

# Replacing worn radius arm bushes

Wear in the rear radius arm occurs very slowly and should not need attention for many thousands of miles if everything has been properly maintained. However, if regular service lubrications are not applied, wear increases rapidly and will eventually cause premature bearing or bush failure.

Wear in the radius arm usually shows up as a knocking from the rear of the car under acceleration and braking. To check the radius arm for wear, raise the affected road wheel off the ground and support the car firmly on axle stands.

Ensure that the handbrake is in the off position, then attempt to rock the wheel in the horizontal plane: grip the wheel at the quarter to and quarter past positions and endeavour to push and pull the wheel inwards and outwards.

Look at the radius arm pivot where it joins to the body while rocking the wheel; a small amount of movement is acceptable, but anything more than this requires the radius arm to be removed in order to gain access to the bearings.

## Preparation

If your car is fitted with Hydrolastic or Hydragas suspension, the system must be completely depressurized first (see *Mechanics 142* and *143*). Also, in some cases, the Hydragas or Hydrolastic suspension unit has to be removed at this stage (see below).

Remove the wheel trim (if fitted) and slightly loosen the road wheel nuts. Jack up the car to a convenient working height and support it on axle stands. Position the stands so



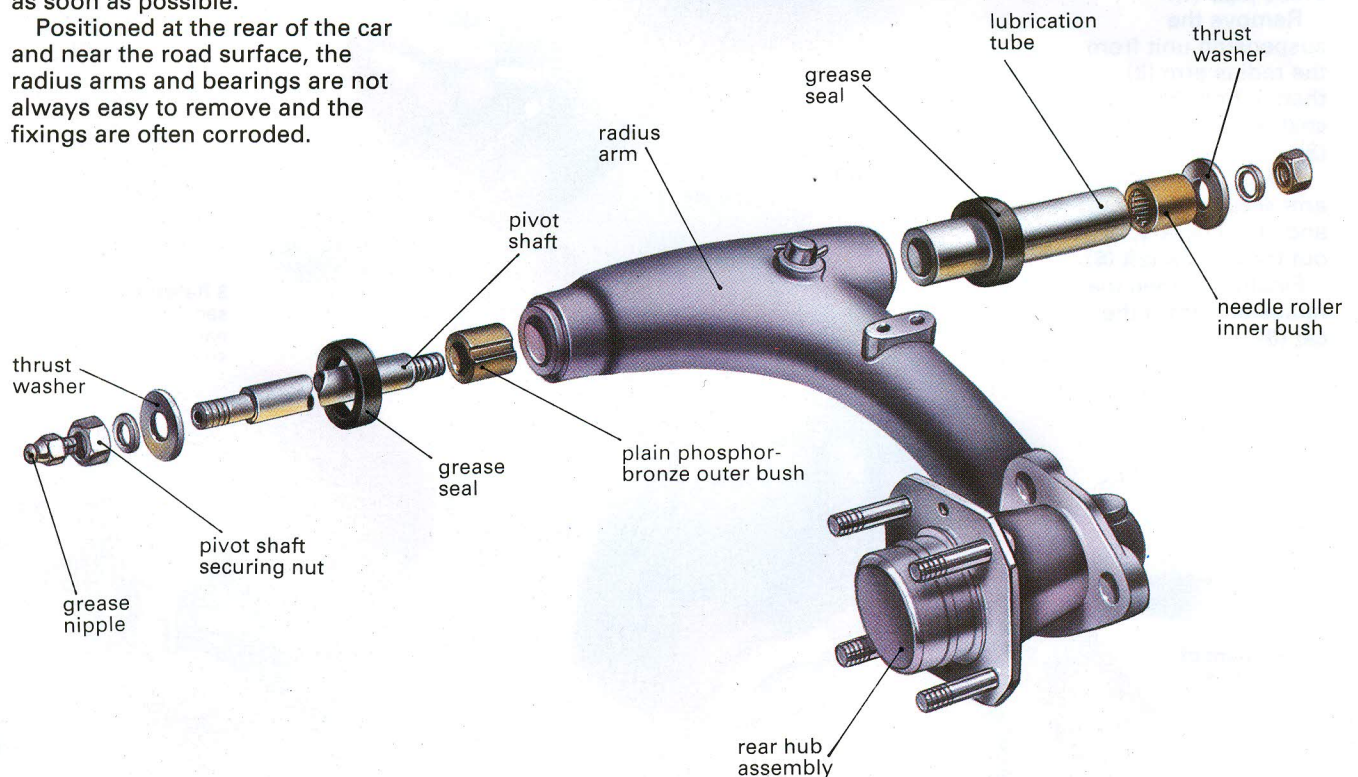
## Tools and materials

- Spanners
- Screwdrivers
- Hose clamp or self-locking pliers
- Jack and axle stands
- Drift
- Hammer
- Hacksaw
- Grease gun
- Reamer
- New bushes, bearings and pivot shaft as necessary

## Arm assembly

The radius arm bearings are vital for proper handling of the car. If you detect wear they must be replaced as soon as possible.

Positioned at the rear of the car and near the road surface, the radius arms and bearings are not always easy to remove and the fixings are often corroded.



## Rubber bushes

Some radius arm bushes are made of rubber and mounted only one end of the pivot assembly, the other end being connected to a reaction lever which in turn is connected to a pivot joint – such as on the Austin Maxi.

The radius arm still has to be removed to change the bearing, and the bearing also has to be drifted off and on the radius arm – but it is a much simpler operation to change this bearing because it is situated on the outside of the arm, rather than inside it.

they do not interfere with the removal of the radius arm. Support the radius arm at a convenient height using a jack, then remove the road wheel.

Disconnect the handbrake cable from the operating lever at the rear of the brake plate. This cable is usually held on with a clevis pin secured by a split pin or a small nut and bolt.

If the cable runs through a quadrant attached to the radius arm – such as on a Mini – bend back the sides of the guide channel in the quadrant using a screwdriver. This will give you enough room to pull the cable out.

The cable should now be completely disconnected from the radius arm. Where necessary – again, as on the Mini – remove the damper unit from the radius arm.

As removing the radius arm involves removing the hub and braking assembly at the same time, the

brake pipe will have to be disconnected from the radius arm.

## Brake connection

The brake pipe connects between the body and the radius arm via a flexible hose section. Use a special brake hose clamp, or a pair of adjustable locking pliers with a piece of card inserted in the jaws for protection, and clamp the hose in order to prevent excessive brake fluid loss.

Undo the hose union which connects the pipe running from the wheel cylinder to the flexible hose and then, without exerting undue pressure, move the rigid pipe so that you can use a ring spanner to undo the flexible hose retaining nut. Leave the flexible hose clamped until after reassembly.

The suspension units have to be disconnected from the radius arm before it can be removed from the rear sub-frame.

## Removing the arm

Jack up the car and support it on axle stands. Disconnect the handbrake cable and brake pipe (1).

Remove the suspension unit from the radius arm (2), then unbolt the pivot shaft securing nuts (3).

Release the radius arm securing bolts (4) and, if necessary, drift out the pivot shaft (5).

Finally, remove the radius arm from the car (6).

1 Release the brake pipe locknut at the support bracket.

brake hose

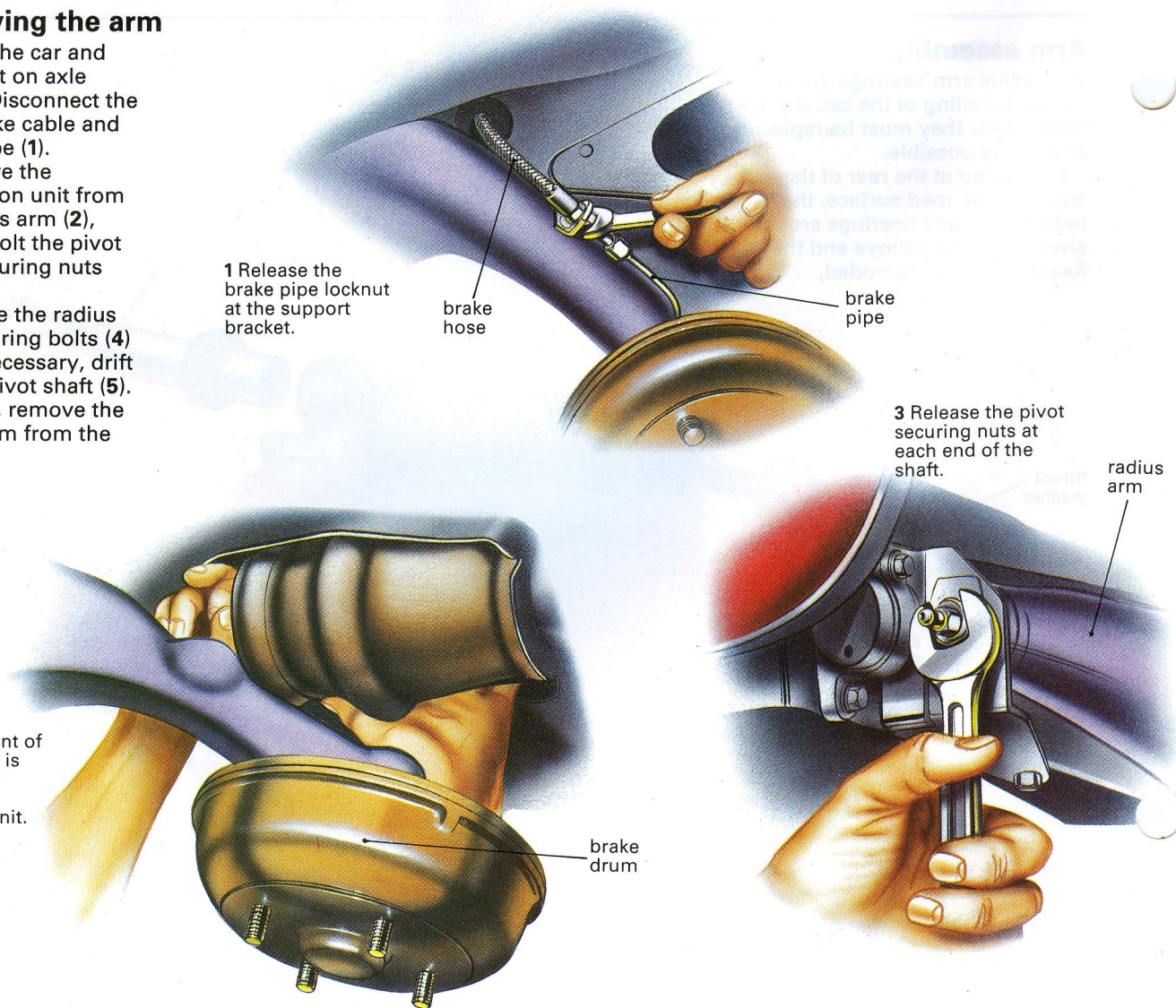
brake pipe

3 Release the pivot securing nuts at each end of the shaft.

radius arm

2 A fair amount of manoeuvring is necessary to remove the suspension unit.

brake drum



## Suspension

Where Hydragas or Hydrolastic units are fitted, remove their securing bolts or straps first. Where there is a pipe connection to the suspension unit, release it and carefully bend the pipe out of the way. Carefully pull the Hydragas or Hydrolastic unit from its seating in the radius arm and remove it completely from the car.

On dry suspension systems – such as the Mini's – disconnect the cone and strut assembly from its knuckle in the radius arm (see *Expert 55* and *56*). If necessary, lower the radius arm slightly to allow the knuckle to be withdrawn.

The radius arm mounting details vary from model to model but basically consist of a mounting bracket at

the outer end of the radius arm with the main pivot secured directly to the sub-frame at the inner end.

## Removing the arm

If necessary, remove the small covering plate or rubber bung to reveal the outer radius arm fixings. Now slacken and remove the inner pivot shaft securing nut along with its washer. Then remove the outer pivot shaft nut and washer in the same manner.

Identify the bolts securing the radius arm retaining plate to the sub-frame and remove them. Some of these may be quite hard to get at – you may need a socket and extension bar to reach them.

Where possible, lift the retaining plate away from the sub-frame. The

## Reaming

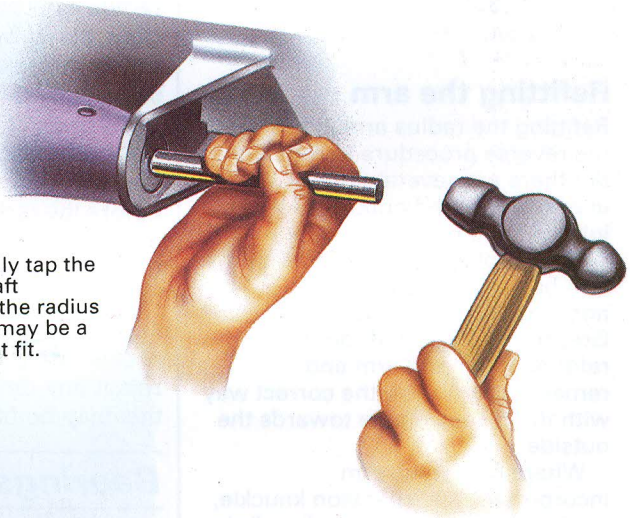
New bronze bushes often require reaming, after they have been fitted, to match the exact size of the pivot shaft.

Reamers are expensive precision tools which are inserted into the bush and turned to increase its internal diameter by cutting into the bronze. The cost of such a tool for a possible one-off job would be prohibitive.

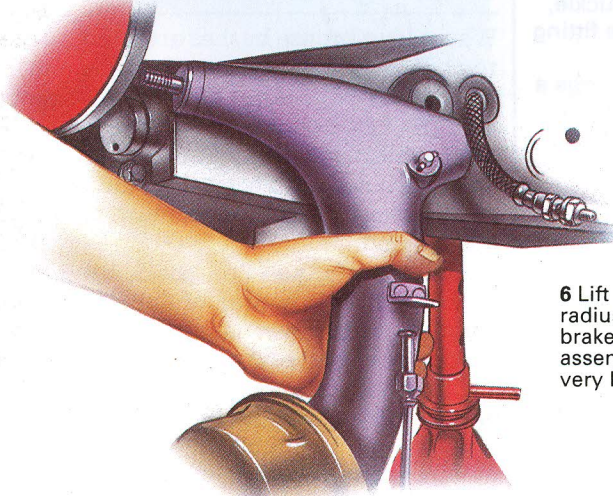
Ask at your local dealers if it is possible to borrow or hire one for a day. Failing this, a hire shop may be able to supply one. If this is possible ask your dealer or refer to your workshop manual for the correct size of reamer you need.



4 Use a socket spanner to reach inaccessible bolts – soak the bolts in penetrating oil before you start.



5 Carefully tap the pivot shaft through the radius arm – it may be a very tight fit.



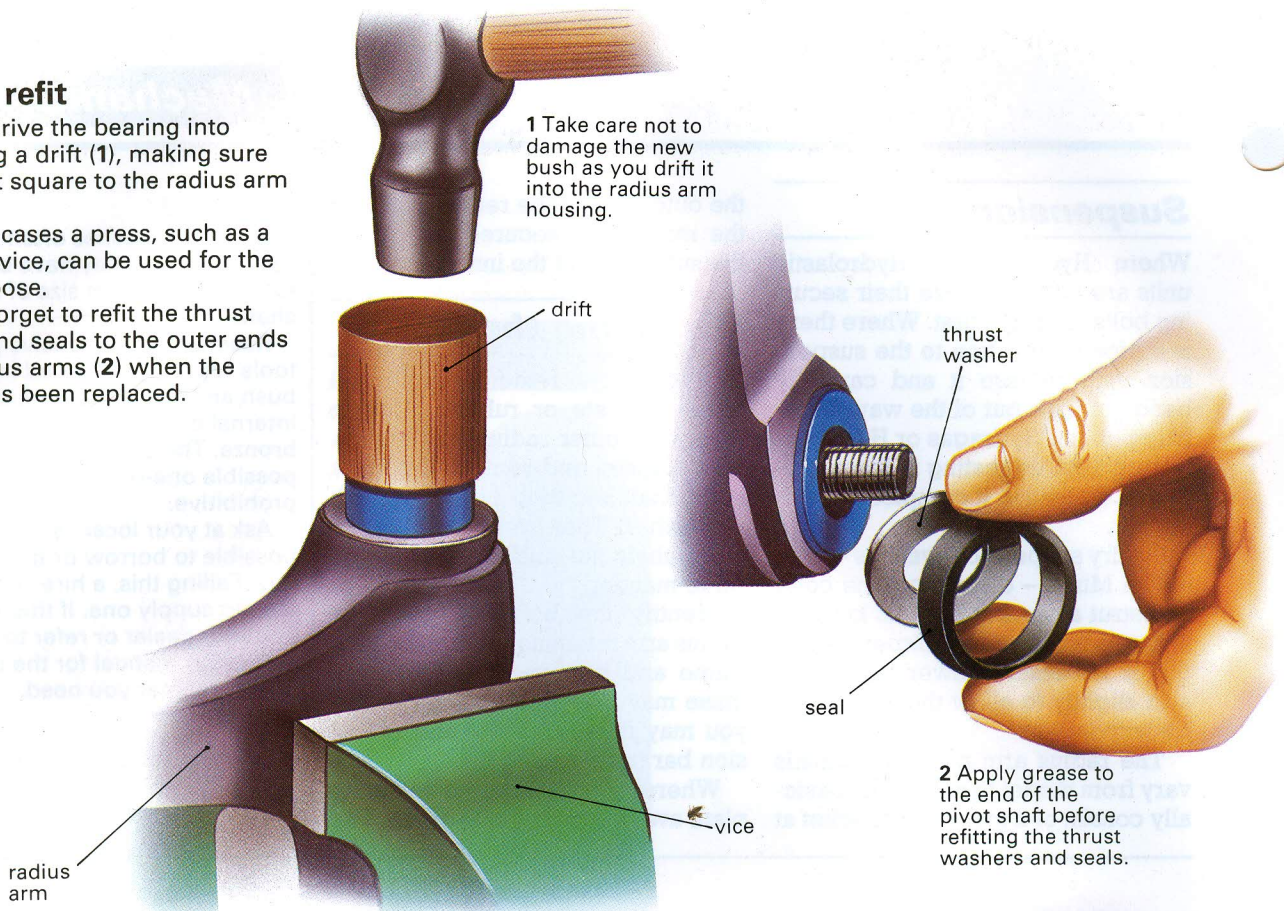
6 Lift out the radius arm and brake hub assembly – it is very heavy.

## Bearing refit

Carefully drive the bearing into place using a drift (1), making sure you keep it square to the radius arm housing.

In some cases a press, such as a workshop vice, can be used for the same purpose.

Do not forget to refit the thrust washers and seals to the outer ends of the radius arms (2) when the bearing has been replaced.



1 Take care not to damage the new bush as you drift it into the radius arm housing.

2 Apply grease to the end of the pivot shaft before refitting the thrust washers and seals.

## Refitting the arm

Refitting the radius arm is basically the reverse procedure to removal but there are several points to bear in mind. Take the opportunity to lubricate the handbrake quadrant (where applicable) before fitting the arm back to the car; they are notorious for seizing up solid. Grease the pivot shaft before refitting it into the arm and remember to fit it in the correct way with the grease nipple towards the outside.

Where the radius arm incorporates a suspension knuckle, apply fresh grease to it before fitting the suspension unit back into position. Always give the bearings a good application of grease from a grease gun before driving on the new bearings or bushes.

radius arm can now be withdrawn from the sub-frame, but take care not to lose any thrust washers or seals that are fitted at the inner and outer ends of the arm.

On other arrangements it is necessary for you to remove the pivot shaft before the radius arm can be disconnected from the sub-frame. Where this is the case, carefully tap out the shaft using a suitably-sized soft drift and a hammer. Now remove the radius arm, again taking care to retain any thrust washers and seals that may be fitted.

## Bearings and bushes

Where long bronze bushes are fitted removal can be quite tricky as a special tool is needed to deal with this. You can use a hacksaw to carefully cut through and pull them out. Take care not to damage the radius arm housing if you have to resort to this method.

Alternatively, you can knock the bushes out with a drift of suitable length and diameter inserted from the opposite end of the arm.

Other bearing types, such as needle rollers, can also be removed

with a drift. If removing the bearings proves too difficult, take the radius arm along to your main dealer who will remove them for you for a small charge.

## Replacement

Before replacing the bearings, examine the pivot shaft itself. If it is badly scored, you must replace it at the same time.

Bronze bushes must be pressed into position on the radius arm and, because they are brittle, they must be positioned very accurately before you push them into position. The bronze bushes may also require reaming to size before the pivot shaft is fitted back into its place (see sideline overleaf).

Needle roller bearings can simply be tapped into place, but take care not to push them too far into the radius arm. The precise distance should be given in your car's workshop manual.

Once the new bushes or bearings are fitted in place the radius arm is ready for reassembly (see sideline left). Check the condition of the brake pipes before fitting them.