FUEL CAUSE OF NEW MANIFOLD

Poor Gasolene Necessitates Many Changes in Its Manufacture.

One of the factors that contribute vary largely to the efficiency of the modern automobile engine is the manifold. As a matter of fact the present types of manifold have been practically forced by the degradation of fuel which has taken place within the past few years. It is peculiarly appropriate, too, that we should consider the question of manifolding just now, when we are standing on the verge of cold weather, because it is during the winter that the manifold exerts its greatest influence on engine efficiency.

In the now dim past when we got a very high grade of gasolene it was all very fine to indulge in the long sweeping manifolds that were then the rule. To get at the bottom of the problem we must bear in mind the fact that cold acts on gasolene just as it does on molasses—thickens it. With a long manifold, where the metal has a chance to get cold, the fuel coming in contact with this cooled area is quite likely to become so heavy that instead of gaseous vapor it is a fluid again. When we got very light, volatile gas, this was not so likely to occur, but with the present grades, which are not very much lighter than kerosene, this precipitation is almost certain to occur if the manifold is long and unheated.

For this reason the modern tendency in manifold design has been all toward short passages, leading directly from the carbureter to the combustion chambers. The long curved manifolds of the past have practically disappeared. Some designers hit upon the scheme of incorporating their manifolds in the cylinder block itself. This had the advantage of compactness of design and, better still, heated the manifold from its proximity to the hot water in the water system.

Today every authority recognizes the fact that it is necessary to apply heat in some form to the inlet manifold in order to secure efficient vaporization of the gasolene fuel. Many different ways of achieving this end have been worked out. One of the first methods tried consisted in putting a jacket around the intake manifold at some point near the combustion chamber and passing the heated gases of the exhaust around the intake. In this way the exhaust is made to furnish heat to keep the intake manifold at a proper operating temperature.

A second method consists in bolting the carbureter directly to the cylinder block and over the exhaust passage, so that the heat of the latter will keep the carburetor sufficiencytly warm to insure the delivery ofa light and volatile fuel. This method is in very general use now.

There were still other schools of experimenters. One insisted that the fuel must be heated before it reached the carbureter. Another group heated the gas in the carbureter itself. The obvious trouble with both these methods was the fact that the fuel heated at such a distance from the combination chamber ran a considerable chance of condensing again before it got to the cylinders. With the constantly decreasing quality of our motor fuel this danger became greater.

It is almost obvious that if the fuel must be heated at all it is better to perform that operation when it is as near as possible to the combustion chamber, so the advocates of heating the fuel after it has left the carburetor have had the better of the argument.

The most recent designs in manifolds agree in placing inlet and exhaust in close proximity, so that the heat of the latter may be imparted to the fuel, keeping the fuel thoroughly vaporized until it is in the combustion chamber Some of these designs place the inlet and exhaust together for a considerable distance, while in others the inlet passage simply passes through the exhaust at a given point. In some constructions the inlet passage is actually within the exhaust for a certain distance, its metal wall being subjected to the heat of the burning gases on their way from the cylinders.

Still another recent idea that helps efficient carburetion is the fitting of a small shutter in the pipe leading to the exhaust, so that after the engine is hot the temperature may be regulated at the point of maximum fuel efficiency.

Last year there was a flood of fuel warming devices known as "hot spots." These were heated areas in the inlet manifold, the fuel passing over which was heated and vaporized on its way to the combustion chamber. Some commentators on motoring matters informed their readers that the hot spot contributed to securing easy starting in cold weather. It requires only a moment's thought to realize that the hot spot depends on the heat of the exhaust for its heating qualities and consequently does not get warm until the engine has been started for some minutes, so that its help in starting is purely imaginary.

Engineers have discovered that while our present grades of fuel must be warmed to a certain degree to obtain fuel efficiency, the heat must not be too great or the gas loses so much in volumetric efficiency that the net result is a power loss which can be ill afforded. If the fuel is properly warmed and is then mixed with cold air the result is a snappy fuel that gives a maximum of power. This is the reason for the use of a shutter permitting the admission of cold air after the engine has run long enough to reach a fair degree of operating efficiency. It may be noted, however, that with our present grades of fuel there is little likelihood of too high a degree of heat being reached in cold weather.

The problem of securing fuel efficiency is by no means a simple one. Some of the best engineering brains in the country are engaged on it at the present time. There are many diverse factors to be taken into consideration and each must have due weight. However, this we can say, that any car owner who has noticed a distinct falling off in engine efficiency during the cold months will do well to see whether the manifold design of his engine is not to blame. There are many improved manifolds on the market today which may be used with benefit by owners whose cars are somewhat aged and equipped with manifolds that were designed to handle a grade of fuel very much superior to what we are getting today. Any such owners who will write this paper will receive advice in regard to devices that may solve their winter fuel problem.

ANSWERS GIVEN TO MOTOR QUESTIONS

Q. Some time ago you had an item in auto notes regarding leaking radiators. I believe it recommended ground flaxseed. I have lost the item. Can you advise me what was really stated? A. It was flaxseed that was recommended, but it should be used only in an emergency. The radiator should be flushed out thoroughly after the flaxseed has been used. There are some excellent prepared cements which are poured into the radiator to stop small leaks. A large opening should be soldered.

Q. I have a Chalmers 1911 model K. Lately there has developed a certain amount of play or backlash in the shaft. It has full floating axles. If I take hold of the axle by hand I can turn it back and forth—that is, in a circular motion — about two inches. How could I tighten it? The foot brake is attached to it, and when I apply the brake it causes the car to stop in a series of jerky motions, causing a disagreeable amount of noise. How can I overcome this? I have put on a new universal joint without any improvement. It runs fairly well, but if I feed gas, no matter how slowly, it goes forward with a big jerk and makes a lot of noise. The car has a disc clutch running in oil, but this part seems to work all right. A. The play is probably between the shaft and the shaft level. There is no adjustment for this. You would have to renew the parts. The jerky motion is caused by the backlash being taken up and released alternately. You need new shafts or bevels or both. I would also be inclined to think that the driving pinion and the ring gear are not meshing properly owing to wear in the gear.

Q. Lately when I start my car and let the clutch in there is a very loud noise that comes from the clutch just as I let it in; you might call it a terrific squeak. It is a leather cone clutch. A. Without doubt a dry leather. Treat the leather with neatsfoot oil.

Q. What does a manufacturer of cars pay for a clutch, say one of the ordinary dry plate clutches? I say around $50 and a friend of mine says around $100.

A. I know both of you are wrong, but I cannot give exact figures without knowing the make of the clutch and the size of the car using it. Some manufacturers only pay about $15 for such clutches. It all depends on the design and the number bought.

Q. I have tried pretty nearly every scheme to keep oil from leaking onto the brakes of my car, but I fail to be able to stop it. I have put in new felt washers every week, I have lowered the oil level, changed the oil to thicker and everything, but still it leaks. Have you any trick that will stop it?

A. Take some ordinary cheesecloth and wrap it around the axle shafts. This is a sure cure, but I would also attempt to find out if there isn't too much opening around the felt washer. The washer usually fits into a metal piece and this must not be badly bent.

Auto Thieves to Be Whipped.

Wilmington, Del.—Judge H. C. Conrad, of the Court of General Sessions, has served notice on motor thieves that the next ones brought before him will be sentenced to be whipped at the post at the county workhouse. The warning was given after Robert Bradley, who pleaded guilty to stealing a car belonging to Arthur Matthews, was sentenced to two years.

Driving on a Flat.

When it is absolutely necessary to run on a flat tire keep the tire in soft dirt if possible. If the trouble occurs on city streets run on the trolley track rather than on cobblestones.

PRACTICAL PARAGRAPHS

Carbon Scraper Easily Made.

A putty knife may be made into an excellent carbon scraper by grinding down the blade in two different curves, one a wider curve than the other. In this way practically every nook and cranny of the cylinder-head can be reached with one curved edge or the other.

How to Use Hand Pumps.

In the use of the hand tire pump the average motorist makes the mistake of pumping in short, quick strokes. The proper method is to pull the handle up all the way and then force it clear down to the bottom of the pump. This gives the benefit of the full volume of air, and the longer strokes are much less tiring than the short, jerky ones.

Removing Dents Puzzling.

The amateur mechanic is often puzzled as to how to remove a dent from a tank. Solder a tire valve to the filler cap and then pump air into the tank, meanwhile tapping lightly around the edges of the dent with a leather mallet. The pressure of the air in the tank will push the dent out even with the rest of the surface with the help of the mallet taps.

Parts Case Convenient.

An ingenious motorist suggests a way of making old battery parts into a convenient case for holding various small parts. The bottoms of several old battery jars are sawed off so that the wells make individual compartments. A number of these cut-off jars are fastened into a shallow box with glue and the case is complete and ready for nuts, bolts, screws, parts of generators, magnetos, etc.

How to Gauge Glass Cutting.

The car owner is often puzzled to make a clean break of a glass cylinder, such as is used on gauges of various sorts. A simple method of doing this is to twist a section of light-resistance wire around the glass at the point where it is desired to be cut. The ends of the wire must be connected to two binding posts and these are then connected with the line circuit. When the current is turned on the wire becomes hot and heats the glass, which is then plunged into cold water. The result is an even fracture at the desired point.

Vulcanizing Block Useful.

A useful aid in vulcanizing tubes is a rubber-covered block which may be made in the following manner: A sheet of fabric is tacked on the block and to this is vulcanized a layer of tread stock, cementing and curing in the usual way. This block has the advantage that no tack heads stick up through the rubber top layer.

HARD SURFACE ROAD WOULD LINK COUNTIES

It is possible to build a hard surfaced highway system of 50,000 miles so located as to serve directly 46 per cent of all the counties of the United States and indirectly 41 per cent of all the others. For an annual expenditure of $100,000,000—hardly $1 a person per year—this fundamental road system could be completed in twelve-and-a-half years and it would serve 87 per cent of the total population of the United States. Such is the statement of the United States Department of Labor.

"The growing needs of the country demand that some such comprehensive highway system be constructed," says R. E. Fulton, vice president of the International Motor Company, manufacturer of Mack trucks.

"In the past there has been too great a lack of foresight on the part of road builders. They have lacked vision to foresee the requirements of even five years ahead. A road built today must be built, not with the idea of present traffic, but that of ten years in the future.

"The growing need of the day is for transportation. We have simply got to provide it. We cannot stop it and the sentiment of the country will not tolerate any handicap of our transportation system."

Auto Growth Rapid.

"An excellent idea of the tremendous growth of the automobile and how it has gradually become a part of our daily life, can be seen from the fact that since 1914 there has been an increase of 258 per cent in the number of automobiles purchased in the United States," says W. L. Kissel, secretary and treasurer of the Kissel Motor Car Company.

NEW HIGHWAY BODY ANNOUNCES POLICY

The Transportation Bureau established in the Federal Highway Council has adopted the following policy as representing its aims and objects:

To assist in co-ordinating the highways with the other transportation agencies of the country; to encourage the development of highways which will advance the economic life of the nation, stimulate their use in such a manner as to facilitate and cheapen the transportation of food, raw materials and finished products, and to co-operate with state and national government agencies, to the end that our highways may be of maximum service in the transportation system of the country.

YOUR AUTO A. B. C.

By OTTO KRANK.

The spark plug is the small creature on which you car depends for its pep. Yet mighty few persons think it makes any difference what sort of a spark plug they have so long as it can be screwed into the cylinder head.

As a matter of fact the length of the spark plug depends on the engine in which it is to be used. It is important that the plug be long enough to extend down into the combustion chamber. If it does not you lose some of the force of your explosion. Dead gas gathers in the recess and your engine will miss at low speeds. A plug which leaves a recess around the shell will, even though the points extend down far enough, accumulate heat. The nemental extension on such a plug will warp and the size of the spark gap will change.

On the other hand, if the plug extends too far into the chamber because the shell of the engine is thin, the valve head may strike it and change the position of the points.

The points of the plug should be about one-thirty-second of an inch apart for coil ignition and one-sixty-fourth for magneto.

The simplest way to test a spark plug is to take a wooden handled screw driver—so you won't get the shock—and rest the metal on top of the plug, allowing the end to touch the cylinder head while the engine is running. This will short circuit the current, and if the plug is all right you will find the cylinder it serves missing, slowing down the engine. If this shooting does not occur, look on to another plug, or elsewhere in your ignition for the cause of misfiring.

Take a missing plug apart and soak the shell and porcelain in kerosene or gasoline to get the carbon off. But do not scratch the porcelain. Scraping roughs it so the carbon will cling to it. You can wash the points with gasoline and scrape them with a knife, but be careful that the distance between points is undisturbed. The current must jump across a gap to make the spark. If the gap is too wide it won't do it. If there is no gap there will be no spark.

Departments Get War Cars.

A bill has been introduced in the Senate authorizing the Secretary of War to transfer free of charge a number of motor propelled vehicles and motor equipment to the Department of Agriculture for use in the improvement of highways, to the Postoffice Department for use in the transmission of mails, to the Navy Department upon request of the Secretary of the Navy, and to the Treasury Department for the use of the Public Health Service.