

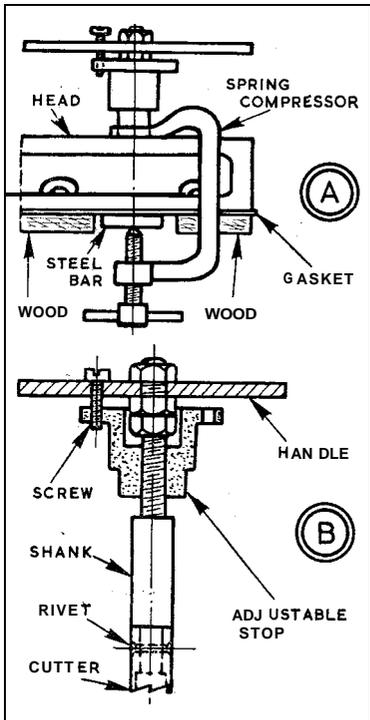
Cutting special gaskets

By GEOMETER

WITH a car which is old, of unusual make, or which was originally made only in small numbers, it is sometimes necessary to renew a damaged cylinder head gasket, and it may happen that no gasket is available commercially. The same difficulty arises if it is desired slightly to raise compression on some engines without taking the irrevocable step of machining the cylinder head, when a special thin gasket is not available.

A temporary replacement, a sort of "get-you-home" solution, can be provided by a gasket cut from a sheet of thin Hallite. Using a ball-ended hammer, hole positions, waterways, combustion chambers, can be marked on the sheet which is laid on the cylinder head. Cutting out is done with punches and wood chisels on a block. The head should be well pulled down on assembly and again when the engine has warmed up.

On an engine of modest compression



ratio, and which is not driven hard, such a gasket can have a life of a few hundred miles or even one or two thousand miles; but in most cases, it eventually burns or blows through between two cylinders-for it is without the copper sheathing which protects the asbestos interior of the normal gasket.

Copper gasket

A much better gasket, whether needed because no other is available, or for modest tuning, can be made from sheet copper, 1/32 in. to 3/64 in. thick. With this there are problems of production, for punching and hammering, which are likely to distort, stretch or thin the sheeting locally, cannot be safely employed, and drilling of any but small holes is risky.

In making such a gasket, experience suggests that the holes for holding bolts or studs should be produced by a hand-operated cutter, rather than by drilling. The other openings should be marked and cut with a saw file, or made by careful small-hole chain-drilling and filed to templates.

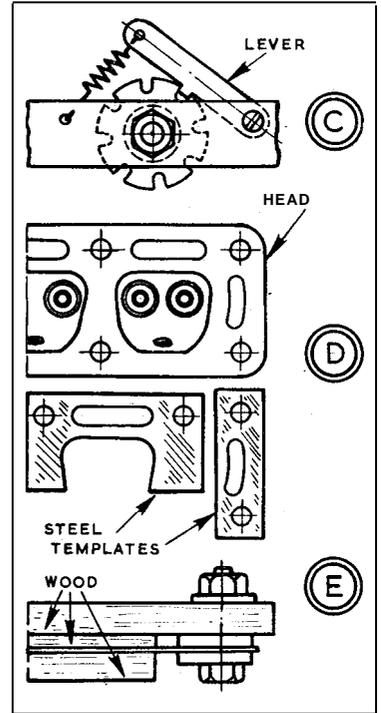
The set-up for producing the holes can be as at A, using a cutter as at B. The copper sheeting for the gasket, slightly larger than the head all round, should be clamped firmly to it with wood. Where the holes are to be cut, the backing should be a flat steel bar held by clamps and a valve spring compressor. This last has a forked end, so the end of the adjustable stop on the cutter can abut to the cylinder head.

Silver steel cutter

When two or three holes covered by the steel bar have been cut, it can be moved (together with the wood); but burrs left by the cutting tool should be filed off, and cut marks arranged so as not to come immediately under other holes.

The silver steel cutter, turned to enter the head holes, should be drilled for the shank and bored at the end to about 3/64 in. wall thickness. Three or four teeth can be filed, and a cross-hole drilled and countersunk for a rivet. Tempering should be to dark straw colour after hardening. Shank and handle should have a fine thread to secure by locknuts.

If the thread is 26 t.p.i. (cycle rate), the advance per turn is 0.038 in.;



and eight holes in the flange of the stop provide adjustment steps for successive cuts of just under 0.005 in.: which is about correct. Thus, a cut can be taken, the stop re-set, and another taken. Faster adjustment than by a screw in the flange of the stop is given by a spring-loaded lever, as at C, where the index holes are cut out to the edge.

As holes are made, the wood can be drilled and bolts used for holding. When all holes are finished, a thick cartridge-paper pattern, marked on the head and carefully cut, can be placed on the gasket, and waterways and combustion chambers marked. With a wood backing the size of the gasket-and the two bolted together-these shapes can be saw filed from starting holes.

Alternatively, steel part-templates locating from holes, as at D, can be made for chain-drilling and filing. Preferably, there should be a template bolted each side of the gasket which should be on a wood backing with packing wood of suitable thickness, as at E.