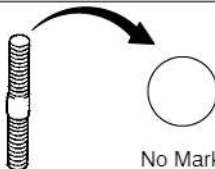
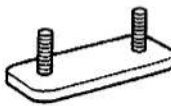
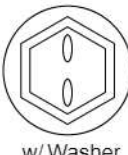


STANDARD BOLT
HOW TO DETERMINE BOLT STRENGTH

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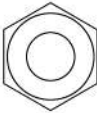
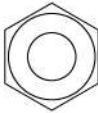
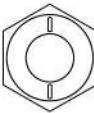
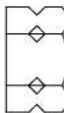
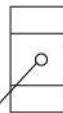
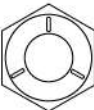
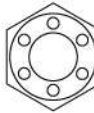
Bolt Type				Class
Hexagon Head Bolt		Stud Bolt	Weld Bolt	
Normal Recess Bolt	Deep Recess Bolt			
 No Mark	 No Mark	 No Mark		4T
 No Mark	 No Mark			5T
 w/ Washer	 w/ Washer			6T
 No Mark	 No Mark			7T
 No Mark	 No Mark	 		8T
 No Mark	 No Mark			9T
 No Mark	 No Mark			10T
 No Mark	 No Mark			11T

B06431

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			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

ENGINE CONTROL SYSTEM

SERVICE DATA

031VK-01

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 2.68 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 w/ motor body assy Throttle valve opening percentage Idle speed Resistance (Throttle control motor) Resistance (Throttle position sensor)	1 (M+) - 2 (M+) 1 (VC) - 4 (E2)	60 % or more 950 to 1,050rpm 0.3 to 100 Ω at 20°C (68°F) 1.25 to 2.35 Ω at 20°C (68°F)
Knock sensor Resistance	1 (Ground) - 2 (Output)	120 to 280 k Ω at 20°C (68°F)
EFI Relay Resistance	B5 - B8	10 k Ω or higher Below 1 Ω (Apply battery voltage to terminal B6 and B7)
Circuit opening relay Resistance	B5 - B8	10 k Ω or higher Below 1 Ω (Apply battery voltage to terminal B6 and B7)

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Camshaft timing oil control valve assy x Cylinder head sub-assy	7.5	76	66 in·lbf
Engine coolant temperature sensor x Cylinder head sub-assy	20	200	14
Throttle w/ motor body assy x Intake manifold	20	204	15
Air cleaner assy x Cylinder head cover sub-assy	7.0	71	62 in·lbf
Air cleaner assy x Throttle w/ motor body assy	3.0	31	27 in·lbf
Air cleaner inlet No. 1 x Air cleaner assy	3.0	31	27 in·lbf
Knock sensor x Cylinder block sub-assy	20	204	15
Intake manifold x Cylinder head sub-assy	20	204	15
Harness clamp x Intake manifold	9.0	92	80 in·lbf
Oil level gauge guide x Intake manifold	9.0	92	80 in·lbf
ECM x Instrument panel reinforcement assy	3.0	31	27 in·lbf
ECM x Blower assy	3.0	31	27 in·lbf

FUEL

SERVICE DATA

031VI-01

Fuel pressure	at idle engine stop	304 to 343 kPa (3.1 to 3.5 kgf/cm ² , 44 to 50 psi) 147 kPa (1.5 kgf/cm ² , 21 psi) or more
Fuel injector assy		
Resistance	1 - 2	13.45 to 14.15 Ω at 21°C (68°F)
Injection volume	Standard	36 to 46 cm ³ (2.1 to 2.8 cu in.)
	Difference between each fuel injector	10 cm ³ (0.6 cu in.) or less
Leakage	Standard	1 drop or less per 12 minutes
Fuel pump		
Resistance	1 - 2	0.2 to 3.0 Ω at 20°C (68°F)
Compression spring (Exhaust pipe assy front x Exhaust manifold)		
Free length	Minimum	40.5 mm (1.594 in.)
Compression spring (Exhaust pipe assy front x Exhaust pipe assy tail)		
Free length	Minimum	38.5 mm (1.516 in.)

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Fuel deliver pipe sub-assy x Cylinder head sub-assy (See page 11-16)	Bolt A	19	194	14
	Bolt B	9.0	92	80 in·lbf
Cylinder head cover sub-assy Cylinder head sub-assy		10	102	7
Ignition coil assy x Cylinder head cover sub-assy		9.0	92	80 in·lbf
Engine wire x Cylinder head cover sub-assy (RHD steering position type)		9.0	92	80 in·lbf
Brake master cylinder reservoir cover x Cylinder head cover sub-assy (LHD steering position type)		8.5	87	75 in·lbf
Reservoir bracket x Body		8.5	87	75 in·lbf
Brake master cylinder reservoir sub-assy x Reservoir bracket		8.5	87	75 in·lbf
Cowl top panel sub-assy outer front x Body		6.4	65	57 in·lbf
Charcoal canister assy x Fuel tank assy		6.0	61	53 in·lbf
Fuel tank band sub-assy No. 1 RH x Body		39	400	29
Fuel tank band sub-assy No. 1 LH x Body		39	400	29
Fuel tank protector No. 1 x Fuel tank assy		5.4	55	48 in·lbf
Exhaust pipe assy front x Exhaust manifold		43	440	32
Exhaust pipe assy front x Exhaust pipe assy tail		43	440	32

EMISSION CONTROL

SERVICE DATA

031UP-01

Air-fuel ratio sensor		
Voltage	E5-23 (A1A+) - E5-28 (E1)	3.0 to 3.6 V
	E5-22 (A1A-) - E5-28 (E1)	2.7 to 3.3 V
Resistance	1 (HT) - 2 (+B)	1.8 to 3.4 Ω at 20°C (68°F)
	2 (+B) - 4 (AF-)	10 k Ω or higher
Vacuum switching valve assy No. 2		
Resistance	1 - 2	26 to 30 Ω at 20°C (68°F)
Heated oxygen sensor		
Resistance	1 (HT) - 2 (+B)	11 to 16 Ω at 20°C (68°F)
	1 (HT) - 4 (E)	10 k Ω or higher

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Vacuum switching valve assy No. 2 x Engine mounting insulator sub-assy RH	7.5	76	66 in·lbf
Charcoal canister assy x Fuel tank assy	6.0	61	53 in·lbf
Air-fuel ratio sensor x Exhaust manifold	44	450	33
Heated oxygen sensor x Exhaust pipe assy front	44	450	33

ENGINE MECHANICAL

SERVICE DATA

031VQ-01

New drive belt deflection Pressing force: 98 N (10 kgf, 22lbf)		9.0 to 12.0 mm (0.35 to 0.47 in.)
Used drive belt deflection Pressing force: 98 N (10 kgf, 22lbf)		11.0 to 15.0 mm (0.43 to 0.59 in.)
New drive belt tension		392 to 588 N (40 to 60 kgf, 88 to 132 lb)
Used drive belt tension		196 to 392 N (20 to 40 kgf, 44 to 88 lb)
Ignition timing		8 to 12 ° BTDC
Idle speed		950 ± 1050 rpm
Compression pressure		882 kPa (9.0 kgf/cm ² 128 psi)
Minimum pressure		686 kPa (7.0 kgf/cm ² 99 psi)
Difference between each cylinder		98 kPa (1.0kgf/cm ² 14 psi)
Valve clearance (cold)	Intake Exhaust	0.17 to 0.23 mm (0.007 to 0.009 in.) 0.27 to 0.33 mm (0.011 to 0.013 in.)
Chain elongation chain length at 16 links	Maximum	124.2 mm (4.890 in.)
Camshaft timing gear diameter (w / chain)	Minimum	96.2 mm (3.787 in.)
Camshaft timing sprocket diameter (w / chain)	Minimum	96.2 mm (3.787 in.)
Chain tensioner slipper wear	Maximum	1.0 mm (0.039 in.)
Chain vibration damper wear	Maximum	1.0 mm (0.039 in.)
Cylinder head bolt length	Standard Maximum	142.8 to 144.2 mm (5.622 to 5.677 in.) 147.1 mm (5.791 in.)
Cylinder head warpage	Maximum Cylinder block side Intake manifold side Exhaust manifold side	0.05 mm (0.0020 in.) 0.10 mm (0.0039 in.) 0.10 mm (0.0039 in.)
Intake valve overall length	Standard Minimum	89.25 mm (3.5138 in.) 88.95 mm (3.5020 in.)
Intake valve stem diameter		4.970 to 4.985 mm (0.1957 to 0.1963 in.)
Intake valve margin thickness	Standard Minimum	1.0 mm (0.039 in.) 0.7 mm (0.028 in.)
Exhaust valve overall length	Standard Minimum	87.90 mm (3.4606 in.) 87.60 mm (3.4488 in.)
Exhaust valve stem diameter		4.965 to 4.980 mm (0.1955 to 0.1961 in.)
Exhaust valve margin thickness	Standard Minimum	1.15 mm (0.0453 in.) 0.85 mm (0.0335 in.)
Valve spring free length		59.77 mm (2.3531 in.)
Valve spring deviation	Maximum	1.6 mm (0.063 in.)
Valve spring angle (reference)	Maximum	2°
Valve spring installed tension at 32.5 mm (1.280 in.)		140 to 154 N (14.2 to 15.7 kgf, 31.5 to 34.6 lbf)
Valve spring working tension at 25.1 mm (0.988 in.)	Maximum	180 to 198 N (18.4 to 20.2 kgf, 40.5 to 44.5 lbf)
Bushing inside diameter		5.010 to 5.030 mm (0.1972 to 0.1980 in.)
Valve guide bushing oil clearance	Standard Intake Exhaust Maximum Intake Exhaust	0.025 to 0.060 mm (0.0010 to 0.0024 in.) 0.030 to 0.065 mm (0.0012 to 0.0026 in.) 0.08 mm (0.0031 in.) 0.10 mm (0.0039 in.)
Valve guide bush diameter	Standard O/S	9.685 to 9.706 mm (0.3813 to 0.3821 in.) 9.735 to 9.755 mm (0.3833 to 0.3841 in.)
Bushing Protrusion height		9.0 to 9.4 mm (0.354 to 0.370 in.)
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.)
Oil clearance	Standard Maximum	0.033 to 0.059 mm (0.0013 to 0.0023 in.) 0.10 mm (0.0039 in.)

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SERVICE SPECIFICATIONS - ENGINE MECHANICAL

Camshaft circle runout	Maximum	0.03 mm (0.0012 in.)
Camshaft cam lobe height	Standard	42.310 to 42.410 mm (1.6657 to 1.6697 in.)
	Minimum	42.16 mm (1.6598 in.)
Camshaft No. 1 journal diameter		34.449 to 34.465 mm (1.3563 to 1.3569 in.)
Camshaft other journals diameter		22.949 to 22.965 mm (0.9035 to 0.9041 in.)
No. 2 camshaft circle runout	Maximum	0.03 mm (0.0012 in.)
No. 2 camshaft cam lobe height	Standard	44.046 to 44.146 mm (1.7341 to 1.7380 in.)
	Minimum	43.90 mm (1.7283 in.)
No. 2 camshaft No. 1 journal diameter		34.449 to 34.465 mm (1.3563 to 1.3569 in.)
No. 2 camshaft other journals diameter		22.949 to 22.965 mm (0.9035 to 0.9041 in.)
Camshaft thrust clearance	Standard	0.040 to 0.095 mm (0.0016 to 0.0037 in.)
	Maximum	0.11 mm (0.0043 in.)
Camshaft oil clearance	Standard	0.040 to 0.095 mm (0.0016 to 0.0037 in.)
	Maximum	0.115 mm (0.0045 in.)
Camshaft bearing cap setting ring pin protrusion height		8.5 to 9.5 mm (0.335 to 0.374 in.)
Connecting rod thrust clearance	Standard	0.16 to 0.36 mm (0.0063 to 0.0142 in.)
	Maximum	0.36 mm (0.0142 in.)
Connecting rod oil clearance	Standard	0.016 to 0.040 mm (0.0006 to 0.0016 in.)
	Maximum	0.06 mm (0.0024 in.)
Crankshaft thrust clearance	Standard	0.09 to 0.19 mm (0.0035 to 0.0075 in.)
	Maximum	0.30 mm (0.0118 in.)
Cylinder block warpage	Maximum	0.05 mm (0.0020 in.)
Cylinder bore diameter	Standard	75.000 to 75.133 mm (2.9528 to 2.9580 in.)
Connecting rod out-of alignment	Maximum	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Connecting rod twist	Maximum	0.05 mm (0.0020 in.) per 100 mm (3.94 in.)
Piston diameter		74.941 to 74.979 mm (2.9504 to 2.9519 in.)
Piston pin hole diameter at 20°C (68°F)		18.013 to 18.016 mm (0.7092 to 0.7093 in.)
Piston pin diameter		18.001 to 18.004 mm (0.7087 to 0.7088 in.)
Oil clearance	Standard	0.009 to 0.015 mm (0.0004 to 0.0006 in.)
	Maximum	0.050 mm (0.0020 in.)
Piston clearance	Standard	0.045 to 0.068 mm (0.0018 to 0.0027 in.)
	Maximum	0.08 mm (0.0032 in.)
Connecting rod inside diameter		17.965 to 17.985 mm (0.7073 to 0.7081 in.)
Piston ring groove clearance	No. 1	0.02 to 0.07 mm (0.0008 to 0.0028 in.)
	No. 2	0.02 to 0.06 mm (0.0008 to 0.0024 in.)
	Oil	0.02 to 0.06 mm (0.0008 to 0.0024 in.)
Piston ring end gap	Standard No. 1	0.20 to 0.30 mm (0.0079 to 0.0118 in.)
	No. 2	0.30 to 0.45 mm (0.0118 to 0.0177 in.)
	Oil	0.10 to 0.40 mm (0.0039 to 0.0158 in.)
	Maximum No. 1	0.61 mm (0.0240 in.)
	No. 2	1.20 mm (0.0472 in.)
	Oil	1.15 mm (0.0453 in.)
Connecting rod bolt diameter	Standard	6.6 to 6.7 mm (0.260 to 0.264 in.)
	Maximum	6.4 mm (0.252 in.)
Crankshaft circle runout	Maximum	0.03 mm (0.0012 in.)
Main journal diameter		45.988 to 46.000 mm (1.8106 to 1.8110 in.)
Main journal taper and out-of-round	Maximum	0.02 mm (0.0008 in.)
Crank pin diameter		39.992 to 40.000 mm (1.5745 to 1.5748 in.)
Crank pin taper and out-of-round	Maximum	0.02 mm (0.0008 in.)
Crankshaft timing sprocket diameter (w/ chain)	Standard	51.72 mm (2.0362 in.)
	Maximum	50.5 mm (1.988 in.)
Crankshaft bearing cap set bolt diameter	Standard	7.3 to 7.5 mm (0.287 to 0.295 in.)
	Minimum	7.3 mm (0.287 in.)
Crankshaft oil clearance	Standard	0.01 to 0.023 mm (0.0004 to 0.0009 in.)
	Maximum	0.07 mm (0.0028 in.)
End plate straight pin protrusion		11.5 to 12.5 mm (0.453 to 0.492 in.)
Oil pan straight pin protrusion		8.5 to 9.5 mm (0.335 to 0.374 in.)
Cylinder head set straight pin protrusion		8.5 to 9.5 mm (0.335 to 0.374 in.)

Chain tensioner straight pin protrusion	18.5 to 19.5 mm (0.728 to 0.768 in.)
Oil pump set ring pin protrusion	3.5 to 4.5 mm (0.138 to 0.177 in.)

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Spark plug x Cylinder head sub-assy		18	184	13
Ignition coil No. 1 x Cylinder head sub-assy		9.0	92	80 in. lbf
Idle pulley assy x Engine mounting bracket		40	408	30
Camshaft x Camshaft bearing cap No.2		13	130	9.6
No. 2 camshaft x Camshaft bearing cap No.1		23	235	17
Oil pump assy x Service hole screw plug		15	153	11
Brake reservoir bracket x Body		8.5	87	75 in. lbf
Brake master cylinder reservoir sub-assy x Brake reservoir bracket		8.5	87	75 in. lbf
Air cleaner assy x Cylinder head cover sub-assy		7.0	71	62 in. lbf
Air cleaner assy x Intake manifold		3.0	31	27 in. lbf
Battery negative terminal x Battery negative cable		6.0	61	53 in. lbf
Engine hanger x Cylinder head sub-assy		40	408	30
E. F. I. water temperature sensor x Cylinder head sub-assy		20	204	15
Radio setting condenser x Cylinder head sub-assy		9.0	92	80 in. lbf
Exhaust manifold x Cylinder head sub-assy		27	275	20
Exhaust manifold x Exhaust manifold heat insulator No. 1		8.0	82	71 in. lbf
Water by-pass pipe No. 1 x Cylinder block sub-assy		9.0	92	80 in. lbf
Water by-pass pipe No. 1 x Cylinder head sub-assy		9.0	92	80 in. lbf
Oil level gage guide x Intake manifold		9.0	92	80 in. lbf
Flywheel x Crankshaft	1st 2nd	49 Turn 90°	500 Turn 90°	36 Turn 90°
Transmission input damper assy x Fly wheel		20	204	15
Starter hole insulator x Hybrid vehicle transaxle assy		32	326	24
Engine mounting bracket RH x Engine mounting insulator RH		52	530	38
Engine mounting insulator bracket LH x Engine mounting insulator LH		80	816	59
Front suspension crossmember sub-assy x Body	Bolt A Bolt B	113 157	1152 1602	83 116
Engine moving control rod x Front suspension crossmember		56	571	41
Engine moving control rod x Hybrid vehicle transaxle assy		100	1020	74
Steering sliding yoke sub-assy x Steering gear assy		35	357	26
Compressor assy x Cylinder block sub-assy		25	255	18
Vacuum switching valve assy No. 2 x Engine mounting insulator RH		7.5	76	5.5 in. lbf
Air cleaner inlet No. 1 x Air cleaner case		3.0	31	27 in. lbf
Front wheel x Front axle		103	1050	76
Oil pan sub-assy x Stud bolt		5.0	51	44 in. lbf
Oil pan sub-assy x Cylinder block sub-assy		24	245	18
Oil pan sub-assy x Oil strainer sub-assy		11	112	8.1
Oil pan sub-assy x Oil pan sub-assy No. 2		9.0	92	80 in. lbf
Oil pan sub-assy No. 2 x Oil pan drain plug		38	387	28
Oil filter union x Oil pan sub-assy		30	306	22
Cylinder head sub-assy x Cylinder block sub-assy	1st 2nd 3rd	29 Turn 90° Turn 90°	296 Turn 90° Turn 90°	21 Turn 90° Turn 90°
Camshaft timing gear assy x Camshaft		64	653	47
Camshaft timing gear x No. 2 Camshaft		64	653	47
Chain vibration damper x Cylinder head sub-assy		9.0	92	80 in. lbf
Chain vibration damper x Cylinder block sub-assy		9.0	92	80 in. lbf
Chain tensioner x Cylinder block sub-assy		9.0	92	80 in. lbf

Part Tightened		N·m	kgf·cm	ft·lbf
Oil pump Assy x Cylinder head & block	Bolt A	32	326	24
	Bolt B, C	11	112	8.1
	Nut D	24	245	18
	Bolt E	24	245	18
Crankshaft damper sub-assy x Crankshaft		128	1305	95
Water pump Assy x Cylinder block sub-assy		11	112	8.1
Engine mounting bracket x Cylinder block sub-assy		55	561	41
Fuel delivery pipe sub-assy x Cylinder head sub-assy	Bolt A	19	194	14
	Bolt B	9.0	92	80 in.·lbf
Cylinder head cover sub-assy x Cylinder head sub-assy		10	102	7.4
Ventilation valve sub-assy x Cylinder head cover sub-assy		27	275	20
Water pump pulley x Water pump Assy		15	153	11
Crank position sensor x Oil pump Assy		7.5	76	66 in. lbf
Water inlet x Cylinder block sub-assy		9.0	92	80 in.·lbf
Camshaft timing oil control valve Assy x Cylinder block sub-assy		7.5	76	66 in. lbf
Cam position sensor x Cylinder head sub-assy		8.0	82	71 in. lbf
Stud bolt x Cylinder head (See page 14-128)	Bolt A	10	102	7.4
	Bolt B	4.0	41	35 in.·lbf
	Bolt C	10	102	7.4
	Bolt D	9.0	92	80 in.·lbf
Oil control valve filter plug x Cylinder head		30	306	22
w/Head taper screw plug No.1 x Cylinder head		44	449	32
Connecting rod cap x Connecting rod	1st	15	153	11
	2nd	Turn 90°	Turn 90°	Turn 90°
Bearing cap x Cylinder block	1st	22	224	16
	2nd	Turn 90°	Turn 90°	Turn 90°
Stud bolt x Cylinder block		5.0	51	44 in.·lbf
Stud bolt (For knock sensor) x Cylinder block		11	112	8
Cylinder block water drain cock plug x Cylinder block		35	357	26

EXHAUST
SERVICE DATA

03171-01

Compression spring (Exhaust pipe assy front x Exhaust manifold) Free length	Minimum	40.5 mm (1.594 in.)
Compression spring (Exhaust pipe assy tail x Exhaust pipe assy front) Free length	Minimum	38.5 mm (1.516 in.)

TORQUE SPECIFICATION

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

COOLING

SERVICE DATA

031V8-01

Thermostat		
Valve opening temperature		80 to 84°C (176 to 183°F)
Valve lift	at 95°C (205°F)	8.5 mm (0.335 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)
Minimum opening pressure		59 kPa (0.6 kgf/cm ² , 8.5 psi)
Cooling fan		
Standard amperage		9.2 to 11.0 A
Cooling fan relay		
Specified condition	Between terminals 3 and 5 Between terminals 3 and 5	10 kΩ or higher Below 1 Ω (Apply battery voltage to terminals 1 and 2)
Cooling fan relay No.2		
Specified condition	Between terminals 3 and 4 Between terminals 3 and 5 Between terminals 3 and 5	Below 1 Ω 10 kΩ or higher Below 1 Ω (Apply battery voltage to terminals 1 and 2)
Integration relay		
Specified condition	Between terminals B1 and B4 Between terminals B1 and B4	10 kΩ or higher Below 1 Ω (Apply battery voltage to terminals 1 and 2)

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Fan x Fan motor		6.2	63	55 in. lbf
Radiator assy x Fan shroud		7.5	76	66 in. lbf
Radiator support x Body		5.0	51	44 in. lbf
Water inlet x Cylinder block		9.0	92	80 in. lbf
Water pump x Oil pump assy		11	112	8.1
Water pump pulley x Water pump		15	153	11
Cooler bracket x Radiator support	Bolt A	20	204	15
Cooler bracket x Suction hose	Bolt B	8.5	87	75 in. lbf
Inverter bracket x Radiator support	Bolt A	21	214	16
Inverter bracket x Inverter	Bolt B	25	255	18
Battery negative terminal x Battery negative cable		6.0	61	53 in. lbf
Radiator fan temperature switch x Radiator		7.0	71	62 in. lbf
Radiator support lower LH x Radiator	Bolt A	5.0	51	44 in. lbf
	Bolt B	3.9	40	35 in. lbf
Radiator support lower RH x Radiator	Bolt A	5.0	51	44 in. lbf
	Bolt B	3.9	40	35 in. lbf
Radiator support upper LH x Radiator	Bolt A	5.0	51	44 in. lbf
	Bolt B	3.9	40	35 in. lbf
Radiator support upper RH x Radiator	Bolt A	5.0	51	44 in. lbf
	Bolt B	3.9	40	35 in. lbf
Engine drain cock plug x Cylinder block		13	133	9.6
Radiator bleeder plug x Radiator		1.5	15	13 in. lbf

LUBRICATION

SERVICE DATA

031VU-01

Oil pressure	at idle speed at 2,500 rpm	59 kPa (0.6 kgf/cm ² , 4.2 psi) or more 150 to 550 kPa (1.5 to 56 kgf/cm ² , 22 to 80 psi)
Oil pump tip clearance	Standard Maximum	0.060 to 0.180 mm (0.0024 to 0.0071 in.) 0.28 mm (0.0110 in.)
Oil pump body clearance	Standard Maximum	0.250 to 0.325 mm (0.0098 to 0.0128 in.) 0.425 mm (0.01673 in.)

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Oil pressure switch x Cylinder block		15	153	11
Stud bolt x Cylinder head		10	102	7.4
Oil pump assy x Cylinder head & block	Bolt A	32	326	24
	Bolt B	11	112	8.1
	Bolt C	11	112	8.1
	Nut D	24	245	18
	Bolt E	24	245	18
Camshaft timing oil control valve assy x Cylinder head		7.5	76	66 in. lbf
Engine mounting bracket x Cylinder block		55	561	41
Engine mounting bracket RH x Engine mounting insulator RH		52	530	38
Crankshaft damper x Crankshaft		128	1305	95
Cylinder head cover x Cylinder head		10	102	7.4
Ignition coil No. 1 x Cylinder head cover		9.0	92	80 in. lbf
Brake master cylinder reservoir cover x Cylinder head cover	RHD	8.5	87	75 in. lbf
	LHD	9.0	92	80 in. lbf
Oil pan drain plug x Oil pan No.2		38	387	28
Oil pump cover x Oil pump assy	Bolt	8.8	90	78 in. lbf
	Screw	10	105	7.6
Windshield washer jar assy x Body	Bolt A	4.9	50	43 in. lbf
	Bolt B	14	143	10
	Nut	5.5	56	49 in. lbf
Reservoir bracket x Body		8.5	87	75 in. lbf
Brake master cylinder reservoir x Reservoir bracket and reservoir		8.5	87	75 in. lbf
Air cleaner assy x Cylinder head cover	Bolt	7.0	71	62 in. lbf
	Clamp	3.0	31	27 in. lbf
Battery negative terminal x Battery negative cable		6.0	61	53 in. lbf
Front wheel RH x Front axle		103	1050	76

IGNITION

SERVICE DATA

031V8-01

Spark plug		
Recommended spark plug	DENSO NGK	SK16R11 IFR5A11
Electrode gap	Standard Maximum	1.0 to 1.1 mm (0.039 to 0.043 in.) 1.2 mm (0.047 in.)
Camshaft position sensor		
Resistance	1 (G+) - 2 (G-)	1,630 to 2,740 Ω (Hot) 2,065 to 3,225 Ω (Cold)
Crankshaft position sensor		
Resistance	1 (NE+) - 2 (NE-)	985 to 1,600 Ω (Hot) 1,265 to 1,890 Ω (Cold)

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Camshaft position sensor x Cylinder head sub-assy	8.0	82	71 in·lbf
Crankshaft position sensor x Oil pump assy	7.5	76	66 in·lbf
Ignition coil assy x Cylinder head cover sub-assy	9.0	92	82 in·lbf
Engine relay block No. 2 x Cowl top panel sub-assy outer front	8.4	86	74 in·lbf

STARTING & CHARGING

TORQUE SPECIFICATION

0317H-01

Part Tightened	N·m	kgf·cm	ft·lbf
Battery hold down clamp x Body	5.4	55	48 in·lbf
Battery hold down clamp x Battery tray	5.4	55	48 in·lbf
Fusible link block assy x Battery	6.0	61	53 in·lbf
Quarter vent duct No. 2 x Body	4.0	41	35 in·lbf
Engine wire No. 3 (battery negative terminal) x Battery	6.0	61	53 in·lbf

HYBRID CONTROL SYSTEM

SERVICE DATA

031RW-01

Inverter Standard	Power switch ON (IG)	
	A2 (GIVA) – A16 (GINV)	Approximately 0 V
	A3 (GIVB) – A16 (GINV)	Approximately 0 V
	A4 (GUU) – A16 (GINV)	Approximately 14 to 16 V
	A5 (GVU) – A16 (GINV)	Approximately 14 to 16 V
	A6 (GWU) – A16 (GINV)	Approximately 14 to 16 V
	A7 (MIVA) – A16 (GINV)	Approximately 0 V
	A8 (MIVB) – A16 (GINV)	Approximately 0 V
	A9 (MUU) – A16 (GINV)	Approximately 14 to 16 V
	A10 (MVU) – A16 (GINV)	Approximately 14 to 16 V
	A11 (MWU) – A16 (GINV)	Approximately 14 to 16 V
	A12 (VH) – A16 (GINV)	Approximately 0.5 V
	A13 (CPWM) – A32 (GCNV)	Approximately 0 V
	A14 (GSDN) – A32 (GCNV)	Approximately 2 to 4.5 V
	A15 (VL) – A32 (GCNV)	Approximately 0.5 V
	A16 (GINV) – C2 (GND)	Approximately 0 V
	A18 (GIWA) – A16 (GINV)	Approximately 0 V
	A19 (GIWB) – A16 (GINV)	Approximately 0 V
	A20 (CT) – A16 (GINV)	Approximately 0 V
	A21 (GIVT) – A16 (GINV)	Approximately 2 to 4.5 V
	A22 (GFIV) – A16 (GINV)	Approximately 5 to 8 V
	A23 (MIWA) – A16 (GINV)	Approximately 0 V
	A24 (MIWB) – A16 (GINV)	Approximately 0 V
	A25 (MSDN) – A16 (GINV)	Approximately 0 V
	A26 (MIVT) – A16 (GINV)	Approximately 2 to 4.5 V
	A27 (MFIV) – A16 (GINV)	Approximately 5 to 8 V
	A28 (OVH) – A16 (GINV)	Approximately 5 to 8 V
	A29 (CSDN) – A32 (GCNV)	Approximately 0 V
	A30 (FCV) – A32 (GCNV)	Approximately 13.5 to 16.5 V
	A31 (OVL) – A32 (GCNV)	Approximately 13.5 to 16.5 V
	A32 (GCNV) – C2 (GND)	Approximately 0 V
	B1 (ILK) – body ground	Below 1 Ω
	C1 (IGCT) – C2 (GND)	Approximately 8 to 16 V
	C2 (GND) – body ground	Below 1 Ω
Converter Operation	"READY" lamp ON OFF	Auxiliary battery voltage 14 V 12 V
Out put current		Approximately 80A or less
Speed sensor (resolver) Standard	A1 (GCS) – A4 (GCSG) A2 (GSN) – A5 (GSNG) A3 (GRF) – A6 (GRFG) B1 (MRF) – B4 (MRFG) B2 (MSN) – B5 (MSNG) B3 (MCS) – B6 (MCSG)	12.6 to 16.8 Ω 12.6 to 16.8 Ω 7.65 to 10.2 Ω 7.65 to 10.2 Ω 12.6 to 16.8 Ω 12.6 to 16.8 Ω
Temperature sensor Standard	C1 (MMT) – C4 (MMTG) C3 (OMT) – C6 (OMTG)	87.3 to 110.5 k Ω at 10°C (50°F) 23.8 to 28.5 k Ω at 40°C (104°F) 87.3 to 110.5 k Ω at 10°C (50°F) 23.8 to 28.5 k Ω at 40°C (104°F)

SERVICE SPECIFICATIONS - HYBRID CONTROL SYSTEM

Integration relay (IGCT Relay) HEV fuse (20A) Standard IGCT relay Standard	7J-1 – 7J-4 7J-1 – 7K-1 7J-2 – 7J-3 7J-4 – 7K-1	Below 1 Ω 10 k Ω or higher Below 1 Ω (Battery voltage is added between terminals 7J-2 and 7J-3) Below 1 Ω Below 1 Ω (Battery voltage is added between terminals 7J-2 and 7J-3) Below 1 Ω 10 k Ω or higher
Pattern select switch assy No. 1 (EV-drive mode switch) Standard	3 (T) – 4 (E) Not pushing the switch Pushing the switch	10 k Ω or higher Below 1 Ω
Battery plug Standard	Install the service plug grip	10 k Ω or higher Below 1 Ω
System main relay No. 1 Continuity Standard	Positive terminal – Negative terminal A1 (CONT1) – Terminal 5 A2 (CONT2) – B1 (CONT2) A3 (CONT3) – C1 (CONT3) B1 (GND) – GND terminal C2 (GND) – GND terminal	10 k Ω or higher Below 1 Ω (Apply voltage between the positive and negative terminals) Below 1 Ω Below 1 Ω Below 1 Ω Below 1 Ω
Resistance Standard	A1 (CONT1) – Terminal 5	70 to 160 Ω
System main relay No. 2 and 3 Continuity Standard	Positive terminal – Negative terminal	10 k Ω or higher Below 1 Ω (Apply voltage between the connector terminals)
Resistance Standard	Connector terminals	20 to 50 Ω
Battery current sensor Standard	Positive probe to terminal 1 (VIB) Negative probe to terminal 2 (GIB) Positive probe to terminal 2 (GIB) Negative probe to terminal 1 (VIB) Positive probe to terminal 1 (VIB) Negative probe to terminal 3 (IB) Positive probe to terminal 3 (IB) Negative probe to terminal 1 (VIB) 2 (GIB) – 3 (IB)	3.5 to 4.5 k Ω 5 to 7 k Ω 3.5 to 4.5 k Ω 5 to 7 k Ω 0.2 k Ω or less
System main resistor Standard		18 to 22 Ω
Battery blower relay No. 1 Standard	3 – 5	10 k Ω or higher Below 1 Ω (When battery voltage is applied to terminals 1 and 2)

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Inverter cover x W/ converter inverter assy	Bolt	11	112	8.1
	Security screw	11	112	8.1
MG 1 power cable x W/ converter inverter assy		8.0	82	71 in. lbf
MG 2 power cable x W/ converter inverter assy		8.0	82	71 in. lbf
W/ converter inverter assy x Body		21	214	16
Air compressor connector bracket x W/ converter inverter assy		8.0	82	71 in. lbf
Inverter bracket No. 1 x W/ converter inverter assy		25	255	18
Inverter bracket No. 2 x W/ converter inverter assy		25	255	18
Circuit bracket sensor No. 1 x W/ converter inverter assy		8.0	82	71 in. lbf
Battery carrier bracket x Battery cover		28	286	21
Battery bracket reinforcement x Battery cover		28	286	21
Battery carrier panel No. 6 x Battery carrier sub-assy UPR		7.5	76	66 in. lbf
Frame wire x System main relay No. 2		5.6	57	50 in. lbf
Frame wire x System main relay No. 3		5.6	57	50 in. lbf
HV battery assy x Body		19	194	14
Battery cover x HV battery assy		8.0	82	71 in. lbf
Battery carrier sub-assy UPR x HV Battery		5.5	56	49 in. lbf
Main battery cable x Frame wire No. 2		5.4	55	48 in. lbf
Main battery cable x System main relay No. 2		5.6	57	50 in. lbf
Aluminium shield wire x Battery carrier sub-assy UPR		3.3	34	29 in. lbf
Main battery cable No. 2 x Frame wire No. 2		5.4	55	48 in. lbf
Main battery cable No. 2 x System main relay No. 3		5.6	57	50 in. lbf
Frame wire No. 2 x Battery pack		5.4	55	48 in. lbf
Battery plug x Wiring harness protector cover No. 1		5.4	55	48 in. lbf
Battery plug x Battery carrier sub-assy UPR		5.4	55	48 in. lbf
Junction block x Battery pack		5.4	55	48 in. lbf
System main relay No. 1 x Battery carrier sub-assy UPR	Bolt	3.4	35	30 in. lbf
	Nut	5.6	57	50 in. lbf
System main relay No. 2 x Battery carrier sub-assy UPR		3.4	35	30 in. lbf
System main relay No. 3 x Battery carrier sub-assy UPR		3.4	35	30 in. lbf
System main resistor x Battery carrier sub-assy UPR		3.4	35	30 in. lbf
Battery current sensor x Battery carrier sub-assy UPR		1.4	14	12 in. lbf
Battery ECU assy x Battery carrier sub-assy UPR		3.3	34	29 in. lbf
Frame wire x Under floor panel		9.0	92	80 in. lbf
Frame wire x Engine room relay block		9.0	92	80 in. lbf
Electric vehicle fuse x Service plug grip		5.4	55	48 in. lbf
Battery blower assy x Body		5.0	51	44 in. lbf
Hybrid vehicle control ECU x ECM		5.5	56	49 in. lbf
Water w/ motor & bracket pump assy x Body		7.0	71	62 in. lbf
Accelerator pedal rod assy x Frame		7.5	77	66 in. lbf
Front suspension crossmember sub-assy x Body	Bolt A	113	1,152	83
	Bolt B	157	1,601	116
Front wheel		103	1,050	76
Auxiliary battery negative terminal		6.0	61	53 in. lbf

HYBRID TRANSAXLE

SERVICE DATA

031V4-01

Differential case side bearing preload		New bearing: 0.98 to 1.57 N·m (9.99 to 16.01 kgf·cm, 8.67 to 13.90 in.·lbf) Reused bearing: 0.49 to 0.78 N·m (5.00 to 7.95 kgf·cm, 4.43 to 6.90 in.·lbf) 0.61 to 1.35 N·m (6.2 to 13.77 kgf·cm, 5.4 to 11.95 in.·lbf)
(Starting torque)		
(Turning torque 20 rpm)		
Differential preload adjusting shim thickness		
	Mark 1	1.80 mm (0.0709 in.)
	Mark 2	1.83 mm (0.0720 in.)
	Mark 3	1.86 mm (0.0732 in.)
	Mark 4	1.89 mm (0.0744 in.)
	Mark 50	1.92 mm (0.0756 in.)
	Mark 51	1.94 mm (0.0764 in.)
	Mark 52	1.96 mm (0.0772 in.)
	Mark 53	1.98 mm (0.0780 in.)
	Mark 54	2.00 mm (0.0787 in.)
	Mark 55	2.02 mm (0.0795 in.)
	Mark 56	2.04 mm (0.0803 in.)
	Mark 57	2.06 mm (0.0811 in.)
	Mark 58	2.08 mm (0.0819 in.)
	Mark 59	2.10 mm (0.0827 in.)
	Mark 60	2.12 mm (0.0835 in.)
	Mark 61	2.14 mm (0.0843 in.)
	Mark 62	2.16 mm (0.0850 in.)
	Mark 63	2.18 mm (0.0858 in.)
	Mark 64	2.20 mm (0.0866 in.)
	Mark 65	2.22 mm (0.0874 in.)
	Mark 66	2.24 mm (0.0882 in.)
	Mark 67	2.26 mm (0.0890 in.)
	Mark 68	2.28 mm (0.0898 in.)
	Mark 69	2.30 mm (0.0906 in.)
	Mark 70	2.32 mm (0.0913 in.)
	Mark 19	2.34 mm (0.0921 in.)
	Mark 20	2.37 mm (0.0933 in.)
	–	2.40 mm (0.0945 in.)
	Mark 22	2.43 mm (0.0957 in.)
	Mark 23	2.46 mm (0.0969 in.)
Input shaft shim thickness		
	Mark 1	1.00 mm (0.0394 in.)
	Mark 2	1.20 mm (0.0472 in.)
	Mark 3	1.40 mm (0.0551 in.)
	Mark 4	1.60 mm (0.0630 in.)
	Mark 5	1.80 mm (0.0709 in.)
	Mark 6	2.00 mm (0.0787 in.)
	Mark 7	2.20 mm (0.0866 in.)
	Mark 8	2.40 mm (0.0945 in.)
	Mark 9	2.60 mm (0.1024 in.)
	Mark 10	2.80 mm (0.1102 in.)
	Mark 11	3.00 mm (0.1181 in.)
	Mark 12	3.20 mm (0.1260 in.)

Counter drive gear shim thickness	Mark A	2.20 mm (0.0866 in.)
	Mark B	2.25 mm (0.0886 in.)
	Mark C	2.30 mm (0.0906 in.)
	Mark D	2.35 mm (0.0925 in.)
	Mark E	2.40 mm (0.0945 in.)
	Mark F	2.45 mm (0.0965 in.)
	Mark G	2.50 mm (0.0984 in.)
	Mark H	2.55 mm (0.1003 in.)
	Mark J	2.60 mm (0.1024 in.)
	Mark K	2.65 mm (0.1043 in.)
	Mark L	2.70 mm (0.1063 in.)
	Mark M	2.75 mm (0.1083 in.)
	Mark N	2.80 mm (0.1102 in.)
Differential oil seal LH and RH drive in depth		2.7 ± 0.5 mm (0.11 ± 0.02 in.)
Oil pressure		9.8 kPa (0.1 kgf/cm ² , 1.4 pst)
Differential side gear backlash	Standard	0.05 to 0.20 mm (0.0020 to 0.0079 in.)
Differential side gear washer thickness		0.95 mm (0.0374 in.)
		1.00 mm (0.0394 in.)
		1.05 mm (0.0414 in.)
		1.10 mm (0.0433 in.)
		1.15 mm (0.0453 in.)
		1.20 mm (0.0472 in.)
Sun gear bush diameter	Standard	25.525 to 25.546 mm (1.00492 to 1.00575 in.)
	Maximum	25.596 mm (1.00771 in.)

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
Oil pump cover x MG2 assembly	5.5	56	49 in.·lbf
Transaxle oil drain plug	39	400	29
Hybrid transaxle assembly x Engine	33	332	24
Coolant drain plug x MG1 assembly	39	400	29
Screw plug x MG1 assembly	55	561	41
Set plug x MG2 assembly	39	400	29
Filler plug x MG2 assembly	39	400	29
MG1 assembly x MG2 assembly	25	250	18
Oil strainer x MG2 assembly	7.9	81	70 in.·lbf
Motor water jacket cover x MG2 assembly	5.5	56	49
Housing tube x MG1 assembly	15	155	11
Detent spring set bolt	9.8	100	86 in.·lbf
Parking cover x MG2 assembly	5.5	56	49 in.·lbf
Parking shaft cover x MG2 assembly	5.5	56	49 in.·lbf
Oil pump cover x plug	7.4	75	65 in.·lbf
Power cable cover x MG1 assembly	4.8	48	42 in.·lbf
Mounting bracket x MG2 assembly	52	530	38
Shift lever assembly x Steering column	8	80	71 in.·lbf
Generator cable x Converter & inverter	5.5	56	49 in.·lbf
Generator cable x MG1 cable cover	5.8	59	51 in.·lbf
Generator cable x MG1 assembly	8.5	87	75 in.·lbf
Connector x MG1 assembly	5.8	59	51 in.·lbf
Connector x MG2 assembly	5.8	59	51 in.·lbf
Transmission case cover x MG2 assembly	7.0	71	62 in.·lbf
Shift control actuator x MG2 assembly	16	160	12
Shift lever assy x Body	12	122	9
Engine hanger x Hybrid transaxle assembly	38	387	28
Stay x Hybrid transaxle assembly	9.0	92	80 in.·lbf
Engine mounting bracket No.3 x Hybrid transaxle assembly	52	530	38
Housing side cover x Hybrid transaxle assembly	32	326	23
Engine mounting insulator x Hybrid transaxle assembly	80	816	59
Earth wire x Hybrid transaxle assembly	9.0	92	80 in.·lbf
Set plug x MG2 assembly	39	400	29
Screw plug x MG2 assembly	13	130	9
Nut x Baring	280	2860	207

FRONT SUSPENSION

SERVICE DATA

031GK-01

Front wheel alignment	Vehicle height EUROPE	A-B: D-C:	95 mm (3.74 in.) 60 mm (2.36 in.)
	Vehicle height AUSTRALIA	A-B: D-C:	93 mm (3.74 in.) 58 mm (2.28 in.)
	Toe-in (total)	Rack end length difference	$0^\circ \pm 12'$ ($0^\circ \pm 0.2^\circ$), 0 ± 2 mm (0 ± 0.08 in.) 1.5 mm (0.059 in.) or less
	Wheel angle	Inside wheel Outside wheel: Reference	$40^\circ 35'$ ($38^\circ 35' - 42^\circ 35'$) 40.58° ($38.58^\circ - 42.58^\circ$) $34^\circ 15'$ 34.25°
	Camber	Right-left error	$-0^\circ 35' \pm 45'$ ($-0.58^\circ \pm 0.75^\circ$) 45' (0.75°) or less
	Caster	Right-left error	$3^\circ 10' \pm 45'$ ($3.17^\circ \pm 0.75^\circ$) 45' (0.75°) or less
	Steering axis inclination	Right-left error	$12^\circ 35' \pm 45'$ ($12.58^\circ \pm 0.75^\circ$) 45' (0.75°) or less
Front suspension	Lower ball joint turning torque		0.98 to 4.90 N·m (10 to 50 kgf·cm, 9 to 43 in·lbf)
Front suspension	Stabilizer link turning torque		0.05 to 1.96 N·m (0.5 to 20 kgf·cm, 0.4 to 17.4 in·lbf)

A: Ground clearance of front wheel center

B: Ground clearance of lower arm No.1 set bolt center

C: Ground clearance of rear axle carrier bush set bolt center

D: Ground clearance of rear wheel center

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Tie rod end lock nut	74	749	54
Steering knuckle x Shock absorber	153	1,560	113
Front wheel hub nut	103	1,050	76
Suspension support x Piston rod	47	479	35
Suspension support x Body	39	398	29
ABS speed sensor wire harness bracket set bolt	19	192	14
Steering gear assy x Suspension cross member	58	591	43
Stabilizer link assy x Shock absorber with coil spring	74	755	55
Steering knuckle x Lower ball joint	71	724	52
Lower suspension arm x Suspension cross member	137	1,400	101
Stabilizer bracket No.1 x Suspension cross member	19	194	14

REAR SUSPENSION

031VM-01

SERVICE DATA

Rear wheel alignment	Toe-in (total)	0°18' ± 15' (0.30° ± 0.25°, 3.0 ± 2.5 mm, 0.12 ± 0.10 in.)
	Camber Right-left error	-1°30' ± 30' (-1.50° ± 0.5°) 30' (0.5°) or less

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TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Hub nut	103	1,050	76
Piston rod set nut	56	571	41
Shock absorber with coil spring x Body	80	816	59
Shock absorber with coil spring x Rear axle beam	80	816	59
Parking brake cable set bolt	5.4	55	48 in·lbf
Rear axle hub set bolt	61	622	45
Skid control sensor wire set bolt	5.0	51	44 in·lbf
Rear axle beam x Body	85	867	63
Stabilizer bar x Rear axle beam	149	1,520	110

TIRE & WHEEL

SERVICE DATA

051QJ-01

Cold tire inflation pressure	EUROPE 195/55R16 87V:	Front*1:	240 kPa (2.4 kgf/cm ² , 35 psi)
		Rear*1:	230 kPa (2.3 kgf/cm ² , 33 psi)
		Front*2:	260 kPa (2.6 kgf/cm ² , 38 psi)
		Rear*2:	250 kPa (2.5 kgf/cm ² , 36 psi)
	AUSTRALIA 195/60R15 88V:	Front*3:	240 kPa (2.4 kgf/cm ² , 35 psi)
		Rear*3:	230 kPa (2.3 kgf/cm ² , 33 psi)
		Front*4:	270 kPa (2.7 kgf/cm ² , 39 psi)
		Rear*4:	260 kPa (2.6 kgf/cm ² , 38 psi)
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

*3: For driving under 140 km/h (87 mph)

*4: For driving at 140 km/h (87 mph) or over

DRIVE SHAFT / PROPELLER SHAFT / AXLE

031UN-01

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.)
Rear axle hub & bearing assy: 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
Rear wheel set nut	103	1,050	76
transaxle x drain plug	39	398	29
Tie rod end sub-assy x Steering knuckle	49	500	36
Suspension arm sub-assy lower No.1 x Steering knuckle	89	908	66
Flexible hose and speed sensor front x Shock absorber assy front	29	300	22
Speed sensor front x Steering knuckle	8.0	82	71 in·lbf
Front axle hub nut	216	2,200	159
Front axle assy x Shock absorber assy front	153	1,560	113
Front disc brake caliper assy x Steering knuckle	109	1,114	81
Rear axle hub & bearing assy x Rear axle beam	61	622	45
Steering knuckle x Lower ball joint assy	71	724	52
Steering knuckle x Front axle hub	56	571	41
Rear disc brake caliper assy x Rear axle carrier sub-assy	47	479	35

BRAKE

SERVICE DATA

030HA-03

Brake pedal height (from asphalt sheet)		138 to 148 mm (5.433 to 5.827 in.)
Brake pedal stroke sensor	Standard value:	0.8 to 1.2 V
Brake pedal freeplay	Pedal free play:	0.5 to 4 mm (0.02 to 0.16 in.)
Stop lamp switch clearance		0.5 to 2.4 mm (0.02 to 0.095 in.)
Pedal reserve distance from asphalt sheet at 196 N (20 kgf, 44.1 lbf)	RHD: LHD:	More than 101 mm (4.0 in.) More than 104 mm (4.1 in.)
Buttery voltage (during engine stop)	Standard value:	10 to 14 V
Front brake pad thickness	Standard thickness: Minimum thickness:	11.0 mm (0.433 in.) 1.0 mm (0.039 in.)
Front brake disc thickness	Standard thickness: Minimum thickness:	22.0 mm (0.866 in.) 20.0 mm (0.787 in.)
Front brake disc runout	Maximum disc runout:	0.05 mm (0.0020 in.)
Rear brake pad thickness	Standard thickness: Minimum thickness:	10.0 mm (0.394 in.) 1.0 mm (0.039 in.)
Rear disc brake thickness	Standard thickness: Minimum thickness:	9.0 mm (0.354 in.) 7.5 mm (0.295 in.)
Rear brake disc runout	Maximum disc runout:	0.15 mm (0.0059 in.)

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Brake line union nut	15	155	11
Bleeder plug	8.4	86	74 in·lbf
Brake booster clevis lock nut	26	265	19
Stop lamp lock nut	26	265	19
Brake stroke sensor assy set bolt	9.3	95	82 in·lbf
Brake pedal sub-assy set bolt	37	375	27
Brake pedal support assy x Body	13	130	9
Brake pedal support assy x Reinforcement	24	241	18
Brake master cylinder union No.1 set screw	1.8	18	16 in·lbf
Brake master cylinder x Bracket	13	127	9
Brake actuator bracket x Tube bracket	5.0	51	44 in·lbf
Cowl top panel sub-assy outer front	6.4	65	57 in·lbf
Engine room R/B No.2 x Body	8.4	86	74 in·lbf
Brake stroke simulator stud bolt	5.0	51	44 in·lbf
Brake stroke simulator x Bracket	6.0	61	53 in·lbf
Brake stroke simulator Bracket x Body	8.5	87	75 in·lbf
Brake stroke simulator x Brake actuator tube assy	8.5	87	75 in·lbf
Wheel nut	103	1,050	76
Front brake cylinder mounting x Steering knuckle	109	1,114	81
Front brake cylinder x Front brake cylinder mounting	34	347	25
Front brake cylinder x Flexible hose	33	337	24
Disc brake cylinder assy rear set bolt	47	475	34
Disc brake cylinder assy rear x Flexible hose	30	310	22
Brake actuator assy x Brake actuator bracket No.2	18	184	13
Brake actuator assy x Gusset assy	7.5	76	66 in·lbf
Brake actuator assy x Bracket	18	184	13
Brake actuator assy x Brake actuator damper	18	184	13
Brake actuator w/ gusset assy x Body	20	200	15
Brake actuator assy x Brake tube clamp bracket	5.0	51	44
Brake actuator x Brake actuator tube assy	8.5	87	75 in·lbf
Brake actuator bracket x Front brake tube No.5 bracket	5.0	51	44 in·lbf
Front speed sensor x Steering knuckle	8.0	82	71 in·lbf
Front speed sensor wire harness clamp x Body Bolt A:	8.0	82	71 in·lbf
Front speed sensor wire harness clamp x Shock absorber Bolt B:	19	192	14
Skid control ECU assy x Body	5.0	51	44 in·lbf
Brake control power supply assy x Body	19	194	14
Yawrate sensor x Body	19	194	14

PARKING BRAKE

SERVICE DATA

03105-01

Parking brake pedal travel at 300 N (31 kgf, 68.3 lbf):		6 – 9 clicks
Rear brake disc inside diameter	Standard	173 mm (6.810 in.)
	Maximum	174 mm (6.850 in.)
Parking brake shoe lining thickness	Standard	3.5 mm (0.138 in.)
	Maximum	1.0 mm (0.039 in.)

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
Wheel nut	103	1,050	76
Parking brake cable lock nut	5.4	55	48 in.·lbf
Parking brake control pedal set bolt (LHD)	20	204	15
Parking brake control pedal set bolt (RHD)	14	143	10
Parking brake cable assy No.1 x Body	14	143	10
Parking brake cable assy No.3 x Body	Bolt A	5.4	48 in.·lbf
	Bolt B	6	53 in.·lbf
Parking brake cable No.3 x Backing plate	8	82	71 in.·lbf
Parking brake cable heat insulator x Body	5.4	55	48 in.·lbf
Parking brake cable assy No.4 x Body	14	143	10
Parking brake cable assy No.4 adjusting nut	5.4	55	48 in.·lbf
Rear disc brake caliper assy LH	47	475	34

STEERING COLUMN

SERVICE DATA

03100-01

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

Part tightened	N·m	kgf·cm	ft·lbf
Steering column assembly set bolt	25	255	18
Power steering motor set bolt	18	185	13
Steering Intermediate shaft assy No.2 x Steering column assembly	35	360	26
Steering Intermediate shaft assy No.2 x Steering sliding yoke sub-assy	35	360	26
Steering sliding yoke sub-assy x Steering Intermediate shaft assy	35	360	26
Steering wheel set nut	50	510	37
Tilt lever bracket set screw	2.0	20	37
Steering wheel pad set screw (Torx screw)	8.8	90	78 in.·lbf
Power steering motor assy x Steering column assembly	18	185	18 in.·lbf
Power steering ECU assy	5	50	44 in.·lbf
Tie rod end lock nut	74	750	54

POWER STEERING

SERVICE DATA

03098-05

STEERING WHEEL		
Steering effort	(Reference)	5.5 N·m (56 kgf·cm, 49 in.·lbf)
Steering wheel freeplay	Maximum	30 mm (1.18 in.)
POWER STEERING GEAR		
Tie rod end sub-assy total preload	(Turning)	2.0 N·m (20.4 kgf·cm, 18 in.·lbf) or less
Steering gear assy total preload	(Turning)	0.6 – 1.2 N·m (6.1 – 12.2 kgf·cm, 5 – 11 in.·lbf)
Steering rack boot clamp clearance		3.0 mm (0.12 in.) or less

TORQUE SPECIFICATION

Part tightened	N·m	kgf·cm	ft·lbf
STEERING WHEEL			
Steering wheel set nut	50	510	37
POWER STEERING GEAR			
Power steering rack x Steering rack end sub-assy	60 (83)	612 (846)	44 (61)
Tie rod assy lock nut	74	749	54
Steering gear assy set bolt	58	591	43
Steering intermediate shaft x Steering gear assy	35	360	26
Front stabilizer bracket No.1	19	194	14
Front stabilizer link assy set nut	74	755	55
Steering sliding yoke sub-assy set bolt	35	360	26
Tie rod end sub-assy set nut	74	749	54
Hub nut	103	1,050	76

(): For use without SST

HEATER & AIR CONDITIONER
SERVICE DATA

031VA-01

Refrigerant charge volume	Standard: 450 ± 30 g (15.9 ± 1.1 oz.)
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TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
AIR CONDITIONING RADIATOR ASSY			
Air conditioning tube assy x Cooler evaporator sub-assy No. 1	3.5	35	30 in.·lbf
ELECTRIC INVERTER COMPRESSOR ASSY			
Electric inverter compressor assy x Engine	25	255	18
Suction hose sub-assy x Electric inverter compressor assy	9.8	100	87 in.·lbf
Discharge hose sub-assy x Electric inverter compressor assy	9.8	100	87 in.·lbf
W/ RECEIVER CONDENSER ASSY			
Cap x W/ receiver condenser assy	2.9	30	25 in.·lbf
W/ receiver condenser assy x Radiator	3.9	40	35 in.·lbf
Radiator support sub-assy upper RH x Radiator Bolt A	5.0	51	44 in.·lbf
Radiator support sub-assy upper RH x Radiator Bolt B	3.9	40	35 in.·lbf
Radiator support sub-assy upper RH x Radiator Bolt C	7.5	76	66 in.·lbf
Radiator support sub-assy upper LH x Radiator Bolt A	5.0	51	44 in.·lbf
Radiator support sub-assy upper LH x Radiator Bolt B	3.9	40	35 in.·lbf
Radiator support sub-assy upper LH x Radiator Bolt C	7.5	76	66 in.·lbf
Cooler refrigerant liquid pipe E x W/ receiver condenser assy	5.4	55	47 in.·lbf
Discharge hose sub-assy x W/ receiver condenser assy	5.4	55	47 in.·lbf

SUPPLEMENTAL RESTRAINT SYSTEM

TORQUE SPECIFICATION

031UD-01

Part Tightened	N·m	kgf·cm	ft·lbf
Horn button assy x Steering wheel assy	8.8	90	78 in·lbf
Steering wheel assy x Steering column assy	50	510	37
Front passenger airbag assy x Instrument panel reinforcement	20	204	15
Curtain shield airbag assy x Body	14	143	10
Airbag ECU assy x Body	17.5	178	13
Airbag sensor front x Body	LH Side:	17.5	178
	RH Side:	9.0	92
Side airbag sensor assy x Body		92	80 in·lbf
Airbag sensor rear x Body		17.5	178
Seat position airbag sensor x Front seat		8.0	82
			71 in·lbf

SEAT BELT

TORQUE SPECIFICATION

031TL-01

Part Tightened	N·m	kgf·cm	ft·lbf
FRONT SEAT BELT			
Front seat outer belt assy RH (For upper bolt) x Body	5.0	51	44 in·lbf
Front seat outer belt assy RH (For lower bolt) x Body	42	430	31
Front seat outer belt (floor anchor) x Body	42	430	31
Front seat outer belt (shoulder anchor) x Body	42	430	31
Front seat inner belt assy RH x Front seat	42	430	31
REAR SEAT BELT			
Rear seat outer belt assy x Body (RH and LH)	42	430	31
Rear seat outer belt assy x Body (Center)	42	430	31
Rear seat outer belt assy (floor anchor) x Body (RH and LH)	42	420	31
Rear seat outer belt assy (floor anchor) x Rear seat inner belt (Center)	42	420	31
Rear seat inner belt assy RH x Body	42	430	31
Rear seat inner belt assy Center x Body	42	430	31
CRS anchorage x Body	31	316	23

WIPER & WASHER

TORQUE SPECIFICATION

031VQ-01

Part Tightened	N·m	kgf·cm	ft·lbf
Wiper motor x Wiper link European Specifications:	7.5	76	66 in·lbf
Wiper motor x Wiper link Australian Specifications:	5.4	55	48 in·lbf
Wiper link x Body	5.5	56	49 in·lbf
Wiper arm x Wiper link	21	214	15
Rear wiper motor x Body	5.5	56	49 in·lbf
Rear wiper motor x Rear wiper arm	5.5	56	49 in·lbf

AUDIO & VISUAL SYSTEM

031V2-01

TORQUE SPECIFICATION

Part Tightened	N·m	kgf·cm	ft·lbf
ANTENNA (CORD/POLE SEPARATE TYPE) HOLDER ASSY			
antenna holder assy x Antenna nut	5.0	51	44 in·lbf
ANTENNA CORD SUB-ASSY			
antenna cord x bolt	7.0	71	62 in·lbf

WINDSHIELD/WINDOWGLASS/MIRROR
TORQUE SPECIFICATION

031UC-01

Part Tightened	N·m	kgf·cm	ft·lbf
OUTER REAR VIEW MIRROR ASSY LH			
Outer rear view mirror assy x Front door	5.5	56	49 in·lbf

INSTRUMENT PANEL/METER

TORQUE SPECIFICATION

031UT-01

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

SEAT

TORQUE SPECIFICATION

031VZ-01

Part Tightened	N·m	kgf·cm	ft·lbf
FRONT SEAT ASSY			
Airbag sensor x Seat adjuster assy	8	82	71 in·lbf
Seat Inner belt assy x Seat adjuster assy	42	428	31
Seatback cover bracket x Seat adjuster assy (w/ Side airbag)	5.5	56	49 in·lbf
Seat assy x Body	37	377	27
REAR SEAT ASSY			
Seatback hinge sub-assy x Seatback frame	36.8	375	27
Seatback hinge sub-assy center x Seatback frame	36.8	375	27
Seatback hinge sub-assy center x Body	18.1	185	13
Seatback hinge sub-assy x Body	18.1	185	13
Seatback lock assy x Seatback frame	18.1	185	13
Seat belt assy outer center x Seatback frame	42	428	31
Seat belt floor anchor x Body	42	428	31

ENGINE HOOD/DOOR

TORQUE SPECIFICATION

031VW-01

Part Tightened	N·m	kgf·cm	ft·lbf
HOOD			
Hood hinge x Hood	13	133	10
Hood hinge x Body	5.5	56	49 in.·lbf
Hood lock x Hood	8.0	82	71 in.·lbf
FRONT DOOR			
Door check x Body	30	306	22
Door check x Door panel	5.5	56	46 in.·lbf
Door frame sub-assy rear lower x Door panel	8.0	82	71 in.·lbf
Door glass x Front door window regulator	5.5	56	49 in.·lbf
Door hinge x Body	26	265	19
Door hinge x Door panel	26	265	19
Door lock x Door panel	5.0	51	44 in.·lbf
Door lock striker x Body	23	235	17
Door outside handle cover x Door panel	7.0	71	62 in.·lbf
Door outside handle frame x Door panel	4.0	41	35 in.·lbf
Outer view mirror x Door panel	10	102	7
Window regulator x Door panel	8.0	82	71 in.·lbf
REAR DOOR			
Door check x Body	30	306	22
Door check x Door panel	5.5	56	49 in.·lbf
Door hinge x Body	26	265	19
Door hinge x Door panel	26	265	19
Door lock x Door panel	5.0	51	44 in.·lbf
Door lock striker x Body	23	235	17
Door outside handle cover x Door panel	4.0	41	35 in.·lbf
Door outside handle frame x Door panel	7.0	71	62 in.·lbf
Window division bar sub-assy x Door panel	5.5	56	49 in.·lbf
BACK DOOR (LIFTBACK MODEL)			
Back door female stopper x Door panel	5.5	56	49 in.·lbf
Back door hinge assy x Body	19.5	200	14
Back door hinge assy x Door panel	19.5	200	14
Back door lock assy x Door panel	8.0	82	71 in.·lbf
Back door lock Striker x Body	11.5	120	8.0
Back door stay sub-assy x Body	7.0	71	62 in.·lbf
Back door stay sub-assy x Door panel	22	224	16
Center stop lamp assy x Door panel	5.5	56	49 in.·lbf

EXTERIOR/INTERIOR TRIM

TORQUE SPECIFICATION

031VY-01

Part Tightened	N·m	kgf·cm	ft·lbf
FRONT BUMPER			
Front bumper reinforcement x Body	13	133	10
Front bumper cover x Body	5.0	51	44 in·lbf
ROOF HEADLINING			
Front seat outer belt x Body	42	430	31
Rear seat belt x Body	42	430	31

HORN

TORQUE SPECIFICATION

031UB-01

Part Tightened	N·m	kgf·cm	ft·lbf
High Pitched Horn Assy			
High pitched hprn assy x Body	20	204	15
Low Pitched Horn Assy			
Low pitched horn assy x Body	20	204	15