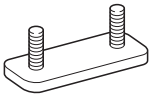
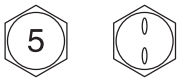
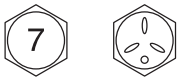
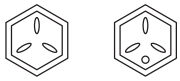
STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

Bolt Type

Hexagon Head Bolt			Stud Bolt	Weld Bolt	Class
Normal Recess Bolt		Deep Recess Bolt			
	No Mark 	No Mark 	No Mark 		4T
					5T
	w/ Washer 	w/ Washer 			6T
					7T
					8T
					9T
					10T
					11T

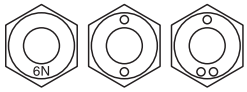
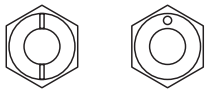
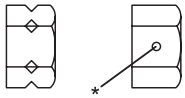
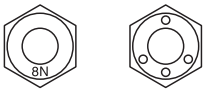
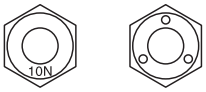
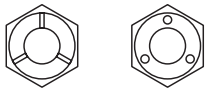
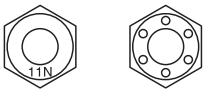
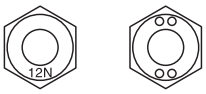
SS

SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter (mm)	Pitch (mm)	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N*m	kgf*cm	ft.*lbf	N*m	kgf*cm	ft.*lbf
4T	6	1	5	55	48 in.*lbf	6	60	52 in.*lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83	-	-	-
5T	6	1	6.5	65	56 in.*lbf	7.5	75	65 in.*lbf
	8	1.25	15.5	160	12	17.5	175	13
	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	670	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	-	-	-
6T	6	1	8	80	69 in.*lbf	9	90	78 in.*lbf
	8	1.25	19	195	14	21	210	15
	10	1.25	39	400	29	44	440	32
	12	1.25	71	730	53	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	170	1,750	127	-	-	-
7T	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166	-	-	-
8T	8	1.25	29	300	22	33	330	24
	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
9T	8	1.25	34	340	25	37	380	27
	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
10T	8	1.25	38	390	28	42	430	31
	10	1.25	78	800	58	88	890	64
	12	1.25	140	1,450	105	155	1,600	116
11T	8	1.25	42	430	31	47	480	35
	10	1.25	87	890	64	97	990	72
	12	1.25	155	1,600	116	175	1,800	130

HOW TO DETERMINE NUT STRENGTH

Nut Type

Present Standard Hexagon Nut	Old Standard Hexagon Nut		Class
	Cold Forging Nut	Cutting Processed Nut	
No Mark 			4N
No Mark (w/ Washer) 	No Mark (w/ Washer) 	No Mark 	5N (4T)
			6N
			7N (5T)
			8N
		No Mark 	10N (7T)
			11N
			12N

HINT:

- *: Nut with 1 or more marks on one side surface of the nut.
- Use the nut with the same number of the nut strength classification or greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example:

- Bolt = 4T
- Nut = 4N or more

2AZ-FE ENGINE CONTROL SYSTEM

SERVICE DATA

Camshaft timing oil control valve assembly		
Resistance	at 20°C (68°F)	6.9 to 7.9 Ω
Camshaft position sensor		
Standard resistance	1 (G+) - 2(G-)	835 to 1,400 Ω at Cold
	1 (G+) - 2(G-)	1,060 to 1,645 Ω at Hot
Crankshaft position sensor		
Standard resistance	Cold	985 to 1,600 Ω
	Hot	1,265 to 1,890 Ω
Throttle body assembly		
Resistance	at 20°C (68°F)	
	2 (M+) - 1 (M-)	0.3 to 100 kΩ
E.F.I. engine coolant temperature sensor		
Resistance	Approx. 20°C (68°F)	2.32 to 2.59 kΩ
	Approx. 80°C (176°F)	0.310 to 0.326 kΩ
Knock sensor		
Resistance	at 20°C (68°F)	120 to 280 kΩ
Circuit opening relay (engine room R/B Unit D)		
Specified condition	1E-8 - 1E-12	Below 1 Ω
	1E-7 - 1E-13	10 kΩ or higher
	1E-7 - 1E-13	Below 1 Ω (when battery voltage is applied to terminals 1G-5 and 1H-9)
EFI relay (engine room R/B Unit D)		
Specified condition	1E-9 - 1E-10	Below 1 Ω
	1E-7 - 1E-12	10 kΩ or higher
	1E-7 - 1E-12	Below 1 Ω (when battery voltage is applied to terminals 1H-10 and 1H-2)
A/F relay (engine room R/B Unit D)		
Specified condition	1E-7 - 1E-10	Below 1 Ω
	1A-3 - 1A-4	10 kΩ or higher
	1A-3 - 1A-4	Below 1 Ω (when battery voltage is applied to terminals 1D-5 and 1H-2)
Accelerator pedal rod		
Standard voltage (ACCEL POS #1)	Released	0.5 to 1.1 V
	Depressed	2.5 to 4.5 V
Standard voltage (ACCEL POS #2)	Released	1.2 to 2.0 V
	Depressed	3.4 to 5.0 V

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Throttle body assembly x Intake manifold	30	305	22
Knock sensor x Cylinder block sub-assembly	20	204	15
ECM x ECM bracket	3.0	30	27
ECM x Body	6.5	66	57
Accelerator pedal rod assembly x Body	5.4	55	48 in.*lbf
Camshaft timing oil control valve assembly x Cylinder head sub-assembly	9.0	92	80 in.*lbf
Vacuum hose clamp x Intake manifold	5.0	51	44 in.*lbf
Camshaft position sensor x Cylinder head sub-assembly	9.0	92	80 in.*lbf
Crankshaft position sensor x Timing chain cover sub-assembly	9.0	92	80 in.*lbf
Engine coolant temperature sensor x Cylinder head sub-assembly	20	204	15
Intake manifold x Cylinder head sub-assembly	30	306	22
Intake manifold x Cylinder block sub-assembly	30	306	22
Cowl top panel outer sub-assembly x Body	5.0	51	44 in.*lbf

2GR-FE ENGINE CONTROL SYSTEM

SERVICE DATA

Throttle body		
	Standard throttle valve opening percentage	60% or more
Camshaft timing oil control valve assembly		
Resistance	at 20°C (68°F)	6.9 to 7.9 Ω
Crankshaft position sensor		
	-10 to 50 °C (14 to 122 °F)	1,630 to 2,740 Ω
	50 to 100 °C (122 to 212 °F)	2,065 to 3,225 Ω
Throttle body		
Resistance	at 20°C (68°F)	
	2 (M+) - 1 (M-)	0.3 to 100 kΩ
	5 (VC) - 3 (E2)	1.2 to 3.2 kΩ
E.F.I. engine coolant temperature sensor		
Resistance	Approx. 20°C (68°F)	2.32 to 2.59 kΩ
	Approx. 80°C (176°F)	0.310 to 0.326 kΩ
Knock sensor		
Resistance	at 20°C (68°F)	120 to 280 kΩ
Circuit opening relay (engine room R/B Unit D)		
Specified condition	1E-8 - 1E-12	Below 1 Ω
	1E-7 - 1E-13	10 kΩ or higher
	1E-7 - 1E-13	Below 1 Ω (when battery voltage is applied to terminals 1G-5 and 1H-9)
EFI relay (engine room R/B Unit D)		
Specified condition	1E-9 - 1E-10	Below 1 Ω
	1E-7 - 1E-12	10 kΩ or higher
	1E-7 - 1E-12	Below 1 Ω (when battery voltage is applied to terminals 1H-10 and 1H-2)
A/F relay (engine room R/B Unit D)		
Specified condition	1E-7 - 1E-10	Below 1 Ω
	1A-3 - 1A-4	10 kΩ or higher
	1A-3 - 1A-4	Below 1 Ω (when battery voltage is applied to terminals 1D-5 and 1H-2)
IG2 Relay		
Standard resistance	3 - 5	10 kΩ or higher
	3 - 5	Below 1 Ω (Battery voltage applied between terminals 1 and 2)
Acceleration pedal rod		
Standard voltage (ACCEL POS #1)	Released	0.5 to 1.1 V
	Depressed	2.5 to 4.5 V
Standard voltage (ACCEL POS #2)	Released	1.2 to 2.0 V
	Depressed	3.4 to 5.0 V

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Throttle body assembly x Intake air surge tank	10	102	7
Knock sensor x Cylinder block sub-assembly	20	199	14
Water outlet x Cylinder head sub-assembly	15	153	11
ECM x Instrument panel reinforcement	5.5	56	49 in.*lbf
ECM x Blower assembly	5.5	56	49 in.*lbf
Accelerator pedal rod assembly x Body	5.4	55	48 in.*lbf
Camshaft timing oil control valve assembly x Cylinder head cover sub-assembly	10	102	7
VVT sensor x Cylinder head cover sub-assembly	10	102	7
Crankshaft position sensor x Cylinder block sub-assembly	10	102	7
Engine coolant temperature sensor x Cylinder head sub-assembly	20	204	15

2AZ-FE ENGINE MECHANICAL

SERVICE DATA

Ignition timing	with Terminals TC and CG of DLC3 connected	8 to 12°BTC at idle
	with Terminals TC and CG of DLC3 disconnected	5 to 15°BTC at idle
Idle speed	M/T	650 to 750 rpm
	A/T	610 to 710 rpm
Compression	Compression pressure	1.360 MPa (13.9 kgf/cm^2, 198 psi)
	Minimum pressure	0.98 MPa (10 kgf/cm^2, 142 psi)
	Difference between each cylinder	100 kPa (1.0 kgf/cm^2, 14 psi)
Valve clearance (cold)	Intake	0.19 to 0.29 mm (0.0075 to 0.0114 in.)
	Exhaust	0.38 to 0.48 mm (0.0150 to 0.0189 in.)
Balanceshaft		
Standard thrust clearance		0.050 to 0.090 mm (0.0020 to 0.0035 in.)
Maximum thrust clearance		0.09 mm (0.0035 in.)
Standard oil clearance		0.004 to 0.049 mm (0.0002 to 0.0019 in.)
Maximum oil clearance		0.049 mm (0.0019 in.)
Housing journal bore diameter	Mark 1	26.000 to 26.006 mm (1.0236 to 1.0239 in.)
	Mark 2	26.007 to 26.012 mm (1.0239 to 1.0241 in.)
	Mark 3	26.013 to 26.018 mm (1.0241 to 1.0243 in.)
Journal diameter	Mark 1	22.985 to 23.000 mm (0.9049 to 0.9055 in.)
	Mark 2	22.985 to 23.000 mm (0.9049 to 0.9055 in.)
	Mark 3	22.985 to 23.000 mm (0.9049 to 0.9055 in.)
	Standard bolt length	58.3 to 59.7 mm (2.295 to 2.350 in.)
	Maximum bolt length	60.3 mm (2.374 in.)
Bearing center wall thickness	Mark 1	1.486 to 1.489 mm (0.0585 to 0.0586 in.)
	Mark 2	1.490 to 1.492 mm (0.0586 to 0.0587 in.)
	Mark 3	1.493 to 1.495 mm (0.0587 to 0.0589 in.)
Oil pump drive sprocket	Minimum sprocket diameter (with chain)	48.2 mm (1.898 in.)
Oil pump drive shaft sprocket	Minimum sprocket diameter (with chain)	48.2 mm (1.898 in.)
Crankshaft timing sprocket	Minimum sprocket diameter (with chain)	51.6 mm (2.031 in.)
Chain tensioner slipper	Maximum wear	1.0 mm (0.039 in.)
Chain vibration damper No. 1	Maximum wear	1.0 mm (0.039 in.)
Chain tensioner plate	Maximum wear	0.5 mm (0.020 in.)
Cylinder head set bolt	Standard bolt length	141.3 to 142.7 mm (5.563 to 5.618 in.)
	Maximum bolt length	144.2 mm (5.677 in.)
Chain sub-assembly	Maximum chain elongation	114.5 mm (4.508 in.)
No. 2 Chain sub-assembly	Maximum chain elongation	102.2 mm (4.024 in.)
Camshaft timing gear assembly	Minimum gear or sprocket diameter (with chain)	97.3 mm (3.831 in.)
Camshaft timing sprocket	Minimum gear or sprocket diameter (with chain)	97.3 mm (3.831 in.)
Camshaft (Intake)		
Maximum circle runout		0.03 mm (0.0012 in.)
Standard cam lobe height		47.306 to 47.406 mm (1.8624 to 1.8664 in.)
Maximum cam lobe height		47.196 mm (1.8581 in.)
No. 1 journal diameter		35.971 to 35.985 mm (1.4162 to 1.4167 in.)
Outer journal diameter		22.959 to 22.975 mm (0.9039 to 0.9045 in.)

Standard thrust clearance	Intake	0.040 to 0.095 mm (0.0016 to 0.0037 in.)
Maximum thrust clearance		0.110 mm (0.0043 in.)
Standard oil clearance	No. 1 journal bearing mark 1	0.007 to 0.038 mm (0.0003 to 0.0015 in.)
	No. 1 journal bearing mark 2	0.008 to 0.038 mm (0.0003 to 0.0015 in.)
	No. 1 journal bearing mark 3	0.008 to 0.038 mm (0.0003 to 0.0015 in.)
	Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
Maximum oil clearance		0.070 mm (0.0028 in.)
Cylinder head journal bore diameter	Mark 1	40.000 to 40.008 mm (1.5748 to 1.5752 in.)
	Mark 2	40.009 to 40.017 mm (1.5752 to 1.5755 in.)
	Mark 3	40.018 to 40.025 mm (1.5755 to 1.5758 in.)
Standard bearing center wall thickness	Mark 1	2.000 to 2.004 mm (0.0787 to 0.0789 in.)
	Mark 2	2.005 to 2.008 mm (0.0789 to 0.0791 in.)
	Mark 3	2.009 to 2.012 mm (0.0791 to 0.0792 in.)
Camshaft journal diameter	Mark 1	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
	Mark 2	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
	Mark 3	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
Camshaft No. 2 (Exhaust)		
Maximum circle runout		0.03 mm (0.0012 in.)
Standard cam lobe height		45.983 to 46.083 mm (1.8104 to 1.8143 in.)
Minimum cam lobe height		45.873 mm (1.8060 in.)
No. 1 journal diameter		35.971 to 35.985 mm (1.4162 to 1.4167 in.)
Other journal diameter		22.959 to 22.975 mm (0.9039 to 0.9045 in.)
Standard thrust clearance	Exhaust	0.080 to 0.135 mm (0.0032 to 0.0053 in.)
Maximum thrust clearance		0.150 mm (0.0059 in.)
Standard oil clearance	No. 1 journal	0.015 to 0.054 mm (0.0006 to 0.0021 in.)
	Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
Maximum oil clearance		0.100 mm (0.0039 in.)
Cylinder head journal bore diameter	Mark 1	40.000 to 40.008 mm (1.5748 to 1.5752 in.)
	Mark 2	40.009 to 40.017 mm (1.5752 to 1.5755 in.)
	Mark 3	40.018 to 40.025 mm (1.5755 to 1.5758 in.)
Standard bearing center wall thickness	Mark 1	2.000 to 2.004 mm (0.00787 to 0.0789 in.)
	Mark 2	2.005 to 2.008 mm (0.0789 to 0.0791 in.)
	Mark 3	2.009 to 2.012 mm (0.0791 to 0.0792 in.)
Camshaft journal diameter	Mark 1	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
	Mark 2	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
	Mark 3	35.971 to 35.985 mm (1.4162 to 1.4167 in.)
Intake manifold	Maximum warpage	0.20 mm (0.0079 in.)
Exhaust manifold	Maximum warpage	0.70 mm (0.0276 in.)
Cylinder head		
Maximum warpage	Cylinder block side	0.05 mm (0.0020 in.)
	Intake manifold side	0.08 mm (0.0031 in.)
	Exhaust manifold side	0.08 mm (0.0031 in.)
Inner compression spring	Free length	47.43 mm (1.867 in.)
	Maximum deviation	1.6 mm (0.063 in.)
Intake valve	Standard overall length	101.71 mm (4.0043 in.)
	Minimum overall length	101.21 mm (3.9846 in.)
	Valve stem diameter	5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	Standard margin thickness	1.05 to 1.45 mm (0.0413 to 0.0571 in.)
	Minimum margin thickness	0.50 mm (0.0197 in.)

Exhaust valve	Standard overall length	101.15 mm (3.9823 in.)
	Minimum overall length	100.70 mm (3.9646 in.)
	Valve stem diameter	5.465 to 5.480 mm (0.2152 to 0.2157 in.)
	Standard margin thickness	1.20 to 1.60 mm (0.0472 to 0.0630 in.)
	Minimum margin thickness	0.50 mm (0.0197 in.)
Intake valve guide bush	Bush inside diameter	5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Standard bush oil clearance	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
	Minimum bush oil clearance	0.080 mm (0.0031 in.)
Bush bore diameter	Use STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	Use O/S 0.05	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
Protrusion height		9.6 to 10.0 mm (0.3779 to 0.3937 in.)
Standard oil clearance		0.025 to 0.060 mm (0.0010 to 0.0024 in.)
Exhaust valve guide bush	Bush inside diameter	5.510 to 5.530 mm (0.2169 to 0.2177 in.)
	Standard oil clearance	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
	Minimum oil clearance	0.100 mm (0.0039 in.)
Bush bore diameter	Use STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	Use O/S 0.05	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
Protrusion height		9.6 to 10.0 mm (0.3779 to 0.3937 in.)
Standard oil clearance		0.030 to 0.065 mm (0.0012 to 0.0026 in.)
Valve lifter	Lifter diameter	30.966 to 30.976 mm (1.2191 to 1.2195 in.)
	Lifter bore diameter	31.009 to 31.025 mm (1.2208 to 1.2215 in.)
	Standard oil clearance	0.033 to 0.059 mm (0.0013 to 0.0023 in.)
	Maximum oil clearance	0.070 mm (0.0028 in.)
Connecting rod		
Standard thrust clearance		0.160 to 0.362 mm (0.0063 to 0.0143 in.)
Maximum thrust clearance		0.362 mm (0.0143 in.)
Standard oil clearance		0.032 to 0.063 mm (0.0013 to 0.0025 in.)
Maximum oil clearance		0.063 mm (0.0025 in.)
Connecting rod bearing center wall thickness (Reference)	Mark 1	1.485 to 1.488 mm (0.0585 to 0.0586 in.)
	Mark 2	1.489 to 1.491 mm (0.0586 to 0.0587 in.)
	Mark 3	1.492 to 1.494 mm (0.0587 to 0.0588 in.)
Connecting rod small end bore diameter		22.005 to 22.014 mm (0.8663 to 0.8667 in.)
Connecting rod small end bore diameter (Reference)	Mark A	22.005 to 22.008 mm (0.8663 to 0.8665 in.)
	Mark B	22.009 to 22.011 mm (0.8665 to 0.8666 in.)
	Mark C	22.012 to 22.014 mm (0.8666 to 0.8667 in.)
Standard oil clearance		0.005 to 0.011 mm (0.0002 to 0.0004 in.)
Maximum oil clearance		0.011 mm (0.0004 in.)
Maximum rod out-of alignment per 100 mm (3.94 in.)		0.05 mm (0.0020 in.)
Maximum rod twist per 100 mm (3.94 in.)		0.15 mm (0.0059 in.)
Cylinder block	Maximum warpage	0.05 mm (0.0020 in.)
	Standard cylinder bore diameter	88.500 to 88.513 mm (3.4843 to 3.4847 in.)
	Maximum cylinder bore diameter	88.633 mm (3.4894 in.)
Piston		
Standard piston diameter		88.469 to 88.479 mm (3.4830 to 3.4834 in.)
Standard piston oil clearance		0.021 to 0.044 mm (0.0008 to 0.0017 in.)
Maximum piston oil clearance		0.10 mm (0.0039 in.)
Piston pin bore diameter		22.001 to 22.010 mm (0.8662 to 0.8665 in.)
Piston pin bore diameter (Reference)	Mark A	22.001 to 22.004 mm (0.8662 to 0.8663 in.)
	Mark B	22.005 to 22.007 mm (0.8663 to 0.8664 in.)
	Mark C	22.008 to 22.010 mm (0.8664 to 0.8665 in.)

Piston ring		
Ring groove clearance	No. 1 Ring	0.020 to 0.070 mm (0.0008 to 0.0028 in.)
	No. 2 Ring	0.020 to 0.060 mm (0.0008 to 0.0024 in.)
	Oil Ring	0.020 to 0.070 mm (0.0008 to 0.0028 in.)
Standard end gap	No. 1 Ring	0.24 to 0.31 mm (0.0094 to 0.0122 in.)
	No. 2 Ring	0.33 to 0.43 mm (0.0130 to 0.0169 in.)
	Oil Ring	0.10 to 0.30 mm (0.0040 to 0.0119 in.)
Maximum end gap	No. 1 Ring	0.89 mm (0.0350 in.)
	No. 2 Ring	1.37 mm (0.0539 in.)
	Oil Ring	0.73 mm (0.0287 in.)
Piston pin		
Standard piston pin diameter		21.997 to 22.006 mm (0.8660 to 0.8664 in.)
Piston pin diameter (Reference)	Mark A	21.997 to 22.000 mm (0.8660 to 0.8661 in.)
	Mark B	22.001 to 22.003 mm (0.8662 to 0.8663 in.)
	Mark C	22.004 to 22.006 mm (0.8663 to 0.8664 in.)
	Mark A	21.997 to 22.000 mm (0.8660 to 0.8661 in.)
	Mark B	22.001 to 22.003 mm (0.8662 to 0.8663 in.)
	Mark C	22.004 to 22.006 mm (0.8663 to 0.8664 in.)
Standard oil clearance		0.001 to 0.007 mm (0.0004 to 0.0003 in.)
Maximum oil clearance		0.010 mm (0.0004 in.)
Connecting rod bolt	Standard diameter	7.0 to 7.3 mm (0.276 to 0.287 in.)
	Maximum diameter	7.0 mm (0.276 in.)
Crankshaft		
Standard thrust clearance		0.040 to 0.240 mm (0.0016 to 0.0095 in.)
Maximum thrust clearance		0.30 mm (0.0118 in.)
Thrust washer thickness		1.930 to 1.980 mm (0.0760 to 0.0780 in.)
Cylinder block main journal bore diameter (Reference)	Mark 0	59.000 to 59.002 mm (2.3228 to 2.3229 in.)
	Mark 1	59.003 to 59.004 mm (2.3230 to 2.3230 in.)
	Mark 2	59.005 to 59.006 mm (2.3230 to 2.3231 in.)
	Mark 3	59.007 to 59.009 mm (2.3231 to 2.3232 in.)
	Mark 4	59.010 to 59.011 mm (2.3232 to 2.3233 in.)
	Mark 5	59.012 to 59.013 mm (2.3233 to 2.3234 in.)
	Mark 6	59.014 to 59.016 mm (2.3234 to 2.3235 in.)
Main journal diameter		54.988 to 55.000 mm (2.1648 to 2.1654 in.)
Main journal diameter (Reference)	Mark 0	54.999 to 55.000 mm (2.1653 to 2.1654 in.)
	Mark 1	54.997 to 54.998 mm (2.1652 to 2.1653 in.)
	Mark 2	54.995 to 54.996 mm (2.1652 to 2.1652 in.)
	Mark 3	54.993 to 54.994 mm (2.1651 to 2.1651 in.)
	Mark 4	54.991 to 54.992 mm (2.1650 to 2.1650 in.)
	Mark 5	54.988 to 54.990 mm (2.1649 to 2.1650 in.)
Standard main bearing center wall thickness (Reference)	Mark 1	1.993 to 1.996 mm (0.0785 to 0.0786 in.)
	Mark 2	1.997 to 1.999 mm (0.0786 to 0.0787 in.)
	Mark 3	2.000 to 2.002 mm (0.0787 to 0.0788 in.)
	Mark 4	2.003 to 2.005 mm (0.0789 to 0.0789 in.)
Maximum circle runout		0.03 mm (0.0012 in.)
Standard oil clearance		0.017 to 0.040 mm (0.0007 to 0.0016 in.)
Maximum oil clearance		0.060 mm (0.0024 in.)
Maximum main journal taper and out-of-round		0.003 mm (0.0001 in.)
Maximum crank pin taper and out-of round		0.003 mm (0.0001 in.)
Crank pin diameter		47.990 to 48.000 mm (1.8894 to 1.8898 in.)

Crankshaft bearing cap set bolt	Standard diameter	7.3 to 7.5 mm (0.287 to 0.295 in.)
	Minimum diameter	7.2 mm (0.284 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Engine mounting bracket No. 2 RH x Timing chain cover		52	531	38
Engine mounting bracket RH x Cylinder block		54	551	40
Engine moving control rod with bracket x Engine mounting bracket No. 2 RH		64	653	47
Engine moving control rod with bracket x Fender apron RH		64	653	47
Engine mounting stay No. 2 RH x Cylinder head		64	653	47
Engine mounting stay No. 2 RH x Engine mounting bracket No. 2 RH		64	653	47
Engine hanger No. 1 x Cylinder head		38	387	28
Engine hanger No. 2 x Cylinder head		38	387	28
ECT sensor x Cylinder head		20	204	15
Knock sensor x Cylinder block		20	204	15
Engine oil pressure switch assembly x Cylinder head		15	153	11
Water by-pass pipe No. 1 x Cylinder block		9.0	92	80 in.*lbf
Oil cooler pipe x Cylinder block		9.0	92	80 in.*lbf
Transverse engine engine mounting bracket x Cylinder block		54	551	40
Drive shaft bearing bracket x Cylinder block		64	653	47
V-ribbed belt tensioner assembly x Timing chain cover		60	607	44
Ignition coil assembly x Cylinder head		9.0	92	80 in.*lbf
Engine cover x Cylinder head cover		7.0	71	62 in.*lbf
Exhaust manifold converter x Cylinder head	Except PZEV	37	378	27
	For PZEV	37	378	27
Exhaust manifold stay x Exhaust manifold converter		44	449	32
Manifold converter insulator No. 1 x Exhaust manifold converter		12	122	9
Oil level gauge guide x Water by-pass pipe No. 1		9.0	92	80 in.*lbf
Intake manifold x Cylinder head		30	306	22
Drive plate and ring gear (A/T) x Crankshaft		98	1,000	72
Flywheel sub-assembly (M/T) x Crankshaft		130	1,330	96
Engine mounting insulator LH x Automatic transaxle assembly		95	969	70
Engine mounting insulator LH x Manual transaxle assembly		143	1,459	105
Engine mounting insulator RH x Engine mounting bracket RH	Nut A	95	969	70
Engine mounting insulator RH x Frame	Nut B	87	888	64
Engine mounting insulator FR x Engine mounting bracket FR		87	888	64
Engine mounting bracket rear No. 2 x Engine lateral control rod (M/T)		89	910	66
Vane pump assembly x Timing chain cover		43	439	32
Frame side plate x Front frame assembly	Bolt A	85	867	63
Frame side plate x Body	Bolt B	32	326	24
Front suspension member brace rear x Front frame assembly	Bolt C	85	867	63
Front suspension member brace rear x Body	Bolt D	32	326	24
Steering return tube clamp x Frame		8.0	80	69 in.*lbf
Compressor and magnetic clutch x Cylinder block		25	250	18
Battery clamp x Body	Bolt	9.0	92	80 in.*lbf
	Nut	3.5	36	31 in.*lbf
Speed sensor front LH (with ABS) x Steering knuckle		8.0	82	71 in.*lbf
Speed sensor front RH (with ABS) x Steering knuckle		8.0	82	71 in.*lbf
Air cleaner assembly x Body		5.0	51	44 in.*lbf
Air cleaner inlet assembly x Body		5.0	51	44 in.*lbf
Balanceshaft housing x Stiffening crankcase assembly	1st	22	220	16
	2nd	Turn 90°	Turn 90°	Turn 90°

Part Tightened		N*m	kgf*cm	ft.*lbf
Stiffening crankcase assembly x Cylinder block		24	245	18
with head taper screw plug No. 1 x Cylinder block		26	265	19
No. 1 oil nozzle sub-assembly x Cylinder block		7.0	71	62 in.*lbf
Oil control valve filter x Cylinder block		30	306	22
Cylinder block water drain cock x Stiffening crankcase assembly		25 13	255 130	18 9
Cylinder head x Cylinder block	1st	79	806	58
	2nd	Turn 90°	Turn 90°	Turn 90°
Camshaft timing gear assembly x Camshaft		54	551	40
Camshaft timing sprocket x Camshaft		54	551	40
Camshaft bearing cap No. 1 x Cylinder head		30	301	22
Camshaft bearing cap No. 2 x Cylinder head		30	301	22
Camshaft bearing cap No. 3 x Cylinder head		9.0	92	80 in.*lbf
Oil pump assembly x Stiffening crankcase assembly		19	194	14
Chain tensioner plate x Stiffening crankcase assembly		12	122	9
Oil pump drive sprocket x Oil pump		30	301	22
Chain vibration damper No. 1 x Cylinder head		9.0	92	80 in.*lbf
Chain vibration damper No. 1 x Cylinder block		9.0	92	80 in.*lbf
Chain tensioner slipper x Cylinder block		19	194	14
Timing chain guide x Crankshaft bearing cap No. 1		9.0	92	80 in.*lbf
Oil pan x Stiffening crankcase assembly		9.0	92	80 in.*lbf
Oil pan drain plug x Oil pan		25	255	18
Timing chain cover x Cylinder block, Cylinder head	Bolt A	9.0	92	80 in.*lbf
	Bolt B	25	255	18
	Bolt C	55	561	41
	Nut	11	112	8
Crankshaft position sensor x Timing chain cover		9.0	92	80 in.*lbf
Crankshaft pulley x Crankshaft	TMMK made	170	1,733	125
	TMC made	180	1,835	133
Chain tensioner assembly No. 1 x Timing chain cover		9.0	92	80 in.*lbf
Camshaft position sensor x Cylinder head		9.0	92	80 in.*lbf
Radio setting condenser x Cylinder head		10	102	7
Cylinder head cover x Cylinder head	Bolt A	11	112	8
	Bolt B	14	143	10
	Nut	11	112	8
Cylinder head cover x Engine wire		8.4	86	74 in.*lbf
Oil filter union x Stiffening crankcase assembly		30	306	22
Oil filter union x Stiffening crankcase assembly (with Oil cooler)	Oil filter union	79	806	58
	Nut	9.0	92	80 in.*lbf
	Union bolt	25	255	18
Oil filter x Oil filter union		13	133	10
Spark plug x Cylinder head		19	194	14
Ventilation valve x Cylinder head cover		19	194	14
No. 1 exhaust pipe support bracket x Body		19	194	14
Stud bolt	Bolt A	5	51	44 in.*lbf
	Bolt B	5	51	44 in.*lbf
	Bolt C	9.5	97	84 in.*lbf
	Bolt D	9.5	97	84 in.*lbf

Part Tightened		N*m	kgf*cm	ft.*lbf
Stud bolt	Bolt A	5.0	51	44 in.*lbf
	Bolt B	22	220	16
	Bolt C	9.5	97	84 in.*lbf
	Bolt D	5.0	51	44 in.*lbf
Crankshaft bearing cap x Cylinder block	1st	20	204	15
	2nd	40	408	29
	3rd	Turn 90°	Turn 90°	Turn 90°
Connecting rod cap x Connecting rod	1st	25	250	18
	2nd	Turn 90°	Turn 90°	Turn 90°

2GR-FE ENGINE MECHANICAL

SERVICE DATA

Ignition timing	Terminals TC and CG of DLC3 connected	8 to 12° BTDC at idle (Transmission in neutral)
	Terminals TC and CG of DLC3 disconnected	5 to 15° BTDC at idle (Transmission in neutral)
Idle speed		600 to 700 rpm (Transmission in neutral)
Compression	Compression pressure	1.4 MPa (14 kgf/cm^2, 199 psi) or more
	Minimum pressure	0.98 MPa (10 kgf/cm^2, 142 psi)
	Difference between each cylinder	0.1 MPa (1.0 kgf/cm^2, 15 psi) or less
Cylinder head set bolt		
Outside diameter	Standard	10.85 to 11.00 mm (0.4272 to 0.4331 in.)
	Minimum	10.70 mm (0.4213 in.)
Chain		
Elongation	Maximum	136.9 mm (5.390 in.)
No. 2 chain		
Elongation	Maximum	137.6 mm (5.417 in.)
Crankshaft timing gear		
Diameter (w/ chain)	Minimum	61.4 mm (2.417 in.)
Idle sprocket		
Diameter (w/ chain)	Minimum	61.4 mm (2.417 in.)
Idle gear shaft		
Idle gear shaft diameter		22.987 to 23.000 mm (0.9050 to 0.9055 in.)
Idle gear inside diameter		23.020 to 30.030 mm (0.9063 to 0.9067 in.)
Oil clearance	Standard	0.020 to 0.043 mm (0.0008 to 0.0017 in.)
	Maximum	0.093 mm (0.0037 in.)
Chain tensioner assembly No. 2		
Worn depth	Maximum	0.9 mm (0.035 in.)
Chain tensioner assembly No. 3		
Worn depth	Maximum	0.9 mm (0.035 in.)
Chain tensioner slipper		
Worn depth	Maximum	1.0 mm (0.039 in.)
Chain vibration damper No. 1		
Worn depth	Maximum	1.0 mm (0.039 in.)
Chain vibration damper No. 2		
Worn depth	Maximum	1.0 mm (0.039 in.)
Cylinder head sub-assembly		
	Cylinder head lower	0.05 mm (0.0020 in.)
	Intake	0.08 mm (0.0031 in.)
	Exhaust	0.08 mm (0.0031 in.)
Warpage	Maximum	0.10 mm (0.0039 in.)
Intake valve		
Valve stem diameter		5.470 to 5.485 mm (0.2154 to 0.2159 in.)
Margin thickness	Standard	1.0 mm (0.039 in.)
	Maximum	0.5 mm (0.0197 in.)
Overall length	Standard	105.85 mm (4.1673 in.)
	Maximum	105.35 mm (4.1476 in.)
Exhaust valve		
Valve stem diameter		5.465 to 5.480 mm (0.2152 to 0.2158 in.)

Margin thickness	Standard	1.0 mm (0.0394 in.)
	Maximum	0.5 mm (0.0197 in.)
Overall length	Standard	111.40 mm (4.3858 in.)
	Maximum	109.90 mm (4.3268 in.)
Inner compression spring		
Free length		45.46 mm (1.7898 in.)
Deviation	Maximum	1.0 mm (0.039 in.)
Angle (reference)	Maximum	2°
Intake valve guide bush		
Inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
Oil clearance	Standard	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
	Maximum	0.08 mm (0.0031 in.)
Bush bore diameter	Use STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	Use O/S 0.05	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
Protrusion height		9.3 to 9.7 mm (0.3661 to 0.3819 in.)
Exhaust valve guide bush		
Inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
Oil clearance	Standard	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
	Maximum	0.10 mm (0.0039 in.)
Bush bore diameter	Use STD	10.285 to 10.306 mm (0.4049 to 0.4057 in.)
	Use O/S 0.05	10.335 to 10.356 mm (0.4069 to 0.4077 in.)
Protrusion height		9.30 to 9.70 mm (0.3661 to 0.3819 in.)
No. 1 camshaft		
Journal diameter	No. 1 journal	35.946 to 35.960 mm (1.4152 to 1.4157 in.)
	Other journals	25.959 to 25.975 mm (1.0220 to 1.0226 in.)
Circuit runout	Maximum	0.04 mm (0.0016 in.)
Cam lobe height	Standard	44.316 to 44.416 mm (1.7447 to 1.7487 in.)
	Maximum	44.166 mm (1.7388 in.)
Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
	Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
	Maximum No. 1 journal	0.10 mm (0.0039 in.)
	Other journals	0.09 mm (0.0035 in.)
Thrust clearance	Standard	0.08 to 0.13 mm (0.0031 to 0.0051 in.)
	Maximum	0.15 mm
No. 2 camshaft		
Journal diameter	No. 1 journal	35.946 to 35.960 mm (1.4152 to 1.4157 in.)
	Other journals	25.959 to 25.975 mm (1.0220 to 1.0226 in.)
Circuit runout	Maximum	0.04 mm (0.0016 in.)
Cam lobe height	Standard	44.262 to 44.362 mm (1.7426 to 1.7465 in.)
	Maximum	44.112 mm (1.7367 in.)
Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
	Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
	Maximum No. 1 journal	0.10 mm (0.0039 in.)
	Other journals	0.09 mm (0.0035 in.)
Thrust clearance	Standard	0.08 to 0.13 mm (0.0031 to 0.0051 in.)
	Maximum	0.15 mm
No. 3 camshaft		
Journal diameter	No. 1 journal	35.946 to 35.960 mm (1.4152 to 1.4157 in.)
	Other journals	25.959 to 25.975 mm (1.0220 to 1.0226 in.)
Circuit runout	Maximum	0.04 mm (0.0016 in.)

Cam lobe height	Standard	44.316 to 44.416 mm (1.7447 to 1.7487 in.)
	Maximum	44.166 mm (1.7388 in.)
Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
	Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
	Maximum No. 1 journal	0.10 mm (0.0039 in.)
	Other journals	0.09 mm (0.0035 in.)
Thrust clearance	Standard	0.08 to 0.13 mm (0.0031 to 0.0051 in.)
	Maximum	0.15 mm
No. 4 camshaft		
Journal diameter	No. 1 journal	35.946 to 35.960 mm (1.4152 to 1.4157 in.)
	Other journals	25.959 to 25.975 mm (1.0220 to 1.0226 in.)
Circuit runout	Maximum	0.04 mm (0.0016 in.)
Cam lobe height	Standard	44.262 to 44.362 mm (1.7426 to 1.7465 in.)
	Maximum	44.112 mm (1.7367 in.)
Oil clearance	Standard No. 1 journal	0.040 to 0.079 mm (0.0016 to 0.0031 in.)
	Other journals	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
	Maximum No. 1 journal	0.10 mm (0.0039 in.)
	Other journals	0.09 mm (0.0035 in.)
Thrust clearance	Standard	0.08 to 0.13 mm (0.0031 to 0.0051 in.)
	Maximum	0.15 mm
Ring pin for cylinder head sub-assembly		
Protrusion height		2.5 to 3.5 mm (0.098 to 0.138 in.)
Straight pin for cylinder head sub-assembly		
Protrusion height		17.5 to 19.5 mm (0.689 to 0.768 in.)
Connecting rod thrust clearance	Standard	0.15 to 0.40 mm (0.0059 to 0.0157 in.)
	Maximum	0.50 mm (0.020 in.)
Connecting rod oil clearance	Standard	0.045 to 0.067 mm (0.0018 to 0.0026 in.)
	Maximum	0.070 mm (0.0028 in.)
Crankshaft thrust clearance	Standard	0.04 to 0.24 mm (0.0016 to 0.0094 in.)
	Maximum	0.30 mm (0.0118 in.)
	Thrust washer thickness	2.43 to 2.48 mm (0.0957 to 0.0976 in.)
Cylinder block warpage	Maximum	0.07 mm (0.0028 in.)
Cylinder bore diameter	Standard	94.000 to 94.012 mm (3.7008 to 3.7013 in.)
	Maximum	94.200 mm (3.7087 in.)
Piston diameter		
	Distance	9.8 mm (0.3858 in.)
	Standard	93.960 to 93.980 mm (3.6992 to 3.7000 in.)
	Maximum	93.830 mm (3.6941 in.)
Oil clearance	Standard	0.02 to 0.052 mm (0.0008 to 0.0020 in.)
	Maximum	0.06 mm
Connecting rod out-of alignment	Maximum	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Connecting rod twist	Maximum	0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
Piston pin hole inside diameter		22.001 to 22.010 mm (0.8662 to 0.8665 in.)
Piston pin diameter		21.997 to 22.006 mm (0.8660 to 0.8664 in.)
Oil clearance	Standard	0.001 to 0.007 mm (0.00004 to 0.00028 in.)
	Maximum	0.015 mm (0.0006 in.)
Connecting rod bushing inside diameter		22.005 to 22.014 mm (0.8663 to 0.8667 in.)
Oil clearance	Standard	0.005 to 0.011 mm (0.0002 to 0.0004 in.)
	Maximum	0.03 mm (0.0012 in.)

Piston ring groove clearance	No. 1	0.020 to 0.070 mm (0.0008 to 0.0028 in.)
	No. 2	0.020 to 0.060 mm (0.0008 to 0.0024 in.)
	Oil	0.070 to 0.150 mm (0.0028 to 0.0059 in.)
Piston ring end gap	Standard No. 1	0.25 to 0.35 mm (0.0098 to 0.0138 in.)
	No. 2	0.50 to 0.60 mm (0.0197 to 0.0236 in.)
	Oil (Side rail)	0.10 to 0.40 mm (0.0039 to 0.0157 in.)
	Maximum No. 1	0.50 mm (0.0197 in.)
	No. 2	0.85 mm (0.0335 in.)
	Oil (Side rail)	0.60 mm (0.0236 in.)
Connecting rod bolt diameter	Standard	7.2 to 7.3 mm (0.283 to 0.287 in.)
	Maximum	7.0 mm (0.276 in.)
Crankshaft bearing cap set bolt diameter	Standard	10.8 to 11.0 mm (0.4252 to 0.4331 in.)
	Maximum	10.7 mm (0.4213 in.)
Crankshaft circle runout	Maximum	0.06 mm (0.0024 in.)
Main journal diameter		60.988 to 61.000 mm (2.4011 to 2.4016 in.)
Main journal taper and out-of-round	Maximum	0.02 mm (0.0008 in.)
Crank pin diameter		52.992 to 53.000 mm (2.0863 to 2.0866 in.)
Crank pin taper and out-of-round	Maximum	0.02 mm (0.0008 in.)
Crankshaft oil clearance	Standard	0.026 to 0.047 mm (0.0010 to 0.0019 in.)
	Maximum	0.050 mm (0.0020 in.)
Straight pin for cylinder block sub-assembly		
Protrusion height	Pin A	23 mm (0.906 in.)
	Pin B	6 mm (0.236 in.)
	Pin C	11 mm (0.433 in.)
	Pin D	9 mm (0.354 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Ignition coil assembly x Cylinder head cover sub-assembly		10	102	7
Engine hanger No. 1 x Cylinder head sub-assembly RH		33	337	24
Engine hanger No. 2 x Cylinder head sub-assembly LH		33	337	24
Engine mounting bracket RH x Cylinder block sub-assembly		54	551	40
Oil level gauge guide x Cylinder head sub-assembly		21	214	15
Idler pulley sub-assembly No. 2 x Timing chain cover sub-assembly		43	438	32
V-ribbed belt tensioner assembly x Cylinder block sub-assembly		43	438	32
Intake manifold x Cylinder head sub-assembly		21	214	15
Exhaust manifold sub-assembly RH x Cylinder head sub-assembly RH		21	214	15
Exhaust manifold sub-assembly LH x Cylinder head sub-assembly LH		21	214	15
Drive plate & ring gear sub-assembly x Crankshaft		83	850	61
Air cleaner case x Body		5.0	51	44 in.*lbf
E.F.I engine coolant temperature x water by-pass joint RR		20	200	14
Engine assembly w/ Transaxle x Body	Bolt A	85	867	63
	Bolt B	32	329	24
	Bolt C	85	867	63
	Bolt D	32	329	24
Manifold stay No. 2 x Exhaust manifold sub-assembly LH		34	347	25
Air cleaner inlet No. 1 x Body		5.0	51	44 in.*lbf
Air cleaner inlet assembly x Body		5.0	51	44 in.*lbf
Battery clamp x Body	Bolt	9.0	92	80 in.*lbf
	Nut	3.5	36	31
Steering intermediate shaft x Steering gear		35	360	26
Stabilizer link x Shock absorber		74	755	55
Tie rod assembly x Steering gear		49	500	36
Speed sensor front x Front axle		8.0	82	71 in.*lbf
Front axle hub nut x Front drive shaft		294	2,998	217
Cooler compressor x V-ribbed belt tensioner		25	250	18
Engine mounting control bracket x Engine mounting bracket front No. 1 LH				
	Bolt A	44	450	32
	Bolt B	38	387	28
	Nut	23	235	17
Engine assembly w/ Transaxle x Front frame assembly	Bolt	87	887	64
	Nut	95	969	70
Drive shaft bearing bracket x Cylinder block sub-assembly		64	650	47
Exhaust manifold heat insulator No. 2 x Exhaust manifold sub-assembly LH		8.5	87	75 in.*lbf
Oil pressure switch x Oil pan sub-assembly		21	210	15
Engine mounting stay No. 2 RH x Intake manifold		21	214	15
Timing gear cover No. 2 x Chain cover sub-assembly		6.0	61	53 in.*lbf
Engine mounting bracket front No. 1 LH x Chain cover		54	551	40
Camshaft bearing cap x Camshaft housing	1st	10	102	7
	2nd	16	163	12
Camshaft housing x Cylinder head sub-assembly		28	286	21
Chain tensioner No. 1 x Cylinder head sub-assembly		10	102	7
Chain tensioner No. 2 x Cylinder head sub-assembly		21	214	15
Chain tensioner No. 3 x Cylinder head sub-assembly		21	214	15

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Part Tightened		N*m	kgf*cm	ft.*lbf
Camshaft timing gear assembly x Camshaft		100	1,020	74
Camshaft timing exhaust gear assembly x Camshaft		100	1,020	74
Engine rear oil seal retainer x Cylinder block sub-assembly		10	102	7
Knock sensor x Cylinder block sub-assembly		20	204	15
Water inlet pipe x Cylinder block sub-assembly		10	102	7
Cylinder head RH x Cylinder block sub-assembly	1st	36	367	27
	2nd	Turn 90°	Turn 90°	Turn 90°
	3nd	Turn 90°	Turn 90°	Turn 90°
Cylinder head sub-assembly LH x Cylinder block sub-assembly				
	Recessed head 1st	36	367	27
	2nd	Turn 90°	Turn 90°	Turn 90°
	3nd	Turn 90°	Turn 90°	Turn 90°
	14 mm (0.55 in.) head	30	306	22
Chain vibration damper No. 1 x Cylinder block sub-assembly		23	230	17
Idle gear No. 1 x Cylinder block sub-assembly		60	612	44
Timing chain cover plate x Timing chain cover sub-assembly		9.1	93	81 in.*lbf
Timing chain cover sub-assembly x Cylinder head and block				
	Areas 1: Bolt	21	214	15
	Areas 2: Bolt	21	214	15
	Areas 3: Bolt and Nut	21	214	15
	Areas 4: Bolt A	43	438	32
	Areas 4: Except Bolt A	21	214	15
Water pump assembly x Timing chain cover sub-assembly		9.1	93	81 in.*lbf
Oil pan baffle plate x Cylinder block sub-assembly		10	102	7
Oil pan stud bolt x Cylinder block and timing chain cover sub-assembly		10	102	7
Oil pan stud bolt x No. 2 oil pan sub-assembly		4.0	41	35 in.*lbf
Oil strainer stud bolt x Timing chain cover sub-assembly		4.0	41	35 in.*lbf
Oil strainer sub-assembly x Cylinder block and timing chain cover sub-assembly		10	102	7
Oil pan sub-assembly x Cylinder block and timing chain cover sub-assembly				
	bolt A	10	102	7
	except bolt A	21	214	15
Oil pan sub-assembly No. 2 x Oil pan sub-assembly		10	102	7
Oil pan drain plug x Oil pan sub-assembly No. 2		40	408	30
Crankshaft pulley x Crankshaft		250	2,550	184
Cylinder head cover sub-assembly x Cylinder head sub-assembly RH				
	bolt A	21	214	15
	except bolt A	10	102	7
Cylinder head cover sub-assembly LH x Cylinder head sub-assembly LH				
	bolt A	21	214	15
	except bolt A	10	102	7
Water outlet x Cylinder head sub-assembly	bolt	10	102	7
	nut	10	104	8
Water inlet housing set nut		10	102	7
Water inlet set bolt and nut		10	102	7
Oil filter cap x Oil pan		25	255	18
Camshaft position sensor		10	102	7

Part Tightened		N*m	kgf*cm	ft.*lbf
Ventilation valve x Cylinder head cover sub-assembly LH		27	275	20
Oil pipe union x Cylinder block sub-assembly		65	663	48
Oil pipe union x Cylinder head cover sub-assembly		65	663	48
Oil pipe x Cylinder head sub-assembly		10	102	7
Crankshaft position sensor x Cylinder block sub-assembly		10	102	7
Camshaft timing oil control valve assembly x Cylinder head cover		10	102	7
Cylinder block water drain cock sub-assembly x Cylinder block sub-assembly		25	255	18
Drain cock sub-assembly x Water inlet housing		30	306	22
Water drain cock plug x Water drain cock sub-assembly		13	130	9
Drain cock plug x Drain cock sub-assembly		13	130	9
Spark plug x Cylinder head sub-assembly		25	254	18
Stud bolt x Cylinder head sub-assembly	For A and B bolts	10	102	7
	For C bolts	4.0	41	35 in.*lbf
W/ head screw plug x Cylinder head sub-assembly		44	449	32
W/ head screw plug No. 2 x Cylinder head sub-assembly		80	816	59
Main bearing cap x Cylinder block sub-assembly	16 pointed head 1st	61	622	45
	2nd	Turn 90°	Turn 90°	Turn 90°
	14 mm head	52	525	38
Connecting rod cap x Connecting rod	1st	25	255	18
	2nd	Turn 90°	Turn 90°	Turn 90°
Stud bolt x Cylinder block sub-assembly	bolt A	10	102	7
	bolt B	17	173	13
Sub-assembly oil nozzle No. 1 x Cylinder block sub-assembly		9.0	92	80 in.*lbf

SS

2AZ-FE FUEL

SERVICE DATA

Fuel pressure		304 to 343 kPa (3.1 to 3.5 kgf/cm^2, 44.1 to 49.7 psi)
Fuel pressure : at fuel pressure remains for 5 minutes after engine has stopped		147 kPa (1.5 kgf/cm^3, 21 psi) or more
Fuel injector		
Resistance	at 20°C (68°F)	11.6 to 12.4 Ω
Injection volume		76 to 92 cm^2 (4.6 to 5.6 cu in.) per 15 seconds
Difference between each injector		16 cm^2 (0.98 cu in.) or less
Fuel drop		1 drop or less per 12 minutes
Fuel pump		
Resistance	at 20°C (68°F)	0.2 to 3.0 Ω

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Fuel delivery pipe x Cylinder head		20	204	15
Fuel pressure pulsation damper x Fuel delivery pipe		9.0	90	80 in.*lbf
Fuel tank bent tube set plate x Fuel tank assembly		5.9	60	52 in.*lbf
Fuel main tube support x Fuel tank assembly		5.4	55	48 in.*lbf
Fuel tank band sub-assembly No. 1 x Body		39	400	29
Fuel tank protector lower center x Fuel tank assembly		5.4	55	48 in.*lbf
Parking brake cable assembly No. 2 x Body	Bolt	6.0	61	53 in.*lbf
	Nut	8.5	87	75 in.*lbf
Parking brake cable assembly No. 3 x Body	Bolt	6.0	61	53 in.*lbf
	Nut	8.5	87	75 in.*lbf
Stabilizer bar bracket x Suspension member		31	316	23

2GR-FE FUEL

SERVICE DATA

Fuel pressure		304 to 343 kPa (3.1 to 3.5 kgf/cm^2, 44.1 to 49.7 psi)
Fuel pressure : at fuel pressure remains for 5 minutes after engine has stopped		147 kPa (1.5 kgf/cm^2, 21 psi) or more
Fuel injector		
Resistance	at 20°C (68°F)	11.6 to 12.4 Ω
Injection volume		84 to 100 cm^2 (5.1 to 6.0 cu in.) per 15 seconds
Difference between each injector		16 cm^3 (0.98 cu in.) or less
Fuel drop		1 drop or less per 16 minutes
Fuel pump		
Resistance	at 20°C (68°F)	0.2 to 3.0 Ω

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Fuel delivery pipe sub-assembly x Intake manifold		21	214	15
Intake air surge tank x Intake manifold	Bolt	18	184	13
	Nut	16	163	12
Intake air surge tank x Cylinder head		21	214	15
Vacuum hose clamp set bolt		5.4	55	48 in.*lbf
Fuel tank bent tube set plate x Fuel tank assembly		5.9	60	52 in.*lbf
Fuel main tube support x Fuel tank assembly		5.4	55	48 in.*lbf
Fuel tank band sub-assembly No. 1 x Body		39	400	29
Fuel tank protector lower center x Fuel tank assembly		5.4	55	48 in.*lbf
Parking brake cable assembly No. 2 x Body	Bolt	6.0	61	53 in.*lbf
	Nut	8.5	87	75 in.*lbf
Parking brake cable assembly No. 3 x Body	Bolt	6.0	61	53 in.*lbf
	Nut	8.5	87	75 in.*lbf
Stabilizer bar bracket x Suspension member		31	316	23

2AZ-FE EMISSION CONTROL

SERVICE DATA

VSV for EVAP		
Resistance	1 - 2	26 to 30 Ω at 20°C (68°F)
	1 - Body ground	10 MΩ or higher
	2 - Body ground	10 MΩ or higher
Air fuel ratio sensor		
Resistance	1 (HT) - 2 (+B)	1.8 to 3.4 Ω at 20°C (68°F)
Oxygen sensor		
Resistance	1 (HT) - 2 (+B)	11 to 16 Ω at 20°C (68°F)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Charcoal canister assembly x Body	39	398	29
Air fuel ratio sensor x Front pipe assembly	44	449	32
Oxygen sensor x Front pipe assembly	44	449	32

2GR-FE EMISSION CONTROL

SERVICE DATA

VSV for EVAP		
Resistance	1 - 2	26 to 30 Ω at 20°C (68°F)
	1 - Body ground	10 MΩ or higher
	2 - Body ground	10 MΩ or higher
Air fuel ratio sensor		
Resistance	1 (HT) - 2 (+B)	1.8 to 3.4 Ω at 20°C (68°F)
Oxygen sensor		
Resistance	1 (HT) - 2 (+B)	11 to 16 Ω at 20°C (68°F)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Charcoal canister assembly x Body	39	398	29
No. 1 Vacuum switching valve x Head cover	5.0	51	44 in.*lbf
Air fuel ratio sensor x Front pipe assembly	44	449	32
Oxygen sensor x Front pipe assembly	44	449	32

2GR-FE INTAKE

SERVICE DATA

Vacuum switching valve		
Resistance	1 - 2	37 to 44 Ω at 20°C (68°F)
	1 - Body ground	10 kΩ or higher
	2 - Body ground	10 kΩ or higher

2AZ-FE EXHAUST

SERVICE DATA

Compression spring	Minimum length: 38.5 mm (1.515 in.)

TORQUE SPECIFICATIONS

2AZ-FE:

Part Tightened	N*m	kgf*cm	ft.*lbf
Center exhaust pipe assembly x Tail exhaust pipe assembly	43	438	32
Front exhaust pipe assembly x Exhaust manifold RH	62	632	46
Front exhaust pipe assembly x Exhaust manifold LH	62	632	46
Front exhaust pipe assembly x Center exhaust pipe assembly	56	571	41
Exhaust pipe damper x Center exhaust pipe assembly	19	194	14
Exhaust pipe No. 1 support bracket x Body	33	337	24
Front exhaust pipe No. 1 support bracket x Body	33	337	24
Rear exhaust pipe No. 1 support bracket x Body	33	337	24
Exhaust pipe support No. 4 x Body	33	337	24
Exhaust pipe No. 4 support bracket sub-assembly x Body	39	398	29
Exhaust pipe No. 4 support bracket sub-assembly x Body	39	398	29
Heated oxygen sensor (Bank 1 Sensor 2) x Front exhaust pipe assembly	44	449	32
Heated oxygen sensor (Bank 2 Sensor 2) x Front exhaust pipe assembly	44	449	32

2GR-FE EXHAUST

SERVICE DATA

Compression spring	Minimum length: 38.5 mm (1.515 in.)

TORQUE SPECIFICATIONS

2GR-FE:

Part Tightened	N*m	kgf*cm	ft.*lbf
Center exhaust pipe assembly x Tail pipe assembly	43	438	32
Front exhaust pipe assembly x Exhaust manifold RH	62	632	46
Front exhaust pipe assembly x Exhaust manifold LH	62	632	46
Front exhaust pipe assembly x Center exhaust pipe assembly	56	571	41
Exhaust pipe damper x Center exhaust pipe assembly	19	194	14
Exhaust pipe No. 1 support bracket x Body	33	337	24
Front exhaust pipe No. 1 support bracket x Body	33	337	24
Rear exhaust pipe No. 1 support bracket x Body	33	337	24
Exhaust pipe support No. 4 x Body	33	337	24
Exhaust pipe No. 4 support bracket sub-assembly x Body	39	398	29
Exhaust pipe No. 4 support bracket sub-assembly x Body	39	398	29
Heated oxygen sensor (Bank 1 Sensor 2) x Front exhaust pipe assembly	44	449	32
Heated oxygen sensor (Bank 2 Sensor 2) x Front exhaust pipe assembly	44	449	32

2AZ-FE COOLING

SERVICE DATA

THERMOSTAT

Condition	Specified Condition
Standard valve opening temperature	80 to 84 °C (176 to 183 °F)
Standard valve lift	10 mm (0.39 in.) or more at 95 °C (203 °F)

COOLING FAN MOTOR

Item	Condition	Specified Condition
Cooling fan motor (w/o Trailer hitch)	at 20°C (68 °F)	7.9 to 10.9 A
Cooling fan motor (w/ Trailer hitch)	at 20°C (68 °F)	11.8 to 14.8 A
No. 2 cooling fan motorr (w/o Trailer hitch)	at 20°C (68 °F)	7.9 to 10.9 A
No. 2 cooling fan motor (w/ Trailer hitch)	at 20°C (68 °F)	7.9 to 10.9 A

COOLING FAN RELAY

Item	Tester Connection	Specified Condition
No. 1 fan relay	3 - 5	10 Ωor higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
No. 2 fan relay	3 - 4	Below 1 Ω
	3 - 5	10 Ωor higher
	3 - 4	10 Ωor higher (when battery voltage is applied to terminals 1 and 2)
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)
No. 3 fan relay	3 - 5	10 Ωor higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

RADIATOR

Item	Condition	Specified Condition
Radiator reservoir cap	For brand-new cap	93.3 to 122.7 kPa (0.95 to 1.25 kgf/cm^2, 13.5 to 17.8 psi)
	After using cap	78.5 kPa (0.8 kgf/cm^2, 11.4 psi)

TORQUE SPECIFICATIONS

COOLANT

Part Tightened	N*m	kgf*cm	ft.*lbf
Cylinder block drain cock plug x Cylinder block	13	130	9

WATER PUMP

Part Tightened	N*m	kgf*cm	ft.*lbf
Water pump x Cylinder block	9.0	92	80 in.*lbf
Water pump pulley x Water pump	26	265	19

THERMOSTAT

Part Tightened	N*m	kgf*cm	ft.*lbf
Water inlet x Cylinder block	9.0	92	80 in.*lbf

RADIATOR

Part Tightened		N*m	kgf*cm	ft.*lbf
Oil cooler assembly x Cooler pipe	for Bolt A	15	150	11
	for Nut B	8.3	85	73 in.*lbf
Condenser assembly x Radiator assembly		5.4	55	48 in.*lbf
Upper radiator support x Radiator support LH and RH		7.0	71	62 in.*lbf
Upper radiator support x Hood lock assembly		7.5	77	66 in.*lbf

2GR-FE COOLING

SERVICE DATA

THERMOSTAT

Condition	Specified Condition
Standard valve opening temperature	80 to 84°C (176 to 183°F)
Standard valve lift	7.7 mm (0.3031 in.) or more at 95°C (203°F)

COOLING FAN MOTOR

Item	Condition	Specified Condition
Cooling fan motor (w/o Trailer hitch)	at 20°C (68°F)	6.8 to 9.8 A
Cooling fan motor (w/ Trailer towing system)	at 20°C (68°F)	11.8 to 14.8 A
No. 2 cooling fan motor (w/o Trailer hitch)	at 20°C (68°F)	6.8 to 9.8 A
No. 2 cooling fan motor (w/ Trailer hitch)	at 20°C (68°F)	6.8 to 9.8 A

COOLING FAN ECU

Item	Condition	Specified Condition
Cooling fan ECU	Ignition switch on (IG). Turn the ignition switch to the ON position.	9 to 14 V

COOLING FAN RELAY

Item	Tester Connection	Specified Condition
Cooling fan relay	3 - 5	10 Ω or higher
	3 - 5	Below 1 Ω (when battery voltage is applied to terminals 1 and 2)

RADIATOR

Item	Tester Connection	Specified Condition
Radiator reservoir cap	For brand-new cap	93.3 to 122.7 kPa (0.95 to 1.25 kgf/cm^2, 13.5 to 17.8 psi)
	After using cap	78.5 kPa (0.8 kgf/cm^2, 11.4 psi)

TORQUE SPECIFICATIONS

COOLANT

Part Tightened	N*m	kgf*cm	ft.*lbf
Cylinder block drain cock plug x Cylinder block	13	130	9

WATER PUMP

Part Tightened		N*m	kgf*cm	ft.*lbf
Water pump x Cylinder block	for bolt A	21	214	15
	for bolt B	9.1	93	81 in.*lbf
	for bolt C	9.1	93	81 in.*lbf
V-ribbed belt tensioner assembly x Cylinder block		43	438	32
No. 2 idler pulley sub-assembly x Cylinder block		43	438	32
Water pump pulley x Water pump		21	214	15
Water inlet housing x Cylinder block		10	102	7
Radiator reservoir tank x Body		5.0	51	44 in.*lbf

THERMOSTAT

Part Tightened	N*m	kgf*cm	ft.*lbf
Water inlet x Water inlet housing	10	102	7

RADIATOR

Part Tightened		N*m	kgf*cm	ft.*lbf
Oil cooler assembly x Cooler pipe	for Bolt A	15	150	11
	for Nut B	8.3	85	73 in.*lbf
Condenser assembly x Radiator assembly		5.0	51	44in.*lbf
Radiator support upper x Radiator support LH and RH		7.0	71	62 in.*lbf
Radiator support upper x Hood lock assembly		7.5	77	66 in.*lbf

2AZ-FE LUBRICATION

SERVICE DATA

OIL PRESSURE

Condition	Specified Condition
Idle	29 kPa (0.3 kgf/cm^2, 4.3 psi) or more
3,000 rpm	170 to 300 kPa (1.7 to 3.1 kgf/cm^2, 24 to 44 psi)

OIL PUMP

Item	Condition	Specified Condition
Oil pump rotor	Standard side clearance	0.030 to 0.085 mm (0.0012 to 0.0033 in.)
	Maximum side clearance	0.16 mm (0.0063 in.)
	Standard tip clearance	0.080 to 0.160 mm (0.0031 to 0.0063 in.)
	Maximum tip clearance	0.35 mm (0.0138 in.)
	Standard body clearance	0.100 to 0.170 mm (0.0039 to 0.0067 in.)
	Maximum body clearance	0.325 mm (0.01128 in.)
Oil pump drive chain	Maximum chain elongation	52.4 mm (2.063 in.)
Oil pump sprocket	Minimum crankshaft sprocket diameter (with chain)	48.2 mm (1.898 in.)
	Minimum oil pump drive shaft sprocket	48.2 mm (1.898 in.)
Chain tensioner plate	Maximum wear	0.5 mm (0.020 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Oil filter x Stiffening crankcase		13	133	10
Oil drain plug x Oil pan		25	255	18
Oil pump cover x Oil pump		8.8	90	78 in.*lbf
Oil pump relief valve x Oil pump		49	500	36
Oil pump strainer x Oil pump		8.8	90	78 in.*lbf
Oil pump X Cylinder block		19	194	14
Oil pressure switch x Cylinder block		15	153	11
Timing chain cover x Cylinder block, Cylinder head	Bolt A	9.0	92	80 in.*lbf
	Bolt B	25	255	18
	Bolt C	55	561	41
	Nut	11	112	8
Stud bolt x Cylinder block		22	220	16
Oil cooler x Cylinder block	Union bolt	79	800	58
	Nut	9.0	92	80 in.*lbf

SS

2GR-FE LUBRICATION

SERVICE DATA

OIL PRESSURE

Condition	Specified Condition
Idle	80 kPa (0.8 kgf/cm^2, 11.6 psi) or more
3,000 rpm	380 kPa (3.9 kgf/cm^2, 55.5 psi) or more

OIL PUMP

Item	Condition	Specified Condition
Oil pump rotor	Standard side clearance	0.030 to 0.090 mm (0.0012 to 0.0035 in.)
	Maximum side clearance	0.090 mm (0.0035 in.)
	Standard tip clearance	0.060 to 0.160 mm (0.0024 to 0.0063 in.)
	Maximum tip clearance	0.16 mm (0.0063 in.)
	Standard body clearance	0.250 to 0.325 mm (0.0098 to 0.0128 in.)
	Maximum body clearance	0.325 mm (0.01128 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Oil pressure switch x Oil pan		15	153	11
Oil filter cap x Oil pan		25	255	18
Oil filter drain plug x Oil filter cap		13	127	10
Oil pan drain plug x No. 2 oil pan		40	408	30
Oil pump cover x Timing chain cover		9.1	93	81 in.*lbf
Plug X Oil pump cover		49	500	37
Timing chain cover x Cylinder block, Cylinder head, Oil pan	Area 1, 2 Bolt	21	214	15
	Area 3 bolt, nut	21	214	15
	Area 4 Bolt A	43	438	32
	Area 4 except bolt A	21	214	15

2AZ-FE IGNITION

SERVICE DATA

Spark Plug	Standard electrode gap	1.0 to 1.1 mm (0.039 to 0.043 in.) for new spark plug
	Maximum electrode gap	1.3 mm (0.051 in.) for used spark plug

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Spark plug x Cylinder head subassembly	19	194	14
Ignition coil assembly x Cylinder head cover	9.0	92	80 in.*lbf

2GR-FE IGNITION

SERVICE DATA

Spark plug	Standard electrode gap	1.0 to 1.1 mm (0.039 to 0.043 in.) for new spark plug
	Maximum electrode gap	1.4 mm (0.055 in.) for used spark plug

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Spark plug x Cylinder head subassembly	18	184	13
Ignition coil assembly x Cylinder head cover	7.5	76	66 in.*lbf

2AZ-FE STARTING

SERVICE DATA

Starter assembly	Rated voltage and output power		12 V 1.7 kW
	Specified current		90 A or less at 11.5 V
Starter armature assembly	Standard depth		3.1 mm (0.122 in.)
	Minimum depth		3.8 mm (0.150 in.)
Brush length	Standard length		9.0 mm (0.354 in.)
	Minimum length		4.0 mm (0.157 in.)
Starter relay	Specified condition	1 - 2	Below 1 Ω
		3 - 5	10 kΩ or higher
Ignition switch	Resistance	LOCK: Between all terminals	10 kΩ or higher
		ACC: 2 (ACC) - 4 (AM1)	Below 1 Ω
		ON: 1 (IG1) - 2 (ACC) - 4 (AM1)	
		ON: 5 (AM2) - 6 (IG2)	
		START: 1 (ST1) - 3 (ST1) - 4 (AM1)	
		START: 5 (AM2) - 6 (IG2) - 7 (ST2)	

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Starter x Engine	Bolt	37	380	28
	Terminal 30	9.8	100	87 in.*lbf
	Terminal C	10	102	7
Starter x Clutch flexible hose bracket	Bolt	12	120	9
Starter commutator end frame assembly x Starter yoke assembly	Bolt	6.0	61	53 in.*lbf
Magnetic switch x Starter drive housing	Screw	7.5	76	66 in.*lbf

2GR-FE STARTING

SERVICE DATA

Starter assembly	Rated voltage and output power		12 V 1.7 kW
	Specified current		90 A or less at 11.5 V
Starter armature assembly	Standard depth		3.1 mm (0.122 in.)
	Minimum depth		3.8 mm (0.150 in.)
Brush length	Standard length		9.0 mm (0.354 in.)
	Minimum length		4.0 mm (0.157 in.)
Starter relay	Specified condition	1 - 2	Below 1 Ω
		3 - 5	10 kΩ or higher
Ignition switch	Resistance	LOCK: Between all terminals	10 kΩ or higher
		ACC: 2 (ACC) - 4 (AM1)	Below 1 Ω
		ON: 1 (IG1) - 2 (ACC) - 4 (AM1)	
		ON: 5 (AM2) - 6 (IG2)	
		START: 1 (ST1) - 3 (ST1) - 4 (AM1)	
		START: 5 (AM2) - 6 (IG2) - 7 (ST2)	
Engine switch	Resistance	Pushed: 7 (SS1) - 5 (GND)	Below 1 Ω
		Pushed: 2 (SS2) - 5 (GND)	
		Not pushed: 7 (SS1) - 5 (GND)	10 kΩ or higher
		Not pushed: 2 (SS2) - 5 (GND)	

SS

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Starter x Engine	Bolt	37	380	28
	Terminal 30	9.8	100	87 in.*lbf
	Terminal C	10	102	7
Starter commutator end frame assembly x Starter yoke assembly	Bolt	6.0	61	53 in.*lbf
Magnetic switch x Starter drive housing	Screw	7.5	76	66 in.*lbf

2AZ-FE CHARGING

SERVICE DATA

Charging circuit without load	Standard amperage: 10 A or less
	Standard voltage: 13.2 to 14.8 V
Charging circuit with load	Standard amperage: 30 A or more
Brush length	Standard exposed length: 9.5 to 11.5 mm (0.374 to 0.453 in.)
	Minimum exposed length: 4.5 mm (0.177 in.)
Generator rotor assembly	Slip rings resistance: 2.3 to 2.7 kΩ at 20°C (68°F)
	Standard slip ring diameter: 14.2 to 14.4 mm (0.559 to 0.567 in.)
	Minimum slip ring diameter: 14.0 mm (0.551 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Bearing retainer plate x Generator drive end frame	2.3	23	20 in.*lbf
Generator coil assembly x Generator drive end frame	5.8	59	51 in.*lbf
Generator brush holder assembly x Generator coil assembly	1.8	18	16 in.*lbf
Generator rear end cover x Generator coil assembly	4.6	47	41 in.*lbf
Clutch pulley x Generator rotor assembly	111	1,125	81
Generator assembly x Cord clip	4.6	47	41 in.*lbf
Generator assembly x Wire harness bracket	8.4	86	74 in.*lbf
Bolt A: Generator assembly x Cylinder block	21	215	16
Bolt B: Generator assembly x Cylinder block	52	530	38
Generator wire x Terminal B	9.8	100	87 in.*lbf

2GR-FE CHARGING

SERVICE DATA

Charging circuit without load	Standard amperage: 10 A or less
	Standard voltage: 12.1 to 15.4 V
Charging circuit with load	Standard amperage: 30 A or more
Brush length	Standard exposed length: 9.5 to 11.5 mm (0.374 to 0.453 in.)
	Minimum exposed length: 4.5 mm (0.177 in.)
Generator rotor assembly	Slip rings resistance: 2.3 to 2.7 kΩ at 20°C (68°F)
	Standard slip ring diameter: 14.2 to 14.4 mm (0.559 to 0.567 in.)
	Minimum slip ring diameter: 14.0 mm (0.551 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Bearing retainer plate x Generator drive end frame	2.3	23	20 in.*lbf
Generator coil assembly x Generator drive end frame	5.8	59	51 in.*lbf
Generator brush holder assembly x Generator coil assembly	1.8	18	16 in.*lbf
Generator rear end cover x Generator coil assembly	4.6	47	41 in.*lbf
Clutch pulley x Generator rotor assembly	111	1,125	81
Generator assembly x Generator bracket	20	204	15
Cylinder block x Generator bracket	20	204	15
Generator assembly x wire harness clamp stay	8.4	86	74 in.*lbf
Generator assembly x Cylinder block	43	438	32
Bolt B: Generator assembly x Cylinder block	52	530	38
Generator wire x Terminal B	9.8	100	87 in.*lbf

U250E AUTOMATIC TRANSAXLE

SERVICE DATA

Line pressure (Wheel locked)		
Engine idling	D position	372 to 412 kPa (3.8 to 4.2 kgf*cm^2, 54 to 60 psi)
	R position	672 to 742 kPa (6.8 to 7.5 kgf*cm^2, 97 to 108 psi)
AT stall (Throttle valve fully open)	D position	931 to 1,031 kPa (9.5 to 10.5 kgf*cm^2, 135 to 150 psi)
	R position	1,768 to 1,968 kPa (18.0 to 20.0 kgf*cm^2, 256 to 285 psi)
Engine stall revolution	D position	2,160 to 2,460 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle speed (A/C OFF)	N position	650 to 750 rpm
Drive plate runout	Maximum	0.20 mm (0.0079 in.)
Torque converter runout	Maximum	0.30 mm (0.0118 in.)
Differential oil seal drive in depth	Transaxle housing oil seal	- 0.5 to 0.5 mm (-0.020 to 0.020 in.)
	Differential side bearing retainer oil seal	- 0.5 to 0.5 mm (-0.020 to 0.020 in.)
Shift schedule		
D position (Normal)		
Throttle valve fully open	1 → 2	47 to 54 km/h (29 to 34 mph)
	2 → 3	92 to 101 km/h (57 to 63 mph)
	3 → 4	145 to 160 km/h (90 to 99 mph)
	4 → 5	208 to 226 km/h (129 to 140 mph)
	5 → 4	201 to 218 km/h (125 to 135 mph)
	4 → 3	137 to 151 km/h (85 to 94 mph)
	3 → 2	84 to 93 km/h (52 to 58 mph)
	2 → 1	34 to 40 km/h (21 to 25 mph)
Throttle valve fully closed	4 → 5	68 to 75 km/h (42 to 47 mph)
	5 → 4	36 to 42 km/h (22 to 26 mph)
3 position		
Throttle valve fully open	1 → 2	47 to 54 km/h (29 to 34 mph)
	2 → 3	92 to 101 km/h (57 to 63 mph)
	4 → 3	141 to 155 km/h (85 to 94 mph)
	3 → 2	84 to 93 km/h (52 to 58 mph)
	2 → 1	34 to 40 km/h (21 to 25 mph)
2 position		
Throttle valve fully open	1 → 2	47 to 54 km/h (29 to 34 mph)
	3 → 2	89 to 98 km/h (52 to 58 mph)
	2 → 1	34 to 40 km/h (21 to 25 mph)
L position		
Throttle valve fully open	2 → 1	40 to 46 km/h (25 to 29 mph)
Lock-up point (Throttle valve opening 5%) D position		
5th gear	Lock-up ON	76 to 84 km/h (47 to 52 mph)
	Lock-up OFF	75 to 82 km/h (47 to 51 mph)
4th gear	Lock-up ON	76 to 85 km/h (47 to 53 mph)
	Lock-up OFF	75 to 82 km/h (47 to 51 mph)
Flex lock-up point (Throttle valve opening 5%) D position		

5th gear	Lock-up ON	56 to 63 km/h (35 to 39 mph)
	Lock-up OFF	55 to 62 km/h (34 to 39 mph)
4th gear	Lock-up ON	41 to 47 km/h (25 to 29 mph)
	Lock-up OFF	40 to 46 km/h (25 to 29 mph)
Oil pump		
Body clearance	STD	0.10 to 0.17 mm (0.0039 to 0.0067 in.)
	Maximum	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Maximum	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Maximum	0.05 mm (0.0020 in.)
Drive gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)
Driven gear thickness	Mark A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	Mark B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	Mark C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	Mark D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	Mark E	11.731 to 11.740 mm (0.4619 to 0.4622 in.)
Pump body bushing inside diameter	STD	38.113 to 38.138 mm (1.50050 to 1.50149 in.)
	Maximum	38.188 mm (1.50346 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.84646 to 0.84748 in.)
	Maximum	21.57 mm (0.8492 in.)
Multiple disc clutch hub		
Inside diameter	STD	23.025 to 23.046 mm (0.9065 to 0.9073 in.)
	Maximum	23.09 mm (0.9091 in.)
Over direct clutch drum sub-assembly		
Inside diameter	STD	23.025 to 23.046 mm (0.9065 to 0.9073 in.)
	Maximum	23.09 mm (0.9091 in.)
Forward clutch		
Pack clearance		0.85 to 1.25 mm (0.0335 to 0.0492 in.)
Return spring free length		26.74 mm (1.0528 in.)
Flange thickness	Mark 0	2.85 mm (0.1122 in.)
	Mark 1	3.00 mm (0.1181 in.)
	Mark 2	3.15 mm (0.1240 in.)
	Mark 3	3.30 mm (0.1299 in.)
	Mark 4	3.45 mm (0.1358 in.)
	Mark 5	3.60 mm (0.1417 in.)
	Mark 6	3.75 mm (0.1476 in.)
Reverse clutch		
Pack clearance		0.60 to 0.82 mm (0.02362 to 0.03228 in.)

Flange thickness	Mark 0	2.9 mm (0.114 in.)
	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
Direct clutch and O/D clutch		
Pack clearance		0.52 mm (0.02047 in.)
Return spring free length		25.91 mm (1.0201 in.)
Flange thickness	Mark 0	2.5 mm (0.098 in.)
	Mark 1	2.6 mm (0.102 in.)
	Mark 2	2.7 mm (0.106 in.)
	Mark 3	2.8 mm (0.110 in.)
	Mark 4	2.9 mm (0.114 in.)
	Mark 5	3.0 mm (0.118 in.)
	Mark 6	3.1 mm (0.122 in.)
2nd brake		
Pack clearance		0.53 to 0.91 mm (0.0209 to 0.0358 in.)
Return spring free length		16.61 mm (0.6539 in.)
Flange thickness	Mark 0	2.9 mm (0.114 in.)
	Mark 1	3.0 mm (0.118 in.)
	Mark 2	3.1 mm (0.122 in.)
	Mark 3	3.2 mm (0.126 in.)
	Mark 4	3.3 mm (0.130 in.)
	Mark 5	3.4 mm (0.134 in.)
	Mark 6	3.5 mm (0.138 in.)
	Mark 7	3.6 mm (0.142 in.)
	Mark 8	3.7 mm (0.146 in.)
2nd brake piston		
Inside diameter		More than 167 mm (6.57 in.)
U/D clutch		
Pack clearance		1.42 to 1.71 mm (0.0559 to 0.0673 in.)
U/D clutch drum bushing inside diameter	STD	32.56 to 32.58 mm (1.2818 to 1.2826 in.)
	Max.	32.63 mm (1.2846 in.)
Return spring free length		17.14 mm (0.6748 in.)
Flange thickness	Mark K	2.9 mm (0.114 in.)
	Mark A	3.0 mm (0.118 in.)
	Mark G	3.1 mm (0.122 in.)
	Mark B	3.2 mm (0.126 in.)
	Mark H	3.3 mm (0.130 in.)
	Mark C	3.4 mm (0.134 in.)
	Mark J	3.5 mm (0.138 in.)
U/D clutch No. 2		
Pack clearance		1.645 to 2.20 mm (0.0648 to 0.0866 in.)
Return spring free length		13.24 mm (0.5213 in.)

Flange thickness	Mark Y	2.8 mm (0.110 in.)
	Mark A	3.0 mm (0.118 in.)
	Mark B	3.2 mm (0.126 in.)
	Mark C	3.4 mm (0.134 in.)
	Mark D	3.6 mm (0.142 in.)
1st & reverse brake		
Pack clearance		0.745 to 1.21 mm (0.0293 to 0.0476 in.)
Return spring free length		17.63 mm (0.6941 in.)
Flange thickness	Mark 1	1.8 mm (0.071 in.)
	Mark 2	1.9 mm (0.075 in.)
	Mark 3	2.0 mm (0.079 in.)
	Mark 4	2.1 mm (0.083 in.)
	Mark 5	2.2 mm (0.087 in.)
	Mark 6	2.3 mm (0.091 in.)
	Mark 7	2.4 mm (0.094 in.)
	Mark 8	2.5 mm (0.098 in.)
U/D planetary gear		
Preload (at 60 rpm)		0.28 to 0.89 N*m (2.9 to 9.1 kgf*cm, 2.478 to 7.877 in.*lbf)
Front planetary gear		
Turning torque (at 60 rpm)		0.19 to 0.4 N*m (1.9 to 4.1 kgf*cm, 1.7 to 3.5 in.*lbf)
Input shaft		
End play		0.262 to 1.249 mm (0.0103 to 0.0492 in.)
Direct clutch to transaxle rear cover		
End play		0.199 to 0.970 mm (0.0078 to 0.0382 in.)
U/D planetary gear assembly to U/D cyindrical roller bearing		
End play		0.198 to 0.693 mm (0.00780 to 0.02728 in.)
Race thickness	Less than 7.339 mm (9.2890 in.)	3.5 mm (0.138 in.)
	7.339 mm (0.2890 in.) or more	3.8 mm (0.150 in.)
Transaxle rear cover		
Bearing press fit depth		20.55 to 21.25 mm (0.8091 to 0.8366 in.)
Transmission valve body		
Valve body installation bolt length	A	25 mm (0.984 in.)
	B	57 mm (2.244 in.)
	C	41 mm (1.614 in.)
Manual valve lever shaft oil seal		
Oil seal drive in depth		-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)
Front differential		
Backlash		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Thrust washer thickness	Mark 1	1.000 mm (0.0394 in.)
	Mark 2	1.100 mm (0.0433 in.)
	Mark 3	1.200 mm (0.0472 in.)
	Mark 4	1.3 mm (0.0512 in.)
Preload (at 60 rpm)	New bearing	0.20 to 1.0 N*m (2.0 to 10.2 kgf*cm, 1.8 to 8.9 in.*lbf)
	Used bearing	0.10 to 0.35 N*m (1.0 to 3.6 kgf*cm, 0.9 to 3.1 in.*lbf)

Flange thickness	Mark 0	1.90 mm (0.0748 in.)
	Mark 1	1.95 mm (0.0768 in.)
	Mark 2	2.00 mm (0.0787 in.)
	Mark 3	2.05 mm (0.0807 in.)
	Mark 4	2.10 mm (0.0827 in.)
	Mark 5	2.15 mm (0.0846 in.)
	Mark 6	2.20 mm (0.0866 in.)
	Mark 7	2.25 mm (0.0886 in.)
	Mark 8	2.30 mm (0.0906 in.)
	Mark 9	2.35 mm (0.0925 in.)
	Mark A	2.40 mm (0.0945 in.)
	Mark B	2.45 mm (0.0965 in.)
	Mark C	2.50 mm (0.0984 in.)
	Mark D	2.55 mm (0.1004 in.)
	Mark E	2.60 mm (0.1024 in.)
	Mark F	2.65 mm (0.1043 in.)
	Mark G	2.70 mm (0.1063 in.)
	Mark H	2.75 mm (0.1083 in.)
	Mark J	2.80 mm (0.1102 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Park/neutral position switch	Bolt	5.4	55	48 in.*lbf
	Nut	6.9	70	61 in.*lbf
Control shaft lever x Control shaft		13	130	9
Shift control cable x Control shaft lever		15	150	11
Transaxle housing x Engine block	Bolt A	64	653	47
	Bolt B	46	470	34
	Bolt C	46	470	34
	Bolt D	44	449	32
Torque converter clutch x Drive plate		41	418	30
Engine mounting bracket FR x Transaxle		64	653	47
Oil filler tube x Transaxle		5.5	56	49 in.*lbf
No. 1 transmission control cable bracket x Transaxle		12	122	9
No. 2 transmission control cable bracket x Transaxle		12	122	9
Oil cooler tube clamp x Control cable bracket		5.4	55	48 in.*lbf
Oil cooler inlet tube x Transaxle		34	350	25
Oil cooler outlet tube x Transaxle		34	350	25
Wire harness x Transaxle		12	130	9
Wire harness clamp x Transaxle		8.4	85	74 in.*lbf
Revolution sensor NC sensor x Transaxle		5.4	55	49 in.*lbf
Revolution sensor NT sensor x Transaxle		5.4	55	49
Drain plug x Oil pan		49	500	36
Transmission wire x Transaxle		5.4	55	48 in.*lbf
ATF temperature sensor x Valve body		6.6	67	58 in.*lbf
Oil pan x Transaxle		7.8	80	69 in.*lbf
Solenoid valve x Valve body	Bolt A, B	11	110	8
	Bolt C, D	6.6	67	58 in.*lbf
Valve body x Transaxle		11	110	8
Oil strainer x Valve body		11	110	8
Floor shift assembly x Body		12	122	9
Control cable x Body		5.0	51	43 in.*lbf
Front planetary gear lock nut		185 to 350	1,886 to 3,569	136 to 258
Brake apply tube clamp x Transaxle case		5.4	55	48 in.*lbf
Transaxle case No.1 plug x Transaxle rear cover		7.4	75	65 in.*lbf
Transaxle case No.1 plug x Transaxle housing		7.4	75	65 in.*lbf
Transaxle case No.1 plug x Transaxle case		7.4	75	65 in.*lbf
Transaxle rear cover x Transaxle case	Bolt A	19	190	14
	Other bolt	25	250	18
Pawl shaft clamp x Transaxle case		9.8	100	87 in.*lbf
Oil pump assembly x Transaxle case		22	225	16
Transaxle housing x Transaxle case	Bolt A	22	225	16
	Bolt B	29	296	21
	Bolt C	29	296	21
Parking lock pawl bracket x Transaxle case		20	205	15
Manual detent spring x Transaxle case	Bolt A	20	205	15
	Bolt B	12	120	9
Transmission wire x Transaxle housing		5.4	55	48 in.*lbf
Transmission valve body x Transaxle case		11	110	8
ATF temperature sensor clamp x Transmission valve body		6.6	67	58 in.*lbf

Part Tightened	N*m	kgf*cm	ft.*lbf
Valve body oil strainer assembly x Transmission valve body	11	110	8
Speed sensor x Transaxle case	8.8	90	79 in.*lbf
Oil cooler tube union (Outlet oil cooler union) x Transaxle case	27	276	20
Oil cooler tube union (Inlet oil cooler union) x Transaxle case	25	255	18
Oil pump body x Stator shaft assembly	9.8	100	87 in.*lbf
Line pressure control solenoid assembly x Transmission valve body assembly	6.6	67	58 in.*lbf
Shift solenoid valve SL1 x Transmission valve body assembly	6.6	67	58 in.*lbf
Shift solenoid valve SL2 x Transmission valve body assembly	11	110	8
Shift solenoid valve SL3 x Transmission valve body assembly	6.6	67	58 in.*lbf
Shift solenoid valve S4 x Transmission valve body assembly	11	110	8
Shift solenoid valve DSL x Transmission valve body assembly	11	110	8
Front differential case x Front differential ring gear	95	970	70
Front planetary gear nut	280	2,855	207

U660E AUTOMATIC TRANSAXLE

SERVICE DATA

Line pressure (Wheel locked)		
Engine idling	D position	372 to 412 kPa (3.8 to 4.2 kgf*cm^2, 54 to 60 psi)
	R position	672 to 742 kPa (6.8 to 7.5 kgf*cm^2, 97 to 108 psi)
AT stall (Throttle valve fully open)	D position	1,160 to 1,350 kPa (11.8 to 13.8 kgf*cm^2, 168 to 196 psi)
	R position	1,900 to 2,200 kPa (19.4 to 22.4 kgf*cm^2, 276 to 319 psi)
Engine stall revolution	D position	2,370 to 2,670 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle speed (A/C OFF)	N position	600 to 700 rpm
Drive plate runout	Maximum	0.20 mm (0.0079 in.)
Torque converter runout	Maximum	0.30 mm (0.0118 in.)
Differential oil seal drive in depth	LH side	-0.5 to 0.5 mm (-0.020 to 0.020 in.)
	RH side	-0.5 to 0.5 mm (-0.020 to 0.020 in.)
Shift schedule		
D position		
Throttle valve fully open (Normal)	1 → 2	50 to 56 km/h (31 to 35 mph)
	2 → 3	93 to 103 km/h (58 to 64 mph)
	3 → 4	128 to 141 km/h (80 to 88 mph)
	4 → 5	174 to 193 km/h (108 to 120 mph)
	5 → 6	258 to 285 km/h (160 to 177 mph
	6 → 5	252 to 278 km/h (157 to 173 mph
	5 → 4	169 to 187 km/h (105 to 116 mph))
	4 → 3	121 to 134 km/h (75 to 83 mph))
	3 → 2	87 to 96km/h (54 to 60 mph)
	2 → 1	33 to 37 km/h (21 to 23 mph)
Throttle valve fully open (Cold)	1 → 2	37 to 41 km/h (23 to 25 mph)
	2 → 3	72 to 79 km/h (45 to 47 mph)
	3 → 4	110 to 122 km/h (68 to 76 mph)
	4 → 5	174 to 192 km/h (108 to 119 mph)
	5 → 6	258 to 285 km/h (160 to 177 mph
	6 → 5	252 to 278 km/h (157 to 173 mph
	5 → 4	169 to 187 km/h (105 to 116 mph))
	4 → 3	104 to 115 km/h (65 to 71 mph))
	3 → 2	65 to 72km/h (40 to 45 mph)
	2 → 1	33 to 37 km/h (21 to 23 mph)
Throttle valve fully open (Failure)	1 → 3	27 to 30 km/h (17 to 19 mph)
	3 → 1	6 to 8 km/h (4 to 5 mph)
Throttle valve fully closed (Normal)	4 → 5	48 to 54 km/h (30 to 34 mph)
	5 → 6	65 to 72 km/h (40 to 45 mph)
	6 → 5	58 to 65 km/h (36 to 40 mph)
	5 → 4	46 to 51 km/h (29 to 32 mph)
5, 4, 3, 2, 1 position		

Manual down shift speed	→ 5	252 to 278 km/h (156 to 172 mph)
	→ 4	169 to 187 km/h (105 to 116 mph)
	→ 3	121 to 134 km/h (75 to 83 mph)
	→ 2	87 to 96km/h (54 to 60 mph)
	→ 1	38 to 42 km/h (23 to 26 mph)
Lock-up schedule (Throttle valve opening 5%) D position		
6th gear	Lock-up ON	69 to 76 km/h (43 to 47 mph)
	Lock-up OFF	67 to 74 km/h (42 to 46 mph)
5th gear	Lock-up ON	59 to 66 km/h (37 to 41 mph)
	Lock-up OFF	57 to 63 km/h (35 to 39 mph)
4th gear	Lock-up ON	43 to 47 km/h (27 to 29 mph)
	Lock-up OFF	41 to 45 km/h (25 to 28 mph)
3rd gear	Lock-up ON	30 to 33 km/h (19 to 21 mph)
	Lock-up OFF	28 to 31 km/h (17 to 19 mph)
2nd gear	Lock-up ON	23 to 25 km/h (14 to 16 mph)
	Lock-up OFF	22 to 24 km/h (14 to 15 mph)
Flex lock-up schedule (Throttle valve opening 5%) D position		
6th gear	Lock-up ON	62 to 68 km/h (39 to 42 mph)
	Lock-up OFF	60 to 67 km/h (38 to 42 mph)
5th gear	Lock-up ON	50 to 55 km/h (31 to 34 mph)
	Lock-up OFF	50 to 55 km/h (31 to 34 mph)
4th gear	Lock-up ON	37 to 41 km/h (23 to 25 mph)
	Lock-up OFF	35 to 39 km/h (22 to 24 mph)
3rd gear	Lock-up ON	27 to 30 km/h (17 to 19 mph)
	Lock-up OFF	25 to 28 km/h (16 to 17 mph)
2nd gear	Lock-up ON	20 to 22 km/h (12 to 14 mph)
	Lock-up OFF	18 to 20 km/h (11 to 12 mph)
Oil pump		
Body clearance	STD	0.08 to 0.15 mm (0.0031 to 0.0059 in.)
	Maximum	0.15 mm (0.0059 in.)
Side clearance	STD	0.025 to 0.04 mm (0.0010 to 0.0016 in.)
	Maximum	0.04 mm (0.0016 in.)
Drive gear thickness		11.547 to 11.555 mm (0.4546 to 0.4549 in.)
		11.555 to 11.563 mm (0.4549 to 0.4552 in.)
		11.564 to 11.571 mm (0.4553 to 0.4556 in.)
		11.572 to 11.579 mm (0.4556 to 0.4559 in.)
		11.580 to 11.587 mm (0.4559 to 0.4562 in.)
Driven gear thickness		11.547 to 11.555 mm (0.4546 to 0.4549 in.)
		11.555 to 11.563 mm (0.4549 to 0.4552 in.)
		11.564 to 11.571 mm (0.4553 to 0.4556 in.)
		11.572 to 11.579 mm (0.4556 to 0.4559 in.)
		11.580 to 11.587 mm (0.4559 to 0.4562 in.)
Pump body bushing inside diameter	STD	43.113 to 43.138 mm (1.6974 to 1.6983 in.)
	Maximum	43.188 mm (1.7003 in.)
Stator shaft bushing inside diameter	STD	22.500 to 22.526 mm (0.8858 to 0.8868 in.)
	Maximum	22.57 mm (0.8886 in.)
Rear planetary sun gear		
Inside diameter	STD	25.580 to 25.601 mm (1.0071 to 1.0079 in.)
	Maximum	25.601 mm (1.0079 in.)

Under drive planetary gear		
Clearance		0.18 to 0.54 mm (0.0071 to 0.0213 in.)
Planetary sun gear		
Inside diameter	STD	25.525 to 25.546 mm (1.0049 to 1.0058 in.)
	Maximum	25.546 mm (1.0058 in.)
2nd brake piston return spring		
Return spring free length		23.85 mm (0.9390 in.)
Planetary gear		
Clearance	A point	0.23 to 0.59 mm (0.0091 to 0.0232 in.)
	B point	0.16 to 0.66 mm (0.0063 to 0.0260 in.)
1st and reverse brake return spring		
Return spring free length		15.79 mm (0.6217 in.)
No. 2 brake		
Piston stroke		0.884 to 1.196 mm (0.0348 to 0.0471 in.)
Flange thickness	Mark 40	4.0 mm (0.157 in.)
	Mark 41	4.1 mm (0.161 in.)
	Mark 42	4.2 mm (0.165 in.)
	Mark 43	4.3 mm (0.169 in.)
	Mark 44	4.4 mm (0.173 in.)
No. 1 brake		
Piston stroke		0.807 to 0.974 mm (0.0318 to 0.0383 in.)
Flange thickness	Mark 30	3.0 mm (0.118 in.)
	Mark 31	3.1 mm (0.122 in.)
	Mark 32	3.2 mm (0.126 in.)
	Mark 33	3.3 mm (0.130 in.)
	Mark 34	3.4 mm (0.134 in.)
	Mark 35	3.5 mm (0.138 in.)
No. 3 brake		
Clearance		0.599 to 0.761 mm (0.0024 to 0.0300 in.)
Flange thickness	Mark 38	3.8 mm (0.150 in.)
	Mark 39	3.9 mm (0.154 in.)
	Mark 40	4.0 mm (0.157 in.)
	Mark 41	4.1 mm (0.161 in.)
	Mark 42	4.2 mm (0.165 in.)
	Mark 43	4.3 mm (0.169 in.)
No. 1 clutch disc		
Piston stroke		0.806 to 0.974 mm (0.0317 to 0.0383 in.)
Flange thickness	Mark 30	3.0 mm (0.118 in.)
	Mark 31	3.1 mm (0.122 in.)
	Mark 32	3.2 mm (0.126 in.)
	Mark 33	3.3 mm (0.130 in.)
	Mark 34	3.4 mm (0.134 in.)
	Mark 35	3.5 mm (0.138 in.)
No. 2 clutch disc		
Pack clearance		0.544 to 0.744 mm (0.0214 to 0.0293 in.)

Flange thickness	Mark 30	3.0 mm (0.118 in.)
	Mark 31	3.1 mm (0.122 in.)
	Mark 32	3.2 mm (0.126 in.)
	Mark 33	3.3 mm (0.130 in.)
	Mark 34	3.4 mm (0.134 in.)
	Mark 35	3.5 mm (0.138 in.)
Input shaft		
End play		0.012 to 1.250 mm (0.0005 to 0.0492 in.)
Intermediate shaft		
End play		0.007 to 1.113 mm (0.0003 to 0.0438 in.)
Transaxle rear cover		
Bearing press fit depth		21.5 to 21.9 mm (0.8464 to 0.8622 in.)
Transmission valve body		
Valve body installation bolt length	A	25 mm (0.98 in.)
	B	30 mm (1.18 in.)
	C	35 mm (1.38 in.)
	D	45 mm (1.77 in.)
	E	55 mm (2.17 in.)
Manual valve lever shaft oil seal		
Oil seal drive in depth		-0.5 to 0.5 mm (-0.0197 to 0.0197 in.)
Front differential		
Backlash		0 to 0.15 mm (0 to 0.0059 in.)
Thrust washer thickness		1.50 mm (0.0591 in.)
		1.55 mm (0.0610 in.)
		1.60 mm (0..0630 in.)
		1.65 mm (0.0650 in.)
		1.70 mm (0.0669 in.)
		1.75 mm (0.0689 in.)
		1.80 mm (0.0709 in.)
		1.85 mm (0.0728 in.)
		1.90 mm (0.0748 in.)
Preload (at 10 rpm)		1.05 to 1.93 N*m (10.7 to 19.67 kgf*cm, 9.29 to 17.08 in.*lbf)

Shim thickness	2.000 mm (0.0787 in.)
	2.025 mm (0.0797 in.)
	2.050 mm (0.0807 in.)
	2.075 mm (0.0817 in.)
	2.100 mm (0.0827 in.)
	2.125 mm (0.0837 in.)
	2.150 mm (0.0847 in.)
	2.175 mm (0.0856 in.)
	2.200 mm (0.0866 in.)
	2.225 mm (0.0876 in.)
	2.250 mm (0.0886 in.)
	2.275 mm (0.0896 in.)
	2.300 mm (0.0906 in.)
	2.325 mm (0.0915 in.)
	2.350 mm (0.0925 in.)
	2.375 mm (0.0935 in.)
	2.400 mm (0.0945 in.)
	2.425 mm (0.0935 in.)
	2.450 mm (0.0965 in.)
	2.475 mm (0.0974 in.)
	2.500 mm (0.0984 in.)
	2.525 mm (0.0994 in.)
	2.550 mm (0.1004 in.)
	2.575 mm (0.1014 in.)
	2.600 mm (0.1024 in.)
	2.625 mm (0.1034 in.)
	2.650 mm (0.1043 in.)
	2.675 mm (0.1053 in.)
	2.700 mm (01063 in.)
	2.725 mm (0.1073 in.)
	2.750 mm (0.1083 in.)
	2.775 mm (0.1093 in.)
	2.800 mm (0.1102 in.)
	2.825 mm (0.1112 in.)
	2.850 mm (0.1122 in.)
	2.875 mm (0.1132 in.)
Counter driven gear	
Preload (at 10 rpm)	3.29 to 6.07 N*m (35.35 to 61.86 kgf*cm, 2.42 to 4.46 in.*lbf)

Shim thickness	2.000 mm (0.0787 in.)
	2.025 mm (0.0797 in.)
	2.050 mm (0.0807 in.)
	2.075 mm (0.0817 in.)
	2.100 mm (0.0827 in.)
	2.125 mm (0.0837 in.)
	2.150 mm (0.0847 in.)
	2.175 mm (0.0856 in.)
	2.200 mm (0.0866 in.)
	2.225 mm (0.0876 in.)
	2.250 mm (0.0886 in.)
	2.275 mm (0.0896 in.)
	2.300 mm (0.0906 in.)
	2.325 mm (0.0915 in.)
	2.350 mm (0.0925 in.)
	2.375 mm (0.0935 in.)
	2.400 mm (0.0945 in.)
	2.425 mm (0.0935 in.)
	2.450 mm (0.0965 in.)
	2.475 mm (0.0974 in.)
	2.500 mm (0.0984 in.)
	2.525 mm (0.0994 in.)
	2.550 mm (0.1004 in.)
	2.575 mm (0.1014 in.)
	2.600 mm (0.1024 in.)
	2.625 mm (0.1034 in.)
	2.650 mm (0.1043 in.)
	2.675 mm (0.1053 in.)
	2.700 mm (01063 in.)
	2.725 mm (0.1073 in.)
	2.750 mm (0.1083 in.)
	2.775 mm (0.1093 in.)
	2.800 mm (0.1102 in.)
	2.825 mm (0.1112 in.)
	2.850 mm (0.1122 in.)
	2.875 mm (0.1132 in.)
	2.900 mm (0.1141 in.)
	2.925 mm (0.1152 in.)
	2.950 mm (0.1161 in.)
	2.975 mm (0.1171 in.)
	3.000 mm (0.1181 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Park/neutral position switch		5.4	55	48 in.*lbf
Control shaft lever x Control shaft		13	130	9
Transmission control cable x Control shaft lever		13	130	9
Transaxle housing x Engine block	Bolt A	64	653	47
	Bolt B	64	653	47
	Bolt C	46	469	34
	Bolt D	43	439	32
Torque converter clutch x Drive plate		41	418	30
Engine mounting front bracket x Transaxle case		64	653	47
Refill plug x Transaxle case		49	500	36
Over flow plug x Transaxle case		40	408	30
Control cable bracket No. 1 x Transaxle case		12	122	9
Oil cooler tube union (inlet oil cooler union) x Transaxle case		27	275	20
Oil cooler tube union (outlet oil cooler union) x Transaxle case		27	275	20
Wire harness x Transaxle case		12	122	9
Wire harness clamp bracket x Transaxle case		8.4	86	74 in.*lbf
Transmission revolution sensor x Valve body		11	112	8
No. 1 transmission oil filler tube x Oil pan		1.7	17	15 in.*lbf
Speedometer driven hole cover x Transaxle case		5.5	56	49 in.*lbf
Transmission wire (ATF temperature sensor) x Valve body		11	112	8
Oil pan x Transaxle case		7.5	76	66 in.*lbf
Transmission wire x Valve body		11	112	8
Valve body x Transaxle case		11	112	8
Oil strainer x Valve body		11	112	8
Breather bracket x Camshaft housing sub-assembly LH		5.5	56	49 in.*lbf
Air cleaner bracket x Body		7.8	80	69 in.*lbf
No. 2 shift cable grommet retainer x Body		5.0	51	44 in.*lbf
Flywheel housing under cover x Transaxle housing		7.8	80	69 in.*lbf
TCM x Transaxle case		11	112	8
Shift lock control unit x Body		12	122	9
Differential gear lube apply tube x Transaxle housing		23	234	17
Lock nut x Transaxle case		120	1,223	88
Transaxle case No. 1 plug x Transaxle rear cover		7.4	75	65 in.*lbf
Transaxle case No. 1 plug x Transaxle housing		7.4	75	65 in.*lbf
Transaxle case No. 1 plug x Transaxle case		29	296	20
Transaxle rear cover x Transaxle case	Bolt A	23	234	17
	Bolt B	17	173	12
Transaxle rear cover plate x Transaxle case		7.5	76	66 in.*lbf
Oil pump assembly x Transaxle case		23	234	17
Transaxle housing x Transaxle case	Bolt A	31	316	23
	Bolt B	23	234	17
Pawl shaft clamp x Transaxle case		23	234	17
Pawl stopper plate x Transaxle case		23	234	17
Manual detent spring x Transaxle case		23	234	17
Oil pump body x Stator shaft assembly		9.3	95	82 in.*lbf
Shift solenoid valve SL3 x Transmission valve body assembly		11	110	8
Shift solenoid valve SL4 x Transmission valve body assembly		11	110	8
Front differential case x Front differential ring gear		120	1,223	88

CLUTCH

SERVICE DATA

Pedal height from asphalt sheet		148.0 to 158.0 mm (5.8268 to 6.2205 in.)	
Clutch pedal free play		5.0 to 15.0 mm (0.197 to 0.591 in.)	
Clutch pedal push rod play at pedal top		1.0 to 5.0 mm (0.039 to 0.197 in.)	
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more	
Disc rivet head depth	Minimum	0.3 mm (0.012 in.)	
Disc runout	Maximum	0.8 mm (0.031 in.)	
Diaphragm spring finger wear	Maximum depth:	0.5 mm (0.020 in.)	
	Maximum width:	6.0 mm (0.236 in.)	
Flywheel runout	Maximum	0.1 mm (0.004 in.)	
Diaphragm spring tip alignment	Maximum variation:	0.5 mm (0.020 in.)	
Clutch start switch assembly	Specified condition	Switch position ON (pushed)	Below 1 Ω
		Switch position OFF (not pushed)	10 kΩ or higher

SS

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Clutch pedal sub-assembly x Clutch pedal support	37	375	27
Clutch pedal support set bolt x Body	19	195	14
Clutch pedal support set nut x Body	12	120	9
Cylinder push rod clevis lock nut	12	120	9
Clutch master cylinder assembly x Clutch pedal support	12	120	9
Clutch master cylinder assembly x Flexible hose tube	15	155	11
Release cylinder bleeder plug	8.3	85	74 in.*lbf
Clutch release cylinder assembly x Transaxle housing	12	120	9
Clutch accumulator assembly set nut	12	120	9
Clutch release cylinder assembly x Flexible hose tube	15	155	11
Clutch accumulator assembly x Flexible hose tube	15	155	11
Release cylinder heat insulator set bolt	12	120	9
Clutch accumulator bracket set bolt A	12	120	9
Clutch accumulator bracket set bolt B	37	380	28
Clutch cover assembly x Flywheel	19	195	14
Release fork support x Transaxle assembly	47	480	35
Clutch start switch assembly set nut	16	160	12

E351 MANUAL TRANSAXLE

SERVICE DATA

MANUAL TRANSAXLE ASSEMBLY:

Transmission case oil seal driven in depth	3.0 to 4.0 mm (0.1181 to 0.1575 in.)
Front transaxle case cover oil seal drive in depth	-0.5 to 0.5 mm (-0.020 to 0.020 in.)

MANUAL TRANSAXLE UNIT:

5th gear thrust clearance	Standard clearance	0.10 to 0.65 mm (0.0039 to 0.0256 in.)
5th gear radial clearance	Standard clearance	0.009 to 0.050 mm (0.0004 to 0.0020 in.)
Reverse idler gear sub-assembly inside diameter	Standard inside diameter	20.056 to 20.074 mm (0.7896 to 0.7903 in.)
	Maximum inside diameter	20.074 (0.7903 in.)
Reverse idler gear shaft outer diameter	Standard outer diameter	19.984 to 20.000 mm (0.7868 to 0.7874 in.)
	Minimum outer diameter	19.984 mm (0.7868 in.)
No. 3 transmission hub sleeve groove - thickness of the claw part on No. 3 gear shift fork	Standard clearance	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
5th gear inside diameter	Standard inside diameter	34.981 to 34.997 mm (1.3772 to 1.3778 in.)
	Maximum inside diameter	34.997 mm (1.3778 in.)
Front transaxle case cover oil seal driven in depth		-0.5 to 0.5 mm (-0.020 to 0.020 in.)
Transmission case oil seal driven in depth		3.0 to 4.0 mm (0.1181 to 0.1575 in.)
Output shaft rear bearing clearance		3.8 to 4.4 mm (0.150 to 0.173 in.)
Output shaft bearing preload	New bearing	0.8 to 1.6 N*m (8.16 to 16.32 kgf*cm, 7.1 to 14.2 in.*lbf)
	Used bearing	0.5 to 1.0 N*m (5.10 to 10.20 kgf*cm, 4.4 to 8.9 in.*lbf)
Output shaft rear bearing shim thickness	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.)
	8	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.)

Front differential case tapered roller bearing preload	New bearing	0.8 to 1.6 N*m (8.16 to 16.32 kgf*cm, 7.1 to 14.2 in.*lbf)
	Used bearing	0.5 to 1.0 N*m (5.10 to 10.20 kgf*cm, 4.4 to 8.9 in.*lbf)
Front differential case shim rear thickness	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.)
Front differential case oil seal clearance		1.0 to 2.0 mm (0.0394 to 0.0.787 in.)
Input shaft front bearing clearance		4.28 to 4.60 mm (0.1685 to 0.1811 in.)
Reverse restrict pin clearance		12.5 to 13.5 mm (0.492 to 0.531 in.)
No. 3 transmission clutch hub snap ring clearance		0.1 mm or less (0.0039 in. or less)
No. 3 transmission clutch hub snap ring thickness	a	1.75 to 1.80 mm (0.0689 to 0.0709 in.)
	b	1.80 to 1.85 mm (0.0709 to 0.0728 in.)
	c	1.85 to 1.90 mm (0.0728 to 0.0748 in.)
	d	1.90 to 1.95 mm (0.0748 to 0.0768 in.)
	e	1.95 to 2.00 mm (0.0768 to 0.0787 in.)
	f	2.00 to 2.05 mm 0.0787 to 0.0807 in.)
	g	2.05 to 2.10 mm (0.0807 to 0.0827 in.)
	h	2.10 to 2.15 mm (0.0827 to 0.0846 in.)
	j	2.15 to 2.20 mm (0.0846 to 0.0866 in.)

INPUT SHAFT ASSEMBLY:

4th gear thrust clearance	Standard clearance	0.10 to 0.57 mm (0.0039 to 0.0224 in.)
3rd gear thrust clearance	Standard clearance	0.10 to 0.35 mm (0.0039 to 0.0138 in.)
4th gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
3rd gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
Input shaft run out	Maximum run out	0.03 mm (0.0012 in.)
Input shaft standard outer diameter	A	35.984 to 36.000 mm (1.4167 to 1.4173 in.)
	B	35.984 to 36.000 mm (1.4167 to 1.4173 in.)
	C	27.957 to 27.972 mm (1.1007 to 1.1013 in.)
Input shaft minimum outer diameter	A	35.984 mm (1.4167 in.)
	B	35.984 mm (1.4167 in.)
	C	27.957 mm (1.1007 in.)
4th gear inside diameter	Standard inside diameter	42.009 to 42.025 mm (1.6539 to 1.6545 in.)
	Maximum inside diameter	42.025 mm (1.6545 in.)

3rd gear inside diameter	Standard inside diameter	43.009 to 43.025 mm (1.6933 to 1.6939 in.)
	Maximum inside diameter	43.025 mm (1.6939 in.)
Between the 4th gear spline end and synchronizer outer ring back clearance		0.75 to 1.65 mm (0.0295 to 0.0650 in.)
Between the 3rd gear spline end and synchronizer outer ring back clearance		0.65 to 1.75 mm (0.0256 to 0.0689 in.)
No. 2 transmission hub sleeve groove - thickness of the claw part on No.1 gear shift fork	Standard clearance	0.11 to 0.69 mm (0.0043 to 0.0272 in.)
No. 2 transmission clutch hub snap ring clearance	Standard clearance	0.1 mm or less (0.0039 in. or less)
No. 2 transmission clutch hub snap ring thickness	H	2.30 to 2.35 mm (0.0906 to 0.0925 in.)
	J	2.35 to 2.40 mm (0.0925 to 0.0945 in.)
	K	2.40 to 2.45 mm (0.0945 to 0.0965 in.)
	L	2.45 to 2.50 mm (0.0965 to 0.0984 in.)
	M	2.50 to 2.55 mm (0.0984 to 0.1004 in.)
	N	2.55 to 2.60 mm (0.1004 to 0.1024 in.)
	P	2.60 to 2.65 mm (0.1024 to 0.1043 in.)
Input shaft rear radial ball bearing snap ring clearance	Standard clearance	0.1 mm or less (0.0039 in. or less)
Input shaft rear radial ball bearing snap ring thickness	1	2.35 to 2.40 mm (0.0925 to 0.0945 in.)
	2	2.40 to 2.45 mm (0.0945 to 0.0965 in.)
	3	2.45 to 2.50 mm (0.0965 to 0.0984 in.)
	4	2.50 to 2.55 mm (0.0984 to 0.1004 in.)
	5	2.55 to 2.60 mm (0.1004 to 0.1024 in.)
	6	2.60 to 2.65 mm (0.1024 to 0.1043 in.)
	7	2.65 to 2.70 mm (0.1043 to 0.1063 in.)
	8	2.70 to 2.75 mm (0.1063 to 0.1083 in.)

OUTPUT SHAFT ASSEMBLY:

1st gear thrust clearance	Standard clearance	0.25 to 0.40 mm (0.0098 to 0.0157 in.)
2nd gear thrust clearance	Standard clearance	0.10 to 0.35 mm (0.0039 to 0.0138 in.)
1st gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051mm (0.0004 to 0.0020in.)
2nd gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051mm (0.0004 to 0.0020in.)
Output shaft run out	Maximum run out	0.03 mm (0.0012 in.)
Output shaft standard outer diameter	A	37.610 to 37.626 mm (1.4807 to 1.4813 in.)
	B	34.502 to 34.512 mm (1.3583 to 1.3587 in.)
Output shaft minimum outer diameter	A	37.610 mm (1.4807 in.)
	B	34.502 mm (1.3583 in.)
2nd gear inside diameter	Standard inside diameter	50.009 to 50.025 mm (1.9689 to 1.9695 in.)
	Maximum inside diameter	50.025 mm (1.9695 in.)
1st gear inside diameter	Standard inside diameter	51.009 to 51.025 mm (2.0082 to 2.0089 in.)
	Maximum inside diameter	51.025 mm (2.0089 in.)
Between the 2nd gear while and No. 2 synchronizer ring back clearance		0.70 to 1.45 mm (0.0276 to 0.0571 in.)
Between the 1st gear while and No. 1 synchronizer ring set back clearance		0.70 to 1.45 mm (0.0276 to 0.0571 in.)
Reverse gear groove - thickness of the claw part on No .1 gear shift fork clearance	Standard clearance	0.15 to 0.35 mm (0.0059 to 0.0138 in.)
2nd gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
1st gear radial clearance	KOYO made	0.009 to 0.053 mm (0.0004 to 0.0021 in.)
	NSK made	0.009 to 0.051 mm (0.0004 to 0.0020 in.)
2nd gear thrust clearance	Standard clearance	0.10 to 0.35 mm (0.0039 to 0.0138 in.)

1st gear thrust clearance	Standard clearance	0.25 to 0.40 mm (0.0098 to 0.0157 in.)

SHIFT AND SELECT LEVER SHAFT ASSEMBLY:

Control shaft cover oil seal drive in depth	28.0 to 29.0 mm (1.1022 to 1.142 in.)
Shift lever slotted pin clearance to the No. 1 shift lever inner assembly	0.4 to 0.5 mm (-0.0157 to 0.0197 in.)
Shift lever slotted pin clearance to the No. 2 shift lever inner	5.8 to 6.8 mm (0.228 to 0.268 in.)

DIFFERENTIAL CASE ASSEMBLY:

Front differential side gear backlash	Standard backlash	0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Front differential pinion thrust washer thickness	Minimum thickness	0.9 mm (0.035 in.)
Front differential No. 1 pinion shaft thickness	Minimum diameter	17.975 mm (0.70768 in.)
Front differential side gear backlash	Standard backlash	0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Front differential side gear thrust washer thickness	1	1.00 mm (0.0394 in.)
	2	1.10 mm (0.0433 in.)
	3	1.20 mm (0.0472 in.)
	4	1.30 mm (0.0512 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Floor shift lever assembly x Body		12	122	9
Floor shift cable transmission control shift retainer x Body		5.0	51	44 in.*lbf
Clutch tube bracket set bolt		17	173	13
Reverse idler gear shaft bolt		30	306	22
Gear shift fork No. 3 shift fork bolt		24	244	17
Manual transmission output shaft rear set nut		123	1,250	90
Control shaft cover set bolt		20	204	15
Control shift lever x Shift and select lever shaft		6.4	65	57 in.*lbf
Selecting bellcrank assembly x Manual transmission case		20	200	14
Release fork support x manual transaxle case		47	480	35
Manual transaxle x Engine	Bolt A	64	653	47
	Bolt B	46	470	34
	Bolt C	44	449	32
Engine mounting insulator LH x Manual transaxle		64	653	47
Manual transmission case protector x Manual transaxle		18	184	13
Engine mounting bracket FR x Manual transaxle		64	653	47
Clutch line x Manual transaxle	Bolt A	12	122	9
	Bolt B	7.0	71	62 in.*lbf
Wire harness clamp bracket x Manual transaxle		8.4	86	74 in.*lbf
Ground cable x Manual transaxle		12	122	9
Transmission case x Manual transaxle case		29	296	21
Manual transaxle case x Transmission case		29	296	21
Bearing retainer rear x Transmission case		43	438	32
Manual transaxle case receiver x Manual transaxle case		7	71	62 in.*lbf
No. 1 gear shift head x No. 2 gear shift fork shaft		24	245	18
No. 1 gear shift fork x No. 1 gear shift fork shaft		24	245	18
Reverse shift arm bracket x Manual transaxle case		17	173	13
Reverse restrict pin plug x Transmission case		13	133	9.6
No. 1 oil receiver pipe x Transmission case		17	173	13
No. 2 oil receiver pipe x Transmission case		17	173	13
Clutch tube bracket x Transmission case		17	173	13
Reverse idler gear shaft bolt x Transmission case		30	306	22
No. 3 transmission clutch hub gear shift fork shaft x input shaft		24	245	18
Manual transmission output rear set nut x Output shaft		123	1,254	91
Drain plug sub-assembly x Transmission case		49	500	36
Manual transmission filler plug x Transmission case		49	500	36
Back up light switch assembly x Transmission case		40	408	30
Manual Transmission breather plug x Transmission case		49	500	36
No. 1 lock ball assembly x Transmission case		29	296	21
Speedometer driven hole cover sub-assembly set bolt		5.5	56	48 in.*lbf
Selecting bellcrank support x Selecting bellcrank No. 2 plate washer		12	122	9
Front differential ring gear x Front differential case		106	1,081	78

DRIVE SHAFT

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel set nut	103	1,050	76
Lower ball joint x Front suspension lower No. 1 arm	75	765	55
Tie rod end x Steering knuckle	49	500	36
Axle hub x Front drive shaft	294	3,000	217
Front drive shaft center bearing set bolt	32	330	24
Front speed sensor set bolt	8.0	82	71 in.*lbf
Front flexible hose and speed sensor wire harness x Shock absorber	19	192	14
Front stabilizer link x Front shock absorber	74	755	55

AXLE

SERVICE DATA

Front axle hub bearing for looseness	Maximum: 0.05 mm (0.0020 in.)
Front axle hub for runout	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub bearing for looseness	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub for runout	Maximum: 0.07 mm (0.0027 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel set nut	103	1,050	76
Front disc brake caliper x Steering knuckle	107	1,090	79
Front axle assembly x Front shock absorber	210	2,140	155
Axle hub x Front drive shaft	294	3,000	217
Front disc brake dust cover x Steering knuckle	8.3	85	73 in.*lbf
Rear wheel set nut	103	1,050	76
Rear axle carrier x Rear disc brake caliper	62	630	46
Rear flexible hose x Rear shock absorber	19	192	14
Rear shock absorber x Rear axle carrier	180	1,836	133
Rear axle hub and bearing set bolt	80	816	59
Rear strut rod x Rear axle carrier	113	1,150	83
Rear No. 2 suspension arm x Rear axle carrier	100	1,020	74
Rear No. 1 suspension arm x Rear axle carrier	100	1,020	74

SUSPENSION

SERVICE DATA

Front wheel alignment	Toe-in (total)	
	A - B	0 +- 2 mm (0 - 0.08 in.)
	Rack end length difference	1.5 mm (0.06 in.) or less

for USA and Canada:

Front wheel alignment	Vehicle height		
	ACV40L-CEAGKA	Front A - B	125 mm (4.92 in.)
		Rear C - D	54 mm (2.13 in.)
	GSV40L-CETGKA	Front A - B	126 mm (4.96 in.)
		Rear C - D	55 mm (2.17 in.)
	ACV40L-AEAGKA	Front A - B	125 mm (4.92 in.)
		Rear C - D	53 mm (2.09 in.)
	GSV40L-AETGKA	Front A - B	126 mm (4.96 in.)
		Rear C - D	54 mm (2.13 in.)
	ACV40L-CEANKA	Front A - B	125 mm (4.92 in.)
		Rear C - D	54 mm (2.13 in.)
	ACV40L-CEMNKA	Front A - B	125 mm (4.92 in.)
		Rear C - D	53 mm (2.09 in.)
	GSV40L-CETNKA	Front A - B	126 mm (4.96 in.)
		Rear C - D	55 mm (2.17 in.)
	ACV40L-AEANKA	Front A - B	125 mm (4.92 in.)
		Rear C - D	53 mm (2.09 in.)
	ACV40L-AEMNKA	Front A - B	125 mm (4.92 in.)
		Rear C - D	52 mm (2.05 in.)
	GSV40L-AETNKA	Front A - B	126 mm (4.96 in.)
		Rear C - D	54 mm (2.13 in.)
	ACV40L-CEASKA	Front A - B	128 mm (5.04 in.)
		Rear C - D	57 mm (2.24 in.)
	ACV40L-CEMSKA	Front A - B	127 mm (5.00 in.)
		Rear C - D	55 mm (2.17 in.)
	GSV40L-CETSKA	Front A - B	129 mm (5.08 in.)
		Rear C - D	58 mm (2.28 in.)

for Mexico:

Front wheel alignment	Vehicle height		
	ACV40L-CEAGKA	Front A - B	115 mm (4.53 in.)
		Rear C - D	40 mm (1.57 in.)
	GSV40L-CETGKA	Front A - B	116 mm (4.57 in.)
		Rear C - D	41mm (1.61 in.)
	ACV40L-CEANKA	Front A - B	115 mm (4.53 in.)
		Rear C - D	40 mm (1.57 in.)

SS

for USA and Canada:

Front wheel alignment	Wheel turning angle		
	ACV40L-CEAGKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	GSV40L-CETGKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	ACV40L-AEAGKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	GSV40L-AETGKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	ACV40L-CEANKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	ACV40L-CEMNKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	GSV40L-CETNKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	ACV40L-AEANKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	ACV40L-AEMNKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	GSV40L-AETNKA	Inside wheel	38°22'+-2° (38.37°+-2°)
		Outside wheel reference	33°33' (33.55°)
	ACV40L-CEASKA	Inside wheel	38°42'+-2° (38.70°+-2°)
		Outside wheel reference	33°46' (33.77°)
	ACV40L-CEMSKA	Inside wheel	38°42'+-2° (38.70°+-2°)
		Outside wheel reference	33°46' (33.77°)
	GSV40L-CETSKA	Inside wheel	38°18'+-2° (38.30°+-2°)
		Outside wheel reference	33°32' (33.53°)

for Mexico:

Front wheel alignment	Wheel turning angle		
	ACV40L-CEAGKA	Inside wheel	38°18'+-2° (38.30°+-2°)
		Outside wheel reference	33°41' (33.68°)
	GSV40L-CETGKA	Inside wheel	38°18'+-2° (38.30°+-2°)
		Outside wheel reference	33°41' (33.68°)
	ACV40L-CEANKA	Inside wheel	38°18'+-2° (38.30°+-2°)
		Outside wheel reference	33°41' (33.68°)

for USA and Canada:

Front wheel alignment	Camber		
	ACV40L-CEAGKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETGKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEAGKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-AETGKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEANKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEMNKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETNKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEANKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEMNKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-AETNKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEASKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEMSKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETSKA	Camber	-0°40'+-45' (-0.67°+-0.75°)
		Right-left difference	45' (0.75°) or less

for Mexico:

Front wheel alignment	Camber		
	ACV40L-CEAGKA	Camber	-0°35'+-45' (-0.58°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETGKA	Camber	-0°35'+-45' (-0.58°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEANKA	Camber	-0°35'+-45' (-0.58°+-0.75°)
		Right-left difference	45' (0.75°) or less

SS

for USA and Canada:

Front wheel alignment	Caster		
	ACV40L-CEAGKA	Caster	3°00'+-45' (3.00°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETGKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEAGKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-AETGKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEANKA	Caster	3°00'+-45' (3.00°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEMNKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETNKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEANKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEMNKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-AETNKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEASKA	Caster	3°00'+-45' (3.00°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEMSKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETSKA	Caster	2°55'+-45' (2.92°+-0.75°)
		Right-left difference	45' (0.75°) or less

for Mexico:

Front wheel alignment	Caster		
	ACV40L-CEAGKA	Caster	2°45'+-45' (2.75°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETGKA	Caster	2°40'+-45' (2.67°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEANKA	Caster	2°45'+-45' (2.75°+-0.75°)
		Right-left difference	45' (0.75°) or less

for USA and Canada:

Front wheel alignment	Steering axis inclination		
	ACV40L-CEAGKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETGKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEAGKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-AETGKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEANKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEMNKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETNKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEANKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEMNKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-AETNKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEASKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEMSKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETSKA	Steering axis inclination	12°15'+-45' (12.25°+-0.75°)
		Right-left difference	45' (0.75°) or less

for Mexico:

Front wheel alignment	Steering axis inclination		
	ACV40L-CEAGKA	Steering axis inclination	12°00'+-45' (12.00°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETGKA	Steering axis inclination	12°00'+-45' (12.00°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEANKA	Steering axis inclination	12°00'+-45' (12.00°+-0.75°)
		Right-left difference	45' (0.75°) or less

front lower ball joint	Lower ball joint turning torque	1.0 to 3.4 N*m (10 to 35 kgf*cm, 9 to 30 in.*lbf)
front stabilizer link assembly	Stabilizer link ball joint turning torque	0.05 to 2.0 N*m (0.5 to 20 kgf*cm, 0.4 to 18 in.*lbf)

Rear wheel alignment	Toe-in (total)	
	A +B	0 +- 24mm (0 +- 0.4 in.)
	C - D	4 +- 2mm (0.16 +- 0.08 in.)
	Rack end length difference	1.5 mm (0.06 in.) or less

SS

for USA and Canada:

Rear wheel alignment	Camber		
	ACV40L-CEAGKA	Camber	-1°18'+-45' (-1.30°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETGKA	Camber	-1°18'+-45' (-1.30°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEAGKA	Camber	-1°15'+-45' (-1.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-AETGKA	Camber	-1°15'+-45' (-1.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEANKA	Camber	-1°18'+-45' (-1.30°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEMNKA	Camber	-1°18'+-45' (-1.30°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETNKA	Camber	-1°18'+-45' (-1.30°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEANKA	Camber	-1°15'+-45' (-1.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-AEMNKA	Camber	-1°15'+-45' (-1.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-AETNKA	Camber	-1°15'+-45' (-1.25°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEASKA	Camber	-1°18'+-45' (-1.30°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEMSKA	Camber	-1°18'+-45' (-1.30°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETSKA	Camber	-1°18'+-45' (-1.30°+-0.75°)
		Right-left difference	45' (0.75°) or less

for Mexico:

Rear wheel alignment	Camber		
	ACV40L-CEAGKA	Camber	-1°06'+-45' (-1.10°+-0.75°)
		Right-left difference	45' (0.75°) or less
	GSV40L-CETGKA	Camber	-1°06'+-45' (-1.10°+-0.75°)
		Right-left difference	45' (0.75°) or less
	ACV40L-CEANKA	Camber	-1°06'+-45' (-1.10°+-0.75°)
		Right-left difference	45' (0.75°) or less

Rear stabilizer link assembly	Stabilizer link ball joint turning torque	0.05 to 1.0 N*m (0.5 to 10 kgf*cm, 0.4 to 8.9 in.*lbf)

TORQUE SPECIFICATIONS

FRONT:

Part tighten	N*m	kgf*cm	ft.*lbf
Suspension support x Body	85	867	63
Shock absorber x Axle	210	2,141	155
Speed sensor wire harness x Shock absorber	19	194	14
Piston rod x Suspension support	70	714	52
Stabilizer link x Shock absorber	74	755	55
Suspension lower No. 1 arm x Member	A 200 B 206	A 2,040 B 2,100	A 148 B 152
Engine mounting insulator x Member	87	887	64
Lower ball joint x Steering knuckle	123	1,250	91
Stabilizer bracket x Member	27	275	20
Stabilizer link x Stabilizer bar	74	755	55
Front wheel set nut	103	1,050	76
Tie rod end lock nut	74	755	55

REAR:

Part tighten	N*m	kgf*cm	ft.*lbf
Suspension support x Body	39	398	29
Shock absorber x Axle carrier	180	1,840	133
Piston rod x Suspension support	55	561	41
Speed sensor wire harness x Shock absorber	5.0	51	44 in.*lbf
Flexible hose x Shock absorber	19	194	14
Stabilizer link x Shock absorber	39	398	29
Strut rod x Axle carrier	113	1,152	83
Strut rod x Body	113	1,152	83
Parking brake No. 3 cable x Body	6.0	61	53 in.*lbf
Suspension No. 1 arm x Suspension member	100	1,020	74
Suspension No. 1 arm x Axle carrier	100	1,020	74
Suspension No. 2 arm x Suspension member	100	1,020	74
Suspension No. 2 arm x Axle carrier	100	1,020	74
Stabilizer bracket x Suspension member	31	316	23
Stabilizer link x Stabilizer bar	39	398	29
Suspension member x Suspension member lower stopper	A 55 B 38	A 561 B 388	A 41 B 28
Suspension member x Body	56	571	41
Rear wheel set nut	103	1,050	76
No. 2 Suspension arm lock nut	56	571	41

TIRE AND WHEEL

SERVICE DATA

Cold tire inflation pressure

Tire size	Front	Rear
P215/60R16 94V	210 kPa (2.1 kgf/cm^2, 31 psi)	210 kPa (2.1 kgf/cm^2, 31 psi)
P215/55R17 93V	220 kPa (2.2 kgf/cm^2, 32 psi)	220 kPa (2.2 kgf/cm^2, 32 psi)

When driving under the above vehicle conditions at sustained high speeds above 160 km/h (100 mph), in countries where such speeds are permitted bylaw, inflate the front and rear tires to 240 kPa (2.4 kgf*cm^2, 35 psi) provided that it does not exceed the maximum cold tire inflation pressure molded on the tire sidewall.

Tire runout	1.4 mm (0.055 in.) or less
Imbalance after adjustment	8.0 g (0.018 lb) or less

TORQUE SPECIFICATIONS

TIRE PRESSURE WARNING RECEIVER

Part tightened	N*m	kgf*cm	ft.*lbf
Tire pressure warning receiver set bolt	7.5	77	66 in.*lbf

TIRE PRESSURE WARNING VALVE AND TRANSMITTER

Part tightened	N*m	kgf*cm	ft.*lbf
Tire pressure warning valve and transmitter set nut	4.0	41	35 in.*lbf
Front wheel set nuts	103	1,050	76
Rear wheel set nuts	103	1,050	76

TIRE PRESSURE WARNING ECU

Part tightened	N*m	kgf*cm	ft.*lbf
Tire pressure warning ECU set nut	7.5	77	66 in.*lbf

BRAKE CONTROL

SERVICE DATA

Front speed sensor	for BOSCH	LH	1 (FL+) - 2 (FL-)	Always	0.92 to 1.22 kΩ at 20 °C(68°F)
			1 (FL+) - Body ground	Always	10 kΩ or higher
			2 (FL-) - Body ground	Always	10 kΩ or higher
		RH	1 (FR+) - 2 (FR-)	Always	0.92 to 1.22 kΩ at 20 °C(68°F)
			1 (FR+) - Body ground	Always	10 kΩ or higher
			2 (FR-) - Body ground	Always	10 kΩ or higher
	for ADVICS	LH	1 (FL+) - 2 (FL-)	Always	1.4 to 1.8 kΩ at 20°C (68 °F)
			1 (FL+) - Body ground	Always	10 kΩ or higher
			2 (FL-) - Body ground	Always	10 kΩ or higher
		RH	1 (FR+) - 2 (FR-)	Always	1.4 to 1.8 kΩ at 20°C (68 °F)
			1 (FR+) - Body ground	Always	10 kΩ or higher
			2 (FR-) - Body ground	Always	10 kΩ or higher
Skid control sensor	for BOSCH	LH	1 (RR+) - 2 (RR-)	Always	Below 2.2 kΩ
			1 (RR+) - Body ground	Always	10 kΩ or higher
			2 (RR-) - Body ground	Always	10 kΩ or higher
		RH	1 (RL+) - 2 (RL-) Below	Always	Below 2.2 kΩ
			1 (RL+) - Body ground 10	Always	10 kΩ or higher
			2 (RL-) - Body ground	Always	10 kΩ or higher
	for ADVICS	LH	2 (RL+) - 1 (RL-)	Always	0.9 to 2.1 kΩ
			2 (RL+) - Body ground	Always	10 kΩ or higher
			1 (RL-) - Body ground	Always	10 kΩ or higher
		RH	2 (RR+) - 1 (RR-)	Always	0.9 to 2.1 kΩ
			2 (RR+) - Body ground	Always	10 kΩ or higher
			1 (RR-) - Body ground	Always	10 kΩ or higher
VSC NO. 1 (Fail Safe) relay			Resistance 3 - 5	Always	10 kΩ or higher
			Resistance 3 - 5	Apply B+ between terminals 1 and 2	Below 1 Ω
VSC NO. 1 relay			Resistance 3 - 5	Always	10 kΩ or higher
			Resistance 3 - 5	Apply B+ between terminals 1 and 2	Below 1 Ω

SS

TORQUE SPECIFICATIONS

Part tightened			N*m	kgf*cm	ft.*lbf
Brake actuator x Brake actuator bracket	BOSCH		8	82	71 in.*lbf
	ADVICS		5.4	55	48 in.*lbf
Brake actuator bracket x Body			19	195	14
Brake actuator x Brake tube	BOSCH with VSC	Bolt A	15 (14)	155 (143)	11 (10)
		Bolt B	19 (17)	194 (173)	14 (13)
	BOSH without VSC		15 (14)	155 (143)	11 (10)
	ADVICS		15 (14)	155 (143)	11 (10)
Front speed sensor x Knuckle			8	82	71 in.*lbf
Front speed sensor x Body			5	51	44 in.*lbf
Front speed sensor x Absorber			19	194	14
Yaw rate and acceleration sensor			13	133	10

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BRAKE

SERVICE DATA

Brake pedal height	Automatic transaxle	129.9 to 139.9 mm(5.114 to 5.508 in.9
	Manual transaxle	131.9 to 141.9 mm (5.193 to 5.587 in.)
Standard stop light switch clearance		1.5 to 2.5 mm (0.059 to 0.098 in.)
Brake pedal free play		1.0 to 6.0 mm (0.039 to 0.236 in.)
Brake pedal reserve distance from dash panel at 500 N (51 kgf, 112 lbf)	Automatic transaxle	61 mm (2.502 in.)
	Manual transaxle	63 mm (2.480 in.)
Brake booster push rod to piston clearance (for TMMK made)	Standard clearance	0 mm (0 in.)
Front brake pad lining thickness	Standard	12.0 mm (0472 in.)
	Minimum	1.0 mm (0.039 in.)
Front brake disc thickness	Standard	28.0 mm (1.102 in.)
	Minimum	25.0 mm (0.983 in.)
Front brake disc runout	Maximum	0.05 mm (0.0020in.)
Rear disc brake pad lining thickness	Standard	11.0 mm (0.433 in.)
	Minimum	1.0 mm (0.039 in.)
Rear brake disc thickness	Standard	10.0 mm (0.390 in.)
	Minimum	8.5 mm (0.334 in.)
Rear brake disc runout	Maximum	0.15 mm (0.0059 in.)

TORQUE SPECIFICATIONS

Parts tightened			N*m	kgf*cm	ft.*lbf
Brake master cylinder x Brake tube	for TMC made		15 (14)	155 (143)	11 (11)
	for TMMK made without VSC		15 (14)	155 (143)	11 (11)
	for TMMK made with VSC	Nut (A)	15 (14)	155 (143)	11 (11)
		Nut (B)	19 (17)	194 (173)	14 (13)
Brake booster clevis lock nut			26	265	19
Brake light switch			1.5	15	13 in.*lbf
Brake pedal sub-assembly set bolt			37	377	27
Brake pedal support assembly x Body			19	194	14
Brake pedal support assembly x No. 1 brake pedal support plate			13	133	10
No. 1 brake pedal support x Body			19	194	14
Brake master cylinder x Brake booster			13	133	10
Cowl top outer front panel sub-assembly x Body		Nut	85	867	63
		Bolt	5.0	51	44 in.*lbf
Brake booster assembly x Brake pedal support assembly			13	133	10
Front brake cylinder mounting x Steering knuckle			107	1,090	79
Bleeder plug			8.3	85	73 in.*lbf
Front disc brake cylinder mounting x Front disc brake cylinder assembly			34	350	25
Front disc brake cylinder assembly x Flexible hose			29	300	21
Flexible hose x Tube			15 (14)	155 (143)	11 (10)
Front flexible hose x Absorber			19	194	14
Rear disc brake cylinder mounting set bolt			62	632	46
Rear disc brake cylinder mounting x Rear disc brake cylinder assembly			27	275	20
Rear disc brake cylinder assembly x Flexible hose			33	337	24
Rear flexible hose x Absorber			19	194	14

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PARKING BRAKE

SERVICE DATA

Parking brake pedal travel at 300 N (31 kgf, 68 lbf)		7 to 10 notches
Parking brake lever travel at 200 N (20 kgf, 45 lbf)		7 to 9 notches
Rear brake disc inside diameter	Standard	170 mm (6.69 in.)
	Maximum	171 mm (6.73 in.)
Parking brake shoe lining thickness	Standard	2.0 mm (0.079 in.)
	Maximum	1.0 mm (0.039 in.)
Clearance between parking brake shoe and parking brake she lever		Less than 0.35 mm (0.014 in.)

TORQUE SPECIFICATIONS

Parts tightened		N*m	kgf*cm	ft.*lbf
Wheel nut		103	1050	76
Wire adjusting No. 1 nut (for Automatic Transaxle)		5.4	55	48 in.*lbf
Wire adjusting No. 1 nut (for Manual Transaxle)		5.0	51	44 in.*lbf
Parking brake switch assembly		1.0	10	9.0 in.*lbf
Parking brake lever sub-assembly x Body	for TMC made	21	214	15
	for TMMK made	22	224	16
Parking brake pedal assembly x Body		39	398	29
No. 1 parking brake cable assembly x Body	Bolt	15	153	11
	Nut	5.4	55	48 in.*lbf
No. 1 parking brake cable assembly x No. 4 parking brake cable assembly		5.4	55	48 in.*lbf
Floor shift lever assembly x Body		12	122	9
No. 3 parking brake cable assembly x Body	Bolt (A)	8.5	87	75 in.*lbf
	Bolt (B)	6.0	61	53 in.*lbf
	Nut (C)	6.0	61	53 in.*lbf
No. 3 parking brake assembly x Backing plate		8.0	82	71 in.*lbf
No. 2 front floor heat lower insulator x Body		4.9	50	43 in.*lbf
Rear disc brake caliper set bolt		62	632	46
Parking brake shoe guide plate set bolt		18	184	13

STEERING COLUMN

SERVICE DATA

Steering free play (Maximum)	30 mm (1.18 in.)

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Steering intermediate shaft assembly x Steering column assembly (for TMC made)	35	360	26
Steering column assembly set nuts (for TMC made)	25	255	18
Steering column assembly set bolt (for TMC made)	25	255	18
Steering intermediate shaft assembly x Power steering link assembly (for TMC made)	35	360	26
Steering post assembly set nuts (for TMMK made)	21	214	16
Steering post assembly set bolt (for TMMK made)	21	214	16
Steering post assembly x Power steering link assembly (for TMMK made)	35	360	26
Steering wheel assembly set nut	50	510	37

POWER STEERING

SERVICE DATA

POWER STEERING FLUID

Fluid level rise (Maximum)	5 mm (0.20 in.)
Fluid pressure at idle speed with valve closed	7,800 to 8,300 kPa (79.5 to 84.6 kgf/cm2, 1,131 to 1,204 psi)
Fluid pressure at idle speed with valve fully open and turn the steering wheel to the full lock position	7,800 to 8,300 kPa (79.5 to 84.6 kgf/cm2, 1,131 to 1,204 psi)

STEERING WHEEL

Steering effort at idle speed (Reference)	LE Grade, XLE Grade	6.0 N*m (61 kgf*cm, 53 in.*lbf)
	SE Grade	6.8 N*m (69 kgf*cm, 60 in.*lbf)

VANE PUMP (for 2AZ-FE)

Vane pump shaft and vane pump housing oil clearance (Maximum)	0.07 mm (0.0028 in.)
Vane plate thickness (Standard)	1.405 to 1.411 mm (0.05531 to 0.05555 in.)
Clearance between the rotor groove and plate (Maximum)	0.03 mm (0.0012 in.)
Compression spring free length (Minimum)	29.2 mm (1.150 in.)
Vane pump rotating torque	0.27 N*m (2.8 kgf*cm, 2.4 in.*lbf)

VANE PUMP (for 2GR-FE)

Vane pump shaft and vane pump housing oil clearance (Maximum)	0.07 mm (0.0028 in.)
Vane plate thickness (Standard)	1.405 to 1.411 mm (0.05531 to 0.05555 in.)
Clearance between the rotor groove and plate (Maximum)	0.03 mm (0.0012 in.)
Compression spring free length (Minimum)	29.2 mm (1.150 in.)
Vane pump rotating torque	0.27 N*m (2.8 kgf*cm, 2.4 in.*lbf)

POWER STEERING LINK

Steering rack runout (Maximum)	0.3 mm (0.0118 in.)
Tie rod end sub-assembly stud bolt turning torque	0.98 to 3.92 N*m (10 to 40 kgf*cm, 8.7 to 34.7 in.*lbf)
Total preload (Control valve rotating torque)	1.5 N*m (15.3 kgf*cm, 13.3 in.*lbf) or less

TORQUE SPECIFICATIONS

VANE PUMP (for 2AZ-FE)

Part tightened	N*m	kgf*cm	ft.*lbf
Vane pump rear housing x Vane pump front housing	22	224	16
Pressure port union x Vane pump front housing	69	704	51
Power steering fluid pressure switch x Vane pump assembly	21	214	16
Power steering suction port union x Vane pump assembly	12	122	9
Vane pump assembly set bolts	29 (43)	294 (439)	21 (32)
Pressure feed tube assembly x Vane pump assembly (union bolt)	50	510	37
Front wheel RH set nuts	103	1,050	76

( ): For use without SST

VANE PUMP (for 2GR-FE)

Part tightened	N*m	kgf*cm	ft.*lbf
Vane pump rear housing x Vane pump front housing	22	224	16
Pressure port union x Vane pump front housing	69	704	51
Power steering fluid pressure switch x Vane pump assembly	21	214	16
Power steering suction port union x Vane pump assembly	12	122	9
Vane pump assembly set bolts	29 (43)	294 (439)	21 (32)
Pressure feed tube assembly clamp set bolt	9.8	100	87 in.*lbf
Pressure feed tube assembly x Vane pump assembly (union bolt)	50	510	37
Front wheel RH set nuts	103	1,050	76

( ): For use without SST

POWER STEERING LINK

Part tightened	N*m	kgf*cm	ft.*lbf
Power steering control valve housing x Rack housing	21	214	16
Control valve lock nut	25	250	18
Rack housing cap	54	546	40
Steering rack end sub-assembly	60 (84)	613 (852)	44 (62)
Right turn pressure tube x Power steering link assembly (union nut)	11 (13)	114 (128)	8 (9)
Left turn pressure tube x Power steering link assembly (union nut)	11 (13)	114 (128)	8 (9)
Power steering link assembly set bolts	70	714	52
Pressure feed tube assembly clamp set bolts	9.8	100	87 in.*lbf
Pressure feed tube assembly x Power steering link assembly (union nut)	22 (25)	227 (250)	16 (18)
Tie rod assembly x Steering knuckle	49	500	36
Steering sliding yoke x Power steering link assembly	35	360	26
Front wheels set nuts	103	1,050	76

( ): For use without SST

AIR CONDITIONING

SERVICE DATA

Refrigerant charge volume (Standard:)	450 to 550g (15.9 to 19.4 oz.)

Magnetic clutch clearance	0.26 to 0.60 mm (0.010 to 0.024 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
AIR CONDITIONING UNIT			
Air conditioning unit assembly x Body	9.8	100	87 in.*lbf
Instrument panel reinforcement assembly x Body (Collar)	6.0	61	53 in.*lbf
Instrument panel reinforcement assembly x Body (Passenger seat)	20	204	15
Instrument panel reinforcement assembly x Body (Driver seat)	17	175	13
Air conditioning tube assembly x Cooler expansion valve	3.5	35	30 in.*lbf
Suction pipe sub-assembly x Air conditioning tube assembly	9.8	100	7
BLOWER UNIT			
Blower assembly x Instrument panel reinforcement assembly	9.8	100	7
COMPRESSOR AND MAGNETIC CLUTCH (for 2GR-FE)			
Compressor and magnetic clutch x Engine	25	255	18
No. 1 cooler refrigerant discharge hose x Compressor and magnetic clutch	9.8	100	7
No. 1 cooler refrigerant suction hose x Compressor and magnetic clutch	9.8	100	7
Magnet clutch hub x Cooler compressor assembly	18	184	13
COMPRESSOR AND PULLEY (for 2AZ-FE)			
Compressor and pulley x Engine	25	255	18
No. 1 cooler refrigerant discharge hose x Compressor and pulley	9.8	100	7
No. 1 cooler refrigerant suction hose x Compressor and pulley	9.8	100	7
CONDENSER			
Cooler condenser assembly x Radiator assembly	5.0	51	44 in.*lbf
Cooler refrigerant discharge pipe x Cooler condenser assembly	9.8	100	87 in.*lbf
Air conditioner tube and accessory x Cooler condenser assembly	9.8	100	87 in.*lbf
Cap x cooler condenser assembly	2.9	30	26 in.*lbf

SUPPLEMENTAL RESTRAINT SYSTEM

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Steering pad x Steering wheel assembly	8.8	90	78 in.*lbf
Driver side knee airbag assembly x Instrument panel reinforcement	10	102	7
Curtain shield airbag assembly x Body	11	112	8
Center airbag sensor assembly x Body	17.5	179	13
Front airbag sensor x Body	17.5	179	13
Side airbag sensor x Body	9.0	92	80 in.*lbf
Rear airbag sensor x Body	9.0	92	80 in.*lbf
Seat position sensor x Front seat assembly	8.0	82	71 in.*lbf

SEAT BELT

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
FRONT SEAT INNER BELT ASSEMBLY			
Front seat inner belt assembly x Front seat assembly	42	428	31
FRONT SEAT OUTER BELT ASSEMBLY			
Front seat outer belt assembly (Floor anchor) x Body	42	428	31
Front seat outer belt assembly (Shoulder anchor) x Front shoulder belt anchor adjuster assembly	42	428	31
Front shoulder belt anchor adjuster assembly x Body	42	428	31
Front seat outer belt assembly (For upper bolt) x Body	7.5	77	66 in.*lbf
Front seat outer belt assembly (For lower bolt) x Body	42	428	31
REAR SEAT INNER BELT ASSEMBLY			
Rear seat inner with center belt assembly RH (For TMC Made) x Body	42	428	31
Rear seat inner with center belt assembly RH (For TMMK Made) x Body	42	428	31
Rear seat inner with center belt assembly LH floor anchor (For TMC Made) x Body	42	428	31
Rear seat inner with center belt assembly LH floor anchor (For TMMK Made) x Body	42	428	31
Rear seat outer belt assembly floor anchor (For LH side) x Body	42	428	31
Rear seat outer belt assembly floor anchor (For RH side) x Body	42	428	31
Rear seat inner with center belt assembly LH x Body	42	428	31
REAR SEAT OUTER BELT ASSEMBLY			
Rear seat outer belt assembly floor anchor (For LH side) x Body	42	428	31
Rear seat outer belt assembly floor anchor (For RH side) x Body	42	428	31
Rear seat outer belt assembly x Body	42	428	31
CHILD RESTRAINT SEAT TETHER ANCHOR			
Child restraint seat tether anchor bracket x Body	21	214	16
CHILD RESTRAINT SEAT ANCHOR BRACKET			
Child restraint seat anchor bracket subassembly x Body	18	184	13

THEFT DETERRENT SYSTEM

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Security horn assembly x Body	31	316	23

CRUISE CONTROL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Cruise control main switch x Steering wheel	2.4	24	21 in.*lbf
Clutch switch x Clutch Pedal	15.7	160	12 ft.*lbf
Main body ECU (Cowl side junction block) x Instrument panel reinforcement	8.0	82	71 in.*lbf

LIGHTING

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
HEADLIGHT ASSEMBLY			
Headlight assembly x Body	3.6	37	32 in.*lbf
FOG LIGHT ASSEMBLY			
Fog light assembly x Front bumper assembly	1.6	16	14 in.*lbf
REAR COMBINATION LIGHT ASSEMBLY			
Rear combination assembly x Body	3.6	37	32 in.*lbf
Rear light assembly x Body	3.6	37	32 in.*lbf
HIGH MOUNTED STOP LIGHT ASSEMBLY			
High mounted stop light assembly x Package tray trim panel assembly	1.6	16	14 in.*lbf
FRONT DOOR COURTESY SWITCH			
Front door courtesy switch assembly x Body	12	122	8.9
REAR DOOR COURTESY SWITCH			
Rear door courtesy switch assembly x Body	12	122	8.9
BACK DOOR COURTESY SWITCH			
Luggage compartment door lock assembly x Body	5.5	56	49 in.*lbf

WIPER AND WASHER

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
FRONT WIPER MOTOR			
Front wiper arm and blade assembly LH x Windshield wiper motor and link assembly	20	204	15
Front wiper arm and blade assembly RH x Windshield wiper motor and link assembly	20	204	15
Windshield wiper motor and link assembly x Body	7.5	77	66 in.*lbf
Windshield wiper link assembly x Windshield wiper motor assembly	5.4	55	48 in.*lbf

DOOR LOCK

TORQUE SPECIFICATIONS

FRONT DOOR LOCK

Part Tightened	N*m	kgf*cm	ft*lbf
Front door lock assembly x Door panel	5.0	51	44 in.*lbf

REAR DOOR LOCK

Part Tightened	N*m	kgf*cm	ft*lbf
Rear door lock assembly x Door panel	5.0	51	44 in.*lbf

METER

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Steering pad switch x Steering wheel	2.4	24	21 in.*lbf
Upper steering column cover x Lower steering column cover	2.0	20	18 in.*lbf

AUDIO / VISUAL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Steering pad switch x Steering wheel	2.4	24	21 in.*lbf

HORN

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Low pitched horn x Body	20	204	15
High pitched horn x Body	20	204	15

WINDSHIELD / WINDOWGLASS

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
POWER WINDOW REGULATOR MOTOR			
Front power window regulator motor assembly x Front door window regulator sub-assembly	5.4	55	48 in.*lbf
Front door window regulator sub-assembly x Front door	8.0	82	71 in.*lbf
Front door glass sub-assembly x Front door window regulator sub-assembly	5.5	56	49 in.*lbf
Rear power window regulator motor assembly x Rear door window regulator sub-assembly	5.4	55	48 in.*lbf
Rear door window regulator sub-assembly x Rear door	8.0	82	71 in.*lbf
WINDSHIELD GLASS			
Inner rear view mirror assembly x Windshield glass	1.8	18	16 in.*lbf
Front wiper arm and blade assembly x Windshield wiper motor and link assembly	20	204	15
BACK WINDOW GLASS			
Rear seat inner with center belt assembly LH x Body	42	428	31
Child restraint seat anchor bracket sub-assembly LH x Body	18	184	13
Rear seat outer belt assembly x Body	42	428	31
Rear seat back assembly x Body	18	184	13
Rear side seat back assembly x Body	18	184	13
Separate type rear seat back assembly x Body	18	184	13
Reclining remote control lever sub-assembly x Body	18	184	13
Center seat back assembly x Body	18	184	13

MIRROR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Inner rear view mirror x Windshield glass	1.8	18	16 in.*lbf
Outer rear view mirror assembly x Door panel	5.5	56	49 in.*lbf

INSTRUMENT PANEL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Instrument Panel Reinforcement x Passenger Airbag	20	204	15
Upper Steering Column Cover x Lower Steering Column Cover	2.0	20	18 in.*lbf

SEAT

TORQUE SPECIFICATIONS

FRONT SEAT

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat back cover bracket x Front seat frame	5.5	56	48 in.*lbf
Front seat x Body	37	377	27

REAR SEAT (for Fixed Type)

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear seat back assembly x Body	18	184	13

REAR SEAT (for Fold Down Seat Type)

Part Tightened	N*m	kgf*cm	ft.*lbf
Separate type rear seat back assembly x Body	18	184	13
Rear side seat back assembly x Body	18	184	13

REAR SEAT (for Reclining Seat Type)

Part Tightened	N*m	kgf*cm	ft.*lbf
Separate type rear seat back assembly x Body	18	184	13
Center seat back assembly x Body	18	184	13
Rear seat reclining adjuster assembly x Body	18	184	13
Reclining remote control lever sub- assembly x Body	18	184	13

ENGINE HOOD / DOOR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
HOOD			
Hood hinge x Hood panel	13	133	10
Hood lock x Body	7.5	77	66 in.*lbf
FRONT DOOR			
Door check x Body	26	265	19
Door check x Door panel	8.0	82	71 in.*lbf
Door hinge x Body	26	265	19
Door hinge x Door panel	26	265	19
Door lock x Door panel	5.0	51	44 in.*lbf
Door lock striker x Body	23	235	17
Power window regulator motor x Window regulator	5.4	55	48 in.*lbf
Window regulator x Door panel	8.0	82	71 in.*lbf
Door glass x Window regulator	5.5	56	49 in.*lbf
Outer rear view mirror x Door panel	5.5	56	49 in.*lbf
Door outside handle frame x Door panel	4.0	41	35 in.*lbf
REAR DOOR			
Door check x Body	26	265	19
Door check x Door panel	8.0	82	71 in.*lbf
Door hinge x Body	26	265	19
Door hinge x Door panel	26	265	19
Door lock x Door panel	5.0	51	44 in.*lbf
Door lock striker x Body	23	235	17
Power window regulator motor x Window regulator	5.4	55	48 in.*lbf
Window regulator x Door panel	8.0	82	71 in.*lbf
Door outside handle frame x Door panel	4.0	41	35 in.*lbf
LUGGAGE DOOR			
Luggage door hinge x Door panel	7.5	77	66 in.*lbf
Luggage lock striker x Body	5.5	56	49 in.*lbf
Luggage lock x Door panel	5.5	56	49 in.*lbf
Luggage lock cylinder x Door panel	5.5	56	49 in.*lbf

EXTERIOR

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Front bumper reinforcement sub-assembly set bolt	34	347	25
Rear bumper reinforcement sub-assembly set nut	68	693	50

INTERIOR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat outer belt assembly LH floor anchor x Body	42	428	31
Front seat outer belt assembly RH floor anchor x Body	42	428	31

SLIDING ROOF

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Sliding roof glass sub-assembly x Sliding roof housing sub-assembly	4.0	41	35 in.*lbf
Sliding roof housing sub-assembly (Bolt) x Body	5.5	56	49 in.*lbf
Sliding roof housing sub-assembly (Nut) x Body	5.5	56	49 in.*lbf
Sliding roof drive gear sub-assembly x Sliding roof housing sub-assembly	5.4	55	48 in.*lbf
Sliding roof piece sub-assembly LH x Sliding roof housing sub-assembly	2.0	20	18 in.*lbf
Sliding roof piece sub-assembly RH x Sliding roof housing sub-assembly	2.0	20	18 in.*lbf
Sliding roof side stopper x Sliding roof housing sub-assembly	2.0	20	18 in.*lbf