

# SECTION MA

## MODIFICATION NOTICE:

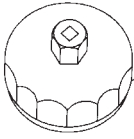
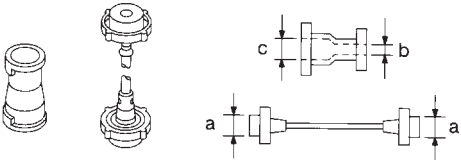
- VG33E engine has been introduced for Australia.
- Automatic transmission models equipped with QD32 engine have been introduced.
- However, since the periodic maintenance schedule and maintenance procedures on chassis and body maintenance have not been changed, except for the air bag system, refer to D22 Service Manual supplement-II and supplement-III, 1st Revision.
- Periodic maintenance on the air bag system has been deleted because the reliability of the air bag system has been confirmed for the vehicle's usable life.

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<div style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></div> <b>VG33E</b> <div style="border: 1px solid black; display: inline-block; width: 100px; height: 15px;"></div>		<b>CHASSIS AND BODY MAINTENANCE</b> .....	16
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# PREPARATION

## Special Service Tools

Tool number Tool name	Description	Engine application
		VG33E
KV10115801 Oil filter cap wrench	 <p>14 faces, Inner span: 64.3 mm (2.531 in) (Face to opposite face)</p> <p>NT362</p>	<p>Removing and installing oil filter</p> <p>X</p>
EG17650301 Radiator cap tester adapter	 <p>NT564</p> <p>a: 28 (1.10) dia. b: 31.4 (1.236) dia. c: 41.3 (1.626) dia. Unit: mm (in)</p>	<p>Adapting radiator cap tester to radiator filler neck</p> <p>X</p>

# PERIODIC MAINTENANCE

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.

## VG33E Engine and Emission Control Maintenance

Abbreviations: I = Inspect and correct or replace as necessary, R = Replace, A = Adjust, C = Clean, D = Drain water and inspect, E = Check and correct the engine coolant mixture ratio.

MAINTENANCE OPERATION				MAINTENANCE INTERVAL								Reference page
Perform at the specified months or mileage whichever comes first.	Months	—	6	12	18	24	30	36	42	48		
	km x 1,000	1	10	20	30	40	50	60	70	80		
	(Miles x 1,000)	(0.6)	(6)	(12)	(18)	(24)	(30)	(36)	(42)	(48)		
I. Engine common item											VG33E	
Drive belts						I				I	MA-6	
Engine coolant (Use Nissan Genuine Engine Coolant or equivalent in its quality)	See NOTE (1)					E				R	MA-7	
Cooling system				I		I		I		I	MA-9	
Fuel lines						I				I	MA-10	
Air cleaner filter (Viscous paper type)★						R				R	MA-11	
Engine oil filter★			R	R	R	R	R	R	R	R	MA-12	
II. Gasoline engine exclusive item												
Engine oil (Use recommended oil)★			R	R	R	R	R	R	R	R	MA-11	
Fuel filter★						R				R	MA-10	
Spark plugs (Platinum-tipped type)						Replace every 100,000 km (60,000 miles)					MA-13	
Ignition wires						I				I	MA-14	
EVAP vapor lines (With carbon canister)						I				I	MA-15	
Timing belt						Replace every 100,000 km (60,000 miles)					EM section	
Heated oxygen sensor						I				I	EC section	

★: Maintenance items with “★” should be performed more frequently according to “Maintenance Under Severe Driving Conditions”.

NOTE: (1) Use Nissan Genuine Engine Coolant, or equivalent in its quality, in order to avoid possible aluminum corrosion within the engine cooling system caused by the use of non-genuine engine coolant. After first replacement, replace every 40,000 km (24,000 miles) or 24 months.

## PERIODIC MAINTENANCE

### Maintenance Under Severe Driving Conditions

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 (VG33E engine models)

- A — Driving under dusty conditions
- B — Driving repeatedly short distances
- C — Towing a trailer or caravan
- D — Extensive idling
- E — Driving in extremely adverse weather conditions or in areas where ambient temperatures are either extremely low or extremely high

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

Driving condition					Maintenance item	Maintenance operation	Maintenance interval	Reference page
A	B	C	D	.	Engine oil & oil filter	Replace	Every 3 months or 5,000 km (3,000 miles)	MA-11, 12
A	.	.	.	.	Air cleaner filter      Viscous paper type	Replace	More frequently	MA-11
A	.	.	.	E	Fuel filter	Replace	Every 20,000 km (12,000 miles) or 12 months	MA-10

# RECOMMENDED FLUIDS AND LUBRICANTS

## Fluids and Lubricants

		Capacity (Approximate)		Recommended Fluids/Lubricants
		Liter	Imp measure	
Engine oil (Refill) With oil filter	VG33E QD32	3.3 2WD 7.2 4WD 6.9	2-7/8 qt 6-3/8 qt 6-1/8 qt	Except for Europe: Gasoline engine: API SE, SF, SG, SH, SJ or SL*1 ILSAC grade GF-I, GF-II, GF-III or SG+*1 Diesel engine: API CC, CD, CE, CF and CF-4*5 JASO DH-1 DHD-1
	Without oil filter	3.0 2WD 6.5 4WD 6.2	2-5/8 qt 5-3/4 qt 5-1/2 qt	
Cooling system (With reservoir)	VG33E QD32	8.2 9.4, 10.2*3, 10.3*4	7-1/4 qt 8-1/4 qt, 9 qt*3, 9-1/8 qt*4	Nissan Genuine Engine Coolant, or equivalent in its quality*2
Manual transmission gear oil	FS5R30A	2WD 2.8 4WD 5.1	4-7/8 pt 9 pt	API GL-4, Viscosity SAE 75W-85 only
	FS5W71C	2WD 2.0 4WD 4.9	3-1/2 pt 8-5/8 pt	
Automatic transmission fluid	RE4R01A	8.5	7-1/2 qt	Genuine Nissan ATF or equivalent*6
Transfer fluid	TX10A	2.2	2 qt	Genuine Nissan ATF or equivalent*6 or API GL-4*1
Differential gear oil	Front R180A	1.3	2-1/4 pt	Standard differential gear: API GL-5*1 Limited-slip differential (LSD) gear: Gear Oil Hypoid LSD (Part No.: KLD31-1400203) or equivalent*7
	Rear C200	1.3	2-1/4 pt	
Power steering fluid		—	—	Type DEXRON™III or equivalent
Brake and clutch fluid		—	—	DOT 3 (U.S. FMVSS No. 116)
Propeller shaft grease		—	—	NLGI No. 2 (Lithium soap base)
Multi-purpose grease		—	—	NLGI No. 2 (Lithium soap base)

\*1: For further details, see "SAE Viscosity Number".

\*2: Use Nissan Genuine Engine Coolant, or equivalent in its quality, in order to avoid possible aluminum corrosion within the engine cooling system caused by the use of non-genuine engine coolant.

**Note that any repairs for the incidents within the engine cooling system while using non-genuine engine coolant may not be covered by the warranty even if such incidents occurred during the warranty period.**

\*3: M/T models for Australia or M/T models with air conditioner

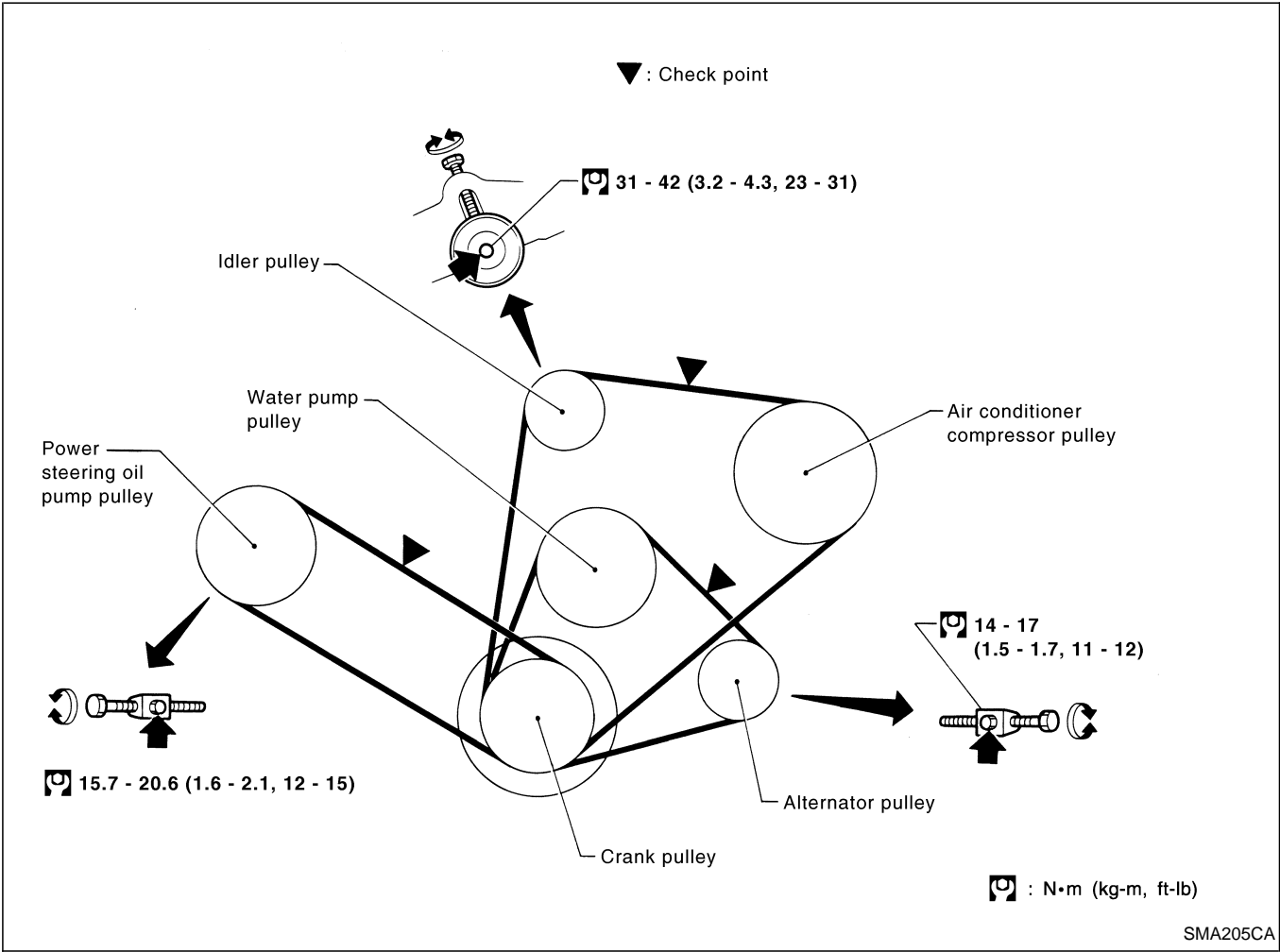
\*4: A/T models

\*5: Never use CG-4 grade oil. However, if JASO DH-1 grade approval is described with CG-4 grade on the oil container, this oil can be used.

\*6: Contact a NISSAN dealership for more information regarding suitable fluid, including recommended brand(s) of DEXRON™III/MERCON™ Automatic Transmission Fluid.

\*7: API GL-5, SAE 140 and 10% volume of LSD Friction Modifier (Part No.: 38469-C6000) is an equivalent.

Checking Drive Belts



**WARNING:**

Be sure to perform when the engine is stopped.

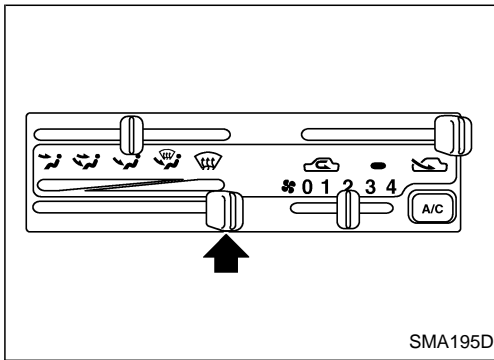
1. Inspect for cracks, fraying, wear or oil adhesion. If necessary, replace with a new one.
2. Inspect drive belt deflection by pushing on the belt midway between pulleys.

- Inspect drive belt deflection when engine is cold.
- Adjust if belt deflection exceed the limit or if belt tension is not within specifications.

**Belt deflection:**

Unit: mm (in)

	Used belt deflection		Deflection of new belt
	Limit	Deflection after adjustment	
Alternator and water pump	12 (0.47)	6 - 8 (0.24 - 0.31)	5 - 7 (0.20 - 0.28)
Air conditioner compressor	16 (0.63)	9 - 11 (0.35 - 0.43)	7 - 9 (0.28 - 0.35)
Power steering oil pump	17 (0.67)	11 - 13 (0.43 - 0.51)	9 - 11 (0.35 - 0.43)
Applied pushing force	98 N (10 kg, 22 lb)		



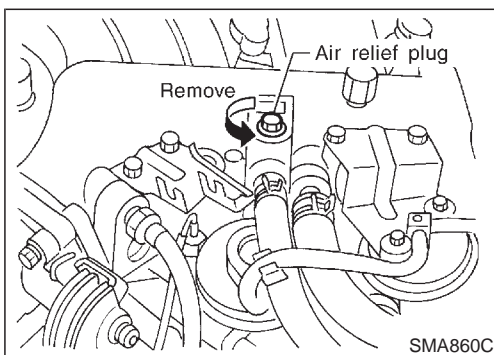
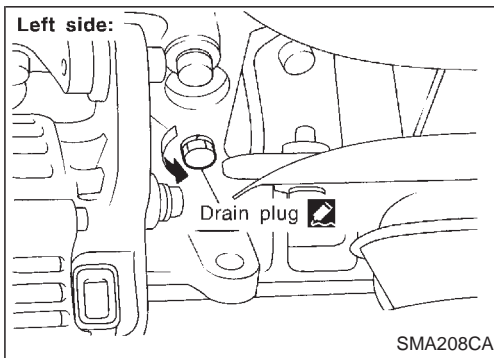
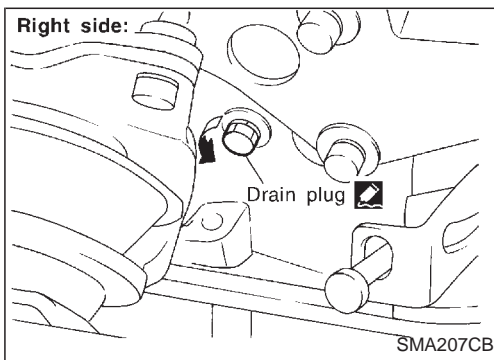
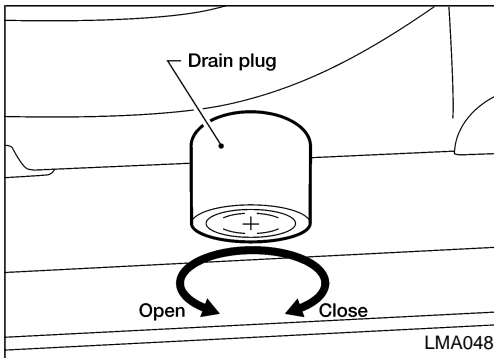
## Changing Engine Coolant

### WARNING:

- To avoid being scalded, never change the engine coolant when the engine is hot.
- Wrap a thick cloth around cap and carefully remove the cap. First, turn the cap a quarter of a turn to release built-up pressure. Then turn the cap all the way.

### — DRAINING ENGINE COOLANT —

1. Move heater "TEMP" control lever all the way to "HOT".
- **Make sure that air conditioner switch is "OFF".**
2. Open radiator drain plug at the bottom of radiator, and remove radiator filler cap.
3. Remove reservoir tank, drain engine coolant, then clean reservoir tank.  
Install it temporarily.
- **Be careful not to allow engine coolant to contact drive belts.**
4. Remove cylinder block drain plug on both sides and air relief plug on heater hose.




5. Check drained engine coolant for contaminants such as rust, corrosion or discoloration.  
If contaminated, flush engine cooling system.  
Refer to "—FLUSHING COOLING SYSTEM—", MA-8.

**Changing Engine Coolant (Cont'd)****— REFILLING ENGINE COOLANT —**


1. Install reservoir tank and cylinder block drain plugs, then close radiator drain plug.

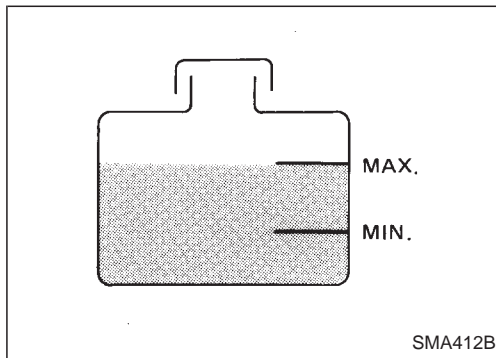
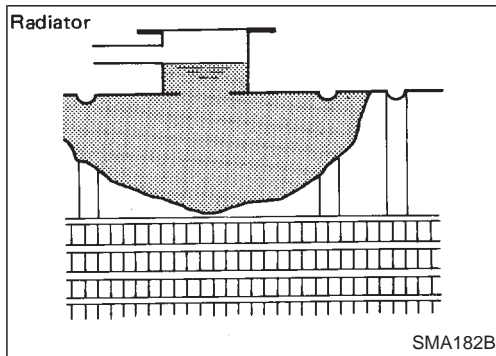
- **Apply sealant to the thread of cylinder block drain plug.**

**Cylinder block drain plug:**

 : 34 - 44 N·m (3.5 - 4.5 kg-m, 25 - 32 ft-lb)

**Radiator drain plug:**

 : 0.78 - 1.56 N·m (0.08 - 0.15 kg-m, 7 - 13 in-lb)



2. Fill radiator slowly with engine coolant until engine coolant spills from the air relief plug hole on heater hose, then install air relief plug.

**Air relief plug**

 : 7 - 8 N·m (0.7 - 0.8 kg-m, 61 - 69 in-lb)

3. Fill radiator and reservoir tank to specified level as soon as engine coolant spills out without bubbles.

- **Use Nissan Genuine Engine Coolant or equivalent mixed with water (distilled or demineralized).**
- **Pour coolant through coolant filler neck slowly to allow air in system to escape.**

Refer to "RECOMMENDED FLUIDS AND LUBRICANTS", MA-5.

**Engine coolant capacity (With reservoir tank)**

**(Approximate):**

**8.2ℓ (7-1/4 Imp qt)**

**Reservoir tank capacity (for MAX level):**

**0.8ℓ (3/4 Imp qt)**

4. Warm up engine to normal operating temperature with radiator cap installed.
5. Run engine at 2,500 rpm for 10 seconds and return to idle speed.

- Repeat two or three times.

**Watch engine coolant temperature gauge so as not to overheat the engine.**

6. Stop engine and cool it down.
- Cool down using a fan to reduce the time.
- If necessary, refill radiator up to filler neck with engine coolant.
7. Refill reservoir tank to Max line with engine coolant.
8. Repeat step 4 through step 7 two or more times until engine coolant level no longer drops.
9. Check cooling system for leaks with engine running.
10. Warm up engine, and check for sound of engine coolant flow while running engine from idle up to 3,000 rpm with heater temperature control set at several positions between COOL and HOT.
- Sound may be noticeable at heater water cock.
11. If sound is heard, bleed air from cooling system by repeating steps 4 through 7 until engine coolant level no longer drops.
- **Clean excess engine coolant from engine.**

**— FLUSHING COOLING SYSTEM —**

1. Open air relief plug on heater hose.
2. Fill radiator with water until water spills from the air relief hole on heater hose, then close air relief plug. Fill radiator and reservoir tank with water and reinstall radiator cap.
3. Run engine and warm it up to normal operating temperature.
4. Rev engine two or three times under no-load.
5. Stop engine and wait until it cools down.



## Changing Engine Coolant (Cont'd)

6. Drain water.
7. Repeat steps 1 through 6 until clear water begins to drain from radiator.

GI

MA

EM

LC

EC

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

RS

BT

HA

EL

IDX

## Checking Cooling System

### **WARNING:**

Never remove the radiator cap when the engine is hot; serious burns could be caused by high pressure fluid escaping from the radiator.

Wrap a thick cloth around the cap and carefully remove the cap by turning it a quarter turn to allow built-up pressure to escape. Then continue turning the cap until it can be removed safely.

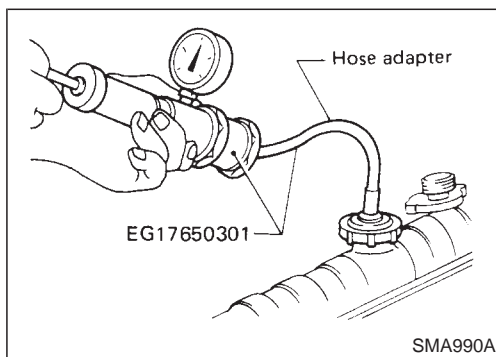
### CHECKING COOLING SYSTEM HOSES

Check hoses for improper attachment, leaks, cracks, damage, loose connections, chafing and deterioration.

### CHECKING RADIATOR

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

- Be careful not to bend or damage the radiator fins.
  - When radiator is cleaned without removal, remove all surrounding parts such as cooling fan, radiator shroud and horns. Then tape the 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 the radiator.
  4. Blow air into the back side of radiator core vertically downward.
  - Use compressed air lower than 490 kPa (4.9 bar, 5 kg/cm<sup>2</sup>, 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.



### CHECKING COOLING SYSTEM FOR LEAKS

To check for leakage, apply pressure to the cooling system with a tester.

#### Testing pressure:

157 kPa (1.5 bar, 1.6 kg/cm<sup>2</sup>, 23 psi)

### **WARNING:**

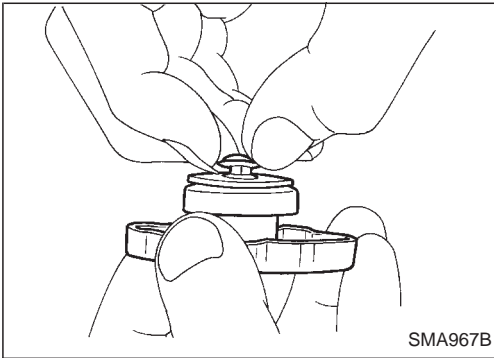
Never remove the radiator cap when the engine is hot. Serious burns could occur from high pressure coolant escaping from the radiator.

### **CAUTION:**

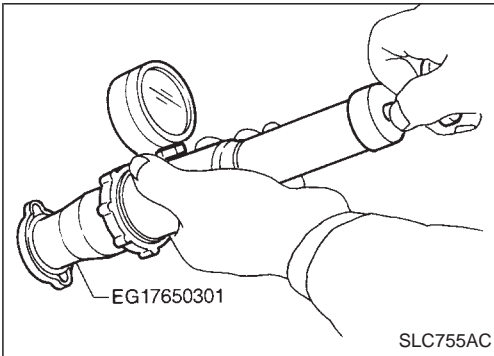
Higher than the specified pressure may cause radiator damage.

## Checking Cooling System (Cont'd)

### CHECKING RADIATOR CAP



1. Pull the negative pressure valve to open it and check that it close completely when released.
  - Check that there is no dirt or damage on the valve seat of the radiator cap negative-pressure valve.
  - Check that there are no abnormalities in the opening and closing conditions of the negative-pressure valve.



2. Check radiator cap relief pressure.

#### Standard:

78 - 98 kPa (0.78 - 0.98 bar, 0.8 - 1.0 kg/cm<sup>2</sup>, 11 - 14 psi)

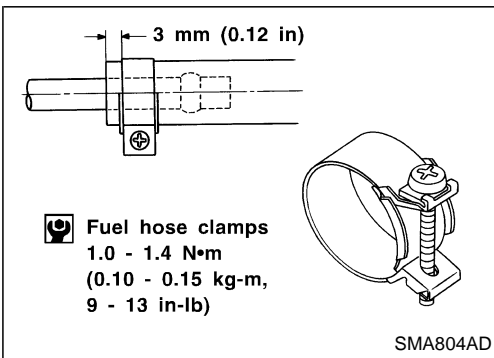
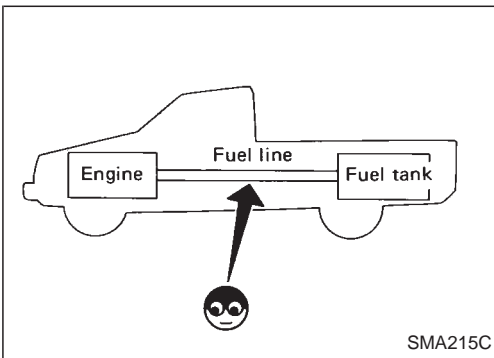
#### Limit:

59 kPa (0.59 bar, 0.6 kg/cm<sup>2</sup>, 9 psi)

- When connecting the radiator cap to the tester, apply engine coolant to the cap seal part.
- Replace the radiator cap if there is an abnormality in the negative-pressure valve, or if the open-valve pressure is outside of the standard values.

## Checking Fuel Lines

Inspect fuel lines and tank for improper attachment and for leaks, cracks, damage, loose connections, chafing and deterioration. If necessary, repair or replace malfunctioning parts.



### CAUTION:

Tighten high-pressure rubber hose clamp so that clamp end is 3 mm (0.12 in) from hose end.

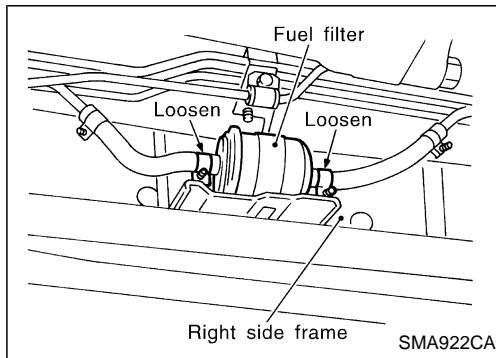
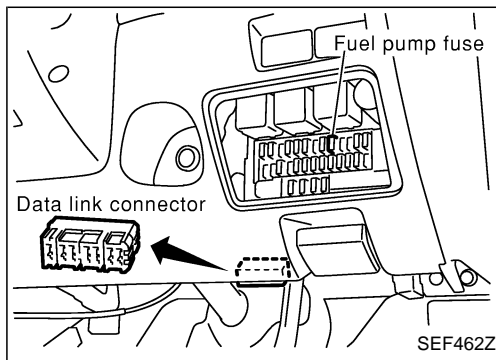
Tightening torque specifications are the same for all rubber hose clamps.

Ensure that screw does not contact adjacent parts.

## Changing Fuel Filter

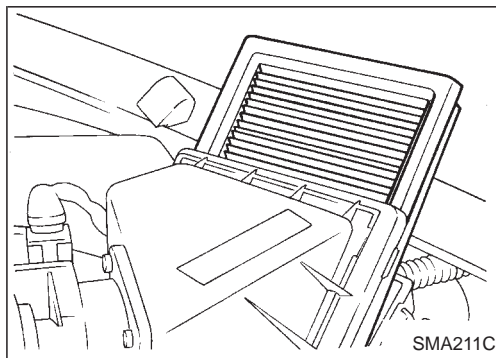
### WARNING:

Before removing fuel filter, release fuel pressure from fuel line to eliminate danger.



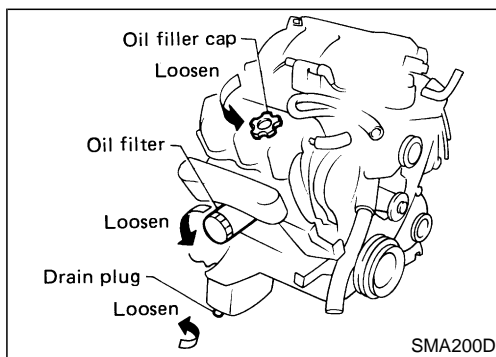
## Changing Fuel Filter (Cont'd)

1. Remove fuse for fuel pump (Without CONSULT-II).
2. Start engine.
3. Perform "FUEL PRESSURE RELEASE" in "WORK SUPPORT" mode to release fuel pressure to zero (With CONSULT-II).
4. After engine stalls, crank engine two or three times to make sure that fuel pressure is released.
5. Turn ignition switch OFF (and install fuse for fuel pump when CONSULT-II is not used).
6. Loosen fuel hose clamps.
7. Replace fuel filter.
  - Be careful not to spill fuel over engine compartment. Place a shop towel to absorb fuel.
  - Use a high-pressure type fuel filter. Do not use a synthetic resinous fuel filter.
  - When tightening fuel hose clamps, refer to "Checking Fuel Lines", MA-10.
8. Check for fuel leaks in the following manner.
  - a. Turn ignition switch ON (do not start engine), then check connections for leaks by applying fuel pressure to fuel piping.
  - b. Start engine and let it idle and make sure there are no fuel leaks at fuel system connections.



## Changing Air Cleaner Filter

The viscous paper type filter does not need cleaning between renewals.



## Changing Engine Oil

### WARNING:

- Be careful not to burn yourself, as the engine oil is 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.
1. Warm up engine, put vehicle horizontally and check for engine oil leakage from engine components.
  2. Stop engine and wait for 15 minutes.
  3. Remove drain plug and oil filler cap.
  4. Drain engine oil.

## Changing Engine Oil (Cont'd)

- Install drain plug and refill with new engine oil.

### Oil capacity (Refill) (Approximate):

With oil filter change

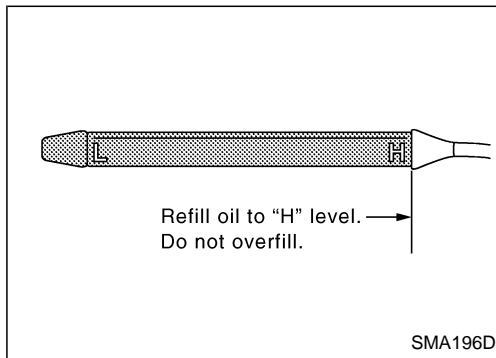
3.3ℓ (2-7/8 Imp qt)

Without oil filter change

3.0ℓ (2-5/8 Imp qt)

### CAUTION:

- Be sure to clean drain plug and install with new washer.  
Oil pan drain plug:  
Ⓐ: 29 - 39 N·m (3.0 - 4.0 kg-m, 22 - 29 ft-lb)
- Use recommended engine oil. Refer to MA-5.
- Since the refill capacity changes depending on the oil temperature and drain time, use these value as a reference and be certain to check the dipstick when changing the oil.



5. Check oil level.
6. Start engine and check area around drain plug and oil filter for oil leakage.
7. Run engine for a few minutes, then it off. After several minutes, check oil level.

## Changing Oil filter

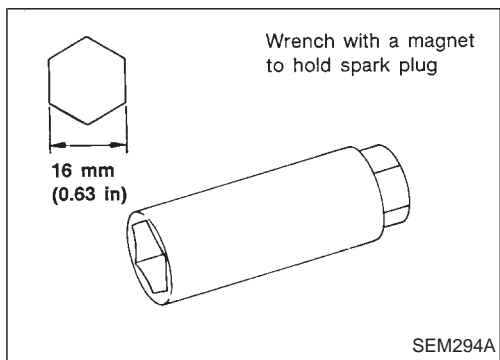
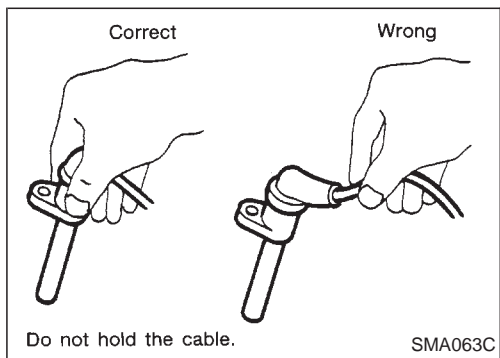
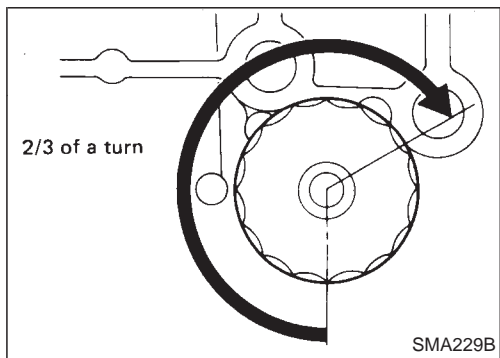
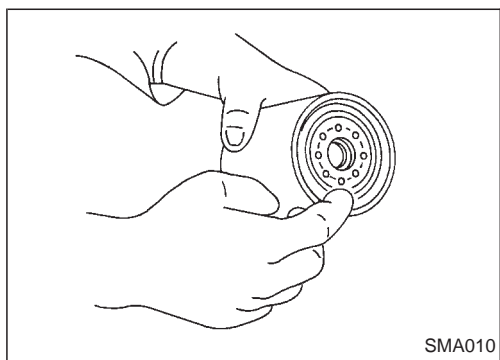
1. Remove oil filter with SST (KV10115801).

### WARNING:

Be careful not to burn yourself, as the engine and engine oil are hot.

### CAUTION:

- Use genuine NISSAN oil filter or equivalent.
- When removing, prepare a shop cloth to absorb any engine oil leakage or spillage.
- Do not allow engine oil to adhere to the drive belts.
- Completely wipe off any engine oil that adhere to the engine and the vehicle.

**Changing Oil filter (Cont'd)**

- Before installing a new oil filter, clean the oil filter mounting surface on cylinder block, and coat the oil filter rubber seal with a little engine oil.

- Screw in the oil filter until a slight resistance is felt, then tighten additionally more than 2/3 turn.
- Add engine oil.

**Refer to MA-11, "Changing Engine Oil".**

**Changing Spark Plugs**

- Disconnect ignition wires from spark plugs at boot. Do not pull on the wire.

- Remove spark plugs with spark plug wrench (commercial service tool).

**Spark plug (Platinum-tipped type):**

	Symbol	Make
Standard type	PFR5G-11	NGK
Hot type	PFR4G-11	NGK
Cold type	PFR6G-11	NGK

- Use standard type spark plug for normal condition.
- The hot type spark plug is suitable when fouling occurs with the standard type spark plug under conditions such as:

- frequent engine starts
- low ambient temperatures

The cold type spark plug is suitable when spark knock occurs with the standard type spark plug under conditions such as:

- extended highway driving
- frequent high engine revolution

**Gap (Nominal): 1.1 mm (0.043 in)**

## Changing Spark Plugs (Cont'd)

**CAUTION:**

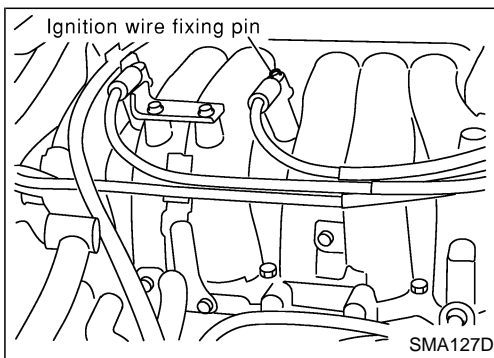
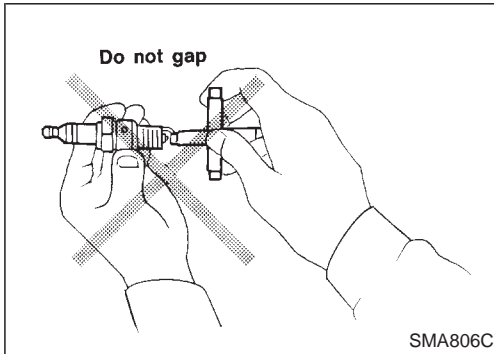
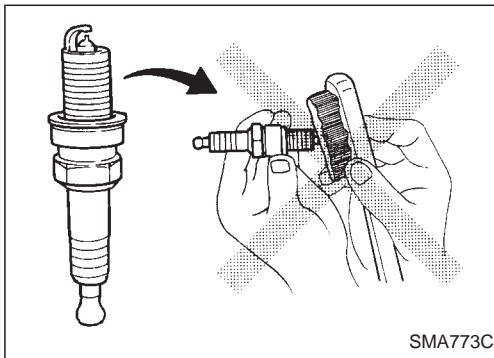
- Do not drop or shock spark plug.
- Do not use a wire brush for cleaning.
- If plug tip is covered with carbon, spark plug cleaner may be used.

Cleaner air pressure:

Less than 588 kPa (5.88 bar, 6 kg/cm<sup>2</sup>, 85 psi)

Cleaning time:

Less than 20 seconds



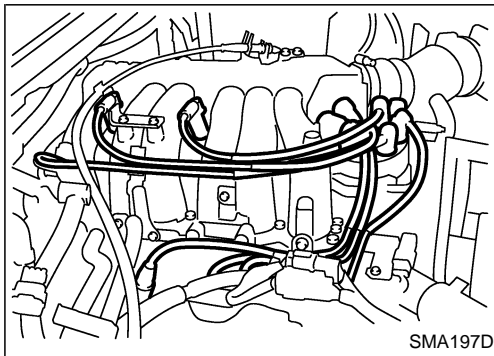
- Checking and adjusting plug gap is not required between change intervals.

3. Install spark plugs. Reconnect ignition wires according to Nos. indicated on them.

**When installing spark plugs to No. 2 and 4 cylinders, securely fit each ignition wire mounting hole onto the ignition wire fixing pin.**

Spark plug:

: 20 - 29 N·m (2.0 - 3.0 kg-m, 14 - 22 ft-lb)

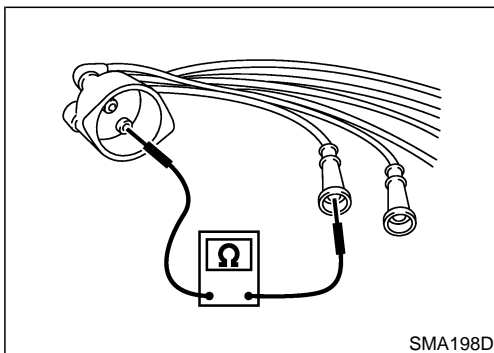


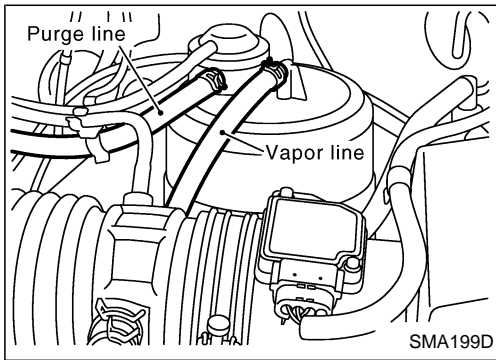
## Checking Ignition Wires

1. Inspect wires for cracks, damage, burned terminals and for improper fit.
2. Measure the resistance of wires and check for intermittent breaks by shaking them.

**Resistance: Less than 30 kΩ**

If NG, replace ignition wires with a new one.





## Checking Vapor Lines

1. Visually inspect vapor lines for improper attachment and for cracks, damage, loose connections, chafing and deterioration.
2. Inspect vacuum relief valve of fuel tank filler cap for clogging, sticking, etc.

**Refer to EC section, "EVAPORATIVE EMISSION CONTROL SYSTEM".**

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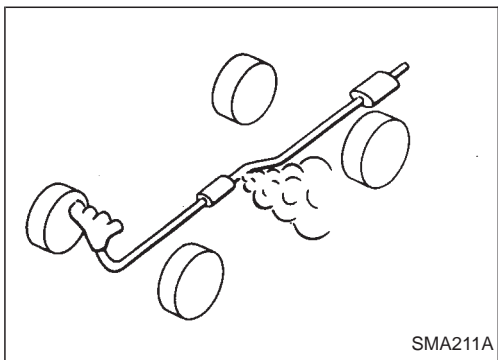
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### Checking Exhaust System

Check exhaust pipes, muffler and mounting for proper attachment, leaks, cracks, damage, loose connections, chafing and deterioration.



## Engine Maintenance

## INSPECTION AND ADJUSTMENT

## Drive belt deflection

Unit: mm (in)			
	Used belt deflection		Deflection of new belt
	Limit	Deflection after adjustment	
Alternator and water pump	12 (0.47)	6 - 8 (0.24 - 0.31)	5 - 7 (0.20 - 0.28)
Air conditioner compressor	16 (0.63)	9 - 11 (0.35 - 0.43)	7 - 9 (0.28 - 0.35)
Power steering oil pump	17 (0.67)	11 - 13 (0.43 - 0.51)	9 - 11 (0.35 - 0.43)
Applied pushing force	98 N (10 kg, 22 lb)		

## Oil capacity (Refill) (Approximate)

Unit: ℓ (Imp qt)

With oil filter change	3.3 (2-7/8)
Without oil filter change	3.0 (2-5/8)

## Coolant capacity (Approximate)

Unit: ℓ (Imp qt)

Without reservoir tank	8.2 (7-1/4)
Reservoir tank	0.8 (3/4)

## Spark plug (Platinum-tipped type)

Standard type	PFR5G-11
Hot type	PFR4G-11
Cold type	PFR6G-11
Gap (Nominal) mm (in)	1.1 (0.043)

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