SECTION MA

CONTENTS

PRE-DELIVERY INSPECTION ITEMS....3
GENERAL MAINTENANCE....4
PERIODIC MAINTENANCE....5
Maintenance Schedule for Diesel Engine Models (annual mileage < 30,000 km/year)....5
Maintenance Schedule for Diesel Engine Models (annual mileage > 30,000 km/year)....8
Maintenance Under Severe Driving Conditions (annual mileage < 30,000 km/year)....11
Maintenance Under Severe Driving Conditions (annual mileage > 30,000 km/year)....14
RECOMMENDED FLUIDS AND LUBRICANTS....17
Fluids and Lubricants....17
SAE Viscosity Number....18
Engine Coolant Mixture Ratio....19

TD

ENGINE MAINTENANCE....20
Retightening Manifold Bolts and Nuts....20
Adjusting Intake and Exhaust Valve Clearance....20
Drive Belt Inspection....20
Changing Engine Oil....21
Changing Oil Filter....21
Changing Engine Coolant....22
Checking Cooling System....23
Checking and Replacing fuel filter and Draining Water....23
Cleaning and Replacing Air Cleaner Filter (Dry paper type)....24
Checking Injection Nozzle....25
Checking Idle Speed....26

ZD

ENGINE MAINTENANCE....28
Checking Tightening Torque....28
Adjusting Intake and Exhaust Valve Clearance....28
Checking Drive Belt....28
Removal....29
Installation....29
Changing Engine Oil....29
Changing Engine Oil Filter....30
Changing Engine Coolant....31
Checking Cooling System....32
Checking and Replacing Fuel Filter and Draining Water....33
Checking Fuel Lines....34
Cleaning and Replacing Air Cleaner Filter....35

CHASSIS AND BODY MAINTENANCE....36
Checking Exhaust System....36
Checking Clutch Operation....36
Checking Clutch Fluid Level and Leaks....36
Checking Clutch System....36
Checking M/T Oil....36
Changing M/T Oil....37
Checking Water Entry....37
Checking Transfer Oil....37
Changing Transfer Oil....38
Checking Propeller Shaft....38
Checking Differential Gear Oil....38
Changing Differential Gear Oil....39
Checking Front Wheel Bearing Grease....39
Repacking Front Wheel Bearing Grease....39
Checking Free-running Hub Grease....40
Checking Brake Fluid Level and Leaks....40
Checking Brake System....40
Checking Brake Booster, Vacuum Hoses, Connections and Check Valve....40
Checking Disc Brake....40
Checking Drum Brake....41
Checking Foot Brake Pedal Operation....42
Checking Parking Brake....42
Changing Brake Fluid....43
Balancing Wheels....43
Tire Rotation....43
Checking Steering Gear and Linkage....43
Checking Fluid Level and Leaks (Power steering)....44

CONTENTS (Cont'd)

Greasing Steering Linkage 44
Ventilation Air Filter 44
Body 45
Checking Body Corrosion 47

SERVICE AND SPECIFICATIONS (SDS) 48
Engine Maintenance 48
Chassis and Body Maintenance 49

Shown below are Pre-delivery Inspection items required for the new vehicle. It is recommended that necessary items other than those listed here be added, paying due regard to the conditions in each country.

Perform applicable items on each model. Consult text of this section for specifications.

UNDER HOOD — engine off

- ☐ Radiator coolant level and coolant hose connections for leaks
- ☐ Battery fluid level, specific gravity and conditions of battery terminals
- ☐ Brake and clutch reservoirs fluid level and fluid lines for leaks
- ☐ Windshield and rear window washer and headlamp cleaner reservoir fluid level
- ☐ Drive belts tension
- ☐ Fuel filter for water or dust, and fuel lines and connections for leaks
- ☐ Power steering reservoir fluid level and hose connections for leaks
- ☐ Engine oil level and oil leaks

INSIDE AND OUTSIDE

- ☐ Operation of all instruments, gauges, lights, anti-theft system and accessories
- ☐ Operation of horn(s), wiper and washer
- ☐ Steering lock for operation
- ☐ Air conditioner for gas leaks
- ☐ Front and rear seats, and seat belts for operation
- ☐ All moldings, trims and fittings for fit and alignment
- ☐ All windows for operation and alignment
- ☐ Hood, tailgate, door panels for fit and alignment
- ☐ Latches, keys and locks for operation
- ☐ Weatherstrips for adhesion and fit
- ☐ Headlamp aiming
- ☐ Tighten wheel nuts
- ☐ Tire pressure (Inc. spare tire)
- ☐ Check front wheels for toe-in
- ☐ Install clock/room lamp fuse
- ☐ Remove wiper blade protectors (if necessary)

UNDER BODY

- ☐ Manual transmission/transaxle and differential gear oil level
- ☐ Brake and fuel lines and oil/fluid reservoirs for leaks
- ☐ Tighten bolts and nuts of steering linkage and gear box, suspension, propeller shafts and drive shafts

ROAD TEST

- ☐ Clutch operation
- ☐ Parking brake operation
- ☐ Service brake operation
- ☐ Steering control and returnability
- ☐ Engine performance
- ☐ Squeaks and rattles

ENGINE OPERATING AND HOT

- ☐ Adjust idle mixture and speed (and ignition timing) (Petrol only)

FINAL INSPECTION

- ☐ Install necessary parts (outside mirror, wheel covers, seat belts, mat, carpet or mud flaps)
- ☐ Inspect for interior and exterior metal and paint damage
- ☐ Check for spare tire, jack, tools and literature
- ☐ Wash, clean interior and exterior

General maintenance includes those items which should be checked during normal day-to-day operation of the vehicle. They are essential if the vehicle is to continue functioning correctly. Owners can perform the checks and inspections themselves, or they can be carried out by a NISSAN dealer.

Item	Reference pages
OUTSIDE THE VEHICLE The maintenance items listed here should be checked periodically, unless otherwise specified.	
Tires Check the pressure with a gauge weekly when at a service station, including the spare, and adjust to the specified pressure if necessary. Check carefully for damage, cuts or excessive wear.	—
Windshield wiper blades Check for cracks or wear if not functioning correctly.	—
Doors and engine hood Check that all doors, the engine hood, the trunk lid and back door function correctly. Also ensure that all latches lock securely. Lubricate if necessary. Make sure that the secondary latch prevents the hood from opening when the primary latch is released. When driving in areas using road salt or other corrosive materials, check for lubrication more often.	MA-45
Tire rotation Tires should be rotated every 5,000 km (3,000 miles).	MA-43
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.	
Lights Make sure that the headlights, stop lights, tail lights, turn signal lights, and other lights are all operating correctly and installed securely. Also check headlight aim.	—
Warning lights and buzzers/chimes Make sure that all warning lights and buzzers/chimes are functioning correctly.	—
Steering wheel Check that it has the specified play. Check for changes in the steering operation, such as excessive free play, hard steering or strange noises. **Free play: Less than 35 mm (1.38 in)**	—
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 of damage.	MA-46
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.	
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-22
Engine oil level Check the level after parking the vehicle (on level ground) and turning off the engine.	MA-21
Brake and clutch fluid level Make sure that the brake fluid level is between the “MAX” and “MIN” lines on the reservoir.	MA-36/MA-40
Battery Check the fluid level in each cell. It should be between the “MAX” and “MIN” lines.	—

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.

Maintenance Schedule for Diesel Engine Models (annual mileage < 30,000 km/year)

Engine Maintenance

TD27Ti engine

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

MAINTENANCE OPERATION		MAINTENANCE INTERVAL												
Perform on a kilometer basis, but on a semi-annual basis when driving less than 20,000 km (12,000 miles) per year.	km x 1,000	10	20	30	40	50	60	70	80	90	100	110	120	Reference page
	(miles x 1,000)	(6)	(12)	(18)	(24)	(30)	(36)	(42)	(48)	(54)	(60)	(66)	(72)	
	Months	6	12	18	24	30	36	42	48	54	50	66	72	
Engine compartment and under vehicle														
Engine oil (Use recommended oil)*		R	R	R	R	R	R	R	R	R	R	R	R	MA-21
Engine oil filter (Use Nissan genuine part or equivalent)*		R	R	R	R	R	R	R	R	R	R	R	R	MA-21
Drive belts		I	I	I	I	I	I	I	I	I	I	I	I	MA-20
Cooling system			I		I		I		I		I		I	MA-23
Engine anti-freeze coolant (Ethylene glycol base)	See NOTE (1)													MA-22
Air cleaner filter (dry paper type)*			C		R		C		R		C		R	MA-24
Intake and exhaust valve clearance			I		I		I		I		I		I	MA-20
Fuel lines					I				I				I	—
Fuel filter*					R				R				R	MA-23
Injection nozzle	See NOTE (2)													MA-25

NOTE: (1) First replace at 80,000 km (48,000 miles), then every 60,000 km (36,000 miles).

(2) If engine power decreases, black exhaust smoke is emitted or engine noise increases, check the fuel injection nozzles' starting pressure and spray pattern.

*** Maintenance items with "*" should be performed more frequently according to "Maintenance under severe driving conditions".**

Maintenance Schedule for Diesel Engine Models (annual mileage < 30,000 km/year) (Cont'd)

ZD30DDTi engine

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

MAINTENANCE OPERATION		MAINTENANCE INTERVAL						
Perform on a kilometer basis, but on an annual basis when driving less than 15,000 km (9,000 miles) per year.	km x 1,000	15	30	45	60	75	90	Reference page
	(miles x 1,000)	(9)	(18)	(27)	(36)	(45)	(54)	
	Months	**12**	**24**	**36**	**48**	**60**	**72**	
Engine compartment and under vehicle								
Engine oil (Use recommended oil)*	See NOTE (5)	R	R	R	R	R	R	MA-29
Engine oil filter (Use Eco filter or equivalent)*	See NOTE (1)	R	R	R	R	R	R	MA-30
Drive belts		I	I	I	I	I	I	MA-28
Cooling system		I	I	I	I	I	I	MA-32
Engine anti-freeze coolant (Use genuine NISSAN Anti-freeze Coolant (L2N) or equivalent)	See NOTE (2)			I				MA-31
Air cleaner filter*					R			MA-35
Fuel lines			I		I		I	MA-34
Injection nozzles	See NOTE (3)							*1
Intake & exhaust valve clearance	See NOTE (4)							MA-28
Fuel filter*				R			R	MA-33

NOTE: (1) Oil filter element assembly and O-ring seal are replacement parts.
(2) First replace at 90,000 km (54,000 miles)/60 months, then every 60,000 km (36,000 miles)/48 months. Perform "I" (Checking the mixture ratio and correcting the mixture ratio if necessary) at the middle of replacement interval.
(3) If engine power decreases, black exhaust smoke is emitted or engine noise increases, check injection nozzles and, if necessary, replace injection nozzle assembly.
(4) If valve noise increases, check valve clearance.
(5) Check the oil level every 7,500 km (4,700 miles).
*** Maintenance items with "*" should be performed more frequently according to "Maintenance under severe driving conditions".**

*1: "Injection Tube and Injection Nozzle" in EC section

Maintenance Schedule for Diesel Engine Models (annual mileage < 30,000 km/year) (Cont'd)

Chassis and Body Maintenance

Abbreviations: R = Replace I = Inspect. Correct or replace if necessary L = Lubricate T = Tighten
[ ] = At the specified mileage only

MAINTENANCE OPERATION		MAINTENANCE INTERVAL												
Perform on a kilometer basis, but on a semi-annual basis when driving less than 20,000 km (12,000 miles) per year.	km x 1,000	10	20	30	40	50	60	70	80	90	100	110	120	Reference page
	(miles x 1,000)	(6)	(12)	(18)	(24)	(30)	(36)	(42)	(48)	(54)	(60)	(66)	(72)	
	Months	6	12	18	24	30	36	42	48	54	50	66	72	
Underhood and under vehicle														
Headlamp aiming			I		I		I		I		I		I	EL-37
Wheel alignment (if necessary, rotate & balance wheels)			I		I		I		I		I		I	MA-43
Brake pads, discs & other components*			I		I		I		I		I		I	MA-40
Brake linings, drums & other components*			I		I		I		I		I		I	MA-41
Foot brake, parking brake & clutch (for free play, stroke & operation)			I		I		I		I		I		I	MA-42
Brake booster vacuum hoses, connections, check valve					I				I				I	MA-40
Brake & clutch, systems and fluid (for level and leaks)			I		I		I		I		I		I	MA-36/ MA-40
Brake fluid*					R				R				R	MA-43
Power steering fluid and lines (for level and leaks)			I		I		I		I		I		I	MA-44
Air bag system	See NOTE (1)													RS-15
Ventilation air filter*				R			R			R			R	MA-44
Transfer and standard differential gear oil*			I		I		R		I		I		R	MA-37/ MA-38
Manual transmission oil			I		I		I		[R]		I		I	MA-36
LSD gear oil (for level and leaks)*			I		I		R		I		I		R	MA-38
Steering gear & linkage, axle & suspension parts, propeller shaft and exhaust system*			I		I		I		I		I		I	MA-43/ FA-4/ RA-4/ MA-38/ MA-36
Greasing points of steering gear linkage, propeller shaft and suspension*	See NOTE (2)		L		L		L		L		L		L	MA-44/ MA-38
Drive shafts*			I		I		I		I		I		I	FA-13
Front wheel bearing grease*			I		R		I		R		I		R	MA-39
Free running hub grease*			I		I		I		I		I		I	MA-40
Body mounting bolts and nuts			T		T		T		T		T		T	BT-48
Body corrosion	See NOTE (3)													MA-47

NOTE: (1) Inspect after 10 years, then every 2 years.
(2) The propeller shaft should be re-greased daily if it is immersed in water.
(3) Inspect once per year.
*** Maintenance items with "*" should be performed more frequently according to "Maintenance under severe driving conditions".**

Maintenance Schedule for Diesel Engine Models (annual mileage > 30,000 km/year)

Engine Maintenance

TD27Ti engine

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

MAINTENANCE OPERATION		MAINTENANCE INTERVAL												
Perform on a kilometer basis only.	km x 1,000	10	20	30	40	50	60	70	80	90	100	110	120	Reference page
	(miles x 1,000)	(6)	(12)	(18)	(24)	(30)	(36)	(42)	(48)	(54)	(60)	(66)	(72)	
Engine compartment and under vehicle														
Engine oil (Use recommended oil)*		R	R	R	R	R	R	R	R	R	R	R	R	MA-21
Engine oil filter (Use Nissan genuine part or equivalent)*		R	R	R	R	R	R	R	R	R	R	R	R	MA-21
Drive belts		I	I	I	I	I	I	I	I	I	I	I	I	MA-20
Cooling system				I			I			I			I	MA-23
Engine anti-freeze coolant (Ethylene glycol base)	See NOTE (1)													MA-22
Air cleaner filter (dry paper type)*			C		R		C		R		C		R	MA-24
Intake & exhaust valve clearance				I			I			I			I	MA-20
Fuel lines							I						I	—
Fuel filter*							R						R	MA-23
Injection nozzles	See NOTE (2)													MA-25

NOTE: (1) First replace at 90,000 km (54,000 miles), then every 60,000 km (36,000 miles).
(2) If engine power decreases, black exhaust smoke is emitted or engine noise increases, check the fuel injection nozzles' starting pressure and spray pattern.
*** Maintenance items with "*" should be performed more frequently according to "Maintenance under severe driving conditions".**

Maintenance Schedule for Diesel Engine Models (annual mileage > 30,000 km/year) (Cont'd)

ZD30DDTi engine

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

MAINTENANCE OPERATION		MAINTENANCE INTERVAL						
Perform on a kilometer basis only.	km x 1,000	15	30	45	60	75	90	Reference page
	(miles x 1,000)	(9)	(18)	(27)	(36)	(45)	(54)	
Engine compartment and under vehicle								
Engine oil (Use recommended oil)*	See NOTE (5)	R	R	R	R	R	R	MA-29
Engine oil filter (Use Eco filter or equivalent)*	See NOTE (1)	R	R	R	R	R	R	MA-29
Drive belts		I	I	I	I	I	I	MA-28
Cooling system			I		I		I	MA-32
Engine anti-freeze coolant (Use genuine NISSAN Anti-freeze Coolant (L2N) or equivalent)	See NOTE (2)			I			R	MA-31
Air cleaner filter*					R			MA-35
Fuel lines					I			MA-34
Injection nozzles	See NOTE (3)							*1
Intake & exhaust valve clearance	See NOTE (4)							MA-28
Fuel filter*					R			MA-33

NOTE: (1) Oil filter element assembly and O-ring seal are replacement parts.
(2) First replace at 90,000 km (54,000 miles), then every 60,000 km (36,000 miles). Perform "I" (Checking the mixture ratio and correcting the mixture ratio if necessary) at the middle of replacement interval.
(3) If engine power decreases, black exhaust smoke is emitted or engine noise increases, check injection nozzles and, if necessary, replace injection nozzle assembly.
(4) If valve noise increases, check valve clearance.
(5) Check the oil level every 7,500 km (4,700 miles).
*** Maintenance items with "*" should be performed more frequently according to "Maintenance under severe driving conditions".**

*1: "Injection Tube and Injection Nozzle" in EC section

Maintenance Schedule for Diesel Engine Models (annual mileage > 30,000 km/year) (Cont'd)

Chassis and Body Maintenance

Abbreviations: R = Replace I = Inspect. Correct or replace if necessary L = Lubricate T = Tighten

MAINTENANCE OPERATION		MAINTENANCE INTERVAL												Refer-ence page
Perform on a kilometer basis only.	km x 1,000	10	20	30	40	50	60	70	80	90	100	110	120	
	(miles x 1,000)	(6)	(12)	(18)	(24)	(30)	(36)	(42)	(48)	(54)	(60)	(66)	(72)	
Underhood and under vehicle														
Headlamp aiming				I			I			I			I	EL-37
Wheel alignment (it necessary, rotate & balance wheels)				I			I			I			I	MA-43
Brake pads, discs & other components*				I			I			I			I	MA-40
Brake linings, drums & other components*				I			I			I			I	MA-41
Foot brake, parking brake & clutch (for free play, stroke & operation)				I			I			I			I	MA-42
Brake booster vacuum hoses, connections, check valve							I						I	MA-40
Brake & clutch, systems and fluid (for level and leaks)				I			I			I			I	MA-36/ MA-40
Brake fluid*							R						R	MA-43
Power steering fluid and lines (for level and leaks)				I			I			I			I	MA-44
Air bag system	See NOTE (1)													RS-15
Ventilation air filter*				R			R			R			R	MA-44
Transfer and standard differential gear oil*				I			R			I			R	MA-37/ MA-38
Manual transmission oil				I			I			R			I	MA-36
LSD gear oil*				I			R			I			R	MA-38
Steering gar & linkage, axle & suspension parts, propeller shaft and exhaust system*				I			I			I			I	MA-43/ FA-4/ RA-4/ MA-38/ MA-36
Greasing points of steering gear linkage, propeller shaft and suspension*	See NOTE (2)			L			L			L			L	MA-44/ MA-38
Drive shafts*				I			I			I			I	FA-13
Front wheel bearing grease*				I			R			I			R	MA-39
Free running hub grease*				I			I			I			I	MA-40
Body mounting bolts and nuts				T			T			T			T	BT-48
Body corrosion	See NOTE (3)													MA-47

NOTE: (1) Inspect after 10 years, then every 2 years.
(2) The propeller shaft should be re-greased daily if it is immersed in water.
(3) Inspect once per year.
*** Maintenance items with "*" should be performed more frequently according to "Maintenance under severe driving conditions".**

Maintenance Under Severe Driving Conditions (annual mileage < 30,000 km/year)

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.

TD27Ti engine

Severe driving conditions

A — Driving under dusty conditions
B — Driving repeatedly short distances
C — Towing a trailer
D — Extensive idling
E — Driving in extremely adverse weather conditions or in areas where ambient temperature is either extremely low or extremely high
F — Driving in high humidity areas or in mountainous areas
G — Driving in areas using salt or other corrosive materials
H — Driving on rough and/or muddy roads or in the desert
I — Driving with frequent use of brakes or in mountainous areas
J — Frequent driving in water

Driving condition	Maintenance item	Maintenance operation	Maintenance interval	Reference page
A B C D	**Engine oil & engine oil filter**			
		Replace	Every 5,000 km (3,000 miles) or 3 months	MA-21
A	**Air cleaner filter (dry paper type)**			
		Clean	Every 10,000 km (6,000 miles) or 6 months	MA-24
		Replace	Every 20,000 km (12,000 miles) or 12 months	
A . . . E	**Fuel filter**			
		Replace	Every 20,000 km (12,000 miles) or 12 months	MA-23
A . . . . F	**Ventilation air filter**			
		Replace	Every 20,000 km (12,000 miles) or 12 months	MA-44
. . . . . F	**Brake fluid**			
		Replace	Every 20,000 km (12,000 miles) or 12 months	MA-43
. . C . . . . H . .	**Limited-slip differential (L.S.D.) gear oil**			
		Replace	Every 30,000 km (18,000 miles) or 18 months	MA-38
. . C . . . . H . .	**Transfer & standard differential gear oil**			
		Replace	Every 60,000 km (36,000 miles) or 24 months	MA-36/MA-37/ MA-38
A . C . . . G H I .	**Brake pads/linings, discs/drums & other brake system components**			
		Inspect	Every 10,000 km (6,000 miles) or 6 months	MA-40/MA-41
. . . . . G H . J	**Greasing points of steering linkage, propeller shafts and suspension**			
		Lubricate	Every 10,000 km (6,000 miles) or 6 months	MA-44/MA-38
. . . . . G H . .	**Steering gear & linkage, axle & suspension parts, propeller shaft & exhaust system**			
		Inspect	Every 10,000 km (6,000 miles) or 6 months	MA-43/FA-4/ RA-4/MA-38/ MA-36

Maintenance Under Severe Driving Conditions (annual mileage < 30,000 km/year) (Cont'd)

Driving condition	Maintenance item	Maintenance operation	Maintenance interval	Reference page
. . C . . . . H . .	**Drive shafts**			
		Inspect	Every 10,000 km (6,000 miles) or 6 months	FA-22
. . . . . J	**Front wheel bearing grease & free running hub grease**			
		Inspect	Every 10,000 km (6,000 miles) or 6 months	MA-39/MA-40

ZD30DDTi engine

Severe driving conditions

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
F — Driving in high humidity areas or in mountainous areas
G — Driving in areas using salt or other corrosive materials
H — Driving on rough and/or muddy roads or in the desert
I — Driving with frequent use of braking or in mountainous areas
J — Frequent off road use or driving in water

Driving condition	Maintenance item	Maintenance operation	Maintenance interval
A B C D	**Engine oil & engine oil filter**		
		Replace	Every 7,500 km (4,500 miles) or 6 months
A	**Air cleaner filter**		
		Replace	Every 30,000 km (18,000 miles) or 24 months
A . . . E	**Fuel filter**		
		Replace	Every 22,500 km (13,500 miles) or 18 months
A . C . . . G H I .	**Brake pads, rotors & other brake components**		
		Inspect	Every 7,500 km (4,500 miles) or 6 months
. . . . . F	**Brake fluid**		
		Replace	Every 15,000 km (9,000 miles) or 12 months
A	**Ventilation air filter**		
		Replace	Every 15,000 km (9,000 miles) or 12 months
. . C . . . . H . .	**Automatic transmission fluid**		
		Replace	Every 30,000 km (18,000 miles) or 24 months
. . C . . . . H . .	**Transfer fluid and limited-slip differential (LSD) gear oil**		
		Replace	Every 30,000 km (18,000 miles) or 24 months
. . C . . . . H . .	**Drive shaft & steering damper**		
		Inspect	Every 7,500 km (4,500 miles) or 6 months
. . . . . J	**Front wheel bearing grease**		
		Inspect	Every 7,500 km (4,500 miles) or 6 months
. . . . . J	**Free-running hub grease**		
		Inspect	Every 7,500 km (4,500 miles) or 6 months
. . . . . G H . .	**Steering gear & linkage, axle & suspension parts, propeller shaft & exhaust system**		
		Inspect	Every 7,500 km (4,500 miles) or 6 months

Maintenance Under Severe Driving Conditions (annual mileage < 30,000 km/year) (Cont'd)

Maintenance for off-road driving

Whenever you drive off-road through sand, mud or water as deep as the wheel hub, more frequent maintenance may be required of the following items:

- ▲ Brake pads and discs
- ▲ Brake lining and drums
- ▲ Brake lines and hoses
- ▲ Wheel bearing grease and free-running hub grease
- ▲ Differential, transmission and transfer oil
- ▲ Steering linkage
- ▲ Propeller shafts and front drive shafts
- ▲ Air cleaner filter
- ▲ Clutch housing (Check water entry.)

Maintenance Under Severe Driving Conditions (annual mileage > 30,000 km/year)

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.

TD27Ti engine

Severe driving conditions

A — Driving under dusty conditions
B — Driving repeatedly short distances
C — Towing a trailer
D — Extensive idling
E — Driving in extremely adverse weather conditions or in areas where ambient temperature is either extremely low or extremely high
F — Driving in high humidity areas or in mountainous areas
G — Driving in areas using salt or other corrosive materials
H — Driving on rough and/or muddy roads or in the desert
I — Driving with frequent use of brakes or in mountainous areas
J — Frequent driving in water

Driving condition	Maintenance item	Maintenance operation	Maintenance interval	Reference page
A B C D	**Engine oil & engine oil filter**			
		Replace	Every 5,000 km (3,000 miles)	MA-21
A	**Air cleaner filter (dry paper type)**			
		Clean	Every 10,000 km (6,000 miles)	MA-24
		Replace	Every 20,000 km (12,000 miles)	
A . . . E	**Fuel filter**			
		Replace	Every 30,000 km (18,000 miles)	MA-23
A . . . . F	**Ventilation air filter**			
		Replace	Every 15,000 km (9,000 miles)	MA-44
. . . . . F	**Brake fluid**			
		Replace	Every 30,000 km (18,000 miles)	MA-43
. . C . . . . H . .	**Limited-slip differential (L.S.D.) gear oil**			
		Replace	Every 30,000 km (18,000 miles)	MA-38
. . C . . . . H . .	**Transfer & standard differential gear oil**			
		Replace	Every 60,000 km (36,000 miles)	MA-36/MA-37/ MA-38
A . C . . . G H I .	**Brake pads/linings, discs/drums & other brake system components**			
		Inspect	Every 15,000 km (9,000 miles)	MA-40/MA-41
. . . . . G H . J	**Greasing points of steering linkage, propeller shafts and suspension**			
		Lubricate	Every 15,000 km (9,000 miles)	MA-44/MA-38
. . . . . G H . .	**Steering gear & linkage, axle & suspension parts, propeller shaft & exhaust system**			
		Inspect	Every 30,000 km (18,000 miles)	MA-43/FA-4/ RA-4/MA-38/ MA-36
. . C . . . . H . .	**Drive shafts**			
		Inspect	Every 15,000 km (9,000 miles)	FA-22
. . . . . J	**Front wheel bearing grease & free running hub grease**			
		Inspect	Every 15,000 km (9,000 miles)	MA-39/MA-40

Maintenance Under Severe Driving Conditions (annual mileage > 30,000 km/year) (Cont'd)

ZD30DDTi engine

Severe driving conditions

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
F — Driving in high humidity areas or in mountainous areas
G — Driving in areas using salt or other corrosive materials
H — Driving on rough and/or muddy roads or in the desert
I — Driving with frequent use of braking or in mountainous areas
J — Frequent off road use or driving in water

Driving condition	Maintenance item	Maintenance operation	Maintenance interval
A B C D	**Engine oil & engine oil filter**		
		Replace	Every 7,500 km (4,500 miles)
A	**Air cleaner filter**		
		Replace	Every 30,000 km (18,000 miles)
A . . . E	**Fuel filter**		
		Replace	Every 30,000 km (18,000 miles)
A . C . . . G H I .	**Brake pads, rotors & other brake components**		
		Inspect	Every 15,000 km (9,000 miles)
. . . . . F	**Brake fluid**		
		Replace	Every 30,000 km (18,000 miles)
A	**Ventilation air filter**		
		Replace	Every 15,000 km (9,000 miles)
. . C . . . . H . .	**Automatic transmission fluid**		
		Replace	Every 60,000 km (36,000 miles)
. . C . . . . H . .	**Transfer fluid and limited-slip differential (LSD) gear oil**		
		Replace	Every 30,000 km (18,000 miles)
. . C . . . . H . .	**Drive shaft & steering damper**		
		Inspect	Every 15,000 km (9,000 miles)
. . . . . J	**Front wheel bearing grease**		
		Inspect	Every 15,000 km (9,000 miles)
. . . . . J	**Free-running hub grease**		
		Inspect	Every 15,000 km (9,000 miles)
. . . . . G H . .	**Steering gear & linkage, axle & suspension parts, propeller shaft & exhaust system**		
		Inspect	Every 15,000 km (9,000 miles)

Maintenance Under Severe Driving Conditions (annual mileage > 30,000 km/year) (Cont'd)

Maintenance for off-road driving

Whenever you drive off-road through sand, mud or water as deep as the wheel hub, more frequent maintenance may be required of the following items:

- ▲ Brake pads and discs
- ▲ Brake lining and drums
- ▲ Brake lines and hoses
- ▲ Wheel bearing grease and free-running hub grease
- ▲ Differential, transmission and transfer oil
- ▲ Steering linkage
- ▲ Propeller shafts and front drive shafts
- ▲ Air cleaner filter

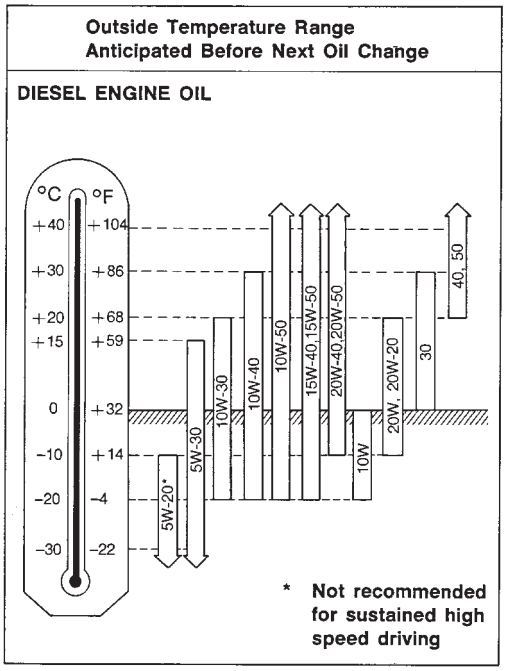
  Clutch housing (Check water entry.)

Fluids and Lubricants

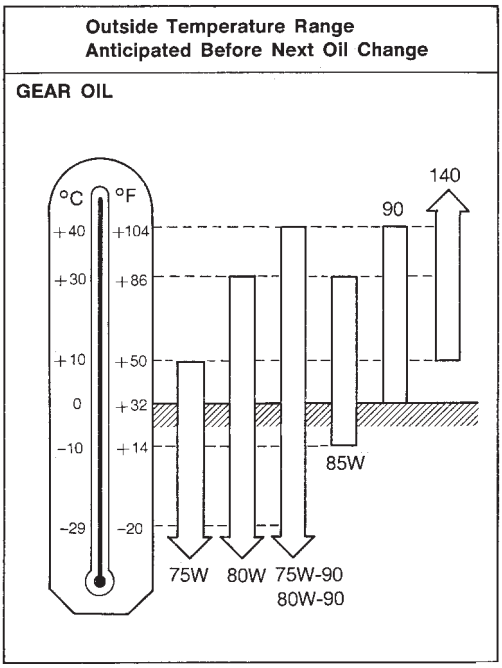
		Capacity (Approximate)		Recommended fluids and lubricants
		Liter	Imp qt	
Engine oil (Refill)				
With oil filter	TD27Ti	6.2	5-1/2	API CE, ACEA B2-96 (CCMC PD1), D5 level SHPD (*1)
Without oil filter	TD27Ti	5.5	4-7/8	
With oil filter	ZD30DDTi	6.7	5-7/8	API CF4 or ACEA B3-96. 98 or ACEA B3/E3-96. 98*4
Without oil filter	ZD30DDTi	6.2	5-1/2	
Cooling system				
Total capacity (With reservoir tank)	TD27Ti	10.0	8-3/4	Anti-freeze coolant (Ethylene glycol base)
	ZD30DDTi	10.6	9-3/8	Genuine Nissan Anti-freeze Coolant (L2N) or equivalent*5
Manual transaxle gear oil	FS5W71C	3.5	6-1/8 pt	API GL-4 (*1)
	FS5R30A	3.6	6-3/8 pt	API GL-4 (*1)
Transfer	TX10A	2.3	2	API GL-4 (*1)
Differential oil				
	R180A	1.3	2-1/4	STANDARD: API GL-5 (*1)
	H233B (LSD)	2.8	4-7/8	Use only LSD gear oil API GL-5 and SAE 80W-90 (*2) approved for NISSAN LSD
Power steering fluid		1.0	7/8	DEXRON™
Brake and clutch fluid		—	—	DOT 4 (USFMVSS No. 116)
Multi-purpose grease		—	—	NLGI No. 2 (Lithium soap base)
Air conditioner system			refrigerant	R134A
			lubrication oil	KLH00-PAGRO

*1: For further details, see “SAE Viscosity Number”.
*2: SAE 90 is acceptable in ambient temperatures above −18°C (0°F)
*3: Do not mix automatic transmission fluid and gear oil.
*4: Never use API CG-4.
*5: Use Genuine Nissan Anti-freeze Coolant (L2N) 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.

SAE Viscosity Number



TI0006



TI0003

- **For warm and cold areas: 15W-40 is preferable for ambient temperatures above −20°C (−4°F).**
- **For hot areas: 20W-40 and 20W-50 are suitable.**
- **On turbo models, 5W-20 is not recommended.**
  Use 5W-30 only below 0°C (32°F).

- **For cold and warm areas:**
  75W-90 for transmission and 80W-90 for differential carrier are preferable.
- **For hot areas:**
  90 is suitable for ambient temperatures below 40°C (104°F)

Engine Coolant Mixture Ratio

The engine cooling system is filled at the factory with a high-quality, year-round and extended life engine coolant. The high quality engine coolant contains the specific solutions effective for the anti-corrosion and the anti-freeze function. Therefore, additional cooling system additives are not necessary.

CAUTION:

- **When adding or replacing coolant, be sure to use only Genuine Nissan Anti-freeze Coolant (L2N) or equivalent. Because L2N is premixed type coolant (Mixture ratio 50%).**

The use of other types of engine coolant may damage your cooling system.

- When checking the engine coolant mixture ratio by the coolant hydrometer, use the chart below to correct your hydrometer reading (specific gravity) according to coolant temperature.

Mixed coolant specific gravity

Unit: Specific gravity

Engine coolant mixture ratio	Coolant temperature °C (°F)			
	15 (59)	25 (77)	35 (95)	45 (113)
30%	1.046 - 1.050	1.042 - 1.046	1.038 - 1.042	1.033 - 1.038
50%	1.076 - 1.080	1.070 - 1.076	1.065 - 1.071	1.059 - 1.065

WARNING:

Never remove the radiator cap when the engine is hot. Serious burns could be caused by high pressure fluid escaping from the radiator. Wait until the engine and radiator cool down.

Retightening Manifold Bolts and Nuts

MANIFOLD BOLTS AND NUTS

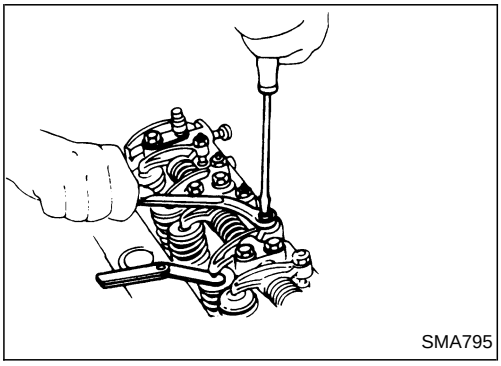
Intake:

: 17 - 23 N·m (1.7 - 2.3 kg-m, 13 - 17 ft-lb)

Exhaust:

: 32 - 38 N·m (3.3 - 3.9 kg-m, 24 - 28 ft-lb)

Retightening should be performed while engine is cold [approximately 20°C (68°F)].


SMA795

Adjusting Intake and Exhaust Valve Clearance

Adjustment should be made while engine is warm but not running.

1. Set No. 1 cylinder in top dead center on its compression stroke, and adjust valve clearance ① , ② , ③ and ⑥ .
2. Set No. 4 cylinder in top dead center on its compression stroke, and adjust valve clearance ④ , ⑤ , ⑦ and ⑧ .

Valve clearance:

Intake ① , ③ , ⑤ and ⑦

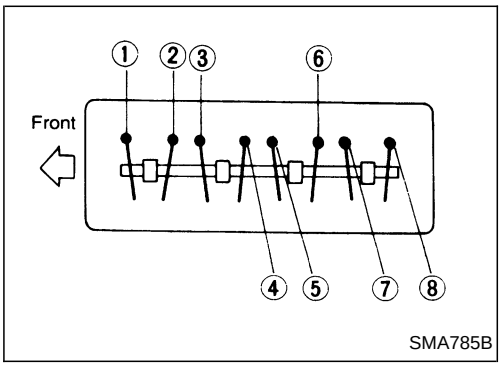
0.25 mm (0.0098 in)

Exhaust ② , ④ , ⑥ and ⑧

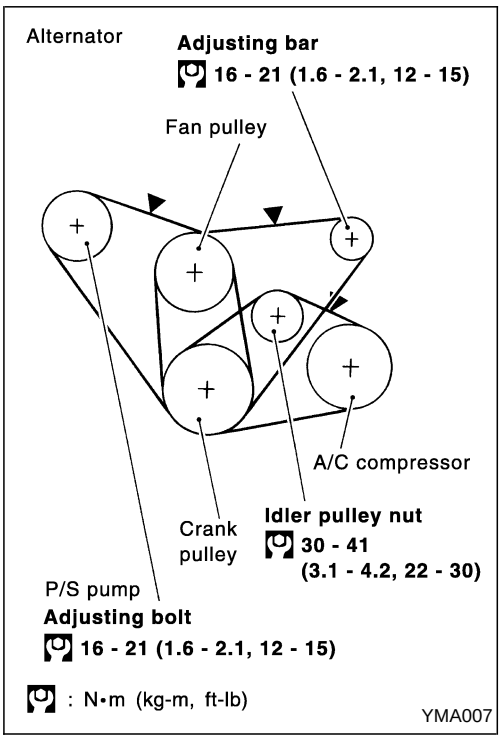
0.25 mm (0.0098 in)

Adjusting screw lock nuts:

: 15 - 20 N·m (1.5 - 2.0 kg-m, 11 - 14 ft-lb)



SMA785B



YMA007

Drive Belt Inspection

1. Inspect for cracks, fraying, wear or oil adhesion. Replace if necessary.

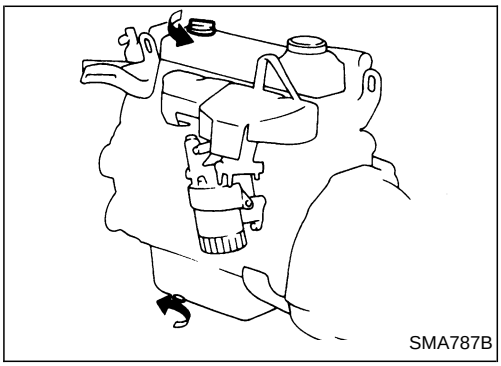
The belts should not touch the bottom of the pulley groove.

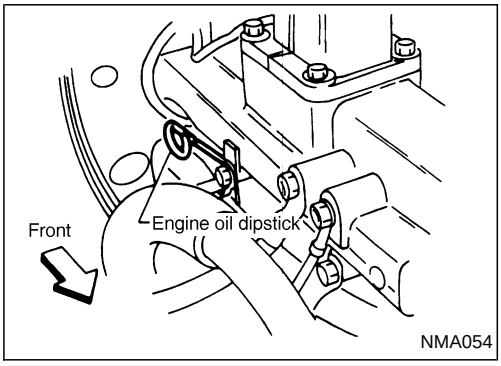
2. Check drive belt deflection by pushing on the belt midway between pulleys. (▼)
3. Adjust if belt deflections exceed the limit.

Unit: mm (in)

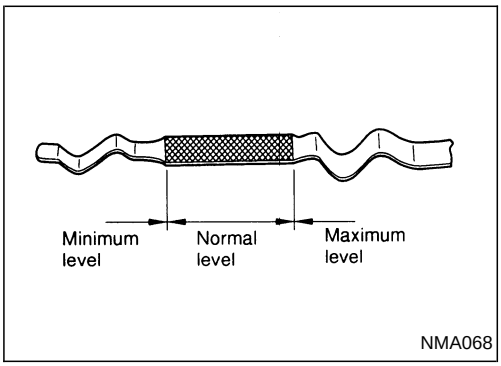
Drive belts	Used belt deflection		Deflection of new belt
	Limit	Deflection after adjustment	
Alternator	20 (0.79)	11 - 13 (0.43 - 0.51)	9 - 11 (0.35 - 0.43)
Air conditioner compressor	12 (0.47)	6 - 7.5 (0.236 - 0.295)	5 - 6.5 (0.197 - 0.256)
Power steering oil pump	15 (0.59)	8 - 9.5 (0.315 - 0.374)	7 - 8.5 (0.276 - 0.335)
Applied pushing force	98 N (10 kg, 22 lb)		

Check drive belt deflections when engine is cold.
If engine is hot, check deflections after 30 minutes or more.


SMA787B



NMA054



NMA068

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 oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.**

1. Warm up engine, and check for oil leakage from engine components.
2. Stop engine.
3. Remove dipstick, oil filler cap and drain plug.
4. Drain oil.
5. Install drain plug.

CAUTION:

- **Be sure to clean drain plug and install with new washer.**
  Drain plug:
  : 29 - 39 N·m(3.0 - 4.0 kg-m, 21 - 29 ft-lb)

6. Fill slowly with new oil whilst not exceeding the maximum level.

Oil specification and viscosity:

- **See “RECOMMENDED FLUIDS AND LUBRICANTS” (MA-17).**

Oil capacity (Approximately):

Unit: ℓ (Imp qt)

Drain and refill	
With oil filter change	6.2 (5-1/2)
Without oil filter change	5.5 (4-7/8)

CAUTION:

- **The refill capacity depends on the oil temperature and drain time. Use these specifications for reference only. Always use the dipstick to determine when the proper amount of oil is in the engine.**

7. Install dipstick and filler cap.
8. Start engine. Check area around drain plug and oil filter for any sign of oil leakage.
9. Run engine for a few minutes, then turn it off. After several minutes check oil level again.
10. If necessary, add oil whilst not exceeding the maximum level.

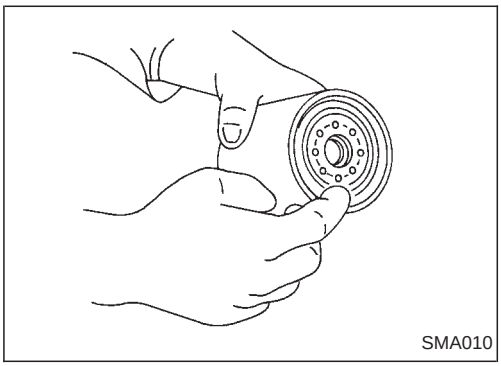
Changing Oil Filter

1. Remove oil filter with a suitable wrench.

WARNING:

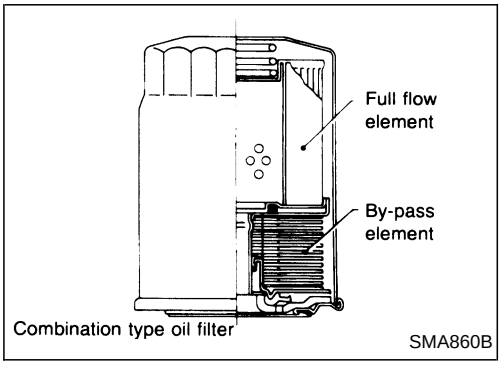
Be careful not to burn yourself as engine and oil is hot.

Changing Oil Filter (Cont'd)


SMA010

2. Before installing new oil filter, clan the oil filter mounting surface on cylinder block and coat the rubber seal of the oil filter with a little engine oil.
3. Install oil filter.
   When installing oil filter, screw it in until a slight resistance is felt, then tighten an additional 2/3 turn or more.
4. Add engine oil.

Refer to Changing Engine Oil.



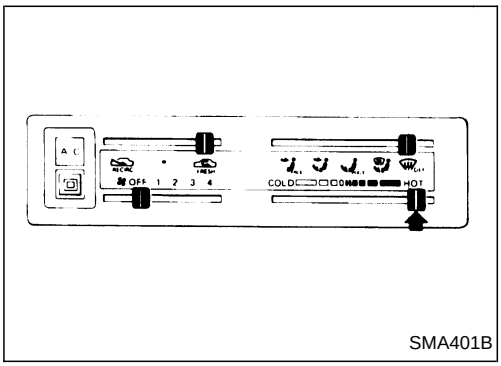
Combination type oil filter
SMA860B

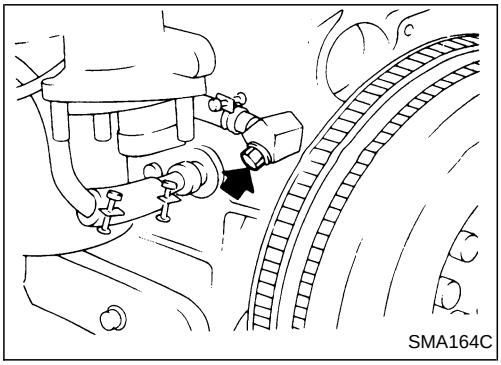
Changing Engine Coolant

WARNING:

To avoid the danger of being scalded, never attempt to change the coolant when the engine is hot.

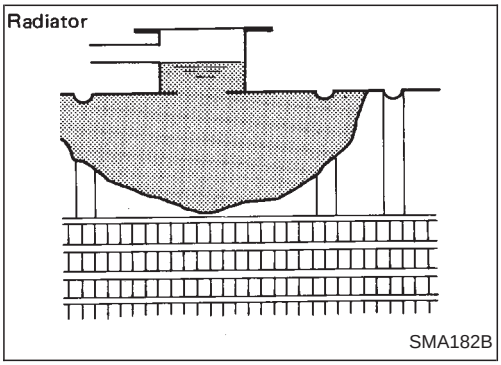
1. Set heater "TEMP" control lever all the way to "HOT" position.
2. Remove radiator cap and engine under cover.
3. Disconnect lower radiator hose to drain coolant.
   Remove reservoir tank, drain coolant, then clean reservoir tank.
   Re-install tank temporarily.


SMA401B


SMA164C

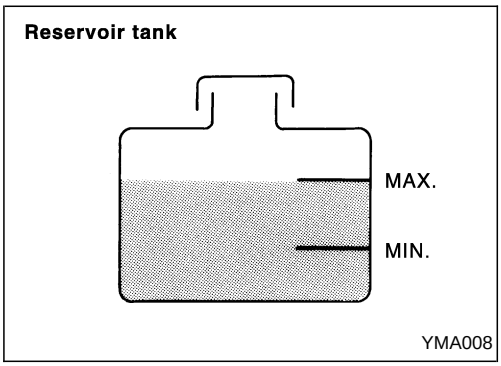
4. Remove cylinder block drain plug located at left rear of cylinder block.
5. Drain coolant and then tighten drain plug securely.
   - **Apply sealant to the thread of drain**
   - **: 30 - 40 N·m (3.1 - 4.1 kg-m, 22.1 - 29.5 ft-lb)**
6. Connect lower radiator hose.
7. Fill radiator and reservoir tank with water. Re-install radiator cap and warm up engine.
8. Stop engine and wait until cools down.
9. Drain water.
10. Repeat step 2 through step 9 two or three times, until clear water begins to drain from radiator.
11. Fill radiator with coolant up to the specified level.
    Follow instructions attached to anti-freeze container for mixing ratio of anti-freeze to water.
    Coolant capacity (with reservoir tank):
    10.0 ℓ (8-3/4 Imp qt)

Slowly pour coolant through coolant filler neck to allow air in system to escape.



SMA182B

Changing Engine Coolant (Cont'd)

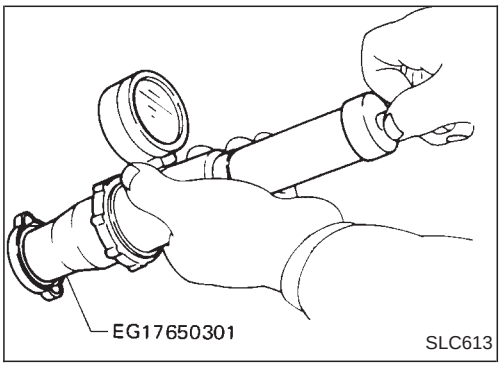


12. Fill reservoir tank up to "MAX" level, and re-install radiator cap.
13. Run the engine at approximately 2,000 rpm for about one minute.
14. Stop engine and cool it down, then refill the radiator and the reservoir tank up to the specified level.

Checking Cooling System

CHECKING HOSES

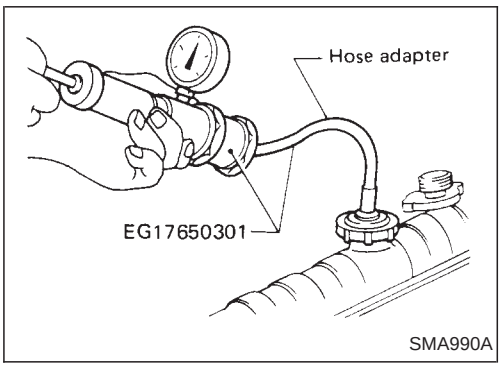
Check hoses for proper attachment, leaks, cracks, damage, loose connections, chafing and deterioration.



CHECKING RADIATOR CAP

Apply pressure to radiator cap by means of a cap tester to see if it is satisfactory.

Radiator cap relief pressure:
78 - 98 kPa
(0.78 - 1.0 bar, 0.8 - 1.0 kg/cm^2, 11 - 14 psi)

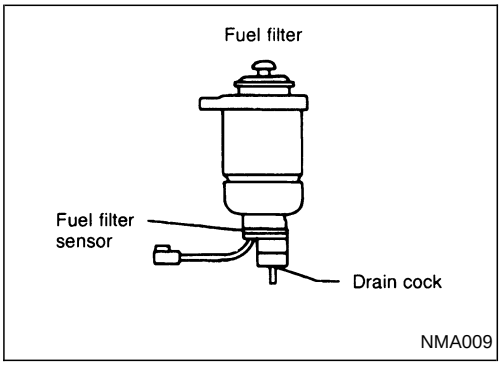


CHECKING COOLING SYSTEM FOR LEAKS

Apply pressure to the cooling system by means of a tester to check for leakage.

Testing pressure:
98 kPa (0.98 bar, 1.0 kg/cm^2, 14 psi)

CAUTION:
Higher than the specified pressure may cause radiator damage.



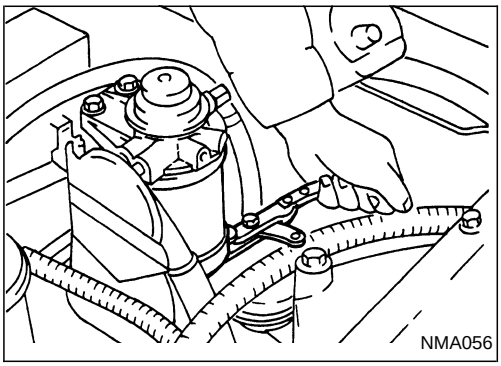
Checking and Replacing fuel filter and Draining Water

Be careful not to spill fuel in engine compartment. Place a rag to absorb fuel.

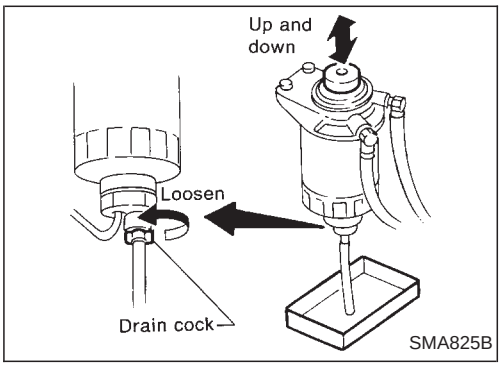
REPLACING FUEL FILTER

1. Remove fuel filter sensor and drain fuel.

Checking and Replacing fuel filter and Draining Water (Cont'd)


NMA056

2. Remove fuel filter, using a suitable tool.
3. Wipe clean fuel filter mounting surface on fuel filter bracket and smear a little fuel on rubber seal of fuel filter.
4. Screw fuel filter on until a slight resistance is felt, then tighten and additional more than 2/3 turn.
5. Install fuel filter sensor to new filter.
6. Bleed air from fuel line.
   Refer to Bleeding Fuel System in EC section.
7. Start engine and check for leaks.



SMA825B

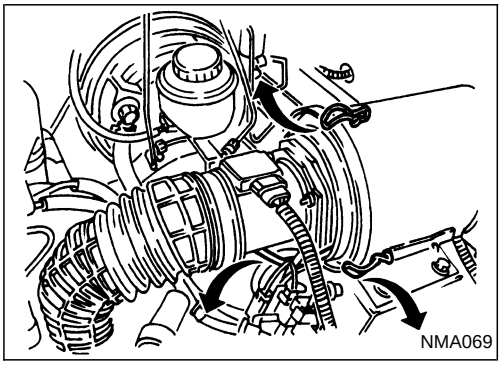
DRAINING WATER

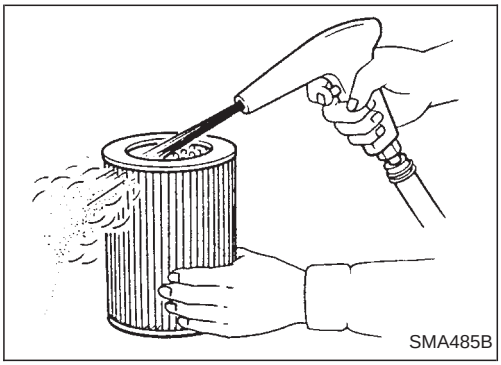
1. Loosen drain cock and drain water.

Loosening drain cock 4 to 5 turns causes water to start draining. Do not remove drain cock by loosening it excessively.

   If water does not drain properly, move the priming pump up and down.
2. Bleed air.
   Refer to section EC for fuel system bleeding instructions.

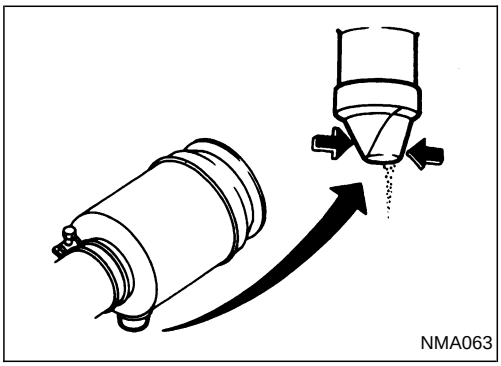
Cleaning and Replacing Air Cleaner Filter (Dry paper type)


NMA069


SMA485B

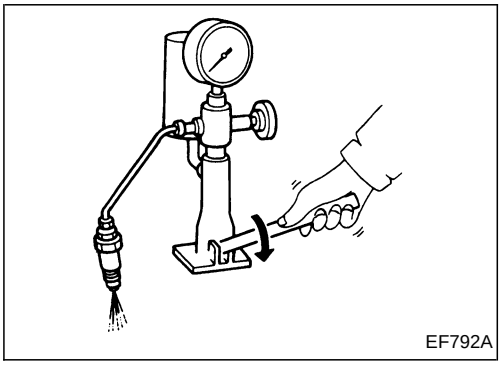
Clean or replace element more often under dusty driving conditions.

Cleaning and Replacing Air Cleaner Filter (Dry paper type) (Cont'd)


NMA063

Pinch the rubber cap located under the cyclone air cleaner assembly to remove dust.

Checking Injection Nozzle


EF792A

WARNING:

When using nozzle tester, do not allow fuel sprayed from nozzle to contact your hand or body, and make sure that your eyes are properly protected with goggles.

1. Check initial injection pressure by pumping tester handle one time per second.

   Initial injection pressure:

   Used Nozzle

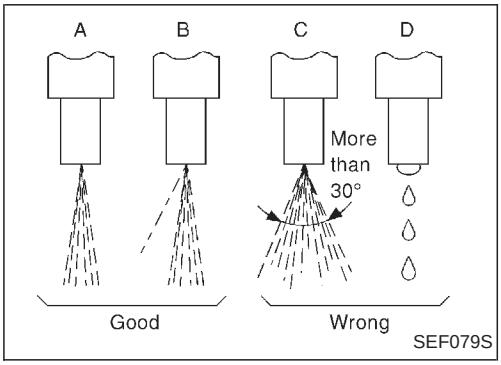
   12,259 - 12,749 kPa
   (122.6 - 127.5 bar, 125 - 130 kg/cm^2,
   1,778 - 1,849 psi)

   New Nozzle

   12,749 - 13,730 kPa
   (127.5 - 137.3 bar, 130 - 140 kg/cm^2,
   1,849 - 1,991 psi)

- **Always check initial injection pressure before installing new nozzle.**

Do not disassemble injection nozzle assembly. Entrust disassembly or adjustment to BOSCH service shop.



SEF079S

2. Check spray pattern by pumping tester handle 4 to 6 times or more per second.
   a. If main spray angle is within 30 degrees as shown, injection nozzle is good.
   b. It is still normal even if a thin stream of spray deviates from the main spray (pattern B).
3. If spray is not correct, clean injection nozzle tip or replace it.

- **For details, refer to INJECTION NOZZLE ASSEMBLY in EC section.**

Checking Idle Speed

Preparation

1. Make sure that injection timing is correct.
2. Make sure that injection nozzle are in good condition.
3. Make sure that the following parts are in good condition.

- Air cleaner clogging
- Glow system
- Engine oil and coolant levels
- Valve clearance
- Air intake system (Oil filler cap, oil level gauge, etc.)

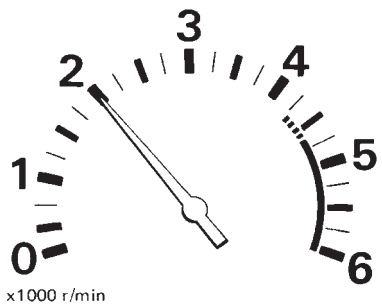
4. Set shift lever in “Neutral” position. Engage parking brake and lock both front and rear wheels with wheel chocks.
5. Turn off air conditioner, lights and accessories.

- Warm up engine until water temperature indicator points to middle of gauge.
- Lights, heater fan and all accessories are off.
- Attach tachometer’s pick-up to No. 1 fuel injection tube.

In order to take accurate reading of engine rpm, remove clamps that secure No. 1 fuel injection tube.

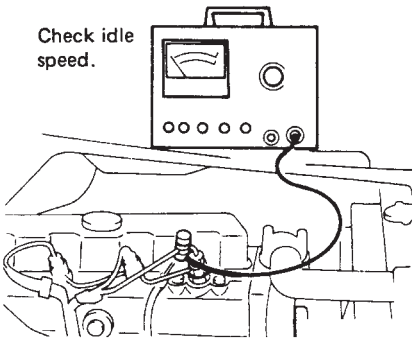
Start engine.

Run engine at about 2,000 rpm for about 2 minutes under no-load.



SMA406B

Run engine for one minute at idle speed.



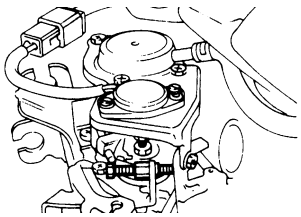
SMA021A

Check idle speed.

IDLE SPEED:
700+ 50 rpm

NG → Adjust idle speed by turning idle speed adjusting screw.

OK

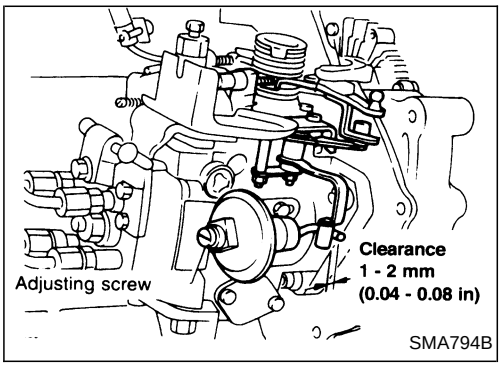


EMA049

END

- **Race engine two or three times and allow engine to return to idle speed. If idle speed is not within the specified range, check acceleration linkage for binding and correct it if necessary.**

Checking Idle Speed (Cont'd)



AIR CONDITIONER EQUIPPED MODEL

1. Make certain that the clearance between the actuator idle control lever pin and the injection pump control lever is within the specified limits.
2. Adjust idle speed to specified rpm without the air conditioner operating.
3. Then check the idle speed when the air conditioner is operating and make sure it is correct.

Unit: rpm

Idle speed (Air conditioner: "ON")	850±50

If not, adjust it by turning FICD actuator stroke adjusting screw.

Checking Tightening Torque

Checking should be performed while engine is cold.

MANIFOLD BOLTS AND NUTS

Intake and exhaust manifolds:

Intake

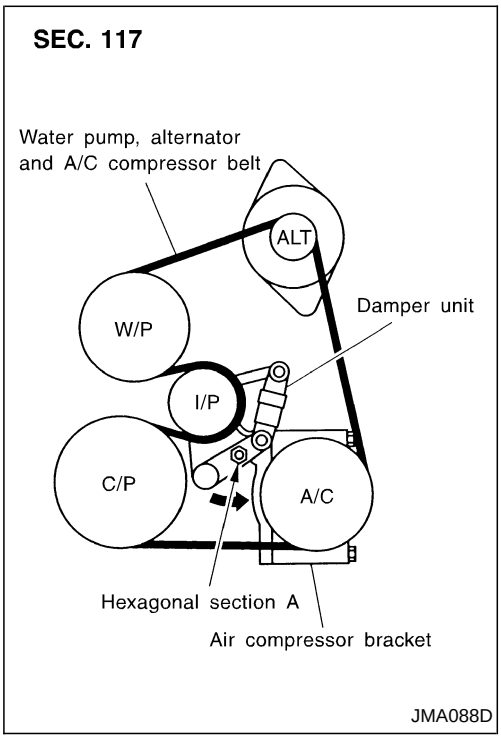
: 25 - 28 N·m (2.5 - 2.9 kg-m, 18 - 20 ft-lb)

Exhaust

: 40 - 49 N·m (4.0 - 4.5 kg-m, 29 - 36 ft-lb)

Adjusting Intake and Exhaust Valve Clearance

Refer to EM section.



Checking Drive Belt

- **Because an auto tensioner adjustment mechanism is provided, it is not necessary to check or adjust the tension of accessory belt.**

1. Inspect for cracks, fraying, wear or oil adhesion. Replace if necessary.

The belts should not touch the bottom of the pulley groove.

2. Check the damper unit of the auto tensioner for oil leaks.

Part	Belt specifications	Tension	Belt deflection
Water pump, alternator, air conditioner compressor belt	V-ribbed belt (7 ribs)	Automatic adjustment by auto tensioner	Automatic adjustment by auto tensioner

Removal

WATER PUMP, ALTERNATOR AND AIR CONDITIONER BELT

1. Remove radiator shroud.
2. Contract and hold the auto tensioner using the following procedure.

a. Securely hold the 19 mm (0.75 in) hexagonal portion A of auto tensioner with a closed wrench.

- Preferably use a tool with a handhold of 500 mm (19.69 in) or more in length.
- No bolts or nuts are required to be loosened during the operation.

b. Turn the hexagonal portion A in the direction shown by the arrow to contract the damper unit of the auto tensioner.

CAUTION:

- **Because the tensioner has a high tension, it shall be securely held and turned with a closed wrench.**
- **Because the hexagonal portion A of the tensioner is made of aluminum and may be damaged by sudden input, turn it slowly according to the contraction of the damper unit.**

3. Remove the belt from the alternator pulley first, and then remove it from the other pulleys.

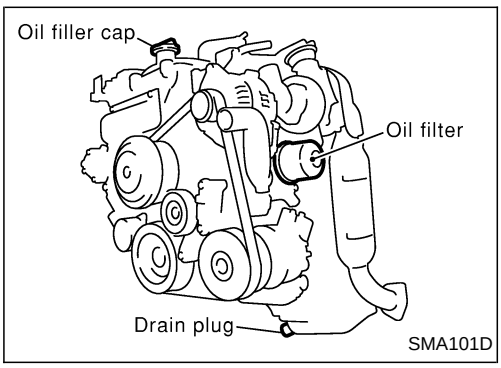
- If the tensioner is not held firmly, your finger may get caught between the belt and the pulleys. Confirm the holding of the tensioner, and then hold the belt side in the place away from the pulleys to attach or remove the belt, paying attention to prevent your finger from being caught.

CAUTION:

- **When handling the belt, pay attention to prevent the oil or coolant from adhering to the belt.**
- **Do not distort or bend the belt intensively.**

Installation

- Install the belt in the reverse order of removal.
- After installation of the belt, confirm that the belt engages the pulleys securely.
- Depending on the engagement between the belt and the idler pulley, noise (belt noise) may be heard when the engine is started just after installation. This noise will stop with time.



Changing Engine Oil

WARNING:

- **Be careful not to burn yourself, as engine oil is 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.**

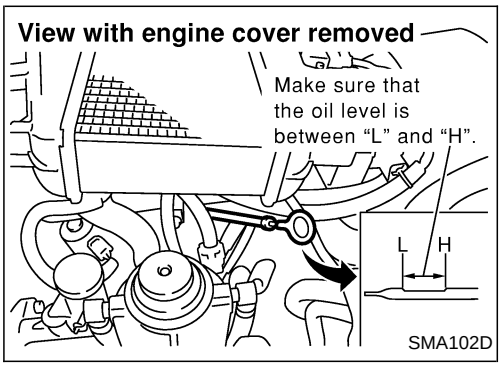
1. Warm up engine, and check for oil leakage from engine components.
2. Remove drain plug and oil filler cap.

Changing Engine Oil (Cont'd)

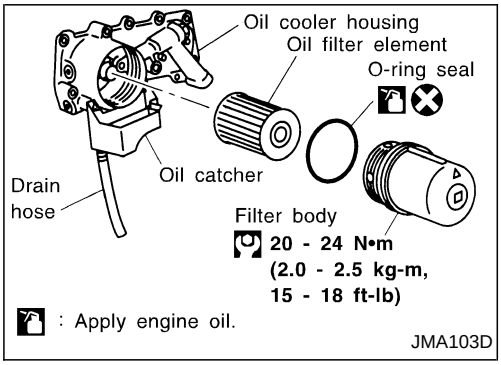
3. Drain oil and fill with new engine oil.
   Oil grade:
   API CF4 or ACEA B3-96.98 or ACEA B3/E3-96.98
   Viscosity:
   See "RECOMMENDED FLUIDS AND LUBRICANTS", MA-1009.
   Refill oil capacity (approximate):
   Without oil filter change
   5.2ℓ (4-5/8 Imp qt)
   With oil filter change
   5.7ℓ (5 Imp qt)

CAUTION:

- **Be sure to clean and install oil pan drain plug with washer.**
  Drain plug:
  : 54 - 58 N·m (5.5 - 6.0 kg-m, 40 - 43 ft-lb)
- **The refill capacity changes depending on the oil temperature and drain time; use these valves as a reference and be certain to check with the dipstick when changing the oil.**



4. Check oil level.
5. Start engine. Check area around drain plug and oil filter for any sign of oil leakage.
6. Run engine for a few minutes, then turn it off. After 10 minutes check oil level.



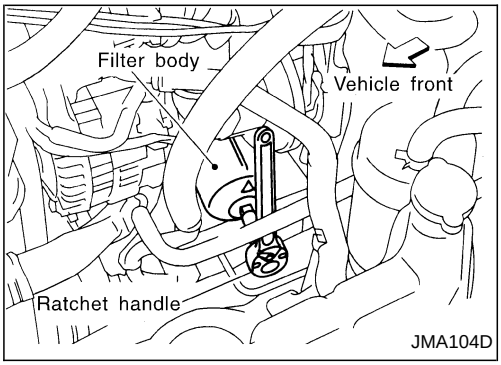
Changing Engine Oil Filter

REMOVAL

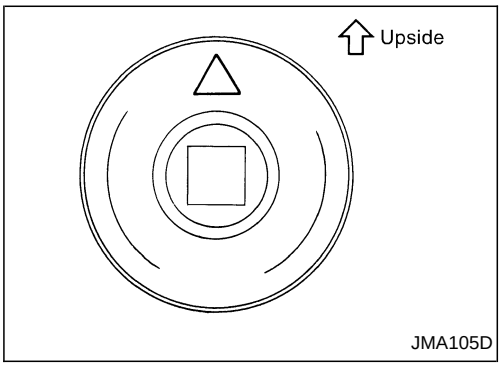
1. Insert a suitable tool with a 12.7 mm square (1/2 inch square) such as an extension bar and ratchet handle into the filter body, and loosen the body by approximately 4 turns.

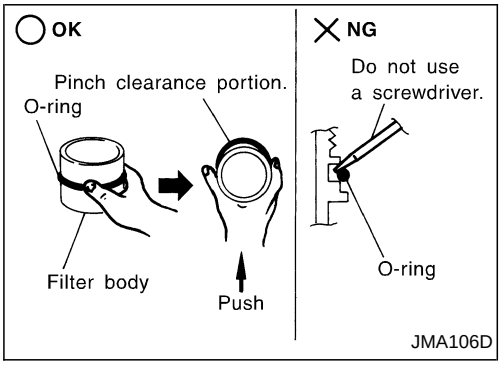
WARNING:

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



Changing Engine Oil Filter (Cont'd)





2. Set the ▲ mark of the filter body to the top position and discharge the oil.
- Receive the oil discharged from the drain hose in a tray.
- About 500 cc (17.6 Imp fl oz) of oil will be discharged in about 3 minutes.
- The oil is discharged from the oil catcher to under the vehicle through the drain hose.

3. Remove the filter body, and then remove the oil filter element.

CAUTION:
- **If the engine oil gets on the engine or vehicle, thoroughly wipe it off.**
- **Thoroughly wipe off the oil remaining in the oil catcher. (This is to prevent misidentifying oil leaking from the oil catcher as oil leaking from the engine.)**

4. Remove the O-ring from the filter body.
- Press the O-ring in any direction with your finger, and pull on the portion of the O-ring separated from the filter body to remove it.

CAUTION:
Because wire and screwdrivers may cause damage to the filter body, do not use such tools.

INSTALLATION

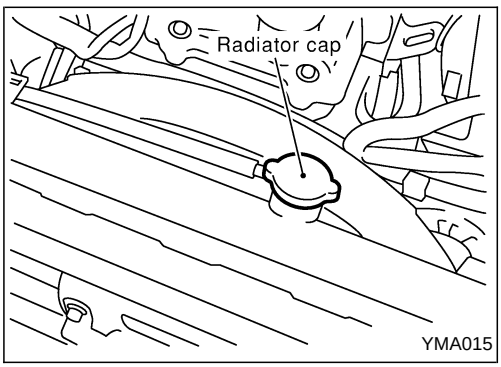
1. Thoroughly remove foreign matter adhering to the inside of filter body and O-ring mounting areas (of the body and oil cooler).
2. Install the oil filter element and O-ring to the filter body.
- Securely press the oil filter element into the filter body.

3. Install the filter body.
   : 20 - 24 N·m (2.0 - 2.5 kg-m, 15 - 18 ft-lb)
4. After warming up the engine, check that no engine oil leaks.

Changing Engine Coolant

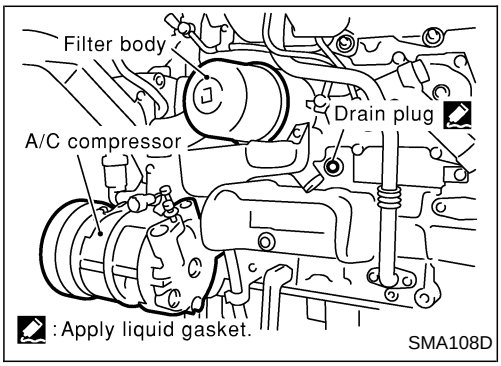
WARNING:
To avoid the danger of being scalded, never change the coolant when the engine is hot.
—DRAINING ENGINE COOLANT—

1. Move heater TEMP control knob all the way to HOT.
2. Remove undercover and disconnect lower radiator hose to drain coolant.

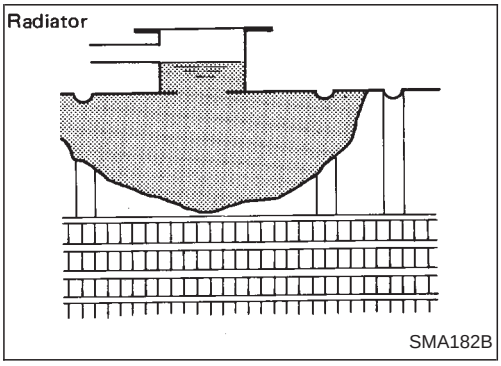


3. Remove radiator filler cap.

Changing Engine Coolant (Cont'd)



4. Remove cylinder block drain plug located at left center of cylinder block.
5. Remove reservoir tank and drain coolant.



—REFILLING ENGINE COOLANT—

6. Install reservoir tank, radiator drain plug, and cylinder block drain plugs.

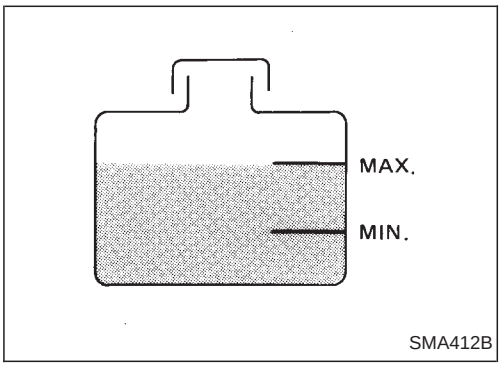
- **Apply sealant to the thread of cylinder block drain plug.**

Cylinder block drain plug:
: 24 - 26 N·m (2.4 - 2.7 kg-m, 18 - 19 ft-lb)

7. Move heater TEMP control knob all the way to HOT.
8. Fill radiator with coolant up to the filler neck.

For coolant mixture ratio, refer to MA-19.

9. Fill reservoir tank with coolant up to the MAX level.



Coolant capacity (With reservoir tank):
10.6 ℓ (9-3/8 Imp qt)
Reservoir tank capacity (for MAX level):
0.75ℓ (5/8 Imp qt)

Pour coolant through coolant filler neck slowly to allow air in system to escape.

10. Install radiator cap.
11. Warm up engine to normal operating temperature.
12. Run engine at 2,000 rpm for 10 seconds and return to idle speed.

- Repeat 2 or 3 times.

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

13. Stop engine and cool it down.

- Cool down using a fan to reduce the time.

14. Remove the radiator cap and check coolant level.

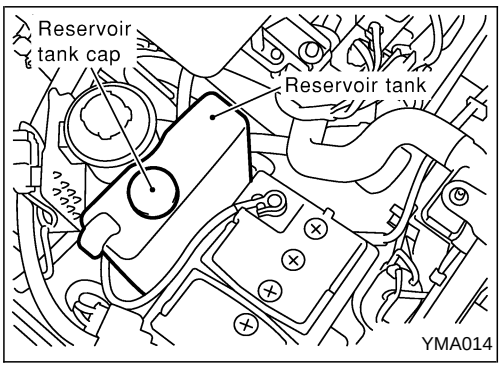
- If necessary, refill radiator up to filler neck with coolant.

15. Refill reservoir tank to Max line with coolant.
16. Repeat step 9 through step 15 two or more times.
17. Warm up engine, and check for sound of coolant flow while running engine from idle up to 2,000 rpm with heater temperature control set at several positions between COOL and HOT.

- Sound may be noticeable at heater water core.

18. If sound is heard, bleed air from cooling system by repeating steps 11 through 17 until coolant level no longer drops.

- **Clean excess coolant from engine.**



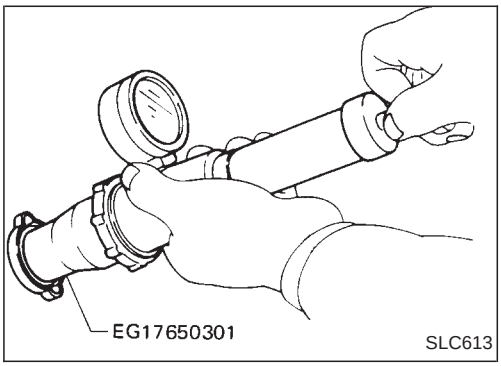
Checking Cooling System

CHECKING HOSES AND CLAMPS

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

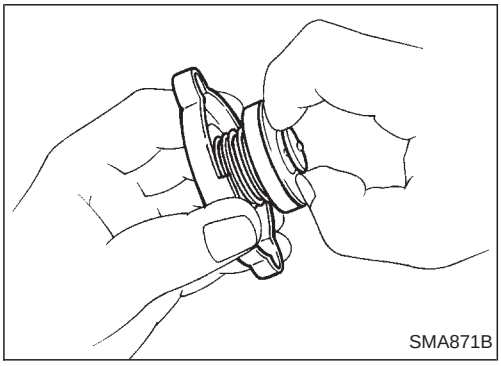
Checking Cooling System (Cont'd)

CHECKING RADIATOR CAP



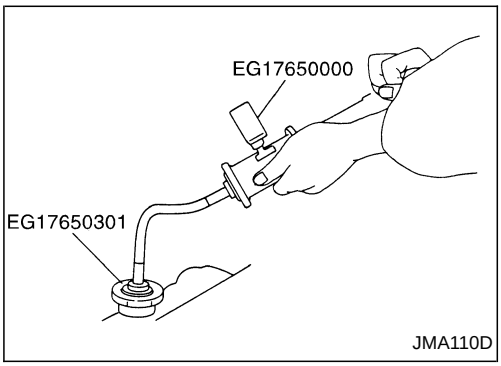
Apply pressure to radiator cap (side with pressure valve) with cap tester to see if it is satisfactory.

Radiator cap relief pressure:
78 - 98 kPa
(0.78 - 0.98 bar, 0.8 - 1.0 kg/cm^2, 11 - 14 psi)



Pull the negative-pressure valve to open it. Check that it closes completely when released.

CHECKING COOLING SYSTEM FOR LEAKS



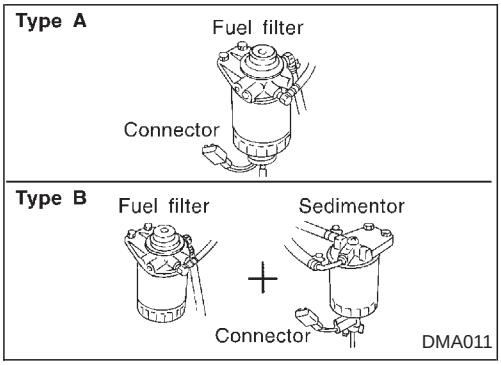
Apply pressure to the cooling system with cap tester to check for leakage.

Testing pressure:
98 kPa (0.98 bar, 1.0 kg/cm^2, 14 psi)

CAUTION:
Use of higher pressure than the specified value may cause damage to radiator.

Checking and Replacing Fuel Filter and Draining Water

Be careful not to spill fuel in engine compartment. Place a rag to absorb fuel.

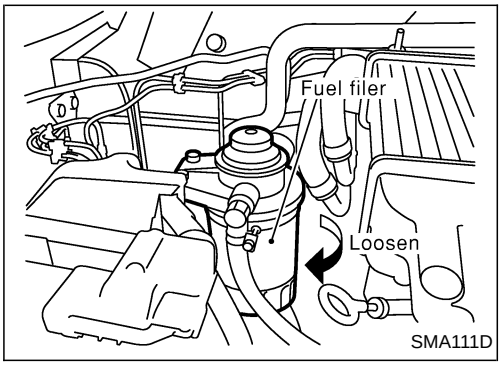


CHECKING FUEL FILTER

Check fuel filter for fuel leakage, damage and other abnormal signs.

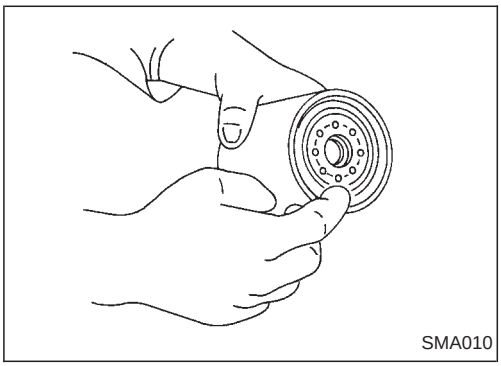
REPLACING FUEL FILTER

1. Disconnect harness connector and drain fuel.
2. Remove fuel filter using band-type filter wrench.
3. Remove fuel filter and fuel filter sensor.



CAUTION:
Remove fuel filter without spilling fuel. If spilt, wipe off immediately. Be specially careful not to spill fuel on engine mount insulator.

Checking and Replacing Fuel Filter and Draining Water (Cont'd)

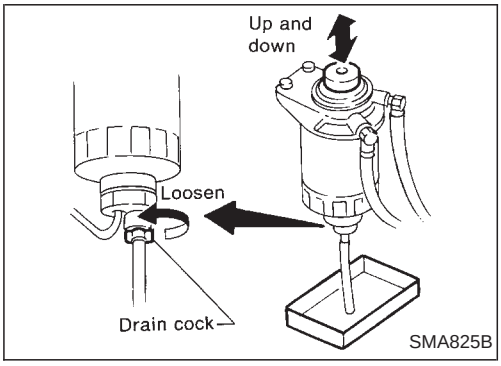

SMA010

4. Wipe clean fuel filter mounting surface on fuel filter bracket and smear a little fuel on rubber seal of fuel filter.
5. Screw fuel filter on until a slight resistance is felt, then tighten an additional more than 2/3 or a turn.
6. Install fuel filter sensor to new fuel filter. (Type A)
7. Bleed air from fuel filter.

Refer to "Air Bleeding" in EC section.

8. Start engine and check for leaks.

DRAINING WATER



SMA825B

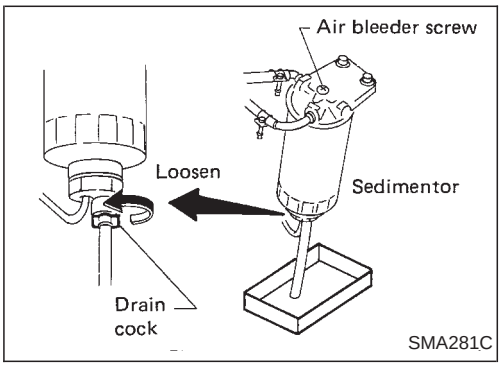
1. Drain water as follows.

Type A

Loosen drain cock and drain water.

Loosening drain cock four to five turns causes water to start draining. Do not remove drain cock by loosening it excessively.

If water does not drain properly, move the priming pump up and down.



SMA281C

Type B

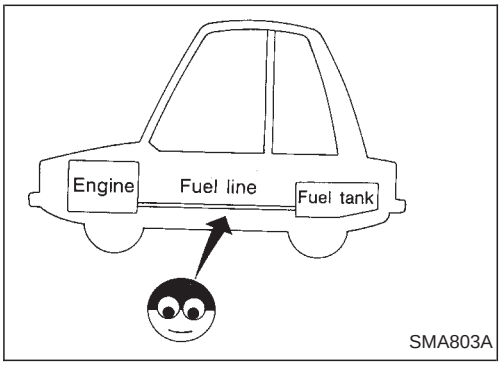
Loosen air bleeder screw from the sedimentor cover and then loosen drain cock and drain water.

Loosening drain cock four to five turns causes water to start draining. Do not remove drain cock by loosening it excessively.

2. Bleed air.

Refer to "Air Bleeding" in EC section.

Checking Fuel Lines

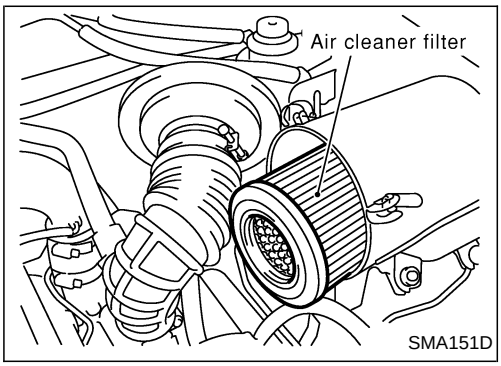


SMA803A

Check fuel lines and tank for proper attachment, leaks, cracks, damage, loose connections, chafing and deterioration.

CAUTION:

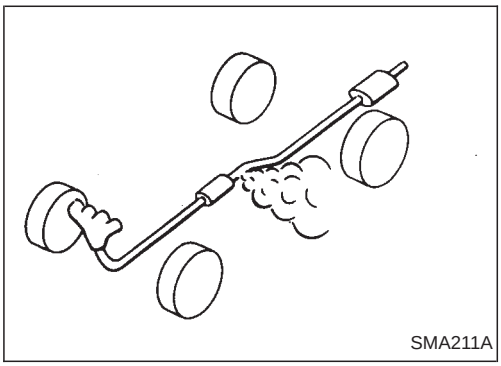
Keep clean parts with compressed air when assembling.



Cleaning and Replacing Air Cleaner Filter

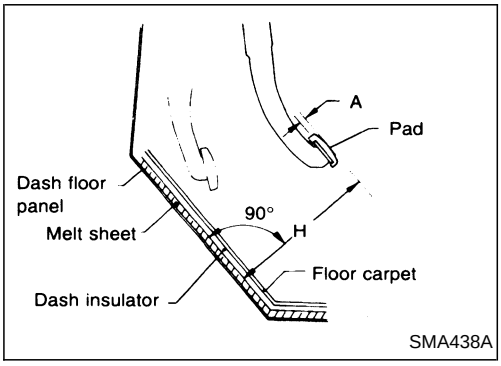
VISCOUS PAPER TYPE

The viscous paper type air cleaner filter does not require any cleaning operation between renewal.


SMA211A

Checking Exhaust System

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



SMA438A

Checking Clutch Operation

Check clutch pedal height, free play and smooth operation.

Pedal height "H":

RHD:

210 - 220 mm (8.27 - 8.66 in)

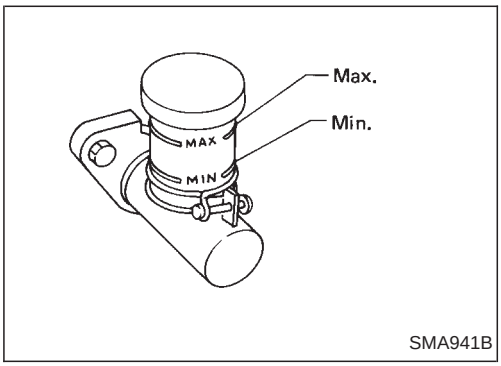
LHD:

227 - 237 mm (8.94 - 9.33 in)

Pedal free play "A":

1.0 - 3.0 mm (0.039 - 0.118 in)

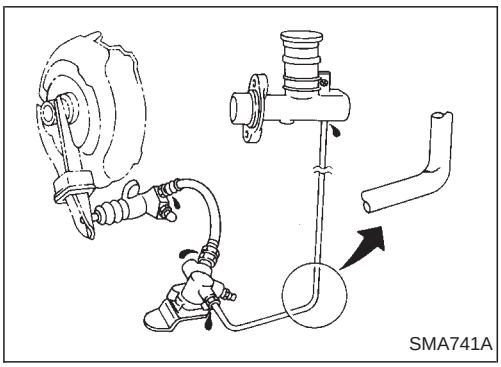
If necessary, adjust clutch pedal height and pedal free play. Refer to Section CL.



SMA941B

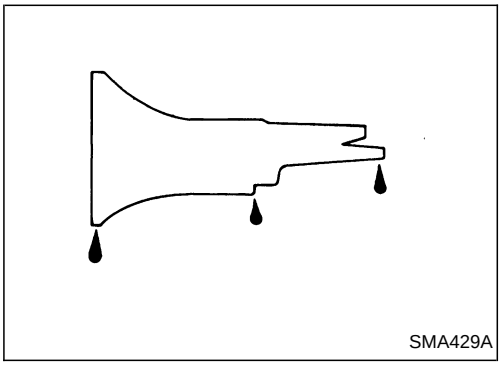
Checking Clutch Fluid Level and Leaks

- If fluid level is extremely low, check clutch system for leaks.


SMA741A

Checking Clutch System

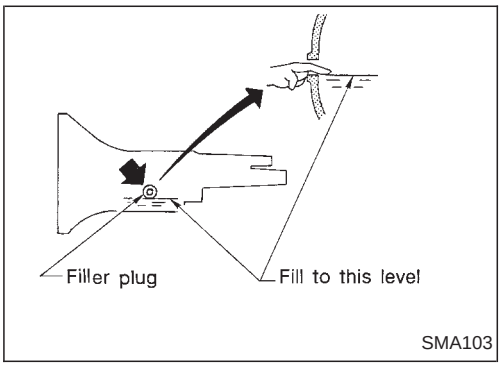
Check fluid lines and operating cylinder for improper attachment, cracks, damage, loose connections, chafing and deterioration.


SMA429A

Checking M/T Oil

1. Check for oil leakage.

Checking M/T Oil (Cont'd)



2. Check oil level.

Never start engine while checking oil level.

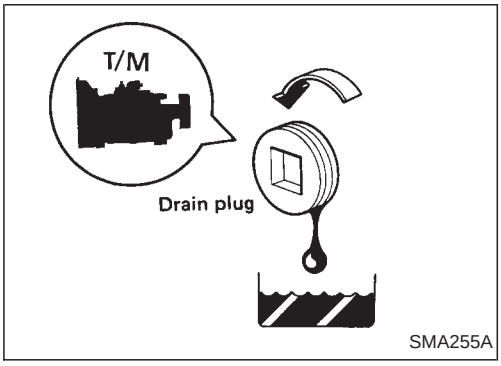
Filler plug:

: 25 - 34 N·m (2.5 - 3.5 kg-m, 18 - 25 ft-lb)

Changing M/T Oil

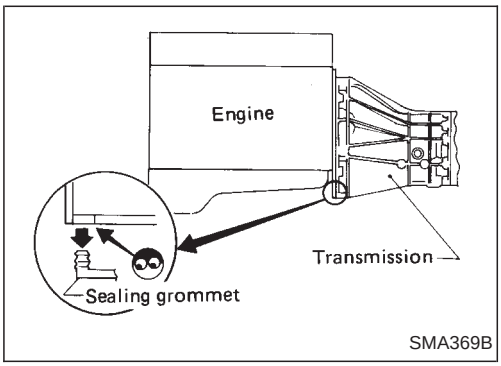
Oil capacity:

3.5 liters (6-1/8 Imp pt)



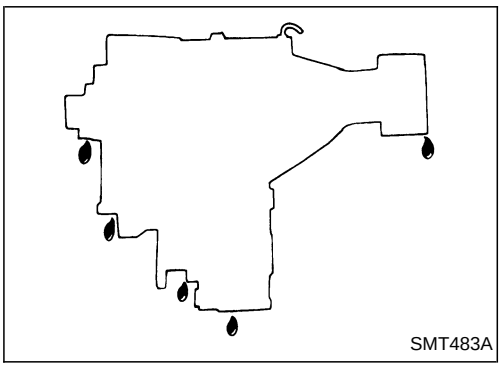
Checking Water Entry

Check water entry in the clutch housing by removing the sealing grommet, whenever driving in deep water or mud.



Checking Transfer Oil

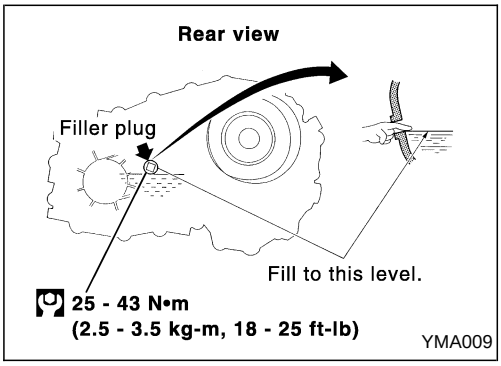
1. Check transfer for leakage.

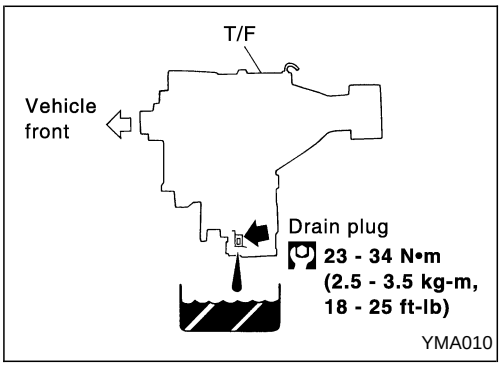


2. Check oil level.

Never start engine while checking oil level.

"DEXRON™" type Automatic Transmission Fluid is used for the transfer in the factory. Never add gear oil (API GL-4) to Automatic Transmission Fluid.

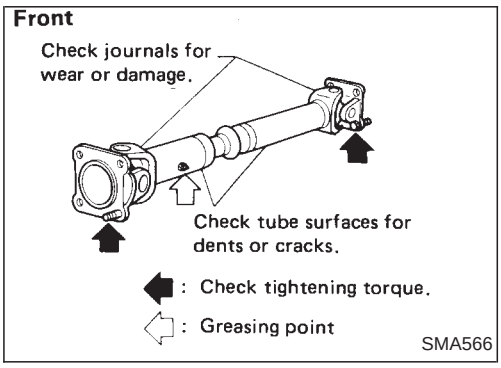




Changing Transfer Oil

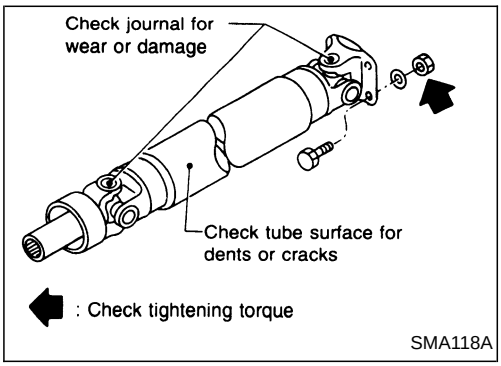
Oil capacity:
2.3 liters (2 Imp qt)

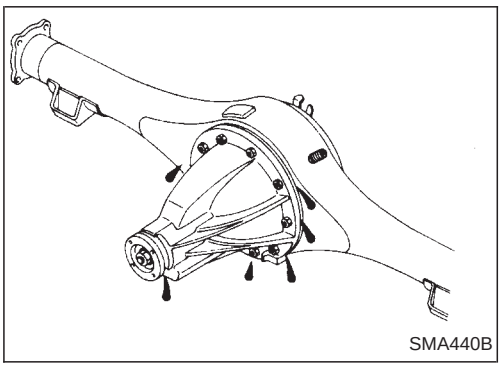
When changing transfer oil completely, either "DEXRON™" type Automatic Transmission Fluid or gear oil (API GL-4) may be used.
Do not mix Automatic Transmission Fluid and gear oil.



Checking Propeller Shaft

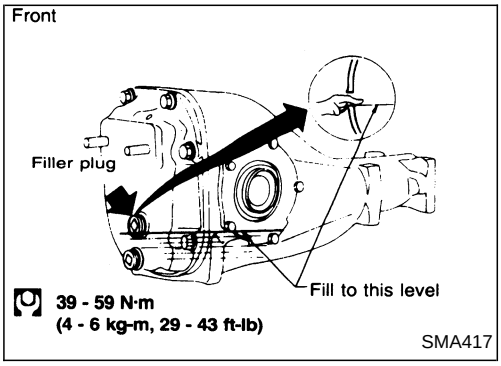
Check propeller shaft for damage, looseness or grease leakage.





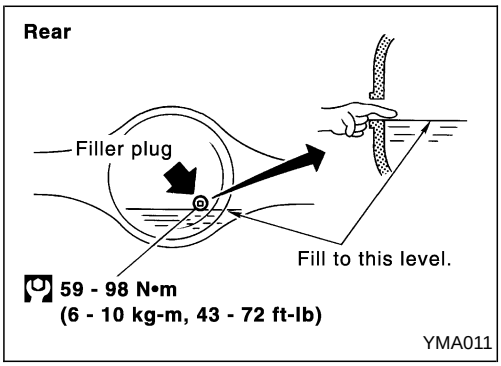
Checking Differential Gear Oil

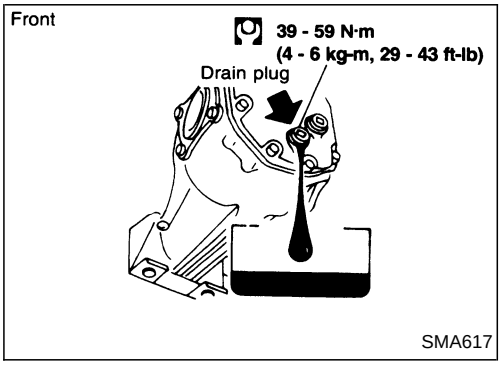
1. Check differential for oil leakage.



2. Check oil level.

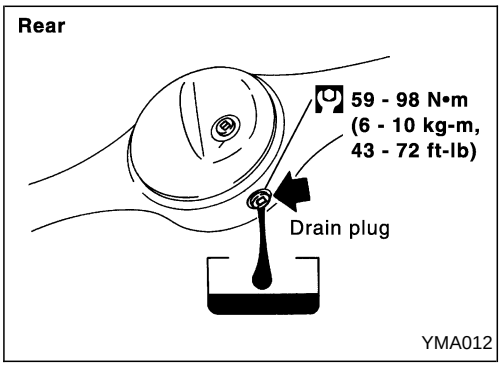
Checking Differential Gear Oil (Cont'd)



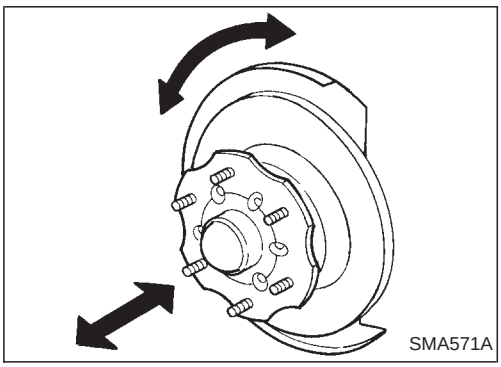


Changing Differential Gear Oil

Oil capacity:
Front
R180A
1.3 liters (2-1/4 Imp pt)

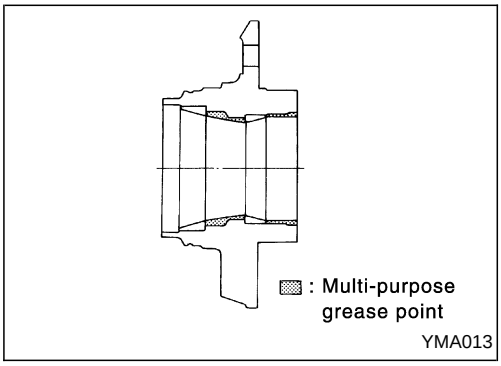


Oil capacity:
Rear
H233B
2.8 liters (4-7/8 Imp pt)



Checking Front Wheel Bearing Grease

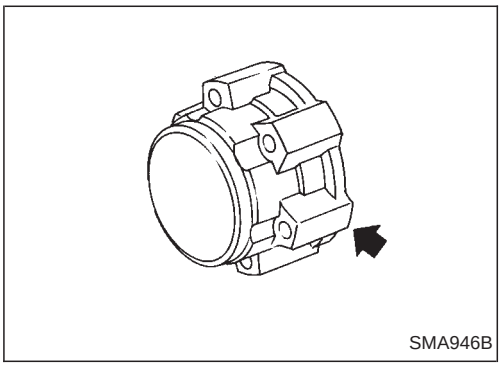
- Check that wheel bearings operate smoothly.
- Check front wheel bearings for grease leakage and water or dust entry.
- Replace front wheel bearings or front wheel bearing grease if wheel bearings do not turn smoothly.



Repacking Front Wheel Bearing Grease

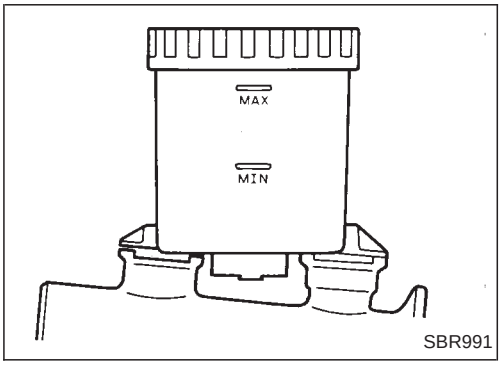
Apply multi-purpose grease sparingly to the following parts:

- Threaded portion of spindle
- Contact surface between wheel bearing washer and outer wheel bearing
- Grease seal lip
- Hub cap or wheel hub (as shown at left)


SMA946B

Checking Free-running Hub Grease

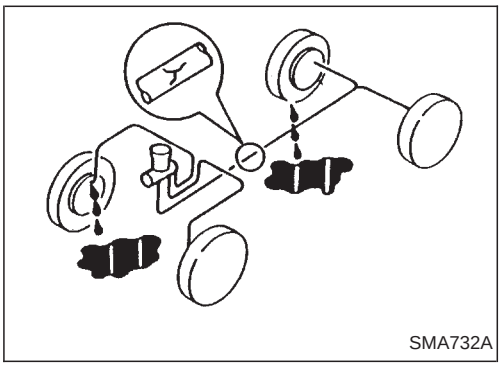
Check free-running hub grease for leakage and water or dust entry.



SBR991

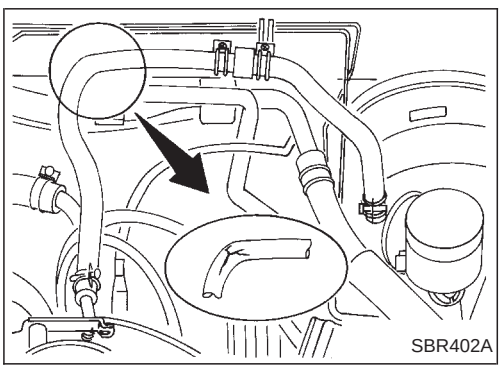
Checking Brake Fluid Level and Leaks

If fluid level is extremely low, check brake system for leaks.


SMA732A

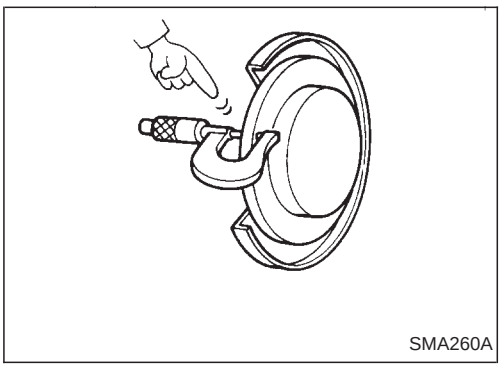
Checking Brake System

Check brake fluid lines and parking brake cables for improper attachment, leaks, chafing, abrasion, deterioration, etc.


SBR402A

Checking Brake Booster, Vacuum Hoses, Connections and Check Valve

Check vacuum lines, connections and check valve for improper attachment, air tightness, chafing and deterioration.


SMA260A

Checking Disc Brake

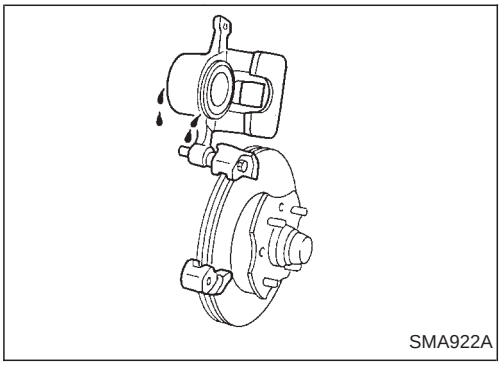
Check condition of disc brake components.

ROTOR

Check condition and thickness.

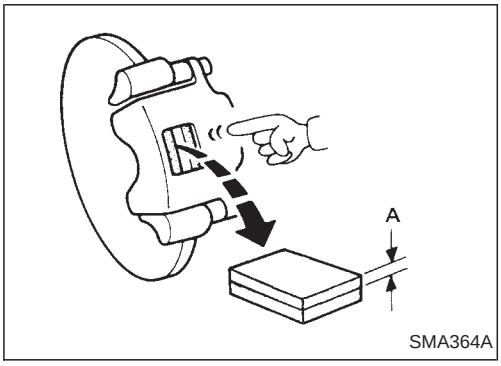
Standard thickness:
26 mm (1.02 in)
Minimum thickness:
24 mm (0.94 in)

Checking Disc Brake (Cont'd)


SMA922A

CALIPER

Check operation and leakage.



SMA364A

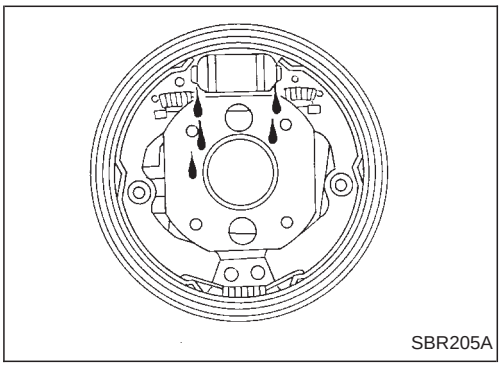
PAD

Check wear or damage.

Standard thickness:
15.5 mm (0.610 in)
Minimum thickness:
2.0 mm (0.079 in)

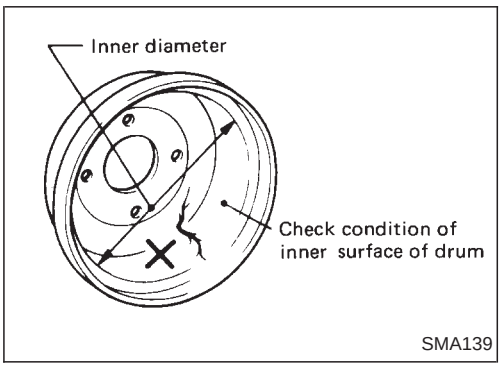
Checking Drum Brake

Check condition of drum brake components.


SBR205A

WHEEL CYLINDER

Check operation and leakage.

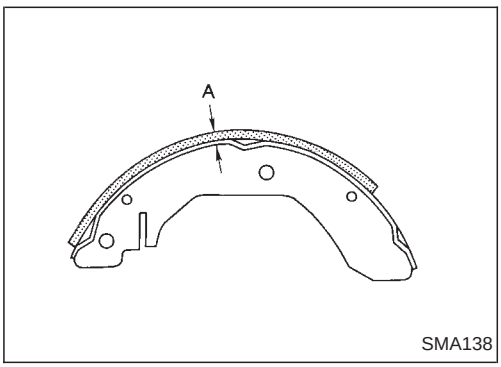


SMA139

DRUM

Check condition of inner surface.

Nominal diameter:
280 mm (11.02 in)
Maximum diameter:
282 mm (11.10 in)
Out of round maximum:
0.05 mm (0.002 in) or less



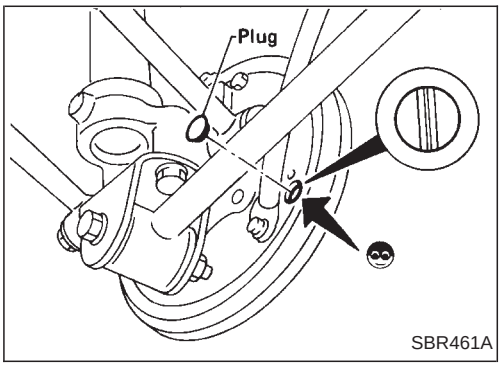
SMA138

LINING

Check wear or damage.

Standard thickness:
Trailing: 3.95 mm (0.16 in)
Leading: 8.95 mm (0.35 in)
Lining wear limit (Minimum thickness):
1.52 mm (0.06 in)

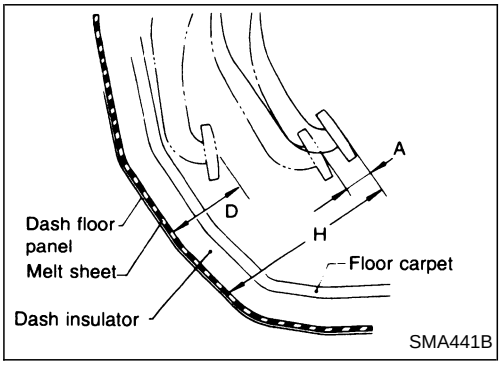
Checking Drum Brake (Cont'd)



TEMPORARY METHOD FOR CHECKING LINING WEAR

Remove inspection hole plug and check for lining wear.

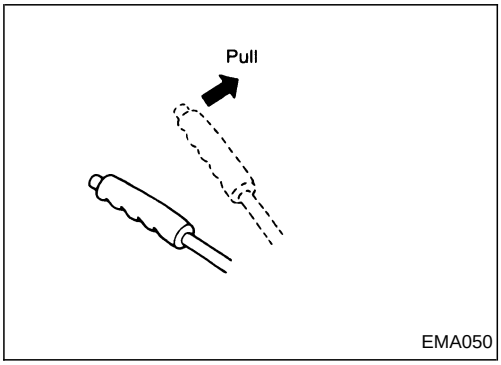
Checking Foot Brake Pedal Operation



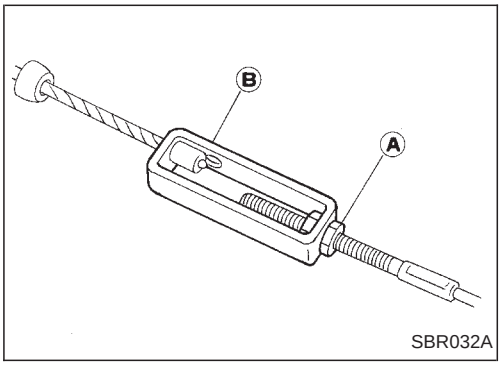
Check brake pedal free height, depressed height and for smooth operation.

H: Free height:
RHD: 196 - 206 mm (7.72 - 8.11 in)
LHD: 210 - 220 mm (8.27 - 8.66 in)
D: Depressed height:
Under force of 490 N (50 kg, 110 lb) with engine running
RHD: 137.7 - 148.7 mm (5.42 - 5.85 in)
LHD: 142.5 - 152.5 mm (5.61 - 6.00 in)
A: Pedal free play
1.0 - 3.0 mm (0.039 - 0.118 in)

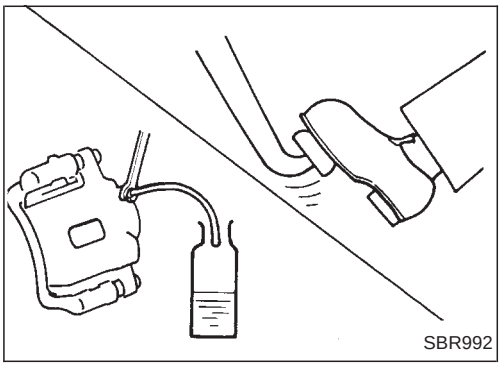
Checking Parking Brake



1. Pull lever with specified amount of force.
   Check lever stroke and for smooth operation.
   Number of notches
   [At pulling force of 196 N (20 kg, 44 lb)]:
   9 - 10



2. Use adjuster to adjust lever stroke.
(1) Loosen lock nut Ⓐ, rotate adjuster Ⓑ.
(2) Tighten lock nut Ⓐ.


SBR992

Changing Brake Fluid

1. Drain brake fluid from each air bleeder valve.
2. Refill until new brake fluid comes out from each air bleeder valve. Use same procedure as in bleeding hydraulic system to refill brake fluid.

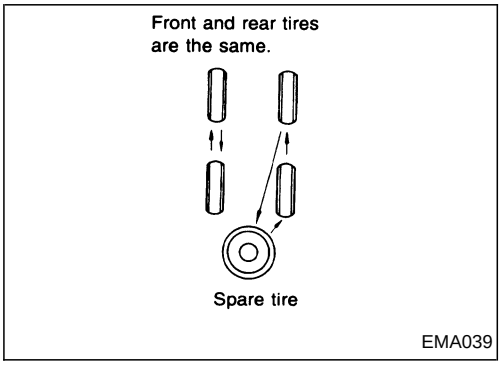
Refer to section BR.

- **Refill with recommended brake fluid “DOT 4”.**
- **Never reuse drained brake fluid.**
- **Be careful not to splash brake fluid on painted areas.**

Balancing Wheels

Adjust wheel balance using the road wheel center.

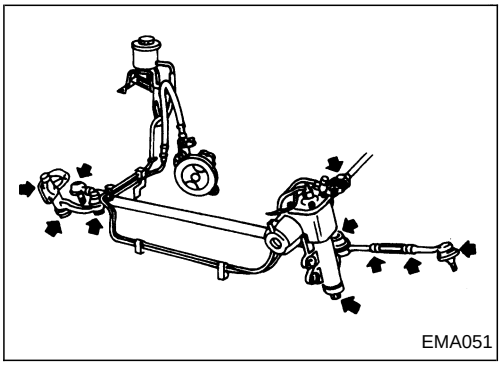
Radial runout limit:
Steel wheel:
0.5 mm (0.020 in)
Aluminum wheel:
0.3 mm (0.012 in)
Lateral runout limit:
Steel wheel:
0.8 mm (0.032 in)
Aluminum wheel:
0.3 mm (0.012 in)



EMA039

Tire Rotation

Wheel nuts
: 118 - 147 N·m (12 - 15 kg-m, 87 - 108 ft-lb)


EMA051

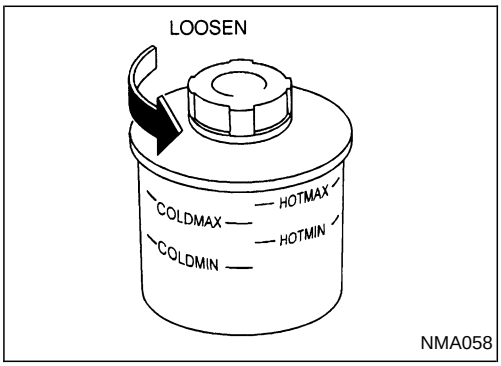
Checking Steering Gear and Linkage

STEERING GEAR

- Check gear housing and boots for looseness, damage or grease leakage.
- Check connection with steering column for looseness.

STEERING LINKAGE

- Check ball joint, dust cover and other component parts for looseness, wear damage or grease leakage.

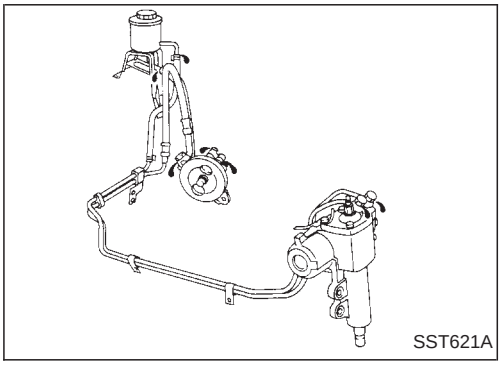


Checking Fluid Level and Leaks (Power steering)

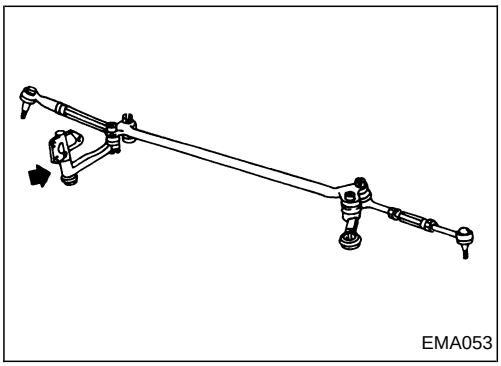
Check fluid level.
Fluid level can be checked when the fluid is either hot or cold.

CAUTION:

- **Do not overfill.**
- **Recommended fluid is Automatic Transmission Fluid "DEXRON™" type.**

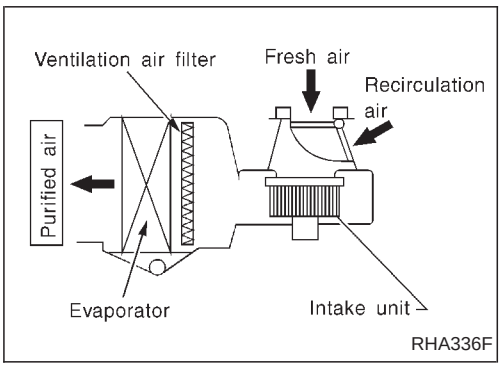


- Check lines for improper attachment, leaks, cracks, damage, loose connections, chafing and deterioration.



Greasing Steering Linkage

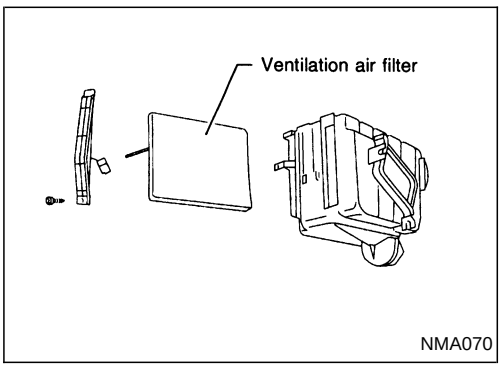
Apply multi-purpose grease to point shown in the illustration.



Ventilation Air Filter

FUNCTION

Air inside passenger compartment is kept clean at either recirculation or fresh mode by installing ventilation air filter into cooling unit.

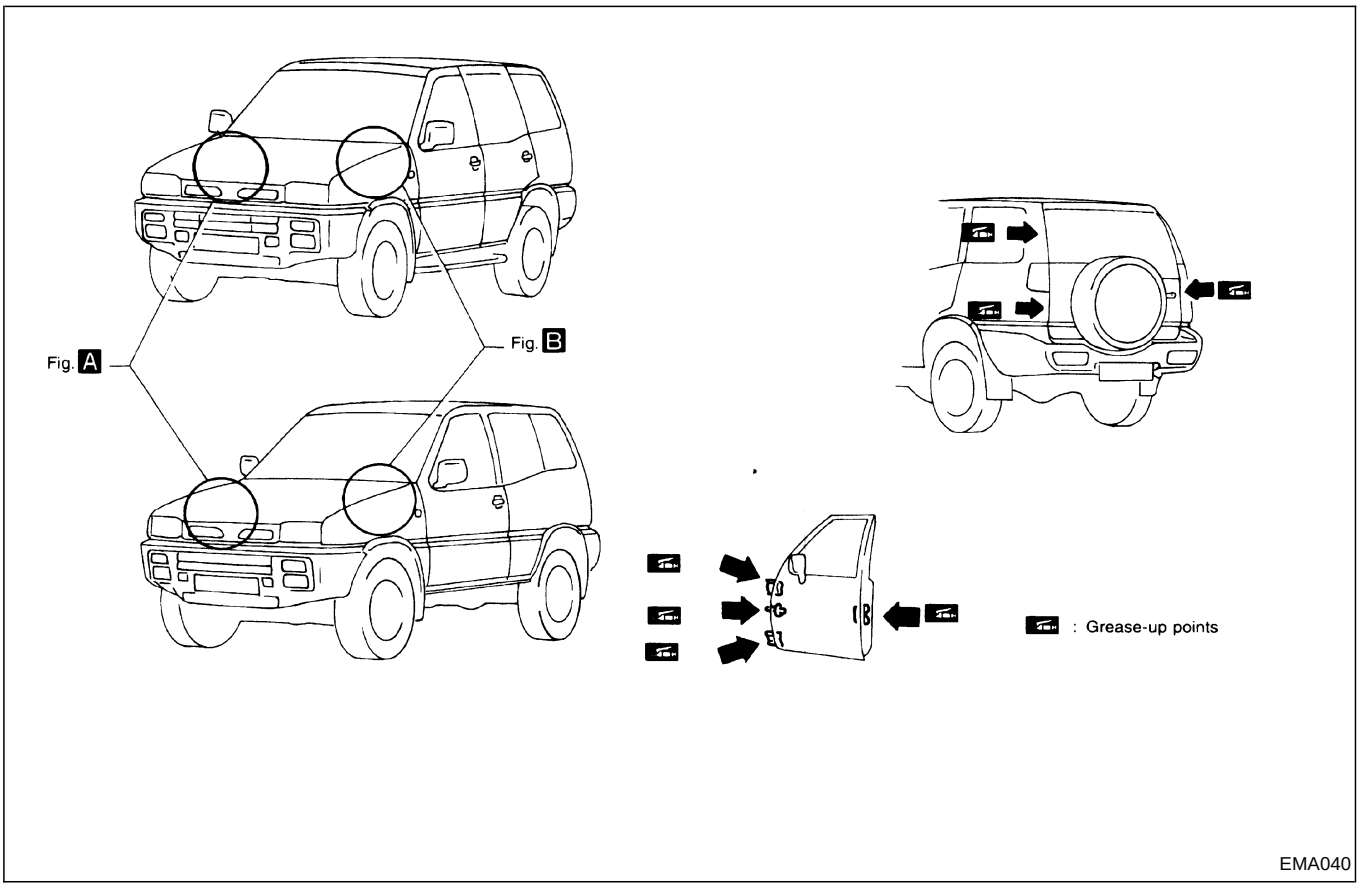


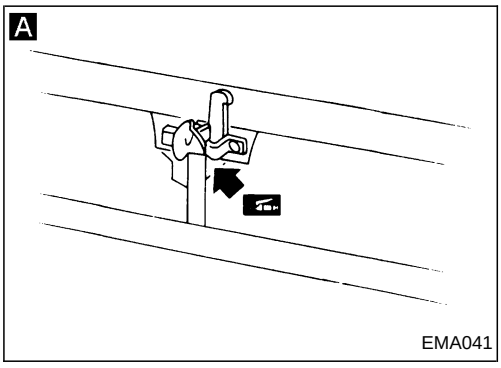
REPLACEMENT PROCEDURES

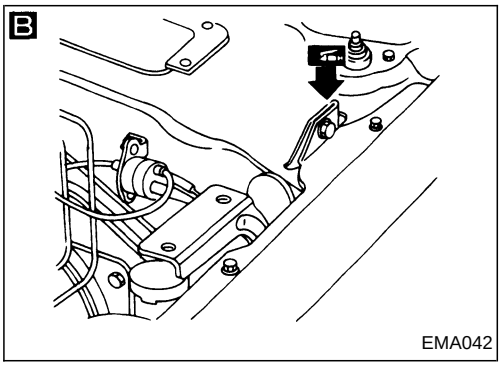
- Remove glove box.
  Refer to BT section.
- Take out ventilation air filter which is secured with one screw, from cooling unit.
- Replace with new one and reinstall glove box.

Body

LUBRICATING HOOD LATCHES, LOCKS AND HINGES

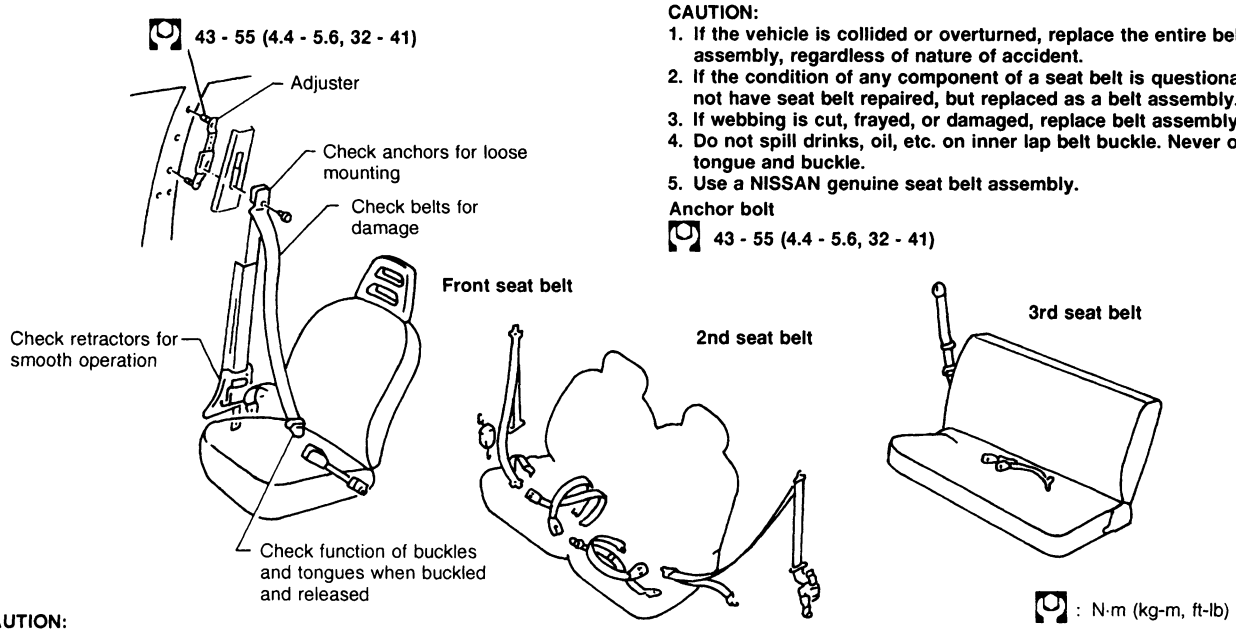






Body (Cont'd)

CHECKING SEAT BELTS, BUCKLES, RETRACTORS, ANCHORS AND ADJUSTERS



CAUTION:

1. **If the vehicle is collided or overturned, replace the entire belt assembly, regardless of nature of accident.**
2. **If the condition of any component of a seat belt is questionable, do not have seat belt repaired, but replaced as a belt assembly.**
3. **If webbing is cut, frayed, or damaged, replace belt assembly.**
4. **Do not spill drinks, oil, etc. on inner lap belt buckle. Never oil tongue and buckle.**
5. **Use a NISSAN genuine seat belt assembly.**

Anchor bolt

43 - 55 (4.4 - 5.6, 32 - 41)

: N·m (kg-m, ft-lb)

CAUTION:

When removing the seat belt and seat belt pre-tensioner retractor, be sure to make the seat belt pre-tensioner inoperative. Refer to "SUPPLEMENTAL RESTRAINT SYSTEM (SRS) — Removal and Installation — Seat Belt Pre-tensioner in section BF

NMA059

Checking Body Corrosion

Visually check the body sheet metal panel for corrosion, paint damage (scratches, chipping, rubbing, etc.) or damage to the anti-corrosion materials. In particular, check the following locations.

Hemmed portion

Hood front end, door lower end, trunk lid rear end, etc.

Panel joint

Side sill of rear fender and center pillar, rear wheel housing of rear fender, around strut lower in engine compartment, etc.

Panel edge

Trunk lid opening, sun roof opening, fender wheel-arch flange, fuel filler lid flange, around holes in panel, etc.

Parts contact

Waist moulding, windshield moulding, bumper, etc.

Protectors

Damage or condition of mudguard, fender protector, chipping protector, etc.

Anti-corrosion materials

Damage or separation of anti-corrosion materials under the body.

Drain holes

Condition of drain holes at door and side sill.

When repairing corroded areas, refer to the Corrosion Repair Manual.

Engine Maintenance

INSPECTION AND ADJUSTMENT

Drive belt deflection

Unit: mm (in)

	Used belt deflection		Deflection of new belt
	Limit	Deflection after adjustment	
Engine	TD27Ti	TD27Ti	TD27Ti
Alternator	20 (0.79)	11 - 13 (0.43 - 0.51)	9 - 11 (0.35 - 0.43)
Air conditioner	12 (0.47)	6 - 7.5 (0.236 - 0.295)	5 - 6.5 (0.197 - 0.256)
Power steering oil pump	15 (0.59)	8 - 9.5 (0.315 - 0.374)	7 - 8.5 (0.276 - 0.335)
Applied pushing force	98 N (10 kg, 22 lb)		

Oil capacity (Refill capacity)

TD27Ti engine

Unit: ℓ (Imp qt)

With oil filter change	6.2 (5-1/2)
Without oil filter change	5.5 (4-7/8)

ZD30DDTi engine

Unit: ℓ (Imp qt)

With oil filter change	6.7 (5-7/8)
Without oil filter change	6.2 (5-1/2)

Cooling system check

Unit: kPa (bar, kg/cm^2, psi)

Cooling system testing pressure	98 (0.98, 1.0, 14)
Radiator cap relief pressure	78 - 98 (0.78 - 1.0, 0.8 - 1.0, 11 - 14)

Coolant capacity (Refill capacity)

Unit: ℓ (Imp qt)

Engine	TD27Ti	ZD30DDTi
Without reservoir tank	10 (8-3/4)	10.6 (9-3/8)
Reservoir tank	0.8 (3/4)	0.75 (5/8)

Valve clearance (Hot)

Unit: mm (in)

Engine	TD27Ti
Intake	0.25 (0.0098)
Exhaust	

Injection nozzle

Unit: kPa (bar, kg/cm^2, psi)

Engine	TD27Ti
Initial injection pressure	
New	12,259 - 12,749 (122.6 - 127.5, 125 - 130, 1,778 - 1,849)
Used	12,749 - 13,730 (127.5 - 137.3, 130 - 140, 1,849 - 1,991)

Idle speed

Unit: rpm

Engine	TD27Ti
With A/C	850±50
Without A/C	700±50

Chassis and Body Maintenance

INSPECTION AND ADJUSTMENT

Clutch

Unit: mm (in)

Vehicle model	All	
Pedal free height	RHD 210 - 220 (8.27 - 8.66)	LHD 227 - 237 (8.94 - 9.33)
Pedal free play	1.0 - 3.0 (0.039 - 0.118)	
Pedal free travel	155 - 160 (6.10 - 6.30)	

Front axle and front suspension (Unladen)*1

Unit: degree

Model	H/T VAN	H/T	WAGON
Camber	0°30′±30′		
Caster	0°29′±30′	0°30′±30′	0°30′±30′
Kingpin inclination	12°37′		
Toe-in A-B mm (in)	3.5 - 5.5 (0.14 - 0.22)	3 - 5 (0.12 - 0.20)	3 - 5 (0.12 - 0.20)
Front wheel turning angle (degrees) (Full turn)*2 Inside	34°27′		
Outside	33°38′		

*1: Fuel, radiator coolant and engine oil full.
Spare tire, jack, hand tools and mats in designated positions.
*2: Wheel turning force (at circumference of steering wheel) of 98 to 147 N (10 to 15 kg, 22 to 33 lb) with engine idle.

Brake

Disc brake mm (in) LD28VA		
Pad		
Standard thickness	15.5 (0.61)	
Minimum thickness	2.0 (0.079)	
Rotor		
Standard thickness	2.60 (1.02)	
Minimum thickness	24.0 (0.94)	
Drum brake mm (in) LT28		
Lining		
Standard thickness		
Leading	8.95 (0.352)	
Trailing	3.95 (0.156)	
Minimum thickness	1.52 (0.06)	
Drum		
Standard diameter	280 (11.02)	
Maximum diameter	282 (11.10)	
Pedal mm (in)	RHD	LHD
Free height	196 - 206 (7.7 - 8.1)	210 - 220 (8.3 - 8.7)
Free play	1.0 - 3.0 (0.039 - 0.118)	
Full stroke	137.7 - 148.7 (5.42 - 5.85)	142.5 - 152.5 (5.61 - 6.00)
Parking brake		
Number of notches [at pulling force 196 N (20 kg, 44 lb)]	9 - 10	

Chassis and Body Maintenance (Cont'd)

Wheel runout

Unit: mm (in)

Wheel type	Steel	Aluminum
	16″ x 7J	16″ x 7J
Radial runout limit	0.5 (0.020)	0.3 (0.012)
Lateral runout limit	0.8 (0.031)	0.3 (0.012)

Wheel bearing

Axial end play limit	mm (in)	0
Lock nut		
Tightening torque N·m (kg-m, ft-lb)		78 - 98 (7.9 - 10, 57 - 72)
Retightening torque N·m (kg-m, in-lb)		0.5 - 1.5 (0.05 - 0.15, 4 - 13)

TIGHTENING TORQUE

Unit	N·m	kg-m	ft-lb
Clutch			
Pedal stopper lock nut	12 - 15	1.2 - 1.5	8.7 - 10.8
Master cylinder push rod lock nut	8 - 11	0.8 - 1.1	5.8 - 8.0
Manual transmission			
Drain and filler plugs			
FS5R30A	25 - 34	2.5 - 3.5	18 - 25
Differential carrier			
Drain and filler plugs			
R180A	39 - 59	4 - 6	28.8 - 43.5
H233B	59 - 98	6 - 10	43.5 - 72.3
Front axle and front suspension			
Tie-rod lock nut	60 - 70	6.1 - 7.1	44.3 - 51.6
Brake system			
Air bleeder valve	7 - 9	0.7 - 0.9	5.1 - 6.5
Wheel and tire			
Wheel nut	118 - 147	12.0 - 15.0	87.0 - 108.4