

# SERVICE SPECIFICATIONS

	Page
MAINTENANCE .....	A-2
ENGINE MECHANICAL (3S-FE) .....	A-3
ENGINE MECHANICAL (3S-GE and 3S-GTE) .....	A-7
TURBOCHARGER SYSTEM (3S-GTE) .....	A-11
EFI SYSTEM (3S-FE) .....	A-12
EFI SYSTEM (3S-GE) .....	A-15
EFI SYSTEM (3S-GTE) .....	A-18
COOLING SYSTEM .....	A-21
LUBRICATION SYSTEM .....	A-21
IGNITION SYSTEM .....	A-22
STARTING SYSTEM .....	A-22
CHARGING SYSTEM .....	A-22
CLUTCH .....	A-23
MANUAL TRANSAXLE (S53) .....	A-24
MANUAL TRANSAXLE (E50F2) .....	A-27
AUTOMATIC TRANSAXLE (A140L, A140E) .....	A-33
PROPELLER SHAFT .....	A-40
FRONT AXLE AND SUSPENSION .....	A-41
REAR AXLE AND SUSPENSION .....	A-43
BRAKE SYSTEM .....	A-46
STEERING .....	A-48
BODY .....	A-50
LUBRICANT .....	A-51

**MAINTENANCE****Engine**

Drive belt tension						
Alternator	3S-FE	w/ A/C	New belt	175 ± 5 lb		
			Used belt	130 ± 10 lb		
		w/o A/C	New belt	125 ± 25 lb		
			Used belt	95 ± 20 lb		
	3S-GE and 3S-GTE	w/ A/C	New belt	175 ± 5 lb		
			Used belt	115 ± 20 lb		
		w/o A/C	New belt	150 ± 25 lb		
			Used belt	130 ± 25 lb		
PS pump			New belt	125 ± 10 lb		
			Used belt	80 ± 20 lb		
Engine coolant capacity (w/ Heater)						
	3S-FE		M/T	6.3 liters	6.7 US qts	5.5 Imp. qts
				A/T	6.2 liters	6.6 US qts
	3S-GE		M/T	6.2 liters	6.6 US qts	5.5 Imp. qts
				A/T	6.1 liters	6.4 US qts
	3S-GTE			6.4 liters	6.8 US qts	5.6 Imp. qts
Intercooler coolant capacity				1.6 liters	1.7 US qts	1.4 Imp. qts
Engine oil capacity (Drain and refill with oil filter change)						
	3S-FE and 3S-GTE			3.9 liters	4.1 US qts	3.4 Imp. qts
	3S-GTE			3.6 liters	3.8 US qts	3.2 Imp. qts
Spark plug						
Type	3S-FE		ND	Q16R-U11		
			NGK	BCPR5EY11		
	3S-GE		ND	PQ16R		
			NGK	BCPR5EP11		
	3S-GTE		ND	PQ16R8		
			NGK	BCPR5EP8		
Gap	3S-FE and 3S-GE			1.1 mm		
	3S-GTE			0.8 mm		
Firing order						
Valve clearance				1 – 3 – 4 – 2		
3S-FE		Intake		0.19 – 0.29 mm	0.007 – 0.011 in.	
		Exhaust		0.28 – 0.38 mm	0.011 – 0.015 in.	
3S-GE and 3S-GTE		Intake		0.15 – 0.25 mm	0.006 – 0.010 in.	
		Exhaust		0.20 – 0.30 mm	0.008 – 0.012 in.	
Idle speed (3S-GE)				750 rpm		

**Chassis**

Front and rear brake				
Pad thickness	Limit	1.0 mm		0.039 in.
Disc thickness				
Front	w/o A.B.S. Limit	21.0 mm		0.827 in.
	w/ A.B.S. and 4WD Limit	24.0 mm		0.945 in.
Rear	Limit	9.0 mm		0.354 in.
Disc runout	Limit	0.07 mm		0.0028 in.
Parking brake				
Lining thickness	Limit	1.0 mm		0.039 in.
Drum inside diameter				
Drum brake	Limit	201.0 mm		6.913 in.
Disc brake	Limit	171.0 mm		6.732 in.
Front axle and suspension				
Ball joint vertical play	Limit	0 mm		0 in.
Steering wheel freeplay		30 mm (1.18 in.) or less		
Torque specifications				
Front seat mount bolts		375 kg-cm	27 ft-lb	37 N·m
Engine mounting center member-to-body mount bolts		400 kg-cm	29 ft-lb	39 N·m
Front suspension lower crossmember-to-body mount nuts		2,125 kg-cm	154 ft-lb	208 N·m
Rear suspension lower crossmember-to-body mount nuts (4WD)		1,620 kg-cm	117 ft-lb	159 N·m

**ENGINE MECHANICAL (3S-FE)****Specifications**

Idle speed				700 ± 50 rpm
Intake manifold vacuum		at Idling		450 mmHg (17.72 in.Hg, 60.0 kPa) or more
Compression pressure		at 250 rpm	STD	12.5 kg/cm <sup>2</sup> (178 psi, 1,226 kPa) or more
			Limit	10.0 kg/cm <sup>2</sup> (142 psi, 981 kPa)
		Difference of pressure between each cylinder		1.0 kg/cm <sup>2</sup> (14 psi, 98 kPa) or less
Cylinder head	Cylinder block side warpage	Limit		0.05 mm 0.0020 in.
	Manifold side warpage	Limit		0.08 mm 0.0031 in.
	Valve seat	Refacing angle		30°, 45°, 75°
		Contacting angle		45°
		Contacting width		1.0 – 1.4 mm 0.039 – 0.055 in.
Valve guide bushing	Inside diameter			6.010 – 6.030 mm 0.2366 – 0.2374 in.
	Outside diameter	STD		11.048 – 11.059 mm 0.4350 – 0.4354 in.
		O/S	0.05	11.098 – 11.109 mm 0.4369 – 0.4374 in.
Valve	Valve overall length	STD	Intake	100.60 mm 3.9606 in.
			Exhaust	100.45 mm 3.9547 in.
		Limit	Intake	100.1 mm 3.941 in.
			Exhaust	100.0 mm 3.937 in.
	Valve face angle			44.5°
	Stem diameter		Intake	5.970 – 5.985 mm 0.2350 – 0.2356 in.
		Exhaust	5.965 – 5.980 mm 0.2348 – 0.2354 in.	

## Specifications (Cont'd)

Valve (cont'd)	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	STD	Intake	0.8 – 1.2 mm	0.031 – 0.047 in.
	Limit	Intake	0.5 mm	0.020 in.	
Valve spring	Free length			45.0 mm	1.772 in.
	Installed load	at 34.7 mm (1.366 in.)		16.7 – 19.3 kg (36.8 – 42.5 lb, 164 – 189 N)	
	Squareness		Limit	2.0 mm	0.075 in.
Valve lifter	Lifter diameter			27.975 – 27.985 mm	1.1014 – 1.1018 in.
	Cylinder head lifter bore diameter			28.000 – 28.021 mm	1.1024 – 1.1032 in.
	Oil clearance		STD	0.015 – 0.046 mm	0.0005 – 0.0018 in.
			Limit	0.07 mm	0.0028 in.
Manifold	Manifold surface warpage		Limit	0.30 mm	0.0118 in.
Camshaft and gear	Thrust clearance	STD	Intake	0.045 – 0.100 mm	0.0018 – 0.0039 in.
			Exhaust	0.030 – 0.085 mm	0.0012 – 0.0033 in.
	Limit	Intake	0.12 mm	0.0047 in.	
		Exhaust	0.10 mm	0.0039 in.	
	Journal oil clearance	STD		0.025 – 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 runout		Limit	0.04 mm	0.0016 in.
	Cam lobe height	STD	Intake	34.910 – 35.010 mm	1.3744 – 1.3783 in.
			Exhaust	35.560 – 35.660 mm	1.4000 – 1.4039 in.
	Limit	Intake	34.80 mm	1.3701 in.	
		Exhaust	35.45 mm	1.3957 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			22.5 – 22.9 mm	0.886 – 0.902 in.	
Idler pulley tension spring	Free length			46.1 mm	1.815 in.
	Installed load	at 51.9 mm (2.043 in.)		6.0 – 7.0 kg (13.2 – 15.4 lb, 59 – 69 N)	
Cylinder block	Cylinder head surface warpage		Limit	0.05 mm	1.0020 in.
	Cylinder bore diameter	STD	Mark 1	86.000 – 86.010 mm	3.3858 – 3.3862 in.
			Mark 2	86.010 – 86.020 mm	3.3862 – 3.3866 in.
			Mark 3	86.020 – 86.030 mm	3.3866 – 3.3870 in.
	Limit			86.23 mm	3.3949 in.
Piston and piston ring	Piston diameter		Mark 1	85.945 – 85.955 mm	3.3836 – 3.3840 in.
			Mark 2	85.955 – 85.965 mm	3.3840 – 3.3844 in.
			Mark 3	85.965 – 85.975 mm	3.8844 – 3.3848 in.
	Piston oil clearance	STD		0.045 – 0.065 mm	0.0018 – 0.0026 in.
		Limit		0.085 mm	0.0033 in.
Ring to ring groove clearance			0.030 – 0.070 mm	0.0012 – 0.0028 in.	

## Specifications (Cont'd)

Piston and piston ring (cont'd)	Piston ring end gap	STD	No. 1	0.270 – 0.500 mm	0.0106 – 0.0197 in.	
			No. 2	0.270 – 0.510 mm	0.0106 – 0.0201 in.	
			Oil	0.200 – 0.550 mm	0.0079 – 0.0217 in.	
		Limit	No. 1	1.10 mm	0.0433 in.	
			No. 2	1.11 mm	0.0437 in.	
			Oil	1.15 mm	0.0453 in.	
Connecting rod	Thrust clearance	STD		0.160 – 0.312 mm	0.0063 – 0.0123 in.	
		Limit		0.35 mm	0.0138 in.	
	Connecting rod bearing center wall thickness	STD	Mark 1	1.484 – 1.488 mm	0.0584 – 0.0586 in.	
			Mark 2	1.488 – 1.492 mm	0.0586 – 0.0587 in.	
			Mark 3	1.492 – 1.496 mm	0.0587 – 0.0589 in.	
	Connecting rod oil clearance	STD	STD	0.024 – 0.055 mm	0.0009 – 0.0022 in.	
			U/S 0.25 (3S-FE only)	0.023 – 0.069 mm	0.0009 – 0.0027 in.	
		Limit		0.08 mm	0.0031 in.	
	Rod bending per 100 mm (3.94 in.)	Limit		0.05 mm	0.0020 in.	
	Rod twist per 100 mm (3.94 in.)	Limit		0.15 mm	0.0059 in.	
Crankshaft	Thrust clearance	STD		0.020 – 0.220 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.	
	Main journal oil clearance	STD	No. 3	STD	0.025 – 0.044 mm	0.0010 – 0.0017 in.
				U/S 0.25 (3S-FE only)	0.027 – 0.067 mm	0.0011 – 0.0026 in.
			Others	STD	0.015 – 0.034 mm	0.0006 – 0.0013 in.
				U/S 0.25 (3S-FE only)	0.019 – 0.059 mm	0.0007 – 0.0023 in.
		Limit			0.08 mm	0.0031 in.
	Main journal diameter	STD			54.988 – 55.003 mm	2.1649 – 2.1655 in.
			U/S 0.25 (3S-FE only)		54.745 – 54.755 mm	2.1553 – 2.1557 in.
	Main bearing center wall thickness	STD	No. 3	Mark 1	1.992 – 1.995 mm	0.0784 – 0.0785 in.
				Mark 2	1.995 – 1.998 mm	0.0785 – 0.0787 in.
				Mark 3	1.998 – 2.001 mm	0.0787 – 0.0788 in.
				Mark 4	2.001 – 2.004 mm	0.0788 – 0.0789 in.
				Mark 5	2.004 – 2.007 mm	0.0789 – 0.0790 in.
		Others	Mark 1	1.997 – 2.000 mm	0.0786 – 0.0787 in.	
			Mark 2	2.000 – 2.003 mm	0.0787 – 0.0789 in.	
			Mark 3	2.003 – 3.006 mm	0.0789 – 0.0790 in.	
			Mark 4	2.006 – 2.009 mm	0.0790 – 0.0791 in.	
			Mark 5	2.009 – 2.012 mm	0.0791 – 0.0792 in.	
Crank pin diameter	STD			47.985 – 48.000 mm	1.8892 – 1.8898 in.	
		U/S 0.25 (3S-FE only)		47.745 – 47.755 mm	1.8797 – 1.8801 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 journal taper and out-of-round	Limit		0.02 mm	0.0008 in.		

## Torque Specifications

Part tightened	kg-cm	ft-lb	N-m	
Oil pump pulley x Oil pump drive shaft	290	21	28	
No. 1 idler pulley x Cylinder head	425	31	42	
No. 2 idler pulley x Cylinder block	425	31	42	
Camshaft timing pulley x Camshaft	550	40	54	
Crankshaft pulley x Crankshaft	1,100	80	108	
Cylinder head x Cylinder block	650	47	64	
Spark plug tube x Cylinder head	400	29	39	
Camshaft bearing cap x Cylinder head	190	14	19	
Cylinder head cover x Cylinder head	230	17	23	
Intake manifold x Cylinder head	195	14	19	
Intake manifold stay x Cylinder head	195	14	19	
Intake manifold stay x Cylinder block	425	31	42	
EGR valve x Intake manifold	130	9	13	
EGR pipe x Cylinder head	600	43	59	
Water outlet x Cylinder head	150	11	15	
Exhaust manifold x Catalytic converter	300	22	29	
Exhaust manifold x Cylinder head	425	31	42	
Engine hanger x Cylinder head	425	31	42	
Alternator bracket x Cylinder head	425	31	42	
Main bearing cap x Cylinder block	600	43	59	
Connecting rod cap x Connecting rod	500	36	49	
Rear oil seal retainer x Cylinder block	95	82 in.-lb	9.3	
Rear end plate x Cylinder block	95	82 in.-lb	9.3	
Flywheel x Crankshaft (M/T)	1,000	72	98	
Drive plate x Crankshaft (A/T)	850	61	83	
Suspension lower crossmember x Body	19 mm head bolt	2,125	154	208
	14 mm head bolt	400	29	39
Engine mounting insulator x Body	Through bolt	800	58	78
	Others	530	38	52
Engine mounting insulator x Engine bracket	Through bolt	800	58	78
	Bolt (Front A/T)	490	35	48
	Bolt (Others)	530	38	52
Engine mounting bracket x Cylinder block	530	38	52	
Engine mounting bracket x Transaxle	530	38	52	
Engine mounting center member x Body	400	29	39	
Engine mounting center member x Engine mounting insulator	400	29	39	
Engine LH mounting stay x Engine mounting bracket	210	15	21	
Engine LH mounting stay x Engine mounting insulator	210	15	21	
Suspension upper brace x Body	Bolt	210	15	21
	Nut	375	27	37
Exhaust front pipe x Catalytic converter	630	46	62	
Exhaust front pipe x Exhaust center pipe	440	32	43	

## ENGINE MECHANICAL (3S-GE and 3S-GTE)

## Specifications

Idle speed (3S-GTE)				750 ± 50 rpm		
Intake manifold vacuum	at Idle speed	3S-GE 3S-GTE		440 mmHg (17.32 in.Hg, 58.7 kPa) or more 450 mmHg (17.72 in.Hg, 58.7 kPa) or more		
Compression pressure	at 250 rpm	STD Limit	3S-GE 3S-GTE	12.5 kg/cm <sup>2</sup> (178 psi, 1,226 kPa) or more 10.0 kg/cm <sup>2</sup> 142 psi 981 kPa 9.0 kg/cm <sup>2</sup> 128 psi 883 kPa		
	Difference of pressure between each cylinder			1.0 kg/cm <sup>2</sup> (14 psi, 98 kPa) or less		
Cylinder head	Cylinder block side warpage	Limit		0.2 mm	0.008 in.	
	Manifold side warpage	Limit	Intake Exhaust	0.2 mm 0.3 mm	0.008 in. 0.012 in.	
	Valve seat	Refacing angle		30°, 45°, 75°		
		Contacting angle		45°		
		Contacting width		1.0 – 1.4 mm	0.039 – 0.055 in.	
Valve guide bushing	Inside diameter			6.000 – 6.018 mm	0.2362 – 0.2369 in.	
	Outside diameter	STD		11.033 – 11.044 mm	0.4344 – 0.4348 in.	
		O/S 0.05		11.083 – 11.094 mm	0.4363 – 0.4368 in.	
Valve	Valve overall length	STD	Intake Exhaust	102.85 mm 101.90 mm	4.0492 in. 4.0118 in.	
		Limit	Intake Exhaust	102.15 mm 101.20 mm	4.0216 in. 3.9842 in.	
				44.5°		
			Intake Exhaust	5.960 – 5.975 mm 5.955 – 5.970 mm	0.2346 – 0.2352 in. 0.2344 – 0.2350 in.	
	Valve face angle					
	Stem diameter		Intake Exhaust	5.960 – 5.975 mm 5.955 – 5.970 mm	0.2346 – 0.2352 in. 0.2344 – 0.2350 in.	
	Stem oil clearance	STD	Intake Exhaust	0.025 – 0.058 mm 0.030 – 0.063 mm	0.0010 – 0.0023 in. 0.0012 – 0.0025 in.	
		Limit	Intake Exhaust	0.08 mm 0.10 mm	0.0031 in. 0.0039 in.	
			STD		0.8 – 1.2 mm	0.031 – 0.047 in.
			Limit		0.5 mm	0.020 in.
	Valve spring	Free length	3S-GE		42.62 mm	1.6779 in.
3S-GTE				45.30 mm	1.7835 in.	
Installed load		at 34.7 mm (1.366 in.)				
		3S-GE 3S-GTE		16.1 – 18.9 kg (35.5 – 41.7 lb, 158 – 185 N) 18.4 – 21.6 kg (40.6 – 47.6 lb, 180 – 212 N)		
Squareness	Limit		2.0 mm	0.079 in.		
Valve lifter	Lifter diameter			27.975 – 27.985 mm	1.1014 – 1.1018 in.	
	Lifter bore diameter			28.000 – 28.021 mm	1.1024 – 1.1032 in.	
	Oil clearance	STD		0.015 – 0.046 mm	0.0006 – 0.0018 in.	
		Limit		0.07 mm	0.0028 in.	
Manifold	Warpage	Limit	Intake Exhaust	0.3 mm 1.0 mm	0.012 in. 0.039 in.	

## Specifications (Cont'd)

Air control valve	Warpage	Limit	0.2 mm	0.008 in.		
Camshaft	Thrust clearance	STD	0.120 – 0.290 mm	0.0047 – 0.0114 in.		
		Limit	0.30 mm	0.0118 in.		
	Journal oil clearance	STD	0.025 – 0.062 mm	0.0010 – 0.0024 in.		
		Limit	0.08 mm	0.0031 in.		
	Journal diameter		26.959 – 26.975 mm	1.0614 – 1.0620 in.		
	Circle runout	Limit	0.06 mm	0.0024 in.		
	Cam lobe height	3S-GE	35.510 – 35.610 mm	1.3980 – 1.4020 in.		
3S-GTE		35.460 – 35.560 mm	1.3961 – 1.4000 in.			
Limit		35.40 mm	1.3937 in.			
Idler pulley tension spring	Free length		43.8 mm	1.724 in.		
	Installed load at 51.86 mm (2.0417 in.)		7.54 kg      16.6 lb	74 N		
Cylinder block			See page A-4			
Piston and piston ring	Piston diameter	Mark 1	85.960 – 85.990 mm	3.3842 – 3.3846 in.		
		Mark 2	85.970 – 85.980 mm	3.3846 – 3.3850 in.		
		Mark 3	85.980 – 85.990 mm	3.3850 – 3.3854 in.		
	Piston oil clearance	STD	0.030 – 0.050 mm	0.0012 – 0.0020 in.		
		Limit	0.07 mm	0.0028 in.		
	Ring to ring groove clearance	3S-GE	No. 1	0.030 – 0.070 mm	0.0012 – 0.0028 in.	
			No. 2	0.020 – 0.060 mm	0.0008 – 0.0024 in.	
		3S-GTE	No. 1	0.040 – 0.080 mm	0.0015 – 0.0031 in.	
			No. 2	0.030 – 0.070 mm	0.0012 – 0.0028 in.	
	Piston ring end gap	STD	3S-GE	No. 1	0.330 – 0.550 mm	0.0130 – 0.0217 in.
				No. 2	0.450 – 0.700 mm	0.0177 – 0.0276 in.
		Oil	3S-GE	No. 1	0.200 – 0.600 mm	0.0079 – 0.0236 in.
				No. 2	0.330 – 0.550 mm	0.0130 – 0.0217 in.
		3S-GTE	No. 1	0.330 – 0.550 mm	0.0130 – 0.0217 in.	
			No. 2	0.450 – 0.670 mm	0.0177 – 0.0264 in.	
		Oil	3S-GTE	No. 1	0.200 – 0.600 mm	0.0079 – 0.0236 in.
				No. 2	0.330 – 0.550 mm	0.0130 – 0.0217 in.
Limit		3S-GE	No. 1	0.85 mm	0.0335 in.	
			No. 2	1.00 mm	0.0394 in.	
	3S-GTE	No. 1	0.90 mm	0.0354 in.		
		No. 2	0.97 mm	0.0382 in.		
Oil	3S-GTE	No. 1	0.85 mm	0.0335 in.		
		No. 2	0.97 mm	0.0382 in.		
Connecting rod	Thrust clearance		See page A-5			
	Connecting rod bearing center wall thickness		See page A-5			
	Bearing oil clearance		See page A-5			
	Rod bent	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			22.005 – 22.017 mm	0.8663 – 0.8668 in.	
	Piston pin diameter			21.997 – 22.009 mm	0.8660 – 0.8665 in.	
	Piston pin oil clearance	STD		0.005 – 0.011 mm	0.0002 – 0.0004 in.	
Limit			0.05 mm	0.0020 in.		
Crankshaft			See page A-5			



## Torque Specifications (3S-GE)

Part tightened	kg-cm	ft-lb	N-m	
Oil pump pulley x Oil pump drive shaft	290	21	28	
No. 1 idler pulley x Cylinder head	440	32	43	
No. 2 idler pulley x Cylinder block	440	32	43	
Camshaft timing pulley x Camshaft	600	43	59	
Crankshaft pulley x Crankshaft	1,100	80	108	
Cylinder head x Cylinder block	550	40	53	
Camshaft bearing cap x Cylinder head	190	14	19	
Cylinder head cover x Cylinder head	55	48 in.-lb	5.4	
Intake manifold x Cylinder head	195	14	19	
No. 1 intake manifold stay x Intake manifold	195	14	19	
No. 1 intake manifold stay x Cylinder block	260	19	25	
No. 2 intake manifold stay x Cylinder head	195	14	19	
No. 2 intake manifold stay x Intake manifold	195	14	19	
No. 3 intake manifold stay x Intake manifold	195	14	19	
No. 3 intake manifold stay x Cylinder block	260	19	25	
Water outlet x Cylinder head	130	9	13	
Exhaust manifold x Cylinder head	440	32	43	
Exhaust manifold stay x Exhaust manifold	440	32	43	
Exhaust manifold stay x Cylinder block	400	29	39	
Engine hanger x Cylinder head	400	29	39	
Main bearing cap x Cylinder head	600	43	59	
Connecting rod cap x Connecting rod cap	680	49	67	
Rear oil seal retainer x Cylinder block	95	82 in.-lb	9.3	
Rear end plate x Cylinder block	95	82	9.3	
Flywheel x Crankshaft (M/T)				
	New bolt	900	65	88
	Reused bolt	950	69	93
Drive plate x Crankshaft (A/T)	850	61	83	
Suspension lower crossmember x Body				
	19 mm head bolt	2,125	154	208
	14 mm head bolt	400	29	39
Engine mounting insulator x Body				
	Through bolt	800	58	78
	Others	530	38	52
Engine mounting insulator x Engine bracket				
	Through bolt	800	58	78
	Bolt (Front A/T)	490	35	48
	Bolt (Others)	530	38	52
Engine mounting bracket x Cylinder block	530	38	52	
Engine mounting bracket x Transaxle	530	38	52	
Engine mounting center member x Body	400	29	39	
Engine mounting center member x Engine mounting insulator	400	29	39	
LH mounting stay x Engine mounting bracket	210	15	21	
LH mounting stay x Engine mounting insulator	210	15	21	
Suspension upper brace x Body				
	Bolt	210	15	21
	Nut	375	27	37
Exhaust front pipe x Exhaust manifold	630	46	62	
Catalytic converter x Exhaust front pipe	440	32	43	

## Torque Specifications (3S-GTE)

Part tightened	kg-cm	ft-lb	N-m
Oil pump pulley x Oil pump drive shaft	290	21	28
No. 1 idler pulley x Cylinder head	440	32	43
No. 2 idler pulley x Cylinder block	440	32	43
Camshaft timing pulley x Camshaft	600	43	59
Crankshaft pulley x Crankshaft	1,100	80	108
Cylinder head x Cylinder block	550	40	53
	1st		
	2nd	90° turns	
RH engine hanger x Cylinder head	195	14	19
Camshaft bearing cap x Cylinder head	190	14	19
No. 3 timing belt cover x Cylinder head	80	69 in.-lb	7.8
Cylinder head cover x Cylinder head	25	21 in.-lb	2.5
Intake manifold x Cylinder head	195	14	19
Intake manifold stay x Intake manifold	260	119	25
Intake manifold stay x Cylinder block	260	119	25
EGR valve x Intake manifold	195	14	19
EGR pipe x Cylinder head	195	14	19
Water outlet x Cylinder head	130	9	13
LH engine hanger x Cylinder head	130	9	13
	12 mm head bolt		
	14 mm head bolt		
Exhaust manifold x Cylinder head	530	38	52
Alternator bracket x Cylinder head	400	29	39
Alternator bracket x Cylinder block	400	29	39
Alternator bracket x Turbine outlet elbow	440	32	43
Catalytic converter x Turbine outlet elbow	300	22	29
Catalytic converter stay x Catalytic converter	650	47	64
Catalytic converter stay x Cylinder block	650	47	64
Suspension upper brace x Body	210	15	21
	Bolt		
	Nut		
Main bearing cap x Cylinder block	600	43	59
Connecting rod cap x Connecting rod	680	49	67
Rear oil seal retainer x Cylinder block	95	82 in.-lb	9.3
Rear end plate x Cylinder block	95	82 in.-lb	9.3
Flywheel x Crankshaft	900	65	88
	New bolt		
	Reused bolt		
Suspension lower crossmember x Body	2,125	154	208
Suspension lower crossmember x Engine mounting center member	400	29	39
Engine mounting center member x Body	400	29	39
Engine mounting center member x Engine mounting insulator	530	38	52
Engine mounting insulator x Body	800	58	78
Engine mounting insulator x Engine mounting bracket	530	38	52
Engine mounting bracket x Cylinder block	530	38	52
Engine mounting bracket x Transaxle	530	38	52
Catalytic converter x Exhaust pipe	440	32	43

**TURBOCHARGER SYSTEM (3S-GTE)****Specifications**

Intercooler coolant capacity		See page A-2
Turbocharger	Turbocharging pressure	0.40 – 0.70 kg/cm <sup>2</sup> (5.7 – 10.0 psi, 39 – 69 kPa)
	Impeller wheel axial play	0.13 mm (0.0051 in.) or less
	Impeller wheel radial play	0.18 mm (0.0071 in.) or less
Intercooler filler cap	Relief valve opening pressure	0.75 – 1.05 kg/cm <sup>2</sup> (10.7 – 14.9 psi, 74 – 103 kPa) 0.6 kg/cm <sup>2</sup> 8.5 psi      59 kPa

**Torque Specifications**

Part tightened	kg-cm	ft-lb	N·m
No. 3 turbo water pipe x Turbocharger	120	9	11
No. 1 turbo water pipe x Turbocharger	120	9	11
Turbocharger x Exhaust manifold	650	47	64
No. 2 oil pipe x Turbocharger	175	13	17
No. 2 oil pipe x No. 1 oil pipe	195	14	19
Turbocharger stay x Turbocharger	810	59	79
Turbocharger stay x Cylinder block	530	38	52
Turbine outlet elbow x Turbocharger	650	47	64

## EFI SYSTEM (3S-FE)

## Specifications

Fuel pressure regulator	Fuel pressure at No vacuum	2.7 – 3.1 kg/cm <sup>2</sup> (38 – 44 psi, 265 – 304 kPa)	
Cold start injector	Resistance Fuel leakage	2 – 4 Ω One drop or less per minute	
Injector	Resistance Injection volume Difference between each injector Fuel leakage	Approx. 13.8 Ω 45 – 55 cc (2.7 – 3.4 cu in.) per 15 sec. 5 cc (0.31 cu in.) or less One drop or less per minute	
Throttle body	Throttle body fully closed angle	6°	
Throttle position sensor	Throttle opening angle (from Vertical)	Clearance between stop screw and lever	IDL – E1
	– – Less than 7.5° 71° 81°	0.50 mm 0.0197 in. 0.90 mm 0.0354 in. – – –	PSW – E1
ISC valve	Resistance +B – ISC1 or ISC2	16.0 – 17.0 Ω	
Cold start injector time switch	Resistance STA – E1 below 30°C (86°F) above 40°C (104°F) STA – Ground	20 – 40 Ω 40 – 60 Ω 20 – 80 Ω	
Air flow meter	Resistance VS – E2  VC – E2 FC – E1  THA – E2 at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F)	200 – 600 Ω (Measuring plate fully closed) 20 – 1,200 Ω (Measuring plate fully open) 200 – 400 Ω Infinity (Measuring plate fully closed) Zero (Others) 10 – 20 kΩ 4 – 7 kΩ 2 – 3 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ	
Water temp. sensor	Resistance at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F) at 80°C (176°F)	10 – 20 kΩ 4 – 7 kΩ 2 – 3 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ 0.2 – 0.4 kΩ	
EGR gas temp. sensor (CALIF. only)	Resistance at 50°C (122°F) at 100°C (212°F) at 150°C (302°F)	69.40 – 88.50 kΩ 11.89 – 14.37 kΩ 2.79 – 3.59 kΩ	

Specifications (Cont'd)

ECU	NOTE:		
	<ul style="list-style-type: none"> <li>● Perform all voltage and resistance measurements with the ECU connected.</li> <li>● Verify that the battery voltage is 11 V or above with the ignition switch is ON.</li> </ul>		
	Voltage		
	Terminals	Condition	STD voltage (V)
	+B +B1 – E1	IG SW ON	10 – 14
	BATT – E1	–	10 – 14
	IDL – E1	IG SW ON	Throttle valve open
	PSW – E1		Throttle valve fully closed
	VC – E2		–
	VS – E2		Measuring plate fully closed
			Measuring plate fully open
			Idling
		3,000 rpm	
	No. 10 – E01 No. 20 – E02	IG SW ON	10 – 14
	THA – E2	IG SW ON	Intake air temp. 20°C (68°F)
	THW – E2		Coolant temp. 80°C (176°F)
	STA – E1	Cranking	
	IGT – E1	Cranking or idling	
	ISC1 ISC2 – E1	IG SW ON	
	W – E1	No trouble (check engine warning light off) and engine running	
*1 A/C – E1	IG SW ON	Air conditioning ON	
T – E1		Check connector *2 TE1 or *3 T – E1 not connected	
		Check connector *2 TE1 or *3 T – E1 connected	
NSW – E1		Shift position P or N range	
		Ex. shift position P or N range	
STP – E1		Stop light SW ON (Brake pedal depressed) or defogger SW ON	

\*1 w/ A/C \*2 CALIF. \*3 Others

## Specifications (Cont'd)

ECU (cont'd)	Resistance		
	Terminals	Condition	STD resistance ( $\Omega$ )
IDL – E1		Throttle valve open	Infinity
		Throttle valve fully closed	0
PSW – E1		Throttle valve fully open	0
		Throttle valve fully closed	Infinity
VC – E2		–	200 – 400
VS – E2		Measuring plate fully closed	200 – 600
		Measuring plate fully open	20 – 1,200
THA – E2		Intake air temp. 20°C (68°F)	2,000 – 3,000
THW – E2		Coolant temp. 80°C (176°F)	200 – 400
G NE – G $\ominus$		–	140 – 180
ISC1 – +B ISC2 – +B1		–	16.0 – 17.0
Fuel cut rpm	w/ Vehicle speed 0 km/h and coolant and coolant temp. 80°C (176°F)		
		Fuel cut rpm	1,700 rpm
		Fuel return rpm	1,300 rpm

## Torque Specifications

Part tightened		kg-cm	ft-lb	N-m
Fuel line	Union bolt type	300	22	29
	Flare nut type	310	22	30
Fuel sender gauge		20	17 in.-lb	2.0
Fuel pump x Fuel tank		35	30 in.-lb	3.4
Fuel tank drain plug		130	9	13
Fuel tank band x Body		400	29	39
Cold start injector x Air intake chamber		95	82 in.-lb	9.3
Cold start injector pipe x Cold start injector		180	13	18
Cold start injector pipe x Delivery pipe		180	13	18
Fuel pressure regulator x Delivery pipe		55	48 in.-lb	5.4
Fuel return pipe x Fuel pressure regulator		180	13	18
Delivery pipe x Cylinder head		130	9	13
Throttle body x Air intake chamber		195	14	19

## EFI SYSTEM (3S-GE)

## Specifications

Fuel pressure regulator	Fuel pressure at No vacuum	2.3 – 2.7 kg/cm <sup>2</sup> (33 – 38 psi, 226 – 265 kPa)	
Cold start injector	Resistance Fuel leakage	3 – 5 Ω One drop or less per minute	
Injector	Resistance Injection volume Difference between each injector Fuel leakage	Approx. 13.8 Ω 66 – 82 cc (4.0 – 5.0 cu in.) per 15 sec. 5 cc (0.31 cu in.) or less One drop or less per minute	
Throttle body	Throttle body fully closed angle	6°	
Throttle position sensor	Clearance between stop screw and lever	Between terminals	Resistance
	0 mm      0 in. 0.50 mm    0.020 in. 0.70 mm    0.028 in. Throttle valve fully opened position –	VTA – E2 IDL – E2 IDL – E2 VTA – E2 VC – E2	0.2 – 0.8 kΩ 2.3 kΩ or less Infinity 3.3 – 10 kΩ 3 – 7 kΩ
Cold start injector time switch	Resistance STA – STJ below 10°C (50°F) above 25°C (77°F) STA – Ground	30 – 50 Ω 70 – 90 Ω 30 – 90 Ω	
Air flow meter	Resistance VS – E2  VC – E2 FC – E1  THA – E2 at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F)	200 – 600 Ω (Measuring plate fully closed) 20 – 1,200 Ω (Measuring plate fully open) 200 – 400 Ω Infinity (Measuring plate fully closed) Zero (Others) 10 – 20 kΩ 4 – 7 kΩ 2 – 3 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ	
Water temp. sensor	Resistance at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F) at 80°C (176°F)	10 – 20 kΩ 4 – 7 kΩ 2 – 7 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ 0.2 – 0.4 kΩ	
EGR gas temp. sensor (CALIF. only)	Resistance at 50°C (122°F) at 100°C (212°F) at 150°C (302°F)	69.40 – 88.50 kΩ 11.89 – 14.37 kΩ 2.79 – 3.59 kΩ	
Oxygen sensor	Heater coil resistance	5.1 – 6.3 Ω	
T-VIS VSV	Resistance	33 – 39 Ω	
Idle-up VSV	Resistance	33 – 39 Ω	

## Specifications (Cont'd)

ECU			
NOTE:			
<ul style="list-style-type: none"> <li>● Perform all voltage and resistance measurements with the ECU connected.</li> <li>● Verify that the battery voltage is 11 V or above with the ignition switch is ON.</li> </ul>			
Voltage			
Terminals	Condition		STD voltage (V)
+B +B1 – E1	IG SW ON		10 – 14
BATT – E1	–		10 – 14
IDL – E2	IG SW ON	Throttle valve open	*2 4 – 6
			*3 8 – 14
VTA – E2		Throttle valve fully closed	0.1 – 1.0
		Throttle valve open	3 – 6
VC – E2		–	4 – 6
VS – E2		Measuring plate fully closed	4 – 5
		Measuring plate fully open	1.0 or less
		Idling	2 – 4
		3,000 rpm	1.0 – 2.0
No. 1 No. 2 – E01 No. 3 – E02 No. 4		IG SW ON	
THA – E2	IG SW ON	Intake air temp. 20°C (68°F)	1 – 3
THW – E2		Coolant temp. 80°C (176°F)	0.1 – 1.0
STA – E1	Cranking		6 – 14
IGT – E1	Cranking or idling		0.7 – 1.0
W – E1	No trouble (check engine warning light off) and engine running		10 – 14
*1 A/C – E1	IG SW ON	Air conditioning ON	8 – 14
T-VIS – E1	Idling		10 – 14
	4,400 rpm or more		2.0 or less
T – E1	IG SW ON	Check connector T – E1 not connected	10 – 14
		Check connector T – E1 connected	0.5 or less
Shift position P or N range		0 – 2	
NSW – E1		Ex. shift position P or N range	6 – 14

\*1 w/ A/C \*2 w/o ECT \*3 w/ ECT



**Specifications (Cont'd)**

ECU (cont'd)	Resistance		
	Terminals	Condition	STD resistance ( $\Omega$ )
IDL – E2	Throttle valve open		Infinity
	Throttle valve fully closed		2,300 or less
VTA – E2	Throttle valve fully open		3,600 – 10,000
	Throttle valve fully closed		200 – 800
VC – E2	–		200 – 400
VS – E2	Measuring plate fully closed		200 – 600
	Measuring plate fully open		20 – 1,200
THA – E2	Intake air temp. 20°C (68°F)		2,000 – 3,000
THW – E2	Coolant temp. 80°C (176°F)		200 – 400
G1 G2 – G⊖ NE	–		140 – 180
Fuel cut rpm	w/ Vehicle speed 0 km/h and coolant and coolant temp. 80°C (176°F)		
	Fuel cut rpm		2,000 rpm
	Fuel return rpm		1,600 rpm

**Torque Specifications**

Part tightened		kg-cm	ft-lb	N-m
Fuel line	Union bolt type	300	22	29
	Flare nut type	310	22	30
Fuel sender gauge		20	17 in.-lb	2.0
Fuel pump x Fuel tank		35	30 in.-lb	3.4
Fuel tank drain plug		130	9	13
Fuel tank band x Body		400	29	39
Cold start injector x Air intake chamber		55	48 in.-lb	5.4
Cold start injector pipe x Cold start injector		180	13	18
Cold start injector pipe x Delivery pipe		180	13	18
Fuel pressure regulator x Delivery pipe		300	22	29
Fuel return pipe x Fuel pressure regulator		180	13	18
Delivery pipe x Cylinder head		195	14	19
Throttle body x Air intake chamber		195	14	19

## EFI SYSTEM (3S-GTE)

## Specifications

Fuel pressure regulator	Fuel pressure at No vacuum	2.3 – 2.7 kg/cm <sup>2</sup> (33 – 38 psi, 226 – 265 kPa)	
Cold start injector	Resistance Fuel leakage	2 – 4 Ω One drop or less per minute	
Injector	Resistance Injection volume Difference between each cylinder Fuel leakage	2 – 4 Ω 104 – 110 cc (6.3 – 6.7 cu in.) per 15 sec. 5 cc (0.31 cu in.) or less One drop or less per minute	
Throttle body	Throttle body fully closed angle	6°	
Throttle position sensor	Clearance between stop screw and lever	Between terminals	Resistance
	0 mm 0 in. 0.50 mm 0.020 in. 0.70 mm 0.028 in. Throttle valve fully opened position –	VTA – E2 IDL – E2 IDL – E2 VTA – E2 VC – E2	0.2 – 0.8 kΩ 2.3 kΩ or less Infinity 3.3 – 10.3 kΩ 3 – 8.3 kΩ
ISC valve	Resistance +B – ISC 1 or ISC 2	16.0 – 17.0 Ω	
Cold start injector time switch	Resistance STA – STJ below 10°C (50°F) above 25°C (77°F) STA – Ground	30 – 50 Ω 70 – 90 Ω 30 – 90 Ω	
Air flow meter	Resistance VS – E2  VC – E2 FC – E1  THA – E2 at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F)	200 – 600 Ω (Measuring plate fully closed) 20 – 1,000 Ω (Measuring plate fully open) 200 – 400 Ω Infinity (Measuring plate fully closed) Zero (Others) 10 – 20 kΩ 4 – 7 kΩ 2 – 3 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ	
Fuel pump resistor	Resistance	Approx. 0.73 Ω	
Solenoid resistor	Resistance +B – No. 10, No. 20, No. 30 or No. 40	5 – 7 Ω	
Water temp. sensor	Resistance at –20°C (–4°F) at 0°C (32°F) at 20°C (68°F) at 40°C (104°F) at 60°C (140°F) at 80°C (176°F)	10 – 20 kΩ 4 – 7 kΩ 2 – 7 kΩ 0.9 – 1.3 kΩ 0.4 – 0.7 kΩ 0.2 – 0.4 kΩ	
EGR gas temp. sensor (CALIF. only)	Resistance at 50°C (122°F) at 100°C (212°F) at 150°C (302°F)	69.40 – 88.50 kΩ 11.89 – 14.37 kΩ 2.79 – 3.59 kΩ	
Oxygen sensor	Heater coil resistance	5.1 – 6.3 Ω	
T-VIS VSV	Resistance	33 – 39 Ω	
EGR VSV	Resistance	33 – 39 Ω	
Turbocharging pressure VSV	Resistance	24 – 30 Ω	
Fuel pressure VSV	Resistance	33 – 39 Ω	

## Specifications (Cont'd)

ECU	NOTE:			
	<ul style="list-style-type: none"> <li>• Perform all voltage and resistance measurements with the ECU connected.</li> <li>• Verify that the battery voltage is 11 V or above with the ignition switch is ON.</li> </ul>			
	Voltage			
Terminals	Condition		STD voltage (V)	
+B +B1 – E1	IG SW ON		10 – 14	
BATT – E1	–		10 – 14	
IDL – E2	IG SW ON	Throttle valve open	4 – 6	
VTA – E2		Throttle valve fully closed	0.1 – 1.0	
		Throttle valve open	3 – 6	
VC – E2		–		4 – 6
VS – E2		Measuring plate fully closed		4 – 5
		Measuring plate fully open		1.0 or less
		Idling		2 – 4
3,000 rpm		1.0 – 2.0		
No. 1 No. 2 – E01 No. 3 – E02 No. 4	IG SW ON		10 – 14	
THA – E2	IG SW ON	Intake air temp. 20°C (68°F)	1 – 3	
THW – E2		Coolant temp. 80°C (176°F)	0.1 – 1.0	
STA – E1	Cranking		6 – 14	
IGT – E1	Cranking or idling		0.7 – 1.0	
ISC1 ISC2 – E1	IG SW ON		9 – 14	
W – E1	No trouble (Check engine warning light off) and engine running		10 – 14	
PIM – E2	IG SW ON		2.5 – 4.5	
*1 A/C – E1	IG SW ON	Air conditioning ON	8 – 14	
*2 T-VIS – E1		Throttle valve fully closed	2.0 or less	
		Throttle valve open	10 – 14	
*3 T-VIS – E1	Idling		2.0 or less	
	4,200 rpm or more		10 – 14	
T – E1	IG SW ON	Check connector T – E1 not connected	10 – 14	
		Check connector T – E1 connected	0.5 or less	

\*1 w/ A/C \*2 w/ Regular Gasoline \*3 w/ Premium Gasoline

## Specifications (Cont'd)

ECU (cont'd)	Resistance		
	Terminals	Condition	STD resistance ( $\Omega$ )
IDL – E2	Throttle valve open		Infinity
	Throttle valve fully closed		2,300 or less
VTA – E2	Throttle valve fully open		3,500 – 10,000
	Throttle valve fully closed		200 – 800
VC – E2	–		200 – 400
VS – E2	Measuring plate fully closed		200 – 600
	Measuring plate fully open		20 – 1,200
THA – E2	Intake air temp. 20°C (68°F)		2,000 – 3,000
THW – E2	Coolant temp. 80°C (176°F)		200 – 400
G1 G2 – G⊖ NE	–		140 – 180
ISC1 – +B ISC2 – +B1	–		16.0 – 17.0
Fuel cut rpm	w/ Vehicle speed 0 km/h and coolant and coolant temp. 80°C (176°F) Fuel cut rpm Fuel return rpm		2,000 rpm 1,600 rpm

## Torque Specifications

Part tightened	kg-cm	ft-lb	N-m
Fuel line			
Union bolt type	300	22	29
Flare nut type	310	22	30
Fuel sender gauge x Fuel tank	15	13 in.-lb	1.5
Fuel pump x Fuel tank	30	26 in.-lb	2.9
Fuel evaporation bent tube x Fuel tank	15	13 in.-lb	1.5
Fuel inlet pipe x Fuel tank	30	26 in.-lb	2.9
Fuel tank drain plug	130	9	13
Fuel tank band x Body	220	16	22
Cold start injector x Intake manifold (Air intake chamber)	60	52 in.-lb	5.9
Cold start injector pipe x Cold start injector	180	13	18
Cold start injector pipe x Delivery pipe	180	13	18
Fuel pressure regulator x Delivery pipe	300	22	29
Delivery pipe x Cylinder head	195	14	19
Fuel inlet hose x Delivery pipe	300	22	29
Throttle body x Intake manifold (Air intake chamber)	195	14	19
Air connector stay x Throttle body	195	14	19
Air connector stay x Cylinder head	80	69 in.-lb	7.8
Air connector x Throttle body	195	14	19

**COOLING SYSTEM****Specifications**

Engine coolant capacity			See page A-2
Radiator cap	Relief valve opening pressure	STD	0.75 – 1.05 kg/cm <sup>2</sup> (10.7 – 14.9 psi, 74 – 103 kPa)
		Limit	0.6 kg/cm <sup>2</sup> 8.5 psi      59 kPa
Thermostat	Valve opening temperature		80 – 84°C      176 – 183°F
	Valve lift at 95°C (203°F)		8 mm (0.31 in.) or more

**Torque Specifications**

Part tightened	kg-cm	ft-lb	N-m
Engine coolant x Drain plug	130	9	13
Water pump x Water pump cover	90	78 in.-lb	8.8
Water pump x Cylinder block	95	82 in.-lb	9.3
Water by-pass pipe x Water pump	95	82 in.-lb	9.3
Water inlet x Water pump	90	78 in.-lb	8.8
Oil cooler x Radiator lower tank	220	16	22

**LUBRICATION SYSTEM****Specifications**

Engine oil capacity			See page A-51
Oil pressure		at Idling at 3,000 rpm	0.3 kg/cm <sup>2</sup> (4.3 psi, 29 kPa) or more 2.5 – 5.0 kg/cm <sup>2</sup> (36 – 71 psi, 245 – 490 kPa)
Oil pump	Body clearance	STD	0.10 – 0.16 mm      0.0039 – 0.0063 in.
		Limit	0.20 mm      0.0079 in.
	Tip clearance	STD	0.08 – 0.16 mm      0.0031 – 0.0063 in.
		Limit	0.20 mm      0.0079 in.

**Torque Specifications**

Part tightened	kg-cm	ft-lb	N-m
Engine oil drain plug	250	18	25
Oil pump body cover x Oil pump body	90	78 in.-lb	8.8
Oil pump x Cylinder block	80	69 in.-lb	7.8
Oil strainer x Cylinder block	90	78 in.-lb	8.0
Oil strainer x Oil pump	55	48 in.-lb	5.4
Oil pan x Cylinder block	55	48 in.-lb	5.4
Oil pan x Oil pump	55	48 in.-lb	5.4
Stiffener plate x Cylinder block	380	27	37
Stiffener plate x Transaxle case	380	27	37
Relief valve plug x Oil filter bracket (3S-GTE)	375	27	37
Union (for oil filter bracket) x Cylinder block (3S-GTE)	300	22	29
Oil filter bracket x Cylinder block (3S-GTE)	80	69 in.-lb	7.8
Oil cooler pipe x Cylinder block (3S-GTE)	525	38	51
Oil cooler pipe x Oil filter bracket (3S-GTE)	525	38	51
Oil nozzle x Cylinder block (3S-GTE)	93	81 in.-lb	9.1

**IGNITION SYSTEM**

Ignition timing		10° BTDC @ idle (w/ Terminals T (or TE1) and E1 connected)
Firing order		1 – 3 – 4 – 2
Spark plug		See page A-2
High-tension cord	Resistance	25 kΩ per cord
Ignition coil	Primary coil resistance	3S-FE 3S-GE and 3S-GTE
	Secondary coil resistance	3S-FE 3S-GE and 3S-GTE
Distributor	Air gap	0.2 – 0.4 mm      0.008 – 0.016 in.
	Signal generator (pickup coil) resistance	140 – 180 Ω

**STARTING SYSTEM**

Starter	Rated voltage and output power		12V 1.0 kW		12V 1.4 kW	
	No-load characteristic	Current	90 A or less at 11.5 V		←	
		rpm	3,000 rpm or more		3,500 rpm or more	
	Brush length	STD	13.5 mm	0.531 in.	15.5 mm	0.610 in.
		Limit	8.5 mm	0.335 in.	10.0 mm	0.394 in.
	Commutator	Outer diameter	STD	30 mm	1.18 in.	←
			Limit	29 mm	1.14 in.	←
		Undercut depth	STD	0.6 mm	0.024 in.	←
			Limit	0.2 mm	0.008 in.	←
	Circle runout	Limit	0.05 mm	0.0020 in.	←	
Spring installed load	STD	1.79 – 2.41 kg (3.9 – 5.3 lb, 17 – 24 N)		←		

**CHARGING SYSTEM**

Drive belt tension		See page A-2	
Battery specific gravity    When fully charged at 20°C (68°F)		1.25 – 1.27	
Alternator	Rated output	3S-FE and 3S-GTE 3S-GE	
	Rotor coil resistance	12 V – 70 A 12 V – 60 A 2.8 – 3.0 Ω	
	Slip ring diameter	STD	14.2 – 14.4 mm      0.559 – 0.567 in.
		Limit	12.8 mm      0.504 in.
	Brush exposed length	STD	10.5 mm      0.413 in.
Limit		1.5 mm      0.059 in.	
Alternator regulator (IC)	Regulating voltage	at 25°C (77°F) at 115°C (239°F)	
		13.9 – 15.1 V 13.5 – 14.3 V	

**CLUTCH****Specifications**

Pedal height (from asphalt sheet)			153 – 163 mm	6.02 – 6.42 in.
Release fork end play			None adjustable type	
Push rod play at pedal top			1.0 – 5.0 mm	0.039 – 0.197 in.
Pedal freeplay			5 – 15 mm	0.20 – 0.59 in.
Disc rivet head depth	Limit		0.3 mm	0.012 in.
Disc runout	Limit		0.8 mm	0.031 in.
Diaphragm spring out of alignment	Limit		0.5 mm	0.020 in.
Diaphragm spring finger wear	Depth	Limit	0.6 mm	0.024 in.
	Width	Limit	5.0 mm	0.197 in.
Flywheel runout	Limit		0.1 mm	0.004 in.

**Torque Specifications**

Part tightened		kg-cm	ft-lb	N·m
Clutch cover x Flywheel		195	14	19
Reservoir tank set bolt		250	18	25
Clutch line union		155	11	15
Flywheel set bolt	3S-FE	1,000	72	98
	3S-GE, 3S-GTE			
	New bolt	900	65	88
	Reused bolt	950	69	93
Bleeder plug		110	8	11

## MANUAL TRANSAXLE (S53)

## Specifications

Input shaft				
Roller bearing journal diameter	Limit		29.970 mm	1.1799 in.
3rd gear journal diameter	Limit		33.090 mm	1.3028 in.
4th gear journal diameter	Limit		32.470 mm	1.2783 in.
5th gear journal diameter	Limit		26.970 mm	1.0618 in.
Runout	Limit		0.05 mm	0.0020 in.
Output shaft				
Roller bearing journal diameter	Limit		31.970 mm	1.2587 in.
1st gear journal diameter	Limit		37.970 mm	1.4949 in.
2nd gear journal diameter	Limit		31.970 mm	1.2587 in.
Runout	Limit		0.05 mm	0.0020 in.
Gear thrust clearance	1st	STD	0.10 – 0.29 mm	0.0039 – 0.0114 in.
		Limit	0.35 mm	0.0138 in.
	2nd	STD	0.20 – 0.44 mm	0.0079 – 0.0173 in.
		Limit	0.50 mm	0.0197 in.
	3rd	STD	0.10 – 0.25 mm	0.0039 – 0.0098 in.
		Limit	0.30 mm	0.0118 in.
	4th	STD	0.20 – 0.45 mm	0.0079 – 0.0177 in.
		Limit	0.50 mm	0.0197 in.
	5th	STD	0.20 – 0.40 mm	0.0079 – 0.0157 in.
		Limit	0.45 mm	0.0177 in.
Gear oil clearance	1st, 2nd, 3rd, 4th	STD	0.009 – 0.053 mm	0.0004 – 0.0021 in.
		Limit	0.070 mm	0.0028 in.
	5th	STD	0.009 – 0.050 mm	0.0004 – 0.0020 in.
		Limit	0.070 mm	0.0028 in.
Shift fork to hub sleeve clearance	Limit		1.0 mm	0.039 in.
Synchronizer ring to gear clearance	Limit		0.6 mm	0.024 in.
Input shaft snap ring thickness				
Input shaft rear bearing	Mark			
	A		2.15 – 2.20 mm	0.0846 – 0.0866 in.
	B		2.20 – 2.25 mm	0.0866 – 0.0886 in.
	C		2.25 – 2.30 mm	0.0886 – 0.0906 in.
	D		2.30 – 2.35 mm	0.0906 – 0.0925 in.
	E		2.35 – 2.40 mm	0.0925 – 0.0945 in.
No. 2 clutch hub	Mark			
	1		1.95 – 2.00 mm	0.0768 – 0.0787 in.
	2		2.00 – 2.05 mm	0.0787 – 0.0807 in.
	3		2.05 – 2.10 mm	0.0807 – 0.0827 in.
	4		2.10 – 2.15 mm	0.0827 – 0.0846 in.
	5		2.15 – 2.20 mm	0.0846 – 0.0866 in.
6		2.20 – 2.25 mm	0.0866 – 0.0886 in.	



## Specifications (Cont'd)

Input shaft snap ring thickness (cont'd)			
No. 3 clutch hub	Mark		
	1	1.60 – 1.65 mm	0.0630 – 0.0650 in.
	2	1.65 – 1.70 mm	0.0650 – 0.0669 in.
	3	1.70 – 1.75 mm	0.0669 – 0.0689 in.
	4	1.75 – 1.80 mm	0.0689 – 0.0709 in.
	5	1.80 – 1.85 mm	0.0709 – 0.0728 in.
	6	1.85 – 1.90 mm	0.0728 – 0.0748 in.
	7	1.90 – 1.95 mm	0.0748 – 0.0768 in.
	8	1.95 – 2.00 mm	0.0768 – 0.0787 in.
	9	2.00 – 2.05 mm	0.0787 – 0.0807 in.
	10	2.05 – 2.10 mm	0.0807 – 0.0827 in.
	11	2.10 – 2.15 mm	0.0827 – 0.0846 in.
	12	2.15 – 2.20 mm	0.0846 – 0.0866 in.
	13	2.20 – 2.25 mm	0.0866 – 0.0886 in.
	14	2.25 – 2.30 mm	0.0886 – 0.0906 in.
	15	2.30 – 2.35 mm	0.0906 – 0.0925 in.
Output shaft snap ring thickness			
No. 1 clutch hub	Mark		
	1	2.50 – 2.55 mm	0.0984 – 0.1004 in.
	2	2.55 – 2.60 mm	0.1004 – 0.1024 in.
	3	2.60 – 2.65 mm	0.1024 – 0.1043 in.
	4	2.65 – 2.70 mm	0.1043 – 0.1063 in.
	5	2.70 – 2.75 mm	0.1063 – 0.1083 in.
	6	2.75 – 2.80 mm	0.1083 – 0.1102 in.
Side bearing preload (at Starting)		10 – 16 kg-cm	8.7 – 13.9 in.-lb      1.0 – 1.6 N-m
Side bearing adjusting shim thickness	Mark		
	1	1.90 mm	0.0748 in.
	2	1.95 mm	0.0768 in.
	3	2.00 mm	0.0787 in.
	4	2.05 mm	0.0807 in.
	5	2.10 mm	0.0827 in.
	6	2.15 mm	0.0846 in.
	7	2.20 mm	0.0866 in.
	8	2.25 mm	0.0886 in.
	9	2.30 mm	0.0906 in.
	10	2.35 mm	0.0925 in.
	11	2.40 mm	0.0945 in.
	12	2.45 mm	0.0965 in.
	13	2.50 mm	0.0984 in.
	14	2.55 mm	0.1004 in.
	15	2.60 mm	0.1024 in.
	16	2.65 mm	0.1043 in.
	17	2.70 mm	0.1063 in.
	18	2.75 mm	0.1083 in.
	19	2.80 mm	0.1102 in.

**Specifications (Cont'd)**

Shift lever preload		50 – 100 g	0.1 – 0.2 lb	0.5 – 1.0 N
Shift lever seat shim thickness	Mark			
	C or 5	0.5 mm	0.020 in.	
	D or 6	0.6 mm	0.024 in.	
	E or 7	0.7 mm	0.028 in.	
	F or 8	0.8 mm	0.031 in.	
	G or 9	0.9 mm	0.035 in.	
	H or 10	1.0 mm	0.039 in.	
	K or 11	1.1 mm	0.043 in.	
	L or 12	1.2 mm	0.047 in.	

**Torque Specifications**

Part tightened	kg-cm	ft-lb	N-m
Transmission case x Transaxle case	300	22	29
Transmission case x Case cover	300	22	29
Rear bearing retainer	210	15	21
Output shaft bearing lock plate	185	13	18
Oil receiver	75	65 in.-lb	7.4
5th driven gear lock nut	1,250	90	123
Reverse idler shaft lock bolt	250	18	25
Control shaft cover	375	27	37
Reverse shift arm bracket	185	13	18
No. 3 shift fork	185	13	18
Straight screw plug	130	9	13
No. 1 lock ball assembly	375	27	37
No. 2 lock ball assembly	230	17	23
Filler plug	500	36	49
Drain plug	500	36	49
Back-up light switch	450	33	44
Side bearing retainer	185	13	18
Clutch release bearing retainer	75	65 in.-lb	7.4

## MANUAL TRANSAXLE (E50F2)

## Specifications

TRANSMISSION ASSEMBLY				
Input shaft				
Roller bearing journal diameter	Limit	32.930 mm	1.2964 in.	
3rd gear journal diameter	Limit	35.950 mm	1.4154 in.	
4th gear journal diameter	Limit	35.950 mm	1.4154 in.	
Runout	Limit	0.060 mm	0.0024 in.	
Output shaft				
1st gear journal diameter	Limit	38.950 mm	1.5335 in.	
2nd gear journal diameter	Limit	38.950 mm	1.5335 in.	
Runout	Limit	0.060 mm	0.0024 in.	
Gear thrust clearance	1st	STD	0.10 – 0.35 mm	0.0039 – 0.0138 in.
		Limit	0.40 mm	0.0157 in.
	2nd	STD	0.10 – 0.45 mm	0.0039 – 0.0177 in.
		Limit	0.50 mm	0.0197 in.
	3rd	STD	0.10 – 0.35 mm	0.0039 – 0.0139 in.
		Limit	0.40 mm	0.0157 in.
	4th	STD	0.10 – 0.55 mm	0.0039 – 0.0217 in.
		Limit	0.60 mm	0.0236 in.
	5th	STD	0.10 – 0.57 mm	0.0039 – 0.0224 in.
		Limit	0.65 mm	0.0256 in.
Gear oil clearance				
1st and 4th gear	STD	0.009 – 0.051 mm	0.0004 – 0.0020 in.	
	Limit	0.080 mm	0.0031 in.	
2nd and 3rd gear	STD	0.009 – 0.053 mm	0.0004 – 0.0020 in.	
	Limit	0.080 mm	0.0031 in.	
5th gear	STD	0.009 – 0.050 mm	0.0004 – 0.0020 in.	
	Limit	0.070 mm	0.0028 in.	
Shift fork to hub sleeve clearance	Limit	1.0 mm	0.039 in.	
Synchronizer ring to gear clearance	Limit	0.6 mm	0.024 in.	
Oil pump assembly				
Rotor body clearance	STD	0.10 – 0.16 mm	0.0039 – 0.0063 in.	
	Limit	0.30 mm	0.0118 in.	
Rotor tip clearance	STD	0.08 – 0.15 mm	0.0031 – 0.0059 in.	
	Limit	0.30 mm	0.0118 in.	
Side clearance	STD	0.03 – 0.08 mm	0.0012 – 0.0031 in.	
	Limit	0.15 mm	0.0059 in.	
Input shaft snap ring thickness				
No. 2 clutch hub	Mark			
	H	2.30 – 2.35 mm	0.0906 – 0.0925 in.	
	J	2.35 – 2.40 mm	0.0925 – 0.0945 in.	
	K	2.40 – 2.45 mm	0.0945 – 0.0965 in.	
	L	2.45 – 2.50 mm	0.0965 – 0.0984 in.	
	M	2.50 – 2.55 mm	0.0984 – 0.1004 in.	
	N	2.55 – 2.60 mm	0.1004 – 0.1024 in.	
P	2.60 – 2.65 mm	0.1024 – 0.1043 in.		

## Specifications (Cont'd)

Input shaft snap ring thickness (cont'd)				
4th gear and rear bearing		Mark		
		1	2.35 – 2.40 mm	0.0925 – 0.0945 in.
		2	2.40 – 2.45 mm	0.0945 – 0.0965 in.
		3	2.45 – 2.50 mm	0.0965 – 0.0984 in.
		4	2.50 – 2.55 mm	0.0984 – 0.1004 in.
		5	2.55 – 2.60 mm	0.1004 – 0.1024 in.
		6	2.60 – 2.65 mm	0.1024 – 0.1043 in.
		7	2.65 – 2.70 mm	0.1043 – 0.1063 in.
		8	2.70 – 2.75 mm	0.1063 – 0.1083 in.
Output shaft snap ring thickness				
No. 1 clutch hub		Mark		
		A	2.80 – 2.85 mm	0.1102 – 0.1122 in.
		B	2.85 – 2.90 mm	0.1122 – 0.1142 in.
		C	2.90 – 2.95 mm	0.1142 – 0.1161 in.
		D	2.95 – 3.00 mm	0.1161 – 0.1181 in.
		E	3.00 – 3.05 mm	0.1181 – 0.1201 in.
		F	3.05 – 3.10 mm	0.1201 – 0.1220 in.
		G	3.10 – 3.15 mm	0.1220 – 0.1240 in.
<b>DIFFERENTIAL ASSEMBLY</b>				
Output shaft preload (at starting)	New bearing		8.0–16.0 kg-cm	6.9 – 13.9 in.-lb 0.8 – 1.6 N-m
	Reused bearing		5.0–10.0 kg-cm	4.3 – 8.7 in.-lb 0.5 – 1.0 N-m
Differential case preload (at starting)	New bearing		1.9–3.7 kg-cm	1.6 – 3.2 in.-lb 0.2 – 0.4 N-m
	Reused bearing		1.2–2.3 kg-cm	1.0 – 2.0 in.-lb 0.1 – 0.2 N-m
Left case inner diameter				
Right case bushing		STD	111.000 – 111.035 mm	4.3701 – 4.3714 in.
		Limit	110.060 mm	4.3724 in.
Left case bushing		STD	90.500 – 90.535 mm	3.5630 – 3.5644 in.
		Limit	90.560 mm	3.5653 in.
No. 2 differential case outer diameter				
Right side		STD	110.929 – 110.964 mm	4.3673 – 4.3687 in.
		Limit	110.850 mm	4.3632 in.
Left side		STD	90.429 – 90.464 mm	3.5602 – 3.5616 in.
		Limit	90.350 mm	3.5571 in.
Differential No. 2 case inner diameter				
Side gear bushing		STD	35.000 – 35.025 mm	1.3780 – 1.3789 in.
		Limit	35.030 mm	1.3791 in.
Conical spring washer height				
Left conical spring washer		STD	2.60 – 2.80 mm	0.1024 – 0.1102 in.
		Limit	2.50 mm	0.0984 in.
Right conical spring washer		STD	1.70 – 1.90 mm	0.0669 – 0.0748 in.
		Limit	1.60 mm	0.0630 in.
Right case backlash			0.05 – 0.20 mm	0.0020 – 0.0079 in.
No. 2 differential case backlash			0.05 – 0.20 mm	0.0020 – 0.0079 in.
Intermediate case backlash			0.05 – 0.20 mm	0.0020 – 0.0079 in.

## Specifications (Cont'd)

Thrust washer thickness			
For right case side gear		0.80 mm	0.0315 in.
		0.85 mm	0.0335 in.
		0.90 mm	0.0354 in.
		0.95 mm	0.0374 in.
		1.00 mm	0.0394 in.
		1.05 mm	0.0413 in.
		1.10 mm	0.0433 in.
		1.15 mm	0.0453 in.
		1.20 mm	0.0472 in.
		1.25 mm	0.0492 in.
		1.30 mm	0.0512 in.
		1.35 mm	0.0531 in.
		1.40 mm	0.0551 in.
For intermediate case side gear		0.80 mm	0.0315 in.
		0.85 mm	0.0335 in.
		0.90 mm	0.0354 in.
		0.95 mm	0.0374 in.
		1.00 mm	0.0394 in.
		1.05 mm	0.0413 in.
		1.10 mm	0.0433 in.
		1.15 mm	0.0453 in.
		1.20 mm	0.0472 in.
		1.25 mm	0.0492 in.
		1.30 mm	0.0512 in.
		1.35 mm	0.0531 in.
		1.40 mm	0.0551 in.
For No. 2 differential case side gear	Mark		
	B	1.00 mm	0.0394 in.
	C	1.05 mm	0.0413 in.
	D	1.10 mm	0.0433 in.
	E	1.15 mm	0.0453 in.
	F	1.20 mm	0.0472 in.
	G	1.25 mm	0.0492 in.
For left case side gear	Mark		
	A	0.95 mm	0.0374 in.
	B	1.00 mm	0.0394 in.
	C	1.05 mm	0.0413 in.
	D	1.10 mm	0.0433 in.
	E	1.15 mm	0.0453 in.
	F	1.20 mm	0.0472 in.
	G	1.25 mm	0.0492 in.
	H	1.30 mm	0.0512 in.
	J	1.35 mm	0.0531 in.
	K	1.40 mm	0.0551 in.

## Specifications (Cont'd)

Adjusting shim thickness			
For differential preload	Mark		
	0	2.00 mm	0.0787 in.
	1	2.05 mm	0.0807 in.
	2	2.10 mm	0.0827 in.
	3	2.15 mm	0.0846 in.
	4	2.20 mm	0.0866 in.
	5	2.25 mm	0.0886 in.
	6	2.30 mm	0.0906 in.
	7	2.35 mm	0.0925 in.
	8	2.40 mm	0.0945 in.
	9	2.45 mm	0.0965 in.
	A	2.50 mm	0.0984 in.
	B	2.55 mm	0.1004 in.
	C	2.60 mm	0.1024 in.
	D	2.65 mm	0.1043 in.
	E	2.70 mm	0.1063 in.
	F	2.75 mm	0.1083 in.
	G	2.80 mm	0.1102 in.
	H	2.85 mm	0.1122 in.
For output shaft preload	Mark		
	0	1.30 mm	0.0512 in.
	1	1.35 mm	0.0531 in.
	2	1.40 mm	0.0551 in.
	3	1.45 mm	0.0571 in.
	4	1.50 mm	0.0591 in.
	5	1.55 mm	0.0610 in.
	6	1.60 mm	0.0630 in.
	7	1.65 mm	0.0650 in.
	B	1.70 mm	0.0669 in.
	9	1.75 mm	0.0689 in.
	A	1.80 mm	0.0709 in.
	B	1.85 mm	0.0728 in.
	C	1.90 mm	0.0748 in.
	D	1.95 mm	0.0768 in.
	E	2.00 mm	0.0787 in.
	F	2.05 mm	0.0807 in.
	G	2.10 mm	0.0827 in.
	H	2.15 mm	0.0846 in.
	J	2.20 mm	0.0866 in.
	K	2.25 mm	0.0886 in.
	L	2.30 mm	0.0906 in.
	M	2.35 mm	0.0925 in.
	N	2.40 mm	0.0945 in.
	P	2.45 mm	0.0965 in.
	Q	2.50 mm	0.0984 in.

## Specifications (Cont'd)

<b>TRANSFER ASSEMBLY</b>			
Ring gear backlash		0.13 – 0.18 mm	0.0051 – 0.0071 in.
Ring gear runout	Limit	0.1 mm	0.004 in.
Driven pinion preload (at starting)	New bearing	1.8 – 2.9 kg	4.0 – 6.4 lb 17.7 – 28.4 N
	Reused bearing	0.9 – 1.4 kg	2.0 – 3.1 lb 3.8 – 13.7 N
Transfer total preload (at starting) (Add driven pinion preload)	New bearing	1.3 – 1.4 kg	2.9 – 3.1 lb 12.7 – 13.7 N
	Reused bearing	0.5 – 0.9 kg	1.1 – 2.0 lb 4.9 – 8.8 N
Right case bushing inner diameter	STD	69.000 – 69.035 mm	2.7165 – 2.7179 in.
	Limit	69.060 mm	2.7189 in.
Left case bushing inner diameter	STD	69.000 – 69.035 mm	2.7165 – 2.7179 in.
	Limit	69.060 mm	2.7189 in.
Control coupling washer thickness	STD	1.49 – 1.51 mm	0.0587 – 0.0594 in.
	Limit	1.45 mm	0.0571 in.
Adjusting shim thickness			
For ring gear backlash	Mark		
	1	2.13 mm	0.0839 in.
	2	2.16 mm	0.0850 in.
	3	2.19 mm	0.0862 in.
	4	2.22 mm	0.0874 in.
	5	2.25 mm	0.0886 in.
	6	2.28 mm	0.0898 in.
	7	2.31 mm	0.0909 in.
	8	2.34 mm	0.0921 in.
	9	2.37 mm	0.0933 in.
	10	2.40 mm	0.0945 in.
	11	2.43 mm	0.0957 in.
	12	2.46 mm	0.0968 in.
	13	2.49 mm	0.0980 in.
	14	2.52 mm	0.0992 in.
	15	2.55 mm	0.1004 in.
	16	2.58 mm	0.1016 in.
	17	2.61 mm	0.1028 in.
	18	2.64 mm	0.1039 in.
	19	2.67 mm	0.1051 in.
	20	2.70 mm	0.1063 in.
	21	2.73 mm	0.1075 in.
	22	2.76 mm	0.1087 in.
	23	2.79 mm	0.1098 in.
	24	2.82 mm	0.1110 in.

## Specifications (Cont'd)

Adjusting shim thickness (cont'd) For tooth contact	Mark		
	A	0.30 mm	0.0118 in.
	B	0.33 mm	0.0130 in.
	C	0.36 mm	0.0142 in.
	D	0.39 mm	0.0154 in.
	E	0.42 mm	0.0165 in.
	F	0.45 mm	0.0177 in.
	G	0.48 mm	0.0189 in.
	H	0.51 mm	0.0201 in.
	J	0.54 mm	0.0213 in.
	K	0.57 mm	0.0224 in.

## Torque Specifications

Part tightened	kg-cm	ft-lb	N-m
Oil pump x Cover	105	8	10
Ring gear x Differential case	1,260	91	124
Rear bearing retainer x Transmission case	430	31	42
Transmission case x Transaxle case	300	22	29
Oil pump assembly x Transaxle case	175	13	17
Shift fork x Shift fork shaft	240	17	24
Oil pipe x Housing	175	13	17
Transmission case x Transmission case cover	300	22	29
Shift and select lever assembly x Transmission case	200	14	20
Bellcrank x Transmission case	200	14	20
Back-up light switch x Transmission case	410	30	40
Driven pinion x Bearing cage	See page MT-111		
Ring gear x Ring gear mounting	985	71	97
Driven pinion cage x Transfer case	400	29	39
Transfer case x Transfer right case	450	33	44
Transfer case x Inspection hole cover	160	12	16
Differential lock sleeve x Shift fork	160	12	16
Transfer right case x Transfer case cover	175	13	17
Driven pinion cage x Extension housing	260	19	25
Extension housing x Dynamic damper	260	19	25
Transaxle assembly x Transfer assembly	700	51	69
Transaxle assembly x Engine			
	M12 bolt	650	47
	M10 bolt	470	34



**AUTOMATIC TRANSAXLE (A140L, A140E)**

**Automatic Transmission (A140L/3S-FE)  
Specifications**

Governor pressure										
Output shaft rpm	(Vehicle speed reference)									
1,000	(approx. 30 km/h 19 mph)	0.9 – 1.8 kg/cm <sup>2</sup>	13 – 26 psi	88 – 177 kPa						
1,800	(approx. 55 km/h 34 mph)	1.6 – 2.5 kg/cm <sup>2</sup>	23 – 36 psi	157 – 245 kPa						
3,500	(approx. 107 km/h 66 mph)	4.5 – 5.4 kg/cm <sup>2</sup>	64 – 77 psi	441 – 530 kPa						
Line pressure (wheel locked)										
Engine idling	D range	3.7 – 4.3 kg/cm <sup>2</sup>	53 – 61 psi	363 – 422 kPa						
	R range	5.4 – 7.2 kg/cm <sup>2</sup>	77 – 102 psi	530 – 706 kPa						
At stall	D range	9.2 – 10.7 kg/cm <sup>2</sup>	131 – 152 psi	902 – 1,049 kPa						
(Throttle valve fully opened)	R range	14.4 – 16.8 kg/cm <sup>2</sup>	205 – 239 psi	1,412 – 1,648 kPa						
Engine stall revolution	2,200 ± 150 rpm									
Time lag	N range → D range	Less than 1.2 seconds								
	N range → R range	Less than 1.5 seconds								
Engine idling speed (A/C OFF)	N range	700 rpm								
Throttle cable adjustment (Throttle valve fully opened)	Between boot end face and inner cable stopper									
	0 – 1 mm					0 – 0.04 in.				
Shift points km/h (mph)	Differential gear ratio	D range (throttle valve fully open)								L range
		1 → 2	2 → 3	3 → O/D *1	Lock-up ON *2	Lock-up OFF *3	O/D → 3 *4	3 → 2	2 → 1	2 → 1
		3.736	48–64 (30–40)	93–110 (58–68)	–	–	–	–	89–108 (55–67)	37–48 (23–30)
<p>*1 3 → O/D up-shift point with closed accelerator pedal is at 25 – 36 km/h (16 – 22 mph).</p> <p>*2 Lock-up "ON" point with closed accelerator pedal is at 60 – 69 km/h (37 – 43 mph).</p> <p>*3 Lock-up "OFF" point with closed accelerator pedal is at 56 – 65 km/h (35 – 40 mph).</p> <p>*4 O/D → 3 down-shift is possible up to maximum speed.</p>										
Oil pump	Side clearance	STD	0.02 – 0.05 mm		0.0008 – 0.0020 in.					
		Limit	0.1 mm		0.004 in.					
	Body clearance	STD	0.07 – 0.15 mm		0.0028 – 0.0059 in.					
		Limit	0.3 mm		0.012 in.					
Tip clearance	Driven gear	STD	0.11 – 0.14 mm		0.0043 – 0.0055 in.					
		Limit	0.3 mm		0.012 in.					
Clutch piston stroke	Forward clutch (C <sub>1</sub> )	1.41 – 1.82 mm		0.0555 – 0.0717 in.						
	Direct clutch (C <sub>2</sub> )	1.14 – 1.49 mm		0.0449 – 0.0587 in.						
	O/D direct clutch (C <sub>0</sub> )	0.72 – 1.68 mm		0.0283 – 0.0661 in.						
Brake piston stroke	Second coast brake (B <sub>1</sub> )	14.0 – 15.5 mm		0.551 – 0.610 in.						

Specifications (Cont'd)

Valve body spring mm (in.)		Free length	Coil outer diameter	No. coils	Color		
	<b>Lower valve body</b>						
		Primary regulator valve	66.65 (2.6240)	18.60 (0.7323)	12.5	None	
		1-2 shift valve	27.17 (1.0697)	6.39 (0.2516)	15.5	Yellow	
		Detent regulator valve	29.72 (1.1701)	7.90 (0.3110)	12.5	Gray	
		2-3 shift valve	27.74 (1.0921)	8.30 (0.3268)	11	Pink	
		3rd coast shift valve	21.10 (0.8307)	10.90 (0.4291)	8.5	White	
		Lock-up signal valve	38.65 (1.5217)	8.15 (0.3209)	15.25	None	
		O/D sequence valve	30.90 (1.2165)	7.00 (0.2756)	18.5	None	
		Secondary regulator valve	32.80 (1.2913)	8.30 (0.3268)	15	Orange	
		Pressure relief valve	11.20 (0.4409)	6.40 (0.2520)	7.5	None	
		Cooler by-pass valve	19.90 (0.7835)	11.00 (0.4331)	8.5	None	
		<b>Upper valve body</b>					
			Throttle modulator valve	21.70 (0.8543)	9.50 (0.3740)	9.5	Orange
			Accumulator control valve	28.06 (1.0472)	10.60 (0.4173)	13.0	Yellow
			Low coast modulator valve	23.40 (0.9213)	7.90 (0.3110)	11.5	Blue
		Kick-down valve	29.76 (1.1717)	8.73 (0.3437)	13.5	Yellow	
		2nd coast modulator valve	20.93 (0.8240)	8.50 (0.3346)	10	Light Green	
		Throttle valve	30.70 (1.2087)	9.20 (0.3722)	9.5	Purple	
	Lock-up relay valve	26.56 (1.0457)	10.20 (0.4016)	11.5	Green		
Accumulator piston spring mm (in.)	B <sub>2</sub> (Center)		66.68 (2.6252)	16.36 (0.6441)	16.5	Orange	
	C <sub>1</sub> (O/D case side)	Inner	48.00 (1.8898)	13.58 (0.5346)	10.5	Red	
		Outer	81.09 (3.1925)	18.60 (0.7323)	17.0	Light Green	
C <sub>2</sub> (Torque converter side)		72.18 (2.8417)	17.58 (0.6921)	16.5	Yellow		
Input shaft	Thrust play		0.3 – 0.9 mm                      0.012 – 0.035 in.				
Drive plate	Runout	Limit	Less than 0.20 mm (0.0079 in.)				
Torque converter	Runout	Limit	Less than 0.30 mm (0.0118 in.)				
Counter drive gear preload			920 – 1,530 g	2.0 – 3.4 lb	9 – 15 N		
Bushing mm (in.)	Bushing name		Finished bore		Bore limit		
	Stator support	Front	21.500 – 21.526 (0.8465 – 0.8475)		21.576 (0.8494)		
		Rear	27.000 – 27.026 (1.0630 – 1.0640)		27.076 (1.0660)		
	Oil pump body		38.113 – 38.138 (1.5005 – 1.5015)		38.188 (1.5035)		
	Direct clutch drum		47.000 – 47.025 (1.8504 – 1.8514)		47.075 (1.8533)		
	Front planetary ring gear flange		19.025 – 19.050 (0.7490 – 0.7500)		19.100 (0.7520)		
	Input sun gear	Front & Rear	22.025 – 22.046 (0.8671 – 0.8680)		22.096 (0.8699)		
Overdrive clutch drum	Front & Rear	22.025 – 22.046 (0.8671 – 0.8680)		22.096 (0.8699)			

## Torque Specifications

Part tightened	kg-cm	ft-lb	N-m	
Transaxle case x Engine	12 mm	650	47	64
	10 mm	470	34	46
Bolt locking plate x Transaxle	250	18	25	
Stiffener plate x Engine	380	27	37	
Stiffener plate x Transaxle case	380	27	37	
Drive plate x Crank shaft	850	61	83	
Torque converter x Drive plate	280	20	27	
Oil pump x Transaxle case	225	16	22	
Oil pump body x Stator shaft	100	7	10	
Second coast brake band guide	55	48 in.-lb	5.4	
Upper valve body x Lower valve body	55	48 in.-lb	5.4	
Valve body	100	7	10	
Accumulator cover	100	7	10	
Oil strainer	100	7	10	
Oil pan	50	43 in.-lb	4.9	
Oil pan drain plug	500	36	49	
Cooler pipe union nut	350	25	34	
Testing plug	75	65 in.-lb	7.4	
Parking lock pawl bracket	75	65 in.-lb	7.4	
Overdrive case x Transaxle case	250	18	25	
Overdrive brake drum x Overdrive case	55	48 in.-lb	5.4	
Neutral start switch x Transaxle case	55	48 in.-lb	5.4	
Neutral start switch	70	61 in.-lb	6.9	

**Automatic Transmission (A140E/3S-GE)  
Specifications**

Line pressure (wheel locked)					
Engine idling		D range	3.7 - 4.3 kg/cm <sup>2</sup>	53 - 61 psi	363 - 422 kPa
		R range	5.4 - 7.2 kg/cm <sup>2</sup>	77 - 102 psi	530 - 706 kPa
At stall (Throttle valve fully opened)		D range	9.2 - 10.7 kg/cm <sup>2</sup>	131 - 152 psi	902 - 1,049 kPa
		R range	14.4 - 16.8 kg/cm <sup>2</sup>	205 - 239 psi	1,412 - 1,648 kPa
Engine stall revolution			2,200 ± 150 rpm		
Time lag	N range	→ D range	Less than 1.2 seconds		
	N range	→ R range	Less than 1.5 seconds		
Engine idle speed (A/C OFF)		N range	750 rpm		
Throttle cable adjustment (Throttle valve fully opened)			Between boot end face and inner cable stopper		
			0 - 1 mm	0 - 0.04 in.	

Shift point km/h (mph)		Throttle valve fully open [ ] Fully closed							
		1 → 2	2 → 3	3 → OD	[3 → O/D]	[O/D → 3]	O/D → 3	3 → 2	2 → 1
D range	NORM	49-55 (30-34)	96-106 (60-66)	150-160 (93-99)	33-38 (21-24)	20-24 (12-15)	142-152 (88-94)	91-100 (57-62)	41-46 (25-29)
	PWR	60-66 (37-41)	110-120 (68-75)	177-188 (110-117)	41-46 (25-29)	20-24 (12-15)	169-180 (105-112)	104-114 (65-71)	41-46 (25-29)
2 range	NORM	60-66 (37-41)	-	-	-	-	-	-	41-46 (25-29)
	PWR	-	-	-	-	-	-	-	-
L range	NORM	-	-	-	-	-	-	-	49-54 (30-34)
	PWR	-	-	-	-	-	-	-	-

Lock-up point km/h (mph)		Throttle valve opening 5%					
		Lock-up ON			Lock-up OFF		
		2nd	3rd	O/D	2nd	3rd	O/D
D range	NORM	-	*57-63 (35-39)	54-60 (34-37)	-	*52-57 (32-35)	52-57 (32-35)
	PWR	-	*68-74 (42-46)	68-74 (42-46)	-	*63-68 (39-42)	63-68 (39-42)
* O/D switch OFF							

Specifications (Cont'd)

Valve body spring mm (in.)		Free length	Coil outer diameter	No. coils	Color		
	Lower valve body						
		Primary regulator valve	66.65 (2.6240)	18.60 (0.7323)	12.5	None	
		1-2 shift valve	29.27 (1.1524)	9.70 (0.3819)	10.5	None	
		2-3 shift valve	29.27 (1.1524)	9.70 (0.3819)	10.5	None	
		3.4 shift valve	29.27 (1.1524)	9.70 (0.3819)	10.5	None	
		Lock-up signal valve	30.00 (1.1811)	8.20 (0.3228)	11.5	None	
		Secondary regulator valve	27.30 (1.0748)	8.30 (0.3268)	13.0	Green	
		Pressure relief valve	11.20 (0.4409)	6.40 (0.2520)	7.5	None	
		Cooler by-pass valve	19.90 (0.7835)	11.00 (0.4331)	8.5	None	
		Upper valve					
			Throttle modulator valve	21.70 (0.8543)	9.50 (0.3740)	9.5	Orange
			Accumulator control valve	28.06 (1.1047)	10.60 (0.4173)	13.0	Yellow
			Low coast modulator valve	21.60 (0.8504)	7.90 (0.3110)	11.5	None
			Kick-down valve	29.76 (1.1717)	8.73 (0.3437)	13.5	Yellow
			2nd coast modulator valve	20.93 (0.8240)	8.50 (0.3346)	10	Light Green
		Throttle valve	30.70 (1.2087)	9.20 (0.3622)	9.5	Purple	
		Cut-back valve	21.80 (0.8583)	6.00 (0.2362)	13.5	None	
Accumulator piston spring mm (in.)	B <sub>2</sub> (Center)	Upper	Inner	54.10 (2.1299)	12.10 (0.4764)	17.5	Green
			Outer	54.00 (2.1260)	17.60 (0.6929)	11.5	White
		Lower		22.00 (0.8661)	16.00 (0.6299)	5	Yellow
	C <sub>1</sub> (O/D case side)	Inner	48.00 (1.8898)	13.58 (0.5346)	10.5	Red	
		Outer	81.09 (3.1925)	18.60 (0.7323)	17.0	Light Green	
		C <sub>2</sub> (Torque converter side)		89.25 (3.5137)	19.37 (0.7626)	19.0	White
Oil pump	Side clearance	STD	0.02 – 0.05 mm	0.0008 – 0.0020 in.			
		Limit	0.1 mm	0.004 in.			
	Body clearance	STD	0.07 – 0.15 mm	0.0028 – 0.0059 in.			
		Limit	0.3 mm	0.012 in.			
Tip clearance	Driven gear	STD	0.11 – 0.14 mm	0.0043 – 0.0055 in.			
		Limit	0.3 mm	0.012 in.			
Clutch piston stroke	Forward clutch (C <sub>1</sub> )		1.41 – 1.82 mm	0.0555 – 0.0717 in.			
	Direct clutch (C <sub>2</sub> )		1.11 – 1.44 mm	0.0437 – 0.0567 in.			
	O/D direct clutch (C <sub>0</sub> )		0.72 – 1.68 mm	0.0283 – 0.0661 in.			
Brake piston distance	Second coast brake (B <sub>1</sub> )		14.0 – 15.5 mm	0.551 – 0.610 in.			
Input shaft	Thrust play		0.3 – 0.9 mm	0.012 – 0.035 in.			
Drive plate	Runout	Limit	Less than 0.20 mm (0.0079 in.)				
Torque converter	Runout	Limit	Less than 0.30 mm (0.0118 in.)				
Counter drive gear preload			920 – 1,530 g	2.0 – 3.4 lb	9 – 15 N		

**Specifications (Cont'd)**

Bushing mm (in.)	Bushing name		Finished bore	Bore limit
	Stator	Front	21.500 – 21.526 (0.8465 – 0.8475)	21.576 (0.8494)
Rear		27.000 – 27.026 (1.0630 – 1.0640)	27.076 (1.0660)	
Oil pump body		38.113 – 38.138 (1.5005 – 1.5015)	38.188 (1.5035)	
Direct clutch drum		47.000 – 47.025 (1.8504 – 1.8514)	47.075 (1.8533)	
Front planetary ring gear flange		19.025 – 19.050 (0.7490 – 0.7500)	19.100 (0.7520)	
Input sun gear	Front & Rear	22.025 – 22.046 (0.8671 – 0.8680)	22.096 (0.8699)	
Overdrive clutch drum	Front & Rear	22.059 – 22.080 (0.8685 – 0.8693)	22.130 (0.8713)	

**Torque Specifications**

Part tightened	kg-cm	ft.-lb	N-m	
Transaxle case x Engine	12 mm	650	47	64
	10 mm	470	34	46
Bolt locking plate x Transaxle	250	18	25	
Stiffener plate x Engine	380	27	37	
Stiffener plate x Transaxle case	380	27	37	
Drive plate x Crank shaft	850	61	83	
Torque converter x Drive plate	280	20	27	
Oil pump x Transaxle case	225	16	22	
Oil pump body x Stator shaft	100	7	10	
Second coast brake band guide	55	48 in.-lb	5.4	
Upper valve body x Lower valve body	55	48 in.-lb	5.4	
Valve body	100	7	10	
Accumulator cover	100	7	10	
Oil strainer	100	7	10	
Oil pan	50	43 in.-lb	4.9	
Oil pan drain plug	500	36	49	
Cooler pipe union nut	350	25	34	
Testing plug	75	65 in.-lb	7.4	
Parking lock pawl bracket	75	65 in.-lb	7.4	
Overdrive case x Transaxle case	250	18	25	
Overdrive brake drum x Overdrive case	55	48 in.-lb	5.4	
Neutral start switch x Transaxle case	55	48 in.-lb	5.4	
Neutral start switch	70	61 in.-lb	6.9	

**Differential (A140L, A140E)**

**Specifications**

Side bearing preload (at starting)			
New bearing	10 – 16 kg-cm	8.7 – 13.9 in.-lb	1.0 – 1.6 N·m
Reused bearing	5 – 8 kg-cm	4.3 – 6.9 in.-lb	0.5 – 0.8 N·m
Drive pinion preload (at starting)			
New bearing	10 – 16 kg-cm	8.7 – 13.9 in.-lb	1.0 – 1.6 N·m
Reused bearing	5 – 8 kg-cm	4.3 – 6.9 in.-lb	0.5 – 0.8 N·m
Total preload (at starting)	Add drive pinion preload		
New bearing	2.9 – 4.0 kg-cm	2.5 – 3.5 in.-lb	0.3 – 0.4 N·m
Reused bearing	1.5 – 2.0 kg-cm	1.3 – 1.7 in.-lb	0.1 – 0.2 N·m
Pinion to side gear backlash	0.05 – 0.20 mm	0.0020 – 0.0079 in.	
Side gear thrust washer thickness	0.95 mm	0.0374 in.	
	1.00 mm	0.394 in.	
	1.05 mm	0.0413 in.	
	1.10 mm	0.0433 in.	
	1.15 mm	0.0453 in.	
	1.20 mm	0.0472 in.	
Side bearing adjusting shim thickness	1.89 – 1.91 mm	0.0744 – 0.0752 in.	
	1.94 – 1.96 mm	0.0764 – 0.0772 in.	
	1.99 – 2.01 mm	0.0783 – 0.0791 in.	
	2.04 – 2.06 mm	0.0803 – 0.0811 in.	
	2.09 – 2.11 mm	0.0823 – 0.0831 in.	
	2.14 – 2.16 mm	0.0843 – 0.0850 in.	
	2.19 – 2.21 mm	0.0862 – 0.0870 in.	
	2.24 – 2.26 mm	0.0882 – 0.0890 in.	
	2.29 – 2.31 mm	0.0902 – 0.0909 in.	
	2.34 – 2.36 mm	0.0921 – 0.0929 in.	
	2.39 – 2.41 mm	0.0941 – 0.0949 in.	
	2.44 – 2.46 mm	0.0961 – 0.0969 in.	
	2.49 – 2.51 mm	0.0980 – 0.0988 in.	
	2.54 – 2.56 mm	0.1000 – 0.1008 in.	
	2.59 – 2.61 mm	0.1020 – 0.1028 in.	
	2.64 – 2.66 mm	0.1039 – 0.1047 in.	
	2.69 – 2.71 mm	0.1059 – 0.1067 in.	
	2.74 – 2.76 mm	0.1079 – 0.1087 in.	
	2.79 – 2.81 mm	0.1098 – 0.1106 in.	

**Torque Specifications**

Part tightened	kg-cm	ft-lb	N·m
Ring gear x Differential case	985	71	97
Side bearing cap	730	53	72
Side bearing retainer	195	14	19
Drive pinion nut	1,750 – 2,950	127 – 213	172 – 289
Differential carrier cover	250	18	25
Filler plug	400	29	39
Drain plug	400	29	29

**PROPELLER SHAFT****Specifications**

Bearing axial play			0.05 mm	0.0020 in.
Front propeller shaft runout	Limit		0.8 mm	0.031 in.
Intermediate shaft runout	Limit		0.8 mm	0.031 in.
Rear propeller shaft runout	Limit		0.8 mm	0.031 in.
Intermediate shaft flange runout	Limit		0.1 mm	0.0039 in.
Snap ring thickness	Color	None	1.475 – 1.525 mm	0.0581 – 0.0600 in.
		Brown	1.525 – 1.575 mm	0.0600 – 0.0620 in.
		Blue	1.575 – 1.625 mm	0.0620 – 0.0640 in.

**Torque Specifications**

Part tightened		kg-cm	ft-lb	N-m
Propeller shaft x Differential		750	54	74
Intermediate shaft x Propeller shaft		750	54	74
Center support bearing x Body		375	27	37
Intermediate shaft x Center support bearing x Joint flange	1st	1,850	134	181
	2nd	Loosen nut		
	3rd	700	51	69
Cross groove joint set bolt		660	48	65



**FRONT AXLE AND SUSPENSION**

**Specifications**

Cold tire inflation pressure	Tire size		Inflation pressure kg/cm <sup>2</sup> (psi, kPa)	
			Front	Rear
	2WD	165 SR 13	2.1 (30, 210)	1.8 (26, 180)
		185/70 SR 13	1.9 (28, 190)	1.8 (26, 180)
		P185/70 SR 13	1.9 (28, 190)	1.8 (26, 180)
		205/60 R 14 87H	1.8 (26, 180)	1.8 (26, 180)
	Convertible	185/70 SR 13	2.0 (29, 200)	2.0 (29, 200)
		P185/70 SR 13	2.0 (29, 200)	2.0 (29, 200)
	4WD	205/60 VR 14	2.1 (30, 210)	2.1 (30, 210)
		205/60 R 14 87H	2.1 (30, 210)	2.1 (30, 210)
Front wheel alignment			Inspection STD	Adjustment STD
	Toe-in		0 ± 2 mm (0 ± 0.08 in.)	0 ± 1 mm (0 ± 0.04 in.)
	Camber		-10' ± 45'	-
	Left-right error		30'	-
	Steering axis inclination		13°30' ± 45'	-
	Left-right error		30'	-
	Caster		1°10' ± 45'	-
	Left-right error		30'	-
Side slip		Less than 3.0 mm/m (0.118 in./3.3 ft)		
Wheel angle	Inside wheel	34°00'		
Max.	Outside wheel	30°00'		
At 20° wheel angle				
	Inside wheel	21°30'		
	Outside wheel	20°		
Front axle and suspension	Wheel lateral runout	Limit	Less than 1.0 mm (0.039 in.)	
	Hub bearing axial direction play	Limit	0.05 mm	0.0020 in.
	Ball joint rotation condition		10–30 kg-cm	9 – 26 in.-lb 1.0 – 2.9 N-m
	Ball joint vertical play	Limit	0 mm	0 in.
	Drive shaft length			
	2WD	3S-FE engine		445.3 mm 17.531 in.
		3S-GE engine	LH	459.3 mm 18.083 in.
		RH	461.8 mm 18.181 in.	
	4WD		400.6 mm 15.772 in.	

## Torque Specifications

Part tightened	kg-cm	ft-lb	N.m	
Steering knuckle x Shock absorber (Apply engine oil to the nut)	2,600	188	255	
Steering knuckle x Lower ball joint	1,135	82	111	
Brake caliper x Steering knuckle	970	70	95	
Tie rod end x Steering knuckle	500	36	49	
Tie rod lock nut	570	41	56	
Wheel bearing lock nut	1,900	137	186	
Suspension support x Body	650	47	64	
Suspension support x Piston rod	475	34	47	
Lower arm x Ball joint	1,300	94	127	
Lower arm x Lower arm shaft	2,160	156	212	
Stabilizer bar x Stabilizer bar link	360	26	35	
Stabilizer bar bracket x Body	195	14	19	
Drive shaft x Side gear shaft				
	2WD	370	27	36
	4WD	660	48	65
Lower arm bracket x Body	1,000	72	98	
Wheel nut	1,050	76	103	
Lower arm shaft x Body	2,110	153	207	
Stabilizer bar link x Lower arm	360	26	35	
Suspension lower crossmember x Body	2,110	153	207	
Suspension lower crossmember x Engine mounting center member	400	29	39	
Center drive shaft lock nut	330	24	32	

**REAR AXLE AND SUSPENSION**

**Specifications**

Rear wheel alignment			Inspection STD	Adjustment STD	
	Toe-in		5 ± 2 mm (0.20 ± 0.08 in.)	5 ± 1 mm (0.20 ± 0.04 in.)	
	Camber		-45' ± 45'		
	Left-right error		30'		
Rear axle and suspension	Disc wheel lateral runout	Limit	Less than 1.0 mm (0.039 in.)		
	Hub bearing axial direction	Limit	0.05 mm	0.0020 in.	
	Drive shaft length		558.5 mm	21.988 in.	
Differential	Drive pinion bearing preload	at Starting			
		New bearing	10 – 16 kg-cm (8.7 – 13.9 in.-lb, 1.0 – 1.6 N-m)		
		Reused bearing	5 – 8 kg-cm (4.3 – 6.9 in.-lb, 0.5 – 0.8 N-m)		
	Total preload	at Starting	Add drive pinion bearing preload		
			3 – 5 kg-cm (2.6 – 4.3 in.-lb, 0.3 – 0.5 N-m)		
	Drive pinion to ring gear backlash		0.13 – 0.18 mm	0.0051 – 0.0071 in.	
	Pinion gear to side gear backlash		0.05 – 0.20 mm	0.0020 – 0.0079 in.	
	Ring gear runout	Limit	0.07 mm	0.0028 in.	
	Companion flange runout				
		Limit	Lateral runout	0.1 mm	0.004 in.
			Radial runout	0.1 mm	0.004 in.
	Ring gear installing temperature		90 – 110°C	194 – 230°F	
	Drive pinion oil seal drive in depth		2.0 mm	0.079 in.	
	Side gear oil seal drive in depth		Flash the carrier end surface		
	Side gear thrust washer thickness		0.95 mm	0.0374 in.	
			1.00 mm	0.0394 in.	
			1.05 mm	0.0413 in.	
			1.10 mm	0.0433 in.	
			1.15 mm	0.0453 in.	
			1.20 mm	0.0472 in.	
	Drive pinion adjusting plate washer thickness		2.27 mm	0.0894 in.	
			2.30 mm	0.0906 in.	
		2.33 mm	0.0917 in.		
		2.36 mm	0.0929 in.		
		2.39 mm	0.0941 in.		
		2.42 mm	0.0953 in.		
		2.45 mm	0.0965 in.		
		2.48 mm	0.0976 in.		
		2.51 mm	0.0988 in.		
		2.54 mm	0.1000 in.		
		2.57 mm	0.1012 in.		
		2.60 mm	0.1024 in.		
		2.63 mm	0.1035 in.		
		2.66 mm	0.1047 in.		
		2.69 mm	0.1059 in.		

## Specifications (Cont'd)

Differential (cont'd)	Side bearing adjusting plate thickness		
		2.21 – 2.23 mm	0.0870 – 0.0878 in.
		2.24 – 2.26 mm	0.0882 – 0.0890 in.
		2.27 – 2.29 mm	0.0894 – 0.0902 in.
		2.30 – 2.32 mm	0.0906 – 0.0913 in.
		2.33 – 2.35 mm	0.0917 – 0.0925 in.
		2.36 – 2.38 mm	0.0929 – 0.0937 in.
		2.39 – 2.41 mm	0.0941 – 0.0949 in.
		2.42 – 2.44 mm	0.0953 – 0.0961 in.
		2.45 – 2.47 mm	0.0965 – 0.0972 in.
		2.48 – 2.50 mm	0.0976 – 0.0984 in.
		2.51 – 2.53 mm	0.0988 – 0.0996 in.
		2.54 – 2.56 mm	0.1000 – 0.1008 in.
		2.57 – 2.59 mm	0.1012 – 0.1020 in.
		2.60 – 2.62 mm	0.1024 – 0.1031 in.
		2.63 – 2.65 mm	0.1035 – 0.1043 in.
		2.66 – 2.68 mm	0.1047 – 0.1055 in.
		2.69 – 2.71 mm	0.1059 – 0.1067 in.
		2.72 – 2.74 mm	0.1071 – 0.1079 in.
		2.75 – 2.77 mm	0.1083 – 0.1091 in.
		2.78 – 2.80 mm	0.1094 – 0.1102 in.
		2.81 – 2.83 mm	0.1106 – 0.1114 in.
		2.84 – 2.86 mm	0.1118 – 0.1126 in.
		2.87 – 2.89 mm	0.1130 – 0.1138 in.
		2.90 – 2.92 mm	0.1142 – 0.1150 in.
		2.93 – 2.95 mm	0.1154 – 0.1161 in.
		2.96 – 2.98 mm	0.1165 – 0.1173 in.
		2.99 – 3.01 mm	0.1177 – 0.1185 in.
		3.02 – 3.04 mm	0.1189 – 0.1197 in.
		3.05 – 3.07 mm	0.1201 – 0.1209 in.
		3.08 – 3.10 mm	0.1213 – 0.1220 in.
		3.11 – 3.13 mm	0.1224 – 0.1232 in.
		3.14 – 3.16 mm	0.1236 – 0.1244 in.
		3.17 – 3.19 mm	0.1248 – 0.1256 in.
		3.20 – 3.22 mm	0.1260 – 0.1268 in.

## Torque Specifications

Part tightened	kg-cm	ft-lb	N·m
Axle shaft x Axle bearing lock nut	1,250	90	123
Axle carrier x Shock absorber	2,300	166	226
Bearing case x Axle carrier	820	59	80
Suspension support x Body	320	23	31
Suspension support x Shock absorber piston rod	500	36	49
No. 1 and No. 2 suspension arm x Axle carrier 2WD	1,850	134	181
4WD	1,250	90	123
No. 1 suspension arm x Body	1,150	83	113
No. 2 suspension arm x Body 2WD	890	64	87
4WD	1,150	83	113

**Torque Specifications (Cont'd)**

Part tightened	kg-cm	ft-lb	N·m	
Drive shaft x Side gear shaft	700	51	69	
Strut rod x Axle carrier	1,150	83	113	
Strut rod x Body	1,150	83	113	
Stabilizer bar x Link	360	26	35	
Stabilizer bar bracket x Body	195	14	19	
Stabilizer link x Shock absorber	360	26	35	
Wheel nut	1,050	76	103	
Differential x Support member				
	Under side	970	70	95
	Rear side	1,500	108	147
Carrier x Carrier cover	475	34	47	
Carrier x Drain plug	500	36	49	
Carrier x Filler plug	400	29	39	
Carrier x Side bearing cap	800	58	78	
Ring gear x Differential case	985	71	97	
Drive pinion x Companion flange	See page RA-39			
Companion flange x Propeller shaft	750	54	74	

**BRAKE SYSTEM****Specifications**

Brake pedal	Pedal height (from asphalt sheet)		153 – 163 mm	6.02 – 6.42 in.	
	Pedal freeplay (Pedal)		3 – 6 mm	0.12 – 0.24 in.	
	(Clevis pin and clevis)		1 – 3 mm	0.04 – 0.12 in.	
	Pedal reserve distance at 50 kg (110.2 lb, 490 N)				
	Rear disc brake		More than 95 mm (3.74 in.)		
	Rear drum brake		More than 90 mm (3.54 in.)		
Brake booster	Booster push rod to piston clearance w/ SST		0 mm	0 in.	
Front brake	Disc thickness	3S-FE	STD	22.0 mm	0.866 in.
			Limit	21.0 mm	0.827 in.
	3S-GE (w/o A.B.S.)	STD	22.0 mm	0.866 in.	
		Limit	21.0 mm	0.827 in.	
	3S-FE (w/ A.B.S.)	STD	25.0 mm	0.984 in.	
		Limit	24.0 mm	0.945 in.	
	3S-GTE	STD	25.0 mm	0.984 in.	
		Limit	24.0 mm	0.945 in.	
	Disc runout	Limit	0.07 mm	0.0028 in.	
	Pad thickness	STD	10.0 mm	0.394 in.	
Limit		1.0 mm	0.039 in.		
Rear brake (Drum)	Drum inside diameter	STD	200.0 mm	7.874 in.	
		Limit	201.0 mm	7.913 in.	
	Lining thickness	STD	4.0 mm	0.157 in.	
		Limit	1.0 mm	0.039 in.	
Rear brake (Disc)	Disc thickness	STD	10.0 mm	0.394 in.	
		Limit	9.0 mm	0.354 in.	
	Disc runout	Limit	0.15 mm	0.0059 in.	
	Pad thickness	STD	10.0 mm	0.394 in.	
		Limit	1.0 mm	0.039 in.	
Parking brake (Drum)	Lever travel at 20 kg (44.1 lb, 196 N)		4 – 7 clicks		
	Shoe to parking brake shoe lever clearance		0 – 0.35 mm	0 – 0.138 in.	
	Parking brake shoe lever shim thickness		0.2 mm	0.008 in.	
			0.3 mm	0.012 in.	
			0.4 mm	0.016 in.	
			0.5 mm	0.020 in.	
			0.6 mm	0.024 in.	
			0.9 mm	0.035 in.	
Drum to shoe clearance		0.6 mm	0.024 in.		
Parking brake (Disc)	Rear disc inner diameter	STD	170 mm	6.69 in.	
		Limit	171 mm	6.73 in.	
	Limit thickness	STD	2.0 mm	0.079 in.	
		Limit	1.0 mm	0.039 in.	
	Lever travel at 20 kg (44.1 lb, 196 N)		4 – 7 clicks		

## Specifications (Cont'd)

Parking brake (Disc) (cont'd)	Clearance between rear shoe and lever Parking brake shoe lever shim thickness	0 – 0.35 mm	0 – 0.0138 in.
		0.3 mm	0.012 in.
		0.6 mm	0.024 in.
		0.9 mm	0.035 in.

## Torque Specifications

Part tightened	kg-cm	ft-lb	N-m
Master cylinder x Piston stopper bolt	100	7	10
Master cylinder x Reservoir	17.5	15.2 in.-lb	1.7
Master cylinder x Brake booster	130	9	13
Brake tube union nut	155	11	15
Suspension upper brace (nuts)	650	47	64
(bolts)	210	15	21
Brake booster clevis lock nut	260	19	25
Brake booster x Pedal bracket	130	18	25
Front disc brake cylinder installation bolt	255	18	25
4WD	370	27	36
Front disc brake torque plate x Steering knuckle	960	69	94
4WD	1,015	73	100
Front disc brake cylinder x Flexible hose	310	22	30
Rear drum brake wheel cylinder x Backing plate	100	7	10
Parking brake cable bracket x Backing plate	80	69 in.-lb	7.8
Rear disc brake cylinder installation bolt	200	14	20
Rear disc brake torque plate x Dust cover	475	34	47
Rear disc brake cylinder x Flexible hose	310	22	30
Parking brake backing plate anchor pin x Dust cover	1,450	105	142
Bleeder plug	85	74 in.-lb	8.3
A.B.S. actuator x Proportioning valve bracket	90	78 in.-lb	8.8
A.B.S. actuator x 3-way union	160	12	16
Proportioning valve installation bolt	90	78 in.-lb	8.8
A.B.S. actuator x Actuator bracket	55	48 in.-lb	5.4
Sensor rotor x Front axle hub	140	10	14
Front speed sensor installation bolt	120	9	12
Rear speed sensor installation bolt	120	9	12
4WD	195	14	19
A.B.S. tube connector x Brake tube (Body side)	260	19	25
A.B.S. tube connector installation bolt	80	69 in.-lb	7.8
A.B.S. actuator bracket x Body (Nut)	130	9	13
A.B.S. computer x Computer bracket	55	48 in.-lb	5.4
A.B.S. deceleration sensor x Computer bracket	32.5	28 in.-lb	3.2
A.B.S. computer bracket installation bolt	130	9	13
Front left	195	14	19
Front right	195	14	19
Rear	195	14	19
A.B.S. computer sub-bracket x Body	185	13	18

## STEERING

### Specifications

Steering	Steering wheel freeplay	30 mm (1.18 in.) or less		
Rigid steering	Main shaft axial play	Less than 0.3 mm (0.012 in.)		
	Main shaft snap ring thickness	1.2 mm	0.047 in.	
		1.4 mm	0.055 in.	
Tilt steering and telescopic steering	No. 1 collar outer diameter	17.989 – 17.996 mm	0.7082 – 0.7085 in.	
		17.996 – 18.003 mm	0.7085 – 0.7088 in.	
		18.003 – 18.010 mm	0.7088 – 0.7091 in.	
		18.010 – 18.017 mm	0.7091 – 0.7093 in.	
		18.017 – 18.024 mm	0.7093 – 0.7096 in.	
	No. 2 collar outer diameter	17.989 – 17.996 mm	0.7082 – 0.7085 in.	
		17.996 – 18.003 mm	0.7085 – 0.7088 in.	
		18.003 – 18.010 mm	0.7088 – 0.7091 in.	
		18.010 – 18.017 mm	0.7091 – 0.7093 in.	
		18.017 – 18.024 mm	0.7093 – 0.7096 in.	
	Support shim thickness	Mark	None	0.197 – 0.203 mm 0.0078 – 0.0080 in.
			5	0.495 – 0.505 mm 0.0195 – 0.0199 in.
			8	0.795 – 0.805 mm 0.0313 – 0.0317 in.
			14	1.395 – 1.405 mm 0.0549 – 0.0533 in.
			18	1.795 – 1.805 mm 0.0707 – 0.0711 in.
Power steering	Drive belt tension	New belt	125 ± 25 lb	
		Used belt	80 ± 20 lb	
	Maximum rise of oil level	Below 5 mm (0.20 in.)		
	Oil pressure at Idle speed	75 – 80 kg/cm <sup>2</sup> (1,067 – 1,138 psi, 7,355 – 7,845 kPa)		
	Steering effort	70 kg-cm (61 in.-lb, 6.9 N·m)		
	Rotor shaft bushing oil clearance	STD	0.01 – 0.03 mm	0.0004 – 0.0012 in.
		Maximum	0.07 mm	0.0028 in.
	Vane plate to rotor groove clearance	0.028 mm 0.0011 in.		
	Vane plate	Minimum height	8.0 mm	0.315 in.
		Minimum thickness	1.77 mm	0.0697 in.
		Minimum length	14.97 mm	0.5894 in.
	Vane plate length	Rotor and cam ring mark	None	14.996 – 14.998 mm 0.5904 – 0.5905 in.
			1	14.994 – 14.996 mm 0.5903 – 0.5904 in.
			2	14.992 – 14.994 mm 0.5902 – 0.5903 in.
			3	14.990 – 14.992 mm 0.59016 – 0.59024 in.
			4	14.988 – 14.990 mm 0.5901 – 0.5902 in.
	Flow control valve spring length	STD	38 mm	1.49 in.
		Minimum	36 mm	1.42 in.
Pump rotating torque	2.8 kg-cm (2.4 in.-lb, 0.3 N·m) or less			
Steering rack runout	Maximum	0.3 mm	0.012 in.	
Bearing preload	4.5 – 6.5 kg-cm (3.9 – 5.6 in.-lb, 0.4 – 0.6 N·m)			
Total preload	9 – 12 kg-cm (7.8 – 10.4 in.-lb, 0.9 – 1.2 N·m)			



**Torque Specifications**

Rigid steering	Part tightened	kg-cm	ft-lb	N-m
	Thrust stopper x Column tube	130	9	13
	Column tube x Body	260	19	25
	Support mounting bolt	120	9	12
	Main shaft x Universal joint	360	26	35
	Universal joint x Pinion	360	26	35
	Steering wheel x Main shaft	350	25	34
Tilt steering and telescopic steering	Support stopper bolt	110	8	11
	Tilt lever retainer	195	14	19
	Tilt sub lever No. 1 bolt	80	69 in.-lb	7.8
	Column tube x Breakaway bracket	185	13	18
	Thrust stopper x Column tube	130	9	13
	Main shaft x Intermediate shaft	260	19	25
	Column tube stopper bolt	80	69 in.-lb	7.8
	Telescopic lever x Telescopic lever bolt	145	10	14
	Column tube x Body	260	19	25
	Support mounting bolt	120	9	12
	Intermediate shaft x Universal joint	360	26	35
	Universal joint x Pinion	360	26	35
	Steering wheel x Main shaft	350	25	34
Power steering	Pressure port union x Pump housing	700	51	69
	Suction port union x Pump housing	130	9	13
	Air control valve x Pump housing	370	27	36
	PS pump pulley x Rotor shaft	440	32	43
	PS pump x Pressure tube	525	38	51
	PS pump x Bracket	440	32	43
		Upper		
		Lower		
	Rear pump stay x Pump bracket (3S-GTE)	400	29	39
	Stabilizer bar bracket x Body (3S-GTE)	195	14	19
	Stabilizer link x Lower arm (3S-GTE)	360	26	35
	Propeller shaft x Intermediate shaft (3S-GTE)	750	54	74
	Exhaust pipe clamp (3S-GTE)	210	15	21
	Lower crossmember	400	29	39
		Center		
		Others		
	Pressure tube x Pressure tube	370	27	36
	Control valve housing x Rack housing	315	23	31
	Bearing guide lock nut	570	41	56
	Rack guide spring cap lock nut	570	41	56
	Rack x Rack end	730	53	72
	Turn pressure tube x Gear housing	200	14	20
	Gear housing x Body	600	43	59
	Rear mount bracket	530	38	52
	Gear housing x Return line	450	33	44
	Gear housing x Pressure line	450	33	44
	Center member x Body	400	29	39
	Tie rod end x Knuckle arm	500	36	49
	Pinion x Universal joint	360	26	35
	Tie rod end lock nut	570	41	56

**BODY****Torque Specifications**

Part tightened	kg-cm	ft-lb	N·m
<b>SEAT</b>			
<b>Front Seat</b>			
Seat back x Seat adjuster	185	13	18
Seat cushion x Seat adjuster	185	13	18
Seat adjuster x Body	375	27	37
<b>Rear Seat (Fixed type)</b>			
Seat back x Body	240	17	24
<b>Rear Seat (Split foldable type)</b>			
Seat back lock x Seat back	175	13	17
Seat back lock striker x Body	175	13	17
Seat center hinge x Seat back	80	69 in.-lb	7.8
Seat center hinge x Body	185	13	18
Seat back hinge x Seat back	240	17	24
Seat back hinge x Body	80	69 in.-lb	7.8
<b>SEAT BELT</b>			
<b>Front Seat Belt</b>			
ELR x Body	440	32	43
Outer belt shoulder anchor x Body	440	32	43
Outer belt lower anchor x Body	440	32	43
Inner belt x Body	440	32	43
<b>Rear Seat Belt (ELR type)</b>			
ELR x Body	440	32	43
Outer belt shoulder anchor x Body	440	32	43
Outer belt lower anchor x Body	440	32	43
Inner belt x Body	440	32	43
CRS, Tether anchor (CANADA only)	210	15	21

## LUBRICANT

Item			Capacity			Classification
			Liters	US qts	Imp. qts	
Engine oil	3S-FE	Dry fill	4.3	4.5	3.8	API grade SF or SF/CC, multigrade, recommended viscosity and fuel-efficient oil
		Drain and refill				
		w/ Oil filter change	3.9	4.1	3.4	
		w/o Oil filter change	3.7	3.9	3.3	
	3S-GE	Dry fill	4.3	4.5	3.8	
		Drain and refill				
		w/ Oil filter change	3.9	4.1	3.4	
		w/o Oil filter change	3.6	3.8	3.2	
	3S-GTE	Dry fill	4.6	4.9	4.0	
Drain and refill						
w/ Oil filter change		3.6	3.8	3.2		
	w/o Oil filter change	3.3	3.6	2.9		
Manual transaxle oil	S53 (w/ Differential fluid)	2.6	2.7	2.3	ATF DEXRON® II	
	E50F2 (w/ Differential and transfer)	4.8	5.1	4.2	Transaxle oil E50 (08885-80206) or equivalent Recommended oil Oil grade : API GL-5 Viscosity : SAE 75W-90 or 80W-90 SAE 90 (above -18°C (0°F)) SAE 80W (below -18°C (0°F))	
Automatic transaxle fluid (w/o Differential fluid)						ATF DEXRON® II
	Dry fill	A140L	6.0	6.3	5.3	
		A140E	6.0	6.3	5.3	
	Drain and refill	A140L	2.5	2.6	2.2	
		A140E	2.5	2.6	2.2	
Differential oil (w/ ATM)			1.6	1.7	1.4	ATF DEXRON® II
Power steering fluid		Pump	350 cc	21.4 cu in.		ATF DEXRON® or DEXRON® II
		Total	800 cc	48.8 cu in.		
Steering gear housing grease				-		Molybdenum disulphide lithium base, NLGI No. 2
Brake fluid				-		SAE J1703 or FMVSS No. 116 DOT3









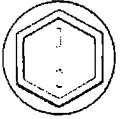
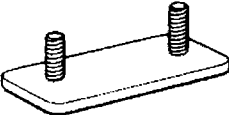

---

# STANDARD BOLT TORQUE SPECIFICATIONS

	Page
STANDARD BOLT TORQUE SPECIFICATIONS .....	B-2

# STANDARD BOLT TORQUE SPECIFICATIONS

## HOW TO DETERMINE BOLT STRENGTH

	Mark	Class		Mark	Class
Hexagon head bolt	 <p>Bolt head No. 4— 5— 6— 7—</p>	4T 5T 6T 7T	Stud bolt	 <p>No mark</p>	4T
	 <p>No mark</p>	4T			
Hexagon flange bolt w/ washer hexagon bolt	 <p>No mark</p>	4T	Welded bolt	 <p>Grooved</p>	6T
Hexagon head bolt	 <p>Two protruding lines</p>	5T			
Hexagon flange bolt w/ washer hexagon bolt	 <p>Two protruding lines</p>	6T		4T	
Hexagon head bolt	 <p>Three protruding lines</p>	7T			

SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			kg-cm	ft-lb	N-m	kg-cm	ft-lb	N-m
4T	6	1	55	48 in.-lb	5.4	60	52 in.-lb	5.9
	8	1.25	130	9	13	145	10	14
	10	1.25	260	19	25	290	21	28
	12	1.25	480	35	47	540	39	53
	14	1.5	760	55	75	850	61	83
	16	1.5	1,150	83	113	—	—	—
5T	6	1	65	56 in.-lb	6.4	—	—	—
	8	1.25	160	12	16	—	—	—
	10	1.25	330	24	32	—	—	—
	12	1.25	600	43	59	—	—	—
	14	1.5	930	67	91	—	—	—
	16	1.5	1,400	101	137	—	—	—
6T	6	1	80	69 in.-lb	7.8	90	78 in.-lb	8.8
	8	1.25	195	14	19	215	16	21
	10	1.25	400	29	39	440	32	43
	12	1.25	730	53	72	810	59	79
	14	1.5	—	—	—	1,250	90	123
7T	6	1	110	8	11	120	9	12
	8	1.25	260	19	25	290	21	28
	10	1.25	530	38	52	590	43	58
	12	1.25	970	70	95	1,050	76	103
	14	1.5	1,500	108	147	1,700	123	167
	16	1.5	2,300	166	226	—	—	—