john clinton's

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WARTIME THRIFT HINTS FOR MOTORISTS

COMPLIMENTS OF UNION OIL MINUTE MEN

Printed in U.S.A.

Dear Friend:

Let's get one thing straight: there's nothing stuffy or complicated in this book. It is a compilation of what Union Minute Men have learned in their daily experience servicing all kinds of automobiles. It contains hints from taxi drivers, from long-distance truck drivers, from veteran race drivers, from test drivers and Union Oil engineers. It is full of stuff that ordinary motorists such as you and I never hear about.

If you follow these hints and suggestions you're a cinch to get greater oil, gas and tire mileage, and longer better service out of your car. And since there's a war going on, and since we don't know when we'll ever get new automobiles, Union Oil Company figured this was the time to jump in and help out. We all hope you like it.

John Clinton

I was feeling pretty low when I rolled into the neighborhood Union Oil Station to see Chuck Duncan, my favorite Minute Man.

I had been thinking about my Hispano-Plymouth and its tires and I had just finished reading about the poor fellow that was hauled out of a wreck on the Ridge Route and how his first words were: "Never mind me, what happened to my tires?"

I was thinking, too, about how armies today travel on rubber and about how war in the Pacific had cut off a good part of our supply.

I was thinking about how even my checks no longer bounce and about Mrs. Clinton, and how she now bulges in all the wrong places.

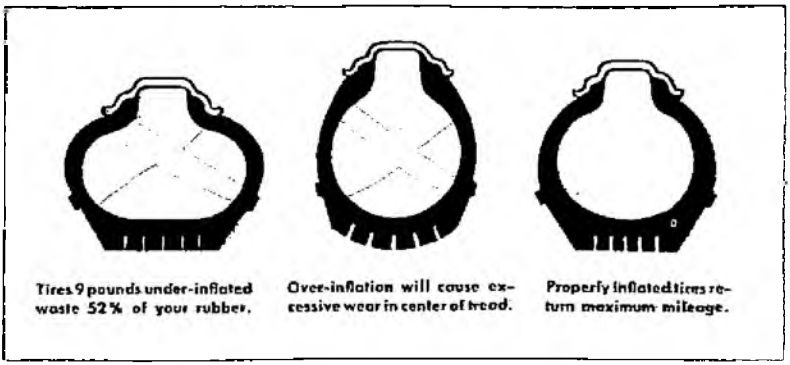
No girdles, no golf balls, no garters, and the tires on the old Hispano-Plymouth must either see me through or the H.P. must stay in the garage for the duration.

"Just take it easy, John," Chuck said. "Your tires are in pretty good shape and with a little care they are going to last you for a long time to come."

Chuck talked me out of taking my tires to bed with me. He agreed with Mrs. C. that this was fussing over them too much. And he did offer these very practical suggestions:

1. *Keep your tires properly inflated.* This is the most important single thing that you can do. They tell me that about 20% of the average tire's life is lost through under-inflation. In other words one tire in every five is thrown away simply because of neglect. At one time maybe we could afford that sort of carelessness, but no more.

Incidentally, new car owners frequently carry too little pressure in their tires. They are enjoying extra riding comfort but at the sacrifice of tire mileage. A tire on the ordinary car loses about three pounds of air a week so it is wise to drive in and have a weekly inflation check-up. Don't over-inflate your tires though because that can be equally bad.



2. *See that your wheels are in line.* It makes old John shudder to think of it but a tire out of line only ½ inch is dragged sideways 87 feet out of every mile. This not only wears down the tread, but it builds up an internal heat that weakens the tire body

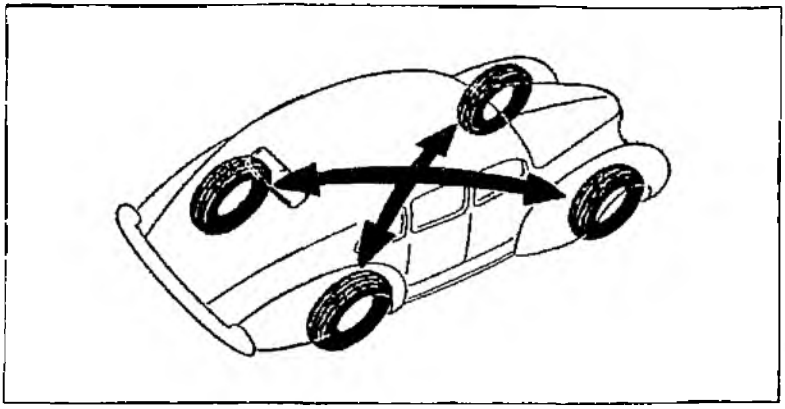
and the inner tube. So have your wheels lined up regularly. This is especially important if your car is equipped with independent front wheel suspension (knee action to you and me).

3. *Check wheel balance.* A wheel assembly that is just one ounce out of balance will cause a 12-pound vibrating force at 60 miles an hour. This means a shock every time the heavy side as well as the light side of the wheel hits the road, and resulting punishment to the tires and the running gear of your car.

4. *Look out for high speeds.* Here is one thing you should remember: heat is the worst enemy of rubber. The faster you drive the more heat you are generating inside your tire. Tire men will tell you that tires running at 40 miles an hour will normally give 73% more mileage than they will at 60 miles an hour. It is not only the heat that causes this. When you are traveling at high speeds you have more tire slippage and as the car sways more it scuffs the rubber off the treads. Ease up on the accelerator and you will ease up on the wear and tear on your tires.

5. *Switch tires every 5,000 miles.* Despite every precaution that you can take, tires are bound to wear unevenly principally because roads are not level. For that reason you should have the tires on your car interchanged every 5,000 miles. Those in the know say that if tires are not too badly worn you can get up to 3,000 more miles out of every set by shifting them around so that they wear evenly. You don't have to mount or dismount the tires but just change the wheel units, provided the wheels are in balance. If you find that the same pattern of tread wear

persists it is probably due to faulty wheel alignment. In this case, of course, it is best to get after the cause of the wear and have your wheels lined up properly.

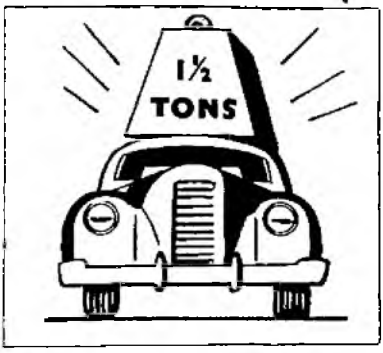


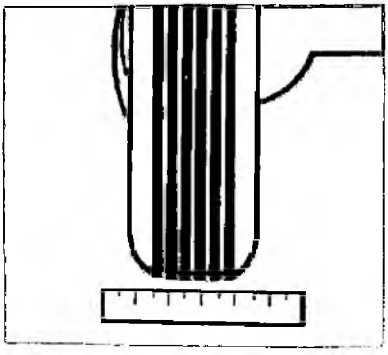
The diagram illustrates a typical tire change. But they should be switched according to your own car's pattern of tread wear.

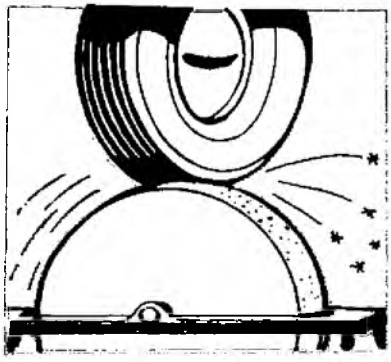
6. *Drive slowly in hot weather.* It is that old devil heat again. You can't do much about the weather but you can protect your tires by driving at moderate speeds when the temperature is soaring.

7. *Park carefully.* Banging into the curb when you park the car can completely ruin a good tire. Hitting a chuck hole, a traffic button, or some sharp object in the road will have just about the same disastrous effect. Chuck reminded me that this sort of thing can very easily result in a bad break in the carcass of the tire that will make it unfit for retreading. Now will you be careful?

8. *Take those curves slowly.* First, let me remind you that the average car weighs about 1½ tons. Second, that all of this weight rests on a few square inches of tire tread. Third, that when you take a curve at high speed you double this weight because of centrifugal force. Fourth, that all of these three tons or more jam your tires against the road like a grindstone, scraping and wearing away miles of good service. Fifth, that if you just think of these four preceding points you will slow up to a reasonable speed when you take a curve.







9. *Don't make those sudden stops.* Slamming on your brakes at 45 miles an hour will grind off 1¼ miles of normal tread wear. Look ahead and try to anticipate your stops. Brake severely only to avoid possible accidents. Quick starts are hard on tires, too, because your wheels slip and scrape off rubber.

10. *Keep your spare tire covered.* If your spare is carried on the outside of your car be sure to keep it protected *and* fully inflated. Your spare should be kept active, too. Put it into operation on one of the wheels when you switch them around.

11. *Clean up your garage floor.* Chuck tells me that oil is bad for rubber, that it acts very much like acid on metal. After I heard that I spent the following Sunday afternoon cleaning up those oil pools on my garage floor. Unless you are a tidier soul than Clinton – which is quite possible – this would be a good idea for you to follow, too.

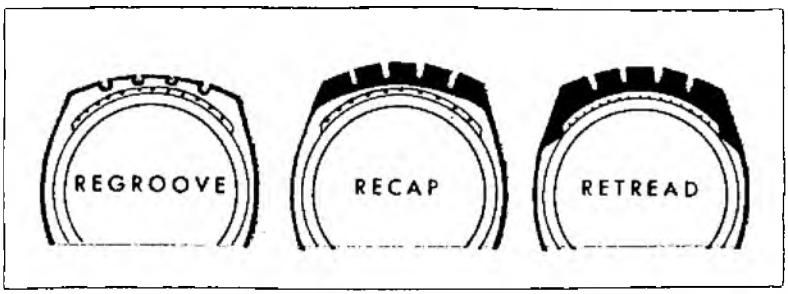
12. *What now, little man?* Up to the present we have presented all the things that you as a driver can do to get the greatest possible mileage out of your tires. If you have followed all

these suggestions faithfully, you can obtain up to three or four years' service from a set of new tires. From there on, though, *your* work is done.

But you have your choice of three methods of lengthening the service of your tires. (At least you did at the time this book was written although developments may very well change this situation.) First, there is *regrooving*. This consists of merely cutting a new tread design in the old rubber. Cutting a tread in the smooth surface permits the tire to run cooler. Regrooving is inexpensive and usually adds from 1,000 to 1,500 more miles on your tires. Remember these two points, though. Regrooving is only of temporary benefit, and only possible if the tire is not worn down too far.

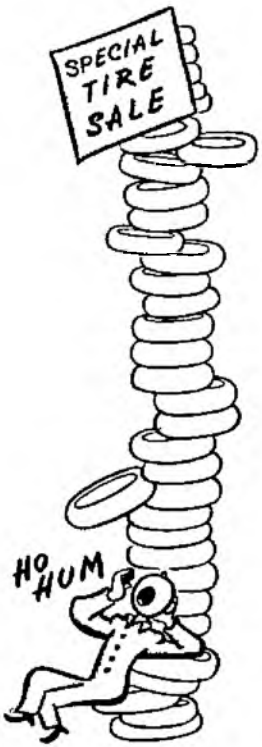
Second, there is *recapping*. This calls for buffing the tire down to a contact point. From there the old tire is capped by adding rubber to make a new tread.

Third, we have *retreading*. This is the most complete process and the one that will give you the longest mileage, even up to 80% of the service built into your original tires. In the retread-



ing process the tire is buffed all the way down to the fabric in the carcass and from there a complete new tread is built up by applying rubber.

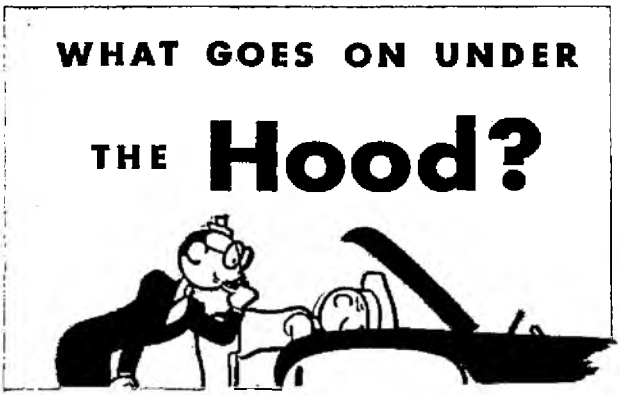
Now let me give you some sound advice about any of these three rubber rejuvenation methods. To begin with, unless you plan regrooving, run your tires down to the fabric. You might as well get that mileage rather than have it buffed off by a machine when they are recapped or retreaded. However, don't let your tires go beyond that point because they can very quickly be worn beyond any hope of rescue.



All of this, I am convinced, means that you should have good, honest advice about your tires. Some people buy bargain retread jobs when their tires are damaged or otherwise hopelessly unfit for this renewing process. Others are high-pressured into it before it is necessary. Have your tires checked regularly, but please have it done by some one who has your best interests in mind.

Incidentally, since you may be driving less, here's a last tip. You'll be money ahead by driving occasionally, because rubber does deteriorate. Driving flexes your tires, keeps the rubber pliable and of course lengthens their life. Driving also extends the life of your battery.

That final point is Clinton adding, I think, a very important postscript to Chuck's advice on making your tires last.



"John, promise me one thing," said Chuck.

"The check will be in the mail tomorrow," I said.

"That's not it," Chuck went on. "John, you are a tinkerer. But promise me you'll give up tinkering on that car of yours until this emergency is over."

I protested but Chuck was firm.

"That bus of yours is a carefully built, precision machine," he said. "With the right kind of care it can last you for ten years. But that doesn't take into consideration your fussing and tinkering over it. Let a good mechanic handle that."

Then Chuck gave me these hints about what goes on under the hood of the Hispano-Plymouth.

13. Check your ignition regularly. As Chuck pointed out, the main job for your ignition system is to provide the spark that causes the explosion that makes your engine turn over. There are several points about it that deserve frequent attention, and one of the most important of these is to make sure that your engine is getting the right distribution of firing power. The *distributor* handles this assignment, and some assignment it is, too, when you realize that it must distribute the spark to the plugs at the rate of 600 times per second at average driving

speed. Because the distributor is so finely built it is easy to get out of adjustment. Have it tuned regularly by experts.

14. *Take care of your battery.* If your battery is under the hood, as most of them are now, remember that it is subjected to terrific heat. As a result it needs water more often. If the water drops below the proper level the plates and separators start to buckle and the rest of the battery has more work to do. That is one worry that I don't have any more because Chuck makes it a point to check my battery regularly.

Watch the water level.

15. *Keep your spark plugs sparking.* Here is another ignition inspection that should be made periodically. At 35 miles per hour each of your spark plugs fires at the rate of 540 times per minute. If they are dirty or improperly spaced they won't give you that full firing action and will rob you of important gasoline mileage and power. For that reason you will be ahead if you have them inspected and cleaned at 3,000 mile intervals and replaced at 10,000 miles. (Here again, at the time this was written, spark plugs were available but a shortage may very well develop.) A worn set of plugs can waste up to one gallon of gasoline in every ten, for if the plug doesn't fire the gasoline in the cylinder is shot out of the exhaust or dropped down to dilute your motor oil.

Have plugs checked and cleaned regularly.

16. *Keep your carburetor properly adjusted.* Unless you are still operating a Stanley Steamer, your car runs on gasoline. The ingenious little device that controls the distribution of that gasoline is the carburetor. To give you maximum power at the lowest

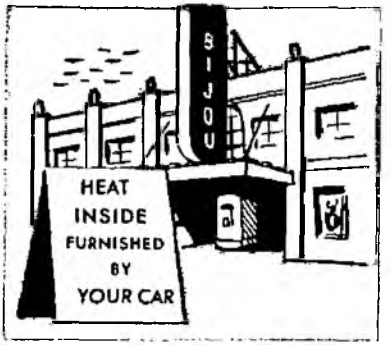
possible cost it must be carefully adjusted. Like your distributor it is a delicate, carefully engineered bit of mechanism. It should have the attention of an expert for frequent check-ups. Incidentally, your carburetor is greatly affected by any change in altitude. If you should move from the mountains down to the coast, for example, be sure to have your carburetor adjusted.

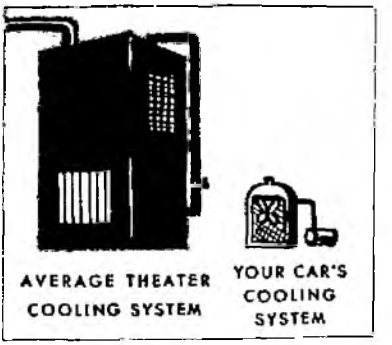
17. *Test your motor's compression.* Frankly, it isn't Chuck's aim (and certainly not mine!) to take you into the fundamentals of the internal combustion engine. (That is just a fancy term for your car and mine.) But this little book wouldn't be complete without a word about compression. Actually that is very simple. Compression is nothing more than the process of compressing the gases in the cylinder chambers in preparation for the explosion that pushes down the pistons that turn the crankshaft that makes the wheels go around. To get the smooth power and quick pick-up in your modern car, engineers have had to design the valves, pistons, and other parts of your motor to fit within 1/1000 of an inch. Worn valves or stuck rings will play havoc with your compression because they permit the combustible gases to escape before the explosion. All that your old friend John can say is who am I to cross swords with those Caltech graduates that work with black magic such as this! I am letting a good mechanic check my motor compression every 15,000 miles and I think you should do the same.

18. *Watch those brakes.* If your brakes are grabbing or pulling unevenly have an inspection made right away. To avoid burning up tires and excessive wear on brake linings, all four brakes should be evenly balanced.

19. *See that your clutch is working properly.* A clutch is one of those things that doesn't need much attention unless it is out of order. However, if it grabs or slips have it corrected right away. Remember, too, when you depress the clutch there should always be a little play between the pedal and the floorboard.

20. *Keep your cooling system cooling.* I don't surprise very easily but I was amazed to find out that the motor in my Hispano-Plymouth can generate enough heat to warm up an average-sized theatre. You can imagine what a terrific load that





puts on your cooling system. Because over-heating burns up gasoline and oil, as well as contributing to other damage, always be sure that your cooling system is right up to snuff.

One good precaution is to have the radiator cleaned and flushed every spring and fall to remove the corrosion, rust, lime and grease that inevitably build up in the radiator tubes. After that is done the addition of a rust inhibitor will help reduce future corrosion.

Here are some other cooling system points that should be checked regularly: the fan belt to see that it is not worn or loose; the water pump to see that it isn't leaking; the radiator itself to make sure that it isn't half clogged with bugs.

Just watch all these things and then old John won't be able to say, "I told you so!"

I'm proud of the way the Hispano-Plymouth looks, too. When we have company and start talking about autos I frequently simulate what I hope is a picturesque shyness and say: "Yes, yes . . . 'take great pride in keeping my car shining and bright, you know. I wash it, polish and wax it every three months."

At this point, Mrs. C. clears her throat . . . "Who does it, dear?" she coos in F-minor. (Well, the Union Minute Men do help a lot – and maybe Mrs. C. does help me once in a while, but a guy's gotta brag some time!)

But I was pretty proud when Chuck said: "I'll have to admit, John – you do keep the Hispano-Plymouth looking bright. But if I were you I'd –"

And then I interrupted. "Now you listen, big boy. I am going to tell you how I do!"–And this is roughly The Clinton System for Making Cars Shine!

21. Keep your car in a garage. If you had to stand out and face the wind, rain, dirt, snow, sleet, and hot sun, you wouldn't look so good either. All of these things not only affect the appearance of your car, but they definitely harm the finish as well. Keep your car under cover as much as possible if you want to preserve its school-girl complexion.

22. ***Polish and wax your car four times a year.*** It is a weary job, I know. Mrs. Clinton practically has to chain me to the car to get me to do it. As a matter of fact I let Chuck handle it most of the time. A good cleaning and wax job will not only make the old family bus *look* like new; it will also give it a protective coating that will really add to the life of your paint job.

23. ***Don't miss the brightwork.*** Polishing up the chrome and brightwork on your car is fun. You can really see the results. Using a good metal polish regularly, also helps prevent oxidation, pitting and rusting.

24. ***Clean the upholstery.*** Clinton's rule here is to give the upholstery a good stiff brushing at least once a month. Go after all those oil spots or stains with a good spot remover. This should prevent any possible rotting of the materials. (Chuck cut in on my speech here to say that if you have leather seats they should be given a good saddle soaping to help prolong the life of the leather as well as making it look better.)

25. ***Invest in seat covers.*** If you are just a regular American family I think you will find that seat covers are a pretty good investment. You can try to be careful but kids and dogs are always going to be hard on upholstery. The new seat covers I have seen recently are not only good-looking but they are obviously built to stand a lot of punishment.

HOW TO DRIVE

Your Car

Chuck regards me with controlled enthusiasm. To him John Clinton is no hero. But after he pretty thoroughly covered the Hispano-Plymouth, I was still a little surprised when he said: "Look here, John, what about you?"

I didn't suspect what was coming. "Who, me?" I replied, "Why thanks, Chuck, I'm right in the pink – take my orange juice and vitamins, and every morning I take my exercise – jump at fifty conclusions before my shower. Why I –"

"That's not the idea," said Chuck. "I'm talking about your driving. The way you handle that buggy of yours."

"Now after all, Chuck, you know I can drive."

"Well, maybe," said Chuck, "but what I want to know is how you drive. You can add a lot of good miles to the old bus if you treat it right. If you don't, you may be riding a horse before this is over."

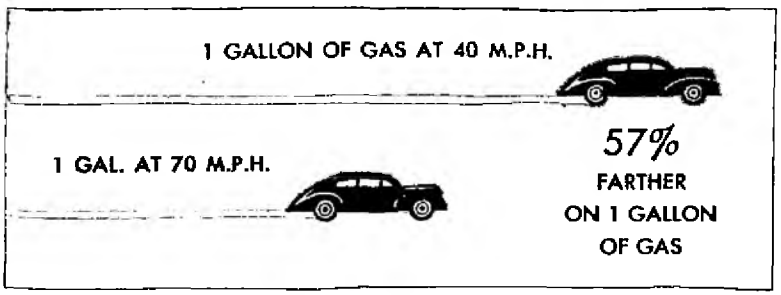
At this point Chuck handed me a piece of paper. "Take a good long look at this list," he said. "It's all sound advice."

So I looked.

26. Warm up for cold starts. Make it a point to take an extra minute or two to run your motor before you start rolling. This gives your oil a chance to circulate and set up a protecting film

against wear. Don't try to hurry the process. Racing a cold motor wastes gasoline and dilutes your motor oil. (Chuck tells me that he makes it a point to depress his clutch pedal when he starts his car. This lessens the load on the battery.) In cold weather, of course, you should use a winter grade oil and good volatile, winter blend gasoline. That will give you quicker starting and faster lubrication.

27. ***Drive at reasonable speeds.*** Put away those goggles and that crash helmet for the duration. Fast driving not only helps age a car before its time; it really burns up the gasoline as well. You can put this down in your amazing-but-true-facts-dept.: one gallon of gasoline will take you 57% farther at 40 miles per hour than at 70. So with me it's "Take-it-Easy" Clinton from here on in.



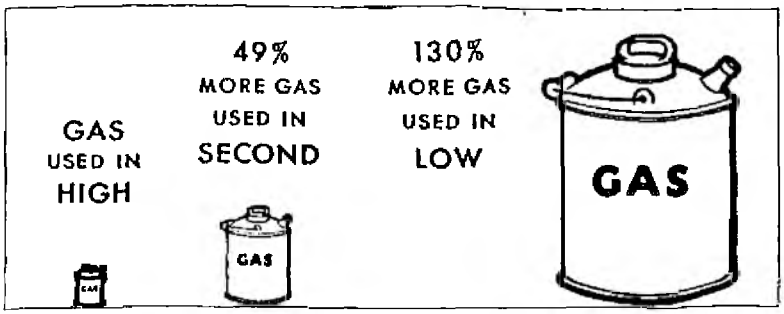
28. ***"Idling" motors waste gas.*** Maybe it is easier to keep the motor running while you park to hash over the war with your neighbor. But it uses up gasoline and shortens the life of your car without any miles to show for it at all. Naturally in traffic driving you can't avoid some "idling." And for that reason it is a good idea to make certain that your motor idles smoothly and slowly. A good mechanic can set the most economical idling

level by checking your carburetor jets. (Chuck's business is *selling* gasoline, so when he tells me how to *save* gasoline I think he deserves a hand.)

29. *Go easy on the choke.* Most of the late model cars have automatic chokes, but lots of us are without benefit of this new gadget. If you are still on your own like I am, just remember that it is seldom necessary to pull the choke out more than a quarter of the way. Over-choking pours enough extra gasoline into your motor to drive several miles. It will also dilute your motor oil.

Unless you are trying to get rid of your money be sure to push the choke back in just as soon as your car will run smoothly without that added priming. Do it anyway and hand over the difference you save to the Red Cross.

30. *Don't start like a jack-rabbit.* Chuck has his own definition of a "split-second." He says that it is the time elapsed from the moment when the light turns green until the guy behind you honks his horn for you to get going. Maybe it is high time, but from now on the flashy driver who likes to gun his motor and make those jack-rabbit starts is really going to pay for his hare-brained antics. You see, it is a fact that your motor is turning



over and burning gasoline 130% faster in low than in high and 49% faster in second than in high. So it is pretty obvious that the driver who zooms away at the signal may be getting a pleasant Indianapolis Speedway sensation, but he is also throwing away gasoline and aging his car before its time. Start out slowly and as soon as you can do it smoothly, shift out of low and second. Just don't do it too quickly or you will put too great a load on your high gear and bearings.

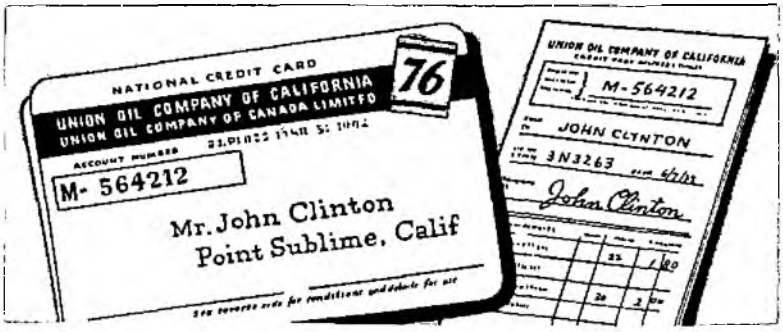
31. ***Look out for "stone-wall" stops.*** As a pedestrian you probably know the Frankenstein that races up to the intersection and slams on his brakes. He may give you a bad moment, but there is some consolation in the knowledge that he is simply losing the power that his gasoline and motor have developed for him. It is a lot easier on gasoline and car wear (to say nothing of pedestrian nerves), if you anticipate your stops. By slowing down sooner you can do it in gear which means that your motor will help your brakes carry out part of the stopping assignment.

32. ***Dragging brakes are costly.*** This may seem fundamental, but strangely enough many people are careless about disengaging their hand brakes before they start. If you want to drag an anchor around behind you, okay, but it does cost money. Incidentally, just because of this carelessness the motor makers are now painting hand brake handles *red.*

33. ***Don't ride that clutch.*** Your clutch, Chuck tells me, was designed to help you shift gears, not as a foot rest. Chuck also points out that these three mistakes are the most common cause of undue clutch wear: slipping the clutch while shifting gears; using the clutch to control your speed, particularly when you are backing up; making the clutch do the work of your brake when you are waiting for the green light on a hill. Anyone of these

means that an important part of the power in your engine never reaches the rear wheels. You are not only wasting gasoline but putting needless wear on your clutch plate.

34. ***Stay off street car tracks.*** If you like to ride down the street car tracks in town it would be much more sensible if you quit your job and become a motorman. You would be collecting nickles then instead of paying them out for repairs on the old buggy simply because you couldn't stop in time.



35. ***Keep a record.*** You will find a log for recording your car expenses in the back of this book. Jot down the operating expenses and the cost of service and repairs on your car. In this regard you will find it particularly convenient to use a credit card. It provides you at the end of the month with one itemized statement of your regular operating expenses. That way you will have all your purchases listed and you won't forget any of them.

36. ***Remember, a stitch in time.*** I hate to repeat that old chestnut, but don't wait for a minor trouble to develop into a major repair job. If you have any indication that something is haywire with your car, have it inspected right away. Above all, make sure that you put your pride and joy in the hands of a capable, well-trained mechanic.

And after reading Chuck's list, your old friend John is learning how to drive all over again.

WHAT ABOUT

Lubrication?

"John, there is just one subject we haven't covered," Chuck said. "I've saved it because in many ways it is the most important one of all. It's lubrication."

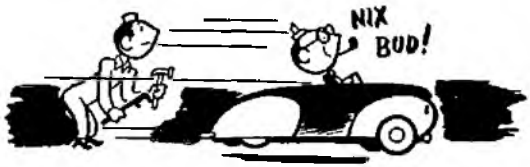
"I'm all ears," I said. "So you are," said Chuck. "But, John, you have over 40,000 miles on that car of yours. Do you realize that it was built to last for 100,000 miles or even more?"

"But will it?" I demanded. "It will if you give it the right kind of care," said Chuck.

So with me and the dear old Hispano-Plymouth standing there dreaming of a long and happy life together, Chuck launched into the all-important subject of lubrication.

He first pointed out that hit and miss lubrication habits probably wouldn't cause any grief for the first twenty or thirty thousand miles, but after that, look out! Then he explained how the

better cars we are driving today have been made possible only through motor design that calls for precise fittings and parts that move with thousandths of an inch clearances. The only thing that separates those swiftly moving parts (and keeps your car out of the repair shop) is a film of oil, a film that in most cases is thinner than this sheet of paper!



37. Change your oil every 1,000 miles. We all know that there is some debate about how often you should change your oil. Chuck admits that, but as he reminded me 1,000 mile changes are not necessarily recommended because your oil "wears out." The thing is that as you drive your motor oil is bound to pick up outside dirt and contamination. Air passes through the inside of your motor and in spite of filters lots of dirt in the air gets into your oil. It is easy enough for dirt to work through that paper thin film of oil and cause motor wear. Then, too, as you drive acids and carbon form and get into the oil. All of these elements ruin the important lubricating qualities. If you want to be sure and protect your motor – and who doesn't at this point! – the safe procedure is to change the oil every 1000 miles. I think you will agree that it is better to keep your car running in good order than to try to stretch five quarts of oil out too far.

38. Change your oil filter, too. This may sound radical but the oil filter's job is to filter. It can't do that when it is clogged up with the junk just mentioned above. It is a good idea to change your filter every 8,000 miles. Don't expect too much of your oil filter. While it keeps the oil *clean,* it cannot remove acids and diluents and thus prolong the life of your motor oil.

39. Chassis lubrication every 1,000 miles. I'll never forget one time when I watched Mrs. C. roll up to the house in the

Hispano-P. Till then I had thought of the H.P. as moving only horizontally, at least on paved roads, but I was amazed to see that the frame underneath went up and down, too. You don't feel that constant vibration in the car; the springs absorb all that, but watch your car some time and you'll see what I mean. Now during this continual process of vibration the only thing that prevents destructive metal-to-metal friction of from twenty to forty various types of bearings is your chassis lubricant. No wonder your car manufacturer recommends that these working parts be lubricated every 1,000 miles, and warns you that the work should be done only by trained men, using regulation lubrication charts, quality lubricants, and the right kind of equipment.

40. ***Springs need lubrication, too.*** Metal covered springs have the lubricant sealed in. They should be refilled every 5,000 miles. They are flexing constantly as you drive and again it is only the lubricant that saves wear here.

41. ***Repack wheel bearings every 5,000 miles.*** J. Clinton, the man, has plenty to worry about: How to pay the rent, an appointment with the dentist, double features at the local movie house, etc. But one thing that never crossed my troubled mind up to this point was wheel bearings. Now that Chuck has told me all, I have them to worry about, too! Do you know that the full weight of your car rests on these poor little bearings – on surfaces as tiny as a pin point, or as a thin razor blade? Yet these little fellows are so mechanically perfect they could go 30,000 miles or more without a drop of oil – *if* they could be sealed from dirt, grit and water. But unfortunately they can't be *permanently*

sealed. Sand and silt and the worn off brake band grit wash in and grind away at them like emery dust. Loose and worn wheel bearings are not only dangerous but they can cause wheels to shimmy and wear out irreplaceable tires. Those bearings are expensive, too. Depending on your car, a complete set costs from $10 to $50 installed. To make sure that doesn't happen to you, have your wheel bearings cleaned and repacked every 5,000 miles.

42. *Universal joints.* Some types of universal joints are lubricated every 1,000 miles and are taken care of as a part of regular lubrication, but *some* cars are equipped with sealed-in needle bearings. This kind must have special attention. They should be disassembled every 15,000 miles and repacked with a special lubricant. This does cost extra but here again you are protecting yourself against a lot bigger repair bill later.

43. *Transmission and differential lubrication.* As Chuck explained it to me those two big names simply mean a series of gears that transfer the power from your motor to your rear wheels and make your buggy go. (Chuck has to simplify such things for me or else I get hopelessly bogged down.) To give you an idea of how these gears have to keep things moving, the

The gear oil in your car must withstand a pressure of 320 tons per square inch.

Would you spend $1.50 to save this?

rear axle on your car revolves 750,000 times for every 1,000 miles. In modern cars, says Chuck, these gears must carry a lot more power and still streamlined car designs have forced manu-

facturers to make them a lot smaller. They require a special kind of oil, a chemically compounded oil that will withstand terrific pressure of 640,000 pounds per square inch. The gears and oil are enclosed in a case that seals out dirt. That part of it is fine, but it also *seals in* the metal particles that wear off your gears. Then, too, any gear oil becomes stringy with use. That is why draining and lubricating these units every 5,000 miles will help make expensive gears last longer. Spending $1.50 may save you a $50 repair bill. That is a pretty good return on your money.

44. *Shock absorbers.* Your car is equipped with them to prevent rebounds and body sway. They are filled with a special oil and must have just the right amount if they are to function properly. Shock absorbers kind of sneak up on you. When they start to get out of whack they do it so gradually that you hardly notice it. So have them checked at regular intervals.

45. *Keep air cleaners clean.* Your Chamber of Commerce may very well brag about your climate, but don't let them tell you your local air is dust free. All air is filled with dust. It is just a question of how much. And dust is the greatest enemy of the inside of your motor. That is why your car is equipped with an air cleaner to prevent as much dust as possible from being sucked into the motor. A copper screening, covered with oil, does this job. However, as you drive that screening becomes clogged with dust and dirt. It should be cleaned every 2,000 miles (more frequently than that in dusty areas). A clogged air cleaner can cause your car to burn as much as 25% more gasoline.

46. *Stop-Wear Lubrication.* About this time I was getting a little confused by all this business about differentials, gears and

bearings – about springs and bolts and lubricants that sealed *in* some stuff and sealed *out* other stuff. "Look, Chuck," I pleaded, "all this is very well. I *want* the Hispano-Plymouth to have regular, constant and loving care. But I have other things to do. I can't camp out under the car with an oil can. Besides how can I remember when all these things have to be done?" Then Chuck told me about Stop-Wear Lubrication. And Stop-Wear, believe me, is the answer to all *your* problems. It was to mine. Look:

Stop-Wear is not just an occasional hit-and-miss grease job! It is planned to be done *every 1,000 miles.* Certain parts have to be lubricated that often; others have to be lubricated every 5,000 miles; others at 8,000, 10,000 and so on. But *you* don't have to keep track of it – *the Union Minute Men do that for you!* They keep the life history of your car on record cards, and they know when, for example, the wheel bearings ought to be packed, the air cleaner dunked in cleaning fluid and stuff like that there.

Moreover, the Minute Men use no less than 9 different kinds of special lubricants. The Minute Men work from special charts for every make and model of automobile – charts that are approved by the manufacturer of the car. The result is that your car gets the kind of lubrication it should have – and at the right intervals. The Minute Men call you up and say what's what – and you say "yes" – and that's all *you* have to do. The Minute Men do the rest.

Stop-Wear Lubrication is different from anything you've ever run into. In the first place the Minute Men give you a written guarantee good for 1,000 miles against faulty chassis lubrication. If, for instance you had a Stop-Wear job done in Portland and drove down to San Francisco and a squeak showed up in the chassis – all you'd have to do would be pop into a Union Oil station that displayed the Stop-Wear sign and show 'em your guarantee and zip – they'd shoot the squeak for free!

Then there are 3 other differences. First when the Minute Men give your car Stop-Wear Lubrication, they tidy it up from stem to stern – get the dust off the outside and the inside – polish the

glass, and dress the tires and the running boards. You can always SEE the difference. Then you can FEEL the difference, too – in the smooth way the old bus shifts and steers. That is because the Minute Men have made sure that a film of lubricant has been forced into every bearing. And you can HEAR the difference in the quiet-as-a-small-gray-mouse manner in which it rides – never a birdie or a rattle due to lack of lubrication. If something else is causing that rattle they will fix it or tell you what the trouble is.

Another thing Stop-Wear includes is attention to the "small things" – a drop of oil on the choke rod, or tinkering up the horn button and a lot of odds and ends most folks don't think of. Stop-Wear, is the next best thing to having a chauffeur – and the surest way to keep that car humming through war times.

47. *Minute Man Service.* Now don't get the idea that all of Chuck's advice and suggestions were delivered in one uninterrupted chunk. In fact he kept whipping away from me almost constantly as customers entered the drive. A Minute Man's life is blighted if a customer ever beats him to the pump island for he specializes in *"High Speed."*

However, there is another side to Minute Man Service – more

important than *High Speed.* It is best stated in the motto: *"Expert Care to Save Car Wear!"* For today the Minute Men not only service your car, they look after it. They are specializing in the kind of expert care that is so essential to proper car maintenance. Take tires, for example. Not only do they keep them inflated correctly, but if the tires show uneven wear, the Minute Men will shift them for you at a nominal price of 15 cents per wheel! The Minute Men also keep an eagle eye on your battery and give it a drink when it needs it. Another thing they will suggest, when the need appears, is a radiator flush. It'd take too long to describe Minute Man Service in detail, but these points will give you an idea. Minute Men have dedicated themselves to one thing – making your car *last!* Take it from me, they'll do it, too – just give 'em a chance.

Just about that time, another car pulled in and Chuck Duncan left us. In me he left a far better, far wiser man. In the Hispano-Plymouth he left a car that is now entering a new era. I realized then that these hectic times had at least done one thing. They had brought the Hispano-P. and old John much closer together than ever before. Even the finance company couldn't break up that beautiful understanding. Then as the sun dropped down behind the Flintridge hills, I lightly squeezed the Hispano's good old fender (the right front one). "Chin up, little chum," I murmured, "We'll see it through!"

Automobile Expense Record

Date	Mileage	Gasoline			Tires Checked	Battery Checked	Oil			Lubrication		Repairs		Misc.	
		No. Gals.	COST				No. Qts.	COST		COST		COST		COST	

UNION *Minute Men* SERVICE