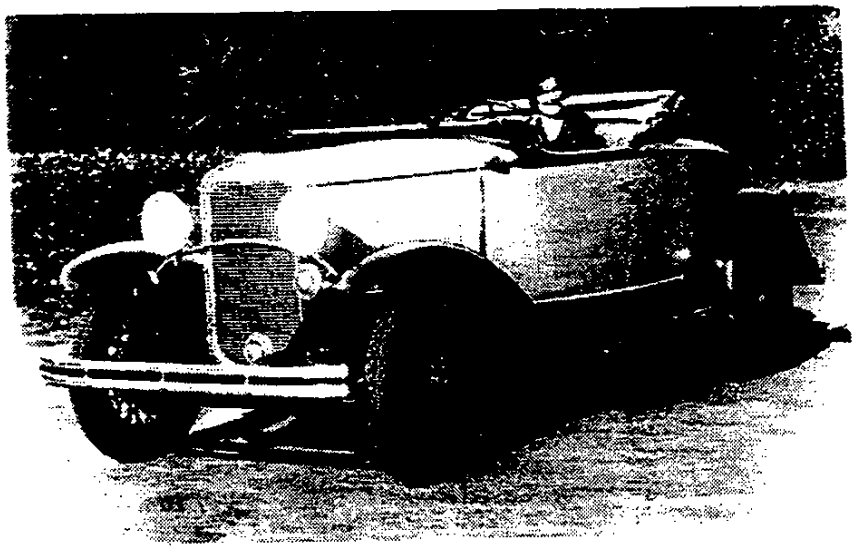
CHEVROLET



1931 Chevrolet, Independence, roadster. OCW

1931

1931 Car

Introduction

This book of Chevrolet engineering features is compiled for the purpose of providing authorized persons in the Chevrolet organization with advance information concerning the 1931 models. This information is strictly confidential and is not intended for publication. Only such features as are new for 1931, or were added to the 1930 model late in the season, are described in detail.

The following data was collected somewhat in advance of production, and is up-to-date as of September 15, 1930. No revisions will be made in this book to cover subsequent changes. Complete specifications will be available later in different form.

ENGI... DATA GROUP

This Book No. 175 is issued to

Mr. _____

and is intended for his use only.

TEC...

ENGI...

Chevrolet Motor Company
Engineering Department
September
Fifteenth
1 9 3 0

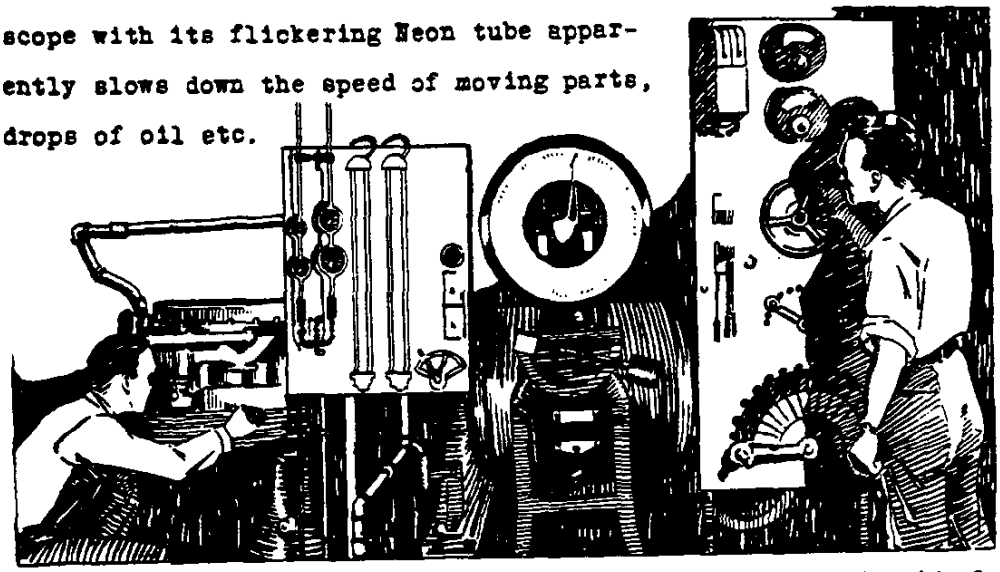
Chevrolet Engineering

The 1931 model, with its increased strength, greater beauty, increased comfort and remarkable performance, embodies the results of the same careful engineering which helped to make its many predecessors successful. Long before the 1930 model had been announced, engineering work on the 1931 model was commenced. With such a background of engineering and testing, a thoroughly proven product is assured.

The twenty Chevrolet Engineers divide among them the various units of the car and truck. Often two or more are engaged in independent studies of the same unit. When the engineer has assured himself that his design represents the best result per dollar, it is released to the Chevrolet Experimental Laboratories.

These laboratories are housed in a separate building having 44,400 square feet of floor space. The experimental laboratory is equipped with the most modern precision machinery which is operated by 107 expert mechanics. Among these mechanics we may find expert tool makers, model builders, wood workers, trimmers, sheet metal workers and blacksmiths who are able to simulate by hand what will finally be produced in vast quantities by mammoth machines. Here facilities are also provided for extensive laboratory tests.

Dynamometers determine the power, torque, fuel consumption and other performance characteristics of the various units. Stroking machines often continue their steady hammer, hammer, hammer at regular intervals through a given stroke hour after hour, subjecting frames, axles and wheels to gruelling tests to find their weak points or to prove their strength. Clutches are subjected to thousands of engagements by a special machine while all of the wear and noise characteristics may be studied in detail. The stroboscope with its flickering Neon tube apparently slows down the speed of moving parts, drops of oil etc.



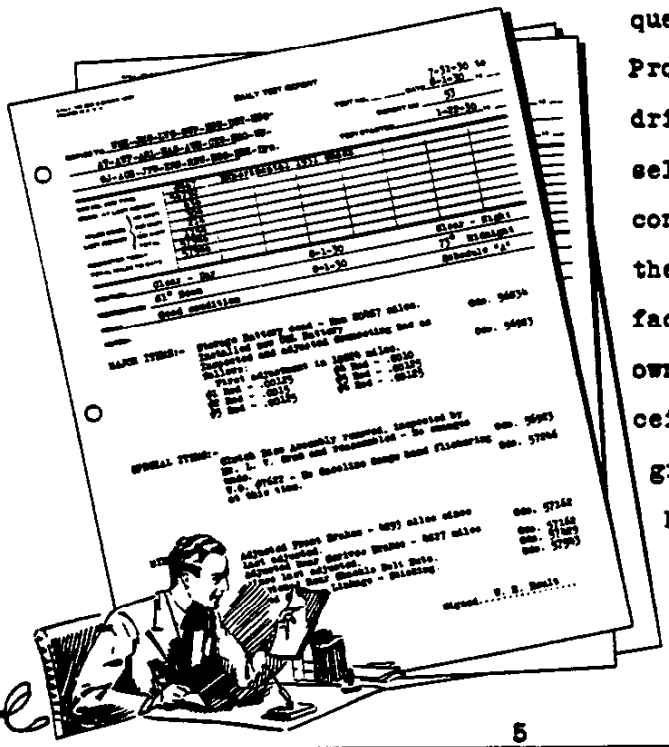
to permit the engineer to study their relative action under ideal conditions.

Thousands of interesting tests are conducted here while the engineers may study the performance of their designs and experiment with them until they function satisfactorily. When the laboratory tests have been completed, the device is installed on cars which are sent to the General Motors Proving Ground.

This wonderful outdoor laboratory, comprising 1,125 acres of hills and valleys, has every conceivable kind of road over which Chevrolet cars are tested day and night in winter and

summer under the most gruelling conditions. Here Chevrolet engineers may again study the performance of their designs under road conditions. The Chevrolet test crew not only drives experimental and production cars and trucks over a million miles a year but also issues reports of their performance, repairs and adjustments in the most minute detail. Every drop of oil applied and

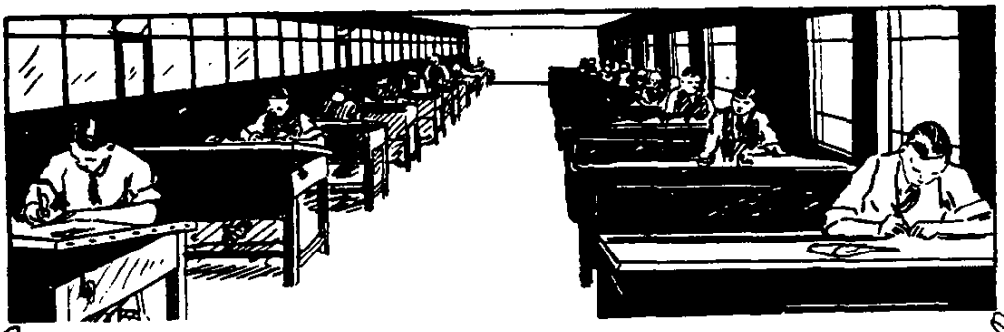
every individual bolt tightened is reported to all engineers daily. The engineers study these reports in detail and make frequent inspections at the Proving Ground. They often drive the test cars themselves to check up on the conditions reported. With these well organized test facilities, the Chevrolet owner is assured of receiving a thoroughly engineered product which has already been subjected to every condition it will be called upon to meet.



At this stage of the development, the manufacturing departments are called into consultation. The men who will finally be charged with the responsibility for producing the vehicle in

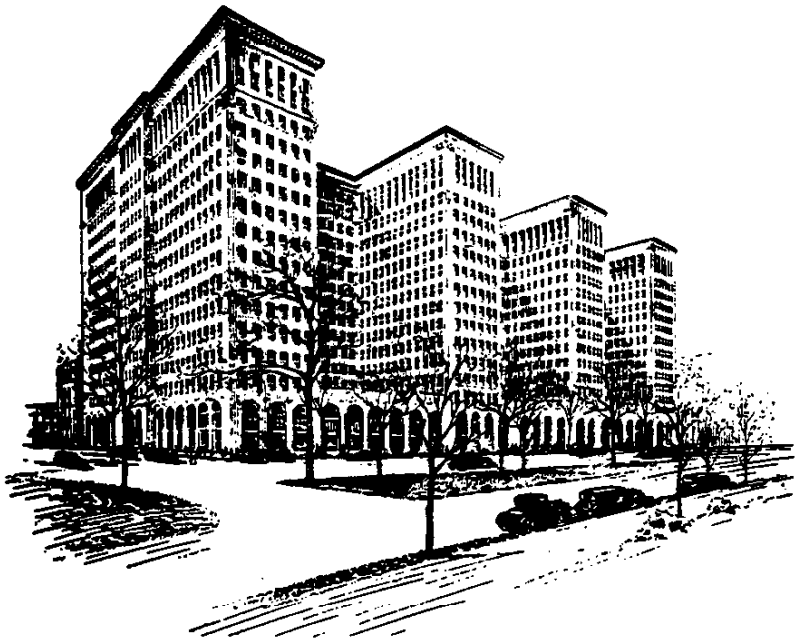
quantities discuss the production possibilities with the engineers. The resulting decisions are incorporated in the final production drawings by a force of 98 draftsmen.

These drawings include definite specifications covering every minute detail: tiny chamfers, fillets, production limits, material specifications, heat treatment and assembly instructions. These drawings serve to guide the pattern makers, die makers, tool makers, mechanics, inspectors, assemblers and all others who have anything to do with the manufacture of Chevrolet products.



With the release of the production drawings, the engineers' responsibility does not end. Often they journey into the field and study the performance in various parts of the country, or help the dealer organization to make proper adjustments to suit the peculiar local conditions. The engineers collect much useful data on these trips among the dealers which they incorporate in subsequent experimental designs.

The existing co-operation between the engineering organization, the manufacturing organization and the field organization can have but one result: to produce a line of cars and trucks which satisfies the needs of Chevrolet customers and can be produced at the lowest possible cost.



New Features in the 1931 Models

FRAME

1. Longer wheelbase.
2. More rigid frame.
3. Heavier side rails.
4. Stronger front cross member - Four rivets to lower flange.
5. Stiffer rear engine support.
6. More rigid one-piece rear cross member.
7. Body brackets added.
8. Step hanger tie bar and fender well brace added.

EXHAUST SYSTEM

9. Improved welding of muffler.
10. Two-point, resilient mounting of muffler and pipes.

SPRING SHACKLES

11. Larger diameter shackle bolts and cold pressed side bars.
12. Secure shackle bolt nut lock.

FRONT AXLE

13. Stronger I beam.
14. Improved King pin lock.
15. Stronger steering arms.
16. Improved brake centralizer lock.

REAR AXLE

17. Improved rear spring seats.

ENGINE

18. Smoother operation.
19. More rigid crankcase and cylinder block.
20. Rigid, cast clutch housing.
21. Stiffer crankshaft.
22. Broached type harmonic balancer.
23. Steel ring gear on flywheel.
24. More gasket clamping space between exhaust valves.
25. Cooler spark plugs.
26. Rubber boot on accelerating pump.
27. Stiffer rocker cover.
28. One-piece rocker cover gasket.
29. Increased piston ring pressure.
30. One-piece upset push rods.
31. Reduced forward water pump thrust.
32. Variable pitch valve springs.
33. Improved air cleaner combined with flame arrester.
34. Improved crankcase ventilator and oil filler.

CLUTCH

35. Ball bearing pilot.
36. Pivot mounted fork.
37. Improved pedal mounting.
38. Increased accessibility for inspection and lubrication.
39. Moulded facings. Pressure plate machined and polished under pressure. Flywheel face polished.

TRANSMISSION

40. Improved external mounting.
41. Second speed gears of nickel-molybdenum steel carburized.
42. Free gear shift.

STEERING MECHANISM

43. Worm and sector type steering gear.
44. Greater reduction ratio.
45. Roller bearing mounted worm.
46. Improved adjustment.
47. Rubber mast jacket bushing.
48. Three-spoke, rubber steering wheel.

WHEELS

49. Wire wheels standard equipment.

SHEET METAL

50. Improved front fender appearance.
51. Stronger front fender iron.
52. Forged, chrome-plated headlamp tie bar.
53. Improved radiator splash guard.
54. Stiffer hood with concealed side hinge.
55. Improved hood louvre appearance.
56. Chrome-plated hood catches and handles.
57. Wider, stiffer running boards with chrome-plated moulding.

58. Improved appearance of running board aprons.

59. Improved rear fender appearance.

60. Improved rear cross member cover.

61. Larger, chrome-plated gasoline tank cap.

ELECTRICAL SYSTEM

62. Improved wiring harness.

63. Chrome-plated parabolic headlamps.

64. Chrome-plated cowl lamps on sport models.

65. Improved chrome-plated tail and stop lamps.

66. High-frequency, vibrator horn with chrome face plate.

67. Black Bakelite control buttons.

68. Improved oil gauge.

69. Improved gasoline gauge.

70. Anti-rattle Electrolock.

71. Improved windshield wiper.

72. Insulated windshield wiper pipe.

RADIATOR

73. Increased cooling capacity.

74. Improved appearance.

75. Cam and spring type filler cap.

76. Chrome-plated radiator screen on sport models.

BODY

77. Longer and roomier.

78. Dropped sill.

79. Insulated dash and front floor mat.

80. Chrome-plated cowl moulding.
81. Fabrikoid door panels in open bodies.
82. Automatic windshield wiper on open models.
83. Weatherstripped doors on open bodies.
84. Oak top bows in natural finish on open bodies.
85. Top slat irons finished in body color on open bodies.
86. Pockets in both open body front doors.
87. Improved Roadster body design.
88. Improved top design on Roadster.
89. Sedan-type robe rail and foot rest in Phaeton.
90. Tonneau carpet in Phaeton.
91. Colored top fabric on open models.
92. Top boot standard equipment on Phaeton.
93. More comfortable rumble seat on Sport Roadster.
94. Improved body panel design on closed bodies.
95. Pressed mouldings throughout closed bodies.
96. Narrower front pillar for better vision.
97. Increased windshield vision.
98. Improved body lines.
99. Concave window reveals.
100. Beaded instrument panel.
101. Narrower upper hinges on closed body doors.
102. Improved body hardware.
103. Both front Coach seats bucket type.
104. Tool compartment under front seats of Coach.
105. Additional row of buttons on front of seat cushions.
106. Optional trimming material.

COMMERCIAL

107. Improved cab.
108. 157 inch, dual-wheel, heavy duty truck added to line.
109. Reinforced side rails on 131 inch trucks.
110. Stronger second cross member.
111. Stronger front axle.
112. Stronger rear axle shaft with larger bearings.
113. Four-shoe, internal rear brakes, 16 inches diameter.
114. Ten inch clutch.
115. Dual wheels on rear of 157 inch trucks.
116. Increased cooling capacity.

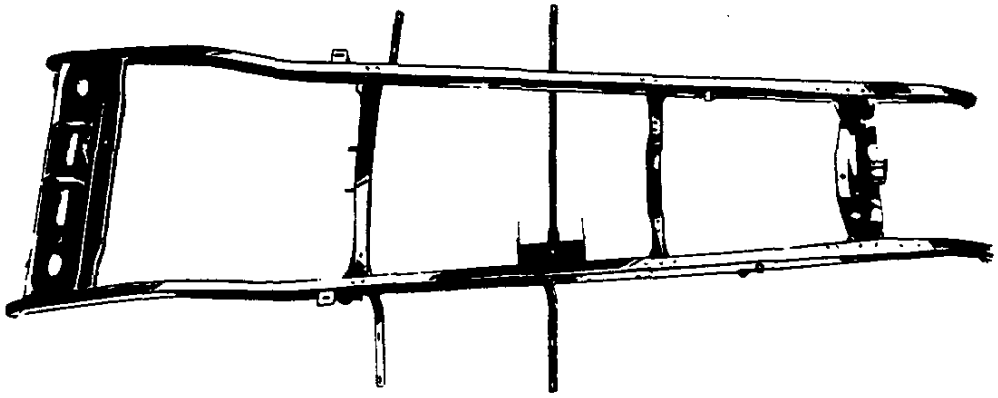
ACCESSORIES

117. Two-stage truck rear springs.
118. Improved fender well lock.
119. Improved bumpers and fender guards.
120. Improved ornamental radiator cap.
121. Seat covers.
122. Burbank material tire cover.
123. Dash clock.

Details of the 1931 Features

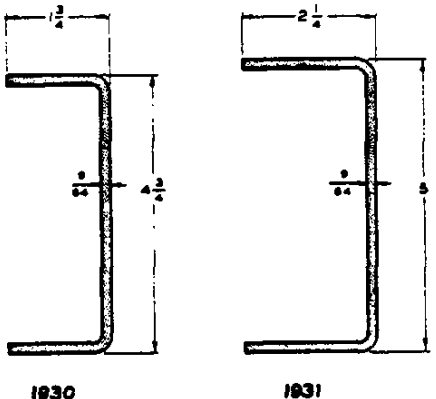
Frame

The frame assembly has been completely redesigned. The length is increased to provide a wheel base of 108 9/16 inches, over two inches longer than the 1930 model. The entire frame

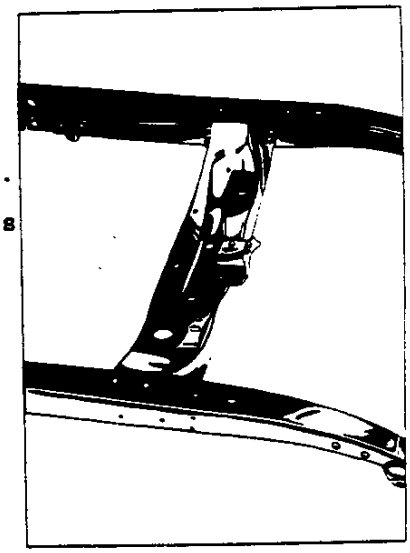


unit is 50 percent stronger torsionally. This increase in strength is accomplished by additional metal distributed at advantageous points to produce the maximum result.

The side rails of the frame have been increased in section as shown in the accompanying illustration. The upper and lower flanges are even wider at the front and rear cross members, providing extremely rigid attachment of those members. The holes in the side rails are very carefully located to avoid localization of stresses. In the design of the side rails, as in all other frame members, the material is used to its greatest advantage, due consideration being given to manufacturing methods and economy.



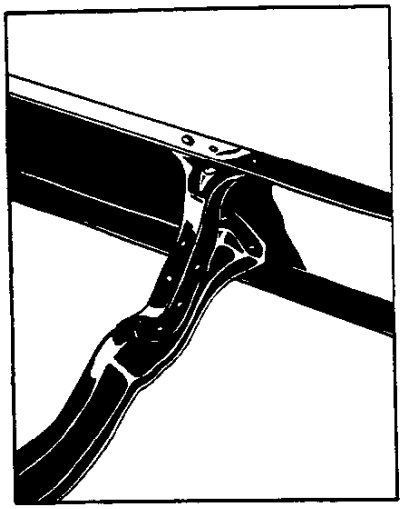
FRONT CROSS MEMBER



The front cross member is very strong and rigid, blending from a modified double channel section at the center to a double "Z" section at the ends. This member, which is widened toward its ends, is attached to the top flanges of the side rails by two rivets on each side and to the lower flanges by four rivets at each side. The side rail stress is greatly reduced by the introduction of these four rivets and by their judicious location.

REAR ENGINE SUPPORT

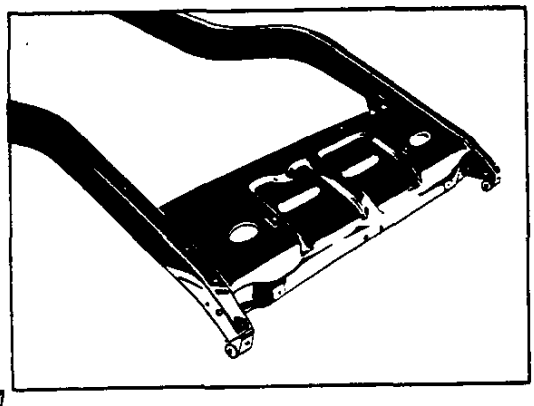
The rear engine support cross member is also improved in design. This member is made in three pieces. The major part is of double "Z" section at the center, blending into a triangular flange at its outer ends, riveted to the webs of the side rails.



The wide stiffening flanges at the bottom are designed so as to protect the flywheel underpan by shielding it from flying stones and road obstructions. At the points where the engine is supported, a reinforcing bracket is introduced at each side, fitting closely over the main member, being secured by five rivets. From these points the brackets bend upward to reach the upper flanges of the side

rails, flaring out to provide a rigid, two-rivet mounting at these points. This cross member contributes a considerable portion of the increased strength and rigidity to the frame. It effectively ties the front of the body by means of the front body mounting bolts which pass through the upper flanges of the side rails and the cross member brackets. Localization of stresses in the vicinity of the dash is avoided by the rear engine support cross member.

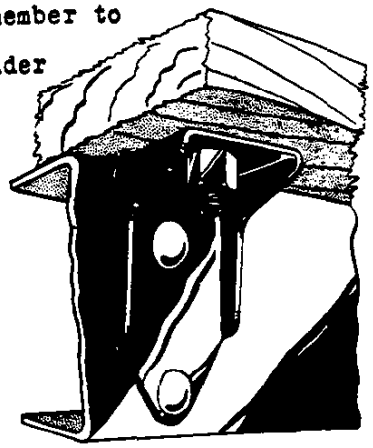
REAR CROSS MEMBER



The rear cross member has also been redesigned. It is a one-piece member, depressed at each side of its center to form supports for the gasoline tank. It is attached to the side rails by three rivets through the upper flanges at each side. Four rivets on each side, two at the front and two at the rear, secure the rear cross member to the lower flanges of the side rails. The torsional strength of the frame at the rear end is increased 30 percent by this design. Separate brackets are riveted to the rear cross member to provide more rigid mountings for the fender guards and the gasoline tank cover.

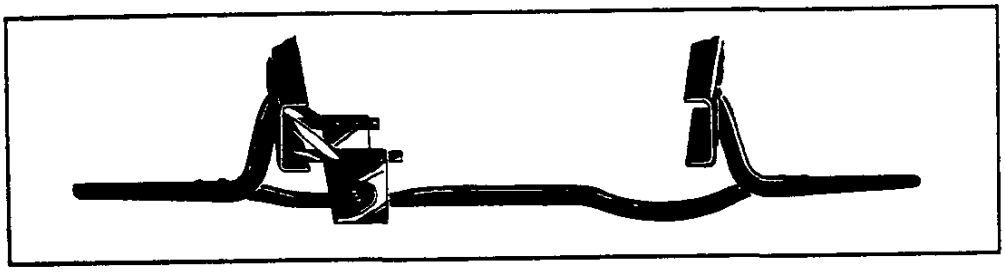
BODY BRACKET

A sturdy stamped bracket extends outward beyond the frame to support the body more effectively. This helps to reduce both frame stresses and body deflections.



STEP HANGER TIE BAR

The front step hangers are connected by a channel section tie bar which also helps to support the battery. This additional tie reduces the vertical movement of the front fenders 75 percent. The relative motion of the radiator, headlamps and running board aprons is also reduced considerably. The additional support under the battery not only protects the battery from damage; but also reduces frame stresses due to the battery mounting.

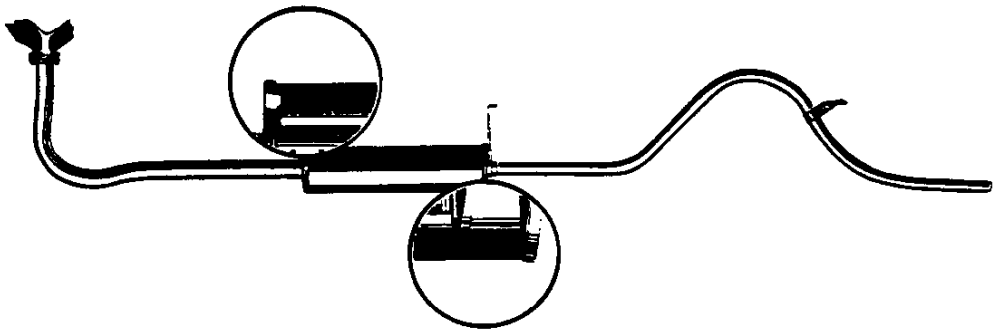


Comparative Specifications

	1930	1931
Wheelbase	106 1/2	108 9/16
Side Rail - Stock Thickness	9/64	9/64
Depth	4 3/4	5
Flange Width	1 3/4	2 1/4
Front Cross Member Rivets to Lower Flange	4	8
Rear Engine Support	One piece	Three piece
Rear Cross Member Rivets to Lower Flange	6	8
Body Bracket	None	Stamped
Step Hanger Tie Bar	None	Channel-Section
Relative torsional rigidity of frame	100%	150%.

Exhaust System

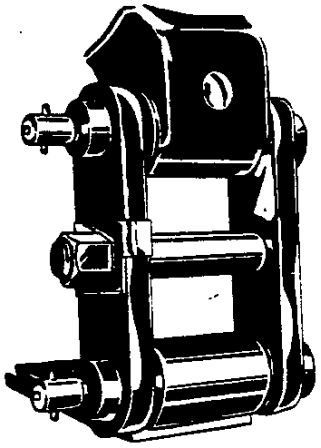
The muffler has been improved by the addition of a flange at the front end of the inner shell. This facilitates spot-welding and insures a secure joint between the inner shell and the front head. The welding of the baffle to the rear end of the inner shell is also made more secure by the addition of five lugs bent over the outside of the shell. By these means considerably more surface is available for welding at both ends.



The exhaust pipe is secured to the manifold as heretofore, but the muffler and tail pipe are mounted on the frame by means of two brackets, one at the rear end of the muffler and another toward the rear end of the tail pipe. The forward bracket clamps the tail pipe to the muffler and is of sufficient length to lend some flexibility to the mounting. This relieves the strain on the flange mounting at the manifold considerably. The rear bracket is relatively rigid and holds the tail pipe in a position closer to the center of the car. In this new position interference with the shock absorber arm is avoided and the spring shackle is protected from the hot exhaust gases.

Spring and Shackles

The front and rear springs have been changed during the 1930 season to incorporate clips of a different type. These clips are riveted to the spring leaves and are bent over the top of the leaves preventing excessive spreading.



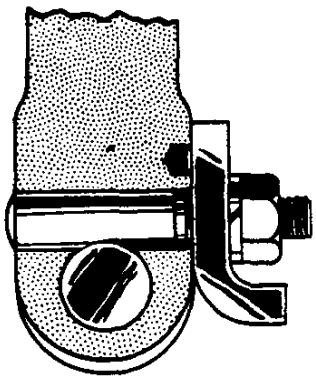
The self-adjusting spring shackles have been refined and improved in design. The side bars are cold punched. By this method of manufacture shrinkage between operations and formation of scale, incident to hot forging, are avoided and greater accuracy is assured. The center bolt has been increased in diameter and is secured by an extra-thick nut which is locked against rotation by a pressed steel lock plate having a hexagonal hole, fitting closely on the nut. The ears of the lock plate are bent over the edges of the shackle. This new design prevents loosening of the nut as well as stretching of the bolt and stripping of threads.

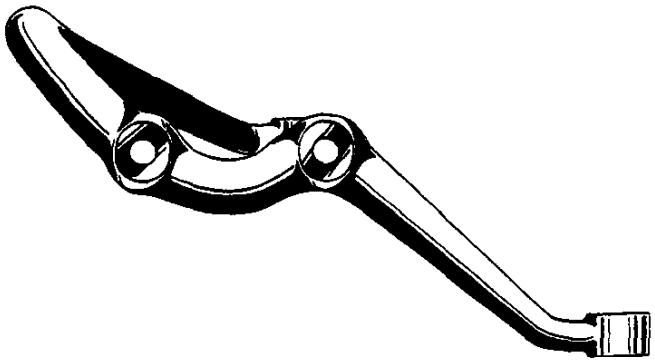
Comparative Specifications

	1930	1931
Spring Shackle Bolt thread size	3/8-24	1/2-20
Spring Shackle Nut thickness	21/64	9/16
Spring Shackle Nut Lock	Pronged Stamping bent over nut.	Stamping with hex. hole bent over shackle.

Front Axle

The front axle I beam has been strengthened at its outer end. The stock added in the forging at this point prevents bending, twisting and deformation of the King pin holes. The King pins have been strengthened by the elimination of the flat portion for locking purposes. The new lock pin is designed so as to provide a curved portion which fits closely on the diameter of the King pin. The lock pin nut pulls these two surfaces together, and the resulting friction prevents rotation and endwise motion of the King pin. Both the steering arms have been increased in strength by the addition of metal around the attaching bolt bosses, both of which are elongated. The rear boss has very heavy draft which also adds to the strength.



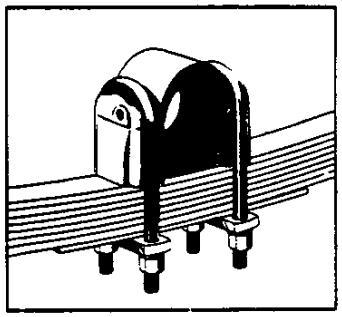


The front brakes have proven so satisfactory that no design changes have been made, with the exception of a more effective lock for the centralizer clamp bolts. The common lockwasher at this point is replaced by a special stamped lock.

Rear Axle

The third member of the rear axle is lengthened to agree with the increase in wheelbase.

The rear spring seats have been completely redesigned. The position of the "U" bolts is reversed. In the new design, these bolts straddle the springs and are parallel to the axle housing. This prevents distortion of the bored hole in the seat and cap and eliminates rattles due to excessive wear. The anchor plate which is riveted to the axle housing to locate the spring seats transversely on same is rolled from channel section steel, providing a thrust surface having 56% greater area. Grooves are provided in the spring seat to conduct lubricant from the cap to the thrust surfaces of the anchor plate. This adequate supply of lubrication combined with the enlarged thrust surface retards wear and prevents rattles.

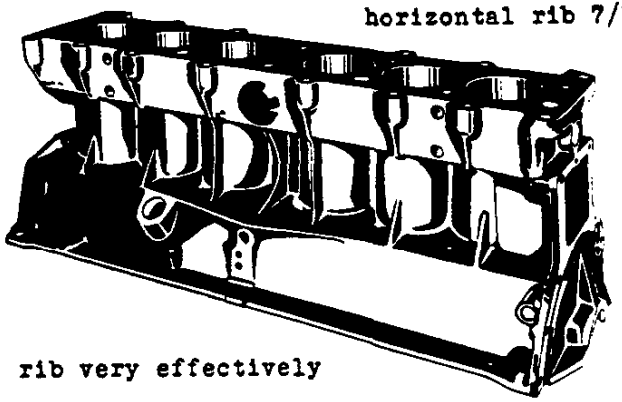


Comparative Specifications

	1930	1931
Rear Spring U Bolt position	Parallel with springs	Parallel with axle
Rear Spring Seat Anchor Plate section	Rectangular	Channel.

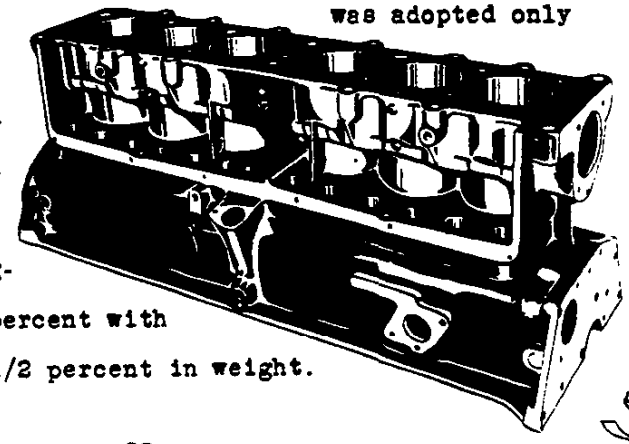
Engine

All of the improvements in the engine are in the nature of refinements which result in greater rigidity, smoothness and durability. The cylinder and case has been strengthened by the addition of ribs at advantageous points. On the manifold side a horizontal rib 7/16 thick has been added for a distance of five inches each side of the center. On the same side a vertical rib has been added between cylinders #3 and #4. This rib very effectively ties the vertical wall between the cylinders to the crankcase roof and the water jacket. The crankcase roof is increased in thickness which has considerable effect on the rigidity. The ribs at cylinders #3 and #4 have been extended downward to the crankcase roof.

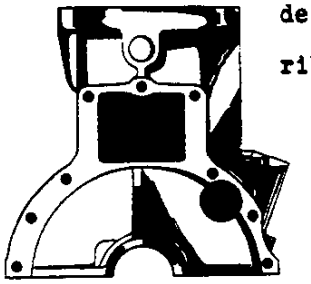


On the valve side the ribs between cylinders #2 and #3 and between cylinders #4 and #5 have also been extended downward to the crankcase roof which is doubled in thickness on this side.

This rib structure was adopted only after extensive tests which definitely proved the value of each added ounce of metal. Final tests show that the rigidity is increased 43 percent with an increase of only 1 1/2 percent in weight.

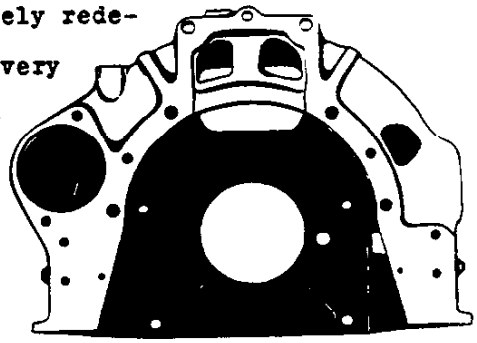


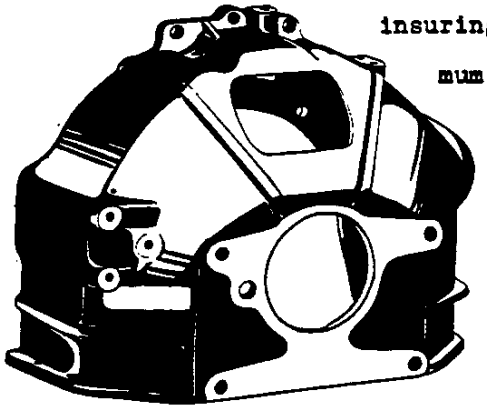
The structure at the rear end of the cylinder and case in combination with the new cast clutch housing reduces rear bearing deflection to a minimum. By means of the side ribs and the stiff flanges the rear bearing load is transferred through the entire rear end structure, making use of the stiffening value of all of the walls and ribs.



CLUTCH HOUSING

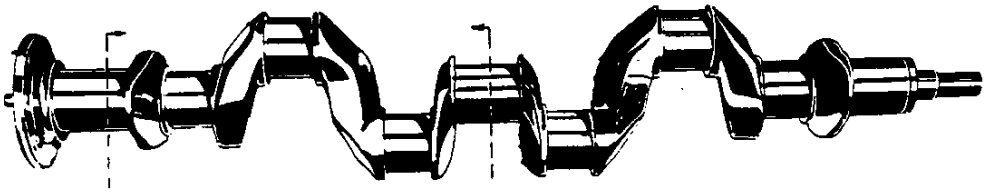
The clutch housing is completely redesigned. It is made of cast iron, very effectively ribbed to minimize deflections. The sturdy forward flange bolts to the rear flange of the crankcase. The two upper bolts attach it to the cylinder and case at the water jacket. Three dowel pins maintain accurate relation between the crankcase and the clutch housing. The housing is inherently sturdy and lends itself to precision machining, insuring very accurate alignment and maximum rigidity. Two strong pressed steel brackets bolted securely to the housing mount on the frame cross member. Closure of the bottom of the clutch housing is effected by means of a three-piece underpan. Each of these pieces is independently removable, permitting easy access to the clutch, flywheel and rear crankshaft bearing for adjustment and inspection.



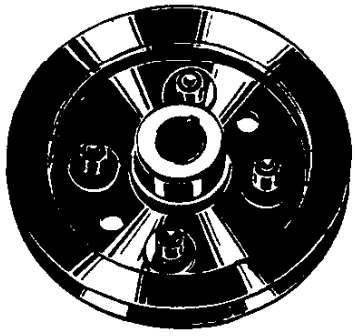


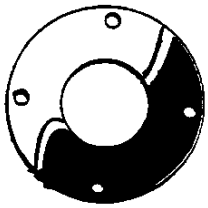
CRANKSHAFT

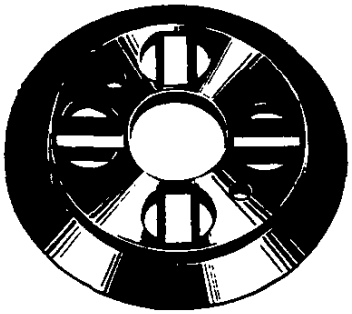
The torsional and bending strength of the crankshaft has been increased by the addition of metal in the short arms. While the additional metal increases the weight very slightly, the effect on engine smoothness is considerable.



The harmonic balancer which was added early in the 1930 season has been simplified in design. This ingenious device is combined with the crankshaft pulley and consists of a small flyweight driven by the pulley on the crankshaft through relatively flexible driving members. Four pins riveted in the pulley act as the driving members. Multiple leaf springs on each side of the pins are retained in cavities broached in the flyweight. The weight is flexibly driven by the eight banks of five springs each.



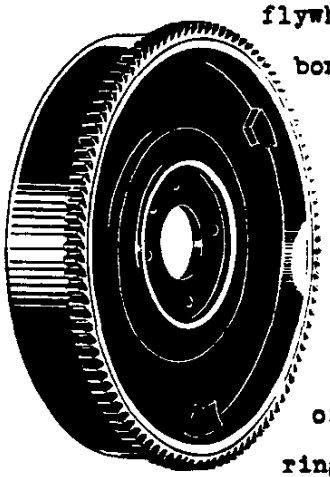




When the engine is running, any change in the velocity of the crankshaft is resisted by the action of the flyweight in the balancer. This resistance is manifested by a bending action in the four banks of springs driven by the pins. These springs then have a tendency to return to their normal position and in so doing tend to produce a bend in the four banks of springs on the opposite side of the pins. This cycle of operation, acting directly opposite to the crankshaft cycle dampens out the vibrations at the critical speed of the crankshaft.

FLYWHEEL

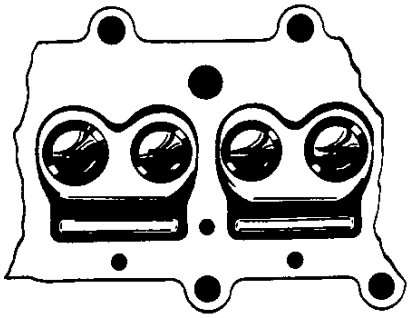
During the 1930 season a steel ring gear was added to the flywheel. This ring gear is made of high carbon steel formed to ring shape and securely welded. It is then normalized by heat treatment. After being carefully machined, the teeth are cut chamfered to facilitate engagement of the starter pinion. The entire ring gear is then hardened by heating to a high temperature and quenching in oil. The finished inside diameter of the ring gear is from .020 to .030 smaller than the outside diameter of the machined shoulder on the flywheel. The ring gear is expanded, by heating to 400 degrees, sufficiently to permit assembly while hot. As the ring gear cools it contracts, shrinking onto the flywheel to form a permanent fit on same.



With this design breakage of flywheel teeth is minimized; and smooth, easy engagement of the starter pinion is assured.

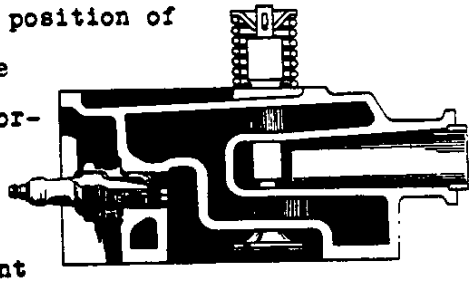
CYLINDER HEADS

The cylinder head was improved during the 1930 season by providing more space for gasket seat between the combustion chambers where exhaust valves are adjacent. This allows the gasket to squeeze out under pressure to a greater extent without being subjected to the hot gases. More effective sealing and longer life result from this improvement.



SPARK PLUGS

The spark plugs have been changed to the "G-12" type. This type of plug provides for the same position of the spark gap as in the "G-14" type previously used, but the exposed portion of the porcelain is shorter. This insures quicker transfer of heat from the points with consequent reduction of plug temperature, which tends to increase plug life.

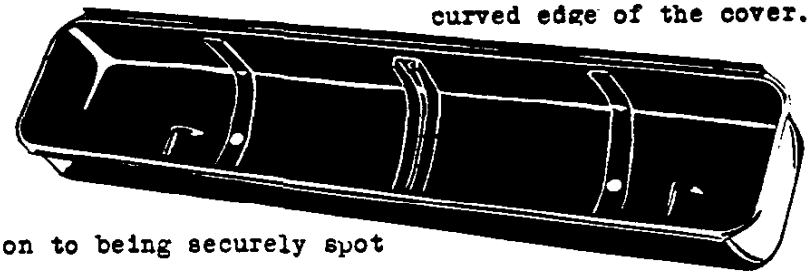


CARBURETOR

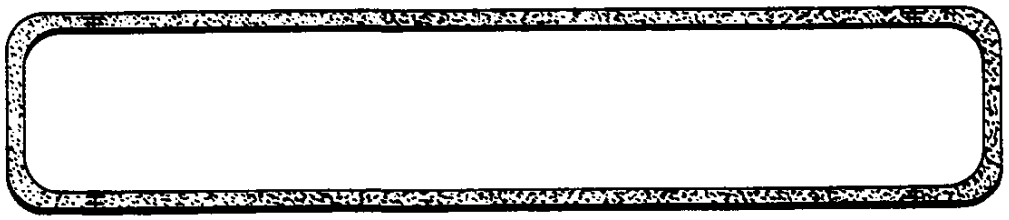
During the 1930 season a rubber boot was introduced at the top of the carburetor accelerating pump. The lower bead of this boot fits snugly over the accelerating pump body while the upper bead contracts into a groove in the pump plunger shaft. This effectively excludes water from the pump cylinder preventing freezing during cold weather.

VALVE ROCKER COVER

The design of the valve rocker cover and the gasket has been improved to insure a leak-proof closure of the rocker compartment on top of the cylinder head. The three reinforcing members inside the cover have been extended downward nearly to the bottom of the cover and the attaching flange is continued around the upper curved edge of the cover. In



addition to being securely spot welded in place, two rivets secure each reinforcement to the side walls of the cover near the bottom. Bulging of the side walls of the cover is thus prevented and equal pressure on the gasket around its entire periphery is insured. The valve rocker cover gasket has been increased in thickness and the four separate pieces comprising the gasket are securely held together by eight



wire clips which are bent over. Thus the four component pieces are attached together so as to form an integral gasket which insures a more effective seal and facilitates handling in service.

PISTON RINGS

The pressure exerted on the cylinder walls by the piston rings has been increased, insuring more effective sealing against blow-bys and oil leakage.

PUSH RODS

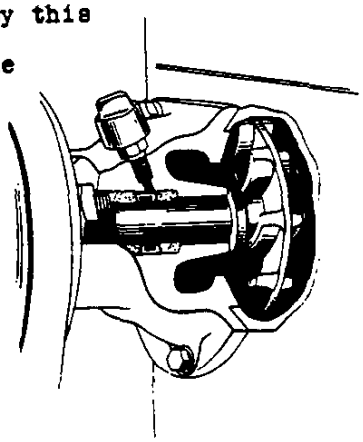
The valve push rods have been redesigned to make possible their manufacture by the swaging or upsetting of a rod. With this method of manufacture it is possible to eliminate the separate ball socket which was previously used at the upper end of the rod. This spherical socket is now integral with the rod.

Thus one joint in the valve train is eliminated; and with its elimination the possibility of wear and the noise resulting from wear are reduced.

The lower end of the push rod is also enlarged in diameter by upsetting. This provides greater area at the point of contact between the push rod and the conical seat in the tappet. Both of these improvements in design tend to make valve adjustments necessary at less frequent intervals.

WATER PUMP

The auxiliary vanes on the rear face of the water pump rotor are reduced in outside diameter. By this means the forward thrust pressure of the rotor is reduced. This improvement in the water pump rotor tends to increase the life of the thrust washer. The packing arrangement and the means for lubrication are retained without change.



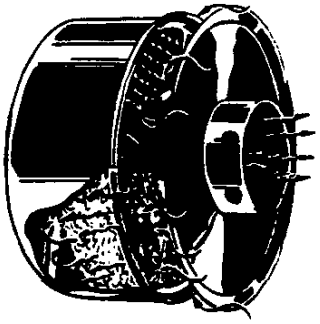
VALVE SPRINGS

Early in the 1930 season the valve springs were redesigned. Coil springs are usually made with a uniform pitch from coil to coil. Extensive engineering research proved that by graduating the pitch, making the coils closer together at the ends and farther apart at the center, several advantages are obtained. This

variable pitch reduces the amplitude of the spring surge more than 35 percent and increases the frequency of vibration to a rate which is not likely to be encountered in normal engine operation. The pressure exerted by these springs was also increased to 44 pounds with the valve closed and 80 pounds with the valve open. With these springs secure closure is assured and spring vibration is eliminated.

AIR CLEANER AND FLAME ARRESTER

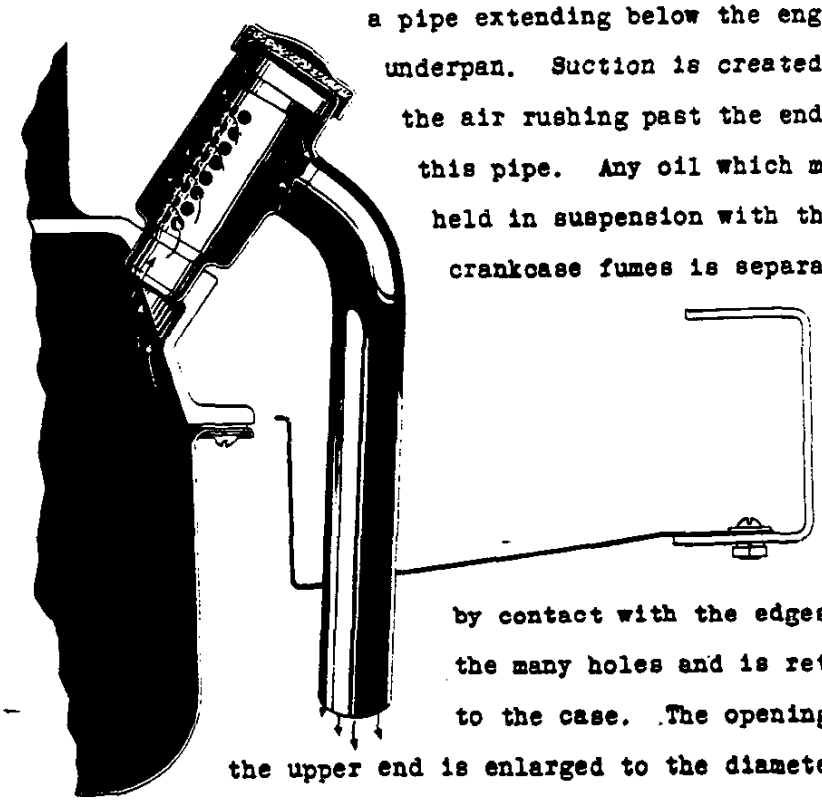
The centrifugal air cleaner has been replaced by a combination air cleaner and flame arrester. All air which enters the carburetor must pass through a filter element made of fine copper mesh finely woven into a disc one inch thick. This unit is saturated with a light oil. Any particles of dirt in the incoming air are caught by the film of oil on the copper mesh and are prevented from entering the carburetor.



Any flame which may be caused by a backfire through the carburetor is prevented from reaching the open air by this same copper mesh unit which functions much as a miner's lamp, preventing ignition of oil on the engine parts and resulting fires.

CRANKCASE VENTILATOR AND OIL FILLER

The crankcase ventilator is entirely new in design. It is combined with the oil filler and is provided with an oil separator. This unit is pressed into a hole on the left side of the crankcase toward the front. The oil filler tube is housed in the ventilator body, which completely surrounds it, forming an outer chamber. The crankcase fumes are exhausted through 48 holes in the upper side of the inner tube into the outer body. From this point the fumes are drawn downward through a pipe extending below the engine underpan. Suction is created by the air rushing past the end of this pipe. Any oil which may be held in suspension with the crankcase fumes is separated



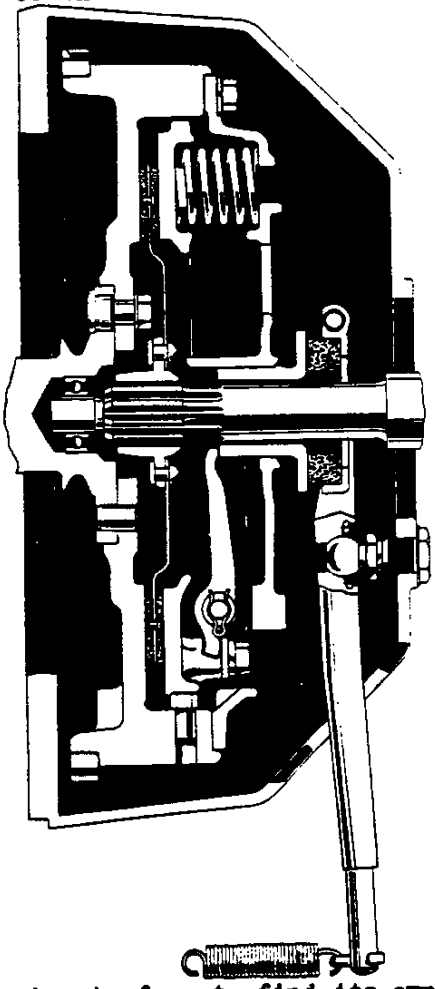
by contact with the edges of the many holes and is returned to the case. The opening at the upper end is enlarged to the diameter of the body. This provides a larger hole for pouring oil into the crankcase and makes this operation easier. The gasketed cap which covers the opening is attached by two cam surfaces pressed in the sides of the body.

Comparative Specifications

	1930	1931
Clutch Housing	Stamping & Casting	Casting.
Flywheel Underpan	One piece Stamping	Three stampings separately removable.
Harmonic Balancer	Separate Spring Cages	Broached holes in weight.
Flywheel	Cast Iron	Cast Iron with steel ring gear.
Spark Plug type	G-14	G-12
Carburetor Accelerating Pump Closure	Metal Cover	Rubber Boot.
Valve Rocker Cover Gaskets	Four separate pieces 3/32" thick	Clipped together 1/8" thick.
Push Rod type	Composite	One piece upset.
Valve Spring type	Uniform pitch	Variable pitch.
Valve Spring pressure-open	62#	80#
Valve Spring pressued-closed	41#	44#
Plain Piston Ring pressure	8# to 10#	8# to 11#
Oil Control Piston Ring pressure	7# to 9#	8# to 11#
Air Cleaner	Centrifugal	Copper mesh.
Flame Arrester	None	Copper mesh.
Crankcase ventilation	Through Carburetor	Through Underpan.

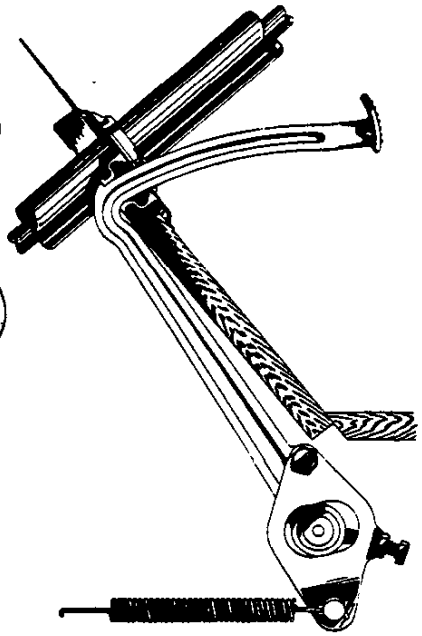
Clutch

The operation of the clutch is improved by the adoption of many refinements in design. The bronze bushing in the rear end of the crankshaft which forms a pilot for the spline shaft on which the clutch disc slides is replaced by a high grade New Departure ball bearing. This bearing is of the "oil shield" type, and is packed at the time of assembly with a grease having a high melting point. No further lubrication is required. This bearing combined with the other features insures perfect alignment and smooth, noiseless operation.



The clutch fork is mounted on a spherical swivel, which is retained in the fork by means of a spherical stamping and snap spring. The swivel ball is screwed in a special shoulder-stud in the clutch housing. By means of this spherical mounting, alignment of the clutch release bearing is maintained because the bearing is free to find its own point of alignment without binding.

The release bearing is made of a carbon-graphite composition clamped in a trunnion collar mounted in the fork. The face of the bearing is relieved to permit liberation of particles of carbon which may wear off.



The clutch is operated by the pedal acting through a stamped lever which is adjustable in relation to the pedal position. Pedal motion is transmitted to the clutch fork through this lever. The pedals are mounted on a shaft which is provided with flats at its end. It bears in a two bolt bracket which, with the bolt through the shaft, forms a more rigid mounting which lends itself to economical production.

The clutch facings are solid-moulded rings secured to the disc by rivets. The disc is depressed at four points to insure gradual engagement. The entire disc assembly is carefully tested for balance and runout.

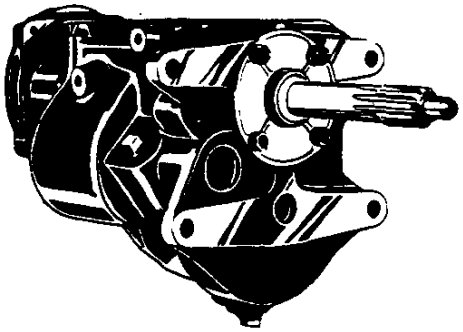
After the springs and levers are assembled, the face of the pressure plate is carefully machined and polished to eliminate distortion due to spring pressure. The face of the flywheel is also polished. These refinements increase the life of the facings and insure smooth engagement. Provision is made for easy access of the clutch for inspection and lubrication, by removal of the cover plate in the toe board and the inspection cover on top of the clutch housing.

Comparative Specifications

	1930	1931
Clutch Facings	Woven	Moulded
Clutch Pilot Bearing	Bronze Bushing	Ball Bearing
Clutch Fork Mounting	Yoke Bracket and Pin	Spherical Pivot
Clutch Release Bearing	Carbon Graphite Plain surface	Carbon Graphite Grooved surface.

Transmission

The transmission case is provided with four sturdy lugs at its front face, by means of which it is externally bolted to the clutch housing. With this arrangement, the transmission may be assembled and disassembled without removal of the clutch housing. Because the attaching bolts are located considerably farther out the mounting is much more rigid. A pilot of large diameter, accurately machined insures perfect alignment of the clutch and transmission, permitting the gears to remain in mesh under all conditions of operation.



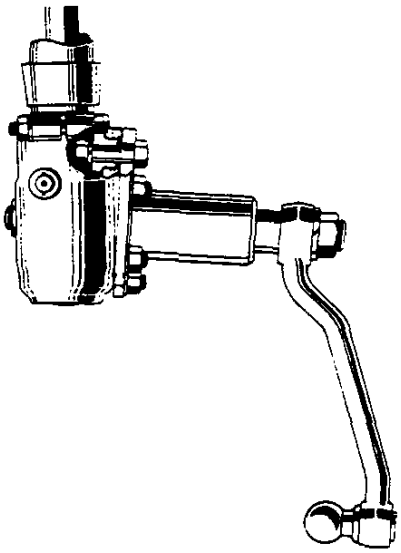
The second speed countershaft and sliding gears are made from nickel-molybdenum alloy steel. These gears are carefully carburized to produce a very hard surface on the wearing faces of the teeth backed up by a very tough core. Maximum life and minimum wear and breakage result from the use of this high-grade alloy steel and its proper heat treatment.

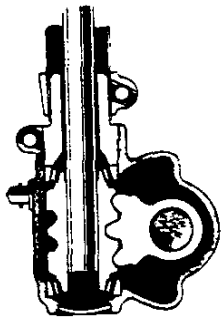
Comparative Specifications

	1930	1931
Transmission Case mounting	Internal Bolts	External Bolts
Second Speed Gear material	Chrome Vanadium steel	Nickel Molybdenum steel
Second Speed Gear treatment	Cyanided	Carburized.

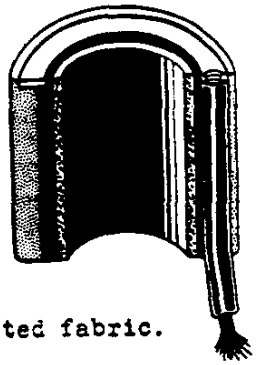
Steering Mechanism

The steering mechanism has been completely redesigned. It is of the worm and sector type having a reduction ratio of twelve to one. The worm is machined from steel bar and is carburized to obtain good wearing qualities combined with toughness. It is attached to the steering shaft by means of eight splines. The ends of the worm run in two tapered roller bearings. The sector is forged integral with the pitman arm shaft from nickel-molybdenum alloy steel carburized. It runs in a bronze bushed flange which is adjustable in relation to the case and worm by means of an eccentric shouldered screw and an eccentric sleeve. Lubrication is provided by a single Alemite fitting, from which the lubricant is conducted to all bearing points. The pitman arm is secured to the sector shaft by the usual serrations.



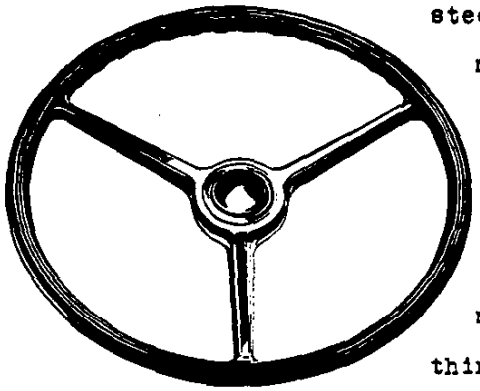


With this improved steering mechanism it is possible to control the car with less effort than heretofore, because of the increased ratio and high grade anti-friction bearings.



The bushing in the upper end of the mast jacket in which the steering shaft bears has an outer shell of soft rubber with an intermediate shell of hard rubber lined with graphited fabric.

Noise and road shocks are eliminated and easy steering is assured. The horn wire is inserted in a hole which runs longitudinally through the shells and is soldered to a brass contact ring which is embedded in the upper face of the bushing. The beautiful new steering wheel is of hard rubber molded on a strong steel frame. It has three spokes which afford a more comfortable position for the hands and unobstructed view of the instruments. The rim is of the popular thin elliptical section with grooves on the top side and finger grip scallops on the bottom. The polished rustless iron hub cover and large hard rubber horn button complete the clean-cut, sturdy design. The satin black finish of the rubber lends a rich appearance and the feel of the rubber is very comfortable.

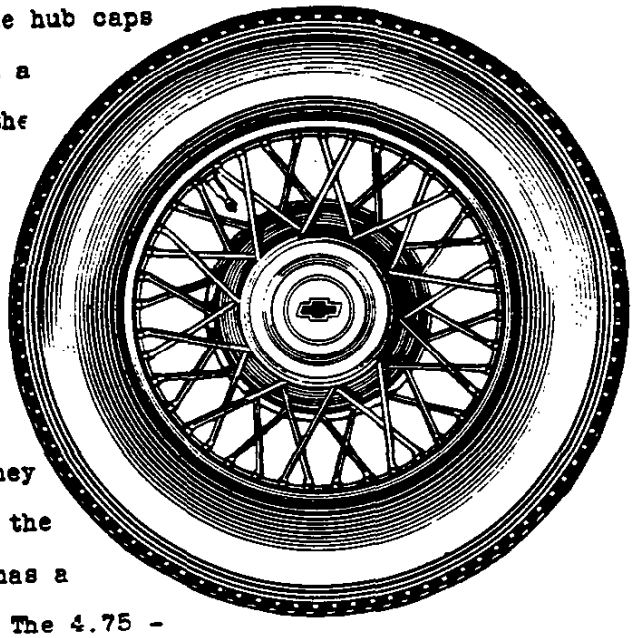


Comparative Specifications

	1930	1931
Steering Gear type	Worm & Wheel	Worm & Sector
Steering Gear ratio	9.5:1	12:1
Steering Gear adjustment	Shims	Eccentric
Steering Worm Bearings	Ball	Tapered Roller
Steering Wheel construction	Pressed steel spider, wood rim, rubber covered spokes.	Hard rubber steel reinforced.
Steering Wheel Spokes	Four	Three.

Wheels

Wire wheels will be furnished as standard equipment on all passenger models. The hubs are very large in diameter, of the concealed bolt type. The hub caps are chromium plated with a black ring surrounding the Chevrolet emblem in the center. The spokes are made of high grade open hearth steel wire with low carbon content, upset to form heads and shoulders. They are riveted securely to the drop-center rim, which has a width of three inches. The 4.75 - 19 tires are seated on a fabric liner which is shellaced to the rim to protect the tire tube from abrasion. The wheels are finished in attractive colors which harmonize with the body colors.



Comparative Specifications

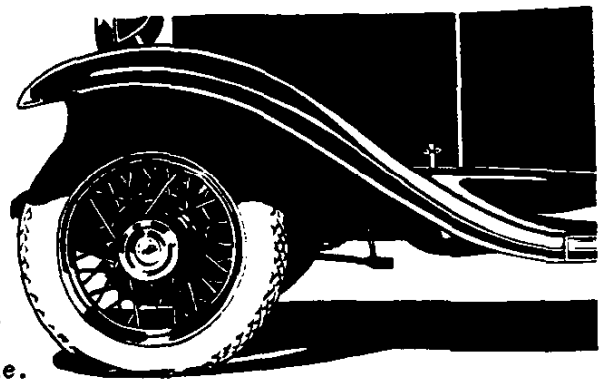
	1930	1931
Wheel type	Disc	Wire
Rims	Demountable	Permanent Drop Center.

Sheet Metal

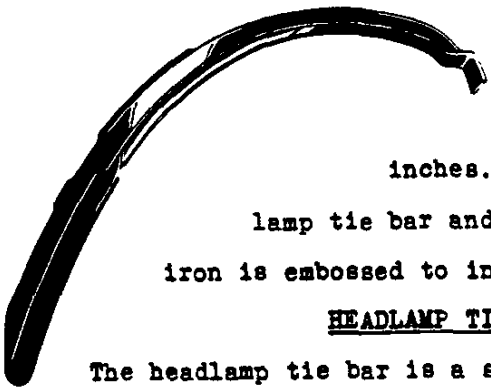
The entire line of fenders, splash guards and aprons is redesigned to harmonize with the body appearance. At all points where squeaks or rattles might occur, the sheet metal parts are insulated from adjacent metal parts by anti-squeak fabric.

FRONT FENDERS

The front fenders are improved in appearance by the reduction in depth of section at the forward end. This lends a lighter and finer appearance when viewed from the front and side.

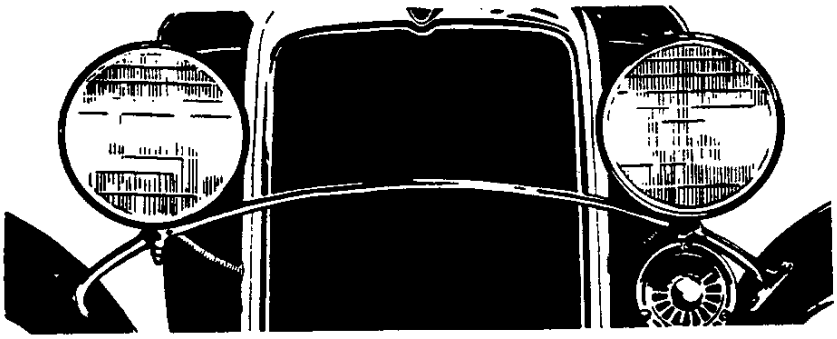


The rigidity of the front fender iron is increased considerably by the addition of stiffening flanges 1/4 inch wide extending upward from the frame end 11 inches. At the points where the headlamp tie bar and fender are attached, the fender iron is embossed to insure proper contact.



HEADLAMP TIE BAR

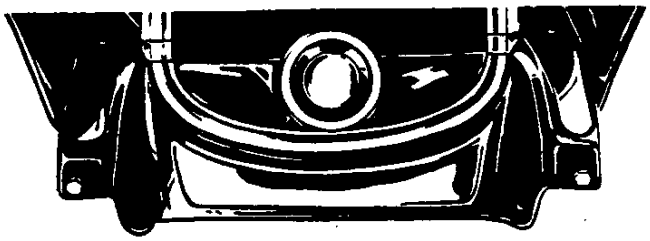
The headlamp tie bar is a solid steel upset forging of slender, graceful design. The section of the central portion is round, blending into sturdy flanges at its ends. It is arched upward in a graceful curve and is beautifully finished in bright chromium plate. Sockets are provided at each side for headlamp mounting. The tie bar serves to tie the fenders securely together



and provides an ideal mounting for the license tag, headlamps and horn. Two chromium plated clips are provided to attach the license tag to the headlamp tie bar. These clips are designed so as to grip the bar firmly and prevent sliding of the tag.

RADIATOR SPLASH GUARD

The radiator splash guard is completely redesigned. A single stamping extends below the radiator and below the inside of the side rails. Two separate ledges are mounted on top of the

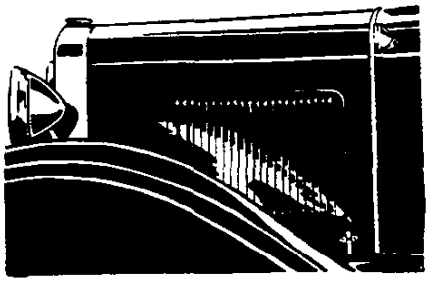


side rails concealing the edges of the splash guard proper. The panels which are pressed into the three vertical faces of the splash guard not only add to the beauty but tend to increase the stiffness. Both the splash guard and the ledges are attractively crowned and are beautifully finished in durable black enamel.

Rubber insulation at the mounting points on the frame prevents squeaks and rattles.

HOOD

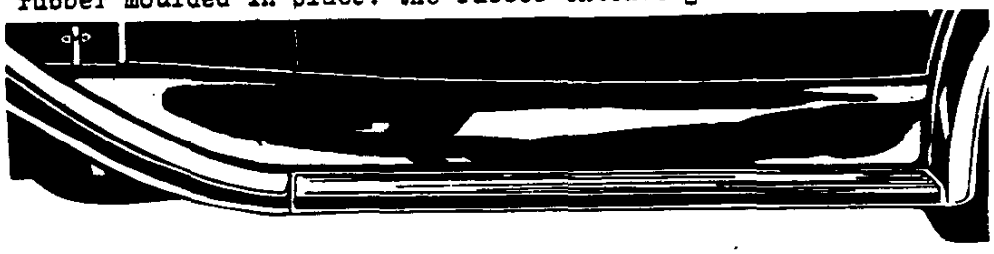
The length of the hood is increased, and the crown of the upper panels is more pronounced. The side hinges are raised to coincide with the moulding line. The moulding is narrow and is designed to conceal the hinge. The number of louvres is increased and they are punched in a raised panel toward the rear of the hood. Each louvre is narrow and shallow, the air capacity being maintained by depressing the front edge of each opening.



The new hood is considerably stiffer and, due to the novel treatment of mouldings and louvres, appears longer than it actually is. The hood catches are attractively finished in chromium.

RUNNING BOARDS AND APRONS

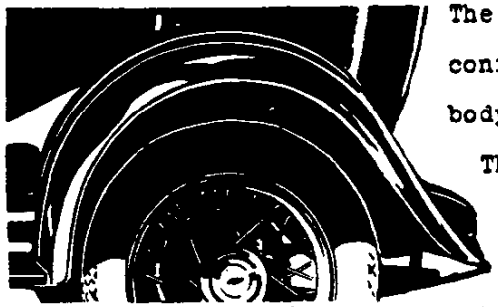
The running boards are longer and wider at the front end. They are made of pressed steel, fully covered with corrugated rubber moulded in place. the rubber extending over the rounded outside edges. Narrow chromium plated moulding is applied around all exposed edges. A channel section reinforcement is welded longitudinally between the hold-down plates to increase the rigidity. The rubber covering with the bright mouldings presents



a neat, distinguished appearance and the additional width allows more foot room when entering or leaving the car.

The running board aprons are designed to conform to the new body lines and sill treatment. They follow the contour of the body and appear to be a continuation of it. The design is extremely plain without any panels or beads to break up the long flowing lines. The concavity at the front end of the aprons also allows more foot room.

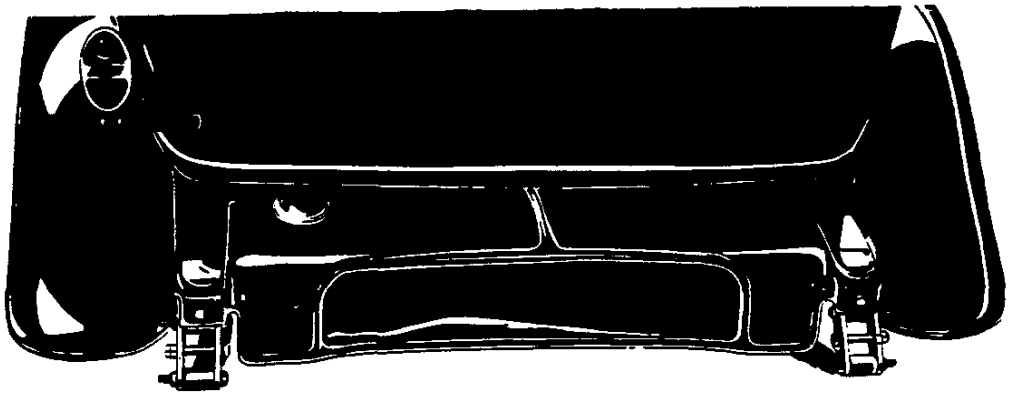
REAR FENDERS



The rear fenders are redesigned to conform to the new lines of the body and other sheet metal parts. The sweep at the rear end is somewhat more pronounced and provisions have been made to fill the space between the fenders and the rear cross member cover.

REAR CROSS MEMBER COVER

The appearance of the rear end is improved to a considerable extent by the new rear cross member cover. It is exceptionally



clean in appearance and has a bead around its lower edge and around the rear panel. This panel bead blends into a dividing bead

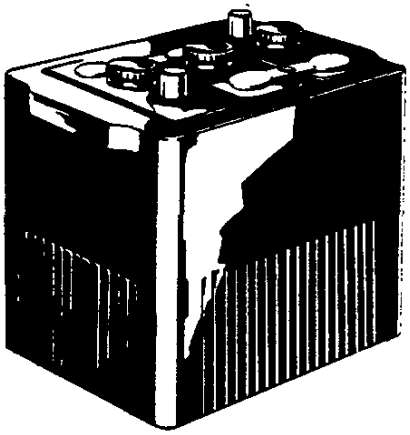
through the middle. The ends have a raised panel which is slightly crowned. The rear panel extends downward to entirely conceal the fuel tank and is depressed for spare tire clearance. The cover extends downward over the sides of the frame to meet the rear fenders and effectively fill the space at this point. The beautiful black enameled finish of the cover is set off by the chromium plated fuel tank cap which has a plain crowned top with a knurled bead.

Comparative Specifications

	1930	1931
Front Fender Iron section	Channel	Channel with stiffening flanges.
Headlamp Tie Bar	Channel section stamping	Round section forging.
Headlamp Tie Bar finish	Black enamel	Chrome plate.
Front License Tag Mounting	Bolts through tie bar	Clips.
Radiator Splash Guard	Horizontal	Vertical
Hood	Wide louvres	Narrow louvres on raised panel.
Hood Catches and Handle	Cadmium plated	Chrome plated.
Running Board Mouldings	Black	Chrome plated.
Running Board Reinforcement	None	Channel section.
Running Board Apron	Beaded	Plain.

Electrical System

The entire electrical system is improved and refined. Much attention has been given to the design of the component units, which results in the elimination of many minor troubles.



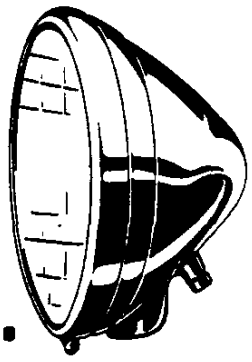
BATTERY

The majority of the batteries furnished in 1931 cars will be of the flush - connector type. In this type of battery the connectors are embedded in the insulating material in the top of the battery. This provides a smooth, flush top with only the cell caps projecting, which facilitates cleaning of the battery and its terminals.

WIRING HARNESS

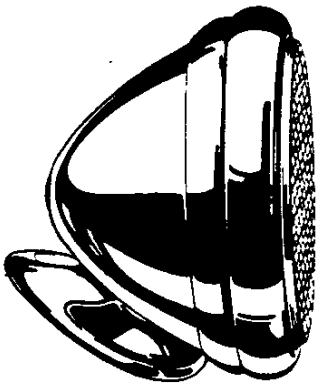
The wiring harness has been improved in several minor details, all of which tend to eliminate failures. The headlamp wires are carried in a separate metal conduit which increases their life and prevents unintentional disconnection of same.

HEADLAMP



The headlamps are of graceful parabolic shape, having two shallow crowned beads at the front. The body and rim are made of brass, beautifully chrome plated. The popular double filament bulb and anti-glare lens are retained. The lamps are adjustably mounted on the tie bar. On the models not equipped with cowl lamps, a parking bulb is provided in each headlamp.

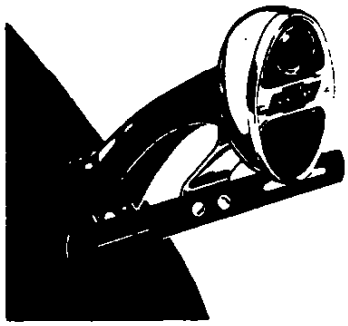
COWL LAMPS



On sport models chromium plated cowl lamps, similar in shape to the headlamp, are furnished. These lamps are mounted on attractive brackets which fit the cowl. A stud through the cowl with a nut on the underside holds the lamp in place.

TAIL AND STOP LAMP

The tail lamp and stop lamp are combined in a beautiful chromium plated casing of elliptical shape. The door is also chromium plated and is attached by two screws. The lamp is attached to a pressed steel, black enameled bracket of elliptical channel section which is mounted on the left hand rear fender by a triangular flange. The tail lamp bulb protrudes through the lamp casing, illuminating the license tag directly without the dimming effect of the usual glass window. The tail lamp lens in the lower half of the lamp casing is a ruby "Filmolens" which is combined with an inserted pyralin condensing lens in the upper half for the stop signal which is illuminated by a separate bulb. The stop light is controlled by a switch mounted on the frame side rail. The switch is actuated by a lever clamped on the brake cross shaft, which is adjustable. The slightest movement of the brake pedal illuminates the stop light. The rear license tag is mounted on a cross bar attached to the tail lamp bracket below the lamp.

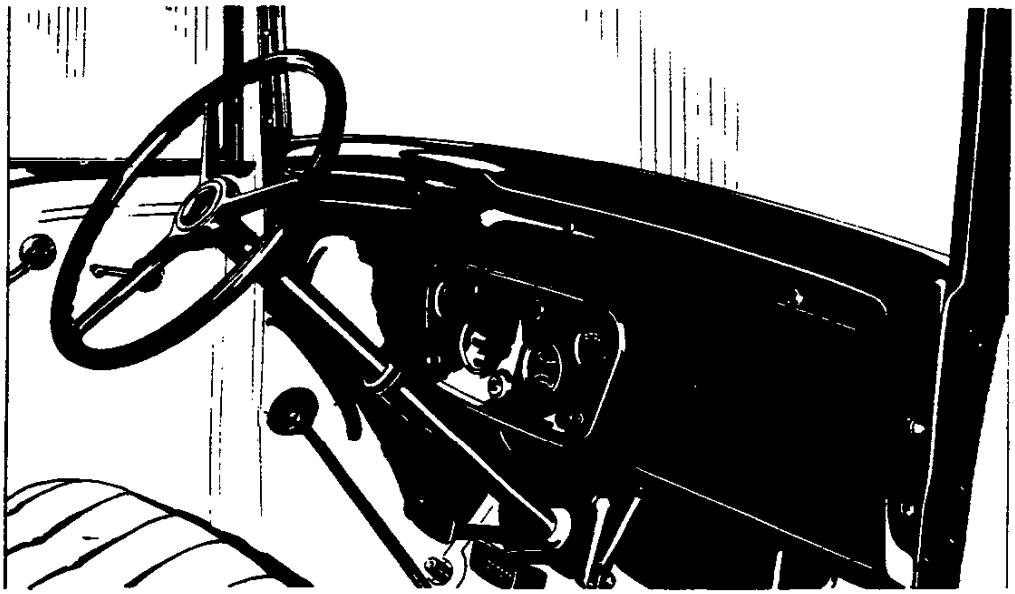


HORN

The horn is of the popular high-frequency vibrator type, mounted just below the left hand headlamp. The body of the horn is black with an attractive chromium plated ornamental face plate. The tone is pleasing but insistent. In operation, this type of horn is very durable; water, ice and snow having no effect on its efficiency.

INSTRUMENTS AND CONTROLS

The four buttons for spark, throttle, choke and light controls made of black molded Bakelite with white letters and a white line rim on their faces. The control rods have a number of annular grooves into which the Bakelite is permanently molded.



The vibration of the oil gauge nand is eliminated by the addition of a friction device in the gauge mechanism. The tube leading to the oil pressure gauge is reduced to 1/8 inch diameter which also tends to reduce vibration.

A balancing member has been added to the gasoline gauge to prevent vibration of the hand. The tank unit has been improved by the redesigning of the coils and contacts. All of these refinements tend to make the gauge indicate more accurately the amount of fuel in the tank.

ELECTROLOCK

The ignition system is locked by means of the Electrolock unit which has been improved in design to insure clearance of the speedometer and to prevent rattling of the lock tumblers. The latter effect is accomplished by an increase in the length of the lock pin. The speedometer clearance is obtained by changing the position of the Electrolock unit in the instrument panel by rotating it 45 degrees.

WINDSHIELD WIPER

The windshield wiper is improved by the addition of means for ventilating and draining the housing. This prevents formation of ice on the mechanism. The windshield wiper is controlled by a lever in the header panel. The wiper blade automatically returns to the extreme position when the valve is closed.

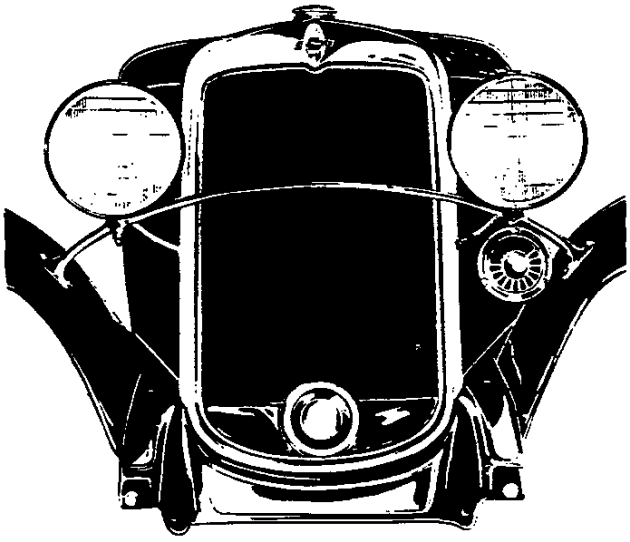
The windshield wiper suction pipe is made in two halves, connected by a section of non-metallic loom which insulates the body from engine noises which might be transmitted through a solid metal tube. Automatic windshield wipers are furnished as standard equipment on the open passenger models.

Comparative Specifications

	1930	1931
Headlamp and Tail Lamp finish	Black and Chrome	Full Chrome
Tail Lamp Mounting	On tire carrier	On fender
Horn	Motor driven	Vibrator.

Radiator

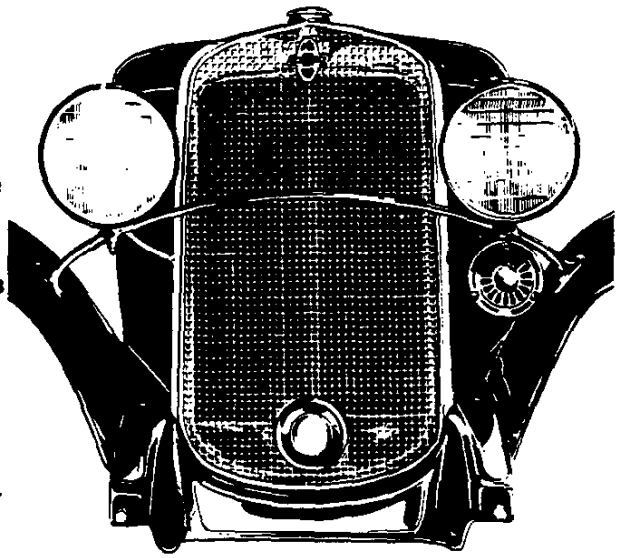
The radiator is improved both in appearance and efficiency. Due to the new treatment of the radiator shell and splash guard the frontal appearance is very different. The shell is made of brass, in two halves, both of which are beautifully chromium plated. A black enameled, beaded panel at the bottom surrounds the starting crank hole. The new radiator design appears to be much higher and the sides appear to have more curvature. The upper panel is somewhat narrower and has greater curvature at the rear edge. The starting crank hole is surrounded by a chromium plated ferrule and is provided with a crowned, chromium plated spring cap.



The cooling element consists of 34 sections of 3/8 inch Harrison hexagon core with brass tubes and short copper fins, which is considerably more effective. Where unusual conditions of climate or altitude overtax the capacity of this standard radiator core, the truck core may be had at additional cost. It consists of 36 sections of 5/16 inch Harrison hexagon copper core of the short-fin type.

The radiator cap is of the spring and cam type, large in diameter and beautifully chromium plated. The operation of the cap is very easy because only a portion of a turn is required for engagement.

On all sport models a beautiful chrome plated radiator screen is furnished as standard equipment. It is attached to the radiator shell at the name plate fastener near the top and by two "T" bolts at the bottom. Rubber bumpers are provided at the sides to space the screen from the radiator shell. At the starting crank hole a beautiful chrome plated ferrule is provided.

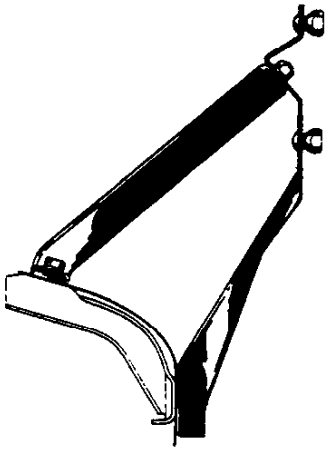


Comparative Specifications

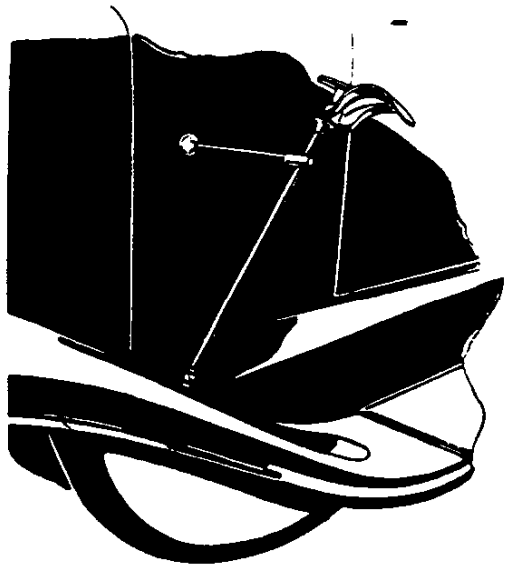
	1930	1931
Radiator Core material	Brass	Copper
Number of Core sections	30	34
Type of Radiator Cap	Screw	Spring & Cam
Starting Crank hole	In Splash Guard	In Radiator.

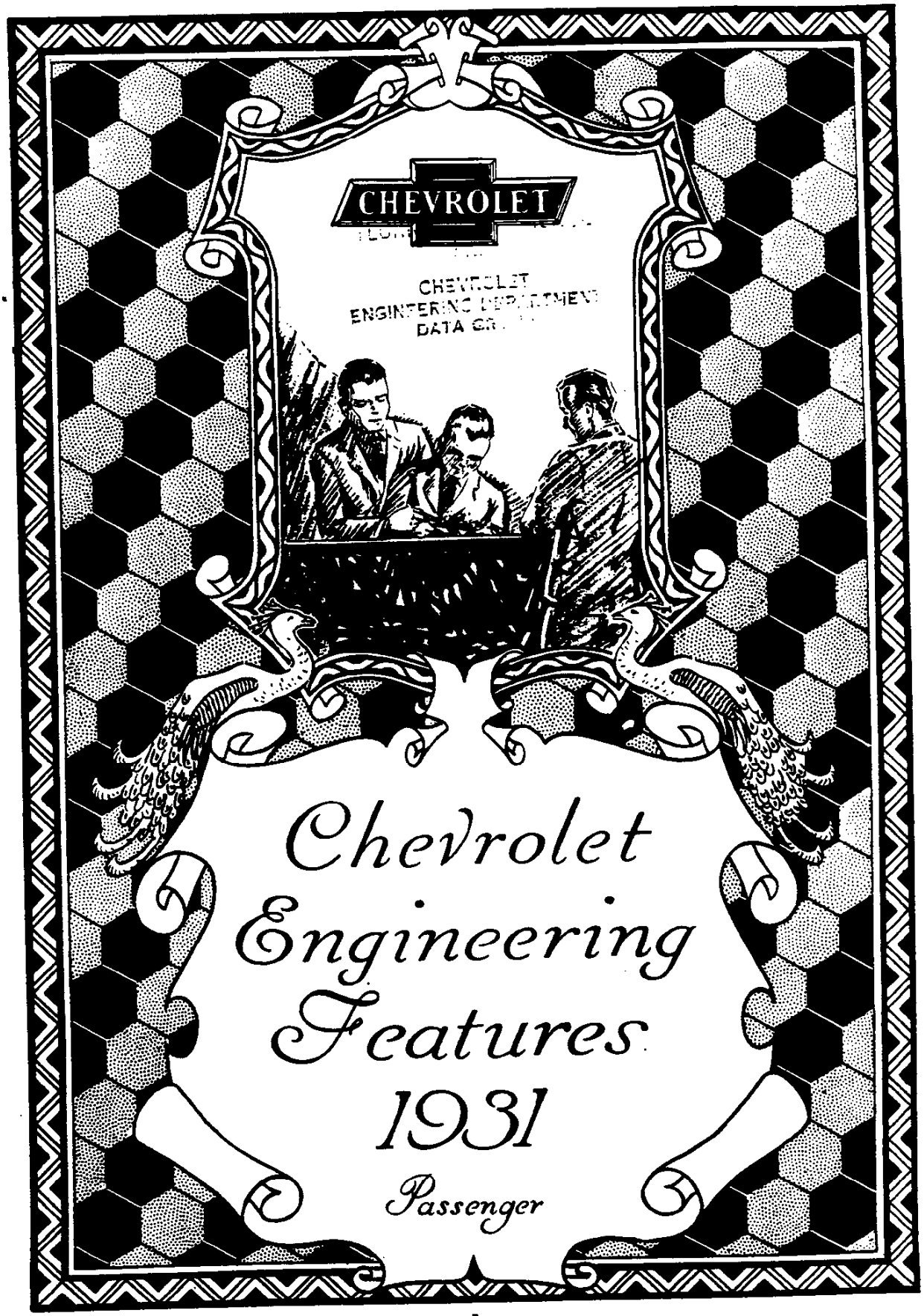
Wire Wheel Carrier

A sturdy carrier for the spare wire wheel is provided at the rear on all models with which five wire wheels are furnished. A rigid channel section member bolts to the rear cross member and is braced by a channel section brace member mounted on top of the rear cross member. Three studs are provided for attachment of the spare wheel.



On models with which six wire wheels are furnished as standard equipment, a fender well is provided on each side to carry the spare wheels. Sturdy braces secure the fender wells to the frame. These in combination with the step hanger tie bar provide rigid support for the fender wells and reduce deflections due to the weight of the spare wheels and tires to a minimum. Anchorage of the spare wheels is by means of rods attached to reinforcements in the fenders, braced by rods attached to the dash and passing through rubber grommets in the cowl. The vertical rods are threaded and "T" handles are provided to hold the retaining clamps in place on the tires. The handles and clamps are chromium plated.





Chevrolet Engineering Features 1931

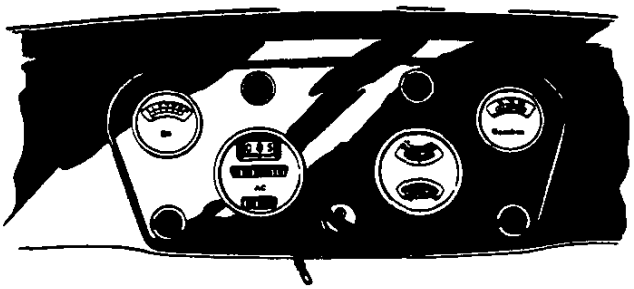
Passenger

Bodies

In redesigning the entire line of open and closed bodies, every effort has been made to improve their appearance and to increase their comfort.

The sill has been lowered to extend below the frame line. This permits the lower side panels to be deeper, tending to make the body appear lower.

The instruments are surrounded by an attractive, raised bead; and the entire panel is set farther forward in relation to the cowl rail. A narrow cowl moulding, beautifully chrome plated, is applied to all models. Insulation is provided on the dash and under the front floor mat to prevent engine noise, heat and fumes from entering the driving compartment.



All bodies are attractively finished in duco, striped with harmonizing colors.

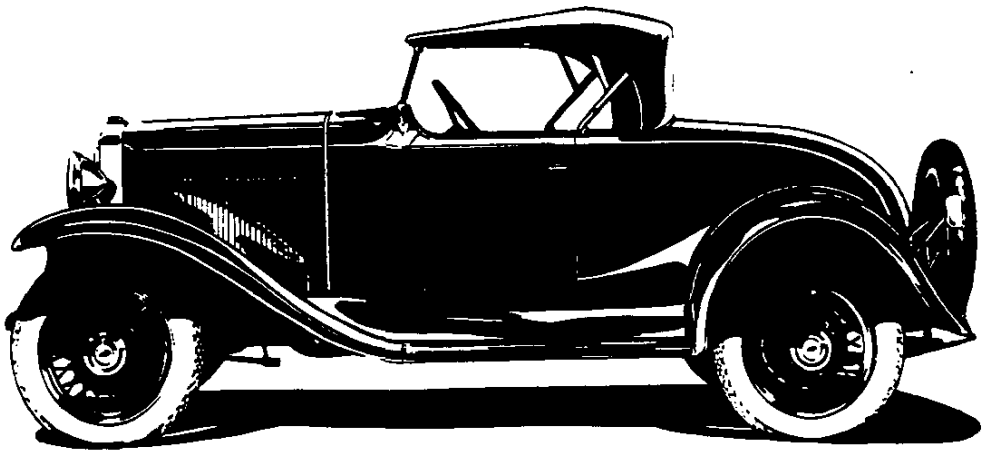
OPEN BODIES

On all of the open bodies an automatic windshield wiper is now furnished as standard equipment instead of the hand operated type which was previously supplied. The beautiful, durable Fabrikoid door panels which replace the usual coated ragboard panels are an outstanding improvement in the open body line. All doors are provided with weatherstrips to exclude wind and rain. The top bows are made of oak in natural wood finish. They are bolted to slat irons finished in body color.

The top holder is also finished in body color and is equipped with an attractive, colored, leather strap with a plated buckle. The trimming in the open bodies is of Fabrikoid in attractive color, arranged in narrow plaits. Both front doors are equipped with pockets.

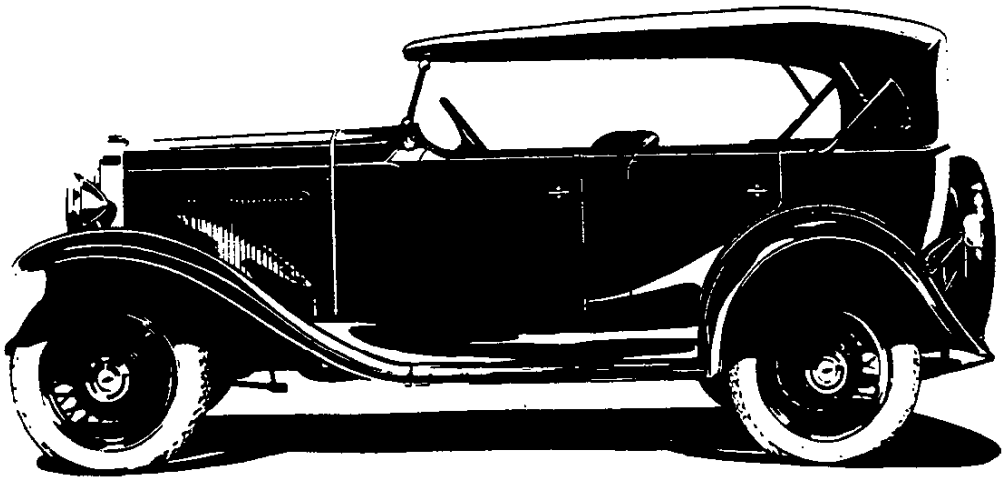
ROADSTER

The lines of the roadster body are entirely new. The body is wider at its front end, and two inches longer. The additional length is in the deck compartment, which is also increased in height. The moulding line is continuous from the front of the hood to the rear of the deck, which greatly improves the appearance. The deck with its new flush door and broader appearance is also more beautiful. The top has been changed in design to appear much narrower and more rakish.



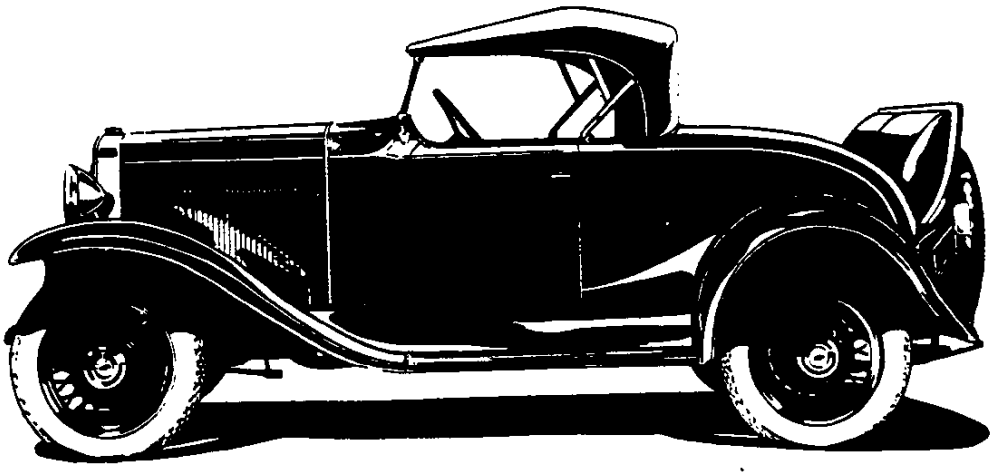
PHAETON

The phaeton body is 2 inches longer and 1 3/4 inches wider at the front end. The rear seat is more comfortable because of its increased rake. The tonneau is equipped with a robe rail and a foot rest of the same type furnished in sedan bodies. The tonneau floor is covered with carpet. The top is of fabric which harmonizes in color with the body and trim. A top boot is furnished as standard equipment.



SPORT ROADSTER

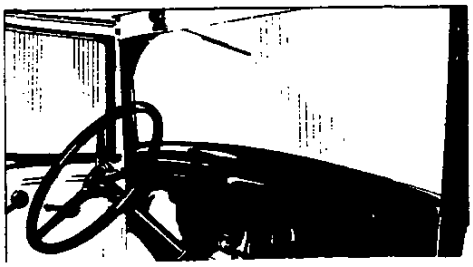
All of the features in the roadster are also incorporated in the sport roadster. The increased length and height of the deck compartment provides more knee room in the rumble seat and also makes it more accessible. This model is equipped with two attractive rubber faced step pads, beautiful chrome plated cowl lamps and radiator screen.

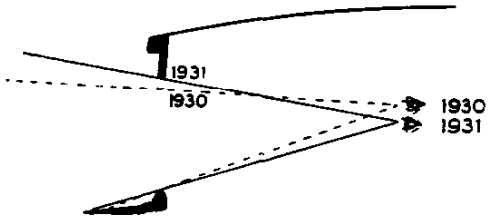


CLOSED BODIES

In all of the closed body models, the sills are made of two-ply oak. The paneling is redesigned to increase the rigidity of the body and to facilitate welding. The front pillar is stamped integral with the cowl side panel, eliminating the unsightly open joint at the junction of the cowl and upper pillar.

An outstanding feature is the increase in vision under the windshield header bar. This is accomplished by raising the header





bar and lowering the front seats. The accompanying sketch shows the relative increase in vision.

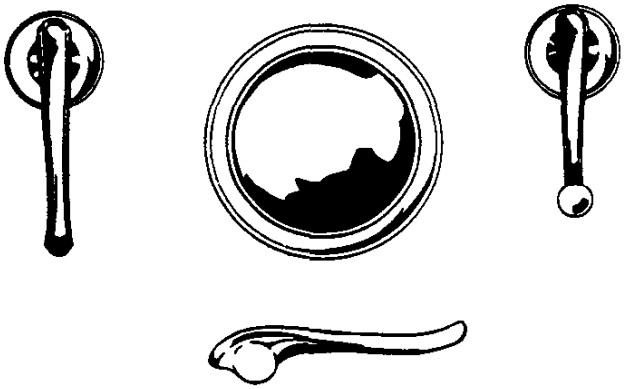
In the new bodies the sloping windshield is retained; but with the new stamped front pillar there is considerably less obstruction to clear vision at the corners. The front pillar is well reinforced and is stamped integral with the cowl side panel.

All body mouldings are pressed in the body panels, eliminating all separate, applied mouldings with their accompanying difficulties. The drip moulding is also pressed integrally in the roof panels. With the adoption of these pressed mouldings the rusty streaks, usually found at the edges of applied mouldings are eliminated because the paint does not crack off of the pressed mouldings. The lower windshield moulding is also pressed in the cowl panel, eliminating the leaks at this point.

The belt line on all closed bodies is raised to further carry out the low appearance caused by the deeper body side panels which have a slight outward bulge. The roof lines are improved by streamlining and by an increase in crown at the front. All window reveals are concave and the back window is longer and slightly narrower. The upper door hinges are narrower and much neater in design.

The dash is strengthened at its junction with the dash legs. Three rivets are added in each leg to reinforce the spot welding. The toe risers are also strengthened by an increase in their section; and they are attached to the sills by screws instead of nails. The hood ledge on the cowl is redesigned to prevent squeaks caused by contact between the hood metal and the cowl. Body squeaks are eliminated by the further use of steel brackets at the highly stressed joints in the frame work.

The cowl bar has an attractive depressed panel; and the instrument panel sets farther forward in relation to it. All of the body hardware is narrower and neater in design. All of the exterior hardware is chrome plated and the interior hardware is nickel plated. All rear doors and left hand front doors are arranged so as to lock by slightly lifting the inside handle.



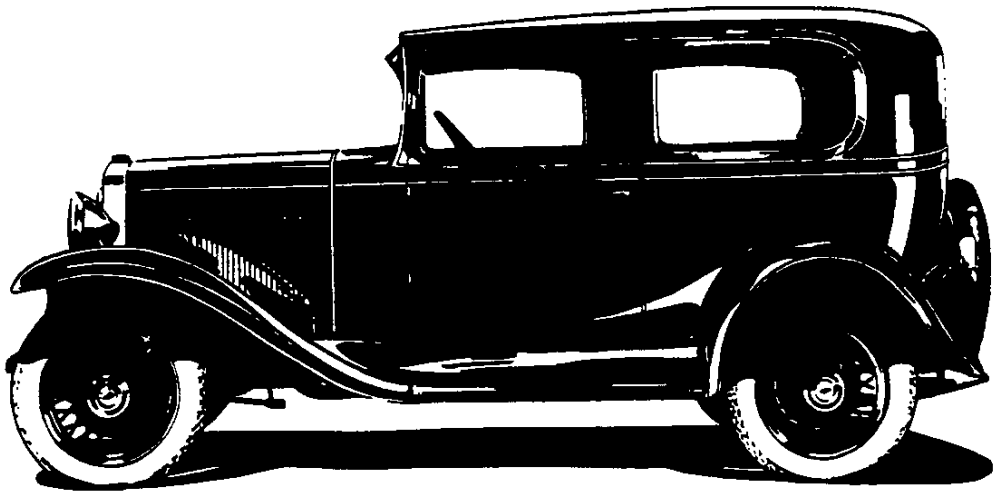
Mohair and broadcloth trimming material are optional on closed body models. The seat cushions have two rows of buttons.

COACH

The coach body is wider at the rear seat. The additional width is obtained by improving trim construction without sacrificing any actual trim depth.

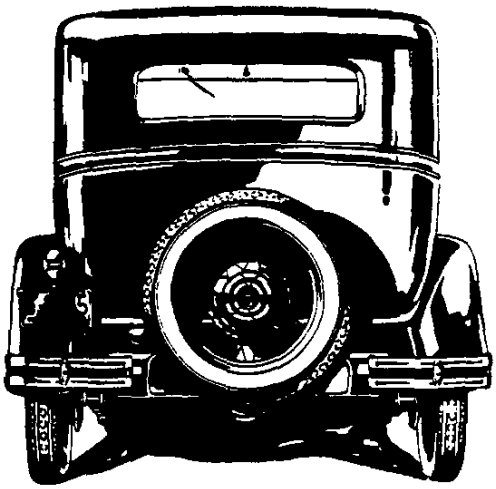
Both front seats are of the "bucket" type, with the curved back permanently attached to the seat. This type of seat is much more comfortable than the folding type due to its permanent back construction. The entire seat is hinged at the front.

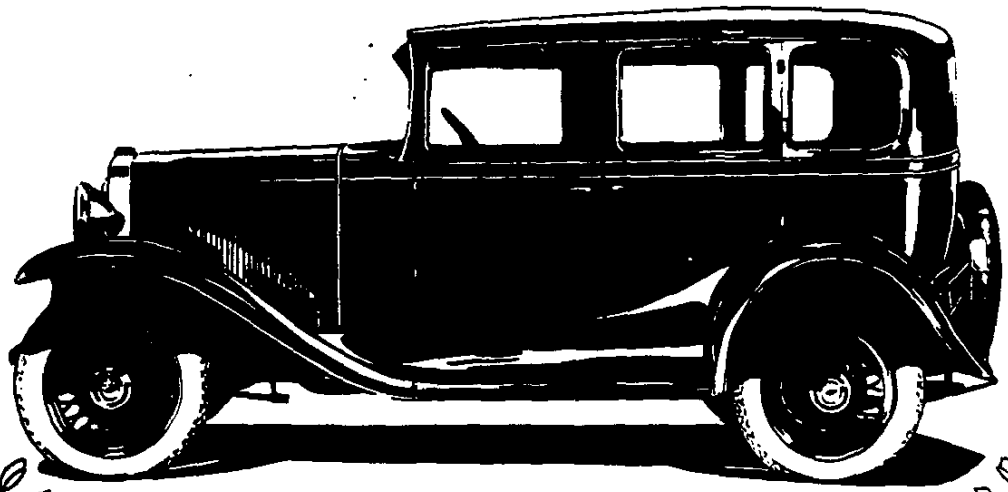
A compartment for tools is provided under the floor board beneath the front seats. This permits access to the tools for making adjustments, tire repairs, etc. without disturbing the occupants of the rear seat.



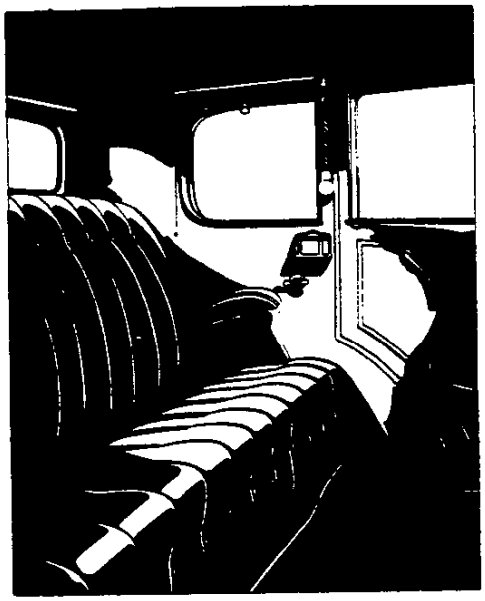
SEDAN

The sedan body is 1 1/2 inches longer and 1 inch wider. The rear seat is considerably roomier because of improved trim structure. The trim depth is maintained. The rear compartment is beautifully carpeted and is equipped with a foot rest and robe rail.

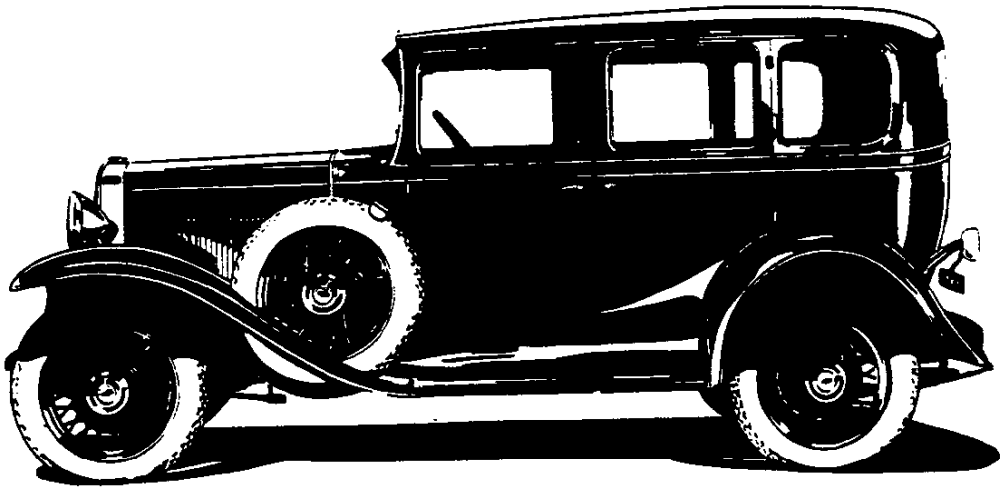




SPECIAL SEDAN

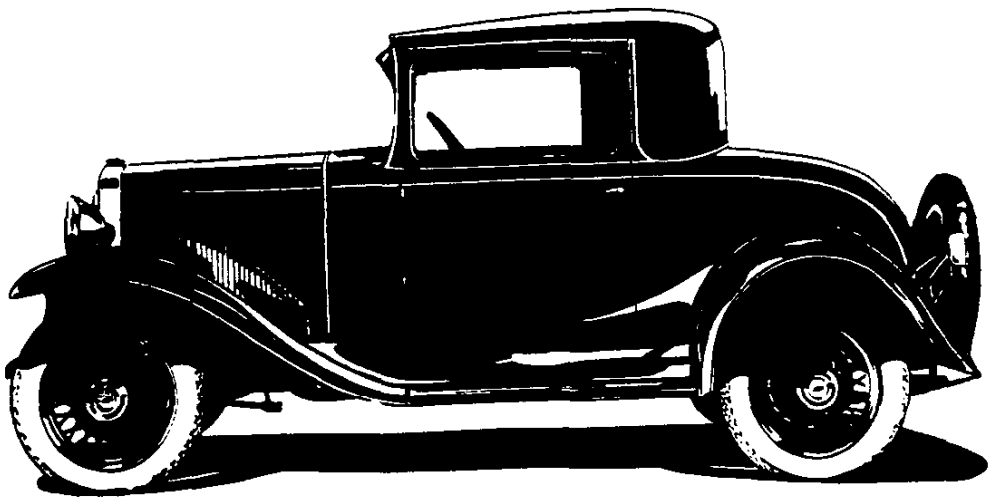


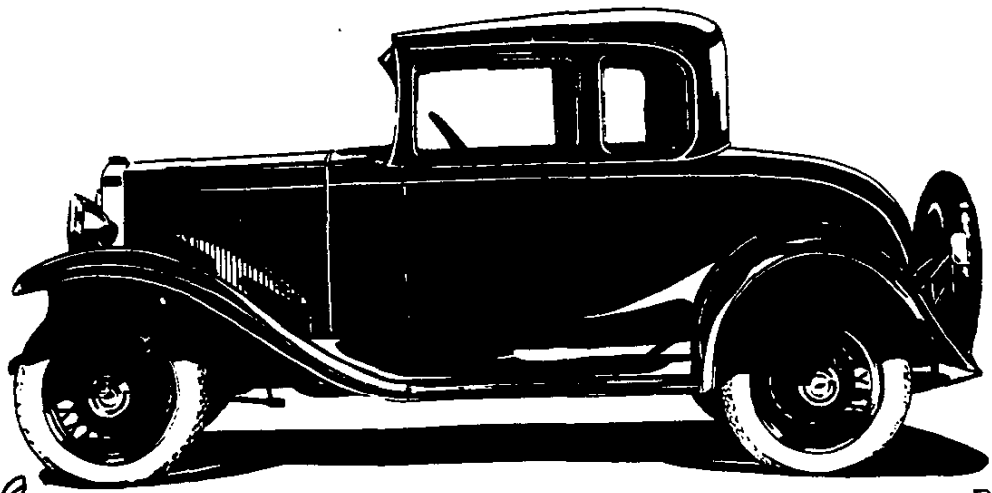
The special sedan is equipped with six wire wheels, the two spare wheels being mounted in the fender wells. Chrome plated cowl lamps and radiator screen are furnished and the rear compartment is equipped with two ash receivers, two arm rests and two assist cords. All of the rear compartment windows have silk roller curtains of harmonizing color.



COUPE

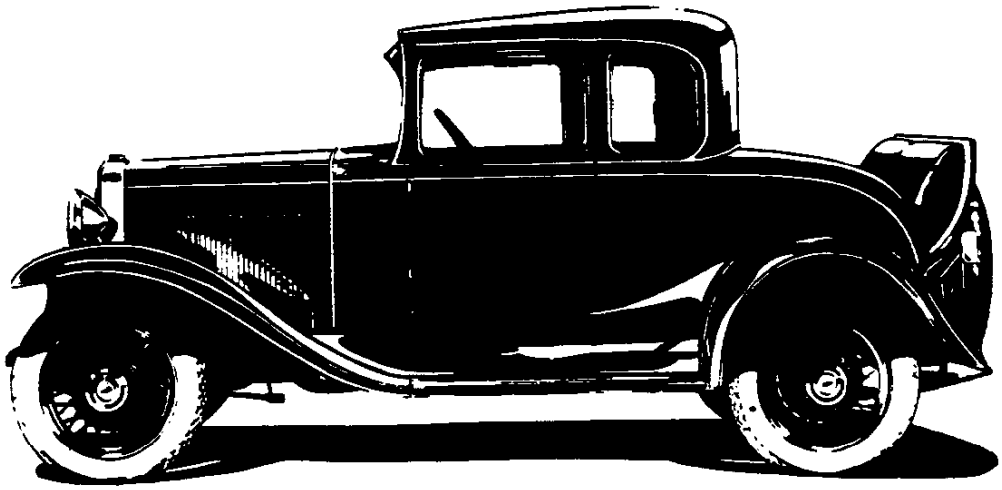
The coupe is built in two types. One has three windows and the other has five windows. Both of these coupe bodies are two inches longer and more roomy because of the improved trim construction. The spacious rear deck compartment has its flush door hinged at the front. The chrome plated handle has a lock built in.

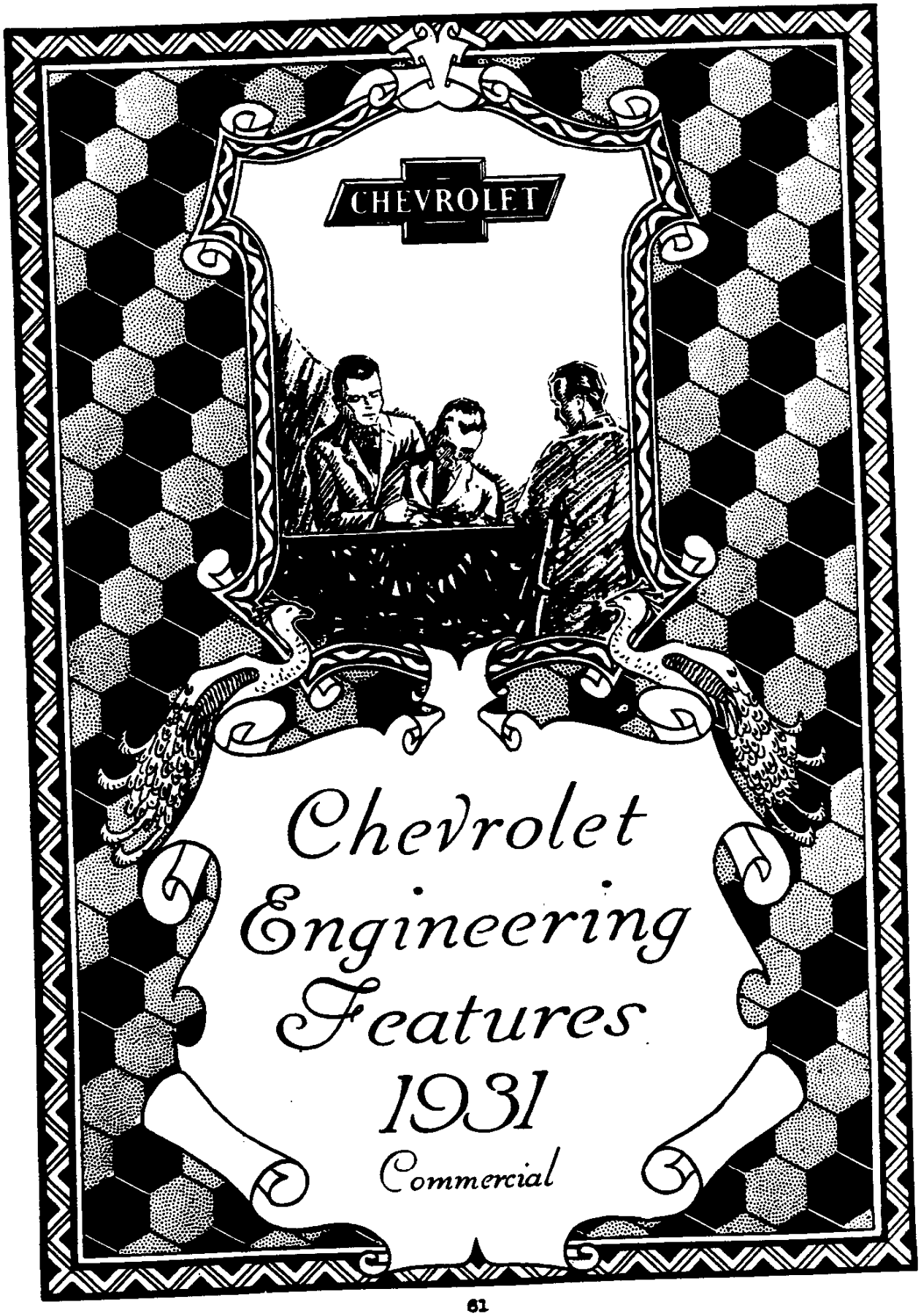




SPORT COUPE

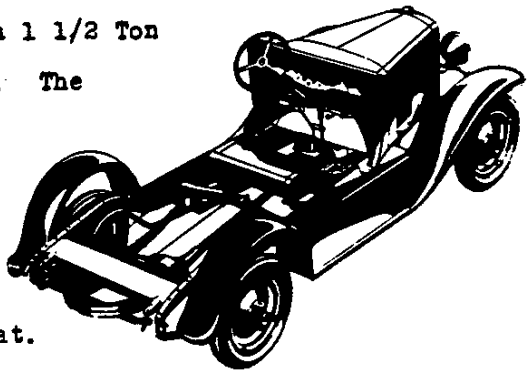
The sport coupe has five windows and a rumble seat. The increased length of the rear compartment adds to the comfort of the rumble seat. Chrome plated cowl lamps and radiator screen are furnished as standard equipment.

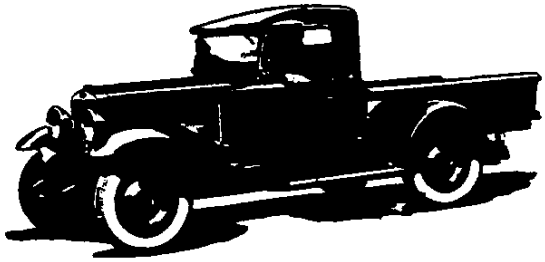



CHEVROLET
Chevrolet
Engineering
Features
1931
Commercial

Commercial

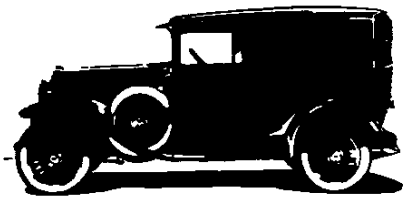
The commercial line includes a Light Delivery, a Roadster Delivery, a Sedan Delivery, a 1 1/2 Ton Truck and a Heavy Duty Truck. The Light Delivery chassis is similar to the passenger job except that it has heavier springs and the fuel tank is mounted under the seat.

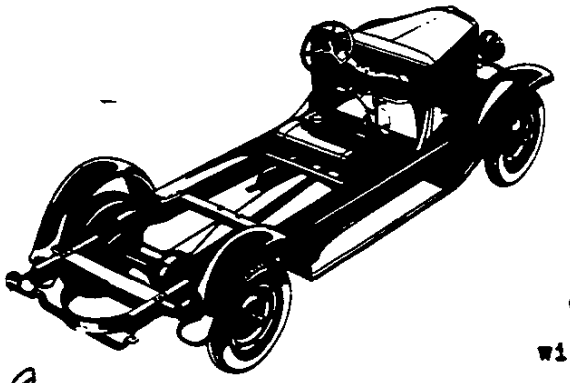




The Roadster Delivery is mounted on the Light Delivery chassis. It is equipped with a pick-up body with provision for mounting a box body on the rear.

The Sedan Delivery is built on the passenger chassis with a panel body having a closed front compartment.

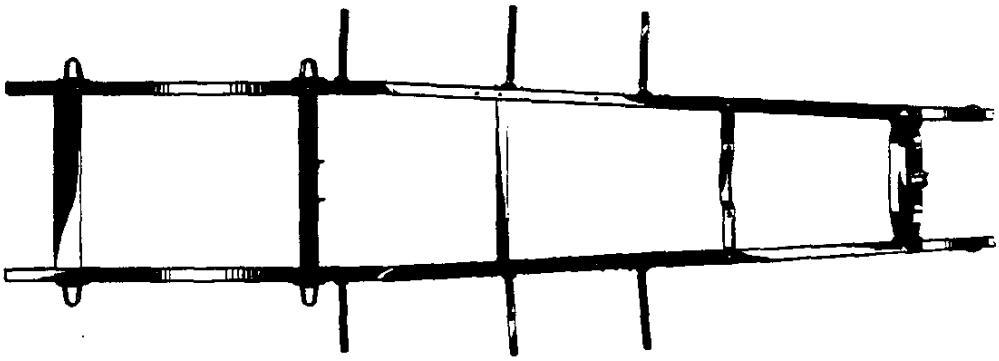




The 1 1/2 Ton Truck chassis has a wheelbase of 131 inches and is equipped with single disc wheels. The Heavy Duty Truck chassis has a wheelbase of 157 inches and is equipped with dual rear wheels.

Frame

The frame in the 131 inch chassis has been strengthened by the addition of channel section reinforcements inside of both side rails between the second and third cross members. These reinforcements are riveted to the upper and lower flanges and to the webs of the side rails.



The second cross member has been completely redesigned. It is wider, deeper and of channel section with stiffening flanges at the bottom. This cross member also serves as a support for the fuel tank.

The 157 inch frame is much heavier and stronger than the shorter job. The side rails are 7/32 thick and have a depth of 7 inches with flanges 2 3/8 wide. An additional cross member is introduced, which not only serves to strengthen the frame structure but provides a means for mounting the propeller shaft support. This cross member is of channel section with wide gussets at its upper and lower flanges.

Comparative Specifications

	1930	1931 (131")	1931 (157")
Side Rail depth	6	6	7
Side Rail width	2 1/4	2 1/4	2 3/8
Side Rail thickness	5/32	5/32	7/32
Side Rail Reinforcement	None	1/8 channel	None
Number of Cross Members	5	5	6
Second Cross Member Section	Angle	Flanged horizontal channel	Vertical channel
Fourth Cross Member Section	None	None	Horizontal channel.

Front Axle

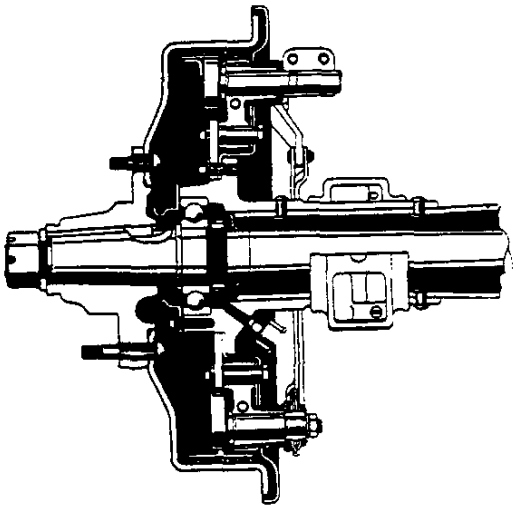
A heavy duty front axle has been provided for the trucks. This includes heavier and stronger I beam, steering knuckles, steering arms, king pins and thrust bearings.

Comparative Specifications

	1930	1931
I Beam section at center	1 3/4 x 2 7/32 web	2 x 2 1/4 5/16 web
I Beam section at outer end	1 7/16 x 1 13/16	1 3/4 x 1 13/16
I Beam material	#1035 steel	#1045 steel
Knuckle diameter at inner bearing	1 3/16	1 5/16
King Pin diameter	.733	.921
Number of balls in thrust bearing	14	16

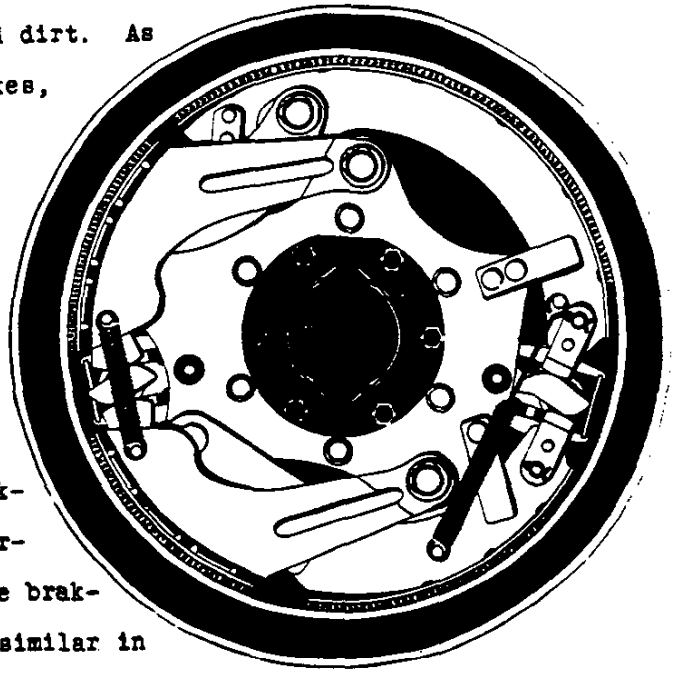
Rear Axle

The outer end of the rear axle has been redesigned to make provision for dual wheel equipment and to incorporate 16 inch internal brakes.

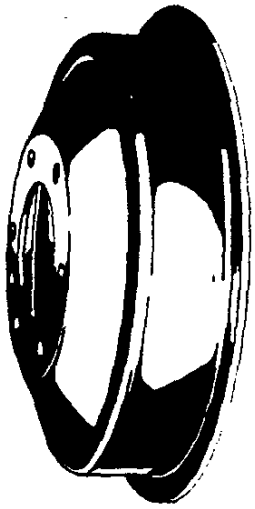


The outer end of the axle shaft is increased 45 percent in sectional area. The wheel bearing is larger, with a greater number of larger balls. The hub flange and all of its related parts are also correspondingly larger and stronger.

The rear brakes are of the four shoe internal expanding type. They are fully enclosed and protected from water and dirt. As in the passenger brakes, the upper and lower shoes are used for service braking and the two short, front shoes for parking. The long service shoe is most effectfive for forward braking and the short service shoe for reverse braking. The shoes are similar in design to the passenger parts and are actuated by cams contacting



roller sectors. The long shoe is articulated and the short shoes are pivoted. The brakes are adjustable by means of screws threaded into sleeves mounted in the two-piece stamped operating levers. movement of these screws changes the angular relation between the operating levers and the involute-faced adjusting levers.



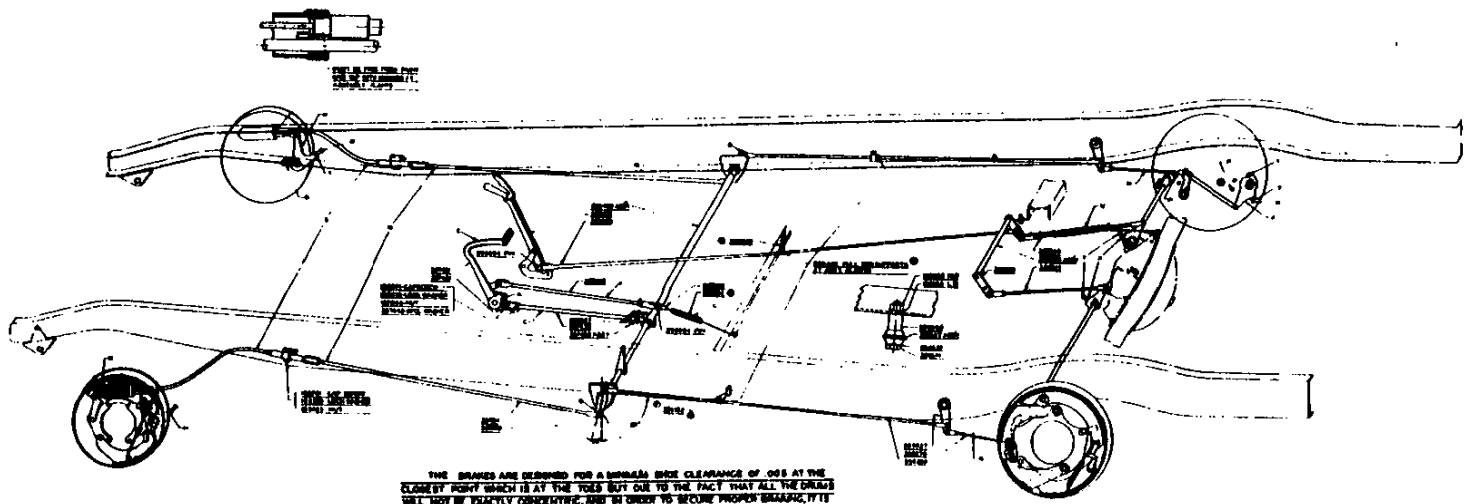
All vital parts of the brakes which are exposed to the weather are protected by cadmium plating.

The rigidity of the brake drums has been increased by the addition of a stiffening flange one inch wide.

Comparative Specifications

	1930	1931
Axle Shaft:		
Diameter at small end of taper	1.410	1.772
Diameter inside of bearing	1.670	2.000
Wheel Bearing:		
Inside diameter	1.772	2.165
Outside diameter	3.937	4.528
Width	.984	1.063
Diameter of balls	21/32	23/32
Number of balls	12	13
Service Brakes:		
Type	External contracting	Internal expanding
Diameter	12 1/2	16
Operation	Lever	Cam
Lining type	Woven	Semi-moulded.

	1930	1931
Lining thickness	3/16"	1/4
Lining width	2	2 1/2
Adjustment	Nuts	Lever & Screw
Total lining area	148 sq.in.	120 sq.in.
Emergency Brakes:		
Diameter	12"	16"
Lining type	Woven	Semi-moulded
Lining thickness	5/32	15/64
Lining width	1 3/4	2 1/2
Adjustment	None	Lever & Screw
Total lining area	116.7 sq.in.	62.5 sq.in.
Rear Brake Drum:		
Inside diameter	12"	16"
Flange	None	1" radial.



THE BRAKES ARE DESIGNED FOR A MINIMUM SHOE CLEARANCE OF .005 AT THE CLOSEST POINT WHICH IS AT THE TOES BUT DUE TO THE FACT THAT ALL THE DRUMS WILL NOT BE EXACTLY CONCENTRIC AND IN ORDER TO SECURE PROPER BRAKING, IT IS OFTEN NECESSARY TO ADJUST THE SHOE CLEARANCE SO THAT THE TOES OF THE SHOES JUST TOUCH THE HIGH SPOTS ON THE DRUMS THIS IS NOT SERIOUS AS THE CLEARANCE WILL SOON ADJUST ITSELF.

TO SET UP PROCEED AS FOLLOWS

1 CHECK THE FRONT WHEEL BEARINGS TO INSURE THAT THEY ARE NOT LOOSE

2 SET BRAKE PEDAL STOP 'A' SO THAT WHEN PEDAL IS IN RELEASED POSITION IT WILL GIVE A 6" EFFECTIVE THROW FOR LEFT DRIVE AND 7" FOR RIGHT DRIVE. ADJUSTING CROSS SHAFT BRACE 'C' TO A LENGTH THAT WILL PERMIT FREE OPERATION OF CROSS SHAFT

3 SET THE CROSS SHAFT OUTER LEVERS 'B' SO THAT THEY MAKE AN ANGLE OF 22° FROM THE VERTICAL WITH THE PEDAL

4 SET THE BRAKE PEDAL 'E' AGAINST ITS STOP AND ADJUST THE PEDAL PULL ROD 'F' TO THE DETERMINED LENGTH HOOK UP THE PULL BACK SPRING 'G'

5 WITH THE BRAKE CAM LEVERS 'M' & 'J' AGAINST THEIR STOPS 'H' & 'L' ADJUST THE FRONT RODS 'K' AND REAR RODS 'N' TO THEIR PROPER LENGTHS. THE FRONT CABLE 'I' MUST BE ADJUSTED SO THAT THERE IS NO SLACK IN IT THIS IS ACCOMPLISHED BY PULLING BACK ON THE REAR END OF THE CABLE SO THAT THE PULL DOES NOT QUITE MOVE THE CAM LEVER 'M' ON THE FRONT BRAKE

6 LOOSEN ALL THE CENTRALIZER CLAMP BOLTS 'O' & 'P' MAKING SURE THE CENTRALIZER IS FREE TO MOVE BY LIGHTLY TAPPING THE CAM LEVERS WITH A HAMMER OR WRENCH GIVE THE BRAKE PEDAL A MODERATE PUSH AND CLAMP UP THE CENTRALIZERS WITH PRESSURE ON PEDAL WHILE RE-TIGHTENING THE CENTRALIZER CLAMP BOLTS BE SURE THAT THE CENTRALIZER DOES NOT MOVE WHILE DOING THIS - CENTRALIZING CAN ALSO BE ACCOMPLISHED BY TIGHTENING THE ADJUSTING SCREWS 'R' UNTIL THE DRUMS DRAG HEAVILY TIGHTEN CENTRALIZER CLAMP BOLTS AND BACK OFF ADJUSTING SCREWS

7 LOOSEN THE CHECK NUTS 'T' ON THE CAM LEVERS 'H' & 'J' AND THEN TURN THE SCREWS TO THE RIGHT UNTIL THE SHOES DRAG VERY LIGHTLY ON THE DRUMS TIGHTEN CHECK NUTS

8 TRY THE BRAKES FOR EQUAL BRAKING LEFT AND RIGHT AND SLIGHTLY BLACK OFF THE BRAKE WHICH PULLS THE HARDER AFTER THIS IT IS ONLY NECESSARY TO TURN THE ADJUSTING SCREWS TO TAKE UP WEAR IN BLACKING OFF AN ADJUSTMENT TURN THE ADJUSTING SCREWS TO THE LEFT AND THEN APPLY PRESSURE ON THE PEDAL TO INSURE THE SLACK BEING TAKEN UP IN THE ADJUSTING LEVERS

9 AFTER 2000 TO 10000 MILES ACCORDING TO THE TYPE SERVICE THE BRAKES ARE SUBJECTED IT WILL BE NECESSARY TO RE-CENTRALIZE THE BRAKES THIS IS DONE THE SAME AS IN PARAGRAPH 6 BE SURE FRONT WHEEL BEARINGS ARE NOT LOOSE WHEN ADJUSTING FRONT WHEEL BRAKES

10 SETTING UP EMERGENCY BRAKES - DISCONNECT PULL BACK SPRING 'V' AT THE INSIDE LEVERS 'V' SO THAT THE EYES ARE 2 1/2" APART THE DIFFERENTIAL CARRIER SET THE EMERGENCY BRAKE CROSS SHAFT SO THAT THE LEVERS ARE 90° FROM THIRD CROSS MEMBER ADJUST REAR RODS 'X' TO THE REQUIRED LENGTH SET HAND BRAKE LEVER IN EXTREME FORWARD POSITION ADJUST ROD TO THE REQUIRED LENGTH THEN HOOK UP PULL BACK SPRING TO ADJUST, LOOSEN CENTRALIZER CLAMP BOLTS 'W' MAKING SURE THE CENTRALIZER IS FREE TO MOVE BY TAPPING ON SHAFT CONNECTING COLLAR PULL BACK HAND BRAKE LEVER WITH MODERATE PRESSURE WITH HAND BRAKE LEVER SET TIGHTEN CENTRALIZER CLAMP BOLTS RELEASE HAND BRAKE LEVER TO ITS FORWARD POSITION AND LOOSEN CHECK NUTS 'Y' TURN ADJUSTING SCREWS 'Z' ON CAM LEVERS UNTIL THE DRUMS DRAG SLIGHTLY THEN TIGHTEN CHECK NUTS TO EQUALIZE SLACK OFF THE BRAKE WHICH PULLS THE HARDER IN TAKING UP WEAR IT IS ONLY NECESSARY TO TIGHTEN THE ADJUSTING SCREWS

Brake Adjustment Diagram

Clutch

The truck clutch was increased in size and capacity during the 1930 season. The outside diameter of the facings is ten inches. The clutch facings are changed from the woven to the moulded type.

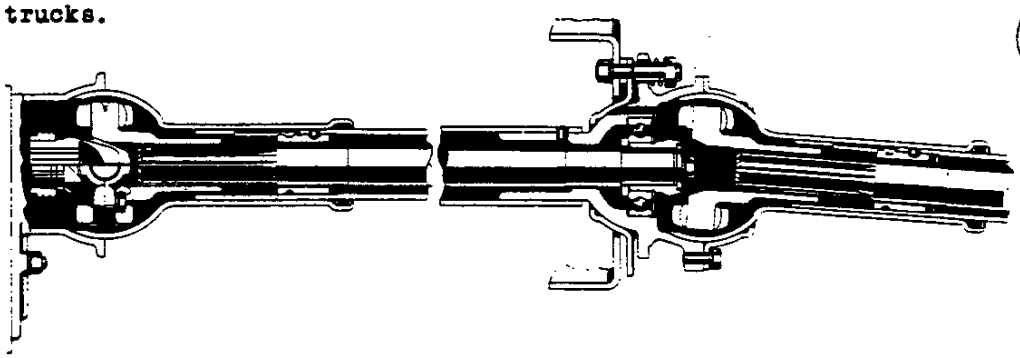
All of the improvements in the passenger car clutch previously described are also reflected in the truck clutch. The increased diameter combined with the ball bearing pilot, the swivel throwout fork mounting and the improved throwout bearing make this important unit of ample proportions and quality for heavy duty use.

Comparative Specifications

	1930	1931
Clutch Disc outside diameter	9"	10"
Clutch Disc inside diameter	6 1/4"	6 1/4"
Total Clutch friction surface	65.9 sq.in.	95.7 sq.in.
Clutch Facings	Woven	Moulded
Clutch Pilot Bearing	Bronze Bushing	Ball Bearing
Clutch Fork Mounting	Yoke Bracket and Pin	Spherical Pivot
Clutch Release Bearing	Carbon graphite. Plain surface.	Carbon graphite. Grooved surface.

Propeller Shaft

In the heavy duty truck with 157 inch wheelbase, the additional propeller shaft length is provided by a separate forward shaft unit. This unit makes up the difference of 26 inches in wheelbase, permitting the use of the same rear axle assembly on both types of trucks.



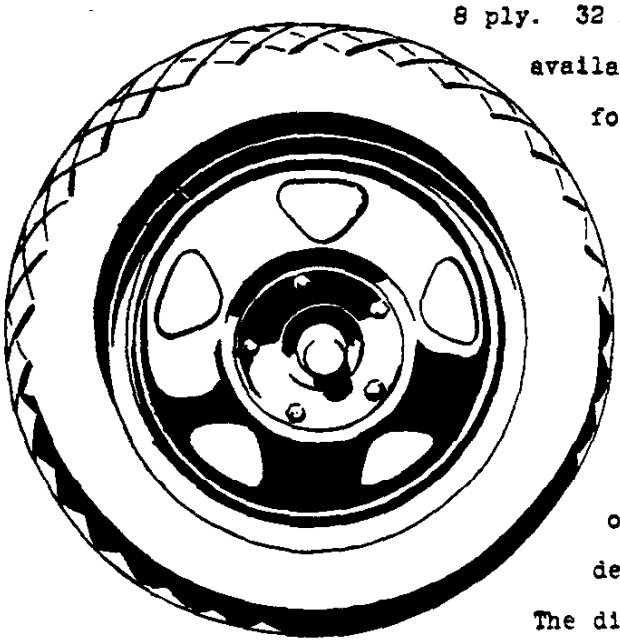
The front end of the propeller shaft extension is splined to fit the standard universal joint yoke on the rear of the transmission. At the second cross member, the extension shaft is connected to the rear axle third member by an additional universal joint. This joint is enclosed in a spherical housing resiliently mounted on the second cross member. The forward yoke of this joint runs in a ball bearing. An Alemite fitting is provided for lubrication. The lubricant is retained by packing rings in the two ball joint collars.

The forward end of the shaft runs in a bronze bushing, doweled into a tube which completes the closure of the unit.

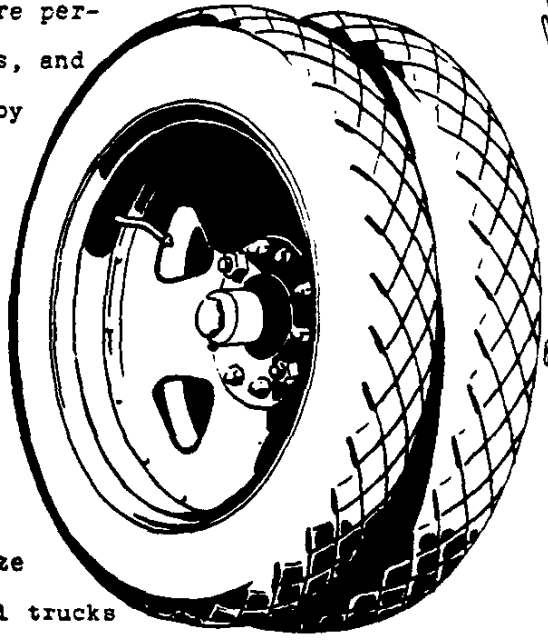
Wheels

On the Light Delivery and Roadster Delivery, disc wheels with demountable rims and 4.75 - 19, 4 ply tires are furnished. The Sedan Delivery is equipped with wire wheels the same as those furnished on passenger models. On 1 1/2 ton trucks, which are equipped with single wheels, solid disc wheels are furnished.

The front tires are 30 x 5, 6 ply; and the rear tires are 32 x 6, 8 ply. 32 x 6, 10 ply tires are available at additional cost for use on the rear wheels. All single wheel jobs have demountable rims. On heavy duty, dual wheel trucks 30 x 5, 6 ply tires are furnished on both front and rear wheels. They are mounted on disc wheels which are demountable at the hub.



The discs have five triangular holes to reduce their weight and to permit access to the curved tire valve stem. The rims are permanently riveted to the discs, and the tires are held in place by clamp rings. The six discs are interchangeable. By means of two special, externally threaded nuts, the rear outer disc may be removed without disturbing the inner disc.



The inner front wheel bearings are increased in size on all trucks. On dual wheel trucks the front hub cap is externally threaded into the hub.

Radiator

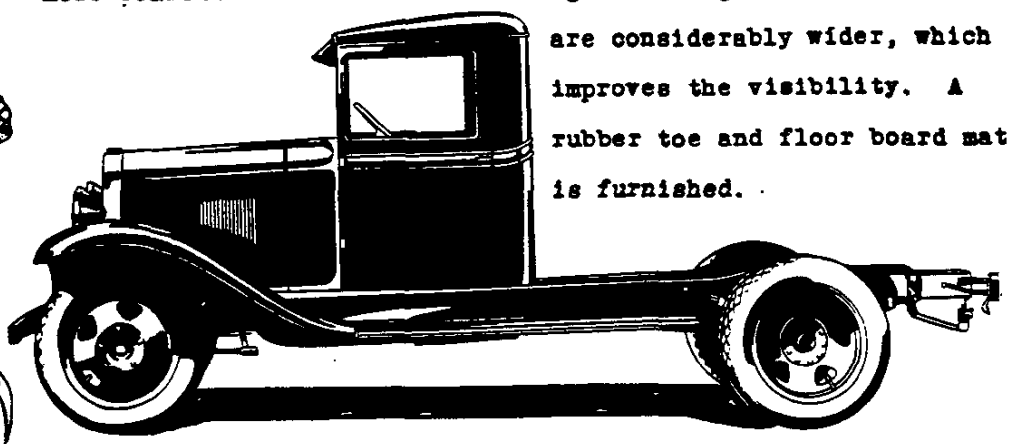
The cooling element of the 1 1/2 ton truck radiator consists of 36 sections of 5/16 inch Harrison hexagon copper core. This core is of the short-fin type and is considerably more effective. The improved four-bladed fan combined with the more effective radiator core insures adequate cooling of the engine.

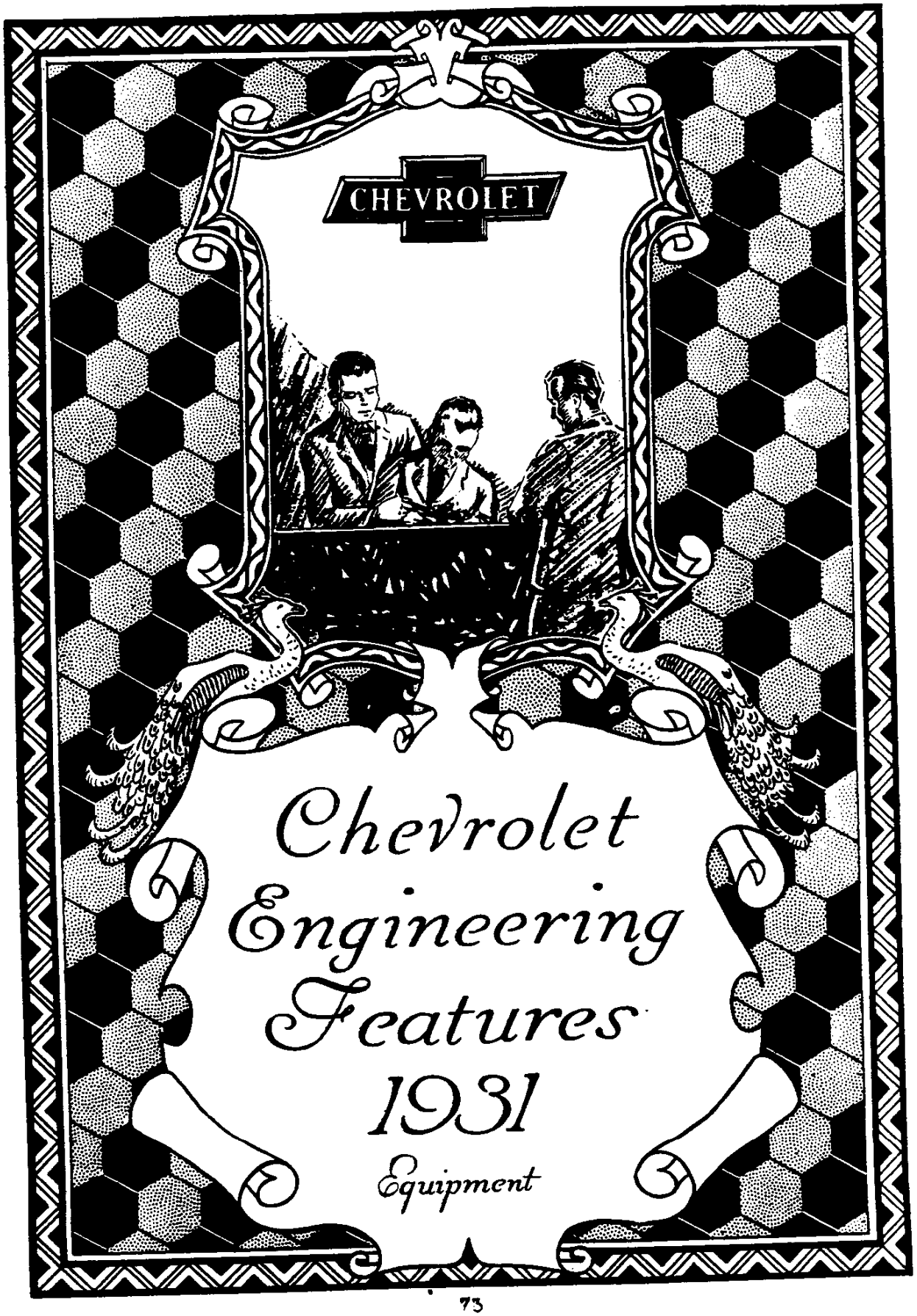
A special high duty radiator core is supplied at additional cost for use where conditions of climate or altitude necessitate increased cooling capacity. The cooling element consists of 45 sections of 1/4 inch Harrison hexagon copper core.

The radiator shell is of the same beautiful shape as in the passenger line; but it is finished in black enamel. The filler cap is also of the cam and spring type.

Bodies

The cab for use with light delivery chasses and 1 1/2 ton trucks has been redesigned. The roof is a one-piece steel stamping, well reinforced and bolted to the framing. This roof is extremely durable and much stronger than the usual wood and fabric structure. The body is wider and the seats are also wider and more comfortable because of their greater angularity. The doors are considerably wider, which improves the visibility. A rubber toe and floor board mat is furnished.




CHEVROLET
Chevrolet
Engineering
Features
1931
Equipment

TWO-STAGE SPRINGS

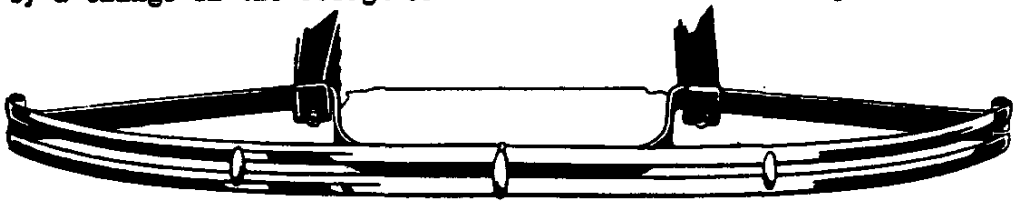
Special springs are provided for use on the trucks under conditions where the trucks are called upon to carry loads having a wide variation in weight. When carrying light loads, only the upper portion of the spring is in action and as heavier loads are applied, the upper leaves deflect to such an extent that the lower portion is also brought into action. This dual action insures more uniform riding conditions at all times.

FENDER WELL WHEEL LOCK

A lock unit is provided to prevent theft of the wheel and tire, when carried in the fender wells. This lock assembles on the brace rod at its lower end; and while it does not contact the wheel, it interferes with its removal. In the unlocked position it may be moved out of the way. A rubber bumper has recently been added to the lock unit to prevent contact with the fender and consequent noise.

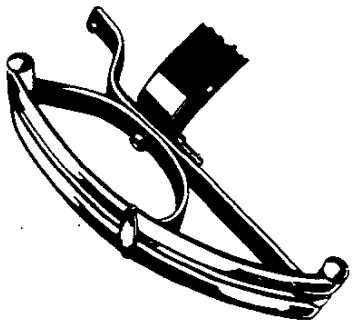
BUMPERS AND FENDER GUARDS

The appearance of the bumpers and fender guards is improved by a change in the design of the medallions and the impact bar



section. The medallions are elliptical in shape with a deep crowned section. They are finer and neater in design and are capped with rustless iron.

The impact bars are half-elliptical in section and appear much richer and finer. A full line of bumper equipment is provided, including full bumpers for front and rear as well as rear fender guards. All impact bars are chrome plated and the back bars are black enameled.



RADIATOR CAP

A beautiful, hinged radiator cap is again provided as an accessory. The ornamental design is generally the same. The internal mechanism is sturdier and more simple in design. It attaches to the radiator by a cam and spring mechanism which is permanently locked to prevent theft. The hinged cover is also secured by a cam and spring mechanism.

SEAT COVERS

A complete line of seat covers is now provided as an accessory. These covers are made of durable material of pleasing pattern. Being designed especially for the job, they fit snugly and are easily detachable for cleaning.

TIRE COVER

A fabric tire cover of attractive Burbank material is provided. A steel ring at the outer edge makes the fabric fit smoothly and snugly over the tire. This cover matches the top material of the open jobs and is therefore particularly adaptable to these models.

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