

Facts

PACKARD
EIGHT
DE LUXE
CARS

ON $142\frac{1}{8}$ " AND $147\frac{1}{8}$ "
WHEELBASES



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PACKARD MOTOR CAR COMPANY
DETROIT, MICHIGAN

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Packard Eight De Luxe Body Types

General Body Construction

For several years now Packard has been making its own bodies. Our body shops, including the die and metal stamping departments, are considered to rank among the foremost in the automobile industry. Some of the equipment and processes now in common use by the majority of automobile body plants originated and were developed in the Packard shops. Every item of material, workmanship and finish which might add to the beauty and quality of the Packard body is regarded important by those who have designed and those who are building this part of our car.

The body framework is built of thoroughly air dried and kiln dried lumber of the proper species, reinforced by metal braces. The individual wooden parts are carefully cut and shaped to master forms. During this process careful selection for proper grain is made of the hardwood used in all important members such as sills, cross sills, cross bars, standing pillars, door pillars, roof rails and cowl bars. The hardwoods used in the body construction are ash, birch, maple. The floor boards are made of laminated fir, which prevents warping if exposed to moisture.

The wooden body framework with the metal braces is completely assembled in

a large metal frame. All joints are fitted closely, glued and screwed in a thoroughly workmanlike manner.

The metal body panels are made of 19 gauge, normalized sheet steel. This grade of sheet metal is finer grain and more homogeneous than ordinarily used. It contributes immensely to the strength and safety of the Packard body. In our metal stamping department steel-faced dies instead of ordinary iron dies are used to produce the sharp, accurate contours of window castings, mouldings and door sections. The roof rails, rear quarters and back are butt-welded electrically to produce even, continuous surfaces.

Before the metal panels are applied to the wood frame the wood frame is painted to impregnate it against moisture and the inside of the metal panels which will not again be exposed are also treated to prevent rusting. So accurately are the wooden frames and metal panels assembled that practically no fitting is ever necessary when the metal parts are applied to the frame.

All Packard bodies are now thoroughly insulated against sound, squeaks and rattles. Factory experts conducted a study of noises over a period of several months and by a process of detection and elimination built a number of cars which were tested very severely and found to be as nearly perfect as it is possible to build. Every point of contact of wood-to-metal or metal-to-metal is now insulated with a rubber compound which forms a film of rubber between joints and surfaces. Other materials used in various places include friction tape, rubber-coated fabric and cotton wadding.

After all the metal panels have been assembled to the wood frame the body passes into the sand blast. In reality a very fine grade of metal chips or grit is used in place of sand. This produces a uniform surface slightly roughened into myriads of small barbs. This surface, also, is the finest possible foundation for the paint. We have never known of any cases where paint has not adhered perfectly and permanently to this surface.

Immediately after the sand blast operation the body is thoroughly air cleaned of all loose particles of the metal grit. This also insures having the surface of the metal perfectly dry before the primer coat is sprayed on. The primer coat is immediately followed by five synthetic oil type surfacer coats which are oven dried, and water sand rubbed to an even finish. At this point any surface imperfections are removed and a black sealer or filler coat is applied.

The body is now ready for the eight full coats of the color lacquer. These are evenly applied with powerful air guns and allowed to oven dry before they receive the oil sand rub. Before the body goes into the upholstery department it receives two more thin coats of the color lacquer. This air-dries while the body is being upholstered. The final processes consist of a light sand rub followed by clay polishing.

We have made no mention of the almost continuous series of inspections which take place during the body construction. The most outstanding of these inspections is the "white room." This is a booth

with floor, sides and ceiling painted a dazzling white and indirectly lighted from all directions. The reflection of light on all surfaces of the body is such that the smallest dent or projection can be immediately detected. Where any such imperfections are found the body is sent to the repair department and re-inspected before it is finally accepted.

We may justly be proud of our Packard bodies. They not only uphold our well-earned reputation of the past but insure an even greater future reputation in the field of fine automobiles.

Design Refinement

The new bodies, while maintaining the simple, enduring lines, have been lowered and given a more sweeping appearance. This has been done by raising the belt line one inch and carrying the bottom of the body down $\frac{3}{4}$ " by adding that amount to the sill. The bottom of the body curves down from the dash in a pleasing line, reducing the height of the side splash.

The chassis on which these bodies are mounted has been lowered $1\frac{3}{4}$ " between the motor and the rear axle, thus reducing the overall height of the car 1", although the radiator and cowl remain at their former height. The windshield has been set at a 7° angle. This, with a flowing curve where the front pillar joins the cowl, has given the front of the body a more pleasing appearance. Slight changes have also been made in the window reveals and castings and windshield header which blend them with the other new body lines.

In the interior appointments several changes have been made. A striking new

instrument board with a dark burl walnut finish sets off to advantage the black tooled instrument sub-panel. The instruments are of the new round face airplane type with the clock placed at the extreme right and the speedometer on the left. In the top center is the gasoline gauge and just below to the right and left are located the oil gauge and motor thermometer. The ammeter is placed in the center near the bottom with the carburetor choke control on the left and a new wireless type cigar lighter to the right. The choke control has been changed to the Bowden wire type which is easy to operate and completely eliminates rattles in this connection. The whole sub-panel is surrounded by a neat chromium-finished band. Indirect lighting is furnished by two 3-candlepower bulbs controlled by a separate switch just to the left of the panel. On the instrument board to the right of the panel is the ignition switch. A reading lamp has been built into the under side of the overhanging cowl and is controlled by a separate switch.

The window mouldings, garnish mouldings and cowl mouldings are a combination of plain dark walnut and burl finish. A convenient ash receptacle has been incorporated in the center of the cowl moulding and is easily reached by both driver and passenger in the front compartment.

The interior hardware has been redesigned, omitting the catalin knobs, which have been replaced with metal knobs in chromium finish. The door handles and window regulator handles are in bright platinum finish and designed to harmonize with the appearance of the new trimming.

The door lock handles have been removed from the window moulding and are now remote control type placed on the side of the doors. Increased leverage with this construction provides easier operation. Raising each handle slightly locks the doors, while a downward motion releases the lock and operates the door latch. Each handle is curved and makes a convenient door pull-to grip. Where robe rails are used they are of flexible cord type except in the seven passenger sedan and limousine where they are the hinged bar type. A smoking set is incorporated in each rear window moulding except in the five passenger sedan which has them just forward of the side arm rests. A vanity set fits into a recess in the right hand arm rest and a clock is provided as a part of the left hand smoking set. The foot rest is of the bar type, carpet covered and adjustable.

The tonneau lights in the enclosed bodies now have a dual switch. This light may be turned on and off by opening and shutting the rear doors or it may be controlled by the customary switch located on the door pillar.

All door sill scuff plates are chromium-plated metal and slope downward quite steeply toward the outside of the car. This construction makes it impossible for water to be blown in under the doors even during the most severe storm.

The new method of upholstery is not materially changed. A five-inch plait replaces the former seven-inch. Seat contours have not been changed.

The upholstery materials are of the highest grade and the cushions and seat backs are built to carefully designed contours

over deep luxury type springs. Each spring is securely fastened in place and enclosed in individual burlap wrappings. This prevents any noise should two coils come in contact. Each coil is of sufficient size and strength to positively prevent distortion under the severest loads.

The cowl ventilator cover is now covered with a screen to keep out dirt and insects. It is operated by a lever from the driver's seat and is easily and quickly adjusted to three different positions. A spring makes it rattle-proof. A side cowl ventilator with screen has been added on each side near the inclined toe board to increase the air circulation in the front compartment. These ventilators are easily opened from the inside.

The door hinges have been increased in width from $1\frac{3}{4}$ " to 2", providing greater strength and rigidity in the mounting of the door. The hinge pin has also been increased in diameter and an oil groove added. This makes it possible to insure positive lubrication of this part at all times.

Great care has been taken in insulating all bodies against heat, cold and noise. The body dash is entirely new and set on an angle to allow for the engine clearance. The gauge of the metal in the main dash has been increased for strength. The dash has been insulated on the motor side by a $\frac{3}{4}$ " piece of suitable insulating material, which in turn has been covered by an auxiliary metal dash. The back of the dash has been covered with a $\frac{1}{8}$ " thick facing material which has a leather type grain finish. Both the front and rear surfaces of the dash have been cleared up to

improve the appearance. This is especially true with that portion of the dash visible from the driver's seat. The front level floor board and inclined toe board are metal stampings covered with a $\frac{3}{4}$ " piece of suitable insulating material. This is in turn covered by a hair felt pad that is finished on the top with an enameled drill material which can be easily cleaned. The rear floor, the rear seat pan and the tool compartment are also covered with this felt insulator. Both front and rear compartment floors are covered with a neat appearing wool carpet. In the front compartment this carpet extends up the dash for about six inches to improve the appearance.

An interesting and valuable feature of the new bodies is the panel insulation. All metal panels below the belt line are provided with a specially designed method of eliminating body rumble. Before the body is trimmed a thick insulating gum is smeared on the surface. Imbedded in this material are sheets of heavy perforated fiber board. The whole is again covered with the gum material. This method of insulation very effectively stops vibration of the body and door panels and reduces resonance which might cause rumbling noises.

This comprehensive system of body insulation, together with chassis improvements which will be discussed later, has produced a body in which the quietness and freedom from all annoying noises will be as pleasing during the entire life of the car as it is on the first day it is driven.

Previous Features Carried Over

The adjustable driver's seat will be standard in all body types. Packard has standardized this type of seat rather than a full adjustable front seat. The passenger seat is so arranged that it is in the most comfortable position for the great majority of people. It is really the driver who must be in the correct position, and the Packard type adjustable seat meets all requirements without inconveniencing the passenger. The support supplied to the side door pillars with the straight-across seat construction is a valuable feature, although this support is not necessary under all normal conditions.

Another feature of previous models found in the new cars is the adjustable steering column. This may be raised and lowered through 5° , thus providing a range of adjustment in the driving position to suit any driver.

Non-shatterable glass is of course still standard equipment in all windshields and windows. It is interesting to note that many states are agitating for a law compelling all passenger vehicles to be equipped throughout with this type of glass instead of just in the windshield as is common practice in some bodies.

The popular and convenient instrument board package compartments have been retained in the new design.

Enclosed Bodies

Types

On the 142 $\frac{1}{8}$ -inch Wheelbase

Type 513—5 Passenger Sedan

Type 516—5 Passenger Club Sedan

Type 517—5 Passenger Coupe
Type 518—2-4 Passenger Coupe

On the 147 $\frac{1}{8}$ -inch Wheelbase

Type 514—7 Passenger Sedan
Type 515—7 Passenger Sedan-Limousine

Details of Enclosed Body

The new sloping windshield has been provided with built-in concealed sector arms. It may be locked in any one of seven positions, including shut and full open. A small chromium-finished finger grip at each end furnishes the means of adjustment. The left hand grip directly in front of the driver is pivoted and when raised releases the locking mechanism so the windshield may be opened. Dropping the grip locks the windshield in the desired position. It may be operated entirely by one hand. The sides and bottom of the frame are fitted with live rubber, effectively preventing water leakage. The hinge at the top is also protected by a sponge rubber strip which acts as a weather seal.

Although the front pillars have been widened at the bottom to blend with the new body lines, the width of the pillar at the line of vision is still narrow so that maximum vision is obtained at all times.

Two independent windshield wipers of the oscillating type, a rear vision mirror and adjustable sun visors are all standard equipment. The windshield wiper motors are completely concealed behind the header bar.

The upholstery material in all enclosed bodies, with the exception of the Limousine

front compartment and the rumble seat of the two-four passenger Coupe, is all wool broadcloth of the finest quality. The Limousine front compartment has black Colonial grain leather and the Coupe rumble seat Colonial grain leather to harmonize with the paint scheme. Curled hair of lasting resiliency and long fiber cotton wadding are used to cover the cushion springs and give the proper seat contours. Arm rests in the rear compartment have a sponge rubber core which permanently maintains their shape. A leather bead is used to bind the edges and intersections of the seat cushions and backs. Worsted tapestry lace is also used to finish various parts. The enclosed bodies are equipped with rear pillar grips of the loop type made of material to harmonize with the upholstery, except in the seven Sedan and Limousine, which have metal assist handles.

Details of Enclosed Body Types

Sedans (5-7 passenger)

The five passenger Sedan on the 142 $\frac{1}{8}$ -inch wheelbase represents the ideal combination of smartness and utility. While possessing all the refinements of the larger Sedan, it maintains the intimacy of the smaller car. It has full vision with three windows on each side.

The seven passenger Sedan is on the 147 $\frac{1}{8}$ -inch wheelbase. The beauty of the long low lines is only surpassed by the richness of the interior. In every appointment this car represents the ultimate in motor car refinement. Comfortable, fully upholstered auxiliary seats fold into a recess in the back of the front seat. Ample leg room is provided for both the passengers on the

rear seat and those on the occasional seats.

Sedan-Limousine (7 passenger)

In seating arrangement this is identical with the seven passenger Sedan. A neat division with straight-across glass partition which may be lowered is built into the back of the front seat. The front compartment is upholstered in leather below the belt and the driver's seat made stationary without the adjustable feature. The front seat is, however, exceptionally comfortable and is upholstered with the same care and precision as the rear seat. The passengers may communicate with the chauffeur through a telephone of the dictograph type. The portable speaker is fastened to the right side of the body just in front of the arm rest. The flexible cord is contained on a concealed reel. In this body type the robe rail is of the hinged bar type.

Club Sedan (5 passenger)

This body type is a close-coupled five passenger model with four doors. In appearance it is in the class of the sport car while still keeping the dignity of the Packard enclosed car. The rear seat is set near enough to the front seat to provide easy, intimate communication between the passengers. The leg room, however, is ample for even taller than average people. Two foot hassocks adjustable to any position are used instead of a folding type foot rest. The smoking sets in this body are recessed into the rear quarters. Between the body and the spare wheel a rear platform provides for an attractive trunk should one be desired. The platform is, however, equipped with chromium-finished

guard rails which present a pleasing appearance without the trunk.

Coupe (5 passenger)

This body type is admirably suited to the owner who wants a small car because he does not ordinarily carry passengers, but who wants to provide comfortable accommodation for his friends if the occasion demanded. It is a two-door model with the front seats of the bucket type fully upholstered. The driver's seat is adjustable as in other body types and the companion seat tilts forward to allow access to the rear seat. A counter balance makes this tilting seat easily handled in any position. The rear seat extends the full width of the body and can seat three passengers with utmost comfort. The floor is recessed to provide additional leg room. The back of the body is extended in a graceful rear deck which furnishes a large luggage compartment.

Coupe (2-4 passenger)

This is a permanent top, two-door Coupe. The front compartment seat and interior fittings are of the same proportion and design as the five passenger Sedan. Provision is made for two additional passengers in a disappearing rumble seat. The rear deck lid is large, which allows the rumble seat back to be made on such generous proportions as to insure perfect comfort for the passengers. A luggage compartment is located back of the front seat and is easily accessible to the driver. In it are found the lever to release the rear deck and the window regulator for the rear window, which may be lowered if desired. A golf bag compartment extends across

the floor back of the front seat and is reached through a door on the right side. The rumble seat compartment is large and roomy and is fitted with a light, carpet and foot rest.

Convertible Bodies

Types

On the 142 $\frac{1}{8}$ -inch Wheelbase

Type 519—2-4 Passenger Coupe Roadster

Type 533—5 Passenger Convertible Sedan

Type 537—5 Passenger Convertible Victoria

Details of Convertible Bodies

These bodies will immediately appeal to those who enjoy a sport car or who desire the convenience of a closed car which can be quickly converted into an open car. Each body in finish and design has the atmosphere of a truly individual custom car. The method of upholstering and the interior fittings are the same as used in the Packard Eight De Luxe enclosed bodies. In place of broadcloth upholstery, however, the finest quality first-cut, hand crushed Colonial grain leathers are used in colors to harmonize with the paint schemes.

The windshield slopes backward and is of the one-piece construction with the same simple hold-open mechanism as is employed on the enclosed bodies. Two independent automatic windshield wipers of the oscillating type and a rear vision mirror are standard equipment.

All windows lower flush with the tops of the doors. Each glass is surrounded with chromium-plated mouldings which not only make it more rigid but also decrease

the friction in the felt lined channels when raised or lowered. The operating mechanism is a counter-balanced type, providing exceptionally easy adjustment. All glass is non-shatterable.

The tops are of the best quality Burbank fitted over specially designed wood and metal bows. The design of the top is such that ease in collapsing is maintained at no expense of rigid, rattle-proof construction. All door windows may be raised or lowered with equal ease when the top is up or down. Particular attention has been paid to all joints between the top and windshield and side pillars to make the car weatherproof under all conditions.

Details of Convertible Body Types

Coupe Roadster (2-4 passenger)

This body incorporates the sporty Roadster lines with the utility of the Convertible Coupe. The doors are fitted with windows which are easily raised or lowered whether or not the top is in place. The top is fully collapsible and disappears inside a compartment back of the front seat. This compartment is covered with a neat Burbank flap which does not break the straight sweeping Roadster lines when the top is down. A luggage compartment covered with a door is located at the bottom of the top compartment.

The seating arrangement is very similar to the two passenger stationary Coupe. The front seat is of generous proportions for two passengers, with the driver's seat adjustable. Provision for two additional passengers is made in the disappearing rumble seat. A feature of the large

and roomy rear compartment is the arrangement for carrying golf bags. A door opens from the right side of the body panel just forward of the rear fender. An ample space is provided for two complete golf bags without interfering with the leg room of the passengers in the rumble seat.

The rumble seat cushion and back are fully upholstered and are quite as comfortable as the front seat. The rumble seat compartment is fitted with a deck light, carpet and foot rest, as well as leather arm pads on each side.

Convertible Victoria (5 passenger)

This body is a companion sport model to the popular five passenger Coupe enclosed body. The two doors are exceptionally wide and permit easy access to the rear seat. The front seats are fully upholstered, although the backs fold forward to allow free passageway into the rear. The driver's seat is adjustable. The full width rear seat provides ample room to seat three passengers comfortably and it is equipped with a center folding arm rest to increase the comfort when only two passengers are carried.

The top of this body also lowers into a recessed compartment in back of the rear seat, folding flush with the body line. This enhances the beauty of the low, straight sporty lines of this body.

A spacious metal trunk is standard equipment for the rear platform. It is painted to match the body panels and carries out the beautiful proportion of the entire car.

Convertible Sedan (5 passenger)

This body incorporates all the interior features found in the enclosed type 513 five passenger Sedan, including adjustable driver's seat. The rear seat is wide enough to accommodate three passengers, although a folding center arm rest is provided for occasions when only two passengers are riding. A feature of the folding arm rest is that it is fully upholstered and when folded does not interfere with the comfort of the center passenger in the rear seat.

Provision has been made for installing a drop type division glass between the front and rear compartment. This division disappears completely in back of the front seat when not in use and may be raised and lowered when the top is up as well as down.

The narrow center pillar posts above the belt line are removed when the top is collapsed. This does not interfere with the operation of the door windows or the partition glass. A spacious compartment is built into the lower back of the front seat to accommodate these pillar posts when removed.

The top folds down neatly into a compact form which is covered by a Burbank top boot furnished as standard equipment.

Open Body Types

On the 142 $\frac{1}{8}$ -inch Wheelbase

Type 510—7 Passenger Touring

Type 511—4 Passenger Phaeton

Type 531—4 Passenger Sport Phaeton

Details of Open Bodies

The open bodies are built of the same materials and with the same fine precision

as the enclosed and convertible bodies. The new low sweeping lines accentuate the sporty appearance of these bodies.

A non-shatterable glass windshield of the swinging sash type is mounted in substantial chromium-finished forgings. The windshield folds forward when the top is lowered. With the top up, a weatherproof flap extends downward and is attached to the windshield by Lift-the-Dot fasteners. Thumb nuts securely clamp the top bow to the windshield, giving a rattle-proof connection.

The top and side curtains are of the finest quality Burbank material, carefully cut and fitted on each individual job. The fit thus obtained insures absolute protection from wind and rain. Each door curtain is supported with a solid rod inserted in the top edge of the door. This prevents damaging the celluloid windows in the curtains when the doors are opened. When not in use the side curtains are carried in specially designed pockets in the left door.

The construction of the top consists of chromium-plated metal slats attached to walnut finish wooden bows. The bows are placed where there is the least danger of passengers striking their heads. The geometry of the top bow construction insures having the top collapse into a small, compact form. Standard equipment includes the Burbank top boot.

The entire interior is upholstered in first-cut, hand crushed Colonial grain leather. The seat cushions and backs are constructed to the same luxurious contours as the enclosed cars. The driver's seat in all open bodies is adjustable. Carpets in the

front and rear compartment are made of an interwoven horsehair material, the same material being used on the heel kick-up.

All doors are fitted with outside door handles of the standard Packard design. Inside handles are of the non-projecting design, recessed so they will not catch the clothing.

A single automatic windshield wiper of the oscillating type, a rear view mirror and a spot light on the driver's side are standard equipment.

Details of Open Bodies

Touring (7 passenger)

This body is notable for an extremely roomy tonneau. It affords comfortable accommodation for three passengers on the rear seat and two on the fully upholstered folding auxiliary seats. A carpet covered adjustable foot rest adds to the comfort of the rear seat passengers.

Phaeton (4 passenger)

The long low lines of this body give it a foremost place among Sport models. The seating arrangement is ample to accommodate four passengers, although five can be carried if desired. An arm rest with smoking set is built into each side of the body at the rear seat. Built into the back of the front seat is a large luggage compartment. The sloping cover to this compartment makes a comfortable foot rest.

Sport Phaeton (4 passenger)

This body in detail is the same as the Phaeton. It is equipped with a hinged tonneau cowl with folding type single

piece windshield of non-shatterable glass. Counter balances on the cowl make it extremely easy to raise and lower. A courtesy light automatically turned on when the rear door is opened is installed on each side of the back of the front seat. Screen covered side ventilators give ample air circulation in the tonneau.

Standard Upholstery for Packard Eight De Luxe Cars

The standard broadcloth for enclosed cars will be D-739 for paint schemes A, B and F; 74-1031 for paint schemes D, E and M; and D-743 for paint schemes C and X. Leather is standard trim in the rumble seat only of the two passenger Coupe and throughout the entire car in all open cars, Coupe, Roadsters, Convertible Victorias and Convertible Sedans. The standard leathers are as follows:

Colonial grain	739 for scheme A
Colonial grain	546 for schemes B and X
Colonial grain	704 for scheme C
Colonial grain	R-201 for schemes D and E
Colonial grain	714 for scheme F
Colonial grain	744 for scheme M

Where leather is used in the front compartment of Sedan-Limousines, Colonial grain leather 546 will be standard in all paint schemes.

Standard Paint Schemes

The following standard paint schemes will be available on Packard Eight De Luxe cars:

Paint Scheme "A"

Standard black chassis parts Black
 Body and bonnet mouldings and window castings, also body base moulding and body above moulding on enclosed cars only Rogers Domestic Gray
 Window reveals, cowl and bonnet above moulding, body above moulding on open cars and convertible cars only, body and bonnet below moulding and steel or wood wheels when specified Rogers Beige Gray
 Stripe—Body, bonnet and wheels . . . Dupont's Deep River Green 244-6202

Paint Scheme "B"

Standard black chassis parts Black
 Body and bonnet mouldings and window castings, also body base mouldings Black
 Window reveals, cowl and bonnet above moulding, also body above moulding, body and bonnet below moulding and steel or wood wheels when specified Packard Blue
 Stripe—Body, bonnet and wheels standard position and size . Gold Bronze

Paint Scheme "C"

Standard black chassis parts Black
 Body and bonnet mouldings and window castings, also body base mouldings and body above moulding on enclosed cars only Black
 Window reveals, cowl and bonnet above moulding, body above moulding on open cars and con-

vertible cars only, also body and bonnet below moulding, and steel or wood wheels when specified . . .
.....Rubicelle Deep

Stripe—Body, bonnet and wheels
standard position and size. Gold Bronze

Paint Scheme "D"

Standard black chassis parts Black

Body and bonnet mouldings and window castings, also body base moulding Black

Window reveals, cowl and bonnet above moulding, also body above moulding, body and bonnet below moulding and steel or wood wheels when specified Shirvan Green

Stripe—Body, bonnet and wheels
standard position and size. Gold Bronze

Paint Scheme "E"

Standard black chassis parts for 940-945 cars. Dupont's Riverhead Green

Body and bonnet mouldings and window castings, also body base moulding and body above moulding on enclosed cars only
.....Riverhead Green

Window reveals, cowl and bonnet above moulding, body above moulding on open cars and convertible cars only, body and bonnet below moulding and steel or wood wheels when specified
.....Bonaventure Green

Stripe—Body, bonnet and wheels . .
.....Dupont's Perugia Green

Paint Scheme "F"

Standard black chassis parts for 940-945 cars. Ault & Wiborg Midnight Blue

Body and bonnet mouldings and window castings, also body base moulding and body above moulding on enclosed cars only
.....Ault & Wiborg Midnight Blue

Window reveals, cowl and bonnet above moulding, body above moulding on open cars and convertible cars only, body and bonnet below moulding and steel or wood wheels when specified
.....Ault & Wiborg Countess Blue

Stripe—Body, bonnet and wheels . .
.....Ault & Wiborg Light Blue

Paint Scheme "M"

(For enclosed cars except convertible cars.)

Standard black chassis parts for 940-945 cars Valentine's
Aztec Olivine Brown 300-5061

Body and bonnet above moulding, window castings, cowl and bonnet above moulding, body and bonnet below moulding, body and bonnet moulding and body base moulding and steel or wood wheels when specified Valentine's
Aztec Olivine Brown 300-5061

Window reveals
..Aztec Olivine Brown Light 300-5062

Stripe—Body, bonnet and wheels . .
.....Dupont's Tacoma Cream 244-1299

(For open cars and convertible cars.)
 Standard black chassis parts for 940-
 945 cars.....Valentine's
 Aztec Olivine Brown 300-5061
 Body and bonnet moulding, also
 body base moulding.....Valentine's
 Aztec Olivine Brown 300-5061
 Body above moulding, cowl and
 bonnet above moulding, body and
 bonnet below moulding and steel
 or wood wheels when specified...
 ...Aztec Olivine Brown Light 300-5062
 Stripe—Body, bonnet and wheels..
 Dupont's Tacoma Cream 244-1299

Paint Scheme "X"

Standard black chassis parts.....Black
 Body and bonnet mouldings and
 window castings, also body base
 mouldings.....Black
 Window reveals, cowl and bonnet
 above moulding, also body above
 moulding, body and bonnet below
 moulding and steel or wood wheels
 when specified.....Black
 Stripe—Body, bonnet and wheels
 standard position and size...Old Ivory

The standard color for wire wheels on all
 paint schemes except schemes E, F and
 M will be black. With schemes E, F and
 M the wheels are the same color as the
 body panels. Special orders are issued
 when some other color is desired. Steel
 and wood wheels will be painted to match
 body panels as indicated.

The exposed metal parts and partitions in
 Sedan-Limousines will be the same color
 as the body above moulding.

Windshield frames on all enclosed cars will
 be black for paint schemes B, C, D and
 X and for paint schemes A, E, F and M
 they will be painted the same color as the
 window reveals. The windshield frames
 on all open cars and convertible types will
 be chromium plated.

Convertible Victoria trunks will be painted
 the same color as the body panels.

Mechanical Features

Motor

The motor is strictly of Packard design
 and is manufactured in the Packard
 factory. The motor is a unit power plant,
 eight cylinders in line with clutch and
 transmission integral. It is of well bal-
 anced design, compact, light in weight and
 exceptionally smooth running.

Every driven unit has its own individual
 drive, which eliminates complicated flexi-
 ble joints that wear out and become noisy,
 and increases accessibility of the units for
 repairs or adjustments. The exceptionally
 clean appearance of the Packard Eight
 motor is the result of the experience
 gained by years of careful engineering.
 Maximum efficiency in combustion is
 obtained by a well balanced layout of
 carburetor and intake manifold in con-
 junction with the best design of cylinder
 head and pistons. The heavy counter-
 balanced crankshaft with its vibration
 damper and the light weight reciprocating
 parts contribute largely to the phenomenal
 smoothness of this motor.

Design refinements incorporated in this
 new motor are: A new drop-forged valve
 rocker arm with force feed lubrication

to the roller, making possible increased valve spring tension, eliminating sticking valves; steel-backed main bearings instead of bronze; stronger connecting rods with caps secured with through bolts; new type piston rings to give maximum compression and lubrication control; replacement of cylinder lubrication device with a column of high pressure oil injected into each cylinder with each revolution of the crankshaft; combined carburetor air cleaner and intake silencer; air cleaner incorporated in crankcase breather; re-design of exhaust and intake manifolds to shorten warming up period; fan blades altered to give greater efficiency and quieter operation; motor completely mounted in rubber; re-design of flywheel and vibration damper to increase smooth and quiet operation; a small metric size spark plug with wider temperature range; new design of cylinder head combustion chamber which reduces detonation and increases the compression ratio from 4.85 to 1 to 6 to 1.

All cylinder head nuts are of the acorn type, chromium plated and polished. Aluminum parts are scraped smooth and sand blasted. The enameled parts are finished in Crane Gray and Black Enamel.

Gasoline System

The gasoline supply tank is located at the rear of the chassis and has a capacity of 25 gallons of fuel on all Eight De Luxe models. A mechanical gasoline pump located on the front end of the motor is used to draw the fuel from the supply tank at the rear to the carburetor. A

gasoline gauge is mounted on the instrument board and registers the amount of fuel in the rear supply tank in gallons.

A gasoline filter with a glass sediment chamber is interposed between the supply tank and the pump to segregate the dirt and water which may be present in the fuel. This is located on the gasoline pump where it can easily be observed and the accumulation of foreign substances emptied before causing stoppage of the feed line.

The gasoline tank filler cap has a bayonet type lock, eliminating the wire bail.

Carburetor

The carburetor is Packard in design and is located on the right side of the motor. It is of the expanding type and automatically provides the correct proportions of air and gasoline throughout the entire range of the motor speeds. All conditions are compensated for by a single adjustment. A better control of the gas mixture in cold weather starting has been provided by automatically spring loading the carburetor air vanes while the choke is being used. An improvement has also been made in the spray nozzle section of the carburetor, which guards against the annoyance of vapor lock when using high test gasolines.

Cylinders

The motor is of the "L" head type, cylinders cast en bloc, with a detachable head. The cylinders are hard gray iron castings, carefully machined and the bores are honed to size. The cylinder bore is $3\frac{1}{2}$ ". The cylinder blocks are cast in the Packard foundry by the best known

method from an iron mixture containing 20 per cent steel. The addition of the steel makes the metal more closely grained and increases the strength as well as making a more homogeneous material. They are cast eight in block for compactness and lessened weight. The intake manifold is designed to distribute gas in exactly the same volume to each cylinder.

It is also provided with a hot spot or pre-heating surface, which assists in further vaporizing the gas as it passes into the cylinders over this heated area.

Water passages are large to give perfect circulation, one entire side of the block being cast open for the purpose of cleaning and inspecting water chambers and outside of cylinder barrels. This opening is covered by a steel plate which acts as a manifold to give even distribution of water around cylinder barrels and is easily removed.

Cylinder bores are accurately finished and honed for size and held to close limits for roundness and taper. The bottom edge of the bore is beveled and enables the block to be slipped over the pistons. The top face of the cylinder head block is carefully ground to insure parallel non-leaking joints.

The cylinder head is removable, thus facilitating service work and permitting the combustion chambers to be completely cleaned. The combustion chamber is of the high turbulence type, specially designed to reduce the possibility of detonation when using ordinary grades of gasoline. The compression ratio is increased from 4.85 to 1 to 6 to 1.

Crankcase

The crankcase is of the barrel-shaped type to give maximum strength with minimum weight. This ribbed bridge-like structure furnishes ample support for the nine main bearings on the crankshaft. To improve bearing fits under all operating conditions, Packard bearing caps are made of cast iron. The crankcase is cast in two parts and is made from aluminum alloy. It is supported at both the front and rear ends by a new design of rubber insulated brackets.

The crankshaft and camshaft main bearings are supported by webs cast in the crankcase upper half. The lower half forms the oil reservoir. This can be removed without disturbing the crankshaft bearings, the gear cover or the transmission case. Baffle partitions are cast crosswise in the lower half to retard surging of oil.

There is an inspection opening at the front of the case for inspecting front end chain adjustment. The spark setting can be checked by removing the motor starter motor and lining up the mark on the face of the flywheel with the pointer attached to the crankcase.

Crankshaft

The crankshaft is manufactured from a steel drop forging and supported in the crankcase by nine main bearings. The shorter the distance between supports, the smaller the tendency for vibration. On the Eight De Luxe models the maximum distance between main bearings is $3\frac{1}{16}$ ". This, combined with the large diameters of the main and crankpin bearings, gives such torsional stiffness that the vibration

periods (common to all gas engines) are practically imperceptible in the speed range of the car.

The crankshaft design is strictly a Packard innovation; the crankpins for the cylinders 3, 4, 5 and 6 lie in one plane at right angles to the common plane of the crankpins for cylinders 1, 2, 7 and 8. This arrangement, together with the system of counterbalancing which relieves certain bearing loads, and a specially designed vibration damper fitted to the front end of the shaft, makes for perfect balance and smooth motor operation. Oil ducts are drilled from the main bearings to each adjacent connecting rod bearing for the purpose of supplying oil to each connecting rod and piston pin bearing.

The crankshaft thrust is taken on the number 7 main bearing. A special oil guard is provided at the rear bearing to eliminate the leakage of oil.

Bearings

The crankshaft main bearings, nine in number, are of the steel shell, babbitt lined type. They are $2\frac{5}{8}$ " in diameter with lengths over all as follows:

Bearing No. 1— $2\frac{15}{32}$ "

Bearing No. 2— $\frac{61}{64}$ "

Bearing No. 3— $1\frac{29}{64}$ "

Bearing No. 4— $\frac{61}{64}$ "

Bearing No. 5— $1\frac{45}{64}$ "

Bearing No. 6— $\frac{61}{64}$ "

Bearing No. 7— $1\frac{9}{16}$ "

Bearing No. 8— $\frac{61}{64}$ "

Bearing No. 9— $2\frac{21}{64}$ "

The total main bearing length on the Eight De Luxe model motors is $13\frac{31}{64}$ ". The rigid

supporting of the crankshaft assists materially in making the Packard Eight De Luxe motor free from vibration.

Connecting Rod

The Packard Eight De Luxe connecting rod is designed to give maximum strength with minimum weight. It is manufactured from a special I-beam steel drop forging and the rods are selected so that each rod in any motor varies less than one-quarter of one ounce in weight from its mates.

Both the connecting rod and piston pin bearings are diamond bored to a perfectly true surface absolutely parallel with each other. The connecting rod lower end bearing is $2\frac{3}{8}$ " in diameter and $1\frac{1}{4}$ " long. The connecting rod is rifle bored lengthwise to provide a passage for oil which is forced up to the piston pin bearing under pressure. The crankshaft and connecting rod bearings on Packard cars have a reputation for extremely long life and efficiency and the Packard Eight bearings are designed to maintain this high standard, which has been acquired by years of careful design and manufacturing.

The connecting rods have been reinforced at the bottom end and the caps secured with through bolts which adds to the life of the rod bearings under the high motor speeds now developed.

Pistons

The pistons are of aluminum alloy with "Invar" struts to control expansion and are fitted with four rings, the lower being a refined design of the oil sealing type with which the maximum is to be ob-

tained in the way of compression and lubrication control.

Camshaft

The camshaft is a steel forging with sixteen integrally forged cams and eight bearings, all of which are hardened and accurately ground. A spiral gear is machined in the center of the shaft for the purpose of driving the oil pump below and the ignition distributor above. The camshaft is lubricated from the crankshaft rear main bearing, which meters the oil in proper quantities through a rifle bored passage extending the length of the camshaft.

Valves

The valves are made of special alloy steel which withstands high temperatures without distorting, consequently giving maximum service without regrinding.

They are made of round bar stock with the head upset on the stem which gives a radial grain to the metal and adds strength. In this construction the valve and valve head are all one-piece, which reduces the tendency to warp and depreciate in service or rupture of a weld between the head and stem. The intake valve is $1\frac{5}{8}$ " in diameter and the exhaust valve $1\frac{1}{2}$ ". The larger intake valve allows for the correct charge being drawn into the cylinder at high motor speeds.

Valve Gear

The valve gear consists of a camshaft operating at half engine speed driven from the front end of the crankshaft by a silent chain designed for that purpose.

Each cam on the shaft actuates a rocker arm or lever interposed between the cams

and the valve push rods. This rocker arm performs the dual function of removing side thrust, which causes excessive wear on valve push rods and provides opening and closing characteristics for the valves, assuring a well charged cylinder even under very high speed conditions.

The stamped steel rocker arms have been replaced by a new design drop-forged rocker arm which incorporates force feed lubrication to roller. This insures a more quiet operation of the valve mechanism. The new rocker arms have made possible an increase in valve spring tension which provides better valve operation at the higher speeds and greatly reduces the tendency of the valves to stick during cold weather.

All wearing surfaces of the valve gear are specially hardened, ground and accurately finished. Anti-friction rollers are fitted to the rocker arms to contact with the camshaft.

A novel design of valve spring assembly incorporating two separate springs, each operating at a very low stress, is used on all Packard Eight De Luxe motors.

Front End Drive

On all 4-cycle engines it is necessary to drive auxiliary units on shafts other than the crankshaft. On the Packard Eight De Luxe motors this is accomplished by means of a silent chain running over three sprockets. This chain is $1\frac{1}{2}$ " wide and but 32" long, which is as short as it could possibly be made.

This minimizes the tendency to stretch. The smaller sprocket, which drives the generator, also incorporates an adjust-

ment feature whereby the chain may be adjusted without disturbing any other parts.

This chain pitch line, approximately an equilateral triangle in shape, has been referred to by authorities as being about as near to the ideal chain layout as has yet been designed.

No attempt has been made to reduce the weight of the sprockets, because some fly-wheel action is desirable. There are holes tapped in the crankshaft sprocket for removal purposes and the splines in the inside of the generator sprocket engage with those on the generator shaft, permitting easy removal of the generator assembly without disturbing the generator drive.

While considering the drive of the various auxiliary units on the Packard Eight De Luxe motor, it is important to note that every unit is removable without disturbing another. The distributor at the top of the cylinder block is driven from the camshaft, the oil pump from a downward extension of the distributor drive, the water pump from the fan belts, the generator from the front end chain and, of course, the starter motor drives the flywheel.

To adjust the chain, it is necessary only to loosen the three nuts on the generator flange studs. The lower stud pivots the generator, making it merely necessary to move the top of the generator away from the motor until the chain has been adjusted properly.

Electrical System

The electrical system is of the single wire or grounded return type. The source of

current is the generator which charges the battery. The positive battery terminal is grounded.

A voltage regulator maintains the proper relation between charge and discharge of battery regardless of driving conditions.

The electric lighting system is protected by a 20 ampere, 25 volt fuse, located on the front of the dash to the right of the lubricator tank. The two poles in the fuse block are connected by a heavy resistance, which will allow enough current to pass to dimly light the lamps in case the fuse burns out. This convenient feature prevents the car from being left in total darkness in case of a short circuit burning out the fuse.

Incorporated in the brake operating mechanism is the switch for the stop light which makes contact when the brake pedal is depressed.

Two chromium-finished horns are fastened to the headlight cross bar under each headlamp.

The lighting system includes two main headlights of the double filament type, two fender lights, two tail lights combined with stop light, two instrument board lights, one for reading, dome and quarter lights in enclosed cars, tonneau lights in Touring cars, Sport Phaetons and Convertible Sedans and rear compartment lights in Coupe, Runabouts and two-four passenger Coupes.

The lighting switch is located on the lower end of the steering gear and is operated by a lever at the steering wheel.

The main driving lights have been altered to improve appearance and are provided with a special reflector and lenses that

employ a depressible beam design. The reflector has two focal points so situated that each filament of the two filament bulb used reflects from a different focal point. The headlamp bulbs have been changed from 20 to 22 candlepower to provide better illumination.

The headlights are mounted on a pressed steel, chromium-plated cross channel fastened to the front fender brackets. The headlight lenses are non-glare. The single tail lamp has been replaced by two single lens lamps mounted on chromium-plated brackets that are attached to the right and left ends of the rear splasher with all bolts and wires concealed. Both lamps carry stop light bulbs, but the back-up light has been omitted. The license bracket is carried above the left hand lamp.

Ignition System

The Packard North East ignition unit is mounted on the motor cylinder head between number four and number five cylinders and is driven from the camshaft by spiral gears. The ignition unit is of the automatic spark control type and provides the proper spark adjustment for all driving conditions. The coil is attached to the front face of instrument board, with the switch and lock projecting through the board. This has been done to make the car more theft-proof.

Wiring

The high tension wiring is carried in a steel rectangular housing along the top of the cylinder block. Each high tension wire has its own separate compartment. The low tension wires are well insulated and gathered together into one unit or wiring harness.

Battery

A new battery has been specified which carries a larger quantity of electrolyte over the plates than the standard battery and thus requires attention only about one-fourth as often as the ordinary battery. It is located in a battery case in the right front fender outside the frame. It is common to the ignition, starting and lighting system and is composed of three cells. The voltage is 6 volts and capacity 160 ampere hours. The battery is readily accessible by removing the cover plate.

A new cover plate has been designed which is equipped with a lock operated by the ignition key.

Generator

The generator is supported in the right front corner of the crankcase with an adjustable mounting to provide for chain stretch. The protecting fuse is located in the cutout relay on top of the instrument.

The generator is designed so as to provide current to the battery at the very low car speeds now encountered in city traffic.

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 flywheel housing by means of a long pilot and one dowel screw, so that the starting motor can easily be removed for inspection or the checking of the motor timing. The starting motor is engaged with the flywheel by means of a standard Bendix drive and is enclosed and protected from dirt.

Starting Switch

The starting switch is located at the right of the accelerator pedal on the inclined toe board.

Ammeter

The ammeter is mounted on the instrument board and indirectly lighted for night driving.

Cooling System

The radiator shell and shutters have been extended forward in a V-shaped projection. The radiator cap has been made larger and lower with bayonet type lock, eliminating the wire bail lock.

The radiator core is of the cellular type and its operation is independent of the outer steel shell. The core is mounted on rubber and is secured to the dash with a V-shaped brace. The core is also attached to the headlamp crossbar by two brackets which helps reduce front-end movement.

The air flow through the radiator is regulated by a thermostatically controlled shutter mechanism built into the assembly.

When cold, the flow will be entirely stopped, which allows the engine to heat more quickly. During driving, the air flow is regulated to preserve the most efficient operating temperature.

Water Pump

The feature of the water pump assembly is its simplicity. Mounted on the front of the cylinder block, it forces the water by centrifugal force through the cylinder water jackets, cylinder head jackets and thence to the radiator.

This water pump construction permits the use of only one packing, which is very accessible, and only two hose connections, thus reducing the probability of leaks to a minimum. The water pump also incorporates the fan drive and the provision for adjusting the fan belts.

The water pump shaft is mounted on two ball bearings which are lubricated by an oil reservoir that is replenished through a conveniently located oil cup.

The Packard Eight cooling system is a model of simplicity and features extreme accessibility of the really very small number of parts used.

The capacity of the cooling system is $6\frac{1}{4}$ gallons.

Fan

The fan is of the built-up construction consisting of sheet aluminum blades riveted to a pressed steel hub. This construction is sturdy, light in weight and provides a maximum draft of air together with ample clearance.

The fan is driven by two belts running in V-shaped grooved pulleys from the end of the crankshaft and turns at motor speed.

By driving the fan off the crankshaft we are able to use a large diameter driven pulley, which is an important factor in eliminating fan belt slippage.

Lubrication System

The lubricating system is of the circulating pressure feed type.

A gear pump submerged in the oil supply in the bottom of the crankcase circulates the oil under pressure through a manifold to the nine main crankshaft bearings through holes drilled in the bearing caps, thence through the crankshaft to the connecting rods and piston pins by means of a rifle bored hole lengthwise of the connecting rod.

Adequate lubrication of the pistons and cylinders without excessive oil consumption has been obtained by drilling the crankshaft so that a column of oil under high pressure is injected into each cylinder with each revolution of the crankshaft. The oil on the cylinder walls is properly controlled by the new type oil ring. This change provides the lubrication that is necessary to keep cylinder wear to a minimum and eliminates the necessity of the cylinder lubricating valve formerly employed when starting.

An oil filter attached to the left side of the cylinder block removes from the oil carbon and dirt that are too small to be caught by the oil pump strainer, thus preventing wear due to abrasive material passing through the bearings.

A crankcase oil gauge has been added to this model. The gauge has a dial indicator actuated by a float at the oil level and is calibrated in ten equal divisions. The oil is drained by means of a plug in the bottom of the crankcase below the gauge.

The camshaft and valve gear are lubricated by a lead from the crankshaft rear main bearing which meters the oil in proper quantities through a rifle bored passage extending the length of the camshaft.

The oil thrown off from the various bearings returns by gravity to the reservoir for recirculation.

A regulator valve is provided as part of the oil pump assembly, limiting the maximum pressure to approximately 50 pounds and so proportioned as to maintain a minimum pressure of 30 pounds under normal engine speeds.

The crankcase oil vapors are drawn through small holes in the side of the cylinder bores into the valve compartment. From this chamber they pass across through the center of the block and down a vent tube which projects below the level of the motor pan. When the car is in motion the air, passing the nozzle of this tube, creates a suction which keeps the motor thoroughly ventilated.

Exhaust System

Special attention has been given the design of the exhaust system to approach as nearly as possible silent discharge of gases into the atmosphere. Complete dampening of resonance of metal parts and proper provision for the expansion of gases, both in muffler and at the exit to the atmosphere, require proper treatment to accomplish this purpose.

The newly developed type of muffler is securely fastened to the frame by means of heavy brackets and acts as the support for the exhaust pipe, which is fastened in the muffler by means of a split clamping device. The muffler consists of an inner and an outer steel shell. The space between is packed with a porous material. The inner tube, through which the gases pass, is perforated. As the waves of ex-

safety and freedom from annoying body squeaks and rattles. These, in addition to the regulation cross members, form a very strong and rigid construction.

Body Mounting

All bodies are now mounted on heavy inter-woven fabric shims which are impregnated with graphite. This new shim makes it possible to obtain a secure body mounting to chassis which will be free from annoying squeaks.

Springs

The front springs are semi-elliptical, 42" long and $2\frac{1}{4}$ " wide, and are mounted on the under side of the front axle and shackled at the front end by a compression shackle. The rear springs are semi-elliptical, $60\frac{1}{2}$ " long and $2\frac{1}{2}$ " wide. They are mounted on compression shackles at the rear end. The front and rear springs are mounted parallel to the center line of the car, which forms a strong and safe construction. All springs are fitted with metallic covers which effectively prevent loss of lubricant or entrance of road dust between the spring leaves.

An automatic adjustment of the spring shackles is a feature that eliminates the necessity of frequent adjustments at this point to prevent rattles.

The shock absorbers are the same type as those used on the eight series cars, but are now arranged so that they can be instantly adjusted to suit different road and temperature conditions through a control located in the front compartment to the left of the steering column. This is an entirely new feature introduced by

Packard that contributes more to real riding comfort and good car control than any accomplishment of recent years.

Three distinct adjustments are provided: soft ride for smooth city pavements; intermediate for poorer pavement; firm ride for high speeds in the open country. The shock absorber connecting links are now of the oilless type that are quiet in operation and require absolutely no attention.

Weight Distribution on Springs

Each spring of a vehicle loaded to normal capacity will carry the load indicated as follows:

Standard Springs

Front Springs

All Bodies.....	{ Left 950 Lbs. Right 1050 Lbs.
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Rear Springs

Touring (7).....	1200 Lbs.
Phaeton (4).....	1100 Lbs.
Coupe Roadster (2-4).....	1200 Lbs.
Sedan (7).....	1400 Lbs.
Limousine (7).....	1400 Lbs.
Club Sedan (5).....	1300 Lbs.
Coupe (5).....	1200 Lbs.
Coupe (2-4).....	1200 Lbs.
Sport Phaeton (4).....	1100 Lbs.
Sedan (5).....	1300 Lbs.
Phaeton (4).....	1100 Lbs.
Convertible Victoria (5).....	1200 Lbs.
Convertible Sedan (5).....	1200 Lbs.

Front and rear springs with a higher or lower rate of action can be supplied on special order to meet unusual conditions.

Front Axle and Steering

The front tread has been increased from $56\frac{1}{16}$ to $57\frac{1}{2}$ inches.

The front axle performs two essential functions—acting as a carrying member and providing, in conjunction with the steering gear, means for guiding the car at the will of the driver. As safety is a preeminent requisite, the front axle as a support must be amply strong and as a control mechanism must function to the greatest convenience of the driver, that is, there must be easy, dependable steering.

Strength is obtained by properly proportioning the members and selecting the most suitable materials.

To obtain easy steering, the steering knuckle pin is mounted top and bottom on ball bearings. The upper bearing has a single row of balls and takes only radial loads. The lower bearing is specially designed to take, in addition to the radial loads, the downward thrust or load due to the weight on the front axle.

Friction is further reduced by employing ball and socket joints for the front axle cross tube. These joints are self-adjusting without employing the high spring pressures commonly used.

The steering spindles are chrome molybdenum steel forgings heat treated to give a tensile strength of 120,000 pounds per square inch.

Unlike conventional designs, the front springs are underslung or clamped to the under surface of the axle I-beam. This construction permits the axle and the main plate of the spring, through which all of the thrust is transmitted, to be as-

sembled in direct contact with each other. With the reverse construction any shifting of spring plates with relation to each other, due to loose spring clips or faulty assembly, causes the front axle to be shifted from its correct position with the resultant tire wear and misalignment of wheels. Again, with the underslung construction, the bending stresses in the front springs, due to braking torque, are greatly reduced.

The steering gear is of the worm and sector type, having three adjustments for accurately assembling the parts with correct relation to each other and to compensate for wear.

Just the right amount of reversibility is provided in the steering gear to obtain the smooth, self-restoring tendency from the front wheels in regaining their straight ahead driving position after making turns.

The steering gear worm and sector are made of nickel steel and hardened. The steering worm and shaft are mounted on tapered roller bearings; the end thrust of the sector shaft is taken on ball thrust bearings. The worm and sector are lapped together to obtain smooth, easy operation.

Road shocks commonly transmitted through the steering mechanism are avoided in the Packard design of mounting the rear end of the left front spring. Instead of being solidly anchored to the frame bracket, the left front spring is attached at the rear end to a shock absorbing device which effectually eliminates wheel shimmy, steering rattles, wheel tramp and other difficulties that are inherent with low pressure tires and front wheel brakes.

The steering wheel is 18½ inches in diameter and made of hard walnut colored rubber over a steel spider. The section through rim is 7/8" in diameter. Harmonizing with the appearance of the wheel is an artistic, compact design for the light and throttle control. Only the chromium-plated handles of the controls are visible above the wheel center plate.

Clutch

A double plate form of clutch driving through a series of compression springs is employed. The friction discs are specially treated moulded asbestos, contacting with the driving face of the fly-wheel and the iron clutch driving plate. The outstanding features of this design are: smooth engagement, the dampening out of motor vibration or harshness due to the cushion spring drive, free release when hot or cold and long life through the reduction of wear to a negligible amount.

The clutch assembly is mounted in a separate compartment at the front of the clutch and transmission case. This construction thoroughly protects the clutch from dirt, oil and water. The clutch shaft is mounted on a ball bearing in the motor crankshaft and on a ball bearing in the transmission case. The direct drive and constant mesh gear is forged integrally with it.

The clutch throw out has been changed to a walking beam type and is automatically lubricated by the chassis system. A single spherical bearing is used which greatly reduces the pedal pressure necessary to release the clutch.

Transmission

The transmission is of the selective sliding gear type, four speeds forward and reverse, with positive inter-locking control. The whole transmission has been lengthened and equipped with gear synchronizers on the third and fourth speeds. Both the main shaft and the counter shaft are short and stiff and mounted on anti-friction bearings. The case has been changed from cast iron to aluminum to reduce weight and is designed to minimize resonance. All gears used in changing speeds are carefully chamfered to insure easy meshing when shifting. All gears are very carefully heat-treated and ground to insure maximum strength and wearing qualities of the teeth. Gears with stripped teeth are practically unheard of in Packard cars. This is true because of the alloy steel and the careful manufacturing processes used in their production. The change speed lever housing is located well forward in the driving compartment and the ball at the upper end is convenient to reach without leaning forward.

		Packard
		Eight
Transmission Gear Ratios		De Luxe
First.....	14.7 to 1	
Second.....	8.63 to 1	
Third.....	6.48 to 1	
Fourth.....	4.69 to 1	
Reverse.....	11.9 to 1	

Speedometer

The speedometer drive is placed at the rear of the transmission and driven by a spiral gear from the transmission shaft. This gives a very quiet drive and is perfectly lubricated at all times.

The speedometer is mounted at the left end of the instrument board.

Universal Joints

Universal joints are of the lubricated all-metal type, all bearing surfaces being effectively enclosed, requiring lubrication only at intervals of every 2500 miles. The propeller shaft is of the tubular type, held within close limits for balance, assuring smooth operation.

Two universal joint shafts are specified, one of which is carried in a self-aligning ball bearing supported by a rubber mounting in the X-shaped cross member of the frame.

Rear Axle and Differential

The hypoid gear design has produced silence of running as far superior to the spiral bevel gear as this form of gearing was superior to the old form of straight bevel gearing first used in automobiles. This form of gearing is used on all Eight De Luxe models. The standard ratio is 4.69 to 1; special ratio of 4.06, 4.41 and 5.07 to 1 is furnished as special equipment. The rear axle is essentially the same as that in the Eighth series except that the tread has been increased from $57\frac{3}{4}$ to 59 inches.

The rear axle is of the semi-floating type. The housing is made of pressed steel. Driving forces and the torque of the rear axle are transmitted through the rear axle springs.

The pinion shaft is straddle mounted on ball bearings specially designed for taking the loads imposed.

The rear axle shafts are mounted on single row, deep groove ball bearings, locked in place, which definitely locate them in the housing.

Wheels

The steel disc wheels, designed for low pressure tires, harmonize with the long wheelbase and general smartness of the body lines. All wheels are interchangeable. Tire inflation is facilitated by accessible valves on the outside of the wheels.

Wood and wire wheels are furnished as optional special equipment and are interchangeable on the hubs and carriers.

Wire wheels are standard equipment with the following body types:

Type 511—Phaeton

Type 531—Sport Phaeton

Type 519—Coupe Roadster

Type 537—Convertible Victoria

Type 533—Convertible Sedan

Brakes

The present Packard four-wheel brakes are the internal expanding, self-energizing type on both front and rear wheels. They are actuated by mechanism that requires from 15 to 30% less angular movement of the shoe to secure a given clearance than does a two-shoe brake. Further, more of the pedal movement is available for taking up wear.

The braking system has been improved by a change in the operating linkage and the use of a special moulded lining that not only increases braking efficiency but

minimizes squeaks and insures a long period of operation before adjustments are required.

It is practically impossible for any dirt or water to be thrown on the brake lining, due to the construction of the brake drum which overlaps the backing plate.

The design is such that the brake lining surface is concentric with the brake drum when the brake is applied. The resultant brake has 93% of the circumference of the drum in active contact. The reverse braking effort has been greatly aided by the insertion of the auxiliary shoe, which acts with a powerful effect when the brake drum moves in the reverse direction.

The brake cross shafts have been mounted in self-aligning spherical bearings which are lubricated automatically from the chassis system. This design eliminates the possibility of brake cross arms binding and preventing good brake retraction. In addition this permits assembly fits that insure the mechanism against rattles.

The brake pedal has been removed from the transmission case and is now mounted on a shaft attached to the frame. The levers on the cross shafts have been shortened to reduce twisting effect. The total result is a powerful, positive operation of the brakes.

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 needed. They are made of steel, to which is vulcanized a heavy rubber mat. This sur-

face is protected by replaceable rubber strips with chromium-plated metal tips. The running board mouldings are steel faced with chromium-plated brass, to which ribs have been added to prevent marring of the polished surface.

The running board splashers are tapered to match the frame and body lines. Anti-squeak liners are used between the frame splashers and running board. The radiator front splashers are very readily detachable. It is made to enclose the front spring, front bracket and also forms a very neat joint at the inner edge of the bonnet frame ledge.

The crankcase splashers are made readily removable and form a mud-tight joint between the crankcase and frame.

Tool Box

A tool box similar to the battery box has been incorporated in the left front fender. The tools have been redesigned to fit the box.

Bonnet

The bonnet has been lengthened 1½ inches. A new type bonnet fastener is specified which operates from a single chromium handle located in the center of each bonnet side panel.

A new design bonnet liner is used that does not require rivets for attaching, thus eliminating one possible source of squeaks.

A new bonnet hinge of improved appearance prevents the lacquered surfaces of the bonnet from contacting when the bonnet is opened.

Tires

19 x 7.00 straight side non-skid six-ply cord tires are specified for both front and rear wheels.

Spare Wheel and Carrier

A spare wheel carrier is supplied on all cars. It is bolted rigidly to the frame rear cross member and cross channel and is of the hub clamping type. No straps or shoes are required. A double rear wheel carrier can be furnished as special equipment for this model.

The spare wheel is clamped between the carrier and the cover and locked in place by means of a flush type lock.

Front fenders with wells are furnished as special equipment.

Bumpers

The front and rear bumpers are still of the double bar type, but the bars have been made wider and the space between the bars reduced to give a more massive and sturdy appearance. They are attached with wide chromium-plated clamps.

Stabilizer

The new Eight De Luxe cars are equipped with a new feature in the form of a stabilizer, which consists of an accurately determined weight neatly mounted in each end of the front bumper. This weight is carried in suspension between two accurately calibrated springs in order to provide a reciprocating mass having a predetermined frequency. The function of the stabilizer is to dampen out torsional

movements of the front end structure caused by contrary motions, and which on a very long wheelbase car may be reflected in a decided wobble of the radiator, lamps, front fenders and associated parts.

The stabilizer, in combination with the new extremely rigid frame, definitely eliminates that wobbly, rubbery feeling that is encountered in many cars at the higher road speeds and provides a sense of security and perfect car control that makes high speed driving in a long wheelbase car a pleasure.

Custom Equipment

This equipment may be specified and includes the following:

- Two wheels mounted in front fenders.
- Rear folding trunk rack.
- Full rear bumper.

The trunk rack has been re-designed with the top bar carrying out the typical radiator lines. Between the two top bars the Packard emblem is mounted. The metal rails on the back of the rack are now chromium plated.

A rack folding to either 8° or 30° may be specified, but the latter may be used only with the following:

- Phaeton and Sport Phaeton
- 2-4 Passenger Coupe
- Coupe Roadster
- 5 Passenger Sedan
- Convertible Sedan
- Club Sedan not equipped with deck trunk.

Standard Equipment

Chassis Equipment

Electric starter
Electric generator and storage battery
Electric headlights with two filament bulbs equipped with non-glare lenses
Two electric tail lamps and electric license tag illuminator combined with rear signal lights
Two electric horns
Fender lights
Tool roll with complete equipment of tools
One-ton jack
One extra wheel and carrier
Wheel carrier lock
Wheel changing wrench
Hydraulic shock absorbers
Bumpers—front and rear
Complete instrument board
Bonnet with complete locking mechanism
Front fenders with battery and tool boxes
Side splashers and running boards complete.

Instrument Board Equipment

Gasoline gauge
Plunger type ignition switch
Lighting switch on steering wheel
Cigar lighter
Clock
Speedometer, including miles per hour, trip and total odometers
Ammeter
Oil pressure gauge
Dash motor thermometer
Carburetor dash adjustment
Instruments lighted indirectly by two three-candlepower bulbs
Reading light
Package compartment at each end of board.

Specifications in Brief

Engine

Eight cylinders cast in one block.
Removable cylinder head.
Nine bearing crankshaft.
Piston displacement 384.8 cubic inches.
Four-point suspension in rubber.

Cylinders

"L" head type, bore 3½ inches, stroke 5 inches.

Horsepower

39.2 S. A. E. rating—block test actually develops over 135 H. P.

Ignition

Generator, battery and Packard North East distributor.

Gasoline System

Mechanical fuel pump. The main tank in the rear has a capacity of 25 gallons.
A gasoline gauge is mounted on instrument board.

Frame

Pressed steel, 8 inches deep.
A rigid torsion tube and built-up box section at front with channel section at rear and large X-shaped center cross member gives entire chassis great firmness and strength.

Springs

All models—front, semi-elliptic, 42 inches long and 2¼ inches wide.
Rear, semi-elliptic, 60½ inches long and 2½ inches wide.
Metal spring covers are standard equipment.

Lubrication

All motor bearings supplied with oil under 30 pounds pressure for normal running. Pressure increases with motor speed. All chassis bearings lubricated by pressure feed oiling system from oil supply reservoir located on dash.

Clutch

Special design double plate disc clutch.

Transmission

Four speeds forward, one reverse—selective type with synchronized third and fourth speed gears.

Brakes

Service brakes are internal expanding on all four wheels. The parking brake operates separately from the service brake on the rear wheels only.

Starting System

Individual starting motor with automatic engagement to flywheel; which has alloy steel heat-treated teeth.

Lighting System

Headlights with auxiliary driving lights and fender lights.

Instrument board lights.

Combination tail and stop lights.

Current supplied to battery by six-volt generator.

Lighting switch control lever is located at top of steering gear.

Cooling System

Capacity $6\frac{1}{4}$ gallons, with automatic thermostat control of both air flow and water temperature.

Aluminum six-bladed fan.

V-shaped fan belts with great driving power.

Turning Radius

142 $\frac{1}{8}$ -inch wheelbase—26'.

147 $\frac{1}{8}$ -inch wheelbase—26' 9".

License Data

Number of cylinders.....8

Cylinder bore.....3 $\frac{1}{2}$ "

Horsepower (N. A. C. C.
rating).....39.2

Piston displacement.....384.8

Stroke.....5 inches

Shipping Weights

Packard Eight De Luxe Lbs.

Phaeton—Type 511—4 Pass.....	4715
Sport Phaeton—Type 531—4 Pass.	4795
Touring—Type 510—7 Pass.....	4760
Coupe Road.—Type 519—2-4 Pass.	4825
Conv. Sedan—Type 533—5 Pass...	4983
Conv. Victoria—Type 537—5 Pass.	4727
Coupe—Type 518—2-4 Pass.....	4825
Coupe—Type 517—5 Pass.....	4985
Club Sedan—Type 516—5 Pass....	5000
Sedan—Type 513—5 Pass.....	5045
Sedan—Type 514—7 Pass.....	5195
Sedan-Limousine—Type 515—7 Pass.	5240
Chassis—Type 903 (142 $\frac{1}{8}$ " W. B.)..	3850
Chassis—Type 904 (147 $\frac{1}{8}$ " W. B.)..	3875

If weight of a car ready for the road is desired, approximately 240 lbs. should be added.

Vehicle number is on Packard patent plate located on motor side of dash.

Motor number is on left front motor supporting arm.

DIMENSIONS AND CAPACITY OF PACKARD EIGHT DE LUXE CARS (All measurements are in inches)

Type Number	Body Models	Length Overall Bumper to Bumper	Width Overall at Front Fenders	Height Overall Unloaded
500	Touring (7).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	70
511	Phaeton (4).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	68 $\frac{11}{16}$
531	Sport Phaeton (4).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	68 $\frac{11}{16}$
519	Coupe Roadster (2-4).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	65 $\frac{7}{8}$
537	Convertible Victoria (5).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	66 $\frac{3}{8}$
533	Convertible Sedan (5).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	68 $\frac{1}{2}$
518	Coupe (2-4).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	69 $\frac{7}{8}$
517	Coupe (5).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	70 $\frac{5}{8}$
516	Club Sedan (5).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	70 $\frac{7}{8}$
513	Sedan (5).....	211 $\frac{3}{8}$	71 $\frac{7}{8}$	70 $\frac{7}{8}$
514	Sedan (7).....	216 $\frac{3}{8}$	71 $\frac{7}{8}$	70 $\frac{7}{8}$
515	Sedan-Limousine (7).....	216 $\frac{3}{8}$	71 $\frac{7}{8}$	70 $\frac{7}{8}$

DIMENSIONS OF PACKARD EIGHT DE LUXE ENCLOSED BODIES

(All measurements are in inches)

	513 Sedan (5 Pass.)	518 Coupe (2-4 Pass.)	517 Coupe (5 Pass.)	516 Club Sedan (5 Pass.)	514 Sedan (7 Pass.)	515 Sed.-Lim. (7 Pass.)
Length over all (at belt) except Coupes.....	112 ⁷ / ₈	114 ⁵ / ₈	113 ⁷ / ₈	104 ³ / ₄	124 ⁷ / ₈	124 ⁷ / ₈
Length—dash to front of front seat.....	24 ³ / ₈	24 ³ / ₈	23 ⁷ / ₈	24 ³ / ₈	23 ⁷ / ₈	23 ³ / ₈
Length—back of front seat to front of rear seat.....	22 ¹ / ₈			15		
Distance from partition to front of folding seat.....						
*Distance from front of rear seat to folding seat.....			6			6 ⁵ / ₈
Width over all (at belt) panel to panel.....	62	60	60 ³ / ₄	62	7 ³ / ₄	7 ³ / ₄
Width of floor in tonneau.....	47	46	45 ³ / ₄	47	47	62
Height inside.....	48 ¹ / ₈	47	49 ³ / ₄	48 ⁵ / ₈	48 ⁵ / ₈	47
Front door width.....	31 ⁷ / ₈	31 ⁷ / ₈	31 ⁷ / ₈	31 ⁷ / ₈	34 ³ / ₈	34 ³ / ₈
Rear door width.....	31 ⁷ / ₈			31 ⁷ / ₈	34 ³ / ₈	34 ³ / ₈
SEATS:						
Front:						
Depth.....	17 ³ / ₈	17 ³ / ₈	17 ³ / ₈	17 ³ / ₈	17 ³ / ₈	17 ³ / ₈
Width.....	44 ¹ / ₂	44 ¹ / ₂	19 ¹ / ₄	44 ¹ / ₂	44 ¹ / ₂	44 ¹ / ₂
Height (floor to top of cushion).....	13 ¹ / ₈	13 ¹ / ₈	13	13 ¹ / ₈	13 ¹ / ₈	13
Height of seat back.....	20 ³ / ₄	20 ³ / ₄	20 ³ / ₄	20 ⁷ / ₈	20 ³ / ₄	21 ⁵ / ₈

*Measured 20" from floor.

DIMENSIONS OF PACKARD EIGHT DE LUXE ENCLOSED BODIES

(All measurements are in inches)

	513 Sedan (5 Pass.)	518 Coupe (2-4 Pass.)	517 Coupe (5 Pass.)	516 Club Sedan (5 Pass.)	514 Sedan (7 Pass.)	515 Sed.-Lim. (7 Pass.)
Rear:						
Depth.....	20		19	19	20	20
Width.....	49		50	49	47	47
Height (floor to top of cushion).....	13 ³ / ₄		14 ¹ / ₄	13 ¹ / ₂	13 ³ / ₄	13 ³ / ₄
Height of seat back.....	21 ³ / ₈		21 ³ / ₄	22	21 ³ / ₈	21 ³ / ₈
Folding:						
Depth.....		16 ¹ / ₂			16 ¹ / ₂	16 ¹ / ₂
Width.....		41 ¹ / ₄			18 ¹ / ₈	18 ¹ / ₈
Height (floor to top of cushion).....		11			15 ¹ / ₂	15 ¹ / ₂
Height of seat back.....		20 ¹ / ₂			14 ¹ / ₂	14 ¹ / ₂
†Head Room: Distance from top of seat cushion to headlining of top—front.....	35 ³ / ₄	35 ³ / ₄	35 ¹ / ₂	35 ³ / ₄	35 ³ / ₄	35 ⁵ / ₈
to headlining of top—rear.....	36 ¹ / ₄		36 ¹ / ₈	37 ³ / ₈	36	36

†Measured from point 5" ahead of seat back cushion.

DIMENSIONS OF PACKARD EIGHT DE LUXE OPEN AND CONVERTIBLE BODIES

(All measurements are in inches)

	510 Touring (7 Pass.)	511 Phaeton (4 Pass.)	531 Sport Phaeton (4 Pass.)	519 Coupe Roadster (2-4 Pass.)	537 Conv. Victoria (5 Pass.)	533 Conv. Sedan (5 Pass.)
Length over all (at belt) except Coupes.....	118½	113⅝	113⅝	114⅝	98⅝	112⅞
Length—dash to front seat.....	23⅞	24⅜	24⅜	24⅜	24⅝	24⅜
Length—back of front seat to front of rear seat..	27⅞	19¾	19¾		6⅝	21
Distance from front of rear seat to folding seat..						
Width over all (at belt) panel to panel.....	59⅞	59	59	60	59¾	62
Width of floor in tonneau.....	47	48	48	46	45¾	47
Front door width.....	28¼	28¼	28¼	33½	40½	35⅞
Rear door width.....	27⅞	27⅞	27⅞			30¼
SEATS:						
Front:						
Depth.....	17½	17½	18½	18¾	18½	18¾
Width.....	44	44	44	44½	20	44½
Height (floor to top of cushion).....	12½	12½	12½	11⅞	11	11⅞
Height of seat back.....	19	19	19	22½	21¾	22⅞

DIMENSIONS OF PACKARD EIGHT DE LUXE OPEN AND CONVERTIBLE BODIES

(All measurements are in inches)

	510 Touring (7 Pass.)	511 Phaeton (4 Pass.)	531 Sport Phaeton (4 Pass.)	519 Coupe Roadster (2-4 Pass.)	537 Conv. Victoria (5 Pass.)	533 Conv. Sedan (5 Pass.)
Rear:						
Depth.....	20⅝	19	19		18¾	20
Width.....	46	48¼	48¼		49	45
Height (floor to top of cushion).....	13½	12¼	12¼		12	13
Height of seat back.....	18¾	21¾	21¾		22½	22¾
Folding:						
Depth.....	16⅞			16½		
Width.....	18⅞			41¼		
*Height (floor to top of cushion).....	15½			11		
Height of seat back.....	14½			20½		
†Head Room: Distance from top of seat cushion to headlining of top—front.....	36¾	33⅞	33⅞	35	35⅝	34¾
to headlining of top—rear.....	37⅞	36¾	36¾		36	36½

*Measured from bottom of floor pan.

†Measured from point 5" ahead of seat back cushion.

