Hints for the Motorist

By Albert L. Clough

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YOUR CAR'S PRIVATE FIRE DEPARTMENT

Better To Be Sure Than Sorry

You probably carry a fire extinguisher on your car. If you do not, you are grossly negligent and are paying unnecessarily high for you fire insurance on this account. Have you looked recently to see if there is anything in your extinguisher? Sometimes the fluid leaks out gradually and all escapes and sometimes a meddlesome person or a practical joker discharges the fluid, returns the extinguisher to its place and does not tell the owner to whom "ignorance is bliss' until a fire starts. Are you sure that the extinguisher will work properly? You can find out by removing it from its bracket, discharging its contents into a can and then returning the discharged liquid. An extinguisher that has been carried for a long time ought to be tested, so that unjustified dependence may not be placed upon it. Do other people, who drive your car, know how to detach the extinguisher, how to operate it and how to place the liquid most effectively? If not, they should be instructed. Is the extinguisher kept where it can instantly be reached. It should be, for a few seconds delay may be decisive as to whether your car will be saved or not. If your car takes fire, do not be deterred from trying to save it, by fear that an explosion is imminent, such a thing is very rare. The thing to do is to "go to it," discharging the liquid on the seat of the flames, and the chances are in favor of success.

PLUNGER OIL PUMP MAY CAUSE RAPPING

B. T. W. writes: My engine has a faint knock or tap, which is to be heard at all times, but is most noticeable at very low speeds. The car is a new one and, so far as I know, everything is in good condition. Listening to the engine from various points, gives no clue to location. What do you suppose causes this sound?

Answer: As this is a new engine, it is not likely that looseness due to wear can account for it. Have you inspected the valve gear carefully to see that the adjustments are not such as to cause any undue clearance at push rods, tappets or elsewhere. Of course, there is a possibility that a piston ring may have broken. Perhaps a valve stem may be sticking slightly in its guide. The fan belt coupling may tap on the pulley. If your oil pump is of the plunger variety, you may find that it is to blame, if there is excessive clearance between the plunger and the cam, which operates it. You would hear such a noise more distinctly at low speeds, because at high speeds other noises would drown it.

STORAGE BATTERY INQUIRY

E. R. E. asks: Would three battery cells, taken from an electric vehicle, injure the ignition coil of my car, if they were used in place of the 6-volt lighting battery, furnished with it

Answer: As they would furnish the same voltage as the battery originally installed, we do not see how they could. It may be well to remember that these electric vehicle cells are capable of furnishing a much heavier maximum current than three ordinary lighting cells and it might be well to protect the system against its effects, by the installation of suitable fuses, if there is not already some such protection provided.

TEST FOR PROPERLY GROUND VALVES

O. L. asks: What is the best way to tell whether a valve has been ground so that it will be tight?

Answer: The usual way is to take a lead pencil and make a series of marks, quite close together, directly across the full width of the valve face. The valve is then placed in position upon its seat and rotated upon it, under light pressure. If, on removing the valve, any of the pencil marks remain intact, it is evidence of failure of the valve to touch its seat at such points. All the marks should be partly erased if the seating is perfect. Another method is as follows: Apply a light, even coating of prepared prussian blue to the valve seat, put the valve in position and rotate it. If contact is good there will be found a continuous blue band around the whole valve face. A blue band with breaks in it donates a poor job. Valves located in cages are sometimes tested by pouring a little gasoline into the cage over the valve. If it does not escape between the valve face and seat, the job is considered tight.

WHAT IS A "GAS KNOCK."

There's Much Yet To Be Learned About Engines.

When there is a knock in an engine and its cause cannot be attributed to carbon deposits, preignition, over advanced spark or mechanical derangement, it is often diagnosed as a "gas knock." Calling such a sound by this name is quite a confession that the exact cause is not ascertained and so little is actually known as to precisely what happens to the gasoline engine cylinder, that no one need be ashamed to admit ignorance as to the origin of such disturbances. A great part of the "doings" of the gas and the engine is yet hardly more than theory, although it is talked of as if it were a settled fact. Things happening so inconceivably rapidly, in closed spaces are not readily followed or fully understood. An engine running on a weak mixture frequently "pounds" when working hard, at low speed and this is generally called a "gas knock." The origin of the sound is probably as follows: The weak mixture produces an effective pressure, so low in comparison with the resistance against which the engine is working, that during the power stroke, the moving parts pass from a condition of delivering useful work to that of receiving power from the flywheel and, if there is looseness in the bearings of such parts, there is a tendency for such looseness or "play" to be taken up first in one direction and then in the other—— the striking together of the surfaces involved being the immediate cause of the pounding. A research recently reported to the Society of Automotive Engineers throws light upon another kind of "gasknock." It seems that the gasoline now in use has a habit of burning by stages There is a combustion when the spark occurs, that may result in the breaking up of a portion of the fuel into compounds, which may then explode with very high pressure, detonate as it is called, if the temperature to which they are subjected is very high It is these detonations, subsequent to the initial explosion and not self-ignition, that produce the knock in many engines, that run hot with too high compression. Pressure diagrams, are shown that seem to demonstrate this detonating action. The search also tends to indicate that carbon deposits cause knocking not by causing self-ignition, but by increasing the compression and combustion temperature to the point which detonating hydrocarbons are formed and fired.

COMPRESSION DATA

W. S. F. asks: (1) How do you figure the compression pressure in a motor-cylinder? (2) In a cylinder of 2½inch bore and 3½ inch stroke, what should the clearance space be to give a gauge compression pressure of 90 pounds per square inch? (3) What degree of compression is ordinarily used and what is the highest that can be employed without causing preignition?

Answer: (1) The absolute compression pressure per square inch (gauge pressure plus 14.7 pounds), is equal to the absolute pressure at admission (14.7 pounds or less), multiplied into the compression ratio raised to the 1.3 power. The compresion ratio is the ratio of the clearance volume to the total volume above the piston, when at its lowest point. A table of compression pressures is found in Heldt's "The Gasoline Automobile," p. 26, the use of which will eliminate calculations. (2) To obtain a compression pressure of 90 pounds per square inch gauge you will require a compression ratio of about 4.76. Your assumed cylinder will have a piston displacement of 17.18 cu. in. and the clearance volume should be about 4.56 cu. in. (3) Most engines carry lower pressures. Ninety pounds is safe only in small cylinders which are well cooled.

INTAKE

W. W. A. asks: Why doesn't my car pick up better? It coughs, spits and splutters for a time, before it can handle the gas, when the throttle is first opened. Besides it does not seem to get gas enough, as I generally have to use the choker to get the desired power.

Answer: These symptoms indicate that the cylinders receive so weak a mixture, that backfires into the carburetor occur and the engine lacks power Adjusting the carburetor for more gasoline, in proportion to air, should relieve this situation, but we should not be suprised if the root of your trouble lay in the fact that your carburetor and intake are sufficiently heated to handle the present grade of fuel. The result of this condition is that the heavier constituents of the gasoline fail to vaporize, thus rendering the mixture leaner than it ought to be, considering the amount of fuel supplied. If you can apply exhaust heat to the intake system, we fancy that your engine will run properly upon your present carburetor adjustment and more economically than it will if you open the gasoline adjustment to supply more fuel.

DRIVING OVER BAD ROADS

The majority of motorists stick pretty closely to city streets and country highways that are at least somewhat improved, but occasionally, through mistake or intentionally they have to drive over bad roads, such as totally neglected country byways, logging trails and even, in rare instances, over fields. Here are a few suggestions applying to such unfavorable conditions: Drive at very low speed, using middle or low gear if necessary, for there may be rocks that will stone-bruise the tires or cause such severe shocks as to break springs. There may also be "bumps," perhaps hidden by long grass. If sharp stones are encountered, run over them, where possible, with power shut off, as the cutting effect on tires will then be less. Look out for stumps or rocks high enough to be struck by the car. Usually if the front axle will clear the rest of the car will, but this is not universally the case. Beware of spring holes or other wet places, where the wheels may sink and lose traction. Don't trust too much to the rude bridges and causways found on neglected roads, for they may fail under the weight of a heavy car. As a general rule, drive in the center of the road, following the ruts made by preceding vehicles, for the sides of such roads are frequently soft and crush under heavy loads. Following deep ruts is, of course, hard on tires, but it is preferable to taking more serious chances. In turning out for other vehicles, use special care on account of the danger of ditching.

Questions of general interest to motorists will be answered in this column, space permitting. Address Albert L. Clough, care of this office.