

HINTS FOR THE MOTORIST

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Winter "Prescriptions" For Cooling Systems

Supply Enough Alcohol At First And Make Good Its Evaporation Loss

FOR THE BENEFIT of those who have acquired cars only recently and for those who do not keep in mind or on file data in regard to the proportions of denatured alcohol required to protect cooling systems from freezing at various temperatures, the following table is presented, the figures being taken from the S. A. E. Handbook and a Bulletin of the Bureau of Standards. The two sets of figures differ considerably. The percentages given represent the proportion of denatured alcohol, the rest of the mixture being water and the degrees Fahrenheit indicate the temperatures at which the various mixtures freeze:

Percentage	S. A. E.	Bureau of Standards
10	24 degrees above	27 degrees above
20	14 " "	19 " "
30	5 " below	10 " "
40	20 " "	2 " below
50	34 " "	18 " "

The Bureau of Standards table calls for much more alcohol to furnish the same protection, especially at the lower temperatures, and may be safer to follow, but it is believed that the S. A. E. table specifies enough to protect against the development of dangerous bursting pressures, although perhaps not enough to prevent the formation of sufficient floating ice crystals somewhat to impede circulation through the radiator passages. In supplying alcohol anti-freeze mixture, proceed as follows: Ascertain the total liquid capacity of the cooling system from the instruction book, or dealer or by measuring it. Determine the amount of alcohol required. For instance, if the system hold 16 quarts, protection is desired down to 2° below zero and the Bureau of Standards table is to be followed 0.4x16=6.4 quarts of alcohol will be needed. Drain the system completely and flush it out with water until it is clean. Replace all drain plugs. Pour into the radiator the 6 1/2 quarts of alcohol and add water to completely fill the system.

IDENTIFYING A LEAKY CYLINDER



W. J. B. writes: I find, upon making a test, that the compression in three of the cylinders of my engine is good but that it is weak in the remaining one. How can I tell which cylinder it is that is not holding its charge properly? I have run this engine so carefully that I cannot believe that any of the cylinders have become scored. My dealer tells me that one seldom finds all cylinders with equally good compression. Is this a fact?
 Answer: Remove all spark-plugs except that in No. 1 cylinder. Hand-crank the engine and whatever resistance you feel will be that due to the compression in this cylinder, as there can be none in those which have their plugs removed. Then remove the plug from No. 1 and screw it into No. 2. Judging the compression in that cylinder by cranking the engine over. Place the plug in cylinder No. 3 and then finally in No. 4, observing the resistance to hand-cranking after each change. What your dealer tells you is perfectly true—more's the pity. There is no reason to think you have damaged your engine. Compression was probably always unequal.

A BOTCHED REPAIR JOB

W. H. J. writes: When I had the armature of the generator on my car rewound, the workman substituted a piece of wire in place of the thermostatic resistance, evidently intending this to act as a fuse. Since then I cannot keep the battery charged. Once in a while the ammeter indicates charge, but then the fuse blows. Most of the time a discharge is indicated. How can this trouble be corrected?
 Answer: It was a very foolish proceeding, leaving out the thermally operated field resistance, as the action of this generator depends entirely upon it and you should have a new one put in at once. Otherwise, the generator circuit will be opened every time that the generator gets well heated up. Presumably, the fuse wire that was substituted for the field resistance unit is not of sufficient capacity to carry the field current. It is to be hoped that there is nothing wrong with your generator, but we should have very little faith in the armature winding of anyone who would perpetrate the stunt you mention. The times when your generator charges are probably when it is cold and before the thermostatic contacts open and cut in the fuse wire.



Draining The Cooling System

No Water Must Be Left In The Cold Stored Car

THE FOLLOWING SUGGESTIONS are intended for the guidance of motorists who are to lay up their cars during the winter and for those who prefer to empty the cooling systems of their cars during periods of disuse in cold weather, instead of making use of anti-freeze mixture.

Do The Job Thoroughly

The main thing is to drain the entire cooling system completely for if water remains in the pump, in any of the radiator passages or in the bottoms of the cylinder jackets, it may cause bursting and resulting leaks in these parts, if it freezes.

Beware Of Obstructions In The Radiator

In order to avoid the possibility of radiator tubes or passages being clogged, with the likelihood of water remaining trapped in some of them, even after all water which can escape has been emptied out, it is well to clean out the system with a soda solution shortly before draining, unless it is certain there are no "dead" spots in the core.

Different Provisions For Draining

Some cooling systems, thermosiphon ones for example, can be entirely drained by opening a cock or removing a plug in the lower radiator tank fitting, but where there is a pump there is often a drain opening in the bottom of its housing and engines with deep water jacketing sometimes have a cock in the bottom of this water space.

The Plugged Up Drain-Cock

All drain-cocks apparent or mentioned in the instruction book should not only be opened but the passages through them should be kept from clogging with sediment by running a wire through them, as otherwise water may cease running out while some is still present. Use the wire after water has ceased to escape, as a precaution.

A Hot Engine Dries Itself

Draining is best accomplished while the cooling system is hot, as the warmth of the parts tends to evaporate water which does not run out and as an additional precaution, the engine may be run idle for a couple of minutes after the system seems to be empty, so as to store heat enough to dry out any remaining liquid. Leave all drain cocks open and plugs out.

Carburetor Jackets

Some cars are still in service, which have a water jacket around the carburetor and in some instances its water inlet and outlet pipes have shut-offs. In this case these shut-offs and the drain opening in the bottom of the jacket should be opened and left open. Cars with thermostatic water control and alcohol condensing tanks may require special draining operations, described in their instruction books.

GEAR LUBRICANT AFFECTS CLUTCH

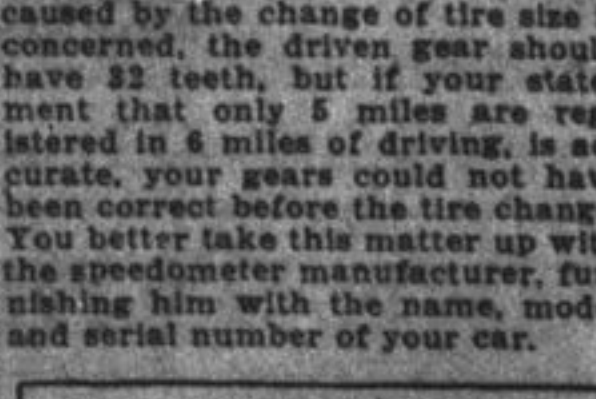


C. A. R. writes: Grease runs out from my car's transmission case at the front end. How can this be prevented? How can the clutch-brake of my single-plate clutch be lightened? I have difficulty in shifting gears?
 Answer: You don't give us the make of your car, so we cannot be specific in our answer, but usually a felt washer around the clutch-shaft, where it enters the transmission case, is used to make an oil seal. A new washer should stop this trouble. After you thoroughly wash from off the clutch parts, the oil which has leaked onto them from the transmission, using several applications of kerosene poured in through the top opening, you will probably find that your gears shift better, but if not, set the slot adjustments so that there

is 2 1/4 in. clearance between back of throwout collar and bearing boss on housing and see that pedal has proper clearance with floor board.

ODOMETER ERROR

C. A. R. writes: I have changed from 33 inch tires to 34 inch tires and now my odometer registers about 5 miles when I have actually driven 6 miles. Speedometer gear on driving shaft has 20 teeth and that on flexible shaft 25 teeth. How many teeth should a new driven gear have to give a correct reading?
 Answer: So far as the error caused by the change of tire size is concerned, the driven gear should have 22 teeth, but if your statement that only 5 miles are registered in 6 miles of driving, is accurate, your gears could not have been correct before the tire change. You better take this matter up with the speedometer manufacturer, furnishing him with the name, model and serial number of your car.



Questions of general interest to the motorist will be answered by Mr. Clough in this column, space permitting. If an immediate answer is desired, enclose self-addressed, stamped envelope.

MOTOR NOTES.

An engine should be idle when reading the indicator of the oil level.

Yellow distilled glycerine is a satisfactory anti-freeze compound for radiators.

By running on soft tires much power is lost, as well as bringing about undue wear on the tires.

It is particularly important to take accurate reading of a balloon tire where a few pounds one way or the other means a lot.

In replacing the priming gears, it is sometimes advisable to endure a humming noise at first in order that they fit better when worn. Timing gears that run quietly when first installed generally rattle when worn in.

Keep the nut that holds the valve stem of the tire tight to the wheel, but not too tight. The purpose of the nut is to keep water from leaking around the stem into the tire. Too much tightening, however, serves to pull the valve stem out and may damage the inner tube.

With the winter season approaching, it is a good idea to see that skid chains are in good condition and safely stored in the car. While non-skid tires may keep the car from skidding on pavements, chains will be needed when it is necessary to drive through mud.

BENZOL GOOD AUTO FUEL.

Benzol is being introduced as a motor fuel. The best results from this fuel are obtained when mixed with gasoline, although straight benzol has been successfully used.

When straight benzol is used in an automobile motor, it is necessary to provide more air than ordinarily required with gasoline fuel.

Comparative tests between gasoline and benzol show that 15 per cent. to 30 per cent. in miles per gallon of fuel were obtained by use of benzol.

After 500 miles of running, the dilution of crankcase oil was found to be 7 per cent. with gasoline and only 3 per cent. with benzol.

The absolute viscosity of oil after use with gasoline decreased 62 per cent. at 75 degrees F. and with benzol it increased 71 per cent. at 75 degrees F.

The volatility of benzol produces greater ease of starting, particularly in cold weather.

Benzol is a powerful solvent, and it has been found that when using benzol mixtures in a car that has been running on gasoline, the accumulation of dirt in the tank and fuel pipe is sometimes loosened and carried forward into the carburetor.

Some experiments have been carried out, using a mixture of benzol and alcohol, but the results were not as satisfactory as those of the benzol-gasoline mixture.

TIRE THEFTS ARE DUE TO THE HIGH PRICES

Detroit, Dec. 4.—The increased price of crude rubber and the proportional increased cost of rubber products has greatly increased the number of tire thefts here.

The number of thefts of automobile tires in this city have doubled since March. The proportional increase in tire thefts have followed closely the scale of rising tire prices.

Stolen cars, when found, are usually stripped of all accessories. Tires seem to be the most sought after.

Second-hand tires have become scarce since the tire price raise has been inaugurated.

NEGLECT OF AUTO CAUSES BIG WASTE

More than \$1,000,000,000 annually are wasted by neglect in the maintenance of automobiles!

Neglect in lubrication and adjustments cause the principal loss.

Other evils which contribute to the waste are faulty brakes, wheels out of alignment, worn parts and the like.

It has been estimated that more than 50 per cent. of all accidents are a direct result of faulty brakes.

This huge waste is considered unnecessary and due to carelessness alone on the part of auto owners.

Anti-Freeze for Radiator.

The following table gives the amounts of anti-freeze solution to use in the radiator at various temperatures. The proportions are given in percentages by volume, the rest being water, and the temperatures, in Fahrenheit, tell at the point such mixtures will freeze.

Alcohol (per cent)	Glycerine (per cent)	Freezing Point
10	10	27
20	15	20
30	25	10
40	35	0
45	40	-10
50	45	-20

Design Problem.

Great Britain auto designers are puzzled over the position for the brake and gear-shift handles. American manufacturers have solved the problem by placing them in the middle of the foot compartment, but English cars are narrower, and British designers believe that putting the levers on the side near the driver will afford more room.

Widen City's Streets.

Boston is planning an extensive highway system to relieve traffic congestion in the busy downtown district. The plan is to construct several main highways 100 feet wide to take care of the principal automobile traffic. Such a plan would cost the city \$50,000,000.



AMONG the many pleasures that attend the holiday season, there is none that we enjoy more than that of greeting our friends. Many new ones have been made during the year and the consistent support we have received from our old ones has been most gratifying.

To all of these we extend our hearty wishes for a Merry Christmas and a Prosperous New Year.

Van Luven Brothers

Ford

SALES AND SERVICE KINGSTON