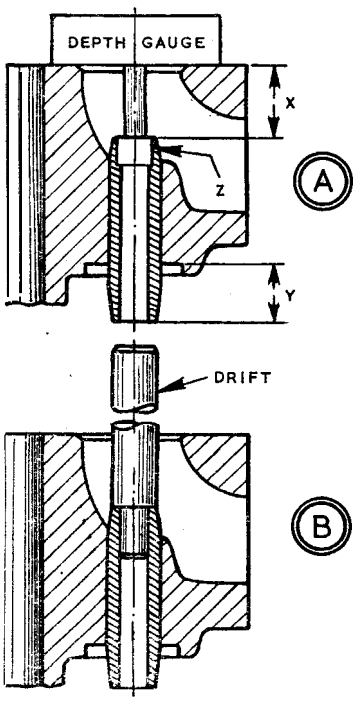
WORKSHOP HINTS and TIPS

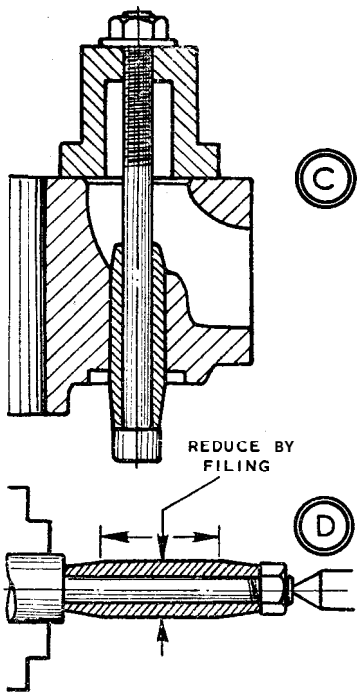
VALVE GUIDES

By GEOMETER

THOUGH valve guides may seem to be components of minor importance by comparison with others in four-stroke i.c. engines, their condition can nevertheless have a considerable influence on performance-when this is interpreted in terms of smooth, quiet running, lengthy periods between servicing, and moderate oil consumption. Of course not all faults attributable to valve guides are to be found in one engine, and not all arise directly with the guides. Engine types and valve gear types have effects, as also have materials and lubricants.

As a generalisation the guides of side valve engines are the most durable, usually being the longest and containing valves which receive a straight push from tappets. The guides of single cylinder o.h.v. engines are the least durable, their length restricted in layout, and carrying valves receiving a substantial side thrust from rockers moving through small arcs. For given capacity and r.p.m., side valve engines require springs less strong than o.h.v. types, there being less weight to deal with in the operating gear.





Typical faults arising with worn guides are oil leakage in the case of o.h.v. engines (this alone, or in the absence of correctly fitted seals, causing a heavy oil consumption), and rolling of the seals when valves do not seat squarely. This in turn, can lead to wide and badly shaped seats, and may help towards burning of valves in engines driven hard. Alternatively, or in addition, there may be considerable noise and carbon formation on valve stems and in the ends of the guides in the ports.

Normal valve guides are of two types-with or without a locating flange, this excluding the special Ford type split longitudinally, which has a flange. When there is a locating flange, it is always on the spring side of the guide, away from the port, and there is no doubt as to the direction in which such guides must be removed, or to what position the new ones must be brought. The situation is obvious from the supplied replacements; or if old guides are to be used as patterns for replacements, it can be ascertained by using a mirror and flashlight in the valve spring chamber of an engine still in the chassis.

For guides without flanges, there is the possibility of removing in either direction and also of locating at positions other than the original. Condition, shape and fitting of guides may provide information as to removal. Position can be checked with a depth gauge, as at ***A,*** depth in the port x, or distance from the end of the guide to the spring seat Y, any difference there may be in fitting between inlet and exhaust guides being noted.

As to condition,. if the end of the guide in the port is burnt or scaled, it can be seen to offer resistance in removing towards the spring side. Ordinary carbon can be scraped off, of course. In the case of some exhaust guides, there may be relief or counterboring at the top end Z, so making the end faces thinner and more likely to break or burr if guides are tight. Scraping in their tops or using a suitable drill, can reveal this feature if it is choked with carbon.

A depth check can also be made on side valve engines to discover if the tappet screws need removing. Separate tappet blocks as on some engines, can be taken out.

Subject to such conditions, guides may be driven out towards the spring side with a stepped steel drift, as at ***B*** (fairly common for o.h.v. engines) or drawn towards the port side., as at C (frequently employed for side valve engines), when the bolt may have a circular nut instead of a shoulder.

New guides may be fitted similarly, but check for size against old ones individually. If an old guide is tight, a new one should not be larger; and may be brought to size, as at ***D,*** by mounting on a mandrel in the lathe, and reducing its diameter carefully with a Swiss file and micrometer checks.