SECTION MA
MAINTENANCE

CONTENTS

VK56VD

CUMMINS 5.0L

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:0000000014386290

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.**

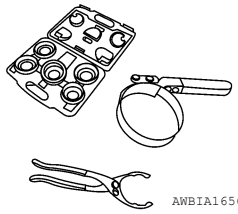
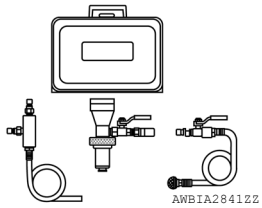
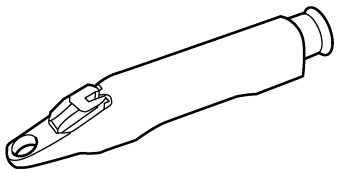
PREPARATION

PREPARATION

Special Service Tool

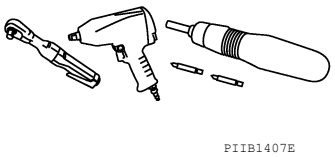
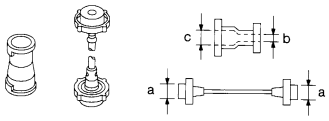
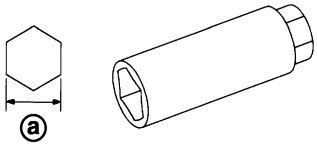
INFOID:0000000014386291

The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name	Description
(223-50000) (—) Oil filter wrench assortment  AWBIA1656ZZ	Removing oil filter
KV991J0070 (J-45695-A) Coolant refill tool  AWBIA2841ZZ	Refilling engine cooling system
— (J-51771) Cooling system pressure test kit 1. — (J-51771-1) Main body 2. — (J-51771-4) Small Adapter 3. — (J-51771-5) Pump with quick release 4. — (J-51771-9) Radiator cap assembly with quick coupler  ALPIA0018ZZ	Checking cooling system and radiator cap
KV991J0010 (J-23688) Engine coolant refractometer  WBIA0539E	Checking concentration of ethylene glycol in engine coolant

Commercial Service Tool

INFOID:0000000014386292

Tool name	Description
Power tool  PIIB1407E	Loosening nuts, screws and bolts
— (J-33984-A) Radiator pressure adapter  S-NT564	Adapting cooling system pressure tester to radiator cap and reservoir tank cap **a: 28 (1.10) diameter** **b: 31.4 (1.236) diameter** **c: 41.3 (1.626) diameter** Unit: mm (in)
Spark plug wrench  JPBIA0399ZZ	Removing and installing spark plug **a: 14 mm (0.55 in)**

PERIODIC MAINTENANCE

GENERAL MAINTENANCE

General Maintenance

INFOID:0000000014386293

General maintenance includes those items which should be checked during the normal day-to-day operation of the vehicle. They are essential if the vehicle is to continue operating properly. The owner can perform the checks and inspections themselves or they can have their NISSAN dealers do them.

OUTSIDE THE VEHICLE

The maintenance items listed here should be performed from time to time, unless otherwise specified.

Item		Reference page
Tires	Check the pressure with a gauge often and always prior to long distance trips. Adjust the pressure in all tires, including the spare, to the pressure specified. Check carefully for damage, cuts or excessive wear.	MA-39
Wheel nuts	When checking the tires, make sure no nuts are missing, and check for any loose nuts. Tighten if necessary.	MA-39
Tire rotation	Tires should be rotated every 5,000 miles (8,000 km).	WT-67
Tire Pressure Monitoring System (TPMS) transmitter components	Replace the TPMS transmitter grommet seat, valve core and cap when the tires are replaced due to wear or age.	WT-71
Wheel alignment and balance	If the vehicle should pull to either side while driving on a straight and level road, or if you detect uneven or abnormal tire wear, there may be a need for wheel alignment. If the steering wheel or seat vibrates at normal highway speeds, wheel balancing may be needed. For additional information regarding tires, refer to "Important Tire Safety Information" (United States) or "Tire Safety Information" (Canada) in the NISSAN Warranty Information Booklet.	MA-46 WT-66
Windshield	Clean the windshield on a regular basis. Check the windshield at least every six months for cracks or other damage. Repair as necessary.	GW-12
Windshield wiper blades	Check for cracks or wear if they do not wipe properly.	—
Doors and engine hood	Check that all doors and the engine hood operate smoothly as well as the back tail gate. Also make sure that all latches lock securely. Lubricate if necessary. Make sure that the secondary latch keeps the engine hood from opening when the primary latch is released. When driving in areas using road salt or other corrosive materials, check lubrication frequently.	MA-49
Lamps	Make sure that the headlamps, stop lamps, tail lamps, turn signal lamps, and other lamps are all operating properly and installed securely. Also check head lamp aim. Clean the head lamps on a regular basis.	EXL-130 EXL-288

INSIDE THE VEHICLE

The maintenance items listed here should be checked on a regular basis, such as when performing periodic maintenance, cleaning the vehicle, etc.

Item		Reference page
Warning lamps and chimes	Make sure that all warning lamps and chimes are operating properly.	WCS-41
Windshield wiper and washer	Check that the windshield wipers and washer operate properly and that the wipers do not streak.	GW-5
Windshield defroster	Check that the air comes out of the defroster outlets properly and in sufficient quantity when operating the heater or air conditioner.	—
Steering wheel	Check that it has the specified play. Check for changes in the steering condition, such as excessive play, hard steering or strange noises. Free play: Less than 35 mm (1.38 in).	ST-33

Item		Reference page
Seats	Check seat position controls such as seat adjusters, seatback recliner, etc. to make sure they operate smoothly and that all latches lock securely in every position. Check that the head restraints move up and down smoothly and that the locks (if equipped) hold securely in all latched positions. Check that the latches lock securely for folding-down rear seat backs.	SE-68
Seat belts	Check that all parts of the seat belt system (e.g. buckles, anchors, adjusters and retractors) operate properly and smoothly and are installed securely. Check the belt webbing for cuts, fraying, wear or damage.	SB-5
Accelerator pedal	Check the pedal for smooth operation and make sure the pedal does not catch or require uneven effort. Keep the floor mats away from the pedal.	—
Brakes	Check that the brake does not pull the vehicle to one side when applied.	—
Brake pedal and booster	Check the pedal for smooth operation and make sure it has the proper distance under it when depressed fully. Check the brake booster function. Be sure to keep the floor mats away from the pedal.	BR-10 BR-16
Parking brake	Check that the lever or pedal has the proper travel and make sure that the vehicle is held securely on a fairly steep hill when only the parking brake is applied.	PB-5
Automatic transmission “Park” mechanism	Check that the lock release button on the selector lever operates properly and smoothly. On a fairly steep hill check that the vehicle is held securely with the selector lever in the P (Park) position without applying the brakes.	—

UNDER THE HOOD AND VEHICLE

The maintenance items listed here should be checked periodically (e.g. each time you check the engine oil or refuel).

Item		Reference page
Windshield washer fluid	Check that there is adequate fluid in the tank.	—
Engine coolant level	Check the coolant level when the engine is cold.	MA-16
Radiator and hoses	Check the front of the radiator and clean off any dirt, insects, leaves, etc., that may have accumulated. Make sure the hoses have no cracks, deformation, deterioration or loose connections.	—
Brake fluid level	Make sure that the brake fluid level is between the “MAX” and “MIN” lines on the reservoir.	MA-39
Battery	Check the fluid level in each cell. It should be between the “MAX” and “MIN” lines. Vehicles operated in high temperatures or under severe conditions require frequent checks of the battery fluid level.	—
Engine drive belt	Make sure that no belt is frayed, worn, cracked or oily.	MA-23
Engine oil level	Check the level on the oil level gauge after parking the vehicle on a level spot and turning off the engine.	MA-19
Power steering fluid level and lines	Check the level when the fluid is cold, with the engine off. Check the lines for proper attachment, leaks, cracks, etc..	ST-16
Automatic transmission fluid level	Check the level on the fluid level gauge after putting the shift selector in “P”(Park) with the engine idling.	MA-30
Exhaust system	Make sure there are no loose supports, cracks or holes. If the sound of the exhaust seems unusual or there is a smell of exhaust fumes, immediately locate the trouble and correct it.	MA-30
Underbody	The underbody is frequently exposed to corrosive substances such as those used on icy roads or to control dust. It is very important to remove these substances, otherwise rust will form on the floor pan, frame, fuel lines and around the exhaust system. At the end of winter, the underbody should be thoroughly flushed with plain water, being careful to clean those areas where mud and dirt can easily accumulate.	—
Fluid leaks	Check under the vehicle for fuel, oil, water or other fluid leaks after the vehicle has been parked for a while. Water dripping from the air conditioner after use is normal. If you should notice any leaks or fuel fumes are evident, check for the cause and correct it immediately.	—

PERIODIC MAINTENANCE

Introduction of Periodic Maintenance

INFOID:0000000014386294

The following tables show the normal maintenance schedule. Depending upon weather and atmospheric conditions, varying road surfaces, individual driving habits and vehicle usage, additional or more frequent maintenance may be required.

Periodic maintenance beyond the last period shown on the tables requires similar maintenance.

Emission Control System Maintenance (VK56VD Engine)

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	5 (8) 6	10 (16) 12	15 (24) 18	20 (32) 24	25 (40) 30	30 (48) 36	35 (56) 42	40 (64) 48	45 (72) 54
Drive belt	NOTE (1)								I*	
Air cleaner filter	NOTE (2)						R			
EVAP vapor lines					I*				I*	
Fuel lines					I*				I*	
Fuel filter	NOTE (3)									
Engine coolant*	NOTE (4)(5)									
Engine oil		R	R	R	R	R	R	R	R	R
Engine oil filter (Use genuine NISSAN engine oil filter or equivalent)		R	R	R	R	R	R	R	R	R
Spark plugs (Iridium-tipped type)		Replace every 105,000 miles (168,000 km)								
Intake and exhaust valve clearance*	NOTE (6)									

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	50 (80) 60	55 (88) 66	60 (96) 72	65 (104) 78	70 (112) 84	75 (120) 90	80 (128) 96	85 (136) 102	90 (144) 108
Drive belt	NOTE (1)	I*		I*		I*		I*		I*
Air cleaner filter	NOTE (2)			R						R
EVAP vapor lines				I*				I*		
Fuel lines				I*				I*		
Fuel filter	NOTE (3)									
Engine coolant*	NOTE (4)(5)									
Engine oil		R	R	R	R	R	R	R	R	R
Engine oil filter (Use genuine NISSAN engine oil filter or equivalent)		R	R	R	R	R	R	R	R	R
Spark plugs (Iridium-tipped type)		Replace every 105,000 miles (168,000 km)								
Intake and exhaust valve clearance*	NOTE (6)									

MAINTENANCE OPERATION		MAINTENANCE INTERVAL						Reference Page
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	95 (152) 114	100 (160) 120	105 (168) 126	110 (176) 132	115 (184) 138	120 (192) 144	
Drive belt	NOTE (1)		I*		I*		I*	MA-23
Air cleaner filter	NOTE (2)						R	MA-24
EVAP vapor lines			I*				I*	EC-723
Fuel lines			I*				I*	MA-27

MAINTENANCE OPERATION		MAINTENANCE INTERVAL						Reference Page
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	95 (152) 114	100 (160) 120	105 (168) 126	110 (176) 132	115 (184) 138	120 (192) 144	
Fuel filter	NOTE (3)							—
Engine coolant*	NOTE (4)(5)							MA-18
Engine oil		R	R	R	R	R	R	MA-21
Engine oil filter (Use genuine NISSAN engine oil filter or equivalent)		R	R	R	R	R	R	MA-21
Spark plugs (Iridium-tipped type)		Replace every 105,000 miles (168,000 km)						MA-25
Intake and exhaust valve clearance*	NOTE (6)							EM-16

NOTE:

- (1) After 40,000 miles (64,000 km) or 48 months, inspect every 10,000 miles (16,000 km) or 12 months. Replace the drive belts if found damaged.
- (2) If operating mainly in dusty conditions, more frequent maintenance may be required.
- (3) Periodic maintenance is not required. For service procedures, refer to the FL section.
- (4) First replacement interval is 105,000 miles (168,000 km) or 84 months. After first replacement, replace every 75,000 miles (120,000 km) or 60 months.
- (5) Use only Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent with proper mixture ratio of 50% anti-freeze and 50% demineralized or distilled water. Mixing any other type of coolant or the use of non-distilled water will reduce the life expectancy of the factory fill coolant.
- (6) Periodic maintenance is not required. However, if valve noise increases, inspect valve clearance.

* Maintenance items and intervals with "*" are recommended by NISSAN for reliable vehicle operation. The owner need not perform such maintenance in order to maintain the emission warranty or manufacturer recall liability. Other maintenance items and intervals are required.

Chassis and Body Maintenance (VK56VD Engine)

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	5 (8) 6	10 (16) 12	15 (24) 18	20 (32) 24	25 (40) 30	30 (48) 36	35 (56) 42	40 (64) 48	45 (72) 54
Brake lines & cables			I		I		I		I	
Brake pads & rotors★			I		I		I		I	
Brake fluid★					R				R	
Automatic transmission fluid	NOTE (1)									
Transfer fluid			I		I		I		I	
Differential gear oil	NOTE (2)		I		I		I		I	
Steering gear & linkage, axle & suspension parts★					I				I	
Tire rotation	NOTE (3)									
Propeller shaft & drive shaft boots (4WD models)★			I		I		I		I	
Exhaust system★					I				I	
In-cabin microfilter				R			R			R
NISSAN Intelligent Key® battery				R			R			R

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	50 (80) 60	55 (88) 66	60 (96) 72	65 (104) 78	70 (112) 84	75 (120) 90	80 (128) 96	85 (136) 102	90 (144) 108
Brake lines & cables		I		I		I		I		I
Brake pads & rotors★		I		I		I		I		I
Brake fluid★				R				R		
Automatic transmission fluid	NOTE (1)									
Transfer fluid		I		I		I		I		I
Differential gear oil	NOTE (2)	I		I		I		I		I
Steering gear & linkage, axle & suspension parts★				I				I		
Tire rotation	NOTE (3)									
Propeller shaft & drive shaft boots (4WD models)★		I		I		I		I		I
Exhaust system★				I				I		
In-cabin microfilter				R			R			R
NISSAN Intelligent Key® battery				R			R			R

MAINTENANCE OPERATION		MAINTENANCE INTERVAL						Reference Page
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	95 (152) 114	100 (160) 120	105 (168) 126	110 (176) 132	115 (184) 138	120 (192) 144	
Brake lines & cables			I		I		I	MA-42
Brake pads & rotors★			I		I		I	MA-42 MA-42 MA-43 MA-43
Brake fluid★			R				R	MA-39
Automatic transmission fluid	NOTE (1)							MA-30
Transfer fluid			I		I		I	MA-33
Differential gear oil	NOTE (2)		I		I		I	MA-35 MA-38
Steering gear & linkage, axle & suspension parts★			I				I	MA-45 ST-23
Tire rotation	NOTE (3)							WT-67
Propeller shaft & drive shaft boots (4WD models)★			I		I		I	MA-34 MA-34
Exhaust system★			I				I	MA-30
In-cabin microfilter				R			R	MA-29
NISSAN Intelligent Key® battery				R			R	—

NOTE:

- **Maintenance items with "★" should be performed more frequently according to "Maintenance Under Severe Driving Conditions".**
- (1) Periodic maintenance is not required under normal driving condition. If using under the severe condition such as towing a trailer, using a car-top carrier, or driving on rough or muddy roads, change (not just inspect) oil at every 30,000 miles (48,000 km) or 24 months.
- (2) If towing a trailer, using a camper or car-top carrier, or driving on rough or muddy roads, change (not just inspect) oil at every 20,000 miles (32,000 km) or 24 months.
- (3) Refer to "Tire rotation" under the "GENERAL MAINTENANCE" heading earlier in this section.

MAINTENANCE UNDER SEVERE DRIVING CONDITIONS (VK56VD Engine)

The maintenance intervals shown on the preceding pages are for normal operating conditions. If the vehicle is mainly operated under severe driving conditions as shown below, more frequent maintenance must be performed on the following items as shown in the table.

Severe driving conditions

- Repeated short trips of less than 5 miles (8 km).
- Repeated short trips of less than 10 miles (16 km) with outside temperatures remaining below freezing.
- Operating in hot weather in stop-and-go “rush hour” traffic.
- Extensive idling and/or low speed driving for long distances, such as police, taxi or door-to-door delivery use.
- Driving in dusty conditions.
- Driving on rough, muddy, or salt spread roads.
- Towing a trailer, using a camper or a car-top carrier.

Maintenance operation: Inspect = Inspect and correct or replace as necessary.

Maintenance item	Maintenance operation	Maintenance interval	Reference page
Brake fluid	Replace	Every 10,000 miles (16,000 km) or 12 months	MA-40
Brake pads & rotors	Inspect	Every 5,000 miles (8,000 km) or 6 months	MA-42 MA-42 MA-43 MA-43
Steering gear & linkage, axle & suspension parts	Inspect	Every 5,000 miles (8,000 km) or 6 months	MA-45 MA-46
Propeller shaft & drive shaft boots (4WD models)	Inspect	Every 5,000 miles (8,000 km) or 6 months	MA-34 MA-34 MA-35 MA-38
Exhaust system	Inspect	Every 5,000 miles (8,000 km) or 6 months	MA-30

RECOMMENDED FLUIDS AND LUBRICANTS

VK56VD Gasoline Engine : Fluids and Lubricants

INFOID:0000000014386295

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

Fluid type			Capacity (Approximate)			Recommended Fluids/Lubricants
			Metric Measure	US Measure	Imperial Measure	
Fuel			98.4 ℓ	26 gal	21-5/8 gal	• For further details, refer to GI-27, "Fuel".
Engine oil Drain and refill	With oil filter change		6.5 ℓ	6-7/8 qt	5-3/4 qt	• Genuine "NISSAN Motor Oil 0W-20 SN is recommended. • If above motor oil is not available, use an equivalent motor oil that matches the above grade and viscosity. For additional information, see "Engine Oil Recommendation".
	Without oil filter change		6.2 ℓ	6-1/2 qt	5-1/2 qt	
Dry engine (engine overhaul)			7.6 ℓ	8 qt	6-3/4 qt	
Engine coolant	XD Models	With reservoir tank at MAX level	14.8 ℓ	15-5/8 qt	13 qt	• Pre-diluted Genuine NISSAN Long Life Antifreeze/ Coolant (blue) or equivalent • Pre-diluted Genuine NISSAN Long Life Antifreeze/ Coolant (blue) or equivalent
	Non-XD Models	With reservoir tank at MAX level	15.23 ℓ	16-1/8 qt	13-3/8 qt	
Automatic transmission fluid			10.0 ℓ*1	10-5/8 qt*1	8-3/4 qt*1	• Genuine NISSAN Matic S ATF • NISSAN recommends using Genuine NISSAN Matic S ATF ONLY in NISSAN automatic transmissions. Do not mix with other fluids. Using fluids that are not equivalent to Genuine NISSAN Matic S ATF may damage the automatic transmission. Damage caused by the use of fluids other than as recommended is not covered under the NISSAN New Vehicle Limited Warranty.
Power steering fluid	XD Models		2.0 ℓ	4 1/4 pt.	3 1/2 pt.	• Genuine NISSAN PSF II or equivalent • DEXRON™ VI type ATF may also be used.
	Non-XD Models		1.4 ℓ	3 pt.	2 1/2 pt.	
Brake fluid			—	—	—	• Genuine NISSAN Super Heavy Duty Brake Fluid*2 or equivalent DOT 3 (US FMVSS No. 116) *2: Available in mainland U.S.A. through a NISSAN dealer.
Transfer fluid	XD Models		1.8 ℓ	1-7/8 qt	1-5/8 qt	• Genuine NISSAN ATF D3M • Using fluid other than Genuine NISSAN ATF D3M may cause deterioration in driveability and transfer durability, and may damage the transfer, which is not covered by the NISSAN New Vehicle Limited Warranty.
	Non-XD Models		1.5 ℓ	1-5/8 qt	1-3/8 qt	

Fluid type			Capacity (Approximate)			Recommended Fluids/Lubricants
			Metric Measure	US Measure	Imperial Measure	
Differential gear oil	Front	XD Models	1.51 ℓ	3-1/4 pt	2-5/8 pt	• Genuine NISSAN Differential Oil Hypoid Super-CT Synthetic GL-5 75W-90 • NISSAN recommends using Genuine NISSAN Differential Oil Hypoid Super-CT Synthetic GL-5 75W-90 ONLY in final drive. Do not mix with other fluids. Using fluids that are not equivalent to Genuine NISSAN Differential Oil Hypoid Super-CT Synthetic GL-5 75W-90 may damage the differential gear. Damage caused by the use of fluids other than as recommended is not covered under the NISSAN New Vehicle Limited Warranty.
		Non-XD Models	1.25 ℓ	2-5/8 pt	2-1/4 pt	
	Rear	XD Models	2.6 ℓ	5-1/2 pt	4-5/8 pt	• API GL-5 synthetic gear oil, Viscosity SAE 75W-90
		Non-XD Models	2.3 ℓ	4-7/8 pt	4 pt	
Multi-purpose grease			—	—	—	• NLGI No. 2 (lithium soap base)
Windshield washer fluid			4.5 ℓ	4-3/4 pt	4 qt	• Genuine NISSAN Windshield Washer Concentrate Cleaner & Anti-freeze or equivalent
Air conditioning system refrigerant		XD Models	0.80 ± 0.05 kg	1.76 ± 0.11 lb	1.76 ± 0.11 lb	• HFC-134a (R-134a)
		Non-XD Models	0.75 ± 0.05 kg	1.60 ± 0.11 lb	1.60 ± 0.11 lb	
Air conditioning system oil			150 mℓ	5.1 fl oz	5.3 fl oz	• A/C System Oil Type S (DH-PS)

*1: The fluid capacity is the reference value.

Engine Oil Recommendation

INFOID:0000000014386296

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

Anti-Freeze Coolant Mixture Ratio

INFOID:0000000014386297

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:

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

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 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 manufactur'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-fill coolant.**

ENGINE MAINTENANCE
ENGINE COOLANT
ENGINE COOLANT : System Inspection

INFOID:0000000014386298

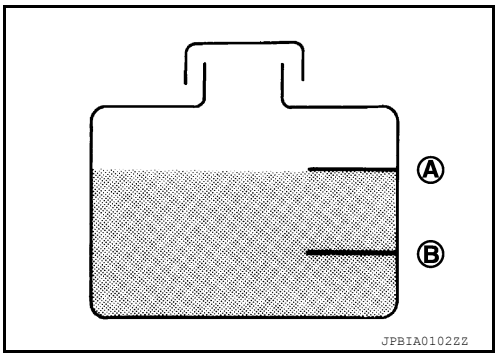
WARNING:
- **Do not remove the radiator cap or reservoir tank cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the cooling system.**
- **When removing the radiator cap or reservoir tank cap, wrap a thick cloth around the cap and slowly turn it a quarter turn to allow built-up pressure to escape. Then carefully remove the cap by turning it all the way.**

CHECKING COOLING SYSTEM HOSES

Check hoses for the following:
- Improper attachment
- Leaks
- Cracks
- Dents
- Bulges
- Internal obstruction
- Damage
- Loose connections
- Chafing
- Deterioration

CHECKING RESERVOIR LEVEL

- Check that the reservoir tank engine coolant level is within the MIN to MAX when the engine is cool.



(A) : MAX
(B) : MIN

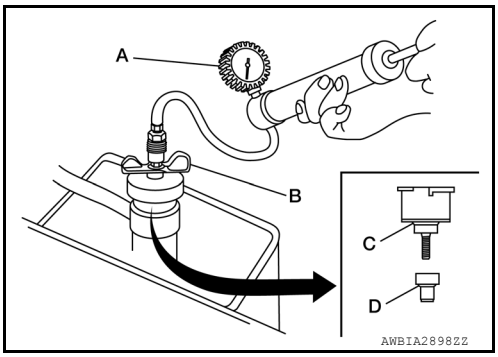
- Adjust coolant level (if necessary), to insure tht the engine coolant level is within the MIN to MAX range.

CAUTION:
Refill Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent in its quality mixed with water (distilled or deminer-alized). Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".

CHECKING COOLING SYSTEM FOR LEAKS

WARNING:
- **Do not remove the radiator cap or reservoir tank cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the cooling system.**
- **When removing the radiator cap or reservoir tank cap, wrap a thick cloth around the cap and slowly turn it a quarter turn to allow built-up pressure to escape. Then carefully remove the cap by turning it all the way.**

To check the cooling system for leaks, apply pressure to the cooling system using Tools (A), (B), (C) and (D).



Tool number (A) : — (J-51771-5)
Tool number (B) : — (J-51771-9)
Tool number (C) : — (J-51771-1)
Tool number (D) : — (J-51771-4)
Leakage test pressure : Refer to CO-33, "Radiator".

CAUTION:
Higher pressure testing than specified may cause radiator dam-age.

CHECKING RESERVOIR TANK CAP

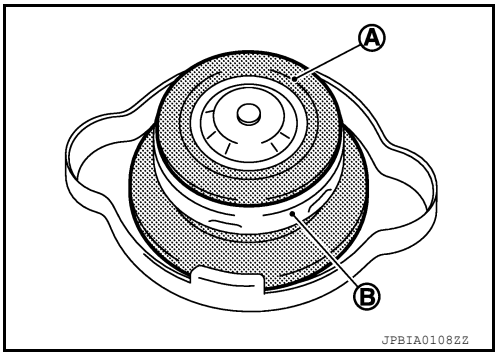
WARNING:

- **Do not remove the radiator cap or reservoir tank cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the cooling system.**
- **When removing the radiator cap or reservoir tank cap, wrap a thick cloth around the cap and slowly turn it a quarter turn to allow built-up pressure to escape. Then carefully remove the cap by turning it all the way.**

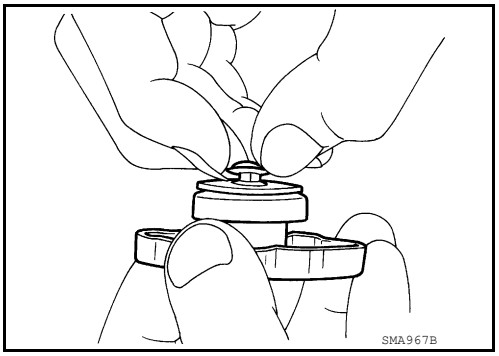
- Check the pressure valve of the reservoir tank cap.
- Replace the reservoir tank cap if the metal plunger (B) on the pressure valve cannot be seen around the edge of the rubber gasket (A).
- Replace the reservoir tank cap if there is damage or deposits of foreign material on the rubber gasket or pressure valve.

CAUTION:

Thoroughly wipe out the reservoir tank filler neck to remove any waxy residue or foreign material.

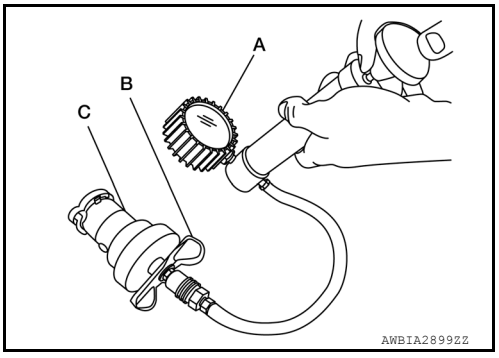


- Check the negative-pressure valve of the reservoir tank cap.
- Replace the reservoir tank cap if the negative-pressure valve does not close completely when pulled open and released.
- Replace the reservoir tank cap if there is damage or deposits of foreign material on the valve seat of the negative-pressure valve.
- Replace the reservoir tank cap if there is an abnormality in the operation of the negative-pressure valve.



- Check reservoir tank cap relief pressure.
- Check the reservoir tank cap relief pressure using Tools (A) and (B), and suitable tool (C).

Tool number (A)	**: —**	**(J-51771-5)**
Tool number (B)	**: —**	**(J-51771-9)**
Tool number (C) (commercially available)	**: —**	**(J-33984-A or equivalent)**
Reservoir tank cap relief pressure	**: Refer to CO-33, "Radiator".**	



- When connecting the reservoir tank cap to suitable tool (C), apply water or coolant to the reservoir tank cap seal surface.
- Replace the reservoir tank cap if the reservoir tank cap relief pressure is outside of specification.

CHECKING RADIATOR

Check radiator for mud or clogging. If necessary, clean radiator as per the following:

- Be careful not to bend or damage radiator fins.
- When radiator is cleaned without removal, remove all surrounding parts such as radiator cooling fan shroud. Then tape harness and connectors to prevent water from entering.

1. Apply water by hose to the back side of the radiator core vertically downward.
2. Apply water again to all radiator core surfaces once per minute.
3. Stop washing if any stains no longer flow out from radiator.
4. Blow air into the back side of radiator core vertically downward.

- Use compressed air lower than 490 kPa (5 kg/cm^2, 71 psi) and keep distance more than 30 cm (11.8 in).

5. Blow air again into all the radiator core surfaces once per minute until no water sprays out.

ENGINE COOLANT : Changing Engine Coolant

INFOID:0000000014386299

DRAINING ENGINE COOLANT

WARNING:

- **Do not remove radiator cap and reservoir tank cap when engine is hot. Serious burns could occur from high-pressure engine coolant escaping from radiator.**
- **Wrap a thick cloth around the caps. Slowly turn them a quarter of a turn to release built-up pressure. Carefully remove the caps by turning it all the way.**

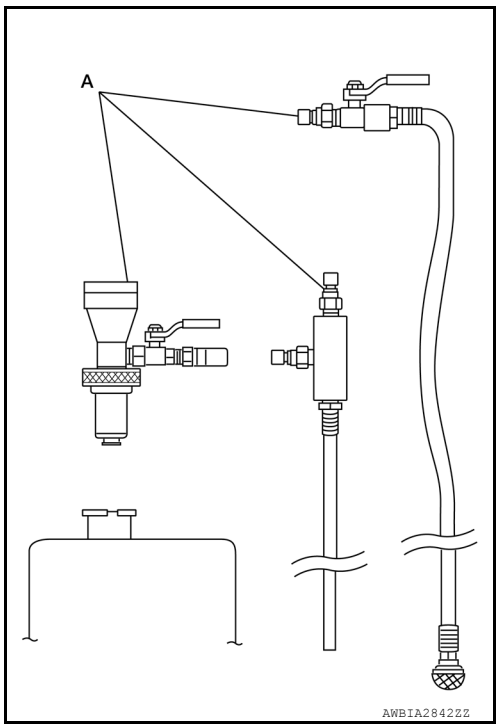
1. Open radiator drain plug at the bottom of radiator and then remove radiator cap and reservoir tank cap. (This is the only step required when partially draining the cooling system.)
   CAUTION:
   - **Do not allow coolant to contact drive belt.**
   - **Perform this step when engine is cold.**
2. Follow this step for heater core removal/replacement only. Disconnect the upper heater hose at the engine side and apply moderate air pressure [103.46 kPa (1.055 kg/cm^2, 15 psi) maximum air pressure] into the hose for 30 seconds to blow the excess coolant out of the heater core.
3. When draining all of the coolant in the system, remove reservoir tank and drain engine coolant and clean reservoir tank before installing.
   NOTE:
   When draining all of the engine coolant in the system, open water drain plug on cylinder block. Refer to EM-128, "Exploded View".
4. Check drained engine coolant for contaminants such as rust, corrosion or discoloration.
   If contaminated, flush the engine cooling system. Refer to MA-18, "ENGINE COOLANT : Changing Engine Coolant".

REFILLING ENGINE COOLANT

1. Install the following, if removed:
   - Cylinder block drain plugs, refer to EM-128, "Exploded View".
   - Reservoir tank, refer to CO-13, "Exploded View".
   - Cooling system hoses, refer to CO-13, "Exploded View".
   - Radiator drain plug, refer to CO-13, "Exploded View".
2. Set the vehicle heater controls to the full HOT and heater ON positions. Turn the vehicle ignition ON with the engine OFF as necessary to activate the heater mode.

3. Fill the cooling system with engine coolant using Tool (A), following the manufacturer's instructions included with the tool.

Tool number (A) : KV991J0070 (J-45695-A)
Engine Coolant : Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".



CAUTION:
- **Use recommended coolant or equivalent.**
- **Do not use any cooling system additives such as radiator sealer. Additives may clog the cooling system and cause damage to the engine, transmission or cooling system.**
- **The compressed air supply must be equipped with an air dryer.**

4. Remove the Tool (A) and top off the cooling system with engine coolant as necessary.
5. Install the radiator cap and reservoir tank cap.
6. Run the engine until it reaches normal operating temperature.
CAUTION:
Do not allow the engine to exceed normal operating temperature or engine damage may occur.
7. Stop the engine and allow it to cool.
8. Check the engine coolant level and adjust if necessary.

FLUSHING COOLING SYSTEM

1. Install reservoir tank if removed and tighten drain plug.
NOTE:
If water drain plug on cylinder block was removed, install water drain plug and tighten. Refer to EM-128, "Exploded View".
2. Fill radiator and reservoir tank with water and reinstall radiator and reservoir caps.
3. Run the engine and warm it up to normal operating temperature.
4. Rev the engine two or three times under no-load.
5. Stop the engine and wait until it cools down.
6. Drain water from the system. Refer to MA-18, "ENGINE COOLANT : Changing Engine Coolant".
7. Repeat steps 1 through 6 until clear water begins to drain from radiator.

ENGINE OIL

ENGINE OIL : Inspection

INFOID:0000000014386300

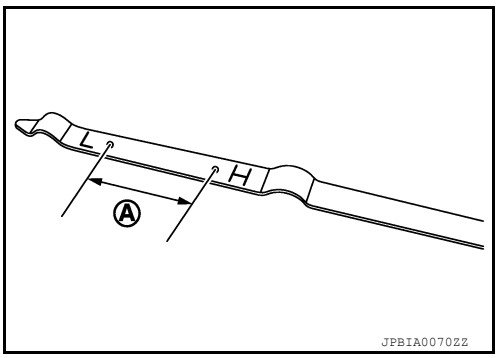
OIL LEVEL

NOTE:
Before starting engine, put vehicle horizontally and check the engine oil level. If engine is already started, stop it and allow 10 minutes before checking.

1. Pull out oil level gauge and wipe it clean.

2. Insert oil level gauge and check the engine oil level is within the range (A) shown in the figure.
3. If it is out of range, adjust it.

CAUTION:
Do not overfill the engine with oil.



OIL APPEARANCE

- Check the engine oil for a white milky appearance or excessive contamination.
- If the engine oil is milky, it is highly probable that it is contaminated with engine coolant. Repair or replace damaged parts.

OIL LEAKAGE

Check for oil leakage around the following areas:

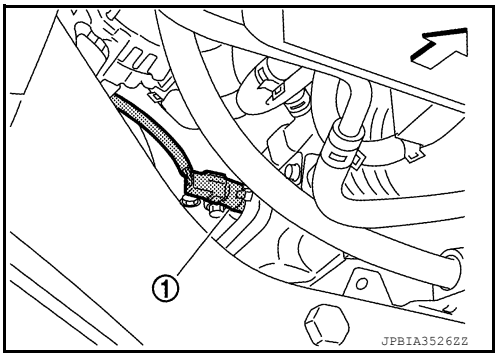
- Oil pan
- Oil pan drain plug
- Oil pressure sensor
- Oil filter
- Oil cooler
- Intake valve timing control cover
- Intake valve timing control solenoid valve
- Front cover
- Mating surface between cylinder block and cylinder head
- Mating surface between cylinder head and rocker cover
- Crankshaft oil seal (front and rear)

OIL PRESSURE CHECK

WARNING:

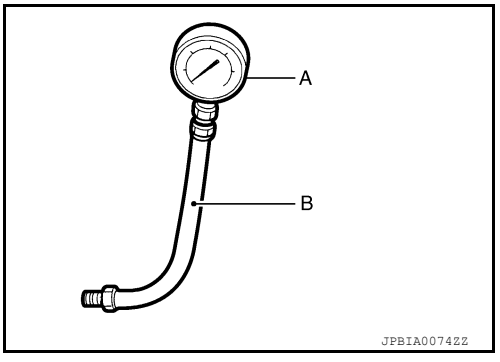
- **Be careful not to burn yourself, as the engine and engine oil may be hot.**
- **Put the A/T shift selector in the Park "P" position.**

1. Check the engine oil level.
2. Remove front under cover.
3. Disconnect the oil pressure sensor (1) harness connector.



⇦ : Front

4. Remove the oil pressure sensor.
   CAUTION:
   Do not drop or shock oil pressure sensor.
5. Install suitable tool (B) into oil pressure sensor hole and connect suitable tool (A).



6. Start the engine and warm it up to normal operating temperature.
7. Check the engine oil pressure with engine running under no-load. Refer to LU-19, "Engine Oil Pressure".
   CAUTION:
   If the difference is extreme, check the oil passages and oil pump for leaks and blockages.
8. After the inspections, install oil pressure sensor as follows:

a. Remove old liquid gasket adhering to oil pressure sensor and engine.
b. Apply liquid gasket and tighten oil pressure sensor to the specification.
   Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-22, "Recommended Chemical Products and Sealants".

   Oil pressure sensor torque : Refer to EM-70, "Exploded View".

c. After warming up engine, make sure there is no leakage of engine oil with engine running.

ENGINE OIL : Draining

INFOID:0000000014386301

WARNING:
- **Be careful not to burn yourself, as the engine and engine oil may be hot.**
- **Prolonged and repeated contact with used engine oil may cause skin cancer; try to avoid direct skin contact with used oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.**

1. Warm up the engine, and check for any oil leaks.
2. Stop the engine and wait for at least 10 minutes.
3. Remove drain plug and oil filler cap to drain the old oil.

ENGINE OIL : Refilling

INFOID:0000000014386302

1. Install drain plug with new washer.
   CAUTION:
   Be sure to clean drain plug and install with new washer.

   Tightening torque : Refer to EM-64, "Exploded View".

2. Refill with new engine oil. Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".
   CAUTION:
   - **The refill capacity depends on the engine oil temperature and drain time. Use these specifications for reference only.**
   - **Always use oil level gauge to determine the proper amount of engine oil in engine.**
3. Warm up the engine and check area around drain plug and oil filter for engine oil leakage.
4. Stop the engine and wait for 10 minutes.
5. Check the engine oil level. Refer to MA-19, "ENGINE OIL : Inspection".

OIL FILTER

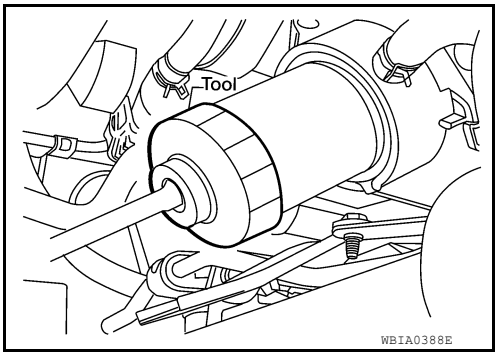
OIL FILTER : Removal and Installation

INFOID:0000000014386303

REMOVAL

1. Remove front under cover.
2. Drain engine oil. Refer to LU-10, "Draining".

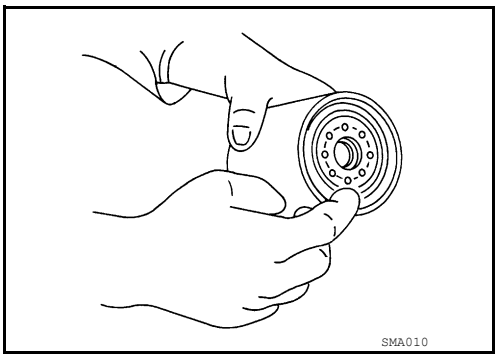
3. Remove oil filter using a suitable tool.



WARNING:
Be careful not to burn yourself, as the engine and engine oil may be hot.
CAUTION:
- **The oil filter is equipped with a pressure relief valve.**
- **Use Genuine NISSAN oil filter or equivalent.**
- **When removing, prepare a shop cloth to absorb any engine oil leaks or spills.**
- **Do not allow engine oil to adhere to the drive belts.**
- **Completely wipe off any engine oil that adheres to the engine and the vehicle.**

INSTALLATION

1. Remove foreign materials adhering to the oil filter seal mating surface.
2. Apply clean engine oil to the oil filter seal circumference of the new oil filter as shown.



3. Screw on the oil filter manually until it touches the installation surface and tighten to specification.

Oil filter : 18.0 N·m (1.8 kg-m, 13 ft-lb)

4. Refill engine with new engine oil. Refer to LU-10, "Refilling".
5. Inspect engine for oil leaks. Refer to LU-9, "Inspection".
6. Install front under cover.

OIL FILTER : Inspection

INFOID:0000000014386304

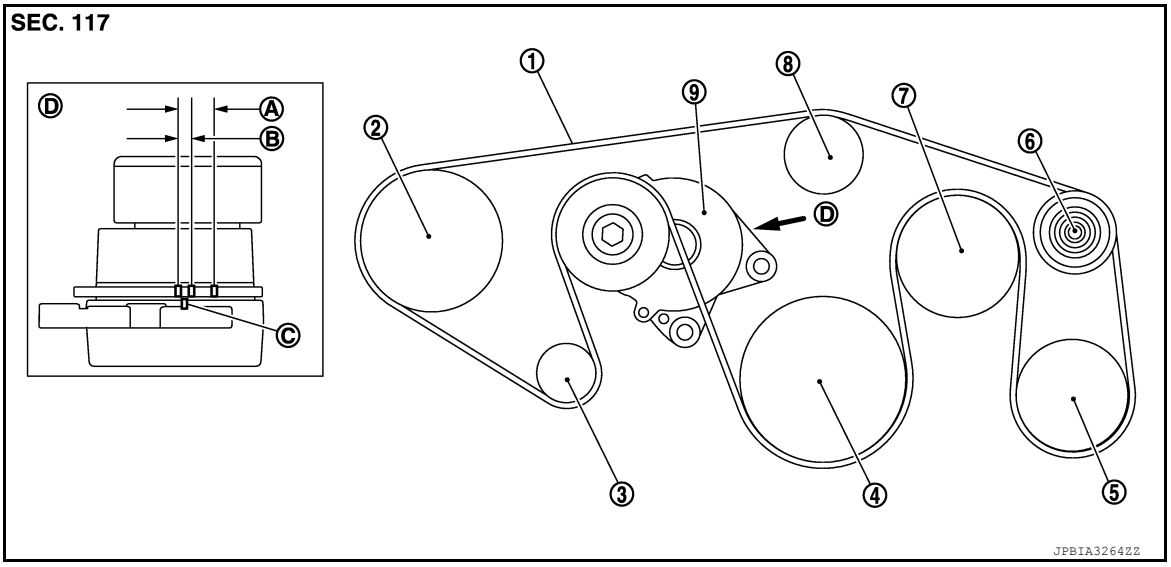
INSPECTION AFTER INSTALLATION

1. Check engine oil level. Refer to LU-9, "Inspection".
2. Start engine and check for engine oil leaks.
3. Stop engine and wait for 10 minutes.
4. Check engine oil level and add engine oil as required.

DRIVE BELTS

DRIVE BELTS : Exploded View

INFOID:0000000014386305



1. Drive belt
2. Power steering oil pump pulley
3. Alternator pulley
4. Crankshaft pulley
5. A/C compressor
6. Idler pulley
7. Cooling fan pulley
8. Water pump pulley
9. Drive belt auto-tensioner
A. Possible use range
B. Range when new drive belt is installed
C. Indicator
D. View D

DRIVE BELTS : Inspection

INFOID:0000000014386306

WARNING:

Be sure to perform the these steps when engine is stopped.

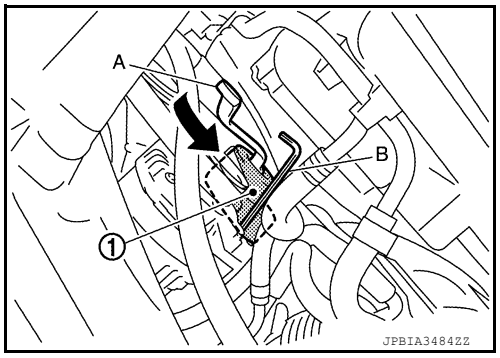
- Check that the indicator (C) (notch on fixed side) of each auto-tensioner is within the possible use range (A).
  NOTE:
  - Check the each auto-tensioners indication when the engine is cold.
  - When new drive belts is installed, the indicator (notch on fixed side) should be within the range (B) in the figure.
- Visually check all drive belts for wear, damage or cracks.
- If the indicator (notch on fixed side) is out of the possible use range or drive belts are damaged, replace drive belts.

DRIVE BELTS : Removal and Installation - Drive Belt

INFOID:0000000014386307

REMOVAL

1. Install suitable tool (A) on drive belt auto tensioner pulley bolt, move in the direction of arrow (loosening direction of tensioner) as shown.
   CAUTION:
   - **Do not place hand in a location where pinching may occur if the holding tool accidentally comes off.**
   - **Do not loosen the hexagonal part in center of auto tensioner pulley (1) (Do not turn it clockwise). If turned clockwise, the complete auto tensioner must be replaced as a unit, including the pulley.**
2. Under the above condition, insert a suitable tool (B) of approximately 6 mm (0.24 in) in diameter through the holding boss to lock auto tensioner pulley arm.
3. Remove drive belt.



INSTALLATION

Installation is in the reverse order of removal.

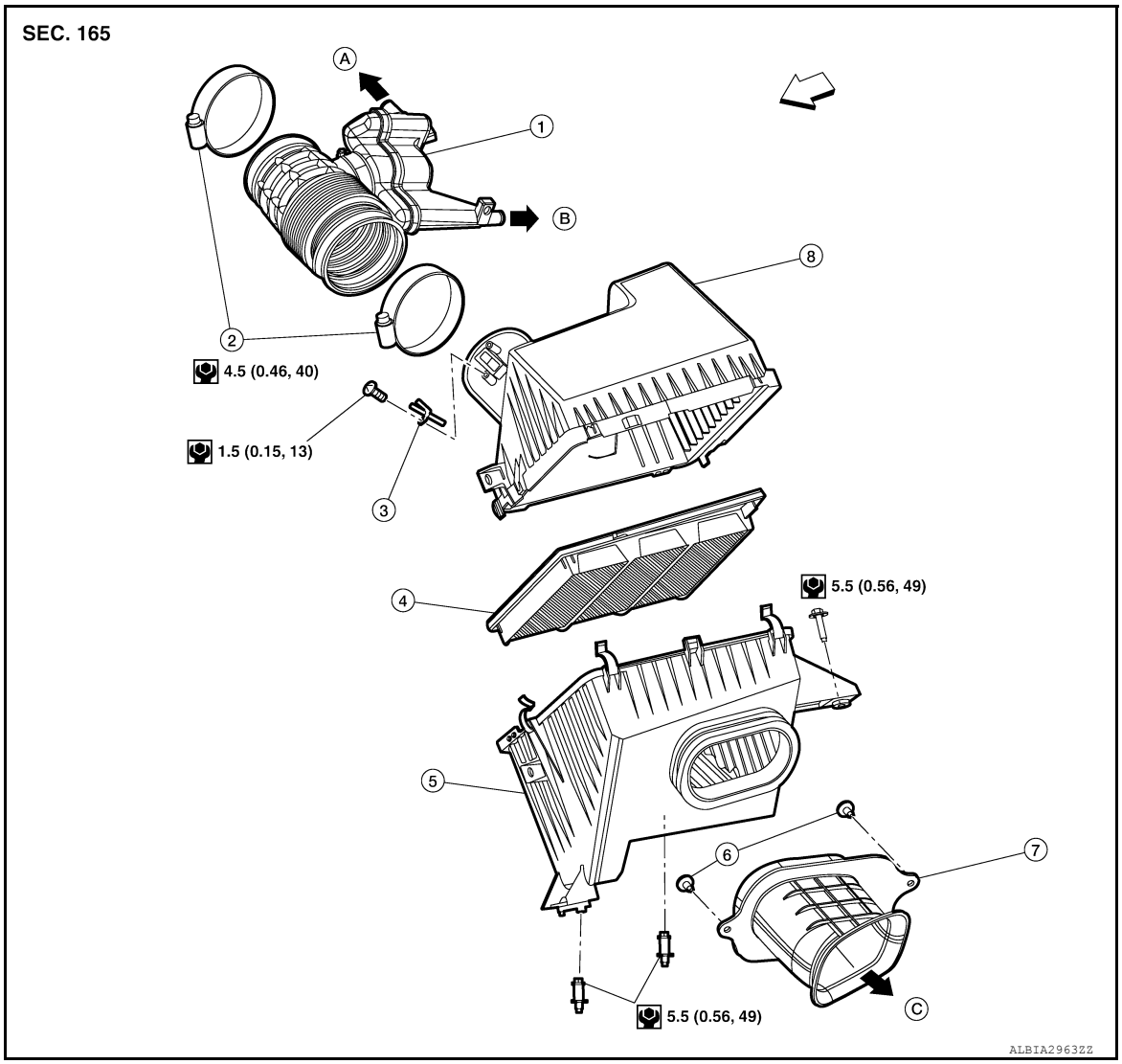
CAUTION:

- **Check drive belts are securely installed around all pulleys.**
- **Check drive belts are correctly engaged with the pulley groove.**
- **Check for engine oil and engine coolant are not adhered drive belts and pulley groove.**

AIR CLEANER FILTER

AIR CLEANER FILTER : Exploded View

INFOID:0000000014386308



1. Air duct	2. Clamp	3. Mass air flow sensor
4. Air filter	5. Air cleaner case (lower)	6. Clip
7. Adapter	8. Air cleaner case (upper)	A. To PCV hose (bank 2)
B. To PCV hose (bank 1)	C. To hoodledge	⇦ Front

AIR CLEANER FILTER : Removal and Installation

INFOID:0000000014386309

REMOVAL

NOTE:

- Replace the air filter as necessary for periodic maintenance. Refer to MA-9, "Introduction of Periodic Maintenance".

1. Unhook clips, and lift air cleaner case (upper).

2. Remove air cleaner filter from air cleaner case.

INSTALLATION

Installation is in the reverse order of removal.

AIR CLEANER FILTER : Inspection

INFOID:0000000014386310

INSPECTION AFTER REMOVAL

Examine with eyes that there is no stain, clogging, or damage on air cleaner element.

- Remove dusts (such as dead leafs) on air cleaner element surface and inside cleaner case.
- If clogging or damage is observed, replace the air cleaner element.

CAUTION:

Do not clean the air cleaner element by blowing as there is a risk of deterioration of its performance.

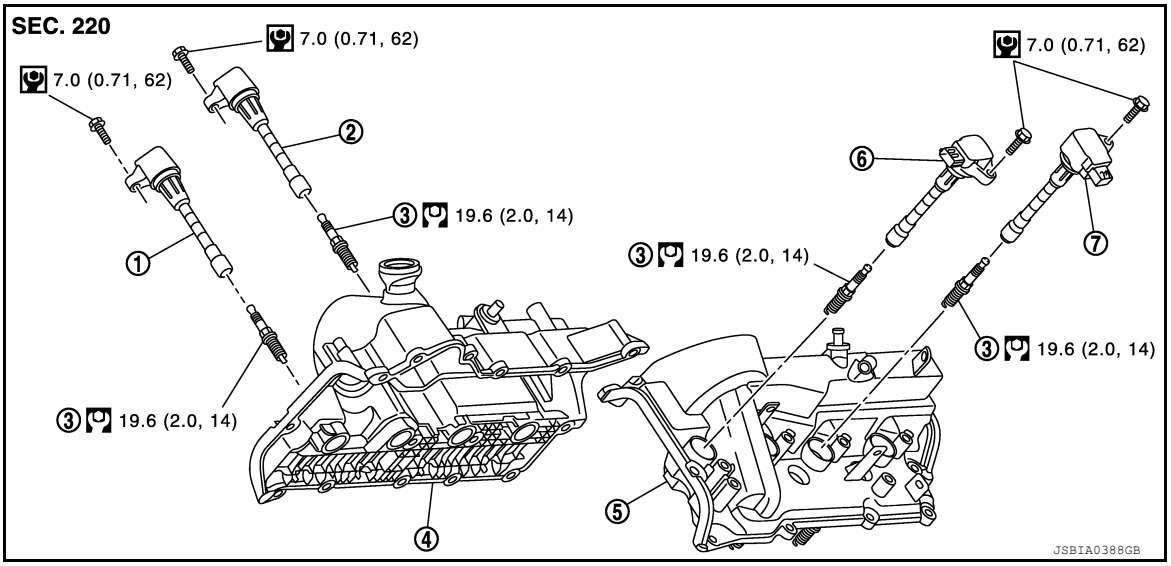
MAINTENANCE INTERVAL

Refer to MA-9, "Introduction of Periodic Maintenance".

SPARK PLUG

SPARK PLUG : Exploded View

INFOID:0000000014386311



1. Ignition coil (No. 2, 4)
2. Ignition coil (No. 6, 8)
3. Spark plug
4. Rocker cover (bank 2)
5. Rocker cover (bank 1)
6. Ignition coil (No. 1, 3)
7. Ignition coil (No. 5, 7)

SPARK PLUG : Removal and Installation

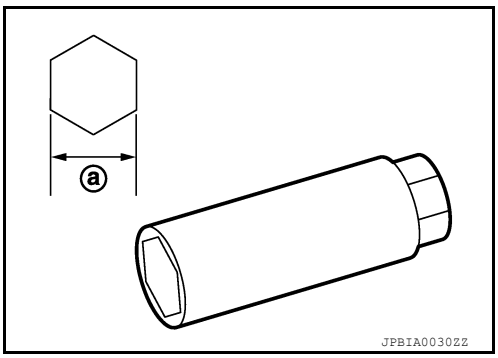
INFOID:0000000014386312

REMOVAL

1. Remove engine cover. Refer to EM-30, "Exploded View".
2. Remove ignition coil. Refer to EM-34, "Exploded View".

3. Remove spark plug with a suitable tool.

(A) : 14 mm (0.55 in)



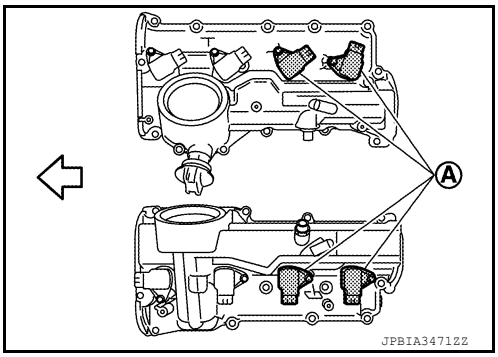
INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

Install ignition coil marked with an identification mark (A) on cylinder No. 5, 6, 7 and 8.

⇦ : Engine front



SPARK PLUG : Inspection

INFOID:0000000014386313

INSPECTION AFTER REMOVAL

Use the standard type spark plug for normal condition.

Spark plug (Standard type) : Refer to EM-154, "Spark Plug".

CAUTION:

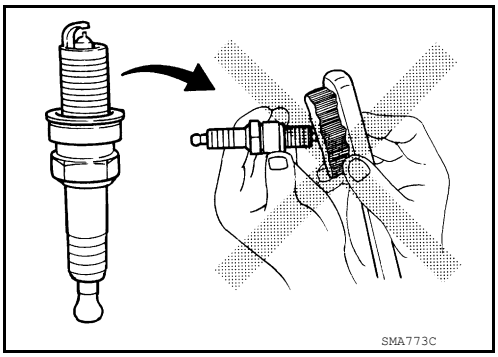
- **Do not drop or impact spark plug, if spark plug has been dropped, do not use.**
- **Do not use a wire brush for cleaning.**
- **If plug tip is covered with carbon, use spark plug cleaner to clean.**

Cleaner air pressure

: Less than 588 kPa (6 kg/cm^2, 85 psi)

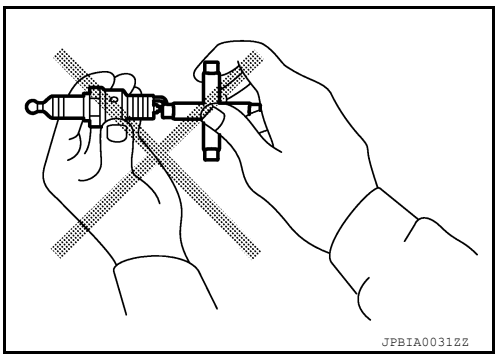
Cleaning time

: Less than 20 seconds



- **Measure spark plug gap. When it exceeds the limit, replace spark plug even if it is within the specified replacement mileage. Refer to EM-154, "Spark Plug".**

- **Spark plug gap adjustment is not required between replacement intervals.**



FUEL SYSTEM

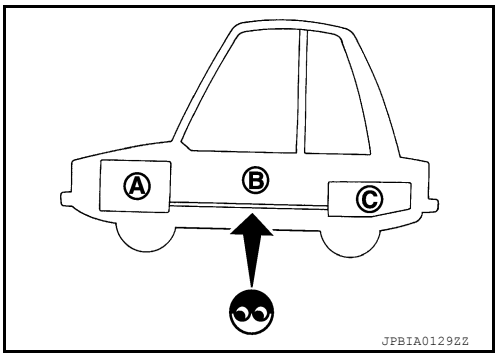
FUEL SYSTEM : Inspection

INFOID:0000000014386314

Inspect fuel lines, fuel filler cap, and fuel tank for improper attachment, leaks, cracks, damage, loose connections, chafing or deterioration.

(A) : Engine
(B) : Fuel line
(C) : Fuel tank

If necessary, repair or replace damaged parts.



FUEL SYSTEM : Quick Connector

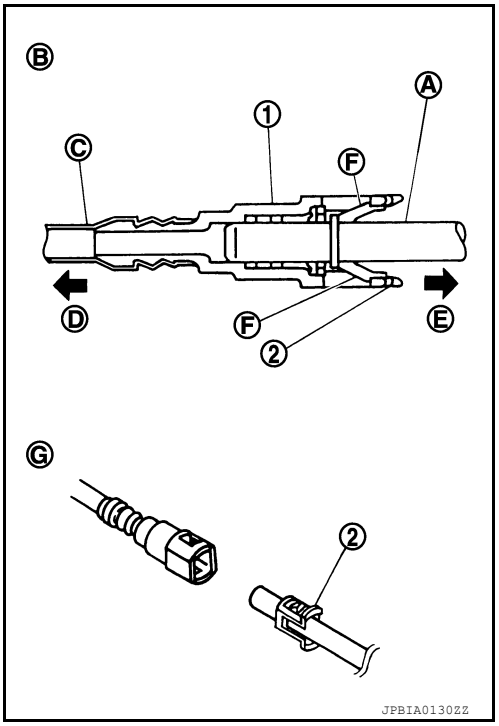
INFOID:0000000014386315

CAUTION:

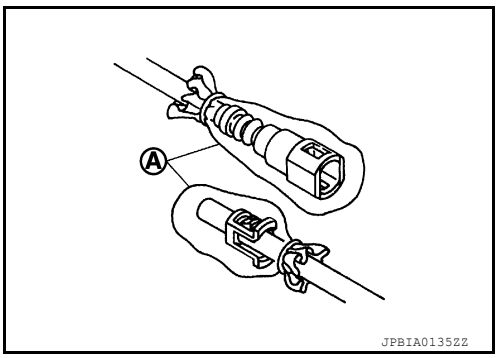
- **After connecting fuel tube quick connectors, check that quick connectors are secure.**
- **Ensure that connector and resin tube never contact any adjacent parts.**
- **Quick connector (1) can be disconnected when the tabs (F) are depressed completely. Do not twist it more than necessary.**

(B) : Connection (cross-section)
(D) : To under floor fuel line
(E) : To fuel tank
(G) : Disconnection

- **Do not use any tools to disconnect quick connector.**
- **Keep resin tube (C) away from heat. Be especially careful when welding near the resin tube.**
- **Prevent acid liquid such as battery electrolyte, etc., from getting on resin tube.**
- **Do not bend or twist resin tube during installation and disconnection.**
- **Do not remove the remaining retainer (2) from hard tube (or the equivalent) (A) except when resin tube or retainer is replaced.**
- **When resin tube or hard tube (or the equivalent) is replaced, also replace retainer with new one.**



- **To keep the connecting portions clean and to avoid damage and foreign materials, cover them completely with plastic bags (A) or something similar.**



CHASSIS AND BODY MAINTENANCE
IN-CABIN MICROFILTER

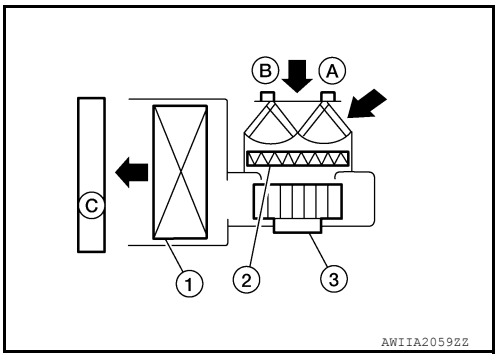
IN-CABIN MICROFILTER : Description

INFOID:0000000014386316

FUNCTION

The air inside the passenger compartment is filtered by the in-cabin microfilter when the heater or A/C controls are set on either the recirculation or fresh mode. The in-cabin microfilter is located in the heater and cooling unit assembly.

(1) : Evaporator
(2) : In-cabin microfilter
(3) : Blower motor
(A) : Recirculation air
(B) : Fresh air
(C) : Purified air



REPLACEMENT TIMING

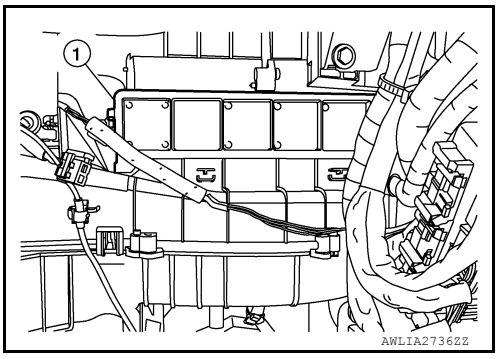
Replacement of the in-cabin microfilter is recommended on a regular interval depending on the driving conditions. Refer to MA-9, "Introduction of Periodic Maintenance". It may also be necessary to replace the in-cabin microfilter as part of a component replacement if it is damaged.

IN-CABIN MICROFILTER : Removal and Installation

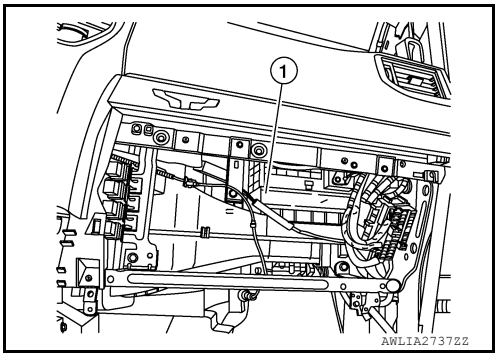
INFOID:0000000014386317

REMOVAL

1. Remove glove box assembly. Refer to IP-21, "Removal and Installation".
2. Release in-cabin microfilter cover tab and remove the cover (1) from under the RH side of the instrument panel.
   CAUTION:
   Use care when lifting up on the in-cabin microfilter tab to avoid damaging it.



3. Remove in-cabin microfilter (1).
   CAUTION:
   If the in-cabin microfilter is deformed/damaged when removing, replace it with a new one. A deformed or damaged in-cabin microfilter may affect the dust collecting performance.



INSTALLATION

Installation is in reverse order of removal.

CAUTION:
When installing, handle the in-cabin microfilter with care to avoid deformation or damage.
NOTE:

The in-cabin microfilter is marked with an air flow arrow. The end of the in-cabin microfilter with the arrow should face the passenger side of the vehicle. The arrow should point toward the rear of the vehicle.

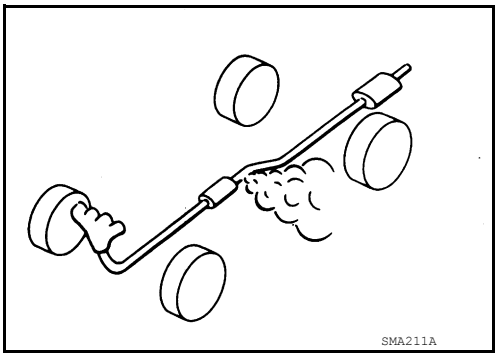
EXHAUST SYSTEM

EXHAUST SYSTEM : Checking Exhaust System

INFOID:0000000014386318

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage or deterioration.

- If anything is found, repair or replace damaged parts.



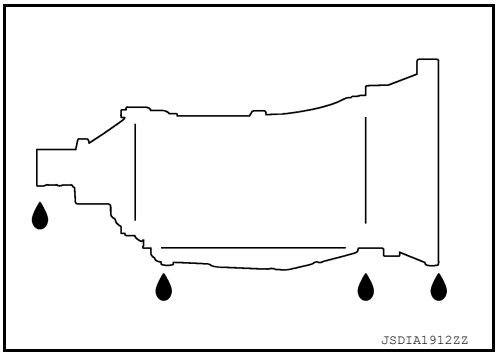
A/T FLUID

A/T FLUID : Inspection

INFOID:0000000014386319

FLUID LEAKAGE

- Check transmission surrounding area (oil seal and plug etc.) for fluid leakage.
- If anything is found, repair or replace damaged parts and adjust A/T fluid level. Refer to MA-32, "A/T FLUID : Adjustment".



A/T FLUID : Changing

INFOID:0000000014386320

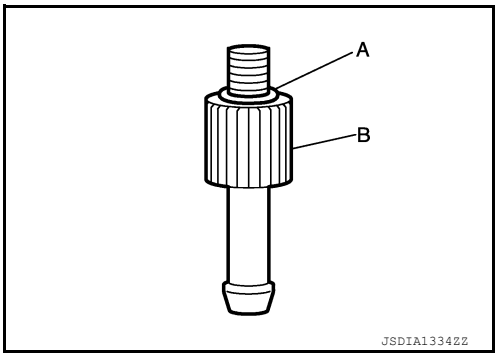
Recommended fluid and fluid capacity : Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".

CAUTION:

- **Use only recommended ATF. Never mix with other ATF.**
- **Using ATF other than recommended ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**
- **When filling ATF, be careful not to scatter heat generating parts such as exhaust.**

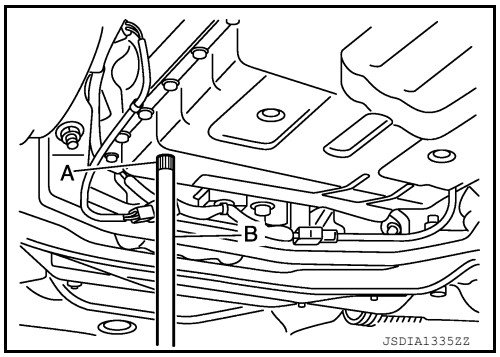
1. Step 1

a. Install the O-ring (315268E000) (A) to the charging pipe (310811EA5A) (B).

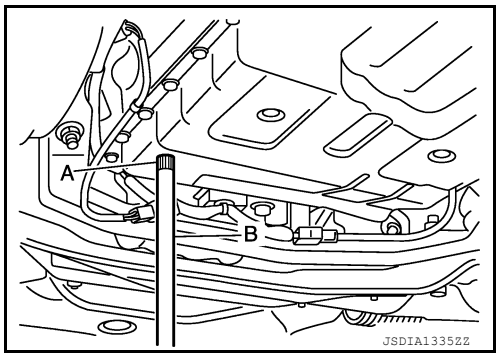


2. Step 2

a. Use CONSULT to check that the ATF temperature is 40°C (104°F) or less.
b. Lift up the vehicle.
c. Remove the drain plug from the oil pan, and then drain the ATF.
d. When the ATF starts to drip, temporarily tighten the drain plug to the oil pan.
NOTE:
Never replace drain plug and drain plug gasket with new ones yet.
e. Remove overflow plug from oil pan.
f. Install the charging pipe (A) to the overflow plug hole.
CAUTION:
Tighten the charging pipe by hand.
g. Install the bucket pump hose (B) to the charging pipe.
CAUTION:
Insert the bucket pump hose all the way to the end of the charging pipe.
h. Fill approximately 3 liters (3-1/8 US qt, 2-5/8 Imp qt) of the ATF.
i. Remove the bucket pump hose to remove the charging pipe, and then temporarily tighten the overflow plug to the oil pan.
CAUTION:
Quickly perform the procedure to avoid ATF leakage from the oil pan.



j. Lift down the vehicle.
k. Start the engine and wait for approximately 3 minutes.
l. Stop the engine.
3. Step 3
a. Repeat “Step 2”.
4. Final Step
a. Use CONSULT to check that the ATF temperature is 40°C (104°F) or less.
b. Lift up the vehicle.
c. Remove the drain plug from the oil pan, and then drain the ATF.
d. When the ATF starts to drip, tighten the drain plug to the oil pan to the specified torque. Refer to TM-464, "Exploded View".
CAUTION:
Do not reuse drain plug and drain plug gasket.
e. Remove overflow plug from oil pan.
f. Install the charging pipe (A) to the overflow plug hole.
CAUTION:
Tighten the charging pipe by hand.
g. Install the bucket pump hose (B) to the charging pipe.
CAUTION:
Insert the bucket pump hose all the way to the end of the charging pipe.
h. Fill approximately 3 liters (3-1/8 US qt, 2-5/8 Imp qt) of the ATF.
i. Remove the bucket pump hose to remove the charging pipe, and then temporarily tighten the overflow plug to the oil pan.
CAUTION:
Quickly perform the procedure to avoid ATF leakage from the oil pan.



j. Lift down the vehicle.
k. Start the engine.
l. Make the ATF temperature approximately 40°C (104°F).
NOTE:
The ATF level is greatly affected by the temperature. Always check the ATF temperature on “ATF TEMP 1” of “Data Monitor” using CONSULT.
m. Park vehicle on level surface and set parking brake.

n. Shift the selector lever through each gear position. Leave selector lever in “P” position.

o. Lift up the vehicle when the ATF temperature reaches 40°C (104°F), and remove the overflow plug from the oil pan.
CAUTION:
Perform “Step 4-o” with the engine at idle.

p. When the ATF starts to drip, tighten the overflow plug to the oil pan to the specified torque. Refer to TM-464, "Exploded View".
CAUTION:
Do not reuse overflow plug.

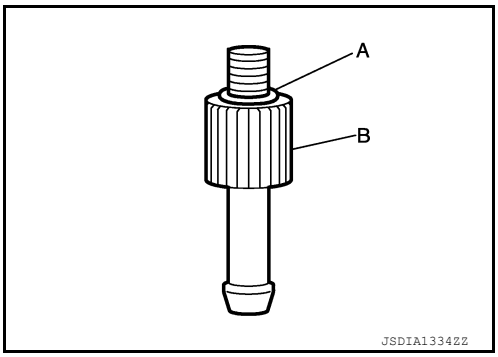
A/T FLUID : Adjustment

INFOID:0000000014386321

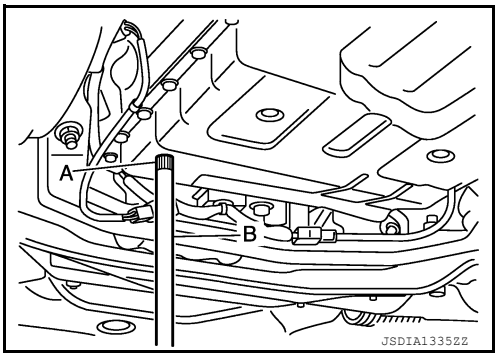
Recommended fluid and fluid capacity : Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".

CAUTION:
- **Use only recommended ATF. Never mix with other ATF.**
- **Using ATF other than recommended ATF will cause deterioration in driveability and A/T durability, and may damage the A/T, which is not covered by the INFINITI new vehicle limited warranty.**
- **When filling ATF, be careful not to scatter heat generating parts such as exhaust.**
- **Always maintain the ATF temperature within between 35°C (95°F) and 45°C (113°F) while checking with CONSULT when the ATF level adjustment is performed.**

1. Install the O-ring (315268E000) (A) to the charging pipe (310811EA5A) (B).



2. Start the engine.
3. Make the ATF temperature approximately 40°C (104°F).
NOTE:
The ATF level is greatly affected by the temperature. Always check the ATF temperature on “ATF TEMP 1” of “Data Monitor” using CONSULT.
4. Park vehicle on level surface and set parking brake.
5. Shift the selector lever through each gear position. Leave selector lever in “P” position.
6. Lift up the vehicle.
7. Check the ATF leakage from transmission.
8. Remove overflow plug from oil pan.
9. Install the charging pipe (A) to the overflow plug hole.
CAUTION:
Tighten the charging pipe by hand.
10. Install the bucket pump hose (B) to the charging pipe.
CAUTION:
Insert the bucket pump hose all the way to the end of the charging pipe.
11. Fill approximately 0.5 liters (1/2 US qt, 1/2 lmp qt) of the ATF.
12. Check that the ATF leaks when removing the charging pipe and the bucket pump hose. If the ATF does not leak, refill the ATF.
CAUTION:
Perform “Step 12” with the engine at idle.



13. When the ATF starts to drip, tighten the overflow plug to the oil pan to the specified torque. Refer to TM-464, "Exploded View".
CAUTION:
Do not reuse overflow plug.

TRANSFER FLUID

TRANSFER FLUID : Inspection

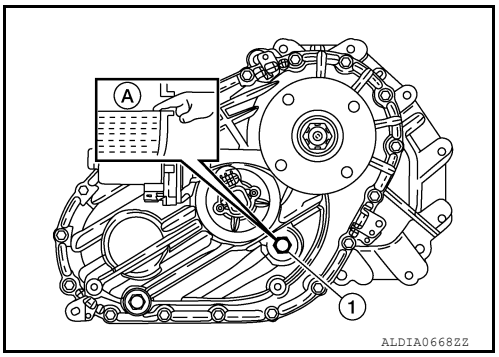
INFOID:0000000014386322

FLUID LEAKS

Check transfer surrounding area (oil seal, drain plug, and filler plug etc.) for fluid leaks.

FLUID LEVEL

1. Remove filler plug (1). Then check that fluid is filled from hole for the filler plug.
CAUTION:
Do not start engine while checking fluid level.
2. Transfer oil level (A) should be level with bottom of filler plug hole.
3. Apply sealant to thread of filler plug (1), and install it on transfer and then tighten to the specified torque.
CAUTION:
Remove old sealant adhering to thread of filler plug.

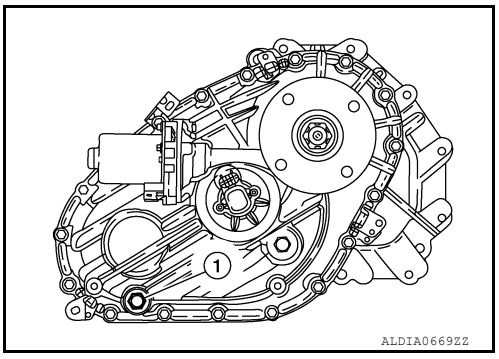


Specified torque : 20.5 N·m (2.1 kg-m, 15 ft-lb)
Sealant : Hylomar 102 silicone or equivalent

TRANSFER FLUID : Draining

INFOID:0000000014386323

1. Stop the engine.
2. Remove the drain plug (1) and drain transfer fluid.
3. Apply sealant to thread of drain plug, and install it to transfer and tighten to the specified torque.
CAUTION:
Remove old sealant adhering to thread of drain plug.



Specified torque : 20.5 N·m (2.1 kg-m, 15 ft-lb)
Sealant : Hylomar 102 silicone or equivalent

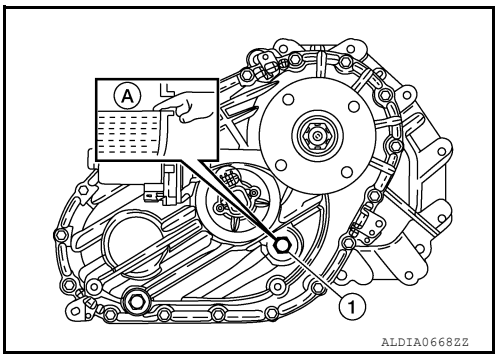
TRANSFER FLUID : Refilling

INFOID:0000000014386324

1. Remove filler plug (1). Fill with new transfer fluid up to hole for the filler plug (A).

Recommended fluid and capacity : Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".

CAUTION:
Carefully fill the fluid. (Fill for approximately 3 minutes.)
2. Leave the vehicle for 3 minutes, and check the fluid level again.
3. Apply sealant to thread of filler plug, and install it on transfer and tighten to the specified torque.
CAUTION:
Remove old sealant adhering to thread of filler plug.



Specified torque : 20.5 N·m (2.1 kg-m, 15 ft-lb)
Sealant : Hylomar 102 silicone or equivalent

FRONT PROPELLER SHAFT

FRONT PROPELLER SHAFT : Inspection

INFOID:0000000014386325

APPEARANCE AND NOISE INSPECTION

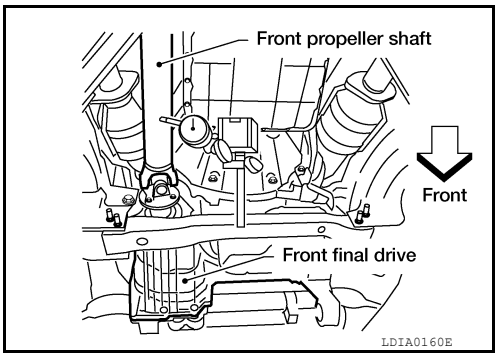
- Inspect the propeller shaft tube for dents or cracks. If damaged, replace the propeller shaft assembly.
- Check bearings for damage and noise. If damaged, replace as necessary.

PROPELLER SHAFT VIBRATION

NOTE:
If vibration is present at high speed, check propeller shaft runout first, then check mounting between propeller shaft and companion flange.

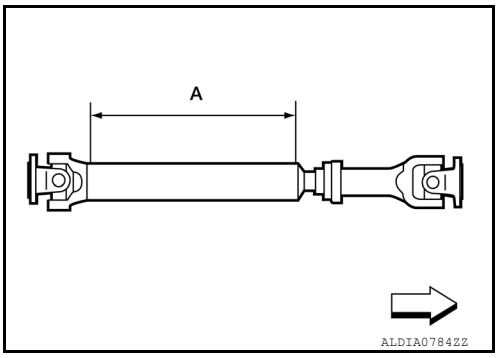
1. Measure the runout of the propeller shaft tube using suitable tool at several points by rotating the final drive companion flange with your hands.

Propeller shaft runout : Refer to DLN-160, "General Specification".



2. If the runout still exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180°, 270° and reconnect propeller shaft.
3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly.

(A) : Runout measuring range
⇦ : Front



4. After installation, check for vibration by driving the vehicle.

REAR PROPELLER SHAFT

REAR PROPELLER SHAFT : Inspection

INFOID:0000000014386326

APPEARANCE AND NOISE INSPECTION

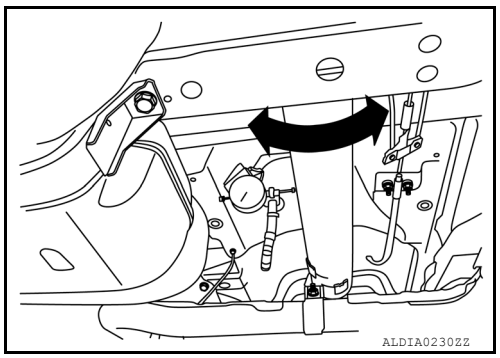
- Inspect the propeller shaft tube for dents or cracks. If damaged, replace the propeller shaft assembly.
- Check bearings for damage and noise. If damaged, replace as necessary.

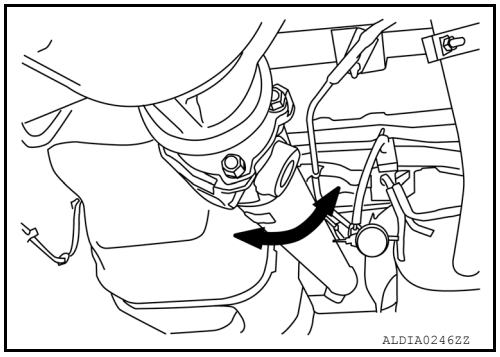
PROPELLER SHAFT VIBRATION

NOTE:
If vibration is present at high speed, check propeller shaft runout first, then check mounting between propeller shaft and companion flange.

1. Measure the runout of the propeller shaft tube at several points by rotating the final drive companion flange with your hands.

Propeller shaft runout : Refer to DLN-175, "General Specification".





2. If the runout still exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180°, 270° and reconnect propeller shaft.
3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly.
4. After installation, check for vibration by driving the vehicle.

FRONT DIFFERENTIAL GEAR OIL

FRONT DIFFERENTIAL GEAR OIL : Inspection - MA235

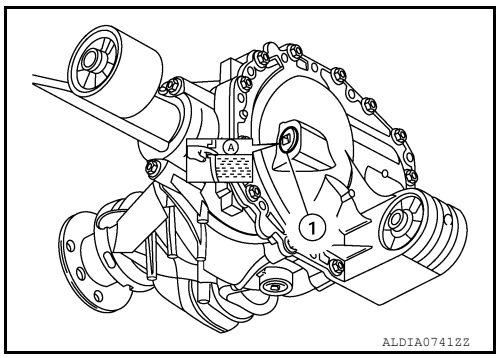
INFOID:0000000014386327

OIL LEAKS

Make sure that oil is not leaking from final drive assembly or around it.

OIL LEVEL

1. Check oil level (A) from filler plug hole as shown in the figure after removing filler plug (1) and gasket from final drive assembly.
CAUTION:
Turn the ignition switch OFF while checking oil level.
• Oil level should be level with bottom of filler plug hole.
2. Set a gasket on filler plug and install it on final drive assembly.
CAUTION:
Do not reuse gasket.
3. Tighten filler plug to the specified torque. Refer to DLN-193, "Exploded View".

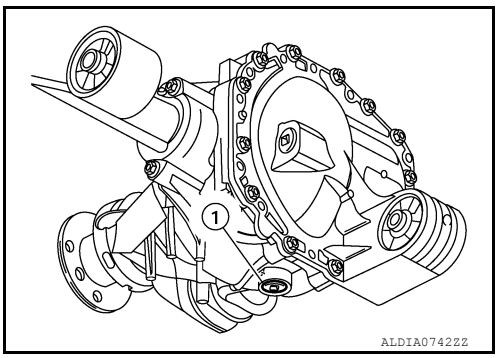


FRONT DIFFERENTIAL GEAR OIL : Draining - MA235

INFOID:0000000014386328

1. Turn the ignition switch OFF.

2. Remove drain plug (1) and gasket.
3. Drain gear oil.
4. Install a gasket on drain plug and install it to final drive assembly.
   CAUTION:
   Do not reuse gasket.
5. Tighten drain plug to the specified torque. Refer to DLN-193, "Exploded View".

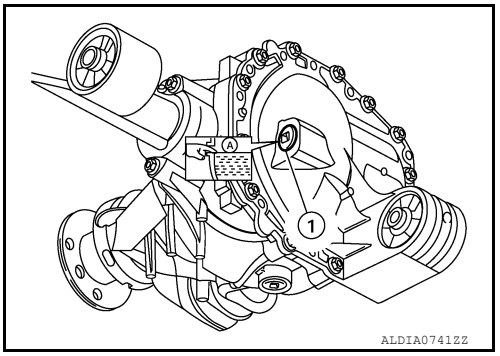


FRONT DIFFERENTIAL GEAR OIL : Refilling - MA235

INFOID:0000000014386329

1. Remove filler plug (1) and gasket. Then fill with new gear oil until oil level (A) reaches the specified level near filler plug mounting hole.

Oil grade and viscosity	**: Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".**
Standard Oil capacity	**: Refer to DLN-206, "General Specification".**



2. Install a gasket on filler plug, and install it to final drive assembly.
   CAUTION:
   Do not reuse gasket.
3. Tighten filler plug to the specified torque. Refer to DLN-193, "Exploded View".

FRONT DIFFERENTIAL GEAR OIL : Inspection - MA210

INFOID:0000000014720824

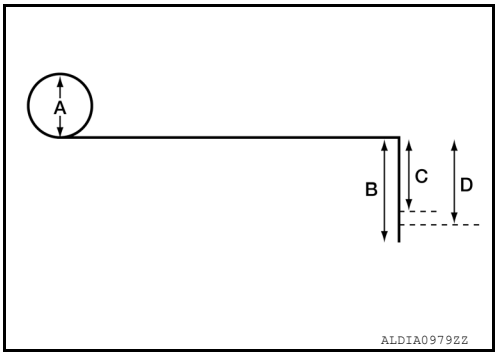
OIL LEAKS

Make sure that oil is not leaking from final drive assembly or around it.

OIL LEVEL

1. Use a stiff wire about 150 mm (5.9 in) long to make a dipstick gauge for measuring the oil level.

a. On one end bend the wire into a circle shape about 25 mm (1.0 in) (A) in diameter. This becomes the dipstick gauge handle.
b. On the opposite end, bend the wire 90 degrees 45 mm (1.8 in) (B) from that end.
c. Measure down from the bend and make an indelible notch or mark 33 mm (1.3 in) (C) on the wire.
d. Measure down again from the bend and make an indelible notch or mark 38 mm (1.5 in) (D) on the wire. The dipstick gauge should look as shown.



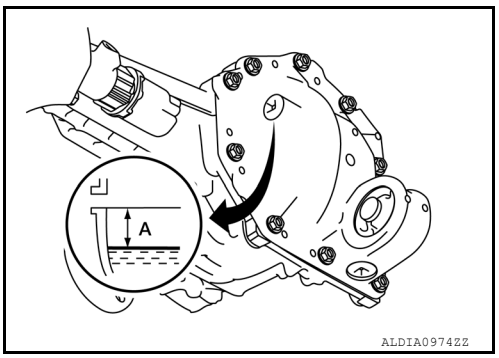
2. Remove the filler plug with O-ring from the front final drive.
3. Using the dipstick gauge, measure the oil level in the front final drive.

a. Insert the notched or marked end of the dipstick gauge into the filler plug hole.
   CAUTION:
   Do not drop the dipstick gauge into the front final drive.
b. Lower the dipstick gauge so that the wire of the gauge is resting on the bottom of the filler plug hole opening.

c. Remove the dipstick gauge and check the oil level on the gauge. Verify within the specified dimension. Adjust the oil level as necessary. Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".

CAUTION:
- **Do not over fill the front final drive.**
- **The full oil level is below the filler plug hole.**

(A) : 33 mm - 38 mm (1.3 in - 1.5 in)



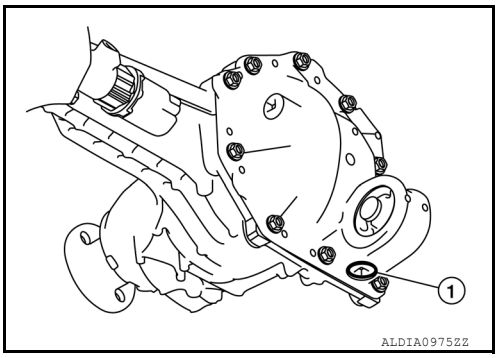
4. Install filler plug with O-ring into final drive assembly.
5. Tighten the filler plug to the specified torque.

32.5 Nm (3.3 kg-m, 24 ft-lb

FRONT DIFFERENTIAL GEAR OIL : Draining - MA210

INFOID:0000000014720825

1. Remove drain plug (1) with O-ring.
2. Drain the gear oil.
3. Install drain plug with O-ring into front final drive.
4. Tighten drain plug to the specified torque. Refer to DLN-224, "Exploded View".



FRONT DIFFERENTIAL GEAR OIL : Refilling - MA210

INFOID:0000000014720828

CAUTION:
- **Do not over fill the front final drive.**
- **The full oil level is below the filler plug hole.**

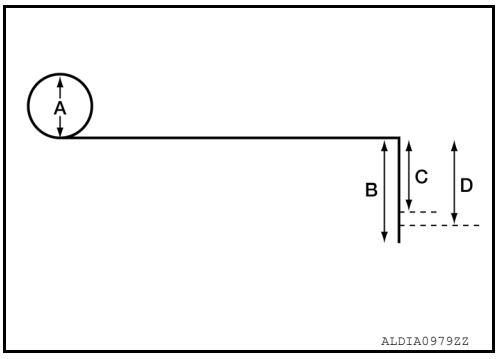
1. Use a stiff wire about 150 mm (5.9 in) long to make a dipstick gauge for measuring the oil level.

a. On one end bend the wire into a circle shape about 25 mm (1.0 in) (A) in diameter. This becomes the dipstick gauge handle.

b. On the opposite end, bend the wire 90 degrees 45 mm (1.8 in) (B) from that end.

c. Measure down from the bend and make an indelible notch or mark 33 mm (1.3 in) (C) on the wire.

d. Measure down again from the bend and make an indelible notch or mark 38 mm (1.5 in) (D) on the wire. The dipstick gauge should look as shown.



2. Remove the filler plug with O-ring from the front final drive.
3. Using the dipstick gauge, measure the oil level in the front final drive.

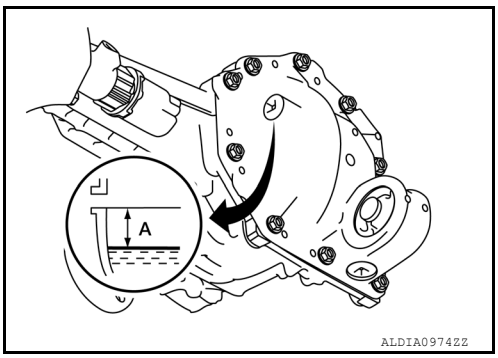
a. Insert notched or marked end of the dipstick gauge into the filler plug hole.

CAUTION:
Do not drop the dipstick gauge into the front final drive.

b. Lower the dipstick gauge so the wire of the gauge is resting on the bottom of the filler plug hole opening.

c. Remove the dipstick gauge and check the oil level on the gauge. Verify the level is within the specified dimension (A).

(A) :33 mm - 38 mm (1.3 in -1.5 in)



4. Adjust the oil level as necessary. Fill with new oil. Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".

5. Install oil filler plug with O-ring into the front final drive.
6. Tighten filler plug to the specified torque. Refer to DLN-224, "Exploded View".

REAR DIFFERENTIAL GEAR OIL

REAR DIFFERENTIAL GEAR OIL : Inspection

INFOID:0000000014386330

OIL LEAKAGE

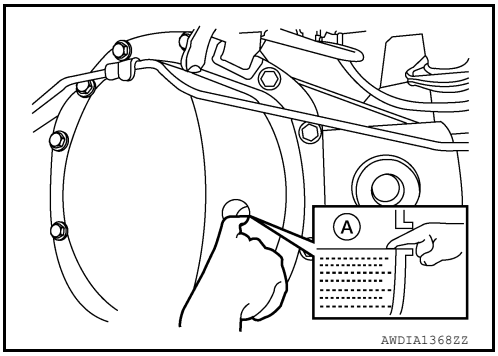
- Check that oil is not leaking from final drive assembly or around it.
- When oil leaking, drain all gear oil, and then fill with specified amount of gear oil. Refer to MA-38, "REAR DIFFERENTIAL GEAR OIL : Draining", MA-39, "REAR DIFFERENTIAL GEAR OIL : Refilling".

CAUTION:
Oil volume cannot checked by oil level height.
NOTE:
Oil is refilled up to filler plug hole.

OIL LEVEL

- Remove filler plug (1) and check oil level (A) from filler plug hole as shown.
  CAUTION:
  Do not start engine while checking oil level.
- Install filler plug and tighten to specification.

Filler plug torque : Refer to DLN-256, "Exploded View".

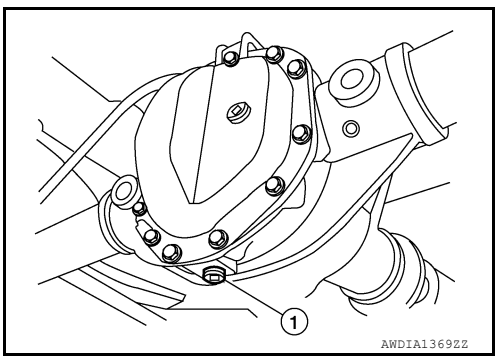


REAR DIFFERENTIAL GEAR OIL : Draining

INFOID:0000000014386331

1. Stop engine.
2. Remove drain plug (1) and drain gear oil.
3. Install the drain plug and tighten to specification.

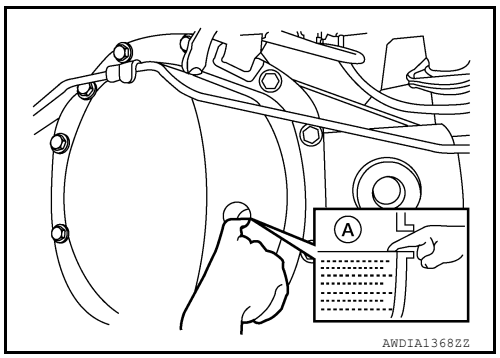
Drain plug torque : Refer to DLN-256, "Exploded View".



REAR DIFFERENTIAL GEAR OIL : Refilling

INFOID:0000000014386332

1. Drain all gear oil. Refer to MA-38, "REAR DIFFERENTIAL GEAR OIL : Draining".
   CAUTION:
   Drain gear oil until gear oil starts to drip.
2. Remove filler plug.
3. Fill with specified amount of gear oil (A).



Oil grade and viscosity	**: Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".**
Oil capacity	**: Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".**

NOTE:
Oil is not refilled up to filler plug mounting hole.
CAUTION:
Oil volume cannot checked by oil level height.

4. Install filler plug and tighten to specification.

Filler plug torque	**: Refer to DLN-256, "Exploded View".**

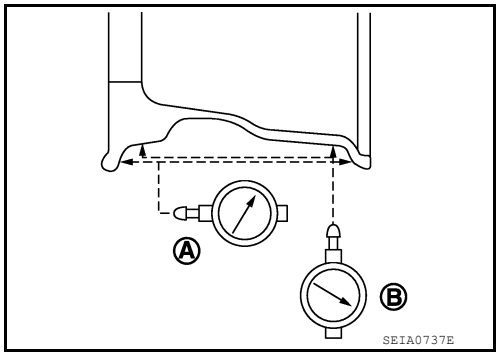
WHEELS

WHEELS : Inspection

INFOID:0000000014386333

WHEEL

1. Check tires for wear and improper inflation.
2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.
3. Remove tire from wheel and mount wheel on a balancer machine.
   CAUTION:
   DO NOT use center hole cone-type clamping machines to hold wheel during tire removal/installation or balancing; damage to wheel paint, cladding or chrome may result. Use only rim-type or universal lug-type clamping machines to hold wheel during servicing.



a. Set dial indicator as shown.
b. Check runout. If runout value exceeds limit, replace wheel.

Axial Runout (A)	**: Refer to WT-76, "Wheel".**
Radial Runout (B)	**: Refer to WT-76, "Wheel".**

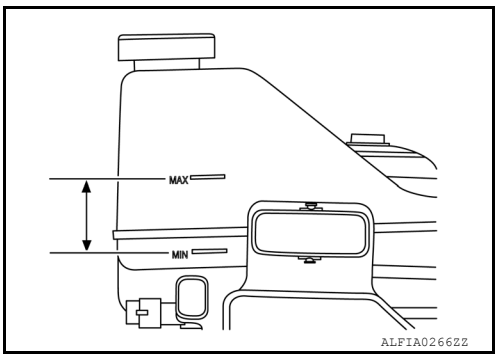
BRAKE FLUID

BRAKE FLUID : Inspection

INFOID:0000000014386334

BRAKE FLUID LEVEL

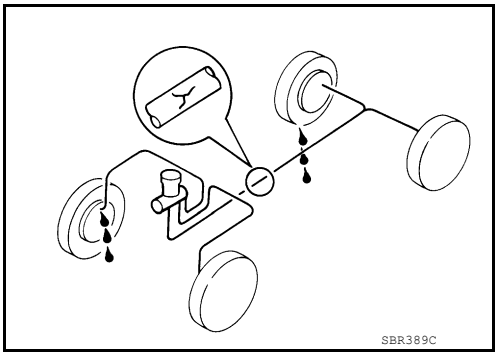
- Make sure that the brake fluid level in the reservoir tank is between the MAX and MIN lines.
  NOTE:
  Since brake fluid is in the accumulator in pressurized condition, the reservoir tank brake fluid level should be lower than the MAX line.



- Visually check around the reservoir tank for brake fluid leaks.
- If the brake fluid level is excessively low, check the brake system for leaks.
- If brake warning lamp remains illuminated after parking brake pedal is released, check the brake system for brake fluid leaks.
- Check the reservoir tank for the mixing of foreign matter (e.g. dust) and oils other than brake fluid.

BRAKE LINE

1. Check brake line (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.
2. Check for brake fluid leaks by fully depressing brake pedal while engine is running.
   CAUTION:
   If brake fluid leak occurs around joints, retighten or replace damaged parts as necessary.



BRAKE FLUID : Drain and Refill

INFOID:0000000014386335

CAUTION:
- **If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.**
- **Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.**
- **Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.**
- **Do not operate the brake pedal excessively during the work procedure.**

DRAINING

1. Turn the ignition switch ON.
2. Connect a vinyl tube to the bleeder valve.
3. Depress the brake pedal and loosen the bleeder valve.
4. Depress the brake pedal several times and gradually discharge brake fluid.

REFILLING

CAUTION:
Monitor the brake fluid level in the reservoir tank while performing the refilling.

1. Check that there is no foreign material in the reservoir tank, and refill with new brake fluid.
   CAUTION:
   - **Do not reuse drained brake fluid.**
   - **Do not allow oils other than brake fluid to enter the reservoir tank.**
2. Turn the ignition switch ON.
3. Connect a vinyl tube to the bleeder valve.

4. Depress the brake pedal and loosen the bleeder valve.
5. Depress the brake pedal several times until the refilled brake fluid is discharged and tighten the bleeder valve to the specified torque with the brake pedal depressed. Refer to BR-37, "BRAKE PAD : Exploded View".
6. Bleed the brake system. Refer to MA-41, "BRAKE FLUID : Bleeding Brake System".

BRAKE FLUID : Bleeding Brake System

INFOID:0000000014386336

CAUTION:
- **If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.**
- **Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.**
- **Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.**
- **Do not operate the brake pedal excessively during the work procedure.**
- **Monitor the brake fluid level in the reservoir tank while performing the air bleeding.**
- **Check that there is no foreign material in the reservoir tank.**
- **Do not reuse drained brake fluid.**
- **Do not allow oils other than brake fluid to enter the reservoir tank.**

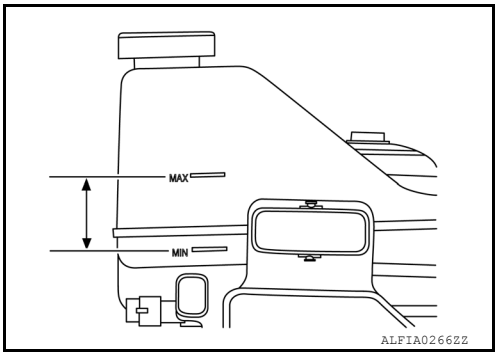
NOTE:
When the ignition switch is ON, the brake warning lamp may turn ON even when the parking brake pedal is released with the brake fluid within the specified level. This indicates the decrease in accumulator fluid pressure.

1. Turn the ignition switch OFF and fill the reservoir tank to MAX line with brake fluid.
2. Turn the ignition switch ON.
   NOTE:
   The motor is activated and automatically stops.
3. Turn the ignition switch OFF.
4. Depress the brake pedal 20 times or more.
   NOTE:
   The pressure loss in the accumulator results in a large brake pedal stroke. In addition to this, the brake pedal depression becomes lighter in initial stage.
5. Repeat steps 2 to 4 for 5 times.
6. Turn the ignition switch ON to check that the time between motor activation and automatic stop is less than 18 seconds. If the time is 18 seconds or more, repeat from Step 2 to 4 for 5 times.
7. With the ignition switch ON, connect vinyl tubes to the front and rear bleeder valves.
8. Depress the brake pedal. Loosen the front bleeder valve to bleed air in brake line, then tighten front bleeder valve. Refer to BR-40, "BRAKE CALIPER ASSEMBLY : Exploded View".
9. Repeat steps 1 to 9 until all of the air is out of the front brake line.
10. Release the brake pedal.
11. Depress and hold the brake pedal. Loosen rear bleeder valve to discharge 100 cc (3.4 US fl oz, 3.5 Imp fl oz), bleed air in brake line, and then tighten rear bleeder valve. Refer to BR-37, "BRAKE PAD : Exploded View".
12. Repeat until air is out of brake lines.
13. Bleed the air in the following order: front (RH), front (LH), rear (RH), rear (LH).

BRAKE FLUID LEVEL ADJUSTMENT AFTER AIR BLEEDING

1. Turn the ignition switch OFF.
2. Depress the brake pedal 20 times or more.
   NOTE:
   The pressure loss in the accumulator results in a large brake pedal stroke. In addition to this, the brake pedal depression becomes lighter in initial stage.

3. Adjust brake fluid level to the reservoir tank MAX line.
CAUTION:
Do not adjust with the ignition switch ON.
4. Turn the ignition switch ON.
5. Check that the reservoir tank brake fluid level is within 6 – 14 mm (0.24 – 0.55 in) lower than the MAX line center.
NOTE:
Since brake fluid is in the accumulator in pressurized condition, the reservoir tank brake fluid level should be lower than the MAX line.

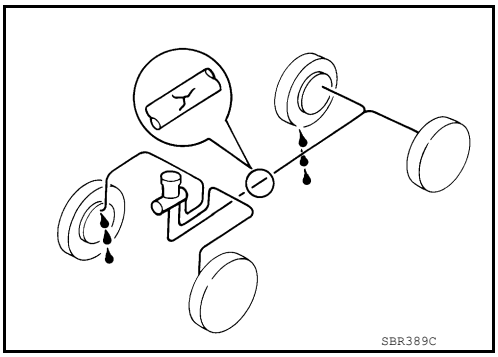


BRAKE LINES AND CABLES

BRAKE LINES AND CABLES : Inspection

INFOID:0000000014386337

1. Check the brake lines and hoses for cracks, deterioration, and other damage. Replace any damaged parts.
CAUTION:
If brake fluid leaks are visible around the brake line joints, retighten the joint, or replace damaged parts as necessary.
2. Check for brake fluid leaks by fully depressing brake pedal while engine is running.



DISC BRAKE

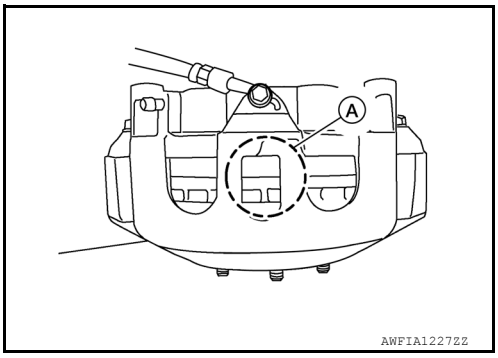
DISC BRAKE : Inspection - Front Brake Pad

INFOID:0000000014386338

INSPECTION

Check brake pad wear thickness from an inspection hole (A) on cylinder body. Check using a scale if necessary.

Wear thickness : Refer to BR-68, "Front Disc Brake".



DISC BRAKE : Inspection - Front Brake Rotor

INFOID:0000000014386339

APPEARANCE

Check surface of disc brake rotor for uneven wear, cracks, or damage. Replace it if necessary. Refer to BR-43, "DISC BRAKE ROTOR : Removal and Installation".

RUNOUT

1. Check wheel bearing axial end play before inspection. Refer to FAX-6, "Inspection".
2. Secure disc brake rotor to wheel hub and bearing with wheel nuts at two wheel nut locations.
3. Measure runout using a dial indicator to 20 mm (0.79 in) from disc brake rotor edge.

Runout : Refer to BR-68, "Front Disc Brake".

4. Find installation position with a minimum runout by shifting the disc brake rotor-to-wheel hub and bearing installation position by one hole at a time if runout exceeds limit value.
5. Refinish disc brake rotor if runout is outside limit even after performing above operation. When refinishing, use Tool.

Tool number : 38-PFM92 (—)

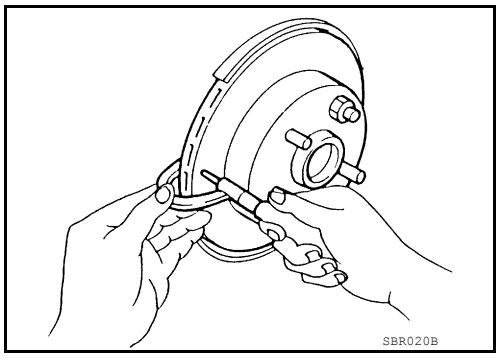
CAUTION:
- **Check in advance that the thickness of the disc brake rotor is wear thickness + 0.3 mm (0.012 in) or more.**
- **If the thickness is less than wear thickness + 0.3 mm (0.012 in), replace the disc brake rotor.**

Wear thickness : Refer to BR-68, "Front Disc Brake".

THICKNESS

Check thickness of disc brake rotor using a micrometer. Replace disc brake rotor if thickness is below the wear limit.

Wear thickness : Refer to BR-68, "Front Disc Brake".



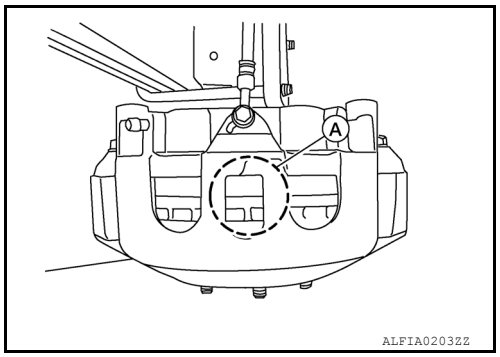
DISC BRAKE : Inspection - Rear Brake Pad

INFOID:0000000014386340

INSPECTION

Check brake pad wear thickness from an inspection hole (A) on cylinder body. Check using a scale if necessary.

Wear thickness : Refer to BR-68, "Rear Disc Brake".



DISC BRAKE : Inspection - Rear Brake Rotor

INFOID:0000000014386341

APPEARANCE

Check surface of disc brake rotor for uneven wear, cracks, or damage. Replace it if necessary. Refer to BR-50, "DISC BRAKE ROTOR : Removal and Installation".

RUNOUT

1. Check wheel bearing axial end play before inspection. Refer to RAX-5, "On-Vehicle Inspection".
2. Secure disc brake rotor to wheel hub and bearing with wheel nuts at two wheel nut locations.
3. Measure runout using a dial gauge 20 mm (0.79 in) from disc brake rotor edge.

Runout : Refer to BR-68, "Rear Disc Brake".

4. Find installation position with a minimum runout by shifting disc brake rotor-to-wheel hub and bearing installation position by one hole at a time if runout exceeds limit value.

5. Refinish disc brake rotor if runout is outside limit even after performing above operation. When refinishing, use Tool.

Tool number : 38-PFM92 (—)

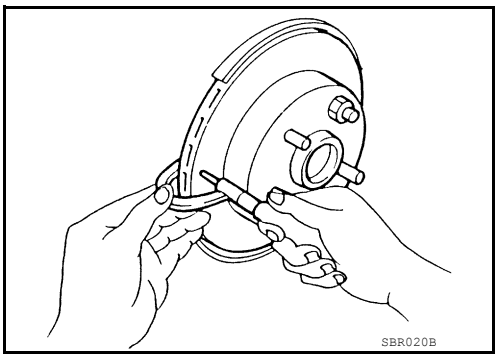
CAUTION:
- **Check in advance that the thickness of the disc brake rotor is wear thickness + 0.3 mm (0.012 in) or more.**
- **If the thickness is less than wear thickness + 0.3 mm (0.012 in), replace the disc brake rotor.**

Wear thickness : Refer to BR-68, "Rear Disc Brake".

THICKNESS

Check thickness of disc brake rotor using a micrometer. Replace disc brake rotor if thickness is below wear limit.

Wear thickness : Refer to BR-68, "Rear Disc Brake".



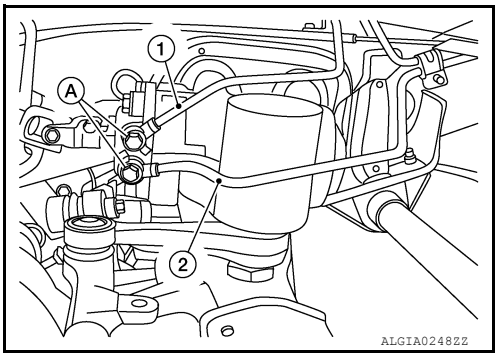
POWER STEERING FLUID AND LINES

POWER STEERING FLUID AND LINES : Draining and Refilling

INFOID:0000000014386342

DRAINING

1. Remove banjo bolts (A) and disconnect the power steering pressure line (1) and return line (2) from the steering gear. Discard the copper sealing washers.
   CAUTION:
   Do not reuse copper sealing washers.



2. Drain power steering fluid into a suitable container.
   CAUTION:
   Do not reuse power steering fluid.

REFILLING

1. Connect hydraulic lines to steering gear. Refer to ST-53, "Exploded View".
2. Fill power steering reservoir while checking power steering fluid level.
3. Bleed air from power steering hydraulic system. Refer to MA-44, "POWER STEERING FLUID AND LINES : Air Bleeding Hydraulic System".
4. Check for power steering fluid leaks. Repair as necessary.

POWER STEERING FLUID AND LINES : Air Bleeding Hydraulic System

INFOID:0000000014386343

Incomplete air bleeding causes the following. When this happens, bleed air again.
- Air bubbles in reservoir tank.
- Clicking noise in power steering oil pump.
- Excessive buzzing in power steering oil pump.

NOTE:

When vehicle is stationary or while steering wheel is being turned slowly, some noise may be heard from power steering oil pump or the power steering gear. This noise is normal and does not affect any system.

1. Stop engine and turn steering wheel fully to right and left several times. When fluid is lowered, refill reservoir. Repeat process until fluid level is stabilized.
   CAUTION:
   Do not allow steering fluid reservoir tank to go below the MIN level line. Check tank frequently and add power steering fluid as needed.
2. Run engine at idle speed. Turn steering wheel fully right and then fully left, hold for about three seconds. Then check for power steering fluid leakage.
3. Repeat step 2 several times at about three second intervals.
   CAUTION:
   Do not hold steering wheel in the locked position for more than five seconds. (There is the possibility that the power steering oil pump may be damaged.)
4. Check for air bubbles or cloudy fluid.
5. If air bubbles or cloudiness still exists, stop engine, perform steps 2 and 3 again until air bubbles or cloudiness does not exist.
6. Stop engine, check power steering fluid level.

AXLE AND SUSPENSION PARTS

AXLE AND SUSPENSION PARTS : Inspection - Front Suspension

INFOID:0000000014386344

ON-VEHICLE SERVICE

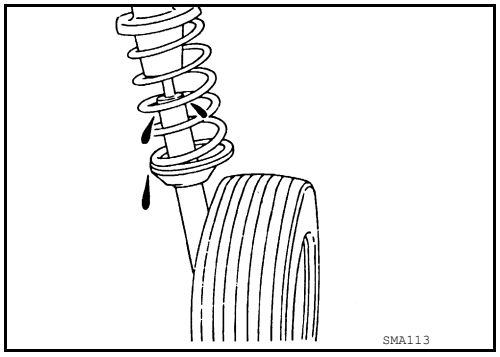
- Check suspension parts for excessive play, cracks, wear or damage. Shake each front wheel to check for excessive play.
- Retighten all nuts and bolts to specified torque.
- Make sure that each cotter pin is installed.
- Check wheelarch height. Refer to FSU-37, "Wheelarch Height (Unladen*1)".

INSPECTION

Check conditions (looseness, backlash) of each component. Verify that component conditions (wear, damage) are normal.

FRONT COIL SPRING AND SHOCK ABSORBER

Check for oil leaks and damage. Replace parts if necessary.



LOWER AND UPPER LINK

- Check lower and upper links for damage, cracks, deformation and replace if necessary.
- Check rubber bushings for damage, cracks and deformation. Replace lower or upper link if necessary.
- Check suspension ball joints for grease leaks and ball joint dust covers for cracks or other damage. Replace applicable lower link or upper link if ball joint is worn or hard to swing.

FRONT STABILIZER

- Check front stabilizer and clamps for any deformation, cracks or damage and replace if necessary.
- Check rubber bushings for deterioration or cracks and replace if necessary.

STEERING KNUCKLE

Check steering knuckle for any deformation, cracks, or other damage and replace if necessary.

AXLE AND SUSPENSION PARTS : Inspection- Rear Suspension

INFOID:0000000014386345

ON-VEHICLE SERVICE

- Check the suspension parts for excessive play, cracks, wear or damage. Shake each rear wheel to check for excessive play.
- Retighten all nuts and bolts to the specified torque.
- Check the wheelarch height. Refer to RSU-14, "Wheelarch Height (Unladen*1)".

SHOCK ABSORBER

- Check for smooth operation through a full stroke for both compression and extension.
- Check for oil leakage on the welded or gland packing portions.
- Check the shock absorber piston rod for cracks, deformation or other damage and replace if necessary.

BUSHINGS

Check the bushings for excessive wear, damage, and replace if necessary.

AXLE AND SUSPENSION PARTS : Inspection - Wheel Alignment

INFOID:0000000014386346

PRELIMINARY INSPECTION

WARNING:

Always adjust the alignment with the vehicle on a flat surface.

NOTE:

If alignment is out of specification, inspect and replace any damaged or worn suspension parts before making any adjustments.

- Check and adjust the wheel alignment with the vehicle under unladen conditions. “Unladen conditions” means that the fuel, engine coolant, and lubricants are full; and that the spare tire, jack, hand tools and mats are in their designated positions.
- Check the tires for incorrect air pressure and excessive wear. Refer to WT-76, "Tire".
- Check the wheels for deformation, cracks, and other damage. Remove the wheel and check wheel run out. Refer to WT-65, "Inspection".
- Check the wheel bearing axial end play. Refer to FAX-6, "Inspection".
- Check the shock absorbers for leaks or damage.
- Check each fastener for looseness or damage.
- Check each suspension component and the frame for damage.
- Check the wheelarch height in unladen conditions. Refer to FSU-37, "Wheelarch Height (Unladen*1)".

GENERAL INFORMATION AND RECOMMENDATIONS

1. A Four-Wheel Thrust Alignment should be performed.
   - This type of alignment is recommended for any NISSAN vehicle.
   - The four-wheel “thrust” process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
   - The alignment machine itself should be capable of accepting any NISSAN vehicle.
   - The alignment machine should be checked to ensure that it is level.
2. Make sure the alignment machine is properly calibrated.
   - Your alignment machine should be regularly calibrated in order to give correct information.
   - Check with the manufacturer of your specific alignment machine for their recommended Service/Calibration Schedule.

THE ALIGNMENT PROCESS

IMPORTANT: Use only the alignment specifications listed in this Service Manual. Refer to FSU-36, "Wheel Alignment (Unladen*1)".

1. When displaying the alignment settings, many alignment machines use “indicators”: (Green/red, plus or minus, Go/No Go). **Do NOT use these indicators.**
   - The alignment specifications programmed into your alignment machine that operate these indicators may not be correct.
   - This may result in an ERROR.
2. Most camera-type alignment machines are equipped with both "Rolling Compensation" method and optional "Jacking Compensation" method to "compensate" the alignment targets or head units. "Rolling Compensation" is the preferred method.

- If using the "Rolling Compensation" method, after installing the alignment targets or head units, push or pull on the rear wheel to move the vehicle. Do not push or pull the vehicle body.
- If using the "Jacking Compensation" method, after installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.
  NOTE:
  Do not use the "Rolling Compensation" method if you are using sensor-type alignment equipment.
- Follow all instructions for the alignment machine you are using for more information.

CAMBER, CASTER, AND KINGPIN INCLINCATION ANGLES INSPECTION

1. Measure camber and caster of both the right and left wheels.

Camber and caster : Refer to FSU-36, "Wheel Alignment (Unladen*1)".

2. If outside the specified value, adjust camber and caster to specification. Refer to MA-47, "AXLE AND SUSPENSION PARTS : Adjustment - Wheel Alignment".

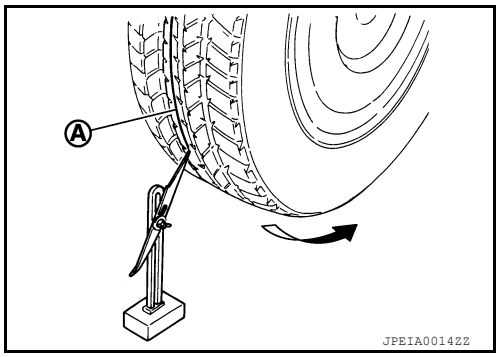
TOTAL TOE-IN INSPECTION

Measure the total toe-in using the following procedure:

WARNING:

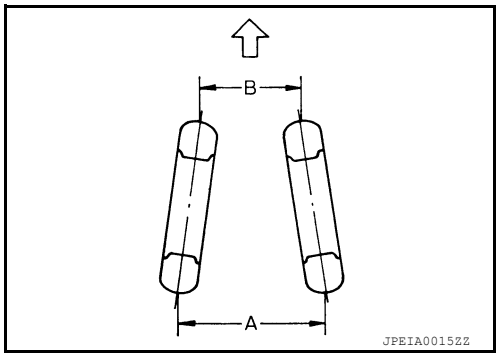
- **Always perform the following procedure on a flat surface.**
- **Make sure that no person is in front of vehicle before pushing it.**

1. Bounce the front of vehicle up and down to stabilize the vehicle height (posture).
2. Push on the rear wheel to move the vehicle straight ahead about 5 m (16 ft).
3. Put a mark on the base line of the tread (rear side) of both tires at the same height of hub center. These are measuring points.



4. Measure the distance (A) from the rear side.

⇦ : Front



5. Push on the rear wheel to move the vehicle slowly ahead and to rotate the wheels 180 degrees (1/2 turn).
   CAUTION:
   If the wheels have rotated more than 180 degrees (1/2 turn), try the above procedure again from the beginning. Do not push vehicle backward.
6. Measure the distance (B) from the front side.
7. Use the formula below to calculate total toe-in.

Total toe-in formula : A - B
Total toe-in specification : Refer to FSU-36, "Wheel Alignment (Unladen*1)".

- If the total toe-in is outside the specification, adjust the total toe-in. Refer to MA-47, "AXLE AND SUSPENSION PARTS : Adjustment - Wheel Alignment".

AXLE AND SUSPENSION PARTS : Adjustment - Wheel Alignment

INFOID:0000000014386347

CAMBER AND CASTER ADJUSTMENT

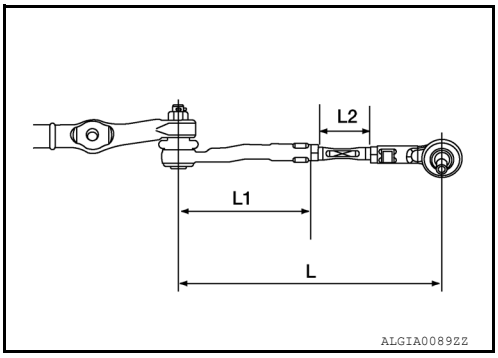
1. Adjust the camber and caster using the cam bolts in the front lower link. Refer to FSU-15, "Exploded View".
   CAUTION:
   After adjusting the camber and caster, check the toe-in.
2. Tighten the cam bolt nuts to specification. Refer to FSU-15, "Exploded View".

TOE-IN ADJUSTMENT

1. Adjust the toe-in by varying the length of the steering outer socket.

a. Loosen the outer tie-rod lock nuts.

b. Adjust the toe-in by screwing the outer tie-rods in or out.



Standard length (L)	**: Refer to ST-87, "Steering Linkage - XD Models",ST-88, "Steering Linkage - Non-XD Models"**
Inner socket length (L1)	**: Refer to ST-87, "Steering Linkage - XD Models",ST-88, "Steering Linkage - Non-XD Models"**
Possible amount of adjustment (L2)	**: Refer to ST-87, "Steering Linkage - XD Models",ST-88, "Steering Linkage - Non-XD Models"**

c. Tighten the outer tie-rod lock nuts to specification.

Lock nut : Refer to ST-56, "Exploded View".

BODY MAINTENANCE

LOCKS AND HINGES

LOCKS AND HINGES : Lubricating Locks, Hinges and Hood Latches

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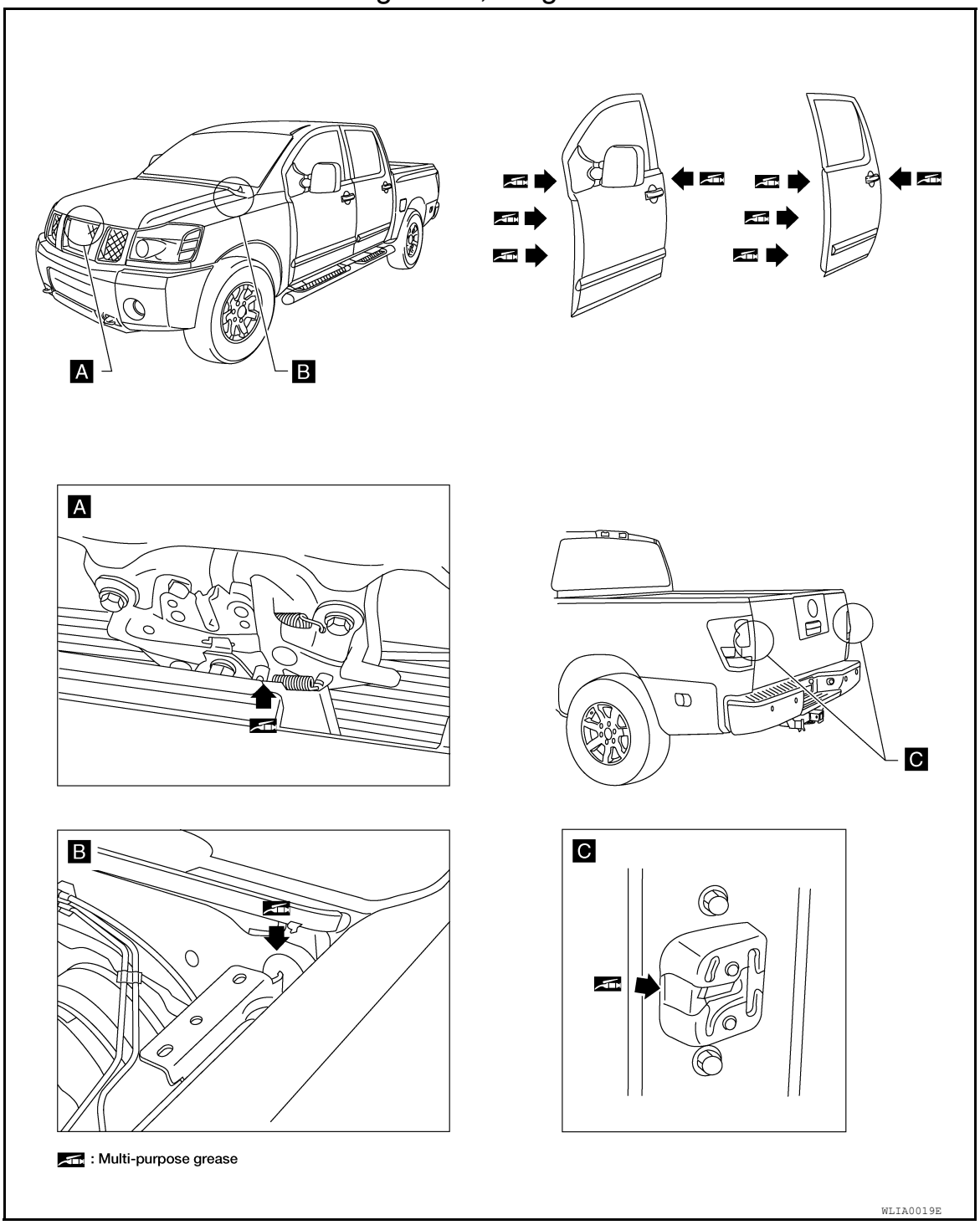

NOTE:
Lubricate the locations shown with a suitable multi-purpose grease.
Refer to MA-13, "VK56VD Gasoline Engine : Fluids and Lubricants".

SEAT BELT, BUCKLES, RETRACTORS, ANCHORS AND ADJUSTERS

SEAT BELT, BUCKLES, RETRACTORS, ANCHORS AND ADJUSTERS : Inspection

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AFTER A COLLISION

WARNING:
Inspect all seat belt assemblies including retractors and attaching hardware after any collision. NISSAN/INFINITI recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Failure to do so could result in serious personal injury in an accident. Seat belt assemblies not in use during a collision should also be replaced if either damage or improper operation is noted. Seat belt pretensioners should be replaced even if the seat belts are not in use during a frontal collision in which the air bags are deployed.
Replace any seat belt assembly (including anchor bolts) if:
- The seat belt was in use at the time of a collision (except for minor collisions and the belts, retractors and buckles show no damage and continue to operate properly).
- The seat belt was damaged in an accident (i.e. torn webbing, bent retractor or guide, etc.).
- The seat belt attaching point is damaged in an accident. Inspect the seat belt attaching area for damage or distortion and repair if necessary before installing a new seat belt assembly.
- Anchor bolts are deformed or worn out.
- The seat belt pre-tensioner should be replaced even if the seat belts are not in use during the collision in which the air bags are deployed.

PRELIMINARY CHECKS

1. Check the seat belt warning lamp for proper operation per the following:

a. Turn ignition switch ON. The seat belt warning lamp should illuminate.

b. Fasten driver seat belt. The seat belt warning lamp should turn OFF.

2. If the air bag warning lamp is blinking, perform self-diagnosis with CONSULT and air bag warning lamp. Refer to SRC-57, "Trouble Diagnosis with CONSULT".
3. Check that the seat belt retractor, seat belt anchor and buckle bolts are tightened firmly.
4. Check the shoulder seat belt guide and shoulder belt height adjuster for front seats. Check that guide swivels freely and that webbing lays flat and does not bind in guide. Check that height adjuster operates properly and holds securely.
5. Check retractor operation:

a. Fully extend the seat belt webbing and check for twists, tears or other damage.

b. Allow the seat belt to retract. Check that webbing returns smoothly and completely into the retractor. If the seat belt does not return smoothly, wipe the inside of the loops with a clean paper cloth. Dirt build-up in the loops of the upper anchors can cause the seat belts to retract slowly.

c. Fasten the seat belt. Check that seat belt returns smoothly and completely to the retractor. If the webbing does not return smoothly, the cause may be an accumulation of dust or dirt. Use the “SEAT BELT TAPE SET” and perform the following steps.

d. Inspect the front seat belt D-ring anchor
   1. Pull the seat belt out to a length of 500 mm (19.69 in) or more.
   2. Hold the seat belt at the center pillar webbing opening with a clip or other device.
   3. Pass a thin wire through the D-ring anchor webbing opening. Hold both ends of the wire and pull it tightly while moving it up and down several times along the webbing opening surface to remove dirt stuck there.
   4. Any dirt that cannot be removed with the wire can be removed by cleaning the opening with a clean cloth.
   5. Apply tape at the point where the webbing contacts the D-ring anchor webbing opening.
      NOTE:
      Apply the tape so that there is no slack or wrinkling.
   6. Remove the clip holding the seat belt and check that the webbing returns smoothly.

6. Repeat steps above if necessary to check the other seat belts.

SEAT BELT RETRACTOR ON-VEHICLE CHECK

Emergency Locking Retractors (ELR) and Automatic Locking Retractors (ALR)
NOTE:
All seat belt retractors are Emergency Locking Retractors (ELR) type. In an emergency (sudden stop) the retractor will lock and prevent the webbing from extending any further. All 3-point type seat belt retractors except the driver seat belt also have an Automatic Locking Retractors (ALR) mode. The ALR mode (also called child restraint mode) is used when installing child seats. The ALR mode is activated when the seat belt

is fully extended. When the webbing is then retracted partially, the ALR mode automatically locks the seat belt in a specific position so the webbing cannot be extended any further. To cancel the ALR mode, allow the seat belt to fully wind back into the retractor.
Check the seat belt retractors with the following test(s) to determine if a retractor assembly is operating properly.

ELR Function Stationary Check

Grasp the shoulder webbing and pull forward quickly. The retractor should lock and prevent the belt from extending further.

ALR Function Stationary Check

1. Pull out the entire length of seat belt from retractor until a click is heard.
2. Retract the webbing partially. A clicking noise should be heard as the webbing retracts, indicating that the retractor is in the Automatic Locking Retractors (ALR) mode.
3. Grasp the seat belt and try to pull out the retractor. The webbing must lock and not extend any further. If it does not operate normally, replace the retractor assembly.
4. Allow the entire length of the webbing to retract to cancel the automatic locking mode.

ELR Function Moving Check

WARNING:

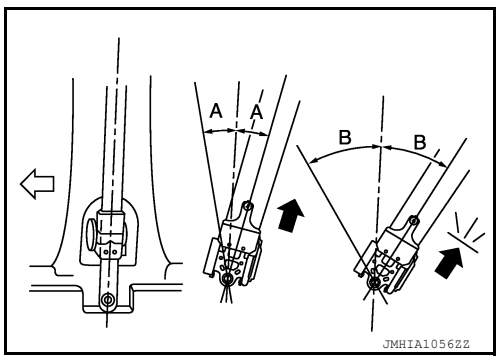
Perform the following test in a safe, open area clear of other vehicles and obstructions (for example, a large, empty parking lot). Road surface must be paved and dry. Never perform the following test on wet or gravel roads or on public streets and highways. This could result in an accident and serious personal injury. The driver and passenger must be prepared to brace themselves in the event that the retractor does not lock.

1. Fasten driver seat belt. Buckle a passenger into the seat for the belt that is to be tested.
2. Proceed to the designated safe area.
3. Drive the vehicle at approximately 16 km/h (10 mph). Notify any passengers of a pending sudden stop and the driver and passenger must be prepared to brace themselves in the event that the retractor does not lock. Apply brakes firmly and make a very hard stop.

During stopping, seat belts should lock and not be extended. If the seat belt retractor assembly does not lock, perform the retractor off-vehicle check.

FRONT SEAT BELT (LH/RH) RETRACTOR OFF-VEHICLE CHECK

1. Remove the front seat belt retractor. Refer to SB-8, "Exploded View".
2. Slowly pull out webbing while tilting the seat belt retractor forward from the mounted position without twisting the seat belt retractor as shown.
   A : The webbing can be pulled out if the retractor is tilted 15° degree or less.
   B : The webbing can not be pulled out if the retractor is tilted 45° degrees or more.
   NOTE:
   A and B show tilting angles.
   ⇦: Front

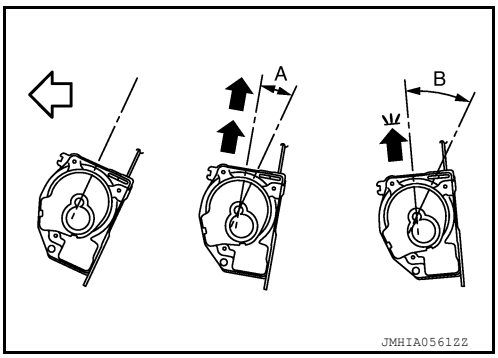


3. Replace the seat belt retractor if it does not operate within specifications.

FRONT SEAT BELT (CENTER) RETRACTOR OFF-VEHICLE CHECK

1. Remove the front seat belt retractor. Refer to SB-8, "Exploded View".
2. Slowly pull out webbing while tilting the seat belt retractor forward from the mounted position without twisting the seat belt retractor as shown.

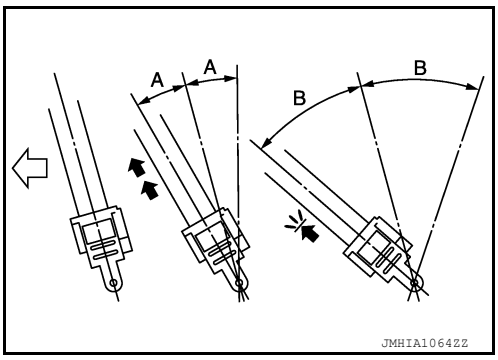
A : The webbing can be pulled out if the retractor is tilted 15° degree or less.
B : The webbing can not be pulled out if the retractor is tilted 45° degrees or more.
NOTE:
A and B show tilting angles.
⇦: Front



3. Replace the seat belt retractor if it does not operate within specifications.

REAR SEAT BELT OUTER RETRACTOR OFF-VEHICLE CHECK

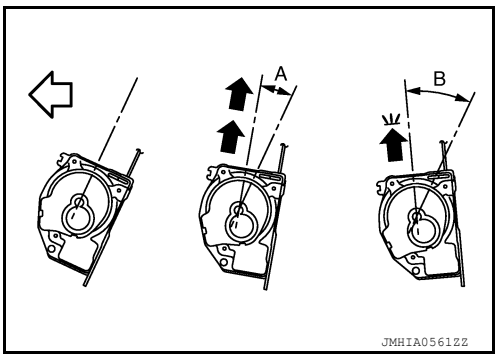
1. Remove the rear seat belt retractor. Refer to SB-14, "Exploded View".
2. Slowly pull out webbing while tilting the seat belt retractor forward from the mounted position without twisting the seat belt retractor as shown.
A : The webbing can be pulled out if the retractor is tilted 15° degree or less.
B : The webbing can not be pulled out if the retractor is tilted 45° degrees or more.
NOTE:
A and B show tilting angles.
⇦: Front



3. Replace the seat belt retractor if it does not operate within specifications.

REAR SEAT BELT CENTER RETRACTOR OFF-VEHICLE CHECK

1. Remove the rear seat belt center retractor. Refer to SB-14, "Exploded View".
2. Slowly pull out webbing while tilting the seat belt retractor forward from the mounted position without twisting the seat belt retractor as shown.
A : The webbing can be pulled out if the retractor is tilted 15° degree or less.
B : The webbing can not be pulled out if the retractor is tilted 45° degrees or more.
NOTE:
A and B show tilting angles.
⇦: Front



3. Replace the seat belt retractor if it does not operate within specifications.

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

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The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.**
- **When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery or batteries, and wait at least three minutes before performing any service.**

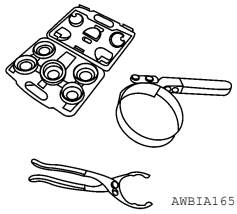
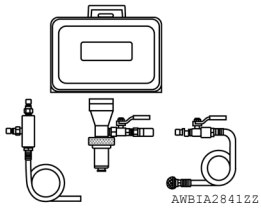
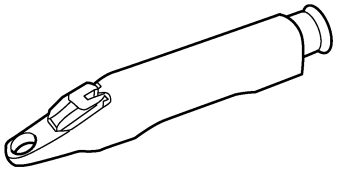
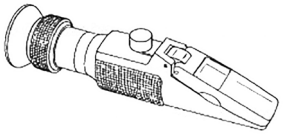
PREPARATION

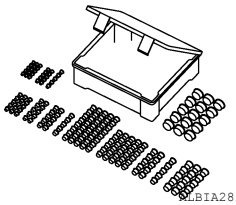
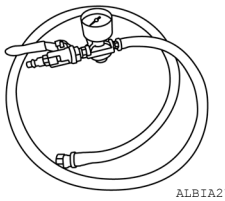
PREPARATION

Special Service Tool

INFOID:0000000014386351

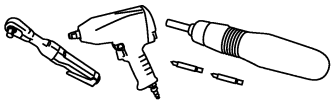
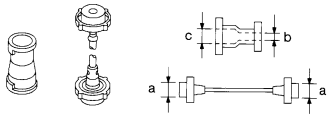
The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name		Description
(223-50000) (—) Oil filter wrench assortment	 AWBIA1656ZZ	Removing oil filter
KV991J0070 (J-45695-A) Coolant refill tool	 AWBIA2841ZZ	Refilling engine cooling system
— (J-51771) Cooling system pressure test kit 1. — (J-51771-1) Main body 2. — (J-51771-4) Small Adapter 3. — (J-51771-5) Pump with quick release 4. — (J-51771-9) Radiator cap assembly with quick coupler	 ALPIA0018ZZ	Checking cooling system and radiator cap
KV991J0010 (J-23688) Engine coolant refractometer	 WBIA0539E	Checking concentration of ethylene glycol in engine coolant
— (J-54466) 5025 DEF refractometer	 ALBIA1465ZZ	Used to measure the freezing point protection and antifreeze concentration of organic acid technology coolant.

Tool number (TechMate No.) Tool name	Description
— (J-54427) Cap plug kit - fuel system  ALBIA2834ZZ	To protect fuel system from contaminants.
— (J-54429) Air Pressure Regulator  ALBIA2745ZZ	Regulate air pressure for pressure/leak tests

Commercial Service Tool

INFOID:0000000014386352

Tool name	Description
Power tool  PIIB1407E	Loosening nuts, screws and bolts
— (J-33984-A) Radiator pressure adapter  S-NT564	Adapting cooling system pressure tester to radiator cap and reservoir tank cap **a: 28 (1.10) diameter** **b: 31.4 (1.236) diameter** **c: 41.3 (1.626) diameter** Unit: mm (in)

PERIODIC MAINTENANCE

GENERAL MAINTENANCE

General Maintenance

INFOID:0000000014386353

General maintenance includes those items which should be checked during the normal day-to-day operation of the vehicle. They are essential if the vehicle is to continue operating properly. The owner can perform the checks and inspections themselves or they can have their NISSAN dealers do them.

OUTSIDE THE VEHICLE

The maintenance items listed here should be performed from time to time, unless otherwise specified.

Item		Reference page
Tires	Check the pressure with a gauge often and always prior to long distance trips. Adjust the pressure in all tires, including the spare, to the pressure specified. Check carefully for damage, cuts or excessive wear.	MA-85
Wheel nuts	When checking the tires, make sure no nuts are missing, and check for any loose nuts. Tighten if necessary.	WT-65
Tire rotation	Tires should be rotated every 5,000 miles (8,000 km).	WT-67
Tire Pressure Monitoring System (TPMS) transmitter components	Replace the TPMS transmitter grommet seat, valve core and cap when the tires are replaced due to wear or age.	WT-71
Wheel alignment and balance	If the vehicle should pull to either side while driving on a straight and level road, or if you detect uneven or abnormal tire wear, there may be a need for wheel alignment. If the steering wheel or seat vibrates at normal highway speeds, wheel balancing may be needed. For additional information regarding tires, refer to "Important Tire Safety Information" (United States) or "Tire Safety Information" (Canada) in the NISSAN Warranty Information Booklet.	MA-92 WT-67
Windshield	Clean the windshield on a regular basis. Check the windshield at least every six months for cracks or other damage. Repair as necessary.	GW-12
Windshield wiper blades	Check for cracks or wear if they do not wipe properly.	—
Doors and engine hood	Check that all doors and the engine hood operate smoothly as well as the back tail gate. Also make sure that all latches lock securely. Lubricate if necessary. Make sure that the secondary latch keeps the engine hood from opening when the primary latch is released. When driving in areas using road salt or other corrosive materials, check lubrication frequently.	MA-95
Lamps	Make sure that the headlamps, stop lamps, tail lamps, turn signal lamps, and other lamps are all operating properly and installed securely. Also check head lamp aim. Clean the head lamps on a regular basis.	EXL-130 EXL-288

INSIDE THE VEHICLE

The maintenance items listed here should be checked on a regular basis, such as when performing periodic maintenance, cleaning the vehicle, etc.

Item		Reference page
Warning lamps and chimes	Make sure that all warning lamps and chimes are operating properly.	WCS-41
Windshield wiper and washer	Check that the windshield wipers and washer operate properly and that the wipers do not streak.	GW-5
Windshield defroster	Check that the air comes out of the defroster outlets properly and in sufficient quantity when operating the heater or air conditioner.	—
Steering wheel	Check that it has the specified play. Check for changes in the steering condition, such as excessive play, hard steering or strange noises. Free play: Less than 35 mm (1.38 in).	ST-33

Item		Reference page
Seats	Check seat position controls such as seat adjusters, seatback recliner, etc. to make sure they operate smoothly and that all latches lock securely in every position. Check that the head restraints move up and down smoothly and that the locks (if equipped) hold securely in all latched positions. Check that the latches lock securely for folding-down rear seat backs.	SE-68
Seat belts	Check that all parts of the seat belt system (e.g. buckles, anchors, adjusters and retractors) operate properly and smoothly and are installed securely. Check the belt webbing for cuts, fraying, wear or damage.	SB-5
Accelerator pedal	Check the pedal for smooth operation and make sure the pedal does not catch or require uneven effort. Keep the floor mats away from the pedal.	—
Brakes	Check that the brake does not pull the vehicle to one side when applied.	—
Brake pedal and booster	Check the pedal for smooth operation and make sure it has the proper distance under it when depressed fully. Check the brake booster function. Be sure to keep the floor mats away from the pedal.	BR-10 BR-16
Parking brake	Check that the lever or pedal has the proper travel and make sure that the vehicle is held securely on a fairly steep hill when only the parking brake is applied.	PB-5
Automatic transmission “Park” mechanism	Check that the lock release button on the selector lever operates properly and smoothly. On a fairly steep hill check that the vehicle is held securely with the selector lever in the P (Park) position without applying the brakes.	—

UNDER THE HOOD AND VEHICLE

The maintenance items listed here should be checked periodically (e.g. each time you check the engine oil or refuel).

Item		Reference page
Windshield washer fluid	Check that there is adequate fluid in the tank.	—
Engine coolant level	Check the coolant level when the engine is cold.	MA-65
Radiator and hoses	Check the front of the radiator and clean off any dirt, insects, leaves, etc., that may have accumulated. Make sure the hoses have no cracks, deformation, deterioration or loose connections.	—
Brake fluid level	Make sure that the brake fluid level is between the “MAX” and “MIN” lines on the reservoir.	MA-86
Battery	Check the fluid level in each cell. It should be between the “MAX” and “MIN” lines. Vehicles operated in high temperatures or under severe conditions require frequent checks of the battery fluid level.	—
Engine drive belt	Make sure that no belt is frayed, worn, cracked or oily.	MA-72
Engine oil level	Check the level on the oil level gauge after parking the vehicle on a level spot and turning off the engine.	MA-68
Power steering fluid level and lines	Check the level when the fluid is cold, with the engine off. Check the lines for proper attachment, leaks, cracks, etc..	ST-16
Automatic transmission fluid level	Check the level on the fluid level gauge after putting the shift selector in “P”(Park) with the engine idling.	MA-78
Exhaust system	Make sure there are no loose supports, cracks or holes. If the sound of the exhaust seems unusual or there is a smell of exhaust fumes, immediately locate the trouble and correct it.	MA-78
Underbody	The underbody is frequently exposed to corrosive substances such as those used on icy roads or to control dust. It is very important to remove these substances, otherwise rust will form on the floor pan, frame, fuel lines and around the exhaust system. At the end of winter, the underbody should be thoroughly flushed with plain water, being careful to clean those areas where mud and dirt can easily accumulate.	—
Fluid leaks	Check under the vehicle for fuel, oil, water or other fluid leaks after the vehicle has been parked for a while. Water dripping from the air conditioner after use is normal. If you should notice any leaks or fuel fumes are evident, check for the cause and correct it immediately.	—

PERIODIC MAINTENANCE

Introduction of Periodic Maintenance

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The following tables show the normal maintenance schedule. Depending upon weather and atmospheric conditions, varying road surfaces, individual driving habits and vehicle usage, additional or more frequent maintenance may be required.

Periodic maintenance beyond the last period shown on the tables requires similar maintenance.

Emission Control System Maintenance [Cummins (5.0L V8D) Engine]

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary. D= Drain water.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	5 (8) 6	10 (16) 12	15 (24) 18	20 (32) 24	25 (40) 30	30 (48) 36	35 (56) 42	40 (64) 48	45 (72) 54
Drive belts	NOTE (1)		I*		I*		I*		I*	
Air cleaner filter	NOTE (2)						R			
Fuel lines					I*				I*	
Fuel filter	NOTE (3)		R/D		R/D		R/D		R/D	
Engine coolant		Replace every 45,000 miles (72,000 km) or 36 months								
Engine oil	NOTE (4)		R		R		R		R	
Engine oil filter	NOTE (5)		R		R		R		R	

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	50 (80) 60	55 (88) 66	60 (96) 72	65 (104) 78	70 (112) 84	75 (120) 90	80 (128) 96	85 (136) 102	90 (144) 108
Drive belts	NOTE (1)	I*		I*		I*		I*		I*
Air cleaner filter	NOTE (2)			R						R
Fuel lines				I*				I*		
Fuel filter	NOTE (3)	R/D		R/D		R/D		R/D		R/D
Engine coolant		Replace every 45,000 miles (72,000 km) or 36 months								
Engine oil	NOTE (4)	R		R		R		R		R
Engine oil filter	NOTE (5)	R		R		R		R		R

MAINTENANCE OPERATION		MAINTENANCE INTERVAL						Reference Page
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	95 (152) 114	100 (160) 120	105 (168) 126	110 (176) 132	115 (184) 138	120 (192) 144	
Drive belts	NOTE (1)		I*		I*		I*	MA-72
Air cleaner filter	NOTE (2)						R	MA-76
Fuel lines			I*				I*	MA-76
Fuel filter	NOTE (3)		R/D		R/D		R/D	—
Engine coolant		Replace every 45,000 miles (72,000 km) or 36 months						
Engine oil	NOTE (4)		R		R		R	MA-70
Engine oil filter	NOTE (5)		R		R		R	MA-71

NOTE:

- (1) Replace the drive belts if found damaged.
- (2) If operating mainly in dusty conditions, more frequent maintenance may be required.
- (3) Both Stage I and Stage II fuel filters.

- (4) If operating on biodiesel blends between 6% and 10% (B6 and B10), the oil should be changed at least every 8,000 miles (12,875 km) or 6 months, whichever comes first.
- (5) If operating on biodiesel blends between 6% and 10% (B6 and B10), the oil filter should be changed at least every 8,000 miles (12,875 km) or 6 months, whichever comes first.

* Maintenance items and intervals with "*" are recommended by NISSAN for reliable vehicle operation. The owner need not perform such maintenance in order to maintain the emission warranty or manufacturer recall liability. Other maintenance items and intervals are required.

Chassis and Body Maintenance [Cummins (5.0L V8D) Engine]

Abbreviations: R = Replace. I = Inspect. Correct or replace if necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	5 (8) 6	10 (16) 12	15 (24) 18	20 (32) 24	25 (40) 30	30 (48) 36	35 (56) 42	40 (64) 48	45 (72) 54
Brake lines & cables			I		I		I		I	
Brake pads & rotors★			I		I		I		I	
Brake fluid★					R				R	
Automatic transmission fluid			I		R		I		R	
Differential gear oil	NOTE (1)		I		I		I		I	
Transfer fluid			I		I		I		I	
Steering gear & linkage, axle & suspension parts★					I				I	
Tire rotation	NOTE (2)									
Propeller shaft & drive shaft boots (4WD models)★			I		I		I		I	
Exhaust system★			I		I		I		I	
In-cabin microfilter				R			R			R
NISSAN Intelligent Key® battery				R			R			R

MAINTENANCE OPERATION		MAINTENANCE INTERVAL								
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	50 (80) 60	55 (88) 66	60 (96) 72	65 (104) 78	70 (112) 84	75 (120) 90	80 (128) 96	85 (136) 102	90 (144) 108
Brake lines & cables		I		I		I		I		I
Brake pads & rotors★		I		I		I		I		I
Brake fluid★				R				R		
Automatic transmission fluid		I		R		I		R		I
Differential gear oil	NOTE (1)	I		I		I		I		I
Transfer fluid		I		I		I		I		I
Steering gear & linkage, axle & suspension parts★				I				I		
Tire rotation	NOTE (2)									
Propeller shaft & drive shaft boots (4WD models)★		I		I		I		I		I
Exhaust system★		I		I		I		I		I
In-cabin microfilter				R			R			R
NISSAN Intelligent Key® battery				R			R			R

MAINTENANCE OPERATION		MAINTENANCE INTERVAL						Reference Page
Perform at number of miles, kilometers or months, whichever comes first.	Miles x 1,000 (km x 1,000) Months	95 (152) 114	100 (160) 120	105 (168) 126	110 (176) 132	115 (184) 138	120 (192) 144	
Brake lines & cables			I		I		I	MA-88
Brake pads & rotors★			I		I		I	MA-88 MA-89
Brake fluid★			R				R	MA-86
Automatic transmission fluid			R		I		R	MA-80
Differential gear oil	NOTE (1)		I		I		I	MA-83 MA-84
Transfer fluid			I		I		I	MA-81
Steering gear & linkage, axle & suspension parts★			I				I	ST-23 FSU-6 RSU-5
Tire rotation	NOTE (2)							WT-67
Propeller shaft & drive shaft boots (4WD models)★			I		I		I	MA-82 MA-83
Exhaust system★			I		I		I	MA-78
In-cabin microfilter				R			R	MA-77
NISSAN Intelligent Key® battery				R			R	DLK-198

NOTE:

- **Maintenance items with "★" should be performed more frequently according to "Maintenance Under Severe Driving Conditions".**
- (1) If towing a trailer, using a camper or car-top carrier, or driving on rough or muddy roads, change (not just inspect) oil at every 20,000 miles (32,000 km) or 24 months.
- (2) Refer to "Tire rotation" under the "GENERAL MAINTENANCE" heading earlier in this section.

MAINTENANCE UNDER SEVERE DRIVING CONDITIONS [Cummins (5.0L V8D) Engine]

The maintenance intervals shown on the preceding pages are for normal operating conditions. If the vehicle is mainly operated under severe driving conditions as shown below, more frequent maintenance must be performed on the following items as shown in the table.

Severe driving conditions

- Repeated short trips of less than 5 miles (8 km).
- Repeated short trips of less than 10 miles (16 km) with outside temperatures remaining below freezing.
- Operating in hot weather in stop-and-go "rush hour" traffic.
- Extensive idling and/or low speed driving for long distances, such as police, taxi or door-to-door delivery use.
- Driving in dusty conditions.
- Driving on rough, muddy, or salt spread roads.
- Towing a trailer, using a camper or a car-top carrier.

Maintenance operation: Inspect = Inspect and correct or replace as necessary.

Maintenance item	Maintenance operation	Maintenance interval	Reference page
Engine oil and filter	Replace	Every 5,000 miles (8,000 km) or when the Engine Oil-Service Due warning appears in the vehicle information display.	MA-70
Brake fluid	Replace	Every 10,000 miles (16,000 km) or 12 months	MA-86
Brake pads & rotors	Inspect	Every 5,000 miles (8,000 km) or 6 months	MA-88 MA-89
Steering gear & linkage, axle & suspension parts	Inspect	Every 5,000 miles (8,000 km) or 6 months	ST-23 MA-91 MA-92

Propeller shaft & drive shaft boots (4WD models)	Inspect	Every 5,000 miles (8,000 km) or 6 months	MA-83
Exhaust system	Inspect	Every 5,000 miles (8,000 km) or 6 months	MA-78

RECOMMENDED FLUIDS AND LUBRICANTS

Cummins 5.0L Engine : Fluids and Lubricants

INFOID:0000000014386355

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

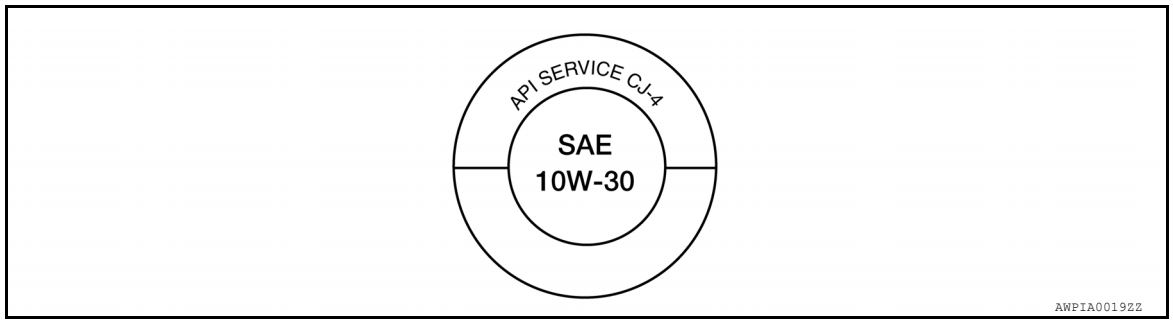
Fluid types		Capacity (Approximate)			Recommended Fluids/Lubricants
		Metric	US measure	Imp measure	
Fuel		98.4 ℓ	26 gal	21-5/8 gal	• Diesel fuel of above 42 cetane minimum above 32°F (0°C); 45 cetane minimum below 32°F (0°C) and with less than 15 ppm of sulfur must be used. • For further details, refer to GI-27, "Fuel".
Diesel exhaust fluid (DEF)		17.65 ℓ	4-5/8 gal	3-7/8 gal	• Genuine NISSAN diesel exhaust fluid (DEF) • ISO22241
Engine oil Drain and refill	With oil filter change	9.5 ℓ	10 qt	8-3/8 qt	• Engine oil meeting specification CES 20081 and American Petroleum Institute (API) certification CJ-4*1 (Low Ash Oil), SAE Viscosity 10W-30*2 or equivalent. *1: For additional information, refer to "Selecting the correct oil" of "ENGINE OIL AND OIL FILTER RECOMMENDATIONS" in this section of the manual. *2: For arctic conditions, engine oil meeting specification CES 20081 and API CJ-4 (Low Ash Oil), SAE viscosity 5W-40 is acceptable. For additional information, refer to "Oil viscosity" of "ENGINE OIL AND OIL FILTER RECOMMENDATIONS" of this manual. • Oils with a high ash content may produce damaging deposits on cylinder head valves and/or aftertreatment system damage. • Gasoline engine oil and diesel engine oil are not equal.
	Without oil filter change	9.1 ℓ	9-5/8 qt	8 qt	
High to Low (Engine Dipstick)		1.9 ℓ	2 qt	1-5/8 qt	
Engine coolant	With reservoir at MAX level	16.5 ℓ	4-3/8 gal	3-5/8 gal	• Pre-diluted Genuine NISSAN Long Life Anti-freeze/ Coolant (blue) or equivalent • Coolant must be nitrite free. • The use of other types of coolant solutions other than Genuine NISSAN Long Life Antifreeze/ Coolant (blue) or equivalent may cause severe engine damage.
Automatic transmission fluid (ATF)		14.0 ℓ	14-3/4 qt	12-3/8 qt	• Genuine NISSAN Matic K ATF • Using automatic transmission fluid that is not equivalent to Genuine NISSAN Matic K ATF may damage the transmission or impact durability. Damage caused by the use of fluid other than as recommended is not covered under the NISSAN New Vehicle Limited Warranty.
Transfer fluid		1.8 ℓ	1-7/8 qt	1-5/8 qt	• Genuine NISSAN ATF D3M is recommended. • Using fluid other than Genuine NISSAN ATF D3M may cause deterioration in driveability and transfer durability, and may damage the transfer case, which is not covered by the NISSAN New Vehicle Limited Warranty.

Fluid types		Capacity (Approximate)			Recommended Fluids/Lubricants
		Metric	US measure	Imp measure	
Differential gear oil	Front	1.51 ℓ	3-1/4 pt	2-5/8 pt	• Genuine NISSAN Differential Oil Hypoid Super-CT Synthetic GL-5 75W-90 • NISSAN recommends using Genuine NISSAN Differential Oil Hypoid Super-CT Synthetic GL-5 75W-90 ONLY in final drive. Do not mix with other fluids. Using fluids that are not equivalent to Genuine NISSAN Differential Oil Hypoid Super-CT Synthetic GL-5 75W-90 may damage the differential gear. Damage caused by the use of fluids other than as recommended is not covered under the NISSAN's New Vehicle Limited Warranty.
	Rear	2.6 ℓ	5-1/2 pt	4-5/8 pt	
Power steering fluid (PSF)		2.0 ℓ	4 1/4 pt.	3-1/2 pt	• Genuine NISSAN PSF II or equivalent • DEXRON™ VI type ATF may also be used.
Brake fluid		—	—	—	• Genuine NISSAN Super Heavy Duty Brake Fluid *3 or equivalent, DOT 3 (US FMVSS No. 116) *3: Available in mainland U.S.A. through a NISSAN dealer.
Multi-purpose grease		—	—	—	• NLGI No. 2 (lithium soap base)
Windshield washer fluid		4.5 ℓ	4-3/4 qt	4 qt	• Genuine NISSAN Windshield Washer Concentrate Cleaner & Anti-freeze or equivalent
Air conditioning system refrigerant		0.80 ± 0.05 kg	1.76 ± 0.11 lb	1.76 ± 0.11 lb	• HFC-134a (R-134a)
Air conditioning system oil		150 m ℓ	5.1 fl oz	5.3 fl oz	• A/C System Oil Type S (DH-PS)

Engine Oil Recommendation

INFOID:0000000014386356

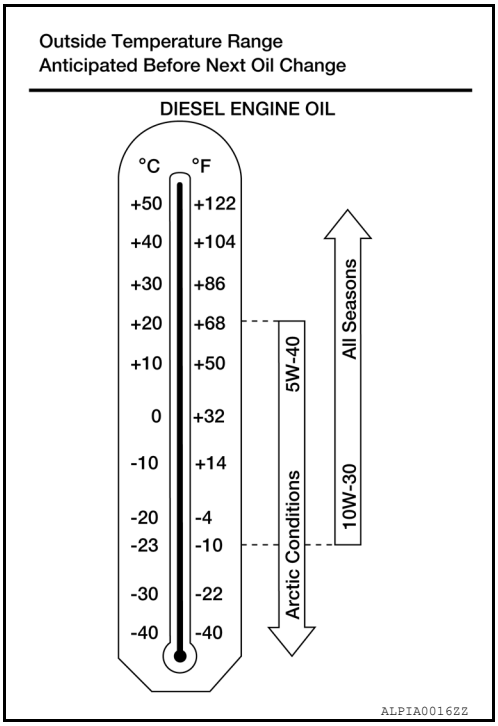
NISSAN recommends the use of an energy conserving oil in order to improve fuel economy. Select only engine oils that meet the Cummins® Engineering Standard (CES) classification (CES 20081) and American Petroleum Institute (API) certification (API CJ-4, Low Ash Oil) and SAE viscosity standard (10W-30 or 5W-40). These oils have the API certification mark and CES 20081 on the container. Oils which do not have the specified information on the label should not be used as they could cause engine damage.



API service symbol

SAE VISCOSITY NUMBER
DIESEL ENGINE

The engine oil viscosity or thickness changes with temperature. Because of this, it is important to select the engine oil viscosity based on the temperatures at which the vehicle will be operated before the next oil change. Choosing an oil viscosity other than that recommended could cause serious engine damage.



Engine Coolant Mixture Ratio

INFOID:0000000014386357

The engine cooling system is filled at the factory with a pre-diluted mixture of 50% Genuine NISSAN Long Life Antifreeze/Coolant (blue) nitrite free 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 or coolant reservoir cap when the engine is hot. Wait until the engine and radiator cool down. Serious burns could be caused by high pressure fluid escaping from the radiator.**
- **The radiator is equipped with a pressure type radiator cap. To prevent engine damage, use only a Genuine NISSAN radiator cap.**

CAUTION:

- **When adding or replacing coolant, be sure to use only Genuine NISSAN Long Life Antifreeze/Coolant (blue) nitrite free or equivalent. Genuine NISSAN Long Life Antifreeze/Coolant (blue) nitrite free 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) nitrite free concentrate following the directions on the container. If an equivalent coolant other than Genuine NISSAN Long Life Antifreeze/Coolant (blue) nitrite free is used, follow the coolant manufactur'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) nitrite free or equivalent may damage the engine cooling system.**
- **Mixing any other type of coolant other than Genuine NISSAN Long Life Antifreeze/Coolant (blue) nitrite free, 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.**

ENGINE MAINTENANCE
ENGINE COOLANT
ENGINE COOLANT : System Inspection

INFOID:0000000014386358

WARNING:
- **Do not remove the radiator cap or reservoir tank cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the cooling system.**
- **When removing the radiator cap or reservoir tank cap, wrap a thick cloth around the cap and slowly turn it a quarter turn to allow built-up pressure to escape. Then carefully remove the cap by turning it all the way.**

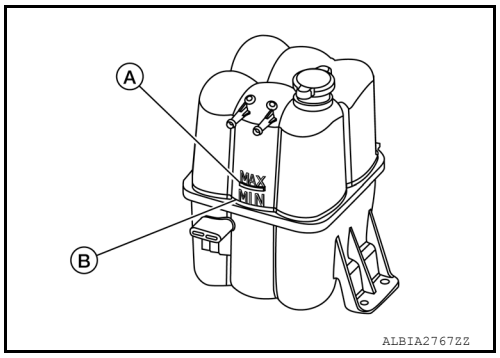
CHECKING COOLING SYSTEM HOSES

Check hoses for the following:
- Improper attachment
- Leaks
- Cracks
- Dents
- Bulges
- Internal obstruction
- Damage
- Loose connections
- Chafing
- Deterioration

CHECKING RESERVOIR LEVEL

- Check if the reservoir tank coolant level is within MIN to MAX when the engine is cool.

(A) : MAX
(B) : MIN



- Adjust coolant level (if necessary), to ensure that the engine coolant level is within the MIN to MAX range.

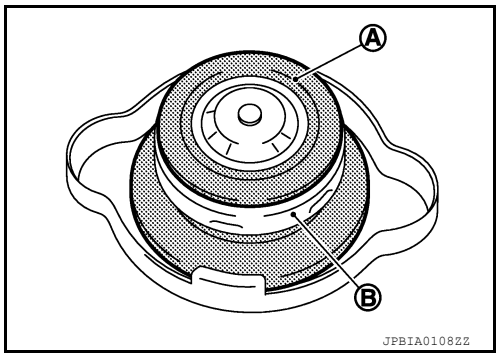
CAUTION:
Refill Genuine NISSAN Long Life Antifreeze/Coolant (blue) or equivalent in its quality mixed with water (distilled or demineralized). Refer to MA-62, "Cummins 5.0L Engine : Fluids and Lubricants".

CHECKING RESERVOIR TANK CAP

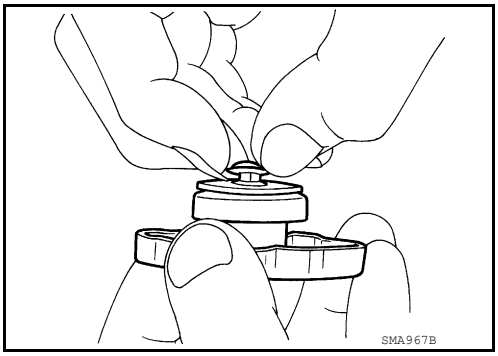
WARNING:
- **Do not remove the radiator cap or reservoir tank cap when the engine is hot. Serious burns could occur from high-pressure engine coolant escaping from the cooling system.**
- **When removing the radiator cap or reservoir tank cap, wrap a thick cloth around the cap and slowly turn it a quarter turn to allow built-up pressure to escape. Then carefully remove the cap by turning it all the way.**
- Check the pressure valve of the reservoir tank cap.

- Replace the reservoir tank cap if the metal plunger (B) on the pressure valve cannot be seen around the edge of the rubber gasket (A).
- Replace the reservoir tank cap if there is damage or deposits of foreign material on the rubber gasket or pressure valve.

CAUTION:
Thoroughly wipe out the reservoir tank filler neck to remove any waxy residue or foreign material.

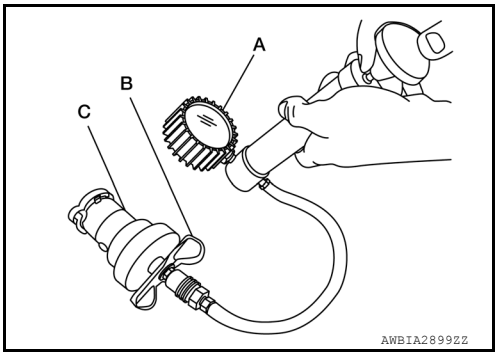


- Check the negative-pressure valve of the reservoir tank cap.
- Replace the reservoir tank cap if the negative-pressure valve does not close completely when pulled open and released.
- Replace the reservoir tank cap if there is damage or deposits of foreign material on the valve seat of the negative-pressure valve.
- Replace the reservoir tank cap if there is an abnormality in the operation of the negative-pressure valve.



- Check reservoir tank cap relief pressure.
- Check the reservoir tank cap relief pressure using Tools (A) and (B), and suitable tool (C).

Tool number (A)	**:**	**— (J-51771-5)**
Tool number (B)	**:**	**— (J-51771-9)**
Tool number (C) (commercially available)	**:**	**— (J-33984-A or equivalent)**
Reservoir tank cap relief pressure	**:**	**Refer to CO-81, "Standard and Limit".**



- When connecting the reservoir tank cap to suitable tool (C), apply water or coolant to the reservoir tank cap seal surface.
- Replace the reservoir tank cap if the reservoir tank cap relief pressure is outside of specification.

CHECKING RADIATOR

Check radiator for mud or clogging. If necessary, clean radiator as follows:

CAUTION:

- **Be careful not to bend or damage the radiator fins.**
- **When radiator is cleaned on-vehicle, remove surrounding parts in order to access the radiator core. Tape the harness and electrical connectors to prevent water from entering.**

1. Spray water to the back side of the radiator core using a side-to-side motion from the top down.
2. Stop spraying when debris no longer flows from radiator core.
3. Blow air into the back side of radiator core using a side-to-side motion from the top down.
   - Use compressed air lower than 490 kPa (5 kg/cm^2, 71 psi) and keep a distance of more than 30 cm (11.8 in).
4. Continue to blow air until no water sprays out.
5. Check for coolant leaks. Repair as necessary.

ENGINE COOLANT : Changing Engine Coolant

INFOID:0000000014386359

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.

DRAINING ENGINE COOLANT

1. Remove the front under cover. Refer to EXT-37, "FRONT UNDER COVER : Removal and Installation".
2. Open the radiator drain plug at the bottom of the radiator and remove the radiator filler cap. This is the only step required when partially draining the cooling system (radiator only).
   CAUTION:
   - **Do not allow the coolant to contact the drive belts.**
   - **Perform this step when engine is cold.**

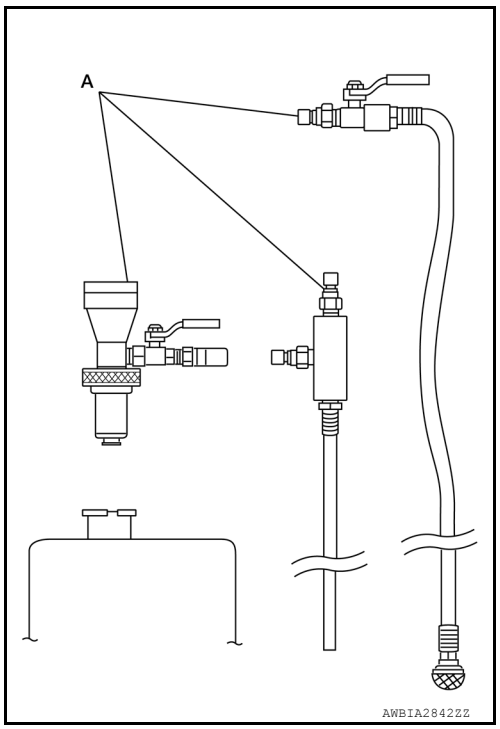
3. Follow this step for heater core removal/replacement only. Disconnect the upper heater hose at the engine side and apply moderate air pressure [103.46 kPa (1.055 kg/cm^2, 15 psi) maximum air pressure] into the hose for 30 seconds to blow the excess coolant out of the heater core.
4. When draining all of the coolant in the system, remove the reservoir tank and drain the coolant then clean the reservoir tank before installation.
   CAUTION:
   - **Do not allow the coolant to contact the drive belts.**
   - **Perform this step when engine is cold.**
5. When performing a complete cooling system drain, remove the water drain plugs on the cylinder block.
6. Check the drained coolant for contaminants, such as rust, corrosion or discoloration.
   If the coolant is contaminated, flush the engine cooling system.

REFILLING ENGINE COOLANT

1. Install the following, if removed:
   - Cylinder block drain plugs.
   - Reservoir tank, refer to CO-49, "Exploded View".
   - Cooling system hoses, refer to CO-49, "Exploded View".
   - Radiator drain plug, refer to CO-49, "Exploded View".
2. Set the vehicle heater controls to the full HOT and heater ON positions. Turn the vehicle ignition ON with the engine OFF as necessary to activate the heater mode.
3. Fill the cooling system with engine coolant using Tool (A), following the manufacturer's instructions included with the tool.

   Tool number (A) : **KV991J0070 (J-45695-A)**
   Engine Coolant : **Refer to MA-62, "Cummins 5.0L Engine : Fluids and Lubricants".**

   CAUTION:
   - **Use recommended coolant or equivalent.**
   - **Do not use any cooling system additives such as radiator sealer. Additives may clog the cooling system and cause damage to the engine, transmission or cooling system.**
   - **The compressed air supply must be equipped with an air dryer.**



4. Remove the Tool (A) and top off the cooling system with engine coolant as necessary.
5. Install the radiator cap and reservoir tank cap.
6. Run the engine until it reaches normal operating temperature.
   CAUTION:
   Do not allow the engine to exceed normal operating temperature or engine damage may occur.
7. Stop the engine and allow it to cool.
8. Check the engine coolant level and adjust if necessary.

FLUSHING COOLING SYSTEM

1. Fill the radiator from the filler neck above the radiator upper hose and reservoir tank with clean water and reinstall radiator filler cap.
2. Run the engine until it reaches normal operating temperature.
3. Rev the engine two or three times under no-load.
4. Stop the engine and wait until it cools down.

5. Drain the water from the system. Refer to CO-47, "Changing Engine Coolant".
6. Repeat steps 1-5 until clear water begins to drain from the radiator.

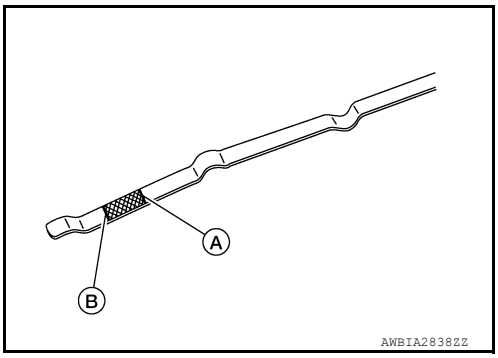
ENGINE OIL

ENGINE OIL : Inspection

INFOID:0000000014386360

OIL LEVEL

- Before starting the engine make sure the vehicle is parked on a flat and level surface, then check the oil level. If the engine is already running, turn it off and allow 10 minutes before checking.
- Check that the oil level is within the low (B) and high (A) range as indicated on the dipstick.
- If the engine oil level is out of range, add oil as necessary. Refer to LU-62, "Standard and Limit".



OIL APPEARANCE

- Check the engine oil for a white milky appearance or excessive contamination.
- If the engine oil is milky, it is highly probable that it is contaminated with engine coolant. Repair the broken parts.

OIL LEAKS

Check for oil leaks around the following areas:

- Oil pan
- Oil pan drain plug
- Oil pressure switch
- Oil filter
- Oil cooler
- Front cover
- Mating surface between cylinder block and cylinder head
- Mating surface between cylinder head and rocker cover
- Crankshaft oil seal (front and rear)
- Block stiffener

OIL LEAK INSPECTION

1. Use a steam cleaner or high-pressure washer to clean the engine.

   WARNING:

   When using high-pressure water or steam cleaning equipment, to avoid the risk of personal injury from flying debris and hot steam:

   - **Wear appropriate eye protection and protective clothing including gloves and a face shield.**

2. Add Tool before running the engine.
   - Using Tool, inspect the engine for source of the of a leak.

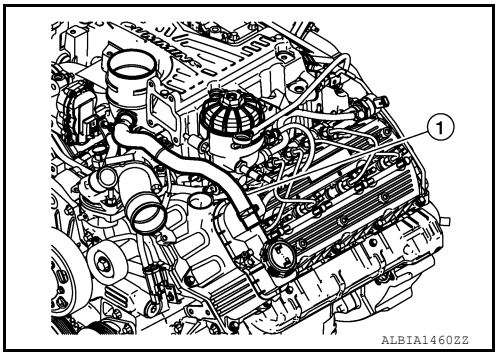
   Tool : — (J-28431-6)

3. Operate the engine until the coolant temperature reaches 82°C (180°F). If necessary, operate the engine under load to create the conditions of the oil leak. Perform stall tests or a road test. Inspect the exterior of the engine for leaking gaskets, seals, O-rings, pipe plugs, or fittings.

   NOTE:

   Before replacing any gaskets, check the bolts to make sure they are tightened to the correct torque values.

4. Inspect the engine crankcase breather tube (1) and hose for restrictions or leaks. Refer to EM-332, "Removal and Installation".

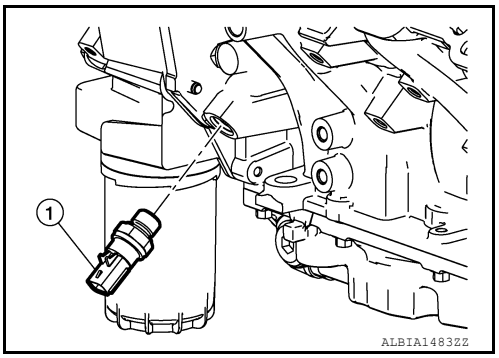


5. Check for a loose or missing oil dipstick tube, dipstick, or oil fill cap.

OIL PRESSURE CHECK

1. Remove the oil pressure switch (1) from the cylinder block on the front left side of the engine. Refer to LU-59, "Exploded View".

WARNING:
To avoid the risk of personal injury:
- **Be careful not to burn yourself, as engine oil may be hot.**
- **Prolonged and repeated contact with used engine oil may cause skin cancer; try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible. Avoid inhalation of vapors, ingestion, and prolonged contact with used engine oil.**
- **If not reused, dispose of in accordance with local environmental regulations**

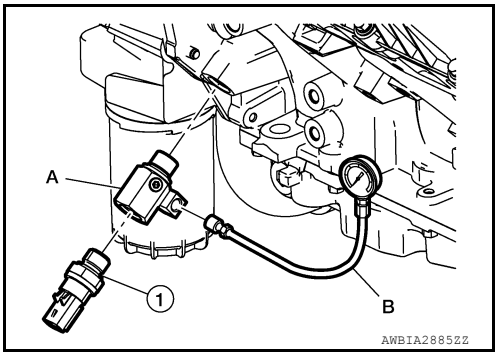


2. Install Tool (A) into the port and install the oil pressure switch (1) into the other end of the tool and thread Tool into Tool (A).

Tool : — (J-54412)
: — (J-54417)

3. Connect suitable tool (B) and start the engine.

CAUTION:
If the lubricating oil pressure does not develop within 15 seconds, shut down the engine to reduce the possibility of internal damage.



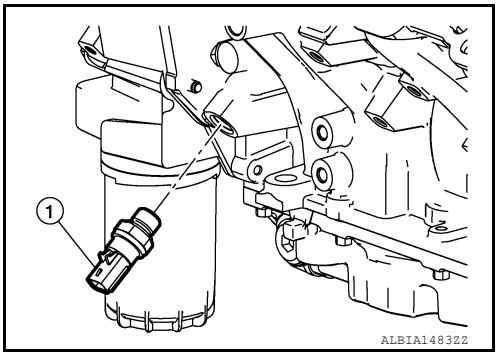
4. Allow the engine to operate and achieve operating temperature. Check for leaks. Record the engine oil pressure reading at idle.

Oil Pressure at Low idle Minimum : 69 kPa (0.70 kg/cm^2, 10 psi)

5. Increase engine speed to rated speed and hold for 30 seconds. Record the lubricating oil pressure reading at rated engine speed.

Oil Pressure at Rated Engine Speed Minimum : 279 kPa (2.85 kg/cm^2, 40.5 psi)

6. Remove the tool assembly from the port and install the oil pressure switch (1). Refer to LU-59, "Exploded View".



ENGINE OIL : Changing Engine Oil

INFOID:0000000014386361

WARNING:
To avoid the risk of personal injury:
- **Be careful not to burn yourself, as engine oil may be hot.**
- **Prolonged and repeated contact with used engine oil may cause skin cancer; try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible. Avoid inhalation of vapors, ingestion, and prolonged contact with used engine oil.**
- **If not reused, dispose of in accordance with local environmental regulations**

1. Remove engine under cover. Refer to EXT-39, "ENGINE UNDER COVER : Removal and Installation".
2. Warm up engine, and check for engine oil leaks. Refer to LU-33, "Inspection".
   NOTE:
   Operate the engine until the coolant temperature reaches 60°C (140°F).
3. Stop engine and wait for 10 minutes.
4. Loosen oil filler cap, then remove drain plug.
5. Drain engine oil.
   NOTE:
   - Be sure to use a container that can hold at least 12 quarts of lubricating oil.
   - The factory fill oil may include a red dye that is added for manufacturing quality processes. The dye makes the oil appear to be red. This is normal. The red dye will be flushed from the engine after approximately 4-5 oil changes.
6. Install oil pan drain plug.

   Oil pan drain plug : 34 N·m (3.5 kg-m, 25 ft-lb)

7. Refill with new engine oil. Refer to LU-62, "Standard and Limit".
   CAUTION:
   - **The refill capacity depends on the engine oil temperature and drain time. Use these specifications for reference only.**
   - **Always use the oil level gauge to determine when the proper amount of engine oil is in the engine.**
8. Warm up engine and check area around drain plug and oil filter for oil leaks.
   NOTE:
   - Operate the engine until the coolant temperature reaches 60°C (140°F).
   - Engine oil pressure **must** be indicated on the gauge within 15 seconds after starting. If oil pressure is **not** registered within 15 seconds, shut the engine off immediately to reduce the possibility of engine damage. Confirm that the correct oil level is in the oil pan.
9. Shut the engine off. Wait approximately 10 minutes to let the oil drain from the upper parts of the engine. Check the level again.
   NOTE:
   Add oil as necessary to bring the oil level to the H (high) mark on the dipstick.
10. Install engine under cover. Refer to EXT-39, "ENGINE UNDER COVER : Removal and Installation".
11. Check engine oil level. Refer to LU-33, "Inspection".

OIL FILTER

OIL FILTER : Removal and Installation

INFOID:0000000014386362

REMOVAL

1. Remove the front under cover. Refer to EXT-37, "FRONT UNDER COVER : Removal and Installation".
2. Drain the engine oil. Refer to LU-35, "Changing Engine Oil".
3. Remove the oil filter using Tool.

Tool number : (223-50000)

WARNING:
To avoid the risk of personal injury:
- **Be careful not to burn yourself, as engine oil may be hot.**
- **Prolonged and repeated contact with used engine oil may cause skin cancer; try to avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible. Avoid inhalation of vapors, ingestion, and prolonged contact with used engine oil.**
- **If not reused, dispose of in accordance with local environmental regulations.**

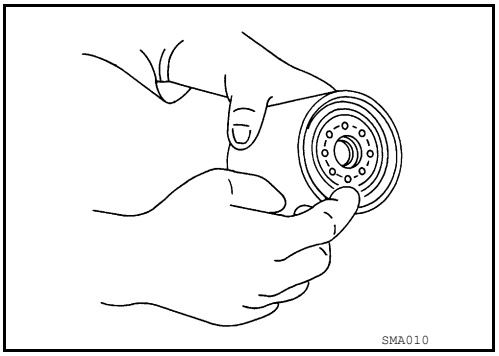
NOTE:
- Clean the area around the oil filter before removing.
- The oil filter sealing ring can stick on the oil filter head. Be sure that the sealing ring is removed and discarded.

INSPECTION AFTER REMOVAL

- Clean the filter head mating surface with a clean lint-free cloth.
- Check for damage to the filter head threads and sealing surface.

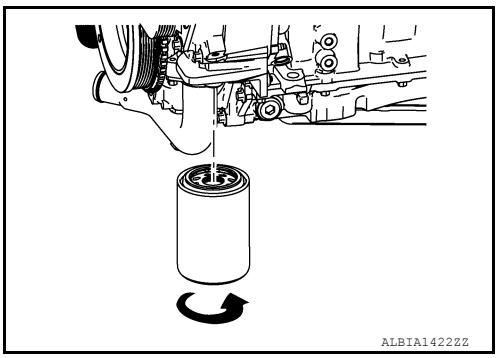
INSTALLATION

1. Remove foreign materials adhering to the oil filter installation surface.
2. Use clean engine oil to coat the gasket surface of the filter and fill the oil filter with clean engine oil. Refer to MA-63, "Engine Oil Recommendation".



CAUTION:
The lack of lubrication during the delay until the filter is pumped full of oil at start-up can damage the engine.
NOTE:
Be careful that no debris is poured into the filter. If using an oil supply with a metallic or plastic seal under the cap, be careful to peel the seal back. Puncturing the seal with a knife or sharp object can create debris in the oil filter.

3. Install the oil filter onto the front cover, turning by hand until the gasket contacts the front gear cover. Once the gasket contacts the front cover, continue to tighten for an additional 270 degrees (3/4 turn).



CAUTION:
Mechanical overtightening of the filter can distort the threads or damage the filter element seal.

4. Refill the engine with new engine oil. Refer to MA-63, "Engine Oil Recommendation".
5. Start the engine and check for engine oil leaks.

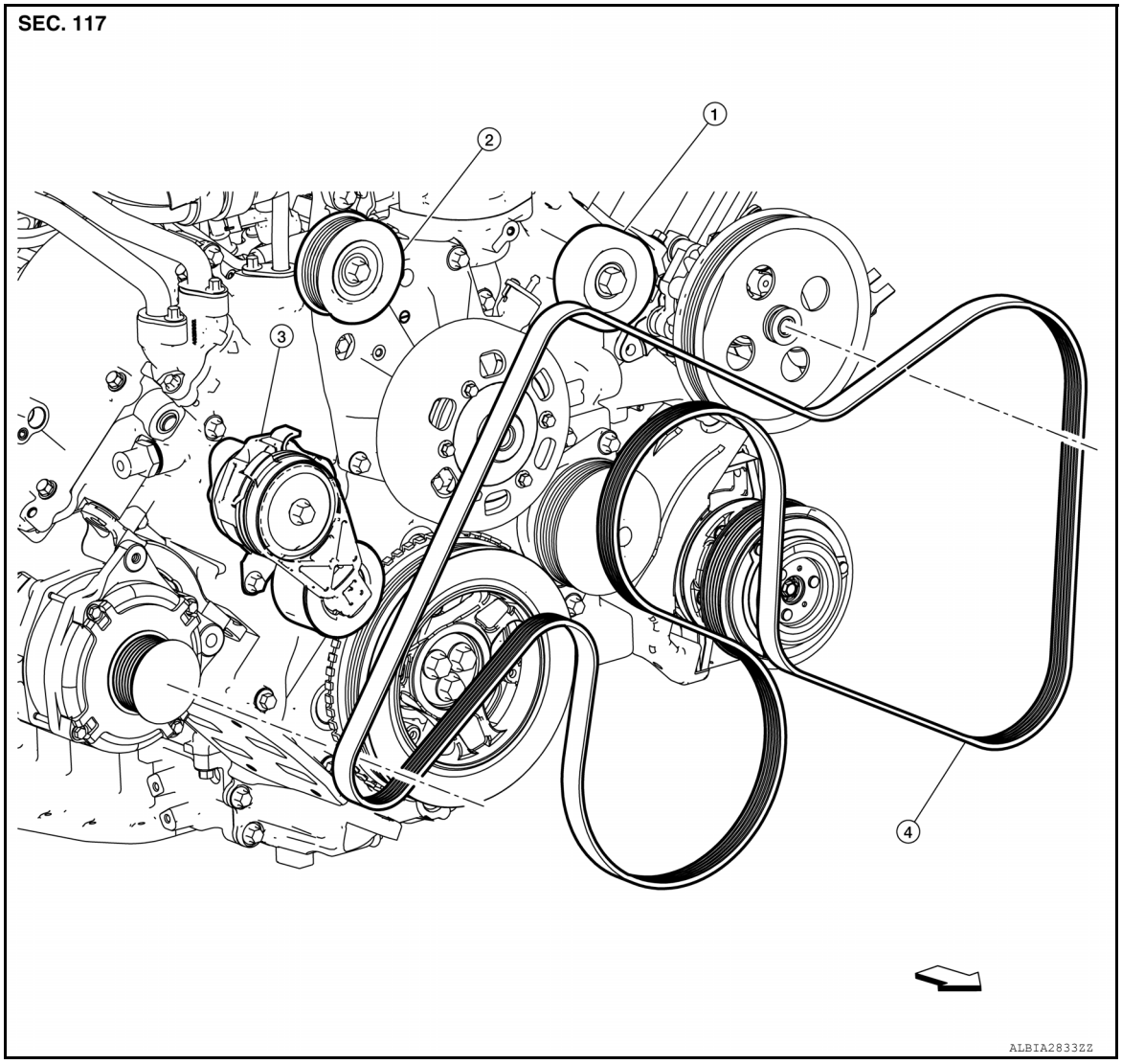
CAUTION:
If the engine does not produce oil pressure in 15 seconds after starting the engine, shut off the engine to reduce the possibility of component damage.

6. Shut down the engine and check the oil level. Refer to LU-33, "Inspection".
7. Install the front under cover. Refer to EXT-37, "FRONT UNDER COVER : Removal and Installation".

DRIVE BELT

DRIVE BELT : Exploded View

INFOID:0000000014386363



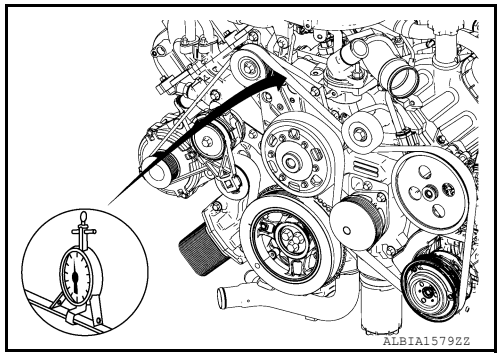
1. Idler pulley
2. Idler pulley
3. Drive belt auto-tensioner
4. Drive belt
⇦ Front

DRIVE BELT : Inspection

INFOID:0000000014386364

INSPECTION BEFORE REMOVAL

1. With the engine stopped and the drive belt installed, record the drive belt tension generated by the existing drive belt auto-tensioner. Use a suitable tool to measure the tension in the drive belt.

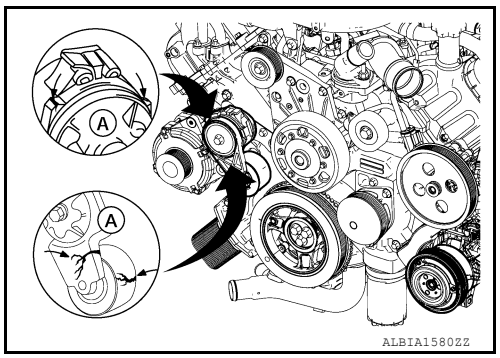


Belt tension minimum : 178 N (18.2 kg-f, 40.0 lb-f)
Belt tension maximum : 365 N (37.2 kg-f, 82.1 lb-f)

NOTE:
If the measurement is out of the specified range, replace only the drive belt and perform the tension test again. If a new drive

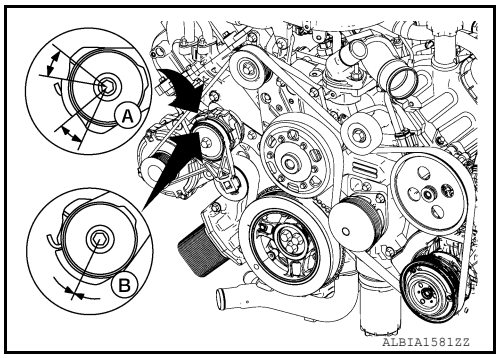
belt has been installed and the measurement is still outside of the specified range, replace the drive belt auto-tensioner.

2. With the engine stopped, check the drive belt auto-tensioner arm, pulley, and stops for cracks (A). If any cracks are found, the drive belt auto-tensioner must be replaced.



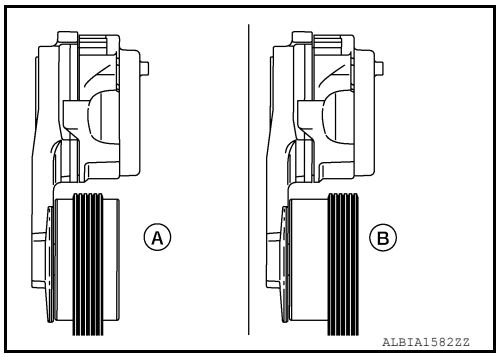
3. With the drive belt installed, verify that the drive belt auto-tensioner arm stop is not in contact with the spring case stop (A). If either of the stops are touching:
   - Verify the correct drive belt part number is installed.
   - If the correct drive belt is installed, replace the drive belt.

   After replacing the drive belt, if the drive belt auto-tensioner arm stops are still in contact with the spring case stop (B), the drive belt auto-tensioner must be replaced.



4. Check the location of the drive belt on the drive belt auto-tensioner pulley. The drive belt should be centered (A) on, or close to the middle of, the pulley. Misaligned drive belts (B), either too far forward or backward, can cause drive belt wear, drive belt roll-off, or increase uneven drive belt auto-tensioner bushing wear.

   NOTE:
   Drive belt misalignment is not always a result of a malfunctioning or faulty drive belt auto-tensioner. Make sure the adjacent pulleys and brackets are aligned and installed correctly. Refer to EM-195, "NVH Troubleshooting - Engine Noise".



DRIVE BELT : Removal and Installation - Drive Belt

INFOID:0000000014386365

REMOVAL

CAUTION:

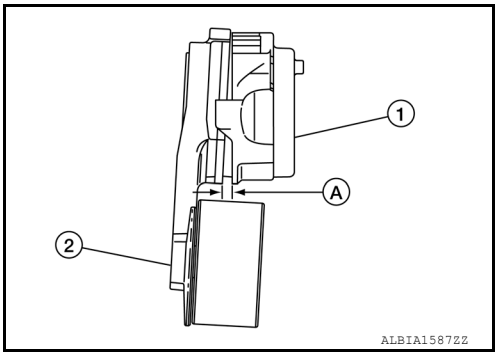
The drive belt auto-tensioner is spring-loaded and must be pivoted away from the drive belt. Pivoting in the wrong direction can result in damage to the cooling fan belt tensioner.

1. Rotate the drive belt auto-tensioner counterclockwise to release the tension.
2. Remove the drive belt.

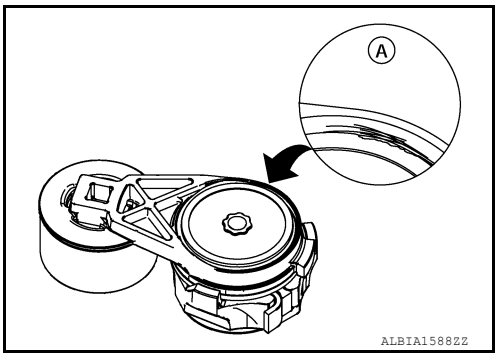
INSPECTION AFTER REMOVAL

1. Inspect the drive belt for reuse.

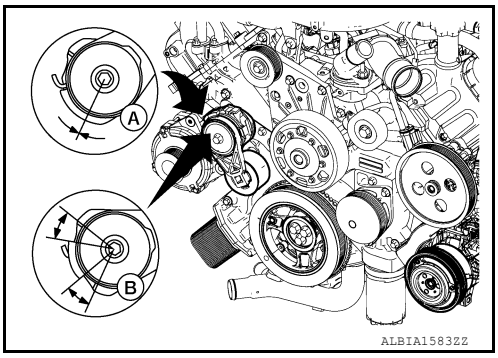
2. Measure the clearance between the drive belt auto-tensioner spring case (1) and the drive belt auto-tensioner arm (2) to verify drive belt auto-tensioner wear-out and uneven bearing wear. If the clearance at the measurement point (A) exceeds 3 mm (0.12 in) at any point, the drive belt auto-tensioner is damaged and must be replaced as a complete assembly.
NOTE:
- Drive belt auto-tensioner generally show a larger clearance gap (A) near the lower portion of the spring case, resulting in the upper portion rubbing against the tensioner arm.
- Always replace the drive belt when a drive belt auto-tensioner is replaced. However, it is not always necessary to replace a drive belt auto-tensioner when a drive belt is replaced.



3. Inspect the drive belt auto-tensioner for evidence of the tensioner arm contacting the tensioner cap. If there is evidence of the two areas making contact (A), the pivot tube bushing has malfunctioned and the drive belt auto-tensioner must be replaced.



4. With the belt removed, verify that the drive belt auto-tensioner arm stop is in contact (A) with the spring case stop. If they are not touching (B), the drive belt auto-tensioner must be replaced.



INSTALLATION

Installation is in the reverse order of removal.

NOTE:
- When installing drive belt, install drive belt on water pulley last.
- Check the alignment of the drive belt on the drive belt auto-tensioner.

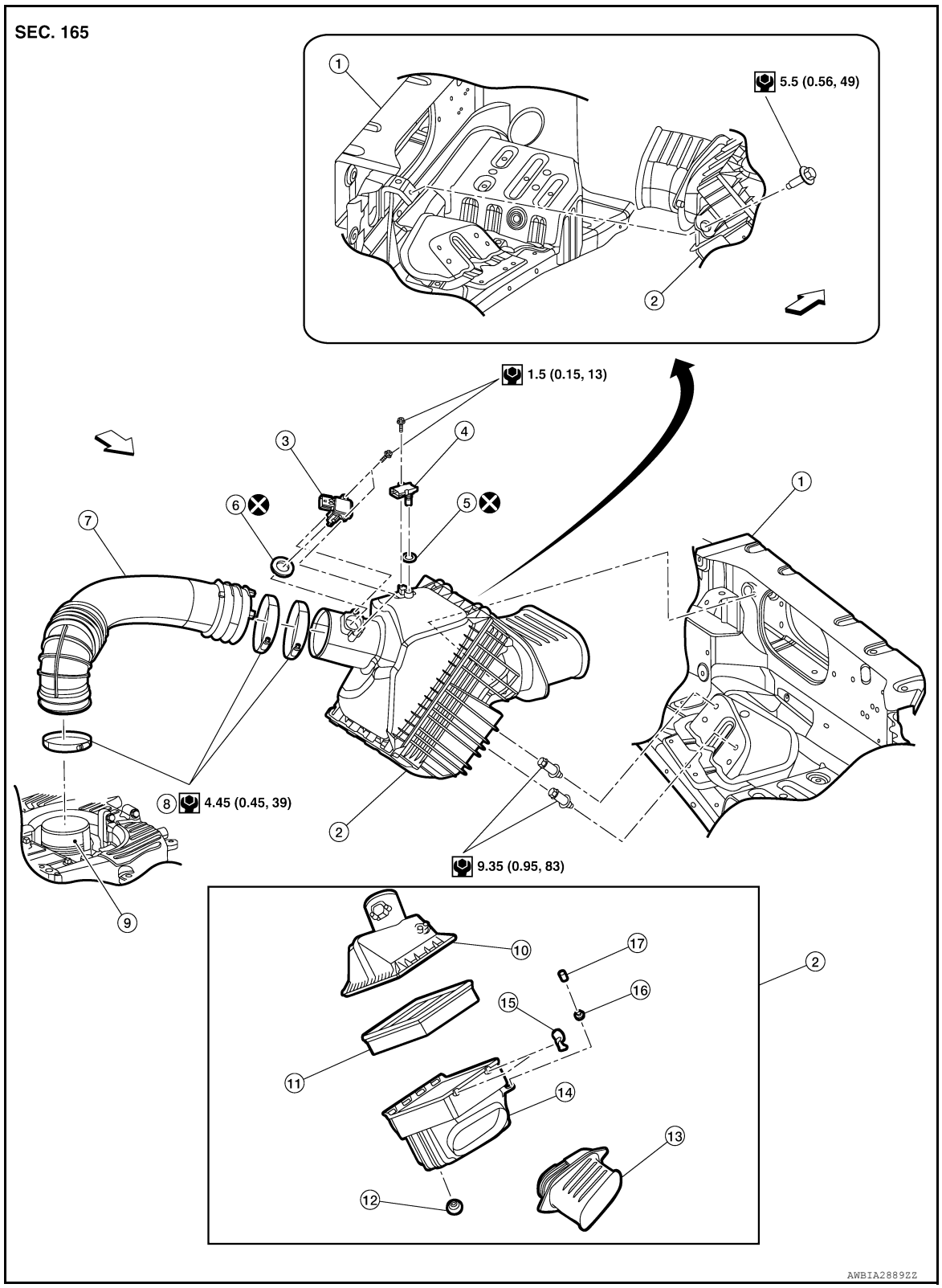
INSPECTION AFTER INSTALLATION

Operate the engine and check for belt squeal. Excessive belt squeal indicates belt slippage.
If belt squeal is present, check the routing of the belt to make sure that the belt is installed correctly on each pulley.

AIR CLEANER FILTER

AIR CLEANER FILTER : Exploded View

INFOID:0000000014386366



1. Hoodledge
2. Air cleaner case
3. Mass air flow sensor
4. Turbocharger compressor intake pressure/temperature sensor
5. O-ring
6. O-ring
7. Air duct
8. Clamp
9. Air inlet connection
10. Air cleaner case (upper)
11. Air filter
12. Mounting rubber

13. Air duct (inlet) 14. Air cleaner case (lower) 15 Clip
16. Mounting rubber 17. Retainer ⇦ Front

AIR CLEANER FILTER : Removal and Installation

INFOID:0000000014386367

REMOVAL

NOTE:
It is not necessary to remove the front air duct to replace the air cleaner filter.

1. Unhook the air cleaner case side clips.
2. Remove the air cleaner filter.

INSTALLATION

Installation is in the reverse order of removal.

FUEL SYSTEM

FUEL SYSTEM : High-Pressure Fuel Line Inspection

INFOID:0000000014386368

GENERAL INFORMATION

- The injector supply lines supply fuel from the fuel rails to the fuel injectors.
- The injector supply lines are not reusable. Once one of the fuel line nuts are untorqued, the line must be replaced.

MAINTENANCE CHECK

WARNING:

- **When using compressed air for cleaning, to avoid the risk of personal injury from flying debris and dirt:**
- **Do not exceed 30psi (207 kPa).**
- **Wear appropriate eye protection and protective clothing including gloves.**
- **When using high-pressure water or steam cleaning equipment, to avoid the risk of personal injury from flying debris and hot steam:**
- **Wear appropriate eye protection and protective clothing including gloves and a face shield.**
- **The fuel system (fuel pump, high pressure fuel lines, fuel rail, injectors) contain very high pressure fuel. To avoid the risk of personal injury or fire:**
- **Do not loosen any fittings while the engine is running.**
- **Wait at least 10 minutes after shutting down the engine before loosening any fittings in the high-pressure fuel system to allow pressure to decrease to a lower level.**
- **Wear appropriate eye protection and protective equipment as high-pressure fuel spray can penetrate the skin.**
- **Never smoke or allow sparks or flames (such as pilot lights, electrical switches, or welding equipment) in the work area. Never allow diesel fuel to spill onto a hot exhaust manifold which can cause a fire.**
- **Diesel fuel and diesel fuel vapor is flammable. To avoid risk of fire or burns, never smoke or allow sparks or flames (such as pilot lights, electrical switches, or welding equipment) in the work area. Never allow diesel fuel to spill onto a hot exhaust manifold which can cause a fire.**

- Inspect the injector high-pressure supply line for leaks, cracks, damage, loose connections, chafing, or deterioration. If necessary, replace the damaged components. In addition, if injector high-pressure supply lines have visible red/orange corrosion associated with rust after rinsing debris replace the component.

CHASSIS AND BODY MAINTENANCE
IN-CABIN MICROFILTER

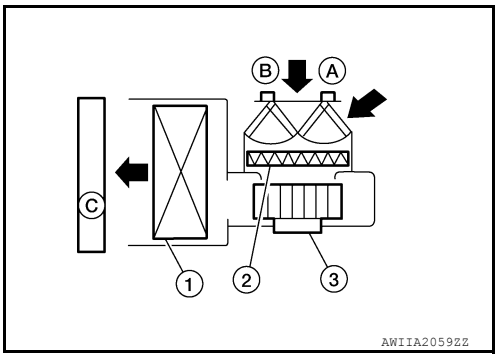
IN-CABIN MICROFILTER : Description

INFOID:0000000014386369

FUNCTION

The air inside the passenger compartment is filtered by the in-cabin microfilter when the heater or A/C controls are set on either the recirculation or fresh mode. The in-cabin microfilter is located in the heater and cooling unit assembly.

(1) : Evaporator
(2) : In-cabin microfilter
(3) : Blower motor
(A) : Recirculation air
(B) : Fresh air
(C) : Purified air



REPLACEMENT TIMING

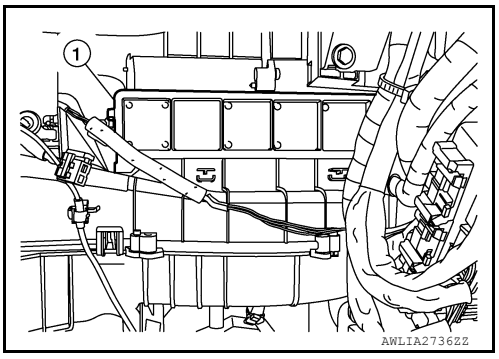
Replacement of the in-cabin microfilter is recommended on a regular interval depending on the driving conditions. Refer to MA-58, "Introduction of Periodic Maintenance". It may also be necessary to replace the in-cabin microfilter as part of a component replacement if it is damaged.

IN-CABIN MICROFILTER : Removal and Installation

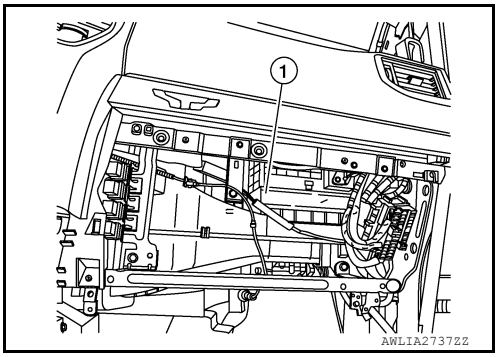
INFOID:0000000014386370

REMOVAL

1. Remove glove box assembly. Refer to IP-21, "Removal and Installation".
2. Release in-cabin microfilter cover tab and remove the cover (1) from under the RH side of the instrument panel.
   CAUTION:
   Use care when lifting up on the in-cabin microfilter tab to avoid damaging it.



3. Remove in-cabin microfilter (1).
   CAUTION:
   If the in-cabin microfilter is deformed/damaged when removing, replace it with a new one. A deformed or damaged in-cabin microfilter may affect the dust collecting performance.



INSTALLATION

Installation is in reverse order of removal.

CAUTION:
When installing, handle the in-cabin microfilter with care to avoid deformation or damage.
NOTE:

The in-cabin microfilter is marked with an air flow arrow. The end of the in-cabin microfilter with the arrow should face the passenger side of the vehicle. The arrow should point toward the rear of the vehicle.

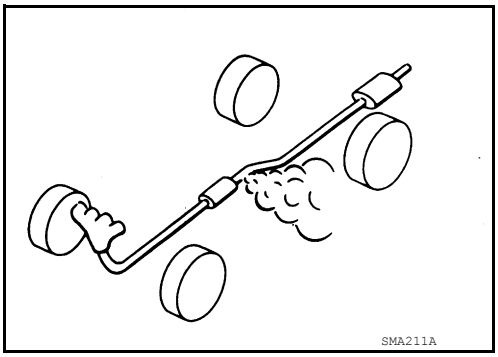
EXHAUST SYSTEM

EXHAUST SYSTEM : Checking Exhaust System

INFOID:0000000014386371

Check exhaust pipes, muffler and mounting for improper attachment, leaks, cracks, damage or deterioration.

- If anything is found, repair or replace damaged parts.



A/T FLUID

A/T FLUID : Checking the A/T Fluid (ATF)

INFOID:0000000014386372

CAUTION:

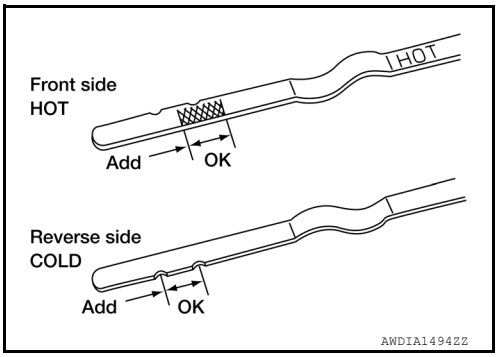
If using the vehicle for towing, the A/T fluid must be replaced as specified. Refer to MA-58, "Introduction of Periodic Maintenance".

1. Before driving, the A/T fluid level can be checked at A/T fluid temperatures of 30° to 50° C (86° to 122° F) using the “COLD” range on the A/T fluid level gauge as follows:

a. Park the vehicle on a level surface and set the parking brake.

b. Start the engine and move the selector lever through each gear position. Shift the selector lever into the “P” position.

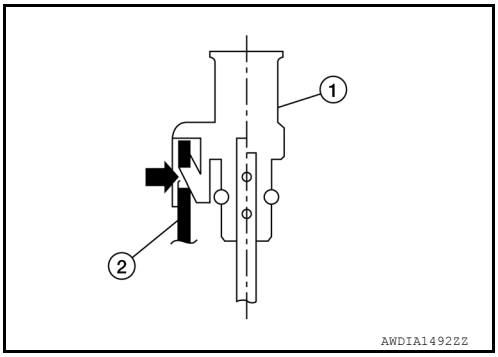
c. Check the A/T fluid level with the engine idling.



d. Pull out the A/T fluid level gauge (1) from the A/T fluid charging pipe (2) after pressing the A/T fluid level gauge in the direction shown (⬅) to release the lock. and wipe it clean with a lint-free paper.

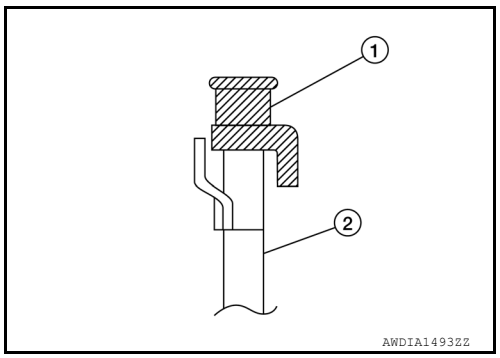
CAUTION:

When wiping the A/T fluid from the A/T fluid level gauge, always use a lint-free paper, not a cloth.



e. Re-insert the A/T fluid level gauge (1) rotating 180° from the originally installed position, then securely push the A/T fluid level gauge until it meets the top end of the A/T fluid charging pipe (2).

CAUTION:
To check A/T fluid level, insert the A/T fluid level gauge until the cap contacts the top of the A/T fluid charging pipe, with the gauge reversed from the normal inserted position.

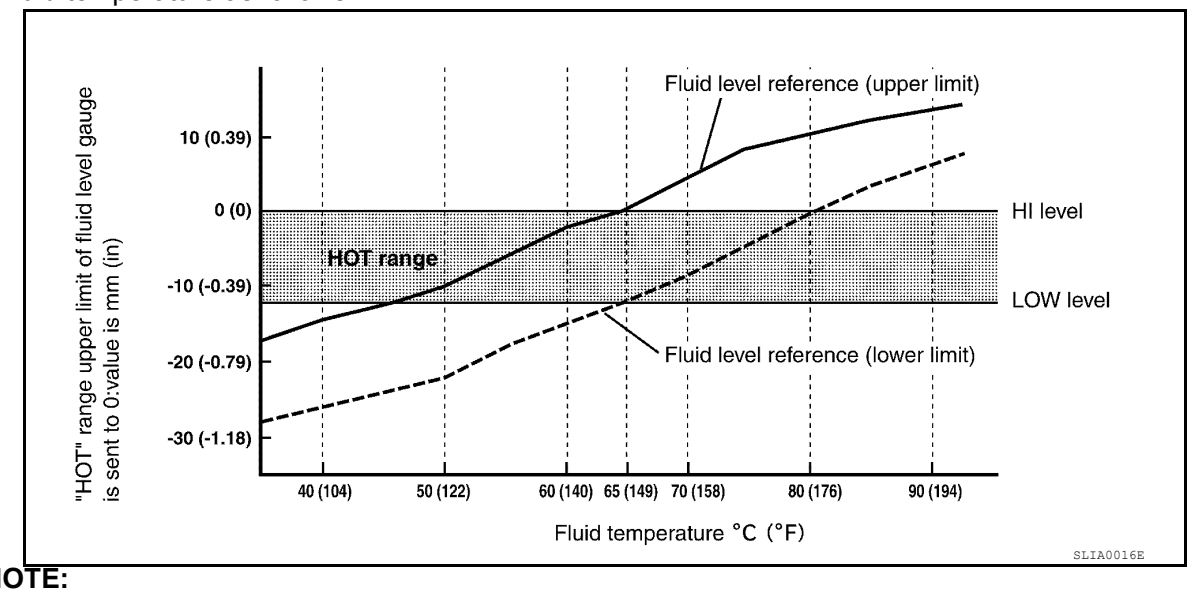


f. Remove the A/T fluid level gauge and note the A/T fluid level. If the A/T fluid level is at low side of range, add A/T fluid to the transmission through the A/T fluid charging pipe.

CAUTION:
Do not overfill the transmission with A/T fluid.

g. Install the A/T fluid level gauge.

2. Warm up the engine and transmission.
3. Check for any A/T fluid leaks.
4. Drive the vehicle to increase the A/T fluid temperature to 80° C (176° F).
5. Allow the A/T fluid temperature to fall to approximately 65°C (149°F). Use the CONSULT to monitor the A/T fluid temperature as follows:

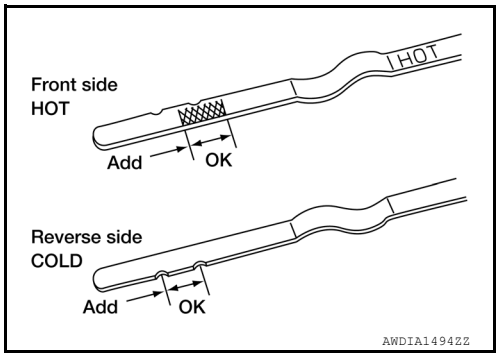


NOTE:
The A/T fluid level will be significantly affected by the A/T fluid temperature as shown. Therefore monitor the A/T fluid temperature data using the CONSULT.

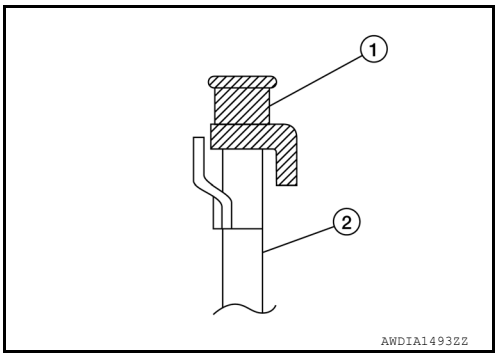
a. Connect CONSULT to data link connector.
b. Select “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT.
c. Read out the value of “ATF TEMP 1”.

6. Re-check the A/T fluid level at A/T fluid temperatures of approximately 65°C (149°F) using the “HOT” range on the A/T fluid level gauge as shown. The HOT range is between 50° - 80° C (122° - 176° F).

CAUTION:
When wiping the A/T fluid from the A/T fluid level gauge, always use lint-free paper, not a cloth.



CAUTION:
To check the A/T fluid level, insert the A/T fluid level gauge (1) until the cap contacts the top of the A/T fluid charging pipe (2), with the gauge reversed from the normal inserted position as shown.



7. Check the A/T fluid condition.
   - If the A/T fluid is very dark or has some burned smell, there may be an internal problem with the transmission. Flush the transmission cooling system after repairing the transmission.
   - If the A/T fluid contains frictional material (clutches, bands, etc.), replace the radiator and flush the transmission cooler lines using cleaning solvent and compressed air after repairing the transmission.
8. Install the A/T fluid level gauge in the A/T fluid charging pipe.
   CAUTION:
   When reinstalling A/T fluid level gauge, insert it into the A/T fluid charging pipe and rotate it to the original installation position until it is securely locked.

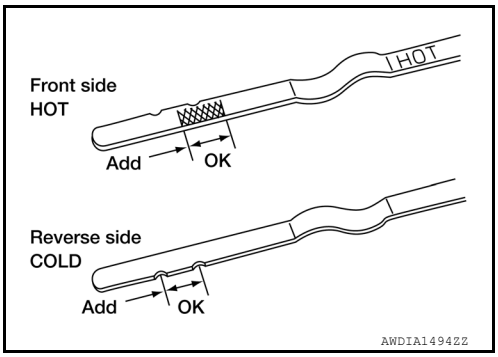
A/T FLUID : Changing the A/T Fluid (ATF)

INFOID:0000000014386373

CAUTION:
If using the vehicle for towing, the A/T fluid must be replaced as specified. Refer to MA-58, "Introduction of Periodic Maintenance".

1. Drive the vehicle to warm up the A/T fluid to approximately 80° C (176° F).
2. Stop the engine.
3. Remove the A/T fluid level gauge.
4. Drain the A/T fluid from the drain plug hole, then install the drain plug with a new gasket. Refill the transmission with new A/T fluid. Always refill with the same volume as the drained A/T fluid. Use the A/T fluid level gauge to check the A/T fluid level as shown. Add A/T fluid as necessary.

Drain plug : Refer to TM-224, "Exploded View".



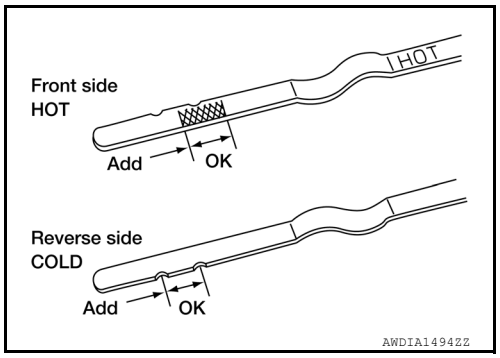
- To flush out the old A/T fluid from the transmission oil coolers, pour new A/T fluid into the A/T fluid charging pipe with the engine idling and at the same time drain the old A/T fluid from the auxiliary transmission oil cooler hose return line.
- When the color of the A/T fluid coming out of the auxiliary transmission oil cooler hose return line is about the same as the color of the new A/T fluid, flushing out the old A/T fluid is complete. The amount of new A/T fluid used for flushing should be 30% to 50% increase of the specified capacity.

A/T fluid grade and capacity : Refer to MA-62, "Cummins 5.0L Engine : Fluids and Lubricants".

CAUTION:
- **If genuine NISSAN Matic K ATF is not available, Genuine NISSAN Matic J ATF may also be used. Using automatic transmission fluid other than Genuine NISSAN Matic K ATF or Matic J ATF will cause deterioration in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the NISSAN new vehicle limited warranty**

- **When filling the transmission with A/T fluid, do not spill the A/T fluid on any heat generating parts such as the exhaust manifold.**
- **Do not reuse the drain plug gasket.**

5. Install the A/T fluid level gauge in the A/T fluid charging pipe.
6. Drive the vehicle to warm up the A/T fluid to approximately 80° C (176° F).
7. Check the fluid level and condition. If the A/T fluid is still dirty, repeat steps 2 through 6.



8. Install the A/T fluid level gauge in the A/T fluid charging pipe.
   CAUTION:
   When reinstalling A/T fluid level gauge, insert it into the A/T fluid charging pipe and rotate it to the original installation position until it is securely locked.

TRANSFER FLUID

TRANSFER FLUID : Inspection

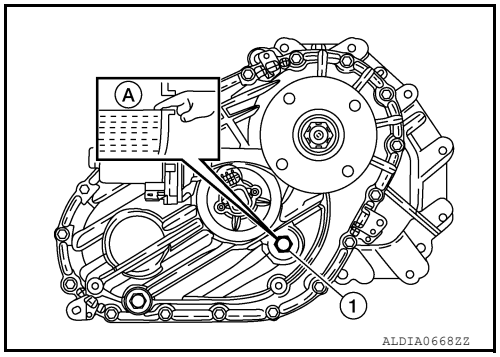
INFOID:0000000014386374

FLUID LEAKS

Check transfer surrounding area (oil seal, drain plug, and filler plug etc.) for fluid leaks.

FLUID LEVEL

1. Remove filler plug (1). Then check that fluid is filled from hole for the filler plug.
   CAUTION:
   Do not start engine while checking fluid level.
2. Transfer oil level (A) should be level with bottom of filler plug hole.
3. Apply sealant to thread of filler plug (1), and install it on transfer and then tighten to the specified torque.
   CAUTION:
   Remove old sealant adhering to thread of filler plug.

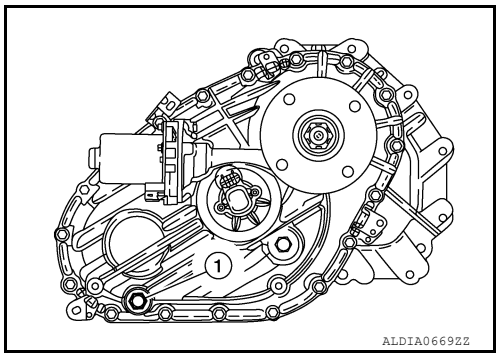


Specified torque : 20.5 N·m (2.1 kg-m, 15 ft-lb)
Sealant : Hylomar 102 silicone or equivalent

TRANSFER FLUID : Draining

INFOID:0000000014386375

1. Stop the engine.
2. Remove the drain plug (1) and drain transfer fluid.
3. Apply sealant to thread of drain plug, and install it to transfer and tighten to the specified torque.
   CAUTION:
   Remove old sealant adhering to thread of drain plug.

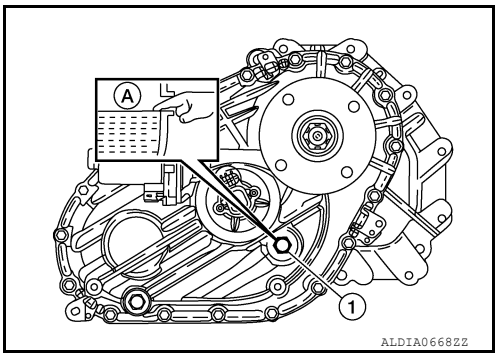


Specified torque : 20.5 N·m (2.1 kg-m, 15 ft-lb)
Sealant : Hylomar 102 silicone or equivalent

TRANSFER FLUID : Refilling

INFOID:0000000014386376

1. Remove filler plug (1). Fill with new transfer fluid up to hole for the filler plug (A).



Recommended fluid and capacity : Refer to MA-62, "Cummins 5.0L Engine : Fluids and Lubricants".

CAUTION:
Carefully fill the fluid. (Fill for approximately 3 minutes.)

2. Leave the vehicle for 3 minutes, and check the fluid level again.
3. Apply sealant to thread of filler plug, and install it on transfer and tighten to the specified torque.

CAUTION:
Remove old sealant adhering to thread of filler plug.

Specified torque : 20.5 N·m (2.1 kg-m, 15 ft-lb)
Sealant : Hylomar 102 silicone or equivalent

FRONT PROPELLER SHAFT

FRONT PROPELLER SHAFT : Inspection

INFOID:0000000014386377

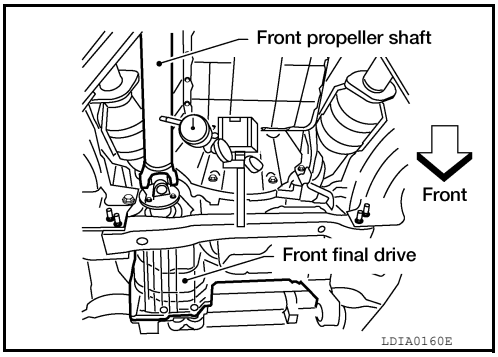
APPEARANCE AND NOISE INSPECTION

- Inspect the propeller shaft tube for dents or cracks. If damaged, replace the propeller shaft assembly.
- Check bearings for damage and noise. If damaged, replace as necessary.

PROPELLER SHAFT VIBRATION

NOTE:
If vibration is present at high speed, check propeller shaft runout first, then check mounting between propeller shaft and companion flange.

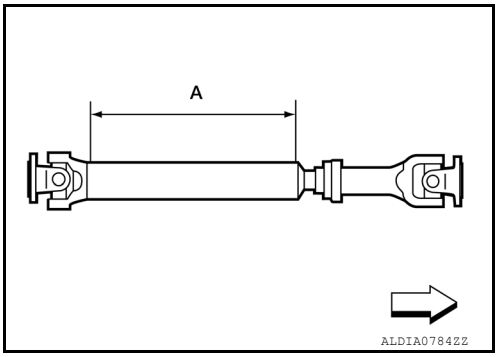
1. Measure the runout of the propeller shaft tube using suitable tool at several points by rotating the final drive companion flange with your hands.



Propeller shaft runout : Refer to DLN-160, "General Specification".

2. If the runout still exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180°, 270° and reconnect propeller shaft.
3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly.

(A) : Runout measuring range
⇦ : Front



4. After installation, check for vibration by driving the vehicle.

REAR PROPELLER SHAFT

REAR PROPELLER SHAFT : Inspection

INFOID:0000000014386378

APPEARANCE AND NOISE INSPECTION

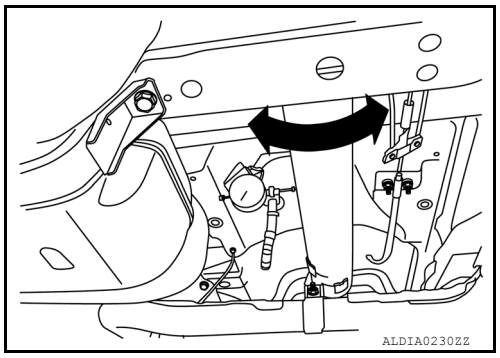
- Inspect the propeller shaft tube for dents or cracks. If damaged, replace the propeller shaft assembly.
- Check bearings for damage and noise. If damaged, replace as necessary.

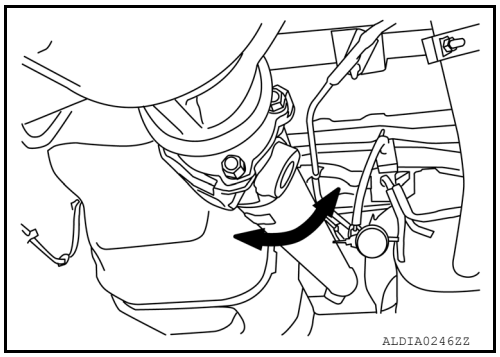
PROPELLER SHAFT VIBRATION

NOTE:
If vibration is present at high speed, check propeller shaft runout first, then check mounting between propeller shaft and companion flange.

1. Measure the runout of the propeller shaft tube at several points by rotating the final drive companion flange with your hands.

Propeller shaft runout **: Refer to DLN-175, "General Specification".**





2. If the runout still exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180°, 270° and reconnect propeller shaft.
3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly.
4. After installation, check for vibration by driving the vehicle.

FRONT DIFFERENTIAL GEAR OIL

FRONT DIFFERENTIAL GEAR OIL : Inspection

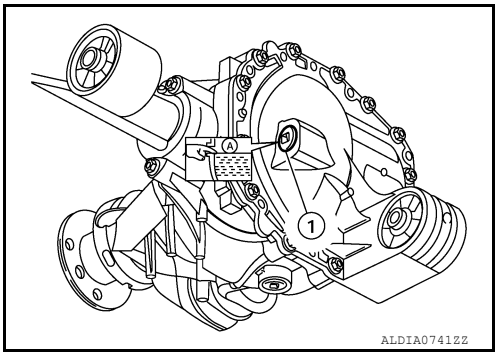
INFOID:0000000014386379

OIL LEAKS

Make sure that oil is not leaking from final drive assembly or around it.

OIL LEVEL

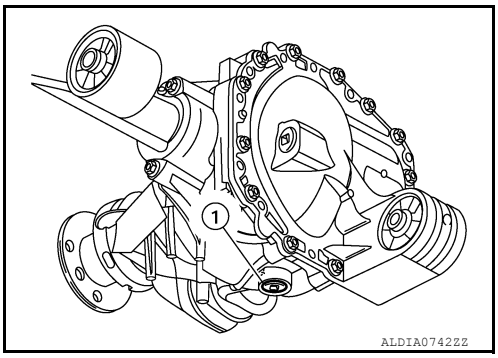
1. Check oil level (A) from filler plug hole as shown in the figure after removing filler plug (1) and gasket from final drive assembly.
CAUTION:
Turn the ignition switch OFF while checking oil level.
• Oil level should be level with bottom of filler plug hole.
2. Set a gasket on filler plug and install it on final drive assembly.
CAUTION:
Do not reuse gasket.
3. Tighten filler plug to the specified torque. Refer to DLN-193, "Exploded View".



FRONT DIFFERENTIAL GEAR OIL : Draining

INFOID:0000000014386380

1. Turn the ignition switch OFF.
2. Remove drain plug (1) and gasket.
3. Drain gear oil.
4. Install a gasket on drain plug and install it to final drive assembly.
CAUTION:
Do not reuse gasket.
5. Tighten drain plug to the specified torque. Refer to DLN-193, "Exploded View".



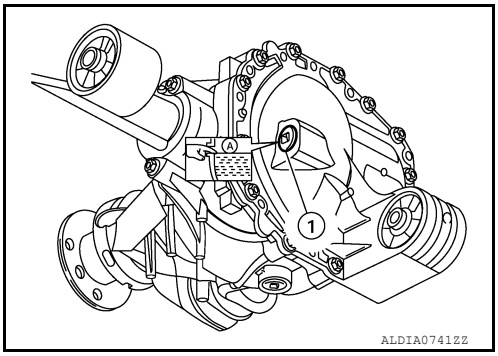
FRONT DIFFERENTIAL GEAR OIL : Refilling

INFOID:0000000014386381

1. Remove filler plug (1) and gasket. Then fill with new gear oil until oil level (A) reaches the specified level near filler plug mounting hole.

Oil grade and viscosity	**: Refer to MA-62, "Cummins 5.0L Engine : Fluids and Lubricants".**
Standard Oil capacity	**: Refer to DLN-206, "General Specification".**

2. Install a gasket on filler plug, and install it to final drive assembly.
CAUTION:
Do not reuse gasket.
3. Tighten filler plug to the specified torque. Refer to DLN-193, "Exploded View".



REAR DIFFERENTIAL GEAR OIL

REAR DIFFERENTIAL GEAR OIL : Inspection

INFOID:0000000014386382

OIL LEAKAGE

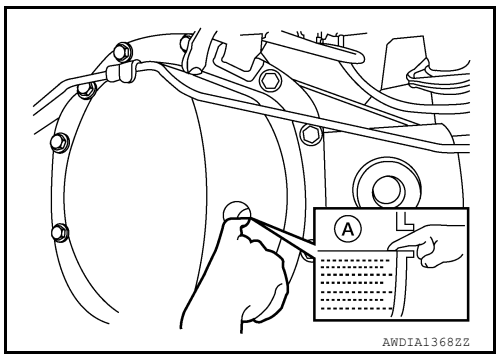
• Check that oil is not leaking from final drive assembly or around it.
• When oil leaking, drain all gear oil, and then fill with specified amount of gear oil. Refer to MA-85, "REAR DIFFERENTIAL GEAR OIL : Draining", MA-85, "REAR DIFFERENTIAL GEAR OIL : Refilling".

CAUTION:
Oil volume cannot checked by oil level height.
NOTE:
Oil is refilled up to filler plug hole.

OIL LEVEL

- Remove filler plug (1) and check oil level (A) from filler plug hole as shown.
  CAUTION:
  Do not start engine while checking oil level.
- Install filler plug and tighten to specification.

Filler plug torque : Refer to DLN-256, "Exploded View".

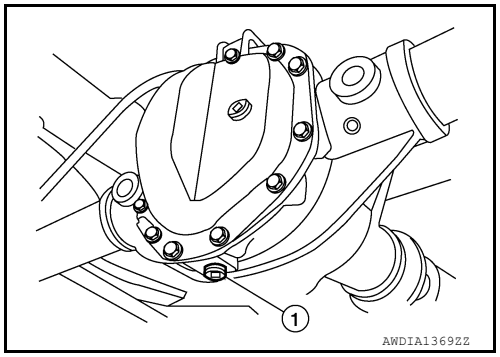


REAR DIFFERENTIAL GEAR OIL : Draining

INFOID:0000000014386383

1. Stop engine.
2. Remove drain plug (1) and drain gear oil.
3. Install the drain plug and tighten to specification.

Drain plug torque : Refer to DLN-256, "Exploded View".



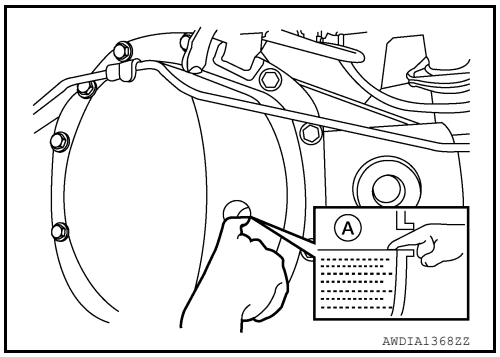
REAR DIFFERENTIAL GEAR OIL : Refilling

INFOID:0000000014386384

1. Drain all gear oil. Refer to MA-85, "REAR DIFFERENTIAL GEAR OIL : Draining".
   CAUTION:
   Drain gear oil until gear oil starts to drip.
2. Remove filler plug.
3. Fill with specified amount of gear oil (A).

Oil grade and viscosity : Refer to MA-62, "Cummins 5.0L Engine : Fluids and Lubricants".

Oil capacity : Refer to MA-62, "Cummins 5.0L Engine : Fluids and Lubricants".



NOTE:
Oil is not refilled up to filler plug mounting hole.
CAUTION:
Oil volume cannot checked by oil level height.

4. Install filler plug and tighten to specification.

Filler plug torque : Refer to DLN-256, "Exploded View".

WHEELS

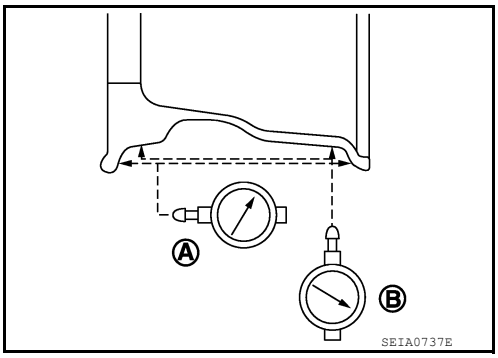
WHEELS : Inspection

INFOID:0000000014386385

WHEEL

1. Check tires for wear and improper inflation.

2. Check wheels for deformation, cracks and other damage. If deformed, remove wheel and check wheel runout.
3. Remove tire from wheel and mount wheel on a balancer machine.
   CAUTION:
   DO NOT use center hole cone-type clamping machines to hold wheel during tire removal/installation or balancing; damage to wheel paint, cladding or chrome may result. Use only rim-type or universal lug-type clamping machines to hold wheel during servicing.



a. Set dial indicator as shown.
b. Check runout. If runout value exceeds limit, replace wheel.

Axial Runout (A) **: Refer to WT-76, "Wheel".**
Radial Runout (B) **: Refer to WT-76, "Wheel".**

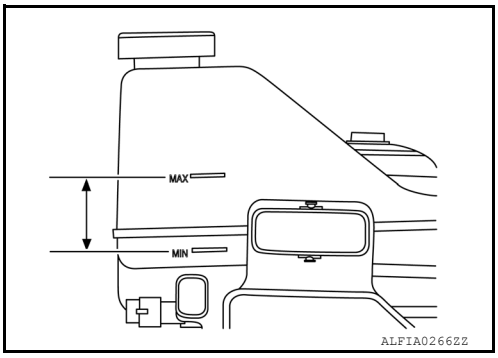
BRAKE FLUID

BRAKE FLUID : Inspection

INFOID:0000000014386386

BRAKE FLUID LEVEL

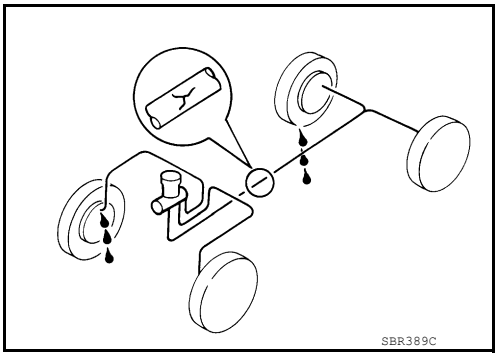
- Make sure that the brake fluid level in the reservoir tank is between the MAX and MIN lines.
  NOTE:
  Since brake fluid is in the accumulator in pressurized condition, the reservoir tank brake fluid level should be lower than the MAX line.



- Visually check around the reservoir tank for brake fluid leaks.
- If the brake fluid level is excessively low, check the brake system for leaks.
- If brake warning lamp remains illuminated after parking brake pedal is released, check the brake system for brake fluid leaks.
- Check the reservoir tank for the mixing of foreign matter (e.g. dust) and oils other than brake fluid.

BRAKE LINE

1. Check brake line (tubes and hoses) for cracks, deterioration or other damage. Replace any damaged parts.
2. Check for brake fluid leaks by fully depressing brake pedal while engine is running.
   CAUTION:
   If brake fluid leak occurs around joints, retighten or replace damaged parts as necessary.



BRAKE FLUID : Drain and Refill

INFOID:0000000014386387

CAUTION:
- **If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.**

- **Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.**
- **Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.**
- **Do not operate the brake pedal excessively during the work procedure.**

DRAINING

1. Turn the ignition switch ON.
2. Connect a vinyl tube to the bleeder valve.
3. Depress the brake pedal and loosen the bleeder valve.
4. Depress the brake pedal several times and gradually discharge brake fluid.

REFILLING

CAUTION:

Monitor the brake fluid level in the reservoir tank while performing the refilling.

1. Check that there is no foreign material in the reservoir tank, and refill with new brake fluid.
   CAUTION:
   - **Do not reuse drained brake fluid.**
   - **Do not allow oils other than brake fluid to enter the reservoir tank.**
2. Turn the ignition switch ON.
3. Connect a vinyl tube to the bleeder valve.
4. Depress the brake pedal and loosen the bleeder valve.
5. Depress the brake pedal several times until the refilled brake fluid is discharged and tighten the bleeder valve to the specified torque with the brake pedal depressed. Refer to BR-44, "BRAKE PAD : Exploded View".
6. Bleed the brake system. Refer to MA-87, "BRAKE FLUID : Bleeding Brake System".

BRAKE FLUID : Bleeding Brake System

INFOID:0000000014386388

CAUTION:

- **If the brake fluid adheres to the brake caliper assembly and disc rotor, quickly wipe it off.**
- **Do not spill or splash brake fluid on painted surfaces. Brake fluid may seriously damage paint. Wipe it off immediately and wash with water if it gets on a painted surface.**
- **Do not operate the brake pedal with the reservoir cap removed. Failure to do this may cause a discharge of brake fluid from the reservoir cap opening.**
- **Do not operate the brake pedal excessively during the work procedure.**
- **Monitor the brake fluid level in the reservoir tank while performing the air bleeding.**
- **Check that there is no foreign material in the reservoir tank.**
- **Do not reuse drained brake fluid.**
- **Do not allow oils other than brake fluid to enter the reservoir tank.**

NOTE:

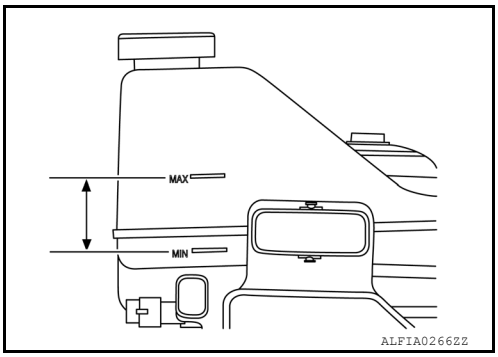
When the ignition switch is ON, the brake warning lamp may turn ON even when the parking brake pedal is released with the brake fluid within the specified level. This indicates the decrease in accumulator fluid pressure.

1. Turn the ignition switch OFF and fill the reservoir tank to MAX line with brake fluid.
2. Turn the ignition switch ON.
   NOTE:
   The motor is activated and automatically stops.
3. Turn the ignition switch OFF.
4. Depress the brake pedal 20 times or more.
   NOTE:
   The pressure loss in the accumulator results in a large brake pedal stroke. In addition to this, the brake pedal depression becomes lighter in initial stage.
5. Repeat steps 2 to 4 for 5 times.
6. Turn the ignition switch ON to check that the time between motor activation and automatic stop is less than 18 seconds. If the time is 18 seconds or more, repeat from Step 2 to 4 for 5 times.
7. With the ignition switch ON, connect vinyl tubes to the front and rear bleeder valves.

8. Depress the brake pedal. Loosen the front bleeder valve to bleed air in brake line, then tighten front bleeder valve. Refer to BR-40, "BRAKE CALIPER ASSEMBLY : Exploded View".
9. Repeat steps 1 to 9 until all of the air is out of the front brake line.
10. Release the brake pedal.
11. Depress and hold the brake pedal. Loosen rear bleeder valve to discharge 100 cc (3.4 US fl oz, 3.5 lmp fl oz), bleed air in brake line, and then tighten rear bleeder valve. Refer to BR-44, "BRAKE PAD : Exploded View".
12. Repeat until air is out of brake lines.
13. Bleed the air in the following order: front (RH), front (LH), rear (RH), rear (LH).

BRAKE FLUID LEVEL ADJUSTMENT AFTER AIR BLEEDING

1. Turn the ignition switch OFF.
2. Depress the brake pedal 20 times or more.
   NOTE:
   The pressure loss in the accumulator results in a large brake pedal stroke. In addition to this, the brake pedal depression becomes lighter in initial stage.
3. Adjust brake fluid level to the reservoir tank MAX line.
   CAUTION:
   Do not adjust with the ignition switch ON.
4. Turn the ignition switch ON.
5. Check that the reservoir tank brake fluid level is within 6 – 14 mm (0.24 – 0.55 in) lower than the MAX line center.
   NOTE:
   Since brake fluid is in the accumulator in pressurized condition, the reservoir tank brake fluid level should be lower than the MAX line.

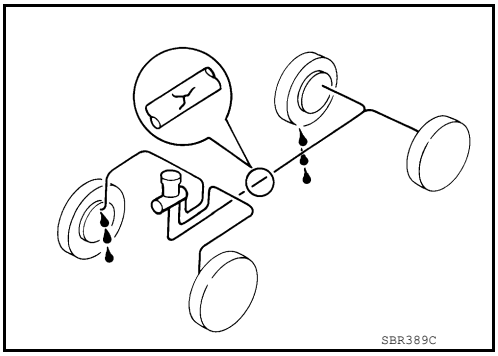


BRAKE LINES AND CABLES

BRAKE LINES AND CABLES : Inspection

INFOID:0000000014386389

1. Check the brake lines and hoses for cracks, deterioration, and other damage. Replace any damaged parts.
   CAUTION:
   If brake fluid leaks are visible around the brake line joints, retighten the joint, or replace damaged parts as necessary.
2. Check for brake fluid leaks by fully depressing brake pedal while engine is running.



DISC BRAKE

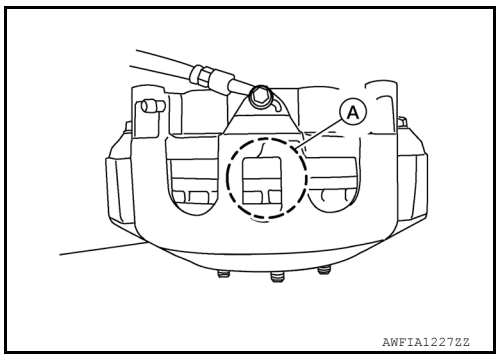
DISC BRAKE : Inspection - Front Brake Pad

INFOID:0000000014386390

INSPECTION

Check brake pad wear thickness from an inspection hole (A) on cylinder body. Check using a scale if necessary.

Wear thickness : Refer to BR-68, "Front Disc Brake".



DISC BRAKE : Inspection - Front Brake Rotor

INFOID:0000000014386391

APPEARANCE

Check surface of disc brake rotor for uneven wear, cracks, or damage. Replace it if necessary. Refer to BR-43, "DISC BRAKE ROTOR : Removal and Installation".

RUNOUT

1. Check wheel bearing axial end play before inspection. Refer to FAX-6, "Inspection".
2. Secure disc brake rotor to wheel hub and bearing with wheel nuts at two wheel nut locations.
3. Measure runout using a dial indicator to 20 mm (0.79 in) from disc brake rotor edge.

Runout : Refer to BR-68, "Front Disc Brake".

4. Find installation position with a minimum runout by shifting the disc brake rotor-to-wheel hub and bearing installation position by one hole at a time if runout exceeds limit value.
5. Refinish disc brake rotor if runout is outside limit even after performing above operation. When refinishing, use Tool.

Tool number : 38-PFM92 (—)

CAUTION:

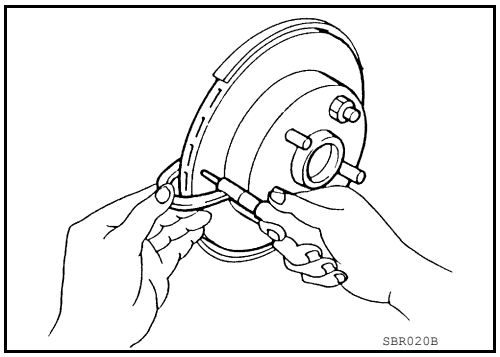
- **Check in advance that the thickness of the disc brake rotor is wear thickness + 0.3 mm (0.012 in) or more.**
- **If the thickness is less than wear thickness + 0.3 mm (0.012 in), replace the disc brake rotor.**

Wear thickness : Refer to BR-68, "Front Disc Brake".

THICKNESS

Check thickness of disc brake rotor using a micrometer. Replace disc brake rotor if thickness is below the wear limit.

Wear thickness : Refer to BR-68, "Front Disc Brake".



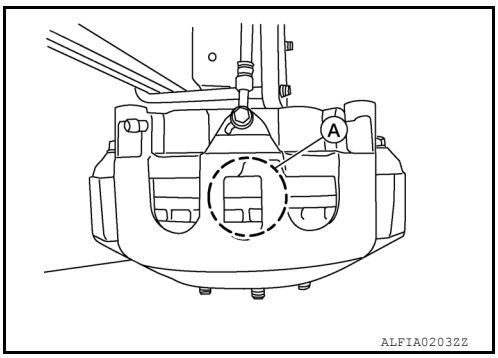
DISC BRAKE : Inspection - Rear Brake Pad

INFOID:0000000014386392

INSPECTION

Check brake pad wear thickness from an inspection hole (A) on cylinder body. Check using a scale if necessary.

Wear thickness : Refer to BR-68, "Rear Disc Brake".



DISC BRAKE : Inspection - Rear Brake Rotor

INFOID:0000000014386393

APPEARANCE

Check surface of disc brake rotor for uneven wear, cracks, or damage. Replace it if necessary. Refer to BR-50, "DISC BRAKE ROTOR : Removal and Installation".

RUNOUT

1. Check wheel bearing axial end play before inspection. Refer to RAX-5, "On-Vehicle Inspection".
2. Secure disc brake rotor to wheel hub and bearing with wheel nuts at two wheel nut locations.
3. Measure runout using a dial gauge 20 mm (0.79 in) from disc brake rotor edge.

Runout : Refer to BR-68, "Rear Disc Brake".

4. Find installation position with a minimum runout by shifting disc brake rotor-to-wheel hub and bearing installation position by one hole at a time if runout exceeds limit value.
5. Refinish disc brake rotor if runout is outside limit even after performing above operation. When refinishing, use Tool.

Tool number : 38-PFM92 (—)

CAUTION:

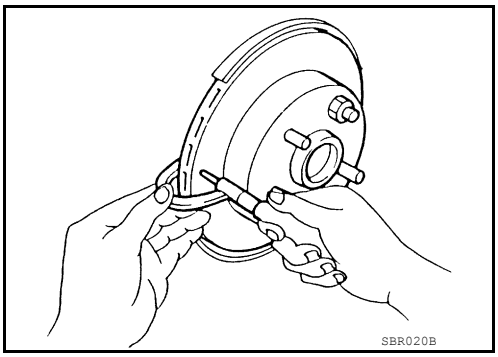
- **Check in advance that the thickness of the disc brake rotor is wear thickness + 0.3 mm (0.012 in) or more.**
- **If the thickness is less than wear thickness + 0.3 mm (0.012 in), replace the disc brake rotor.**

Wear thickness : Refer to BR-68, "Rear Disc Brake".

THICKNESS

Check thickness of disc brake rotor using a micrometer. Replace disc brake rotor if thickness is below wear limit.

Wear thickness : Refer to BR-68, "Rear Disc Brake".



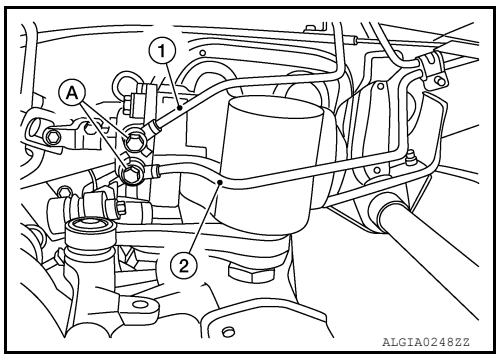
POWER STEERING FLUID AND LINES

POWER STEERING FLUID AND LINES : Draining and Refilling

INFOID:0000000014386394

DRAINING

1. Remove banjo bolts (A) and disconnect the power steering pressure line (1) and return line (2) from the steering gear. Discard the copper sealing washers.
CAUTION:
Do not reuse copper sealing washers.



2. Drain power steering fluid into a suitable container.
CAUTION:
Do not reuse power steering fluid.

REFILLING

1. Connect hydraulic lines to steering gear. Refer to ST-53, "Exploded View".
2. Fill power steering reservoir while checking power steering fluid level.
3. Bleed air from power steering hydraulic system. Refer to MA-91, "POWER STEERING FLUID AND LINES : Air Bleeding Hydraulic System".
4. Check for power steering fluid leaks. Repair as necessary.

POWER STEERING FLUID AND LINES : Air Bleeding Hydraulic System

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Incomplete air bleeding causes the following. When this happens, bleed air again.
- Air bubbles in reservoir tank.
- Clicking noise in power steering oil pump.
- Excessive buzzing in power steering oil pump.

NOTE:
When vehicle is stationary or while steering wheel is being turned slowly, some noise may be heard from power steering oil pump or the power steering gear. This noise is normal and does not affect any system.

1. Stop engine and turn steering wheel fully to right and left several times. When fluid is lowered, refill reservoir. Repeat process until fluid level is stabilized.
CAUTION:
Do not allow steering fluid reservoir tank to go below the MIN level line. Check tank frequently and add power steering fluid as needed.
2. Run engine at idle speed. Turn steering wheel fully right and then fully left, hold for about three seconds. Then check for power steering fluid leakage.
3. Repeat step 2 several times at about three second intervals.
CAUTION:
Do not hold steering wheel in the locked position for more than five seconds. (There is the possibility that the power steering oil pump may be damaged.)
4. Check for air bubbles or cloudy fluid.
5. If air bubbles or cloudiness still exists, stop engine, perform steps 2 and 3 again until air bubbles or cloudiness does not exist.
6. Stop engine, check power steering fluid level.

AXLE AND SUSPENSION PARTS

AXLE AND SUSPENSION PARTS : Inspection - Front Suspension

INFOID:0000000014386396

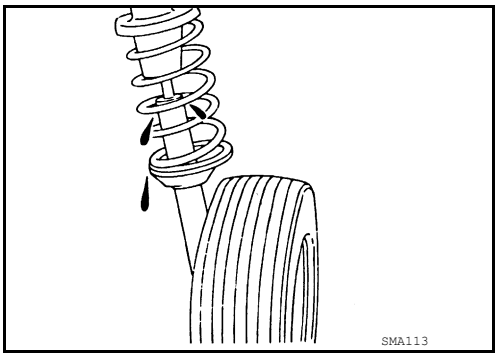
ON-VEHICLE SERVICE
- Check suspension parts for excessive play, cracks, wear or damage. Shake each front wheel to check for excessive play.
- Retighten all nuts and bolts to specified torque.
- Make sure that each cotter pin is installed.
- Check wheelarch height. Refer to FSU-37, "Wheelarch Height (Unladen*1)".

INSPECTION

Check conditions (looseness, backlash) of each component. Verify that component conditions (wear, damage) are normal.

FRONT COIL SPRING AND SHOCK ABSORBER

Check for oil leaks and damage. Replace parts if necessary.



LOWER AND UPPER LINK

- Check lower and upper links for damage, cracks, deformation and replace if necessary.
- Check rubber bushings for damage, cracks and deformation. Replace lower or upper link if necessary.
- Check suspension ball joints for grease leaks and ball joint dust covers for cracks or other damage. Replace applicable lower link or upper link if ball joint is worn or hard to swing.

FRONT STABILIZER

- Check front stabilizer and clamps for any deformation, cracks or damage and replace if necessary.
- Check rubber bushings for deterioration or cracks and replace if necessary.

STEERING KNUCKLE

Check steering knuckle for any deformation, cracks, or other damage and replace if necessary.

AXLE AND SUSPENSION PARTS : Inspection- Rear Suspension

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ON-VEHICLE SERVICE

- Check the suspension parts for excessive play, cracks, wear or damage. Shake each rear wheel to check for excessive play.
- Retighten all nuts and bolts to the specified torque.
- Check the wheelarch height. Refer to RSU-14, "Wheelarch Height (Unladen*1)".

SHOCK ABSORBER

- Check for smooth operation through a full stroke for both compression and extension.
- Check for oil leakage on the welded or gland packing portions.
- Check the shock absorber piston rod for cracks, deformation or other damage and replace if necessary.

BUSHINGS

Check the bushings for excessive wear, damage, and replace if necessary.

AXLE AND SUSPENSION PARTS : Inspection - Wheel Alignment

INFOID:0000000014386398

PRELIMINARY INSPECTION

WARNING:

Always adjust the alignment with the vehicle on a flat surface.

NOTE:

If alignment is out of specification, inspect and replace any damaged or worn suspension parts before making any adjustments.

- Check and adjust the wheel alignment with the vehicle under unladen conditions. “Unladen conditions” means that the fuel, engine coolant, and lubricants are full; and that the spare tire, jack, hand tools and mats are in their designated positions.
- Check the tires for incorrect air pressure and excessive wear. Refer to WT-76, "Tire".
- Check the wheels for deformation, cracks, and other damage. Remove the wheel and check wheel run out. Refer to WT-65, "Inspection".
- Check the wheel bearing axial end play. Refer to FAX-6, "Inspection".
- Check the shock absorbers for leaks or damage.

- Check each fastener for looseness or damage.
- Check each suspension component and the frame for damage.
- Check the wheelarch height in unladen conditions. Refer to FSU-37, "Wheelarch Height (Unladen*1)".

GENERAL INFORMATION AND RECOMMENDATIONS

1. A Four-Wheel Thrust Alignment should be performed.
   - This type of alignment is recommended for any NISSAN vehicle.
   - The four-wheel “thrust” process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
   - The alignment machine itself should be capable of accepting any NISSAN vehicle.
   - The alignment machine should be checked to ensure that it is level.
2. Make sure the alignment machine is properly calibrated.
   - Your alignment machine should be regularly calibrated in order to give correct information.
   - Check with the manufacturer of your specific alignment machine for their recommended Service/Calibration Schedule.

THE ALIGNMENT PROCESS

IMPORTANT: Use only the alignment specifications listed in this Service Manual. Refer to FSU-36, "Wheel Alignment (Unladen*1)".

1. When displaying the alignment settings, many alignment machines use “indicators”: (Green/red, plus or minus, Go/No Go). **Do NOT use these indicators.**
   - The alignment specifications programmed into your alignment machine that operate these indicators may not be correct.
   - This may result in an ERROR.
2. Most camera-type alignment machines are equipped with both "Rolling Compensation" method and optional "Jacking Compensation" method to "compensate" the alignment targets or head units. "Rolling Compensation" is the preferred method.
   - If using the "Rolling Compensation" method, after installing the alignment targets or head units, push or pull on the rear wheel to move the vehicle. Do not push or pull the vehicle body.
   - If using the "Jacking Compensation" method, after installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.
     NOTE:
     Do not use the "Rolling Compensation" method if you are using sensor-type alignment equipment.
   - Follow all instructions for the alignment machine you are using for more information.

CAMBER, CASTER, AND KINGPIN INCLINCATION ANGLES INSPECTION

1. Measure camber and caster of both the right and left wheels.

   Camber and caster : Refer to FSU-36, "Wheel Alignment (Unladen*1)".

2. If outside the specified value, adjust camber and caster to specification. Refer to FSU-36, "Wheel Alignment (Unladen*1)".

TOTAL TOE-IN INSPECTION

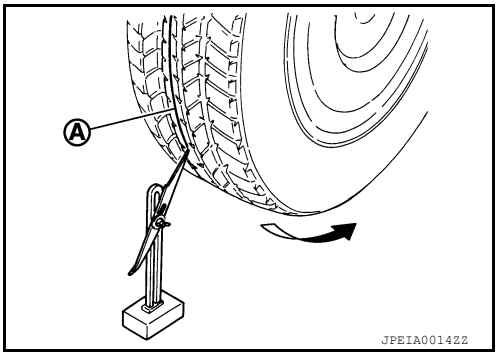
Measure the total toe-in using the following procedure:

WARNING:

- **Always perform the following procedure on a flat surface.**
- **Make sure that no person is in front of vehicle before pushing it.**

1. Bounce the front of vehicle up and down to stabilize the vehicle height (posture).
2. Push on the rear wheel to move the vehicle straight ahead about 5 m (16 ft).

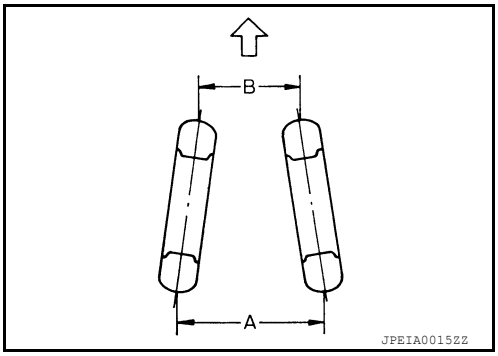
3. Put a mark on the base line of the tread (rear side) of both tires at the same height of hub center. These are measuring points.



4. Measure the distance (A) from the rear side.

⇦ : Front

5. Push on the rear wheel to move the vehicle slowly ahead and to rotate the wheels 180 degrees (1/2 turn).
CAUTION:
If the wheels have rotated more than 180 degrees (1/2 turn), try the above procedure again from the beginning. Do not push vehicle backward.
6. Measure the distance (B) from the front side.



7. Use the formula below to calculate total toe-in.

Total toe-in formula : A - B
Total toe-in specification : Refer to FSU-36, "Wheel Alignment (Unladen*1)".

- If the total toe-in is outside the specification, adjust the total toe-in. Refer to FSU-8, "Adjustment".

AXLE AND SUSPENSION PARTS : Adjustment - Wheel Alignment

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CAMBER AND CASTER ADJUSTMENT

1. Adjust the camber and caster using the cam bolts in the front lower link. Refer to FSU-15, "Exploded View".
CAUTION:
After adjusting the camber and caster, check the toe-in.

2. Tighten the cam bolt nuts to specification. Refer to FSU-15, "Exploded View".

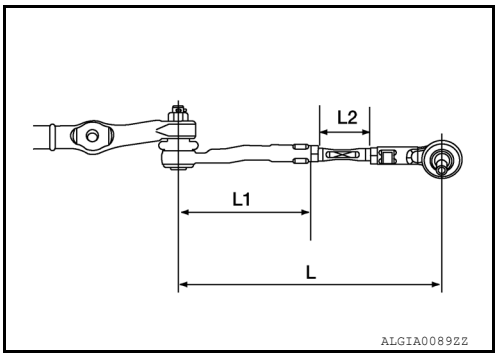
TOE-IN ADJUSTMENT

1. Adjust the toe-in by varying the length of the steering outer socket.

a. Loosen the outer tie-rod lock nuts.

b. Adjust the toe-in by screwing the outer tie-rods in or out.

Standard length (L) : Refer to ST-87, "Steering Linkage - XD Models".
Inner socket length (L1) : Refer to ST-87, "Steering Linkage - XD Models".
Possible amount of adjustment (L2) : Refer to ST-87, "Steering Linkage - XD Models".



c. Tighten the outer tie-rod lock nuts to specification.

Lock nut : Refer to ST-56, "Exploded View".

BODY MAINTENANCE

LOCKS AND HINGES

LOCKS AND HINGES : Lubricating Locks, Hinges and Hood Latches

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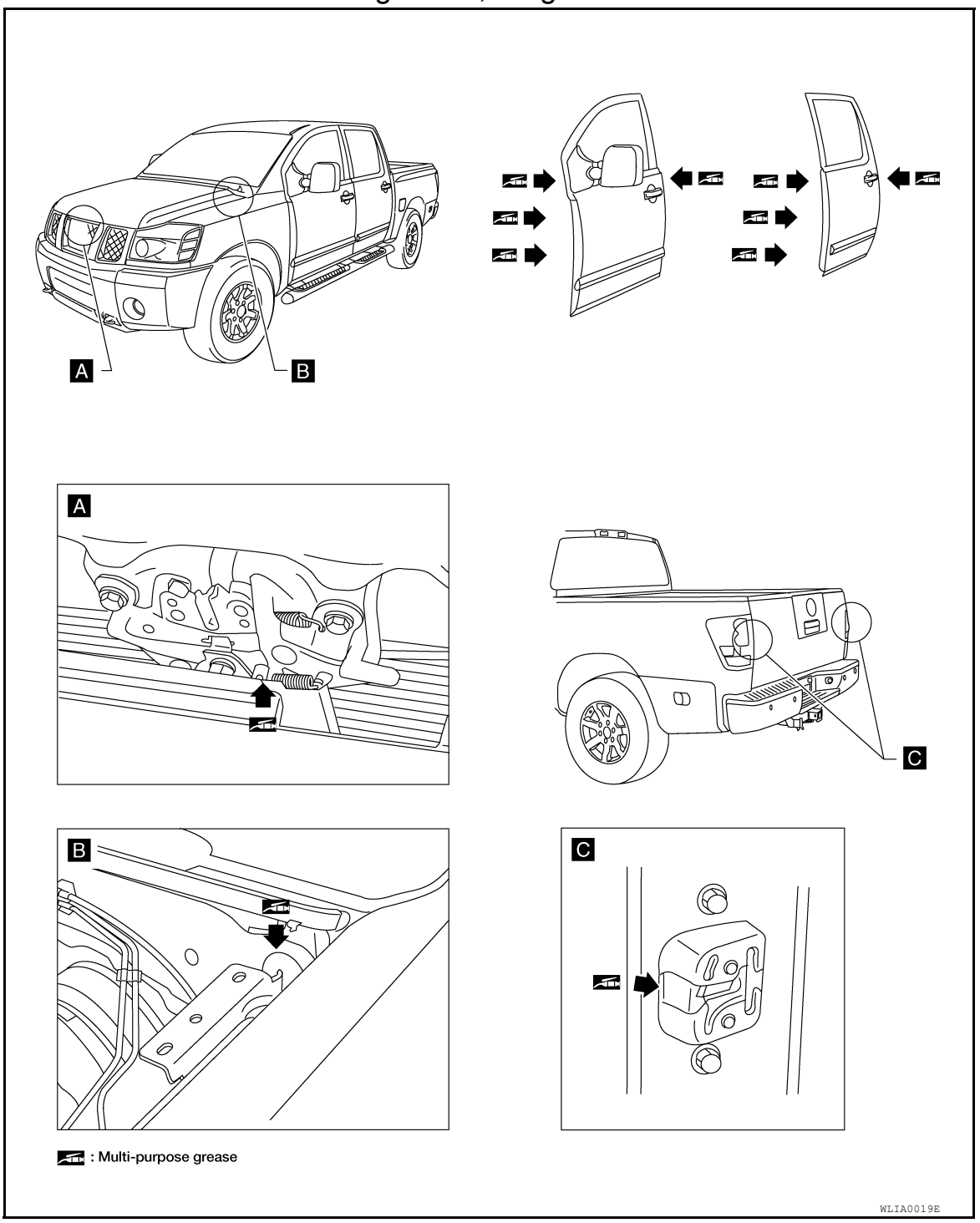

NOTE:
Lubricate the locations shown with a suitable multi-purpose grease.
Refer to MA-62, "Cummins 5.0L Engine : Fluids and Lubricants".

SEAT BELT, BUCKLES, RETRACTORS, ANCHORS AND ADJUSTERS

SEAT BELT, BUCKLES, RETRACTORS, ANCHORS AND ADJUSTERS : Inspection

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AFTER A COLLISION

WARNING:
Inspect all seat belt assemblies including retractors and attaching hardware after any collision. NISSAN/INFINITI recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Failure to do so could result in serious personal injury in an accident. Seat belt assemblies not in use during a collision should also be replaced if either damage or improper operation is noted. Seat belt pretensioners should be replaced even if the seat belts are not in use during a frontal collision in which the air bags are deployed.

Replace any seat belt assembly (including anchor bolts) if:

- The seat belt was in use at the time of a collision (except for minor collisions and the belts, retractors and buckles show no damage and continue to operate properly).
- The seat belt was damaged in an accident (i.e. torn webbing, bent retractor or guide, etc.).
- The seat belt attaching point is damaged in an accident. Inspect the seat belt attaching area for damage or distortion and repair if necessary before installing a new seat belt assembly.
- Anchor bolts are deformed or worn out.
- The seat belt pre-tensioner should be replaced even if the seat belts are not in use during the collision in which the air bags are deployed.

PRELIMINARY CHECKS

1. Check the seat belt warning lamp for proper operation per the following:

a. Turn ignition switch ON. The seat belt warning lamp should illuminate.

b. Fasten driver seat belt. The seat belt warning lamp should turn OFF.

2. If the air bag warning lamp is blinking, perform self-diagnosis with CONSULT and air bag warning lamp. Refer to SRC-57, "Trouble Diagnosis with CONSULT".
3. Check that the seat belt retractor, seat belt anchor and buckle bolts are tightened firmly.
4. Check the shoulder seat belt guide and shoulder belt height adjuster for front seats. Check that guide swivels freely and that webbing lays flat and does not bind in guide. Check that height adjuster operates properly and holds securely.
5. Check retractor operation:

a. Fully extend the seat belt webbing and check for twists, tears or other damage.

b. Allow the seat belt to retract. Check that webbing returns smoothly and completely into the retractor. If the seat belt does not return smoothly, wipe the inside of the loops with a clean paper cloth. Dirt build-up in the loops of the upper anchors can cause the seat belts to retract slowly.

c. Fasten the seat belt. Check that seat belt returns smoothly and completely to the retractor. If the webbing does not return smoothly, the cause may be an accumulation of dust or dirt. Use the “SEAT BELT TAPE SET” and perform the following steps.

d. Inspect the front seat belt D-ring anchor
   1. Pull the seat belt out to a length of 500 mm (19.69 in) or more.
   2. Hold the seat belt at the center pillar webbing opening with a clip or other device.
   3. Pass a thin wire through the D-ring anchor webbing opening. Hold both ends of the wire and pull it tightly while moving it up and down several times along the webbing opening surface to remove dirt stuck there.
   4. Any dirt that cannot be removed with the wire can be removed by cleaning the opening with a clean cloth.
   5. Apply tape at the point where the webbing contacts the D-ring anchor webbing opening.
      NOTE:
      Apply the tape so that there is no slack or wrinkling.
   6. Remove the clip holding the seat belt and check that the webbing returns smoothly.

6. Repeat steps above if necessary to check the other seat belts.

SEAT BELT RETRACTOR ON-VEHICLE CHECK

Emergency Locking Retractors (ELR) and Automatic Locking Retractors (ALR)
NOTE:
All seat belt retractors are Emergency Locking Retractors (ELR) type. In an emergency (sudden stop) the retractor will lock and prevent the webbing from extending any further. All 3-point type seat belt retractors except the driver seat belt also have an Automatic Locking Retractors (ALR) mode. The ALR mode (also called child restraint mode) is used when installing child seats. The ALR mode is activated when the seat belt

is fully extended. When the webbing is then retracted partially, the ALR mode automatically locks the seat belt in a specific position so the webbing cannot be extended any further. To cancel the ALR mode, allow the seat belt to fully wind back into the retractor.
Check the seat belt retractors with the following test(s) to determine if a retractor assembly is operating properly.

ELR Function Stationary Check

Grasp the shoulder webbing and pull forward quickly. The retractor should lock and prevent the belt from extending further.

ALR Function Stationary Check

1. Pull out the entire length of seat belt from retractor until a click is heard.
2. Retract the webbing partially. A clicking noise should be heard as the webbing retracts, indicating that the retractor is in the Automatic Locking Retractors (ALR) mode.
3. Grasp the seat belt and try to pull out the retractor. The webbing must lock and not extend any further. If it does not operate normally, replace the retractor assembly.
4. Allow the entire length of the webbing to retract to cancel the automatic locking mode.

ELR Function Moving Check

WARNING:

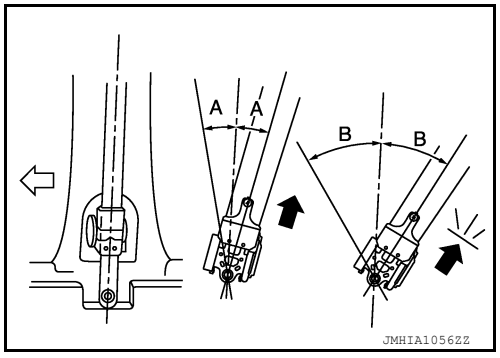
Perform the following test in a safe, open area clear of other vehicles and obstructions (for example, a large, empty parking lot). Road surface must be paved and dry. Never perform the following test on wet or gravel roads or on public streets and highways. This could result in an accident and serious personal injury. The driver and passenger must be prepared to brace themselves in the event that the retractor does not lock.

1. Fasten driver seat belt. Buckle a passenger into the seat for the belt that is to be tested.
2. Proceed to the designated safe area.
3. Drive the vehicle at approximately 16 km/h (10 mph). Notify any passengers of a pending sudden stop and the driver and passenger must be prepared to brace themselves in the event that the retractor does not lock. Apply brakes firmly and make a very hard stop.

During stopping, seat belts should lock and not be extended. If the seat belt retractor assembly does not lock, perform the retractor off-vehicle check.

FRONT SEAT BELT (LH/RH) RETRACTOR OFF-VEHICLE CHECK

1. Remove the front seat belt retractor. Refer to SB-9, "SEAT BELT RETRACTOR : Removal and Installation".
2. Slowly pull out webbing while tilting the seat belt retractor forward from the mounted position without twisting the seat belt retractor as shown.
   A : The webbing can be pulled out if the retractor is tilted 15° degree or less.
   B : The webbing can not be pulled out if the retractor is tilted 45° degrees or more.
   NOTE:
   A and B show tilting angles.
   ⇦: Front

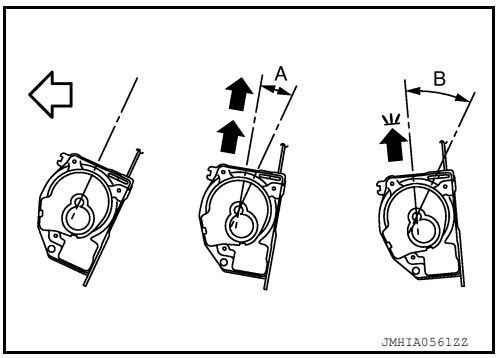


3. Replace the seat belt retractor if it does not operate within specifications.

FRONT SEAT BELT (CENTER) RETRACTOR OFF-VEHICLE CHECK

1. Remove the front seat belt retractor. Refer to SB-9, "SEAT BELT RETRACTOR : Removal and Installation".
2. Slowly pull out webbing while tilting the seat belt retractor forward from the mounted position without twisting the seat belt retractor as shown.

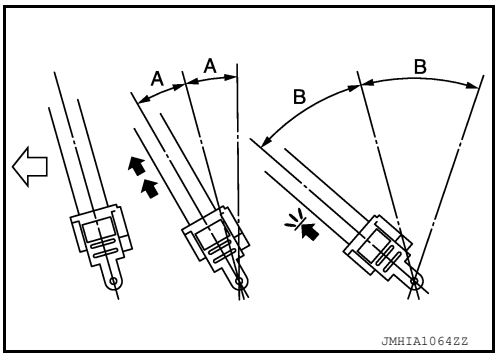
A : The webbing can be pulled out if the retractor is tilted 15° degree or less.
B : The webbing can not be pulled out if the retractor is tilted 45° degrees or more.
NOTE:
A and B show tilting angles.
⇦: Front



3. Replace the seat belt retractor if it does not operate within specifications.

REAR SEAT BELT OUTER RETRACTOR OFF-VEHICLE CHECK

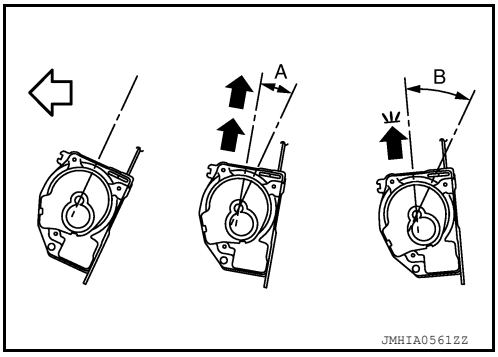
1. Remove the rear seat belt retractor. Refer to SB-14, "SEAT BELT RETRACTOR : Removal and Installation".
2. Slowly pull out webbing while tilting the seat belt retractor forward from the mounted position without twisting the seat belt retractor as shown.
A : The webbing can be pulled out if the retractor is tilted 15° degree or less.
B : The webbing can not be pulled out if the retractor is tilted 45° degrees or more.
NOTE:
A and B show tilting angles.
⇦: Front



3. Replace the seat belt retractor if it does not operate within specifications.

REAR SEAT BELT CENTER RETRACTOR OFF-VEHICLE CHECK

1. Remove the rear seat belt center retractor. Refer to SB-14, "SEAT BELT RETRACTOR : Removal and Installation".
2. Slowly pull out webbing while tilting the seat belt retractor forward from the mounted position without twisting the seat belt retractor as shown.
A : The webbing can be pulled out if the retractor is tilted 15° degree or less.
B : The webbing can not be pulled out if the retractor is tilted 45° degrees or more.
NOTE:
A and B show tilting angles.
⇦: Front



3. Replace the seat belt retractor if it does not operate within specifications.