

MAINTENANCE

SECTION MA

MA

MODIFICATION NOTICE:

Engine and Emission Control Service (For Europe)

SR engine

- The maintenance schedules for Europe have been revised in conjunction with the adoption of SR20DE engine.
- The belt deflection adjustment and check point for deflection have been changed.
- The spark plug type has been changed.

CD engine

- The belt deflection adjustment has been changed.
- An injection nozzle with needle lift sensor has been adopted on No. 1 cylinder.
- The idle speed inspection has been deleted.

Chassis and Body Service (For Europe)

- The replacement interval of the ventilation air filter has been added.

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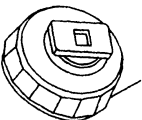
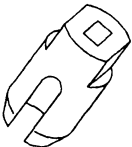
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PREPARATION

Special Service Tools

Tool number Tool name	Description	Engine application			
		GA	SR	CD	
99545R2500 (KV101060S0) Oil filter wrench	 15 faces, Inner span: 92.5 mm (3.642 in) (Face to opposite corner) NT631	Removing oil filter	—	—	X
KV119E0010 Nozzle holder socket	 NT563	Removing and installing injec- tion nozzle assembly	—	—	X

PERIODIC MAINTENANCE (For Europe)

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.

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Engine Oil & Minor Service

GASOLINE ENGINE

Abbreviation: R = Replace.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL							
Perform either at number of kilometers (miles) or months, whichever comes first.	km x 1,000	15	30	45	60	75	90	105	120
	(Miles x 1,000)	(9)	(18)	(27)	(36)	(45)	(54)	(63)	(72)
	Months	12	24	36	48	60	72	84	96
Underhood and under vehicle									
Engine oil (API SG or SH oil)★		R	R	R	R	R	R	R	R
Engine oil filter★		R	R	R	R	R	R	R	R

DIESEL ENGINE

Abbreviations: R = Replace, I = Inspect and correct or replace as necessary

MAINTENANCE OPERATION		MAINTENANCE INTERVAL							
Perform either at number of kilometers (miles) or months, whichever comes first.	km x 1,000	10	20	30	40	50	60	70	80
	(Miles x 1,000)	(6)	(12)	(18)	(24)	(30)	(36)	(42)	(48)
	Months	6	12	18	24	30	36	42	48
Underhood and under vehicle									
Engine oil (Use API CD oil)★		R	R	R	R	R	R	R	R
Engine oil filter★		R	R	R	R	R	R	R	R
Drive belts		I	I		I		I		I

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

PERIODIC MAINTENANCE (For Europe)

Engine and Emission Control Service

Abbreviations: I = Inspect and correct or replace as necessary, R = Replace.

MAINTENANCE OPERATION			MAINTENANCE INTERVAL			
Perform either at number of kilometers (miles) or months, whichever comes first.	km x 1,000	30	60	90	120	
	(Miles x 1,000)	(18)	(36)	(54)	(72)	
	Months	12	24	36	48	
Underhood and under vehicle						
Engine anti-freeze coolant (Ethylene glycol base) (LLC)		See NOTE (1)		R		
Cooling system		I	I	I	I	
Fuel lines			I			I
Air cleaner filter (Viscous paper type)★			R			R
GASOLINE ENGINE	Intake & exhaust valve clearance (GA series engine only)	See NOTE (2)				
	Drive belts	See NOTE (3)		I	I	I
	Fuel filter★				R	
	Spark plugs	R	R	R	R	R
	Ignition wires				I	
	PCV filter★ (GA series engine only)			R		R
	Vapor lines (Hoses, connections, etc.)			I		I
	(Heated) oxygen sensor			I		I
DIESEL ENGINE	Fuel filter			R		R
	Nozzles	See NOTE (4)				
	Timing belts for camshaft and injection pump	Replace every 90,000 km (54,000 miles)				

NOTE: (1) Replace at the first 90,000 km (54,000 miles) or 60 months, then every 60,000 km (36,000 miles) or 24 months, whichever comes first.

(2) If valve noise increases, check valve clearance.

(3) After 60,000 km (36,000 miles) or 24 months, inspect every 30,000 km (18,000 miles) or 12 months, whichever comes first.

(4) If engine power decreases, black smoke is emitted or engine noise increases, check and, if necessary, adjust the fuel injection nozzle's starting pressure and the fuel spray pattern.

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

PERIODIC MAINTENANCE (For Europe)

Chassis and Body Service

Abbreviations: R = Replace. I = Inspect, and correct or replace as necessary.

MAINTENANCE OPERATION		MAINTENANCE INTERVAL			
Perform either at number of kilometers (miles) or months, whichever comes first.	km x 1,000	30	60	90	120
	(Miles x 1,000)	(18)	(36)	(54)	(72)
	Months	12	24	36	48
CHASSIS AND BODY		Underhood and under vehicle			
Brake & clutch oil (For level & leaks)★		I	I	I	I
Automatic transaxle fluid (For level & leaks)★		I	I	I	I
Brake fluid★			R		R
Brake booster vacuum hoses, connections & check valve			I		I
Power steering fluid & lines (For level & leaks)		I	I	I	I
Brake & clutch systems		I	I	I	I
Manual transaxle oil (For leaks)★		I	I	I	I
Steering gear & linkage, axle & suspension parts & exhaust system★			I		I
Drive shafts★		I	I	I	I
Outside and Inside					
Wheel alignment (If necessary, rotate & balance wheels)		I	I	I	I
Brake pads, disc & other brake components★		I	I	I	I
Brake linings, drums & other components★		I	I	I	I
Headlamp aiming		I	I	I	I
Foot brake, parking brake & clutch (For free play, stroke & operation)		I	I	I	I
Ventilation air filter★	See NOTE (1)	R	R	R	R
Body corrosion				Annually	
Air bag system	See NOTE (2)				

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

(1) For replacement procedure of ventilation air filter, refer to page HA-83 in the model N15 Service Manual (Pub. No. SM5E-0N15G0).

(2) Inspect at the first 10 years and then every 2 years.

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PERIODIC MAINTENANCE (For Europe)

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.

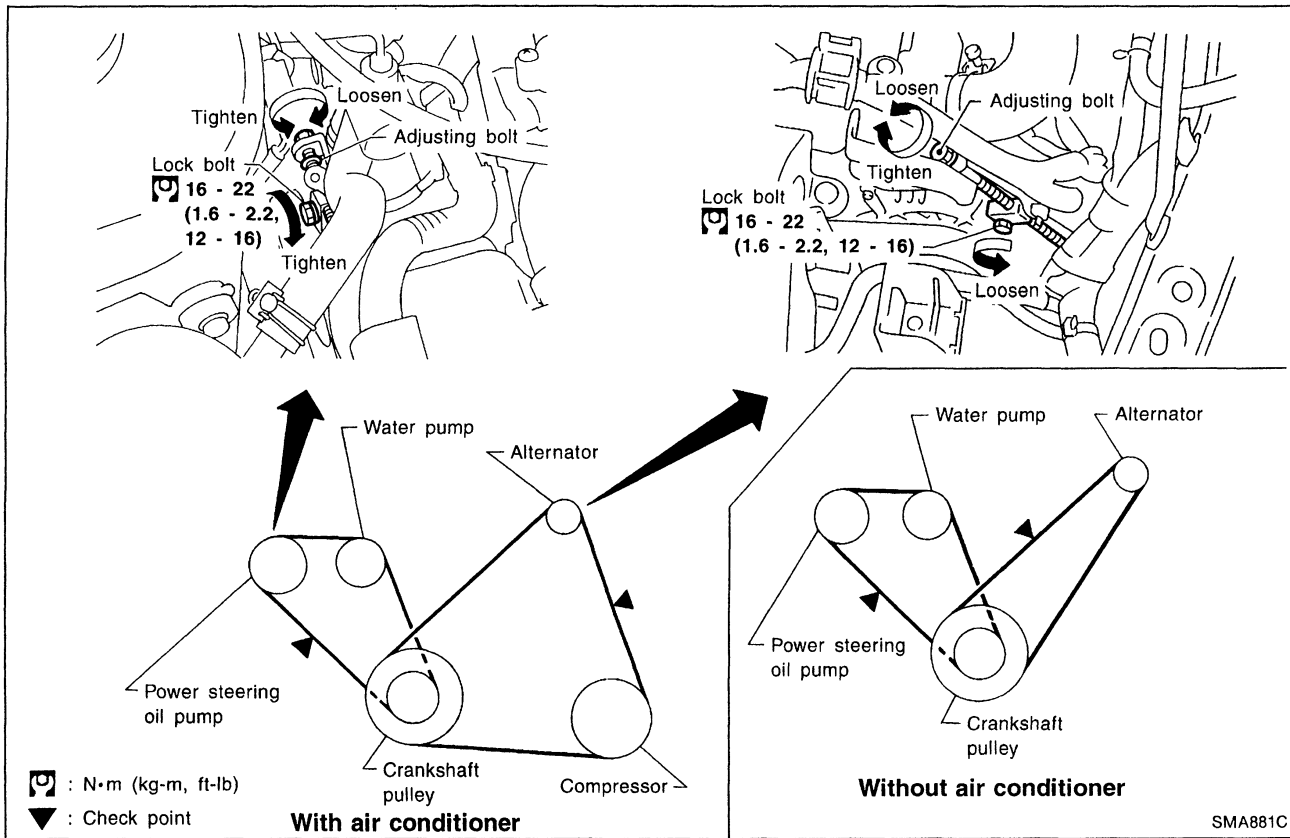
SEVERE DRIVING CONDITIONS

- | | |
|--|---|
| <p>A — Driving under dusty conditions</p> <p>B — Driving repeatedly short distances</p> <p>C — Towing a trailer</p> <p>D — Extensive idling</p> <p>E — Driving in extremely adverse weather conditions or in areas where ambient temperatures are either extremely low or extremely high</p> | <p>F — Driving in high humidity areas or in mountainous areas</p> <p>G — Driving in areas using salt or other corrosive materials</p> <p>H — Driving on rough and/or muddy roads or in the desert</p> <p>I — Driving with frequent use of braking or in mountainous areas</p> |
|--|---|

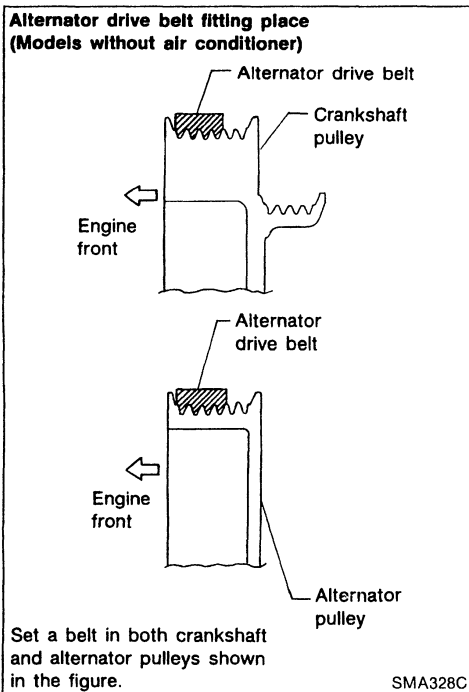
Driving condition					Maintenance item	Maintenance operation	Maintenance interval
A	B	C	D	.	Engine oil & oil filter		
					Gasoline engine	Replace	Every 7,500 km (4,500 miles) or 6 months
					Diesel engine	Replace	Every 5,000 km (3,000 miles) or 3 months
A	.	.	.	.	Air cleaner filter & PCV filter (GA series engine only)	Replace	
A	.	.	E	.	Fuel filter	Replace	
.	.	.	F	.	Brake fluid	Replace	Every 30,000 km (18,000 miles) or 12 months
.	.	.	.	G H	Steering gear & linkage, axle & suspension parts & exhaust system	Check	
.	C	.	.	H	Automatic & manual transaxle oil	Replace	Every 60,000 km (36,000 miles) or 24 months
A	.	C	.	G H I	Brake pads, discs & other brake components	Check	
A	.	C	.	G H I	Brake lining, drums & other brake components	Check	Every 15,000 km (9,000 miles) or 6 months
.	.	C	.	H	Drive shaft	Check	
A	.	.	.	.	Ventilation air filter	Replace	More frequently

Maintenance operation: Check = Check. Correct or replace if necessary.

Checking Drive Belts



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

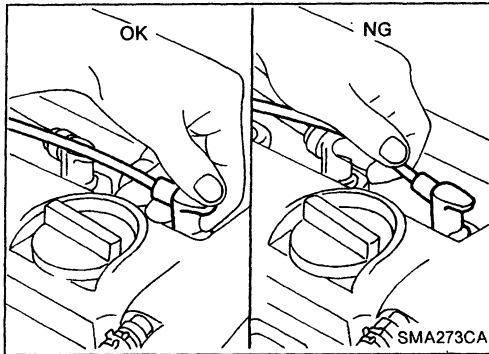


Adjust if belt deflections exceed the limit.
Belt deflection:

Unit: mm (in)

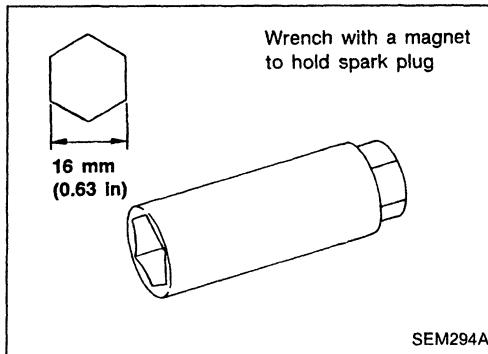
Drive belts	Used belt deflection		Deflection of new belt
	Limit	Deflection after adjustment	
Alternator			
With air conditioner compressor	9 (0.35)	5.5 - 6.5 (0.217 - 0.256)	4.5 - 5.5 (0.177 - 0.217)
Without air conditioner compressor	12 - 13 (0.47 - 0.51)	8 - 9 (0.31 - 0.35)	7 - 8 (0.28 - 0.31)
Power steering oil pump	12 (0.47)	8 - 9 (0.31 - 0.35)	7 - 8 (0.28 - 0.31)
Applied pushing force	98 N (10 kg, 22 lb)		

Inspect drive belt deflections when engine is cold.



Changing Spark Plugs

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



2. Remove spark plugs with spark plug wrench.

Spark plug:

Make	NGK
Standard type	BKR5EY-11
Hot type	BKR4EY-11
Cold type	BKR6EY-11

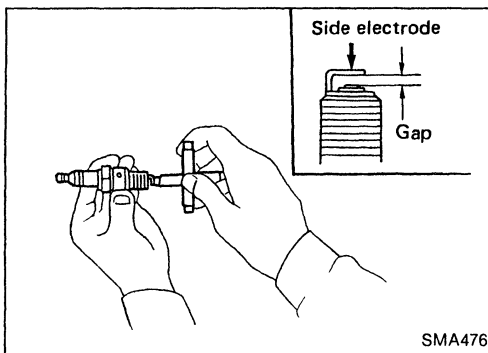
Use standard type spark plug for normal condition.

The hot type spark plug is suitable when fouling may occur with the standard type spark plug such as:

- frequent engine starts
- low ambient temperatures

The cold type spark plug is suitable when spark knock may occur with the standard type spark plug such as:

- extended highway driving
- frequent high engine revolution



3. Check plug gap of each new spark plug.

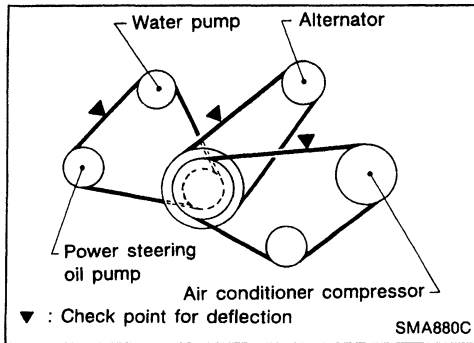
Gap: 1.0 - 1.1 mm (0.039 - 0.043 in)

- **Use a wire brush for cleaning, if necessary.**
4. Install spark plugs. Reconnect ignition wires according to numbers indicated on them.

Spark plug:

⌚: 20 - 29 N·m

(2.0 - 3.0 kg-m, 14 - 22 ft-lb)



Checking Drive Belt

WARNING:

Inspect drive belt deflections when engine is cold. When engine is hot, check deflections at least 30 minutes after engine has been switched off.

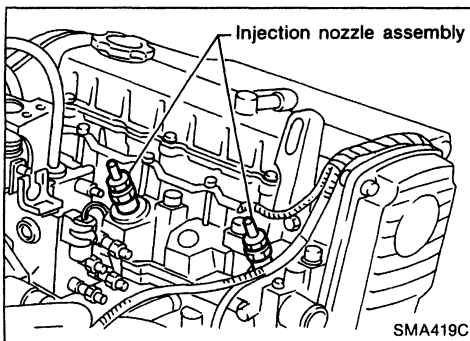
1. Inspect belts for cracks, fraying, wear or oil adhesion. If necessary, replace with new ones.
2. Inspect drive belt deflections by pushing on the belt midway between pulleys.
3. Adjust belt deflection if it exceeds the limit.

Belt deflection:

Unit: mm (in)

	Used belt deflection		Deflection of new belt
	Limit	Deflection after adjustment	
Alternator	17 (0.67)	10.5 - 12.5 (0.413 - 0.492)	8.5 - 10.5 (0.335 - 0.413)
Air conditioner compressor	17 (0.67)	11.5 - 13.5 (0.453 - 0.531)	9.5 - 11.5 (0.374 - 0.453)
Power steering oil pump	8 (0.31)	5 - 7 (0.20 - 0.28)	4 - 6 (0.16 - 0.24)
Water pump without power steering	—	8 (0.31)	6 (0.24)
Applied pushing force	98 N (10 kg, 22 lb)		

Inspect drive belt deflections when engine is cold.



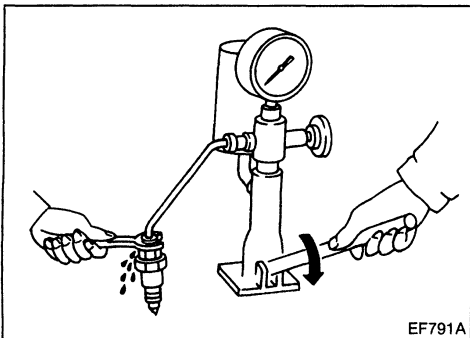
Checking Injection Nozzle

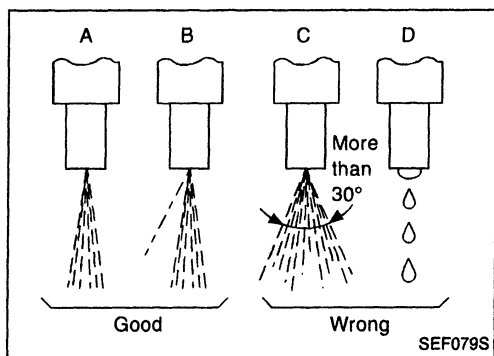
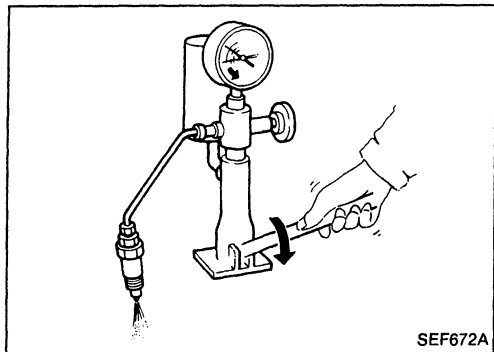
1. Remove injection delivery tubes and fuel spill tube.
 2. Remove nozzle assembly with Tool.
- No. 1 injection nozzle should not be disassembled as it is provided with a needle lift sensor.

WARNING:

When using nozzle tester, be careful not to allow diesel fuel sprayed from nozzle to come into contact with your hand or body, and make sure that your eyes are properly protected.

3. Clean and check nozzles.
4. Install nozzle to injection nozzle tester and bleed air from flare nut.
5. Check initial injection pressure by pumping tester handle one time per second.





Checking Injection Nozzle (Cont'd)

6. Install injector to pressure tester.
7. Check initial injection pressure by pumping tester handle slowly (one time per second).

Injection pressure:

12,749 kPa (127.5 bar, 130 kg/cm², 1,849 psi)

- Always check initial injection pressure before installing new nozzle.

8. Check spray pattern by pumping tester handle one full stroke 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 main spray (pattern B).

9. If initial injection pressure or injection nozzle is not normal, adjust or clean injection nozzle or replace it.

Refer to EC section for injection pressure adjustment, cleaning and replacement.

10. Install all injection nozzles with Tool and securely connect fuel spill tube and delivery tubes.

11. Bleed air from fuel system and check for fuel leakage with engine running.

Engine Maintenance (SR)

INSPECTION AND ADJUSTMENT

Drive belt deflection

Unit: mm (in)

	Used belt deflection		Deflection of new belt
	Limit	Deflection after adjustment	
Alternator			
With air conditioner compressor	9 (0.35)	5.5 - 6.5 (0.217 - 0.256)	4.5 - 5.5 (0.177 - 0.217)
Without air conditioner compressor	12 - 13 (0.47 - 0.51)	8 - 9 (0.31 - 0.35)	7 - 8 (0.28 - 0.31)
Power steering oil pump	12 (0.47)	8 - 9 (0.31 - 0.35)	7 - 8 (0.28 - 0.31)
Applied pushing force	98 N (10 kg, 22 lb)		

Spark plug

Make	NGK
Standard type	BKR5EY-11
Hot type	BKR4EY-11
Cold type	BKR6EY-11
Plug gap mm (in)	1.0 - 1.1 (0.039 - 0.043)

MA

Engine Maintenance (CD)

INSPECTION AND ADJUSTMENT

Drive belt deflection

Unit: mm (in)

	Used belt deflection		Deflection of new belt
	Limit	Deflection after adjustment	
Alternator	17 (0.67)	10.5 - 12.5 (0.413 - 0.492)	8.5 - 10.5 (0.335 - 0.413)
Air conditioner compressor	17 (0.67)	11.5 - 13.5 (0.453 - 0.531)	9.5 - 11.5 (0.374 - 0.453)
Power steering oil pump	8 (0.31)	5 - 7 (0.20 - 0.28)	4 - 6 (0.16 - 0.24)
Water pump without power steering	—	8 (0.31)	6 (0.24)
Applied pushing force	98 N (10 kg, 22 lb)		

Engine oil capacity (Refill capacity)

Unit: ℓ (Imp qt)

Without oil filter	4.7 (4-1/8)
With oil filter	5.2 (4-5/8)