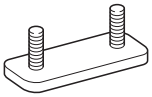
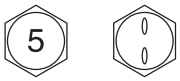
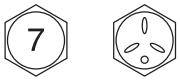
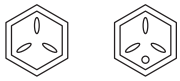
STANDARD BOLT

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

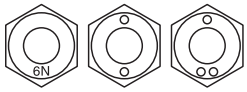
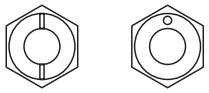
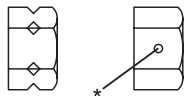
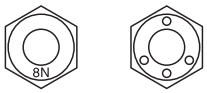
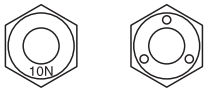
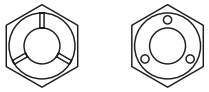
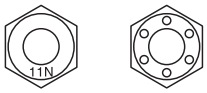
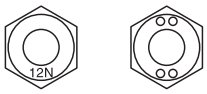
SS

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

3MZ-FE ENGINE CONTROL SYSTEM

SERVICE DATA

Throttle body	Standard throttle valve opening percentage: 60 % or more
Accelerator pedal position sensor	Standard voltage: 0.6 to 1.0 V
Mass air flow meter assembly	THA (4) - E2 (5) at -20°C (-4°F): 13.6 to 18.4 kΩ at 20°C (68°F): 2.21 to 2.69 kΩ at 60°C (140°F): 0.493 to 0.667 kΩ
Camshaft timing oil control valve assembly	at 20°C (68°F): 6.9 to 7.9 Ω
Accelerator pedal rod assembly	VPA2 (3) - EP1 (5): 5.0 kΩ or less VPA1 (6) - EP2 (2): 5.0 kΩ or less VCP1 (4) - EP1 (5): 2.25 to 4.75 kΩ VCP2 (1) - EP2 (2): 2.25 to 4.75 kΩ
Throttle body	at 20°C (68°F) M+ (2) - M - (1): 0.3 to 100 kΩ VC (5) - E2 (3): 1.2 to 3.2 kΩ
EFI engine coolant temperature sensor	Approx. 20°C (68°F): 2.32 to 2.59 kΩ Approx. 80°C (176°F): 0.310 to 0.326 kΩ
Knock sensor	at 20°C (68°F): 120 to 280 kΩ
EFI relay	3 - 5: 10 kΩ or higher 3 - 5: Below 1 Ω (Applying battery voltage terminals 1 and 2)
Circuit opening relay	3 - 5: 10 kΩ or higher 3 - 5: Below 1 Ω (Applying battery voltage terminals 1 and 2)
Crankshaft position sensor	Cold: 1,630 to 2,740 Ω Hot: 2,065 to 3,225 Ω

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Throttle body assembly x Intake air connector	11	112	8
V-bank cover sub assembly x Cylinder head cover sub-assembly LH	7.9	81	70 in.*lbf
Knock sensor x Cylinder block sub-assembly	20	199	14
Water outlet x Cylinder head sub-assembly	15	153	11
Water outlet x Cylinder head LH	15	153	11
Intake manifold x Cylinder head sub-assembly	15	153	11
Intake manifold x Cylinder head LH	15	153	11
Ground cable x Intake manifold	8.4	86	74 in.*lbf
Crank shaft position sensor x Oil pump	8.0	80	71 in.*lbf
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	4.9	50	43 in.*lbf

3MZ-FE ENGINE MECHANICAL

SERVICE DATA

Battery specific gravity	at 20°C (68°F)	1.25 to 1.29
New drive belt deflection (Pressing force: 98 N (10 kgf, 22 lbf))	For fan and generator	9.1 to 10.5 mm (0.358 to 0.413 in.)
	For vane pump	7.0 to 9.0 mm (0.276 to 0.354 in.)
Used drive belt deflection (Pressing force: 98 N (10 kgf, 22 lbf))	For fan and generator	11.0 to 13.5 mm (0.433 to 0.531 in.)
	For vane pump	10.0 to 12.0 mm (0.394 to 0.472 in.)
New drive belt tension	For fan and generator	617 to 853 N (63 to 87 kgf, 139 to 192 lbf)
	For vane pump	686 to 784 N (70 to 80 kgf, 154 to 176 lbf)
Used drive belt tension	For fan and generator	294 to 490 N (30 to 50 kgf, 66 to 110 lbf)
	For vane pump	343 to 490 N (33 to 50 kgf, 73 to 110 lbf)
Ignition timing	Terminals TC and CG of DLC3 connected	8 to 12° BTDC
	Terminals TC and CG of DLC3 disconnected	7 to 24° BTDC
Idle speed		650 to 750 r/min
Compression	Compression pressure	1.5 MPa (15.3 kgf/cm^2, 218 psi) or more
	Minimum pressure	1.0 MPa (10.2 kgf/cm^2, 145 psi)
	Difference between each cylinder	100 kPa (1.0 kgf/cm^2, 15 psi) or less
Valve clearance at cold	Intake	0.15 to 0.25 mm (0.0059 to 0.0098 in.)
	Exhaust	0.25 to 0.35 mm (0.0098 to 0.0138 in.)
Camshaft		
Maximum circle runout		0.06 mm (0.0024 in.)
Specified cam lobe height	STD intake	43.132 to 43.232 mm (1.6981 to 1.7020 in.)
	STD exhaust	43.010 to 43.110 mm (1.6933 to 1.6972 in.)
	Minimum intake	42.98 mm (1.6921 in.)
	Minimum exhaust	42.86 mm (1.6874 in.)
Camshaft Journal diameter		26.959 to 26.975 mm (1.0614 to 1.0620 in.)
12 pointed head cylinder head set bolt diameter at tension portion	STD	8.95 to 9.05 mm (0.3524 to 0.3563 in.)
	Maximum	8.75 mm (0.3445 in.)
Cylinder head		
Maximum warpage	Cylinder block side	0.05 mm (0.0020 in.)
	Intake manifold side	0.10 mm (0.0039 in.)
	Exhaust manifold side	0.10 mm (0.0039 in.)
Intake valve		
Valve overall length	STD intake	95.45 mm (3.7579 in.)
	STD exhaust	95.40 mm (3.7559 in.)
	Minimum intake	94.95 mm (3.7382 in.)
	Minimum exhaust	94.90 mm (3.7362 in.)
Valve stem diameter	STD intake	5.470 to 5.485 mm (0.2154 to 0.2159 in.)
	STD exhaust	5.465 to 5.480 mm (0.2152 to 0.2157 in.)
Margin thickness	STD intake	1.0 mm (0.039 in.)
	STD exhaust	1.0 mm (0.039 in.)
	Minimum intake	0.5 mm (0.020 in.)
	Minimum exhaust	0.5 mm (0.020 in.)
Inner Compression Spring		
Free length		45.50 mm (1.7913 in.)
Maximum deviation		2.0 mm (0.079 in.)

Installed tension	at 33.8 mm (1.331 in.)	186 to 206 N (19.0 to 21.0 kgf, 41.9 to 46.3 lbf)
Valve guide bush		
Bush inside diameter		5.510 to 5.530 mm (0.2169 to 0.2177 in.)
Specified bush oil clearance	STD intake	0.025 to 0.060 mm (0.0010 to 0.0024 in.)
	STD exhaust	0.030 to 0.065 mm (0.0012 to 0.0026 in.)
	Maximum intake	0.08 mm (0.0031 in.)
	Maximum exhaust	0.10 mm (0.0039 in.)
Cylinder head valve guide bush bore diameter	STD	10.295 to 10.313 mm (0.4053 to 0.4060 in.)
	O/S 0.05	10.345 to 10.363 mm (0.4073 to 0.4080 in.)
Bush diameter	STD	10.333 to 10.344 mm (0.4068 to 0.4072 in.)
	O/S 0.05	10.383 to 10.394 mm (0.4088 to 0.4092 in.)
Bush length	Intake	34.5 mm (1.358 in.)
	Exhaust	40.5 mm (1.594 in.)
Bush protrusion height	Intake	11.1 to 11.5 mm (0.437 to 0.453 in.)
	Exhaust	8.9 to 9.3 mm (0.350 to 0.366 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.)
Specified oil clearance	STD	0.033 to 0.059 mm (0.0013 to 0.0023 in.)
	Maximum	0.07 mm (0.0028 in.)
Camshaft		
Gear backlash	STD	0.020 to 0.200 mm (0.0008 to 0.0079 in.)
	Maximum	0.30 mm (0.0118 in.)
Journal thrust clearance	STD	0.040 to 0.090 mm (0.0016 to 0.0035 in.)
	Maximum	0.12 mm (0.0047 in.)
Journal oil clearance	STD intake #4, #5	0.025 to 0.057 mm (0.0010 to 0.0022 in.)
	STD other	0.025 to 0.062 mm (0.0010 to 0.0024 in.)
	Maximum	0.10 mm (0.0039 in.)
Connecting rod		
Thrust clearance	STD	0.15 to 0.30mm (0.0059 to 0.0118 in.)
	Maximum	0.35 mm (0.0138 in.)
Connecting rod oil clearance	STD	0.038 to 0.066 mm (0.0015 to 0.0026 in.)
	Maximum	0.08 mm (0.0031 in.)
Crankshaft		
Crankshaft thrust clearance	STD	0.04 to 0.24 mm (0.0016 to 0.0094 in.)
	Maximum	0.30 mm (0.0118 in.)
Cylinder block		
Maximum warpage	Maximum	0.05 mm (0.0020 in.)
Specified cylinder bore diameter	STD	92.000 to 92.012 mm (3.6220 to 3.6225 in.)
	Maximum	92.080 mm (3.6252 in.)
Piston		
Piston diameter	At 13.0 mm (0.512 in.) from piston bottom	91.953 to 91.967 mm (3.6202 to 3.6207 in.)
Oil clearance	STD	0.033 to 0.059 mm (0.0013 to 0.0023 in.)
	Maximum	0.13 mm (0.0051 in.)
Connecting rod		
Maximum misalignment per 100 mm (3.94 in.)		0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Maximum rod twist per 100 mm (3.94 in.)		0.15 mm (0.0059 in.) per 100 mm (3.94 in.)
Bush inside diameter		22.005 to 22.014 mm (0.8663 to 0.8667 in.)
Piston pin		
Piston pin diameter		21.997 to 22.006 mm (0.8660 to 0.8664 in.)

Oil clearance	STD	0.005 to 0.011 mm (0.0002 to 0.0004 in.)
	Maximum	0.05 mm (0.0020 in.)
Piston ring		
Piston ring groove clearance	No.1	0.03 to 0.08 mm (0.0012 to 0.0031 in.)
	No.2	0.02 to 0.06 mm (0.0008 to 0.0024 in.)
	Oil (Side rail)	0.03 to 0.11 mm (0.0012 to 0.0043 in.)
End gap	STD No.1	0.30 to 0.40 mm (0.0118 to 0.0157 in.)
	Maximum No.1	0.95 mm (0.0374 in.)
	STD No.2	0.50 to 0.60 mm (0.0197 to 0.0236 in.)
	Maximum NO.2	1.05 mm (0.0413 in.)
	STD oil (Side rail)	0.15 to 0.40 mm (0.0059 to 0.0157 in.)
	Maximum oil (Side rail)	1.00 mm (0.0394 in.)
Connecting rod bolt		
Specified diameter	STD	7.2 to 7.3 mm (0.283 to 0.287 in.)
	Minimum	7.0 mm (0.276 in.)
Crankshaft bearing cap set bolt		
Specified diameter	STD	7.5 to 7.6 mm (0.295 to 0.299 in.)
	Minimum	7.2 mm (0.283 in.)
Crankshaft		
Maximum circle runout		0.06 mm (0.0024 in.)
Main journal taper and out-of-round		60.988 to 61.000 mm (2.4011 to 2.4016 in.)
Maximum crank journal taper and out-of-round		0.02 mm (0.0008 in.)
Crank pin diameter		52.992 to 53.000 mm (2.0863 to 2.0866 in.)
Maximum crank pin taper and out-of-round		0.02 mm (0.0008 in.)
Crankshaft oil clearance	STD No.1 and No.2 journals	0.014 to 0.034 mm (0.0006 to 0.0013 in.)
	STD No.3 and No.4 journals	0.026 to 0.046 mm (0.0010 to 0.0018 in.)
	Maximum No.1 and No.2 journals	0.05 mm (0.0020 in.)
	Maximum No.3 and No.4 journals	0.06 mm (0.0024 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Vane pump assembly x Pump bracket		43	439	32
Vane pump assembly x Adjust strut		43	439	32
Generator bracket No.2 x Generator assembly		58	591	43
Fan belt adjusting slider x Generator assembly		18	184	13
Front wheel		103	1,050	76
Cylinder head cover x Cylinder head		8.0	80	71 in.*lbf
Engine wire harness x Cylinder head cover		8.4	85	74 in.*lbf
Engine wire harness protector x Cylinder head cover		8.4	85	74 in.*lbf
Ignition coil assembly x Cylinder head cover		8.0	80	71 in.*lbf
Intake air surge tank x Intake manifold		28	286	21
Surge tank stay No.2 x Intake air control valve assembly		20	199	14
Surge tank stay No.2 x Cylinder head		20	199	14
Surge tank stay No.1 x Intake air surge tank		20	199	14
Surge tank stay No.1 x Cylinder head		20	199	14
Engine hanger No.1 x Intake air surge tank		20	199	14
Engine hanger No.1 x Cylinder head		20	199	14
PS pressure tube x Engine hunger No.1		7.8	80	69 in.*lbf
Emission control valve set x Emission control valve bracket		8.0	82	71 in.*lbf
V-bank cover x Cylinder head cover		7.9	81	70 in.*lbf
Engine hanger No.2 x Cylinder head		20	199	14
Engine oil pressure switch assembly x Cylinder block		15	153	11
Generator bracket No.1 x Cylinder block		58	591	43
Pump bracket x Cylinder head		32	326	24
Engine mounting bracket RH x Cylinder block		54	551	40
Manifold stay No.2 x Cylinder block		49	500	36
Engine mounting bracket RR x Cylinder block		64	653	47
Engine mounting insulator RH x Engine mounting bracket RH		95	969	70
Engine mounting insulator LH x Automatic transaxle assembly		95	969	70
Engine mounting insulator FR x Engine mounting bracket FR		87	887	64
Engine mounting insulator RR x Engine mounting bracket RR		75	765	55
Power steering link assembly (4WD) x Front frame assembly		70	714	52
Stabilizer bar front (4WD) x Front frame assembly		29	296	21
Adjust strut x Engine mounting bracket RH		43	439	32
Frame side rail plate sub-assembly x Front frame assembly	Bolt A	85	867	63
	Bolt B	32	326	24
	Nut	32	326	24
Front suspension member brace rear x Front frame assembly	Bolt C	85	867	63
	Bolt D	32	326	24
	Nut	32	326	24
Height control sensor link sub-assembly front (w/ Air suspension) x Front frame assembly		5.4	55	48 in.*lbf
Exhaust pipe support bracket No.1 x Oil pan sub-assembly		21	214	15
Cam shaft sub-gear x Main gear		5.4	55	48 in.*lbf
Engine rear oil seal retainer x Cylinder block		8.0	82	71 in.*lbf
Oil pump assembly x Cylinder block	Bolt A	8.0	82	71 in.*lbf
	Bolt B	20	199	14
	Bolt C	43	439	32
Crankshaft position sensor x Oil pump assembly		8.0	82	71 in.*lbf

Part Tightened		N*m	kgf*cm	ft.*lbf
Oil pan baffle plate x Oil pan sub-assembly		8.0	82	71 in.*lbf
Oil pan sub-assembly x Cylinder block	10 mm head	8.0	82	71 in.*lbf
	12 mm head	20	199	14
Oil strainer sub-assembly x Oil pan sub-assembly		8.0	82	71 in.*lbf
Oil pan sub-assembly No.2 x Oil pan sub-assembly		8.0	82	71 in.*lbf
Oil pan drain plug x Oil pan sub-assembly No.2		45	459	33
Water inlet housing x Cylinder block		8.0	82	71 in.*lbf
Cylinder head x Cylinder block	12 pointed head 1st	54	550	40
	2nd	Turn 90°	Turn 90°	Turn 90°
	Recessed head	19	189	14
Oil control valve filter x Cylinder head		45	459	33
Cylinder head cover rear x Cylinder head		10	102	7
Camshaft timing gear assembly (VVT-i) x Camshaft		150	1,530	111
Camshaft bearing cap x Cylinder head		16	163	12
Timing belt plate x Oil pump assembly		8.0	82	71 in.*lbf
Water pump assembly x Cylinder block		8.0	82	71 in.*lbf
Oil level gage guide x Cylinder block		8.0	82	71 in.*lbf
Oil filter union x Cylinder block		30	306	22
Timing belt idler bracket x Cylinder block		28	286	21
Timing belt No.3 cover x Cylinder head		8.5	87	76 in.*lbf
Camshaft timing pulley x Camshaft		125	1,275	92
Timing belt idler sub-assembly No.2 x Timing belt idler bracket		43	438	32
Timing belt idler sub-assembly No.1 x Cylinder block		34	347	25
Chain tensioner assembly No.1 x Oil pump assembly		27	280	20
Engine mounting bracket RH x Cylinder block		28	286	21
Timing belt No.2 cover x Timing belt No.3 cover		8.5	87	76 in.*lbf
Timing belt No.1 cover x Oil pump assembly		8.5	87	76 in.*lbf
Crankshaft pulley x Crankshaft		220	2,250	162
VVT sensor x Cylinder head		8.0	82	71 in.*lbf
Camshaft timing oil control valve assembly x Cylinder head		8.0	82	71 in.*lbf
Spark plug x Cylinder head		25	250	18
Generator bracket No.2 x Engine mounting bracket RH		28	286	21
Engine mounting stay No.2 RH x Engine mounting bracket RH		64	653	47
Engine moving control rod	Bolt A to C	64	653	47
	Bolt D	23	235	17
Exhaust manifold converter sub-assembly x Cylinder head		49	500	36
Manifold stay x Exhaust manifold converter sub-assembly		34	347	25
Manifold stay x Automatic transaxle assembly		34	347	25
Exhaust manifold heat insulator No.1 x Exhaust manifold converter sub-assembly		8.5	87	75 in.*lbf
Water outlet x Cylinder head		15	153	11
Intake manifold x Cylinder head		15	153	11
Ground cable x Intake manifold		8.4	86	74 in.*lbf
Wire harness clamp bracket x Cylinder head		5.4	55	48 in.*lbf
Ground cable x Cylinder head		5.4	55	48 in.*lbf
Exhaust manifold converter sub-assembly No.2 x Cylinder head		49	500	36
Exhaust manifold heat insulator No.2 x Exhaust manifold converter sub-assembly No.2		8.5	87	75 in.*lbf
Manifold converter insulator No.3 x Exhaust manifold converter sub-assembly No.2		8.5	87	75 in.*lbf

Part Tightened		N*m	kgf*cm	ft.*lbf
Drive plate & ring gear sub-assembly x Crankshaft		83	846	61
W/ head straight screw plug No.1 x Cylinder head		44	449	32
W/ head straight screw plug No.2 x Cylinder head		44	449	32
Connecting rod cap x Connecting rod	1st	25	255	18
	2nd	Turn 90°	Turn 90°	Turn 90°
Main bearing cap x Cylinder block	12 pointed head 1st	22	224	16
	2nd	Turn 90°	Turn 90°	Turn 90°
	6 pointed head	27	275	20
Cylinder block w/ head straight screw No.1 plug x Cylinder block		30	306	22
Cylinder block w/ head straight screw No.2 plug x Cylinder block		30	306	22
Cylinder block w/ head straight screw No.3 plug x Cylinder block		50	510	37
Water seal plate x Cylinder block		18	184	13
Cylinder block water drain cock sub-assembly x Cylinder block		39	398	29

3MZ-FE FUEL

SERVICE DATA

Fuel pressure	304 to 343 kPa (3.1 to 3.5 kgf/cm^2, 44 to 50 psi)
Fuel pressure	147 kPa (1.5 kgf/cm^2, 21 psi) or more
Fuel injector assembly	Resistance: 13.4 to 14.2 Ωat 20°C (68°F) Injection volume: 60 to 73 cm^3 (3.7 to 4.5 cu in.) per 15 seconds Difference between each injector volume: Injection volume: 13 cm^3 (0.9 cu in.) or less Fuel drop: 1 drop or less in 12 minutes
Fuel pump assembly	Resistance: 0.2 to 3.0 Ω at 20°C (68 °F)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Fuel delivery pipe sub-assembly x Intake manifold	10	102	7
Fuel delivery pipe No.2 x Intake manifold	10	102	7
Fuel pipe No.2 union bolt x Fuel delivery pipe No.2	33	331	24
Fuel pressure pulsation damper assembly x Fuel delivery pipe sub-assembly	33	331	24
Fuel pipe sub-assembly No.1 x Intake manifold	20	199	14
Intake air surge tank x Intake manifold	28	286	21
Surge tank stay No.2 x Intake air connector assembly	20	199	14
Surge tank stay No.2 x Cylinder head sub-assembly	20	199	14
Surge tank stay No.1 x Intake air surge tank	20	199	14
Surge tank stay No.1 x Cylinder head sub-assembly	20	199	14
Engine hunger No.1 x Intake air surge tank	20	199	14
Engine hunger No.1 x Cylinder head sub-assembly	20	199	14
Pressure feed tube assembly x Engine hunger No.1	7.8	80	69 in.*lbf
Emission control valve set x Emission control valve bracket	8.0	82	71 in.*lbf
Air cleaner cap sub-assembly x Air cleaner case sub-assembly	5.0	51	44 in.*lbf
Cowl top panel sub-assembly outer x Body	5.0	51	44 in.*lbf
Front shock absorber RH x Body	80	815	59
Front shock absorber LH x Body	80	815	59
Fuel tank side plate x Fuel tank bracket	30	306	22
Fuel tank assembly x Body	20	200	14
Fuel tank band sub-assembly RH x Body	39	400	29
Fuel tank band sub-assembly LH x Body	39	400	29
Fuel tank protector sub-assembly No.1 x Fuel tank band sub-assembly RH	5.5	56	49 in.*lbf
Fuel tank protector sub-assembly No.1 x Fuel tank band sub-assembly LH	5.5	56	49 in.*lbf
Fuel tank protector No.1 x Fuel tank band sub-assembly LH	5.5	56	49 in.*lbf
Fuel tank protector No.1 x Fuel tank assembly	5.5	56	49 in.*lbf
Exhaust pipe support bracket No.4 x Body (4WD drive type)	22	224	16

3MZ-FE EMISSION CONTROL

SERVICE DATA

VSV for canister closed valve	Resistance at 20°C (68°F): 25 to 30 Ω at 100°C (212°F): 32 to 40 Ω
VSV for EVAP	Resistance at 20°C (68°F): 27 to 32 Ω
Air fuel ratio sensor	Resistance HT (1) - +B (2) at 20°C (68°F): 1.8 to 3.4 Ω HT (1) - AF- (4) No continuity
Heated oxygen sensor (for bank 1)	Resistance HT (1) - +B (2) at 20°C (68°F): 11 to 16 Ω HT (1) - E2 (4) No continuity
Heated oxygen sensor (for bank 2)	Resistance HT (1) - +B (2) at 20°C (68°F): 11 to 16 Ω HT (1) - E2 (4) No continuity

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Charcoal canister assembly x Body	5.5	56	49 in.*lbf
Front floor heat insulator No.3 x Charcoal canister assembly	4.9	50	43 in.*lbf
Exhaust pipe assembly center x Exhaust pipe sub-assembly front No.3	48	490	35
Exhaust pipe assembly center x Exhaust pipe assembly tail	48	490	35

3MZ-FE INTAKE

SERVICE DATA

Intake air control valve No.3 (VSV)	Resistance at 20°C (68°F): 37 to 44 Ω
Vacuum switching valve assembly No.1	Resistance at 20°C (68°F): 33 to 39 Ω

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Intake air control valve No.2 x Intake air surge tank	10	102	7

3MZ-FE EXHAUST

SERVICE DATA

Compression spring	
Free length	
Exhaust pipe assembly center x Exhaust pipe sub-assembly front No.3	Minimum: 41.5 mm (1.634 in.)
Exhaust pipe assembly center x Exhaust pipe assembly tail	Minimum: 40.5 mm (1.594 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Exhaust pipe assembly front x Exhaust manifold converter sub-assembly No.2	56	571	41
Exhaust pipe sub-assembly front No.3 x Exhaust manifold converter sub-assembly	56	571	41
Exhaust pipe sub-assembly front No.3 x Exhaust pipe assembly front	56	571	41
Exhaust pipe assembly center x Exhaust pipe sub-assembly front No.3	48	490	35
Exhaust pipe assembly center x Exhaust pipe assembly tail	48	490	35
Heated oxygen sensor x Exhaust pipe assembly front	44	449	33
Heated oxygen sensor x Exhaust pipe sub-assembly front No.3	44	449	33
Exhaust pipe assembly front (Clamp bolt) x Exhaust pipe support bracket No.1	21	214	16

3MZ-FE COOLING

SERVICE DATA

Thermostat	
Valve opening temperature	80 to 84°C (176 to 183°F)
Valve lift	at 95°C (203°F): 10 mm (0.394 in.) or more
Radiator cap sub-assembly	
Standard opening pressure	74 to 103 kPa (0.75 to 1.05 kgf/cm^2, 10.7 to 14.9 psi)
Minimum opening pressure	59 kPa (0.6 kgf/cm^2, 8.6 psi)
Cooling fan	
Standard amperage No.1	10.6 to 16.6 A
Standard amperage No.2	5.6 to 11.6 A
Cooling fan relay	
Specified voltage	9 to 12 V

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Water pump assembly x Cylinder block	8.0	82	71 in.*lbf
Timing belt idler sub-assembly No.1 x Cylinder block	34	347	25
Water inlet x Water inlet housing	8.0	82	71 in.*lbf
Water inlet pipe (TMC MADE) x Cylinder head	20	199	14
Water inlet pipe (TMMWV MADE) x Cylinder head	20	199	14
Cylinder block drain cock plug x Cylinder block drain cock	13	130	9
Radiator assembly x Radiator support lower	5.0	51	44 in.*lbf
Radiator assembly x Radiator support upper	5.0	51	44 in.*lbf
Radiator assembly x Fun shroud	13.5	138	10
Radiator support sub-assembly upper x Body	7.8	71	62 in.*lbf
Radiator support sub-assembly upper x Suction tube	9.8	100	87 in.*lbf
Hood lock assembly x Radiator support sub-assembly upper	8.0	82	71 in.*lbf

3MZ-FE LUBRICATION

SERVICE DATA

Oil pressure	at idle speed: 29 kPa (0.3 kgf/cm^2, 4.3 psi) or more at 3,000 rpm: 245 to 539 kPa (2.5 to 5.5 kgf/cm^2, 36 to 78 psi)
Oil pump	Standard tip clearance: 0.11 to 0.24 mm (0.0043 to 0.0094 in.) Maximum tip clearance: 0.35 mm (0.0138 in.) Standard body clearance: 0.125 to 0.162 mm (0.0050 to 0.0064 in.) Maximum body clearance: 0.30 mm (0.0118 in.) Standard side clearance: 0.03 to 0.09 mm (0.0012 to 0.0035 in.) Maximum side clearance: 0.15 mm (0.0059 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Engine oil pressure switch x Cylinder block	15	153	11
Oil pump assembly x Cylinder block (Bolt A)	8.0	82	71 in.*lbf
Oil pump assembly x Cylinder block (Bolt B)	20	199	14
Oil pump assembly x Cylinder block (Bolt C)	43	439	32
Crankshaft position sensor x Oil pump assembly	8.0	82	71 in.*lbf
Oil pan sub-assembly x Cylinder block (10 mm head)	8.0	82	71 in.*lbf
Oil pan sub-assembly x Cylinder block (12 mm head)	20	199	14
Oil pan sub-assembly x Cylinder block (14 mm head)	37	379	27
Fly wheel housing under cover x Automatic transaxle assembly	7.8	80	69 in.*lbf
Oil strainer sub-assembly x Oil pan sub-assembly	8.0	82	71 in.*lbf
Oil pan sub-assembly No.2 x Oil pan sub-assembly	8.0	82	71 in.*lbf
Engine mounting bracket RH x Cylinder block	54	551	40
Engine mounting bracket RH x PS pump bracket	43	439	32
Engine mounting insulator RH x Engine mounting bracket RH	95	969	70
Engine mounting insulator RH x Front frame assembly	87	887	64
Engine mounting insulator FR x Engine mounting bracket FR	87	887	64
Engine mounting insulator FR x Front frame assembly	52	530	38
Engine mounting insulator RR x Front frame assembly	52	530	38
Compressor mounting bracket No.1 x Cylinder block	25	250	18
Compressor and magnetic clutch x Compressor mounting bracket No.1	25	250	18
Generator belt adjusting bar x Cylinder block (Nut A)	43	438	32
Generator belt adjusting bar x Cylinder block (Bolt B)	18	184	13
Generator belt adjusting bar x Cylinder block (Bolt C)	8.4	85	74 in.*lbf
Oil pump rotor set x Oil pump assembly	10	105	8
Oil pump relief valve plug x Oil pump body	49	500	36
Oil pan drain plug x Oil pan sub-assembly No.2	45	459	33

3MZ-FE IGNITION

SERVICE DATA

Recommended spark plug	DENSO made: SK20R11 NGK made: IFR6A11
Correct electrode gap for new spark plug	1.0 to 1.1 mm (0.039 to 0.043 in.)
Maximum electrode gap for used spark plug	1.3 mm (0.051 in.)
VVT sensor Resistance	Cold: 835 to 1,400 Ω Hot: 1,060 to 1,645 Ω

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
VVT sensor x Cylinder head sub-assembly	8.0	82	71 in.*lbf
VVT sensor x Cylinder head LH	8.0	82	71 in.*lbf
Crankshaft position sensor x Oil pump assembly	8.0	82	71 in.*lbf
Spark plug x Cylinder head	25	250	18
Ignition coil x Cylinder head cover	8.0	82	71 in.*lbf

3MZ-FE STARTING

SERVICE DATA

Starter Specified current:	90 A or less at 11.5 V
Starter relay Specified condition:	3 - 5: 10 kΩ or higher 3 - 5: Below 1 Ω(Applying battery voltage terminals 1 and 2)
Starter armature assembly Depth:	STD: 3.1 mm (0.122 in.) Maximum: 3.8 mm (0.150 in.)
Starter commutator end frame assembly Brush length	STD: 9.0 mm (0.354 in.) Minimum: 4.0 mm (0.158 in.)
Ignition Switch	LOCK: Between all terminals 10 kΩ or higher ACC: 2 - 3 Below 1 Ω ON: 2 - 3 Below 1 Ω ON: 2 - 4 Below 1 Ω ON: 6 - 7 Below 1 Ω START: 1 - 2 Below 1 Ω START: 2 - 4 Below 1 Ω START: 6 - 7 Below 1 Ω START: 7 - 8 Below 1 Ω

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Starter assembly x Transaxle housing	37	380	26
Starter wire x Starter assembly	9.8	100	87 in.*lbf
Air cleaner inlet No.1 x Body	7.0	71	62 in.*lbf
Air cleaner bracket x Body	12	122	9
Air cleaner case sub-assembly x Air cleaner bracket	5.0	51	44 in.*lbf
Air cleaner case sub-assembly x Body	5.0	51	44 in.*lbf
Air cleaner cap sub-assembly x Air cleaner case sub-assembly	5.0	51	44 in.*lbf
Air cleaner inlet No.2 x Body	7.0	71	62 in.*lbf
Battery clamp sub-assembly x Body	5.5	56	49 in.*lbf
Battery clamp sub-assembly x Battery clamp bolt	5.5	56	49 in.*lbf
Terminal x Battery	3.5	36	31 in.*lbf
Starter yoke assembly x Starter commutator end frame assembly	6.0	61	53 in.*lbf
Repair service starter kit x Starter motor terminal kit	7.5	76	66 in.*lbf
Lead wire x Repair service starter kit	10	102	7

3MZ-FE CHARGING

SERVICE DATA

Battery Except maintenance-free battery	Standard specific gravity: 1.25 to 1.29 at 20°C (68°F)
Battery	Voltage: 12.6 to 12.8 V at 20°C (68°F)
Voltage regulator	Regulating voltage: 13.2 to 14.8 V Standard amperage: 10 A or less
Generator brush holder assembly Brush length	Standard: 10.5 mm (0.413 in.) Minimum: 4.5 mm (0.177 in.)
Generator rotor assembly Open circuit	Resistance: 2.3 to 2.7 Ω at 20°C (68°F) for 100 A Generator Resistance: 1.5 to 1.9 Ω at 20°C (68°F) for 130 A Generator
Generator rotor assembly Slip ring diameter	Standard: 14.2 to 14.4 mm (0.559 to 0.567 in.) Minimum: 14.0 mm (0.551 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Generator assembly x Generator bracket No.1	58	592	43
Generator assembly x Generator belt adjusting bar	18	184	13
Generator wire x Generator assembly	9.8	100	87 in.*lbf
Retainer plate x Drive end frame assembly generator	2.3	23	20 in.*lbf
Generator rectifier end frame x Drive end frame assembly generator	5.8	59	51 in.*lbf
Generator brush holder assembly x Generator rectifier end frame	1.8	18	16 in.*lbf
Generator rear end cover x Generator rectifier end frame	4.6	47	41 in.*lbf
Generator pulley x Generator rotor assembly (100 A Generator)	111	1,127	82
Generator pulley x Generator rotor assembly (130 A Generator)	110	1,125	82

U151E AUTOMATIC TRANSAXLE

SERVICE DATA

U151E		
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 (6.9 to 7.6 kgf*cm^2, 97 to 108 psi)
	AT stall (Throttle valve fully opened)	
	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 20.1 kgf*cm^2, 256 to 285 psi)
Engine stall revolution	D and R positions	2,100 +- 150 rpm
Time lag	N → D position	Less than 1.2 seconds
	N → R position	Less than 1.5 seconds
Engine idle revolution (A/C OFF)	N position	650 +- 50 rpm
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter runout	Max.	0.30 mm (0.0118 in.)
Differential oil seal drive in depth	LH side	0 +- 0.5 mm (0 +- 0.020 in.)
	RH side	0 +- 0.5 mm (0 +- 0.020 in.)
U151E		
Shift schedule (Shift lever with Multi-mode automatic transmission & Gate shift type)		
D position (Throttle valve fully opened)		
	1 → 2	39 to 48 km/h (24 to 30 mph)
	2 → 3	79 to 90 km/h (49 to 56 mph)
	3 → 4	129 to 147 km/h (80 to 91 mph)
	4 → 5	191 to 213 km/h (119 to 132 mph)
	5 → 4	184 to 205 km/h (114 to 127 mph)
	4 → 3	125 to 142 km/h (78 to 88 mph)
	3 → 2	74 to 84 km/h (46 to 52 mph)
	2 → 1	36 to 43 km/h (22 to 27 mph)
(Throttle valve fully closed)	4 → 5	45 to 53 km/h (28 to 33 mph)
	5 → 4	35 to 42 km/h (22 to 26 mph)
Lock-up point	Throttle valve opening 5 %	
D position		
5th gear	Lock-up ON	80 to 90 km/h (50 to 56 mph)
	Lock-up OFF	79 to 89 km/h (49 to 55 mph)
4th gear	Lock-up ON	98 to 110 km/h (61 to 68 mph)
	Lock-up OFF	95 to 107 km/h (59 to 66 mph)

U151E		
3th gear	Lock-up ON	64 to 74 km/h (40 to 46 mph)
	Lock-up OFF	61 to 70 km/h (38 to 43 mph)

Oil pump		
Body clearance	STD	0.10 to 0.17 mm (0.0039 to 0.0067 in.)
	Max.	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Max.	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Max.	0.05 mm (0.0020 in.)
Drive gear thickness	Mark	
	A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	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.)
	B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	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.)
	Max.	38.188 mm (1.50346 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.84646 to 0.84748 in.)
	Max.	21.57 mm (0.8492 in.)

Multiple disc clutch		
Inside diameter	STD	23.025 to 23.045 mm (0.9065 to 0.9073 in.)
	Max.	23.09 mm (0.9091 in.)

Forward clutch		
Pack clearance		1.00 to 1.25 mm (0.0394 to 0.4921 in.)
Return spring free length		26.74 mm (1.0528 in.)
Flange thickness	Mark	
	1	3.00 mm (0.1181 in.)
	2	3.15 mm (0.1240 in.)
	3	3.30 mm (0.1299 in.)
	4	3.45 mm (0.1358 in.)
	5	3.60 mm (0.1417 in.)

Reverse clutch	
Pack clearance:	0.60 to 0.82 mm (0.02362 to 0.03228 in.)

Reverse clutch		
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)
	6	3.5 mm (0.138 in.)
	7	3.6 mm (0.142 in.)

SS

Direct clutch & O/D clutch		
Pack clearance		0.61 to 0.83 mm (0.02401 to 0.03268 in.)
Return spring free length		25.91 mm (1.0201 in.)
Flange thickness	Mark	
	0	2.5 mm (0.098 in.)
	1	2.6 mm (0.102 in.)
	2	2.7 mm (0.106 in.)
	3	2.8 mm (0.110 in.)
	4	2.9 mm (0.114 in.)
	5	3.0 mm (0.118 in.)
	6	3.1 mm (0.122 in.)

2nd brake		
Pack clearance		0.62 to 0.91 mm (0.0244 to 0.0358 in.)
Return spring free length		16.61 mm (0.6539 in.)
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)
	6	3.5 mm (0.138 in.)
	7	3.6 mm (0.142 in.)

U/D clutch		
Pack clearance		1.51 to 1.71 mm (0.0594 to 0.0673 in.)
U/D clutch drum bushing inside diameter	STD	37.06 to 37.08 mm (1.4591 to 1.4598 in.)
	Max.	37.13 mm (1.4618 in.)
Return spring free length		17.14 mm (0.6752 in.)
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)

U/D brake	
Pack clearance	1.81 to 2.20 mm (0.0713 to 0.0866 in.)
Return spring free length	14.04 mm (0.5528 in.)

U/D brake		
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.2 mm (0.126 in.)
	3	3.4 mm (0.134 in.)

1st & reverse brake		
Pack clearance		1.16 to 1.35 mm (0.0457 to 0.0531in.)
Return spring free length		15.53 mm (0.6114 in.)
Flange thickness	Mark	
	1	1.8 mm (0.071 in.)
	2	1.9 mm (0.075 in.)
	3	2.0 mm (0.079 in.)
	4	2.1 mm (0.083 in.)
	5	2.2 mm (0.087 in.)
	6	2.3 mm (0.091 in.)
	7	2.4 mm (0.094 in.)
	8	2.5 mm (0.098 in.)

U/D planetary gear	
Preload (at 60 rpm)	0.50 to 1.42 N*m (5.1 to 14.5 kgf*cm, 0.06 to 0.17 in.*lbf)

Front planetary gear		
Turning torque (at 60 rpm)	New Bearing	0.51 to 1.02 N*m (5.1 to 10.0 kgf*cm, 4.4 to 8.7 in.*lbf)
	Used Bearing	0.26 to 0.51 N*m (2.7 to 5.2 kgf*cm, 2.3 to 4.5 in.*lbf)

Input shaft	
End play	0.262 to 1.249 mm (0.0103 to 0.0492 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	41 mm (1.614 in.)
	B	57 mm (2.244 in.)
	C	25 mm (0.984 in.)

Accumulator			
Spring		Free length/Outer diameter	Color
B_3	Inner	62.00 (2.4409) / 15.50 (0.610)	Purple
	Outer	74.23 (2.9224) / 16.50 (0.649)	Purple
C_2		60.96 (2.3999) / 14.10 (0.555)	Yellow
C_3		72.20 (2.8425) / 19.0 (0.748)	Colorless

Front differential (U151E)		
Backlash		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Thrust washer thickness	Mark	
	-	1.625 mm (0.0640 in.)
	-	1.725 mm (0.0679 in.)
	-	1.825 mm (0.0719 in.)

Front differential (U151E)		
Preload (at 60 rpm)	New bearing	0.20 to 0.69 N*m (2.0 to 7.0 kgf*cm, 1.8 to 6.1 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	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.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft*lbf
Park/neutral position switch	Nut	6.9	70	61 in.*lbf
	Bolt	5.4	55	48 in.*lbf
Control shaft lever x Control shaft		13	130	9
Shift control cable x Control shaft lever		13	130	9
Transaxle housing x Engine block	A bolt	64	653	47
	B bolt	46	470	34
	C bolt	37	377	27
Torque converter clutch x Drive plate		48	489	35
Flywheel housing under cover x Automatic transaxle		7.8	80	69 in.*lbf
Engine mounting bracket FR x Transaxle		64	653	47
Oil filler tube x Transaxle		5.5	56	49 in.*lbf
Control cable bracket No.1 x Transaxle		12	122	9
Control cable bracket No.2 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	347	25
Oil cooler outlet tube x Transaxle		34	347	25
Starter x Transaxle		37	377	27
Starter wire x Starter		9.8	100	87 in.*lbf
Wire harness x Transaxle		13	133	10
Wire harness clamp x Transaxle		8.4	86	74 in.*lbf
Speed sensor (NC) x Transaxle		11	115	8
Speed sensor (NT) x Transaxle		11	112	8
Air cleaner x Air cleaner hose		5.0	51	44 in.*lbf
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	A B bolt	11	110	8
	C D bolt	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	120	9
Control cable x Body		4.9	50	43 in.*lbf
Transfer x Transaxle (U151F)		78	800	58
Transfer x Transfer stiffener plate RH (U151F)		34	350	25
Engine mount bracket RR x Transfer stiffener, plate RH		34	350	25
Oil cooler assembly x Body	Nut	7.0	71	62 in.*lbf
	bolt			
Differential gear lube apply tube x Transaxle housing		9.8	100	87 in.*lbf
Front planetary gear lock nut		210 to 350	2,141 to 3,569	155 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 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	226	16

Part Tightened		N*m	kgf*cm	ft*lbf
Transaxle housing x Transaxle case	Bolt A	25	255	18
	Bolt B	33	337	24
	Bolt C	29	295	21
	Bolt D	22	226	16
Automatic transmission case plug x Transaxle housing		7.4	75	65 in.*lbf
Automatic transmission case plug x Transaxle case		7.4	75	65 in.*lbf
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
Valve body oil strainer assembly x Transmission valve body		11	110	8
Automatic transaxle oil pan sub-assembly x Transaxle case		7.8	80	69 in.*lbf
Drain plug x Automatic transaxle oil pan sub-assembly		49	500	36
Speed sensor x Transaxle case		11	115	8
Oil cooler tube union x Transaxle case	Union	27	276	20
	Elbow	27	276	20
Park/neutral start switch x nut		6.9	70	61 in.*lbf
Park/neutral start switch x Bolt		5.4	55	48 in.*lbf
Park/neutral start switch x Control shaft lever		13	130	9
Speedometer driven hole cover sub-assembly x Transaxle case		6.9	70	61
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		10.8	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		10.8	110	8
Shift solenoid valve DSL x Transmission valve body assembly		10.8	110	8
Front differential case x Front differential ring gear		95.1	970	70

U151F AUTOMATIC TRANSAXLE

SERVICE DATA

U151F		
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 (6.9 to 7.6 kgf*cm^2, 97 to 108 psi)
	AT stall (Throttle valve fully opened)	
	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 20.1 kgf*cm^2, 256 to 285 psi)
Engine stall revolution	D and R positions	2,550 +- 150 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 +- 50 rpm
Drive plate runout	Max.	0.20 mm (0.0079 in.)
Torque converter runout	Max.	0.30 mm (0.0118 in.)
Differential oil seal drive in depth	LH side	0 +- 0.5 mm (0 +- 0.020 in.)
	RH side	6.0 +- 0.5 mm (0.236 +- 0.020 in.)
Shift schedule (Shift lever with Multi-mode automatic transmission & Gate shift type)		
D position (Throttle valve fully opened)		
	1 → 2	42 to 49 km/h (26 to 30 mph)
	2 → 3	81 to 88 km/h (50 to 55 mph)
	3 → 4	132 to 143 km/h (82 to 89 mph)
	4 → 5	195 to 207 km/h (121 to 129 mph)
	5 → 4	187 to 200 km/h (116 to 124 mph)
	4 → 3	128 to 139 km/h (80 to 86 mph)
	3 → 2	76 to 82 km/h (47 to 51 mph)
	2 → 1	36 to 42 km/h (22 to 26 mph)
(Throttle valve fully closed)	4 → 5	46 to 51 km/h (29 to 32 mph)
	5 → 4	35 to 41 km/h (22 to 25 mph)
Lock-up point	Throttle valve opening 5 %	
D position		
5th gear	Lock-up ON	83 to 90 km/h (52 to 56 mph)
	Lock-up OFF	81 to 87 km/h (50 to 54 mph)
4th gear	Lock-up ON	100 to 107 km/h (62 to 66 mph)
	Lock-up OFF	97 to 104 km/h (60 to 65 mph)

U151F		
3th gear	Lock-up ON	65 to 72 km/h (40 to 45 mph)
	Lock-up OFF	62 to 68 km/h (39 to 42 mph)

Oil pump		
Body clearance	STD	0.10 to 0.17 mm (0.0039 to 0.0067 in.)
	Max.	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 to 0.15 mm (0.0028 to 0.0059 in.)
	Max.	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 to 0.05 mm (0.0008 to 0.0020 in.)
	Max.	0.05 mm (0.0020 in.)
Drive gear thickness	Mark	
	A	11.690 to 11.699 mm (0.4602 to 0.4606 in.)
	B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	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.)
	B	11.700 to 11.709 mm (0.4606 to 0.4610 in.)
	C	11.710 to 11.720 mm (0.4610 to 0.4614 in.)
	D	11.721 to 11.730 mm (0.4615 to 0.4618 in.)
	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.)
	Max.	38.188 mm (1.50346 in.)
Stator shaft bushing inside diameter	STD	21.500 to 21.526 mm (0.84646 to 0.84748 in.)
	Max.	21.57 mm (0.8492 in.)

Multiple disc clutch		
Inside diameter	STD	23.025 to 23.045 mm (0.9065 to 0.9073 in.)
	Max.	23.09 mm (0.9091 in.)

Forward clutch		
Pack clearance		1.00 to 1.25 mm (0.0394 to 0.4921 in.)
Return spring free length		26.74 mm (1.0528 in.)
Flange thickness	Mark	
	1	3.00 mm (0.1181 in.)
	2	3.15 mm (0.1240 in.)
	3	3.30 mm (0.1299 in.)
	4	3.45 mm (0.1358 in.)
	5	3.60 mm (0.1417 in.)

Reverse clutch	
Pack clearance:	0.60 to 0.82 mm (0.02362 to 0.03228 in.)

SS

Reverse clutch		
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)
	6	3.5 mm (0.138 in.)
	7	3.6 mm (0.142 in.)

Direct clutch & O/D clutch		
Pack clearance		0.61 to 0.83 mm (0.02401 to 0.03268 in.)
Return spring free length		25.91 mm (1.0201 in.)
Flange thickness	Mark	
	0	2.5 mm (0.098 in.)
	1	2.6 mm (0.102 in.)
	2	2.7 mm (0.106 in.)
	3	2.8 mm (0.110 in.)
	4	2.9 mm (0.114 in.)
	5	3.0 mm (0.118 in.)
	6	3.1 mm (0.122 in.)

2nd brake		
Pack clearance		0.62 to 0.91 mm (0.0244 to 0.0358 in.)
Return spring free length		16.61 mm (0.6539 in.)
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)
	6	3.5 mm (0.138 in.)
	7	3.6 mm (0.142 in.)

U/D clutch		
Pack clearance		1.51 to 1.71 mm (0.0594 to 0.0673 in.)
U/D clutch drum bushing inside diameter	STD	37.06 to 37.08 mm (1.4591 to 1.4598 in.)
	Max.	37.13 mm (1.4618 in.)
Return spring free length		17.14 mm (0.6752 in.)
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)

U/D brake	
Pack clearance	1.81 to 2.20 mm (0.0713 to 0.0866 in.)
Return spring free length	14.04 mm (0.5528 in.)

U/D brake		
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.2 mm (0.126 in.)
	3	3.4 mm (0.134 in.)

1st & reverse brake		
Pack clearance		1.16 to 1.35 mm (0.0457 to 0.0531in.)
Return spring free length		15.53 mm (0.6114 in.)
Flange thickness	Mark	
	1	1.8 mm (0.071 in.)
	2	1.9 mm (0.075 in.)
	3	2.0 mm (0.079 in.)
	4	2.1 mm (0.083 in.)
	5	2.2 mm (0.087 in.)
	6	2.3 mm (0.091 in.)
	7	2.4 mm (0.094 in.)
	8	2.5 mm (0.098 in.)

U/D planetary gear	
Preload (at 60 rpm)	0.50 to 1.42 N*m (5.1 to 14.5 kgf*cm, 0.06 to 0.17 in.*lbf)

Front planetary gear		
Turning torque (at 60 rpm)	New Bearing	0.51 to 1.02 N*m (5.1 to 10.0 kgf*cm, 4.4 to 8.7 in.*lbf)
	Used Bearing	0.26 to 0.51 N*m (2.7 to 5.2 kgf*cm, 2.3 to 4.5 in.*lbf)

Input shaft	
End play	0.262 to 1.249 mm (0.0103 to 0.0492 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	41 mm (1.614 in.)
	B	57 mm (2.244 in.)
	C	25 mm (0.984 in.)

Accumulator			
Spring		Free length/Outer diameter	Color
B_3	Inner	62.00 (2.4409) / 15.50 (0.610)	Purple
	Outer	74.23 (2.9224) / 16.50 (0.649)	Purple
C_2		60.96 (2.3999) / 14.10 (0.555)	Yellow
C_3		72.20 (2.8425) / 19.0 (0.748)	Colorless

Front differential (U151F)	
Side gear backlash	0.05 to 0.20 mm (0.0020 to 0.0079 in.)

Front differential (U151F)		
Thrust washer thickness = Clearance - 0.162 to 0.265 mm (0.0064 to 0.0104 in.)		
	Mark	
	A	0.95 mm (0.0373 in.)
	B	1.00 mm (0.0393 in.)
	C	1.05 mm (0.0413 in.)
	D	1.10 mm (0.0433 in.)
	E	1.15 mm (0.0453 in.)
	F	1.20 mm (0.0472 in.)
	G	1.25 mm (0.0492 in.)
	H	1.30 mm (0.0512 in.)
	J	1.35 mm (0.0532 in.)
	K	1.40 mm (0.0552 in.)
Pinion's backlash		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Thrust washer thickness	Mark	
	MA	0.80 mm (0.0313 in.)
	MB	0.85 mm (0.0333 in.)
	MC	0.90 mm (0.0353 in.)
	MD	0.95 mm (0.0373 in.)
	ME	1.00 mm (0.0393 in.)
	MF	1.05 mm (0.0413 in.)
	MG	1.10 mm (0.0433 in.)
	MH	1.15 mm (0.0453 in.)
	MJ	1.20 mm (0.0472 in.)
	MK	1.25 mm (0.0492 in.)
	ML	1.30 mm (0.0512 in.)
	MM	1.35 mm (0.0532 in.)
	MN	1.40 mm (0.0552 in.)
Preload (at 60 rpm)	New bearing	0.20 to 0.69 N*m (2.0 to 7.0 kgf*cm, 1.8 to 6.1 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	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 (U151F)	
Oil seal press in depth	5.5 to 6.5 mm (0.217 to 0.256 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft*lbf
Park/neutral position switch	Nut	6.9	70	61 in.*lbf
	Bolt	5.4	55	48 in.*lbf
Control shaft lever x Control shaft		13	130	9
Shift control cable x Control shaft lever		13	130	9
Transaxle housing x Engine block	A bolt	64	653	47
	B bolt	46	470	34
	C bolt	37	377	27
Torque converter clutch x Drive plate		48	489	35
Flywheel housing under cover x Automatic transaxle		7.8	80	69 in.*lbf
Engine mounting bracket FR x Transaxle		64	653	47
Oil filler tube x Transaxle		5.5	56	49 in.*lbf
Control cable bracket No.1 x Transaxle		12	122	9
Control cable bracket No.2 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	347	25
Oil cooler outlet tube x Transaxle		34	347	25
Starter x Transaxle		37	377	27
Starter wire x Starter		9.8	100	87 in.*lbf
Wire harness x Transaxle		13	133	10
Wire harness clamp x Transaxle		8.4	86	74 in.*lbf
Speed sensor (NC) x Transaxle		11	115	8
Speed sensor (NT) x Transaxle		11	112	8
Air cleaner x Air cleaner hose		5.0	51	44 in.*lbf
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	A B bolt	11	110	8
	C D bolt	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	120	9
Control cable x Body		4.9	50	43 in.*lbf
Transfer x Transaxle (U151F)		78	800	58
Transfer x Transfer stiffener plate RH (U151F)		34	350	25
Engine mount bracket RR x Transfer stiffener, plate RH		34	350	25
Oil cooler assembly x Body	Nut	7.0	71	62 in.*lbf
	bolt			
Differential gear lube apply tube x Transaxle housing		9.8	100	87 in.*lbf
Front planetary gear lock nut		210 to 350	2,141 to 3,569	155 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 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	226	16

Part Tightened		N*m	kgf*cm	ft*lbf
Transaxle housing x Transaxle case	Bolt A	25	255	18
	Bolt B	33	337	24
	Bolt C	29	295	21
	Bolt D	22	226	16
Automatic transmission case plug x Transaxle housing		7.4	75	65 in.*lbf
Automatic transmission case plug x Transaxle case		7.4	75	65 in.*lbf
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
Valve body oil strainer assembly x Transmission valve body		11	110	8
Automatic transaxle oil pan sub-assembly x Transaxle case		7.8	80	69 in.*lbf
Drain plug x Automatic transaxle oil pan sub-assembly		49	500	36
Speed sensor x Transaxle case		11	115	8
Oil cooler tube union x Transaxle case	Union	27	276	20
	Elbow	27	276	20
Park/neutral start switch x nut		6.9	70	61 in.*lbf
Park/neutral start switch x Bolt		5.4	55	48 in.*lbf
Park/neutral start switch x Control shaft lever		13	130	9
Speedometer driven hole cover sub-assembly x Transaxle case		6.9	70	61
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		10.8	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		10.8	110	8
Shift solenoid valve DSL x Transmission valve body assembly		10.8	110	8
Front differential case x Front differential ring gear		95.1	970	70

MF2A TRANSFER

SERVICE DATA

Driven pinion preload (For use with SST(s))	New bearing	1.1 to 1.6 N*m (11 to 16 kgf*cm, 9.7 to 14.2 in.*lbf)
	Used bearing	0.9 to 1.4 N*m (9 to 14 kgf*cm, 8.0 to 12.4 in.*lbf)
Total preload (For use with SST(s))	New bearing	1.30 to 1.98 N*m (13.3 to 20.2 kgf*cm, 11.5 to 17.5 in*lbf)
	Used bearing	1.07 to 1.68 N*m (10.9 to 17.1 kgf*cm, 9.5 to 14.9 in.*lbf)
Ring gear	Backlash	0.10 to 0.15 mm (0.0039 to 0.0059 in.)
Ring gear runout	Maximum	0.1 mm (0.004 in.)
Transfer ring gear mounting case	Maximum	0.03 mm (0.0012 in.)
Washer thickness LH side	Mark	
	AA	2.07 mm (0.0814 in.)
	AB	2.10 mm (0.0826 in.)
	AC	2.13 mm (0.0838 in.)
	BA	2.16 mm (0.0850 in.)
	BB	2.19 mm (0.0862 in.)
	BC	2.22 mm (0.0874 in.)
	CA	2.25 mm (0.0885 in.)
	CB	2.28 mm (0.0897 in.)
	CC	2.31 mm (0.0909 in.)
	DA	2.34 mm (0.0921 in.)
	DB	2.37 mm (0.0933 in.)
	DC	2.40 mm (0.0944 in.)
	EA	2.43 mm (0.0956 in.)
	EB	2.46 mm (0.0968 in.)
	EC	2.49 mm (0.0980 in.)
	FA	2.52 mm (0.0992 in.)
	FB	2.55 mm (0.1003 in.)
	FC	2.58 mm (0.1015 in.)
	GA	2.61 mm (0.1027 in.)
	GB	2.64 mm (0.1039 in.)
	GC	2.67 mm (0.1051 in.)
	HA	2.70 mm (0.1062 in.)
	HB	2.73 mm (0.1074 in.)
	HC	2.76 mm (0.1086 in.)
	JA	2.79 mm (0.1098 in.)
	JB	2.82 mm (0.1110 in.)
	JC	2.85 mm (0.1122 in.)
	KA	2.88 mm (0.1133 in.)
	KB	2.91 mm (0.1145 in.)
	KC	2.94 mm (0.1157 in.)
	LA	2.97 mm (0.1169 in.)
	LB	3.00 mm (0.1181 in.)

Driven pinion bearing washer thickness front side	Mark	
	AA	1.20 mm (0.0472 in.)
	AC	1.22 mm (0.0480 in.)
	BB	1.24 mm (0.0488 in.)
	CA	1.26 mm (0.0496 in.)
	CC	1.28 mm (0.0503 in.)
	DB	1.30 mm (0.0511 in.)
	EA	1.32 mm (0.0519 in.)
	EC	1.34 mm (0.0527 in.)
	FB	1.36 mm (0.0535 in.)
	GA	1.38 mm (0.0543 in.)
	GC	1.40 mm (0.0551 in.)
	HB	1.42 mm (0.0559 in.)
	JA	1.44 mm (0.0566 in.)
	JC	1.46 mm (0.0574 in.)
	KB	1.48 mm (0.0582 in.)
	LA	1.50 mm (0.0590 in.)
	LC	1.52 mm (0.0598 in.)
	MB	1.54 mm (0.0606 in.)
	NA	1.56 mm (0.0614 in.)
	NC	1.58 mm (0.0622 in.)
	PB	1.60 mm (0.0629 in.)
	QA	1.62 mm (0.0637 in.)
	QC	1.64 mm (0.0645 in.)

Washer thickness RH side	Mark	
	AA	1.47 mm (0.0578 in.)
	AB	1.50 mm (0.0590 in.)
	AC	1.53 mm (0.0602 in.)
	BA	1.56 mm (0.0614 in.)
	BB	1.59 mm (0.0625 in.)
	BC	1.62 mm (0.0637 in.)
	CA	1.65 mm (0.0649 in.)
	CB	1.68 mm (0.0661 in.)
	CC	1.71 mm (0.0673 in.)
	DA	1.74 mm (0.0685 in.)
	DB	1.77 mm (0.0696 in.)
	DC	1.80 mm (0.0708 in.)
	EA	1.83 mm (0.0720 in.)
	EB	1.86 mm (0.0732 in.)
	EC	1.89 mm (0.0744 in.)
	FA	1.92 mm (0.0755 in.)
	FB	1.95 mm (0.0767 in.)
	FC	1.98 mm (0.0779 in.)
	GA	2.01 mm (0.0790 in.)
	GB	2.04 mm (0.0803 in.)
	GC	2.07 mm (0.0814 in.)
	HA	2.10 mm (0.0826 in.)
	HB	2.13 mm (0.0838 in.)
	HC	2.16 mm (0.0850 in.)
	JA	2.19 mm (0.0862 in.)
	JB	2.22 mm (0.0874 in.)
	JC	2.25 mm (0.0885 in.)
	KA	2.28 mm (0.0897 in.)
	KB	2.31 mm (0.0909 in.)
	KC	2.34 mm (0.0921 in.)
	LA	2.37 mm (0.0933 in.)
	LB	2.40 mm (0.0944 in.)
	LC	2.43 mm (0.0956 in.)
	MA	2.46 mm (0.0968 in.)
	MB	2.49 mm (0.0980 in.)
	MC	2.52 mm (0.0992 in.)
	NA	2.55 mm (0.1003 in.)
	NB	2.58 mm (0.1015 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft*lbf
Transfer gear nut (For use with SST(s))	STD	277	2,820	204
	Max.	378	3,855	279
Ring gear mount set bolt		78	790	57
Transfer case x Transfer RH bearing retainer sub-assembly		28	286	21
Transfer case x Transfer extension housing		26	260	19
Transfer case x Transfer & transaxle setting stud bolt		39	400	29
Transfer extension housing x Transfer dynamic damper		26	260	19
Transfer case cover No. 1 x Transfer case breather oil deflector		6.5	66	57 in.*lbf
Transfer case x Transfer case cover No. 1		20	200	14
Transaxle assembly x Transfer assembly		69	700	51
Transfer case No. 1 plug x Transfer case		49	500	36
Transfer case No. 2 plug x Transfer Case		49	500	36
Transfer drain plug x Transfer case		49	500	36

PROPELLER SHAFT

SERVICE DATA

Propeller shaft assembly swing	Maximum: 0.8 mm (0.031 in.)
Propeller shaft assembly rear swing	Maximum: 0.8 mm (0.031 in.)
Intermediate shaft runout	Maximum: 0.8 mm (0.031 in.)
Intermediate shaft front flange runout	Maximum: 0.1 mm (0.004 in.)
Intermediate shaft rear flange runout (horizontal direction)	Maximum: 0.1 mm (0.004 in.)
Intermediate shaft rear flange runout (vertical direction)	Maximum: 0.1 mm (0.004 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Intermediate shaft x Center support bearing assembly No. 1 (front) 1st	182	1,850	134
Intermediate shaft x Center support bearing assembly No. 1 (front) Loosen nut			
Intermediate shaft x Center support bearing assembly No. 1 (front) 2nd	69	700	51
Intermediate shaft x Center support bearing assembly No. 1 (rear) 1st	182	1,850	134
Intermediate shaft x Center support bearing assembly No. 1 (rear) Loosen nut			
Intermediate shaft x Center support bearing assembly No. 1 (rear) 2nd	69	700	51
Propeller shaft assembly x Front flange	74	750	54
Propeller shaft assembly rear x Rear differential	74	750	54
Inter mediate shaft rear flange x Propeller shaft assembly rear	29	296	21
Center support bearing assembly No. 1 (front) x Body	37	375	27
Center support bearing assembly No. 1 (rear) x Body	37	375	27

DRIVE SHAFT

SERVICE DATA

Front drive shaft damper distance	225.5 to 229.5 mm (8.879 to 9.035 in.)
Front axle outboard joint boot LH No. 2 clamp	0.8 mm (0.031 in.)
Front axle inboard joint boot LH No. 2 clamp	0.8 mm (0.031 in.)
Rear drive shaft outboard joint boot LH clamp	1.3 mm (0.051 in.)
Rear drive shaft outboard joint LH No. 2 clamp	1.3 mm (0.051 in.)
Rear drive shaft inboard joint boot LH clamp	1.3 mm (0.051 in.)
Rear drive shaft inboard joint boot LH No. 2 clamp	1.3 mm (0.051 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wheel set nut	103	1,050	76
Front drive shaft x Front axle hub nut	294	3,000	217
Front speed sensor x Steering knuckle	8.0	82	71 in.*lbf
Front speed sensor wire x Front shock absorber	19	192	14
Front suspension arm sub-assembly lower No. 1 x Lower ball joint	127	1,300	94
Front drive shaft bearing set bolt	32	330	24
Rear wheel set nut	103	1,050	76
Rear drive shaft assembly x Rear axle shaft nut	294	3,000	217
Rear drive shaft assembly x Differential side gear shaft sub-assembly	56	571	41

DIFFERENTIAL

SERVICE DATA

Rear differential	Carrier oil seal drive in depth		2.0 +- 0.3 mm (0.079 +- 0.012 in.)
	Side gear shaft oil seal drive in depth		0 +- 0.5 mm (0 +- 0.019 in.)
	Companion flange vertical runout		0.10 mm (0.0039 in.) or less
	Companion flange horizontal runout		0.10 mm (0.0039 in.) or less
	Ring gear runout		0.07 mm (0.0028 in.) or less
	Side gear backlash		0.05 to 0.20 mm (0.0020 to 0.0079 in.)
	Drive pinion to ring gear backlash		0.13 to 0.18 mm (0.0051 to 0.0071 in.)
	Drive pinion preload (at starting)	New bearing	1.1 to 1.7 N*m (11 to 17 kgf*cm, 9.6 to 14.8 in.*lbf)
		Reused bearing	0.6 to 0.9 N*m (6 to 9 kgf*cm, 5.2 to 7.8 in.*lbf)
	Total preload (Drive pinion preload plus)		0.3 to 0.5 N*m (3 to 5 kgf*cm, 2.6 to 4.3 in.*lbf)
Rear differential	Side gear thrust washer thickness (mm (in.))		0.93 to 0.97 (0.0366 to 0.0382)
			0.98 to 1.02 (0.0386 to 0.0402)
			1.03 to 1.07 (0.0406 to 0.0421)
			1.08 to 1.12 (0.0425 to 0.0441)
			1.13 to 1.17 (0.0445 to 0.0461)
			1.18 to 1.22 (0.0465 to 0.0480)
			1 23 to 1.27 (0.0484 to 0.0500)
			1.28 to 1.32 (0.0504 to 0.0520)
			1.33 to 1.37 (0.0524 to 0.0539)
			1.38 to 1.42 (0.0543 to 0.0559)
Rear differential	Drive pinion plate washer thickness (mm (in.))		2.26 to 2.28 (0.0890 to 0.0898)
			2.29 to 2.31 (0.0902 to 0.0909)
			2.32 to 2.34 (0.0913 to 0.0921)
			2.35 to 2.37 (0.0925 to 0.0933)
			2.38 to 2.40 (0.0937 to 0.0945)
			2.41 to 2.43 (0.0949 to 0.0957)
			2.44 to 2.46 (0.0961 to 0.0969)
			2.47 to 2.49 (0.0972 to 0.0980)
			2.50 to 2.52 (0.0984 to 0.0992)
			2.53 to 2.55 (0.0996 to 0.1004)
			2.56 to 2.58 (0.1008 to 0.1016)
			2.59 to 2.61 (0.1020 to 0.1028)
			2.62 to 2.64 (0.1031 to 0.1039)
			2.65 to 2.67 (0.1043 to 0.1051)
			2.68 to 2.70 (0.1055 to 0.1063)

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

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft*lbf
Drain plug	49	500	36
Filler plug	49	500	36
Breather plug	21	210	15
Companion flange x Drive pinion	108	1,100	80
Companion flange x Propeller shaft	74	750	54
Differential case x Ring gear	97	985	71
Differential carrier x Side bearing cap	79	800	58
Differential carrier x Differential carrier cover	47	475	34
Rear differential support No.1 x Differential carrier assembly	103	1,050	76
Rear differential support No.1 x Rear suspension member sub-assembly	137	1,400	101
Differential carrier assembly x Rear suspension member sub-assembly	95	970	70

SUSPENSION CONTROL

SERVICE DATA

Air suspension	Amount of change in vehicle height		
		N → HI position: N → LO position: N → Get on and off mode position:	30 mm (1.18 in.) 15 mm (0.59 in.) 30 mm (1.18 in.)
	Time of change in vehicle height		
		N → HI position: HI → N position: N → LO position: LO → N position:	40 to 60 seconds 20 to 40 seconds 10 to 30 seconds 20 to 40 seconds
	Time of target height		
		4 people on the vehicle: 4 people out of the vehicle:	40 to 60 seconds 10 to 30 seconds

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft*lbf
Pneumatic cylinder assembly x Air tube	17	175	13
Height control compressor assembly x Height control dryer assembly	6.4	65	57 in.*lbf
Height control compressor x Rear height control compressor bracket	5.9	60	52 in.*lbf
Height control compressor bracket x Rear height control compressor bracket	19	194	14
Pneumatic w/ tube tank assembly x Body	29	296	21
Height control sensor sub-assembly front x Body	7.8	80	69 in.*lbf
Height control sensor sub-assembly front x Lower arm assembly	5.4	55	48 in.*lbf
Front disc wheel hub nut	103	1,050	76
Height control sensor sub-assembly rear x Rear suspension member sub-assembly	7.8	80	69 in.*lbf
Height control sensor sub-assembly rear x Rear suspension arm assembly No. 2	5.4	55	48 in.*lbf
Height control valve sub-assembly No. 1 x Body	5.4	55	48 in.*lbf
Height control valve sub-assembly No. 2x Body	5.4	55	48 in.*lbf
Suspension control ECU x Air conditioner amplifier assembly	7.8	80	69 in.*lbf

SUSPENSION

SERVICE DATA

Front wheel alignment	Vehicle height		
	Except air suspension FF	Front: A - B Rear: D - C	119 mm (4.71 in.) 41.1 mm (1.62 in.)
	Except air suspension 4WD	Front: A - B Rear: D - C	109.6 mm (4.32 in.) 31.1 mm (1.22 in.)
	Vehicle height		
	Air suspension FF	Front: A - B Rear: D - C	116.9 mm (4.60 in.) 41.1 mm (1.62 in.)
	Air suspension 4WD	Front: A - B Rear: D - C	111.9 mm (4.41 in.) 36.1 mm (1.42 in.)
Front wheel alignment	Toe-in (total) Rack end length difference		0° +- 12' (0° +- 0.16°) 0 +- 2 mm (0 +- 0.08 in.) 1.5 mm (0.059 in.) or less
	Wheel angle		
	Except air suspension FF	Inside wheel Outside wheel: Reference	35°28' +- 2° (35.47° +- 2°) 31°13' (31.22°)
	Except air suspension 4WD	Inside wheel Outside wheel: Reference	35°41' +- 2° (35.68° +- 2°) 31°22' (31.37°)
	Wheel angle		
	Air suspension FF	Inside wheel Outside wheel: Reference	35°42' +- 2° (35.70° +- 2°) 31°18' (31.30°)
	Air suspension 4WD	Inside wheel Outside wheel: Reference	35°48' +- 2° (35.80° +- 2°) 31°18' (31.30°)
Except air suspension Front wheel alignment	Camber	FF: 4WD: Right-left error	-0°40' +- 45' (-0.67° +- 0.75°) -0°35' +- 45' (-0.58° +- 0.75°) 45' (0.75°) or less
	Caster	FF: 4WD: Right-left error	2°51' +- 45' (2.85° +- 0.75°) 2°50' +- 45' (2.83° +- 0.75°) 45' (0.75°) or less
	Steering axis inclination	FF: 4WD: Right-left error	10°45' +- 45' (10.75° +- 0.75°) 10°45' +- 45' (10.75° +- 0.75°) 45' (0.75°) or less
Are suspension Front wheel alignment	Camber	FF: 4WD: Right-left error	-0°40' +- 45' (-0.67° +- 0.75°) -0°37' +- 45' (-0.62° +- 0.75°) 45' (0.75°) or less
	Caster	FF: 4WD: Right-left error	2°51' +- 45' (2.85° +- 0.75°) 2°40' +- 45' (2.67° +- 0.75°) 45' (0.75°) or less
	Steering axis inclination	FF: 4WD: Right-left error	10°42' +- 45' (10.70° +- 0.75°) 10°35' +- 45' (10.58° +- 0.75°) 45' (0.75°) or less
Front suspension	Lower ball joint turning torque		0.98 - 3.43 N*m (10 - 35 kgf*cm, 8.7 - 30 in.*lbf)
	Stabilizer bar link ball joint turning torque		0.05 - 1.96 N*m (0.5 - 20 kgf*cm, 0.4 - 17.4 in.*lbf)

A: Ground clearance of front wheel center
B: Ground clearance of lower suspension arm No.2 bush set bolt center
C: Ground clearance of rear axle carrier bush set bolt center
D: Ground clearance of rear wheel center

Rear wheel alignment	Toe-in (total)	
	Air suspension	0°18' +- 12' (0.3° +- 0.2° , 3 +- 2 mm, 0.12 +- 0.08 in.)
	Coil suspension	0°14' +- 9' (0.24° +- 0.16° , 3 +- 2 mm, 0.12 +- 0.08 in.)
	No.2 lower suspension arm length difference	
	2WD	1.5 mm (0.06 in.) or less
	4WD	1.0 mm (0.04 in.) or less
	Camber	
	Air suspension: 2WD	-1°21' +- 45' (-1.35° +- 0.75°)
	4WD	-0°55' +- 45' (-0.92° +- 0.75°)
	Coil suspension: 2WD	-1°20' +- 45' (-1.33° +- 0.75°)
	4WD	-0°50' +- 45' (-0.83° +- 0.75°)
	Right-left error	45' (0.75°) or less
Rear suspension	Stabilizer link ball joint turning torque	1.0*m (10 kgf*cm, 9 in*lbf) or less

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft*lbf
Tie rod end lock nut		74	755	55
Steering knuckle x Shock absorber		230	2,350	170
Hub nut		103	1,050	76
Suspension support x Body		80	816	59
Suspension support x Piston rod		49	500	36
Speed sensor wire harness bracket set bolt		19	194	14
Lower suspension arm set bolt	Front side:	200	2,040	148
	Rear side:	206	2,100	152
Front axle assembly x Lower ball joint assembly		127	1,300	94
Stabilizer bar bracket x Suspension member		16	163	12
Stabilizer bar link set nut		74	755	55
Hub nut		103	1,050	76
Tie rod adjusting tube set nut		56	570	41
Pneumatic shock absorber x Rear axle carrier		180	1,840	133
Pneumatic shock absorber x Body		58	590	43
Shock absorber with coil spring x Rear axle carrier		180	1,840	133
Shock absorber with coil spring x Body		58	590	43
Support assembly rear suspension x Shock absorber piston rod		49	500	36
Flexible hose set bolt		19	192	14
Skid control sensor wire set bolt		5.0	51	44 in.*lbf
Speed sensor set bolt		8.0	82	71 in.*lbf
Speed sensor wire set bolt		5.0	51	44 in.*lbf
Strut rod x Body		80	816	59
Strut rod x Rear axle carrier		80	816	59
Parking brake cable set bolt		39	400	29
Parking brake cable set nut		6.0	61	53 in.*lbf
Rear suspension member (4WD) set nut	Front side	115	1,173	85
	Rear side	181	1,846	134
Rear suspension arm assembly No.1 x Rear suspension member	2WD	120	1,224	89
	4WD	80	816	59
Rear suspension arm assembly No.1 x Rear axle carrier	2WD	112	1,140	83
	4WD	112	1,140	83
Rear suspension arm assembly No.2 x Rear suspension member	2WD	120	1,224	89
	4WD	100	1,020	74
Rear suspension arm assembly No.2 x Rear axle carrier	2WD	112	1,140	83
	4WD	112	1,140	83
Height control sensor x Rear suspension arm assembly No.		5.4	55	48 in.*lbf
Stabilizer link set nut		39	400	29
Stabilizer bar bracket set bolt		19	194	14
Stabilizer bar set bolt	Left side	54	550	40
	Right side	19	194	14

TIRE AND WHEEL

SERVICE DATA

	Tire size	Front	Rear
Cold tire inflation pressure	225/65R17 101S	210 kPa (2.1 kgf/cm^2, 30 psi)	210 kPa (2.1 kgf/cm^2, 30 psi)
	P235/55R18 99V		

Tire runout	1.0 mm (0.039 in.) or less
Imbalance after adjustment	8.0 g (0.018 lb) or less

BRAKE CONTROL

SERVICE DATA

Brake pedal stroke sensor	Standard voltage : 0.8 to 1.2 V

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft*lbf
Brake actuator with bracket Body		19	194	14
Brake actuator assembly x Brake tube		15	155	11
Brake actuator x Brake actuator bracket assembly		5.4	55	48 in.*lbf
Wheel nut		103	1,050	76
Front speed sensor x Steering knuckle		8.0	83	71 in.*lbf
Front speed sensor wire harness clamp x Shock absorber		29	300	22
Front speed sensor wire harness clamp x Body		5.0	51	44 in.*lbf
Rear speed sensor x Rear axle	4WD:	8.0	82	71 in.*lbf
Rear speed sensor wire harness clamp x Body		5.0	51	44 in.*lbf
Yawrate sensor x Body		14	143	10

BRAKE

SERVICE DATA

Brake pedal height (from asphalt sheet)		150.0 - 160.0 mm (5.906 - 6.299 in.)
Brake pedal free play		2.0 - 3.0 mm (0.079 - 0.118 in.)
Stop light switch clearance		0.5 - 2.6 mm (0.020 - 0.102 in.)
Pedal reserve distance from asphalt sheet at 490 N (50 kgf, 110 lbf)		More than 80mm (3.1 in.)
Brake booster push rod to piston clearance (w/ SST)		0 mm (0 in.)
Front brake pad thickness	Standard: Minimum:	11.0 mm (0.433 in.) 1.0 mm (0.039 in.)
Front brake disc thickness	Standard: Minimum:	28.0 mm (1.102 in.) 26.0 mm (1.024 in.)
Front brake disc runout	Maximum:	0.05 mm (0.0020 in.)
Rear brake pad thickness	Standard: Minimum:	10.0 mm (0.394 in.) 1.0 mm (0.039 in.)
Rear brake disc thickness	Standard: Minimum:	10.0 mm (0.394 in.) 8.5mm (0.335 in.)
Rear brake disc runout	Maximum:	0.15 mm (0.0059 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft*lbf
Bleeder plug	8.3	85	73 in.*lbf
Brake booster clevis look nut	26	265	19
Stop lamp switch assembly lock nut	17	173	13
Brake pedal support sub-assembly x Brake pedal sub-assembly	37	375	27
Brake master cylinder x Brake tube	15	155	11
Brake booster x Body	13	130	9
Brake pedal support sub-assembly x Body	13	130	9
Brake pedal support sub-assembly x Instrument panel reinforcement	20	204	15
Brake master cylinder x Brake booster	13	127	9
Wheel nut	103	1,050	76
Front brake cylinder mounting x Steering knuckle	104	1,061	77
Front brake cylinder x Front brake cylinder mounting	34	350	25
Front disc brake cylinder x Flexible hose	29	300	21
Rear disc brake cylinder mounting x Rear axle	78	799	58
Rear brake cylinder x Rear brake cylinder mounting	43	440	32
Rear disc brake cylinder x Flexible hose	29	300	21

PARKING BRAKE

SERVICE DATA

Parking brake pedal travel at 300 N (31 kgf, 68.3 lbf):		5 - 7 clicks
Rear brake disc inside diameter	Standard	190 mm (7.480 in.)
	Maximum	191 mm (7.520 in.)
Parking brake shoe lining thickness	Standard	2.5 mm (0.098 in.)
	Maximum	1.0 mm (0.039 in.)
Parking brake shoe clearance between rear shoe and lever		Less than 0.35 mm (0.014 in.)

TORQUE SPECIFICATIONS

Part Tightened		N*m	kgf*cm	ft.*lbf
Wheel nut		103	1,050	76
Parking brake cable lock nut		6	61	53 in.*lbf
Parking brake control pedal set bolt		39	400	29
Parking brake cable assembly No.1 x Body	Bolt	8.5	87	75 in.*lbf
	Nut	6	61	53 in.*lbf
Parking brake cable assembly No.3 x Body	Bolt A	8.5	87	75 in.*lbf
	Bolt B	39	400	29
	nut	6	61	53 in.*lbf
Parking brake cable assembly No.3 x Backing plate		8	82	71 in.*lbf

STEERING COLUMN

SERVICE DATA

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

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
Steering wheel set nut	50	510	37
Steering column assembly set bolts	26	265	19
Steering column assembly set nuts	26	265	19
Steering wheel pad set screw "Torx"	8.8	90	78 in.*lbf
Steering column assembly x Steering shaft universal joint assembly	35	360	26
Steering intermediate shaft sub-assembly x steering gear assembly	35	360	26
Multiplex tilt and telescopic ECU x Steering column assembly	1.5	15	13 in.*lbf
Tie rod end lock nut	74	750	54

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 (80 to 85 kgf/cm^2, 1,138 to 1,209 psi)
STEERING WHEEL		
Steering effort at idle speed	(Reference)	6.0 N*m (60 kgf*cm, 53 in.*lbf)
VANE PUMP ASSEMBLY/ VANE PUMP ASSEMBLY (From September, 2003)		
Vane pump rotating torque		0.27 N*m (2.8 kgf*cm, 2.4 in.*lbf) or less
Vane pump shaft and vane pump housing oil clearance	STD	0.027 to 0.054 mm (0.00106 to 0.00213 in.)
	Maximum	0.07 mm (0.0028 in.)
Vane plate thickness	Minimum	1.397 to 1.403 mm (0.0550 to 0.05524 in.)
Clearance between the rotor groove and plate	Maximum	0.03 mm (0.0012 in.)
Spring free length	Minimum	32.24 mm (1.2693 in.)
POWER STEERING LINK ASSEMBLY		
Tie rod assembly stad bolt torque	(Turning)	0.49 to 3.43 N*m (5.0 to 35.0 kgf*cm, 4.3 to 30.4 in.*lbf)
Steering rack runout	Maximum	0.3 mm (0.0118 in.)
Total preload (Control valve rotating torque)	(Turning)	1.2 to 1.5 N*m (12.2 to 15.3 kgf*cm, 10.6 to 13.3 in.*lbf)
Rack boot clamp clearance		3.0 mm (0.118 in.) or less

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft*lbf
VANE PUMP ASSEMBLY			
Pump bracket front x Housing front	43	438	32
Housing rear x Housing front	24	245	18
Pump bracket rear x Housing rear	43	438	32
Pressure port union	83	846	61
Suction port union set bolt	13	133	10
Pump pulley set nut	44	449	32
Pump assembly set bolt	43	438	32
Pressure feed tube assembly set union bolt	52	525	38
Oil pressure switch	21	214	15
VANE PUMP ASSEMBLY (From September, 2003)			
Pump bracket front x Housing front	44	449	32
Housing rear x Housing front	24	245	18
Pump bracket rear x Pump bracket front	44	449	32
Pressure port union	83	846	61
Suction port union set bolt	13	133	10
Pump assembly set bolt	43	438	32
Pressure feed tube assembly set union bolt	52	525	38
Oil pressure switch	21	214	15
POWER STEERING LINK ASSEMBLY			
Control valve housing set bolt	21	214	15
Control valve shaft lock nut	25	250	18
Rack housing cap	59	597	43
Rack guide spring cap lock nut	51 (69)	515 (699)	38 (51)
Rack x Rack end sub-assembly	50 (84)	505 (851)	37 (62)
Tie rod assembly lock nut	74	750	55
Turn pressure tube union nut	12 (13)	122 (127)	9 (9)
Steering link assembly set bolt	70	714	52
Pressure feed tube assembly union nut	22 (24.5)	230 (250)	16 (18)
Pressure feed tube clamp set bolt	9.8	100	87 in.*lbf
Pressure feed tube clamp set nut	9.8	100	87 in.*lbf
Stabilizer bracket No.1 x Suspension crossmember	16	163	12
Intermediate shaft assembly x Steering link assembly	35	360	26

( ): For use without SST

AIR CONDITIONING

SERVICE DATA

Refrigerant charge volume (Standard:)	550 to 650 (19.4 to 22.9 oz.)
Magnetic clutch clearance	0.35 to 0.60 mm (0.013 to 0.023 in.)

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
AIR CONDITIONING UNIT			
Air conditioning tube assembly x Cooler evaporator sub-assembly No. 1	3.5	35	30 in.*lbf
Air duct No. 2 x Air conditioner radiator assembly	2.5	25	22 in.*lbf
Instrument panel reinforcement assembly x Body	20	204	15
Air duct sub-assembly x Body	9.8	100	87 in.*lbf
Air conditioner unit assembly x Body	9.8	100	87 in.*lbf
Air duct No. 1 x Body	9.8	100	87 in.*lbf
Cowl top panel sub-assembly outer x Body (Nut A:)	80	816	59
BLOWER UNIT			
Blower assembly x Instrument panel reinforcement (Bolt:)	9.8	100	87 in.*lbf
Blower assembly x Body (Nut:)	9.8	100	87 in.*lbf
Air duct No. 2 x Blower assembly	2.5	25	22 in.*lbf
COMPRESSOR AND MAGNET CLUTCH			
Magnetic clutch hub x Cooler compressor assembly	18	183	13
Compressor and magnetic clutch x Engine	25	250	18
Bracket x Engine (Bolt E:)	5.0	51	44 in.*lbf
Cooler refrigerant suction hose No. 1 x Compressor and magnetic clutch	9.8	100	87 in.*lbf
Cooler refrigerant discharge hose No. 1 x Compressor and magnetic clutch	9.8	100	87 in.*lbf
Generator installation bolt (Bolt A:)	18	183	13
Generator installation bolt (Bolt B:)	58	591	43
CONDENSER			
Cap x Cooler condenser assembly	2.9	29	25 in.*lbf
Cooler condenser assembly x Radiator assembly	3.9	40	35 in.*lbf
Radiator support sub-assembly upper RH x Cooler condenser assembly (Bolt A:)	5.0	51	44 in.*lbf
Radiator support sub-assembly upper RH x Cooler condenser assembly (Bolt B:)	7.0	71	62 in.*lbf
Radiator support sub-assembly upper RH x Cooler condenser assembly (Bolt C:)	3.9	40	35 in.*lbf
Liquid tube sub-assembly A x Cooler condenser assembly	5.4	55	48 in.*lbf
Cooler refrigerant discharge pipe A x Cooler condenser assembly	5.4	55	48 in.*lbf
AIR CONDITIONER AMPLIFIER			
ECM x Body	5.5	56	49 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	7.6	78	68 in.*lbf
Front passenger airbag assembly x Instrument panel reinforcement	20	200	14
Curtain shield airbag assembly x Body	14	143	10
Center airbag sensor assembly x Body	17.5	179	13
Front airbag sensor x Body	9.0	92	80 in.*lbf
Side airbag sensor x Body	17.5	179	13
Rear airbag sensor x Body	17.5	179	13
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 Seat adjuster assembly	42	428	31
Front seat assembly x Body	37	377	27
FRONT SEAT OUTER BELT ASSEMBLY			
Front seat outer belt assembly x Body (Upper bolt)	7.5	77	66 in.*lbf
Front seat outer belt assembly x Body (Lower bolt)	42	428	31
Front seat outer belt assembly x Body (shoulder anchor side)	42	428	31
Front seat outer belt assembly x Body (floor anchor side)	42	428	31
REAR SEAT INNER BELT ASSEMBLY			
Rear seat belt assembly Inner x Rear seat frame assembly	42	428	31
Separate type rear seat cushion assembly x Rear seat frame assembly ("Torx" bolt)	21	214	16
Separate type rear seat cushion assembly x Rear seat frame assembly (Bolt)	18	184	13
Rear Seat assembly LH x Body	37	377	27
Fold seat stopper band assembly No. 2 x Body	9.0	92	80 in.*lbf
Separate type rear seat cushion assembly x Rear seat frame assembly ("Torx" bolt)	21	214	16
Separate type rear seat cushion assembly x Rear seat frame assembly (Bolt)	18	184	13
Center seat assembly x Rear seat frame assembly	21	214	16
Rear Seat assembly RH x Body	37	377	27
Fold seat stopper band assembly No. 1 x Body	9.0	92	80 in.*lbf
REAR SEAT OUTER BELT ASSEMBLY			
Rear seat outer belt assembly x Body (Upper bolt)	7.5	77	66 in.*lbf
Rear seat outer belt assembly x Body (Lower bolt)	42	428	31
Rear seat outer belt assembly x Body (shoulder anchor side)	42	428	31
Rear seat outer belt assembly x Body (floor anchor side)	42	428	31
Rope hook x Body	8.0	80	70 in.*lbf
Rear Seat assembly LH x Body	37	377	27
Fold seat stopper band assembly No. 2 x Body	9.0	92	80 in.*lbf
Rear Seat assembly RH x Body	37	377	27
Fold seat stopper band assembly No. 1 x Body	9.0	92	80 in.*lbf
REAR CENTER SEAT INNER BELT ASSEMBLY			
Rear center seat inner belt assembly x Body	42	428	31
Rear Seat assembly LH x Body	37	377	27
Fold seat stopper band assembly No. 2 x Body	9.0	92	80 in.*lbf
REAR CENTER SEAT OUTER BELT ASSEMBLY			
Rear center seat belt assembly x Rear seat frame assembly (Bolt)	7.5	77	66 in.*lbf
Rear center seat belt assembly x Rear seat frame assembly (Nut)	42	428	31
Rear seat belt hook x Rear seatback frame sub-assembly	6.0	61	53 in.*lbf
Rear seat lock striker x Rear seat frame assembly	33	337	24
Separate type rear seat cushion assembly x Rear seat frame assembly ("Torx" bolt)	21	214	16
Separate type rear seat cushion assembly x Rear seat frame assembly (Bolt)	18	184	13
Center seat assembly x Rear seat frame assembly	21	214	16
Rear Seat assembly RH x Body	37	377	27
Fold seat stopper band assembly No. 1 x Body	9.0	92	80 in.*lbf

CRUISE CONTROL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Distance Control ECU x Body	5	51	44 in.*lbf
Laser Radar Sensor x Body	50	510	37

LIGHTING

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Height control sensor x Rear suspension arm	5.4	55	48 in.*lbf
Headlight swivel ECU x Body	7.0	71	62 in.*lbf
Headlight leveling ECU x Body	7.0	71	62 in.*lbf

WIPER AND WASHER

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front wiper arm and blade assembly LH x Windshield wiper motor and link assembly	24	245	18
Front wiper arm and blade assembly RH x Windshield wiper motor and link assembly	24	245	18
Windshield wiper motor and link assembly x Body	7.0	71	62 in.*lbf
Windshield wiper motor and link assembly x Windshield wiper motor assembly	5.4	55	48 in.*lbf
Crank arm x Windshield wiper motor assembly	17	175	13
Rear wiper motor x Back door panel	5.5	56	49 in.*lbf
Rear wiper motor x Rear wiper arm	5.5	56	49 in.*lbf
Headlight washer actuator x Front bumper assembly	4.5	46	40 in.*lbf

DOOR LOCK

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear No. 1 seat outer belt assembly x Body	42	428	31

AUDIO / VISUAL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Antenna nut x Amplifier antenna	4.5	46	40 in.*lbf

HORN

TORQUE SPECIFICATIONS

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

OTHER SYSTEM

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Rear No. 1 seat outer belt assembly RH x Body	42	428	31
Rear No. 1 seat outer belt assembly LH x Body	42	428	31

WINDSHIELD / WINDOWGLASS

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Wiper arm x Wiper link	24	245	18
Rear wiper motor x Body	5.5	56	49 in.*lbf
Rear wiper motor x Rear wiper arm	5.5	56	49 in.*lbf

MIRROR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbft.*lbf
Inner rear view mirror x Front windshield	1.5	15	1.3 in.*lbf
Outer rear view mirror assembly x Front door	8.0	82	71 in.*lbf

INSTRUMENT PANEL

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Instrument Panel Reinforcement x Passenger Airbag	20	204	15

SEAT

TORQUE SPECIFICATIONS

Part tightened	N*m	kgf*cm	ft.*lbf
FRONT SEAT ASSEMBLY			
Front seat cushion frame sub-assembly x Seat adjuster assembly (Driver seat only)	19	194	14
Front seat side airbag assembly x Seat adjuster assembly	5.5	56	49 in.*lbf
Seat position sensor x Seat adjuster assembly (Driver seat only)	8.0	82	71 in.*lbf
Separate type front seatback cover bracket x Seat adjuster assembly	5.6	57	50 in.*lbf
Seat armrest assembly x Seat adjuster assembly	37	377	27
Front seat inner belt assembly x Seat adjuster assembly	42	428	31
Front seat assembly x Body	37	377	27
REAR SEAT ASSEMBLY (for LH Side)			
Fold seat cushion frame No. 1 x Rear seat track assembly inner	42	428	31
Fold seat cushion frame No. 1 x Rear seat track assembly outer	42	428	31
Reclining control link sub-assembly x Rear seat track assembly	42	428	31
Rear seatback frame sub-assembly lower x Rear seat track assembly	42	428	31
Rear seatback frame sub-assembly x Rear seatback frame sub-assembly lower	42	428	31
Seat track stop plate x Rear seatback frame sub-assembly lower	18	184	13
Rear seat belt hook x Rear seatback frame sub-assembly	6.0	61	53 in.*lbf
Rear seat belt assembly Inner x Rear seat frame assembly	42	428	31
Separate type rear seat cushion assembly x Rear seat frame assembly ("Torx" bolt)	21	214	16
Separate type rear seat cushion assembly x Rear seat frame assembly (Bolt)	18	184	13
Rear Seat assembly LH x Body	37	377	27
Fold seat stopper band assembly No. 2 x Body	9.0	92	80 in.*lbf
REAR SEAT ASSEMBLY (for RH Side)			
Fold seat cushion frame No. 2 x Rear seat track assembly inner	42	428	31
Fold seat cushion frame No. 2 x Rear seat track assembly outer	42	428	31

Part tightened	N*m	kgf*cm	ft.*lbf
Reclining control link sub-assembly x Rear seatback frame sub-assembly lower (Bolt)	21	214	16
Reclining control link sub-assembly x Rear seat track assembly (Nut)	42	428	31
Rear seatback frame sub-assembly lower x Rear seat track assembly ("Torx" bolt T45)	42	428	31
Rear seatback frame sub-assembly lower x Rear seat track assembly ("Torx" bolt T55)	80	816	59
Rear seatback frame sub-assembly x Rear seatback frame sub-assembly lower (Bolt)	55	561	41
Rear seatback frame sub-assembly x Rear seatback frame sub-assembly lower ("Torx" bolt T45)	42	428	31
Seat track stop plate x Rear seatback frame sub-assembly lower	18	184	13
Rear center seat belt assembly x Rear seat frame assembly (Bolt)	7.5	77	66 in.*lbf
Rear center seat belt assembly x Rear seat frame assembly (Nut)	42	428	31
Rear seat belt hook x Rear seatback frame sub-assembly	6.0	61	53 in.*lbf
Rear seat lock striker x Rear seat frame assembly	33	337	24
Rear seat belt assembly Inner x Rear seat frame assembly	42	428	31
Separate type rear seat cushion assembly x Rear seat frame assembly ("Torx" bolt)	21	214	16
Separate type rear seat cushion assembly x Rear seat frame assembly (Bolt)	18	184	13
Rear seatback lock sub-assembly x Center seatback frame sub-assembly	21	214	16
Rear seat armrest assembly center x Center seatback assembly	21	214	16
Rear seatback hinge sub-assembly center x Center seatback assembly	21	214	16
Center seat cushion assembly x Center seatback assembly	21	214	16
Center seat assembly x Rear seat frame assembly	21	214	16
Rear Seat assembly RH x Body	37	377	27
Fold seat stopper band assembly No. 1 x Body	9.0	92	80 in.*lbf
Rear center seat outer belt assembly x Rear seatback frame sub-assembly lower	42	428	31

ENGINE HOOD / DOOR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
HOOD			
Hood auxiliary catch hook assembly x Hood panel	7.0	71	62 in.*lbf
Hood auxiliary catch release lever assembly x Hood panel	7.0	71	62 in.*lbf
Hood hinge x Body	13	133	10
Hood hinge x Hood panel	13	133	10
Hood lock x Body	8.0	82	71 in.*lbf
Hood support rod x Body	19.5	199	14
FRONT DOOR			
Door check x Body	27	275	20
Door check x Door panel	8.0	82	71 in.*lbf
Door frame sub-assembly rear lower x Door panel	5.0	51	42 in.*lbf
Door glass x Front door regulator sub-assembly	8.0	82	71 in.*lbf
Door hinge x Body	26	265	19
Door hinge x Door panel	27	275	20
Door lock x Door panel	5.0	51	44 in.*lbf
Door lock striker x Body	23	235	17
Door outside handle cover x Door panel	7.0	71	62 in.*lbf
Door outside handle frame x Door panel	7.0	71	62 in.*lbf
Outside view mirror x Door panel	8.0	82	71 in.*lbf
Power window regulator motor x Window regulator	5.4	55	48 in.*lbf
Window regulator x Door panel	8.0	82	71 in.*lbf
REAR DOOR			
Door check x Body	27	275	20
Door check x Door panel	8.0	82	71 in.*lbf
Door division bar x Door panel	5.0	51	42 in.*lbf
Door hinge x Body	26	265	19
Door hinge x Door panel	27	275	20
Door lock x Door panel	5.0	51	44 in.*lbf
Door lock striker x Body	23	235	17
Door outside handle cover x Door panel	7.0	71	62 in.*lbf
Door outside handle frame x Door panel	7.0	71	62 in.*lbf
Power window regulator motor x Window regulator	5.4	55	48 in.*lbf
Window regulator x Door panel	8.0	82	71 in.*lbf
BACK DOOR			
Back door hinge x Body	11.5	117	8
Back door hinge x Door panel	8.0	82	71 in.*lbf
Back door stay sub-assembly x Body	8.0	82	71 in.*lbf
Back door stay sub-assembly x Door panel	8.0	82	71 in.*lbf
Back door lock assembly x Door panel	13	133	10
Luggage compartment door closer assembly x Body	31	316	23
Power back door sensor x Door panel	3.5	36	31 in.*lbf
Door lock striker x Body	23	235	17
Power back door drive unit x Body panel	31	316	23

EXTERIOR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
FRONT BUMPER			
Front bumper reinforcement x Body	77	780	57
Front bumper stay No. 2 x Body	8.0	82	71 in.*lbf
Front bumper side support x Body	3.0	31	27 in.*lbf
Front bumper cover lower x Body	8.0	82	71 in.*lbf
REAR BUMPER			
Rear bumper cover x Body (Bolt:)	8.0	82	71 in.*lbf
Rear bumper cover x Body (Nut:)	8.0	82	71 in.*lbf
Rear bumper side support x Body	3.0	31	27 in.*lbff
Rear bumper side retainer x Body	3.0	31	27 in.*lbf
Rear bumper reinforcement No.1 x Body	27	275	20
REAR SPOILER			
Rear spoiler x Door panel	9.8	99	87 in.*lbf
BACK DOOR GARNISH			
Back door garnish x Body	9.8	99	87 in.*lbf

INTERIOR

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	ft.*lbf
Front seat outer belt assembly set bolt	42	428	31
Rear No.1seat outer belt assembly set bolt	42	428	31

SLIDING ROOF

TORQUE SPECIFICATIONS

Part Tightened	N*m	kgf*cm	in.*lbf
Sliding roof glass assembly x Drive cable	5.5	56	49
Siding roof drive gear sub-assembly x Body	8.0	82	71