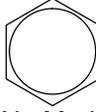
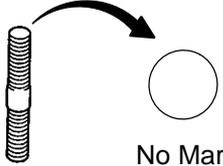
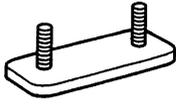
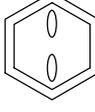
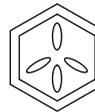
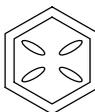
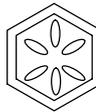
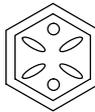


# STANDARD BOLT

## HOW TO DETERMINE BOLT STRENGTH

031WJ-01

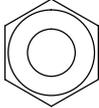
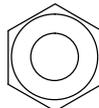
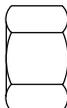
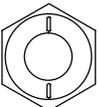
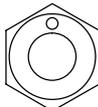
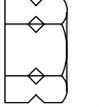
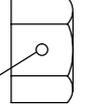
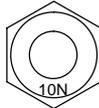
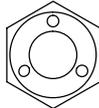
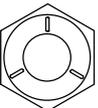
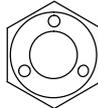
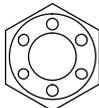
| Bolt Type  |   |   | Class   |           |
|--|---|---|---|-----------|
| Hexagon Head Bolt  |   | Stud Bolt   |   | Weld Bolt |
| Normal Recess Bolt   | Deep Recess Bolt  |   |   |           |
|  <br>No Mark     | <br>No Mark  | <br>No Mark  |  | 4T        |
|                  |    |   |   | 5T  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

B06431

## SPECIFIED TORQUE FOR STANDARD BOLTS

| Class | Diameter<br>mm | Pitch<br>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 Forged Nut   |  | Cutting Processed Nut |
| <br>No Mark  |   |  | 4N                    |
| <br>No Mark (w/Washer)   | <br>No Mark (w/Washer)   | <br>No Mark   | 5N (4T)               |
|    |   |  | 6N                    |
|   |     |   | 7N (5T)               |
|     |   |  | 8N                    |
|     |   | <br>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 greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example: Bolt = 4T

Nut = 4N or more

2004 Prius - Preliminary Release (RM1075U)

B06432

# ENGINE CONTROL SYSTEM

## SERVICE DATA

031VG-01

|  |                                    |  |
|--|------------------------------------|--|
| Camshaft timing oil control valve assy<br>Resistance   | 1 (+) – 2 (-)                      | 6.9 to 7.9 $\Omega$ at 20°C (68°F)   |
| Mass air flow meter<br>Resistance  | 4 (THA) – 5 (E2)                   | 13.6 to 18.4 k $\Omega$ at -20°C (-4°F)<br>2.21 to 2.68 k $\Omega$ at 20°C (68°F)<br>0.493 to 0.667 k $\Omega$ at 60°C (140°F) |
| Engine coolant temperature sensor<br>Resistance  | 1 (E2) – 2 (THW)                   | 2.32 to 2.59 k $\Omega$ at 20°C (68°F)<br>0.310 to 0.326 k $\Omega$ at 80°C (176°F)  |
| Throttle w/ motor body assy<br>Throttle valve opening percentage<br>Idle speed<br>Resistance (Throttle control motor)<br>Resistance (Throttle position sensor) | 1 (M+) – 2 (M+)<br>1 (VC) – 4 (E2) | 60 % or more<br>950 to 1,050rpm<br>0.3 to 100 $\Omega$ at 20°C (68°F)<br>1.25 to 2.35 $\Omega$ at 20°C (68°F)                  |
| Knock sensor<br>Resistance   | 1 (Ground) – 2 (Output)            | 120 to 280 k $\Omega$ at 20°C (68°F)   |
| EFI Relay<br>Resistance  | B5 – B8                            | 10 k $\Omega$ or higher<br>Below 1 $\Omega$ (Apply battery voltage to terminal B6 and B7)                                      |
| Circuit opening relay<br>Resistance  | B5 – B8                            | 10 k $\Omega$ or higher<br>Below 1 $\Omega$ (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

031VE-01

|   |   |  |
|---|---|--|
| Fuel pressure   | at idle<br>5 minutes after the engine has stopped | 304 to 343 kPa (3.1 to 3.5 kgf/cm <sup>2</sup> , 44 to 50 psi)<br>147 kPa (1.5 kgf/cm <sup>2</sup> , 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 <sup>3</sup> (2.1 to 2.8 cu in.)   |
|   | Difference between each fuel injector             | 10 cm <sup>3</sup> (0.6 cu in.) or less  |
| Leakage   | Standard  | 1 drop or less per 12 minutes  |
| Fuel tank assy (fuel pump)  |   |  |
| Resistance  | 3 - 7   | 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<br>(See page 11-15) | 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          |
| Ignition coil assy x Cylinder head cover sub-assy                       |        | 9.0 | 92     | 80 in.-lbf |
| Engine wire x Cylinder head cover sub-assy                              |        | 9.0 | 92     | 80 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 |
| Trap w/ outlet valve canister assy x Fuel tank assy                     |        | 6.0 | 61     | 53 in.-lbf |
| Fuel tank bracket RR 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         |
| 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

031UR-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 3.9 $\Omega$ at 20°C (68°F)                                     |
|  | 2 (+B) – 4 (AF-)          | 10 k $\Omega$ or higher  |
| Vapor pressure sensor                            |                           |  |
| Voltage  | 1 – 3                     | 4.5 to 5.5 V   |
|  | 2 – 3                     | 3.0 to 3.6 V   |
| Vacuum switching valve assy No. 2                |                           |  |
| Resistance                                       | 1 – 2                     | 26 to 30 $\Omega$ at 20°C (68°F)                                       |
| Charcoal canister vacuum switching valve         |                           |  |
| Resistance                                       | 1 – 2                     | 36 to 42 $\Omega$ at 20°C (68°F)                                       |
| Trap w/ outlet valve canister assy               |                           |  |
| Resistance (VSV for CCV (canister closed valve)) | 1 – 2                     | 25 to 30 $\Omega$ at 20°C (68°F)<br>32 to 40 $\Omega$ at 100°C (212°F) |
| Heated oxygen sensor                             |                           |  |
| Resistance                                       | 1 (HT) – 2 (+B)           | 11 to 16 $\Omega$ at 20°C (68°F)                                       |
|  | 1 (HT) – 4 (E)            | 10 k $\Omega$ or higher  |

## TORQUE SPECIFICATION

| Part Tightened  | N-m | kgf·cm | ft·lbf     |
|---|-----|--------|------------|
| Charcoal canister assy x Fuel tank assy                                   | 6.0 | 61     | 53 in.·lbf |
| Trap w/ outlet valve canister assy x Fuel tank assy                       | 6.0 | 61     | 53 in.·lbf |
| Charcoal canister filter sub-assy x Body                                  | 34  | 347    | 25         |
| Vacuum switching valve assy No. 2 x Engine mounting insulator sub-assy RH | 7.5 | 76     | 66 in.·lbf |
| Charcoal canister vacuum switching valve x Charcoal canister assy         | 2.9 | 30     | 26 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

031LO-02

|  |  |   |
|--|--|---|
| New drive belt deflection<br>Pressing force: 98 N (10 kgf, 22lbf)  |  | 9.0 to 12.0 mm (0.35 to 0.47 in.)   |
| Used drive belt deflection<br>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 <sup>2</sup> 128 psi)   |
| Minimum pressure   |  | 686 kPa (7.0 kgf/cm <sup>2</sup> 99 psi)  |
| Difference between each cylinder                                   |  | 98 kPa (1.0kgf/cm <sup>2</sup> 14 psi)  |
| Valve clearance (cold)   | Intake<br>Exhaust  | 0.17 to 0.23 mm (0.007 to 0.009 in.)<br>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<br>Maximum  | 142.8 to 144.2 mm (5.622 to 5.677 in.)<br>147.1 mm (5.791 in.)  |
| Cylinder head warpage  | Maximum Cylinder block side<br>Intake manifold side<br>Exhaust manifold side | 0.05 mm (0.0020 in.)<br>0.10 mm (0.0039 in.)<br>0.10 mm (0.0039 in.)  |
| Intake valve overall length  | Standard<br>Minimum  | 89.25 mm (3.5138 in.)<br>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<br>Minimum  | 1.0 mm (0.039 in.)<br>0.7 mm (0.028 in.)  |
| Exhaust valve overall length                                       | Standard<br>Minimum  | 87.90 mm (3.4606 in.)<br>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<br>Minimum  | 1.15 mm (0.0453 in.)<br>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<br>Exhaust<br>Maximum Intake<br>Exhaust                      | 0.025 to 0.060 mm ( 0.0010 to 0.0024 in.)<br>0.030 to 0.065 mm (0.0012 to 0.0026 in.)<br>0.08 mm (0.0031 in.)<br>0.10 mm (0.0039 in.) |
| Valve guide bush diameter  | Standard<br>O/S  | 9.685 to 9.706 mm (0.3813 to 0.3821 in.)<br>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<br>Maximum  | 0.033 to 0.059 mm (0.0013 to 0.0023 in.)<br>0.10 mm (0.0039 in.)  |

## 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                 |
| Idler 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<br>2nd        | 49<br>Turn 90°             | 500<br>Turn 90°             | 36<br>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<br>Bolt B  | 113<br>157                 | 1152<br>1602                | 83<br>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<br>2nd<br>3rd | 29<br>Turn 90°<br>Turn 90° | 296<br>Turn 90°<br>Turn 90° | 21<br>Turn 90°<br>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 14-124)                      | 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

031TF-01

|  |         |                     |
|--|---------|---------------------|
| Compression spring (Exhaust pipe assy front x Exhaust manifold)<br>Free length       | Minimum | 40.5 mm (1.594 in.) |
| Compression spring (Exhaust pipe assy tail x Exhaust pipe assy front)<br>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

031LQ-02

|  |   |   |
|--|---|---|
| Thermostat<br>Valve opening temperature<br>Valve lift                          | at 95°C (205°F)   | 80 to 84°C (176 to 183°F)<br>8.5 mm (0.335 in.) or more   |
| Radiator cap sub-assy<br>Standard opening pressure<br>Minimum opening pressure |   | 74 to 103 kPa (0.75 to 1.05 kgf/cm <sup>2</sup> , 10.7 to 14.9 psi)<br>59 kPa (0.6 kgf/cm <sup>2</sup> , 8.5 psi) |
| Cooling fan<br>Standard amperage   |   | 9.2 to 11.0 A   |
| Cooling fan relay<br>Specified condition                                       | Between terminals 3 and 5<br>Between terminals 3 and 5                              | 10 kΩ or higher<br>Below 1 Ω (Apply battery voltage to terminals 1 and 2)   |
| Cooling fan relay No.2<br>Specified condition                                  | Between terminals 3 and 4<br>Between terminals 3 and 5<br>Between terminals 3 and 5 | Below 1 Ω<br>10 kΩ or higher<br>Below 1 Ω (Apply battery voltage to terminals 1 and 2)                            |
| Integration relay<br>Specified condition                                       | Between terminals B1 and B4<br>Between terminals B1 and B4                          | 10 kΩ or higher<br>Below 1 Ω (Apply battery voltage to terminals 1 and 2)   |

## TORQUE SPECIFICATION

| Part Tightened   |        | N-m | kgf-cm | ft-lbf     |
|--|--------|-----|--------|------------|
| Fan × Fan motor  |        | 6.2 | 63     | 55 in. lbf |
| Radiator assy × Fan shroud                                       |        | 7.5 | 76     | 66 in. lbf |
| Radiator support × Body  |        | 5.0 | 51     | 44 in. lbf |
| Water inlet × Cylinder block                                     |        | 9.0 | 92     | 80 in. lbf |
| Water pump × Oil pump assy                                       |        | 11  | 112    | 8.1        |
| Water pump pulley × Water pump                                   |        | 15  | 153    | 11         |
| Cooler bracket × Radiator support                                | Bolt A | 20  | 204    | 15         |
| Cooler bracket × Suction hose                                    | Bolt B | 8.5 | 87     | 75 in. lbf |
| Inverter bracket × Radiator support                              | Bolt A | 21  | 214    | 16         |
| Inverter bracket × Inverter                                      | Bolt B | 25  | 255    | 18         |
| Battery negative terminal × Battery negative cable               |        | 6.0 | 61     | 53 in. lbf |
| Radiator fan temperature switch × Radiator                       |        | 7.0 | 71     | 62 in. lbf |
| Radiator support lower LH × Radiator                             | Bolt A | 5.0 | 51     | 44 in. lbf |
|  | Bolt B | 3.9 | 40     | 35 in. lbf |
| Radiator support lower RH × Radiator                             | Bolt A | 5.0 | 51     | 44 in. lbf |
|  | Bolt B | 3.9 | 40     | 35 in. lbf |
| Radiator support upper LH × Radiator                             | Bolt A | 5.0 | 51     | 44 in. lbf |
|  | Bolt B | 3.9 | 40     | 35 in. lbf |
| Radiator support upper RH × Radiator                             | Bolt A | 5.0 | 51     | 44 in. lbf |
|  | Bolt B | 3.9 | 40     | 35 in. lbf |
| Engine drain cock plug × Cylinder block                          |        | 13  | 133    | 9.6        |
| Radiator bleeder plug × Radiator                                 |        | 1.5 | 15     | 13 in. lbf |
| Coolant heat storage tank assy × Body                            |        | 19  | 194    | 14         |
| Coolant heat storage tank assy × Coolant heat storage water pump |        | 6.0 | 61     | 53 in. lbf |

# LUBRICATION

## SERVICE DATA

031LS-02

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

# LUBRICATION

## SERVICE DATA

031LS-02

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

031VC-01

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

031TE-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

031RY-01

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

SERVICE SPECIFICATIONS – HYBRID CONTROL SYSTEM

|  |  |   |
|--|--|---|
| Integration relay (IGCT Relay)<br>HEV fuse (20A)<br>Standard<br>IGCT relay<br>Standard | 7J-1 – 7J-4<br>7J-1 – 7K-1<br>7J-2 – 7J-3<br>7J-4 – 7K-1   | Below 1 Ω<br>10 kΩ or higher<br>Below 1 Ω<br>(Battery voltage is added between terminals 7J-2 and 7J-3)<br>Below 1 Ω<br>Below 1 Ω<br>(Battery voltage is added between terminals 7J-2 and 7J-3)<br>Below 1 Ω<br>No continuity |
| Battery plug<br>Standard   | Install the service plug grip  | No continuity<br>Continuity   |
| System main relay No. 1<br>Continuity<br>Standard                                      | Positive terminal – Negative terminal<br>A1 (CONT1) – Terminal 5<br>A2 (CONT2) – B1 (CONT2)<br>A3 (CONT3) – C1 (CONT3)<br>B1 (GND) – GND terminal<br>C2 (GND) – GND terminal   | 10 kΩ or higher<br>Below 1 Ω<br>(Apply voltage between the positive and negative terminals)<br>Below 1 Ω<br>Below 1 Ω<br>Below 1 Ω<br>Below 1 Ω   |
| Resistance<br>Standard   | A1 (CONT1) – Terminal 5  | 70 to 160 Ω   |
| System main relay No. 2 and 3<br>Continuity<br>Standard                                | Positive terminal – Negative terminal  | 10 kΩ or higher<br>Below 1 Ω<br>(Apply voltage between the connector terminals)   |
| Resistance<br>Standard   | Connector terminals  | 20 to 50 Ω  |
| Battery current sensor<br>Standard   | Positive probe to terminal 1 (VIB)<br>Negative probe to terminal 2 (GIB)<br>Positive probe to terminal 2 (GIB)<br>Negative probe to terminal 1 (VIB)<br>Positive probe to terminal 1 (VIB)<br>Negative probe to terminal 3 (IB)<br>Positive probe to terminal 3 (IB)<br>Negative probe to terminal 1 (VIB)<br>2 (GIB) – 3 (IB) | 3.5 to 4.5 kΩ<br>5 to 7 kΩ<br>3.5 to 4.5 kΩ<br>5 to 7 kΩ<br>0.2 kΩ or less  |
| System main resistor<br>Standard   |  | 18 to 22 Ω  |
| Battery blower relay No. 1<br>Standard   | 3 – 5  | 10 kΩ or higher<br>Below 1 Ω<br>(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

031TO-01

|   |   |        |                      |        |                      |        |                      |        |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |   |                      |         |                      |         |                      |
|---|---|--------|----------------------|--------|----------------------|--------|----------------------|--------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---------|----------------------|---|----------------------|---------|----------------------|---------|----------------------|
| Differential case side bearing preload<br><p style="text-align: right;">(Starting torque)</p> <p style="text-align: right;">(Turning torque 20 rpm)</p> | New bearing:<br>0.98 to 1.57 N·m (9.99 to 16.01 kgf·cm, 8.67 to 13.90 in.-lbf)<br>Reused bearing:<br>0.49 to 0.78 N·m (5.00 to 7.95 kgf·cm, 4.43 to 6.90 in.-lbf)<br>0.61 to 1.35 N·m (6.2 to 13.77 kgf·cm, 5.4 to 11.95 in.-lbf)   |        |                      |        |                      |        |                      |        |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |   |                      |         |                      |         |                      |
| Differential preload adjusting shim thickness   | <table border="0"> <tr><td>Mark 1</td><td>1.80 mm (0.0709 in.)</td></tr> <tr><td>Mark 2</td><td>1.83 mm (0.0720 in.)</td></tr> <tr><td>Mark 3</td><td>1.86 mm (0.0732 in.)</td></tr> <tr><td>Mark 4</td><td>1.89 mm (0.0744 in.)</td></tr> <tr><td>Mark 50</td><td>1.92 mm (0.0756 in.)</td></tr> <tr><td>Mark 51</td><td>1.94 mm (0.0764 in.)</td></tr> <tr><td>Mark 52</td><td>1.96 mm (0.0772 in.)</td></tr> <tr><td>Mark 53</td><td>1.98 mm (0.0780 in.)</td></tr> <tr><td>Mark 54</td><td>2.00 mm (0.0787 in.)</td></tr> <tr><td>Mark 55</td><td>2.02 mm (0.0795 in.)</td></tr> <tr><td>Mark 56</td><td>2.04 mm (0.0803 in.)</td></tr> <tr><td>Mark 57</td><td>2.06 mm (0.0811 in.)</td></tr> <tr><td>Mark 58</td><td>2.08 mm (0.0819 in.)</td></tr> <tr><td>Mark 59</td><td>2.10 mm (0.0827 in.)</td></tr> <tr><td>Mark 60</td><td>2.12 mm (0.0835 in.)</td></tr> <tr><td>Mark 61</td><td>2.14 mm (0.0843 in.)</td></tr> <tr><td>Mark 62</td><td>2.16 mm (0.0850 in.)</td></tr> <tr><td>Mark 63</td><td>2.18 mm (0.0858 in.)</td></tr> <tr><td>Mark 64</td><td>2.20 mm (0.0866 in.)</td></tr> <tr><td>Mark 65</td><td>2.22 mm (0.0874 in.)</td></tr> <tr><td>Mark 66</td><td>2.24 mm (0.0882 in.)</td></tr> <tr><td>Mark 67</td><td>2.26 mm (0.0890 in.)</td></tr> <tr><td>Mark 68</td><td>2.28 mm (0.0898 in.)</td></tr> <tr><td>Mark 69</td><td>2.30 mm (0.0906 in.)</td></tr> <tr><td>Mark 70</td><td>2.32 mm (0.0913 in.)</td></tr> <tr><td>Mark 19</td><td>2.34 mm (0.0921 in.)</td></tr> <tr><td>Mark 20</td><td>2.37 mm (0.0933 in.)</td></tr> <tr><td>–</td><td>2.40 mm (0.0945 in.)</td></tr> <tr><td>Mark 22</td><td>2.43 mm (0.0957 in.)</td></tr> <tr><td>Mark 23</td><td>2.46 mm (0.0969 in.)</td></tr> </table> | 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.) |
| 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  | <table border="0"> <tr><td>Mark 1</td><td>1.00 mm (0.0394 in.)</td></tr> <tr><td>Mark 2</td><td>1.20 mm (0.0472 in.)</td></tr> <tr><td>Mark 3</td><td>1.40 mm (0.0551 in.)</td></tr> <tr><td>Mark 4</td><td>1.60 mm (0.0630 in.)</td></tr> <tr><td>Mark 5</td><td>1.80 mm (0.0709 in.)</td></tr> <tr><td>Mark 6</td><td>2.00 mm (0.0787 in.)</td></tr> <tr><td>Mark 7</td><td>2.20 mm (0.0866 in.)</td></tr> <tr><td>Mark 8</td><td>2.40 mm (0.0945 in.)</td></tr> <tr><td>Mark 9</td><td>2.60 mm (0.1024 in.)</td></tr> <tr><td>Mark 10</td><td>2.80 mm (0.1102 in.)</td></tr> <tr><td>Mark 11</td><td>3.00 mm (0.1181 in.)</td></tr> <tr><td>Mark 12</td><td>3.20 mm (0.1260 in.)</td></tr> </table>  | 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.) |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |         |                      |   |                      |         |                      |         |                      |
| 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 <sup>2</sup> , 1.4 pst)  |
| Differential side gear backlash                | Standard | 0.05 to 0.20 mm (0.0020 – 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.)                         |
| 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

031QM-01

## SERVICE DATA

|                       |                                |  |  |
|-----------------------|--------------------------------|--|--|
| Front wheel alignment | Vehicle height                 | A-B:<br>D-C:   | 95 mm (3.74 in.)<br>62 mm (2.40 in.)   |
|                       | Toe-in (total)                 | Rack end length difference                               | $0^\circ \pm 12'$ ( $0^\circ \pm 0.2^\circ$ ), $0 \pm 2$ mm ( $0 \pm 0.08$ in.)<br>1.5 mm (0.059 in.) or less                        |
|                       | Wheel angle                    | Inside wheel<br>Outside wheel: Reference                 | $40^\circ 35'$ ( $38^\circ 35' - 42^\circ 35'$ )<br>$40.58^\circ$ ( $38.58^\circ - 42.58^\circ$ )<br>$34^\circ 15'$<br>$34.25^\circ$ |
|                       | Camber                         | Right-left error   | $-0^\circ 35' \pm 45'$ ( $-0.58^\circ \pm 0.75^\circ$ )<br>45' (0.75°) or less   |
|                       | Caster                         | Right-left error   | $3^\circ 10' \pm 45'$ ( $3.17^\circ \pm 0.75^\circ$ )<br>45' (0.75°) or less   |
|                       | Steering axis inclination      | Right-left error   | $12^\circ 35' \pm 45'$ ( $12.58^\circ \pm 0.75^\circ$ )<br>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

031WH-01

## SERVICE DATA

|                      |                  |   |
|----------------------|------------------|---|
| Rear wheel alignment | Toe-in (total)   | $0^{\circ}18' \pm 15'$ ( $0.30^{\circ} \pm 0.25^{\circ}$ , $3.0 \pm 2.5$ mm, $0.12 \pm 0.10$ in.) |
|                      | Camber           | $-1^{\circ}30' \pm 30'$ ( $-1.50^{\circ} \pm 0.5^{\circ}$ )                                       |
|                      | Right-left error | $30'$ ( $0.5^{\circ}$ ) or less   |

## 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

03100-01

|                              |                            |        |  |
|------------------------------|----------------------------|--------|--|
| Cold tire inflation pressure | 185/65R 15 86S             | Front: | 240 kPa (2.4 kgf/cm <sup>2</sup> , 35 psi) |
|                              |                            | Rear:  | 230 kPa (2.3 kgf/cm <sup>2</sup> , 33 psi) |
| Tire runout                  | 1.4 mm (0.055 in.) or less |        |  |
| Imbalance after adjustment   | 8.0 g (0.018 lb) or less   |        |  |

# DRIVE SHAFT / PROPELLER SHAFT / AXLE

031UL-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         |

# BRAKE

## SERVICE DATA

030FQ-05

|   |                           |                                    |
|---|---------------------------|------------------------------------|
| 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) |                           | More than 104 mm (4.1 in.)         |
| Front brake pad thickness   | Standard thickness:       | 11.0 mm (0.433 in.)                |
|   | Minimum thickness:        | 1.0 mm (0.039 in.)                 |
| Front brake disc thickness  | Standard thickness:       | 22.0 mm (0.866 in.)                |
|   | Minimum thickness:        | 20.0 mm (0.787 in.)                |
| Front brake disc runout   | Maximum disc runout:      | 0.05 mm (0.0020 in.)               |
| Rear brake drum inside diameter                                       | Standard inside diameter: | 200.0 mm (7.874 in.)               |
|   | Minimum inside diameter:  | 201.0 mm (7.913 in.)               |
| Rear drum brake shoe lining thickness                                 | Standard thickness:       | 4.0 mm (0.157 in.)                 |
|   | Minimum thickness:        | 1.0 mm (0.039 in.)                 |
| Brake drum to brake shoe clearance                                    | Clearance:                | 0.6 mm (0.024 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         |
| Rear drum brake wheel cylinder x Backing plate                 | 9.8 | 100    | 87 in.-lbf |
| 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

03104-01

|   |              |
|---|--------------|
| Parking brake pedal travel at 300 N (31 kgf, 68.3 lbf): | 6 - 9 clicks |
|---|--------------|

**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           | 20     | 204    | 15         |
| 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 intermediate lever adjusting nut | 12.5   | 127    | 9          |

# STEERING COLUMN

## SERVICE DATA

031Q3-01

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

**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

030EH-04

| 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  |
|--|---------|-----------|---------|
| <b>STEERING WHEEL</b>                            |         |           |         |
| Steering wheel set nut                           | 50      | 510       | 37      |
| <b>POWER STEERING GEAR</b>                       |         |           |         |
| 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

031W1-01

|                           |                                       |
|---------------------------|---------------------------------------|
| Refrigerant charge volume | Standard: 450 ± 30 g (15.9 ± 1.1 oz.) |
|---------------------------|---------------------------------------|

**TORQUE SPECIFICATION**

| Part Tightened  | N-m | kgf-cm | ft-lbf     |
|---|-----|--------|------------|
| <b>AIR CONDITIONING RADIATOR ASSY</b>                         |     |        |            |
| Air conditioning tube assy x Cooler evaporator sub-assy No. 1 | 3.5 | 35     | 30 in.-lbf |
| <b>ELECTRIC INVERTER COMPRESSOR ASSY</b>                      |     |        |            |
| 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 |
| <b>W/ RECEIVER CONDENSER ASSY</b>                             |     |        |            |
| 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

031TZ-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                               | 9.0      | 92     | 80 in.-lbf |
| Airbag sensor rear x Body                                    | 17.5     | 178    | 13         |
| Seat position airbag sensor x Front seat                     | 8.0      | 82     | 71 in.-lbf |

# SEAT BELT

## TORQUE SPECIFICATION

031TK-01

| Part Tightened   | N-m | kgf-cm | ft-lbf     |
|--|-----|--------|------------|
| <b>FRONT SEAT BELT</b>   |     |        |            |
| 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         |
| <b>REAR SEAT BELT</b>  |     |        |            |
| 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

031W4-01

| Part Tightened                    | N-m | kgf-cm | ft-lbf     |
|-----------------------------------|-----|--------|------------|
| Wiper motor x Wiper link          | 5.4 | 55     | 48 in.-lbf |
| Wiper motor x Crank arm           | 17  | 175    | 13         |
| 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

## TORQUE SPECIFICATION

031W6-01

| 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

031U8-01

| 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

031W3-01

| Part Tightened                                    | N-m | kgf-cm | ft-lbf |
|---|-----|--------|--------|
| Instrument Panel Reinforcement × Passenger Airbag | 20  | 204    | 15     |

# SEAT

## TORQUE SPECIFICATION

031WM-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

031W9-01

| Part Tightened                              | N-m  | kgf-cm | ft-lbf     |
|---|------|--------|------------|
| <b>HOOD</b>                                 |      |        |            |
| 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 |
| <b>FRONT DOOR</b>                           |      |        |            |
| 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 |
| <b>REAR DOOR</b>                            |      |        |            |
| 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 |
| <b>BACK DOOR (LIFTBACK MODEL)</b>           |      |        |            |
| Back door femaie 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

031VX-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

031U9-01

| 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     |