

IN THE VAUXHALL WORKS

POINTS OF INTEREST IN THE CONSTRUCTION OF A HIGH-GRADE CAR

IN the Vauxhall works the ideal aimed at is to make every possible economy that machinery offers, so long as the high standard of quality and finish set by the Company's policy does not suffer. It follows from this that the methods employed do not profess to be always the most rapid, nor the least costly in human effort. A more rapid or less expensive method cannot be entertained, if its result would be to lower the traditional Vauxhall standard.

In particular, freedom is preserved for giving early effect to advances in design, which are always put into the car with the least delay, thus keeping it abreast with the progress of automobile engineering, to the advantage of the user.

AIDS TO PERFECTION

A HIGH-GRADE chassis is considered by the Vauxhall Company as an individual piece of work on which the maximum skilled attention must be bestowed. Its construction is far from being merely a matter of machining operations. Before the road-testing stage is reached, many aids to perfection are called into service. Visitors to the Vauxhall works are always impressed by the thought and care given to perfecting the product.

Some of the measures thus taken to ensure the highest refinement of functioning may be instanced.

For every engine a set of connecting-rods, of exactly the same weight each, is made up; this is done by selection and by milling away small portions of metal.

Similarly, the perfect running balance of each finished crankshaft is assured. A new type of machine is employed for this purpose.

The crankshaft is rigidly fastened to a light cradle of aluminium, one end of which is

free to move and the other fixed. Being as yet out of balance, the crankshaft, when set in motion, oscillates at a certain speed, and the cradle repeats this oscillation at its free end. By means of a needle the extent of the oscillation and the angular location of the disturbing mass are registered. This operation is carried out at both ends of the crankshaft, which is then corrected for balance by milling off a little metal in accordance with the data obtained.

BALANCING OPERATIONS

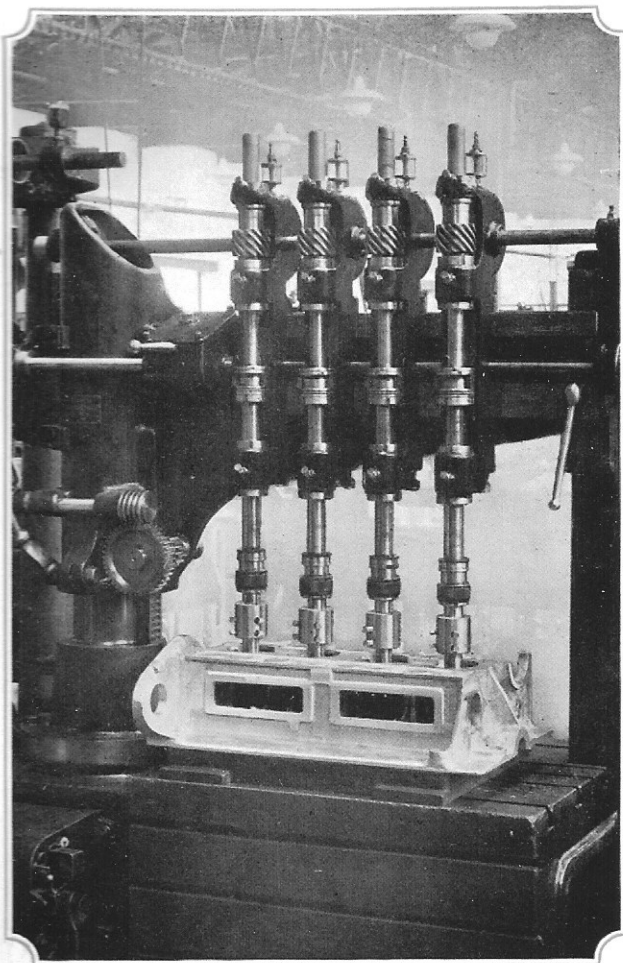
OTHER components of the engine, such as the connecting-rods, the clutch and the fly-wheel are also subjected to balancing tests of various kinds, there being a special department in which these operations are carried out. In view of the high speeds at which modern engines are required to run, the importance of making a careful study of the influence of exact balance will be appreciated.

Every assembly of crankshaft, connecting rods and pistons is carefully aligned before it becomes part of the complete engine. Owing to the multiplicity of pieces and dimensions in such an assembly, it is possible for the aggregate effect of minute errors to be considerable from the standpoint of the maker of a high-grade chassis. Complete accuracy is ensured by the alignment check.

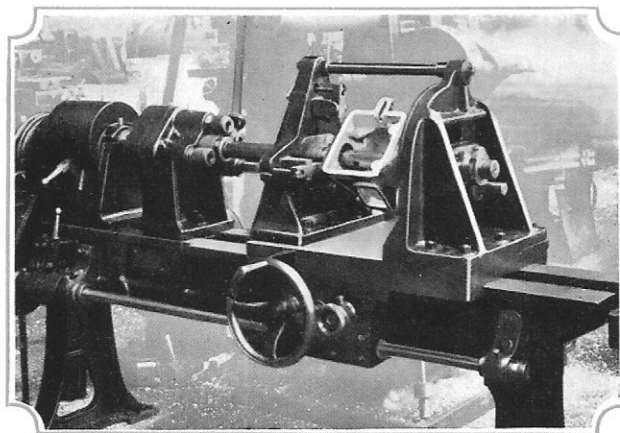
SILENCE TESTS

IN addition to the earlier tests undergone by bevels and gear wheels, the complete back-axes and gear-boxes are tested both for silence and manipulation, before being built into the chassis. There is a silence test for the harmonic balancing gear. Lastly, there is the thorough running test which the

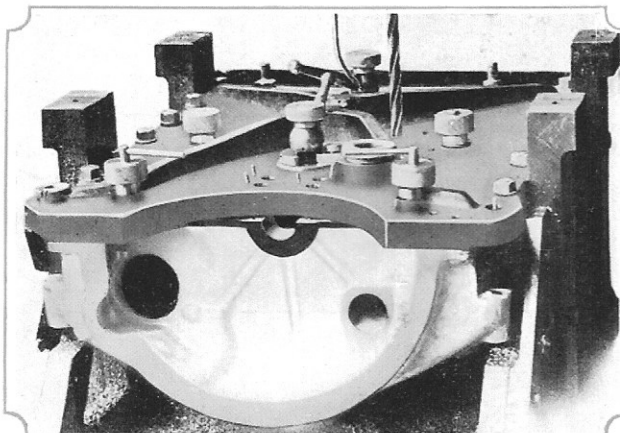
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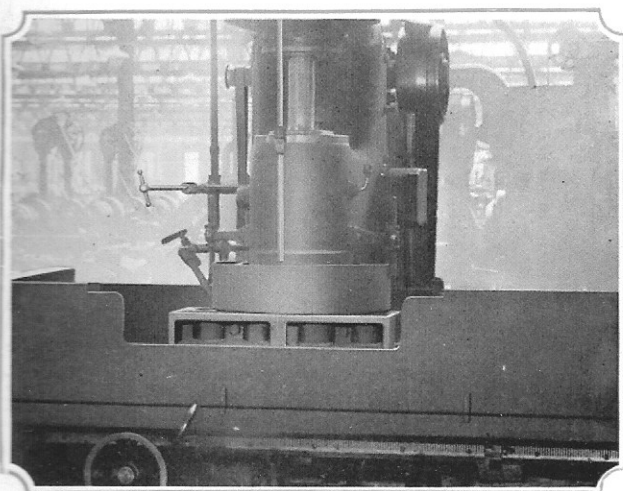
FOUR-SPINDLE DRILLING MACHINE An example of a machine designed and made in the Vauxhall works. The heads being movable it can be used for a variety of heavy drilling work.



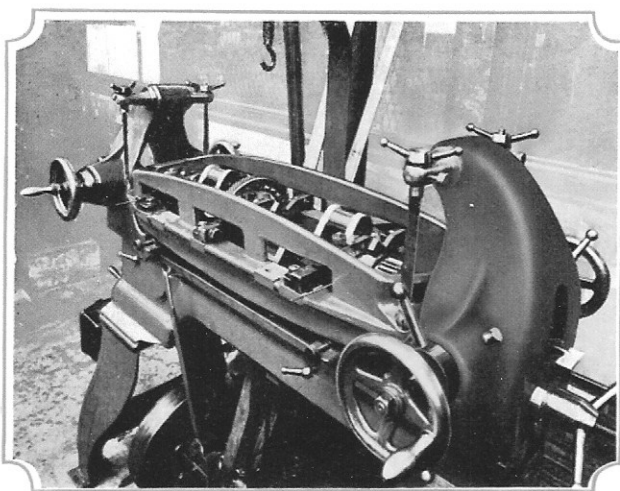
GEAR-BOX BORING MACHINE An example of a single-purpose machine of high precision and rapidity. The gear-box is of the 14-40 h.p. model.



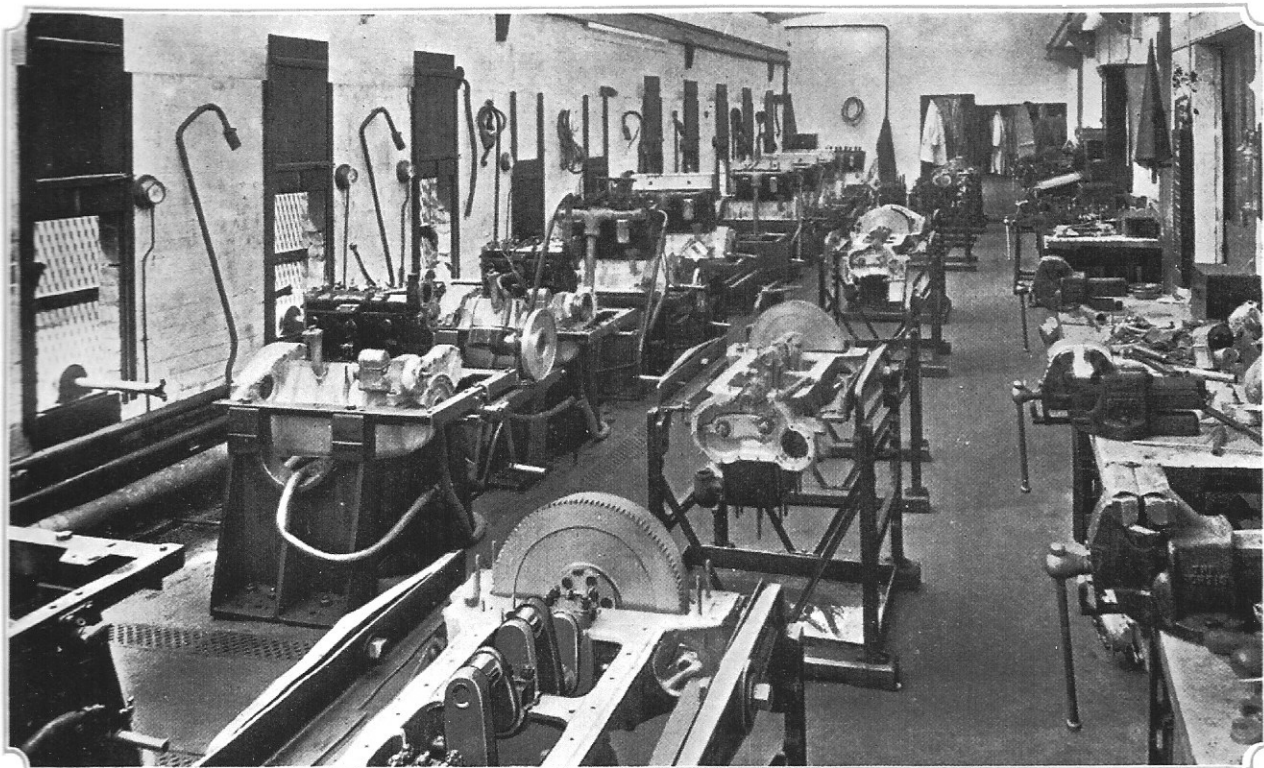
CRANKCASE DRILLING The function of a jig, as a means of securing perfect accuracy in repeated mechanical operations, is well exemplified in this picture.



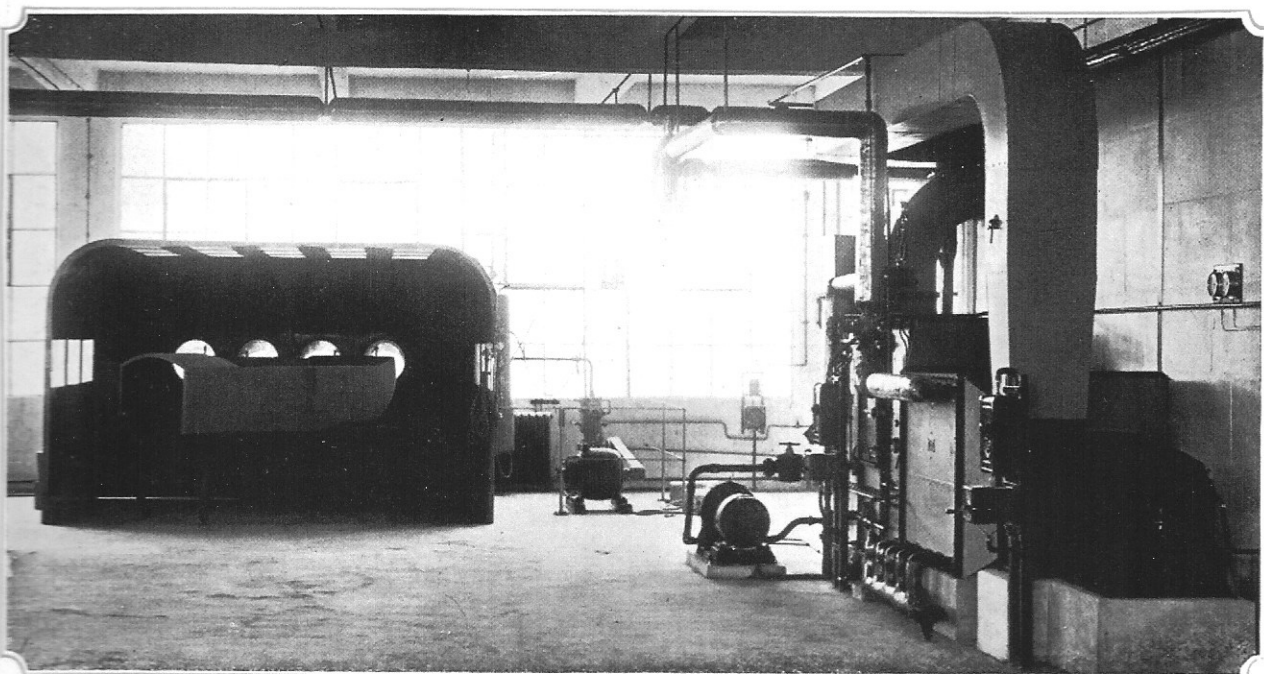
CYLINDER BLOCK GRINDING A new machine for grinding cylinder faces from the rough.



CRANKSHAFT BALANCING A new type of machine for putting crankshafts into balance.



ENGINE TESTING ROOM Every engine undergoes a thorough running test on the bench. This test is followed by dismantlement for examination



BODY-BUILDING Left : One of the fumexers for paint-spraying. Right : One of the Carrier plants for controlling air temperature and humidity

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complete engine undergoes, each engine after this test being taken to pieces and examined. The finished chassis is, of course, tested on the road, but there is also available an auxiliary indoor test, which provides for any last-moment contingency that may arise. This is the complete chassis-testing equipment, on which a chassis or car can be placed and tested in all its functions (except steering) under conditions that permit of convenient observation. It is thus possible to test a highly-finished car, even when the weather conditions, or the promised delivery date, may render it impracticable to carry out a further road test.

In each of the three Vauxhall models there are several thousand different machine operations. Practically every operation is governed by jigs and controlled by inspection gauge, ensuring interchangeability and the highest accuracy. Single-purpose machines are employed wherever it is possible to do so, without retarding the adoption of advances made in design.

BODY-BUILDING

In body-building the same broad principles are observed as those which regulate chassis production. Machinery is used wherever it can be without losing the desirable features of hand work. The bodies built

are for the Vauxhall open cars ('Kingston,' 'Princeton,' 'Velox,' 'Melton,' 'Wensum'), and for the 'Norfolk' saloon, a closed body of special design which is produced in relatively large numbers.

The closed bodies illustrated in this catalogue are built by leading coachmakers having special experience in constructing closed bodies for the Vauxhall chassis. The designs and specifications are always carefully considered beforehand by the Vauxhall Company.

FLEXIBLE BODY-MOUNTING

ALL the bodies manufactured by the Vauxhall Company are flexibly mounted to prevent creaking and rattling; that is, rubber pads are interposed between the chassis frame and the body; and the scuttle-dash (the forepart of the body) is not rigidly bolted to the dashboard, the latter being regarded as a part of the chassis, but rests on rubber supports. The gap between the scuttle and the dashboard is filled with a neat leather packing.

Just as the workmanship of every Vauxhall car is of the highest quality and finish, so the materials employed, thanks to an extremely well-equipped laboratory, in which is carried on research and investigation work of the greatest value, are the best that are known to automobile engineering science.

<i>Part</i>	<i>Particulars of Materials</i>	<i>Ultimate stress—tons per sq. inch (Approx.)</i>	<i>Elastic limit—tons per sq. inch (Approx.)</i>	<i>Elongation on 2 inches per cent. (Approx.)</i>
Crankshaft - - - -	Chrome steel - - - - -	50	40	20
Gear shafts, propeller shafts and axles	Nickel steel - - - - -	40	28	25
Gear wheels - - - -	Air-hardening nickel chrome steel - -	100	90	14
Front axles - - - -	Best axle steel - - - - -	45	28	25
Stub axles - - - -	Nickel chrome steel - - - - -	55	45	20
Crankshaft bearings - -	White metal - - - - -	—	—	—
Bushes generally - - -	Phosphor bronze - - - - -	22	20	3
Connecting rods - - -	Duralumin - - - - -	30	20	23
Crankcase and gearbox -	Alloy of aluminium, zinc and copper - -	13	—	5
Cylinders - - - -	Cast iron - - - - -	—	—	—
Levers - - - -	Mild steel - - - - -	35	25	25