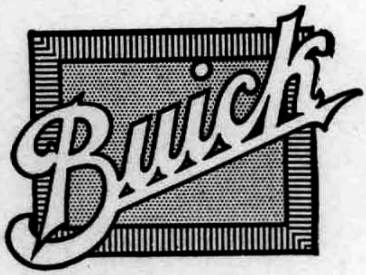
DETAILED SPECIFICATIONS

Buick

1929

BUICK MOTOR COMPANY
DIVISION OF GENERAL MOTORS CORPORATION FLINT, MICH.



1929 MODELS

Detailed Specifications

This book is issued by the sales department of Buick Motor Company for the information of the sales and service departments of Buick branches, distributors and dealers.

AUGUST 1, 1928

PRINTED IN U. S. A.

1929 Models

116″ SERIES

29-20	5-Passenger Two Door Sedan
29-25	5-Passenger Sport Touring
29-26	2-Passenger Business Coupe
29-26S	4-Passenger Sport Coupe
29-27	5-Passenger Four Door Sedan
Engine	3 5/16″ Bore x 4 5/8″ Stroke
Piston Displacement	239 cu. in.
Rated Horsepower	26.33 S.A.E.
Actual Horsepower	74 at 2800 R.P.M.
Tires	30 x 5.50 low pressure
Turning Circle	38 ft.
Wheel Base	115 3/4″
Tread	Front 56″, Rear 58″
Braking Area, Service Brakes	270 sq. in.
Gas Tank Capacity	16 gallons
Gear Ratio—Model 25	4.45 to 1
Models 26-26S	4.63 to 1
Models 20-27	4.9 to 1

121″ SERIES

29-44	4-Passenger Roadster
29-41	5-Pass. Four Door Close Coupled Sedan
29-46	2-Passenger Coupe
29-46S	4-Passenger Coupe
29-47	5-Passenger Four Door Sedan
Engine	3 5/8″ Bore x 5″ Stroke
Piston Displacement	309 cu. in.
Rated Horsepower	31.54 S. A. E.
Actual Horsepower	90.5 at 2800 R.P.M.
Tires	32 x 6.50 low pressure
Wheel Base	120 3/4″
Tread	Front 56″, Rear 58″
Turning Circle	42 ft.
Braking Area, Service Brakes	350 sq. in.
Gas Tank Capacity	19 gallons
Gear Ratio—Model 44	4.07 to 1
Models 46-46S	4.45 to 1
Models 41-47	4.63 to 1

129″ SERIES

29-49	7-Passenger Touring
29-50	7-Passenger Sedan
29-50L	7-Passenger Imperial Sedan
29-51	5-Passenger Four Door Brougham
29-54CC	4-Passenger Convertible Coupe
29-55	5-Passenger Sport Touring
29-57	5-Passenger Four Door Sedan
29-58	5-Passenger Coupe
Engine	3 5/8″ Bore x 5″ Stroke
Piston Displacement	309 cu. in.
Rated Horsepower	31.54 S. A. E.
Actual Horsepower	90.5 at 2800 R.P.M.
Tires	32 x 6.50 low pressure
Wheel Base	128 3/4″
Tread	Front 56″, Rear 58″
Turning Circle	44 ft.
Braking Area, Service Brakes	350 sq. in.
Gas Tank Capacity	19 gallons
Gear Ratio—Models 50-50L-51-57-58	4.63 to 1
Models 54CC-49	4.45 to 1
Model 55	4.07 to 1

Outstanding Improvements

ENGINE

The engine on both the 116″ Series and the 121-129″ Series has been redesigned with larger bore and stroke with a consequent increase in power. The increase is shown by the following tables:

116″ Series

	1928	1929
Bore and Stroke	3 1/8″ x 4 1/2″	3 5/16″ x 4 5/8″
Displacement	207 cu. in.	239 cu. in.
Rated H.P.	23.44	26.33
Actual H.P. at 2800 R.P.M.	63	74

121-129″ Series

	1928	1929
Bore and Stroke	3 1/2″ x 4 3/4″	3 5/8″ x 5″
Displacement	274 cu. in.	309 cu. in.
Rated H.P.	29.4	31.54
Actual H. P. at 2800 R.P.M.	77	90.5

CRANKSHAFT

The crankshaft has been increased in size throughout, using heavier counter weights and torsion balancer to insure maximum smoothness.

116″ Series

Main Bearings increased from 2 1/4″ to 2 3/8″.
Crank Pins increased from 2″ to 2 1/8″.

121-129″ Series

Main Bearings increased from 2 3/8″ to 2 1/2″.
Crank Pins increased from 2 1/4″ to 2 3/8″.

	116″ Series	121-129″ Series
Weight Crankshaft Assembly	86 lbs.	106 lbs.
Weight Torsion Balancer Assembly	6 lbs. 10 oz.	10 lbs.

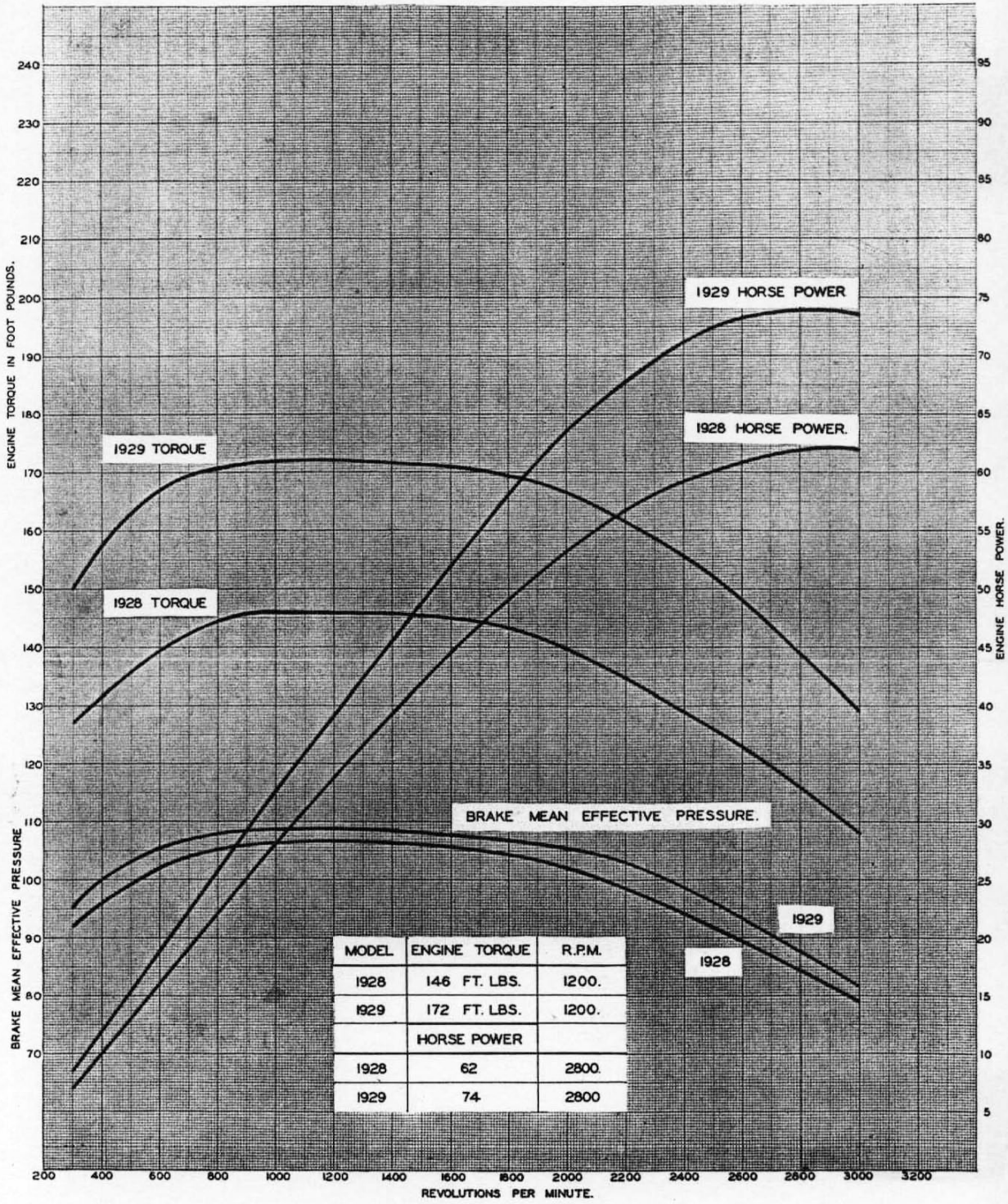
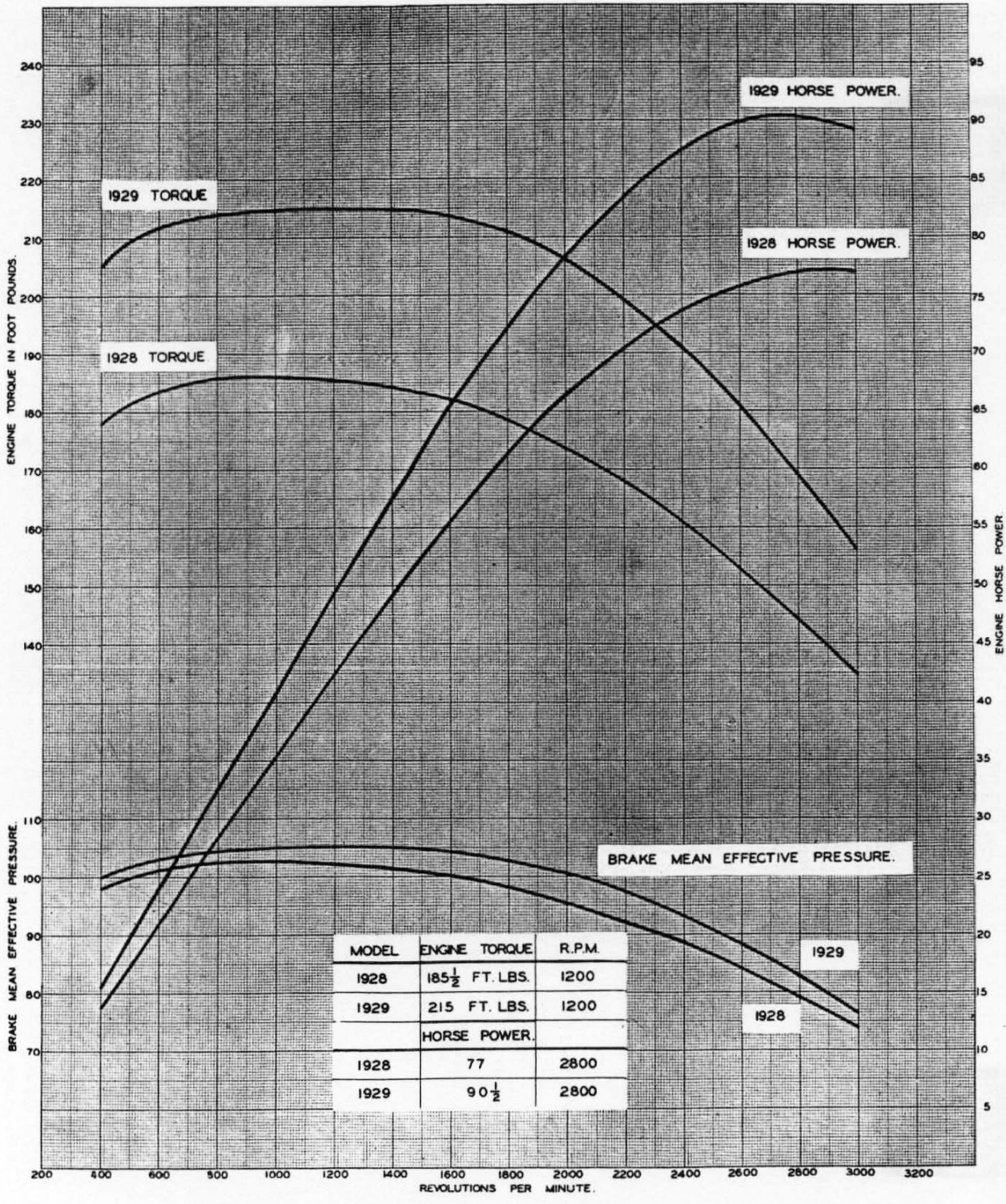


Fig. 1. Comparison of Engine Horse Power, Torque and Brake Mean Effective Pressure between 1928, 115″ Series and 1929, 116″ Series.



MODEL	ENGINE TORQUE	R.P.M.
1928	185½ FT. LBS.	1200
1929	215 FT. LBS.	1200
	HORSE POWER.	
1928	77	2800
1929	90½	2800

Fig. 2. Comparison of Engine Horse Power, Torque and Brake Mean Effective Pressure between 1928, 120-128″ Series and 1929, 121-129″ Series.

MAIN BEARINGS

Steel backed bearings are used both bottom and top on all models. Bearing sizes have been increased because of increase in horsepower.

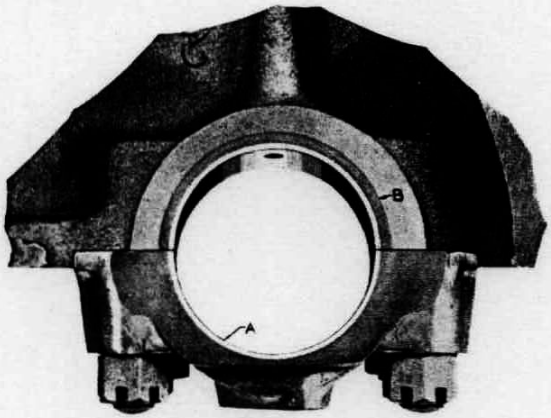


Fig. 3. 1928 Construction. A—Babbitt, B—Bronze.

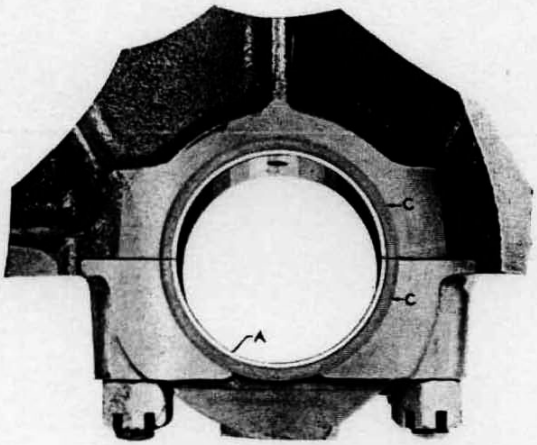


Fig. 4. 1929 Construction. A—Babbitt. C—Steel.

CONNECTING RODS

Connecting rods have been made stronger throughout because of the increased size of the engines. The length has been increased on the 121-129″ Series from 10 61/64″ to 11 1/4″ while that of the 116″ Series remains the same, 10″.

Connecting rod bolts have been increased in diameter from 3/8″ to 7/16″ giving 30% increase in strength.

CAMSHAFT AND VALVE GEAR

The cam contour has been changed to give quieter valve action, to reduce valve spring pressure, to reduce spark rap and to improve valve timing for greater power.

ROCKER ARM BUSHINGS

Babbitt lined steel backed bushings are used instead of brass in the rocker arms to lessen the tendency of the shaft to wear or score.

VALVES

Both intake and exhaust valves in the 116″ Series have been increased in clear diameter from 1 7/16″ to 1 9/16″. Valves in the 121-129″ Series remain the same size as in 1928 Models.

PISTON PINS

Piston pins have been increased in diameter as follows:

116″ Series from 3/4″ to 7/8″.
121-129″ Series from 7/8″ to 15/16″.

OIL CONTROL RINGS

On the 116″ Series the oil control ring has been increased in width from 1/8″ to 3/16″. This width permits the use of the double slotted type for more efficient oil control.

OIL PUMP

Capacity increased 21% by use of gears 1 1/16″ wide. Pump body made of one single casting. Driving shaft one piece, no Oldham coupling used. Driving gear attached to shaft by Woodruff key. No goose neck pipe used because of danger of foreign matter reaching the pump if pipe should loosen. Crankcase ventilator effectively removes water from the crankcase and prevents any chance of screen stoppage due to ice.

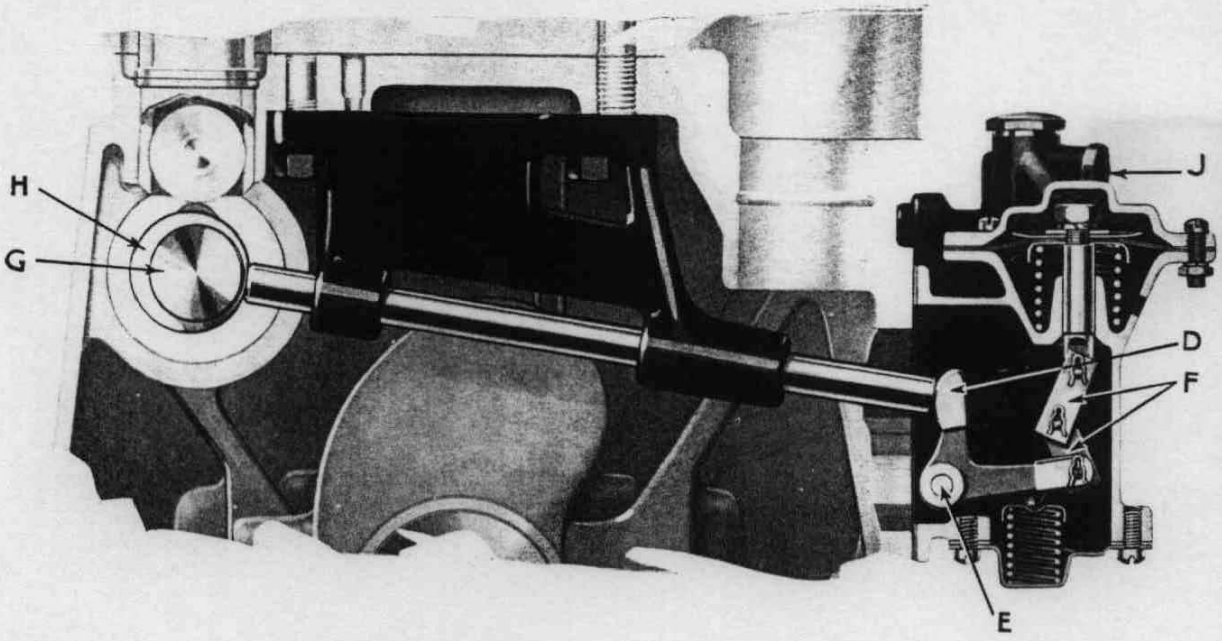


Fig. 5. Sectional View of Fuel Pump and Drive from Camshaft.

FUEL PUMP

The AC Fuel Pump has been adopted for all models. This device replaces the vacuum tank formerly used and supplies ample amount of fuel under all driving conditions. This pump is a variable stroke diaphragm type operated from an eccentric on the camshaft by means of a push rod. Integral with the pump is the fuel strainer which is fitted with two fine mesh wire screens.

The revolving eccentric (H) on camshaft (G) actuates push rod and in turn rocker arm (D) which is pivoted at (E) and which pulls linkage (F) together with diaphragm held between metal discs (B) downward against spring (C) thus creating a vacuum in pump chamber (M).

Fuel from the main tank will enter at (J) through strainer (K) and suction valve (L) into pump chamber (M). On the return stroke, the pressure of spring (C) pushes diaphragm (A) upward forcing fuel from chamber (M) through pressure valve (N) and opening (O) to the carbureter.

When carbureter bowl is filled, the carbureter float will close the inlet needle valve, this creating a pressure in pump chamber (M). This pressure will force

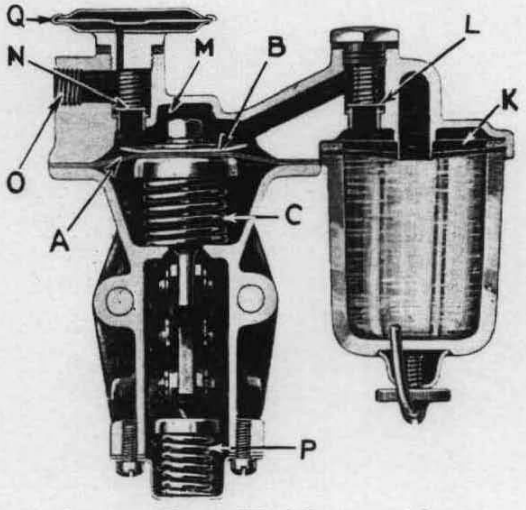


Fig. 6. Sectional View of Fuel Pump and Strainer.

diaphragm (A) downward against the pressure of spring (C) and the diaphragm will remain in the lower position until the fuel level in the carbureter bowl is lowered and the needle valve opens.

Spring (P) is merely for the purpose of keeping rocker arm (D) in constant contact with push rod to eliminate noise.

(Q) is a diaphragm type pulsator which acts to keep the flow of fuel constant.

FUEL GAUGE

The K-S Telegage which is a hydrostatic type of fuel gauge has been adopted for all models. It is simple in construction, has no moving parts to wear or bind and requires no attention or adjustment.

This device consists of three units—the Head, located in the instrument panel; the Tank Unit, located in the main fuel tank; and the Air Line, connecting these two units. It operates as follows: See Figures No. 7 to No. 10.

The head consists of a "U" tube containing a red liquid. One end of the tube is connected to the air line and the other end is open to the atmosphere.

The air tube and the air chamber of the tank unit and the air line are filled with air.

The fuel tends to rise to the same level in the tank unit as it is in the main tank which causes a pressure on the air trapped between the bottom of the tank unit and the red liquid in the head and causes that liquid to rise in the "U" tube. The pressure exerted and the consequent rise or fall of the red liquid is directly proportional to the height of the fuel in the main tank. The reading on the graduated scale at the level of the red liquid registers the amount of fuel in the main tank.

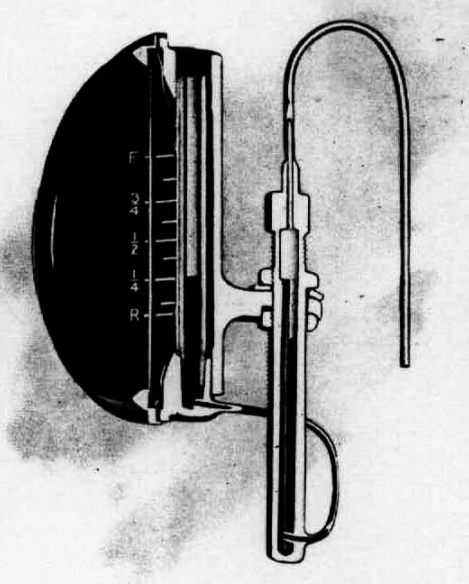


Fig. 7. Sectional View of Head.

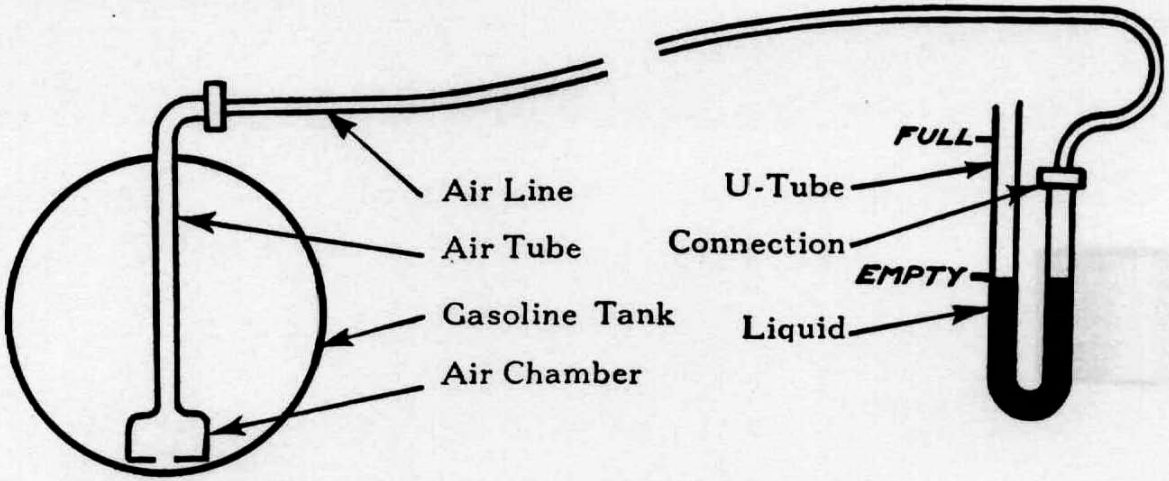


Fig. 8. Chart Illustrating Simple Telegauge—Tank Empty.

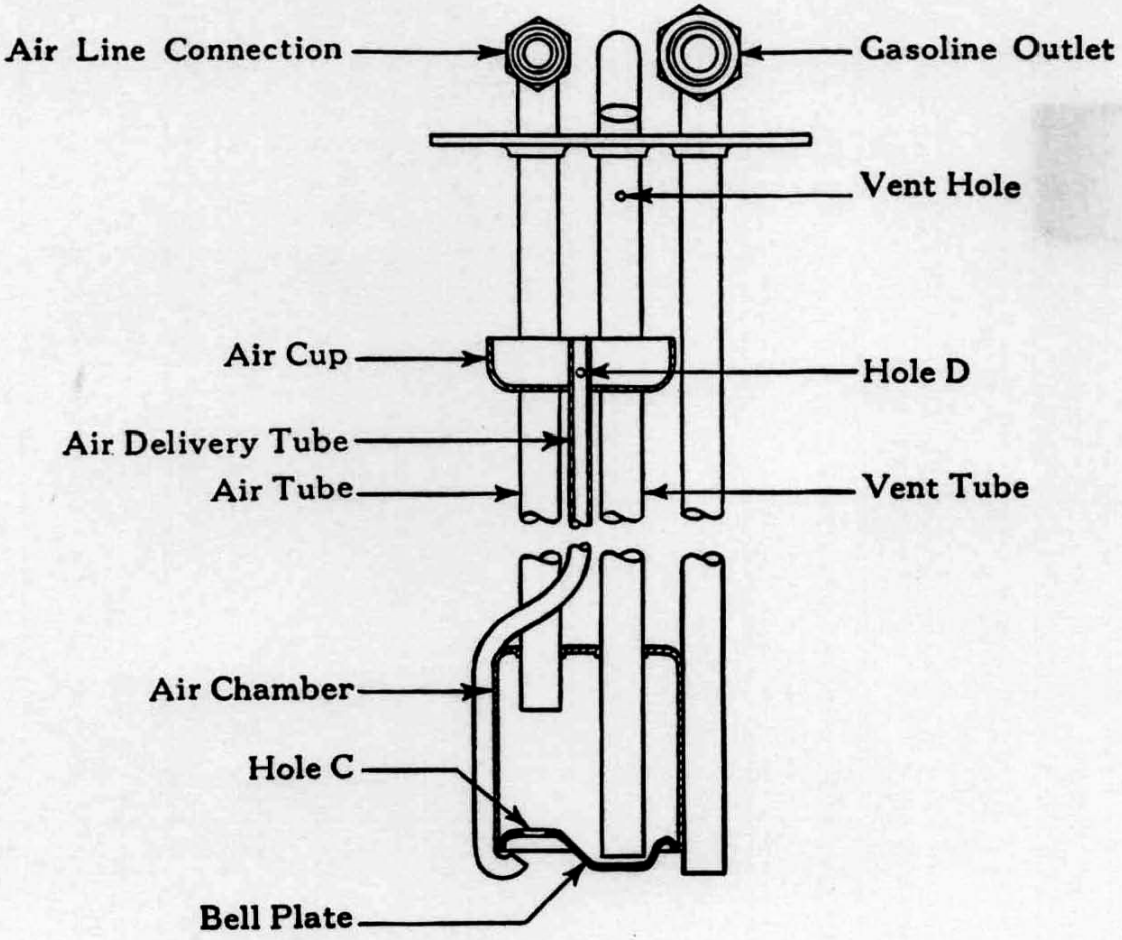


Fig. 9. Tank Unit.

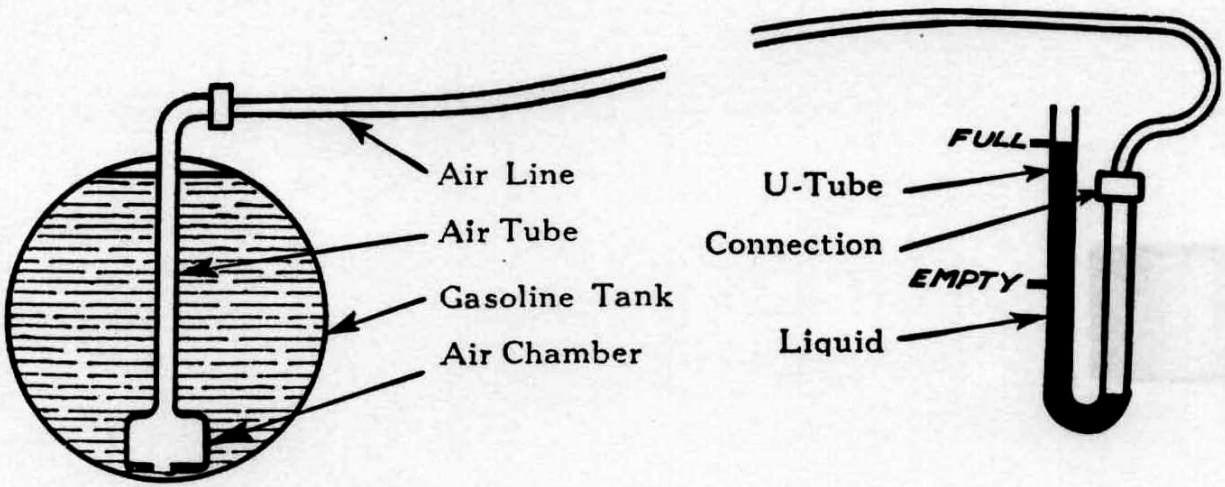


Fig. 10. Chart Illustrating Simple Telegauge—Tank Filled.

CARBURETOR

The same type of Marvel Carburetor and heat control is used as on previous models. An intermediate nozzle has been incorporated which stands beside the high speed nozzle but somewhat lower. This nozzle assists in providing correct fuel mixture throughout the range. It is non-adjustable and fuel supply for it as well as the high speed nozzle is controlled by the metering pin.

The float valve needle has been improved by the addition of a guide to assure correct seating. This should eliminate float chamber flooding. The heat control has been improved by the addition of a ratchet to the cam which will maintain the heat lever in the selected position.

EXHAUST MANIFOLD HEATER VALVE

Shaft has been increased in diameter and made of special steel. Fly made of special steel in two parts and welded to the shaft. Anti-rattle springs improved. These changes were adopted on the late 1928 production.

RADIATOR

The thickness of the core on the 121-129" Series has been increased from 2¾" to 3¼" while that of the 116" Series remains 2¼". A bayonet type filler cap fitted with a tightening screw is provided. A new type of mounting on frame cross member has been adopted.

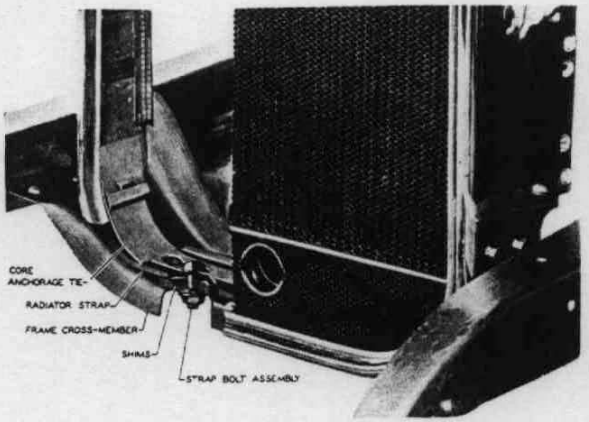


Fig. 11. Radiator Sectioned to Show Mounting.

FAN BELT

"V" type fan belt used on all models.

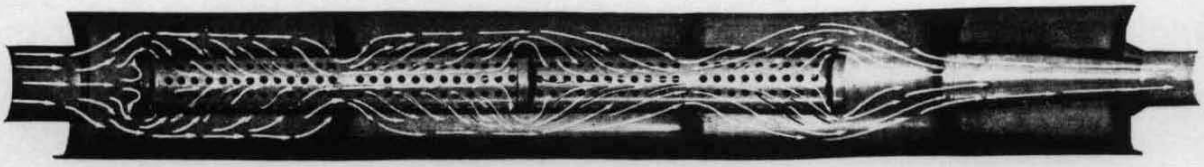


Fig. 12. Sectional View of Muffler. Arrows Indicate Path of Gas.

MUFFLER

An improved type of muffler has been adopted for all models. This construction provides a much quieter exhaust with a minimum of back pressure.

FRAME

Double drop type frame used on all models has been improved to provide greater strength and rigidity by the following changes.

Side rails have been increased in thickness of material as follows:

116" Series from $\frac{9}{64}$" to $\frac{5}{32}$".

121-129" Series from $\frac{5}{32}$" to $\frac{3}{16}$".

The top flanges of side rails have been rolled upward at the center portion.

Additional cross member has been added, just forward of the gas tank, on the 121-129" Series and the same member on the 116" Series has been made heavier.

Rear center body bracket and rear spring center hanger made as an integral drop forging to reduce flexing of the side rail.

STEERING GEAR

Improvement has been made in the steering gear to provide easier operation. In addition to the guides at the back of the half nuts, additional guides are provided for the front faces. This construction maintains proper meshing of the half nuts and the worm throughout their entire travel.

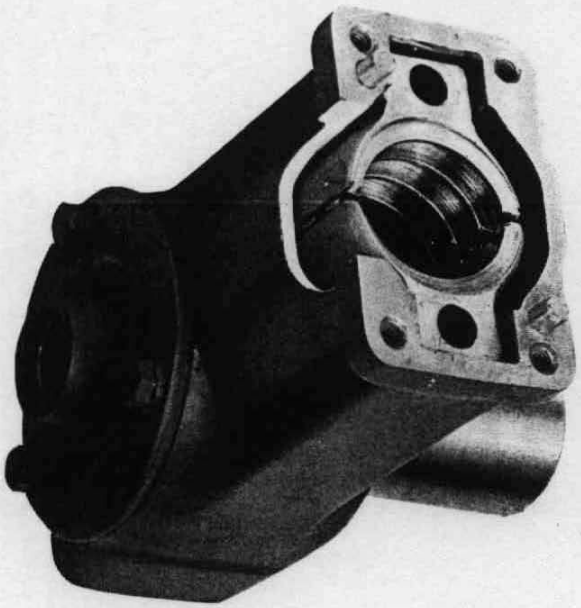


Fig. 13. 1928 Steering Gear. Half Nuts Guided at Back Only.

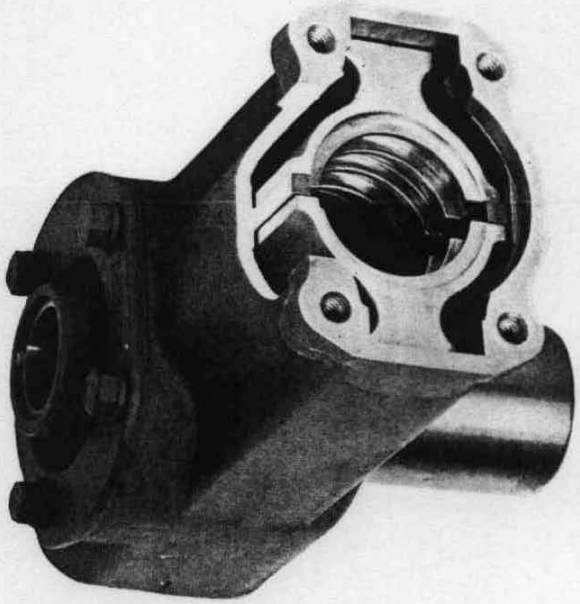


Fig. 14. 1929 Steering Gear. Half Nuts Guided at Back and Front.

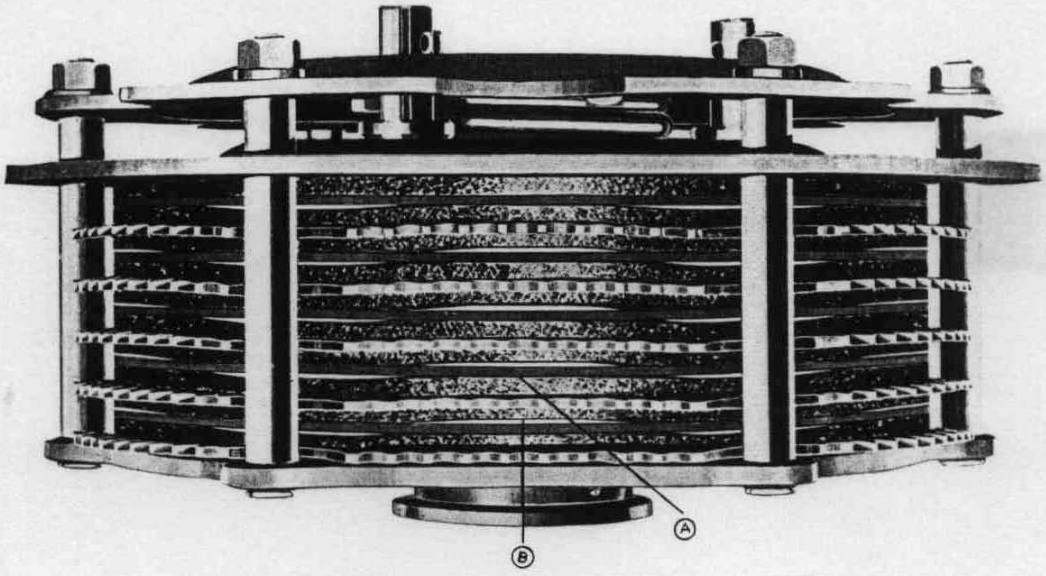


Fig. 15. Clutch Assembly Shown in Partial Engagement.
A—Portion in contact. B—Portion not yet in contact.

CLUTCH

Same sizes and construction used except that driving plates are radially waved to provide smoother engagement and to reduce tendency to grab or chatter.

UNIVERSAL JOINT

The construction of the universal joint has been improved by the use of hardened and ground bushings at the yoke pins to reduce wear and galling at the bearing surfaces.

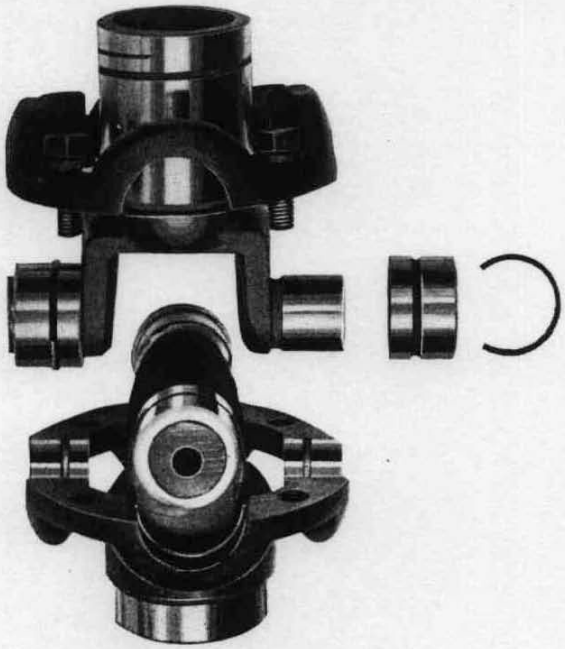


Fig. 16. Universal Joint Disassembled to Show Bushings and Locks.

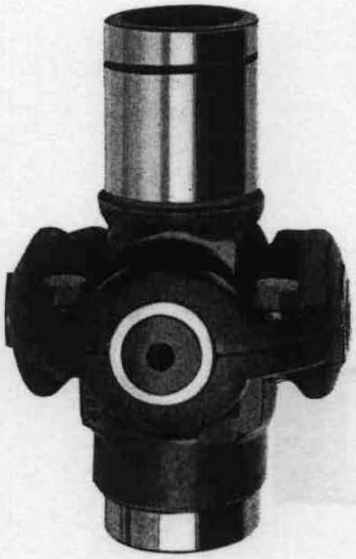


Fig. 17. Universal Joint Assembly.

REAR AXLE

A standardized type of ¾ floating axle using Hyatt High Duty rear wheel bearings and two pinion differential is used on all models. These axles are built in two sizes; one for the 116" Series and one for the 121-129" Series.

These axles are larger and stronger than the 1928 axles, because of the increased engine torque.

The following changes have been incorporated:

Axle housing has been increased in size—116" Series from 2¼" to 2½" diameter, 121-129" Series from 2½" to 2¾" diameter.

The material used in the tubes has 50% greater strength.

Axle shafts have been increased in diameter.

Differential carriers are more rigid to prevent distortion of gear alignment under load.

Differential gears are larger and made of 3½% nickel steel.

Differential pin is 1½% nickel steel, chrome plated.

Positive lubrication of differential gears is provided by means of a deflector attached to housing cover which directs oil thrown by ring gear into differential case.

Spring seat upper halves are provided with a hard rolled bronze liner to reduce wear of seat or housing.

Strut rod lugs have been made stronger.

TREAD

Tread of front wheels is 56", the same as in the 1928 Models, but the rear axle tread has been increased to 58". This was necessary because the rear seat in all Models has been increased a like amount.

TIRES

Tires on all models have been increased in section. The outside diameters remain the same as in 1928 while the wheel diameters have been decreased one inch. This increased section provides longer tire life and maintaining same outside diameter does not sacrifice road clearance.

WHEELS

Due to the decreased diameter of wheel and the increased diameter of hub, the spokes are shorter and heavier. The new type of hub shell and hub cap add materially to sturdy appearance of the wheel.

TIRE CARRIER

The tire carrier mounting is practically the same as used in 1928 but the ring on which the rim is mounted has been changed to a channel section.

This construction is much more rigid and prevents the possibility of tire and rim removal without unlocking.

BATTERIES

Greater battery capacity has been provided for all models. While the number of plates in the batteries is the same as previously used, the capacity has been increased as follows:

116" Series from 85 to 100 ampere hours.

121-129" Series from 100 to 120 ampere hours.

The greater battery capacity together with the increase in starter gear ratio provides greater cranking ability.

STARTER GEAR RATIO

The ratio of the starting gears has been increased to provide better starting torque. The ratio on both 116" Series and 121-129" Series is 13.66 to 1.

ADJUSTABLE FRONT SEATS

The front seats on all closed models, except Model 50-L and the right hand seat of Models 20 and 58, are adjustable by means of a convenient handle at front or side of seat.

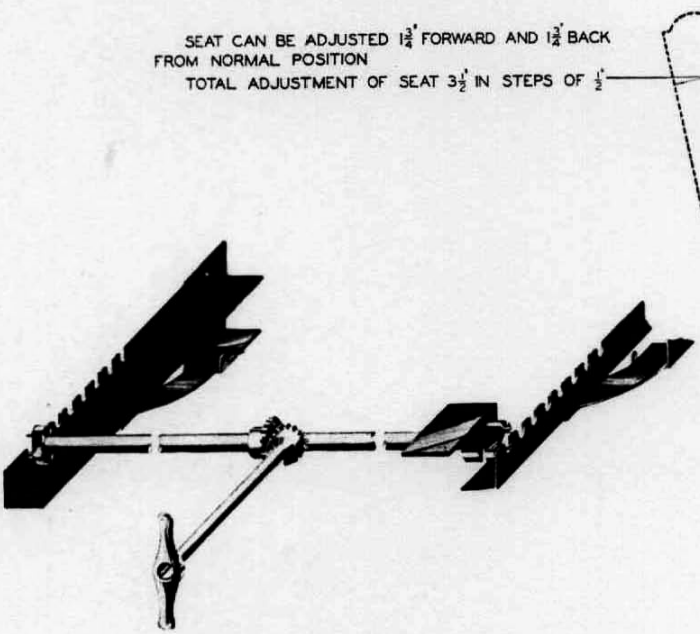


Fig. 18. Adjusting Mechanism.

Fig. 19. Front Seat Sectional View. Forward Position.

SPECIAL WHEELS

A new design of wood, wire or steel disc demountable wheels may be had as special equipment. The three types are interchangeable on the same hubs and the same wheels are interchangeable on all models of the 116, 121-129" Series.

SPECIAL TRUNK RACKS

Sturdy folding trunk racks may be had as special equipment on all models. These are designed to improve the appearance of the car when folded or when equipped with a trunk.

SPECIAL FENDER WELL MOUNTING

Special equipment of new design may be had for mounting wheels in front fenders.

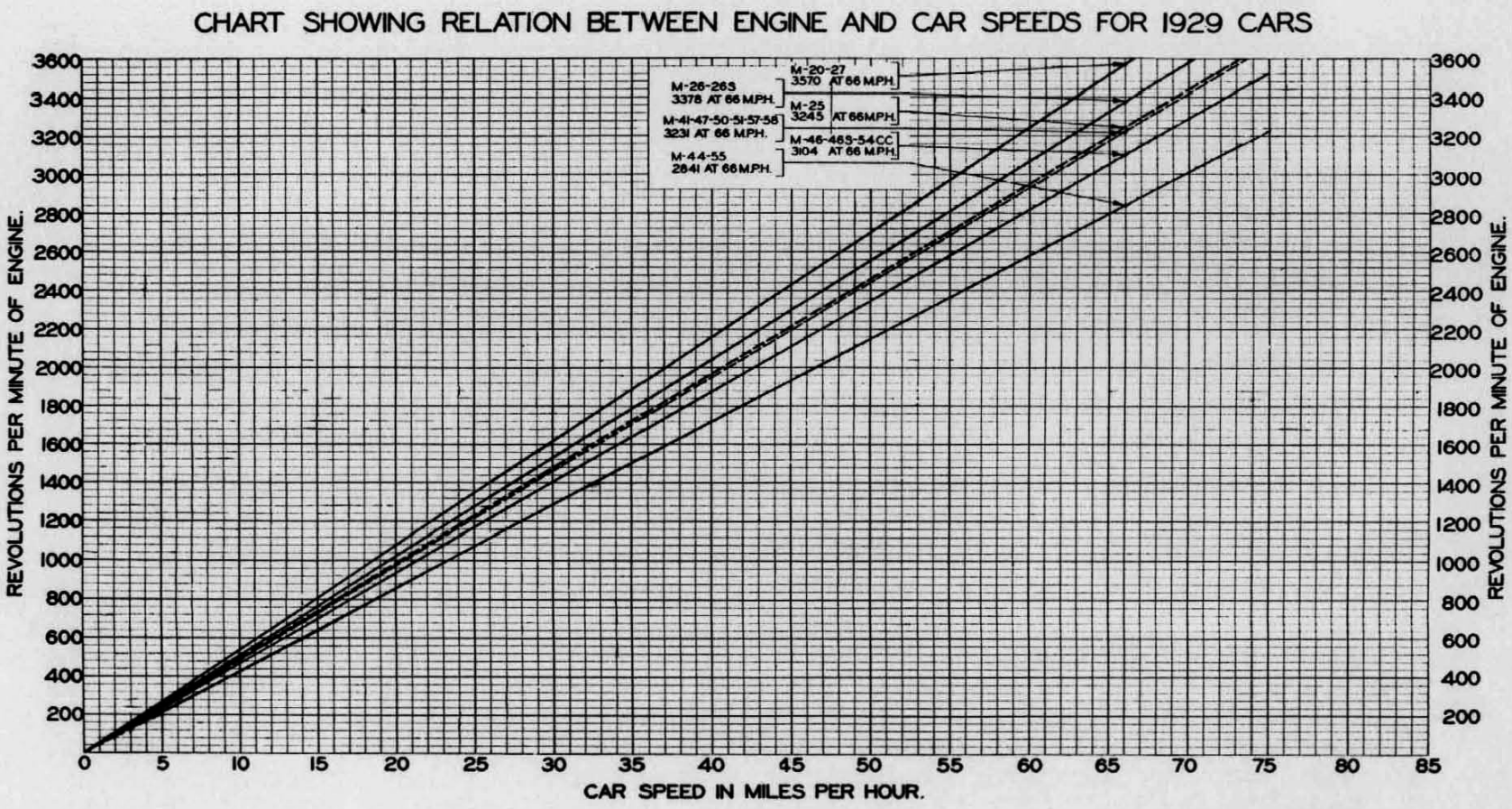


CHART SHOWING RELATION BETWEEN ENGINE AND CAR SPEEDS FOR 1929 CARS
M-20-27 3570 AT 66 M.P.H.
M-25 3245 AT 66 M.P.H.
M-46-463-54CC 3104 AT 66 M.P.H.
M-44-55 2841 AT 66 M.P.H.
M-41-47-50-51-57-58 3231 AT 66 M.P.H.
M-26-263 3378 AT 66 M.P.H.
REVOLUTIONS PER MINUTE OF ENGINE.
CAR SPEED IN MILES PER HOUR.
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85
200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600

Fig. 20.

Mechanical Specifications in Detail

ENGINE

Six cylinder, overhead valve type.

Cylinders cast enbloc with single detachable cylinder head.

Combustion chambers entirely machined to ensure uniform compression in each cylinder, and dome shaped to increase turbulence.

Engine suspension at three points with rubber insulation.

	116" Series	121-129" Series
Cylinder Size	3 5/16" Bore x 4 5/8" Stroke	3 5/8" Bore x 5" Stroke
Displacement	239.1 cu. in.	309.6 cu. in.
S.A.E. Rating	26.33	31.54
Actual Brake H.P.	74 at 2800 R.P.M.	90.5 at 2800 R.P.M.
Torque	172 ft. lbs. at 1200 R.P.M.	215 ft. lbs. at 1200 R.P.M.
Compression—(Corrected)	90 lbs. at 500 R.P.M.	82 lbs. at 500 R.P.M.
Compression Ratio	4.3 to 1	4.3 to 1
Firing Order	1-4-2-6-3-5	1-4-2-6-3-5

CYLINDER BLOCK

Cylinders are cast enbloc of special semi-steel cast iron. The water jacket extends the full length of the piston stroke.

CYLINDER HEAD

The cylinder head is a single casting of semi-steel cast iron. Combustion chambers are fully machined to provide uniform compression in all cylinders. Heads are attached to cylinder block by 15 studs and 2 bolts of 7/16" diameter.

CRANKCASE

Upper half made of cast iron, strongly reinforced by ribbing to provide rigid foundation for the engine. Lower half made of pressed steel. Bottom formed with ribs to prevent drumming and baffles placed transversely to prevent surging of oil. Oil drain plug located at lowest point of pan to ensure complete drainage of oil.

CRANKSHAFT

The four bearing crankshaft is made of drop forged, heat treated high carbon steel. Four counter weights are used to prevent deflection of the shaft due to centrifugal forces and a torsion balancer is attached between No. 1 and No. 2 crank throws to counteract vibration set up by the piston impulses. The crankshaft assembly with counter weights and torsion balancer is balanced both statically and dynamically within 3/4 ounce inch.

FLYWHEEL

Flywheels are of ample weight to ensure smooth low speed idling and proper low speed torque. Flywheels are balanced both statically and dynamically within 3/4 ounce inch. The starter ring gear is pressed on and spot welded to the flywheel.

	116" Series	121-129" Series
Diameter	15.525	15.525
Weight	58 lbs.	106 lbs.
Teeth in Gear	123	123
Teeth in Pinion	9	9
Reduction	13.66	13.66

FLYWHEEL HOUSING

The cast iron flywheel housing is divided in the horizontal plane and the two sections bolted and doweled together. The upper section is bolted and doweled to the upper crankcase and is cast integral with the two rear engine arms. Flywheel housing is faced and turned after engine assembly to ensure correct alignment of engine, transmission and clutch.

MAIN BEARINGS

Steel backed, babbitt lined bearings are used. The bearings are doweled in crankcase and bearing caps. Bearing caps are inset in crankcase to ensure proper clearance and maintain alignment.

116″ Series

Bearing Sizes	Diameter	Length
Front	2 3/8″	2 1/4″
Front Center	2 3/8″	1 5/8″
Rear Center—Thrust	2 3/8″	1 11/16″
Rear	2 3/8″	2 9/16″

121-129″ Series

Bearing Sizes	Diameter	Length
Front	2 1/2″	2 7/16″
Front Center	2 1/2″	1 13/16″
Rear Center—Thrust.	2 1/2″	1 7/8″
Rear	2 1/2″	2 23/32″

MAIN BEARING CLEARANCE

Shims are provided between upper and lower halves of bearings to allow adjustment for wear without necessity of filing the caps.

Radial Clearance **All Models**

April 1st to Nov. 1st...001″ to .002″
Nov. 1st to April 1st...0015″ to .0025″

End Clearance

Rear Center Bearing...005″ to .007″ total
Other Three Bearings 1/32″ to 1/16″ at each end.

PISTONS

Pistons are made of cast iron because of its long wearing qualities and to maintain uniform clearance under all operating conditions. Pistons are relieved at pin bosses and provided with three ring grooves all above the piston pin. The lower groove is drilled with 12-5/32″ holes for oil control.

Piston pin bosses in which pin operates are bronze bushed, and offset 3/32″ toward camshaft.

	116″ Series	121-129″ Series
Length	3 31/32″	4 5/64″
Clearance	.002″ to .003″	.0025″ to .0035″

Pistons are fitted in cylinders by use of feelers 1/4″ wide.

Piston must pass of its own weight on feeler of minimum thickness and hold its own weight on feeler of maximum thickness.

PISTON RINGS

Three concentric type, diagonally cut rings are used above the piston pin. The two upper or compression rings are 1/8″ wide and the lower or oil control type is 3/16″ wide on all models.

PISTON PINS

The hardened and ground piston pin is hollow. The hole is tapered from either end with greatest wall thickness at center giving maximum strength with minimum weight. The pin is clamped in upper end of connecting rod and oscillates in the bronze bushings in piston bosses.

	116″ Series	121-129″ Series
Diameter	7/8″	15/16″

CONNECTING RODS

Connecting rods are I-beam section, drop forged, heat treated steel. The lower or crank pin end is babbitt lined, bonded directly to the steel. Shims are provided at this bearing to permit adjustment without filing rod or cap. Bearings are fitted to crank pins with radial clearance of .002″ to .0025″ and end clearance of .007″ on all models.

	116″ Series	121-129″ Series
Length	10″	11 1/4″
Lower End Bearing—Width	1 1/2″	1 3/4″
Diameter	2 1/8″	2 3/8″
Cap Bolts—Diameter	7/16″	7/16″

CAMSHAFT

The camshaft is made of drop forged steel and case hardened. It is supported in the crankcase in four bronze bushings and driven from the crankshaft by helical gears.

Cam contour designed for quiet action.

	116" Series		121-129" Series	
Bearing sizes	Diam.	Length	Diam.	Length
Front	2 1/16"	1 9/16"	2 1/16"	1 15/16"
Front Center	2 1/32"	1 3/8"	2 1/32"	1 1/2"
Rear Center	1 15/16"	1"	1 15/16"	1 1/2"
Rear	1 25/32"	1 3/32"	1 25/32"	1 1/16"

VALVES

Valves are one piece construction. Inlet valves are made of chrome nickel steel and exhaust valves of Silchrome No. 1 steel.

	116" Series		121-129" Series	
	Inlet	Exhaust	Inlet	Exhaust
Head—Clear Dia.	1 9/16"	1 9/16"	1 7/8"	1 5/8"
Stem Dia.	3/8"	3/8"	3/8"	3/8"
Lift	21/64"	21/64"	21/64"	21/64"
Lash	.008"	.008"	.008"	.008"

VALVE LIFTERS, ROLLERS AND PINS

Valve lifters are hollow for lightness. Rollers and pins are case hardened and ground. Pins are also hollow to reduce weight and facilitate lubrication.

Lifters	All Models
Diameter	1"
Length	2 5/16"
Rollers	
Diameter	17/64"
Width	7/16"
Pins	
Diameter	1/2"
Length	3/4"

VALVE LIFTER GUIDES

Valve guides are individual iron castings. They may be easily removed with the lifters from the side of the engine.

VALVE SPRINGS

Two springs are used on each valve to provide quiet action and positive closing of valves at all engine speeds.

Spring Pressure	All Models
Valve Closed	44 to 56 lbs.
Valve Open	125 to 141 lbs.

PUSH RODS

Valve push rods are made of steel tubing for lightness and strength. Tubing is 7/16" outside diameter with wall 1/32" thick.

ROCKER ARM SHAFT

Shaft is one piece steel tubing case hardened and ground. Shaft outside diameter 7/8". Wall thickness 3/16".

ROCKER ARMS

Rocker arms are drop forged heat treated steel fitted with steel backed babbitt bushings. The end which contacts with valve stem is case hardened and ground.

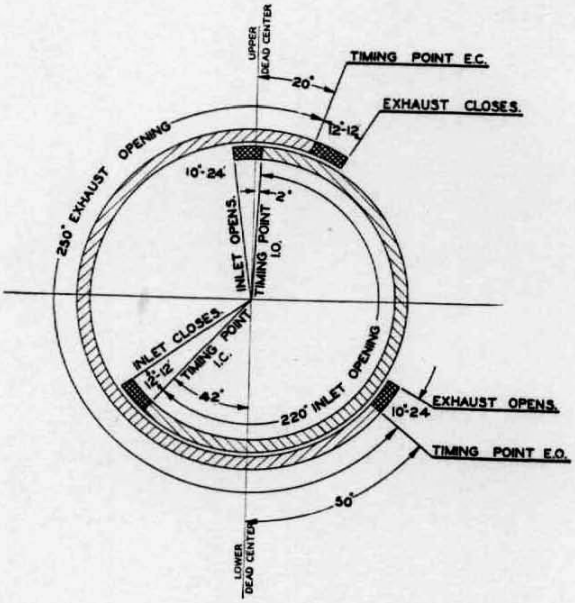


Fig. 21. 116″ Series Valve Timing Diagram.

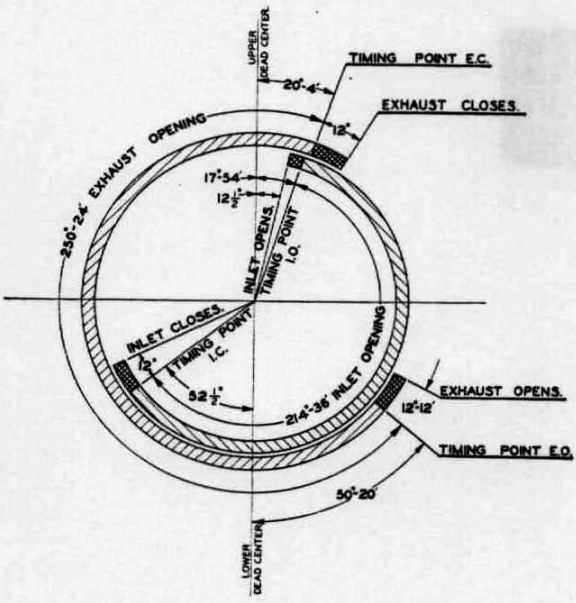


Fig. 22. 121-129″ Series Valve Timing Diagram.

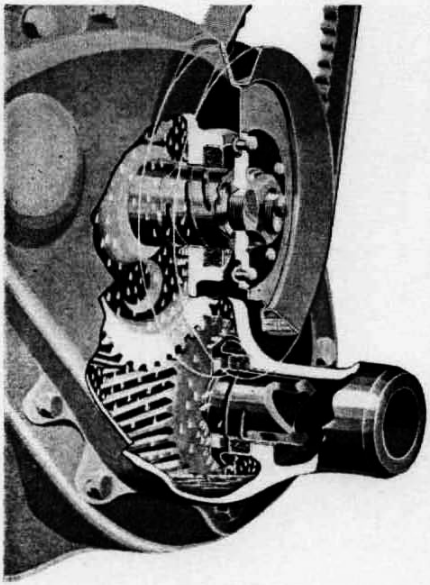


Fig. 23. Cut-a-Way of Timing Gear Case Showing Oil Seals.

TIMING GEARS

Timing gear train consists of three helical cut gears. Crankshaft and generator shaft gears are steel in mesh with a Textolite camshaft gear between the two. Width of gear face, 1⅜″ on all models.

ENGINE COVERS

Valve rocker arm mechanism and the push rod chambers are provided with pressed steel covers and cork gaskets to prevent oil leakage and to keep the compartments free from dust. The breather openings in the rocker arm cover are fitted with baffles to deflect oil vapors and eliminate seepage. Spark plug chambers are also provided with covers to prevent water from reaching plugs or wires.

COOLING SYSTEM

	116" Series	121-129" Series
Capacity	4¼ gallons	5⅝ gallons

RADIATOR

The radiator core is a Harrison Cellular type with copper water passages and copper cooling fins. A pressed steel shell encloses the core and supports it on the frame cross member to which it is attached, by two bolts.

	116" Series	121-129" Series
Thickness of core	2¼"	3¼"
Frontal area	455 sq. in.	455 sq. in.

FAN

The four blade fan is mounted on an adjustable bracket attached to the cylinder block and driven by a ⅝" wide "V" belt from a pulley mounted on end of camshaft. Fan revolves on a plain bearing which is lubricated under pressure by a gear pump which draws oil from a reservoir in the fan hub shell. A stand pipe is provided at the filler hole to indicate proper oil level when filling. Only engine oil should be used in the fan.

	116" Series	121-129" Series
Diameter of Fan Blades	17"	17¾"

WATER PUMP

The centrifugal type water pump is mounted at the rear of the generator on a rigid bracket integral with the upper crankcase. It is driven at 1½ times crankshaft speed by the generator shaft through an Oldham coupling.

The shaft is case hardened and supported in the pump body in two bronze bushings.

	All Models
Impellor Dia.	3 1/16"
Impellor Width	⅞"
Shaft Dia.	9/16"

THERMOSTATIC WATER CONTROL

Circulation of water is controlled by a thermostat attached to the upper tank of the radiator. This unit consists of a metallic bellows attached to a poppet valve. The valve remains closed and prevents circulation when water temperature is below 120°. When temperature reaches 120° the bellows expands and opens the valve which permits circulation of water through the system.

If, after the engine has been warmed sufficiently to open the thermostat valve, it should be stopped, the valve will close when water temperature falls to 120°. This will prevent thermosyphon circulation and thus retain the engine heat for a long time and assist in subsequent starting without excessive use of choke which is a large factor in the dilution of engine oil by raw fuel.

The thermostat requires no adjustment and is easily removable from the housing for inspection.

WATER TEMPERATURE GAUGE

A water temperature gauge is mounted in the instrument panel to indicate the temperature of the water in the cylinder head.

LUBRICATION SYSTEM

Engine lubricating system is of the force feed type. Oil is supplied under pressure to main bearings and through drilled passages in the crankshaft to the connecting rod bearings. A secondary line from the pump delivers oil to the oil filter and from there to the hollow rocker arm shaft.

Cylinder walls, pistons, piston pin bearings and camshaft bearings are lubricated by oil thrown from the ends of main and connecting rod bearings and through a small hole drilled through the lower end of each connecting rod which meters with the hole in crankshaft once each revolution.

Timing gears, front camshaft bearing and generator shaft bearing are lubricated by the overflow of oil from the rocker arm shaft.

Oil Capacity	116″ Series	121-129″ Series
Dry engine	7½ Qts.	9 Qts.
To refill	5½ Qts.	6½ Qts.

OIL PUMP

The oil pump is located at the lowest point of the oil pan. It consists of two gears, of 1 1/16″ face, enclosed in a one piece housing. Gears are driven from the camshaft through a one piece shaft. The driving gear is attached to the shaft by a Woodruff key. Oil pump is provided with a fine mesh screen.

	116″ Series	121-129″ Series
Oil Pressure	35 to 40 lbs.	28 to 30 lbs.

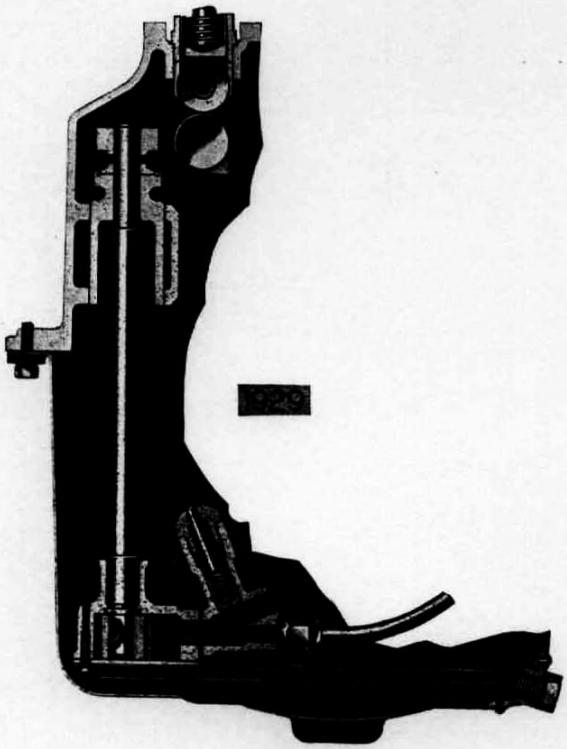


Fig. 24. Sectional View of Oil Pump and Drive.

OIL FILTER

A new sealed container type oil filter has been adopted which carries the same filtering element as used in the late 1928 models. An automatic by-pass valve is provided within the container to ensure a constant supply of oil to the rocker arm shaft even though the filter should become clogged. The filtering element is a cloth bag having 600 square inches of surface which is rolled up and supported in a wire screen cylinder.

The filter is connected in the oil line leading from the pump to the rocker arm shaft and the oil passes through the filtering cartridge under pressure. The abrasive matter carried by the oil is retained in the cloth bag. The clear oil, after passing through the filter, is forced to the rocker arm shaft and returns through an overflow pipe to the front gear case and from there to the engine pan.

One quart of oil passes through the filter per minute at a car speed of 25 miles per hour, when the filtering cartridge is new. Filter requires no attention other than a replacement after 10,000 miles of driving.

CRANKCASE VENTILATOR

The crankcase ventilator is attached to the crankcase at the left side of the engine and is made integral with the oil filler tube. The fan blows a stream of air through the funnel of the ventilator which is connected to a pipe extending below the engine side pan. This pipe has an opening into the oil filler tube. The suction created at this opening, due to the air stream passing it, draws from the crankcase the vapors which are made up of water and fuel. These vapors being ejected below the engine side pan are prevented from reaching the interior of the car.

The ventilator requires no adjustment or attention other than to keep the oil filler cover shut tight. This ventilating system does not remove all of the fuel dilution because a minimum amount is an advantage in cold weather. It does, however, prevent an accumulation of more than 20% of fuel dilution and removes all of the water under average driving conditions.

INLET MANIFOLD

The inlet manifold has a straight horizontal runner with three ports, each port feeding two cylinders. It is rigidly clamped to the cylinder head by six studs and nuts, two to each port. Special attention has been given to this manifold both in design and manufacture to ensure even distribution of gas to each cylinder.

	116″ Series	121-129″ Series
Inside diameter of manifold	1¼″	1 7/16″ to 1½″

CARBURETOR

The Marvel automatic air valve, heat controlled type carburetor is used on all models. Two adjustments are provided; one for the low speed nozzle and one for the air valve. Three nozzles are employed, namely one low, one intermediate and one high speed. The latter two nozzles are controlled by a metering pin and the air valve.

Detail	116″ Series	121-129″ Series
Air Intake Diameter	1 7/8″	2 1/8″
Air Valve Diameter	1 7/8″	2″
Air Valve Spring	No. 24-115	No. 24-114
High Speed Nozzle	No. 49-100-C-33	No. 49-100-D-28
Intermediate Nozzle	No. 49-125-A-10	No. 49-180-A-10
Low Speed Nozzle	No. 47-7	No. 47-7
Meter Pin Jet	No. 84-088	No. 84-43
Meter Pin	No. 173-528	No. 173-528
Venturi Diameter	13/32″	13/32″

CARBURETOR RISER

A double wall riser, between carburetor and inlet manifold connected to the exhaust manifold, by-passes exhaust gases between riser walls for the purpose of preheating the fuel mixture. This device assists in vaporizing the fuel and thereby reduces its consumption.

The amount of heat furnished to the riser is controlled by two valves; one located in the heat damper body between exhaust manifold and the exhaust pipe, and the other at the riser outlet to the tube extending from riser to heat damper body. These two valves are automatically and manually operated. They are connected by linkage to the carburetor throttle and are opened and closed by the corresponding opening and closing of the throttle. The automatic action of these valves may be varied to suit climatic conditions by means of lever conveniently located on the instrument panel. The throttle is located in the heat riser.

AIR CLEANER

The AC Air Cleaner prevents dust particles from entering the engine through the carburetor air intake. The suction created by the pistons draws air into the cleaner through directing vanes which give the air stream a rapid spiral rotation. Centrifugal force throws the dust particles against the walls of the cleaner and the swirling action of the air sweeps the dust from the walls and ejects it through a small opening at the bottom. The clean air stream passes through the center of the cleaner to the carburetor.

FUEL PUMP

The AC fuel pump has been adopted for all models to replace the vacuum tank.

The pump and its working parts are contained in a die-cast housing and the drive is from eccentric on the camshaft through a push rod which is supported in a bracket attached to the crankcase. The operation of this pump is explained on page 7.

FUEL STRAINER

The AC fuel strainer, mounted on the fuel pump housing, prevents dirt and water from entering the fuel pump or carburetor. The glass bowl is easily detached for cleaning.

FUEL TANK

The gasoline tank located at the rear of frame is neatly covered by sheet metal. Filler tube located at the right end of the tank is fitted with a bayonet type cover.

	116″ Series	121-129″ Ser.
Tank Capacity	16 gallons	19 gallons

FUEL GAUGE

An hydrostatic type fuel gauge has been adopted to replace the mechanical type formerly used. This gauge is illustrated and described in detail on page 8.

EXHAUST MANIFOLD

The exhaust manifold is of six port construction held to the cylinder head by 12 studs and nuts, two to each port.

EXHAUST PIPE

Exhaust pipe extends from the damper valve body to the muffler.

	116″ Series	121-129″ Ser.
Diameter	2¼″	2½″

MUFFLER

An improved type of muffler has been adopted for all models. Its design ensures effective silencing with very low back pressure. This muffler is illustrated and described on page 10.

TAIL PIPE

The muffler tail pipe extends from the muffler to the rear of the car to discharge the gases clear of the body and reduce exhaust noise.

	116″ Series	121-129″ Ser.
Diameter	1½″	1¾″

CLUTCH

The ten plate dry type clutch is a self-contained unit piloted in the fly wheel. The driving plates, which are lined on either side with frictional facings, each have 60 teeth in mesh with an annular ring gear integral with the fly wheel. These plates are formed with alternate high and low radial segments. As the clutch comes into engagement only partial contact of facings is made with the driven discs. When fully engaged the clutch spring pressure is sufficient to flatten the driving plates and give full surface contact. See page 12.

This construction gives the clutch a degree of flexibility, provides smooth engagement and eliminates the tendency of clutch to grab and chatter.

The driven plates which alternate with the driving plates each have 53 teeth in mesh with the clutch hub. Driven plates are made of high carbon steel to ensure long life. Clutch hub is drop-forged heat treated steel and is splined to the clutch shaft. The clutch shaft is supported by two ball bearings, one mounted in the front end of transmission case and the other in the end of crankshaft.

The clutch release bearing is a ball thrust type containing twelve ⅜″ diameter balls.

The only adjustment in connection with the clutch is at the clutch pedal. When clutch is engaged the pedal should clear the under side of the toe board ¼″ and

should have 1" to 1½" free travel. Toe board clearance is adjusted by means of a set screw on lower end of pedal and free pedal travel by a thumb nut on rear end of clutch release rod. Both adjustments are outside the clutch housing, making them very accessible.

	116" Series	121-129" Series
Area frictional surface	212 sq. in.	212 sq. in.
Facing size	5¾ I.D., 7¾ O.D., ⅛" Thick	5¾ I.D., 7¾ O.D., 5/32" Thick
Pedal reduction	19.2 to 1	17.3 to 1
Spring pressure	320 to 330 lbs.	370 to 380 lbs.

TRANSMISSION

Transmission is selective sliding gear type having three forward speeds and a reverse with S.A.E. standard shift.

The main shaft of high carbon heat treated steel with six splines is supported, at the front end, in a plain bronze bearing, in the rear end in a New Departure single row ball bearing. Clutch gear bearing, in front end of transmission case, is a New Departure single row ball bearing. The counter gear shaft is hardened and ground and is stationary in the case. The counter gear assembly carries two bronze bushings. Gear material is chrome nickel steel heat treated.

Transmission Bearings	116" Series	121-129" Series
Clutch Gear Bearing	No. 1209 N.D. Single	No. 1210 N.D. Single
Main Shaft—Front	15/16" Dia. 2 1/16" Long	15/16" Dia. 2 5/16" Long
Main Shaft—Rear	No. 1306 N.D. Single	No. 1307 N.D. Single
Counter Gear Assembly	2-1" Dia. 2" Long	2-1" Dia. 2⅜" Long

Transmission Gears	116" Series No. Teeth	121-129" Ser. No. Teeth	All Models Pitch
Clutch Gear	17	19	7
High and Intermediate—Sliding Gear	24	27	7
Low and Reverse—Sliding Gear	30	34	7-9
Countershaft—Constant Mesh Gears	31	34	7
Countershaft—Intermediate Gear	24	26	7
Countershaft—Low Speed Gear	18	19	7-9
Countershaft--Reverse Gear	15	15	7-9
Reverse—Idler Gear	17	19	7-9

GEAR REDUCTIONS

116″ Series

In Transmission All Models	Total at Wheels Models 20-27	Models 26-26S	Model 25
High—Direct	4.9 to 1	4.64 to 1	4.45 to 1
Intermediate—1.824 to 1	8.93 to 1	8.46 to 1	8.12 to 1
Low—3.039 to 1	14.89 to 1	14.09 to 1	13.54 to 1
Reverse—3.647 to 1	17.87 to 1	16.91 to 1	16.24 to 1

121-129″ Series

In Transmission All Models	Total at Wheels Models 41-47-50-51-57-58	Models 46-46S-54CC	Models 44-45
High—Direct	4.636 to 1	4.454 to 1	4.077 to 1
Intermediate—1.858 to 1	8.613 to 1	8.275 to 1	7.575 to 1
Low—3.202 to 1	14.844 to 1	14.262 to 1	13.054 to 1
Reverse—4.056 to 1	18.801 to 1	18.067 to 1	16.536 to 1

	116″ Series	121-129″ Ser.
Lubricant required to fill to proper level	3½ lbs.	3¾ lbs.

UNIVERSAL JOINT

The universal joint is entirely enclosed by the ball drive housing and is lubricated automatically from the transmission. The front yoke is attached to the transmission main shaft by 6 splines and locked by a nut and washer. The rear yoke is attached to the pinion shaft by means of 10 splines and supported in a bronze bushing in the driving ball.

The joint ring is fitted with hardened and ground bushings to prevent wear at the yoke pins. Bushings are locked in place by steel wire snap rings. See page 12.

	116″ Series	121-129″ Ser.
Yoke Pin, diameter	27/32″	15/16″

The universal joint assembly is interchangeable with the 1928 assembly but the individual parts are not interchangeable.

DRIVING BALL

The driving ball is connected to the torque tube by means of a flange and is supported in a two piece housing at the rear of the transmission. It is lubricated from within by oil from the transmission case.

	116″ Series	121-129″ Ser.
Diameter of Ball	4¾″	5⅛″
Flange Bolts	Four—⅜″	Six—⅜″

TORQUE TUBE

Torque tube through which both torque and drive are taken is held in alignment with rear axle housing by 5/8" diameter strut rods.

	116" Series	121-129" Series
Diameter of Tube—Inner End	2 1/2"	3 1/4"
Outer End	2 9/32"	2 1/4"
Wall Thickness	3/16"	5/32"

PINION SHAFT

Heat treated high carbon steel.

	116" Series	121-129" Series
Inner End	1 3/16"	1 3/8"
Center	1 11/32"	1 9/16"
Outer End	1 1/4" Six Spline	1 3/8" Ten Spline

PINION SHAFT BEARINGS

Two ball bearings support the pinion.

Pinion, pinion shaft and bearings are easily removable at rear of axle housing without removing axle assembly from car.

Fore and aft adjustment of pinion provided through opening at side of carrier.

	116" Series	121-129" Series
Bearing on Pinion	No. 1309 New Departure Single Row	No. 1310 New Departure Single Row
Bearing on Shaft	No. 5306 New Departure Double Row	No. 5307 New Departure Double Row

REAR AXLE

3/4 Floating type using pressed steel banjo type housing and malleable iron differential carrier on all models. Housing provided with 9/16" truss rod for additional strength.

Axle shafts removable without removing axle assembly from car.

Differential of two pinion type supported on each side by New Departure cup and cone ball bearings. Differential adjustable and easily removable from housing without removing axle assembly from car.

Ring gears and pinions are spiral bevel type.

Baffle attached to housing cover to direct a continuous flow of oil to differential gears.

	116" Series	121-129" Series
Main Housing Tube—		
Diameter	2 1/2"	2 3/4"
Wall Thickness	1/4"	1/4"
Differential Bearings	New Departure No. 0210	New Departure No. 0211
Differential Pin Diameter	7/8"	1"
Gear Ratios	Model 25—4.45 to 1	Models 44-55—4.07 to 1
	Models 26-26S—4.63 to 1	Models 46-46S-49-54CC—4.45 to 1
	Models 20-27—4.9 to 1	Models 41-47-50-50L-51-57-58—4.63 to 1
Tread	58"	58"

Fig. 25. Cut-a-Way Showing Oil Baffle.

Grease to Fill, all M	6 lbs.	6 lbs.

SPRING SEATS

Rear axle spring seats are provided with hard rolled bronze liners in upper halves to reduce wear of seats and axle tubing. End play of seats is prevented by case hardened steel blocks riveted to axle tubing.

Jack rest cast integral with spring seat.

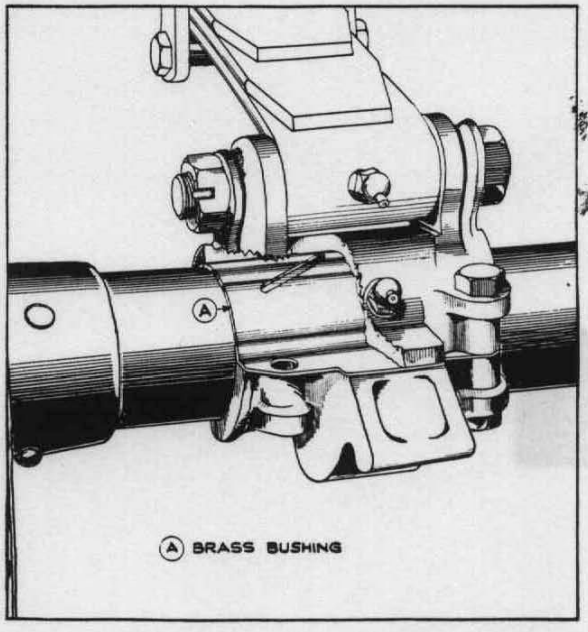


Fig. 26. Spring Seat Cut-a-Way Showing Brass Liner.

AXLE SHAFTS

Heat treated Manganese alloy steel.
10 splines at inner end.

	116" Series	121-129" Series
Diameter—		
Outer End	1 3/8"	1 17/32"
Necked Portion	1 3/16"	1 5/16"
Inner End	1 5/16"	1 15/32"

FRONT AXLE

Reverse Elliott type I-beam drop-forged and heat treated high carbon steel.

Knuckles are drop-forged, heat treated nickel alloy steel. Bearings for king pin hard rolled bronze.

I-beam section and spindle diameters on 116" Series are the same as on 1928 models.

I-beam section increased from 2¼" x 1⅞" x ¼" and spindle diameter, inner increased from 1 7/16" on 121-129" Series.

	116" Series	121-129" Series
I-Beam Section	2¼" x 1⅞" x 7/32"	2 5/16" x 2 1/16" x ¼"
Spindle Diameter—Inner	1 5/16"	1½"
Outer	¾"	15/16"
King Bolt Diameter	⅞"	1"
Thrust Bearing	17-¼" Balls	14-5/16" Balls
Tread	56"	56"
Clearance under I-Beam	9¼"	9⅜"

TIE ROD

Located back of I-beam. Adjustable ball sockets at either end.

	116" Series	121-129" Series
Tube Diameter	1"	1⅛"
Wall Thickness	⅛"	⅛"

DRAG LINK

The drag link is made of steel tubing with adjustable ball sockets at either end.

	116" Series	121-129" Series
Outside Diameter of Tubing	1"	1⅛"
Wall Thickness	⅛"	3/16"

WHEELS

Standard equipment wheels are 12 spoke, artillery type, with steel felloe. All wheels fitted with balance weights to counterbalance weight of driving lug and tire valve.

	116" Series	121-129" Series
Spoke Width	1⅜"	1⅜"
Flange Diameter—Front	7⅜"	7 13/16"
Rear	7⅜"	8 3/16"
Flange Bolts	12-⅜"	12-⅜"

FRONT WHEEL BEARINGS

New Departure adjustable cup and cone type.

116" Series	121-129" Series
Inner 11—9/16" Balls	Inner 10—11/16" Balls
Outer 9—15/32" Balls	9—9/16" Balls

REAR WHEEL BEARINGS

Hyatt heavy duty type in all models.

	116" Series	121-129" Series
Number of Rolls	20	21
Diameter of Rolls	⅜"	7/16"
Length of Rolls	1¾"	1 13/16"

RIMS

Black finish to match tires. Centering bosses pressed into rim set on outer leg of felloe to ensure rim mounting central with wheel.

116″ Series

Rim Stock ..... 9/64″
No. Wedges 5
Rim Size ..... 20″ Diam. 4″ Section

121-129″ Series

Rim Stock ..... 9/64″
No. Wedges 6
Rim Size ..... 20″ Diam. 4½″ Section

HUB CAPS

New design of large diameter, used in conjunction with a shield over hub, adds to the appearance of wheel. Special hub cap wrench furnished in tool kit.

TIRES

Low pressure type with black side walls and tread.

116″ Series	121-129″ Series
30 x 5.50	32 x 6.50

BRAKES

Same type of four wheel mechanically operated external contracting service brakes as used since the 1924 models.

Design assures effective braking with extremely light pedal pressure. Adjustment is simple and accessible.

Band facings are protected from dirt and water by pressed steel shields fastened to the brake discs.

Parking brakes are provided at rear wheels and operated by hand lever. These are internal expanding type.

BRAKE DIMENSIONS

	116″ Series	121-129″ Series
External		
Drum Diameter	12 3/8″	14″
Facing	3/16″ x 1¾″ x 38 5/8″	3/16″ x 2″ x 43¾″
Braking Area	270 sq. in.	350 sq. in.
Internal		
Drum Diameter	12″	13 5/8″
Facing	3/16″ x 1⅜″ x 35 9/16″	5/32″ x 1⅝″ x 40 11/16″
Braking Area	98 sq. in.	132½ sq. in.

SPRINGS

Front springs are semi-elliptic.

Rear springs are full floating cantilever.

Spring leaves are all made of high carbon steel except the main leaf of the front spring which is chrome vanadium.

Carrying capacity and number of leaves vary with different models to ensure proper riding qualities.

Leaves should not be lubricated any more than is necessary to prevent squeaks.

	116″ Series	121-129″ Series
Front spring		
Length	36½″	36¾″
Width	2″	2″
Bolts—Front	9/16″ Dia.	11/16″ Dia.
Rear	9/16″ Dia.	⅞″ Dia.
Rear Spring		
Length	48″	48″
Width	2½″	2½″
Bolts—Front	9/16″ Dia.	9/16″ Dia.
Rear	¾″ Dia.	⅞″ Dia.

FRAME

Changes have been made in the double-drop frame, to provide greater rigidity, as follows:

Side rails made of heavier stock and the top flange as well as the bottom flange rolled through the central portion.

An additional cross member has been added just forward of the gasoline tank on the 121-129" Series and this member has been made heavier on the 116" Series.

The combination rear spring trunnion and body bracket is a drop forging with greater contact area on side rail to prevent flexing of rail.

	116" Series	121-129" Series
Side Rail—		
Thickness	5/32"	3/16"
Maximum Height	6 17/32"	7 1/16"
Maximum Width	1 25/32"	2 1/32"
No. Cross Members	6	8

STEERING GEAR

Worm and split nut semi-irreversible type is used. Half nuts, made of special bronze, have six threads in contact with the worm to reduce unit pressure and resist wear. Half nuts are guided, full length, on both front and back faces. See page 11. Hardened and ground steel blocks are attached to half nuts to contact with the hardened and ground steel rollers on the pitman arm shaft.

Three bronze bearings support the pitman arm shaft in the housing.

The steering tube is supported in plain bearings at upper and lower end and provided with an adjustable ball thrust bearing at upper end of housing to compensate for wear.

Ferrules are provided in nest tubes to prevent rattle.

	116" Series	121-129" Series
Ratio	15.15 to 1	16.2 to 1
Worm Diameter	1 3/4"	2 1/8"
Steering Tube	1" Dia.	1" Dia.
Mast Jacket	1 5/8" Dia.	1 5/8" Dia.
Pitman Arm Shaft	1 1/8" Dia.	1 1/4" Dia.

Caution: Do not use air pressure to force grease into steering gear housing.

STEERING WHEEL

Steering wheels have ebony finished wood rims and black enameled spokes. The hub is large in diameter which adds to the appearance and protects the fingers from being caught between the wheel spokes and the spark and throttle levers.

Spark, throttle and light control levers and horn button are placed above the steering wheel. Steering wheel position is adjustable for distance between wheel and seat by means of the supporting bracket attached to instrument board.

Steering wheel position may be adjusted, to suit the individual driver, by means of the bracket at the instrument board.

	116" Series	121-129" Series
Steering Wheel Diam.	17 1/2"	18"

STEERING GEAR LOCK

A lock for the steering gear is in combination with the ignition switch. It is mounted in a housing integral with the steering gear bracket. Gear may be locked only after the ignition lever is turned to the "Off" position. This lock is fully approved by the Underwriter's Laboratories.

PITMAN ARM

The pitman arm is made of drop-forged heat treated steel and is splined to the steering gear shaft. The lower end to which the drag link is attached is provided with a case hardened ball to reduce wear from contact with the socket plugs.

	116" Series	121-129" Series
Pitman Arm Length	8¼"	8"

SPEEDOMETER

AC 90 mile speedometers are used on all models. These instruments are the same type as used in 1928 production.

SPEEDOMETER GEARS

The speedometer drive gear is keyed to the front universal joint yoke and the driven gear is supported in a sleeve which is mounted in the drive ball housing.

The gears are lubricated automatically from the transmission.

Fig. 27. Housing Cut-a-Way Showing Speedometer Gears.

	116" Series		121-129" Series	
Speedometer Gears	Driven	Driving	Driven	Driving
Models 20-27	22	7		
Model 25	20	7		
Models 26-26S	21	7		
Models 44-55			20	8
Models 46-46S-54CC-49			22	8
Models 41-47-58-50-50L-51-57			23	8

SHOCK ABSORBERS

Lovejoy shock absorbers are supplied as regular equipment front and rear on all models. These have been calibrated to function properly with the springs of each model to provide best riding qualities.

TIRE CARRIER

Full circle type carrier is supplied as regular equipment. It is attached to the rear of the frame by two brackets and two supporting arms. Band is drilled for attachment of brackets for second extra rim and tire. Brackets are not supplied as regular equipment but may be had from the Parts Department.

CHASSIS LUBRICATION

Zerk high pressure lubrication system is used on the chassis. Connections may all be reached without crawling under the car. Brake cross shaft and rear spring front shackle bolts connections are grouped at a trap door in each side apron. Brake camshaft connections are extended to the rear of the axle housing. Hand gun is included in the tool kit.

STARTING, LIGHTING AND IGNITION

The Delco-Remy system of starting, lighting and ignition is used on all models. It is a six volt, single wire or grounded type, the engine and frame of car forming the return side of the circuit.

The equipment consists of the following:

	Model No.	Buick Part No.
Starting motor	725 B	823279
Generator	940 M	823687
Lighting switch	484 A	820869
Ignition coil	528 H	823693
Distributor assembly	640 J	825409
Signal lamp switch	466 B	820867
Current limit relay	410 D	820871
Cut-out relay	265 B	812970
Horn	K-18-B	820865
Instrument board switch	1328	001328
Steering post bracket assembly (includes lock and switch)		
Models 25-44-49-55		216713
All other models		188484
Signal lamp		
Models 20-26-27-41-46-47	810 B	824895
All other models	810 C	824891
Battery, Exide		
116″ Series	3MxV-13-1	214232
121-129″ Series	3MxV-15-1	214233

STARTING MOTOR

The starting motor, mounted on flywheel housing on right side of engine, is a direct drive mechanical shift type. It is a four-pole unit with the field coils in parallel and connected in series with the armature. The armature shaft is supported in two bronze bushings, inlaid with graphite which require no further lubricant.

Engagement with the flywheel is made through the drive unit, which consists of a pinion, spring, shifting collar and overrunning clutch. This drive unit is mounted on the splined armature shaft. It is moved endwise by means of a shifting yoke which fits in the shifting collar. The upper end of the shifting yoke is connected through a lever and cross shaft to the starter pedal.

When the starter pedal is depressed, the drive unit is shifted toward the flywheel and the pinion engages with the flywheel gear. After the pinion is well meshed with the flywheel gear, the upper arm of the shifting yoke comes in contact with a switch on top of the motor housing, completing the electrical circuit between the starting motor and storage battery. The armature then revolves and cranks the engine.

The teeth of both the flywheel gear and starting pinion are chamfered, providing easy engagement. In shifting the drive unit, if the teeth of pinion do not slide into mesh with the flywheel gear, the spring behind the pinion is compressed until circuit is closed, and when the armature begins to rotate, the pinion slides into complete engagement.

The overrunning clutch is provided to automatically disconnect the drive unit from the armature shaft and prevent the flywheel driving the armature at high speed

after engine starts running on its own power and before the starter pedal is released.

The flywheel teeth are cut in a heat treated steel ring, shrunk on flywheel and welded to it.

	116″ Series	121-129″ Series
No. Flywheel teeth	123	123
No. Pinion teeth	9	9
Ratio	13.66-1	13.66-1

GENERATOR

The generator is mounted on right side at front of engine. It is a two pole shunt wound unit, having third brush and thermostat regulation for controlling the charging rate.

The generator furnishes current for the lights and ignition and keeps the storage battery charged so that a supply of current is available for starting the lighting when engine is not running.

The armature shaft is driven at one and one-half engine speed in a clock-wise direction (looking at front end) by the engine timing gears, and is supported at the front end by two special bronze bearings and at rear end by an annular ball bearing. Lubrication for the front bearing is supplied by overflow of oil from rocker arm shaft to oil well below bronze bearings. An oil ring on armature shaft dips into this well and carries oil up to the bearings.

The generator starts charging at a car speed of 8 to 10 miles per hour. Below this speed no current is generated and all current required is taken from the storage battery. In order to prevent battery from discharging through generator below charging speed, a cut-out relay is used.

Control of the charging rate as mentioned above is accomplished by a third brush regulator and thermostat. The ordinary type of shunt generator furnishes a current that increases with speed. The third brush applied to the shunt wound generator produces a current output that reaches its maximum at a car speed of approximately 25 miles per hour and automatically decreases above that speed. The position of the third brush determines the maximum charging rate and is mounted on an adjustable plate, which is held in position by a lock screw at the end of the generator. By means of this plate the brush position may be changed. The thermostat is an automatic switch which allows a high charging rate when generator is cold but cuts the charging rate down to protect generator and storage battery when generator becomes hot. This unit makes it unnecessary to change the third brush setting for winter or summer driving, as the proper charging rate is automatically maintained.

CUT-OUT RELAY

The cut-out relay, mounted on top of the generator, and magnetically operated completes the current between the battery and generator when generator voltage exceeds that of battery, and opens the circuit when the generator voltage drops below that of battery.

DISTRIBUTOR

The distributor is an integral part of the generator, being mounted on the commutator end housing. It is of the combined automatic and manual spark advance, and is driven by generator armature shaft through spiral gears at one-half engine speed.

The purpose of the distributor is to interrupt the primary circuit and distribute the high tension current to the spark plugs.

AUTOMATIC AND MANUAL SPARK ADVANCE

The automatic advance mechanism, located in distributor cup automatically advances or retards the spark for different driving speeds, eliminating the necessity of frequently shifting of the spark lever located on steering wheel.

On the 121-129″ Series the distributor, in the advanced position, is set to fire 17° before upper dead center and on the 116″ Series 15° before upper (measured on the flywheel).

The automatic advance cuts in at approximately eleven miles per hour, car speed, and gradually advances spark 15° to 19° at car speed of forty miles per hour. With this setting the total maximum advance, both manual and automatic is from 32° to 36°.

CURRENT LIMIT RELAY

A protective device known as the current limit relay is mounted on the inside of dash board.

The normal current to the lighting circuits does not affect the current limit relay, but in the event of an abnormally heavy flow of current, such as would be caused by a ground in any of the lighting circuits, the current limit relay operates and intermittently cuts off the flow of current, causing an audible clicking sound which gives a distinctive warning that abnormal conditions exist. This will continue until the ground is removed or switch is operated to cut off the circuit in which the ground exists. In this manner, the current limit relay protects the wiring, switch and storage battery. As soon as ground is removed the current limit relay restores the current.

HEADLAMPS

The headlamps have an adjustable mounting on a tie rod between the fenders and are supported on rigid posts. Special reflectors are used with two-filament bulbs. Both filaments are of the same candle power.

LIGHTING SWITCH

The lighting switch is mounted at base of steering gear and is operated by lever at top of steering wheel.

The switch has four positions and from left to right are: Parking—Off—Dim—Bright.

Parking position lights—cowl and tail lamp.

Dim position lights—head lamp upper filament and tail lamp.

Bright position lights—head lamp lower filament and tail lamp.

The lever when moved to dim position, lights the upper filament of bulb, throwing light beam directly in front of car.

When moved to bright position, lights the lower filament of bulb, throwing light beam at a greater distance ahead of car.

Head lamps are focused by means of screw at back of lamp body.

SIGNAL LAMP

The signal lamp is mounted on the frame side member and consists of stop, back-up, tail light and license illuminating lenses, contained in exclusive Buick housing.

A 3 C. P. bulb, controlled by lighting switch, illuminates the red tail lens and license plate lens.

A 15 C.P. bulb operated by brake-pedal and transmission control lever, illuminates both the stop and back-up lenses.

SIGNAL LAMP SWITCH

The signal lamp switch is mounted on transmission cover and, is operated by the brake pedal and also by the control lever when in reverse position.

INSTRUMENT BOARD SWITCH

A two way switch is provided on instrument board to control the instrument panel indirect lights and the front compartment direct lights.

LAMP BULBS

	Candle Power
Head lamp	21
Cowl lamp	3
Tail lamp	3
Indirect instrument lamp	3
Dome lamp	6
Signal lamp	15
Front compartment lamp	3

IGNITION COIL

The ignition coil is mounted on the timing gear case. Its purpose is to convert the low voltage primary current from the battery or generator to a very high voltage capable of jumping the gap in the spark plugs.

does not require a resistance
e of the method of winding.
/ winding is outside the second-
. The increased diameter thus
ds sufficient wire to the primary
oroduce the proper resistance
resistance in the secondary cir-
n likewise reduced, due to the
neter which materially adds to
:y of the coil. This type of
velops a hotter spark with a
nt consumption and increases
ne breaker points.

GNITION SWITCH

switch is in combination with
gear lock. Lever may be locked
position by the steering gear

SPARK PLUGS

G Regular Metric plugs used on
Due to better cooling, these
onger life. No other type should
ed.

HORN

Klaxon vibrator horn, Model K-18-B is mounted on bracket attached to inlet manifold and is used on all models.

ELECTRIC WINDSHIELD WIPER

A tandem type electric Windshield Wiper is provided on all closed models except the 54CC. The current for this wiper passes through the ignition switch to prevent wiper being left in operation when car is at rest.

STORAGE BATTERY

116" Series—Exide No. 3M x V-13-1, 13 plates, 6-8 volts, 100 ampere hour capacity.

121-129" Series—Exide No. 3M x V-15-1, 15 plates, 6-8 volts, 120 ampere hour capacity.

CLOSED MODELS

There are fourteen closed models in the 1929 line as follows:

116″ Series

Model 20—Two-Door, 5-Pass. Sedan
Model 26—2-Pass. Business Coupe
Model 26S—4-Pass. Country Club Coupe
Model 27—Four-Door, 5-Pass. Sedan

121″ Series

Model 41—Four-Door, 5 Pass. Sedan
Model 46—2-Pass. Business Coupe
Model 46S—4-Pass. Country Club Coupe
Model 47—Four-Door 5-Pass. Sedan

129″ Series

Model 50—4-Door, 7-Pass. Sedan
Model 50L—4-Door, 7-Pass. Limousine
Model 51—4-Door, 5-Pass. Brougham
Model 54CC—4-Pass. Convertible Coupe
Model 57—4-Door—5-Pass. Sedan
Model 58—5-Pass. Coupe

These cars have entirely new body, hood and fender lines.

All bright parts such as radiator, headlamps and cowl lamp are chrome plated.

Bodies are wider and both rear and front seats have head room increased.

Front seats adjustable in all models except the 50L and the right hand seat in models 20 and 58.

All internal trimming of finest grade Mohair plush in plain colors.

Inside of dash fully trimmed in all models.

All inside window moldings wood, walnut finish.

Foot rests and robe rails of new design.

Rear corner light in all 129″ Series bodies.

All models are equipped with side cowl ventilators.

Tandem type Electric Windshield Wipers used on all models except the 54CC which has a tandem vacuum type.

OPEN MODELS

There are four De Luxe open models in the 1929 line as follows:

Series

116″—Model 25—Five-Pass. Touring
121″—Model 44—Four-Pass. Roadster
129″—Model 49—Seven-Pass. Touring
129″—Model 55—Five-Pass. Touring

These cars embody all the requirements in appearance, refinement and equipment of the finest sport models.

All bright parts such as radiator, headlamps, cowl bands and side lamp are chrome plated.

Tops are of high grade light tan colored material, with natural wood bows and plated sockets. The tops fold very compactly and are fitted with dust cover with trimming and bead to match interior finish.

The side curtains have large pyrolin lights and when not in use fit into large door pockets.

All models are trimmed with light pig grain leather.

Windshield has upper glass adjustable for ventilating and the entire shield folds forward if desired.

All models are equipped with side cowl ventilators except Model 25.

Single type vacuum windshield wiper used on all models.

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