

AUSTIN & MG METRO

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1980 to May 1990 (up to G registration)

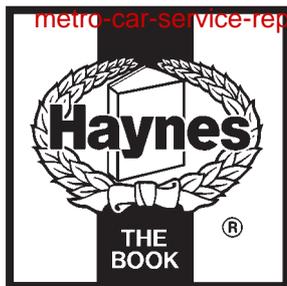
Haynes Service and Repair Manual



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Includes **Fault Finding** and **MOT Test Check** Sections

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Austin/MG Metro Service and Repair Manual

A K Legg LAE MIMI and Finn Deacon

Models covered

All Austin and MG Metro models including Turbo, Vanden Plas, automatic (inc. 1991 model), Van and special/limited edition models; 998 cc and 1275 cc

Does not cover revised Rover Metro range introduced May 1990

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ABCDE
FGHIJ
KLMNO
PQRST

A book in the Haynes Service and Repair Manual Series

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The Austin Metro was first introduced in October 1980 and was initially only on sale to the UK market, export sales to the European market following in early 1981.

The 998 cc and 1275 cc engines are fitted, with low compression and economy versions available.

The body is of computer-based design and is assembled and welded by computer-controlled robots. The "A-Plus" engine and gearbox assembly is similar to that fitted to the Mini range, although it is much improved, with durability and economy prime considerations. Drive is through the front wheels and the engine/gearbox unit is fitted transversely across the front of the car.

The most significant design characteristics are bolt-on front wings, self-cleaning distributor contact points, fully closed crankcase ventilation system, front-mounted aluminium radiator, dual circuit braking system, and Hydragas suspension. Instrumentation is comprehensive and includes a seat belt warning lamp, brake pad wear warning lamp, and handbrake warning lamp.

Later additions to the range include a luxurious Vanden Plas version, sporty MG and MG Turbo versions, and 1.0 and 1.3 Vans. The range from 1985 includes 5-door as well as 3-door versions.



Metro 1.3 HLS



Metro Vanden Plas

Your Metro Manual

The aim of this manual is to help you get the best from your car. It can do so in several ways. It can help you decide what work must be done (even should you choose to get it done by a garage), provide information on routine maintenance and servicing and give a logical course of action and diagnosis when random faults occur. However, it is hoped that you will use the manual by tackling the work yourself. On simpler jobs it may even be quicker than booking the car into a garage and going there twice to leave and collect it. Perhaps most important, a lot of money can be saved by avoiding the costs the garage must charge to cover its labour and overheads.

The manual has drawings and descriptions to show the function of the various components so that their layout can be understood. Then the tasks are described and photographed in a step-by-step sequence so that even a novice can do the work.

Its arrangement

The manual is divided into Chapters, each covering a logical subdivision of the vehicle. The Chapters are each divided into Sections, numbered with single figures, e.g. 5; and the Sections are divided into numbered paragraphs.

It is freely illustrated, especially in those parts where there is a detailed sequence of operations to be carried out. The reference numbers used in illustration captions pinpoint the pertinent Section and the paragraph within that Section. That is, illustration 3.2 means that the illustration refers to Section 3, and paragraph 2 within that Section.

There is an alphabetical index at the back of the manual, as well as a contents list at the front. Each Chapter is also preceded by its individual contents list.

References to the "left" or "right" of the vehicle are in the sense of a person in the driver's seat, facing forwards.

Unless otherwise stated, nuts and bolts are removed by turning anti-clockwise, and tightened by turning clockwise.

Vehicle manufacturers continually make changes to specifications and recommendations, and these, when notified, are incorporated into our manuals at the earliest opportunity.



MG Metro Turbo

Acknowledgements

Thanks are due to Champion Spark Plug, who supplied the illustrations showing spark plug conditions. Thanks are also due to Rover for the supply of technical information. Sykes-Pickavant Limited provided some of the workshop tools. Special thanks are due to all those people at Sparkford who helped in the production of this manual.

We take great pride in the accuracy of information given in this manual, but vehicle manufacturers make alterations and design changes during the production run of a particular vehicle of which they do not inform us. No liability can be accepted by the authors or publishers for loss, damage or injury caused by errors in, or omissions from, the information given.

Working on your car can be dangerous. This page shows just some of the potential risks and hazards, with the aim of creating a safety-conscious attitude.

General hazards

Scalding

- Don't remove the radiator or expansion tank cap while the engine is hot.
- Engine oil, automatic transmission fluid or power steering fluid may also be dangerously hot if the engine has recently been running.

Burning

- Beware of burns from the exhaust system and from any part of the engine. Brake discs and drums can also be extremely hot immediately after use.

Crushing

- When working under or near a raised vehicle, always supplement the jack with axle stands, or use drive-on ramps. **Never venture under a car which is only supported by a jack.**



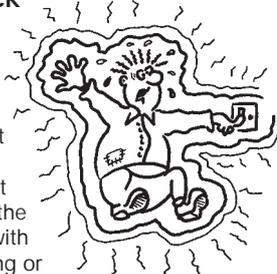
- Take care if loosening or tightening high-torque nuts when the vehicle is on stands. Initial loosening and final tightening should be done with the wheels on the ground.

Fire

- Fuel is highly flammable; fuel vapour is explosive.
- Don't let fuel spill onto a hot engine.
- Do not smoke or allow naked lights (including pilot lights) anywhere near a vehicle being worked on. Also beware of creating sparks (electrically or by use of tools).
- Fuel vapour is heavier than air, so don't work on the fuel system with the vehicle over an inspection pit.
- Another cause of fire is an electrical overload or short-circuit. Take care when repairing or modifying the vehicle wiring.
- Keep a fire extinguisher handy, of a type suitable for use on fuel and electrical fires.

Electric shock

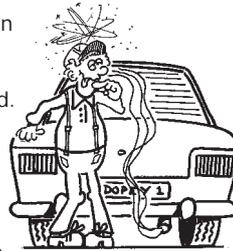
- Ignition HT voltage can be dangerous, especially to people with heart problems or a pacemaker. Don't work on or near the ignition system with the engine running or the ignition switched on.



- Mains voltage is also dangerous. Make sure that any mains-operated equipment is correctly earthed. Mains power points should be protected by a residual current device (RCD) circuit breaker.

Fume or gas intoxication

- Exhaust fumes are poisonous; they often contain carbon monoxide, which is rapidly fatal if inhaled. Never run the engine in a confined space such as a garage with the doors shut.
- Fuel vapour is also poisonous, as are the vapours from some cleaning solvents and paint thinners.



Poisonous or irritant substances

- Avoid skin contact with battery acid and with any fuel, fluid or lubricant, especially antifreeze, brake hydraulic fluid and Diesel fuel. Don't syphon them by mouth. If such a substance is swallowed or gets into the eyes, seek medical advice.
- Prolonged contact with used engine oil can cause skin cancer. Wear gloves or use a barrier cream if necessary. Change out of oil-soaked clothes and do not keep oily rags in your pocket.
- Air conditioning refrigerant forms a poisonous gas if exposed to a naked flame (including a cigarette). It can also cause skin burns on contact.

Asbestos

- Asbestos dust can cause cancer if inhaled or swallowed. Asbestos may be found in gaskets and in brake and clutch linings. When dealing with such components it is safest to assume that they contain asbestos.

Special hazards

Hydrofluoric acid

- This extremely corrosive acid is formed when certain types of synthetic rubber, found in some O-rings, oil seals, fuel hoses etc, are exposed to temperatures above 400°C. The rubber changes into a charred or sticky substance containing the acid. *Once formed, the acid remains dangerous for years. If it gets onto the skin, it may be necessary to amputate the limb concerned.*
- When dealing with a vehicle which has suffered a fire, or with components salvaged from such a vehicle, wear protective gloves and discard them after use.

The battery

- Batteries contain sulphuric acid, which attacks clothing, eyes and skin. Take care when topping-up or carrying the battery.
- The hydrogen gas given off by the battery is highly explosive. Never cause a spark or allow a naked light nearby. Be careful when connecting and disconnecting battery chargers or jump leads.

Air bags

- Air bags can cause injury if they go off accidentally. Take care when removing the steering wheel and/or facia. Special storage instructions may apply.

Diesel injection equipment

- Diesel injection pumps supply fuel at very high pressure. Take care when working on the fuel injectors and fuel pipes.



Warning: Never expose the hands, face or any other part of the body to injector spray; the fuel can penetrate the skin with potentially fatal results.

Remember...

DO

- Do use eye protection when using power tools, and when working under the vehicle.
- Do wear gloves or use barrier cream to protect your hands when necessary.
- Do get someone to check periodically that all is well when working alone on the vehicle.
- Do keep loose clothing and long hair well out of the way of moving mechanical parts.
- Do remove rings, wristwatch etc, before working on the vehicle – especially the electrical system.
- Do ensure that any lifting or jacking equipment has a safe working load rating adequate for the job.

DON'T

- Don't attempt to lift a heavy component which may be beyond your capability – get assistance.
- Don't rush to finish a job, or take unverified short cuts.
- Don't use ill-fitting tools which may slip and cause injury.
- Don't leave tools or parts lying around where someone can trip over them. Mop up oil and fuel spills at once.
- Don't allow children or pets to play in or near a vehicle being worked on.

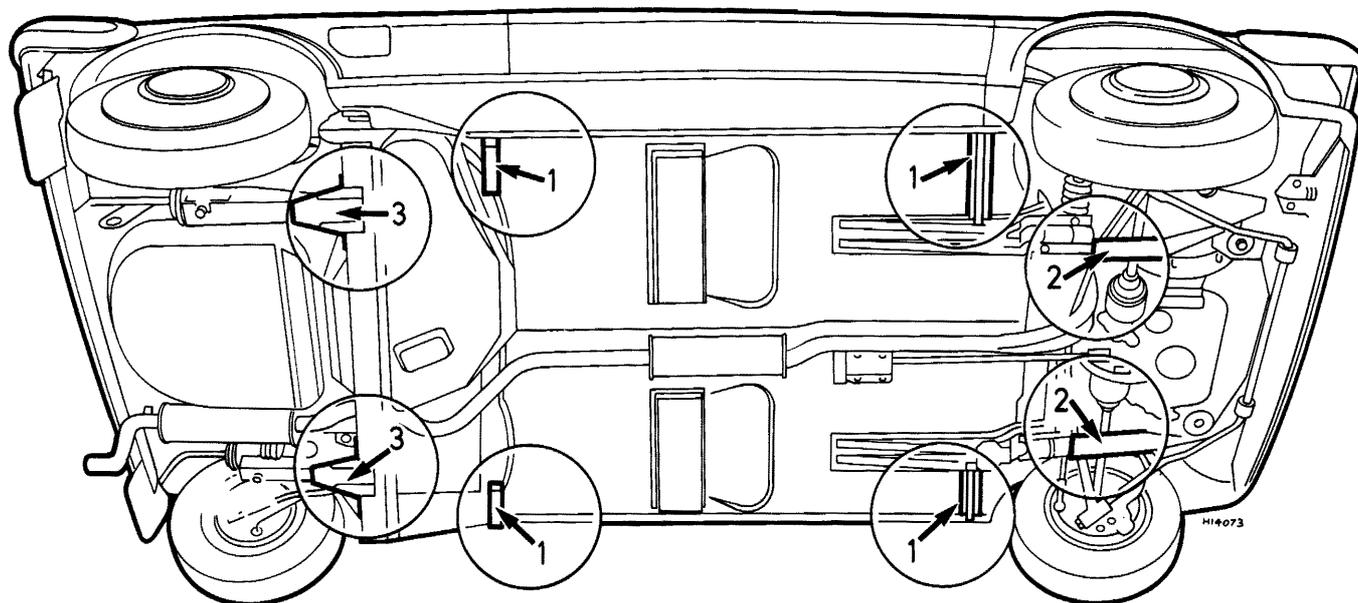
Jacking and vehicle support

The jack provided with the vehicle is designed primarily for emergency wheel changing, and its use for servicing and overhaul work on the vehicle is best avoided. Instead, a more substantial workshop jack (trolley jack or similar) should be used. Whichever type is employed, it is essential that additional safety support is provided by means of axle stands designed for this purpose. Never use makeshift means such as wooden blocks or piles of house bricks, as

these can easily topple or, in the case of bricks, disintegrate under the weight of the vehicle. When jacking up the car with a trolley jack, lift under the widest points of the subframe (see illustration). To raise both wheels at the same time use a 36 in (914 mm) length of square steel tubing placed beneath the subframes with a central spigot to fit the jack. Never jack up the car beneath the suspension arms. To support the car, place axle stands under the jacking points beneath

the sills or under the widest points of the subframe.

If removal of the wheels is not required, the use of drive-on ramps is recommended. Caution should be exercised to ensure that they are correctly aligned with the wheels, and that the vehicle is not driven too far along them so that it promptly falls off the other ends, or tips the ramps.



Jacking and support points

1 Jacking brackets

2 Front jacking points (servicing)

3 Rear jacking points (servicing)

Towing

Provided a fault has not developed in the gearbox or final drive, the car may be towed on its four wheels using either lashing eye located on the front subframe. The lashing eye located beneath the left-hand rear underbody is intended for use on a transporter only, and should not be used for towing another vehicle (see illustration).

On automatic transmission models always check that the engine oil level is correct before towing the car. Do not tow the car at speeds greater than 30 mph (50 km/h) or for a distance of more than 30 miles (50 km). If these conditions cannot be met, or if transmission damage is suspected, the car must be towed with the front wheels clear of the ground.



Rear lashing eye - not to be used for towing

Wheel changing

To change a roadwheel, remove the spare wheel and tool kit from the well in the rear compartment (see illustration). Apply the handbrake and chock the wheel diagonally opposite the one to be changed. Make sure that the car is located on firm level ground. Lever off the hub cover (see illustration) and slightly loosen the wheel nuts with the

spanner provided. Raise the jack and insert the peg in the nearest jacking point to the wheel being removed (see illustration). Using the handle provided, raise the jack until the wheel is free of the ground (see illustration). Unscrew the wheel nuts and remove the wheel, then remove the wheel finisher if fitted.

Fit the finisher to the spare wheel and fit the

wheel on the studs. Fit and tighten the wheel nuts with their tapered ends towards the wheel. Lower the jack, then finally tighten the wheel nuts and refit the hub cover. Remove the chock, and refit the wheel and tool kit to the rear compartment.



Spare wheel compartment



Levering off the hub cover



Body jacking point



Jacking the car

Identifying leaks

Puddles on the garage floor or drive, or obvious wetness under the bonnet or underneath the car, suggest a leak that needs investigating. It can sometimes be difficult to decide where the leak is coming from, especially if the engine bay is very dirty already. Leaking oil or fluid can also be blown rearwards by the passage of air under the car, giving a false impression of where the problem lies.



Warning: Most automotive oils and fluids are poisonous. Wash them off skin, and change out of contaminated clothing, without delay.



The smell of a fluid leaking from the car may provide a clue to what's leaking. Some fluids are distinctively coloured. It may help to clean the car carefully and to park it over some clean paper overnight as an aid to locating the source of the leak. Remember that some leaks may only occur while the engine is running.

Sump oil



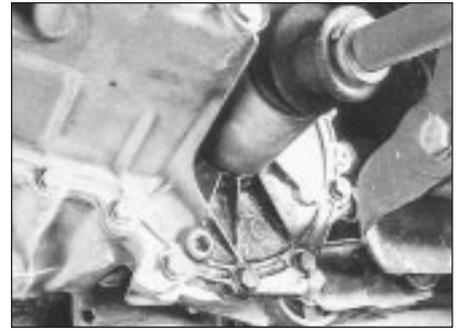
Engine oil may leak from the drain plug...

Oil from filter



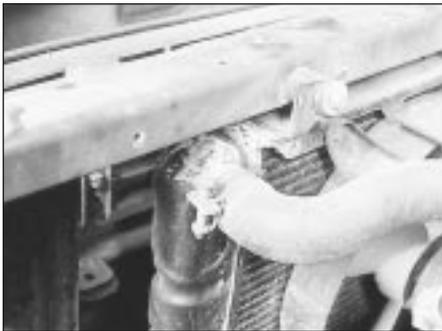
...or from the base of the oil filter.

Gearbox oil



Gearbox oil can leak from the seals at the inboard ends of the driveshafts.

Antifreeze



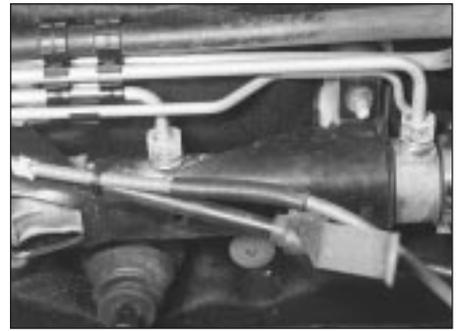
Leaking antifreeze often leaves a crystalline deposit like this.

Brake fluid



A leak occurring at a wheel is almost certainly brake fluid.

Power steering fluid



Power steering fluid may leak from the pipe connectors on the steering rack.

Jump starting

HAYNES
HiNT

Jump starting will get you out of trouble, but you must correct whatever made the battery go flat in the first place. There are three possibilities:

- 1** The battery has been drained by repeated attempts to start, or by leaving the lights on.
- 2** The charging system is not working properly (alternator drivebelt slack or broken, alternator wiring fault or alternator itself faulty).
- 3** The battery itself is at fault (electrolyte low, or battery worn out).

When jump-starting a car using a booster battery, observe the following precautions:

- ✓ Before connecting the booster battery, make sure that the ignition is switched off.
- ✓ Ensure that all electrical equipment (lights, heater, wipers, etc) is switched off.

- ✓ Make sure that the booster battery is the same voltage as the discharged one in the vehicle.
- ✓ If the battery is being jump-started from the battery in another vehicle, the two vehicles **MUST NOT TOUCH** each other.
- ✓ Make sure that the transmission is in neutral (or PARK, in the case of automatic transmission).



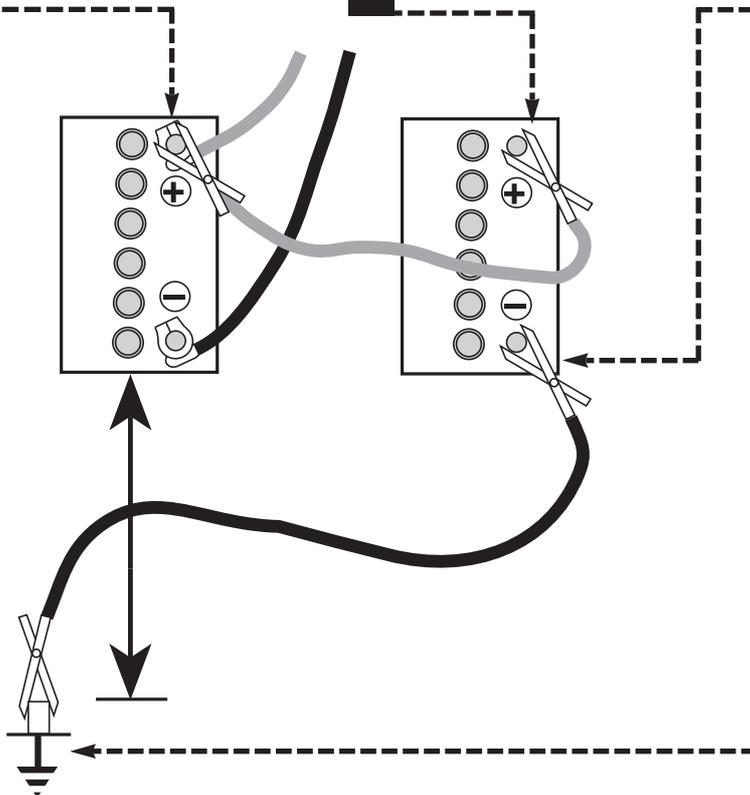
1 Connect one end of the red jump lead to the positive (+) terminal of the flat battery



2 Connect the other end of the red lead to the positive (+) terminal of the booster battery.



3 Connect one end of the black jump lead to the negative (-) terminal of the booster battery



4 Connect the other end of the black jump lead to a bolt or bracket on the engine block, well away from the battery, on the vehicle to be started.

5 Make sure that the jump leads will not come into contact with the fan, drivebelts or other moving parts of the engine.

6 Start the engine using the booster battery, then with the engine running at idle speed, disconnect the jump leads in the reverse order of connection.

Introduction

There are some very simple checks which need only take a few minutes to carry out, but which could save you a lot of inconvenience and expense.

These "Weekly checks" require no great skill or special tools, and the small amount of time they take to perform could prove to be very well spent, for example;

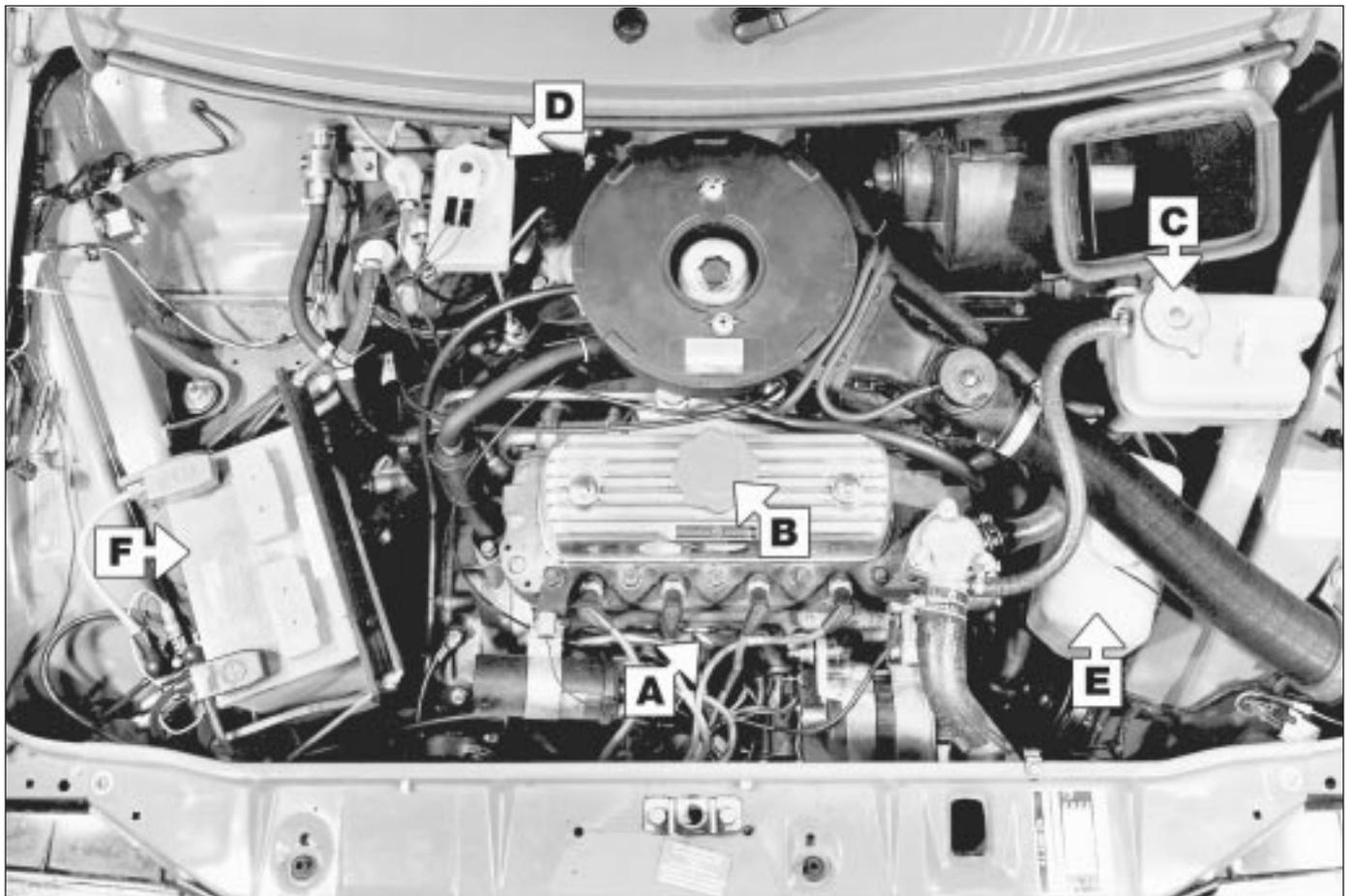
□ Keeping an eye on tyre condition and pressures, will not only help to stop them wearing out prematurely, but could also save your life.

□ Many breakdowns are caused by electrical problems. Battery-related faults are particularly common, and a quick check on a regular basis will often prevent the majority of these.

□ If your car develops a brake fluid leak, the first time you might know about it is when your brakes don't work properly. Checking the level regularly will give advance warning of this kind of problem.

□ If the oil or coolant levels run low, the cost of repairing any engine damage will be far greater than fixing the leak, for example.

Underbonnet check points



A Oil level dipstick

B Engine oil filler cap

C Coolant expansion tank cap

D Brake fluid reservoir

E Windscreen washer reservoir

F Battery

Engine oil level

Before you start

- ✓ Make sure that your car is on level ground.
- ✓ Check the oil level 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 vehicle, some of the oil will remain in the upper engine components, resulting in an inaccurate reading on the dipstick!

The correct oil

Modern engines place great demands on their oil. It is very important that the correct oil for your car is used (See "Lubricants and Fluids").

Car Care

- If you have to add oil frequently, you should check whether you have any oil leaks. Place some clean paper under the car overnight, and check for stains in the morning. If there are no leaks, the engine may be burning oil (see "Fault Finding").
- Always maintain the level between the upper and lower dipstick marks (see photo 3). If the level is too low severe engine damage may occur. Oil seal failure may result if the engine is overfilled by adding too much oil.



1 The engine oil level is checked with a dipstick that extends through the dipstick tube on the side of the cylinder block and into the sump at the bottom of the engine.



2 Using a clean rag or paper towel remove all oil from the dipstick. Insert the clean dipstick into the tube as far as it will go, then withdraw it again.



3 Note the oil level on the end of the dipstick, which should be between the upper ("MAX") mark and lower ("MIN") mark. Approximately 0.5 litre of oil will raise the level from the lower mark to the upper mark.



4 Oil is added through the filler cap. Unscrew the cap and top-up the level; a funnel may help to reduce spillage. Add the oil slowly, checking the level on the dipstick frequently. Avoid overfilling (see "Car Care").

Coolant level



Warning: DO NOT attempt to remove the expansion tank pressure cap when the engine is hot, as there is a very great risk of scalding. Do not leave open containers of coolant about, as it is poisonous.

Car Care

- With a sealed-type cooling system, adding coolant should not be necessary on a regular basis. If frequent topping-up is required, it is likely there is a leak. Check the radiator, all hoses and joint faces for signs of staining or wetness, and rectify as necessary.

- It is important that antifreeze is used in the cooling system all year round, not just during the winter months. Don't top-up with water alone, as the antifreeze will become too diluted.



1 The coolant level varies with the temperature of the engine. When the engine is cold, the coolant level should be as shown. When the engine is hot, the level may rise slightly above the "MAX" mark.



2 If topping-up is necessary, wait until the engine is cold. Slowly turn the expansion tank cap anti-clockwise to relieve the system pressure. Once any pressure is released, turn the cap anti-clockwise until it can be lifted off.



3 Add a mixture of water and antifreeze through the expansion tank filler neck until the coolant reaches the "MAX" level mark. Refit the cap, turning it clockwise as far as it will go until it is secure.

Screen washer fluid level

Screenwash additives not only keep the windscreen clean during foul weather, they also prevent the washer system freezing in cold

weather - which is when you are likely to need it most. Don't top up using plain water as the screenwash will become too diluted, and will

freeze during cold weather. On no account use engine antifreeze in the washer system - this could discolour or damage paintwork.



1 On all MG Turbo models, a combined reservoir is mounted in the left-hand rear of the luggage compartment



2 Early models have separate reservoirs for the windscreen and tailgate, being located on the left-hand front of the engine compartment and the left-hand rear of the luggage compartment



3 Later models with front and rear washers have a combined reservoir in the left-hand front of the engine compartment. Models with windscreen washers only, have a single reservoir.

Brake fluid level



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 which can cause a dangerous loss of braking effectiveness.



• Make sure that your car is on level ground.
• The fluid level in the master cylinder reservoir will drop slightly as the brake pads wear down, but the fluid level must never be allowed to drop below the 'MIN' mark.

Safety first

● If the reservoir requires repeated topping-up this is an indication of a fluid leak somewhere in the system, which should be investigated immediately.

● If a leak is suspected, the car should not be driven until the braking system has been checked. Never take any risks where brakes are concerned.



1 The brake reservoir is mounted on the right-hand side next to the air filter. The "MAX" and "MIN" marks are indicated on the side of the reservoir. The fluid level must be kept between the marks.



2 If topping-up is necessary, first wipe the area around the filler cap with a clean rag before removing the cap.



3 When adding fluid, it's a good idea to inspect the reservoir. The system should be drained and refilled if dirt is seen in the fluid (see Chapter 9 for details).



4 Carefully add fluid avoiding spilling it on surrounding paintwork. Use only the specified hydraulic fluid; mixing different types of fluid can cause damage to the system. After filling to the correct level, refit the cap securely, to prevent leaks and the entry of foreign matter. Wipe off any spilt fluid.

Clutch fluid level (if applicable)



Warning: Brake and clutch 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 which can cause a dangerous loss of braking effectiveness.

Before you start:

- ✓ Park the vehicle on level ground.
- ✓ The engine should be turned off.



For improved access, remove the air cleaner as described in Chapter 4



1 The clutch master cylinder (if fitted) is located next to the brake master cylinder. Unscrew the filler cap and top-up the clutch master cylinder to the bottom of the filler neck with hydraulic fluid.

Safety First:

● The need for frequent topping-up indicates a leak, which should be investigated immediately.

Electrical system

✓ Check all external lights and the horn. Refer to the appropriate Sections of Chapter 12 for details if any of the circuits are found to be inoperative.

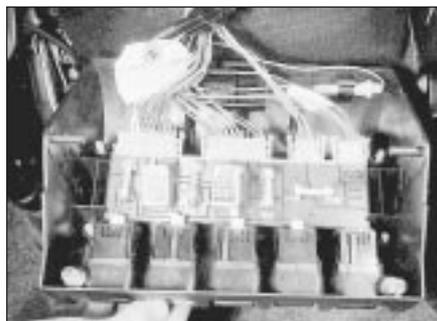
✓ Visually check all wiring connectors, harnesses and retaining clips for security, and for signs of chafing or damage.



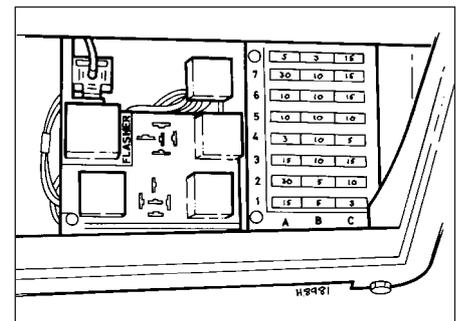
If you need to check your brake lights and indicators unaided, back up to a wall or garage door and operate the lights. The reflected light should show if they are working properly.



1 If a single indicator light, brake light or headlight has failed it is likely that a bulb has blown and will need to be replaced. Refer to Chapter 12 for details. If both brake lights have failed, it is possible that the brake light switch above the brake pedal needs adjusting. This simple operation is described in Chapter 9.



2 If more than one indicator light or headlight has failed it is likely that either a fuse has blown or that there is a fault in the circuit (refer to "Electrical fault-finding" in Chapter 12). On early models, the fuses are located behind the switch panel on the right-hand side of the facia. Access is gained by removing the two screws from the switch panel, and pivoting the panel downwards.



3 Later (1985-on) models have a fusebox located below the right-hand side of the facia. Remove the cover by twisting the retainers using a coin. To replace a blown fuse, simply prise it out. Fit a new fuse of the same rating, available from car accessory shops. It is important that you find the reason that the fuse blew - a checking procedure is given in Chapter 12.

Battery

Caution: Before carrying out any work on the vehicle battery, read the precautions given in "Safety first" at the start of this manual.

✓ Make sure that the battery tray is in good condition, and that the clamp is tight. Corrosion on the tray, retaining clamp and the battery itself can be removed with a solution of water and baking soda. Thoroughly rinse all cleaned areas with water. Any metal parts damaged by corrosion should be covered with a zinc-based primer, then painted. The exterior of the battery should be inspected periodically for damage such as a cracked case or cover.

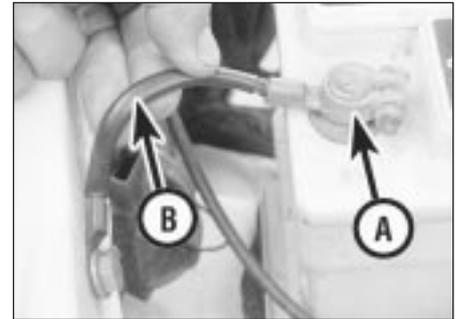
✓ Periodically (approximately every three months), check the charge condition of the battery as described in Chapter 5.

✓ If the battery is flat, and you need to jump start your vehicle, see "Roadside Repairs".

✓ If the battery is of maintenance-free type, it is not possible to check the electrolyte level.



1 The battery is located on the left-hand side of the engine compartment. The electrolyte level may be checked and if necessary topped up. If the battery is of standard or low-maintenance type, check that the level of electrolyte is approximately 15 mm above the tops of the cell plates. If necessary top-up the level, using only distilled or demineralised water.



2 Check the tightness of battery clamps (A) to ensure good electrical connections. You should not be able to move them. Also check each cable (B) for cracks and frayed conductors.



Battery corrosion can be kept to a minimum by applying a layer of petroleum jelly to the clamps and terminals after they are reconnected.

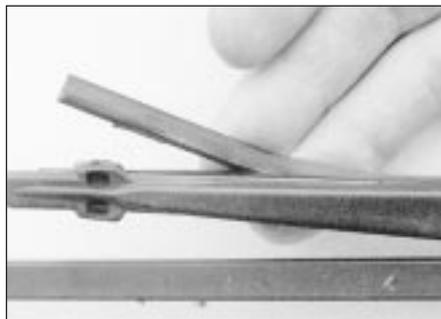


3 If corrosion (white, fluffy deposits) is evident, remove the cables from the battery terminals, clean them with a small wire brush, then refit them. Accessory stores sell a useful tool for cleaning the battery post ...



4 ... as well as the battery cable clamps

Wiper blades



1 Check the condition of the wiper blades; if they are cracked or show any signs of deterioration, or if the glass swept area is smeared, renew them. For maximum clarity of vision, wiper blades should be renewed annually, as a matter of course.



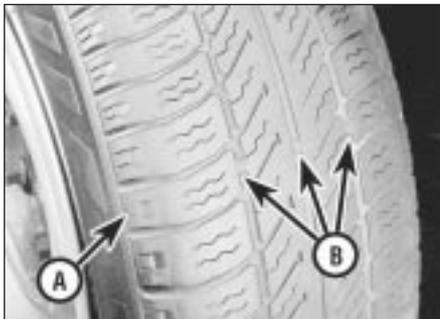
2 To remove a wiper blade, pull the arm fully away from the glass until it locks. Swivel the blade through 90°, press the locking tab(s) with your fingers, and slide the blade out of the arm's hooked end. On refitting, ensure that the blade locks securely into the arm.

Tyre condition and pressure

It is very important that tyres are in good condition, and at the correct pressure - having a tyre failure at any speed is highly dangerous. Tyre wear is influenced by driving style - harsh braking and acceleration, or fast cornering, will all produce more rapid tyre wear. As a general rule, the front tyres wear out faster than the rears. Interchanging the tyres from front to rear ("rotating" the tyres) may result in more even wear. However, if this is completely effective, you may have the expense of replacing all four tyres at once! Remove any nails or stones embedded in the tread before they penetrate the tyre to cause deflation. If removal of a nail does reveal that

the tyre has been punctured, refit the nail so that its point of penetration is marked. Then immediately change the wheel, and have the tyre repaired by a tyre dealer. Regularly check the tyres for damage in the form of cuts or bulges, especially in the sidewalls. Periodically remove the wheels, and clean any dirt or mud from the inside and outside surfaces. Examine the wheel rims for signs of rusting, corrosion or other damage. Light alloy wheels are easily damaged by "kerbing" whilst parking; steel wheels may also become dented or buckled. A new wheel is very often the only way to overcome severe damage.

New tyres should be balanced when they are fitted, but it may become necessary to re-balance them as they wear, or if the balance weights fitted to the wheel rim should fall off. Unbalanced tyres will wear more quickly, as will the steering and suspension components. Wheel imbalance is normally signified by vibration, particularly at a certain speed (typically around 50 mph). If this vibration is felt only through the steering, then it is likely that just the front wheels need balancing. If, however, the vibration is felt through the whole car, the rear wheels could be out of balance. Wheel balancing should be carried out by a tyre dealer or garage.



Tread Depth - visual check

1 The original tyres have tread wear safety bands (B), which will appear when the tread depth reaches approximately 1.6 mm. The band positions are indicated by a triangular mark on the tyre sidewall (A).



Tread Depth - manual check

2 Alternatively tread wear can be monitored with a simple, inexpensive device known as a tread depth indicator gauge.



Tyre Pressure Check

3 Check the tyre pressures regularly with the tyres cold. Do not adjust the tyre pressures immediately after the vehicle has been used, or an inaccurate setting will result. Tyre pressures are shown on the next page.

4 Tyre tread wear patterns



Shoulder Wear

Underinflation (wear on both sides)

Under-inflation will cause overheating of the tyre, because the tyre will flex too much, and the tread will not sit correctly on the road surface. This will cause a loss of grip and excessive wear, not to mention the danger of sudden tyre failure due to heat build-up.

Check and adjust pressures

Incorrect wheel camber (wear on one side)

Repair or renew suspension parts

Hard cornering

Reduce speed!



Centre Wear

Overinflation

Over-inflation will cause rapid wear of the centre part of the tyre tread, coupled with reduced grip, harsher ride, and the danger of shock damage occurring in the tyre casing.

Check and adjust pressures

If you sometimes have to inflate your car's tyres to the higher pressures specified for maximum load or sustained high speed, don't forget to reduce the pressures to normal afterwards.



Uneven Wear

Front tyres may wear unevenly as a result of wheel misalignment. Most tyre dealers and garages can check and adjust the wheel alignment (or "tracking") for a modest charge.

Incorrect camber or castor

Repair or renew suspension parts

Malfunctioning suspension

Repair or renew suspension parts

Unbalanced wheel

Balance tyres

Incorrect toe setting

Adjust front wheel alignment

Note: *The feathered edge of the tread which typifies toe wear is best checked by feel.*

Lubricants and fluids

Engine/gearbox (transmission)	Multigrade engine oil, viscosity SAE 15W/50 (pre August 1983) or 10W/40 (August 1983-on)
Suspension grease points	Multi-purpose lithium based grease
Distributor	Multigrade engine oil, viscosity SAE 15W/50 or 10W/40
Carburettor piston damper	Multigrade engine oil, viscosity SAE 15W/50 or 10W/40
Brake and clutch fluid reservoirs	Hydraulic fluid to FMVSS 166 DOT 3 or SAE J1703C

Capacities (approx.)

Engine/manual gearbox oil (without filter)	8.5 pints (4.8 litres)
Oil filter (manual gearbox)	0.6 pint (0.3 litres)
Engine/automatic transmission oil (without filter)	8.8 pints (5.0 litres)
Oil filter (automatic transmission)	1.0 pint (0.6 litre)
Cooling system (including heater)	8.5 pints (4.8 litres)
Fuel tank:	
(early models)	6.6 Imp gals (30 litres)
1986-on models	7.8 Imp gals (35 litres)

Tyre pressures

Pressures (cold) - psi (bar)	Front	Rear
135 SR 12	32 (2.2)	28 (2.0)
165/70R 12	32 (2.2)	26 (1.8)
165/60 HR 13	28 (2.0)	28 (2.0)
150/65 R315	30 (2.1)	28 (2.0)
155/70 SR 12	28 (2.0)	32 (2.2)
165/65 HR 13	28 (2.0)	28 (2.0)
160/65 R315	28 (2.0)	26 (1.8)
185/55 13	29 (2.0)	29 (2.0)

Note: Pressures apply only to original-equipment tyres, and may vary if any other make or type is fitted; check with the tyre manufacturer or supplier for correct pressures if necessary.

Chapter 1

Routine maintenance and servicing

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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 
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1 Maintenance schedule

The maintenance intervals in this manual are provided with the assumption that you will be carrying out the work yourself. These are the minimum maintenance intervals 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.

Always road test your car after servicing.

1.2 Maintenance schedule

Every 250 miles (400 km) or weekly - whichever comes first

- Refer to "Weekly Checks"

Every 6000 miles (10 000 km) or 6 months - whichever comes first

In addition to the previous Section, carry out the following:

- Renew the engine oil and filter (Section 3).
- Clean the magnetic drain plug (Section 3).
- Check the carburettor piston damper and top-up if necessary (Section 15, paragraph 2).
- Check the operation of the transmission selector (automatic models only) (Section 4).

Every 12 000 miles (20 000 km) or 12 months - whichever comes first

In addition to the previous Section, carry out the following:

- Renew the air cleaner element (Section 5).
- Renew the spark plugs (Section 6).
- Renew the fuel line filter (Turbo only) (Section 7).
- Renew the carburettor vent filter (where fitted) (Section 8).
- Check the crankcase ventilation system (Section 9).
- Check the condition of the battery and clean the terminals (Section 10).
- Check the antifreeze concentration (Section 11).
- Check the cooling system and hoses for leaks (Section 12).
- Check and adjust the contact breaker points (Section 13).
- Check the alternator and water pump drivebelt; renew and retension if necessary (Section 14).
- Check and adjust the valve clearances (Chapter 2A).
- Check and adjust the engine idle speed and carburettor mixture (Section 15).
- Check, and if necessary adjust, the ignition timing (Section 16).
- Check the fuel supply system for damage, deterioration and leaks (Section 12).
- Check the clutch hydraulic pipes for leaks (Section 12).
- Check the driveshaft gaiters for splits and leakage (Section 17).
- Check, and adjust if necessary, the clutch return stop clearance (Section 18).
- Check the exhaust system for leaks and security (Section 19).
- Check the door and bonnet locks for operation (Section 20).
- Check the seat belts for operation and damage (Section 21).
- Check the headlight beam alignment (Section 22).
- Check the brake line and flexible hose (Section 23).
- Check the front brake pads and discs for wear (Section 24).

Every 12 000 miles (20 000 km) or 12 months (continued)

- Check the brake pad warning indicators (Section 24).
- Check the rear brake linings and drums for wear (Section 24).
- Check the steering rack unit for security and damage (Section 25).
- Check the steering joints and arms for wear and damage (Section 25).
- Check the steering gaiters for splits and leakage (Section 25).
- Check the suspension joints and mountings for wear and damage (Section 25).
- Grease the front and rear suspension pivots (Section 25).
- Check the Hydragas units and lines for leaks (Section 26).
- Check the handbrake operation and adjust if necessary (Section 27).
- Lubricate the handbrake linkages and cables (Section 27).
- Check, and if necessary adjust, the front wheel alignment (Section 28).
- Road test (Section 29).

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

In addition to the 6000 miles (10 000 km) Section, carry out the following:

- Renew the brake fluid (Section 30).
- Renew the clutch fluid (Section 31).

Every 24 000 miles (40 000 km) or 2 years - whichever comes first

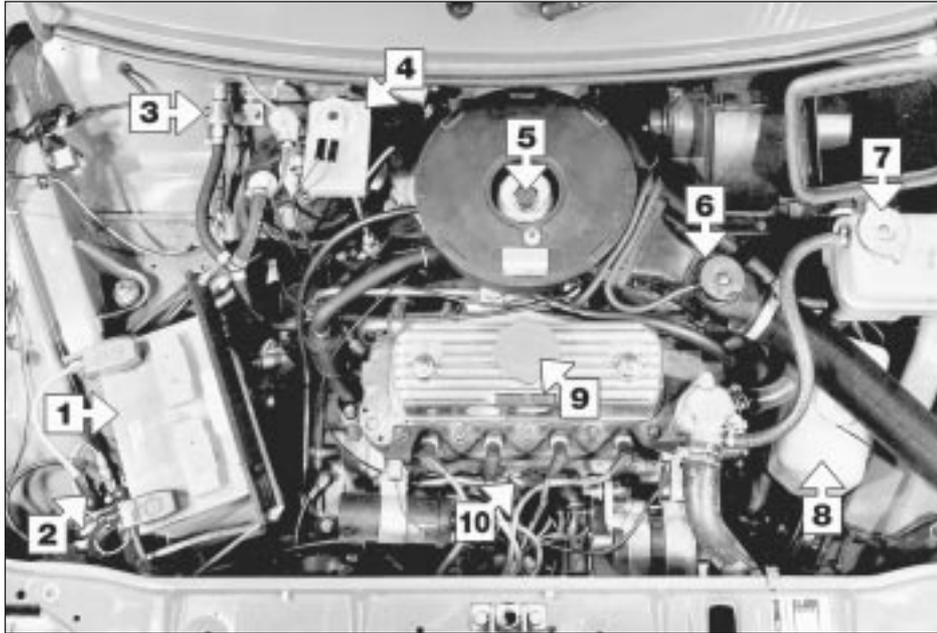
In addition to the 12 000 miles (20 000 km) Section, carry out the following:

- Drain the cooling system and flush it, then refill with new antifreeze solution (Section 32).
- Renew the oil filler cap (Section 33).
- Renew the distributor contact points (Section 34).
- Renew the alternator drivebelt (Section 14).

Every 36 000 miles (60 000 km) or 3 years - whichever comes first

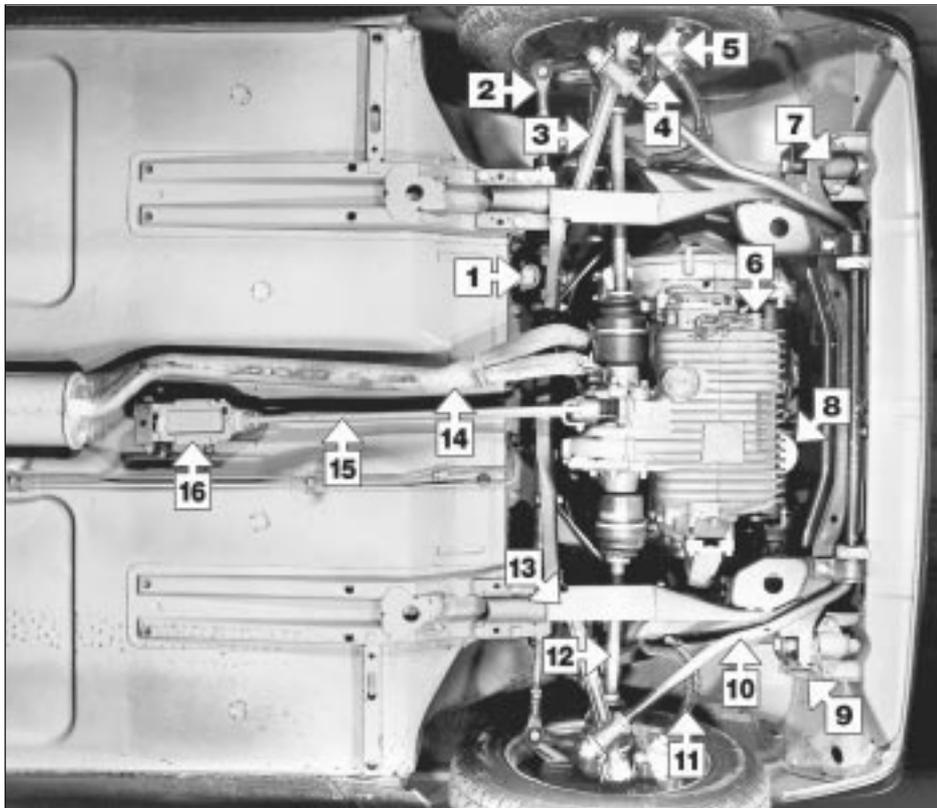
In addition to the 18 000 miles (30 000 km) Section, carry out the following:

- Renew the brake fluid and all the fluid seals and flexible hoses in the brake hydraulic circuit (Section 30).



Under bonnet view of MG Metro 1300

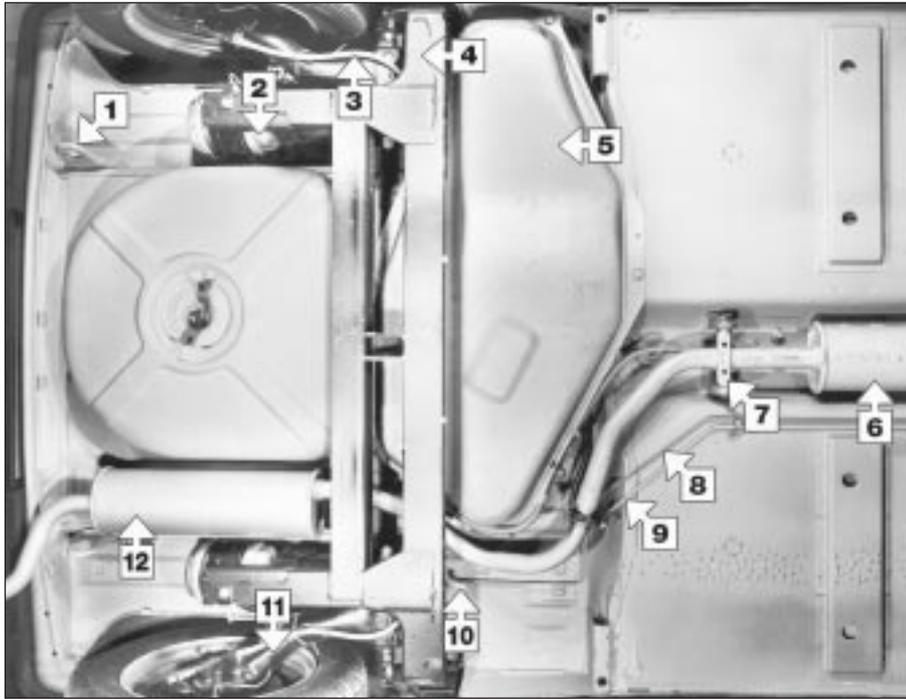
- 1 Battery
- 2 Starter motor solenoid
- 3 Anti run-on valve
- 4 Brake hydraulic reservoir
- 5 Carburettor damper cap
- 6 Air cleaner vacuum motor
- 7 Expansion tank filler cap
- 8 Windscreen washer reservoir
- 9 Oil filler cap
- 10 Engine oil dipstick



View of the front underside of a typical vehicle

- 1 Steering gear
- 2 Tie-rod end
- 3 Front suspension lower arm
- 4 Brake pad wear sensor wiring
- 5 Disc/caliper
- 6 Engine/transmission oil drain plug
- 7 Front subframe mounting
- 8 Oil filter
- 9 Front lashing eye
- 10 Anti-roll bar
- 11 Brake flexible hydraulic hoses
- 12 Driveshaft
- 13 Front subframe
- 14 Front exhaust system
- 15 Gearchange rods
- 16 Gearchange remote control housing

1.4 Maintenance procedures



View of the rear underside of a typical vehicle

- 1 Rear lashing eye
- 2 Rear Hydragas unit
- 3 Handbrake cable
- 4 Rear subframe
- 5 Fuel tank
- 6 Intermediate silencer
- 7 Exhaust mounting
- 8 Brake rigid hydraulic line
- 9 Fuel supply pipe
- 10 Charging valve for Hydragas units
- 11 Rear suspension radius arm
- 12 Rear exhaust system and silencer

Maintenance procedures

1 Introduction

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

2 The Chapter contains a master maintenance schedule, followed by Sections dealing specifically with each task in 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.

3 Servicing 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.

4 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.

5 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.

2 Intensive 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 the 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 (refer to Chapter 2A, Section 1) will provide valuable information regarding the overall performance of the main internal components. Such a test can be used as a basis to decide 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 2B) 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 (Section 10).
- b) Check all the engine-related fluids (See "Weekly Checks").
- c) Check the condition and tension of the auxiliary drivebelt (Section 14).
- d) Renew the spark plugs (Section 6).
- e) Inspect the distributor components and HT leads - as applicable (Chapter 5).
- f) Check the condition of the air cleaner filter element, and renew if necessary (Section 5).
- g) Renew the fuel filter, if fitted (Section 7).
- h) Check the condition of all hoses, and check for fluid leaks (Section 12).
- i) Check the engine idle speed and mixture settings - as applicable (Section 15).

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

Secondary operations

- a) Check the charging system (Chapter 5).
- b) Check the ignition system (Chapter 5).
- c) Check the fuel system (Chapter 4).
- d) Renew the distributor cap, points, condenser and rotor arm - as applicable (Chapter 5).
- e) Renew the ignition HT leads - as applicable (Chapter 5).

6000 Miles (10 000 Km) / 6 Months

3 Engine oil and filter renewal



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

2 Before starting this procedure, gather all the necessary tools and materials. It is a good idea to renew the drain plug washer each time you replace the engine oil. 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 better, and more built-up sludge will be removed with it. Take care, however, 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. 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.

3 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. Recover the sealing washer from the drain plug (see illustrations).

HAYNES HINT As the 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!

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

5 After all the oil has drained, wipe off the drain plug with a clean rag. Check the sealing washer for condition and renew it if necessary. Clean the area around the drain plug opening, and refit the plug. Tighten the plug to the specified torque.

6 Move the container into position under the oil filter. It is located at the front of the engine at the side of the block.

Manual gearbox models

7 On these models the filter is a cartridge type. Using an oil filter removal tool if necessary, slacken the filter initially, then unscrew it by hand the rest of the way (see illustrations). Discard the old filter. Clean the oil filter head.

8 Apply a light coating of clean engine oil to the sealing ring on the new filter, then screw it into position on the engine. Tighten the filter firmly by hand only - do not use any tools.

Automatic transmission models

9 Automatic models use a canister with an internal disposable element (see illustration). With these models unscrew the centre bolt on the canister. Empty the oil from the canister into the container and discard the filter. Clean the area around the filter mounting.

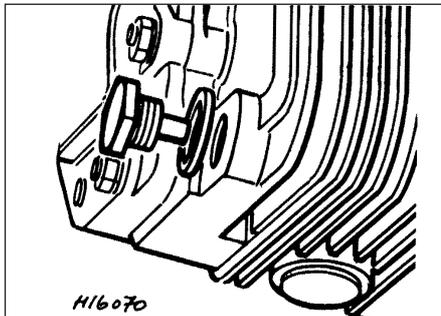
10 Insert the new element in the bowl. Using a new sealing ring, locate the bowl centrally and tighten the centre bolt, to the specified torque.

All models

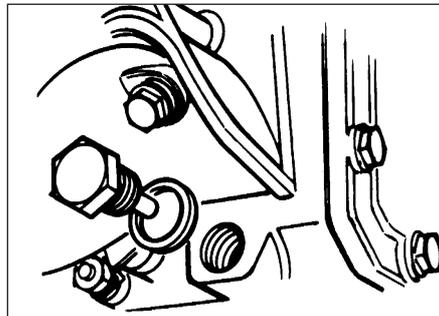
11 Remove the old oil and all tools from under the car, then lower the car to the ground (if applicable).

12 Remove the oil filler cap. Fill the engine, using the correct grade and type of oil (see

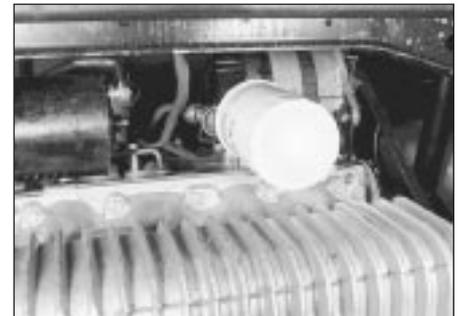
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3.3a Location of engine/gearbox oil drain plug - manual gearbox



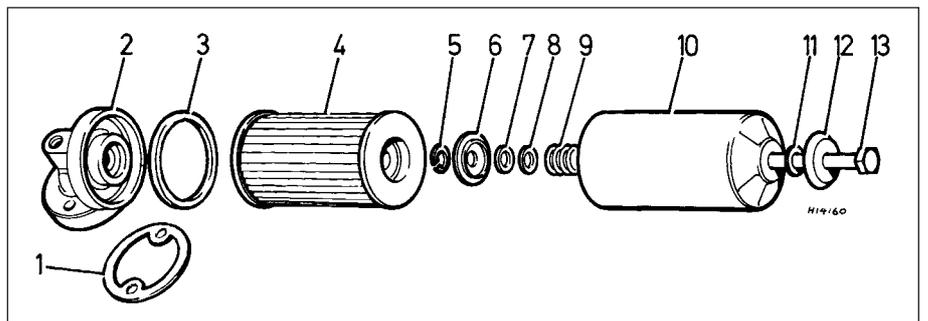
3.3b Location of engine/transmission oil drain plug - automatic transmission



3.7a The oil filter cartridge



3.7b Removing the oil filter cartridge



3.9 Oil filter components on automatic transmission models

- | | | | |
|----------------|------------------|----------|----------------|
| 1 Gasket | 5 Circlip | 8 Washer | 11 Seal |
| 2 Head | 6 Pressure plate | 9 Spring | 12 Collar |
| 3 Sealing ring | 7 Seal | 10 Bowl | 13 Centre bolt |
| 4 Element | | | |

1.6 Maintenance procedures

"Lubricants, fluids and capacities"). An oil can spout or funnel may help to reduce spillage. Pour in half the specified quantity of oil first, then wait a few minutes for the oil to fall to the sump. Continue adding oil a small quantity at a time until the level is up to the lower mark on the dipstick. Adding 0.5 litre at a time, bring the level up to the upper mark on the dipstick. Insert the dipstick and refit the filler cap.

13 Start the engine and run it for a few minutes; check 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 oil pressure warning light goes out when the engine is first started, as the oil circulates through the engine oil galleries and the new oil filter before the pressure builds up.

14 Switch off 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 completely full, recheck the level on the dipstick, and add more oil as necessary.

15 Dispose of the used engine oil safely, with reference to "General repair procedures" in the reference Sections of this manual.

4 Automatic transmission selector check

1 To check, select "N" and start the engine. Move the lever to "R" and check that the reverse is engaged, then slowly move the lever back to "N" - the gear should disengage when the lever reaches the "N" position, or slightly before. Repeat the check but this time select "1".

2 When carrying out the adjustment check, it may be found that either first or reverse gear does not disengage when the selector lever reaches the "N" position.

3 If "R" remains engaged in position "N", reduce the gap at the end of the selector lever travel by 0.01 in (0.25 mm). Refer to Chapter 7B, for further details.

4 If "1" remains engaged in position "N" increase the gap at the end of the selector lever travel by 0.01 in (0.25 mm).

5 Recheck the adjustment and repeat paragraph 3 or 4 as necessary.

6 Check that the starter motor can be operated only in positions "P" and "N". Adjust the starter inhibitor switch if necessary as described in Chapter 7B.

12 000 Miles (20 000 Km) / 12 Months

5 Air filter element renewal

Non-Turbo models

1 Unscrew and remove the two wing nuts on the top of the air cleaner (see illustration).

2 Withdraw the air cleaner, at the same time disconnecting it from the hot air shroud tube.

3 To remove the element, use a wide-bladed screwdriver to separate the lid from the body, then lift out the element and discard it (see illustration).

4 Clean the interior of the air cleaner with a fuel-moistened cloth, and wipe dry.

5 Install the new element and snap the cover onto the body.

6 Check that the seal is in good condition, then refit the air cleaner and connect it to the hot air shroud tube. Insert and tighten the two wing nuts.

MG Turbo models

7 The air cleaner on MG Turbo models is remote from the carburettor, being mounted on the left-hand side of the engine compartment.

8 To renew the air cleaner element, release

the spring clips and take off the cover. Extract the element, wipe clean the inside of the housing and fit a new element. Refit the cover and secure with the spring clips.

6 Spark plug renewal

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 (as specified at the end 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 Check each plug one at a time. This will ensure that the plug leads are replaced in their correct location (see illustration).

3 Pull the lead from each plug by gripping the end fitting, not the lead, otherwise the lead connection may be fractured. Check the lead for damage.

4 Unscrew the plugs using a spark plug spanner, a box spanner or a deep socket and extension bar. Keep the socket aligned with the spark plug - 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 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.

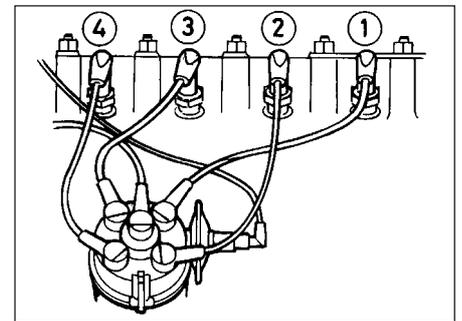
8 The spark plug electrode gap is of considerable importance as, if it is too large or too small, the size of the spark and its efficiency will be seriously impaired. The gap should be set to the value given in the Specifications at the end of this Chapter.



5.1 Removing the air cleaner lid



5.3 Lifting out the air cleaner element



6.2 HT lead connections and distributor orientation



6.9a Measuring the spark plug gap with a feeler blade

9 To set the gap, measure it with a feeler blade or wire gauge and then bend open, or close, the outer plug electrode until the correct gap is achieved (see illustrations). The centre electrode should never be bent, as this will crack the insulator and cause plug failure, if nothing worse. If using feeler blades, the gap is correct when the appropriate-size blade is a firm sliding fit.

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.



6.9b Measuring the spark plug gap with a wire gauge . . .



6.9c . . . and adjusting the gap using a special tool

7 Fuel filter renewal (Turbo only)



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.

Removal

1 The fuel filter is located in the fuel line between the pressure regulator and the carburettor. It should be renewed if filter blockage is suspected.

2 Take precautions against fire when removing the filter, and do not smoke. Residual pressure in the fuel lines may lead to significant fuel spillage when the filter is removed.

3 Release the hose clamps on each side of the filter and carefully pull off the hoses. Inspect the hoses and clips; renew these too, if necessary. Mop up any fuel spill.

Refitting

4 Fit the new filter. A directional arrow or an "OUT" marking should point towards the carburettor; an "IN" marking should face the pressure regulator. Without any markings the filter may be fitted either way round.

5 Secure the new filter with the hose clamps. When all spilt fuel has been removed from the engine bay, start the engine and check for leaks.

8 Carburettor vent filter renewal

The SU HIF carburettor requires an unrestricted flow of air to the float chamber through the vent pipe. If the pipe is allowed to become blocked, kinked or even incorrectly routed the mixture will be weakened, causing poor performance and difficult starting. On 1.0 litre models fitted with "economy" engines, a small air filter is fitted to the vent to improve

carburettor calibration. This filter must be renewed at the specified interval, or the mixture will become excessively weak during part-load running. The filter must never be omitted or the fuel consumption will increase.

9 Crankcase ventilation system check

Check all crankcase ventilation and vacuum hoses for damage and leakage (refer to Chapter 2A). Where necessary remove the hoses and clear them of any blockage.

10 Battery terminal check

Caution: Before carrying out any work on the vehicle battery, read through the precautions given in 'Safety first!' at the beginning of this manual.

1 The battery is located on the left-hand side of the engine compartment. The exterior of the battery should be inspected periodically for damage such as a cracked case or cover.

2 Check the tightness of the battery cable clamps to ensure good electrical connections, and check the entire length of each cable for cracks and frayed conductors. Check the positive cable between the battery and the starter motor.

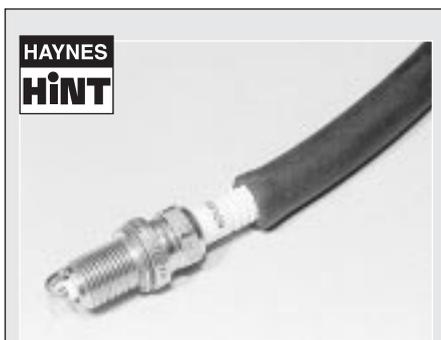
3 If corrosion (visible as white, fluffy deposits) is evident, remove the cables from the battery terminals, clean them with a small wire brush, then refit them.



Corrosion can be kept to a minimum by applying a layer of petroleum jelly to the clamps and terminals after they are reconnected.

4 Make sure that the battery retaining clamp is secure.

5 Corrosion on the retaining clamp and the battery terminals can be removed with a solution of water and baking soda. Thoroughly rinse all cleaned areas with plain water.



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 5/16 inch internal diameter 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, which prevents damage to the cylinder head.

12 Remove the rubber hose, and tighten the plug to the specified torque using the spark plug socket and a torque wrench.

13 Repeat the process with the remaining spark plugs.

1•8 12 000 Miles (20 000 Km)

6 Any metal parts of the vehicle damaged by corrosion should be covered with a zinc-based primer, then painted.

7 Periodically (approximately every three months), check the charge condition of the battery as described in Chapter 5.

8 Further information on the battery, charging and jump starting can be found in Chapter 5 and in the preliminary sections of this manual.

11 Antifreeze (coolant) concentration check



1 The antifreeze should always be maintained at the specified concentration. This is necessary not only to maintain the antifreeze and coolant properties, but also to prevent corrosion that would otherwise occur as the corrosion inhibitors become progressively less effective.

2 The check should be made with the engine cold, and it will be necessary to obtain an antifreeze tester from a car accessory shop.

3 Slowly unscrew the cap from the top of the coolant expansion tank, then draw coolant into the tester. Check the concentration of the antifreeze according to the manufacturer's instructions. The most common tester consists of three coloured balls of varying density - a high concentration will cause all three balls to float whereas a low concentration may only cause one ball to float.

4 If the concentration is incorrect, slight adjustments may be made by drawing some of the coolant out of the expansion tank and replacing it with undiluted antifreeze. If the concentration is excessively out, it will be necessary to completely drain the system and renew the solution with reference to Section 32.

5 Tighten the cap onto the expansion tank on completion.

12 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. Bear in mind that, 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 that 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 that 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.

4 Inspect all the cooling system components (hoses, joint faces etc.) for leaks. A leak in the cooling system will usually show up as white or rust-coloured deposits on the area adjoining the leak. Where any problems of this nature are found on system components, renew the component or gasket with reference to Chapter 3.

5 Check that the pressure cap on the expansion tank is fully tightened and shows no sign of coolant leakage.

6 With the car 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 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.

9 If applicable, check the clutch hydraulic circuit for leaks or damage.

13 Ignition check and adjustment



Note: Some models are fitted with breakerless, electronic distributors, which require minimal maintenance.

1 Due to its location, it is recommended that the distributor is removed to carry out this work (refer to Chapter 5).

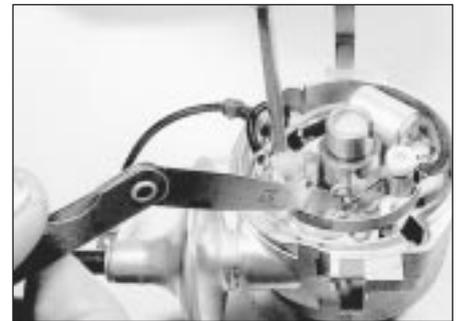
2 Clamp the distributor lightly in a vice and remove the distributor cap and rotor arm.

Mechanical distributor

3 Open the points and examine the condition of their faces. If they are blackened or pitted, remove them as described in Section 34 and clean them using emery tape or a grindstone. On the Ducellier distributor, take care to maintain the contour of the points. If the points are worn excessively, renew them. Refer to Section 34 for further details.

4 If the contact points do not show any excessive pitting, turn the drive dog until the heel of the movable contact is on the high point of one of the cam lobes.

5 Using a feeler blade, check that the gap between the two points is as given in the Specifications. If not, loosen the fixed contact screw and reposition the fixed contact until the feeler blade is a firm sliding fit between the



13.5 Adjusting the contact breaker points gap (Lucas)

two points. Use a screwdriver in the special notch to make a fine adjustment, and when correct, tighten the fixed contact screw (see illustration).

6 Apply one drop of engine oil to the felt pad in the cam recess, then refit the rotor arm.

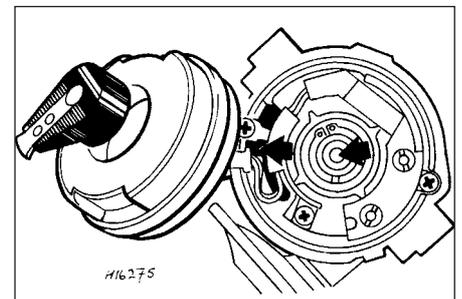
7 Wipe clean the ignition coil tower and the distributor cap, and make sure that the carbon brush moves freely against the tension of the spring. Clean the metal segments in the distributor cap, but do not scrape away any metal otherwise the HT spark at the spark plugs will be reduced.

8 Refit the distributor as described in Chapter 5. Use a dwell meter to check the dwell angle of the points. This angle should be within the parameters given in the Specifications. Reduce the contacts points gap to increase the dwell angle, or increase the gap to reduce it. Refer to Section 16 to adjust the timing.

Electronic distributor

9 Thoroughly clean the distributor cap inside and out with a dry lint-free rag. Examine the four HT lead segments inside the cap. If the segments appear badly burned or pitted, renew the cap. Make sure that the carbon brush in the centre of the cap is free to move and that it protrudes by approximately 0.1 in (3 mm) from its holder.

10 Lift off the rotor arm. On pre-1985 models, remove the plastic anti-flash shield and carefully apply two drops of engine oil to the felt pad in the centre of the cam spindle. Also lubricate the centrifugal advance mechanism by applying two drops of oil through the square hole in the baseplate. On 1985 and later models, lubricate the bearing in



13.10 Breakerless distributor lubrication points (arrowed)



14.4 Checking the drivebelt tension

the upper housing with a little engine oil, and lubricate the centrifugal advance mechanism by prising the plastic plug from the lower housing (see illustration). Wipe away any excess oil and refit the anti-flash shield (where fitted), rotor arm and distributor cap.

11 Refit the distributor as described in Chapter 5 and adjust the ignition timing as described in Section 16.

14 Drivebelt check (and renewal)

1 The drivebelt is used to drive the water pump and alternator from the crankshaft pulley.

2 Examine the drivebelt for cracks, splitting, fraying, glazing (shiny patches) or any other damage. Renew the belt at service interval or if any damage is found.

3 To renew, loosen the alternator pivot bolts and adjustment nut. Swivel the alternator towards the cylinder block. Remove the belt.

4 Fit new belt over the pulleys and lever the alternator away from the block until the specified tension is achieved (see illustration). Lever the alternator at the drive end to avoid damage to end cover.

5 Tighten the adjustment and pivot bolt nuts.

6 Run the engine at 1000 rpm for five minutes, then recheck and adjust as necessary.

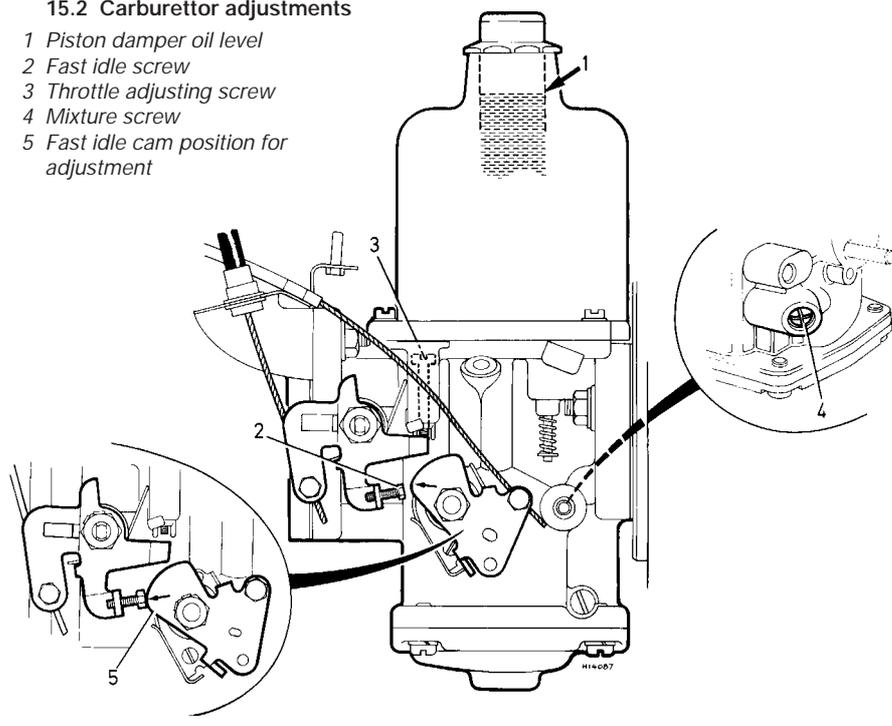
15 Engine idle and fast idle adjustment

Note: Accurate adjustment of the carburettor is only possible after adjustment of the ignition timing, contact breaker gap, and spark plug gaps. Incorrect valve clearances can also affect carburettor adjustment.

Note: Depending on operating territory and production date, the idle mixture adjustment screw may be "tamperproofed" by means of a plastic cap or seal, which must be destroyed in order to make an adjustment. The object of fitting the seal is to discourage (and to detect) adjustment by unqualified or unskilled operators. If you wish to remove a tamperproof seal, satisfy yourself that you are not breaking any local or national anti-pollution laws by so doing. Fit a new seal on

15.2 Carburettor adjustments

- 1 Piston damper oil level
- 2 Fast idle screw
- 3 Throttle adjusting screw
- 4 Mixture screw
- 5 Fast idle cam position for adjustment



completion where this is required by law.

1 Connect a tachometer to the engine in accordance with the manufacturer's instructions. Remove the air cleaner.

2 Unscrew the piston damper and check that the oil level is level with the top of the hollow piston rod (see illustration). If not, top-up with clean engine oil. Refit the piston damper. On MG Turbo models there is a securing clamp that must be released first and secured afterwards. Failure to secure the damper cap may result in dangerous fuel leakage.

3 Check that the choke control cable has 0.08 in (2 mm) free play.

4 If available, connect an exhaust gas analyser to the engine in accordance with the manufacturer's instructions.

5 Run the engine at a fast idling speed until it reaches its normal operating temperature, indicated by the electric cooling fan operating. Continue to run the engine for a further five minutes.

6 Increase the engine speed to 2500 rpm for 30 seconds and repeat this at three-minute intervals during the adjustment procedure. This will ensure that any excess fuel is cleared from the inlet manifold.

7 Allow the engine to idle and check the idling speed against that given in the Specifications. If necessary, turn the throttle adjustment screw on top of the carburettor clockwise to increase the speed or anti-clockwise to decrease the speed (see illustration).

8 To adjust the idling mixture, slowly turn the mixture screw, located on the right-hand side of the carburettor, clockwise (to enrich) or anti-clockwise (to weaken), until a point is reached where the engine speed is fastest (see illustration).

9 Slowly turn the mixture screw anti-clockwise until the engine speed just starts to drop.

10 Turn the throttle adjustment screw to regain the specified idling speed.



15.7 Adjusting the idling speed



15.8 Adjusting the mixture

11 If an exhaust gas analyser is being used, adjust the mixture screw to obtain the specified idling exhaust gas content, then readjust the throttle screw.

12 Pull out the choke control knob until the arrow on the fast idle cam is aligned with the fast idle adjusting screw, then check that the fast idle speed is as given in the Specifications. If not, turn the fast idle adjusting screw as necessary.

13 Lubricate the throttle and choke controls and check connections.

14 Return the choke control knob, and switch off the engine.

15 Disconnect the tachometer and exhaust gas analyser as necessary.

16 Refit the air cleaner with reference to Chapter 4.

16 Ignition timing check and adjustment



Mechanical ignition

1 For the home mechanic, there is only one method that may be used to time the ignition - the stroboscopic timing light method. However, for initial setting-up purposes (i.e. after a major overhaul, or if the timing has been otherwise completely lost), a basic static timing method should be used to get the engine started. This involves the use of a test bulb. Once the engine is running, the timing should then be correctly set using the stroboscopic timing light method. A further method, employing the light emitting diode (LED) sensor bracket and timing disc located on the bottom of the timing cover, may be used, but the equipment for use with this system will not normally be available to the home mechanic.

Test bulb method

2 Remove the No 1 spark plug (crankshaft pulley end) and place the thumb over the aperture.

3 Turn the engine in the normal running direction (clockwise from crankshaft pulley end) until pressure is felt in No 1 cylinder, indicating that the piston is beginning its compression stroke. Use a spanner on the crankshaft pulley bolt, or engage top gear and pull the car forwards on manual gearbox models.

4 Continue turning the engine until the V-notch in the crankshaft pulley is exactly in line with the timing cover pointer representing 4° BTDC. Note that the large pointer indicates top dead centre (TDC) and the remaining pointer peaks are in increments of 4° BTDC.

5 Remove the distributor cap and check that the rotor arm is pointing in the direction of the No 1 terminal of the cap.

6 Connect a 12 volt test bulb between the end of the moving contact spring and an earthing point on the engine.

7 Loosen the distributor clamp plate bolt.

8 Switch on the ignition. If the bulb is already lit, turn the distributor body slightly anti-clockwise until the bulb goes out.

9 Turn the distributor body clockwise until the bulb just lights up, indicating that the points have just opened. Tighten the clamp bolt.

10 Switch off the ignition and remove the test bulb.

11 Refit the distributor cap and No 1 spark plug and HT lead. Once the engine has been started, check the timing as follows and adjust as necessary.

Stroboscopic timing light method

12 Disconnect and plug the vacuum pipe at the distributor.

13 Wipe clean the crankshaft pulley notch and timing cover pointers. If necessary, use white paint or chalk to highlight the marks.

14 Connect the timing light to the engine in accordance with the manufacturer's instructions (usually between No 1 spark plug and HT lead).

15 Connect a tachometer to the engine in accordance with the manufacturer's instructions.

16 Start the engine and run it at the speed given in the Specifications, in Chapter 5, for stroboscopic timing.

17 Point the timing light at the timing marks and they should appear to be stationary with the crank pulley notch in alignment with the appropriate mark: refer to the Specifications for the ignition timing applicable to the engine being worked on. Note that the large pointer indicates top dead centre (TDC) and the remaining pointer peaks are in increments of 4° BTDC (see illustration).

18 If adjustment is necessary (i.e. the pulley notch does not line up with the appropriate mark), loosen the distributor clamp plate bolt and turn the body clockwise to advance and anti-clockwise to retard the ignition timing. Tighten the bolt when the setting is correct.

19 Gradually increase the engine speed while still pointing the timing light at the timing marks. The pulley notch should appear to move anti-clockwise proving that the centrifugal weights are operating correctly. If the ignition advance is not in accordance with the information given in the Specifications, Chapter 5, the distributor should be replaced as described in the same Chapter.

20 Switch off the engine and remove the timing light and tachometer.

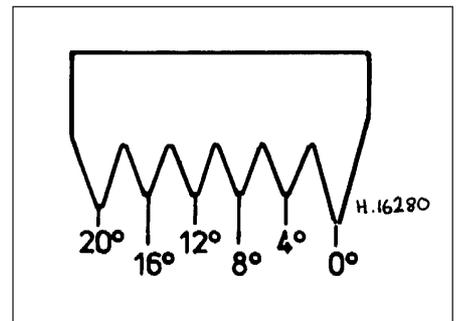
21 Reconnect the vacuum pipe to the distributor. Disconnect the pipe from the carburettor and remove the distributor cap. Suck on the end of the pipe and check that the baseplate (Lucas) or pivot link (Ducellier) move to advance the points. If not, the vacuum unit may be faulty.

22 Refit the distributor cap and vacuum pipe.

Electronic ignition system

Static timing

23 The only method of electronic ignition timing for road use, is using a stroboscopic lamp. However, for initial setting-up purposes (e.g. after engine overhaul, or if the timing has been completely lost) the following procedure will enable the engine to be run in order to undertake dynamic timing.



16.17 Typical timing scale. Moving mark is on the crankshaft pulley

24 Pull off the HT lead and remove No 1 spark plug (nearest the crankshaft pulley).

25 Place a finger over the plug hole and turn the engine in the normal direction of rotation (clockwise from the crankshaft pulley end) until pressure is felt in No 1 cylinder. This indicates that the piston is beginning its compression stroke. The engine can be turned with a socket and bar on the crankshaft pulley bolt.

26 Continue turning the engine until the notch in the crankshaft pulley is aligned with the TDC pointer on the timing scale.

27 Remove the distributor cap and check that the rotor arm is pointing towards the No 1 spark plug HT lead segment in the cap.

28 On pre-1985 models, lift off the rotor arm and anti-flash shield and observe the position of the reluctor in relation to the pick-up coil. One of the teeth on the reluctor should be aligned with, or very near to the small limb, of the pick-up coil. Slacken the distributor clamp retaining bolt and turn the distributor body until the reluctor tooth and pick-up limb are directly in line. Using feeler blades, preferably of plastic or brass, measure the air gap between the reluctor tooth and pick-up assembly (see illustration). If the measured dimension is outside the tolerance given in the Specifications, slacken the adjusting nuts on the pick-up assembly and reposition the unit as necessary. Tighten the distributor clamp and refit the anti-flash shield and the rotor arm.

29 On 1985-on models, if the rotor arm is not pointing towards the No 1 spark plug HT lead

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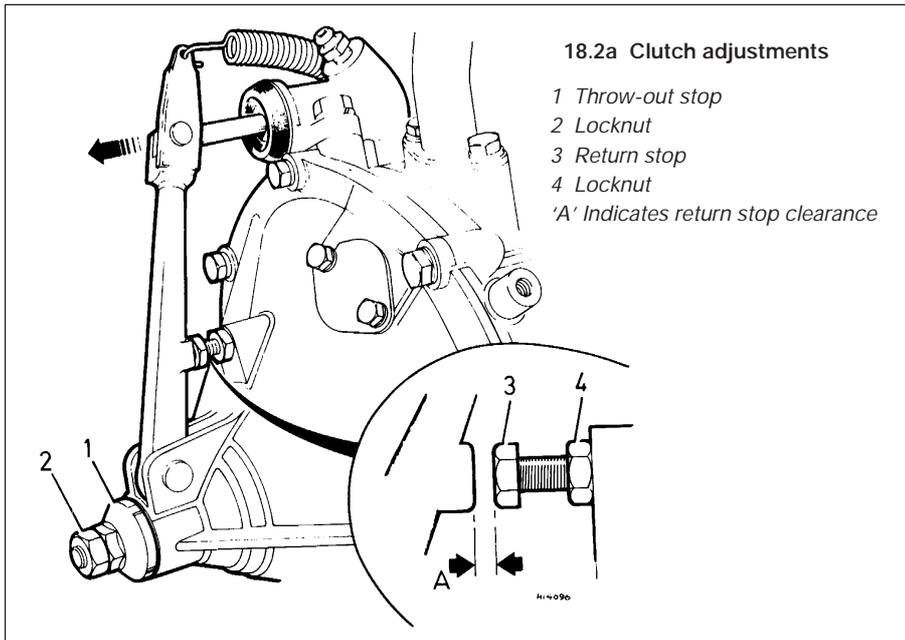
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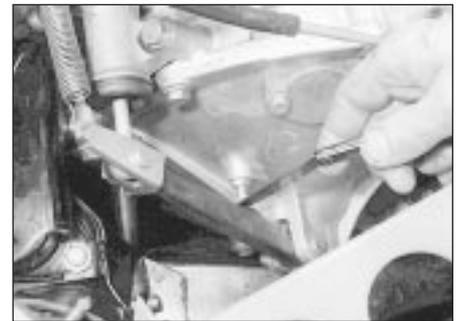
16.28 Reluctor air gap adjustment

- 1 Adjusting nuts
- 2 Pick-up coil
- 3 Pick-up limb
- 4 Reluctor tooth
- A Specified gap



18.2a Clutch adjustments

- 1 Throw-out stop
- 2 Locknut
- 3 Return stop
- 4 Locknut
- 'A' Indicates return stop clearance



18.2b Checking the clutch return stop clearance

segment in the cap, slacken the distributor clamp bolt and turn the distributor body as necessary, then tighten the bolt. It is not possible to align the reluctor arms as they are totally enclosed within the distributor.

30 Refit the distributor cap, No 1 spark plug and the HT lead.

31 It should now be possible to start and run the engine, enabling the ignition timing to be checked accurately using a stroboscopic timing light, as described earlier in this section.

17 Driveshaft rubber gaiter check

1 With the vehicle raised and securely supported on stands, 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. 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 possibly a loose driveshaft retaining nut.

18 Clutch - adjustment and maintenance

1 To adjust the return stop, pull the release lever out against the tension of the slave cylinder return spring until all the free movement is taken up.

2 Using a feeler blade, check that the clearance between the return stop and the release lever is as given in the Specifications (see illustrations). If not, loosen the locknut and reposition the return stop screw as necessary, then tighten the locknut. Make sure that the lever is held against the spring tension during the adjustment.

3 To adjust the throw-out stop, unscrew the locknut on the end of the release plunger to the limit of the thread, then unscrew the throw-out stop to the locknut.

4 Have an assistant fully depress the clutch pedal and keep it depressed. Screw in the throw out stop until it contacts the housing.

5 With the clutch pedal released, screw in the stop one further flat (60°), and tighten the locknut while holding the stop stationary.

19 Exhaust system check



Warning: If the engine has been running take care not to touch the exhaust system, especially the front section, as it may still be hot.

1 Position the car over an inspection pit or on car ramps. Alternatively raise the front and rear of the car and support on axle stands (see "Jacking and vehicle support").

20 Hinge and lock lubrication

1 Work around the vehicle, clean and then lubricate the hinges of the doors, bonnet and tailgate with a light machine oil.

2 Lubricate the bonnet release mechanism, hinges and safety locks with a smear of petroleum jelly.

3 Check carefully the security and operation of all hinges, latches and locks, adjusting them where required. Check the operation of the central locking system (if fitted).

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

5 On completion check the operation of all door locks, tailgate/boot locks and the fuel filler flap. Check that the child safety catches on the rear doors operate correctly.

21 Seat belt check

1 Working on each seat belt in turn, carefully examine the seat belt webbing for cuts or any signs of serious fraying or deterioration. Pull the belt all the way out, and examine the full extent of the webbing.

2 Fasten and unfasten the belt, ensuring that the locking mechanism holds securely and releases properly when intended. Check also that the retracting mechanism operates correctly when the belt is released.

3 Check the security of all seat belt mountings and attachments that are accessible, without removing any trim or other components, from inside the vehicle.

22 Headlight beam alignment check



1 Check the headlights for damage that may occur as stone chipping.

2 The headlamp alignment should be checked every 12 000 miles (20 000 km) or 12 months, whichever occurs first.

3 It is recommended that the alignment is carried out by a Rover dealer or specialist, using modern beam setting equipment. However, in an emergency, the following procedure will provide an acceptable light pattern.

4 Position the car on a level surface with the ride heights correct, the car normally laden and the tyres correctly inflated, approximately 10 metres (33 feet) in front of, and at right-angles to, a wall or garage door.

5 Draw a horizontal line on the wall or door at headlamp centre height. Draw a vertical line corresponding to the centre line of the car, then measure off a point either side of this, on the horizontal line, corresponding with the headlamp centres.

6 Switch on the main beam and check that the areas of maximum illumination coincide with the headlamp centre marks on the wall. If not, turn the plastic knobs located on the rear of the headlamps turn both knobs to raise or lower the beam, and one knob (either will do) to move the beam horizontally.

23 Brake line and flexible hose check



1 Raise the front and rear of the car and securely support on axle stands (see "*Jacking and vehicle support*"). Remove all wheels.

2 Thoroughly examine all brake lines and brake flexible hoses, including the servo hose, for security and damage. To check the flexible hoses, bend them slightly in order to show up any cracking of the rubber.

3 Check the complete braking system for any signs of brake fluid leakage.

4 Where necessary carry out repairs to the braking system with reference to Chapter 9.

24 Front brake pad and rear brake lining check



Warning: Read the 'Safety First' section, in the Preliminary Chapter, before proceeding.

1 Firmly apply the handbrake, then jack up the front of the car and support it securely on axle stands (see "*Jacking and vehicle support*"). Remove the front roadwheels.

2 For a quick check, the thickness of friction material remaining on each brake pad can be measured through the aperture in the caliper body. If any pad's friction material is worn to the specified thickness or less, all four pads on that axle must be renewed as a set.

3 For a comprehensive check, the brake pads should be removed and cleaned. The operation of the caliper can then also be checked, and the condition of the brake discs can be fully examined on both sides. Further details can be found in Chapter 9.

4 The disc pad warning indicators should also be checked. To do this, first locate the twin terminal black plastic sockets located on the wiring harness over each wheel arch. Switch on the ignition and connect a bridging wire between the terminals of one socket; the pad wear warning light should be illuminated on the instrument panel. If not, either the warning bulb is blown or there is a fault in the circuit. Repeat the check on the remaining front brake. On some models the pad wear system is only fitted to the right-hand side inner pad.

5 To check the rear brake linings, the rear wheels and drums need to be removed. For full details including adjustment procedures, refer to Chapter 9.

6 On completion refit the wheels and lower the car to the ground.

25 Steering, suspension and shock absorber check



1 Raise the front and rear of the car, and securely support it on axle stands (see "*Jacking and vehicle support*").

2 The front and rear suspension should be lubricated with a grease gun. The front grease nipple is located on the upper suspension arm at the pivot end. The rear nipple is located on the outer end of the radius arm pivot. Always clean the nipple before using the grease gun.

3 Check all the suspension joints and mountings for security and damage.

4 Check the steering gaiters for splitting, and examine the steering balljoints for wear. Check the steering gear for security.

5 Visually inspect all balljoint dust covers and the steering rack gaiters for splits, chafing or deterioration. 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.

6 The front and rear suspension should be lubricated with a grease gun. The front grease nipple is located on the upper suspension arm at the pivot end. The rear nipple is located on the outer end of the radius arm pivot. Always clean the nipple before using the grease gun.

7 Grasp each front roadwheel in turn at the 12 o'clock and 6 o'clock positions, and try to rock it. 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 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.

8 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.

9 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.

10 Check for any signs of fluid leakage around the front shock absorbers. Should any fluid be noticed, the shock absorber is defective internally, and should be renewed.

Note: Shock absorbers should always be renewed in pairs on the same axle.

11 Lower the car to the ground.

12 The efficiency of the shock absorbers may be checked by depressing each corner of the car in turn. If the shock absorbers are in good condition, the body will rise and then settle in its normal position. If it continues to rise and fall, the shock absorber is probably suspect. Examine also the shock absorber upper and lower mountings for any signs of wear.

13 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 the rack-and-pinion steering gear itself.

26 Hydragas units check



Note: Checking the pressure of this units, along with repressurising and depressurising must be done by either a Rover dealer or specialist with the necessary equipment needed.

1 A fault in a Hydragas unit can be determined by checking the car ride height as shown. If the measurements are less than those specified (refer to Chapter 10), first check the units and rear interconnecting pipe for signs of leakage, which will appear as a slight residue left after the fluid has evaporated.

2 If the cause is a union, tighten the nut and have the system repressurised.

3 Where a leak in a Hydragas unit is suspected, clean the area around the charging valve threads to determine whether the valve is the source of the leak (Talcum powder dusted around the clean valve may be helpful in tracing a leak).

26 Front wheel alignment check

4 If it is established that the leak is occurring round the valve threads, have the system depressurised, then unscrew the valve.

5 Screw in a new valve, using a sealant on the threads. Tighten the valve to the specified torque (see Chapter 10). Have the system repressurised on completion, and check for leaks.

6 If it is determined that a Hydragas unit is leaking fluid, renew the unit and again have it repressurised.

7 If no fluid leak can be found, it is possible that nitrogen has leaked from the unit. To check this, have the unit checked with the pressure pump. The fluid pressure should increase rapidly to the pressure of the nitrogen, and thereafter increase at a noticeably slower rate. If nitrogen has been leaking, the pressure will have dropped and the fluid pressure will increase rapidly above the normal nitrogen pressure.

8 If it is determined that a Hydragas unit has leaked nitrogen, renew it and have the suspension repressurised.

**28 Front wheel alignment check**

1 Due to the special measuring equipment necessary to check the wheel alignment accurately, checking and adjustment is best left to a Rover dealer or similar expert. Note that most tyre-fitting shops now possess sophisticated checking equipment. Refer to Chapter 10 for more information.

2 Before having the front wheel alignment checked, all tyre pressures should be checked and if necessary adjusted (see "Weekly Checks").

29 Road test (after every service)**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. Check the function of the heating control systems.

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, or when driving over bumps.

Drivetrain

6 Check the performance of the engine, clutch (if applicable), gearbox/transmission and driveshafts. On Turbo models, check that the boost pressure needle moves up to the red zone during brief acceleration.

7 Listen for any unusual noises from the engine, clutch (if applicable) and gearbox/transmission.

8 Make sure that the engine runs smoothly

when idling, and that there is no hesitation when accelerating.

9 On manual gearbox models, check that the clutch action is smooth and progressive, that the drive is taken up smoothly, and that the pedal travel is correct. Also listen for any noises when the clutch pedal is depressed. Check that all gears can be engaged smoothly, without noise, and that the gear lever action is not abnormally vague or 'notchy'.

10 On automatic transmission models, make sure that all 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 Rover dealer.

11 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, refer to Chapter 8.

Check the operation and performance of the braking system

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

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

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

15 Test the operation of the brake servo unit (where applicable) as follows. With the engine off, depress the footbrake four or five times to exhaust the vacuum. Start the engine, holding the brake pedal depressed. 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 now, 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.

27 Handbrake adjustment

1 Chock the front wheels, then jack up the rear of the car and support it on axle stands (see "Jacking and vehicle support").

2 Apply the handbrake four times to settle the compensator and cable positions.

3 Adjust the rear brakes as described in Chapter 9.

4 Apply the handbrake six notches on an old cable, or four notches on a new cable, then check that both rear wheels are locked.

5 To adjust the handbrake, loosen the cable locknut using a spanner through the access slot in the carpet behind the handbrake. Turn the adjusting nut until the correct tension is achieved, then tighten the locknut.

6 Lubricate the linkages and cables.

7 Release the handbrake and check that the wheels rotate freely, then lower the car to the ground.

18 000 Miles (30 000 Km) /18 Months**30 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 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, except that the brake fluid reservoir should be emptied by syphoning. Use a clean poultry baster or similar before starting, and 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 old fluid has been emptied from the fluid reservoir. Top-up to the "MAX" level with new fluid, and continue pumping until only the new

fluid remains in the reservoir, and new fluid can be seen emerging from the 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.

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