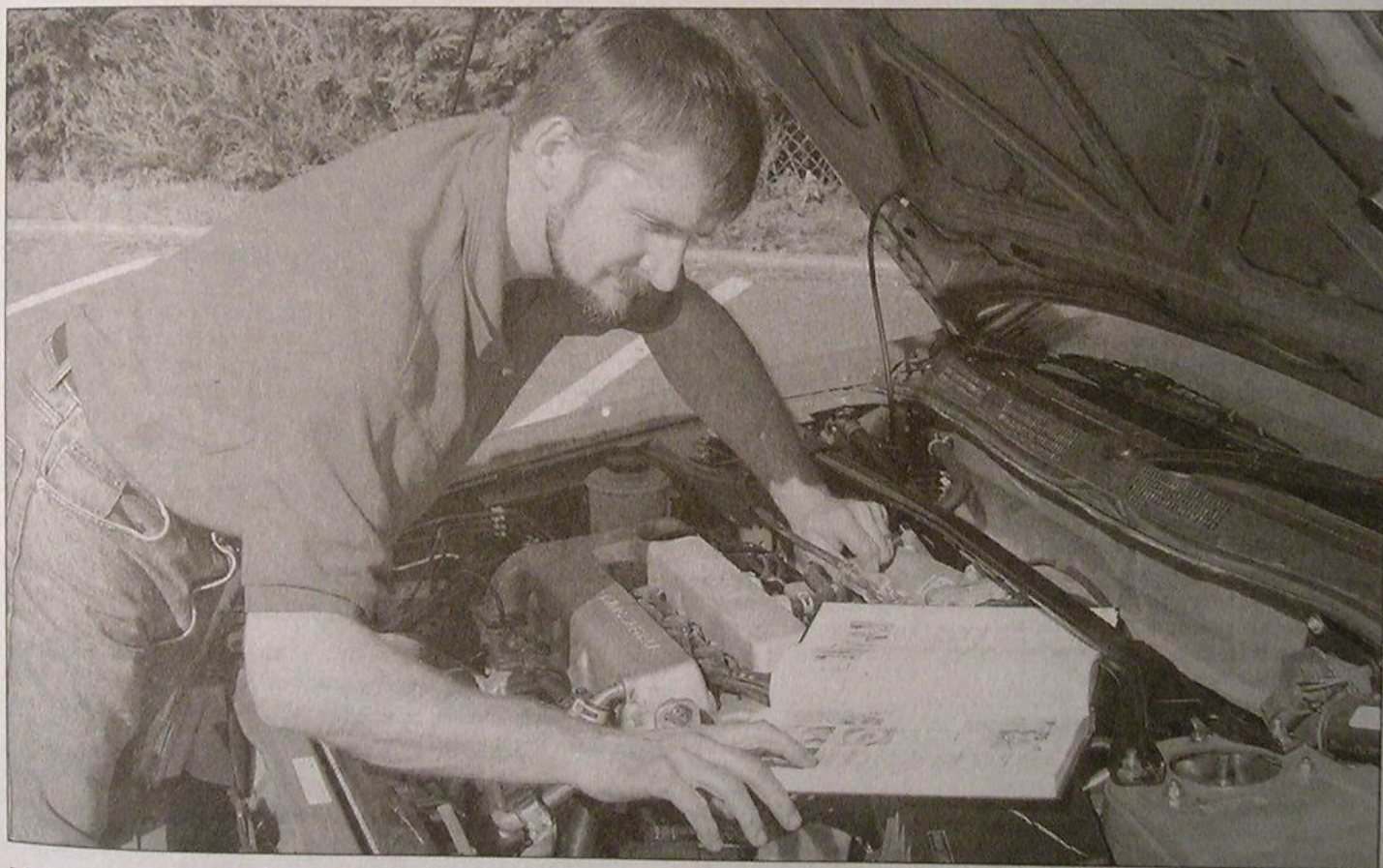


# Chapter 1

## Routine maintenance and servicing

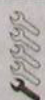
### Contents

Air conditioning system check .....	11	Hinge and lock lubrication .....	25
Air filter renewal .....	27	Hose and fluid leak check .....	6
Automatic transmission fluid level check .....	19	Idle speed and mixture check and adjustment .....	4
Automatic transmission fluid renewal .....	33	Ignition system check .....	28
Auxiliary drivebelt checking and renewal .....	16	Manual transmission oil level check .....	7
Brake fluid renewal .....	18	Manual transmission oil renewal .....	32
Braking system vacuum servo unit check .....	30	PCV filter renewal - 1.6 litre engine and 2.0 litre single-point injection engine .....	29
Clutch adjustment check and control mechanism lubrication .....	10	Rear brake shoe check .....	17
Coolant renewal .....	31	Regular maintenance .....	2
Driveshaft gaiter check .....	21	Road test .....	26
Emissions control systems check .....	14	Roadwheel balance check .....	23
Engine oil and filter renewal .....	3	Seat belt check .....	24
Exhaust gas sensor check - models with a catalytic converter .....	15	Spark plug renewal - models with a catalytic converter .....	12
Front and (where fitted) rear brake pad condition check .....	8	Spark plug renewal - models without a catalytic converter .....	5
Fuel filter renewal .....	13	Steering and suspension check .....	20
General information .....	1	Wheel alignment check .....	22
Handbrake check and adjustment .....	9		



### Degrees of difficulty

Easy, suitable for novice with little experience



Fairly easy, suitable for beginner with some experience



Fairly difficult, suitable for competent DIY mechanic



Difficult, suitable for experienced DIY mechanic



Very difficult, suitable for expert DIY or professional





## 1.2 Servicing specifications

### Lubricants and fluids

Refer to end of *Weekly Checks* on page 0•17

### Capacities

#### Engine oil:

At oil change:

1.6 litre engine .....

2.0 litre engine .....

At oil and filter change:

1.6 litre engine .....

2.0 litre engine .....

Difference between MAX and MIN dipstick marks (approximately) ..

#### Phase I and Phase II models

3.1 litres

3.7 litres

3.5 litres

3.9 litres

1.0 litre

#### Phase III models

2.9 litres

2.8 litres

3.3 litres

3.0 litres

1.0 litre

#### Cooling system:

1.6 litre engine .....

2.0 litre engine: .....

Engine code SR20De .....

Engine code SR20DE .....

#### Phase I and Phase II models

6.4 litres

6.5 litres

#### Phase III models

5.5 litres

6.0 litres

6.4 litres

#### Manual transmission

1.6 litre engine .....

2.0 litre engine .....

2.9 litres

3.6 litres

Automatic transmission .....

7.0 litres

Fuel tank .....

60.0 litres

### Cooling system

Antifreeze mixture (ethylene glycol antifreeze):

Protection down to -15°C .....

Protection down to -35°C .....

#### Antifreeze

30%

50%

#### Water

70%

50%

**Note:** Refer to antifreeze manufacturer for latest recommendations.

### Fuel system

Idle speed and mixture settings:

Carburettor engines without a catalytic converter:

Idle speed .....

Idle mixture CO content .....

750 ± 50 rpm

1.5 ± 0.5 %

Carburettor engines with a catalytic converter:

Idle speed .....

Idle mixture CO content .....

750 ± 50 rpm

1.0 ± 0.5 % (at exhaust gas sampling pipe)

Single-point fuel injection engine:

Idle speed (not adjustable)\* .....

Idle mixture CO content:

Models without catalytic converter .....

Models with catalytic converter .....

850 ± 50 rpm (controlled by ECU)

Less than 2.0 %

Less than 1.0 % (not adjustable - controlled by ECU)

Multi-point fuel injection engine:

Idle speed (not adjustable)\*:

1.6 litre engine .....

Phase I and Phase II 2.0 litre engine .....

Phase III 2.0 litre engine .....

Idle mixture CO content:

Models without a catalytic converter .....

Models with a catalytic converter .....

700 ± 50 rpm (controlled by ECU)

800 ± 50 rpm (controlled by ECU)

750 ± 50 rpm (controlled by ECU)

Less than 2.0 %

Less than 1.0 % (not adjustable - controlled by ECU)

\*Although the idle speed is not adjustable, the base idle speed can be set as described.

### Ignition system

Spark plugs:

1.6 litre engine .....

2.0 litre engine .....

#### Type

Bosch FR 7 D+X

Bosch FR 78 X

#### Electrode gap

1.1 mm

Not adjustable



## Auxiliary drivebelts

Drivebelt deflection - 1.6 litre engines:

	Setting (mm)	Limit (mm)
Alternator:		
With power steering	7 to 9	11
Without power steering	7 to 9	10
Air conditioning compressor	6 to 8	9.5
Power steering pump	4 to 6	7.5

Drivebelt deflection - 2.0 litre engines:

	Setting (mm)	Limit (mm)
Alternator:		
With air conditioning	7 to 8	11.5 to 12.5
Without air conditioning	8 to 9	12 to 13
Power steering pump	4 to 5	6 to 7

**Note:** In all cases, the drivebelt deflection is measured by applying a force of 98 N (10 kg) as described in the text. All figures are quoted for a 'used' drivebelt - if a new belt has been fitted, the setting deflection should be decreased by 1 mm.

## Brakes

Minimum front brake pad friction material thickness	2.0 mm
Minimum rear brake pad friction material thickness	2.0 mm
Minimum rear brake shoe lining thickness	1.5 mm
Number of clicks required to fully apply handbrake:	
Phase I and Phase II models:	
Saloon and Hatchback models	6 to 8 clicks
Estate models:	
Models with rear disc brakes	7 to 9 clicks
Models with rear drum brakes	8 to 10 clicks
Phase III models	6 to 8 clicks
Number of clicks required to operate handbrake 'on' warning light:	
Phase I and Phase II models:	
Saloon and Hatchback models	1 to 2 clicks
Estate models	0 to 1 click
Phase III models	1 to 2 clicks

## Suspension and steering

Tyre pressures	Refer to manufacturer's plate fitted to driver's door rear pillar
Wheel alignment:	
Front wheel toe setting:	
Phase I and Phase II models:	
Saloon and Hatchback models	Parallel to 2.0 mm (0°12') toe-in
Estate models	1.0 to 3.0 mm (0°6' to 0°17') toe-in
Phase III models	Parallel to 2.0 mm (0°12') toe-in
Rear wheel toe-setting:	
Saloon and Hatchback models:	
Phase I models	2.0 mm (0°12') toe-out to 2.0 mm (0°12') toe-in
Phase II models	1.0 mm (0°6') toe-out to 3.0 mm (0°18') toe-in

**Note:** All wheel alignment specifications given are for an unladen vehicle - ie, no driver or passengers, fuel tank full, engine coolant and oil levels normal, and spare wheel, jack and tools fitted in normal locations. Additional wheel alignment and steering angle specifications are contained in Chapter 10.

## Torque wrench settings

	Nm	lbf ft
Air conditioning compressor drivebelt tensioning pulley nut - (1.6 litre)	28	21
Automatic transmission drain plug	34	25
Cylinder block coolant drain plug	40	30
Engine sump drain plug	35	26
Manual transmission drain plug	29	21
Manual transmission filler/level plug:		
1.6 litre models	29	21
2.0 litre models	15	11
Rear suspension parallel link securing nuts (Use new nuts).		
(Phase I and Phase II Saloon and Hatchback models)	120	89
Roadwheel nuts	110	81
Seat belt mounting bolts	50	37
Spark plugs	25	18



## 1.4 Maintenance schedule

The maintenance intervals in this manual are provided with the assumption that you, not the dealer, will be carrying out the work. These are the minimum maintenance intervals based on the schedule recommended by the manufacturer for vehicles driven daily. If you wish to keep your vehicle in peak condition at all times, you may wish to perform some of

these procedures more often. We encourage frequent maintenance because it enhances the efficiency, performance and resale value of your vehicle. If the vehicle is driven in dusty areas, used to tow a trailer, or driven frequently at slow speeds (idling in traffic) or on short journeys, more frequent maintenance intervals are recommended. Nissan actually

recommend that many service intervals are halved for vehicles which are used under these conditions.

When the vehicle is new, it should be serviced by a factory-authorised dealer service department in order to preserve the factory warranty.

### Every 250 miles (400 km) or weekly

- ☐ Refer to Weekly checks.

### Every 4500 miles (7500 km) or 6 months - whichever comes first

**Note:** Frequent oil and filter changes are good for the engine. We recommend changing the oil at the mileage specified here, or at least twice a year if the mileage covered is less.

- ☐ Renew the engine oil and filter (Section 3)

### Every 9000 miles (15 000 km) or 6 months - whichever comes first

*In addition to all the items listed above, carry out the following:*

- ☐ Check and adjust the idle speed and mixture settings - carburettor models (Section 4)
- ☐ Renew the spark plugs - models without a catalytic converter (Section 5)
- ☐ Check all underbonnet components and hoses for fluid leaks (Section 6)
- ☐ Check manual transmission oil level (Section 7)
- ☐ Check the brake pads (front and, if fitted, rear) and renew if necessary (Section 8)
- ☐ Check and adjust the handbrake (Section 9)
- ☐ Check and adjust the clutch (Section 10)

### Every 18 000 miles (30 000 km) or 12 months - whichever comes first

*In addition to all the items listed above, carry out the following:*

- ☐ Check the condition of the air conditioning system components (see Section 11)
- ☐ Renew the spark plugs - models with a catalytic converter (Section 12)
- ☐ Renew the fuel filter (Section 13)
- ☐ Check the condition of the emissions control system hoses and components (Section 14)
- ☐ Check the operation of the lambda (oxygen) sensor (Section 15)
- ☐ Check the condition of the auxiliary drivebelt, and renew if necessary (Section 16)
- ☐ Check the rear brake shoes (where fitted) and renew if necessary (Section 17)
- ☐ Change the brake fluid (Section 18)
- ☐ Check the automatic transmission fluid level (Section 19)
- ☐ Check the steering and suspension components for condition and security (Section 20)
- ☐ Check the condition of the driveshaft rubber gaiters (Section 21)
- ☐ Check the wheel alignment (Section 22)
- ☐ Check the balance of each roadwheel (Section 23)
- ☐ Check the operation and security of all seat belts (Section 24)
- ☐ Lubricate all hinges and locks (Section 25)
- ☐ Carry out a road test (Section 26)

### Every 36 000 miles (60 000 km) or 2 years - whichever comes first

*In addition to all the items listed above, carry out the following:*

- ☐ Renew the air filter (Section 27)
- ☐ Check the ignition system components (Section 28)
- ☐ Renew the PCV filter - 1.6 litre models and 2.0 litre single-point injection models (Section 29)
- ☐ Check the operation of the braking system servo unit and check-valve (Section 30)
- ☐ Renew the coolant (Section 31)
- ☐ Renew the manual transmission oil (Section 32)
- ☐ Renew the automatic transmission fluid (Section 33)



## Underbonnet view of a 1.6 litre carburettor catalyst model

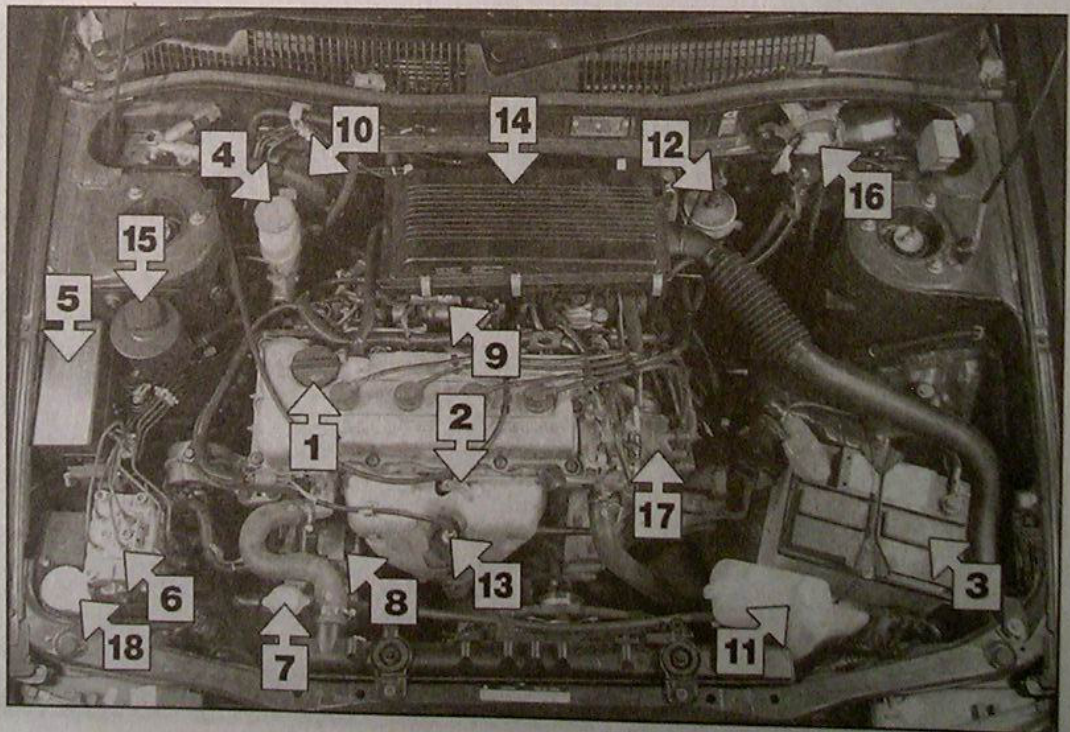
- 1 Engine oil filler cap
- 2 Engine oil dipstick
- 3 Battery
- 4 Master cylinder brake fluid reservoir
- 5 Relay box
- 6 Auxiliary fusebox
- 7 Radiator filler cap
- 8 Alternator
- 9 Fuel pump
- 10 Braking system vacuum servo unit
- 11 Coolant expansion tank
- 12 Fuel filter
- 13 Exhaust gas sensor
- 14 Air cleaner housing
- 15 Power steering fluid reservoir
- 16 Air induction valve (AIV)
- 17 Distributor
- 18 Windscreen washer reservoir



1

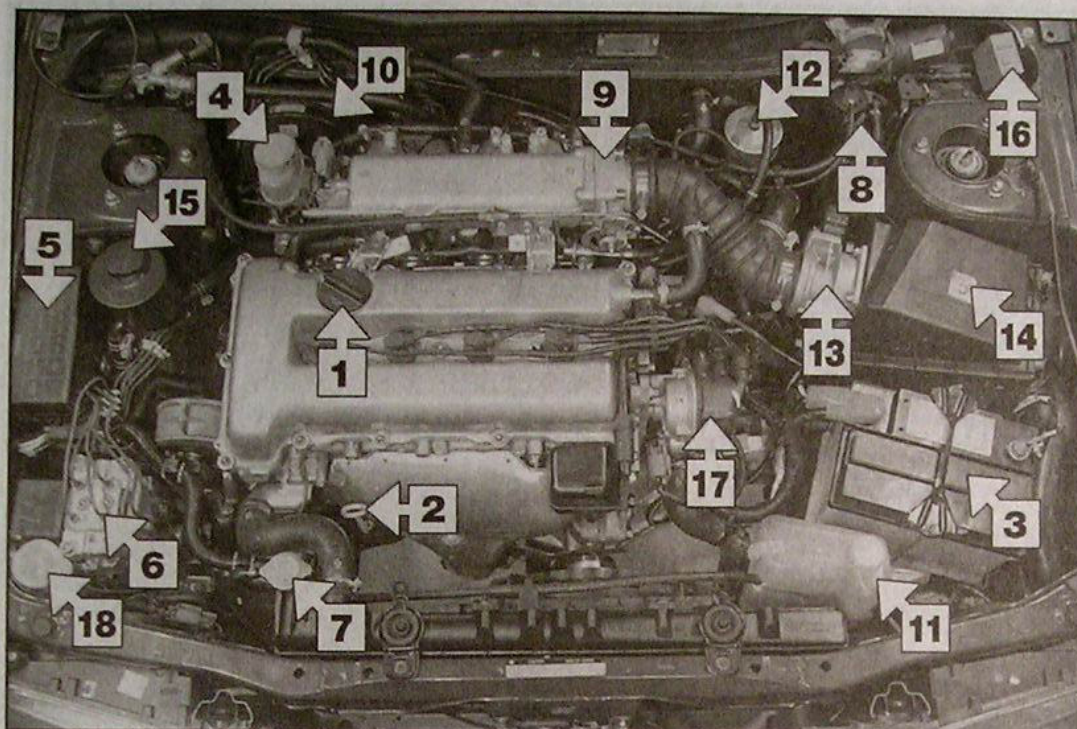
## Underbonnet view of a Phase II 1.6 litre fuel-injected model

- 1 Engine oil filler cap
- 2 Engine oil dipstick
- 3 Battery
- 4 Master cylinder brake fluid reservoir
- 5 Relay box
- 6 ABS unit
- 7 Radiator filler cap
- 8 Alternator
- 9 Throttle housing
- 10 Braking system vacuum servo unit
- 11 Coolant expansion tank
- 12 Fuel filter
- 13 Exhaust gas sensor
- 14 Air cleaner housing
- 15 Power steering fluid reservoir
- 16 Windscreen wiper motor
- 17 Distributor
- 18 Windscreen washer reservoir



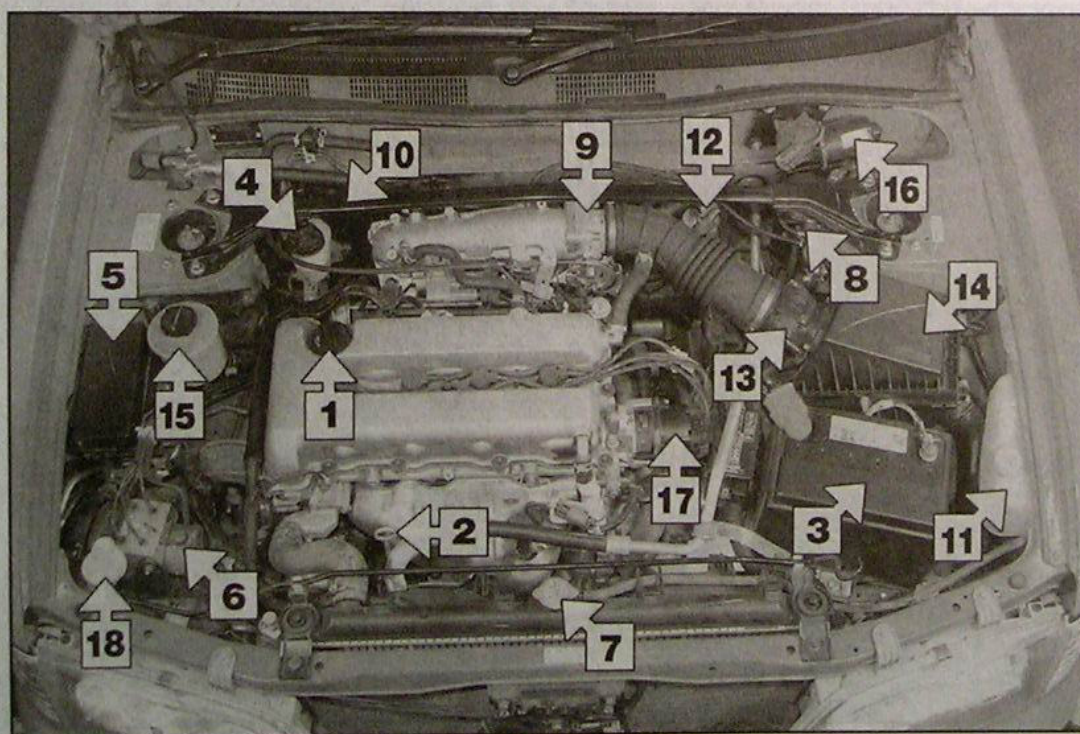


Underbonnet view of a Phase II 2.0 litre fuel-injected model



- 1 Engine oil filler cap
- 2 Engine oil dipstick
- 3 Battery
- 4 Master cylinder brake fluid reservoir
- 5 Relay box
- 6 ABS unit
- 7 Radiator filler cap
- 8 Carbon canister
- 9 Throttle housing
- 10 Braking system vacuum servo unit
- 11 Coolant expansion tank
- 12 Fuel filter
- 13 Airflow meter
- 14 Air cleaner housing
- 15 Power steering fluid reservoir
- 16 Windscreen wiper motor
- 17 Distributor
- 18 Windscreen washer reservoir

Underbonnet view of a Phase III 2.0 litre fuel-injected model



- 1 Engine oil filler cap
- 2 Engine oil dipstick
- 3 Battery
- 4 Master cylinder brake fluid reservoir
- 5 Relay box
- 6 ABS unit
- 7 Radiator filler cap
- 8 Carbon canister
- 9 Throttle housing
- 10 Braking system vacuum servo unit
- 11 Coolant expansion tank
- 12 Fuel filter
- 13 Airflow meter
- 14 Air cleaner housing
- 15 Power steering fluid reservoir
- 16 Windscreen wiper motor
- 17 Distributor
- 18 Windscreen washer reservoir



## Front underbody view - Phase II 2.0 litre model (1.6 model similar)

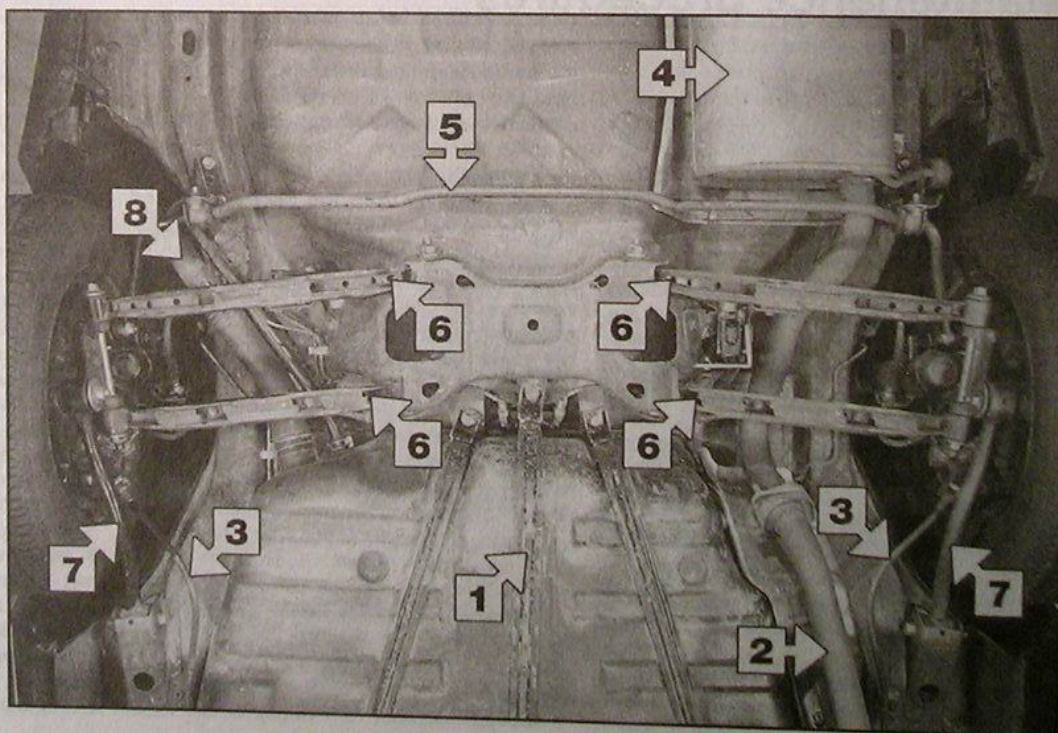
- 1 Centre member
- 2 Sump drain plug
- 3 Alternator
- 4 Radiator cooling fan
- 5 Driveshaft support bearing
- 6 Brake caliper
- 7 Lower arm
- 8 Driveshaft
- 9 Anti-roll bar
- 10 Exhaust system front pipe
- 11 Gearchange linkage selector rod
- 12 Track rod
- 13 Transmission filler/level plug
- 14 Transmission drain plug



1

## Rear underbody view - Phase II Saloon model

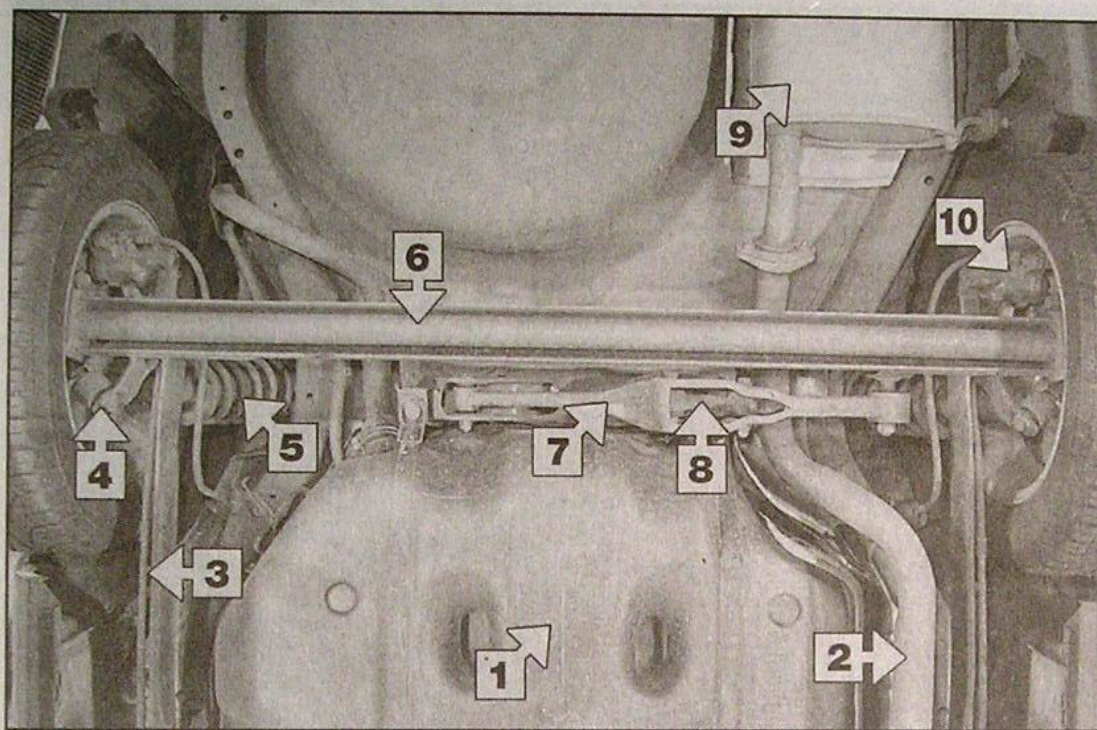
- 1 Fuel tank
- 2 Exhaust system intermediate pipe
- 3 Handbrake cable
- 4 Exhaust system rear box
- 5 Anti-roll bar
- 6 Parallel link
- 7 Radius rod
- 8 Fuel tank filler neck





## 1•8 Maintenance - component location

### Rear underbody view - Phase III Hatchback model



- 1 Fuel tank
- 2 Exhaust system intermediate pipe
- 3 Trailing arm
- 4 Shock absorber lower mounting
- 5 Coil spring
- 6 Axle beam
- 7 Lateral link
- 8 Control rod
- 9 Exhaust system rear box
- 10 Brake caliper

## Maintenance procedures

### 1 General information

This Chapter is designed to help the home mechanic maintain his/her vehicle for safety, economy, long life and peak performance.

The Chapter contains a master maintenance schedule, followed by sections dealing specifically with each task on the schedule. Visual checks, adjustments, component renewal and other helpful items are included. Refer to the accompanying illustrations of the engine compartment and the underside of the vehicle for the locations of the various components.

Servicing of your vehicle in accordance with the mileage/time maintenance schedule and the following sections will provide a planned maintenance programme, which should result in a long and reliable service life. This is a comprehensive plan, so maintaining some items but not others at the specified service intervals, will not produce the same results.

As you service your vehicle, you will discover that many of the procedures can -

and should - be grouped together, because of the particular procedure being performed, or because of the close proximity of two otherwise-unrelated components to one another. For example, if the vehicle is raised for any reason, the exhaust can be inspected at the same time as the suspension and steering components.

The first step in this maintenance programme is to prepare yourself before the actual work begins. Read through all the sections relevant to the work to be carried out, then make a list and gather all the parts and tools required. If a problem is encountered, seek advice from a parts specialist, or a dealer service department.

**Note:** In certain Sections of this Chapter references are made to Phase I, Phase II and Phase III models according to year of production. This classification has been necessary where modifications to the model range affect the repair procedure being described. The Phases relate to the model years as follows:

**Phase I** - 1990 to June 1993

**Phase II** - June 1993 to October 1996

**Phase III** - October 1996 to September 1999

### 2 Regular maintenance

1 If, from the time the vehicle is new, the routine maintenance schedule is followed closely, and frequent checks are made of fluid levels and high-wear items, as suggested throughout this manual, the engine will be kept in relatively good running condition, and the need for additional work will be minimised.

2 It is possible that there will be times when the engine is running poorly, due to lack of regular maintenance. This is even more likely if a used vehicle, which has not received regular and frequent maintenance checks, is purchased. In such cases, additional work may need to be carried out, outside of the regular maintenance intervals.

3 If engine wear is suspected, a compression test (Chapter 2A or 2B) will provide valuable information regarding the overall performance of the main internal components. Such a test can be used as a basis to decide on the extent of the work to be carried out. If for example a compression test indicates serious



internal engine wear, conventional maintenance as described in this Chapter will not greatly improve the performance of the engine, and may prove a waste of time and money, unless extensive overhaul work (Chapter 2C) is carried out first.

4 The following series of operations are those most often required to improve the performance of a generally poor-running engine:

## Primary operations

- a) Clean, inspect and test the battery (See Weekly checks).
- b) Check all the engine-related fluids (See Weekly checks).

- c) Check the condition and tension of the auxiliary drivebelt(s) (Section 16).
- d) Renew the spark plugs (Section 5 for non-catalyst models, or 12 for catalyst models).
- e) Inspect the distributor cap and rotor arm (Section 28).
- f) Inspect the ignition HT leads (Section 28).
- g) Check the condition of the air filter, and renew if necessary (Section 27).
- h) Check the condition of all hoses, and check for fluid leaks (Section 6).

5 If the above operations do not prove fully effective, carry out the following secondary operations:

## Secondary operations

All items listed under Primary operations, plus the following:

- a) Check the charging system (Chapter 5A).
- b) Check the ignition system (Chapter 5B).
- c) Check the fuel system (Chapter 4A, 4B or 4C).
- d) Renew the air filter (Section 27).
- e) Renew the distributor cap and rotor arm (Section 28).
- f) Renew the ignition HT leads (Section 28).

## Every 4500 miles or 6 months - whichever comes first

### 3 Engine oil and filter renewal



**Frequent oil and filter changes are the most important preventative maintenance procedures which can be undertaken by the DIY owner. As engine oil ages, it becomes diluted and contaminated, which leads to premature engine wear.**

1 Before starting this procedure, gather together all the necessary tools and materials. Also make sure that you have plenty of clean rags and newspapers handy, to mop up any spills. Ideally, the engine oil should be warm, as it will drain more easily, and more built-up sludge will be removed with it. Take care not to touch the exhaust or any other hot parts of the engine when working under the vehicle. To avoid any possibility of scalding, and to protect yourself from possible skin irritants and other harmful contaminants in used engine oils, it is advisable to wear gloves when carrying out this work.

2 Access to the underside of the vehicle will be greatly improved if it can be raised on a lift, driven onto ramps, or jacked up and supported on axle stands (see *Jacking and vehicle support*). Whichever method is chosen, make sure that the vehicle remains level, or if it is at an angle, that the drain plug is at the lowest point. The drain plug is located at the rear of the sump.

3 Remove the oil filler cap from the cylinder head cover (twist it anti-clockwise and withdraw it).

4 Using a spanner, or preferably a suitable socket and bar, slacken the drain plug about half a turn. Position the draining container under the drain plug, then remove the plug completely. If possible, try to keep the plug pressed into the sump while unscrewing it by hand the last couple of turns (see *Haynes Hint*).

5 Allow some time for the oil to drain, noting that it may be necessary to reposition the container as the oil flow slows to a trickle.

6 After all the oil has drained, wipe the drain plug and the sealing washer with a clean rag. Examine the condition of the sealing washer - renew it if it shows signs of scoring or other

damage which may prevent an oil-tight seal. Clean the area around the drain plug opening, and refit the plug complete with the washer. Tighten the plug securely - preferably to the specified torque, using a torque wrench.

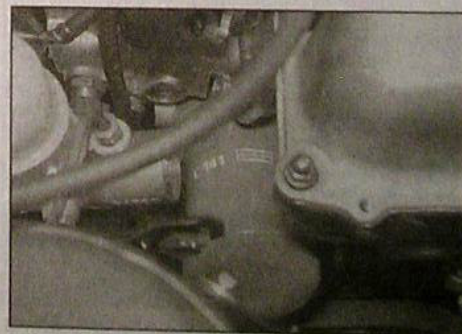
7 The oil filter is located at the rear right-hand side of the cylinder block. Note that on 1.6 litre engine models, access is most easily obtained from underneath the vehicle.

8 Move the container into position under the oil filter.

9 Use an oil filter removal tool (if required) to slacken the filter initially, then unscrew it by hand the rest of the way (see *illustration*). Empty the oil from the old filter into the container. **Note:** Oil filter removal is simplified if the special Nissan filter removal tool is used (Part No. KV10105900 on 1.6 litre engines or KV10115800 on 2.0 litre engines); the tool is in the form of a socket which fits over the end of the filter, and can be turned using a suitable ratchet or extension bar.



**As the drain plug releases from the threads, move it away sharply so the stream of oil issuing from the sump runs into the container, not up your sleeve.**



3.9 On 2.0 litre engines, access to the oil filter is very poor, and removal may prove difficult without the special Nissan tool



## 1•10 Every 4500 miles or 6 months



3.11a Apply a coat of oil to the filter sealing ring prior to fitting



3.11b Fitting the oil filter - 2.0 litre engine (viewed from above)



3.11c Fitting the oil filter - 1.6 litre engine (viewed from below)

10 Use a clean rag to remove all oil, dirt and sludge from the filter sealing area on the engine. Check the old filter to make sure that the rubber sealing ring has not stuck to the engine. If it has, carefully remove it.

11 Apply a light coating of clean engine oil to the sealing ring on the new filter, then screw the filter into position on the engine. Lightly tighten the filter until its sealing ring contacts the block, then tighten it through a further two-thirds of a turn (see illustrations).

12 Remove the old oil and all tools from under the vehicle then, if applicable, lower the vehicle to the ground.

13 Fill the engine through the filler hole in the cylinder head cover, using the correct grade and type of oil (see *Weekly checks*). Pour in half the specified quantity of oil first, then wait a few minutes for the oil to drain into the sump. Continue to add oil, a small quantity at a time, until the level is up to the lower mark on the dipstick. Adding a further 1.0 litre will bring the level up to the upper mark on the dipstick.

14 Start the engine and run it for a few minutes, while checking for leaks around the oil filter seal and the sump drain plug. Note that there may be a delay of a few seconds

before the low oil pressure warning light goes out when the engine is first started, as the oil circulates through the new oil filter and the engine oil galleries before the pressure builds up. Do not run the engine above idle speed while the warning light is on.

15 Stop the engine, and wait a few minutes for the oil to settle in the sump once more. With the new oil circulated and the filter now completely full, recheck the level on the dipstick, and add more oil as necessary.

16 Dispose of the used engine oil safely, with reference to *General repair procedures* in the Reference section of this manual.

## Every 9000 miles or 6 months - whichever comes first

### 4 Idle speed and mixture check and adjustment



1 Before checking the idle speed and mixture setting, always check first the following.

- Check that the ignition timing is accurate (Chapter 5B).
- Check that the spark plugs are in good condition and correctly gapped (Section 5 or 12).
- Check that the accelerator cable is correctly adjusted (see relevant Part of Chapter 4).
- Check that the crankcase breather hoses

are secure, with no leaks or kinks (Section 14).

- Check that the air cleaner filter element is clean (Section 27).
- Check that the exhaust system is in good condition (see relevant Part of Chapter 4).
- If the engine is running very roughly, check the compression pressures as described in Chapter 2.
- On fuel-injected models, check that the fuel injection/ignition system warning light is not illuminated (see relevant Part of Chapter 4).

2 The idle mixture (exhaust gas CO level) is set at the factory, and should require no further adjustment. If, due to a change in engine characteristics (carbon build-up, bore wear etc) or after a major carburettor overhaul, the mixture becomes incorrect, it can be reset. Note, however, that an exhaust gas analyser (CO meter) will be required to check the mixture and to set it with the necessary standard of accuracy; if this is not available, the car must be taken to a Nissan dealer for the work to be carried out.

3 Take the car on a journey of sufficient length to warm it up to normal operating temperature. **Note:** Adjustment should be completed within two minutes of return, without stopping the engine. If this cannot be achieved, or if the radiator electric cooling fan operates, wait for the cooling fan to stop. Clear any excess fuel from the inlet manifold

by racing the engine two or three times to between 2000 and 3000 rpm, then allow it to idle again.

4 Ensure that all electrical loads are switched off; if the car is not equipped with a tachometer, connect one following its manufacturer's instructions. Note the idle speed, comparing it with that specified. Proceed as described under the relevant sub-heading.

### 1.6 litre carburettor non-catalyst models

5 The idle speed adjusting screw is situated at the rear of the carburettor, and is accessible from behind the air cleaner housing. Screw it in or out as necessary to obtain the specified speed (see illustration).

6 If an exhaust gas analyser is available, follow the manufacturer's instructions to check the exhaust gas CO level. If adjustment is required, it is made by altering the mixture adjustment screw which is situated directly below the idle speed adjusting screw.

7 Using a suitable flat-bladed screwdriver, turn the mixture adjustment screw in very small increments until the level is correct; screwing it in (clockwise) weakens the idle mixture and reduces the CO level, screwing it out will enrich the mixture and increase the CO level.

8 When adjustments are complete, disconnect any test equipment and recheck the idle speed, adjusting as necessary.

4.5 On carburettor engines, the idle speed adjusting screw is situated at the rear of the carburettor (shown with air cleaner removed for clarity)



### 1.6 litre carburettor catalyst models

9 Adjust the idle speed as described in paragraph 5.

10 Referring to paragraph 2, check and adjust the idle mixture as follows.

11 Stop the engine and turn off the ignition switch. Disconnect the wiring connector from the exhaust gas sensor (which is screwed into the exhaust manifold) and the air induction solenoid control valve (which is mounted onto the left-hand side of the inlet manifold) (see Chapter 4 for further information).

12 Remove the cap from the top of the exhaust gas take-off pipe which is situated on the left-hand side of the exhaust manifold, and connect the CO meter to the take-off pipe (see illustration).

13 Start the engine, clear excess fuel from the inlet manifold by racing the engine two or three times to between 2000 and 3000 rpm, then allow it to idle again. Check the exhaust gas CO level is within the limits given in the Specifications.

14 If adjustment is required, using a sharp instrument, hook out the tamperproof plug from carburettor to gain access to the mixture adjustment screw, which is situated directly below the idle speed adjusting screw.

15 Using a suitable flat-bladed screwdriver, turn the mixture adjustment screw in very small increments until the level is correct; screwing it in (clockwise) weakens the idle mixture and reduces the CO level, screwing it out will richen the mixture and increase the CO level.

16 When adjustments are complete, disconnect any test equipment and fit a new tamperproof plug to the mixture adjustment screw. Refit the cap to the exhaust gas take-off pipe, and reconnect the exhaust gas sensor and solenoid valve wiring connectors.

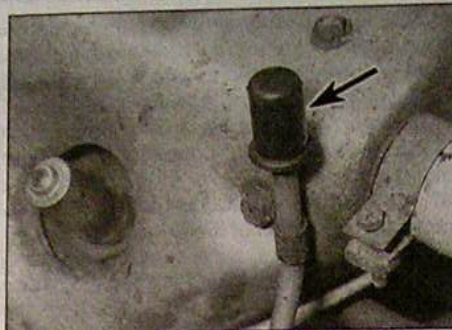
17 Check the idle speed and, if necessary, readjust.

### 1.6 litre fuel-injected models

18 Stop the engine and turn off the ignition switch. Disconnect the wiring connector from the throttle potentiometer, which is mounted onto the side of the throttle housing (see Chapter 4 for further information).

19 Start the engine, clear excess fuel from the inlet manifold by racing the engine two or three times to between 2000 and 3000 rpm, then allow it to idle again. Check that the idle speed is within the limits given in the Specifications. If adjustment is necessary, the idle speed adjusting screw is situated on the right-hand side of the throttle housing (see illustration). Screw it in or out as necessary to obtain the specified speed. When the idle speed is correctly set, switch off the engine and reconnect the throttle potentiometer wiring connector.

20 Experienced home mechanics with a considerable amount of skill and equipment (including a good-quality tachometer and a good-quality, carefully-calibrated exhaust gas analyser) may be able to check the exhaust



4.12 On catalyst carburettor engines, the exhaust gas CO level is checked at the take-off pipe (arrowed) on the exhaust manifold

CO level. However, if it is found to be in need of adjustment, there must be a fault in the ECCS control system; no adjustment of the mixture is possible.

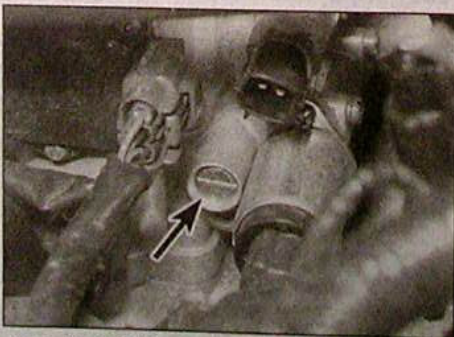
21 If the exhaust gas CO content is incorrect, check the operation of the exhaust gas sensor and fuel injection system components using the ECCS control unit self-diagnostic function (see Chapter 4B). If this fails to show the problem, the vehicle must be taken to a Nissan dealer for testing.

### 2.0 litre single-point injection non-catalyst models

22 Stop the engine and turn off the ignition switch. Disconnect the wiring connector from the throttle potentiometer, which is mounted onto the side of the throttle body (see Chapter 4 for further information).

23 Start the engine, clear excess fuel from the inlet manifold by racing the engine two or three times to between 2000 and 3000 rpm, then allow it to idle again. Check that the idle speed is within the limits given in the Specifications. If adjustment is necessary, the idle speed adjusting screw is situated on the left-hand side of the throttle housing, and is accessed from the rear. Screw it in or out as necessary to obtain the specified speed. When the idle speed is correctly set, switch off the engine and reconnect the throttle potentiometer wiring connector.

24 If an exhaust gas analyser is available, follow the equipment manufacturer's instructions to check the exhaust gas CO level. If



4.19 On 1.6 litre fuel injection engines, the idle speed adjusting screw (arrowed) is on the right-hand side of the throttle housing

adjustment is required, it is made via the mixture adjustment potentiometer screw on the right-hand side of the ECCS control unit. To gain access to the control unit, release the retaining screw and fastener, and remove the right-hand trim panel from the front of the centre console; the screw is located behind the stick-on label on the side of the unit.

25 Peel off the label and, using a suitable flat-bladed screwdriver, turn the mixture adjustment screw in very small increments until the level is correct; screwing it in (clockwise) richens the mixture and increases the CO level, screwing it out will weaken the mixture and decrease the CO level.

26 When adjustments are complete, disconnect any test equipment then fit a new label over the mixture adjustment screw and refit the trim panel. Check the idle speed and, if necessary, readjust.

### 2.0 litre single-point injection catalyst models

27 Adjust the idle speed as described above in paragraphs 22 to 23.

28 Experienced home mechanics with a considerable amount of skill and equipment (including a good-quality tachometer and a good-quality, carefully-calibrated exhaust gas analyser) may be able to check the exhaust CO level. However, if it is found to be in need of adjustment, there must be a fault in the ECCS control system; no adjustment of the mixture is possible.

29 If the exhaust gas CO content is incorrect, check the operation of the exhaust gas sensor and fuel injection system components using the ECCS control unit self-diagnostic function (see Chapter 4B). If this fails to show the problem, the vehicle must be taken to a Nissan dealer for testing.

### 2.0 litre multi-point injection non-catalyst models

30 Stop the engine and turn off the ignition switch. Disconnect the wiring connector from the throttle potentiometer (which is mounted onto the side of the throttle housing - see Chapter 4 for further information).

31 Start the engine, clear excess fuel from the inlet manifold by racing the engine two or three times to between 2000 and 3000 rpm, then allow it to idle again. Check the idle speed is within the limits given in the Specifications. If adjustment is necessary, the idle speed adjusting screw is situated on the top of the idle air adjusting unit, which is bolted to the right-hand end of the inlet manifold. Turn the screw it in or out as necessary to obtain the specified speed. When the idle speed is correctly set, switch off the engine and reconnect the throttle potentiometer wiring connector.

32 If an exhaust gas analyser is available, follow the equipment manufacturer's instructions to check the exhaust gas CO level. If adjustment is required, it is made via the mixture adjustment potentiometer screw on the top of the airflow meter.





**5.4 Tools required for spark plug removal, gap adjustment and refitting**

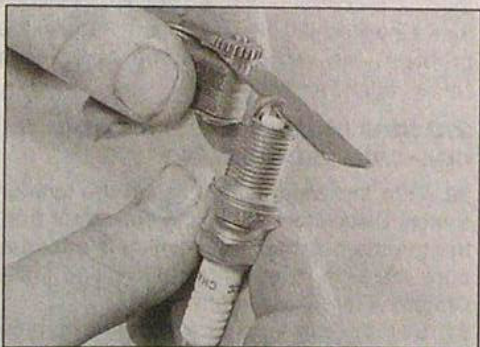
**33** Using a sharp instrument, hook out the tamperproof plug from top of the airflow meter to gain access to the mixture adjustment screw. Using a suitable flat-bladed screw-driver, turn the mixture adjustment screw in very small increments until the level is correct; screwing it in (clockwise) richens the idle mixture and increases the CO level, screwing it out will weaken the mixture and decrease the CO level.

**34** When adjustments are complete, disconnect any test equipment and fit a new tamperproof plug to the airflow meter. Check the idle speed and, if necessary, adjust as described above.

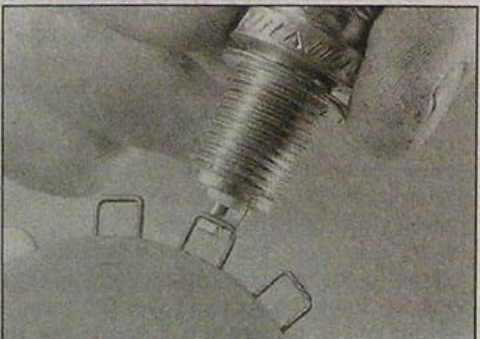
## 2.0 litre multi-point injection catalyst models

**35** Adjust the idle speed as described above in paragraphs 30 and 31.

**36** Experienced home mechanics with a considerable amount of skill and equipment



**5.9a Measuring the spark plug gap with a feeler blade**



**5.9b Measuring the spark plug gap with a wire gauge . . .**

(including a good-quality tachometer and a good-quality, carefully-calibrated exhaust gas analyser) may be able to *check* the exhaust CO level. However, if it is found to be in need of *adjustment*, there must be a fault in the ECCS control system; no adjustment of the mixture is possible.

**37** If the exhaust gas CO content is incorrect, check the operation of the exhaust gas sensor and fuel injection system components using the ECCS control unit self-diagnostic function (see Chapter 4B). If this fails to show the problem, the vehicle must be taken to a Nissan dealer for testing.

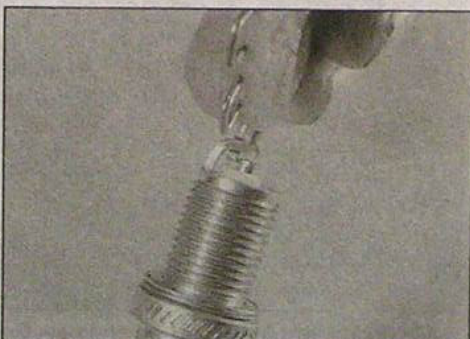
## 5 Spark plug renewal - models without a catalytic converter

**1** The correct functioning of the spark plugs is vital for the correct running and efficiency of the engine. It is essential that the plugs fitted are appropriate for the engine (the suitable type is specified at the beginning of this Chapter). If this type is used and the engine is in good condition, the spark plugs should not need attention between scheduled replacement intervals. Spark plug cleaning is rarely necessary, and should not be attempted unless specialised equipment is available, as damage can easily be caused to the firing ends.

**2** If the marks on the original-equipment spark plug (HT) leads cannot be seen, mark the leads one to four to correspond to the cylinder the lead serves (No 1 cylinder is at the timing chain end of the engine). Pull the leads from the plugs by gripping the plug cap, not the lead, otherwise the lead connection may be fractured.

**3** It is advisable to remove the dirt from the spark plug recesses using a clean brush, vacuum cleaner or compressed air before removing the plugs, to prevent dirt dropping into the cylinders.

**4** Unscrew the plugs using a spark plug spanner, suitable box spanner or a deep socket and extension bar (*see illustration*). Keep the socket aligned with the spark plug, otherwise if it is forcibly moved to one side, the ceramic insulator may be broken off. As each plug is removed, examine it as follows.



**5.9c . . . and adjusting the gap using a special adjusting tool**

**5** Examination of the spark plugs will give a good indication of the condition of the engine. If the insulator nose of the spark plug is clean and white, with no deposits, this is indicative of a weak mixture or too hot a plug (a hot plug transfers heat away from the electrode slowly, a cold plug transfers heat away quickly).

**6** If the tip and insulator nose are covered with hard black-looking deposits, then this is indicative that the mixture is too rich. Should the plug be black and oily, then it is likely that the engine is fairly worn, as well as the mixture being too rich.

**7** If the insulator nose is covered with light tan to greyish-brown deposits, then the mixture is correct and it is likely that the engine is in good condition.

**8** The spark plug electrode gap is of considerable importance as, if it is too large or too small, the size of the spark and its efficiency will be seriously impaired. The gap should be set to the value given in the Specifications at the beginning of this Chapter.

**9** To set it, measure the gap with a feeler blade and then bend open, or closed, the outer plug electrode until the correct gap is achieved (*see illustrations*). The centre electrode should never be bent, as this may crack the insulator and cause plug failure, if nothing worse.

**10** Special spark plug electrode gap adjusting tools are available from most motor accessory shops, or from some spark plug manufacturers.

**11** Before fitting the spark plugs, check that the threaded connector sleeves are tight, and that the plug exterior surfaces and threads are clean. It is very often difficult to insert spark plugs into their holes without cross-threading them. To avoid this possibility, fit a short length of hose over the end of the spark plug (*see Haynes Hint*).



*It's often difficult to insert spark plugs into their holes without cross-threading them. To avoid this possibility, fit a short piece of rubber hose over the end of the spark plug. The flexible hose acts as a universal joint, to help align the plug with the plug hole. Should the plug begin to cross-thread, the hose will slip on the spark plug, preventing thread damage.*



- 12 Tighten the plug to the specified torque using the spark plug socket and a torque wrench. Refit the remaining spark plugs in the same manner.
- 13 Connect the HT leads in their correct order, ensuring that they are correctly clipped into their retaining clips.

## 6 Hose and fluid leak check

- 1 Visually inspect the engine joint faces, gaskets and seals for any signs of water or oil leaks. Pay particular attention to the areas around the camshaft cover, cylinder head, oil filter and sump joint faces. Over a period of time, some very slight seepage from these areas is to be expected - what you are really looking for is any indication of a serious leak. Should a leak be found, renew the offending gasket or oil seal by referring to the appropriate Chapters in this manual.
- 2 Also check the security and condition of all the engine-related pipes and hoses. Ensure that all cable ties or securing clips are in place and in good condition. Clips which are broken or missing can lead to chafing of the hoses pipes or wiring which could cause more serious problems in the future.
- 3 Carefully check the radiator hoses and heater hoses along their entire length. Renew any hose which is cracked, swollen or deteriorated. Cracks will show up better if the hose is squeezed. Pay close attention to the hose clips that secure the hoses to the cooling system components. Hose clips can pinch and puncture hoses, resulting in cooling system leaks. If the crimped-type hose clips are used, it may be a good idea to replace them with standard worm-drive clips.
- 4 Inspect all the cooling system components (hoses, joint faces, etc) for leaks. Where any problems of this nature are found on system components, renew the component or gasket with reference to Chapter 3 (see Haynes Hint).
- 5 Where applicable, inspect the automatic transmission fluid cooler hoses for leaks or deterioration.
- 6 With the vehicle raised, inspect the petrol tank and filler neck for punctures, cracks and other damage. The connection between the filler neck and tank is especially critical. Sometimes a rubber filler neck or connecting hose will leak due to loose retaining clamps or deteriorated rubber.
- 7 Carefully check all rubber hoses and metal fuel lines leading away from the petrol tank. Check for loose connections, deteriorated hoses, crimped lines and other damage. Pay particular attention to the vent pipes and hoses, which often loop up around the filler neck and can become blocked or crimped. Follow the lines to the front of the vehicle, carefully inspecting them all the way. Renew damaged sections as necessary.

- 8 Check the condition of all brake fluid hoses.
- 9 From within the engine compartment, check the security of all fuel hose attachments and pipe unions, and inspect the fuel hoses and vacuum hoses for kinks, chafing and deterioration.
- 10 Where applicable, check the condition of the power steering fluid hoses and pipes.

## 7 Manual transmission oil level check

- 1 Park the car on a level surface. The oil level must be checked before the car is driven, or at least 5 minutes after the engine has been switched off. If the oil is checked immediately after driving the car, some of the oil will remain distributed around the transmission components, resulting in an inaccurate level reading. To improve access, position the car over an inspection pit, or raise the car off the ground and position it on axle stands, (see *Jacking and vehicle support*) making sure the vehicle remains level to the ground.
- 2 Wipe clean the area around the filler/level plug, which is on the front face of the transmission. Unscrew the plug and clean it.
- 3 The oil level should reach the lower edge of the filler/level hole. A certain amount of oil will have gathered behind the filler/level plug and will trickle out when it is removed; this does not necessarily indicate that the level is correct. To ensure that a true level is established, wait until the initial trickle has stopped, then add oil as necessary until a trickle of new oil can be seen emerging. The level will be correct when the flow ceases; use only good-quality oil of the specified type (see illustration).
- 4 Refilling the transmission is an extremely awkward operation; above all, allow plenty of time for the oil level to settle properly before checking it. If a large amount had to be added to the transmission and a large amount flows out on checking the level, refit the filler/level plug, and take the vehicle on a short journey. This will allow the new oil to be distributed fully around the transmission components. On returning, recheck the level when the oil has settled again.



7.3 Topping-up the manual transmission oil



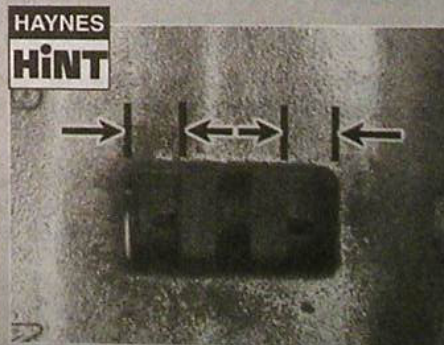
A leak in the cooling system will usually show up as white or rust-coloured deposits on the area adjoining the leak

- 5 If the transmission has been overfilled so that oil flows out as soon as the filler/level plug is removed, check that the car is completely level (front to rear and side to side). If necessary, allow the surplus to drain off into a suitable container.
- 6 When the level is correct, refit the filler/level plug, tightening it to the specified torque wrench setting. Wash off any spilt oil.

## 8 Front and (where fitted) rear brake pad condition check

### Front brake pads

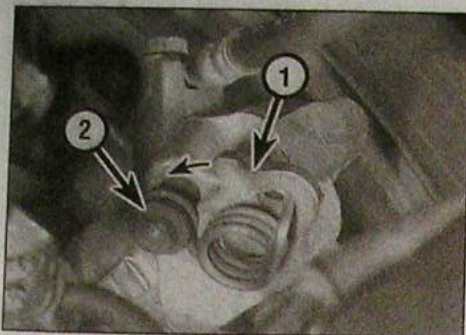
- 1 Apply the handbrake, then jack up the front of the car and support it on axle stands (see *Jacking and vehicle support*). Remove the front roadwheels.
- 2 If any pad's friction material is worn to the specified thickness or less, all four pads must be renewed as a set (see Haynes Hint).
- 3 For a comprehensive check, the brake pads should be removed and cleaned. This will permit the operation of the caliper to be checked, and the condition of the brake disc itself to be fully examined on both sides. Refer to Chapter 9 for further information.



For a quick check, the thickness of friction material on each brake pad can be measured through the aperture in the caliper body.



## 1•14 Every 9000 miles or 6 months



**9.5** Ensure that, when released, the handbrake lever rests against the stopper bolt - models with rear disc brakes

- 1 Handbrake lever (shown here with handbrake applied)
- 2 Stopper bolt

### Rear brake pads

- 4 Chock the front wheels, then jack up the rear of the car and support it on axle stands (see *Jacking and vehicle support*). Remove the roadwheels.
- 5 Proceed as described for the front brake pads in paragraphs 2 and 3.

### 9 Handbrake check and adjustment

- 1 The rear brakes are of the self-adjusting type, and the only adjustments required are to the operating cables.
- 2 The handbrake should be capable of holding the parked vehicle stationary, even on steep slopes, when applied with moderate force. The mechanism should be firm and positive in feel, with no trace of stiffness or sponginess from the cables, and the



**9.12** Using a spanner to turn the handbrake adjuster nut

mechanism should release immediately the handbrake lever is released. If the mechanism does not operate satisfactorily, it should be checked immediately.

- 3 To check the operation of the handbrake, chock the front wheels, then jack up the rear of the car and support it on axle stands (see *Jacking and vehicle support*).
- 4 Fully release the handbrake, and check that the rear roadwheels can be rotated by hand - slight dragging is acceptable, but it should be possible to turn each wheel easily without undue force.

5 On models with rear disc brakes, check that the handbrake levers on the calipers return to rest against the stopper bolts with the handbrake fully released (see *illustration*). This will prove easier if the rear roadwheels are removed.

- 6 Depress the brake pedal several times to establish the correct shoe-to-drum, or pad-to-disc clearance, as applicable.
- 7 With the pedal released, again, check that the rear roadwheels can be rotated.
- 8 Apply normal moderate pressure to operate the handbrake lever, and count the number of clicks necessary to bring the lever to the fully-

applied position (check that the roadwheels are locked with the lever fully applied). The number of clicks should be as specified (see *Specifications*).

- 9 If the number of clicks required to fully apply the handbrake is not as specified, proceed as follows.

10 Working inside the vehicle, remove the centre console as described in Chapter 11.

- 11 The handbrake adjuster nut is located under the lever on the threaded end of the front cable.

12 Turn the adjuster nut as required (see *illustration*), and re-check the adjustment as described in paragraph 8, until the handbrake operates correctly over the specified number of clicks.

- 13 Check that the handbrake 'on' warning light illuminates after the specified number of handbrake clicks (see *Specifications*). If necessary, bend the switch bracket to give the correct adjustment.

14 On completion, where applicable refit the roadwheels, then lower the vehicle to the ground.

### 10 Clutch adjustment check and control mechanism lubrication

- 1 Check that the clutch pedal moves smoothly and easily through its full travel. Check also that the clutch itself functions correctly, with no trace of slip or drag, then adjust the clutch as described in Chapter 6. If excessive effort is required to operate the clutch, check first that the cable is correctly routed and undamaged, then remove the pedal to ensure that its pivot is properly greased. Refer to Chapter 6 for further information.

## Every 18 000 miles or 12 months - whichever comes first

### 11 Air conditioning system check

**Note:** Before proceeding, refer to the precautions given in Chapter 3 regarding work on the air conditioning system.

- 1 Check the tension and condition of the auxiliary drivebelt which drives the air conditioning compressor, as described in Section 16.
- 2 Check the condition of the condenser fins, and clean if necessary (where applicable, remove the front grille panel for access (see Chapter 11). Clean dirt and insects, etc, from the fins using compressed air, or a soft brush. Be careful not to damage the condenser.
- 3 Operate the air conditioning system for at least 10 minutes each month, even during

cold weather, to keep the seals, etc, in good condition.

- 4 Regularly inspect the refrigerant pipes, hoses and unions for security and condition.

5 The most common cause of poor cooling is simply a low system refrigerant charge. If a noticeable drop in cool air output occurs, one of the following checks will help to determine if the refrigerant level is low.

- 6 Warm up the engine to normal operating temperature.

7 Move the temperature control knob to the coldest setting, and move the blower motor control knob to the highest setting. Open the doors (to ensure that the air conditioning system does not shut off as soon as it cools the passenger compartment).

- 8 With the compressor engaged - the compressor clutch will make an audible click, and the centre of the clutch will rotate - inspect the sight glass on the top of the

receiver/drier bottle, where applicable. If air bubbles are present in the sight glass, or the refrigerant looks foamy, the charge is low.

- 9 If no sight glass is fitted, feel the inlet and outlet pipes at the compressor. One side should be cold, and the other hot. If there is no perceptible difference in temperature between the two pipes, this indicates a fault with the compressor, a low refrigerant charge, or some other system fault - consult a Nissan dealer or air conditioning specialist for advice.

10 The air conditioning system will lose a proportion of its charge through normal seepage - so it is as well to regard periodic recharging as a maintenance operation. Recharging must be done by a Nissan dealer or an air conditioning specialist.

- 11 Do not under any circumstances attempt to open any of the refrigerant lines, or renew any or the components.



## 12 Spark plug renewal - models with a catalytic converter

Refer to Section 5.

## 13 Fuel filter renewal



**Warning:** Before carrying out the following operation, refer to the precautions given in *Safety first!* at the beginning of this manual, and follow them implicitly. Petrol is a highly-dangerous and volatile liquid, and the precautions necessary when handling it cannot be overstressed.

1 The fuel filter is situated in the engine compartment, mounted on the engine compartment bulkhead.

2 Release the retaining clips and disconnect the fuel hoses from the filter. On fuel injection models, bear in mind the information given in the relevant Part of Chapter 4 on depressurising the fuel system before the hoses are disconnected (see illustration).

3 Slacken the retaining clamp screw (see illustration), then slide the filter out of the clamp, noting the direction of the arrow marked on the filter body. Remove the filter from the engine compartment.

4 Dispose safely of the old filter; it will be highly inflammable, and may explode if thrown on a fire.

5 Slide the filter into position in the clamp, ensuring that the arrow on the filter body is pointing in the direction of the fuel flow, i.e. towards the carburettor/throttle body/fuel rail (see illustration). This should be as noted on removal, but can be determined by tracing the fuel hoses back along their length.

6 Connect the fuel hoses to the filter, and secure them in position with their retaining clips.

7 Start the engine, and check the filter hoses connections for leaks.



13.5 On refitting, ensure that the filter is fitted the correct way round so its arrow (arrowed) is pointing in the direction of fuel flow



13.2 Slacken the retaining clips and disconnect the hose from the filter ...

## 14 Emissions control systems check

1 Details of the emissions control system components and testing are given in Chapter 4D.

2 Checking consists simply of a visual check for obvious signs of damaged or leaking hoses and joints.

## 15 Exhaust gas sensor check - models with a catalytic converter

### Carburettor models

1 On carburettor models, the exhaust gas sensor is tested as described in Chapter 4D.

### Fuel-injected models

2 On fuel-injected models, the exhaust gas sensor can be tested using the ECCS control unit self-diagnosis facility as described in Chapter 4B.

## 16 Auxiliary drivebelt checking and renewal

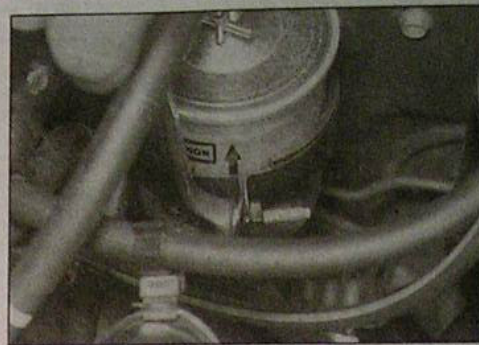
1 On 1.6 litre models, there are either one, two or three auxiliary drivebelts fitted, depending on specification. The drivebelt arrangements are as follows.

**Models without power steering or air conditioning** - one drivebelt (drives alternator and coolant pump).

**Models with power steering** - two drivebelts (one drives the alternator, and the other the power steering pump and coolant pump).

**Models with power steering and air conditioning** - three drivebelts (as for models with power steering, with an additional belt for the air conditioning compressor).

2 On 2.0 litre models, there are two auxiliary drivebelts; one drives the power steering pump and coolant pump, and the other the alternator and (where fitted) the air conditioning compressor.



13.3 ... then slacken the clamp bolt and slide the filter out of position

## Checking the auxiliary drivebelt condition

3 Apply the handbrake, then jack up the front of the car and support it on axle stands. Remove the right-hand front roadwheel.

4 From underneath the front of the car, undo the retaining screws and remove the plastic cover from underneath the wing to gain access to the crankshaft pulley. If necessary, also undo the retaining screws and remove the engine undershield to improve access.

5 Using a suitable socket and extension bar fitted to the crankshaft pulley bolt, rotate the crankshaft so that the entire length of the drivebelt(s) can be examined. Examine the drivebelt(s) for cracks, splitting, fraying or damage. Check also for signs of glazing (shiny patches) and for separation of the belt plies. Renew the belt if worn or damaged.

6 If the condition of the belt is satisfactory, check the drivebelt tension as described below under the relevant sub-heading.

## Air conditioning compressor drivebelt (1.6 litre models) - removal, refitting and tensioning

### Removal

7 If not already done, proceed as described in paragraphs 3 and 4.

8 Disconnect the battery negative terminal (refer to *Disconnecting the battery* in the Reference Chapter of this manual).

9 Slacken the nut securing the tensioning pulley assembly to the engine.

10 Rotate the adjuster bolt to move the tensioner pulley away from the drivebelt until there is sufficient slack for the drivebelt to be removed from the pulleys.

### Refitting

11 Fit the belt around the pulleys, ensuring that the belt is of the correct type if it is being renewed, and take up the slack in the belt by tightening the adjuster bolt.

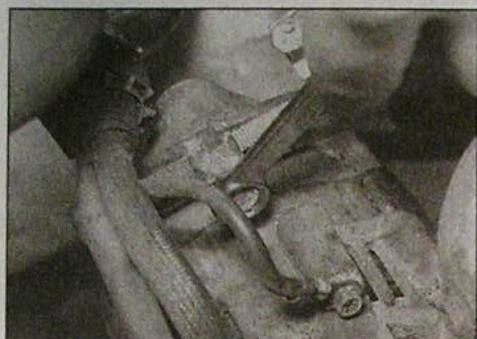
12 Tension the drivebelt as described in the following paragraphs.

### Tensioning

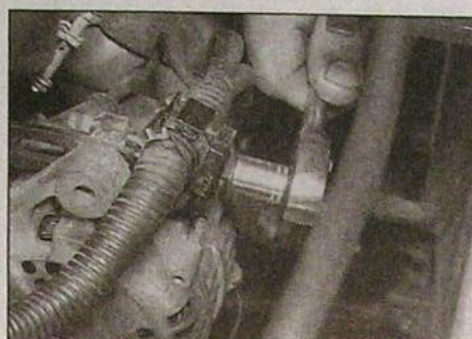
13 If not already done, proceed as described in paragraphs 3 and 4.

14 Correct tensioning of the drivebelt will ensure that it has a long life. Beware,





**16.32 Slacken the alternator mounting bolts...**



**16.33a ... then loosen the adjuster bolt...**



**16.33b ... and slip the drivebelt off the alternator pulley**

however, of overtightening, as this can cause wear in the alternator bearings.

**15** The belt tension is checked at the mid-point between the pulleys on the top belt run. Referring to the Specifications given at the start of this Chapter, apply the specified force and check that the belt deflection is within the specified range.

**16** To adjust the tension, with the tensioner pulley assembly retaining nut slackened, rotate the adjuster bolt until the correct tension is achieved. Once the belt is correctly tensioned, rotate the crankshaft a couple of times and recheck the tension.

**17** When the belt is correctly tensioned, tighten the tensioner pulley assembly retaining nut to the specified torque setting, and reconnect the battery negative lead.

**18** Refit the cover(s), securely tightening their fasteners, then refit the roadwheel and lower the vehicle to the ground.

### **Power steering pump drivebelt (1.6 litre models) - removal, refitting and tensioning**

#### **Removal**

**19** If not already done, proceed as described in paragraphs 3 and 4.

**20** Disconnect the battery negative terminal (refer to *Disconnecting the battery* in the Reference Section of this manual). On models with air conditioning, remove the air conditioning compressor drivebelt as described in paragraphs 9 and 10.

**21** Slacken the power steering pump mounting nuts/bolts (as applicable).

**22** Back off the adjuster bolt to relieve the tension in the drivebelt, then slip the drivebelt from the pulleys.

#### **Refitting**

**23** Fit the belt around the pulleys, ensuring that the belt is of the correct type if it is being renewed, and take up the slack in the belt by tightening the adjuster bolt.

**24** Tension the drivebelt as described in the following paragraphs. Where necessary, refit and tension the air conditioning compressor drivebelt as described in paragraphs 11 to 17.

#### **Tensioning**

**25** If not already done, proceed as described in paragraphs 3 and 4.

**26** Correct tensioning of the drivebelt will ensure that it has a long life. Beware, however, of overtightening, as this can cause wear in the alternator bearings.

**27** The belt tension is checked at the mid-point between the pulleys on the upper belt run. Referring to the Specifications given at the start of this Chapter, apply the specified force and check that the belt deflection is within the specified range.

**28** To adjust, with the upper mounting nut/bolt just holding the power steering pump firm, and the other mounting nut/bolt loosened, turn the adjuster bolt until the correct tension is achieved. Rotate the crankshaft a couple of times, recheck the tension, then securely tighten both the power steering pump mounting nuts/bolts.

**29** Refit the cover(s), securely tightening their fasteners, then refit the roadwheel and lower the vehicle to the ground.

### **Alternator drivebelt (1.6 litre models) - removal, refitting and tensioning**

#### **Removal**

**30** If not already done, proceed as described in paragraphs 3 and 4.

**31** Disconnect the battery negative terminal (refer to *Disconnecting the battery* in the Reference Section of this manual). On models with air conditioning, remove the air conditioning drivebelt as described in paragraphs 9 and 10. On models with power steering, remove the power steering drivebelt as described in paragraphs 21 and 22.



**16.41a Loosen the alternator upper...**

**32** Slacken both the alternator upper and lower mounting nuts/bolts (as applicable) (see illustration).

**33** Back off the adjuster bolt to relieve the tension in the drivebelt, then slip the drivebelt from the pulleys (see illustrations).

#### **Refitting**

**34** Fit the belt around the pulleys, ensuring that the belt is of the correct type if it is being renewed, and take up the slack in the belt by tightening the adjuster bolt.

**35** Tension the drivebelt as described in the following paragraphs. Where necessary, refit the air conditioning compressor drivebelt as described in paragraphs 11 to 17.

#### **Tensioning**

**36** If not already done, proceed as described in paragraphs 3 and 4.

**37** Correct tensioning of the drivebelt will ensure that it has a long life. Beware, however, of overtightening, as this can cause wear in the alternator bearings.

**38** The belt should be tensioned is checked at the mid-point between the pulleys on the upper belt run. Referring to the Specifications given at the start of this Chapter, apply the specified force and check that the belt deflection is within the specified range.

**39** To adjust, with the upper mounting nut/bolt just holding the alternator firm, and the lower mounting nut/bolt loosened, turn the adjuster bolt until the correct tension is achieved. Rotate the crankshaft a couple of times, recheck the tension, then securely tighten both the alternator mounting nuts/bolts.

**40** Refit the cover(s), securely tightening their fasteners, then refit the roadwheel and lower the vehicle to the ground.

### **Alternator drivebelt (2.0 litre models) - removal, refitting and tensioning**

**41** Refer to the information given in paragraphs 30 to 40, ignoring the remarks about removing/refitting the air conditioning compressor and power steering pump drivebelt(s). **Note:** On models without air conditioning, on refitting ensure that the drivebelt is seated in the same grooves of both the crankshaft and alternator pulleys, so that the belt run is true (see illustrations).





16.41b ... and lower mounting bolts (arrowed) to allow adjustment of the drivebelt

### Power steering pump drivebelt (2.0 litre models) - removal, refitting and tensioning

42 Refer to the information given in paragraphs 19 to 29, ignoring the remarks about removing/refitting the air conditioning compressor drivebelt. Note that it is necessary to remove/refit the alternator drivebelt instead (see paragraph 41).

### 17 Rear brake shoe check

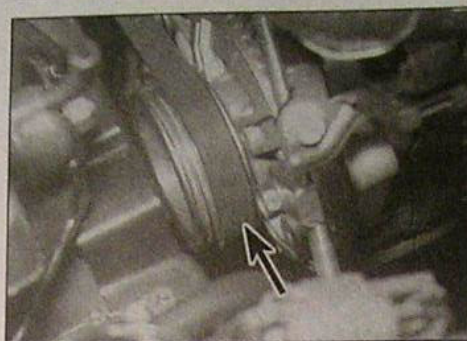
1 Remove the rear brake drums, and check the brake shoes for signs of wear or contamination. At the same time, also inspect the wheel cylinders for signs of leakage, and the brake drum for signs of wear. Refer to the relevant Sections of Chapter 9 for further information.

### 18 Brake fluid renewal

**Warning:** Brake hydraulic fluid can harm your eyes and damage painted surfaces, so use extreme caution when handling and pouring it. Do not use fluid that has been standing open for some time, as it absorbs moisture from the air. Excess moisture content can cause a dangerous loss of braking effectiveness.

1 The procedure is similar to that for the bleeding of the hydraulic system as described in Chapter 9. The brake fluid reservoir should be emptied by siphoning, using a clean poultry baster or similar before starting, then refilled with fresh fluid. Allowance should be made for the old fluid to be expelled when bleeding a section of the circuit.

2 Working as described in Chapter 9, open the first bleed screw in the sequence and pump the brake pedal gently until nearly all the fluid has been emptied from the master cylinder reservoir. Top-up to the MAX level with more fresh fluid, and continue pumping until new fluid can be seen emerging from the



16.41c On 2.0 litre engines without air conditioning, ensure that the drivebelt (arrowed) is correctly seated in the same grooves of the alternator pulley as those of crankshaft pulley - ie. so that the spare grooves are at the front

bleed screw. Tighten the screw and top the reservoir level up to the MAX level line.

3 Old hydraulic fluid is invariably much darker in colour than the new, making it easy to distinguish the two.

4 Work through all the remaining bleed screws in the sequence until new fluid can be seen at all of them. Be careful to keep the master cylinder reservoir topped-up to above the MIN level at all times, or air may enter the system and greatly increase the length of the task.

5 When the operation is complete, check that all bleed screws are securely tightened, and that their dust caps are refitted. Wash off all traces of spilt fluid, and recheck the master cylinder reservoir fluid level.

6 Check the operation of the brakes before taking the car on the road.

### 19 Automatic transmission fluid level check

1 Take the vehicle on a short journey to warm the transmission up to normal operating temperature, then park the vehicle on level ground. The fluid level is checked using the dipstick located at the front of the engine compartment, directly below the distributor, which is mounted onto the left-hand end of the cylinder head.



20.2 Checking a steering gear gaiter

2 With the engine idling and the selector lever in the P (Park) position, withdraw the dipstick from the tube, and wipe all the fluid from its end with a clean rag or paper towel. Insert the clean dipstick back into the tube as far as it will go, then withdraw it once more. Note the level on the end of the dipstick, noting that there are two sets of level markings. On one side of the dipstick are the COLD upper and lower marks (which are in the form of cut-outs on the edge of the dipstick - for use when the fluid temperature is between 30°C and 50°C); on the other side are the HOT upper and lower marks (which are in the form of lines marked on the dipstick - for use when the fluid temperature is between 50°C and 80°C). If the vehicle is fully warmed-up, the HOT marks should be used.

3 If topping-up is necessary, add the required quantity of the specified fluid to the transmission via the dipstick tube. Use a funnel with a fine mesh gauze, to avoid spillage and to ensure that no foreign matter enters the transmission. Add fluid as necessary until the level is between the relevant set of upper and lower marks on the dipstick. **Note:** Never overfill the transmission so that the fluid level is above the upper mark.

4 After topping-up, take the vehicle on a short run to distribute the fresh fluid, then recheck the level again, topping-up if necessary.

5 Always maintain the level between the two dipstick marks. If the level is allowed to fall below the lower mark, various problems, and even severe transmission damage, could result.

### 20 Steering and suspension check

#### Front suspension and steering check

1 Apply the handbrake, then jack up the front of the car and support it on axle stands (see *Jacking and vehicle support*).

2 Visually inspect the balljoint dust covers and the steering rack and pinion gaiters for splits, chafing or deterioration (see *illustration*). Any wear of these components will cause loss of lubricant, together with dirt and water entry, resulting in rapid deterioration of the balljoints or steering gear.

3 On vehicles with power steering, check the fluid hoses for chafing or deterioration, and the pipe and hose unions for fluid leaks. Also check for signs of fluid leakage under pressure from the steering gear rubber gaiters, which would indicate failed fluid seals within the steering gear.

4 Grasp the roadwheel at the 12 o'clock and 6 o'clock positions, and try to rock it (see *illustration*). Very slight free play may be felt, but if the movement is appreciable, further investigation is necessary to determine the source. Continue rocking the wheel while an





**20.4 Rocking the roadwheel to check steering/suspension components**

assistant depresses the footbrake. If the movement is now eliminated or significantly reduced, it is likely that the hub bearings are at fault. If the free play is still evident with the footbrake depressed, then there is wear in the suspension joints or mountings.

5 Now grasp the wheel at the 9 o'clock and 3 o'clock positions, and try to rock it as before. Any movement felt now may again be caused by wear in the hub bearings or the steering track-rod balljoints. If the inner or outer balljoint is worn, the visual movement will be obvious.

6 Using a large screwdriver or flat bar, check for wear in the suspension mounting bushes by levering between the relevant suspension component and its attachment point. Some movement is to be expected as the mountings are made of rubber, but excessive wear should be obvious. Also check the condition of any visible rubber bushes, looking for splits, cracks or contamination of the rubber.

7 With the car standing on its wheels, have an assistant turn the steering wheel back and forth about an eighth of a turn each way. There should be very little, if any, lost movement between the steering wheel and roadwheels. If this is not the case, closely observe the joints and mountings previously described, but in addition check the steering column universal joints for wear, and also check the rack-and-pinion steering gear itself.

### Suspension strut/shock absorber check

8 Check for any signs of fluid leakage around the suspension strut/shock absorber body, or



**21.1 Checking driveshaft constant velocity joint (CV) joint gaiter**

from the rubber gaiter around the piston rod. Should any fluid be noticed, the suspension strut/shock absorber is defective internally, and should be renewed. **Note:** Suspension struts/shock absorbers should always be renewed in pairs on the same axle.

9 The efficiency of the suspension strut/shock absorber may be checked by bouncing the vehicle at each corner. Generally speaking, the body will return to its normal position and stop after being depressed. If it rises and returns on a rebound, the suspension strut/shock absorber is probably suspect. Examine the suspension strut/shock absorber upper and lower mountings for any signs of wear.

## 21 Driveshaft gaiter check

1 With the vehicle raised and securely supported on stands (see *Jacking and vehicle support*), turn the steering onto full lock, then slowly rotate the roadwheel. Inspect the condition of the outer constant velocity (CV) joint rubber gaiters, squeezing the gaiters to open out the folds (see illustration). Check for signs of cracking, splits or deterioration of the rubber, which may allow the grease to escape, and lead to water and grit entry into the joint. Also check the security and condition of the retaining clips. Repeat these checks on the inner CV joints. If any damage or deterioration is found, the gaiters should be renewed as described in Chapter 8.

2 At the same time, check the general condition of the CV joints themselves by first holding the driveshaft and attempting to rotate the wheel. Repeat this check by holding the inner joint and attempting to rotate the driveshaft. Any appreciable movement indicates wear in the joints, wear in the driveshaft splines, or a loose driveshaft retaining nut.

## 22 Wheel alignment check

**Note:** Refer to Chapter 10 for wheel alignment and steering angle specifications additional to those given at the beginning of this Chapter.

### Definitions

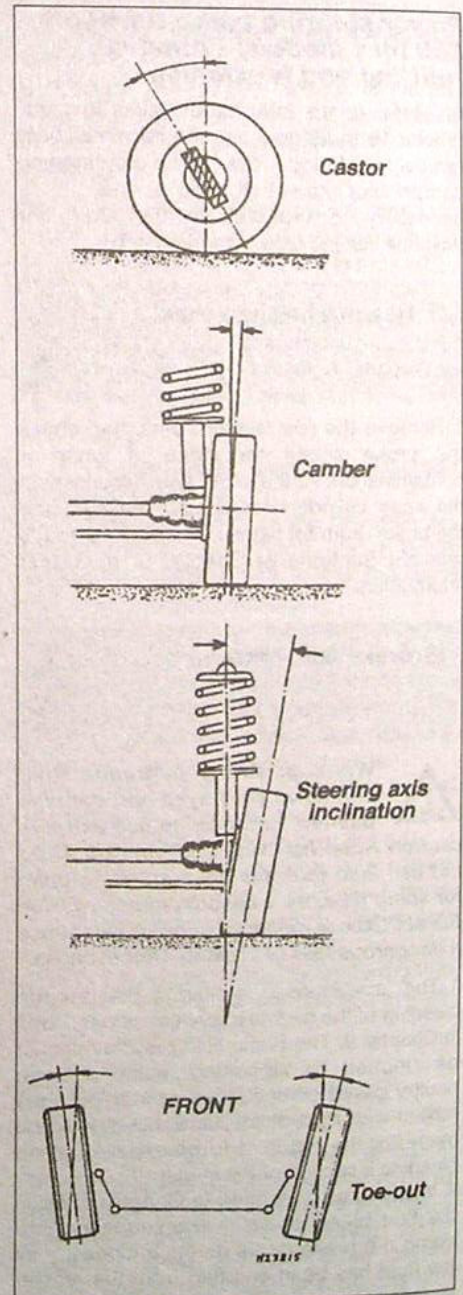
1 A vehicle's steering and suspension geometry is defined in four basic settings - all angles are expressed in degrees (toe settings are also expressed as a measurement); the steering axis is defined as an imaginary line drawn through the axis of the suspension strut, extended where necessary to contact the ground (see illustration).

2 **Camber** is the angle between each roadwheel and a vertical line drawn through its centre and tyre contact patch, when viewed from the front or rear of the car. Positive

camber is when the roadwheels are tilted outwards from the vertical at the top; negative camber is when they are tilted inwards.

3 **Camber** is not adjustable, and is given for reference only; while it can be checked using a camber checking gauge, if the figure obtained is significantly different from that specified, the vehicle must be taken for careful checking by a professional, as the fault can only be caused by wear or damage to the body or suspension components.

4 **Castor** is the angle between the steering axis and a vertical line drawn through each roadwheel centre and tyre contact patch, when viewed from the side of the car. Positive castor is when the steering axis is tilted so



**22.1 Wheel alignment and steering angle measurements**



that it contacts the ground ahead of the vertical; negative castor is when it contacts the ground behind the vertical.

**5 Castor** is not adjustable, and is given for reference only; while it can be checked using a castor checking gauge, if the figure obtained is significantly different from that specified, the vehicle must be taken for careful checking by a professional, as the fault can only be caused by wear or damage to the body or suspension components.

**6 Steering axis inclination/SAI** - also known as **kingpin inclination/KPI** - is the angle between the steering axis and a vertical line drawn through each roadwheel centre and tyre contact patch, when viewed from the front or rear of the car.

**7 SAI/KPI** is not adjustable, and is given for reference only.

**8 Toe** is the difference, viewed from above, between lines drawn through the roadwheel centres and the car's centre-line. Toe-in is when the roadwheels point inwards, towards each other at the front, while toe-out is when they splay outwards from each other at the front.

**9** The front wheel toe setting is adjusted by screwing the track-rod ends in or out of their track-rods, to alter the effective length of the track-rod assemblies.

**10** On Phase I and Phase II Estate models, and all Phase III models, rear wheel toe setting is set during manufacture and is not adjustable. If there is any reason to suspect a problem with the rear wheel toe setting, the vehicle must be taken for careful checking by a professional, as the fault can only be caused by wear or damage to the body or suspension components.

**11** On Phase I and Phase II Saloon and Hatchback models, the rear wheel toe setting is controlled by the position of the eccentrics on the bolts securing the inboard ends of the rear parallel links (see Chapter 10).

## Checking - general

**12** Due to the special measuring equipment necessary to check the wheel alignment, and the skill required to use it properly, the checking and adjustment of these settings is best left to a Nissan dealer or similar expert. Note that most tyre-fitting shops now possess sophisticated checking equipment.

**13** For accurate checking, the vehicle must be at the kerb weight, ie unladen and with a full tank of fuel.

**14** Before starting work, check first that the tyre sizes and types are as specified (see Chapter 10), then check the tyre pressures and tread wear, the roadwheel run-out, the condition of the hub bearings, the steering wheel free play (front wheels only), and the condition of the suspension components. Correct any faults found.

**15** Park the vehicle on level ground, check that the front roadwheels are in the straight-ahead position, then rock the rear and front ends to settle the suspension. Release the



22.23 Loosen the track-rod end locknut

handbrake, and roll the vehicle backwards approximately 1 metre, then forwards again, to relieve any stresses in the steering and suspension components.

## Front wheel toe setting - checking and adjusting

**16** The front wheel toe setting is checked by measuring the distance between the front and rear inside edges of the roadwheel rims. Proprietary toe measurement gauges are available from motor accessory shops.

**17** Prepare the vehicle as described in paragraphs 13 to 15 above.

**18** A tracking gauge must now be obtained. Two types of gauge are available, and can be obtained from motor accessory shops. The first type measures the distance between the front and rear inside edges of the roadwheels, as described previously, with the car stationary. The second type, known as a scuff plate, measures the actual position of the contact surface of the tyre in relation to the road surface, with the vehicle in motion. This is achieved by pushing or driving the front tyre over a plate, which then moves slightly according to the scuff of the tyre, and shows this movement on a scale. Both types have their advantages and disadvantages, but either can give satisfactory results if used correctly and carefully. Alternatively, a tracking gauge can be fabricated from a length of steel tubing, suitably cranked to clear the engine and gearbox assembly, with a setscrew and a locknut at one end.

**19** Many tyre specialists will also check toe settings free, or for a small charge.



22.24 Counterhold the track-rod end, and turn the track-rod

**20** Make sure that the steering is in the straight-ahead position when taking measurements.

**21** If adjustment is found to be necessary, clean the threaded ends of the track-rods.

**22** Note that the following adjustment operation is easier if the front of the vehicle is raised and supported on axle stands (see *Jacking and vehicle support*).

**23** Counterhold the track-rod end using the flats provided, then loosen the track-rod end locknut (see illustration).

**24** Still counterholding the track-rod end as before, turn the track-rod as required (clockwise to increase toe-in, anti-clockwise to decrease toe-in) (see illustration). Note how far the track-rod is turned, so that the remaining track-rod can be turned an equal amount.

**25** Tighten the locknut on completion.

**26** Repeat the procedure described in paragraphs 23 to 25 on the remaining side of the vehicle, ensuring that the track-rods are turned exactly the same amount.

**27** Where applicable, lower the vehicle to the ground, then again check that the front roadwheels are in the straight-ahead position, and rock the rear and front ends to settle the suspension. Release the handbrake, and roll the vehicle backwards approximately 1 metre, then forwards again, to relieve any stresses in the steering and suspension components.

**28** Re-check the tracking as described previously.

**29** If further adjustment is necessary, repeat the operations described in paragraphs 23 to 28 until the adjustment is correct.

**30** On completion, tighten the track-rod end locknuts, whilst counterholding the track-rod ends.

**31** Check that the track-rod lengths are equal, and that the steering wheel spokes are in the straight-ahead position.

## Rear wheel toe setting (Phase I and Phase II Saloon and Hatchback models) - checking and adjusting

**Note:** The rear wheel toe setting on all other models is set in production at the factory, and no adjustment is possible. If the toe setting is suspect, this is likely to be due to accident damage or excessive wear in the rear suspension components.

**32** Prepare the vehicle as described previously in paragraphs 13 to 15.

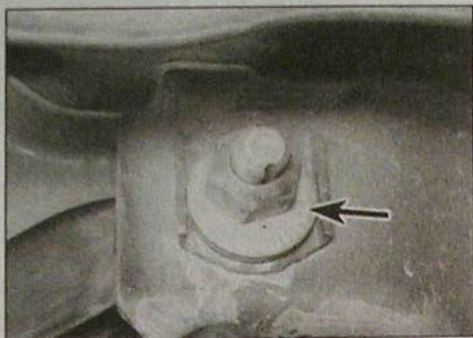
**33** The toe setting should be checked using a tracking gauge as described previously for the front wheel toe setting.

**34** If adjustment is required, chock the front wheels, then jack up the rear of the vehicle and support securely on axle stands.

**35** Working under the rear of the vehicle, on one side, note the position of the eccentric on the rear parallel link inboard securing bolt, then loosen the nut (see illustration).

**36** Turn the bolt to move the eccentric by one graduation (if necessary, make an index mark





**22.35 Note the position of the eccentric (arrowed) on the parallel link inboard securing bolt**

on the body bracket), then tighten the nut to the specified torque.

**37** Repeat the procedure described in paragraphs 37 and 38 on the remaining side of the vehicle, ensuring that the eccentric is moved exactly the same amount (ie, one graduation) in the opposite direction to the previous adjustment - if the previous eccentric was moved clockwise, the remaining eccentric should be moved anti-clockwise, and vice-versa. Tighten the nut to the specified torque.

**38** Lower the vehicle, then rock the rear and front ends to settle the suspension. Release the handbrake, and roll the vehicle backwards approximately 1 metre, then forwards again, to relieve any stresses in the steering and suspension components.

**39** Re-check the toe setting, as described previously.

**40** If further adjustment is required, repeat the adjustment procedure until the correct toe setting is obtained.

## 23 Roadwheel balance check

This task should be entrusted to a Nissan dealer or a suitably-equipped tyre specialist, who should be able to carry out the work for a nominal fee.

Note that the manufacturers recommend that the wheels are balanced off the vehicle.

## 24 Seat belt check

**1** All models are fitted with three-point lap and diagonal inertia reel seat belts at both front and at the rear outer seats. The rear centre seat has either a two-point lap-type belt of static type (ie, not inertia reel), or a

three-point lap and diagonal inertia reel belt.

**2** Inspect the belts for signs of fraying or other damage. Also check the operation of the buckles and retractor mechanisms, and ensure that all mounting bolts are securely tightened. Note that the bolts are shouldered so that the belt anchor points are free to rotate.

**3** If there is any sign of damage, or any doubt about the condition of a belt, it must be renewed. If the vehicle has been involved in a collision, any belts in use at the time should be renewed as a matter of course, and all other belts should be checked carefully.

**4** Use only warm water and non-detergent soap to clean the belts. Never use any chemical cleaners, strong detergents, dyes or bleaches. Keep the belts fully extended until they have dried naturally - do not apply heat to dry them.

## 25 Hinge and lock lubrication

**1** Work around the vehicle, and lubricate the hinges of the bonnet, doors, and tailgate, or boot lid, with a light machine oil.

**2** Lightly lubricate the bonnet release mechanism and the exposed sections of the inner cable with a smear of grease. Similarly, lubricate the tailgate/boot lid/fuel filler flap release mechanisms, where accessible.

**3** Check carefully the security and operation of all hinges, latches and locks, adjusting them where required (see Chapter 11). Check the operation of the central locking system.

**4** Check the condition and operation of the tailgate/boot lid struts, renewing them if either is leaking or no longer able to support the tailgate securely when raised.

## 26 Road test

### Instruments and electrical equipment

**1** Check the operation of all instruments and electrical equipment.

**2** Make sure that all instruments read correctly, and switch on all electrical equipment in turn to check that it functions properly.

### Steering and suspension

**3** Check for any abnormalities in the steering, suspension, handling or road feel.

**4** Drive the vehicle, and check that there are no unusual vibrations or noises.

**5** Check that the steering feels positive, with no excessive sloppiness, or roughness, and check for any suspension noises when cornering and driving over bumps.

### Drivetrain

**6** Check the performance of the engine, clutch (where applicable), transmission and driveshafts.

**7** Listen for any unusual noises from the engine, clutch and transmission.

**8** Make sure that the engine runs smoothly when idling, and that there is no hesitation when accelerating.

**9** Check that, where applicable, the clutch action is smooth and progressive, that the drive is taken up smoothly, and that the pedal travel is not excessive. Also listen for any noises when the clutch pedal is depressed.

**10** On manual transmission models, check that all gears can be engaged smoothly without noise, and that the gear lever action is not abnormally vague or notchy.

**11** On automatic transmission models, make sure that all the gearchanges occur smoothly, without snatching, and without an increase in engine speed between changes. Check that all the gear positions can be selected with the vehicle at rest. If any problems are found, they should be referred to a Nissan dealer.

**12** Listen for a metallic clicking sound from the front of the vehicle as the vehicle is driven slowly in a circle with the steering on full lock. Carry out this check in both directions. If a clicking noise is heard, this indicates wear in a driveshaft joint, in which case, the complete driveshaft must be renewed (see Chapter 8).

### Check the operation and performance of the braking system

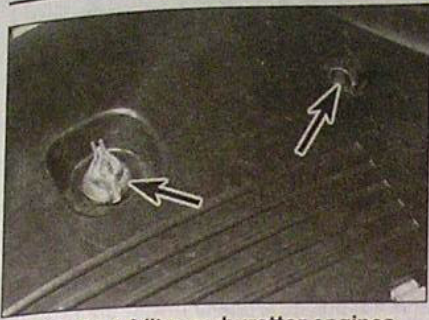
**13** Make sure that the vehicle does not pull to one side when braking, and that the wheels do not lock prematurely when braking hard.

**14** Check that there is no vibration through the steering when braking.

**15** Check that the handbrake operates correctly without excessive movement of the lever, and that it holds the vehicle stationary on a slope.

**16** Test the operation of the brake servo unit as follows. Depress the footbrake four or five times to exhaust the vacuum, then start the engine. As the engine starts, there should be a noticeable give in the brake pedal as vacuum builds up. Allow the engine to run for at least two minutes and then switch it off. If the brake pedal is depressed again, it should be possible to detect a hiss from the servo as the pedal is depressed. After about four or five applications, no further hissing should be heard, and the pedal should feel considerably harder.





27.1a On 1.6 litre carburettor engines, unscrew the retaining nut and bolt (arrowed) ...



27.1b ... then release the air cleaner lid retaining clips

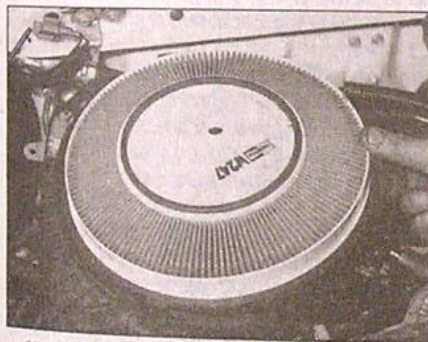


27.2 Removing the air cleaner housing lid - 1.6 litre fuel injection engine

## Every 36 000 miles or 2 years - whichever comes first

### 27 Air filter renewal

- 1 Where necessary, unscrew the air cleaner housing lid retaining nut(s) and screw (as applicable) (see illustrations).
- 2 Release the lid retaining clips, then lift off the lid and position it clear of the housing (see illustration). If necessary, disconnect the inlet duct from the lid to allow the lid to be removed from the engine compartment.
- 3 Lift the air cleaner filter element out of the housing, noting which way around it is fitted (see illustrations).
- 4 Wipe the inside of the air cleaner housing and lid with a clean cloth to remove all traces of dirt and debris.



27.3a Removing the air filter element - 1.6 litre carburettor engine



27.3b Removing the air filter element - 1.6 litre fuel injection engine



27.3c Removing the air filter element - 2.0 litre multi-point injection engine



27.6 On refitting, ensure that the lid is securely held in position by all the relevant retaining clips



**Warning:** Voltages produced by an electronic ignition system are considerably higher than those produced by conventional ignition systems. Extreme care must be taken

### 28 Ignition system check

*when working on the system with the ignition switched on. Persons with surgically-implanted cardiac pacemaker devices should keep well clear of the ignition circuits, components and test equipment*

- 1 The ignition system components should be checked for damage or deterioration as described under the relevant sub-heading.

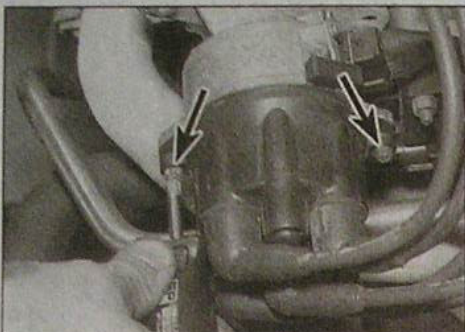
#### General component check

- 2 The spark plug (HT) leads should be checked whenever new spark plugs are installed in the engine. Where necessary, unclip the cover from the distributor.
- 3 Ensure that the leads are numbered before removing them, to avoid confusion when refitting. Pull the leads from the plugs by gripping the end fitting, not the lead, otherwise the lead connection may be fractured (see illustration).
- 4 Check inside the end fitting of each lead for signs of corrosion, which will look like a white crusty powder. Push the end fitting back onto the spark plug, ensuring that it is a tight fit on the plug. If not, remove the lead again and use pliers to carefully crimp the metal connector inside the end fitting until it fits securely on the end of the spark plug.
- 5 Using a clean rag, wipe the entire length of the lead, to remove any built-up dirt and grease. Once the lead is clean, check for burns, cracks and other damage. Do not bend the lead excessively, or pull the lead lengthwise - the conductor inside might break.



28.3 Ensure that the HT leads are clearly numbered before removing them





**28.9a** The distributor cap is retained by two screws (arrowed)

6 Disconnect the other end of the lead from the distributor cap. Again, pull only on the end fitting. Check for corrosion and a tight fit in the same manner as the spark plug end. Refit the lead securely on completion.

7 Check the remaining leads one at a time, in the same way.

8 If new spark plug (HT) leads are required, purchase a set for your specific car and engine.

9 Slacken and remove the distributor cap retaining screws. Remove the cap, and recover the cap seal. Wipe the cap clean, and carefully inspect it inside and out for signs of cracks, carbon tracks (tracking) and worn, burned or loose contacts. Check that the cap's carbon brush is unworn, free to move against spring pressure, and making good contact with the rotor arm. Also inspect the cap seal for signs of wear or damage, and renew if necessary. Slacken the retaining screw, remove the rotor arm from the distributor shaft, and inspect the rotor arm (see illustrations). It is common practice to renew the cap and rotor arm whenever new spark plug (HT) leads are fitted. When fitting a new cap, remove the leads from the old cap one at a time, and fit them to the new cap in the exact same location - do not simultaneously remove all the leads from the old cap, or firing order confusion may occur. On refitting, ensure that the rotor arm is pressed securely onto the distributor shaft, and securely tighten its retaining screw. Ensure that the cap seal is in position, then fit the cap and securely tighten its retaining screws. Where necessary, refit the cover to the distributor.



**29.3a** On 1.6 litre carburettor engines, undo the retaining screws...



**28.9b** Slacken and remove the retaining screw, and pull the rotor arm off the shaft

10 Even with the ignition system in first-class condition, some engines may still occasionally experience poor starting, attributable to damp ignition components. To disperse moisture, suitable aerosol products can be very effective. Products are also available to provide a sealing coat to exclude moisture from the ignition system, and in extreme difficulty will help to start a car when only a very poor spark occurs.

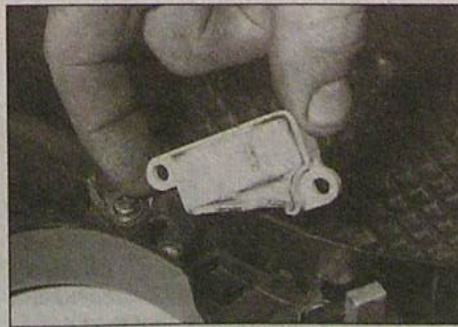
### Ignition timing check and adjustment

11 Check the ignition timing as described in Chapter 5B.

### 29 PCV filter renewal - 1.6 litre engine and 2.0 litre single-point injection engine

#### 1.6 litre carburettor engine

- 1 Undo the air cleaner housing lid retaining nut and screw, and release its retaining clips.
- 2 Lift the lid, and turn it over to gain access to the PCV filter which is screwed onto the underside of the lid.
- 3 Undo the two retaining screw and remove the filter assembly. Remove the filter element from the frame, and discard it (see illustrations).
- 4 Fit a new PCV filter element and refit the filter assembly to the air cleaner lid, tightening its retaining screws securely.
- 5 Refit the lid, and secure it in position with its retaining nut, screw and clips.



**29.3b** ... then remove the PCV filter assembly from the air cleaner lid

#### 1.6 litre fuel-injected engine

- 6 Release the retaining clips, and lift off the air cleaner housing lid.
- 7 Lift the filter element out from the housing to gain access to the PCV filter.
- 8 Remove the filter from the air cleaner housing, and wipe clean the area around the filter (see illustration).
- 9 Fit a new PCV filter to the housing, and refit the air cleaner filter element.
- 10 Seat the air cleaner lid on the housing, and secure it in position with the retaining clips.

#### 2.0 litre single-point injection engine

- 11 Undo the air cleaner housing lid retaining nuts, and release its retaining clips.
- 12 Lift the lid to gain access to the PCV filter.
- 13 Undo the two retaining screws and remove the filter assembly. Remove the filter element from the frame, and discard it.
- 14 Fit a new PCV filter element and refit the filter assembly, tightening its retaining screws securely.
- 15 Refit the lid, and secure it in position with its retaining nuts and clips.

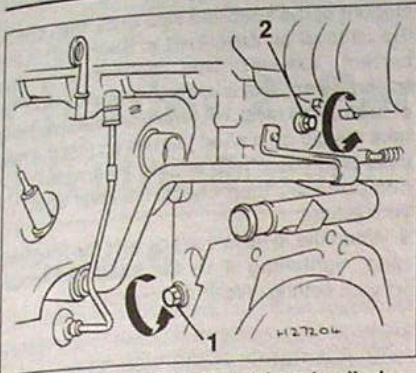
### 30 Braking system vacuum servo unit check

- 1 To test the operation of the servo unit, depress the footbrake several times to exhaust the vacuum, and check that there is no change in the pedal stroke.
- 2 Depress the brake pedal, then start the engine whilst keeping the pedal firmly depressed. As the engine starts, there should be a noticeable give in the brake pedal as the vacuum builds up. Allow the engine to run for at least two minutes, then switch it off. If the brake pedal is now depressed, it should feel normal, but further applications should result in the pedal feeling firmer, with the pedal stroke decreasing with each application.
- 3 With the engine running, depress the brake pedal then, with the pedal still depressed, stop the engine. The pedal should not give for at least 30 seconds.



**29.8** On 1.6 litre fuel-injected engines, the PCV filter is fitted to the air cleaner housing base





31.6a Coolant drain plug (1) and cylinder head air bleed screw (2) - 1.6 litre engine

4 If the servo does not operate as described, first inspect the servo unit check-valve as described in Chapter 9.

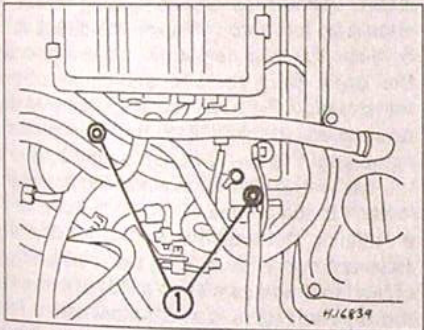
5 If the servo unit still fails to operate satisfactorily, the fault lies within the unit itself. Repairs to the unit are not possible - if faulty, the servo unit must be renewed (see Chapter 9).

## 31 Coolant renewal

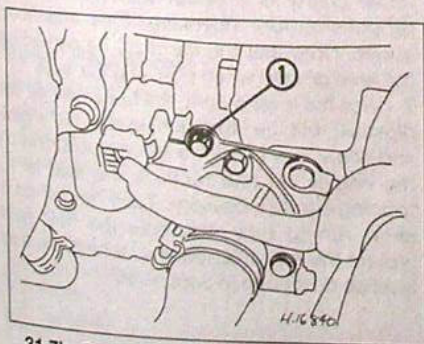
### Cooling system draining



**Warning:** Wait until the engine is cold before starting this procedure. Do not allow antifreeze to come in contact with your skin, or with the painted surfaces of the vehicle. Rinse off



31.7a Cooling system air bleed screws (1) - 1.6 litre engine



31.7b Cooling system cylinder head air bleed screw (1) - 2.0 litre engine

spills immediately with plenty of water. Never leave antifreeze lying around in an open container, or in a puddle in the driveway or garage floor. Children and pets are attracted by its sweet smell, but antifreeze can be fatal if ingested.

1 To drain the cooling system, first cover the radiator pressure tank cap with a wad of rag, and slowly turn the cap anti-clockwise to relieve the pressure in the cooling system (a hissing sound will normally be heard). Wait until any pressure remaining in the system is released, then continue to turn the cap until it can be removed.

2 Inside the car, move the heater temperature control lever fully to the HOT position.

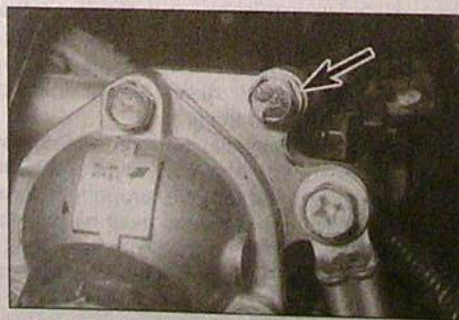
3 Where applicable, remove the engine undershield, then check to see whether a radiator drain plug is fitted in the bottom of the radiator. If a drain plug is fitted, position a suitable container beneath drain plug. Loosen the drain plug, and allow the coolant to drain into the container.

4 On models without a radiator drain plug, position the container beneath the radiator bottom hose connection, then slacken the hose clip and ease the hose from the radiator stub. If the hose joint has not been disturbed for some time, it will be necessary to manipulate the hose to break the joint. Allow the coolant to drain into the container.

5 If necessary, remove the coolant expansion tank, drain out the coolant, then refit the tank, ensuring that the hoses are securely reconnected. Take care not to spill coolant on the surrounding components.

6 Re-position the container under the cylinder block drain plug. The drain plug is located at the front of the cylinder block, at the transmission end on 1.6 litre engines, and at the timing chain end on 2.0 litre engines (see illustrations).

7 Remove the cylinder block drain plug, then unscrew the air bleed screws. The 1.6 litre engine has bleed screws located at the transmission end of the cylinder head, next to the distributor; at the rear timing chain end of the cylinder head; and/or in the heater hose at the rear of the engine. On 2.0 litre engines, the bleed screws are located in the front distributor end of the cylinder head (next to the thermostat housing), and in the heater hose at the rear of the engine (see illustrations).



31.7c Alternative location (arrowed) for cylinder head air bleed screw - 2.0 litre engine



31.6b Coolant drain plug (arrowed) viewed from underneath vehicle - 2.0 litre engine

8 If the coolant has been drained for a reason other than renewal, then provided it is clean and less than two years old, it can be re-used.

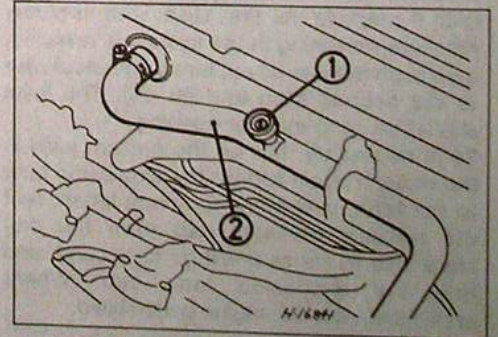
### Cooling system flushing

9 If coolant renewal has been neglected, or if the antifreeze mixture has become diluted, then in time, the cooling system may gradually lose efficiency, as the coolant passages become restricted due to rust, scale deposits, and other sediment. The cooling system efficiency can be restored by flushing the system clean.

10 The radiator should be flushed independently of the engine, to avoid unnecessary contamination.

11 To flush the radiator, fit and tighten the radiator pressure cap, and if the radiator is fitted to the vehicle, clamp the hose running from the top of the radiator to the coolant expansion tank.

12 Disconnect the top hose at the radiator, then insert a garden hose into the radiator top inlet. Direct a flow of clean water through the radiator, and continue flushing until clean water emerges from the radiator bottom outlet (the bottom radiator hose should have been disconnected to drain the system). If after a reasonable period, the water still does not run clear, the radiator can be flushed with a good proprietary cleaning agent. It is important that the cleaning agent manufacturer's instructions are followed carefully. If the contamination is particularly bad, insert the hose in the radiator bottom outlet, and flush the radiator in reverse (reverse-flushing).



31.7d Cooling system heater hose air bleed screw - 2.0 litre engine

1 Air bleed screw

2 Heater hose



## 1•24 Every 36 000 miles or 2 years

**13** Remove the thermostat as described in Chapter 3, then temporarily refit the thermostat cover. Close the cooling system bleed screws if they have been opened.

**14** With the radiator top and bottom hoses disconnected from the radiator, insert a hose into the radiator bottom hose. Direct a clean flow of water through the engine, and continue flushing until clean water emerges from the radiator top hose.

**15** On completion of flushing, refit the thermostat with reference to Chapter 3, and reconnect the hoses.

### Cooling system filling

**16** Before attempting to fill the cooling system, make sure that all hoses and clips are in good condition, and that the clips are tight. Note that an antifreeze mixture must be used all year round, to prevent corrosion of the alloy engine components.

**17** Ensure that the air bleed screws have been unscrewed (see paragraph 7), and reconnect the radiator bottom hose.

**18** Position the container under the cylinder block drain plug, then refill the cooling system through the radiator filler neck, until coolant runs from the cylinder block drain plug aperture. Coat the threads of the drain plug with suitable sealant, then refit and tighten the plug.

**19** Continue to fill the system through the radiator until coolant free from air bubbles emerges from the air bleed screws. Close the bleed screws once the coolant escaping is free from bubbles.

**20** Continue to fill the radiator until the level reaches the filler opening, then fill the expansion tank until the coolant level reaches the MAX mark. Refit the radiator pressure cap, and the expansion tank cap.

**21** Start the engine, and warm it up until it reaches normal operating temperature. Race the engine two or three times under no load, and check the coolant temperature gauge for signs of overheating.

**22** Stop the engine, allow it to cool completely, then check for leaks, particularly around the disturbed components.

**23** With the system cold (the system must be cold for an accurate coolant level indication), remove the radiator pressure cap (turn the pressure cap on the radiator anti-clockwise until it reaches the first stop; wait until any pressure remaining in the system is released, then push the cap down, turn it anti-clockwise to the second stop and lift off). The level should be up to the filler opening.

**24** If necessary, top-up the coolant level in the radiator, then top-up the expansion tank to the MAX level mark. On completion, refit the radiator pressure cap (turn the cap clockwise as far as it will go to secure), and refit the expansion tank cap. Where applicable, refit the engine undershield.

### Antifreeze mixture

**25** Always use an ethylene-glycol based antifreeze which is suitable for use in mixed-metal cooling systems. The quantity of antifreeze and levels of protection are indicated in the Specifications.

**26** Before adding antifreeze, the cooling system should be completely drained, preferably flushed, and all hoses and clips checked for condition and security.

**27** After filling with antifreeze, a label should be attached to the radiator or expansion tank stating the type and concentration of antifreeze used, and the date installed. Any subsequent topping-up should be made with the same type and concentration of antifreeze.

**28** Do not use engine antifreeze in the windscreen/tailgate/headlight washer system, as it will cause damage to the vehicle paintwork. A screenwash additive should be added to the washer system in the quantities recommended on the bottle.

### 32 Manual transmission oil renewal

**1** This operation is much quicker and more efficient if the car is first taken on a journey of sufficient length to warm the engine/transmission up to normal operating temperature.

**2** Park the car on level ground, switch off the ignition and apply the handbrake firmly. For improved access, jack up the front of the car and support it securely on axle stands. Note that the car must be lowered to the ground and level, to ensure accuracy, when refilling and checking the oil level.

**3** Wipe clean the area around the filler/level plug, which is on the front face of the transmission. Unscrew the plug and clean it.

**4** Position a suitable container under the drain plug situated on the left-hand side of the transmission differential housing.

**5** Allow the oil to drain completely into the container. If the oil is hot, take precautions against scalding. Clean both the filler/level and the drain plugs, being especially careful to wipe any metallic particles off the magnetic inserts.

**6** When the oil has finished draining, clean the drain plug threads and those of the transmission casing, then refit the drain plug, tightening it to the specified torque wrench setting. If the car was raised for the draining operation, lower it to the ground.

**7** Refilling the transmission is an extremely awkward operation. Above all, allow plenty of time for the oil level to settle properly before checking it. Note that the car must be parked on flat level ground when checking the oil level.

**8** Refill the transmission with the exact

amount of the specified type of oil, then check the oil level as described in Section 7; if the correct amount was poured into the transmission, and a large amount flows out on checking the level, refit the filler/level plug and take the car on a short journey so that the new oil is distributed fully around the transmission components, then check the level again on your return.

**9** When the level is correct, refit the filler/level plug, tightening it to the specified torque wrench setting. Wash off any spilt oil.

### 33 Automatic transmission fluid renewal

**1** Take the vehicle on a short run to warm the transmission up to normal operating temperature.

**2** Park the car on level ground, switch off the ignition and apply the handbrake firmly. For improved access, jack up the front of the car and support it securely on axle stands (see *Jacking and vehicle support*). Note that the car must be lowered to the ground and level, to ensure accuracy, when refilling and checking the fluid level.

**3** Remove the dipstick, then position a suitable container under the transmission.

**4** Unscrew the drain plug from the transmission sump, and allow the fluid to drain completely into the container. If the fluid is hot, take precautions against scalding. Clean the drain plug, being especially careful to wipe any metallic particles off the magnetic insert. Discard the original sealing washer; it should be renewed whenever it is disturbed.

**5** When the fluid has finished draining, clean the drain plug threads and those of the transmission. Fit a new sealing washer to the drain plug and refit it to the transmission, tightening it to the specified torque setting. If the car was raised for the draining operation, lower it to the ground.

**6** Refilling the transmission is an extremely awkward operation, adding the specified type of fluid to the transmission a little at a time via the dipstick tube. Use a funnel with a fine mesh gauze, to avoid spillage and to ensure that no foreign matter enters the transmission. Allow plenty of time for the level to settle properly before checking it as described above. Note that the car must be parked on flat level ground when checking the level.

**7** Once the level is up to the MAX mark on the dipstick, refit the dipstick then start the engine and allow it to idle for a few minutes. Switch the engine off and recheck the fluid level, topping-up if necessary. Take the car on a short run to fully distribute the new fluid around the transmission and recheck the fluid level as described in Section 19.



# Contents

## REPAIRS AND OVERHAUL

### Engine and associated systems

1.6 litre engine in-car repair procedures	Page 2A•1
2.0 litre engine in-car repair procedures	Page 2B•1
Engine removal and overhaul procedures	Page 2C•1
Cooling, heating and ventilation systems	Page 3•1
Fuel/exhaust systems - carburettor models	Page 4A•1
Fuel/exhaust systems - single-point fuel injection models	Page 4B•1
Fuel/exhaust systems - multi-point fuel injection models	Page 4C•1
Emissions control systems	Page 4D•1
Starting and charging systems	Page 5A•1
Ignition system	Page 5B•1

### Transmission

Clutch	Page 6•1
Manual transmission	Page 7A•1
Automatic transmission	Page 7B•1
Driveshafts	Page 8•1

### Brakes and suspension

Braking system	Page 9•1
Suspension and steering	Page 10•1

### Body equipment

Bodywork and fittings - Phase I and Phase II models	Page 11A•1
Bodywork and fittings - Phase III models	Page 11B•1
Body electrical systems - Phase I and Phase II models	Page 12A•1
Body electrical systems - Phase III models	Page 12B•1

### Wiring diagrams

Phase I and Phase II models	Page 12A•24
Phase III models	Page 12B•13

## REFERENCE

Dimensions and weights	Page REF•1
Conversion factors	Page REF•2
Buying spare parts	Page REF•3
Vehicle identification	Page REF•3
General repair procedures	Page REF•4
Jacking and vehicle support	Page REF•5
Disconnecting the battery	Page REF•5
Tools and working facilities	Page REF•6
MOT test checks	Page REF•8
Fault finding	Page REF•12
Glossary of technical terms	Page REF•20

### Index

Page REF•24
-------------