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Always make sure you get the grade of Imperial Polarine Oil recommended on our Chart for your type of motor. See Chart at your dealer's, or write to 56 Church Street, Toronto, for booklet, "Automotive Lubrication."

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Watch for the Blue Crank-Case Service Sign. Dealers who display it give Imperial Polarine Crank-Case Service. They will drain and thoroughly clean your crank-case, using Imperial Flushing Oil, the modern flushing agent which removes grit, dirt and other impurities. It is sure economy to employ Imperial Polarine Crank-Case Service frequently.

WE GIVE IMPERIAL Polarine CRANK-CASE SERVICE

A GRAVE SITUATION MALABAR INDIA.

BOMBAY, India, Aug. 24.—A grave situation has arisen in the Malabar district on the west coast of British India, where seditious agitators have been working on the religious fanaticism of the ignorant natives. Their activities have resulted in serious mass rioting, bloodshed and destruction of property, military forces have fired upon rioters causing many casualties.

Railway lines have been cut, post offices have been robbed and the law is almost supreme in several small towns. A proclamation has been issued by the British officer commanding troops in the Malabar area. It refers to "open rebellion prevailing in the district of north Penai, thirty eight miles south east of Calicut."

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Hints for the Motorist
By Albert L. Clough Editor Motor Service Review of Reviews

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The Boiling Radiator And Lost Power

Steam In Engine Jackets Prevents Proper Cooling

AT FIRST THOUGHT it would seem that so long as water was circulating through the jackets, no cylinder parts could become heated above the boiling point, but such is not the case, for when steam begins to be formed at the hottest surfaces, such as the exhaust valve seats, it occupies much of the space in the circulating passages and prevents the contact of water with the parts of the cylinder walls which most require cooling. If circulation is not very energetic and the jacket spaces free from "pockets" or points of sluggish water movement, there are areas of the cylinder wall that are so enshrouded with steam that they become very highly heated locally, while the whole cylinder acquires an excessive average temperature. In fact, the head parts of an engine especially, can become objectionably overheated although the cooling system contains practically its usual amount of water. The result is that a steam engine is quite likely actually to preignite its charges, by hot spots in its piston heads or its exhaust valves, reverse forces thereupon acting on its pistons, with consequent reduction of useful power and severe knocking, these effects being pronounced in high compression engines, especially at open throttle and even if no actual self ignition occurs, the charges become so hot, at the height of compression, that the gas knock—detonation or whatever it may be—becomes noticeable. Furthermore, the cylinder walls and intake parts are so hot that the charges are pre-expanded upon entering and contain a lessened amount of fuel which, in burning, does not produce full power. Excessive heating of the water under the abnormal temperature also causes undue friction and lessened output. Very few modern engines can be operated without knocking, loss of power and considerable useless wear and tear, with the circulating water boiling and, while there may be no danger of cylinder scoring or any similar damage, so long as the system is full enough to insure circulation, it is best to keep the water temperature safely below the boiling point, in order to insure maximum engine performance, smooth operation and minimum wear of engine parts. The use of a reliable radiator thermometer is almost essential if boiling, with its attendant risk of low water and the evils above set forth, is to be avoided. Timely notification of the rise of the water temperature, if the radiator thermometer used is accurately adapted to the cooling system with which it is installed, its indication as to the best operating temperature to be maintained can safely be followed.

REAR END THROWS GREASE



H. W. E. asks: How do you account for my new Ford sedan's throwing oil from the left end of the rear axle? It has been run but three months and the factory filling of lubricant is in the rear axle housing.

Answer: It is quite possible that a mistake was made in the amount of grease or oil supplied. If grease is used, the differential housing should be packed only about one-third full and if a liquid lubricant like steam cylinder oil, is used its level should not be higher than about 1/4 inch below the filling hole only high enough to let the ring gear dip properly. There may also be something wrong with the felt washer at this end of the axle housing, and we suggest that you remove the wheel and inspect it, renewing it if it seems necessary, after removing what surplus lubricant you can from this part of the housing.

AMMETER READINGS

A. I. R. asks: Do the readings of a motor car ammeter mean the same thing as the amperes indicated by a power-plant instrument? That is, when an ammeter on a car shows 10 amperes does that mean that there is really a flow of 10 amperes or are the marks on the dial merely arbitrary?

Answer: When the auto ammeter dial bears the word "amperes" the figures to which the needle points are just as really amperes as are those shown on a power plant instrument. An ammeter is an ammeter and represents a certain voltage or current matter, while the conditions, just as an inch is always an inch. Ten amperes in an auto-generator circuit means very little power compared with the same flowing in a high-tension power-plant circuit, but the volume of current is the same in both cases. An auto current indicator, the face of which is not marked with the word "amperes," may possibly not indicate amperes flowing, but still the presumption is very strong that it does, in case the dial bears figures.



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Neither Too Tight Nor Too Loose

Inspection Every Thousand Miles Is Very Desirable

FRONT WHEEL BEARINGS are too often neglected. How long since yours have been inspected? Better jack up the front end and take a look at them, as to adjustment and lubrication, before starting on that projected trip. These bearings should be perfectly free, but not loose enough so that there is noticeable shake at the wheel. If they are too tight they grind out and if they are too loose they pound out. The unbalanced weight of the valve stem should be sufficient to cause the wheel to turn. Do not mistake looseness in the steering-knuckle for looseness in the wheel bearing and set the latter up too tight in an attempt to remove the shake from the wheel. The chances are that you will have to tighten the bearings a little, by turning up of the axle nut a trifle. Probably the bearings ought to be removed and cleaned in gasoline. In repacking them, don't use that hard "cheesy" yellow grease, which doesn't distribute, but use "dope" of vaseline consistency, and clean all old grease out of the hub space and off the spindle, replacing it with fresh. For Heaven's sake, be sure that the axle-nuts are securely locked, for life and limb depends upon this. That little cotter-pin separates you from eternity.

ANOTHER STEAMING RADIATOR



Mrs. J. B. writes: My car boils its water after running three miles, although I have had it at the garage and they report that pump, fan and circulation are all right. Will this boiling do any harm, and how can it be prevented?

Answer: Boiling of the water, in itself, is not necessarily harmful, although it may prevent the engine from giving its best results, but the danger is that the water may so far boil away that circulation will stop, and then overheating will do serious damage to the engine may result. We believe the garage people overlooked something and that the circulation is not right. If the rubber connections are old, you better have them renewed, and if the radiator has not been cleaned out for some time, you better have this done with washing soda solution or lye. Be sure that your brakes are not dragging, check up the spark timing to insure that it is not too late and use as lean a gasoline mixture as you can. If you can readily spin the belt by hand, the engine is stopped, the belt is not tight enough.

LIGHTS DIRECT FROM GENERATOR

H. F. writes: I have installed a magneto on my car, and as I do not use the starter, am using the battery for lights only. Can I remove the battery and use the generator for lights direct or shall I need a resistance of some kind?

Answer: You might try the following, but we don't know what results it will give you. Disconnect one side of the generator field circuit and bring it out to a switch on the cowl, wiring from the other side of this switch back to the connection from which the field wire was removed. When this switch is open the generator will be dead and when it is closed, it should excite itself. Leave all lights switched on at all times and, when driven at low speed, the switch is open the generator will be excited. You can fasten the relay-contacts closed, if you wish. You may find that your generator regulates close enough to give you fairly good light or can be made to do so by altering the third-brush position. Never run the generator excited unless all lights are on.

STARTER GEARS LOCK

M. N. writes: When I press my starter button, the engine is not turned over and when I try cranking it by hand, I cannot do so, as it is locked. The only way to loosen it up is to rock the car violently, when in gear, or to move the starter motor. I have just put on a new flywheel and have had the starter off several times. What is the matter?

Answer: We believe that it is a case of faulty meshing of the pinion and flywheel gear, due to incorrect positioning of the starting motor. Possibly your new flywheel



USED CAR HAS KNOCKING ENGINE

J. J. N. writes: I bought a 1917 used car from a reliable dealer, which ran all right for the first 300 miles, but now it knocks when I start to use it, especially when climbing hills. Carbon was supposed to have been removed and the engine overhauled before I bought it. What do you think causes this knock?

Answer: We can merely guess as to this, but we shouldn't wonder if carbon had come back, even in the short distance you have driven it. Quite likely this engine has loose pistons, as this defect is rather common in used cars and the fact that it knocks when you try to accelerate rapidly bears out this theory. Moreover, rapid carbonization is a characteristic of engines with poorly fitted pistons, because there is usually a large escape of oil into the combustion spaces. Of course, you know that the piston rings are not tight, but in overhauling an engine to sell, it is usual to take up the bearings but less usual to fit pistons, as this latter is expensive. We suggest that you have the cylinders burned out with oxygen which will demonstrate whether or not knocking is from carbon or some other cause.

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Grit, The Foe Of Bearings

Its Entrance Into The Engine Necessitates Frequent Oil Renewal

THE AIR DRAWN INTO THE CYLINDERS, through the carburetor, generally contains some road dust and, if the road surface is soft and unbound, the traffic heavy or a wind blowing, it is simply overlaid with grit, which is nothing more or less than sand or silica, the sharp, abrasive material used in grinding valves. Some of this gritty material sticks to the piston heads and forms a constituent in the so-called carbon deposits, as proved by chemical analysis, while some of it hobbly goes out through the exhaust, but a portion of it sticks in the oil upon the cylinder walls, where it acts to wear out cylinders, pistons and rings by a veritable grinding action. As fresh oil reaches the cylinder walls, this abrasive matter is washed down and enters the crank case, from which it is circulated through the bearings repeatedly and splashed into the cylinders again and again to continue its destructive cutting action. The radiator fan greatly aggravates the dust evil, as it draws, at high speed, into the hood space, an immense volume of gritty air, which is not required for combustion; conditions being at their worst during high speed, open throttle operation, when the current into the carburetor is so rapid that the dust does not have time to settle out of the entering air. The motorist who is compelled to drive over dusty roads can protect his engine from grit abrasion to a certain extent, by drawing off the crankcase oil and renewing it more frequently than would otherwise be necessary, thus getting rid of accumulated cutting material in the lubricant. He can keep his hot-air pipe on as there is probably less dust drawn in through it than through the naked carburetor intake and he can disconnect his fan, when weather conditions and cooling system capabilities permit. All tractors and many trucks are provided with air-washers to remove dust and it remains to be seen whether they will have to be installed upon passenger cars.

MIXTURE IS WEAK AT STARTING



C. W. C. says: My Ford engine runs well, but it is "some job" to start it cold. It takes me 20 minutes to start on a morning and five minutes on dry cells, and I prime it six or eight times. I have a new carburetor, timer and plugs and have removed carbon and had valves attended to. How can I rectify this condition?

Answer: The fact that the engine runs well almost eliminates itself as a cause of trouble, but your difficulty is that you do not get a sufficiently rich mixture to start on, at first. You should open the carburetor adjustment about a regular inch and use the regular running position, to insure a rich mixture. We suspect that you have air-leaks on the intake side of your engine, which when the engine is sucking, let in enough air to dilute the gasoline vapor in the cylinders below the ignition point. If the carburetor flange connection or the intake manifold connections to the block are not perfectly tight or if the inlet valve stems fit their guides too loosely, these air-leaks will take place. Try the following: Tighten the switch "off" hold the primer and crank the engine over several times, with throttle closed, then release primer, open

MAGNETO CURRENT IS UNCERTAIN

H. D. W. asks: What is the matter with my Ford, which behaves thus: Sometimes the engine will not start, on a night, I can switch on the lights and spin the engine, when some times they will come on all right and, on another trial, they will not burn. At times the engine will die suddenly, without apparent cause. Occasionally it will crank readily and again I have to walk home. The connections seem all right and I think the mag to is out of order.



Answer: The magneto winding itself rarely gives trouble, but your mag may have done so, if you do not find the dot elsewhere. Examine the magneto contact-spring, which can be gotten at by removing the screws that hold in place the binding-post on the crank case cover, making sure that it is perfectly clean and makes a firm connection. The wire from this connection to the block, most likely the coil box, may be defective or imperfectly connected and you better try replacing it. If this does not remove the trouble, most likely the magneto ground may be unreliable, or there may be some other winding trouble. Why don't you install dry-cells on the battery side of your switch and use them to run on until you can hunt down and remove your present trouble?

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Clicking Valves

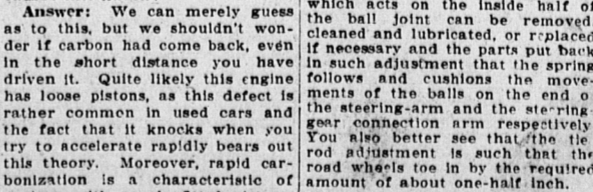
A Signal That Valve Gear Adjustment Is Required

LIGHT BUT DISTINCT CLICKING SOUNDS, which are especially noticeable when an engine is running otherwise quietly, with the throttle closed, as when the car is coasting, are very likely to be valve gear noises and their most usual cause is too much lost motion or clearance between the cam operated pushrod and the valve stem (in pocketed valve engines) or the rocker-arm end (in overhead valve engines). The ends of the push-rods carry a nut and check-nut adjustment to alter their effective length and thus to vary their clearance with the part which they operate. In making a readjustment, the engine is taken when warm and the cylinder to be operated upon is set on its firing point, to close both valves fully. Every instruction book states what the clearance should be (sometimes a little more for exhaust than intake), which is usually in the vicinity of .001 inch or the thickness of a very thin card. If the clearance of either valve is found incorrect, the check-nut is loosened and the other push-rod nut is moved to lengthen (or shorten) the push-rod by the required amount, when the check-nut is again securely locked. Each cylinder is set on its firing point, by noting the position of the distributor arm and the numbers molded in the distributor-cap, before its valves are adjusted. With many engines, adjustments made when it is cold are too close and result in the valves holding open, when running temperature is attained, loss of compression and missed explosions being the result. Too great clearance not only makes an engine "sound like a sewing machine," but it decreases the opening of the valve upon which the push-rod acts, thus interfering with the entrance of the charge or the exit of the exhaust as the case may be and, what is of more importance, makes the valve open late and close early, thus reducing the power.

STEERING WHEEL JERKS

F. A. H. writes: The steering wheel of my car jerks around in my hands, when traveling a rough road. The lost motion in the knuckles has been taken up and the pins in the tie-rod have also been tightened. What is wrong and how can the trouble be remedied?

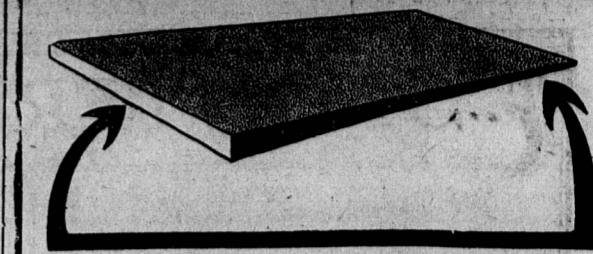
Answer: Most likely the buffer-springs in the ends of the steering connecting-rods are likely to have ceased to work properly, because they have broken or become stuck. The cushioning effect of these springs is relied upon to prevent slight movements of the road wheels from reaching the steering wheel, but if they are out of order, there is nothing to absorb these road shocks and they reach the operator's hands. If unscrewing the plug which forms the outside of the ball joint in each end of the drag-link, the spiral spring, which acts on the lower half of the ball joint, can be removed, cleaned and lubricated, or replaced, if necessary and the parts put back in such adjustment that the spring follows and cushions the movements of the balls on the end of the steering-arm and the steering-gear connection arm respectively. You also better see that the tie-rod adjustment is such that the road wheels toe in by the required amount of about one-half inch.



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BOMB GARBAGE CAN

HAVANA, August 25.—Two persons were slightly injured and business houses within a radius of half a block were damaged early this morning when a bomb, hidden in a garbage can, exploded near the doorway of a branch of the Banco Espanol on Galiano street. The plant to grow...



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- 1—They are the big butt shingles—the only asphalt shingle that gives a shadow line, which so improves the appearance of a roof—something architects have long wanted in Asphalt Shingles.
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- 3—Being tapered extra thickness and weight are distributed where extra thickness and weight are needed—in the part exposed to the weather.

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Write for our valuable history of roofing "Shelter." On every page is a photograph of a different kind of a roof, in a different part of the world. It will be mailed free to responsible parties.

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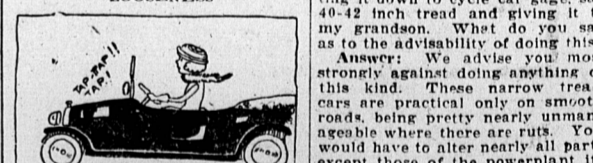
For Sale by GILL & LANTZ

What The Tire Treads Tell

They Are Silent Witnesses Of Certain Derangements

IN LOOKING OVER YOUR TIRES has it ever seemed that the tread of one of the rear ones was wearing down faster than it should? If so, the fact should be taken note of and not hastily attributed to inferior tread material, for it is far more likely that there is another and a preventable cause. When the tire on one of the rear wheels wears down faster than that on the other, it is usually because it is doing most of the braking and that it is the one that is locked as it slides along the road surface, when an emergency stop is made. The thing to do is to jack up the rear-end and adjust both brakes of each set to take hold simultaneously and equally. Rear tires naturally wear their treads faster than front ones, but sometimes inspection shows that the front ones are grinding down equally fast or even faster. This should raise a suspicion that the front wheels are not properly aligned, but are "scuffing" their tires destructively. If the front wheels toe out, this action is very pronounced and more than a very little toeing in is nearly as bad. Bad scratches or tears, lengthwise of the tread, are sometimes occasioned by the front springs having settled, so that a fender touches a tire, when the front wheels strike an abrupt bump.

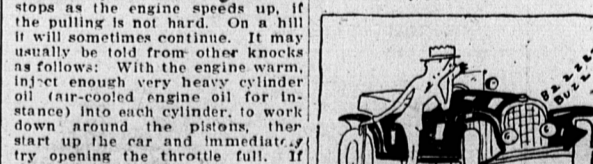
DIAGNOSING PISTON LOOSENESS



T. S. writes: There is a knock in my engine, which I think may be a piston. The heavy head cylinder does not suck much oil and the compression is good. How can this kind of a knock be distinguished?

Answer: Generally the piston-slap is more of a rattle or clatter than a pound and usually is not at all heavy. It is pretty sure to show up when the throttle is opened suddenly, with the engine at slow speed and it sometimes stops as the engine speeds up, if the pulling is not hard. On a hill it will sometimes continue. It may usually be told from other knocks as follows: With the engine warm, inject enough very heavy cylinder oil (air-cooled engine oil for instance) into each cylinder, to work down around the pistons, then start up the car and immediately try opening the throttle full. If the knock is not heard for a short time or until the engine has all worked out, you may infer that the pistons were slapping and that the thick oil around them prevented this temporarily.

NOISY FAN



O. H. writes: My engine makes an objectionable buzzing noise, which I traced to the fan, by holding it from turning while the engine was being run. What causes this and how can it be stopped?

Answer: Possibly one of the blades is loosely riveted and chatters or the fan may be loose on its bearings. If it has ball bearings and these have ever run dry for any length of time, their cups and cones may have become scored, under which circumstances they will never run quietly and must be renewed. We suggest that you see that the blades are tight and inspect the bearings. We assume that you have assured yourself that the blades do not touch anything when they are in motion.

A. E. S. writes: I have an old car, the power plant of which is still in pretty good shape, but as I do not expect to use it

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