

Hints for the Motorist

By Albert L. Clough
Editor Motor Service Bureau, Review of Reviews

KNOCKING DUE TO TOO HIGH COMPRESSION

Maximum Allowable Compression Depends Upon The Fuel.

There are a great many instances of engines—not of the latest models, but still built within the last four or five years—that now give trouble by knocking, especially when they have continuously operated very heavily loaded, for some time. Such engines may be in perfect mechanical condition and free from carbon, the mixture may be correct and the ignition perfectly timed and still they are prone to knock, under trying conditions. The fault makes the operation of such engines unsatisfactory and its probable cause is obscure to many motorists who are troubled by it. The sound that is properly called a "knock" is generally caused by premature ignition, which produces a downward or reverse pressure upon the piston, while it is still moving upward on compression and heating the fresh charge. The "near kerosene" fuel, now being used, will not withstand, without exploding, the same elevation of temperature that the real gasoline formerly used would stand and, when the cylinders are very hot, it ignites prematurely at the high compression attained in engines of older design, and knocking and loss of power results. The remedy of knocking in engines, which have too high compression to burn present-day gasoline successfully, is to increase the clearance space above their pistons and thus reduce the compression ratio. This can be accomplished in two ways. The cylinders can be raised slightly from the crank case, so that the pistons do not travel quite so far toward the cylinder heads. A metal gasket or flange placed between the cylinder flange and the crank case surface, will accomplish this and no other adjustment is usually required than the lengthening of the valve push-rods. Most manufacturers, whose engines need them, can furnish such cylinder gaskets, which are usually from one eight to one-quarter inch in thickness. The other remedy is the use of low compression valve caps. Ordinary valve caps close the clearance space about flush with the interior surface of the head, but these special valve caps are hollowed out to form chambers and thus add to the clearance space and diminish the compression. Such valve caps are obtainable from manufacturers, whose engines have developed preignition troubles of this kind, or they can be made specially. Naturally this preignition tendency, due to the change in fuel, is most often found in engines which were designed on high compression lines, but those having defective water jacket provisions or weak circulation are also subject to it. Many an old engine which now fails to "stand for" long, hard pulls, without knocking, can be made to do so by lowering its compression.

moves slowly forward. Please explain how this action can be stopped?

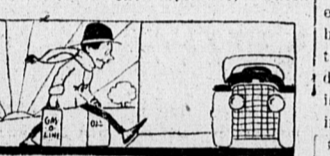


Answer: Probably the clutch lever screw which bears upon the clutch cam, requires an extra turn to make up for the wear and to cause the clutch to be held in neutral. It may also be that the lever brake needs a little taking up as, if they were in good adjustment, the car could hardly move, even though the clutch did drag. Be sure that the low speed is not unnecessarily tight. If you are using a grade of oil, which becomes extremely thick when cold, it will cause the clutch to drag, even though its plates come out of actual metallic contact. In Ford transmissions, which have seen extensive service, the clutch plate driving lugs, upon the inside of the out of fit with slots in the discs, with the results that the discs tend to wedge and do not release as they should.

LIMBERING UP COLD ENGINE

D. W. P. writes: After my car has stood in my unheated garage for several days, I sometimes find that it is almost impossible to turn the engine over. Is there anything I can do to loosen it up, upon such occasions?

Answer: You might try this procedure: Remove the spark-plugs and inject quite a little gasoline on top of each piston, which should loosen up their oil films. Follow this up with an injection of light machine oil in each cylinder, which



will not thicken at the temperature of the engine. If most of the resistance is in the pistons, you ought to be able to turn the engine over but if the main bearings are very stiff, cranking may be difficult. With an engine fitted with crank case hand rolls, the removal of which exposes the main bearings these can be loosened up by squirting them with machine oil.

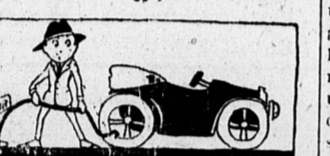
PREIGNITION FROM UNSUITABLE SPARK-PLUGS

The Engine Builder Usually Recommends The Best Adapted Type Of Plug

A not uncommon cause of knocking from preignition of the charges is the use of spark-plugs ill adapted to the particular engine. Some plugs are made with very long shells, which are required in certain engines to bring the spark point properly into the combustion space. However, when such plugs are used in other engines, the shell may protrude so far into the

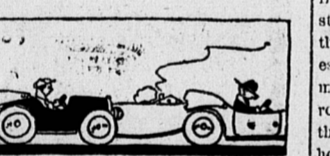
combustion space that it becomes hot enough to fire the charges prematurely, under continuous, full throttle operation. Some plugs have thin porcelain cores of the petticoat type, designed to give a soot-proof effect. These cores do not always cool effectively and the porcelain may become hot enough to cause premature firing or to cause misfiring by failure of its insulating properties when heated. Other plugs are made with quite massive spark points of considerable length and it sometimes happens that the heat retained by these, under high speed open throttle conditions, is sufficient to raise them to a pre-igniting temperature. These troubles, naturally, are met with especially in engines which are running close to the safe limit as to compression pressure. While it is by no means necessary for a motorist to stick to the same make of spark-plug that is supplied with his engine, it is generally a safe practice to adhere to the use of plugs of the same general type and proportions. Nearly every large manufacturer of plugs make a number of types, one of which will be found to conform closely to that found best by the manufacturers of each particular engine.

ANGER FROM TIRES BLOWING OFF



A. L. G. asks: Is there any danger that a tire may blow off the rim and hurt someone, while air is being put into it?

Answer: There have been a few bad accidents and numerous narrow escapes caused by the outer ring blowing off the rim during inflation, the ring being projected with very dangerous force. Such an accident is caused by the failure of the locking device to hold the outer rim securely and can be avoided by seeing that the ring is securely in place and the locking device acting properly before air is put in. After very slight inflation, the locking arrangement can again be inspected to make sure that it is going to hold. Standing out of the way of the ring, should it blow off, is always a safe precaution.



STIFF ENGINE RESISTS CRANKING

J. R. writes: After taking up on the main bearings of my engine, I find that I cannot crank it. I am almost certain that none of the bearings are dangerously tight, as I took great care in the adjustment. I can exert enough force to spring the starting crank, but the engine does not budge. How can I turn it over?

Answer: By hitching your car be-

hind another and allowing the latter to tow it, putting your car into high gear and then gradually letting in your clutch, your engine can probably be turned over, but this must be done cautiously or your engine bearings may suffer. If you jack up one rear wheel of your car, throw in the low gear and clutch and turn the free rear wheel in the forward direction, by hand, you will exert great cranking power on the engine and start it, unless the bearings are altogether too tight for safety.

PREVENTING UNAUTHORIZED USE OF CAR



C. B. L. writes: I have a very strong suspicion that my car, which I keep in a public garage, has several times been used by someone, without my knowledge or consent, but I have no absolute proof of this. Is there any way I can get a check upon this sort of thing?

Answer: The most natural thing to do is privately to read the odometer and the gasoline gauge every time the car is left and screw on the gasoline filler cap to a secret mark. If any change is noted upon your return, the car has presumably been used. You can write your initials on a postage stamp and stick it upon some inconspicuous part of the exhaust pipe when it is cold. If the stamp has been removed or is found charred, it is a pretty sure sign that the car has been upon the road. It is possible to leave the brake set and the lever seated with a private seal, but if this is found broken, the excuse probably will be made that the car had to be moved to make room for others. The unauthorized use of cars has sometimes been discovered by the owners finding the engine warm, when he has not used it for days.

ELECTRIC STARTER HINTS

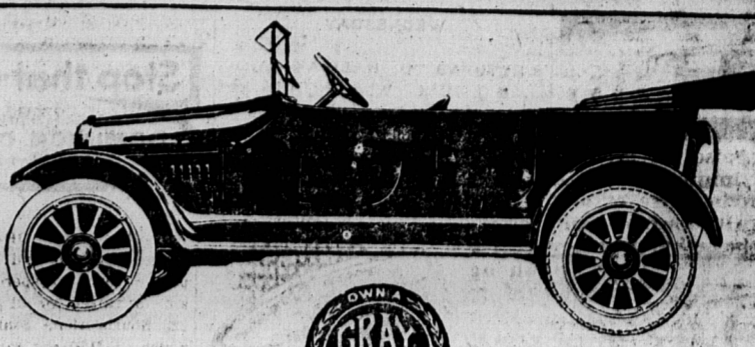
Careful usage Reduces Repairs Here As Everywhere Else.

The following suggestions relate to the use of starters, especially to those in the operation of which a motor gear has to be meshed with the fly wheel gear: Do not force the starting operation by jamming down the pedal abruptly. Do it gently, especially at the last of the movement and, if the gears do not engage readily, let the pedal back and go through the operation again. Avoid holding down the pedal after the engine is running under its own power, as the over-running clutch mechanism which is then called into action, is not intended for anything but momentary operation. Under no conditions operate the starter, when the engine is running, as the bringing together of the gears under these conditions will most certainly burr or strip the teeth. This caution may seem unnecessary, but a meddlesome person or a careless operator may do it. One may forget that the motor is running or, in a very noisy place, may think that it has stopped when this is not the case. A touch upon the accelerator will always indicate whether or not the engine is in operation. It is inadvisable to operate the starter with the spark too far advanced, even though a safety device is provided to guard against damage from "bad kicks". Throwing out the clutch, considerably lessens the load on the starter motor, when a car is cold, particularly if the gearbox lubricant is very stiff. Do not allow the mechanism of the motor-pinion engaging drive to become sluggish in action from the presence upon it of gummy oil. It should work freely. Starter connections, the switch, commutator and brushes have to carry very large currents and they should be kept tight and clean at all times. Be sure that the alignment of the starter-pinion with the flywheel gear does not become faulty. Do not make the starter spin the motor more than half a minute at time. Verify carburation and ignition conditions before trying it again.

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

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