

SPARK PLUG SIMPLE DEVICE AND RELIABLE IF TREATED WITH CONSIDERATION BY OWNER

Construction and Installation Described by Expert; Hundreds of Designs; Two Important Parts to Every Plug.

The spark plug is simply the means of introducing into the combustion chamber of the engine a spark gap formed between the ends of two wires. The spark jumps this gap, as it does so imparting its heat to the gas mixture, thus exploding it. Simply stated, this is the function of the plug—to explode the mixture by means of the heat of a spark, but at the same time the plug itself must be able to withstand the tremendous heat and pressure inside the cylinder; it must not allow escape of the gas mixture, it must unfailingly transmit current so the gap will be jumped and it must do this many thousands of times a mile of running. When one considers the work a spark plug has to do, it is surprising how well and how long this little part remains in service. Plug trouble today is not so common as it was years ago, and many have heard of plugs functioning without any attention for as many as 20,000 miles.

DIFFICULT TO DESIGN PLUG.
There are hundreds of designs of plugs made of a variety of materials and made in numerous shapes and styles. It is easy to see how difficult it is to design a plug to meet all the conditions demanded of it, yet the modern spark plug does its work admirably well. This article is intended to describe the construction of plugs, the way to install them properly, the type to get and not to get, plug troubles and how they may be remedied.

Since the end of the plug must introduce a gap into the combustion chamber there must be two wires or electrodes with their ends separated to form the gap. One of these electrodes which takes the current from the cable or wire from the ignition device must be perfectly insulated so no current will leak out, while the other electrode must be grounded in some way. This latter always is attached to the spark plug shell or the metal part which screws into the cylinder, while the other one, called the center electrode, always is imbedded in an insulator made of porcelain, stone, mica, etc. The insulator and the shell then must be joined together to make a unit of the plug, and this is done either by cementing them together, forcing them

to compression tightness by means of a nut, etc. Of course, the two parts must be so fitted together that no mixture escapes, and the usual way of obtaining this tightness is by introducing a gasket or two between the parts.
Plugs are made with open or closed ends, but certain engines only will operate successfully with each type. Often a closed-end plug gives trouble with an engine which operating with open end plugs gives entire satisfaction.

TWO IMPORTANT PARTS.
The really important parts of the spark plug are the insulator and electrodes. The former is usually made of mica or porcelain so as to withstand the tremendous heat, also changes of temperature without cracking. Porcelain and various stone compositions are used, but of course, this type is more easily cracked than mica, both by the heat and by a wrench when installing. These materials may be used in combination in the same plug, the best form consisting of an outer stone insulator and an inner mica one. The only trouble with mica, is that it is liable to absorb oil, but if the construction is right this may be prevented altogether. The one advantage of the combination type is that there is double protection, so that if one insulator becomes broken the other will prevent current leakage. In buying a plug you cannot tell by looking at the insulator whether it is good or not, because some cheap stone looks just like good material. The reliability of the maker is the thing to consider.
Electrodes must be of such material as not to be quickly affected by heat, spreading and changing the gap size, or burning away altogether. Nickel wire, or similar high heat resisting wire, usually is used, but the car owner should take note of the thickness of the electrodes. Thick ones last longer than those of small diameter.

INSULATORS GIVE TROUBLE.
The commonest trouble with spark plugs is caused by cracked insulators, which then allow current leakage, causing a poor spark or none at all at the gap. Often one cannot tell by examining the outside whether the insulator is cracked, because the trouble may be in the hidden portion. The only safe way is either to dismantle the plug if it is not of the one-piece type or test it by laying it on the cylinder head with the plug cable attached. Then by cranking the engine the gap may be watched for a good spark. Cracks, except hidden ones, may at once be noticed if the engine is operating in a

dark area; sparks will be seen on the outside of the insulator.
Fouling is another plug trouble. This term refers to the carbonizing of the electrode ends and bottom of the insulator, resulting in a short circuit, since the current will pass through the carbon instead of jumping the gap which offers greater resistance. The carbon deposits in troublesome quantity, because oil is splashed on the plug, and if the plug is of the sort which retains the oil carbon forms there. It is usual to hook shape the ground electrode so that oil will tend to flow away from the gap.

When plugs become carbonized they should be cleaned by immersing in kerosene and then removing and scraping the carbon off. The scraping may be done with a knife, but care should be taken not to roughen the parts, as this makes a good footing for more carbon. When plug fouling persists the cause should be gone into—probably leaky piston rings, too much oil, too thin an oil, worn or pitted cylinders, etc.

SET SPARK GAP PROPERLY.
The gap at the plug end must be properly set. The usual gap is 1-32 inch, but this will vary slightly in different engines. If the gap is too short the spark may be too weak; if the gap is too wide there may not be sufficient voltage to cause the current to jump it. The gap is easily adjusted by slight bending of the ground electrode.

A spark plug should be not removed or taken apart unless it is giving trouble or thought to be giving trouble. Occasionally squirt oil around the plug joints and watch to see if there is any leakage of gas. Bubbles will appear if there is leakage. At the shell to cylinder joint this may be caused by a poor gasket, dirty gasket, or worn gasket, or the plug not being screwed in tight enough. If the plug is of two parts the gasket at the joint may be dirty or bent, or the check nut may not be tight.

The right length of plug should always be used. It must have the points just below the level of the cylinder head and not in a pocket, where dead gases always exist. It also must not stick too far down. Find out the best type for your engine and always ask for that no matter what make you get. Avoid sensational types which are said to spark even if carbonized and to give more than one spark. If they are carbonized the current will go through the carbon and not where the maker says it will.
Never throw spark plugs haphazard into the tool box, where they may become cracked. Never throw an old plug away. Save the old ones and buy spare insulators or electrodes and save money.—Los Angeles Times.

It used to be the fashion to recommend shellac as a satisfactory medium for painting rims. As a matter of fact shellac has the fatal characteristic of peeling off after brief service. Graphite paint or even ordinary paint is better for use on the rims than shellac.

CADILLAC WAR DUTY COVERED WIDE RANGE

Famous Make Adopted as Standard U. S. Army Seven-Passenger Automobile; War 85 Per Cent Mechanical.

Recapitulation of America's industrial achievements from the time this country entered the war reveals a work that is stupendous, not only in its volume, but in the variety of tasks performed. Practically every American industry was called upon to do its part. Sometimes that part was humble and inconspicuous. Again it was brilliant and spectacular.

The automobile industry fell largely into the latter class, because as some one has said, the war was 85 per cent mechanical and 15 per cent military. The part played by the Cadillac Motor Car company in America's war work is extremely interesting now that it can be told in some detail.

Keeping the government supplied with Cadillac cars, which were adopted as the seven-passenger automobile of the United States army; keeping pace with the urgent demands for Liberty engines for the 2½-ton artillery tractor, and withal sacrificing the services of more than 1200 mechanics and workmen in the factory, comprises briefly the activities of the Cadillac company during the war.

CADILLAC SUPERIOR CAR.
Cadillac performance has already demonstrated the superior advantages of the standard Cadillac car for army motor transport previous to the participation of the United States in the war. The government had been using a number of them in the earlier stages. The English and Canadian governments also had used a large number of Cadillac chassis and found them adaptable to their needs, particularly for ambulance service at the front. When it came time to adopt a standard seven-passenger car the certainty of the government in its selection of the Cadillac was due directly to the outcome of a competitive motor test held at Marfa, Texas, in July, 1917. Under the observation of United States army officers a 2000-mile run under the most severe conditions brought honors to the Cadillac.

In addition to this, the Cadillac completed a 5000-mile test under similar circumstances in excellent shape. That the car maintained its reputation previously made is shown by only one of the tasks it performed overseas. A number of Cadillac cars were used

A NUMBER OF TRAFFIC RULES FOR EVERYONE TO FOLLOW

Because of the constantly increasing use of automobiles since the termination of the war and the accompanying increase in the number of accidents in which automobiles played a part, the police department of the city of Detroit has issued a set of rules, or rather a threefold set of rules, one set for motorists, one for pedestrians and a third for children. Inasmuch as the rules which apply in Detroit are very apropos here we publish them in the hope that all three classes of people referred to will heed them and contribute not only to their own safety, but to the safety of others:

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| <p>MOTORISTS</p> <ol style="list-style-type: none"> 1. Save the children. When passing children, drive slowly; they do the unexpected thing. In their play they are liable to dash suddenly in front of an automobile and the only way you can save them is by having your vehicle well under control. Sixty children were killed on Detroit streets by motor vehicles in a year. Drive right. 2. Stop behind street cars taking on or discharging passengers. 3. Give good clearance to occupied safety zones. 4. Give warning signal when turning or stopping. 5. Remove headlight glare. 6. Be sure your brakes are in good working order; inspect them frequently. 7. When in doubt have your car under perfect control for a quick stop. Always be considerate. Drive right. | <p>PEDESTRIANS</p> <ol style="list-style-type: none"> 1. Don't forget to "keep to the right." It is the universal rule. 2. Don't cross streets before looking both ways. Your immediate danger is from the left. 3. Don't read or let your mind wander when standing where vehicles pass. Don't saunter away from approaching traffic. 4. Don't cross the streets except at corners, and then go straight across, not diagonally. Don't jaywalk. 5. Don't run across, behind or in front of a car, automobile or wagon. Wait and see what is on the other side, then move at a fast walk. Don't run. 6. Don't block others on the sidewalk. 7. Don't resent traffic officers' directions—they are doing their best to prevent accidents. 8. Don't overlook the other fellow's viewpoint. Co-operation means safety. | <p>CHILDREN</p> <ol style="list-style-type: none"> 1. Do not play in the roadway. 2. Play on the sidewalk or on the nearest playground or vacant lot. 3. Roller skate on the sidewalk where vehicles cannot harm you. 4. Never chase a ball across the street. 5. Don't hitch on autos, trolleys or wagons. 6. Do not coast where trolleys or autos go. 7. Don't play around autos. 8. Never run behind a standing trolley car; there may be another car or automobile approaching on the other side. 9. Do not fear the policemen; they will help and protect you. Always be careful. |
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to relieve the railroad on a French mail route out of Paris. The runs varied from 160 to 200 miles in length.
The cars used by the army are standard Cadillac seven-passenger cars, except that they are painted olive drab and carry auxiliary fuel tanks on the running boards. A very considerable number of these seven-passenger cars were actually used by the government.

FIRST ADVERTISING GAS MOTOR CARS

Automobiles used for advertising purposes first made their appearance in 1900 in France. A motor vehicle on the rear part of which was placed an immense bottle representing some kind of beverage, and another upon which an enormous teakettle was mounted, were the pioneers in this new form of advertising.

A cover of artificial leather made to slip over the tool box will keep rain and moisture away from the tools within, and is a necessity for the truck operator who takes an interest in his tools.

Plane moving made easy. Call 72. Peasey Transfer & Storage Co.—Adv.

YANKEE INGENUITY SURPRISES FRENCH

Open Air Truck Assembly Plant Source of Never-ending Wonderment to Monsieur Le Poilu

American ingenuity introduced some novelties to the French in the matter of motor truck assembly when the United States forces arrived on the continent and established their transport and ambulance systems.

One of the first things done was to establish an open-air assembly for G. M. C. ambulance chassis, and the sight of a truck assembly under the blue sky was a source of never ending wonderment to the natives. Incidentally, it was a new wrinkle in motor car construction for the world. The American forces were not equipped with factory space and special machinery. So they improvised.
A track of rough lumber was constructed along a roadside and the G. M. C. trucks were unloaded in boxed shape at one end. The boxes were opened and the chassis started down the tracks as soon as the wheels had been put on. Groups of khaki-clad mechanics, supervised by commissioned officers, completed the assembly as the chassis progressed, and a finished truck was turned out at the end.

The assembly was made necessary because it was found that trucks could not be shipped in good condition if assembled. The regular G. M. C. export shipping program was followed for all the G. M. C. trucks that left the factory for overseas. This consisted of dismantling the truck and packing it in a huge box, specially constructed. This was then carried on conveyers and loaded onto a flat car, six to a car. At the embarkation port the derricks of the steamer conveyed the boxes to the hold and unloaded them again on the other side.

This method insured the trucks arriving in good shape in France and experienced assemblers put them together, just as good as when they left the factory.

PHONE 72 for baggage wagons. Prompt service. Peasey Transfer & Storage Co.—Adv.

"The man who has never used an automobile has no realization of the time he is constantly throwing away"

John N. Willys.

Overland

The Thrift Car
BOISE OVERLAND CO.

Phone 324

"Home of the Overland and Willys-Knight"

What Fordson Service Will Do For You

There are two big factors to consider when you are buying a tractor—both equally important—the tractor itself and the service rendered.

A tractor which is standing idle because the service station is far away or because the dealer hasn't the proper parts is a poor investment, no matter how well the tractor itself may be made.

Fordson Tractors are selling by the thousands every month and are giving universal satisfaction all over the world because of this:

The tractor itself is made as durable, dependable, efficient and economical as the best engineering skill, the finest materials and workmanship can make it.

And added to this, wherever a Fordson Tractor is sold, you will find parts and service as quickly and easily available as the kerosene you put into the tank.

Our service means this to you. First, that we will thoroughly instruct you how to get the most out of your tractor—how to operate it properly so as to avoid trouble—how to make all minor repairs and adjustments so that only on rare occasions will you have to call for help.

Then when you do require help for repair work or parts you will find us ready at a moment's notice.

Our stock of parts is complete, our mechanics are experts.

Fordson service is delivered to your farm.

To own a Fordson means that you own a durable, dependable, economical tractor that will serve you every working day in the year.

The Fordson Company make it durable and dependable.

We keep it so.

H. H. BRYANT & SON, Distributors

11th and Front Sts., Boise, Idaho.

