

2. Governing by varying the ratio of fuel to air; quality governing:

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In this system the governor is usually made to act upon the fuel admission valve, so that as the load on the engine decreases the engine receives less and less fuel in the same total charge volume This, of course, decreases the area of the indicator card developed to suit the load. Instead of acting upon the fuel valve, this method of governing has also been carried out by sucking back a certain amount of exhaust gases, thus also decreasing the heat content of the charge. Another way is to regulate the air admission valve, making the fuel valve automatic. All things considered, however, the first mentioned method is the best.

Considered from a thermal standpoint this system has the advantage that, since the total charge volume remains practically the same for all loads, the compression pressure remains constant throughout.

It, therefore, should follow on theoretical grounds that the therefficiency of the cylinder mal should be about the same for all loads. In pracitce, however, it has been clearly shown that this system is inferior at low loads to the next one to be described. In fact, the fuel consumption per horse-power usually increases very rapidly as the load drops. Very rapidity as the load drops. The reason is that, as the fuel-ratio is decreased, the mixture rapidly becomes difficult to ignite, and above all, slow burning. This necessarily increases the heat loss to the jackets and the ignition difficulty may go as far as to pre-vent ignition altogether, causing a direct loss of fuel. In most cases after-burning is clearly recognizable by the low dropping of the expansion line. Designers have tried to overcome this difficulty by placing the time of ignition also under control, making it earlier as the load decreases. The scheme, however, does not appear to have been very successful.

As a method of governing, this system is capable of giving close regulation with the proper weight of fly-wheel. The very fact, however, that the compression pressure does not drop in proportion to the maximum pressure introduces a disturbing factor into the crank effort diagram, which would tend to make the regulation under this system less close at low roads than under System III.

3. Governing by varying the quantity of charge of constant composition to suit the load; quantity governing: Governing by changing the

Governing by changing the quantity of charge to suit the load may be carried out in three ways:

may be carried out in three ways: (a) The engine draws a charge full stroke each time, but a part of the charge, depending upon the load, is forced back into the suction passages, the inlet valve being under governor control.

(b) The incoming charge is completely cut off by the governor at the proper time, the charge expanding behind the piston for the rest of the stroke. This is known as the cut-off method.

(c) The charge is throttled down throughout the entire compression stroke, the governor determining the position of the inlet valves. This is called the throttling method.

Quantity governing in general is, on thermal grounds, open to the objection that the compression pressure decreases with the load, and hence the cylinder efficiency constantly decreases. On the other hand, the mixtures remain readily ignitable down to the friction load, with the result that quantity governing is on the whole more economical than quality governing. The fact, too, that the compression pressure, de-Continued ent issue

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