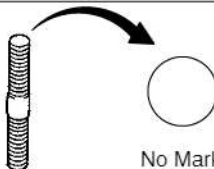
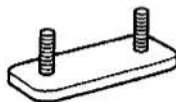
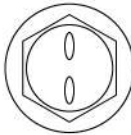
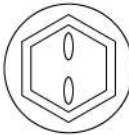


STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

030UK-08

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

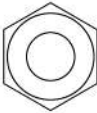
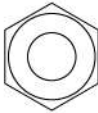
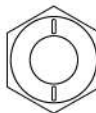
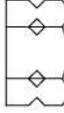
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SPECIFIED TORQUE FOR STANDARD BOLTS

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

cardiagn.com

HOW TO DETERMINE NUT STRENGTH

Nut Type			Class
Present Standard Hexagon Nut	Old Standard Hexagon Nut		
	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

*: Nut with 1 or more marks on one side surface of the nut.

HINT:

Use the nut with the same number of the nut strength classification or the greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example: Bolt = 4T

Nut = 4N or more

AVENSIS Supplement (RM1045E)

ENGINE CONTROL SYSTEM

SERVICE DATA

031TB-01

2AZ-FSE:

Camshaft timing oil control valve assy Resistance	1 (-) - 2 (+)	6.9 to 7.9 Ω at 20°C (68°F)
Mass air flow meter Resistance	4 (THA) - 5 (E2)	13.6 to 18.4 k Ω at -20°C (-4°F) 2.21 to 2.69 k Ω at 20°C (68°F) 0.493 to 0.667 k Ω at 60°C (140°F)
Engine coolant temperature sensor Resistance	1 (E2) - 2 (THW)	2.32 to 2.59 k Ω at 20°C (68°F) 0.310 to 0.326 k Ω at 80°C (176°F)
Throttle body assy Resistance	1 (M-) - 2 (M+) 3 (E2) - 5 (VC)	0.3 to 100 Ω at 20°C (68°F) 1.2 to 3.2 k Ω at 20°C (68°F)
Knock sensor Resistance	1 (Ground) - 2 (Output)	120 to 280 k Ω at 20°C (68°F)
Accelerator pedal rod assy Resistance	3 (EP1) - 6 (VCP1) 1 (EP2) - 4 (VCP2)	2.25 to 4.75 k Ω 2.25 to 4.75 k Ω
Voltage	3 (EP1) - 5 (VPA1) 1 (EP2) - 2 (VPA2)	0.4 to 4.6 V 0.9 to 4.7 V
Main relay Resistance	3 - 5 3 - 5 (Apply battery voltage to terminal 1 and 2)	10 k Ω or higher Below 1 Ω
Circuit opening relay Resistance	3 - 5 3 - 5 (Apply battery voltage to terminal 1 and 2)	10 k Ω or higher Below 1 Ω

1CD-FTV:

Mass air flow meter Resistance	2 (THA) - 1 (E2) at -20°C (-4°F) at 20°C (68°F) at 60°C (140°F)	12.5 to 16.9 k Ω 2.19 to 2.67 k Ω 0.50 to 0.68 k Ω
Intake shutter assy Resistance	1 (VC) - 2 (E2)	4.0 to 8.0 k Ω
Accelerator pedal assy Resistance	VPA1 - EP1 VPA2 - EP2 VCP1 - EP1 VCP2 - EP2	5.0 k Ω or less 5.0 k Ω or less 1.5 to 6.0 k Ω 1.5 to 6.0 k Ω
Diesel turbo inlet air temperature sensor Resistance	at 20°C (68°F)	2.21 to 2.65 k Ω
Crankshaft position sensor Resistance	at cold at hot	1630 to 2740 Ω 2065 to 3225 Ω
Camshaft position sensor Resistance	at cold at hot	1630 to 2740 Ω 2065 to 3225 Ω
Diesel engine engine coolant temperature sensor Resistance	at 20°C (68°F) at 80°C (176°F)	2.32 to 2.59 k Ω 0.310 to 0.326 k Ω
Fuel temperature sensor Resistance	THF - E2 at 20°C (68°F) at 80°C (176°F)	2.21 to 2.69 k Ω 0.287 to 0.349 k Ω

SERVICE SPECIFICATIONS - ENGINE CONTROL SYSTEM

EDU relay		
Specified condition	3 – 5	10 k Ω or higher
3 – 5 (When battery voltage is applied to terminals 1 and 2)		Below 1 Ω
EFI main relay		
Specified condition	3 – 5	10 k Ω or higher
3 – 5 (When battery voltage is applied to terminals 1 and 2)		Below 1 Ω

TORQUE SPECIFICATION

2AZ-FSE:

Part Tightened	N·m	kgf·cm	ft·lbf
Throttle body assy x Intake manifold	9.0	90	80 in·lbf
Throttle body bracket x Cylinder head sub-assy	20	210	15
Throttle body bracket x Throttle body assy	20	210	15
Ground terminal x Throttle body bracket	8.4	86	74 in·lbf
Wiring harness protector x Throttle body bracket	8.4	86	74 in·lbf
Air cleaner hose No. 1 x Throttle body assy	1.5	15	13 in·lbf
Engine cover sub-assy x Cylinder head cover sub-assy	9.0	92	80 in·lbf
Engine wire No. 3 x Battery	5.4	55	48 in·lbf
Knock sensor x Cylinder block sub-assy	20	204	15
Accelerator pedal assy x Body	5.4	55	48 in·lbf

1CD-FTV:

Part Tightened	N·m	kgf·cm	ft·lbf
Intake shutter assy x Intake air connector	21	209	15
Engine cover sub-assy No. 1 x Cylinder head cover sub-assy	8.0	82	71 in·lbf
Engine cover sub-assy No. 1 x Intake manifold	8.0	82	71 in·lbf
Air tube No. 2 x Transmission	25	255	18
Air tube No. 1 x Air tube No. 2	25	255	18
ECM x Body	5.5	56	49 in·lbf
Air hose No. 4 x Intake shutter assy	6.0	61	53 in·lbf
Battery clamp x Body	5.0	51	44 in·lbf

FUEL

SERVICE DATA

031E0-02

2AZ-FSE:

Fuel pressure	at idle Engine stopped	196 to 588 kPa (2 to 6 kgf/cm ² , 28 to 85 psi) 147 kPa (1.5 kgf/cm ² , 21 psi) or more
Fuel high pressure	at idle	9.5 to 10.5 MPa (97 to 107 kgf/cm ² , 1,380 to 1,520 psi)
Fuel injector assy Resistance	1 - 2	2.55 to 2.85 Ω at 20°C (68°F)
Fuel pump assy Resistance	1 - 2	1.19 to 1.39 Ω at 20°C (68°F)
Fuel pump assy Resistance	4 - 5	0.2 to 3.0 Ω at 20°C (68°F)
Compression spring (Exhaust pipe assy center x Exhaust pipe assy tail) Free length	Minimum	38.5 mm (1.516 in.)

1CD-FTV:

Injection or supply pump assy Resistance	at 20°C (68°F)	1.6 to 2.6 Ω
Injector assy Resistance	at 20°C (68°F)	0.45 to 1.45 Ω
Common rail assy Resistance	PR - E2 PR2 - E2S VC - PR VCS - PR2	16.4 k Ω or less 16.4 k Ω or less 3 k Ω or less 3 k Ω or less
Pressure discharge valve Resistance	at 20°C (68°F)	0.45 to 1.45 Ω
Fuel heater assy Resistance	at 20°C (68°F)	0.5 to 20 Ω
Level warning switch Specified condition	When raising the float When letting the float down	Below 1 Ω 10 k Ω or higher
Fuel temperature sensor Resistance	at 20°C (68°F) at 80°C (176°F)	2.21 to 2.69 Ω 0.287 to 0.349 Ω

TORQUE SPECIFICATION

2AZ-FSE:

Part Tightened	N·m	kgf·cm	ft·lbf
Nozzle holder clamp x Cylinder head sub-assy	13	127	9
Fuel delivery pipe sub-assy x Cylinder head sub-assy	19	194	14
Surge tank stay No. 1 x Cylinder block sub-assy	21	210	15
Engine wire x Surge tank stay No. 1	9.8	100	7
Stud bolt x Cylinder head sub-assy	9.5	97	84 in.·lbf
Intake manifold x Cylinder head sub-assy	30	306	22
Intake manifold x Cylinder block sub-assy	30	306	22
Vacuum sensor assy x Body (LHD Steering position type)	5.5	56	49 in.·lbf
Engine wire No. 3 (Battery negative terminal) x Battery	5.4	55	48 in.·lbf
Fuel pump assy x Cylinder head cover sub-assy	25	255	18
Fuel pipe sub-assy No. 1 x Fuel delivery pipe sub-assy	9.0	92	80 in.·lbf
Fuel pipe sub-assy No. 1 x Fuel pump assy	30	306	22
Fuel tube sub-assy x Fuel pump assy	33	331	24
Fuel tank band sub-assy No. 1 x Body	40	400	29
Fuel tank band sub-assy No. 1 LH x Body	40	400	29
Parking brake cable assy No. 3 x Body	5.0	51	44 in.·lbf
Parking brake cable assy No. 2 x Body	5.0	51	44 in.·lbf
Fuel tank protector No. 1 x Body	5.4	55	48 in.·lbf
Fuel tank protector No. 1 x Fuel tank band sub-assy No. 1	5.4	55	48 in.·lbf
Rear floor heat insulator front x Body	5.5	56	49 in.·lbf
Rear floor heat insulator front x Fuel tank band sub-assy	5.5	55	49 in.·lbf
Exhaust pipe assy center x Exhaust pipe assy front	43	440	32
Exhaust pipe assy center x Exhaust pipe assy tail	43	440	32

1CD-FTV:

Part Tightened	N·m	kgf·cm	ft·lbf
Nozzle holder clamp x Cylinder head sub-assy	27	270	20
Nozzle leakage pipe assy x Injector assy	Hollow screw Union bolt	16 20	12 15
Nozzle leakage pipe No. 2 x Cylinder head sub-assy	8.8	90	78 in.·lbf
Injection pipe sub-assy No. 1 - No. 4 x Injector assy			
Used pipe with SST	36	372	27
Used pipe without SST	40	408	30
New pipe with SST	31	316	23
New pipe without SST	34	347	25
Injection pipe sub-assy No. 1 - No. 4 x Common rail assy			
with SST	31	316	23
without SST	34	347	25
Injection pipe No. 3 x Exhaust fuel addition injector			
with SST	22	223	16
without SST	24	240	17
Fuel inlet pipe sub-assy x Common rail assy			
with SST	31	316	23
without SST	34	347	25
Fuel inlet pipe sub-assy x Injection pump assy			
with SST	31	316	23
without SST	34	347	25
Air cleaner case x Body	7.0	71	62 in.·lbf
Engine cover sub-assy No. 1 x Cylinder head cover sub-assy	8.0	82	71 in.·lbf
Engine cover sub-assy No. 1 x Intake manifold	8.0	82	71 in.·lbf
Vacuum reservoir sub-assy x Cowl top panel outer	8.3	85	73 in.·lbf
Injection or supply pump assy x Water pump assy	21	209	15

AVENSIS Supplement (RM1045E)

SERVICE SPECIFICATIONS - FUEL

Part Tightened	N·m	kgf·cm	ft·lbf
Injection pump drive pulley x Injection pump assy	64	653	47
Intake manifold insulator No. 1 x Intake manifold	5.0	51	44 in·lbf
Common rail assy x Cylinder head sub-assy	43	438	32
Front wheel	103	1,050	76
Injector driver x Body	5.5	56	49 in·lbf
Cylinder head cover sub-assy x Cylinder head sub-assy	13	135	9.8
Fuel pipe No. 3 x Cylinder head cover sub-assy	5.0	51	44 in·lbf
Fuel pipe No. 3 x Injection or supply pump	27	275	20
Air tube No. 1 x Turbocharger	6.0	61	53 in·lbf
Air tube No. 1 x Air tube No. 2	25	255	18
Injection pump stay No. 1 x Cylinder block	21	209	15

EMISSION CONTROL

SERVICE DATA

031FF-02

2AZ-FSE:

Vacuum switching valve assy No. 1 Resistance	1 - 2	26 to 30 Ω at 20°C (68°F)
Heated oxygen sensor Resistance	1 (HT) - 2 (+B) 1 (HT) - 4 (E1)	11 to 16 Ω at 20°C (68°F) 10 k Ω or higher

1CD-FTV:

Exhaust fuel addition injector assy Resistance	at 20°C (68°F)	11.6 to 12.4 Ω
Exhaust gas temperature sensor Resistance	at 20°C (68°F)	242k Ω
Air fuel ratio sensor Resistance	1 (HT) - 2 (+B) 1 (HT) - 4 (AF-)	0.8 to 1.4 Ω at 20°C (68°F) 10 k Ω or higher
EGR valve position sensor Resistance	at 20°C (68°F)	4.0 to 6.0 k Ω
EGR valve assy Resistance	at 20°C (68°F)	6.5 to 7.5 Ω

INTAKE

SERVICE DATA

031FQ-02

2AZ-FSE:

Vacuum switching valve assy No. 1		
Resistance	1 - 2	33 to 39 Ω at 20°C (68°F)
	1 - Body	10 k Ω or higher
	2 - Body	10 k Ω or higher

1CD-FTV:

Turbocharging pressure		
Standard pressure		15 to 45 kPa (0.15 to 0.46 kgf/cm ² , 2.2 to 6.5 psi)
Turbo pressure sensor		
Voltage	3 (VC) - 1 (E2)	4.5 to 5.5 V
Voltage drop	apply vacuum 13.3 kPa (100 mmHg, 3.94 in.Hg)	0.1 to 0.3 V
	apply vacuum 26.7 kPa (200 mmHg, 7.87 in.Hg)	0.3 to 0.5 V
	apply vacuum 40.0 kPa (300 mmHg, 11.81 in.Hg)	0.5 to 0.7 V
	apply vacuum 57.3 kPa (400 mmHg, 15.75 in.Hg)	0.7 to 0.9 V
	apply vacuum 66.7 kPa (500 mmHg, 19.96 in.Hg)	0.9 to 1.0 V
Voltage up	applied vacuum 19.6 kPa (0.20 kgf/cm ² , 2.84 psi)	0.1 to 0.4 V
	applied vacuum 39.2 kPa (0.40 kgf/cm ² , 5.69psi)	0.4 to 0.7 V
	applied vacuum 58.8 kPa (0.60 kgf/cm ² , 8.53psi)	0.7 to 1.0 V
	applied vacuum 78.5 kPa (0.80 kgf/cm ² , 11.4psi)	1.0 to 1.3 V
	applied vacuum 98.0 kPa (1.00 kgf/cm ² , 14.2psi)	1.3 to 1.6 V
Vacuum regulating valve assy		
Resistance	at 20°C (68°F)	10 to 14 Ω

TORQUE SPECIFICATION

1CD-FTV:

Part Tightened		N·m	kgf·cm	ft·lbf
Turbo water pipe sub-assy No.1 x Turbocharger sub-assy		13	135	9.8
Turbocharger sub-assy x Exhaust manifold		60	612	44
Turbo oil outlet pipe x Turbocharger sub-assy		13	135	9.8
Manifold converter sub-assy x Turbocharger sub-assy	1st	8.0	82	71 in.·lbf
	2nd	25	255	18
Manifold stay x Manifold converter sub-assy	1st	8.0	82	71 in.·lbf
	2nd	61	622	45
Manifold stay x Cylinder block sub-assy	1st	8.0	82	71 in.·lbf
	2nd	61	622	45
Turbocharger stay x Turbocharger sub-assy	1st	8.0	82	71 in.·lbf
	2nd	56	571	41
Turbocharger stay x Cylinder head sub-assy	1st	8.0	82	71 in.·lbf
	2nd	56	571	41
Manifold stay No. 2 x Manifold converter sub-assy	1st	8.0	82	71 in.·lbf
	2nd	56	571	41
Manifold stay No. 2 x Cylinder head sub-assy	1st	8.0	82	71 in.·lbf
	2nd	56	571	41
Exhaust manifold heat insulator No. 2 x Turbocharger sub-assy		12	122	8.9
Turbo insulator No. 1 x Manifold converter sub-assy		20	204	15
Turbo insulator No. 1 x Turbocharger sub-assy		20	204	15
Turbo insulator No. 2 x Manifold converter sub-assy		20	204	15
Exhaust pipe assy x Heater bracket sub-assy	w/ Cold area	7.5	76	66 in.·lbf
Exhaust pipe assy x Body	w/ Cold area	7.5	76	66 in.·lbf
Heater bracket x Body	w/ Cold area	7.5	76	66 in.·lbf
Heater pump assy x Heater bracket	w/ Cold area	7.5	76	66 in.·lbf
Air tube No. 1 x Air tube No. 2		25	255	18
Air tube No. 1 x Intake air connector		25	255	18
Air tube No. 1 x Cylinder head cover		25	255	18
Air tube No. 1 x Engine mounting bracket FR		25	255	18
Air cleaner case x Body		7.0	71	62 in.·lbf
Engine cover No. 1 x Cylinder head cover sub-assy		8.0	82	71 in.·lbf
Engine cover No. 1 x Intake manifold		8.0	82	71 in.·lbf
Vacuum reservoir sub-assy x Cowl top panel outer		8.3	85	73 in.·lbf
EGR pipe insulator x EGR		12	122	8.9

ENGINE MECHANICAL

SERVICE DATA

031H1-02

2AZ-FSE:

Battery specific gravity	at 20°C (68°F)	1.25 to 1.29
Ignition timing	w/ Terminals TC and CG of DLC3 connected w/ Terminals TC and CG of DLC3 disconnected	8 to 12° BTDC 5 to 23° BTDC
Idle speed		625 to 725 rpm
Compression	Compression pressure Minimum pressure Difference between each cylinder	1.3 MPa (13.3 kgf/cm ² , 189 psi) 1.0 MPa (10.2 kgf/cm ² , 145 psi) 0.1 MPa (1.0 kgf/cm ² , 14 psi)
Cylinder head set bolt Bolt length	Standard Maximum	161.3 to 162.3 mm (6.350 to 6.390 in.) 164.2 mm (6.465 in.)
Valve clearance		
Intake	(Cold)	0.19 to 0.29 mm (0.0075 to 0.0114 in.)
Exhaust		0.30 to 0.40 mm (0.0118 to 0.0157 in.)

1CD-FTV:

New drive belt deflection	Pressing force: 98 N (10 kgf, 22 lbf) For vane pump V belt (A/C equipped) For vane pump V belt (A/C not equipped)	8.0 to 10.5 mm (0.31 to 0.41 in.) 10 to 12 mm (0.39 to 0.47 in.)
Used drive belt deflection	Pressing force: 98 N (10 kgf, 22 lbf) For vane pump V belt (A/C equipped) For vane pump V belt (A/C not equipped)	10.5 to 12.5 mm (0.41 to 0.49 in.) 14 to 17 mm (0.55 to 0.67 in.)
New drive belt tension	For vane pump V belt (A/C equipped) For vane pump V belt (A/C not equipped)	647 to 843 N (66 to 86 kgf, 145 to 189 lbf) 686 to 784 N (70 to 80 kgf, 154 to 176 lbf)
Used drive belt tension	For vane pump V belt (A/C equipped) For vane pump V belt (A/C not equipped)	441 to 637 N (45 to 65 kgf, 99 to 143 lbf) 294 to 441 N (30 to 45 kgf, 66 to 99 lbf)
Idle speed		750 to 850 rpm.
Maximum speed		5,100 to 5,250 rpm.
Compression pressure	at 250 rpm. Minimum	2,628 kPa (26.8 kgf/cm ² , 381 psi) or more 2,157 kPa (22.0 kgf/cm ² , 312 psi) or more
Difference between each cylinder		490 kPa (5.0 kgf/cm ² , 71 psi) or less
Cylinder head set bolt Outside diameter	Standard	10.40 to 11.00 mm (0.4094 to 0.4331 in.)
Valve clearance		
Intake	(cold)	0.20 to 0.30 mm (0.008 to 0.012 in.)
Exhaust		0.35 to 0.45 mm (0.014 to 0.018 in.)
Adjusting shim thickness	Mark 2.500 Mark 2.550 Mark 2.600 Mark 2.650 Mark 2.700 Mark 2.750 Mark 2.800 Mark 2.850 Mark 2.900 Mark 2.950 Mark 3.000 Mark 3.050 Mark 3.100 Mark 3.150 Mark 3.200 Mark 3.250 Mark 3.300	2.500 mm (0.0984 in.) 2.550 mm (0.1004 in.) 2.600 mm (0.1024 in.) 2.650 mm (0.1043 in.) 2.700 mm (0.1063 in.) 2.750 mm (0.1083 in.) 2.800 mm (0.1102 in.) 2.850 mm (0.1122 in.) 2.900 mm (0.1142 in.) 2.950 mm (0.1161 in.) 3.000 mm (0.1181 in.) 3.050 mm (0.1201 in.) 3.100 mm (0.1220 in.) 3.150 mm (0.1240 in.) 3.200 mm (0.1260 in.) 3.250 mm (0.1280 in.) 3.300 mm (0.1299 in.)

TORQUE SPECIFICATION

2AZ-FSE:

Part Tightened		N·m	kgf·cm	ft·lbf
Front wheel RH		103	1,050	76
Drain plug (M/T)		49	500	36
Engine hanger No.1 x Cylinder head		38	387	28
Engine hanger No.2 x Cylinder head		38	387	28
Engine coolant temperature sensor x Cylinder head		20	208	15
Knock sensor x Cylinder block		20	208	15
Engine oil pressure switch assy x Cylinder head		15	153	11
Water by-pass pipe No.1 x Cylinder block		9.0	92	80 in.·lbf
Water by-pass pipe No. 3 x Cylinder block		9.0	92	80 in.·lbf
Oil cooler pipe x Cylinder block		9.0	92	80 in.·lbf
Drive shaft bearing bracket x Cylinder block		54	551	40
Oil level gauge guide x Cylinder block		9.0	92	80 in.·lbf
V-ribbed belt tensioner assy x Timing chain cover		60	607	44
Ignition coil assy x Cylinder head		9.0	92	80 in.·lbf
Water inlet x Cylinder block		9.0	92	80 in.·lbf
Exhaust manifold converter x Cylinder head		37	378	27
Exhaust manifold stay x Exhaust manifold converter		44	449	32
Exhaust manifold heat insulator No. 1 x Exhaust manifold converter		12	122	9
Surge tank stay No. 1 x Intake manifold		21	210	15
Intake manifold x Cylinder head		30	306	22
Throttle Body bracket x Throttle body		21	210	15
Drive plate & ring gear x Crankshaft		98	1,000	72
Transverse engine engine mounting bracket front x Transverse engine engine mounting insulator front		87	887	64
Transverse engine engine mounting bracket rear x Transverse engine engine mounting insulator rear		87	887	64
Front suspension cross member sub-assy front x Body	Bolt	45	459	33
	Nut	133	1,356	98
Front suspension brace RH x Frame	Bolt A	133	1,356	98
	Bolt B	80	816	59
Front suspension brace LH x Frame	Bolt A	133	1,356	98
	Bolt B	80	816	59
Transverse engine engine mounting insulator LH x Engine mounting bracket LH		87	887	64
Transverse engine engine mounting insulator RH x Engine mounting bracket RH		52	530	38
Engine mounting bracket x No. 2 RH x Transverse engine engine mounting insulator	A	52	530	38
	B	113	1,152	83
Vane pump assy x Timing chain cover		37	370	27
Front suspension arm sub-assy lower No. 1 x Lower ball joint		127	1,296	94
Front stabilizer link assy x Front suspension		74	755	55
Floor panel brace front x Floor		30	306	22
Engine service cover bracket RH x Body	RHD steering position type	9.0	92	80 in.·lbf
Cooler bracket x Body	LHD steering position type	9.0	92	80 in.·lbf
Oil reservoir bracket No. 1 x Body		8.0	82	71 in.·lbf
Return tube sub-assy x Frame		8.0	82	71 in.·lbf
Radiator reserve tank Sub-assy x Body		5.0	51	44 in.·lbf
Compressor and magnetic clutch x Cylinder block		25	255	18
Radiator relay block x Frame		5.0	51	44 in.·lbf

SERVICE SPECIFICATIONS - ENGINE MECHANICAL

Part Tightened		N·m	kgf·cm	ft·lbf
Engine cover No. 1 x Cylinder head cover		9.0	92	80 in.·lbf
Air cleaner assy x Body		5.0	51	44 in.·lbf
Cylinder head x Cylinder block	1st 2nd	79 Turn 90°	806 Turn 90°	58 Turn 90°
Camshaft timing oil control valve assy x Cylinder head		9.0	92	79 in.·lbf
Camshaft timing gear assy x Camshaft		54	551	40
Battery carrier x Frame		13	131	9.5
Battery clamp x Body	Bolt Nut	5.0 3.5	51 36	44 in. lbf 31 in. lbf
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
Chain tensioner assy No. 1 x Timing chain cover		9.0	92	80 in.·lbf
Chain tensioner plate x Stiffening crankcase assy		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
Timing chain guide x Cylinder block		9.0	92	80 in.·lbf
Chain tensioner slipper x Cylinder block		19	194	14
Timing chain cover (See page 14-45)	Bolt A Bolt B Bolt C Nut	9.0 21 43 9.0	92 214 438 92	80 in.·lbf 15 32 80 in.·lbf
Oil pan x Stiffening crankcase assy		9.0	92	80 in.·lbf
Oil pan drain plug x Oil pan		25	255	18
Crankshaft pulley x Crankshaft		170	1,733	125
Cylinder head cover x Cylinder head	Bolt A Bolt B Bolt C	11 14 21	112 143 214	8.0 10 15

1CD-FTV:

Part Tightened		N·m	kgf·cm	ft·lbf
Air tube No. 1 hose clamp bolt		6.0	61	53 in.·lbf
Air tube No. 1 x Air tube No. 2		25	255	18
Air tube No. 1 x Intake air connector		25	255	18
Air tube No. 1 x Cylinder head cover sub-assy		25	255	18
Air tube No. 1 x Engine mounting bracket FR		25	255	18
Engine cover No. 1 x Cylinder head cover sub-assy		8.0	82	71 in.·lbf
Engine cover No. 1 x Intake manifold		8.0	82	71 in.·lbf
Front wheel		103	1,050	76
Drain plug (Manual transaxle)		49	500	36
Engine hanger No.1 x Cylinder head		37	377	27
Engine hanger No.2 x Cylinder head		37	377	27
Engine hanger No. 1 UPR x Engine hanger No. 1		37	377	27
Engine coolant temperature sensor x Cylinder head		20	200	14
Crankshaft position sensor x Oil pump assy		8.8	90	78 in.·lbf
Camshaft position sensor x Camshaft oil seal retainer		8.8	90	78 in.·lbf
Fuel filler to injection pump fuel pipe x Cylinder block	M6 M8	8.8 21	90 209	78 in.·lbf 15
Oil cooler pipe x Cylinder block		56	575	42
Compressor mounting bracket x Cylinder block		42	428	31
Timing belt No.3 cover x Cylinder head		7.4	75	65 in.·lbf

Part Tightened		N·m	kgf·cm	ft·lbf
Intake manifold x Cylinder head		21	209	15
Power steering idle pulley bracket x Cylinder head (See page 14-108)	Bolt A	72	734	53
	Bolt B	39	398	29
Intake manifold insulator No. 1 x Intake manifold		5.0	51	44 in.·lbf
Injection pipe x Common rail				
	With SST	31	316	23
	Without SST	34	347	25
Injection pipe x Injector				
For used pipe	With SST	36	372	27
	Without SST	40	408	30
For new pipe	With SST	31	316	23
	Without SST	34	347	25
Injection pipe clamp x Intake manifold		5.0	51	44 in.·lbf
Fuel inlet pipe x Common rail				
	With SST	31	316	23
	Without SST	34	347	25
Fuel inlet pipe x injection pump				
	With SST	31	316	23
	Without SST	34	347	25
Nozzle leakage pipe No.2 x Cylinder head cover sub-assy		8.8	90	78 in.·lbf
Nozzle leakage pipe No.2 x Cylinder head		8.8	90	78 in.·lbf
Vacuum pump x Cylinder head		21	214	15
EGR valve assy x Cylinder head		18	184	13
Intake air connector with diesel throttle body x Intake manifold		21	209	15
Water inlet x Cylinder block		8.8	90	78 in.·lbf
Water outlet sub-assy x Cylinder head		21	209	15
Exhaust manifold x Cylinder head		47	474	34
EGR pipe sub-assy x Cylinder head	Bolt	37	375	27
	Nut	25	250	18
Vacuum pump oil pipe x Cylinder block	Bolt	21	214	15
	Nut	8.8	90	78 in.·lbf
Vacuum transmitting pipe No. 2 x Manifold converter				
For nut	With SST	27	275	20
	Without SST	30	306	22
For bolt		25	255	18
Vacuum transmitting pipe No. 1 x Manifold converter				
For nut	With SST	27	275	20
	Without SST	30	306	22
For bolt		25	255	18
Exhaust gas temperature sensor x Manifold converter	With SST	27	275	20
	Without SST	30	306	22
Exhaust gas temperature sensor x Vacuum transmitting pipe No. 2		6.4	65	57 in.·lbf
Oil filter bracket x Oil pan sub-assy		34	347	25
V-ribbed belt tensioner bracket x Cylinder block		20	204	15
V-ribbed belt tensioner assy x Oil pump		31	316	23
Generator bracket No.1 x Cylinder block		37	377	27
Idler pulley Sub-assy x V-ribbed belt tensioner assy		40	408	30
Engine mounting bracket RR x Engine mounting insulator RR		64	653	47
Engine mounting bracket FR x Engine mounting insulator FR		64	653	47
Drive shaft bearing bracket x Cylinder block		64	653	47
Rear end plate x Cylinder block		8.4	86	74 in.·lbf
Flywheel x Crankshaft		71	720	52
Engine mounting member sub-assy center x Body		45	459	33

SERVICE SPECIFICATIONS - ENGINE MECHANICAL

Part Tightened		N·m	kgf·cm	ft·lbf
Front suspension crossmember sub-assy x Rear engine mounting bracket		87	887	64
Front suspension crossmember sub-assy x Front engine mounting bracket		52	530	38
Front suspension crossmember sub-assy x Body		133	1,356	98
Front suspension member brace x Front suspension crossmember sub-assy		133	1,356	98
Front suspension member brace x Body		80	816	59
Return tube sub-assy x Body		8.0	82	71 in.·lbf
Engine mounting insulator RH x Body		52	530	38
Engine mounting insulator RH x Transverse engine engine mounting bracket		52	530	38
Engine mounting bracket LH x Engine mounting insulator LH		80	816	59
Air tube No. 2 hose clamp bolt	Intake shutter side	6.0	61	53 in.·lbf
	Air hose No. 3 side	5.3	54	47 in.·lbf
Injector driver x Engine mounting insulator RH		5.5	56	49 in.·lbf
Engine wire x Body		8.4	85	74 in.·lbf
Air tube No.2 x Manual transaxle		25	255	18
Relay block x Radiator assy		5.3	54	47 in.·lbf
Differential pressure sensor x Body		5.5	56	49 in.·lbf
Air cleaner assy x Body x Engine mounting bracket LH		7.0	71	62 in.·lbf
Battery clamp x Body	Body	5.0	51	44 in.·lbf
	Nut	3.0 to 4.0	31 to 41	27 to 35 in.·lbf
Battery terminal		5.4	55	48 in.·lbf
Timing belt tensioner x Cylinder block		21	214	15
Timing chain cover plate x Camshaft oil seal retainer		9.0	92	80 in.·lbf
Transverse engine engine mounting bracket x Cylinder block (See page 14-138)	Bolt A	37	375	27
	Bolt B	64	650	47
Timing belt No. 1 cover x Transverse engine engine mounting bracket		7.4	75	65 in.·lbf
Timing belt No. 1 cover x Oil pump assy		7.4	75	65 in.·lbf
Timing belt No. 2 cover x Transverse engine engine mounting bracket		7.4	75	65 in.·lbf
Timing belt No. 2 cover x Cylinder head cover sub-assy		7.4	75	65 in.·lbf
Timing belt No. 2 cover x Camshaft oil seal retainer		7.4	75	65 in.·lbf
Timing belt No. 2 cover x Timing belt cover No. 3		7.4	75	65 in.·lbf
Crankshaft pulley x Crankshaft		180	1,835	133
Camshaft bearing cap x Cylinder head		20	204	15
Camshaft oil seal retainer x Cylinder head		9.8	100	7.2
Camshaft timing pulley x Camshaft		88	899	65
Nozzle leakage pipe x Injector		16	163	12
Nozzle leakage pipe x Camshaft bearing cap No. 4		20	204	15
Cylinder head cover x Cylinder head		13	135	9.7
Vacuum reservoir sub-assy x Cowl top panel outer		8.3	85	73 in.·lbf
Cylinder head x Cylinder block	1st	45	459	33
	2nd	Turn 90°	Turn 90°	Turn 90°
	3rd	Turn 90°	Turn 90°	Turn 90°
	4th	Turn 90°	Turn 90°	Turn 90°
Exhaust fuel addition injector x Cylinder head		12	117	8.5
Drain plug (oil pan)		34	350	25

EXHAUST

SERVICE DATA

031E2-03

2AZ-FSE:

Compression spring (Exhaust pipe assy front x Exhaust manifold converter sub-assy)		
Free length	Minimum	41.5 mm (1.634 in.)
Compression spring (Exhaust pipe assy tail x Exhaust pipe assy center)		
Free length	Minimum	38.5 mm (1.516 in.)

1CD-FTV:

Compression spring		
Minimum length	Exhaust pipe assy front x Exhaust manifold	41.5 mm (1.634 in)
Compression spring		
Minimum length	Exhaust pipe assy front x Tail pipe assy	38.5 mm (1.515 in)

TORQUE SPECIFICATION

2AZ-FSE:

Part Tightened	N·m	kgf·cm	ft·lbf
Exhaust pipe assy front x Exhaust manifold converter sub-assy	43	440	32
Exhaust pipe assy center x Exhaust pipe assy front	43	440	32
Exhaust pipe assy tail x Exhaust pipe assy center	43	44	32
Floor panel brace front x Body	30	302	22

1CD-FTV:

Part Tightened	N·m	kgf·cm	ft·lbf
Exhaust pipe assy front x Exhaust manifold	43	440	32
Exhaust pipe assy front x Tail pipe assy	43	440	32
Floor panel brace front x Body	30	302	22
Air fuel ratio sensor x Exhaust pipe assy front	44	449	33

COOLING

SERVICE DATA

031H3-02

2AZ-FSE:

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-assy		
Standard opening pressure		74 to 103 kPa (0.75 to 1.05 kgf/cm ² , 10.7 to 14.9 psi)
Cooling fan		
Standard amperage	at 20°C (68°F)	8.5 to 11.5 A
Standard amperage (No. 2)	at 20°C (68°F)	5.2 to 8.2 A
Cooling fan relay		
Specified condition	Between terminals 3 and 5	10 kΩ or higher Below 1 Ω (Apply battery voltage terminals 1 and 2)
Cooling fan relay No. 2		
Specified condition	Between terminals 3 and 4	Below 1 Ω
	Between terminals 3 and 5	10 kΩ or higher (Apply battery voltage terminals 1 and 2)
		10 kΩ or higher
		Below 1 Ω (Apply battery voltage terminals 1 and 2)
Cooling fan relay No. 3		
Specified condition	Between terminals 3 and 5	10 kΩ or higher Below 1 Ω (Apply battery voltage terminals 1 and 2)

1CD-FTV:

Thermostat		
Valve opening temperature		80 to 84°C (176 to 183°F)
Valve lift	at 95°C (203°F)	8.5 mm (0.335 in.) or more
Radiator cap sub-assy		
Standard opening pressure		93 to 122 kPa (0.95 to 1.25 kgf/cm ² , 13.4 to 17.6 psi)
Minimum opening pressure		78 kPa (0.8 kgf/cm ² , 11.4 psi)

TORQUE SPECIFICATION

2AZ-FSE:

Part Tightened	N·m	kgf·cm	ft·lbf
Water pump x Cylinder block	9.0	92	80 in.·lbf
Water pump x Water pump pulley	26	265	19
Water inlet x Cylinder block	9.0	92	80 in.·lbf
Radiator support upper x Body	19	194	14
Fan assy w/ motor x Radiator	6.0	61	53 in.·lbf
Radiator relay block x Radiator	5.0	54	46 in.·lbf

1CD-FTV:

Part Tightened	N·m	kgf·cm	ft·lbf
Drain plug	13	133	10
Water pump x Cylinder block	31	320	23
Injection pipe x Common rail			
With SST	31	316	23
Without SST	34	347	25
Injection pipe x Injector			
For used pipe			
With SST	36	372	27
Without SST	40	408	30
For new pipe			
With SST	31	316	23
Without SST	34	347	25
Fuel inlet pipe sub-assy x Common rail assy			
With SST	31	316	23
Without SST	34	347	25
Fuel inlet pipe sub-assy x Injection pump			
With SST	31	316	23
Without SST	34	347	25
Timing belt idler Sub-assy No.1 x Cylinder head	35	357	26
Front wheel	103	1,050	76

LUBRICATION

SERVICE DATA

031H5-02

2AZ-FSE:

Oil pressure	at idle speed at 3,000 rpm	29 kPa (0.3 kgf·cm ² , 4.3 psi) or more 245 to 539 kPa (2.5 to 5.5 kgf·cm ² , 36 to 78 psi) or more
Adhesive		Part No. 08833-00080, THREE BOND 1344, LOCTITE 242, or equivalent

1CD-FTV:

Oil pressure	at idle speed at 4,500 rpm	29 kPa (0.3 kgf·cm ² , 4.3 psi) or more 245 to 588 kPa (2.5 to 6.0 kgf·cm ² , 36 to 85 psi)
Adhesive		Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242, or equivalent

TORQUE SPECIFICATION

2AZ-FSE:

Part Tightened		N·m	kgf·cm	ft·lbf
Oil pressure switch x Cylinder head		15	153	11
Oil cooler Assy x Cylinder block				
	Union bolt	79	800	58
	Nut	9.0	92	80 in·lbf
Oil pan drain plug x Oil pan		25	250	18
Oil pump x Cylinder block		19	195	15
Timing chain guide x Cylinder block		9.0	92	80 in·lbf
Chain vibration damper No.1 x Cylinder block		9.0	92	80 in·lbf
Oil pan sub-assy x Cylinder block		9.0	92	80 in·lbf
Transverse engine engine mounting insulator x Cylinder block		52	530	38
Engine service cover bracket RH x Body	RHD steering position type	9.0	92	80 in·lbf
Cooler bracket RH x Body	LHD steering position type	9.0	92	80 in·lbf
Engine x Wire		7.0	71	62 in·lbf
Oil reservoir bracket No. 1 x Body		8.0	82	71 in·lbf
Cooler refrigerant suction hose No. 1 x Cooler bracket No. 1	LHD steering position type	9.0	92	80 in·lbf
Return tube x Body		8.0	82	71 in·lbf
Ignition coil Assy x Cylinder head cover		9.0	92	80 in·lbf
Vane pump x Cylinder block		37	377	27
Engine cover sub-assy x Cylinder block		7.0	71	62 in·lbf
Front wheel RH		103	1,050	76

1CD-FTV:

Part Tightened		N·m	kgf·cm	ft·lbf
Oil pump x Cylinder block		31	320	23
Oil pan sub-assy x Cylinder block (See page 17-11)				
	Bolt A	42	428	31
	Bolt B	21	209	15
	Bolt C	11	112	8
	Nut D	11	112	8
Oil pan insulator x Oil pan sub-assy		7.5	76	66 in·lbf
Oil strainer sub-assy x Oil pan sub-assy				
	Bolt	21	209	15
	Nut	13	135	10
Oil pan Sub-assy No.2 x Oil pan sub-assy		12	119	9
Engine oil level sensor x Oil pan sub-assy No.2		7.0	71	62 in·lbf
Oil level gage guide x Injection pump stay No. 1		18	184	13
Timing belt idler sub-assy No. 2 x Oil pump Assy		47	479	34
Front wheel RH		103	1,050	76

IGNITION

SERVICE DATA

031E4-02

2AZ-FSE:

Spark plug	DENSO	SK20BE11
Recommended spark plug	Maximum (for used)	1.3 mm (0.051 in.)
Electrode gap	Standard (for new)	1.00 to 1.10 mm (0.0394 to 0.0433 in.)
Camshaft position sensor		
Resistance	1 (G+) – 2 (G-)	835 to 1,400 Ω at cold 1,060 to 1,645 Ω at hot
Crankshaft position sensor		
Resistance	1 (NE+) – 2 (NE-)	985 to 1,600 Ω at cold 1,265 to 1,890 Ω at hot

TORQUE SPECIFICATION

2AZ-FSE:

Part Tightened	N·m	kgf·cm	ft·lbf
Ignition coil assy x Cylinder head cover sub-assy	9.0	92	80 in·lbf
Spark plug x Cylinder head sub-assy	19	194	14
Camshaft position sensor x Cylinder head sub-assy	9.0	92	79 in·lbf
Wire harness protector x throttle body bracket	8.4	86	74 in·lbf
Engine wire No. 3 (battery negative terminal) x Battery	5.4	55	48 in·lbf
Crankshaft position sensor x Timing chain cover sub-assy	9.0	92	79 in·lbf

STARTING & CHARGING

SERVICE DATA

031E8-03

2AZ-FSE:

Starter assy Specified current	Standard	75 A or less at 11.5 V
Starter relay Resistance	3 – 5 3 – 5 (Apply battery voltage to terminal 1 and 2)	10 k Ω or higher Below 1 Ω
Charging circuit Amperage Voltage	Standard Standard	10 A or less 12.9 to 14.9 V

1CD-FTV:

Glow plugs Resistance	at 20 °C (68 °F)	Approx. 1.1 Ω
Glow plug relay Specified condition	1 – 2 1 – 2 (When battery voltage is applied to terminals 3 and 4)	10 k Ω or higher Below 1 Ω

TORQUE SPECIFICATION

2AZ-FSE:

Part Tightened		N·m	kgf·cm	ft·lbf
Lead wire x Starter magnetic switch assy		5.9	60	52 in.·lbf
Wire harness clamp x Starter assy		8.4	86	74 in.·lbf
Starter assy x Cylinder block sub-assy		37	380	28
Starter wire x Starter assy		13	130	9
Battery carrier x Body		13	131	9
Battery clamp sub-assy x Body		5.0	51	44 in.·lbf
Battery clamp sub-assy x Battery clamp bolt		3.5	36	31 in.·lbf
Engine wire No. 3 (battery negative terminal) x Battery		5.4	55	48 in.·lbf
Wire harness clamp bracket x Generator assy		8.4	86	74 in.·lbf
Generator assy x Cylinder block sub-assy (see page 19-8)	Bolt A	52	530	38
	Bolt B	21	214	16
Generator wire x Generator assy		9.8	100	7

FRONT SUSPENSION

TORQUE SPECIFICATION

0313A-07

Part Tightened	N·m	kgf·cm	ft·lbf
Suspension crossmember sub-assy x Engine mounting insulator	80	816	59
Suspension crossmember sub-assy x Center member	96	979	71
Suspension member brace x Body	Bolt A:	80	816
	Bolt B:	133	1,360
Stabilizer bar link set nut	74	755	55
Lower suspension arm x Lower ball joint	89	908	66
Lower suspension arm x Suspension crossmember	137	1,400	101

TIRE & WHEEL

SERVICE DATA

0313C-07

Cold tire inflation pressure	Engine type: 2AZ-FSE		
	Tire size	Front kPa (kgf/cm ² , psi)	Rear kPa (kgf/cm ² , psi)
	205/55R16 91V: with 4 or less occupants with 5 or more occupants 215/45R17 87W: with 4 or less occupants with 5 or more occupants	220 (2.2, 32) * ¹ 250 (2.5, 36) * ² 220 (2.2, 32) * ¹ 270 (2.7, 39) * ² 240 (2.4, 35) * ¹ 290 (2.9, 42) * ² 240 (2.4, 35) * ¹ 310 (3.1, 45) * ²	220 (2.2, 32) * ¹ 250 (2.5, 36) * ² 220 (2.2, 32) * ¹ 280 (2.8, 41) * ² 240 (2.4, 35) * ¹ 290 (2.9, 42) * ² 240 (2.4, 35) * ¹ 330 (3.3, 48) * ²
Tire runout	1.4 mm (0.055 in.) or less		
Imbalance after adjustment	8.0 g (0.018 lb) or less		

*¹: For driving under 160 km/h (100 mph)*²: For driving at 160 km/h (100 mph) or over

DRIVE SHAFT / PROPELLER SHAFT / AXLE

030KB-08

SERVICE DATA

Front axle hub bearing	Backlash	Maximum: 0.05 mm (0.0020 in.)
Front axle hub sub-assy	Deviation	Maximum: 0.05 mm (0.0020 in.)
Rear axle hub & bearing assy	Backlash	Maximum: 0.05 mm (0.0020 in.)
	Deviation	Maximum: 0.07 mm (0.0028 in.)

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Front wheel set nut	103	1,050	76
Tie rod end sub-assy x Steering knuckle	49	500	36
Flexible hose and speed sensor front x Shock absorber assy front	19	194	14
Speed sensor front x Steering knuckle	8.0	82	71 in·lbf
Front stabilizer link assy x Shock absorber assy front	74	755	55
Front axle hub nut	216	2,200	159
Automatic transaxle fluid drain plug	49	500	36
Drive shaft bearing case x Bearing bracket	64	650	47
Suspension arm sub-assy lower NO.1 x Steering knuckle	89	908	66

BRAKE

TORQUE SPECIFICATION

030MV-04

Part Tightened	N·m	kgf·cm	ft·lbf
Brake booster clevis lock nut	22	224	16
Brake booster assy x Body	13	133	10
Brake line union nut 10 mm	15	155	11
Brake tube clamp x body	6	61	53 in.·lbf
Wheel nut	103	1,050	76

AUTOMATIC TRANSMISSION / TRANSAXLE

SERVICE DATA

030A9-12

U151E		
Line pressure (Wheel locked)	Engine idling D position R position AT stall (Throttle valve fully open) D position R position	372 to 412 kPa (3.8 to 4.2 kgf-cm ² , 54 to 60 psi) 672 to 742 kPa (6.9 to 7.6 kgf-cm ² , 97 to 108 psi) 931 to 1,031 kPa (9.5 to 10.5 kgf-cm ² , 135 to 150 psi) 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	2,250 ± 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 to 750 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 (with Kick down switch)		
Shift schedule (Shift lever with Multi-mode automatic transmission & Gate shift type)		
D position (Throttle valve fully open)	1 → 2 2 → 3 3 → 4 4 → 5 5 → 4 4 → 3 3 → 2 2 → 1	38 to 44 km/h (24 to 27 mph) 73 to 81 km/h (45 to 50 mph) 119 to 130 km/h (74 to 81 mph) 174 to 187 km/h (108 to 116 mph) 136 to 148 km/h (85 to 92 mph) 86 to 93 km/h (53 to 58 mph) 50 to 56 km/h (31 to 35 mph) – to 11 km/h (– to 7 mph)
(Throttle valve fully closed)	4 → 5 5 → 4	43 to 48 km/h (27 to 30 mph) 34 to 39 km/h (21 to 24 mph)
D position Kick down switch ON	5 → 4 4 → 3 3 → 2 2 → 1	167 to 180 km/h (104 to 112 mph) 115 to 126 km/h (71 to 78 mph) 69 to 76 km/h (43 to 47 mph) 33 to 38 km/h (21 to 24 mph)
Manual down shift	4 → 3 3 → 2 2 → 1	119 to 130 km/h (74 to 81 mph) 73 to 80 km/h (45 to 50 mph) 36 to 42 km/h (22 to 26 mph)
Lock-up point	Throttle valve opening 5 %	
D position		
5th gear	Lock-up ON Lock-up OFF	58 to 64 km/h (36 to 40 mph) 56 to 62 km/h (35 to 39 mph)
4th gear	Lock-up ON Lock-up OFF	95 to 103 km/h (59 to 64 mph) 93 to 100 km/h (58 to 62 mph)

U151E (without kick down switch)		
Shift schedule (Shift lever with Multi-mode automatic transmission & Gate shift type)		
D position		
(Throttle valve fully open)	1 → 2	38 to 44 km/h (24 to 27 mph)
	2 → 3	73 to 81 km/h (45 to 50 mph)
	3 → 4	119 to 130 km/h (74 to 81 mph)
	4 → 5	174 to 187 km/h (108 to 116 mph)
	5 → 4	167 to 180 km/h (104 to 112 mph)
	4 → 3	115 to 126 km/h (71 to 78 mph)
	3 → 2	69 to 76 km/h (43 to 47 mph)
	2 → 1	33 to 38 km/h (21 to 24 mph)
(Throttle valve fully closed)	4 → 5	43 to 48 km/h (27 to 30 mph)
	5 → 4	34 to 39 km/h (21 to 24 mph)
Manual down shift		
	4 → 3	119 to 130 km/h (74 to 81 mph)
	3 → 2	73 to 80 km/h (45 to 50 mph)
	2 → 1	36 to 42 km/h (22 to 26 mph)
Lock-up point Throttle valve opening 5 %		
D position		
5th gear	Lock-up ON	58 to 64 km/h (36 to 40 mph)
	Lock-up OFF	56 to 62 km/h (35 to 39 mph)
4th gear	Lock-up ON	95 to 103 km/h (59 to 64 mph)
	Lock-up OFF	93 to 100 km/h (58 to 62 mph)

TORQUE SPECIFICATION

U151E				
Part Tightened		N·m	kgf·cm	ft·lbf
Park/neutral position switch x Transaxle	Bolt	5.4	55	48 in.·lbf
Battery carrier x Body		13	133	10
Engine hanger x Engine		38	387	28
Drain plug x Oil pan		47	479	35
Transaxle x Engine	Bolt A:	64	653	47
	Bolt B:	46	469	34
	Bolt C:	44	449	32
Torque converter clutch x Drive plate		41	418	30
Engine mounting bracket RR x Transaxle		64	653	47
Engine mounting bracket FR x Transaxle		64	653	47
Center member x Body		45	459	33
Front suspension Crossmember sub-assy x Engine mounting insulator RR		52	530	38
Front suspension Crossmember sub-assy x Engine mounting insulator FR		52	530	38
Engine mounting insulator RR x Engine mounting bracket RR		87	887	64
Engine mounting insulator FR x Engine mounting bracket FR		52	530	38
Engine mounting bracket LH x Transaxle		64	653	47
Engine mounting insulator LH x Body		52	530	38
Engine mounting insulator LH x Engine mounting bracket LH		80	816	59
Starter x Transaxle		37	377	27
Starter wire x Starter		9.8	99	87 in.·lbf
Oil filler tube x Transaxle		5.5	56	49 in.·lbf
Transmission Oil cooler x Engine mounting bracket FR		12	122	9
Transmission Oil cooler x Transmission control cable bracket No.1		12	122	9
Transmission control cable bracket No.1 x Transaxle		12	122	9
Transmission control cable clamp		12	122	9
Wire harness x Transaxle	Bolt A:	5.0	51	44 in.·lbf
	Bolt B:	8.4	86	74
Air cleaner assy x Body		5.0	51	44 in.·lbf
Engine cover sub-assy No. 1 x Engine		9.0	92	80 in.·lbf
Speed sensor x Transaxle		11	115	8
Transmission wire x Transaxle		5.4	55	48 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
ATF temperature sensor x Valve body		6.6	67	58 in. lbf
Oil strainer x Valve body		11	110	8
Oil pan x Transaxle		7.8	80	69 in.·lbf
Control cable x Control shaft lever		12	122	9

HEATER AND AIR CONDITIONING
SERVICE DATA

031HH-02

Refrigerant charge volume	Standard:	440 ± 30 g (15.51 ± 1.06 oz.)
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TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
W/PULLEY COMPRESSOR ASSY (2AZ-FSE)			
W/pulley compressor assy x Engine	29	300	21
Cooler refrigerant discharge hose No. 1 x W/pulley compressor assy	9.8	100	87 in.·lbf
Cooler refrigerant suction hose No. 1 x W/pulley compressor assy	9.8	100	87 in.·lbf