VOL. 5 NO. 2 JANUARY 15, 1931

Piston Replacements

WE are all quite generally agreeing that an oil purolator requires changing somewhere between eight and ten thousand miles. Many of us accept the reasoning of a recent advertising campaign that spark plugs should be changed at ten thousand miles and there are other parts of the car which actually do not receive exceedingly severe service, which are replaced around ten thousand miles without any qualms. You will also agree with us that because of these campaigns and educational work, it is easier to sell more of these parts, but now let's take a different case—The owner with twice this ten or fifteen thousand miles drives into the Service Station with a noisy motor and what happens. Some service salesman, after listening to things in a general way, sums up the entire situation by some such remark as: "Well, Mister, what you need is a new cylinder block; that will give you practically a new motor, and the cost is around $200.00, this will include refitting of bearings, which probably is necessary. This will give you an entirely satisfactory job."

Now this may have sounded like a real sales talk to that service salesman; in fact he may have prided himself on his ability to render such an efficient little sales talk on a nice big order for the shop, but if this service salesman is still living in spite of the fully warranted attack on the part of the customer, we would like to inform him that here is what happened in all probability. The customer has not been sold a thing. He has been shocked into the belief that his Packard car, which he bought in good faith as a fine, dependable automobile, has failed him and is now in a most unsatisfactory condition. It is just a shade above a used car ready for the junk pile. The service salesman listens with sad sympathy to the owner's story of how he ran his other make of car for some 70,000 miles without doing any work on the motor and very likely he agrees with the customer that certainly no such amount of work should be necessary on his Packard car at twenty to thirty thousand miles.

Well, let's look into this a little further. Is the cylinder block worn out and does the customer need a new block, or is it simply a case of worn pistons and a case of where the owner should have been sold on the idea that his car required the replacement of the pistons.

Don't for one minute listen to a story about soft cylinder blocks. If this thought even occurs to you, take a look at the valve seats; if the block is soft these will be pounded down to such an extent that there would be no argument about soft material. Such a condition is almost unheard of on a Packard cylinder. No, the material on the Packard cylinder block is not soft; in fact, as much as fifteen per cent of its make-up is steel and if this percentage were any higher, the block would be brittle, and, furthermore, on an actual test of cylinder blocks containing various percentages of steel, it was definitely proved that the hardness of the block had little to do with the wear developed. The block showing the longest wear being one of fifteen per cent steel. You can easily convince yourself that this talk of soft blocks means nothing.

Now let's see if it is so unreasonable to expect a piston to wear to the point where replacement is necessary at such a mileage. We have run across some figures, which represent averages and they may prove of interest in dealing with this subject. Someone has figured out that a piston used five hours a day at forty miles per hour goes just 56,500 miles. In other words, this one little piston takes a trip twice around the entire world in a period of one year. If the rest of the car covered the same mileage wouldn't other parts need attention?

Someone else has figured that on the average, each piston starts and stops some 6,000 times for every mile of car travel; this would represent some 48,000 starts and stops for all of the pistons. On this basis at 20,000 miles the same pistons have started and stopped about 960,000,000 times and on this basis we are quite confident you will agree with us that this little piston has done quite a sizeable job. At least you should be convinced that the pistons of the modern high speed engine are just about the busiest and hardest worked part of the whole motor. We are wondering if, after the work as outlined, the piston isn't entitled, at somewhere around this mileage, to be pensioned off to the home for old and disabled parts.

Why isn't it easier in such cases to face the problem as these other people have done and accept the fact that one of the hardest worked parts in the motor has a definite life and requires replacing. Certainly the motor

of today works harder than the motor of several years ago; it travels more miles and travels these miles faster and the piston is certainly very definitely responsible for giving the owner more and faster transportation. It should, therefore, be entitled to more consideration, but let's talk piston wear and piston refitting, and piston replacement, rather than cylinder wear, cylinder replacement, or motor overhaul. Let's explain to the customer why his pistons require replacement and that it is not unreasonable to expect such wear. Let's talk to him on the basis of "pistons," because the average owner when you say "Cylinder," sees a picture of the whole motor and when you talk to him about replacing so large a part of his motor, he immediately is under the impression that something is radically wrong, whereas if you talk "Pistons" and "Piston Wear," and that this is logically to be expected, just the same as the replacement of the purolator or the spark plugs, or any other such parts, then you are talking in a language which does not shock him, nor upset his belief in the sound value of the car which he has purchased. You will always have the story that the customer has never had any such experience before, nor on any other make of car, but you know the answer to this. You probably know the condition that his other car is in; you undoubtedly are driving a cheaper make of car along with your Packard and you know that you do not give the cheaper car the same attention, nor require the same results from it in the way of smooth motor operation that you do from your Packard. Instead of accepting such incidents, as some sort of a serious error in design or choice of material, let us accept the fact that no design and no material will offset the job that a piston is called upon to do and that piston replacement is necessary as the result of the large amount of work which it is called upon to perform and let's go out and sell these jobs for just what they are, simply the replacement of exceptionally active parts, which wear through normal use and require replacement.

Service Films

The November film release deals with the operation and servicing of the gasoline fuel pump and the automatic chassis lubricator.

The December release covers the Packard rear axle. If you are not receiving films regularly, you are missing a real opportunity in the solution of the problem of training for better Packard service. We urge you to take advantage of every possible means of bettering the type of service your organization is rendering.

Service films are now $3.00 each; projectors for small meetings are $12.00 and for large meetings $45.00.

Emulso Oil

All cars shipped from the factory have Emulso oil in the cooling system. This material is a thick black oil, which when added to water becomes a white milky substance. It is used to guard against corrosion and it assists in preventing radiator stoppage by preventing the formation of rust. It is used with, or without anti-freeze mixtures and is recommended by the factory.

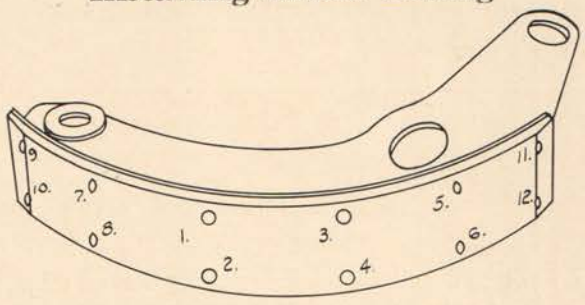
We urge you to continue the use of Emulso oil, as it will materially increase the life of the core and insure a more satisfactory operating of the cooling system.

Emulso oil should be obtained from the Sun Oil Company and its distributing organizations.

Lubricate Distributor Shaft Gear

When a motor has been dis-assembled for any reason to the point where the distributor shaft gear is available, the gear should be very thoroughly lubricated. This applies particularly where the gear has been removed for any reason. Since some time is required to lubricate the gear under running conditions some difficulty may develop during this period, if the gear is left dry when the motor is re-assembled and started up.

Installing Brake Lining



The attached sketch shows the proper sequence to follow when riveting a moulded lining to the brake shoe. If this procedure is followed you should have no difficulty in producing a first class job without buckles or high spots.

Speed and Tire Wear

The average car speed on the open road is at least 10 to 15 miles faster than it was a few years ago. Forty miles an hour average is no longer unusual on long trips and, of course, one must keep in mind that to make this average, much of the distance must be covered at speeds between 60 and 70.

What is not usually appreciated is the fact that tire tread wear increases faster than the speed. For instance, increasing the speed of the car 10 miles an hour from 60 to 70 miles will increase the tread wear much more than like increase from 30 to 40.

As an example, in one test recently made, one set of tires ran 12,000 miles at 35 miles per hour, while another set of identical quality gave only 6,000 miles at 50 miles per hour under the same operating conditions. In other words, an increase of 15 miles per hour doubled the rate of tread wear.

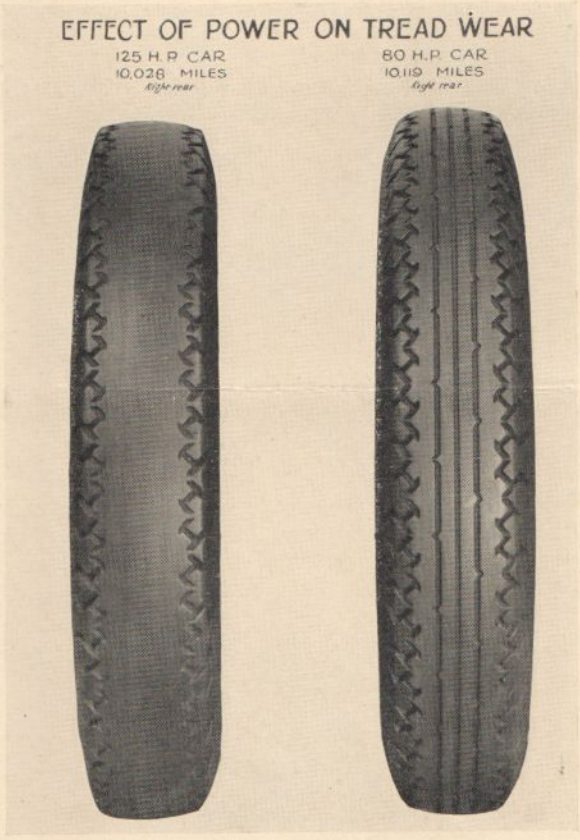
Horsepower: The effect of increased power is illustrated forcibly by the accompanying illustrations of tires run under identical conditions on cars of the same weight but of different horsepower. Note that whereas the tire from the 80 horsepower car still has much of the tread after 10,000 miles, the tire from the 125 horsepower car is worn perfectly smooth.

Temperature: Closely tied up with the question of speed is the effect of temperature on tire life. Rubber softens as it gets hot, and as it softens the carcass of the tire is weakened and the tread is more susceptible to abrasion.

The heat from friction between the tire and the road is only a minor source of the heat to which a tire is subjected. All rubber when it is flexed produces heat from internal friction and the continuous flexing of a tire as it rolls along under load is a source of heat that must be

reckoned with. Under moderate driving conditions, this heat dissipates about as fast as it is produced, but in the case of fast driving and particularly when excessive speeds are maintained for a considerable period without interruption, the heat builds up much faster than it can be dissipated by windage with the result that the temperature rises all through the casing and tube to the danger point.

Probably no more impressive illustration can be given of the effect of both speed and temperature on tire mileage than the tires built for racing cars. The heat developed in a tire under racing conditions is so hard to combat that the tires are unable to carry more than $\frac{3}{32}$ to $\frac{1}{8}$ of an inch of tread thickness, and such tires are performing well if they run 500 miles. Racing tires are obviously impractical for general use. The amount of rubber and number of plies must be so balanced that the maximum tire service is obtained. Mere addition of tread rubber does not necessarily mean added tire life.



Under-Inflation: One factor which contributes tremendously to accentuating this heating is under-inflation. When the tire does not have the proper air pressure, the flexing is much greater and, of course, this results in generating more heat. The heavier the car, the more important it is that the inflation pressure be closely watched.

Even a small reduction in air pressure may cause a large increase in tire wear. Two sets of tires, one run at recommended inflation and one under-inflated 6 pounds, have shown a difference in mileage of 25%.

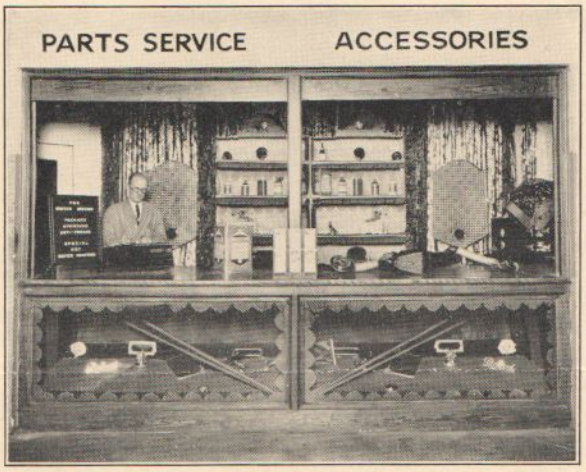
Road Surfaces: The kind of roads over which tires are run has a large bearing on the rate of tread wear. It is when an owner moves from one locality to another with different roads that he comes most in contact with this factor, in many cases without realizing it.

The opinion seems to prevail that improved roads have lessened the importance of this factor as a cause of tire wear. The opposite is in reality true. Instead of making for greater tire mileage, improved roads have lessened it because of the fact that they permit high speeds for long periods of time.

Furthermore, progress in spring suspension has permitted high speeds to be maintained over roads which in years past would have necessitated slow going. In addition, many improved roads have begun to break up and unless repaired are as bad in their effect on tire wear as unimproved roads.

Show Them and Sell Them

That our Worcester, Mass. Dealer believes in letting the customer see what he needs is proven by the display pictured here. The one shown above is the main display in their Service Department, but this is supplemented by a smaller one near the Service Sales Room. The one below is a case at the entrance to their Sales Room.



Tom McCue is the leading spirit behind their accessory sales, and with the aid of the Service Department display his sales last month totaled better than $1600.00. It is Tom's idea to build up sales with the aid of proper displays. We feel he should know what he is talking about because his experience certainly is one which will make him succeed inasmuch as twelve years ago he started at Packard-Boston as a "greaser" and climbed successfully up the ladder as mechanic, assistant shop foreman, shop foreman, production manager and in 1928 was made service manager at Worcester.

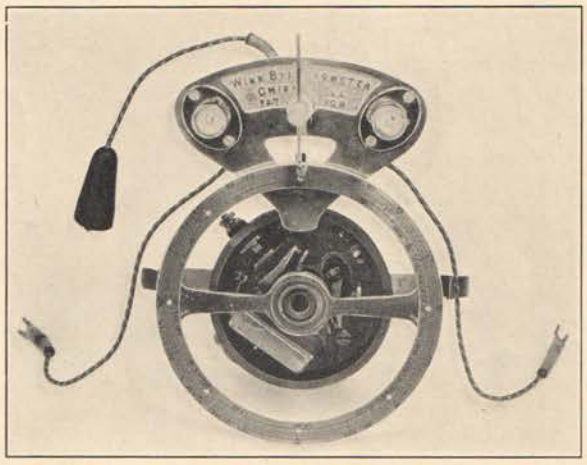
It might be a good plan for some of you other fellows to sit down and figure out how you can make accessory sales help you in the same manner as they have helped McCue. Possibly it's a matter of sales plans, or maybe it's a matter of proper display, give it some thought *now*.

Special Tools

DISTRIBUTOR SYNCHROMETER ST-792

NET PRICE $18.50

Correct synchronization of the contact breaker points is essential for a smooth running motor. The synchrometer will synchronize any Packard distributor with



double breaker points. Perfect synchronization can only be made by checking all cam lobes for wear. If cam conditions were always perfect, dependable synchronizing would only require a pair of test lights. A satisfactory check up on cam lobe conditions is simply and easily made with the proper tool. The tool must be a 360 degree graduated circle in conjunction with some visible means for checking interruption of one set of points independent of the other as well as consecutive interruption.

HYDRAULIC JACK ST-788

NET PRICE $30.00

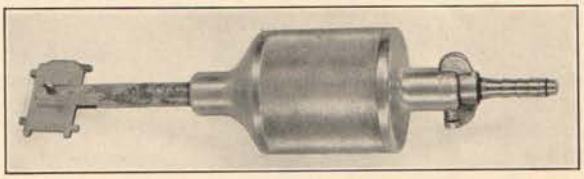
A direct lift jack—Fast—Positive and Safe. Will not leak or settle under load. One valve only under direct cylinder pressure.

One, three and five ton capacity with release in the handle.

AIR VALVE GRINDER ST-752

NET PRICE $12.50

An 18 ounce machine operated by air pressure with adjustable control regulating speed from zero to three thousandths, one quarter revolution per minute. This is

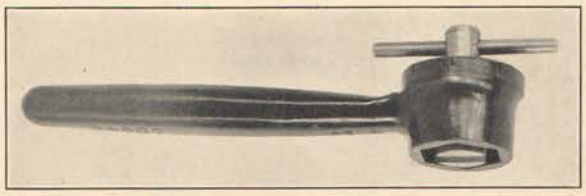


a very smooth running machine for grinding and finishing valves and will complete the job in half the usual time. It is guaranteed for one year.

SHOCK ABSORBER ADJUSTING WRENCH ST-743-626-726 ONLY

NET PRICE $1.75

This tool is used for adjusting the Packard shock absorber metering valves on 626-726 models.



See Service Letter Vol. 3 No. 11 for Detail Instructions.

MOTOSCOPE ST-796

NET PRICE $37.50

The motoscope is a scientific instrument that records engine troubles, reveals the true conditions of your engine and shows the mechanic exactly where the trouble lies without taking down any part of the engine.

We Welcome Suggestions and Inquiries from Packard Service Men. Address All Communications Care Editor, Packard Service Letter.

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