VOL. 2 No. 10 MAY 15, 1928

Front Wheel *and* Axle Alignment

T. P. Thomas—*Service Department*

THE high average driving speeds of today coupled with the use of balloon tires and four wheel brakes has made the matter of front wheel and axle alignment one that must be treated with a great deal of care.

Before going into a discussion of the alignment it will be well to define our terms so that we may all have the same understanding of them.

King Pin Inclination—the angle at which the steering knuckle pin, or king pin, is pointed out at the bottom, Figure 2, Plate 1.

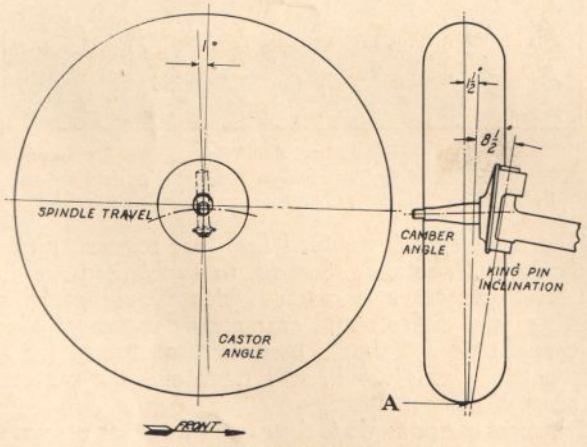


Fig. 1 PLATE ONE Fig. 2

Front Axle with Vertical King Pin and without Castor or Camber

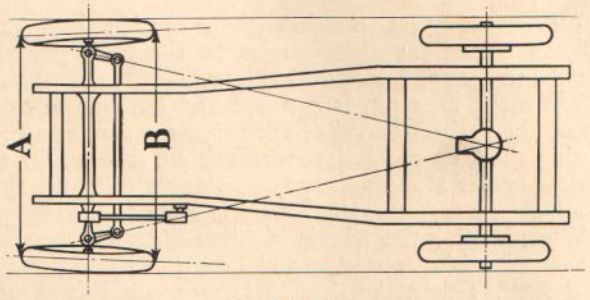


PLATE TWO

Toe-in

Camber (or dish)—the angle at which the wheels lean out at the top, Figure 2, Plate 1.

Castor Angle—the angle at which the front axle and king pins are tilted forward at the bottom, Figure 1, Plate 1.

Toe-in—the amount that the front wheels are closer together at the front "A" than at the rear "B," Plate 2.

The angles of king pin inclination and camber are definitely set at the factory and will not change in service except through some injury which has bent the axle.

The king pin is inclined and the wheels cambered for the same reason, to make the steering easier. If the king pins were vertical and the wheels not cambered as in Figure 2, Plate 3 the resistance of the wheels to

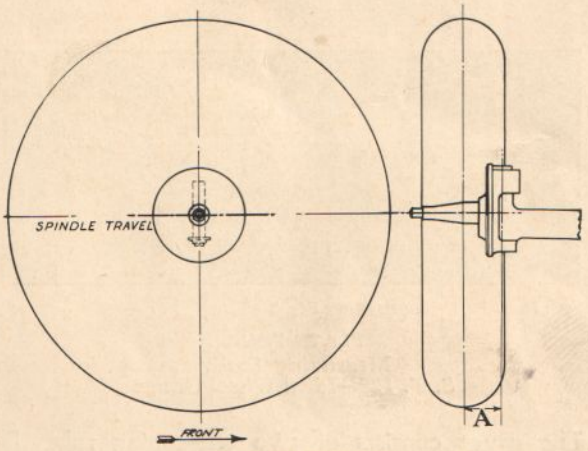


Fig. 1 PLATE THREE Fig. 2

King Pin Inclination, Camber and Castor Angles

rolling would have a leverage "A" trying to bend the spindles back. In this condition the car would be very hard to steer. The wheels are cambered 1½°, figure 2, plate 1, to bring the point of contact between the tire and the ground "A" as nearly under the king pin as possible. Camber has an added advantage in that it brings the wheel into a more nearly vertical position

on crowned roads. The camber should not be much in excess of 1½° however or it will cause excessive tire wear.

Cambering the wheel alone cannot make possible center point steering; that is, having the center of the tire contact with the ground come directly under the centerline of the king pin. To fully accomplish this, the king pin is inclined 8½° in the plane of the axle, figure 2, plate 1, so that the center line meets the ground at the center of contact "A."

If the contact between the tire and the ground was at only a small point we would have a perfectly easy steering. The weight of the car, however, spreads the tire so that it has a very large area of contact. When the car is moving forward the resistance to rolling caused by this large area of contact tends to spread the wheels apart at the bottom. This action scuffs the tires and makes the car hard to steer.

The front wheels are adjusted, toed in, so that they are closer together at the front than at the rear to correct this pull and cause the tires to run parallel when the car is in motion.

Lack of toe-in is indicated by excessive tire wear and hard steering. Too much toe-in, on the other hand, is more difficult to detect, for unless it is a great deal too much the steering is not affected, the only result being excessive tire wear.

Toe-in is measured with the Ideal Wheel Gauge S. T. 128, Plate 4.

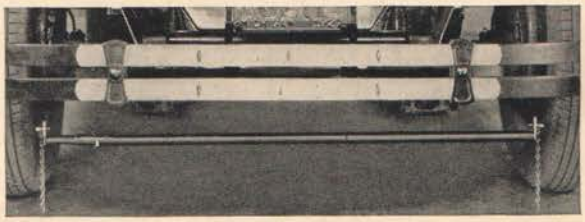


Fig. 1

Fig. 2

PLATE FOUR
Measuring Toe-in
S. T. 128—Ideal Wheel Gauge

The gauge consists of two telescoping tubes held together by a spring. The toe-in is measured at the same point on the tires in both the front and rear positions without removing the gauge from the wheels. In this way correction is automatically made for lumpy tires, sprung wheels, etc.

Before checking for toe-in roll the car forward three to four feet to take up all the play in the wheel and steering connections. Then mount the gauge between the wheels in front resting the contact points against the tire in such a position that the chains just touch the floor, Figure 1, Plate 4. It is important that the gauge be as nearly parallel to the front axle as possible. Set the moveable scale so that the hand registers zero. Roll the car forward until the gauge is in the rear position, figure 2, plate 4—with the chains just touching the floor as in the forward position. The toe-in which is read directly in inches on the indicator should be ⅛".

To adjust the toe-in, lengthen or shorten the tie rod as required. Lengthening increases the toe-in; shortening decreases it. To adjust the length of the tie rod the ball joint on the threaded side—left—is removed and the housing threaded in or out on the rod. The Steering Cross Tube Ball Joint Puller S. T. 653, Plate 5, will save time and possible damage to the ball joint when removing it to make this adjustment.

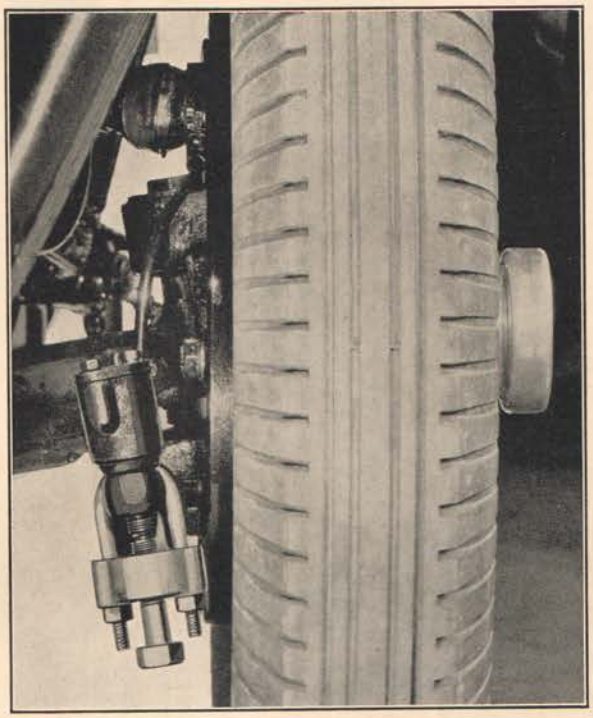


PLATE FIVE
Removing Tie Rod to Adjust Toe-in
S. T. 653—Steering Cross Tube Ball Joint Puller

The front axle is castored for three reasons. First to make an easier steering. Second, to avoid the possibility of developing reverse castor which would make the steering very difficult and extremely dangerous. Third, in case the tie rod should become disconnected for any reason the wheels would still track and the car could be controlled.

Incorrect castor angle is the cause of a great percentage of the steering troubles encountered today. The correct castor angle causes the car to hold a straight course and assists the driver in righting the car after turning a corner.

When turning on an axle without camber the spindle follows a path at right angles to the king pin and parallel to the road, Fugure 1, Plate 3.

When the king pin is castored and the spindle cambered, the path of travel of the spindle generates a cone having the king pin as its axis. The arc traveled by the spindle end is along a curve at an angle with the road equal to the castor angle, Figure 1, Plate 1.

When turning the wheels in either direction the effect is that of raising one side and lowering the other side of the car. This makes it a little more difficult to turn but when straightening out again the weight of the car helps to turn the wheels back to the straight ahead position.

If the ability of the steering to right itself is too pronounced, it will cause the wheels to vibrate violently

from side to side at certain speeds in what is commonly called shimmy.

The castor angle should be 1° but it may be increased to as much as 2° with good results in the case of high speed drivers and those who prefer a definite tendency of the steering to right itself. Increasing the castor angle will steady cars that have a tendency to wander.

The castor angle should never be altered by guess for it may have very dangerous results. If the axle should be tilted in the wrong direction the car will steer very erratically and buckle when turning a corner so that it is very difficult to straighten it out.

The castor angle should be measured with the axle tilt gauge, S. T. 696, Plate 6.

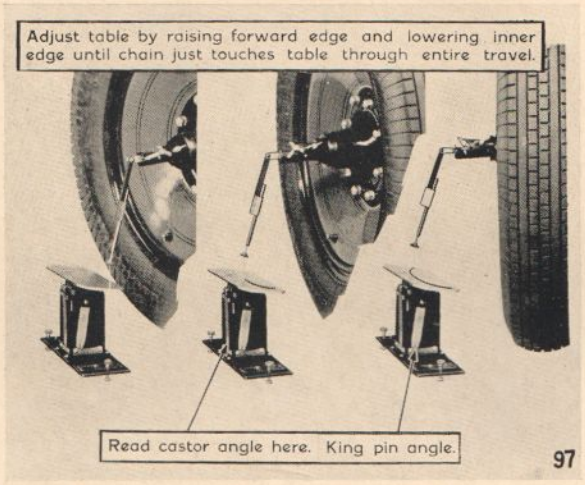


Fig. 1 Fig. 2 Fig. 3

PLATE SIX
Measuring Castor Angle
S. T. 696—Axle Tilt Gauge

To use the gauge the car is placed on as level a section of the floor as possible. Remove the front hub caps and jack up both front wheels by placing jacks under the springs directly under the axle. It is extremely important that both wheels be raised the same amount which must not exceed ½ inch.

Turn the wheels to the straight ahead position. Then place the gauge on the floor parallel with the car and about four inches out from the center of the wheel.

Adjust the three legs until the two spirit levels show the gauge to be level. If the floor is not level, only the cross level should be adjusted. Then the string which is attached to the gauge stretched along the floor parallel to the car, to a point opposite the rear wheel and held at the same height from the floor as the fixed end of the table. With the string in this position the gauge is raised or lowered by turning the adjusting screw until the string rests flush along the entire length of the base.

Now set both pointers to register zero and attach the distance indicator to the spindle nut. Adjust the chain on the distance indicator so that with the wheels still in the straight ahead position, it just touches the table top in the center between the two arrows, Figure 2, Plate 6. All adjustments should be made on the distance indicator. After the gauge has been placed four inches out from the center of the wheel, parallel with the car and has been leveled, the position should not be changed during the test.

Next turn the wheel so that the chain moves to the forward corner of the table, Figure 1, Plate 6. In this position, the chain does not touch the table top. Tap on the rear edge of the plate raising it until the chain just touches.

Now turn the wheels in the opposite direction and watch the chain drag across the table through Figure 2 to Figure 3, Plate 6, to the rear corner. The chain will rest on the table with considerable slack in this position. Adjust the table by lowering the rear end to take up half this slack. Then grasp the table firmly in the center and lower the inner edge to take up the other half until the chain just touches the plate.

Make one-half of the adjustment by lowering the inner edge and the other half by raising or lowering the end of the table. If this is done accurately, the adjustment will be correct the first time.

Continue to turn the wheels back and forth adjusting the table until the chain just touches the table along the path shown on the table top in Plate 6.

The castor angle is now shown by the pointer on the scale mounted on either side and marked "Castor right" and "Castor left." The scale mounted on the end shows the king pin inclination. We need pay no attention to this except that it must be measured to get an accurate measurement of the castor. Both front wheels however, should read about the same.

Both sides of the car should be tested to determine whether or not one side is castored more than the other. If it is found to be, a wedge should be inserted between the spring and the axle to make both sides alike. Inserting the wedge with the thick side to the rear decreases the castor. Putting the thick edge to the front increases the castor angle. After adjusting the castor always recheck with the gauge before trying the car on the road.

When placing the gauge take care to see that the side marked "Castor Right" is on the outside when measuring the right side of the car and the side marked "Castor Left" out when doing the left side. This is important.

Model	*Toe-in*	*Castor*	*King Pin Inclination*	*Camber*
126-133	3/8″	3°	0	2°
226-233	3/8″	2°	7½°	2½°
136-143	1/4″	1°	7½°	2½°
326-333	1/8″	1°	8½°	1½°
236-243	1/8″	1°	8½°	1½°
426-433	1/8″	1°	8½°	1½°
336-343	1/8″	1°	8½°	1½°
526-533	1/8″	1°	8½°	1½°
443	1/8″	1°	8½°	1½°

S. T. 653—Steering Ball Joint Puller $1.90
S. T. 128—Ideal Wheel Gauge 8.50
S. T. 696—Axle Tilt Gauge 16.00

Don't Forget the Mileage

IN writing a repair-order it is of the utmost importance that the mileage be noted on it. The majority of service stations know this, but we still hear of a few who do not appreciate the necessity of having this information.

In the business of servicing automobiles the elapsed time between visits, to the service station, means very little as compared to the mileage. If you are without this information you are at a decided disadvantage, when dealing with owners, who may possibly have a mistaken idea that the time element is more important than the mileage.

Heard in a Parking Lot

Packard Car: "Beautiful day, brother."

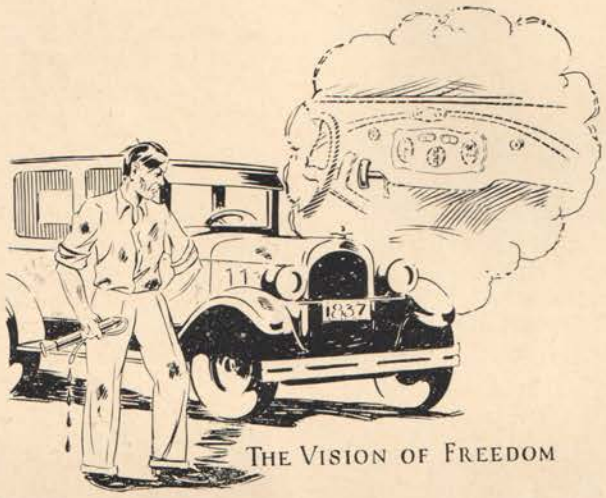
Rattler Six: "Bah! don't start that stuff as I am in no mood to be admiring the weather."

Packard: "What's the matter?"

Rattler: "Matter enough. My owner makes me sore. When he bought me it seemed as though he couldn't give me grease enough. I oozed grease I got it so regularly. Those were the happy days, but now—."

Packard: "Owners are like that some times."

Rattler: "My owner got tired of handling the old grease gun finally, and used to send me into the service station, but these trips became further and further apart, until now my bones cry out for the need of life giving lubrication. I was a good car in my day and would have been silent like you, if I could have been saved from that insidious disease, friction. By the way how many miles have you ran?"



THE VISION OF FREEDOM

Packard: "Forty thousand miles."

Rattler: "Holy cats, that's funny. You don't squeak and rattle and have travelled twice as far as I have. It must be that your owner is one of those thoughtful fellows who takes you to the service station at regular intervals."

Packard: "No, he doesn't take me there, except for motor oil changes, but I get a good oil bath every day to 31 of my chassis parts."

Rattler: "Don't kid me brother, because I'm not in a kidding mood. You can't tell me your owner gets the old gun out and takes the time to manicure you every day."

Packard: "No, he doesn't have to do that, and like your owner, he wouldn't do it."

Rattler: "I suppose you are going to tell me that some knock-kneed fairy comes along with a sprinkling can, and does it eh?

Packard: "No, we don't even bother the fairy. I have a Chassis Lubricating System built right into me, so that all my owner has to do is to pull a handle which sends a stream of oil through all my thirty-one joints that, otherwise, would be squeaking and rattling like yours."

Rattler: "Where is this handle you are spouting about?"

Packard: "Located, right under my instrument board, in plain sight where my owner can't help but see it."

Rattler: "Why can't they install one on me, I wonder?"

Packard: "Too bad old chap, but it has to be built into you when being made at the factory."

Rattler: "Well, here's the old boy at the wheel so I have to be going." (squeak—rattle—squeak.)

Packard (to itself): "Poor chap, and to think I have twice the mileage he has. He sounds like a busy day in a trip-hammer shop."

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Fair Play

DON'T be too ready to believe the worst of the other fellow, until you have at least heard his side of the story.

We refer to the ill-feeling that often develops when some owner returns to his "home" distributer or dealer, with a repair bill rendered to him by a "foreign" dealer or distributer. The owner tells the "home" dealer, that the other dealer told him, the work was necessary due to some slip-shod work performed by the "home" dealer, and therefore he expects to be reimbursed for the paid bill.

The "home" dealer then wiggles and squirms and in most cases—even when he knows he is not in the wrong—pays the bill seeking to mollify the, supposedly, infuriated owner. He then retires to some quiet spot and thinks up all the mean cuss words that can be applied to the traitorous Packard dealer who caused the trouble—and hopes and prays he can get revenge by "serving" one of this dealer's owners.

All of which is wrong and gets all of us nowhere. Why not write to the other fellow and present your case before condemning him? How do you know that the owner may not have stretched his "imagination" a bit? Would you want me "gunning" for you when you didn't even know why I was on the war-path?

Certainly, there are cases where the "foreign" distributer or dealer is too free with his remarks and we regret this as much as you do. However, one black sheep can't turn the whole flock black.

Don't be too quick to condemn those who may be innocent. The chances are greatly in the other dealer's favor that he observes the ethics of our business—otherwise, the Packard shingle wouldn't grace his place of business.

Packard Service in Milwaukee

TWICE each month Chas. Prinz, Service Manager of Packard-Milwaukee, gets his gang together and they hold a council of war.

The Packard Service Letters are discussed from A to Z, and past issues are reviewed.

After the Service Letters are discussed a session is held for suggestions covering—better ways of serving the boss (the Packard owner)—better and shorter ways of performing repair operations—development of new tools—in short, anything that will improve the Packard-Milwaukee service.

As a diversion and education, slide-fims are shown. These fims are cheerfully loaned by various manufacturers of automobile equipment and are very instructive. Incidentally, the factory service department has already produced one service film and is planning to bring through several more.

Charlie encourages his men to ask questions, and the meetings are like big family affairs. Every employee is made to feel that he is an important factor in service matters, with the result that all the boys are pulling together and the Packard owners in Milwaukee are well taken care of.

The accompanying picture shows the dispensers of Packard service in Milwaukee. They look to us like a delegation of bankers. Charlie Prinz is shown at the extreme right in the second row. In addition to being a successful service manager the boy claims to be the champion bass fisherman of all Packardom. (We wonder if Horace Ward of Kansas City and Frank Butler of Youngstown will agree with the last statement.)

Gossip From the Field

J. T. NERHOOD, formerly Manager of the Parts and Accessories Department, at Packard-Denver, advances to the position of service manager. Good luck J. T. and don't forget to take good care of the tourists.

Ralph E. Brown, President of Packard-Buffalo has this to say, "When you lose faith in yourself you come mighty close to making it a unanimous decision. For if YOU don't believe in you, howinell can you expect anybody else to take you seriously."

From faraway Australia comes the news that the Universal Motors Ltd., Packard dealers in Brisbane, are using the service follow-up post card with excellent results. That's encouraging to our pet hope that some day we can shout, "World Wide Packard Service—Efficient and Uniform."

In line with the preceding paragraph it is interesting to know that, in the one month's Service Mechanical School recently completed, the following countries were represented. Phillipine Islands, Porto Rico, France, Germany, Norway and Columbia.

When C. P. McClain, Service Manager of Packard Jacksonville, visits his dealers' service departments, he goes via airplane. Tell us Mac. do the mosquitoes bother you when you get up that high.

Packard-Oklahoma City, now occupies a brand new building. A ramp connects the two stories of the service department. With Pat Horan at the service helm, Packard owners in Oklahoma City are now assured of excellent attention.

It's the Unexpected Little Things That Count

IF WE were to give in a general way one rule for conducting a successful service station, we would say, "do the things that your customers expect to be well done, just a little better than they expect."

The outstanding individuals and companies of today, do just that—they give to the world just a trifle more than the world expects of them. This thought spells the difference between success and mediocrity.

It is just the little extra effort, in courtesy and personal interest, in our owners, that will make "Packard Service" different from "ordinary service."

Some months ago Mr. Macauley received a letter, from a Packard owner, commending one of our service stations on the fact that he, a tourist, had been given, what to him seemed, exceptional service. He drove into this service station during the noon hour and the service men willingly left their lunch and started work on the car, not leaving it until the work was finished. The service station referred to is that of the Lackawanna Automobile Co. of Scranton, Pa.

Mr. Macauley, in commenting on this letter said, "*At intervals I receive such letters and I notice that such letters and such enthusiasm is usually inspired by some unusually good service involving a certain amount of self-sacrifice on the part of the server; this leads to the thought that just ordinary good service is accepted without comment, and service just a little bit better than expected, is appreciated and talked about.*

"*And this leads again to the thought that the very best man is only a tiny bit better than the second best. There are probably one thousand violinists in the world who are only a shade less good than Kreisler—but Kreisler is known throughout the world and gets Four Thousand Dollars for a performance, while the other fellows, most of them, are playing in theatre orchestras.*"

In the case mentioned above the tourist no doubt expected that his car would be repaired properly, but what amazed him was the fact that the service men very obligingly left their lunch, began to work on his car, and stayed with the job until they had the tourist on his way. *This service station had done what the customer expected, and just a little bit more.*

Read Service Letters No. 4 Vol. I and No. 6 Vol. I, and you will see that the reprinted letters given, therein, were both inspired by the service stations doing something that was out of the ordinary; something that the owners, from past experience, did not expect. *Little things perhaps, but unusual.*

The acclaim of the people for a masterful painting is really nothing more than recognition for the pains taken by the artist, in presenting small details which, well done and added together, form a wonderful work.

A great writer produces a book which wins for him renown. The book itself is nothing more than a collection of thousands of thoughts, blended into an interesting whole. Not one great work alone, but an accumulation of many well done little things.

Napoleon, one of the outstanding generals of all time, was noted for his uncanny grasp on the small details, which went to make up the well planned campaigns that raised him to everlasting fame.

So, too, we find that the most successful service managers in Packard are those who keep their eyes on the little things and realize that good service is the doing of all these little things, a little better than is expected.

Your future will be determined largely by the little things you did yesterday, today, and will do tomorrow, and how you do them.

Service Is the Reason

EVEN at the risk of becoming tiresome, we cannot resist the temptation of printing a few more of the replies received from owners, who give good service as the principal reason for buying a Packard.

What one thing more than any other led you to buy a Packard?

Attorney, Streator, Ill. "Excellent service given by local dealer and by the factory. Readiness of company to stand back of their cars and their policy of service."

Comptroller of Agricultural College, "Service at the Hartford Branch."

Realtor, New York City. "The courtesy and apparent efficiency in the service stations, together with the evident desire to show the owner how few repairs the car needs, rather than how much, as I have found in other service stations."

School Principal, Mount Vernon, N. Y. "Among other things the service flat-rates. My continued satisfaction with a Packard will largely be determined by the efficiency of the service I receive at the various Packard stations. Lack of workmanship and trustworthiness on the part of employees of the service stations, representing the cars I have previously owned, has caused me great inconvenience and disappointment."

Physician. "The service given by the Packard agency and courtesy of men employed. One of the main reasons for purchasing this car, was the courtesy and service extended my friends by Mr. Steinmetz, one of the Akron Packard salesmen."

Attorney: "Dependability, both of car and dealers. Your local agent, Turner Automobile Co., Uniontown, Pa., is to be commended for the nature of service it is giving. For the first time Packard is being represented here by a concern worthy of the car."

Fellows, we here at the factory naturally believe wholeheartedly in Packard—we honestly believe the Packard car to be the best on four wheels.

BUT, we are not so narrowminded that we believe the car, or the factory producing it, can put the Packard car over alone. There is another element, which has become a giant in size, and that element is SERVICE.

There was a day when a car could be sold on its merits alone, but that day has gone forever. Today the prospect is prone to ask his friends about the local service as well as the car, and he is right when he does so. Automobiles, like locomotives, depend for satisfaction largely on the maintenance shops back of them, and don't think for one minute that the average buyer is ignorant of this fact.

Reputation for rendering either good or bad service is a mighty factor in selling new cars. Is this factor a detriment or a great help in your case?

SERVICE LESSON No. 8
The Importance of Parts Department Records

IN THE business of running a parts department, the big objective to be sought is the happy condition of having just the right amount of parts on hand, a thing more easily talked about than accomplished.

The stockkeeper works between two evils. The one of having too much stock, thereby tying up good money with the possible loss of much of it, due to obsolesence; and the other of not having enough which causes dissatisfaction of customers and the loss of patronage.

Of course, the first essential in the successful operation of this department is that the person in charge of it be aware of his responsibilities; that he is the custodian of money, because when he looks at parts in any other light, he is off on the wrong track.

The stockkeeper's best safeguard and tool is his records. With dependable records, intelligently kept, he has little to fear. The great mistake made by many persons is that they look upon records as just so much red tape, and this viewpoint is responsible for the loss of a great deal of money each year.

What should a stock record accomplish? How should it be used?

The Stock Record Card should provide the following information, (a) the piece number and name of the part, (b) the bin number or location of where the part is kept, (c) the list and cost price of the part, (d) the minimum amount that should be carried in stock, (e) the amount of parts on order, (f) a record of the individual receipts and disbursements, (g) the amount on hand.

The accompanying illustration of a stock record card shows how this information should be shown on the record.

This card, Form D-21 (5″ x 8″) is furnished by the factory, 60c a hundred.

This card records each part. It represents a history of the entire activity of each part. In the accurate operation of this system lies the secret of efficient stockkeeping. It keeps the stock free from inactive parts and develops a turnover, consistent with a minimum of back orders, directly resulting in a greater profit.

The most important feature in the operation of these cards, is the accurate posting of all entries, and within a short time after parts are received or sold.

Experience has taught that a sufficient stock should be on hand and on order, to cover a period of approximately ninety days. As nearly as possible, two months' supply should be in the bin, and one month's supply on order, or in transit.

To establish a minimum amount of stock to be carried, a total should be made of the number of parts disbursed from stock, over a consecutive three months' period. The minimum is one-third of this amount. The minimum should not be set entirely by these figures. The judgment of the stockkeeper, based on seasonal demand for the parts; the model it is used on; and the number of cars in the territory, should all be taken into consideration. The amount of time required for a freight shipment to arrive from the factory should also be taken into consideration. Thus, if it takes only two weeks to receive reordered parts, the minimum to carry must be a two weeks' supply. The stockkeeper should direct his attention toward obtaining a turnover which will give a satisfactory net profit on the entire investment. Good service cannot be given where too high a turnover is obtained on 40% of the stock and none on the other 60%. The important thing is to obtain a reasonable turnover on the entire 100% carried. The factory considers a turnover above six times a year to be dangerous in the light of good service and low operating costs. A turnover of less than two will hardly give a satisfactory profit. It is important that the minimum be revised at least three times a year.

Parts should always be ordered from the Stock Record Card, but never without first checking the balance shown to be on hand with the actual stock in the bin.

Here are a few "dont's" in connection with the keeping of stock records.

Don't let your records get behind. Keep them up to date.

Don't fail to post orders placed with the factory, as the absence of this information may cause duplicate ordering.

Don't neglect frequent checking of the cards with the actual stock, as this audit protects you against errors, which may have been made in posting to the cards.

Don't overlook going through your records frequently, and picking out those items on which you are overstocked. These items should be listed with the distributer in the case of a dealer, and with the factory in the case of a distributer. Form D-24 should be used for listing new parts to be returned for possible credit.

Don't allow stock to drop below the minimum without reordering. Every time an entry is made on a record card always compare the balance on hand with the minimum.

MAXIMUM | MINIMUM 6 | NAME: Motor Piston Pin | PIECE NO. 109492

LIST	COST	DATE
.60	.45	
1.05	.79	4/1/20

BIN NO. C318

ORDERED						RECEIVED AND DISSBURSED							
DATE	ORDER NO.	AMT.	REC'D	BAL. DUE	MAIL-ORDER	DATE	ORDER NO.	AMT.	BAL.	DATE	ORDER NO.	AMT.	BAL.
5/22/20	1046	18				1-1-20	INV.		15				
6-2-20	1046		18	0	106762	1-17	Cash	4	11				
						3-2	R.P.104	4	7				
						4-16	R.P.269	3	4				
						5-21	R.P.378	2	2				
						6-2	106762	18	20				

D-21 50M. H.H. & G.CO. 125065

Actual size 5″ x 8″

Ask Me Another

1. *Why must the louvre doors in the Eight bonnet be opened in warm weather?*
   If they are closed the motor will overheat, and the carburetion at low speeds will be affected.
2. *What is the proper amount of caster for the steering knuckle pins?*
   From 1° to 2°. Insufficient caster will cause the steering to wander. If the caster is excessive the steering will turn hard when going into a turn and will straighten up very easily. Excessive caster may also increase the road shock. No change should ever be made unless there is a device available by which the caster may be accurately measured, and it should never be less than 1°.
3. *In adjusting the breaker points, which operation should be performed first, synchronizing, or setting the gaps?*
   The gaps should be set first, because this changes the timing. Synchronizing should always be the last step.
4. *What causes the starter motor to spin instead of meshing with fly wheel?*
   It is usually caused by congealed oil on the screw shaft in the Bendix drive. This is almost entirely a cold weather condition.
5. *Do the wheel bolts ever work loose?*
   The bolts will never loosen if they are properly tightened, and this should be done not only before delivery of the car but also after it has been driven a few hundred miles.
6. *In what part of the spring do squeaks usually occur?*
   Squeaks usually develop at the ends of the leaves. It will be found that there is a high spot on the upper side at the end which rubs against the leaf above it.
7. *What is the easiest way to correct a sticking valve?*
   By disconnecting the suction pipe between the vacuum tank and the manifold at the tank end, dipping the pipe in a cup of light oil, and drawing about a pint of oil through the motor.
8. *Is this a permanent correction?*
   No. The valves will stick again if operating conditions are the same. It may be caused by slow running on cold weather or it may be that the valve seats should be recentered with the guides, using the Packard reseating tool.

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We Want Your Brains

WE RECEIVED a letter recently from a dealer who, among other things, said, "I know that the opinion of the smaller service point is not of any great importance to the factory."

Fellows, that hurts. We do not know what we could have done to warrant such a belief. We do, value the opinions of these so-called "smaller service points," and without intending to slight the efforts of the larger points, we want to say in all sincerity that the majority of the ideas that have been presented in the Packard Service Letter, have come from the smaller places.

A dangerous idea, to get into your head, is that you or your company is too small, to matter much in the general Packard service scheme of things.

This department, at the factory, can be of service to the field only, insofar, as the field co-operates with us. The ideas that we give you are not our ideas, but ideas coming from various Packard service stations. When you cease to help us, by giving us your good thoughts, right at that moment we must cease to be of help to you.

We operate, purely and simply, as a clearing house for good ideas. We are not geniuses, but common people like yourselves. We will not "high-hat" any thoughts you may care to send us; true, we cannot always use everything that comes in, but if we can't you can depend on it that we will write and tell you why.

If you are a mechanic—no matter whether "grease-hound" or shop foreman—and you know of some way of doing a repair operation quicker and better, or know of something that will improve shop methods or routine, we want you to feel that we will be tickled to pieces to have you write, telling us all about it.

If you are a service salesman, tester or anyone else who comes in contact with the public, please tell us what you think are better ways of serving that public.

If you are employed in the parts department, give us any slants you may have on better stock-keeping methods.

If you are manager of a service department (no matter how small or how large) why not come across and give us your pet ideas on conducting your business.

We know, absolutely, that the lake of good ideas hasn't even been skimmed. We further know that the fellow in Podunk Center is every bit as apt to have a good idea, as the fellow in the big city.

Here's a thought for you.

"He who is silent is forgotten; he who abstains is taken at his word; he who does not advance falls back; he who stops is overwhelmed, distanced, crushed; he who ceases to grow greater becomes smaller; he who leaves off, gives up; the stationary condition is the beginning of the end."—Amiel.

Come on fellows, let us know you are on earth.

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