

## TESTING and FACING VALVES

**D**EPENDING ON EQUIPMENT available and, to some extent, on the condition of the valves themselves, there are various ways by which they can be tested and faced during de-carbonising or overhaul of an engine-aspects of reconditioning not dealt with in previous articles.

The problem, of course, can be dodged completely by fitting new valves and, where the old are obviously bad or doubtful, this is the best way. Alternatively-a method which works well where valve stems and guides are in good condition-a spare set of valves can be kept, faced up between-whiles by a firm, to be ready to grind in on the next occasion.

### Wear and wobble tests

Necessary or expedient as such methods may be, however, they cannot cover all cases, particularly those in which, for some reason or other, emphasis must be on individual resourcefulness.

Drawn from its guide, the appear-

ance of a valve stem reveals where it has rubbed. With a micrometer the extent of wear can be checked by reference to diameters where contact has not occurred. Diagram A X-XI, Y-Y1 shows a difference of 0.004 in. to 0.005 in. which is acceptable. Ordinarily, wear is reasonably general or round one side, though when a rocker is the means of operation, or a spring has been wrongly fitted-imparting side thrust-the wear may be as A, diagonal. When fairly considerable it can be felt with a finger or nail, or seen by using a caliper.

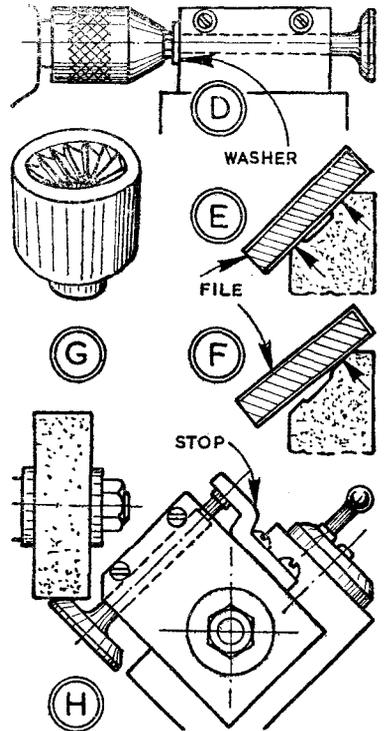
With the valve in its guide, a test for wear should be made with the face clear of the seating at approximately mid-lift, where play will be most noticeable. On a side-valve engine, the cam can be situated for the valve to be raised by the tappet and the head moved sideways, B.

Rotating the valve in its guide reveals wobble arising from bending close to the head, or eccentricity from incorrect machining-though it is necessary to distinguish this from the play occurring from slackness in the guide. If an indicator is available it can be fixed with its plunger touching the side of the valve head to show extent of wear and wobble. Laid in V-blocks C the stem of a valve is checked for bending, and with the head against a stop (a heavy block), the face is checked-both tests employing an indicator if available.

### Methods of facing

On a valve facing machine, the stem is held in collets and the face rotated against that of a grinding wheel. On a lathe, the stem is gripped in the chuck and a single-point tool used on the angled top-slide. With a lathe, support is given by the tailstock centre-if that in the valve head is true. If not, a centred flat metal disc should be used on the tailstock centre, pressed to the valve head with a rubber disc interposed. This gives support and prevents vibration.

Using a lathe, or jig and medium speed drilling machine, preferably electric (with assistance), a valve face in reasonably good condition can be trued by filing, employing medium-cut and fine files, with firm slow



strokes, finally polishing the face with fine emery cloth on the file.

A block of light alloy or hardwood, drilled for the stem, split and provided with clamping screws, permits mounting in the vice D, a washer interposed for location. The file should be applied with flat contact E, not on one edge F. Bright marks reveal how contact is made and metal removed. A cutter G enables facing by hand. A guide locates the valve stem which is gripped in soft jaws in the vice, then the tool rotated. One tool covers a range of valve heads and interchangeable guides take stems of different diameter.

Fitting a stop to the jig D and mounting on the angled top-slide of a lathe, valves can be trued running a grinding wheel on a mandrel in the chuck, using the highest possible speed, putting on cut from the top-slide, and turning the valve with a screwdriver or pin tool H. □

