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# NISSAN PATHFINDER MODEL R51 SERIES

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## QUICK REFERENCE INDEX

| A GENERAL INFORMATION                           | GI General Information                       |
|-------------------------------------------------|----------------------------------------------|
| B ENGINE                                        | EM Engine Mechanical                         |
|                                                 | LU Engine Lubrication System                 |
|                                                 | CO Engine Cooling System                     |
|                                                 | EC Engine Control System                     |
|                                                 | FL Fuel System                               |
|                                                 | EX Exhaust System                            |
|                                                 | STR Starting System                          |
| C HYBRID                                        | ACC Accelerator Control System               |
|                                                 | HBC Hybrid Control System                    |
|                                                 | HBB Hybrid Battery System                    |
|                                                 | HBR Hybrid Brake System                      |
| D TRANSMISSION & DRIVE-LINE                     | TM Transaxle & Transmission                  |
|                                                 | DLN Driveline                                |
|                                                 | FAX Front Axle                               |
|                                                 | RAX Rear Axle                                |
| E SUSPENSION                                    | FSU Front Suspension                         |
|                                                 | RSU Rear Suspension                          |
|                                                 | SCS Suspension Control System                |
|                                                 | WT Road Wheels & Tires                       |
| F BRAKES                                        | BR Brake System                              |
|                                                 | PB Parking Brake System                      |
|                                                 | BRC Brake Control System                     |
|                                                 | ST Steering System                           |
| G STEERING                                      | STC Steering Control System                  |
|                                                 | SB Seat Belt                                 |
| H RESTRAINTS                                    | SBC Seat Belt Control System                 |
|                                                 | SR SRS Airbag                                |
|                                                 | SRC SRS Airbag Control System                |
|                                                 | VTL Ventilation System                       |
| I VENTILATION, HEATER & AIR CONDITIONER         | HA Heater & Air Conditioning System          |
|                                                 | HAC Heater & Air Conditioning Control System |
|                                                 | INT Interior                                 |
| J BODY INTERIOR                                 | IP Instrument Panel                          |
|                                                 | SE Seat                                      |
|                                                 | ADP Automatic Drive Postioner                |
|                                                 | AP Adjustable Pedal                          |
| K BODY EXTERIOR, DOORS, ROOF & VEHICLE SECURITY | DLK Door & Lock                              |
|                                                 | SEC Security Control System                  |
|                                                 | GW Glass & Window System                     |
|                                                 | PWC Power Window Control System              |
|                                                 | RF Roof                                      |
|                                                 | EXT Exterior                                 |
|                                                 | BRM Body Repair Manual                       |
|                                                 | MIR Mirrors                                  |
| L DRIVER CONTROLS                               | EXL Exterior Lighting System                 |
|                                                 | INL Interior Lighting System                 |
|                                                 | WW Wiper & Washer                            |
|                                                 | DEF Defogger                                 |
|                                                 | HRN Horn                                     |
|                                                 | PWO Power Outlet                             |
|                                                 | BCS Body Control System                      |
|                                                 | LAN LAN System                               |
|                                                 | PCS Power Control System                     |
|                                                 | CHG Charging System                          |
| M ELECTRICAL & POWER CONTROL                    | PG Power Supply, Ground & Circuit Elements   |
|                                                 | MWI Meter, Warning Lamp & Indicator          |
|                                                 | WCS Warning Chime System                     |
|                                                 | SN Sonar System                              |
| N DRIVER INFORMATION & MULTIMEDIA               | AV Audio, Visual & Navigation System         |
|                                                 | CCS Cruise Control System                    |
| O CRUISE CONTROL                                | MA Maintenance                               |
| P MAINTENANCE                                   |                                              |

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# FOREWORD

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**This manual contains maintenance and repair procedure for the 2009 NISSAN PATHFINDER.**

**In order to assure your safety and the efficient functioning of the vehicle, this manual should be read thoroughly. It is especially important that the PRECAUTIONS in the GI section be completely understood before starting any repair task.**

**All information in this manual is based on the latest product information at the time of publication. The right is reserved to make changes in specifications and methods at any time without notice.**

## IMPORTANT SAFETY NOTICE

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**The proper performance of service is essential for both the safety of the technician and the efficient functioning of the vehicle.**

**The service methods in this Service Manual are described in such a manner that the service may be performed safely and accurately. Service varies with the procedures used, the skills of the technician and the tools and parts available. Accordingly, anyone using service procedures, tools or parts which are not specifically recommended by NISSAN must first be completely satisfied that neither personal safety nor the vehicle's safety will be jeopardized by the service method selected.**



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Technical Publications Department



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Your comments are important to NISSAN and will help us to improve our Service Manuals.  
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Nissan North America, Inc.  
Technical Service Information  
39001 Sunrise Drive, P.O. Box 9200  
Farmington Hills, MI USA 48331  
FAX: (248) 488-3910

**SERVICE MANUAL:** Model: \_\_\_\_\_ Year: \_\_\_\_\_

**PUBLICATION NO. (Refer to Quick Reference Index):** \_\_\_\_\_

Please describe any Service Manual issues or problems in detail:

Page number(s) \_\_\_\_\_ *Note: Please include a copy of each page, marked with your comments.*

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**Are the trouble diagnosis procedures logical and easy to use? (circle your answer)** YES NO

If no, what page number(s)? \_\_\_\_\_ *Note: Please include a copy of each page, marked with your comments.*

Please describe the issue or problem in detail: \_\_\_\_\_

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**Is the organization of the manual clear and easy to follow? (circle your answer)** YES NO

Please comment: \_\_\_\_\_

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**What information should be included in NISSAN Service Manuals to better support you in servicing or repairing customer vehicles?**

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DATE: \_\_\_\_\_ YOUR NAME: \_\_\_\_\_ POSITION: \_\_\_\_\_

DEALER: \_\_\_\_\_ DEALER NO.: \_\_\_\_\_ ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE/PROV./COUNTRY: \_\_\_\_\_ ZIP/POSTAL CODE: \_\_\_\_\_

QUICK REFERENCE CHART: PATHFINDER

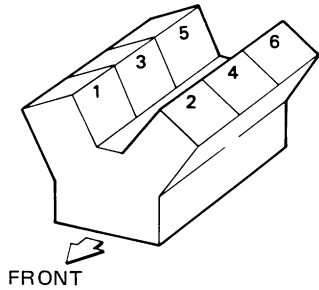
Engine Tune-up Data: VQ40DE

INFOID:000000001733188

GENERAL SPECIFICATIONS

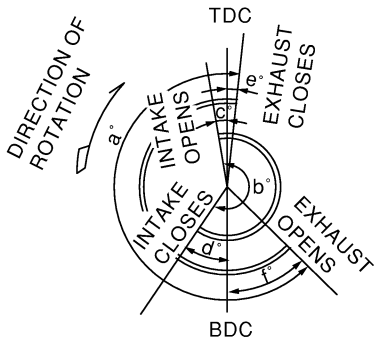
|                                                           |                                      |                                            |
|-----------------------------------------------------------|--------------------------------------|--------------------------------------------|
| Cylinder arrangement                                      |                                      | V-6                                        |
| Displacement $\text{cm}^3(\text{cu in})$                  |                                      | 3,954 (241.30)                             |
| Bore and stroke $\text{mm (in)}$                          |                                      | $95.5 \times 92.0$ ( $3.76 \times 3.622$ ) |
| Valve arrangement                                         |                                      | DOHC                                       |
| Firing order                                              |                                      | 1-2-3-4-5-6                                |
| Number of piston rings                                    | Compression                          | 2                                          |
|                                                           | Oil                                  | 1                                          |
| Number of main bearings                                   |                                      | 4                                          |
| Compression ratio                                         |                                      | 9.7                                        |
| Compression pressure<br>( $\text{kg/cm}^2$ , psi)/300 rpm | kPa Standard                         | 1,275 (13.0, 185)                          |
|                                                           | Minimum                              | 981 (10.0, 142)                            |
|                                                           | Differential limit between cylinders | 98 (1.0, 14)                               |

Cylinder number



SEM713A

Valve timing  
(Intake valve timing control - "OFF")



PBIC0187E

Unit: degree

|     |     |    |    |   |    |
|-----|-----|----|----|---|----|
| a   | b   | c  | d  | e | f  |
| 244 | 240 | -4 | 64 | 6 | 58 |

# QUICK REFERENCE CHART: PATHFINDER

2009

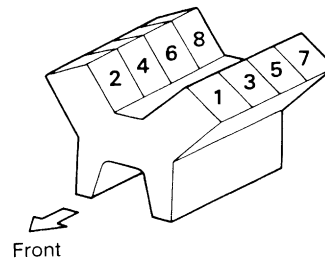
Engine Tune-up Data : VK56DE

INFOID:000000001733189

## GENERAL SPECIFICATIONS

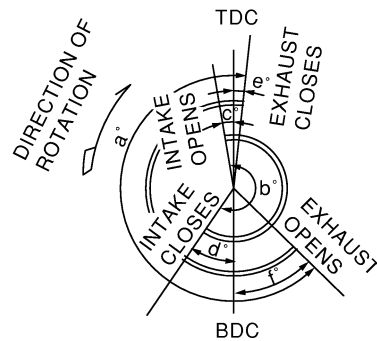
|                                                              |                                      |                       |
|--------------------------------------------------------------|--------------------------------------|-----------------------|
| Cylinder arrangement                                         |                                      | V-8                   |
| Displacement $\text{cm}^3$ ( $\text{in}^3$ )                 |                                      | 5,552 (338.80)        |
| Bore and stroke $\text{mm}$ (in)                             |                                      | 98 x 92 (3.86 x 3.62) |
| Valve arrangement                                            |                                      | DOHC                  |
| Firing order                                                 |                                      | 1-8-7-3-6-5-4-2       |
| Number of piston rings                                       | Compression                          | 2                     |
|                                                              | Oil                                  | 1                     |
| Number of main bearings                                      |                                      | 5                     |
| Compression ratio                                            |                                      | 9.8:1                 |
| Compression pressure<br>( $\text{kg}/\text{cm}^2$ , psi)/rpm | kPa Standard                         | 1,520 (15.5, 220)/200 |
|                                                              | Minimum                              | 1,324 (13.5, 192)/200 |
|                                                              | Differential limit between cylinders | 98 (1.0, 14)/200      |

Cylinder number



SEM957C

Valve timing



PBIC0187E

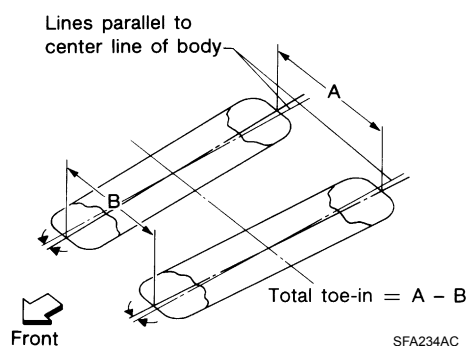
Unit: degree

| a    | b    | c  | d   | e   | f   |
|------|------|----|-----|-----|-----|
| 244° | 232° | 8° | 60° | 10° | 54° |

## Front Wheel Alignment (Unladen\*1)

INFOID:000000001733190

| Drive type                                            |              | 2WD                    | 4WD                    |
|-------------------------------------------------------|--------------|------------------------|------------------------|
| Camber<br>Degree minute (decimal degree)              | Minimum      | -0° 30' (-0.50°)       | -0° 15' (-0.25°)       |
|                                                       | Nominal      | 0° 15' (0.25°)         | 0° 30' (0.50°)         |
|                                                       | Maximum      | 1° 00' (1.00°)         | 1° 15' (1.25°)         |
|                                                       | Cross camber | 0° 45' (0.75°) or less | 0° 45' (0.75°) or less |
| Caster<br>Degree minute (decimal degree)              | Minimum      | 2° 15' (2.25°)         | 2° 00' (2.00°)         |
|                                                       | Nominal      | 3° 0' (3.00°)          | 2° 45' (2.75°)         |
|                                                       | Maximum      | 3° 45' (3.75°)         | 3° 30' (3.50°)         |
|                                                       | Cross caster | 0° 45' (0.75°) or less | 0° 45' (0.75°) or less |
| Kingpin inclination<br>Degree minute (decimal degree) | Nominal      | 13° 0' (13.00°)        | 12° 45' (12.75°)       |



|                                 |                                                                     |                                           |                                           |                                           |                  |
|---------------------------------|---------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|------------------|
| Total toe-in                    | Distance (A – B)                                                    |                                           | Minimum                                   | 2.1 mm (0.08 in)                          | 2.1 mm (0.08 in) |
|                                 |                                                                     |                                           | Nominal                                   | 3.1 mm (0.12 in)                          | 3.1 mm (0.12 in) |
|                                 |                                                                     |                                           | Maximum                                   | 4.1 mm (0.16 in)                          | 4.1 mm (0.16 in) |
|                                 | Angle (left wheel or right wheel)<br>Degree minute (decimal degree) |                                           | Minimum                                   | 0° 5' (0.08°)                             | 0° 5' (0.08°)    |
|                                 |                                                                     |                                           | Nominal                                   | 0° 7' (0.12°)                             | 0° 7' (0.12°)    |
|                                 |                                                                     |                                           | Maximum                                   | 0° 9' (0.15°)                             | 0° 9' (0.15°)    |
| Wheel turning angle (full turn) |                                                                     | Inside<br>Degree minute (Decimal degree)  | 33° 26' – 35° 26' *2<br>(33.43° – 35.43°) | 33° 33' – 35° 33' *4<br>(33.60° – 35.60°) |                  |
|                                 |                                                                     | Outside<br>Degree minute (Decimal degree) | 29° 22' – 31° 22' *3<br>(29.37° – 31.37°) | 29° 38' – 31° 38' *5<br>(29.73° – 31.73°) |                  |

\*1: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

\*2: Target value 35° 26' (35.43°)

\*3: Target value 31° 22' (31.37°)

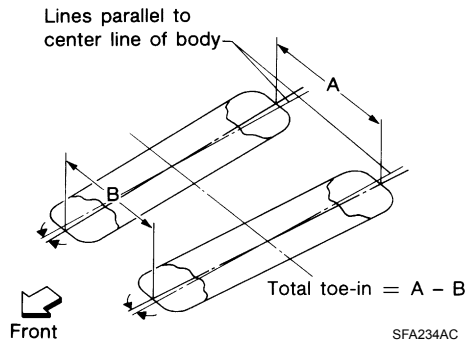
\*4: Target value 35° 33' (35.55°)

\*5: Target value 31° 38' (31.63°)

## Rear Wheel Alignment

INFOID:000000001733191

|                                          |         |                    |
|------------------------------------------|---------|--------------------|
| Camber<br>Degree minute (decimal degree) | Minimum | - 0° 32' (- 0.53°) |
|                                          | Nominal | - 0° 2' (- 0.03°)  |
|                                          | Maximum | 0° 28' (0.47°)     |

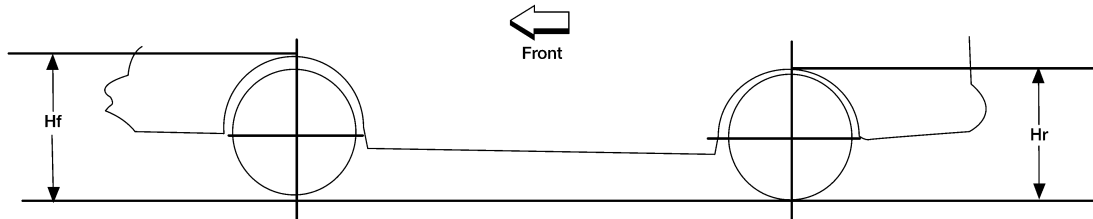


|              |                                                       |           |                         |
|--------------|-------------------------------------------------------|-----------|-------------------------|
| Total toe-in | Distance (A - B)                                      | Minimum   | - 1.4 mm (- 0.055 in)   |
|              |                                                       | Nominal   | 1.9 mm (0.075 in)       |
|              |                                                       | Maximum   | 5.2 mm (0.205 in)       |
|              |                                                       | Cross toe | 0 ± 2 mm (0 ± 0.079 in) |
|              | Angle (left, right)<br>Degree minute (decimal degree) | Minimum   | - 0° 3' (-0.05°)        |
|              |                                                       | Nominal   | 0° 4' (0.07°)           |
|              |                                                       | Maximum   | 0° 11' (0.18°)          |

## Wheelarch Height (Unladen\*)

INFOID:0000000001733192

Unit: mm (in)



LEIA0085E

| Engine                      | VQ40DE         |                |                |                |                |                |                | VK56DE         |                |
|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Drive type                  | 2WD            |                |                | Part time 4WD  |                |                | Full time 4WD  | 2WD            | 4WD            |
| Tire size                   | 245/75R16      | 265/70R16      | 265/65R17      | 245/75R16      | 265/70R16      | 265/75R16      | 265/65R17      | 265/60R18      |                |
| Front wheelarch height (Hf) | 867<br>(34.13) | 865<br>(34.06) | 865<br>(34.06) | 875<br>(34.45) | 873<br>(34.37) | 889<br>(35.00) | 874<br>(34.41) | 868<br>(34.17) | 876<br>(34.49) |
| Rear wheelarch height (Hr)  | 875<br>(34.45) | 873<br>(34.37) | 873<br>(34.37) | 884<br>(34.80) | 882<br>(34.72) | 898<br>(35.35) | 883<br>(34.76) | 876<br>(34.49) | 886<br>(34.88) |

\*1: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

## Brake General Specification

INFOID:0000000001733193

Unit: mm (in)

|             |                                  |                                            |
|-------------|----------------------------------|--------------------------------------------|
| Front brake | Brake model                      | CLZ33VB                                    |
|             | Rotor outer diameter × thickness | 296 × 28 (11.654 × 1.102)                  |
|             | Pad Length × width × thickness   | 111.0 × 73.5 × 10.0 (4.73 × 2.894 × 0.394) |
|             | Cylinder bore diameter (each)    | 46.4 (1.83)                                |

# QUICK REFERENCE CHART: PATHFINDER

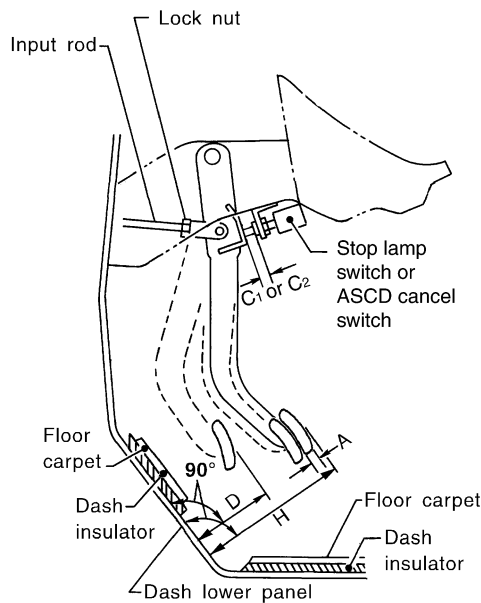
2009

|                         |                                  |                                                |
|-------------------------|----------------------------------|------------------------------------------------|
| Rear brake              | Brake model                      | CLZ14VB                                        |
|                         | Rotor outer diameter × thickness | 308 × 18 (12.126 × 0.709)                      |
|                         | Pad Length × width × thickness   | 83.0 × 33.0 × 11.0 (3.268 × 1.299 × 0.433)     |
|                         | Cylinder bore diameter           | 38.1 (1.50)                                    |
| Control valve           | Valve model                      | Electric brake force distribution              |
| Brake booster           | Booster model                    | C215T                                          |
|                         | Diaphragm diameter               | 215 (8.46)                                     |
| Recommended brake fluid |                                  | Refer to <a href="#">Fluids and Lubricants</a> |

## Brake Pedal

INFOID:0000000001733194

Unit: mm (in)



WFIA0160E

|                                                                                                   |                             |
|---------------------------------------------------------------------------------------------------|-----------------------------|
| Free height "H"                                                                                   | 182.1 - 192.1 (7.17 - 7.56) |
| Depressed pedal height ("D" [under a force of 490 N (50 kg, 110 lb) with engine running])         | 105 - 115 (4.13 - 4.53)     |
| Clearance between pedal stopper and threaded end of stop lamp switch and ASCD switch "C1" or "C2" | 0.74 - 1.96 (0.029 - 0.077) |
| Pedal play "A"                                                                                    | 3 - 11 (0.12 - 0.43)        |

## Front Disc Brake

INFOID:0000000001733195

Unit: mm (in)

|             |                                                |                |
|-------------|------------------------------------------------|----------------|
| Brake model |                                                | CLZ33VB        |
| Brake pad   | Standard thickness (new)                       | 10.0 (0.394)   |
|             | Repair limit thickness                         | 2.0 (0.079)    |
| Disc rotor  | Standard thickness (new)                       | 28.0 (1.102)   |
|             | Repair limit thickness                         | 26.0 (1.024)   |
|             | Maximum uneven wear (measured at 8 positions)  | 0.015 (0.0006) |
|             | Runout limit (with it attached to the vehicle) | 0.05 (0.0020)  |

# QUICK REFERENCE CHART: PATHFINDER

2009

## Rear Disc Brake

INFOID:000000001733196

Unit: mm (in)

|             |                                                |                |
|-------------|------------------------------------------------|----------------|
| Brake model |                                                | CLZ14VB        |
| Brake pad   | Standard thickness (new)                       | 11.0 (0.433)   |
|             | Repair limit thickness                         | 2.0 (0.079)    |
| Disc rotor  | Standard thickness (new)                       | 18.0 (0.709)   |
|             | Repair limit thickness                         | 16.0 (0.630)   |
|             | Maximum uneven wear (measured at 8 positions)  | 0.015 (0.0006) |
|             | Runout limit (with it attached to the vehicle) | 0.05 (0.0020)  |

## Fluids and Lubricants

INFOID:000000001733197

| Description                                          |                              |        | Capacity (Approximate) |                |                |
|------------------------------------------------------|------------------------------|--------|------------------------|----------------|----------------|
|                                                      |                              |        | Metric                 | US measure     | Imp measure    |
| Fuel                                                 |                              |        | 80 ℓ                   | 21 1/8 gal     | 17 5/8 gal     |
| Engine oil<br>Drain and refill                       | With oil filter<br>change    | VQ40DE | 5.1 ℓ                  | 5 3/8 qt       | 4 1/2 qt       |
|                                                      |                              | VK56DE | 6.2 ℓ                  | 6 1/2 qt       | 5 1/2 qt       |
|                                                      | Without oil filter<br>change | VQ40DE | 4.8 ℓ                  | 5 1/8 qt       | 4 1/4 qt       |
|                                                      |                              | VK56DE | 5.9 ℓ                  | 6 1/4 qt       | 5 1/4 qt       |
| Dry engine (engine overhaul)                         |                              | VQ40DE | 6.3 ℓ                  | 6 5/8 qt       | 5 1/2 qt       |
|                                                      |                              | VK56DE | 7.6 ℓ                  | 8 qt           | 6 3/4 qt       |
| Cooling system<br>(with reservoir at “MAX”<br>level) | Without rear A/C             |        | 10.2 ℓ                 | 2 3/4 gal      | 2 1/4 gal      |
|                                                      | With rear A/C                |        | 13.4 ℓ                 | 3 1/2 gal      | 3 gal          |
| Automatic transmission fluid (ATF)                   |                              |        | 10.3 ℓ                 | 10 7/8 qt      | 9 1/8 qt       |
| Rear final drive oil                                 |                              | VQ40DE | 1.4 ℓ                  | 3 pt           | 2 1/2 pt       |
|                                                      |                              | VK56DE | 1.75 ℓ                 | 3 3/4 pt       | 3 1/8 pt       |
| Transfer fluid                                       | ATX14B                       |        | 3.0 ℓ                  | 3 1/8 qt       | 2 5/8 qt       |
|                                                      | TX15B                        |        | 2.0 ℓ                  | 2 1/8 qt       | 1 3/4 qt       |
| Front final drive oil                                |                              | VQ40DE | 0.85 ℓ                 | 1 3/4 pt       | 1 1/2 pt       |
|                                                      |                              | VK56DE | 1.6 ℓ                  | 3 3/8 pt       | 2 7/8 pt       |
| Power steering fluid (PSF)                           |                              |        | 1.0 ℓ                  | 2 1/8 pt       | 1 3/4 pt       |
| Brake fluid                                          |                              |        | —                      | —              | —              |
| Multi-purpose grease                                 |                              |        | —                      | —              | —              |
| Windshield washer fluid                              |                              |        | 4.5 ℓ                  | 1 1/4 gal      | 1 gal          |
| A/C system refrigerant                               | Without rear A/C             |        | 0.70 ± 0.05 kg         | 1.54 ± 0.11 lb | 1.54 ± 0.11 lb |
|                                                      | With rear A/C                |        | 0.85 ± 0.05 kg         | 1.87 ± 0.11 lb | 1.87 ± 0.11 lb |
| A/C system oil                                       | Without rear A/C             |        | 180 m ℓ                | 6.1 fl oz      | 6.3 fl oz      |
|                                                      | With rear A/C                |        | 210 m ℓ                | 7.1 fl oz      | 7.4 fl oz      |