

How to uprate your engine fan 2

On most cars with in-line engines, fitting an electric cooling fan is a simple task. But there are a few models where the work is considerably more involved. Some cars will not accept an electric fan mounted in the conventional position between the radiator and the front grille. Others will do so only after extensive modification. Fitting also calls for extra work on Leyland front-wheel drive cars fitted with side-mounted radiators, where lack of space is the main problem.

The difficulties always arise at the stage where the fan unit itself is being mounted in position. Fitting the thermal control, wiring up and setting the thermostat are basically as described in the first part of this article.

The conventional electric fan works by blowing air over the radiator, rather than sucking it through like an engine-driven fan. On some in-line engined cars, usually because of lack of space between radiator and grille, the electric fan has to work by suction and goes in place of the original fan behind the radiator. A suction fan is also employed on Leyland transverse-engined cars, but is mounted in the nearside wheel arch and sucks air over the radiator from the engine compartment.

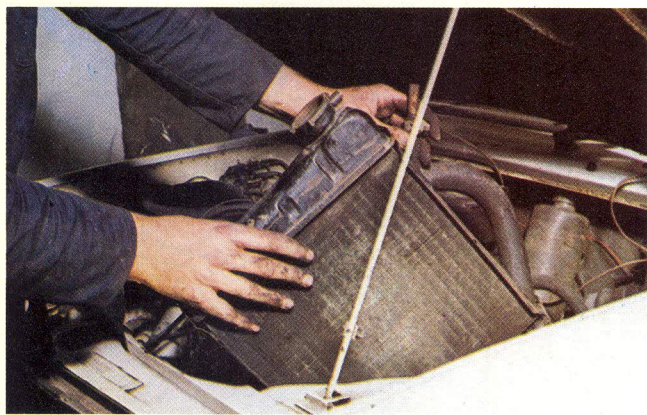
With all of the special cases below, it is important to follow the individual instructions given for each car, especially in locating the mounting brackets. The manufacturers have carried out extensive tests to determine the simplest way of fitting their fans and, unfortunately, there are no short cuts.

Special instructions—cars with blower fans

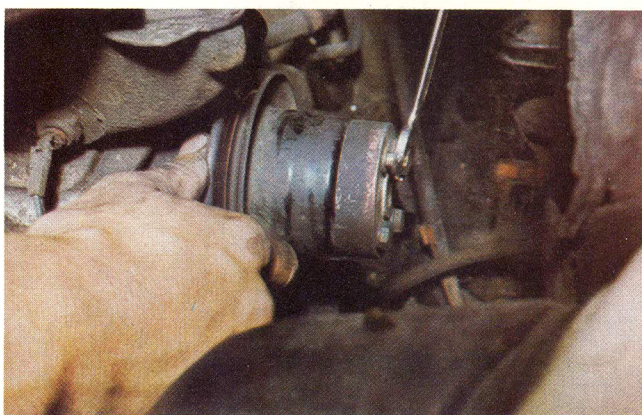
Ford Cortina Mk III: on this car, the radiator has to be loosened to allow the cowl around it to be removed. This in turn provides enough room for a fan to be fitted in the normal way. To remove the radiator (see pages 653 to 657), first drain the cooling system. Disconnect the top and bottom hoses and unscrew the two mounting bolts on either side of the radiator. The plastic cowl for the old fan is also held by these bolts and should be discarded. You can now fit the blower fan by bolting both of its adjustable mounting arms to the lower pressing. This is a panel running across the engine compartment and joining the two front wings. It will already have holes in it to accommodate the bolts. Once the fan has been positioned, you can proceed to re-fit the radiator.

Moskvich: This car has a shutter round the radiator, secured by studs. This should be removed. You must then bolt the two mounting brackets to the two "L"-shaped adaptor brackets provided with the fan kit. These are bolted on each side of the radiator, about two thirds of the way down, using two of the shutter studs and holes.

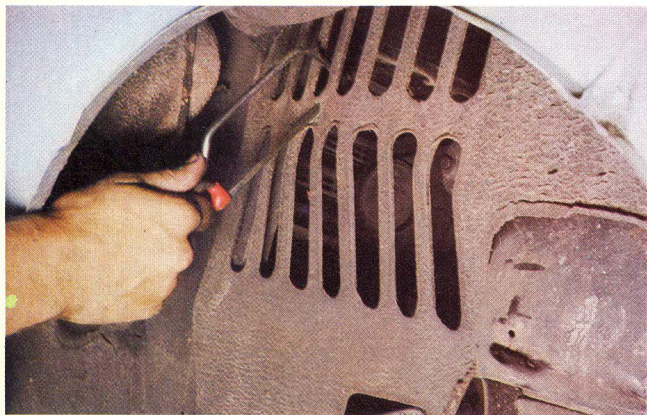
Morris Marina: The radiator on this car is held on four mountings and has to be moved back slightly to allow a blower fan to fit in front of it. Start by removing the radiator, then take the two rubber grommets found on the lower mounting feet and press them into the centre holes of the "A"-brackets supplied in the kit. Next, bolt the brackets to the mounting feet locations in the car to form two new radiator mountings 25.4 mm (1ins) further back towards the engine. Replace the radiator, fitting the dowels on the



1 Unfortunately, you have to remove the radiator when fitting an electric fan to one of the Leyland transverse-engined models



2 With the radiator and the original fan removed, there is plenty of room to replace the fan pulley and re-tighten the fan belt

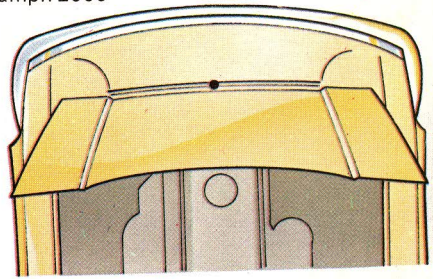


3 When sawing through the wheel arch grille, you can use a drill or padsaw on the thin slats and a hacksaw on the thicker ones

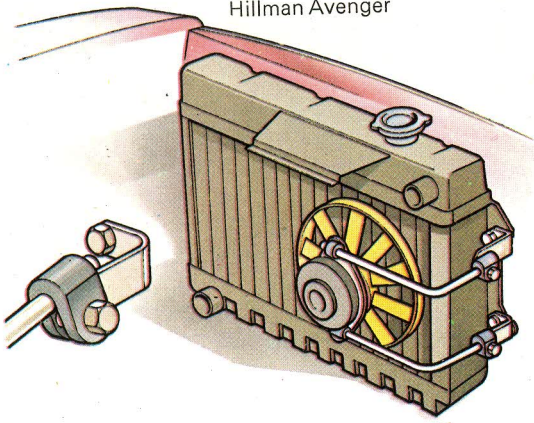


4 Carefully remove the sawn-out section and discard it. It is a good idea to file down any jagged edges left around the hole

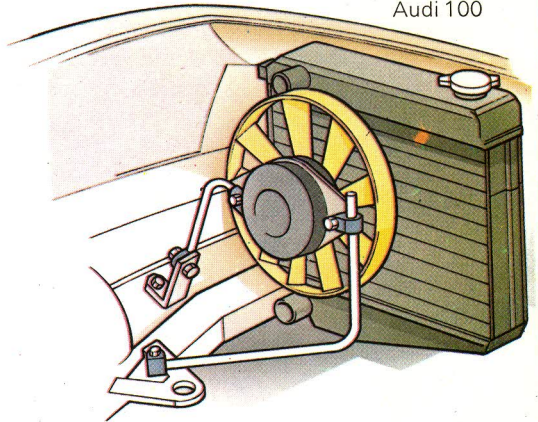
Triumph 2000



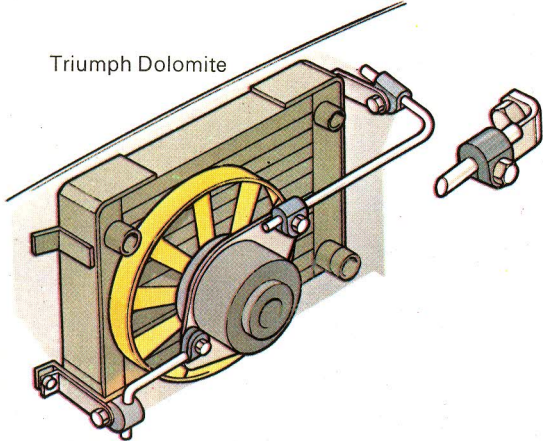
Hillman Avenger



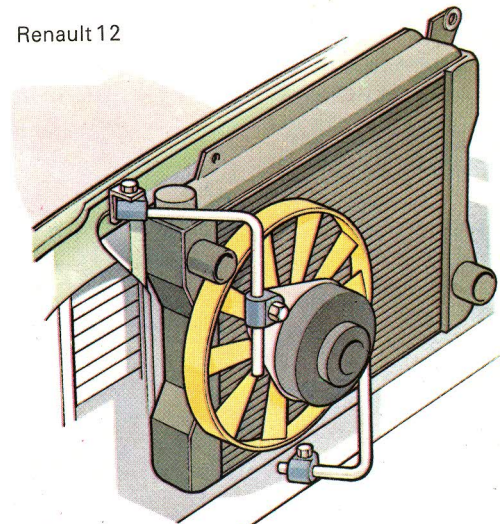
Audi 100



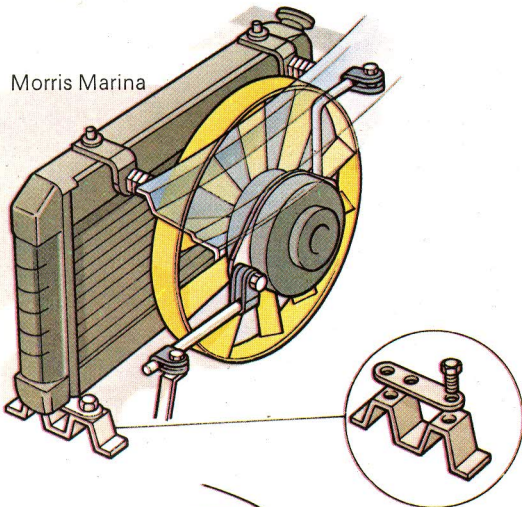
Triumph Dolomite



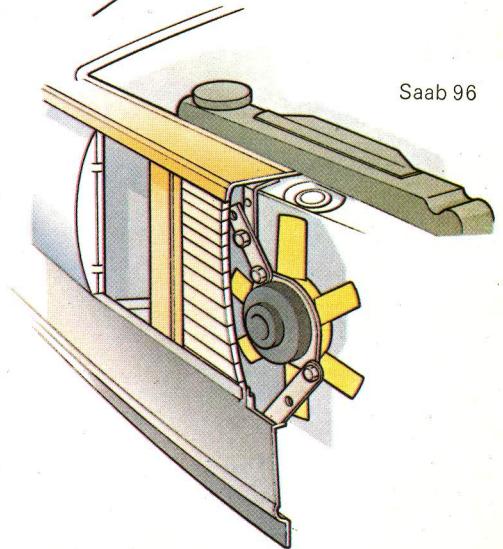
Renault 12



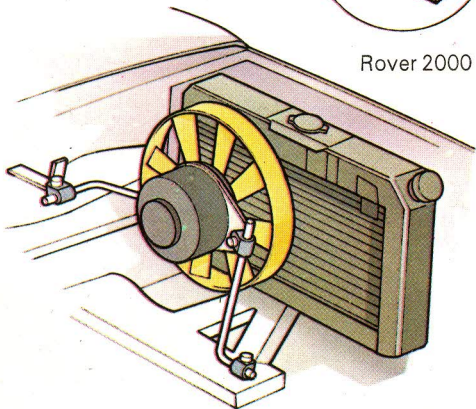
Morris Marina



Saab 96



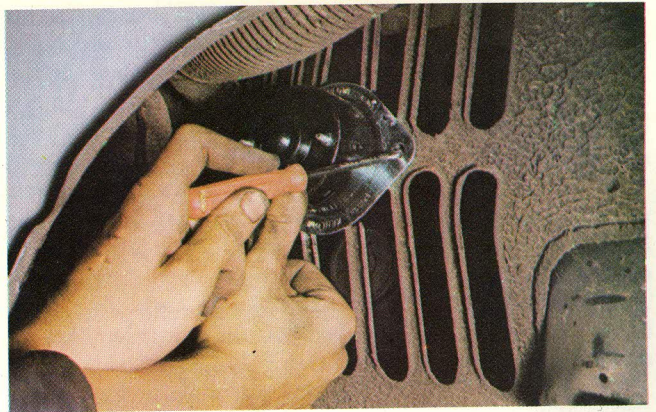
Rover 2000



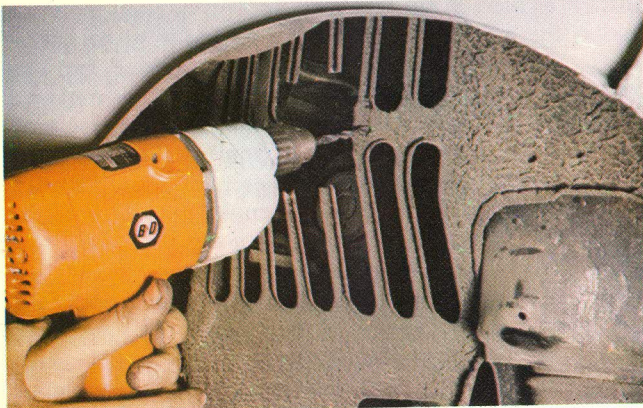
5 Illustrations to show how electric fans can be fitted to the cars mentioned under 'Special instructions' in the text



6 On this Mini 1275GT, there is only one mounting bracket. This is bolted to the motor loosely, leaving some room for adjustment



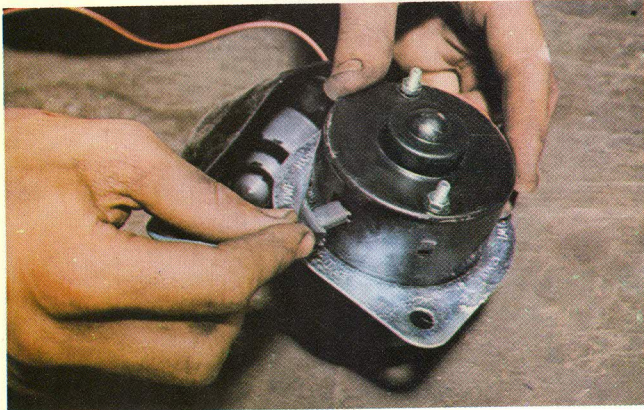
7 The other side of the motor bolts directly to the arch. Locate the fan assembly and mark the positions of the bolt holes



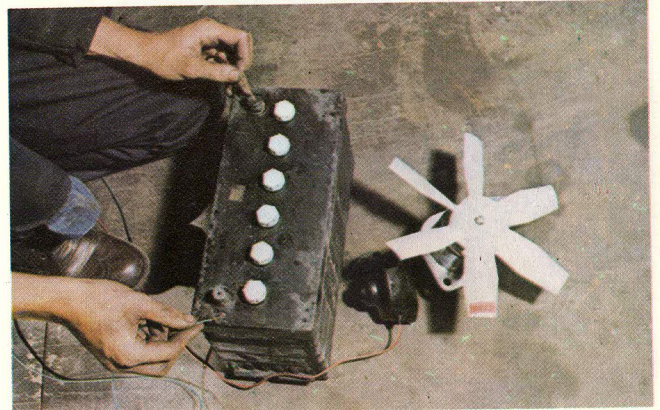
8 Drilling the bolt holes. You will have to drill the two nearest the front of the car from inside the engine compartment



9 When connecting the motor wires, feed them through the plastic cover and the shrouds before crimping on the spade connectors



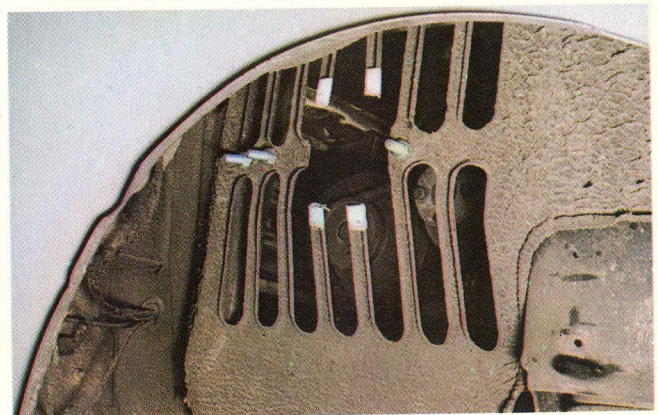
10 The shroud terminals must fully cover the connectors before you join them to the motor to form an extra waterproof seal



11 Before you test that the fan is rotating the right way, make sure that the blade is securely screwed on to the motor spindle



12 Having completed the test and changed the wires if necessary slide the plastic waterproof cover right over the motor body



13 The motor bolts in position on the wheel arch. The first set of nuts have been screwed down, turning the bolts into studs

bottom fitting into the grommets in the "A"-brackets. The top of the radiator is secured with two long bolts which are provided and these have four nuts each on the shafts to act as spacers between the radiator and the front panel (fig. 5). On the Marina, it is also important to mount the fan mounting brackets as shown in fig. 5.

Saab 95 and 96 V-4: Some earlier Saab models have rubber radiator securing straps which may have to be lengthened to give sufficient clearance for the fan unit. To do this, obtain a small metal plate for each strap about 25 mm (1ins) square. Drill two holes in each plate, bolt the plates to the straps and then bolt the new assemblies to the original strap fixing points (fig. 5).

Bolt the fan mounting brackets as shown in fig. 5, and pay special attention to the clearance between the fan blades and the bonnet catch with the bonnet down. If your car has a headlamp wiper unit installed behind the grille, you will have to dispense with it to make way for the fan.

Triumph 2000/2500, Stag, Dolomite and Toledo 1300/1500. There is a small drain hole on these cars in the middle of the front panel under the bonnet (fig. 5). This must be blocked, by sticking the two adhesive discs provided, to either side. Otherwise drained water will drip on to the fan motor.

Special instructions—cars with suction fans

The following cars are all designed to take Kenlowe suction fans, which are mounted between the radiator and the engine. The differences between fitting a blower fan and fitting a suction fan are confined solely to the mounting of the unit itself. Installation of the thermal control, wiring up and setting are the same.

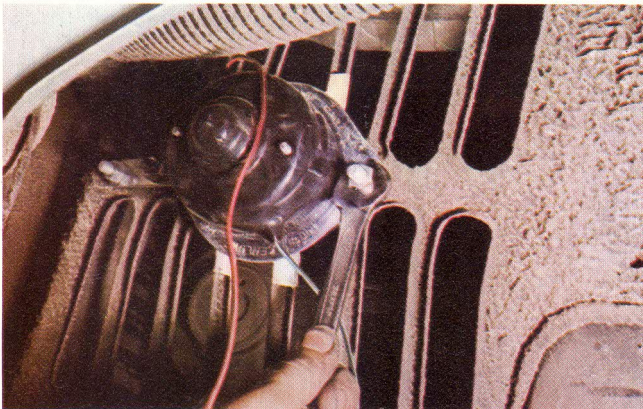
Initial preparations for mounting the fan unit are also

identical to those for the blower units. The radiator must be part-drained and the top-hose removed. The next step is to unbolt the original fan from its pulley and then to replace the bolts to hold the pulley in place. Use washers to take up the space left by the fan blade. The electric fan unit is assembled in the normal way, by bolting the two mounting brackets to the motor backing plate with the black plastic clamps provided. You should then follow the instructions for your particular car as outlined below.

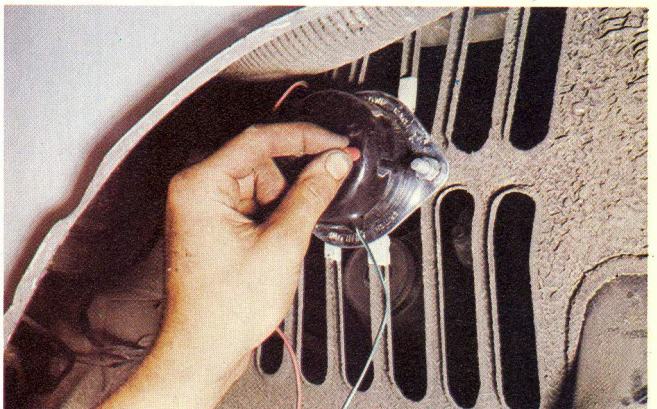
Unless otherwise stated, there will be no need to drill any holes for the mounting brackets—suitable ones will be found on the car.

Audi 100 coupe: On this car the original engine-driven fan is mounted in front of the radiator. It must be removed, together with its pulley and casting, to give maximum air-flow to the new fan behind. It is also particularly important not to clutter up the grille with spotlights or badges which restrict airflow. The Kenlowe suction fan is mounted behind the radiator, alongside the engine. One mounting bracket is attached to the cross-member behind and one fixed to the side panel, using the adaptor bracket provided in the kit (fig. 5). In this case, holes for the mounting brackets will have to be drilled. If your car has disc brake air-intake trumpets behind the radiator which stop the fan being mounted in this position, you must apply direct to the manufacturer for specific fitting instructions.

Chrysler Avenger/Centura: The suction fan is mounted to the left of the water pump (looking from the front of the car) off-set from the middle of the radiator. The mounting brackets have adaptors enabling them to be secured beneath two of the radiator mounting bolts as in fig. 5. Automatic Avengers have a transmission oil-cooler mounted to the right of the water pump. In this particular model the fan can



14 Locate the motor and its brackets on to the bolts and tighten down the remaining nuts. The unit should now be firmly held



15 If there are red caps provided in your kit, press them on to the protruding motor shafts to complete the waterproofing



16 Fix on the fan blade from inside the engine compartment. Screw down the fixing screw tightly and then check for fouling



17 To cut down the radiator cowling, start by removing the upper part, held by four bolts. It can then be worked on on the bench

be mounted on the opposite side of the pump.

MGB/C: Mounting the fan on this car is similar to mounting the Avenger fan, except that it is offset to the side of the radiator opposite the generator. The mounting brackets are fixed to the top and bottom radiator mounting bolts on this side. Owing to the lack of space, it is permissible for the fan to extend beyond the radiator by as much as 25 mm (1ins).

Morris Minor/Traveller: Follow the instructions for the MGC but note that the fan is mounted to the right of the water pump as viewed from the front of the car.

Renault 12 range/R.15 TL: On these cars, the fan is positioned off-centre towards the nearside with the mounting brackets positioned as in fig. 5.

Renault 17 TL/15 TS: Unfortunately, fitting a fan to these cars is a rather more difficult job and the manufacturer's specialized instructions will be required. Briefly, the radiator must be removed together with the fan cowl if fitted. The timing chain cover must then be replaced by an R.17 TS cover (part no. 7700503974) and gasket, allowing room for the fan to be mounted in the normal way.

Rover 3½ litre/coupé: Like the Morris Minor 1000, the suction fan on this car is positioned off-centre, to the right of the water pump. The mounting brackets are also bolted on that side with special adaptor brackets. The top one goes to the panel surrounding the radiator and the bottom bracket to the cross-member underneath it.

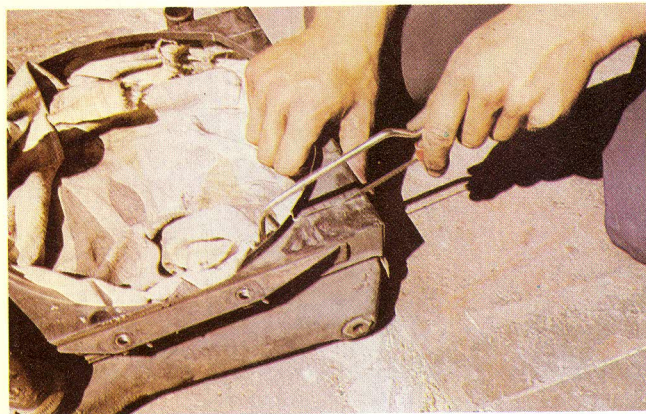
Rover 2000/3500 (old style): With these cars it is important to mount the fan according to the manufacturer's instructions (shown in fig. 5 for the 2000), otherwise there may be a great deal of vibration. As with other suction fans, the fan is mounted off-set from the centre of the radiator. You should ensure that the motor is not close enough to the water pump to knock against it with the engine running.

Triumph Dolomite 1850/Sprint: On this car you must remove the fan and pulley complete by unbolting the casting that holds them on to the cylinder head. Next, drain the radiator and remove all the hoses attached to it except the one at the bottom near the battery. Follow this by undoing the lower radiator mounting bolt, near the horn, and the top one diagonally opposite above the battery. Replace these with the two adaptor brackets supplied and mount the fan as in fig. 5. Replace all the hoses and coolant and finish by fitting the special shortened fan belt provided between the crankshaft pulley and the generator.

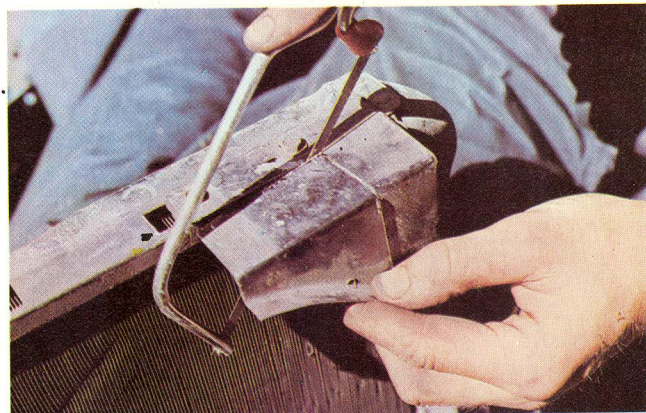
Transverse-engined cars

Many transverse-engined cars on the road today have electric fans fitted as standard. Notable exceptions are the Leyland Mini, Maxi, 1100, 1300 and 1800. These cars all have side-mounted radiators, facing the transverse, engine-driven fan on the nearside of the car. The Kenlowe fan fits between the radiator and the wing valance on that side. The original fan is removed and the fan pulley replaced, as with in-line engined cars.

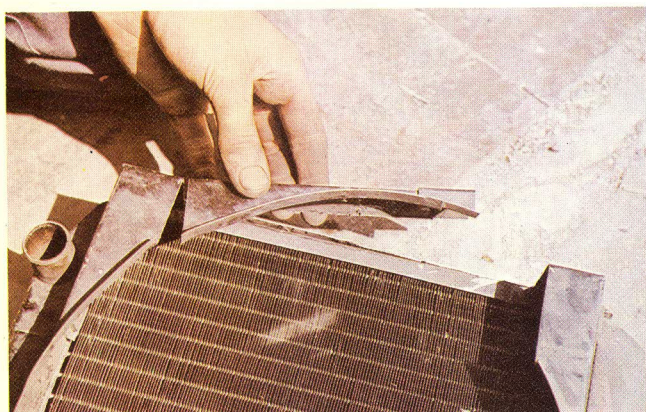
Disconnect the battery, jack up the front of the car and remove the nearside front wheel. Next remove the radiator (see pages 653 to 657), fan belt, fan and pulley (fig. 1). You must then replace the fan pulley (fig. 2). Now turn your attention to the wheel arch and identify the small, slotted grille in it which allows air to flow over the radiator. This must be cut away with a padsaw or hacksaw to allow the fan motor to protrude through towards the radiator (figs. 3 and 4). On the 1800 and Maxi, remove the whole grille. On the Mini and 1100/1300, cut away only the area shown in fig. 22. Next, bolt the two mounting brackets (only one on the Mini Clubman) to the motor backplate as shown in fig. 6.



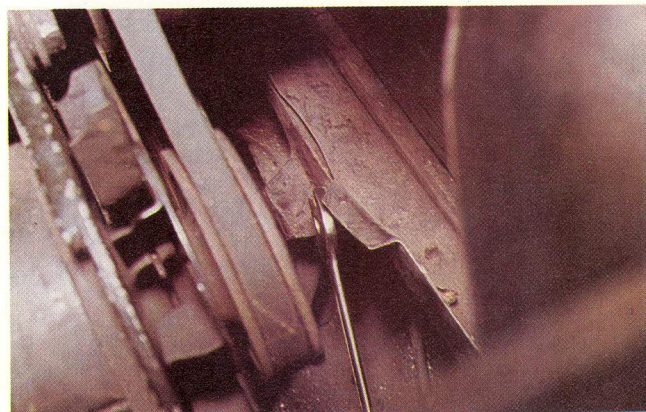
18 You will need to replace it before making the final cuts, which call for the cowl to be rigid. Use rags to protect the core



19 The radiator cowl is made of quite soft metal and it is not difficult to cut through it with a padsaw and hacksaw



20 The finished job. Before you re-fit the radiator, ensure that the core is free of metal filings, rags and any other debris



21 Tightening up the radiator bottom bracket. Make sure you check that the fan blade is not interfering with the core first

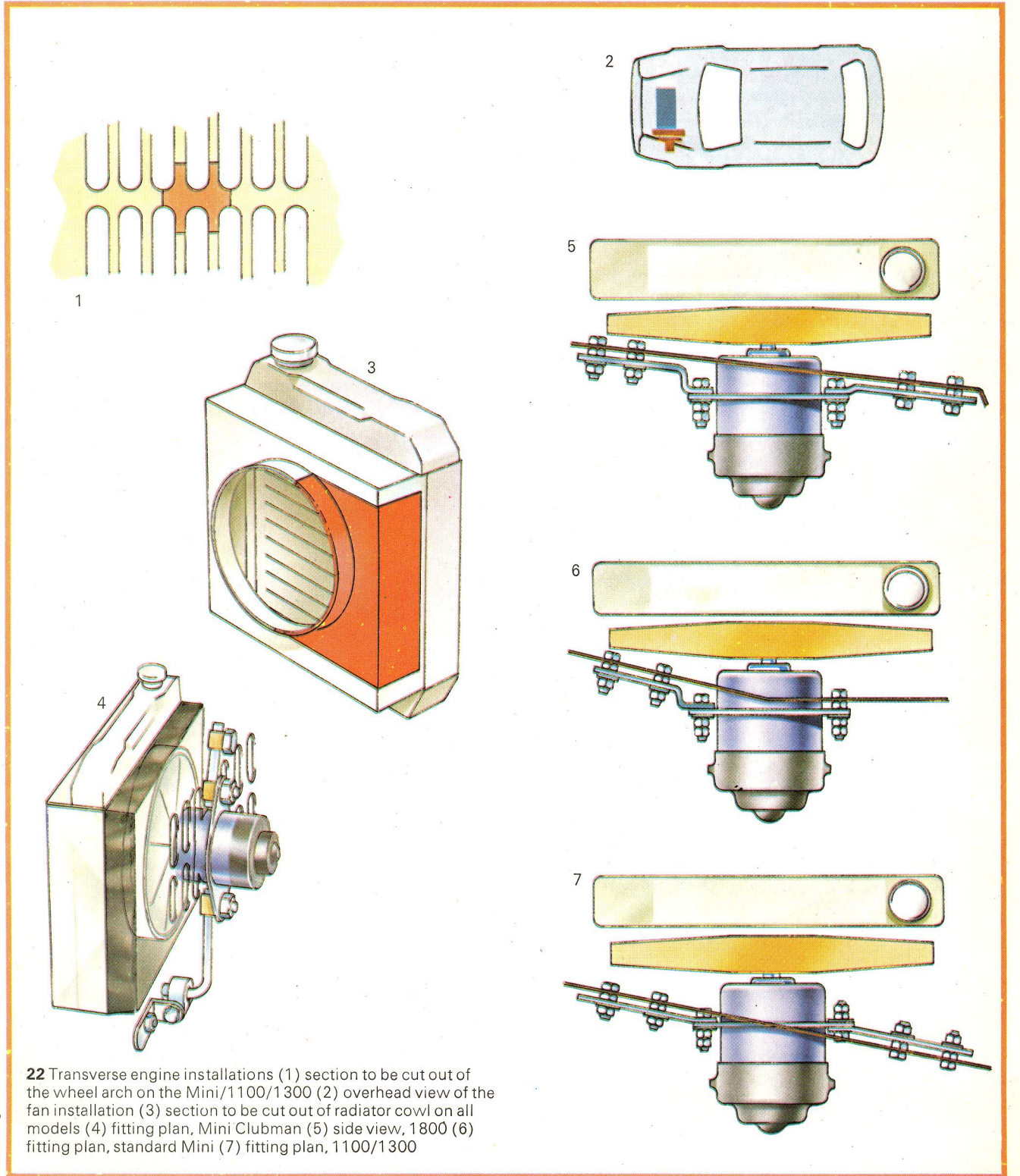
Offer up the assembly to the hole in the wheel arch and line up the brackets to suit your particular car. Estimate and then mark (fig. 7) the positions of the bracket or clamp bolts, using fig. 22 as a guide, and drill four (only three on the Mini Clubman) 8 mm (5/16ins) holes in the wheel arch at the appropriate points (fig. 8).

At this stage, the motor must be wired up. Connect two of the shroud terminals provided in the kit to the ends of the two motor wires also supplied and connect them to the motor (figs. 9 and 10). Connect the other ends to the battery terminals and check that the motor is rotating the right way round (fig. 11). If it is not, change over the wires on it. Make sure that the shroud terminals are pushed firmly home, then

thread the other ends of the wire through the waterproof cover provided. Push the cover over the motor (fig. 12) and slide the two red caps provided over the protruding motor shafts where they emerge from the now waterproofed motor. The wires can now be left until the final wiring up.

Next, on the Mini, 1100 and 1300, push the bracket bolts through the holes in the wheel arch. Tighten down the first set of nuts to make the bolts into studs (fig. 13). Take up the fan assembly once more and locate it on the studs (fig. 14). Screw down the remaining nuts and washers as shown in fig. 22.

On the 1800, slide the plastic clamps provided on to the metal mounting arms to form adjustable brackets. Bolt one



22 Transverse engine installations (1) section to be cut out of the wheel arch on the Mini/1100/1300 (2) overhead view of the fan installation (3) section to be cut out of radiator cowl on all models (4) fitting plan, Mini Clubman (5) side view, 1800 (6) fitting plan, standard Mini (7) fitting plan, 1100/1300

end of each bracket to the fan motor, offer up the whole assembly to the wheel arch and bolt it in place (see pages 690 to 695 for complete instructions).

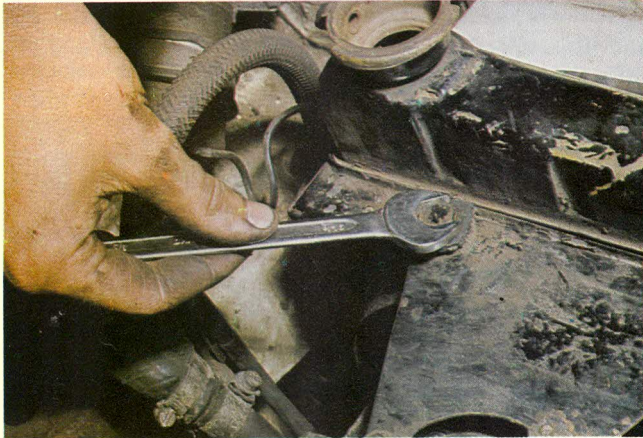
On all cars, small adjustments can be made before fully tightening the bolts or clamps and you should also fit the fan itself at this stage. Make sure that it is the right way round by referring to the instructions on the red label attached to one of the blades. Remember also to allow 1.5 mm (1/16ins) between the blade and the end of the spindle on the motor. After you have checked that the assembled fan is not crooked (refer to fig. 22) tighten the fan locking screw on the spindle (fig. 16) and all the bracket or clamp bolts.

Before re-fitting the radiator, cut away the side cowling as

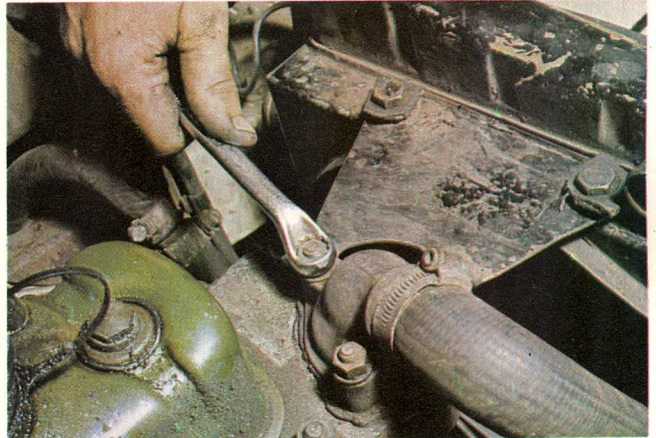
shown in figs. 17 to 20. This is important because it will provide a greater air flow from the front of the car over the radiator and so lessen the need to use the fan.

Twin-fan installations

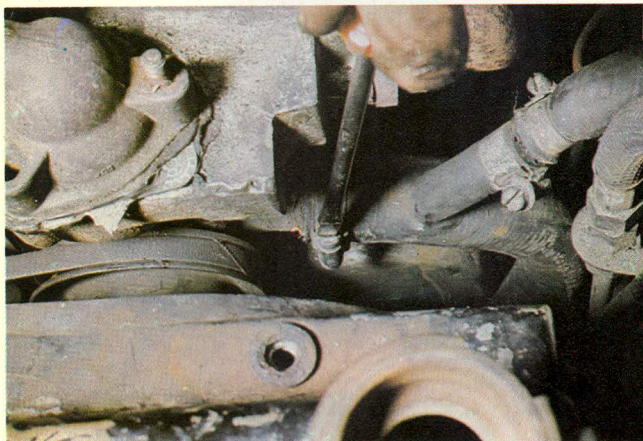
Several cars with large engines require twin-fan installations. These are mounted in exactly the same way as single fans, using the extra brackets provided in the kits. The most important aspect of twin-fans is their positioning. The fans should go side by side with a gap of 12 mm (½ins) between them. On no account must they overlap each other. If they extend beyond the area of the radiator core in this position, they must be mounted diagonally across the radiator, still



23 Fixing the top bracket. Bits of rubber hose with holes drilled in them are used instead of the old grommets to stop vibration



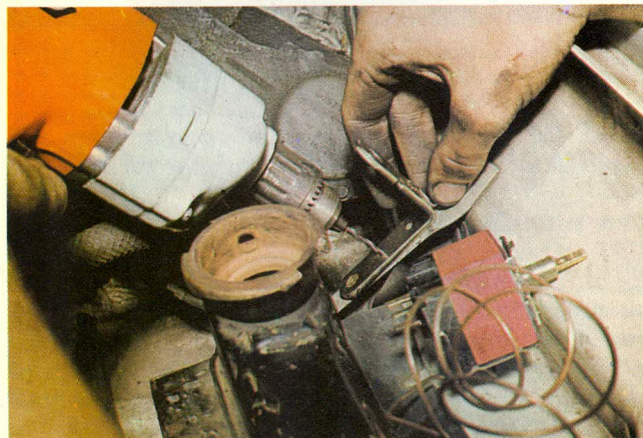
24 The engine side of the bracket is fixed with two of the bolts on the thermostat housing. Take care not to overtighten them



25 Tighten the Jubilee clip on the bottom hose where it leaves the engine. The radiator end of the hose is hard to reach



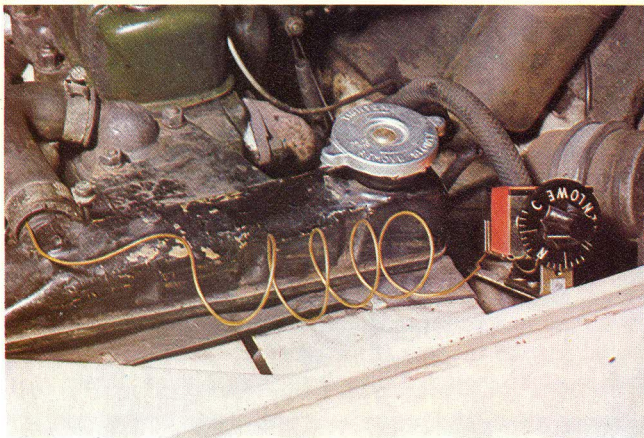
26 With the thermal control sensor inserted into the radiator and the rubber seal in position, tighten the clip on the top hose



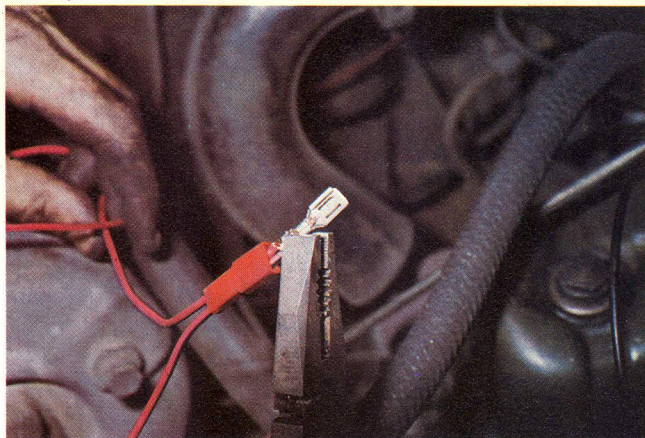
27 Use the control unit bracket as a template and drill holes for the fixing screws. Try to choose a site near the radiator



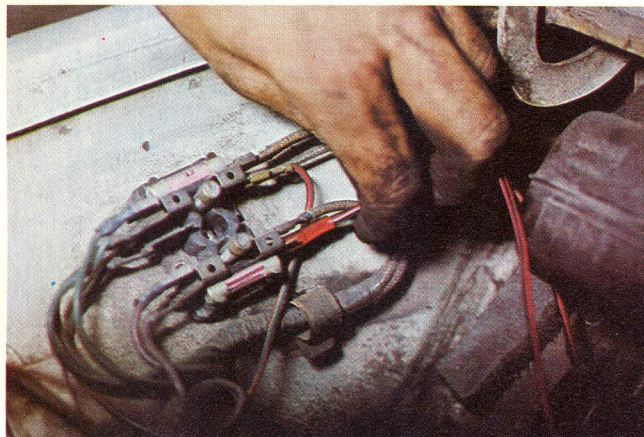
28 Fix the control unit on to the bracket, screwing the half-nut on to the spindle. The copper capillary must run down behind



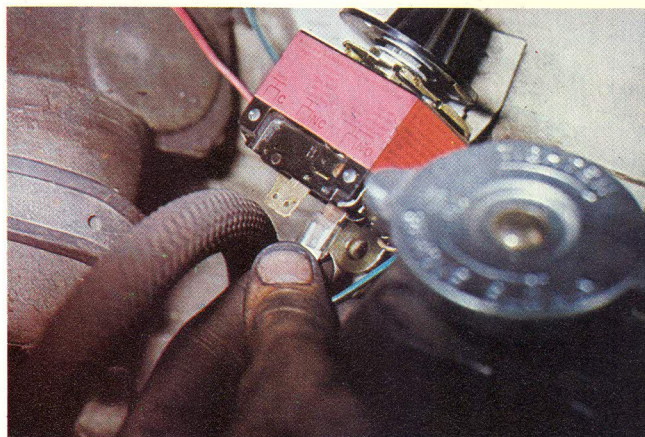
29 To complete the installation, press on the indicator dial and arrange the capillary so that it is coiled and cannot vibrate



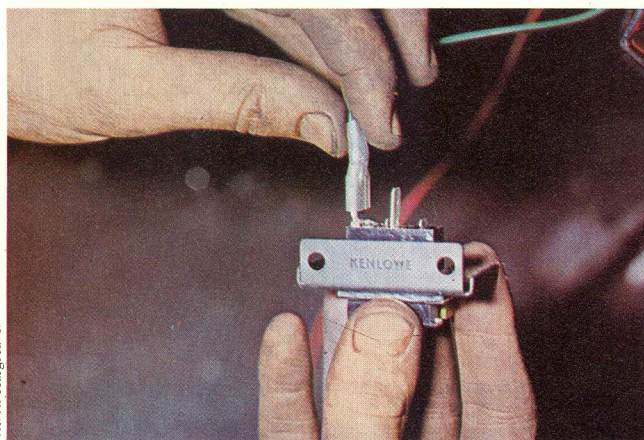
30 Where two wires are crimped to the same connector, remember to feed them through one of the large red shrouds first



31 Take the live supply to a spare terminal on the switch side of the fuse box. After connecting, tape the wires back to hold them



32 The connections at the thermal control unit are made in just the same way. Do not forget the earth wire from the bracket



33 Finally, connect up the manual over-ride switch. Feed the wire through any convenient hole in the engine bulkhead



34 The switch in place on the fascia. Whenever the fan starts up the warning light comes on, whether the switch is on or off

with the correct gap between them. The higher of the two should be at the same side of the radiator as the top-hose.

Towing and touring

Towing a caravan or trailer, towing in hot climates, and driving in mountainous country all impose a great strain on any car's cooling system. This is further increased if the car has automatic transmission. If your car has a blower-type Kenlowe fan, mounted in front of the radiator, you can put back your original engine-driven fan for this kind of driving. The engine-driven fan will cool the engine under normal conditions, but if it cannot cope at any time, the electric fan is available as a booster. When your towing trip or tour has

ended, the engine fan can come off again and you will regain all the advantages of a hotter running engine.

Cars with air-conditioning

Under extremely hot conditions, when a car's air conditioning system is working to full capacity, the condenser located by the radiator will dissipate a lot of heat into the cooling system, so overloading it. The Kenlowe fan should be used in conjunction with the standard engine-driven fan whenever these conditions arise, as it is slim enough to be fitted in front of the condenser.

During the cooler winter months the engine driven fan can be removed as the air conditioner is not in use.