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# NISSAN
## MURANO HYBRID
## MODEL Z52 SERIES



## QUICK REFERENCE INDEX

# FOREWORD

**This manual contains maintenance and repair procedures for the 2016 NISSAN MURANO HEV.**

**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

**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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**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**

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

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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: MURANO HYBRID

## Engine Tune-up Data

INFOID:0000000013679770

### GENERAL SPECIFICATIONS

| | | |
|---|---|---|
| Engine type | | QR25DER |
| Cylinder arrangement | | In-line 4 |
| Displacement cm$^3$ (cu in) | | 2,488 (151.82) |
| Bore and stroke mm (in) | | 89.0 x 100.0 (3.504 x 3.937) |
| Valve arrangement | | DOHC |
| Firing order | | 1-3-4-2 |
| Number of piston rings | Compression | 2 |
| | Oil | 1 |
| Compression ratio | | 9.1 : 1 |
| Compression pressure kPa (bar, kg/cm$^2$, psi)/250 rpm | Standard | 1,410 (14.1, 14.4, 204.7) |
| | Minimum | 1,220 (12.2, 12.1, 176.3) |
| | Differential limit between cylinders | 100 (1.0, 1.0, 14) |

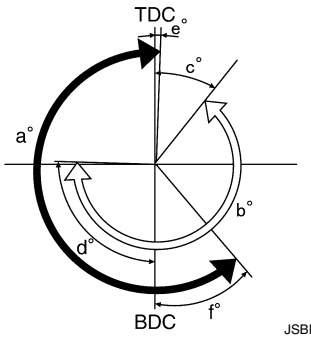
Unit: degree

Valve timing

⇦ : Intake valve

⬅ : Exhaust valve

VTC Minimum phasing (Mechanical)

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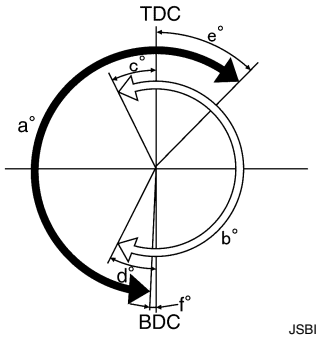
VTC Maximum phasing (Mechanical)

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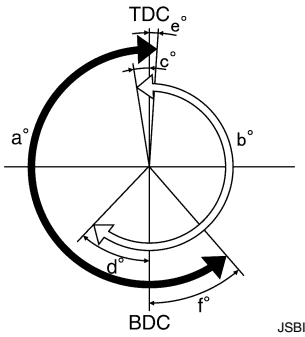
Engine start (Mechanical)

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| a<br>EXH valve opening angle | b<br>INT valve opening angle | c<br>INT open | d<br>INT close | e<br>EXH close | f<br>EXH open |
|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| VTC Minimum phasing (Mechanical) *1 | 224 | 232 | 39 ATDC | 91 ABDC | 3 ATDC | 41 BBDC |
| VTC Maximum phasing (Mechanical) *2 | | | 26 BTDC | 26 ABDC | 48 ATDC | 4 ABDC |
| Intermediate lock phasing (Mechanical) *3 | | | 9 BTDC | 43 ABDC | 3 ATDC | 41 BBDC |

*1: When running at idle with engine coolant temperature more than 48°C (118.4°F).

*2: When the intake or exhaust valve opening angle is at the maximum.

*3: When starting the engine with engine coolant temperature 48°C (118.4°F) or less.

INFOID:0000000013679771

## DRIVE BELT

| | |
|---|---|
| Tension of drive belt | Belt tension is not necessary, as it is automatically adjusted by drive belt auto-tensioner. |

INFOID:0000000013679772

## SPARK PLUG

Unit: mm (in)

| | |
|---|---|
| Make | NGK |
| Standard type | DILKAR7C9H |
| Spark plug gap (Nominal) | 0.9 (0.035) |

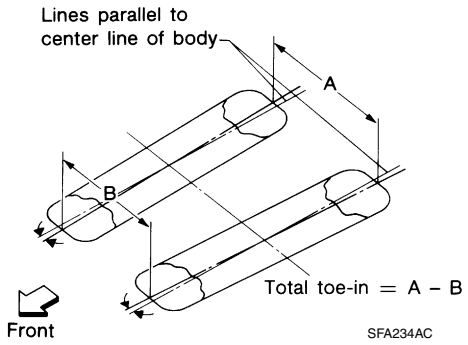
## Front Wheel Alignment (Unladen*1)

INFOID:0000000013679769

**WARNING:**

**If the vehicle is equipped with the Intelligent Cruise Control (ICC) system and the rear toe has been adjusted during a wheel alignment, the ICC sensor must be aligned.**

| Measurement wheel | | (LH) side | (RH) side |
|---|---|---|---|
| Camber<br>Degree minute (Decimal degree) | Minimum | –1° 00′ (–1.00°) | –1° 15′ (–1.25°) |
| | Nominal | –0° 15′ (–0.25°) | –0° 30′ (–0.50°) |
| | Maximum | 0° 30′ (0.50°) | 0° 15′ (0.25°) |
| | Difference (LH-RH) | 0° 15′ ± 0° 33′ (0.25° ± 0.55°) | |
| Caster<br>Degree minute (Decimal degree) | Minimum | 4° 00′ (4.00°) | |
| | Nominal | 4° 45′ (4.75°) | |
| | Maximum | 5° 30′ (5.50°) | |
| | (LH) and (RH) difference | 0.30′ (0.50°) Maximum | |
| Kingpin inclination<br>Degree minute (Decimal degree) | Minimum | 12° 00′ (12.00°) | 12° 15′ (12.25°) |
| | Nominal | 12° 45′ (12.75°) | 13° 00′ (13.00°) |
| | Maximum | 13° 30′ (13.50°) | 13° 45′ (13.75°) |




| | | | |
|---|---|---|---|
| Total toe-in | Distance (A - B) | Minimum | Out 0.6 mm (Out 0.024 in) |
| | | Nominal | In 1.4 mm (In 0.055 in) |
| | | Maximum | In 3.4 mm (In 0.134 in) |
| | Angle (LH) and (RH)<br>Degree minute<br>(Decimal degree) | Minimum | Out 0°′ (Out 0.06°) |
| | | Nominal | In 0° 06′ (In 0.10°) |
| | | Maximum | In 0° 15′ (In 0.26°) |

*1 Fuel, engine coolant, and lubricants are full. Spare tire, jack, hand tools and mats are in designated positions.

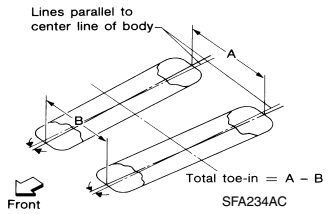
## Rear Wheel Alignment (Unladen*)

INFOID:0000000013679768

**WARNING:**

**If the vehicle is equipped with the Intelligent Cruise Control (ICC) system and the rear toe has been adjusted during a wheel alignment, the ICC sensor must be aligned.**

| Item | | Standard |
|---|---|---|
| Camber<br>Degree minute (Decimal degree) | Minimum | –1° 15′ (–1.25°) |
| | Nominal | –0° 45′ (–0.75°) |
| | Maximum | –0° 15′ (–0.25°) |




| | | | |
|---|---|---|---|
| Total toe-in | Distance (A - B) | Minimum | In 0.5 mm (In 0.020 in) |
| | | Nominal | In 3.3 mm (In 0.130 in) |
| | | Maximum | In 6.1 mm (In 0.240 in) |
| | Angle (LH and RH)<br>Degree minute<br>(Decimal degree) | Minimum | In 0° 2′ (In 0.04°) |
| | | Nominal | In 0° 14′ (In 0.24°) |
| | | Maximum | In 0° 26′ (In 0.44°) |

*: Fuel, engine coolant, and lubricants are full. Spare tire, jack, hand tools, and mats are in designated positions.

## Wheelarch Height (Unladen*)

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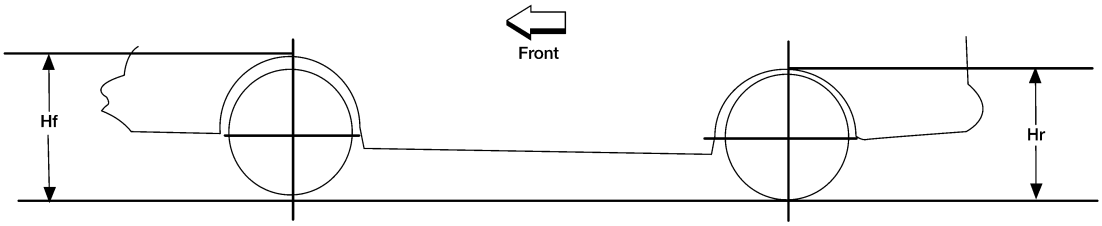


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| Tire size | 235/65R18 | 235/55R20 |
|---|---|---|
| Front (Hf) | 833 mm (32.80 in) | 832 mm (32.76 in) |
| Rear (Hr) | 823 mm (32.40 in) | 821 mm (32.32 in) |

*: Fuel, engine coolant, and lubricants are full. Spare tire, jack, hand tools, and mats are in designated positions.

## Brake Specifications

INFOID:0000000013679766

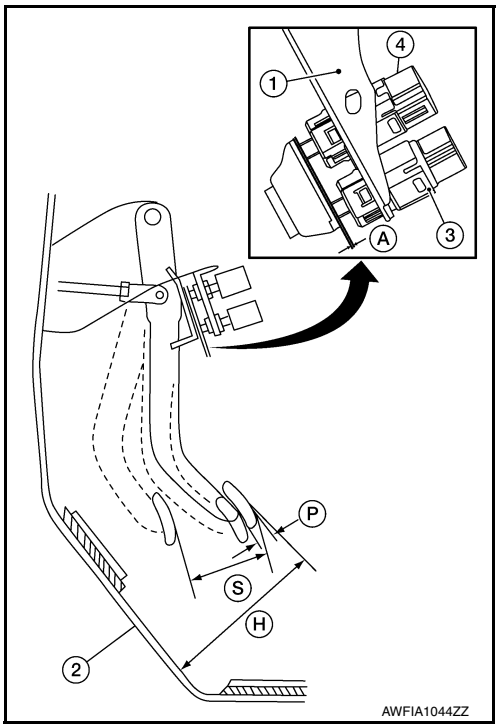
Unit: mm (in)

| | | |
|---|---|---|
| Front disc brake | Cylinder bore diameter | 45.0 (1.772) × 2 |
| | Pad length × width × thickness | 131.4 (5.173) × 53.0 (2.087) × 10 (0.394) |
| | Disc brake rotor outer diameter × thickness | 320 (12.598) × 28 (1.102) |
| Rear disc brake | Cylinder bore diameter | 42.86 (1.6874) |
| | Pad length × width × thickness | 83 (3.268) × 33 (1.299) × 8.5 (0.335) |
| | Disc brake rotor outer diameter × thickness | 308 (12.126) × 16 (0.630) |
| Master cylinder | Cylinder bore diameter | 27 (1.063) |
| Control valve | Valve type | Electric brake force distribution |

## Brake Pedal

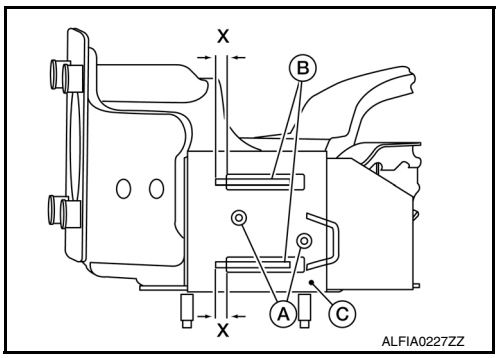
INFOID:0000000013679765

Unit: mm (in)




| Item | Standard |
|---|---|
| Brake pedal height (H) | 196.1 – 206.1 (7.72 – 8.11) |
| Clearance (A) between brake pedal bracket, stop lamp switch (4) and brake pedal position switch (3) contact ends | 0.74 – 1.96 (0.0291 – 0.0772) |
| Brake pedal full stroke (S) | 135.8 (5.35) |
| Brake pedal play (P) | 4.6 (0.18) |

Unit: mm (in)




| | |
|---|---|
| Overlap distance (X) between sub-bracket (B) and slide plate (C) | 5.5 ± 0.5 (0.22 ± 0.02) |

## Front Disc Brake

INFOID:0000000013679764

Unit: mm (in)

| Item | | Limit |
|---|---|---|
| Brake pad | Wear thickness | 2 (0.079) |
| Disc brake rotor | Wear thickness | 26 (1.024) |
| | Thickness variation (measured at 8 positions)* | 0.004 (0.0002) |
| | Runout (with disc brake rotor attached to the vehicle) | 0.040 (0.0016) or less |

*To check if rotor imbalance, rotor runout, or rotor deformation exists.

## Rear Disc Brake

INFOID:0000000013679763

Unit: mm (in)

| Item | | Limit |
|---|---|---|
| Brake pad | Wear thickness | 2 (0.079) |
| Disc brake rotor | Wear thickness | 14 (0.551) |
| | Thickness variation (measured at 8 positions)* | 0.010 (0.0004) |
| | Runout (with disc brake rotor attached to the vehicle) | 0.05 (0.0020) or less |

*To check if rotor imbalance, rotor runout, or rotor deformation exists.

## Fluids and Lubricants

INFOID:0000000013679759

The following are approximate capacities, The actual refill capacities may be slightly different. When refilling, follow the procedures described elsewhere in this manual.

| Fluid types | | Capacity (Approximate) | | |
|---|---|---|---|---|
| | | Metric | US measure | Imp measure |
| Fuel | | 72.0 ℓ | 19 gal | 15-7/8 gal |
| Engine oil Drain and refill | With oil filter change | 5.8 ℓ | 6-1/8 qt | 5-1/8 qt |
| | Without oil filter change | 5.5 ℓ | 5-7/8 qt | 4-7/8 qt |
| | Dry engine (Over-haul) | 6.5 ℓ | 6-7/8 qt | 5-3/4 qt |
| Engine coolant | | 9.2 ℓ | 9-3/4 qt | 8-1/8 qt |
| Inverter coolant | | 3.2 ℓ | 3-3/8 qt | 2-7/8 qt |
| CVT fluid | | 5.9 ℓ | 6-1/4 qt | 5-1/4 qt |
| Differential gear oil | | 0.5 ℓ | 1 pt | 7/8 pt |
| Transfer fluid | | 0.13 ℓ | 5/8 pt | 1/2 pt |
| Power steering fluid (E-PSF) | | 1.0 ℓ | 1-1/8 qt | 7/8 qt |
| Brake fluid | | — | — | — |
| Multi-purpose grease | | — | — | — |
| Windshield washer fluid | | 4.6 ℓ | 4-7/8 qt | 4 qt |
| Air conditioning system refrigerant | | 0.55 ± 0.03 kg | 1.21 ± 0.11 lb | 1.21 ± 0.11 lb |
| Air conditioning system oil | | 120 m ℓ | 4.1 fl oz | 4.2 fl oz |

## Engine Coolant Mixture Ratio

INFOID:0000000013679761

The engine cooling system is filled at the factory with a pre-diluted mixture of 50% Genuine NISSAN Long Life Antifreeze/Coolant (blue) and 50% water to provide year-round anti-freeze and coolant protection. The anti-freeze solution contains rust and corrosion inhibitors. Additional engine cooling system additives are not necessary.

**WARNING:**

**Do not remove the radiator cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the radiator. Wrap a thick cloth around the cap. Slowly push down and turn it a quarter turn to allow built-up pressure to escape. Carefully remove the cap by pushing it down and turning it all the way.**

**CAUTION:**

- **When adding or replacing coolant, be sure to use only Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent. Genuine NISSAN Long Life Antifreeze/Coolant (blue) is pre-diluted to pro-**

**vide antifreeze protection to -34°F (-37°C). If additional freeze protection is needed due to weather where the vehicle is operated, add Genuine NISSAN long life Antifreeze/Coolant (blue) concentrate following the directions on the container. If an equivalent coolant other than Genuine NISSAN Long Life Antifreeze/Coolant (blue) is used, follow the coolant manufacturer's instructions to maintain minimum antifreeze protection to -34°F (-37°C). The use of other types of coolant solutions other than Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent may damage the engine cooling system.**

- **Mixing any other type of coolant other than Genuine NISSAN Long Life Antifreeze/Coolant (blue), including Genuine NISSAN Long Life Antifreeze/Coolant (green) or the use of non-distilled water will reduce the life expectancy of the factory filled coolant.**

## Engine Oil Recommendation

*INFOID:0000000013679760*

NISSAN recommends the use of an energy conserving oil in order to improve fuel economy. Select only engine oils that meet the American Petroleum Institute (API) certification and International Lubricant Standardization and Approval Committee (ILSAC) certification and SAE viscosity standard. These oils have the API certification mark on the front of the container. Oils which do not have the specified quality label should not be used as they could cause engine damage.


1. API certification mark
2. API service symbol

## Inverter Cooling System

*INFOID:0000000013679762*

The inverter cooling system is filled at the factory with a pre-diluted mixture of 50% Genuine NISSAN Long Life Antifreeze/Coolant (blue) and 50% water to provide year-round anti-freeze and coolant protection. The antifreeze solution contains rust and corrosion inhibitors. Additional inverter cooling system additives are not necessary.

**WARNING:**

- **Never remove the coolant reservoir cap when the engine and inverter are hot. Wait until the engine and inverter cool down. Serious burns could be caused by high pressure fluid escaping from the radiator.**
- **The inverter reservoir is equipped with a pressure type cap. To prevent engine and inverter damage, use only a genuine NISSAN inverter reservoir cap.**

**CAUTION:**

- **Never use any additives in the coolant such as radiator sealer in the cooling system. This may cause damage to electrical equipment such as the motor and inverter, and also to engine and transmission.**
- **When adding or replacing coolant, be sure to use only Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent. Genuine NISSAN Long Life Antifreeze/Coolant (blue) is pre-diluted to provide antifreeze protection to -34°F (-37°C). If additional freeze protection is needed due to weather where you operate your vehicle, add Genuine NISSAN Long Life Antifreeze/Coolant (blue) concentrate following the directions on the container. If an equivalent coolant other than Genuine NISSAN Long Life Antifreeze/Coolant (blue) is used, follow the coolant manufacturer's instructions to maintain minimum antifreeze protection to -34°F (-37°C). The use of other types of coolant solutions other than Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent may damage the inverter cooling system.**
- **Mixing any other type of coolant other than Genuine NISSAN Long Life Antifreeze/Coolant (blue), including Genuine NISSAN Long Life Antifreeze/Coolant (green), or the use of non-distilled water will reduce the life expectancy of the factory-fill coolant.**