STD (Mark 4)	2.495 – 2.498 mm (0.0982 – 0.0983 in.)
		STD (Mark 5)	2.498 – 2.501 mm (0.0983 – 0.0985 in.)
		STD (Mark 6)	2.501 – 2.504 mm (0.0985 – 0.0986 in.)
	Crank pin diameter	STD	56.982 – 57.000 mm (2.2434 – 2.2441 in.)
		U/S 0.25	56.745 – 56.755 mm (2.2341 – 2.2344 in.)
	Circle runout	Limit	0.06 mm (0.0024 in.)
	Main journal taper and out–of–round	(Limit)	0.02 mm (0.0008 in.)
	Crank pin tape and out–of–round	(Limit)	0.02 mm (0.0008 in.)

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TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
Air intake connector x Cylinder head	20	200	14
Air intake connector x Carburetor	5.4	55	48 in.·lbf
Distributor x Cylinder head	21	210	15
Throttle body x Air intake chamber	21	210	15
Spark plug x Cylinder head	20	200	14
Fuel filter x Intake manifold	21	210	15
Intake manifold x Cylinder head	21	210	15
Heater inlet pipe x Intake manifold	21	210	15
EGR pipe x Cylinder head	21	210	15
Cylinder head x Cylinder block (1st)	39	400	29
Cylinder head x Cylinder block (2st)	Turn 90°	Turn 90°	Turn 90°
Cylinder head x Cylinder block (3rd)	Turn 90°	Turn 90°	Turn 90°
Cylinder head x Timing chain cover	21	210	15
Camshaft beairng cap x Cylinder head	16	160	12
Camshaft timing gear x Camshaft	74	750	54
Chain tensioner x Cylinder head	21	210	15
Water by—pass outlet x Cylinder head	21	210	15
Engine hanger x Cylinder head	41	420	30
Exhaust manifold x Cylinder head	39	400	29
Heat insulator x Exhaust manifold	19	195	14
PAIR reed valve x Cylinder head	20	200	14
Air pipe x PAIR reed valve	21	210	15
Air pipe x Exhaust manifold	21	210	15
Air pipe x Cylinder head	20	200	14
Heater pipe x Timing chain cover	21	210	15
Heater pipe x Cylinder head	20	200	14
Front exhaust pipe x Exhaust manifold	62	630	46
Intake manifold x Cylinder head	21	210	15
No.1 support bracket x Transmission	39	400	29
No.1 support bracket clamp bolt	19	195	14
Front exhaust pipe x No.3 front exhaust pipe	39	400	29
Fuel inlet hose x Fuel filter	29	300	22
Delivery pipe x Intake manifold	21	210	15
No.1 fuel pipe x Delivery pipe (Union bolt)	29	300	22
No.1 fuel pipe x Delivery pipe (Bolt)	20	200	14
No.1 fuel pipe x Fuel filter	29	300	22
Fuel return pipe x Intake manifold	20	200	14
Emission control valve set assembly x Intake manifold	20	200	14
Air intake chamber x Intake manifold	21	210	15
Oil dipstick guide x Intake manifold	20	200	14
Oil dipstick guide x No.1 oil pan	20	200	14
Heater inlet pipe x Air intake chamber	20	200	14
EGR pipe x EGR valve	64	650	47
No.2 water by—pass pipe x Cylinder head	20	200	14
No.2 water by—pass pipe x Engine hanger	20	200	14
Water outlet x Cylinder head	21	210	15
Alternator bracket x Cylinder head	43	440	32

Distributor x Cylinder head	21	210	15
PS reservoir tank x Cylinder head	20	200	14
Oil jet x Cylinder block	20	200	14
Chain tensioner slipper x Cylinder block	69	700	51
Vibration damper x Cylinder block	20	200	14
Timing chain cover x Cylinder block	21	210	15
Drive belt idler pulley x Timing chain cover	43	440	32
Crankshaft pulley x Crankshaft	412	4,200	304
No.1 oil pan x Cylinder block (14 mm head bolt)	43	440	32
No.1 oil pan x Cylinder block (12 mm head bolt)	20	200	14
No.1 oil pan x Timing chain cover	20	200	14
No.2 oil pan x No.1 oil pan (Bolt)	7.8	80	69 in.-lbf
No.2 oil pan x No.1 oil pan (Nut)	8.8	90	78 in.-lbf
Transmission housing x No.1 oil pan	72	730	53
Oil level sensor x No.1 oil pan	5.4	55	48 in.-lbf
Radiator pipe x No.1 oil pan	21	210	15
A/C compressor bracket x No.1 oil pan	37	375	27
A/C compressor bracket x Cylinder block	37	375	27
A/C compressor x A/C compressor bracket	25	250	18
Water pump x Timing chain cover	21	210	15
Main bearing cap x Cylinder block (1st)	74	750	54
Main bearing cap x Cylinder block (2nd)	Turn 90°	Turn 90°	Turn 90°
Connecting rod cap x Connecting rod (1st)	48	490	35
Connecting rod cap x Connecting rod (2nd)	Turn 90°	Turn 90°	Turn 90°
Oil nozzle x Cylinder bracket	25	250	18
Rear oil seal retainer x Cylinder block	20	200	14
Oil cooler cover x Cylinder block	21	210	15
LH engine mounting bracket x Cylinder block	69	700	51
LH insulator x LH engine mounting bracket	72	730	43
RH engine mounting bracket x Cylinder block	69	700	51
RH insulator x RH engine mounting bracket	72	730	43
PS pump x Cylinder block	36	370	27
Knock sensor x Cylinder block	44	450	33
Oil filter union x Cylinder block	44	450	33
Drive plate x Crankshaft	100	1,000	74
Transmission x Cylinder block	72	730	43
Transmission x No.1 oil pan	72	730	43
Torque converter clutch x Drive plate	55	550	41
A/T oil cooler pipe x Union (Transmission)	34	350	25
Starter x Transmission	39	400	29
Frame crossmember x Frame	61	620	45
Frame crossmember x Engine rear mounting insulator	74	750	54
Engine front mounting insulator x Frame	74	750	54
Transfer under cover x Frame crossmember	28	290	21
Transfer shift lever x Transmission	18	185	13
Transmission shift lever assembly x Body	5.4	55	48 in.-lbf
Transmission control rod x Control shaft lever	13	130	9
Front propeller shaft x Front differential	74	750	54
Front propeller shaft x Transfer	74	750	54

Rear propeller shaft x Rear differential	88	900	65
Rear propeller shaft x Transfer	88	900	65
Stabilizer bar bracket mounting bolt	18	185	13
Stabilizer bar x Axle carrier	25	260	19

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