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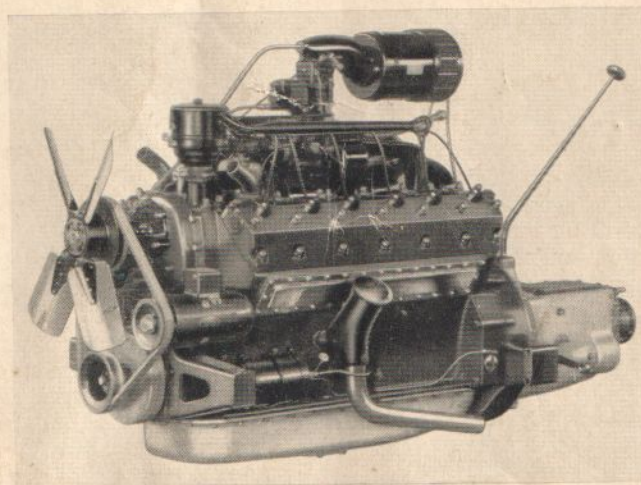
The Reason for the Twin Six

THE demand for still greater power than that furnished by the Packard De Luxe Eight indicated, for many reasons, a multi-cylinder power plant. In the present state of the art it is impossible, for reasons related to combustion, to make cylinder bores larger than $3\frac{1}{2}$ " without creating excessive roughness. Increasing cylinder bores quite obviously increases the overall engine length, which, in its final analysis means longer wheel-base and, consequently, a heavier car to provide the passenger space that Packard bodies must have. Increasing cylinder bores also means a longer crankshaft, which again adds weight and certainly complicates securing the torsional rigidity and stiffness so necessary to smooth operation. Nor is it feasible, we think, to increase the stroke beyond that used in the De Luxe Eight to secure greater piston displacement because that again would reduce, rather than increase, the torsional stiffness of the crankshaft. Moreover, increasing the stroke adds to the cubical content of the cylinder but it is not possible to compensate for this with greater breathing capacity—through the use of larger valves—since the valves already are as large as the

cylinder bore will accommodate. Further, it was felt that to actually take full advantage of rather recent developments in the industry, such as down-draft carburetion, automatic clearance take-up valve gear, automatic choke and numerous other desirable items, a complete new engine, into which these features are really engineered, offered the one completely satisfactory solution. The traditional Packard Policy of being committed to no particular type of engine, permitted its engineers to be influenced only by these and other important engineering considerations in adopting the Twin Six as the type of power plant best adapted to meet the requirements of its ultra car.

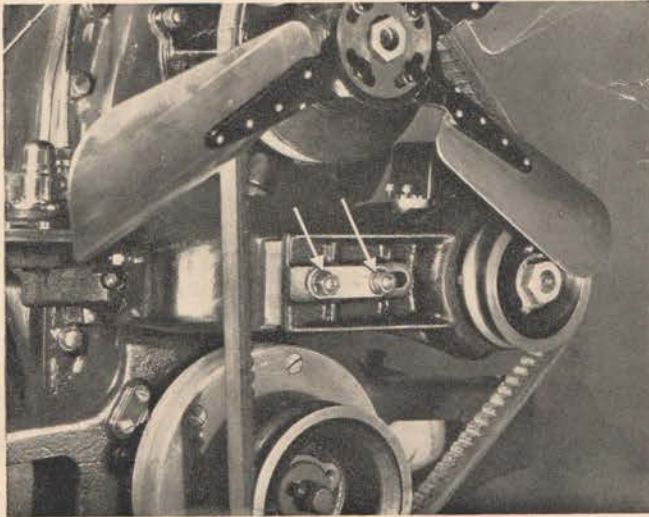
SPECIFICATIONS

Horse Power, N. A. C. Rating.....	56.7
Horse Power — at 3200 R.P.M. Brake.....	160
Bore.....	$3\frac{7}{16}$ "
Stroke.....	4"
Disp.....	445.5 cu. in.
Comp.....	6.00 to 1
Comp. 125 R. P. M.....	95 to 100 lbs.
Weight.....	1250 lbs.
	with clutch and trans.
Angle Cyl.....	67°
Oil capacity.....	10 qts.
Crankcase—Upper integral with cylinders. Cast iron. Lower—Aluminum.	



Fan Belt Adjustment TWIN SIX

Loosen two gear cover nuts on generator support. Attach spring scale to generator, pull out to 180-lb. reading and tighten nuts.



Service Carburetor Silencer and Air Cleaner

This device has a two-fold purpose: (1) a Silencer which eliminates intake noise through the carburetor and power roar in the intake manifold and (2) functions as an efficient Air Cleaner.

The Air Cleaner element of this device is wetted with oil, so that dust particles in the intake air are collected by these oily surfaces. After these surfaces are covered, the Air Cleaner ceases to function and dirty air passes into the engine, causing wear.

The Air Cleaner element can be quickly re-operated by removing it from the engine and washing it by moving the cleaner up and down in a can of gasoline—then re-oil it by dipping the entire assembly in some new or used engine oil, allowing excess oil to drain off, and then reassemble on the engine. *This should be done regularly every 2,500 miles or oftener if extremely dusty conditions prevail.*

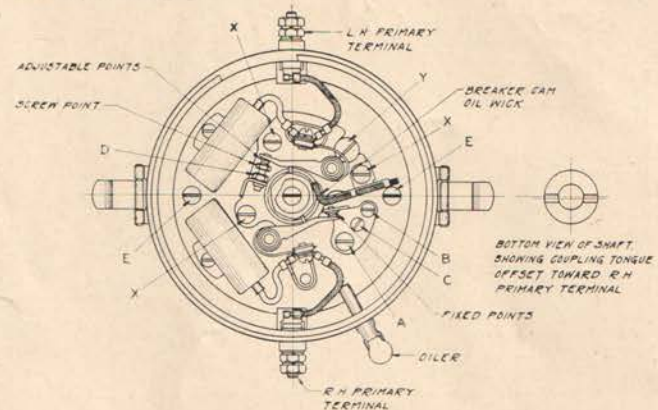
This cleaning operation makes the Air Cleaner just as good as new again.

Twin Six Ignition

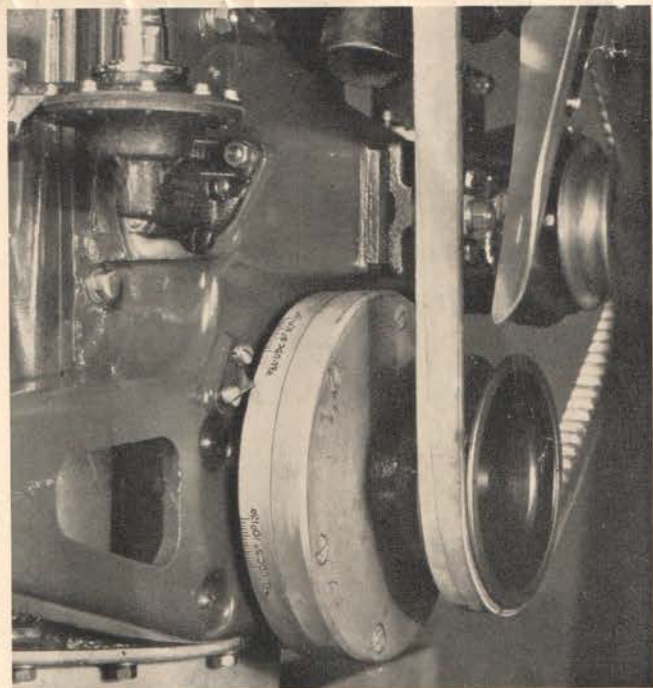
The new Packard Twin Six is equipped with an IGO-4,001 Auto-Lite distributor of the 12 cylinder type using a 6 lobe cam operating two sets of breaker points, the right hand set operating on the right cylinder block, the left set on the left cylinder block. There are also two condensers and two coils, right and left. By this it can be seen that it is extremely important to synchronize one set of points with the other in order that the motor will operate smoothly.

The right hand set of points is stationary and can only be adjusted for proper gap; but the left set is mounted on a sub-plate and can be shifted around the cam in order to synchronize them with the right set.

In synchronizing the two sets of breakers, and in setting the timing, first adjust both sets of points with exactly .020 gap.



To adjust the fixed set for gap, loosen the two screws, "A" and "B", with the breaker arm on top of a cam lobe. Rotate eccentric screw "C" until the proper gap is obtained. Then be sure to lock screws "A" and "B". Turn motor by hand until breaker arm of left set is on top of the same lobe on the cam, and adjust screw type point by loosening lock nut "D" until proper gap is obtained. Then lock. Rotate motor to 7° ahead of top dead center, No. 1 cylinder, right block (see marking on vibration damper.) Rotate distributor ahead in usual manner until right set of points just start to open, and tighten clamp on distributor bracket. Rotate motor until ~~7~~ 1° ahead of top dead center, No. 6 cylinder, left block, and shift left set of breakers by loosening three screws marked "X" and rotating eccentric screw "Y" until points just start to break.



To set timing accurately a light should be used. In setting the right bank, connect light to right hand primary terminal and ground. The same for the left bank. Light should flash on and off with the slightest movement of the cam.

You will note that the distributor is equipped with a felt lubricator for the cam. This is saturated with the

proper lubricant in assembly and never requires any further lubrication, but should be checked about every 10,000 miles and replaced if necessary.

You will note that the distributor is equipped with two oilers, the upper one for the purpose of lubricating the breaker cam ball bearing, the lower one to lubricate two plain bearings which the drive shaft runs in. A few drops of medium engine oil should be used in both oilers periodically.

If it is ever found necessary to remove the distributor driving shaft, it should be replaced by turning the engine to 7° ahead of top dead center, No. 1 cylinder, right block, and replacing shaft so that the tongue of the coupling is parallel to the crankshaft with the offset in the coupling toward the center of the motor.

The firing order of the motor is: 1-R, 6-L, 5-R, 2-L, 3-R, 4-L, 6-R, 1-L, 2-R, 5-L, 4-R, 3-L.

To simplify connecting up the spark plug wires in case of re-wiring, the distributor cap is plainly marked.

"Jumbo" Tires

Requests have been received concerning the new over-sized tire, generally known as the "jumbo" tire. This type tire is known by different names and is sometimes referred to as the "doughnut" tire.

The question as to whether or not these may, in the near future, be applied to Packard cars has been answered by the Engineering Department as follows:

We are going into this matter very carefully, but it will take the best part of the year to determine definitely the advantages and disadvantages of this type of tire.

As far as heavier cars are concerned, the information seems to be very definite that this type of tire equipment will not be satisfactory. It is believed that the standard De Luxe and Twin Six cars will continue to be carried on the standard six ply type of the present dimensions.

It is not suggested that this new type of tire be used for service replacements until it has been determined whether or not any basic car changes are necessary, such as smaller brakes, smaller wheels, or possible changes to the steering mechanism.

Twin Six Gear Ratios

Two gear ratios are used in Twin Six cars. All open, sport and convertible models are equipped with a 4.41 to 1 gearing, and a 4.69 to 1 gearing is used in the other types.

Ordinarily the standard ratios are the ones which will be found most desirable for the types for which they are specified, but either ratio may be obtained when the car is ordered from the factory.

Steering Connecting Rod Ball Joints

For several years the standard adjustment on the steering connecting rod ball joints has been made by turning the screw plugs inward until they bottom and then backing off 2½ complete turns.

This adjustment provides a rather light tension on the ball joint springs, and provides the freest possible steering, but we find that in the current model steering gears a tighter adjustment of the connecting rod ball joint is preferable.

The steering in the Light Eight and the Twin Six has a slower gearing than anything we have previously used, and provides very easy operation if it is in standard

condition. We find that with this gear a better result is obtained by bottoming the screw plugs and backing off only 1½ turns instead of 2½ as before.

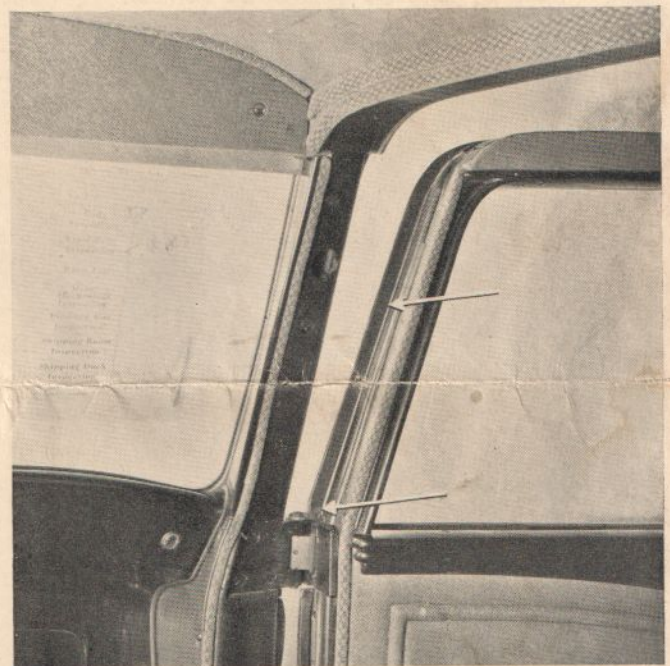
The new adjustment reduces any tendency toward rattle which might exist if the steering connections were very free.

Door Snapping Noise — 900

One or two cases have been reported of a snapping noise, apparently located at the front of the body near the lower right hand corner of the windshield. This has been located and should be remedied as follows:

The noise is due to the looseness of the metal at the point indicated by the arrows in the picture. Preventing any movement at the edge of this metal, will eliminate the noise.

A cure is effected by holding a heavy flat piece of steel, or block of iron, protected with a heavy piece of cardboard against the door on the outer side; by using a flat



faced cold chisel, the metal is then forced down tight against the door panel. This should be done from the center hinge up as far as it appears to be loose, which may be nearly to the top part of the door, but usually is about ten or twelve inches up from the hinge. A punch should then be used about every three-eighths of an inch to peen the edge of the strip that you have just tightened into the pillar flange. This will hold the metal securely.

You will, of course, be sure to protect the finish on the outside of the door when performing these operations.

In production this edge is now being spot welded so that on cars now coming through you will not encounter this difficulty.

Tire Cover Protector Center Bolt

In some cases the end of the center clamp bolt on the Light Eight tire cover protector projects beyond the nut. Should the protector receive a hard blow the bolt is liable to damage the metal tire cover. This will be corrected on protectors furnished in the future. We would suggest that in the meantime you saw this bolt off on any protectors that you install.

New Tools Available for Twin Six Cars

S. T. 121—Cylinder Head Lifter.....	\$1.35
S. T. 224—Cylinder Head Nut Wrench.....	3.00
S. T. 763—Exhaust Pipe Wrench.....	1.00
S. T. 871—Exhaust Manifold Port Covers.....	.30
(To eliminate possibility of dropping nuts and washers in the cylinder casting)	
S. T. 872—Piston Ring Compressor Band.....	.75
S. T. 1390—Piston Ring Compressor Band Tongs.....	.80
S. T. 874—Valve Holder.....	1.25
S. T. 875— $\frac{9}{16}$ " Universal Socket Wrench.....	1.60
(To remove exhaust and intake manifolds.)	
S. T. 877—Valve Seat Counterboring Tool.....	2.50
S. T. 878—Water Pump Packing Nut Wrench.....	1.00
S. T. 860—Valve Lifter.....	7.50
S. T. 863—Valve Guide and Main Bearing Puller.....	2.25
(For removing valve guides from the cylinder.)	
S. T. 864—Key Inserter.....	1.50
S. T. 865—Valve Clearance Gauge.....	.60
S. T. 866—Rocker Lever Plug Wrench.....	.75
(For removing automatic pistons)	
S. T. 867—Valve Guide Ring Replacing Tool.....	2.50
S. T. 868—Distributor Make and Break Wrenches.....	.05
S. T. 869—Special Carburetor Tools.....	5.00
(Set of four socket wrenches)	
S. T. 870—Valve Rocker Lever Holder.....	1.00

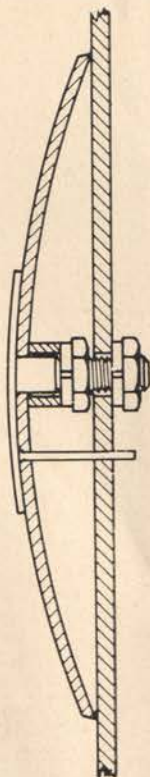
Trunk Rack Emblem Mounting

The trunk rack emblem on the Twin Six consists of two parts, the Packard Coat of Arms and a mounting plate. The Coat of Arms is held to the mounting plate by means of a stud through the center hole of the plate. A lock washer and brass nut are used to hold these two parts together. When this assembly is placed in position on the trunk rack an additional lock washer and brass nut are added to the same stud.

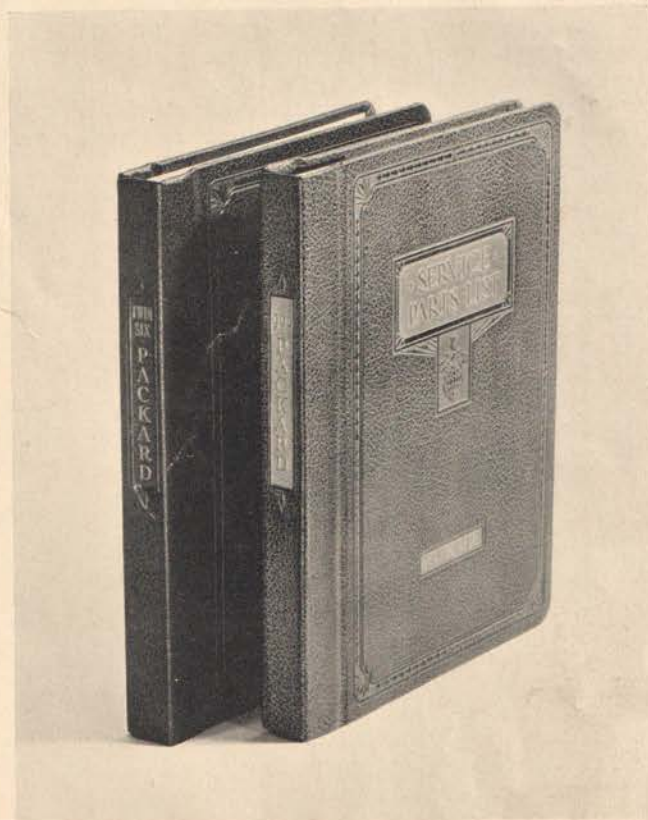
On the first cars that were shipped this assembly was placed in position with only one lock washer and only one brass nut, which not only held the two parts together, but fastened the assembly to the rack. This, however, placed an uneven tension on the mounting plate and caused the enamel to crack.

By using both lock washers and both nuts, as described, the assembly may be properly installed and the mounting plate will not be distorted.

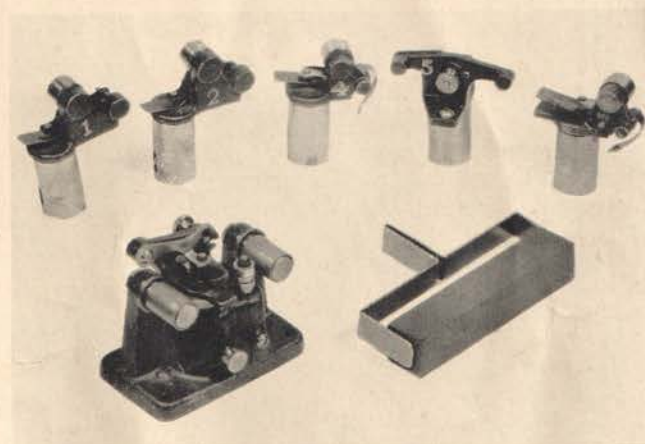
This should be checked on any Twin Six cars which you have on hand or which have been delivered. Be sure the assembly is attached as illustrated.



Service Parts List Binders



We now have available complete Parts Lists for the 900 Series and will very shortly have temporary lists for the Twin Six. We have procured special binders of an attractive and durable nature, which we have priced at our cost. They are \$1.50 each. Please specify model when ordering.



Distributor Point Dressing Tool ST-835

ALL MODELS. NET PRICE \$12.00. (WITH ONE HOLDER)
Additional holders for other types of arms Net Price \$3.00 each.

This tool is for re-servicing contact points. It gives a much better finish than can be secured with the ordinary file. It consists of a base, which supports the holder in which the contact arms are held, an oil stone and a set of holders for the various Delco and North East contact arms.

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