

### Tractor Spark Plugs.

An automobile runs at full load and speed during only a very small part of its term of service. A tractor engine is running at full load practically all the time. Because of this and the fact that low-grade fuels are largely used in tractor engines, the problem of spark plugs for tractors differs to some extent from that of spark plugs for automobiles.

As a rule, the use of low-grade fuel means higher compression, higher temperature and more dirt and carbon. The last item is made still worse by dust taken in while working during the dry seasons.

It is impossible at the present time to recommend any one type of plug for tractor work. High temperature engines require a plug with an insulator which is exceptionally good electrically, can stand the repeated applications of high heat and at the same time not have enough of the central electrode exposed to cause overheating, which may induce pre-ignition. An oily engine requires a plug having an insulator with unusually long shorting surface at the firing end.

In spite of the great number of different plugs on the market, there are in reality just two types, those with petticoat or open insulators, and those with conical or closed insulators. The former can be recommended for the engines which show a tendency to foul up rapidly while the latter are recommended only in case the extra extension of wire in the petticoat type shows a tendency to cause pre-ignition.

As a rule the tractor owner and operator are safe in using the plug furnished with the machine by the manufacturer. Failure of one or two plugs on any particular machine should not be considered enough cause for a change to another type of plug. A few defective plugs do get out into service from time to time in spite of the utmost vigilance on the part of the plug manufacturer.

Troubles due to spark plugs may be divided into two classes—first, cutout or missing; second, pre-ignition.

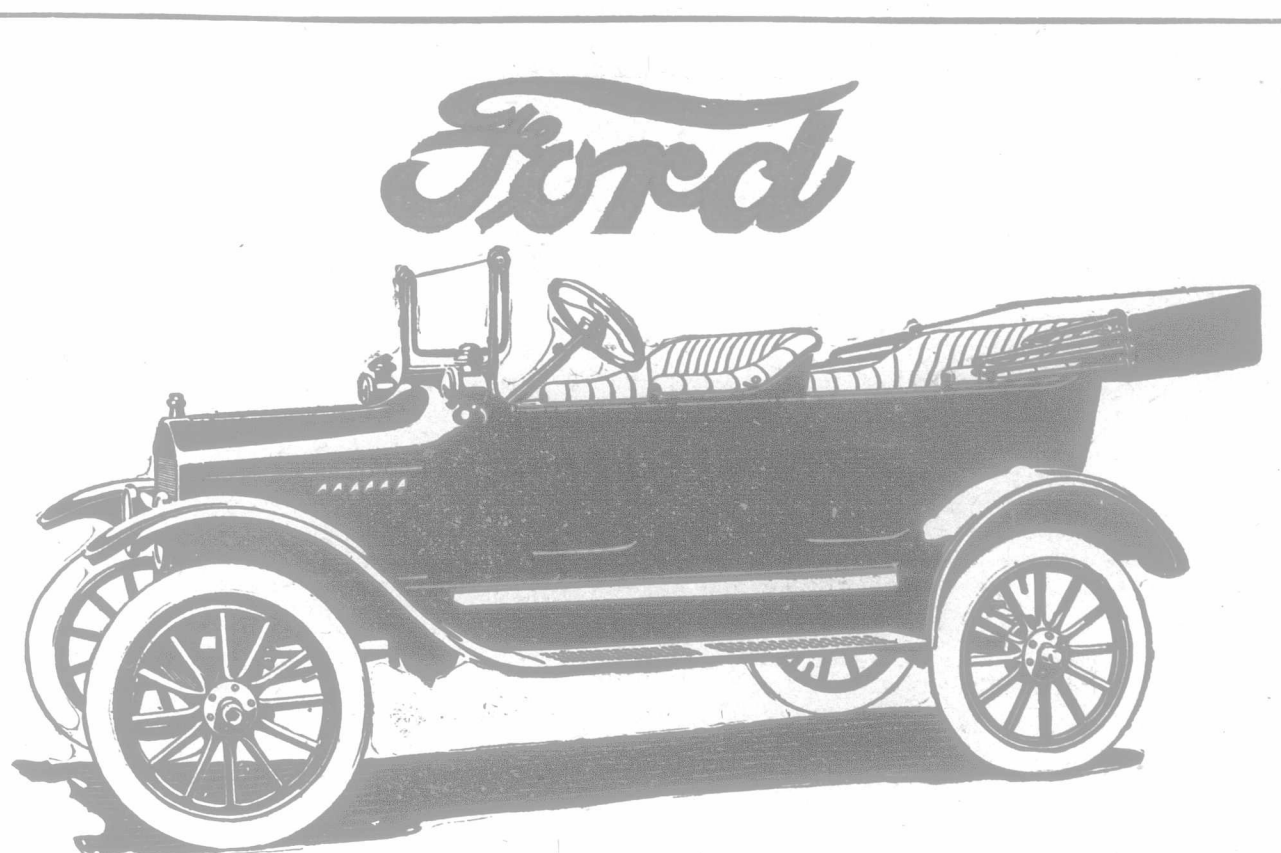
A missing plug can usually be detected by shorting from the upper terminal of the plug to the engine with a screwdriver. The miss may be caused by a broken insulator. If this is the case, the plug will miss fire pretty steadily, both under load and while running idle. The only remedy in case of a two-piece plug is a new insulator, and in case of a one-piece plug a new plug.

The miss may be caused by an insulator which is weak electrically. If this is the case, it will miss when under load, but will recover when running idle. The remedy in this case is a new plug with a better grade of porcelain. In a case of this kind it is not always necessary to get another make of plug, but to specify to the dealer that the very latest insulator is desired.

This miss may be caused by fouling or surface short. By this we mean that a continuous layer of carbon or other conducting material has been deposited on the lower end of the insulator and the spark is travelling through this instead of across the gap. A miss of this kind is usually intermittent for a while and finally the plug stops firing altogether. The immediate remedy is to clean the insulator by taking it out of the shell and cleaning with gasoline and by scraping if necessary. Where plugs show a tendency to foul up in this way very rapidly, especially where a wet, shiny coating of oil is deposited, it is advisable to change to another brand of oil, which in many cases will get rid of most of this trouble.

Pre-ignition may be caused by other things than the plugs. If it is severe it sometimes manifests itself by a splitting back through the intake, but it is always accompanied by a loss of power. What actually happens is this: Some part of the material inside the combustion chamber valves, carbon, plugs, etc., has become hot enough to fire the mixture before time for the spark. The piston is not yet at the top of its compression stroke when the force of this premature explosion tries to drive it back down. The momentum of the flywheel carries it over for a while, but power is of course lost. In case of pre-ignition, the engine should first be examined to see whether there is an excessive accumulation of carbon and whether there are any particles hanging loose on valves or spark plugs.

The plugs should be looked over for rough edges on either wire or shell. If a petticoat plug is being used and no indications of this kind are to be found, it may be advisable to try a conical



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