

## CUTTING and FITTING GASKETS

GEOMETER gives some advice on an operation which is needed in the workshop from ti

**J**OINTING MATERIAL in sheets permits the cutting of various types of washers and gaskets which are unobtainable or not to hand when required. Not so many years ago, in fact, it was common practice to do this, except in the case of car cylinder head joints. Nowadays, there are gasket sets, but they do not necessarily contain all joints, and on occasion it is necessary to cut one's own.

Ordinary thick note paper or brown paper is suitable in many instances, apart from the available special materials-toughened papers, fibre, cork sheeting and-to resist heat-asbestos-base sheeting such as Hallite.

### Holes and perimeters

First thing with sheeting, having obtained a piece of suitable size, is to mark the shape of the joint, which is best done on the component containing the holes, not on that with the studs. The material is held flat on the face, or a piece of board is placed on top one end. If the material is thin, pressure of the fingers will reveal the position of holes, but if thick so finger pressure is inadequate, a small hammer is necessary-one with a flat and a ball end.

On a small joint, all holes and the perimeter can be marked, and the sheeting removed for cutting. On a complicated joint, two opposite holes can be marked, these punched, then the material located with bolts, while the remainder of the holes are marked. Where there is a spigot or protruding diameter, the sheeting is marked and cut first to locate on it.

There are various ways of cutting holes. For small ones? from about 3/32 in., there is the plier-punch, A, producing six different sizes. Tubular punches, B, can be bought in all standard sizes, or made from steel pipe or rod-by drilling the centre. They can be chamfered on a grinding

wheel to keep sharp. The punching block can be hardwood on the end grain, or a lump of cast lead-kept flat by hammering. In cutting round washers, the bores must be punched, then the outsides; if done the other way, they often split. Large holes can be cut with the compass-type cutter, C, this having a blade or sharp disc set to required radius from a rule. The material should be on a flat board, and the spike of the tool well pressed in.

Subject to there being no damage to components, holes can be cut in thin material using the ball end of the hammer, and outside perimeters with the flat, D. If the material is thick, it is depressed at the end, made ragged or broken, so punching is advisable.

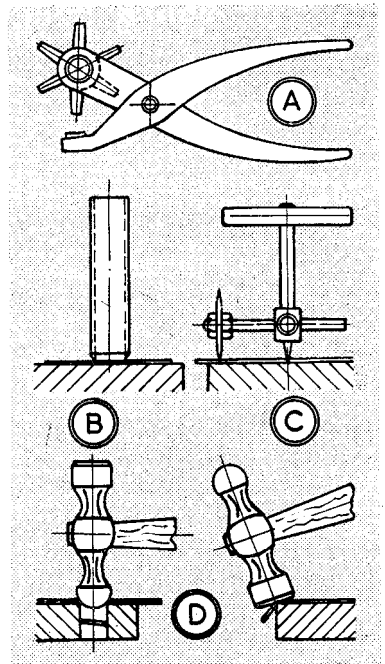
### Cutting and securing

The inside perimeter of narrow joints should be cut first, and often the outside can be trimmed when the components are assembled, using a sharp knife or scraper. Thin material can be cut with straight and curved-blade scissors, thick material with flat and half-round wood chisels on a board or block.

Where dismantling without difficulty is necessary, joints may be fitted dry or lightly oiled. If there is the possibility of leakage, jointing compound should be used, but on manifolds where there is heat, jointing compound should not be used. On cylinder head gaskets, jointing compound is used, or ordinary grease-this helping the joint to slip during tightening.

In assembling, it is very important to employ a suitable order of nut tightening, and to tighten gradually which means going over the nuts in the given order, tightening each a little at a time until secure.

The general principle is to provide balanced tightening, or on stud joints like car cylinder heads to tighten from the centre outwards.  $\square$



Above: Tools used in cutting gaskets

Below: E and F are typical four-stud and six-stud joints. G, side valve motorcycle cylinder head and H, small car cylinder head

