

Facts About the "Single-Six"

NUMBER ONE ISSUED SEPT., 1920

Packard MOTOR CARS



Property of
Packard Motor Car Company
Detroit, Michigan

INDEX

SUBJECT	PAGE
Bodies	
Coupe Body	15-16
General	9
Runabout Body	11-13
Sedan Body	13-15
Touring Body	11
Trimming of Bodies (open)	9-10
Trimming of Bodies (enclosed)	10
Brief Specifications	30-31
Chassis:-	
Angle of Steering Column	22
Brakes	24
Chassis Lubrication	22
Clutch	25
Exhaust System	26
Frame	22
Gasoline System	26
Rear Axle	24
Rear Axle Gear Ratio	24
Running Board and Splashers	24-25
Speedometer	25-26
Springs	23
Steering	23
Tires	26
Tire Carrier	26
Transmission	25
Transmission Gear Ratio	25
Tread	22
Turning Radius	24
Universal Joints	23
Weights of Rear Springs	23
Wheels	24
Wheelbase	22
Dimensions of complete cars	32
Dimensions of Sedan & Coupe bodies	34
Dimensions of Touring & Runabout bodies	33
Motor:-	
Ammeter	21
Battery	21
Bearings	18
Cam Shaft	18-19
Connecting Rods	18
Cooling System	21
Crankcase	17-18
Crankshaft	18

SUBJECT	PAGE
Cylinders.....	17
Electrical System.....	20
Fan.....	19
Front End.....	19
Fuelizer.....	16-17
Generator.....	21
Ignition.....	20
Lubricating System.....	22
Pistons.....	18
Starting Motor.....	21
Starting Switch.....	21
Valves.....	19
Valve Springs.....	19
Wiring.....	20

Single-Six Selling Policy 3-8

Standard Equipment:-

Chassis Equipment.....	28
Enclosed Bodies.....	28
Instrument Board.....	29
Open Bodies.....	28
Tires and Rims.....	28

Standard Painting:-

Enclosed Cars.....	27
Open Cars.....	26-27

Standard Trimming:-

Enclosed Cars.....	27
Open Cars.....	27

Weights of complete cars 31

Weights of complete cars.....	31
Weights of Road Bodies.....	31
Weights of Sedan & Coupe Bodies.....	31
Weights of Touring & Runabout Bodies.....	31

Single-Six Selling Policy

The time has arrived when the attention of all "Packardom" should be focused upon the Single-Six.

This car will soon be offered to the public, and it is imperative that Distributers and their salesmen thoroughly understand the reasons for the introduction by Packard of a car of this type and that the sales presentation of the Single-Six be uniform throughout the territory, conforming strictly to the representations authorized by the Factory.

The following information is therefore released for the education and guidance of all interested in the distribution of the Single-Six.

For twenty-one years the Packard Motor Car Company has manufactured a product of the highest quality—By its just policies and the merit of its product, it has carried an exalted position, not only in the automobile industry but among all of the great institutions of America. It established for itself the highest standards and has steadfastly held to its ideals, making the name "Packard" a well known synonym for quality and equity.

The Twin-Six expresses the highest achievement in automotive passenger transportation. But there is a broad field yet unserved for a smaller quality vehicle especially adapted to the needs of the business and professional men, the individual user, and the man with the small family.

How to serve this demand has absorbed the best Executive and Engineering talent of the Company for approximately six years. The problem was to produce a car which could properly bear the name "Packard," embodying the maximum degree of economy and quality, not found in any other vehicle within an appreciable degree of the price.

Without dwelling upon the details, the Single-Six is now offered as the culmination of years of research and experimentation conducted by the factory and supplemented by the experience of Packard Distributers.

The Single-Six, as its name implies, is a six-cylinder car.

The question may arise: "If the best car in the world must have twelve cylinders, why do you make the new car but six?"

No design other than a Twin-Six, can give, ever has given, or ever will give, full Twin-Six results.

The S. A. E. rating of the Twin-Six motor is 43.2 horsepower. The rating of the Single-Six is 27.3 horse-

power. A Twin-Six motor—one of 27.3 horsepower rating—would have cylinders so small as to be below the dimensions which engineering practice has established as the minimum for efficient results. Cylinders of less than a 3 in. bore are not approved, as long experience has shown that they do not compare favorably in results with those between 3 and 3½ in. bore.

Next is the question of balance and vibration, which excludes the eight-cylinder motor and leads naturally to the six-cylinder type, which is inherently balanced and free from vibration.

Exhaustive consideration has been given to the selection of a name. A hundred or more names have been submitted by Distributers and employees, but the term "Single-Six" has been chosen as the most appropriate. There are other sixes on the market, bearing various descriptive names, but there is none called the Single-Six. The name is therefore distinctive. The term "single" is a term of differentiation from double or "Twin." It is therefore particularly significant from a Packard viewpoint, as serving to distinguish it from the Twin-Six. The name "Single-Six," if persistently used, promises to develop a meaning separate from its common usage and as distinctly Packard as the Twin-Six has become. Care should be taken not to employ limited adjectives such as small, light, or little Six. These convey the impression of diminutive size and consequently of diminutive price. While it is a small car, care should be taken to avoid giving the impression of small price because it is distinctively a quality car and the price is in keeping with the quality, not the size.

Your attention is called to the fact that no attempt has been made to incorporate any spectacular or freakish engineering features. The car expresses the most advanced engineering practices. It has a maximum speed of more than sixty miles per hour. It has a wide range of high gear speeds and a quick pickup which is admirably shown in demonstration. It delivers an average of seventeen miles to a gallon of gasoline, and 2,000 miles per gallon of oil. Tire mileage, from 15,000 to 20,000 miles.

In appearance the car is unmistakably Packard. In the quality of steel, close measurement and character of workmanship, Packard high standards are maintained. Expense has not been spared in any particular where serviceability and economy of operation is at stake. Deference has been paid to economy only in the matter of embellishments.

The comfort which has been built into the seats, cushions and driving position excites favorable comment. This feature has made a strong impression upon all who have tested the car. It will afford a very important sales help.

The enclosed bodies have been most carefully designed by Packard engineers. They are being built by the foremost coach builders in America—the Pullman Company. The Superintendent of the Pullman shops is responsible for the statement that these bodies are the most scientifically designed of any automobile bodies on the market. Correctly designed and built by such a capable and responsible organization as the Pullman Company—Packard high standards are assured. This should provide effective sales capital.

Dependability has been a major result sought after in the development of the Single-Six. First costs are of less importance than the total cost over a period of time. The Single-Six gives excellent results on gas and oil, and its simplicity of design, accessibility of parts and refinement of construction makes it a car of great attractiveness, combined with maximum durability and economy.

There has prevailed a fear among Packard men that the Single-Six would be a competitor of the Twin-Six and that it would seriously interfere with the sale of the Twin. Recently, whenever possible, opportunity has been given to salesmen and Distributers to drive both cars for purposes of comparison. In every such instance, the verdict has been that the Twin-Six and the Single-Six are two very different types of transportation. It is impossible to make a Twin-Six out of a Single-Six, and despite its quality, economy performance, the Single-Six is not a Twin-Six. It does not render the same type of transportation, does not cost the same money, is not the same car. Each car fulfills a distinct mission and each should be sold to deliver the transportation for which it is intended.

It should be borne in mind that all automotive engineering is a compromise. A car built solely for racing is not a business man's car nor a family car. Many features must be sacrificed to speed. In building a chassis and body for the general public, consideration must be given to the features desired by the public.

These features are broadly, Appearance, Comfort, Performance, Investment, Service and Safety, with their subdivisions as listed below:

- | | | |
|------------|---|-------------|
| Appearance | { | Design |
| | | Pleasing |
| | | Tasteful |
| | | Distinctive |

SAMPLE NET RESULT COMPARISON CHART

	Ideal Car		
Appearance	10		
Comfort	15		
Performance	35		
Investment	10		
Service	15		
Safety	15		
	100%		

A study of this plan of analysing car values will prove that the introduction of the Single-Six in no way encroaches on the Twin-Six field, but rather opens to Packard Distributors a virgin field of prospects who will appreciate Packard name and quality in a medium priced car.

In selling the Single-Six, therefore, the efforts of the sales organization should be directed to educating and selling the public up from equal or lower first priced and less desirable cars, giving them a more satisfactory grade of passenger transportation, rather than to sell only down from higher priced classes.

A United States Government Bond is the best security in the world—some are issued in denominations of \$1,000 and others in denominations of \$500. If an investor has \$500 only to invest, he would not hesitate on the ground that a \$1,000 bond pays more interest. He would derive the same rate of interest on the \$500 as on \$1,000 but he would not get the same amount of interest. In other words, he would not get the same net result as the investor in a \$1,000 bond. He would, however, get the best net result for his investment—security, regularity of interest, payments and certainty of redemption at maturity. By the investment of \$1,000 he would have the same guarantee with a larger volume of income. Both bear the name "United States of America."

Comfort } Physical
 } Mental

Performance } Acceleration
 } High Gear
 } Hill Climbing
 } Lack of Vibration
 } Dependability
 } Road Ability

Investment } List Price
 } Economy
 } Longevity
 } Market Ability
 } Re-sale Value

Service } Local
 } National
 } Factory

Safety } Construction
 } Performance

Obviously, a car in which each of these features could be rated as PERFECT, could justly claim to be the IDEAL car, returning 100 per cent in NET RESULT, and could be accepted as a true standard by which all cars could be compared and graded. Such a comparison will show the real net result returned by any car. It will distinguish the car excelling in several features from those excelling in only one or two, and, in a word, will rank all cars in their proper place.

In such a comparison Packard cars have every advantage. By reason of its characteristic features, the Twin-Six will show a Net Result placing it at the head of the list.

The Single-Six, by reason of its features, will show a Net Result below that of the Twin-Six, but high enough to place it at the head of its price class, and to seriously threaten the supremacy of several cars above it.

The Single-Six and the Twin-Six render proportionate dividends on the investment. Both bear the name "Packard."

Many new cars have appeared and are appearing on the market but it is seldom any car is offered to the public which has had provided for it in advance of its advent, a thoroughly organized, well trained and fully equipped service organization. The Single-Six enjoys this unique distinction. This service organization has a reputation to preserve, not one to make. It is already made. With such facilities available the Single-Six may be offered to the public by Packard salesmen in full confidence that it is the result of the most up to date engineering and manufacturing practices, and is amply protected by an extensive and efficient service organization.

The Single-Six Bodies

(GENERAL)

There are four different styles of bodies mounted on the same Single-Six chassis of 116" wheelbase; namely, the five passenger Touring, two passenger Runabout, five passenger Sedan and four passenger Coupe.

The bodies are made almost entirely of aluminum. All body panels of the open models are 14 gauge cold rolled sheet aluminum and the door panels are 16 gauge aluminum. The dash panel is also cold rolled sheet aluminum. The enclosed body panels doors, sides and entire roof panel are 16 gauge cold rolled sheet aluminum of the best quality.

Thoroughly air dried and kiln dried lumber of the proper consistency is used for the main framework, which is reinforced by steel braces. The bent woods, which are employed to obtain the correct contours, are bent on forms and placed in dry kilns having a temperature of 100° to 120° F. and left to dry for 24 hours to ensure them holding shape. All joints are closely fitted, screwed and glued in a thorough workmanlike manner. After first assembly of the aluminum panels to the wooden frame all the surfaces are either wire brushed or sanded to prevent all surface imperfections and irregularity of line in the finished product. The joints of all panels are smoothly filed with great care and exact symmetry of lines is adhered to in the first as well as last operations. The following woods are used in the body construction of all Single-Six models: maple, oak, rock, basswood, spruce, mahogany, and other hardwoods.

Trimming of Bodies (open)

All materials used in trimming the bodies are of uniform high quality. Neatness of finish and

good workmanship are most noticeable. The leather used is best quality-black, machine buffed, pebble grained, dull finish leather. The design of trimming is of the plaited type with plaits approximately 4 inches wide. All springs in the cushions are of the ventilating type and the cushions are upholstered with the best grade of hair, covered with a cotton wadding. The entire tonneau floor is covered with best quality carpet, well fitted around the sill kick-up, rear floor boards and heel boards.

Trimming of Bodies (enclosed)

The trimming is along the same order as for open bodies. All window moldings are hardwood, stained a black walnut finish.

The headlining in the Sedan and Coupe is plain trimmed and extends in one section, neatly covering the entire roof. Trimming of the body sides and rear is also plain. The rear seat of the Sedan is trimmed with the same upholstery material as used in the headlining and sides and is in plaited style. The windlace cord around the doors is covered with material to match the trimming, except at the bottom where it is covered with leather around the bottom of the door openings and up to and in line with the rear seat carpet panel.

All the interior hardware and fittings are of an exclusive Packard design.

Body Types

The Single-Six Touring Body (5 passengers)

The same seating dimensions, as in the Sedan are used to provide accommodations for five persons in the Touring car.

The sloping, tapered, windshield is of the same construction as the Runabout windshield with swinging upper, and stationary lower sash.

The top, of best quality material, is semi-lined and securely fastened to the windshield stanchions by means of an acorn head nut. A plate glass window 8" x 20" is used in the rear top curtain.

Pebble-grained dull finished leather is used in the seat cushions and seat backs. The tonneau floor is carpeted, and fitted with a nickel plated folding foot rest easily adjustable to two positions.

The front and rear cushions, are low, deep, and tilted at the most comfortable angle. There is ample clearance between the steering wheel and seat cushion back, the distance being 8" and 13½" respectively.

All doors are fitted with outside and inside handles of the Twin-Six type, nickel plated. The doors swing forward on concealed hinges and are of a square cornered design with mouldings.

A space for carrying tools is provided beneath the front seat lid.

The curtains, which are close fitting and storm proof, are stowed away in the left, front and rear doors, in specially constructed pockets.

A folding, solid type robe rail is fitted to the back of the front seat.

The high, narrow radiator and the bonnet with distinct Packard characteristics blend into a high rounded cowl and are exceptionally well proportioned to the after part of the body.

A hardwood moulding is neatly affixed to the tops of the doors and tops of the body sides and is continued around the face of the cowl in a graceful curve. It is stained black walnut with a very rich semi-gloss finish and adds the finishing touch to a well proportioned and expertly constructed body.

The Single-Six Runabout Body (2 passengers)

Ample room for two persons is provided on the seat width of the Runabout, and both passengers are

assured generous leg room, the distance between the front seat cushion and the dash being 26 $\frac{1}{4}$ ".

Ventilation is provided by an efficient ventilator device in the cowl. It is adjusted by means of a button on the instrument board and forms a watertight joint when closed.

The windshield is sloping and tapers outward from the cowl to meet the top. The upper windshield sash swings backward or forward, and is fitted with a weather strip of entirely new design, all around the sash, which eliminates leakage between the sash and stanchions. The stanchions are very light steel forgings and the front of the top is fastened securely to them by means of an acorn-head nut. This makes a solid, rattle-proof connection between the top and windshield. A wrench must be used to release the top.

The lower windshield glass is stationary—rattle and rain proof.

A new Packard design is expressed in the instrument board, on which the following instruments are mounted: Ammeter, oil pressure gauge, lamp with dimmer attachment, carburetor adjustment, cowl ventilator regulator, ignition and lighting switches and speedometer.

The top of best quality black top material is semi-lined, and supported on three bows, none of which are placed where there is any danger of striking the head. In the folded position, the top rests on the rear deck, which is equipped with a rubber mat, bordered with an aluminum moulding, and bumpers to prevent marring of the deck finish. A one piece plate glass window is set in the rear curtain. The side curtains, which are stowed in the left front door are made to fit perfectly, and are storm proof in every respect. A small round opening covered with a flap is provided in the left side curtain to permit of signalling from the driver's seat without unfastening or damaging the curtains.

Two luggage compartments are provided; one in the rear deck of generous proportions, which will easily accommodate two good sized suit-cases or other heavy luggage. A distinctive feature of the deck compartment is the self draining construction of the lid joints, which prevents water from entering. A smaller compartment is provided directly behind the front seat back, suitable for parcels, small satchels, etc. The compartment deck is fitted with a Yale lock.

The doors, which are square in outline, and exceptionally wide for a body of this type, swing forward. The right front door has a pocket for carry-

ing small accessories, etc. and the left door pocket of special construction accommodates the curtains. Both doors have outside and inside nickel plated handles. The outside handles are of the Twin-Six design. The doors have the double locking feature. The seat and back cushions are equipped with ventilating type springs and the contour is designed to give the utmost comfort. Genuine horsehair and cotton wadding cover the springs and the entire cushion and seat back is upholstered with dull finish, pebble grained best quality leather. One of the most pleasing trimmings on the body is the hardwood moulding which is neatly affixed to the tops of the doors, and is continued around the face of the cowl in an unbroken curve. It is stained black walnut with a semi-gloss finish.

The Single-Six Sedan Body (5 passengers)

The Single-Six Sedan comfortably seats five persons with a rear seat width of 46 inches and front seat width of 42 inches. The front seat cushion and cushion back are trimmed in dull finish, pebble grained leather of the best quality and are tilted at a sufficient angle to give the utmost driving comfort. The cushion back extends 18 inches above the seat cushion which is 12 $\frac{1}{2}$ inches above the floor of the driver's compartment. The front seat cushion is 7 inches thick and built up of resilient springs, of the ventilating type, and best quality hair and padding. The rear seat cushion and cushion back are trimmed with upholstery cloth to match the compartment doors, headlining, sides, and back of the front seats. The rear cushion is set at the same comfortable angle and being 19 $\frac{3}{8}$ inches in depth and 14 inches from the floor, supports the knee at the most restful position.

All four doors have outside handles of a neat, bevel edge, square corner design. They are opened from the inside by convenient easy operating swivel handles. Nickel plated pull-to fixtures are fitted to the two rear and front doors.

There are inside locks on the two left and rear right doors. The right front door locks from the outside with a Yale cylinder lock.

The front doors are hinged to swing forward and the rear doors swing to the rear. This feature enables any occupant to change seats while the car is in motion, by using the unobstructed running boards. It also prevents the passenger's clothes being soiled on the rear fender when entering or leaving the car.

Comfortable arm rests are provided at each end of the rear seat.

Selected plate glass $\frac{1}{8}$ inch thick is used in the sloping windshield and all other windows. The lower half of the windshield is stationary and the upper glass is hinged on a piano type hinge which is rattle proof and operates smoothly. The upper glass is adjustable from the driver's seat, from a closed to fully open position. The upper windshield glass makes a rainproof joint with the lower glass to the top edge of which is fitted a rubber weather strip of new design. A weather strip of an entirely new design all around the sash absolutely prevents leakage of water between the sash and stanchions.

The front pillars and stanchions are of very small proportions but have great strength as the entire side of the sloping windshield front is a solid bronze one piece casting. The small diameter of the windshield front pillars eliminates the most common objection to a sloping front construction—viz: poor visibility through the front oblique positions.

A convenient rotating button, mounted on the dash operates a well designed ventilator mounted in the cowl. The ventilator lid forms a water-tight joint when closed.

All door windows lower flush with the door window sill and are operated by the rotary type window regulator. The two side windows at the ends of the rear seat lower half way and are fitted with a pull-up strap which is neatly stowed when not in use in an opening just below the window sill. The window is released for lowering by a nickel plated thumb button. The glass in the rear window is stationary, rattle and storm proof, being set in channel rubber and securely held in place with a hardwood moulding stained black walnut. All the door and other window mouldings are of the same construction stained in a rich black walnut finish to match the steering wheel rim.

The equipment includes silk roller curtains on the two side and direct rear windows. A flexible cord robe rail trimmed in upholstery material to match, is conveniently mounted on the back of the front seat. The nickel plated tubular foot rail is easily adjusted to two different positions, and folds back when not required.

An instrument lamp with a dimmer attachment is provided on the dash and a dome light of the square cornered design illuminates the entire compart-

ment when switched on at a button mounted on one of the body pillars.

The Single-Six Coupe Body (4 passengers)

Three passengers can be carried with utmost comfort in the Single-Six Coupe and when desired a small swinging seat folded beneath the cowl increases the capacity to four. The seat for two passengers is slightly behind and to the side of the driver's seat. The larger seat is $33\frac{1}{4}$ inches wide and $18\frac{7}{8}$ inches deep and is upholstered in cloth to match the headlining, sides and back panel upholstery. The driver's seat is upholstered with best quality dull finish pebble grained leather to resist the extra wear and tear to which it will be subjected. The same quality and type of cushions and springs as used in the Sedan, assure parallel riding and driving comfort in the Coupe.

By unique features of construction, as in the Sedan, wide, unobstructed vision is assured in every direction. The side members of the windows, doors, and windshield being unusually narrow.

The windshield of a greatly improved Packard design, is the same sloping construction as used in the Sedan, and the same type of ventilator is mounted in the cowl.

All windshield, door and window glass is of the best selected plate and all windows with the exception of the direct rear window lower flush with the window sills, thus affording ample ventilation in warm weather. The two door windows are lowered by means of the rotary type regulator and the two side windows are operated with the pull-up strap and thumb button release. The mouldings are stained black walnut, semi-gloss finish.

Both doors swing forward on unconcealed hinges and are fitted with outside and inside handles, which emphasize the square corner design. The left door locks on the inside, and the right door on the outside by means of a Yale cylinder lock.

In lines the Coupe is very pleasing to the eye, there being no unsightly jog in the body where the rear fender is joined, as is usually the case in cars of this type.

Ample luggage space is provided by a compartment in the rear deck, the lid of which is fitted with a suitable lock. Leakage of water into the compartment around the edges of the deck lid is prevented by a concealed self-draining water trough.

A compartment with a hinged lid is also provided directly behind the driver's seat for parcels, portfolios, small satchels, etc.

The direct rear window, as in the Sedan, is stationary and this window together with the two side windows are fitted with roller silk curtains to match the upholstery.

A dome light and instrument board lamp provide ample interior illumination.

Motor

The motor is strictly Packard in design and manufacture. It is compact, light in weight, smooth running and exceptionally quiet.

Six cylinder unit power plant with motor, clutch, transmission and change speed control integral.

Fuelizer

The Packard Fuelizer is a new automatic device which completely vaporizes all the gas passing from the carburetor to the engine by burning a small amount of mixture in a combustion chamber situated between the carburetor and the intake header. The combustion chamber is supplied with a mixture from the carburetor. This mixture is ignited by a special spark plug connected to the regular engine ignition system. The hot, burnt gas from this chamber passes into the fresh charge, changing it to a dry gas. The maximum heat is applied when the motor is idling, the flame automatically diminishing as the throttle is opened. The entire device is, to use an electrical term, a shunt around the main carburetor. The suction of the intake is shunted through the auxiliary system when the throttle is partially closed, causing the Fuelizer to function at a time when the engine requires the heated charge.

When the throttle is open the shunt ceases to operate. In other words, the great value of the Fuelizer lies in the fact that the maximum heat is supplied under idling conditions when it is most needed, and the minimum heat under heavy load conditions when the motor is already sufficiently warm. In this respect its action is exactly opposite from that of the ordinary exhaust heated device. An interesting feature of the Fuelizer is an observation window of Pyrex glass through which the quality of the mixture in the combustion chamber can be determined from the colors of the flame. A steady green flame indicates a good mixture, a dark blue flame shows too thin a mixture, and a reddish

yellow flame, one that is too rich. With the Fuelizer, it is possible, even in cold weather, to operate the car with the choke adjustment set at normal running position, within twenty to thirty seconds of the time the motor is started. The acceleration is considerably increased, particularly at low speeds. There is practically no collection of gasoline in the crankcase. Spark plug fouling is eliminated. The frequency of necessary carbon cleaning and valve grinding and the rate of wear on cylinders and pistons is greatly reduced. Gasoline economy is little effected one way or the other, except that in cold weather a somewhat increased gasoline economy will be noted with the Fuelizer in operation.

The Fuelizer as adapted to the Single-Six differs somewhat from that used on the Twin-Six. In the Single-Six carburetor no auxiliary jet is used to supply the mixture to the Fuelizer chamber. The mixture is drawn up direct from the main jet of the carburetor, through a by-pass to the Fuelizer combustion chamber directly above the main jet, and cast intergally with the upper half of the carburetor body. When the butterfly valve in the main carburetor is opened the suction is decreased in the by-pass from and to the combustion chamber and the flame is gradually extinguished. The Pyrex glass observation window is located directly on top of the combustion chamber and the flame is visible when viewed from the top of the carburetor.

Cylinders

The cylinders are hard gray iron castings carefully machined and the bores are ground to sizes and furnished in one standard of limits only. Large water jacketing is provided; water completely surrounds each cylinder barrel to insure proper expansion of metal and radiation of heat. The cylinder is of the "L" head type, cast en bloc with a detachable cylinder head which greatly facilitates service and permits the combustion chambers to be completely machined. The bore of the cylinders is $3\frac{3}{8}$ " and the stroke of the motor is $4\frac{1}{2}$ ".

Crankcase

The crankcase is cast in two parts and is made of aluminum alloy castings. It is supported at three points.

The crank shaft and cam shaft main bearings are in the upper half of the case, and the lower half forms the oil reservoir. The lower half can be removed without disturbing the crankshaft bearings, the front cover, or the clutch and transmission assembly.

There is an inspection opening in the upper half over the fly wheel, to facilitate checking the timing; also one at the front of the case for inspecting the chain adjustment.

Crank Shaft

Drop forged from high carbon steel, carefully heat treated, machined all over and balanced. The shaft has seven main bearings which are finish ground and lapped to size. The crank shaft is drilled from the main bearings to each adjacent connecting rod bearing for the purpose of forming oil ducts which supply oil under pressure to each connecting rod bearing.

The crank shaft thrust is taken on the rear main bearing and a special oil guard is provided at that point to minimize the leakage of oil.

Bearings

The crank shaft bearings seven in number are of the bronze shell, babbitt lined type. The bearings are of 1 $\frac{3}{4}$ " diameter and lengths as follows:

Bearing No. 1	2- $\frac{9}{16}$ "
Bearing No. 2	1- $\frac{1}{8}$ "
Bearing No. 3	1- $\frac{1}{8}$ "
Bearing No. 4	1- $\frac{7}{8}$ "
Bearing No. 5	1- $\frac{1}{8}$ "
Bearing No. 6	1- $\frac{1}{8}$ "
Bearing No. 7	2- $\frac{1}{2}$ "

Connecting Rods

The connecting rods are drop forged and have an I-beam cross section. The I-beam section is not machined but is forged to close limits so that the rods will not vary appreciably in weight. The connecting rods are heat treated to bring out the maximum physical properties of the metal and are provided with a babbitt lined bronze bearing at the lower end and a hard bronze bearing at the top. The connecting rod lower end bearing is 1 $\frac{3}{4}$ " in diameter and 1 $\frac{1}{2}$ " long, and lubricated by pressure. The upper end bearing is lubricated by spray from the crank case.

Pistons

The pistons are cast iron with three rings at the top. The piston pin is securely locked in place so that it cannot loosen and damage the cylinder walls.

Cam Shaft

Steel forging with twelve integrally forged cams. All cams are hardened and accurately ground. A

spiral gear is forged and machined integrally with the cam shaft at the centre for the purpose of driving the gear oil pump below and the ignition assembly above. Shaft is drilled and forms an oil lead to the cam shaft bearings. The four cam shaft bearings are hard bronze.

Valves

Diameter 1 $\frac{1}{2}$ " in the clear and are made of special alloy steel, which withstands high temperatures, giving maximum service without regrinding.

The valves are located on the right hand side of the motor and are accessible after removing a hand cover.

The cam shaft operates the valves through the intermediary of the rocker levers and valve tappets which are adjustable. The rocker levers are pivoted from the crank case and are provided with cam rollers. The rotating motion of the cam shaft causes the cam to raise the free end of rocker lever through contact with the cam roller which is almost centrally located on the rocker lever. One end of the rocker lever being securely pivoted to the crank case the other end is raised or allowed to lower by the action of the cam and roller. The free end is directly underneath the valve tappets and the motion which opens and closes the valves is transmitted to the tappet without side or rotating motion, as is common practice in a motor with the cam shaft operating the tappets direct.

This construction greatly eliminates the amount of wear on the valve tappet guides and insures quiet operation of valves and tappets over a long period, with a minimum amount of adjustment.

Valve Springs

The valve springs are double to obtain proper pressure without undue stress.

Front End

The cam shaft and generator are driven from the crank shaft by means of an adjustable triangular silent chain 1 $\frac{1}{2}$ " wide.

The outside adjustment, to compensate for chain stretch, is provided for in the generator mounting.

Fan

Stamped steel, driven by a new link type of fan belt. This fan provides a maximum draft of air and gives ample clearance between the belt and the radiator.

Electrical System

The whole electrical system is of the single-wire or the ground return type. Instead of running two wires, to lamps and other electrical units, only one wire is required, the other terminal being run directly to a ground connection to the frame.

The wiring is enclosed in junction boxes and conduits, and is out of sight entirely. Binding posts have been provided at the front of the dash which facilitates removal of all wires and conduits when the body is removed.

At the back of the dash, binding posts are provided for the connections of the coils and switch.

The electric lighting system is protected by means of a circuit breaker, which is located at the back of the lighting switch on the instrument board. If a short circuit should develop in the lighting system the circuit breaker automatically operates and gives warning by means of a slow buzzing noise and continues to buzz till the short circuit is removed.

The horn is fastened directly to the dash, and the connections to it are very accessible, and are out of sight as well as being protected from dampness. A very simple connection is made at the base of the steering post which can be easily detached when the steering gear is removed. This eliminates any necessity of breaking a connection in the wire to the horn button, which is a possible source of trouble.

The lighting system includes two main headlights, two auxiliary head lights for city driving, tail light, instrument board lamp and dome lights in enclosed bodies.

The head lights are supported by brackets fastened to the front fender brackets, and reinforced by a cross bar, which strengthens the fender brackets and at the same time holds the lamps in line. The head light lenses are non-glare. The tail lamp is supported from a bracket bolted to the frame.

Ignition System

The Packard-Delco ignition unit is mounted directly on the motor cylinder head between No. 3 and 4 cylinders and is driven from the cam shaft by means of spiral gears. The coils are located on the rear of the dash.

Wiring

High tension wiring is carried in a tube along the top of the cylinder block. All wiring is housed and protected.

Battery

100 ampere hours capacity, supported inside of the frame and can be easily removed for inspection by removing the floor board.

Generator

Supported on crank case at right front corner of motor with provision in drive for adjustment of chain to compensate for chain stretch. The cut-out relay is mounted on top of the generator.

Starting Motor

The starting motor is located on the left side of the motor, close to the cylinder block and attached to the front face of the fly wheel housing by means of a long pilot and one dowel screw, so that the starting motor can be very readily removed for inspection. The starting motor is engaged with the fly wheel by means of the standard Bendix drive and is enclosed and protected from dirt.

Ammeter

Located on instrument board.

Starting Switch

Located on right of accelerator pedal under inclined toe board and operates automatic gear shift.

Cooling System

The radiator is of the cellular type and has all the Packard characteristics. It is made with a detachable shell which can be readily removed.

The core is supported on the front cross member and is completely connected so that all of its functions are performed without the shell. This is important from a standpoint of manufacturing and service.

The water pump is mounted at the front of the motor cylinder cover and is driven by the fan belt. The thermostat is mounted directly on top of the water pump and the by-pass leads from the thermostat down the side of the cylinder block, and into the cylinder water inlet manifold which is bolted to the cylinder block.

Cooling is assisted by an 18" diameter fan, which is driven by a "V" belt and is provided with an eccentric for quick adjustment.

The hood is louvered, permitting free outlet of heated air from the radiator and motor. The capacity of the cooling system is approximately $4\frac{1}{2}$ gallons.

Lubricating System

All motor bearings are supplied with oil under 20 to 25 pounds pressure for normal running, pressure increasing with the power requirements. The pressure is maintained by means of an improved pump driven from the motor and regulated by an oil pump relief valve. Oil is conveyed from the crank case reservoir under pressure to the crank shaft bearings and thru a drilled crank shaft to crank pin bearings. The piston pin bearings and cylinder walls are lubricated by spray from the connecting rod lower end bearings. Cam shaft and all other bearings including front end drive, supplied with oil under pressure. Valve mechanism lubricated by oil mist from the crank case.

Chassis

There is but one type of Single-Six Chassis.
The wheel base is 116 inches
The angle of the steering column is 40° - 41° degrees.
The tread is 56 inches.

Chassis Lubrication

Grease cups have been eliminated and a new patented system of grease lubrication is being used. All points requiring grease lubrication, such as spring bolts, rear axle bearings, steering connections, etc., are fitted with connectors to which a flexible metallic hose and large, high pressure grease gun can be quickly and easily attached. The grease gun plunger being threaded, a few turns of the handle forces the lubricant through the hose and into the bearing under very high pressure, dislodging the old grease and covering the bearing surfaces with a fresh supply.

Frame

The frame has been designed to give maximum strength. This has been obtained by using a 7" depth of the side member, and by tapering the frame from the front and rear ends so that all offsets are eliminated. Rigid forgings at each end of the frame are fitted with cross tubes which are riveted in place. These in addition to the regulation cross members form a very strong and rigid construction.

Springs

The front springs are semi-elliptical, 38" long and 2" wide. The front spring is shackled at its rear end by a compression shackle and the bolt is well supported, as it extends through the frame. The rear springs are semi-elliptical, 54" long and $2\frac{1}{4}$ " wide, and are shackled at the rear end. Both front and rear springs are parallel to the tapered frame and firmly mounted to it, which forms a strong and safe construction.

Weights of Rear Springs

725-pound used on Runabout
980-pound used on Touring and Coupe
1100-pound used on Sedan

Steering

The steering gear is of the worm and split nut type. A ball thrust bearing is mounted at the upper end of the steering gear case, and is adjustable to take up wear. It is therefore very accessible and very easily lubricated. The outer end of the steering yoke shaft is made with integral tapered serrations which match with the tapered serrations in the upper end of the steering lever. This lever is drawn up to place by a nut, which makes a very rigid fastening. The lower end of the steering lever is fitted with a ball joint between it and the steering connection rod rear end. This eliminates a complicated block joint. The steering sockets come above the balls, preventing the collection of water and dirt in the ball joints, and greatly increasing their life. The steering column is at an angle of 40° - 41° on all models, and consequently only one steering gear and one mounting in the frame is necessary. The upper end of the column is supported by brackets attached to the instrument board which makes a very firm construction. The spider which supports the control lever sector has been constructed so that it can be readily removed and the steering wheel taken off without disturbing any other parts. The steering wheel is 17" in diameter with an oval section notched rim.

The electric horn button is in the center of the steering wheel and there is a fixed quadrant above the wheel for the spark and throttle control. The ignition and light switches are placed on the instrument board where they can be readily reached by the driver.

Universal Joints

The propeller shaft is of the tubular type fitted with spiders and flexible fabric disc universal joints at both ends. This construction does not require lubrication, and is quiet in operation.

Turning Radius

The turning radius of the Single-Six is 20 feet 9 inches.

Rear Axle

The rear axle is of the semi-floating type. The housing is made of pressed steel. The torque of the rear axle is taken up by a torque arm of rugged construction made of a steel stamping, with ends securely riveted in place.

The differential, the pinion shaft and the rear axle shaft are mounted on adjustable tapered roller bearings.

Rear Axle Gear Ratio

4.3 to 1.

Wheels

The wheels are designed to take 32"x 4" rims and are made of hickory spokes and a pressed steel felloe. On the front wheels the inner bearing dust closure is effected by means of a stamping which eliminates the right and left hand threading and therefore makes it possible to use the front wheels interchangeably on both right and left side. The rear wheels also can be used interchangeably on the right and left side. All wheels have 12 spokes.

Brakes

The service brake is of the external contracting type and the emergency brake of the internal expanding type.

The brake bands are lined with wire woven asbestos lining, and act on a pressed steel drum, 14" in diameter, which is securely bolted to the rear wheels with twelve bolts.

The service brakes are equipped with equalizers and the connections are kept from rattling by separate retracting springs, anchored to brackets, riveted to the frame.

Running Boards and Splashers

The running boards are tapered to match the frame. This gives a wider running board under the front door, and is therefore an advantage, as it gives a little extra room at the point where it is most needed.

The running board splashers are tapered to match the frame and body lines.

The radiator front splasher is very readily detach-

able. It is made to enclose the front spring front bracket and also forms a very neat joint at the inner edge of the frame, where it matches the inner edge of the bonnet frame ledge.

The crank case splashers are made readily removable, and form a mud tight joint between the crank case and the frame.

Clutch

Packard dry plate clutch with four driving plates. The clutch assembly is mounted in a separate compartment at the front of the integral, clutch and transmission case. This construction thoroughly protects the clutch assembly from dirt, oil and water. The clutch shaft is mounted on an oilless bushing at the front end, on a roller bearing at the rear end and has the transmission direct drive gear integral with it. The driving plates are lined with a special friction material and the driven plates are of steel hardened and ground. No adjustments are necessary as the wear is automatically compensated for. The clutch pedal adjustment is made very accessible and easy by means of a nut, which is placed in easy reach from above. The clutch throwout bearing has no load upon it except when the clutch is disengaged. The clutch operates with greatest ease and has a very soft action.

Transmission

Selective sliding gear type, three speeds forward and reverse with positive interlocking control integral with gear set.

All gears are made from alloy steel and are carefully heat treated. The driving shaft is mounted on a roller bearing at the front end and on a two row ball bearing at its rear end. The countershaft gears are forged and machined integrally, and are mounted on two roller bearings.

The speedometer shaft is driven by a pair of spiral gears installed in the rear end of the transmission shaft. The change speed lever is made to present a neat appearance and the ball at the upper end is convenient to reach without stooping forward. The speeds are geared in the following ratios:

Transmission Gear Ratio

First	3.37 to 1
Second	1.78 to 1
Third or High	1 to 1
Reverse	4.26 to 1

Speedometer

The speedometer drive is placed at the rear of the transmission and driven by a special gear on the

transmission shaft. This results in a very quiet drive and is perfectly lubricated at all times. The speedometer is mounted on the instrument board and is of the flush type.

Gasoline System

A vacuum feed gasoline system is used. The main gasoline tank is located on rear of the frame with a capacity of 19 gallons and the vacuum feed tank is located on the front of the dash.

The gasoline filler is placed at the extreme right end of the tank, and the gasoline shut off is placed in the outlet from the vacuum tank. The gasoline tank is provided with a gauge which indicates the amount of gasoline in the tank. The gasoline strainer is located in the bottom of the carburetor body and is readily removable for cleaning.

The carburetor and fuelizer are of strictly Packard design and are located on the right side of the motor.

Exhaust System

The exhaust gas is carried thru a large diameter pipe to the muffler which is located on the right side of the chassis and about midway between the front and rear axles. From the muffler the gases are carried to the rear of the car, and allowed to pass into the air.

Tires

Standard, Goodyear, or Firestone-Cord, straight side 33" x 4½" rib tread front and non-skid rear.

Tire Carrier

A new design of tire carrier is used on the Single-Six. It is bolted rigidly to the frame rear cross member, and cross tube, and is of the dummy rim type. No straps or shoes are used. One of the best features of the carrier is the self-contained cylinder lock. No pad-lock or tire lock chain being used. A turn of the key in the locking device, which is a part of the carrier and not an attachment, is all that is required to effect a secure locking of the spare rim and tire to the carrier rim.

Standard Painting

Open Cars

Body and door panels, Sedan Green, striped with Armenian Red.

Mouldings around doors, Sedan Green. Bonnet moulding and top body moulding, Black. Wheels—Sedan Green, striped with Armenian Red. Bonnet, Sedan Green. All other parts, Black. All bright metal parts, Nickel Plated.

Enclosed Cars

Body and door panels, Sedan Green, striped with Armenian Red. Upper body, body front, Black. Wheels, Sedan Green, striped with Armenian Red. Bonnet, Sedan Green. All other parts, black. All bright metal parts, Nickel Plated.

Standard Trimming

Open Cars

Seats, black, pebble grained, dull finish leather plaited style trimming. Plaits approximately 4" wide.

Floor and heel panel in tonneau, horse hair carpet. Pockets in all doors. Pockets in left doors specially constructed and used for storing storm curtains.

Floor boards linoleum carpeted with aluminum mouldings. Floor board at pedals is an aluminum casting.

Enclosed Cars

Front seat, of Sedan, black, pebble grained, dull finish leather.

Front and rear seats plaited style trimming. Plaits approximately 4" wide.

Driver's seat of Coupe, black, pebble grained, dull finish leather.

Rear seat of Sedan, upholstery cloth plaited, matches interior trimming.

Passenger's seat of Coupe—upholstery cloth plaited, matches interior trimming.

Entire compartment, including roof, sides, seat backs and doors, trimmed in standard Packard upholstery cloth—Set "D".

All trimming with exception of cushion backs and cushions—plain.

Floor in rear compartment of Sedan carpeted to match upholstery.

Two rear side windows and direct rear window fitted with silk roller curtains to match upholstery. Finishing strips and steering wheel rim, hardwood stained black walnut in semi-gloss finish.

Floor boards linoleum carpeted with aluminum mouldings.

Floor board at pedals is an aluminum casting.

Standard Equipment

Chassis—Includes:

- Electric starter.
- Electric generator and storage battery.
- Gasoline tank, gauge, tubing and connections.
- Front fenders and splashers.
- Running boards, covered with linoleum.

Equipment:

- Power tire pump and hose.
- Electric head and auxiliary lights equipped with non-glare lenses.
- Electric rear lamp combined with electric license tag illuminator.
- Instrument board lamp with dimmer attachment.
- Electric horn.
- Tool roll with complete equipment of tools.
- One-ton jack.
- Rear tire carrier for one extra tire with tire lock.
- One extra rim.
- Rim changing equipment,
- Gasoline gauge.
- Snubbers.
- Moto-meter.

Tire and Rims

- Goodyear or Firestone cord, straight side, 33"x4½" rib tread front and non-skid rear.
- Rims 32" x 4" all around, Kelsey straight side demountable.

Open Bodies

- Packard, one-man top with enclosing curtains.
- Four door-curtain opening attachments.
- Packard windshield.
- Robe rail,
- Adjustable folding foot rest.

Enclosed Bodies

- Rotating window regulators.
- Thumb button release and pull-up strap on rear side windows.
- Dome light.
- Flexible robe rail.
- Adjustable folding foot rest.
- Inside locks on left doors and rear right door of Sedan.
- Outside cylinder locks on right door of Coupe, and right front door of Sedan.

Instrument Board Equipment

- Ignition and lighting switches.
- Speedometer including miles per hour, trip and total odometers.
- Ammeter.
- Oil pressure gauge.
- Carburetor dash adjustment.
- Cowl ventilator regulator.
- Instrument lamp with dimmer attachment.

"THE SINGLE-SIX"

Specifications in Brief.

Motor

Six cylinders cast en bloc. Removable cylinder head. Seven bearing crank shaft. Piston displacement 242.5 cu. in.

Fuelizer

Exclusive Packard feature, standard equipment.

Cylinders

"L" head type, bore $3\frac{3}{8}$ ", stroke $4\frac{1}{2}$ ".

Horsepower

27.3 S. A. E. rating. Block test, actually develops over 54 H. P.

Ignition

Generator, battery and Packard-Delco distributor.

Frame

Pressed steel, 7" deep, rigid torsion tubes at front and rear, and cross channels, prevent frame weave.

Springs

Semi-elliptic, front 38" long and 2" wide. Rear, semi-elliptic, 54" long and $2\frac{1}{4}$ " wide.

Lubrication

Pressure feed, 20 to 25 pounds pressure for normal running, increasing with power requirements.

Clutch

Multiple disc, dry plate clutch. Four driving discs.

Transmission

Three speeds forward and one reverse, selective type.

Brakes

Internal emergency and external service brakes on 14" drums.

Starting System

Separate starting motor, special Packard-Atwater Kent independent of generator.

Lighting System

Head lights, auxiliary driving lights, instrument board, and rear light. Current for lighting supplied to battery by special Packard-Atwater Kent generator. Six volts.

Cooling System

Capacity $4\frac{1}{2}$ gallons with automatic thermostat regulating temperature of water. Steel fan.

Wheel Base

116 inches.

Tread

56 inches.

Turning Radius

20 feet 9 inches.

WEIGHTS

Single-Six Touring Car	2920 lbs.
" Runabout	2790 lbs.
" Sedan	3170 lbs.
" Coupe	2990 lbs.
" Chassis only	2340 lbs.

The weights given above are for cars with standard equipment, with gasoline tank and cooling system empty. To obtain weight of car ready for the road, including gasoline, water, and one extra tire complete, add 200 pounds. For weight of the body only subtract the weight of the chassis only from that of the complete car.

DIMENSIONS AND CAPACITY OF PACKARD SINGLE-SIX CARS

All Measurements are in Inches

TYPE NUMBER	LENGTH Over All TOP DOWN	WIDTH OVER ALL	HEIGHT Over All TOP UP
190	175½	68½	77¾
191	165¾	68½	78¾
192	165¾	68½	77¼
193	165¾	68½	76¾

APPROXIMATE DIMENSIONS OF PACKARD SINGLE-SIX OPEN BODIES

All Measurements are in Inches

	190	191
	TOURING BODY	RUNABOUT BODY
Length over all (at belt).....	105½	63½
Length—dash to front of seat.....	26½	26½
*Length—back front seat to front rear seat.....	22½	18
Width over all (at belt—panel to panel).....	54	49½
Greatest width floor in tonneau.....	43½	18
Front door width—over mouldings.....	22½	26¾
Rear door width—over mouldings.....	23½	18
SEATS:		
Front: Depth.....	17½	17½
Width.....	41	41
Height—floor to top of cushion.....	12½	20
Height of seat back.....	17½	12½
Rear: Depth.....	21	22
Width.....	45	16½
Height—floor to top of cushion.....	14	14
Height of seat back.....	19	19
†Head Room:—distance from top of seat cushion to headlining of top.....	38½	38½

*Measured 20" from Floor

†Measured from Point 5" Ahead of Seat Back Cushion

APPROXIMATE DIMENSIONS OF PACKARD SINGLE-SIX ENCLOSED BODIES

All Measurements are in Inches

	192 SEDAN BODY	193 COUPE BODY
Length over all (at belt).....	103 $\frac{13}{16}$	68 $\frac{9}{16}$
Length of enclosed compartment.....	91 $\frac{1}{2}$	56 $\frac{1}{4}$
Length—dash to front seat.....	26 $\frac{1}{2}$	27 $\frac{7}{8}$
*Length—back front seat to front rear seat.....	21 $\frac{1}{16}$	40 $\frac{3}{8}$
Width over all (at belt—panel to panel).....	57 $\frac{1}{2}$	55 $\frac{1}{4}$
Width of floor in rear compartment.....	43 $\frac{1}{2}$	50 $\frac{1}{4}$
Height of front compartment.....	49 $\frac{11}{16}$	24 $\frac{5}{8}$
Height of rear compartment.....	50 $\frac{3}{4}$	
Front door width—over mouldings.....	25 $\frac{3}{8}$	
Rear door width—over mouldings.....	25 $\frac{3}{4}$	
SEATS:		
Front: Depth.....	17 $\frac{5}{8}$	18 $\frac{1}{8}$
Width.....	42	18 $\frac{1}{2}$
Height—floor to top of cushion.....	12 $\frac{1}{2}$	12 $\frac{3}{4}$
Height of seat back.....	18	16 $\frac{1}{4}$
Rear: Depth.....	19 $\frac{7}{8}$	18 $\frac{3}{8}$
Width.....	46	33 $\frac{1}{4}$
Height—floor to top of cushion.....	14	13 $\frac{1}{2}$
Height of seat back.....	19 $\frac{1}{2}$	21
†Headroom:—distance from top of seat cushion to headlining of top.....	Front 39 $\frac{1}{2}$ Rear 38 $\frac{1}{4}$	Driv. 39 $\frac{1}{8}$ Pass. 38 $\frac{5}{8}$

*Measured 20" from Floor

†Measured from Point 5" Ahead of Seat Back Cushion