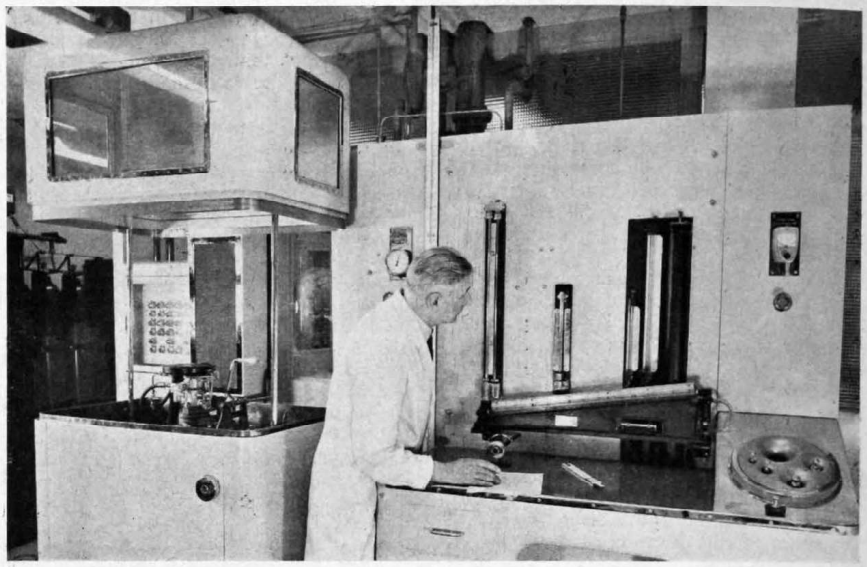
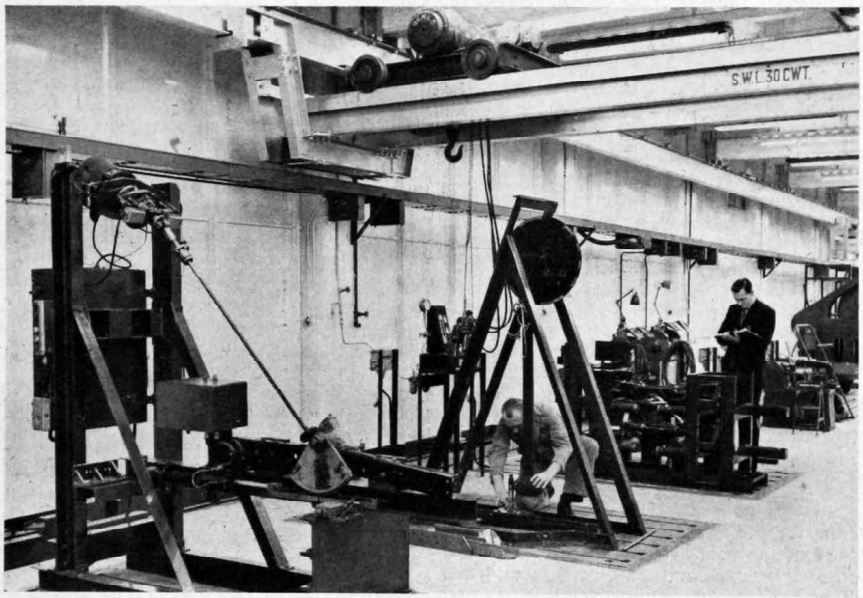
Automobile Engineering Test Facilities

There have been established recently two new extensions of the engineering department of Vauxhall Motors, Ltd., at Luton, a dynamometer building and a component test facility. The new engine test building, which has been designed for extension to include eventually a chassis dynamometer and a vehicle cold room, uses exclusively electric dynamometers supplied from motor/generator sets, and tests simulating exactly the load-speed relationship of road running are conducted under automatic control. We observed an experimental Bedford 300 cubic inch oil engine with an AiResearch turbo-charger running on a 6000 r.p.m. G.E.C. dynamometer with Emery hydraulic torque sensing ; the supercharger speed was monitored by an inductive pick-off detecting the passage of a permanent magnet on the impeller and passing the pulses to a Berkeley timer with direct digital readout.





The new building also includes a fuel injection equipment bay and a temperature-controlled room for carburetter airbox testing ; the continuous flow rig is seen ABOVE. The long-term stability of streamline metering orifices is valuable, as there is no positive displacement rig against which to calibrate them.

The testing of components demands a great variety of rigs, including one which subjects a seat cushion to the effect of two passengers continuously squirming vigorously. The picture, LEFT, shows, nearest the camera, a truck steering box being run backwards and forwards through its travel against the resistance of a power steering ram. Beyond this is an impact test machine, and beyond that a rig on which car steering linkages are being cycled against spring forces to establish the life of the nipple-lubricated ball joints. Further away is a stroking machine, on which a truck fuel tank is being slammed violently backwards and forwards to simulate the stresses set up when, for instance, coupling up a semi-trailer. Nearby are two machines which test road wheels by pressing two wheels, complete with tyres, together and rotating them, the tyres being cooled by a water spray.

A large proportion of the work load is devoted to the testing of electrical equipment. Some of the more life-like looking tests are those of windscreen wipers, which are set to wipe screens wetted only occasionally in order to impose the dry-screen overload condition so dangerous to electric wiper motors. RIGHT can be seen a battery of stop-light switches being cycled by cams ; beyond them ignition-starter switches being tested. Under the bench are a pair of fuel tanks being rocked to and fro to impose irregular movement on the contents gauge floats while water is pumped from one to the other and back. Cigar-lighters are tested on a 5 minute operating cycle, and on the boards in the background batches of traffic signal flashing relays are running. Equivalent to the automatically controlled dynamometer simulating road journeys is a test for engine starting systems which imposes the full cranking torque on the starter motor.