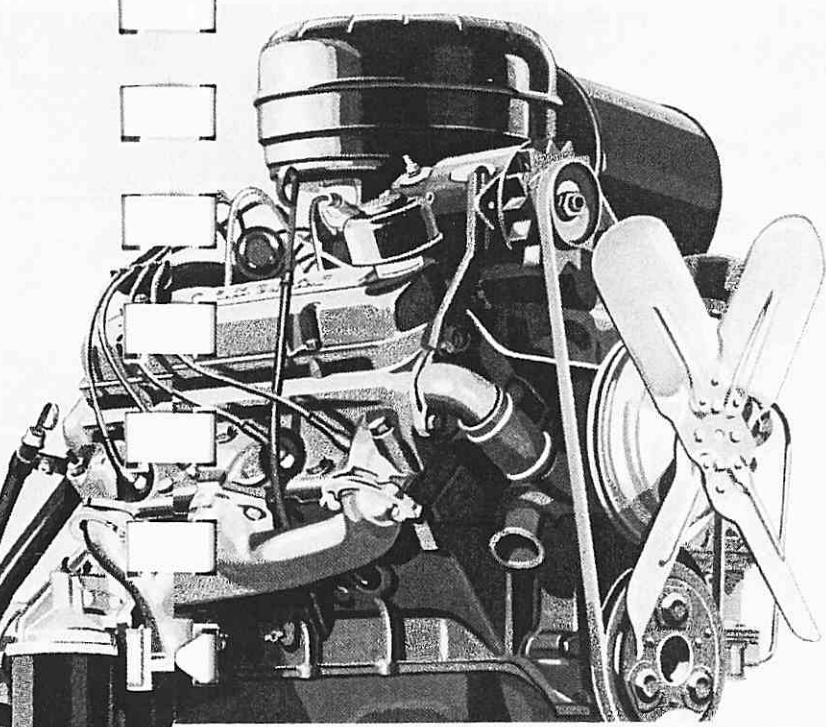
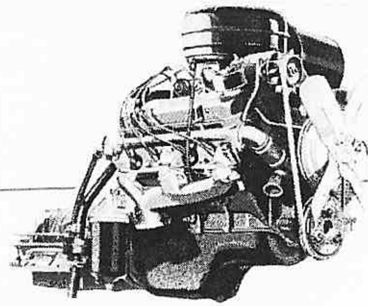
1956
227-H.P.
STRATO-STREAK V-8 ENGINE





MORE POWERFUL THAN EVER BEFORE!

PONTIAC Strato-Streak V-8

WITH 227 HORSEPOWER!

Pontiac's V-8 engine, product of the engineering and productive skill of scores of specialists, has, since its introduction with the 1955 model, stood the acid test of commercial use. Mounting demand and thousands of satisfied owners verify the considered opinion of its designers that here, indeed, was . . . and is . . . an engine that would provide the practical ultimate in economy, power, performance and durability. Preproved in over 3,500,000 test miles for 1955, that same figure might well be 4 billion if average customer mileage with a year's production were projected.

Many of the outstanding features of the engine used in the 1955 model have been carried over for 1956, not only because they have proven satisfactory, but because at this time they are the latest and most up-to-date features available for an engine such as the Strato-Streak V-8. However, in keeping with a policy of constant improvement wherever possible, and in order "to provide more and better things for more people," related development work on this engine has continued. This work has culminated in provision of a bigger, more powerful, more durable, better performing and more easily serviced engine. In addition, for added distinction, a four-barrel carburetor is now standard equipment on the Star Chief series which provides, in substance . . . two standard engines in the Pontiac line. Other engine changes, too numerous to mention here, will be found as you read over the following pages. And when you do, you'll see even more reasons why the Pontiac Strato-Streak V-8 engine for 1956 has more to offer the Pontiac owners of America.

HERE'S WHY PONTIAC'S

Strato-Streak V-8 Engine

IS THE FINEST EVER BUILT!

1. Pontiac's Strato-Streak V-8 is inherently lighter! This results in better steering, balance, performance and handling.

2. Pontiac's V-8 engine is ideally suited for favorable combustion chamber design! Because it is so designed, you get a higher compression ratio, which results in more power from the fuel.

3. Strato-Streak is stronger and exceptionally quiet. The new engine is more rigid and can withstand greater explosion pressures! This rigidity makes for outstanding quietness.

4. V-8 engine design requires less engine compartment space. This feature permits the adoption of the latest body style trends.

5. The new Strato-Streak is more powerful than ever before! Greater driving safety and performance can now be obtained through this added horsepower to give every driver a "power reserve" for emergency.

These are just a few of the many advantages offered by the new Pontiac Strato-Streak V-8 engine for 1956. Basically, it is the same engine that was tested for over 3,500,000 test miles before it was put into the 1955 model and, with the millions of miles driven by proud owners of the 1955 Pontiac, the Strato-Streak engine has more than proven itself to be one of the world's finest, most efficient V-8 engines. As you proceed in this section, you will see many new improvements that have been made, which make this V-8 even better for 1956.

PONTIAC'S

horsepower and torque

PROVE THE STRATO-STREAK V-8 ENGINE TO BE ONE OF THE FINEST

In order to provide outstanding driving performance and safety, horsepower and torque must work well together. In a manner of speaking, you might say that torque is the "twist" that takes you away from a stop to a safe speed quickly and surely. Relatedly, horsepower is associated with time and increases with engine speed up to maximum and, therefore, is important to over-all performance. All of these aspects were taken into consideration when Pontiac's engineers perfected the Pontiac Strato-Streak V-8 engine.

As you know, piston displacement determines comparative size of any engine and is of fundamental significance in determining performance. Nothing can substitute for engine size when it comes to power output in traffic speeds. This is true because of its direct relationship to torque output and is corroborated by the fact that the larger the car, the greater the engine displacement. Large displacement means added get-up-and-go from the stop light; it means quick getaway when passing; it means power when you need it.

Pontiac's new Strato-Streak V-8 engine now has an increased piston displacement of 316.6 cubic inches . . . one of the largest in its price range. At regular cruising speeds this engine is using only a small part of its available power, which leaves a substantial increment for acceleration and added maneuverability. These are very important safety and economy advantages.

So you see, because of its higher compression ratio (8.9:1 standard with Hydra-Matic and Synchromesh transmissions) and greater piston displacement, the Strato-Streak V-8 offers even more all-around driving pleasure than ever before.

STAR CHIEF MODELS

WITH 8.9:1 COMPRESSION RATIO & HYDRA-MATIC TRANSMISSION

Maximum horsepower (premium fuel) 227 @ 4800 rpm

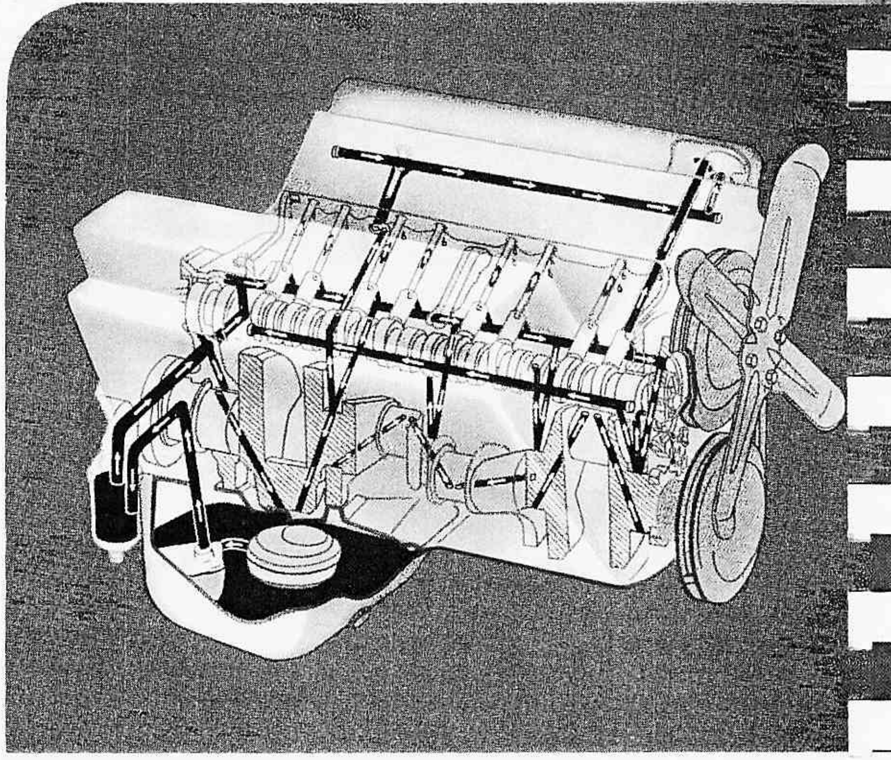
Maximum torque (premium fuel) . . . . 312 lb. ft. @ 3000 rpm

860 & 870 MODELS

WITH 8.9:1 COMPRESSION RATIO & HYDRA-MATIC TRANSMISSION

Maximum horsepower (premium fuel) . . . . 202 @ 4600 rpm

Maximum torque (premium fuel) 294 @ 2600 rpm



QUAD-GALLERY LUBRICATION SYSTEM

With the advent of the new and more powerful V-8 engine in 1955, Pontiac's engineers decided that a new lubrication system would be needed because of the increased horsepower and engine torque. Then, too, there were the hydraulic valve lifters and valve mechanisms that would also need lubricating. After much exploration in the field of engine lubrication, they developed what is considered the finest lubrication system yet devised.

Here is how this new system works. Oil is delivered by a helical gear type pump mounted on the right rear bottom of the cylinder block taking oil from a floating type oil intake, which means only the cleanest oil is drawn into the pump.

From the pump, oil is directed through a full-flow filter (accessory) and then to two parallel galleries, traveling from rear to front in the left-hand gallery and rearward in the right-hand gallery. Oil is also directed to a gallery in each cylinder head—thus, four galleries in all.

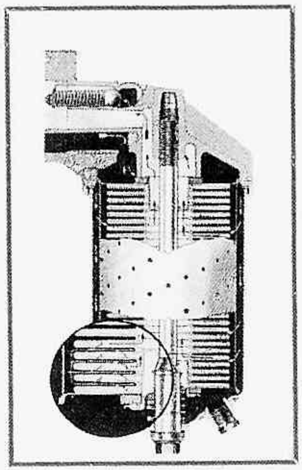
Embodying the best engineering principles, the Strato-Streak V-8 features a positive, quad-gallery pressure system, exclusive with Pontiac, which delivers oil under pressure through the galleries to the crankshaft, connecting rod, camshaft bearings and valve-actuating mechanism. Timing chain and sprockets receive metered-jet lubrication, while piston pins and bushings are splash lubricated. Cylinder walls are metered-jet lubricated along with normal splash from crankshaft; oil travels through a hole in the cylinder block to lubricate the distributor. Fuel pump eccentric and arm are lubricated by a high-velocity jet.

Here are a few of the many advantages of Pontiac's quad-gallery lubrication system:

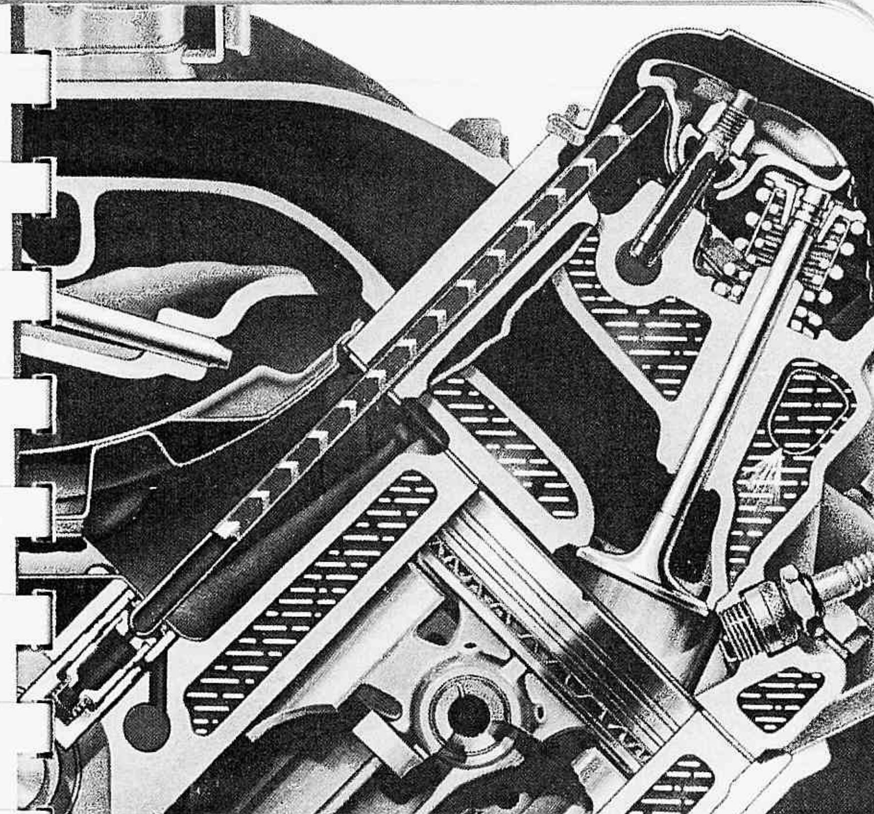
1. Through the system, no external oil lines, which are apt to break, are used.
2. Crankshaft sealing is positive, which prevents oil loss.
3. Oil pan design minimizes splashing and foaming, which permits complete oil supply even on fast turns or acceleration.
4. An oil pan baffle prevents oil in the pump from being thrown against the crankshaft, which reduces aeration.
5. Oil can be added by either of the two breather caps.
6. Accurate means of measuring oil level.

FLOATING OIL INTAKE

PUMP AND FULL-FLOW FILTER



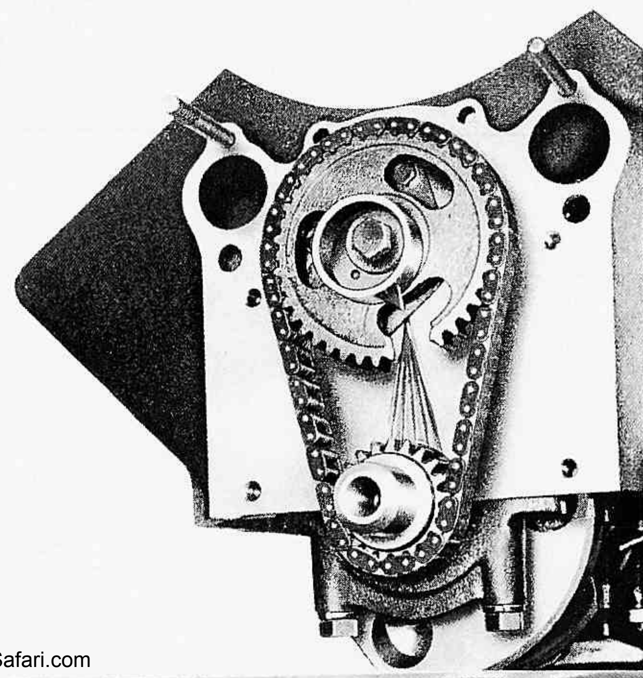
A floating type oil intake is utilized in the Pontiac Strato-Streak V-8 engine, which means the cleanest oil in the pan is fed into the system. Oil entering the intake passes through a screen and is drawn into the pump. Should the intake screen become clogged, an incorporated safety feature allows the oil to bypass the screen and enter through a central hole. From the intake, oil is driven by a helical gear type pump operated by the distributor drive shaft. Oil pressure is controlled by a regulator valve. From the pump, oil enters a full-flow filter (accessory) which removes dirt and foreign particles. A bypass valve is provided should flow through the filter for any reason become restricted.



Oil is fed to the hydraulic valve lifters through the galleries in the cylinder block. Simultaneously, oil under pressure is forced from a hole in the push rod seat up through the hollow push rod. This provides lubrication at both ends of the push rod, the high-pressure areas, where complete lubrication is of great importance. Oil from cylinder head galleries flows up through holes drilled in each rocker arm ball stud and out through a hole; this, coupled with grooves in the top of the ball, lubricates the rocker arm. Oil flowing over the rocker arm lubricates the contact area between the rocker arm and the valve stem.

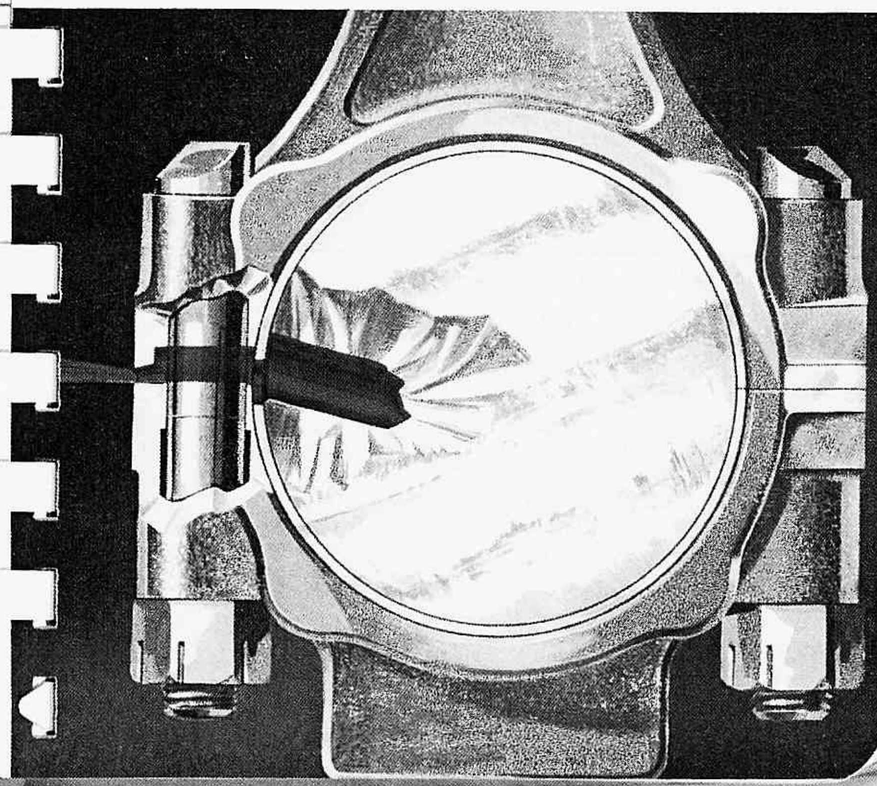
TIMING CHAIN AND SPROCKET LUBRICATION

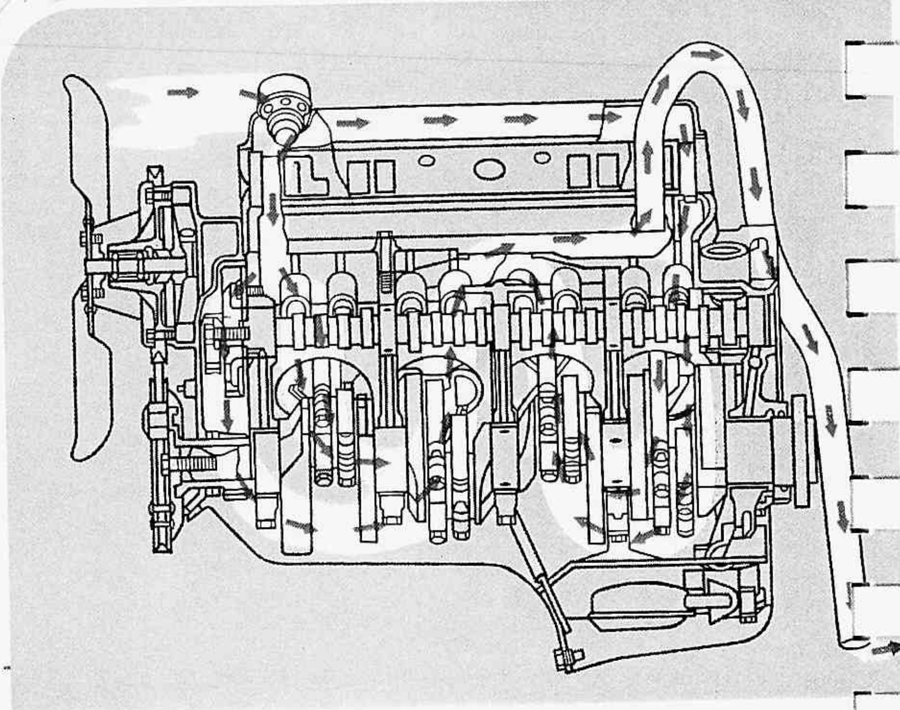
Lubrication of the timing chain and sprocket are of utmost importance to guard against wear. This is very capably handled by two holes drilled in the front of the camshaft. One hole, drilled laterally, feeds oil to the other, drilled longitudinally, which in turn feeds oil intermittently under pressure through a groove in the cylinder block and camshaft thrust plate hole onto the timing chain and sprocket. Similarly, the fuel pump eccentric is also lubricated by oil from the hole in the thrust plate.



CYLINDER BORE LUBRICATION

Here's another example of Pontiac thoroughness! Even though cylinder walls are lubricated by the splash from the crankshaft, a metered-jet system is also employed to further increase performance and life. By grooving connecting rod caps, oil meters out through small openings to stream over the cylinder walls. And because of ample oil in each cylinder, piston pins receive required lubrication.





IDEAL-FLOW PRESSURE-SUCTION CRANKCASE VENTILATION

One of the problems to be faced in the use of internal combustion engines is water vapor. This water vapor is a by-product of the burning gas and is formed at the surprising rate of slightly over a gallon of water for every gallon of gasoline. For the most part, this water vapor is carried away in the exhaust system, but some of it remains and leaks down into the crankcase where it could freeze in cold weather. But an even greater danger than freezing is the fact that when the gas burns in the cylinders sulphur dioxide is formed and when combined with the water vapor the result is sulphurous acid . . . a deadly enemy of steel and highly machined parts.

In order to prevent such damage to the engine, Pontiac engineers developed the first pressure-suction system. This is the system whereby air is forced into the engine through an opening just to the rear of the fan, circulated through the engine and literally sucked out an exhaust tube. For the Strato-Streak V-8, Pontiac developed a completely new crankcase ventilation system.

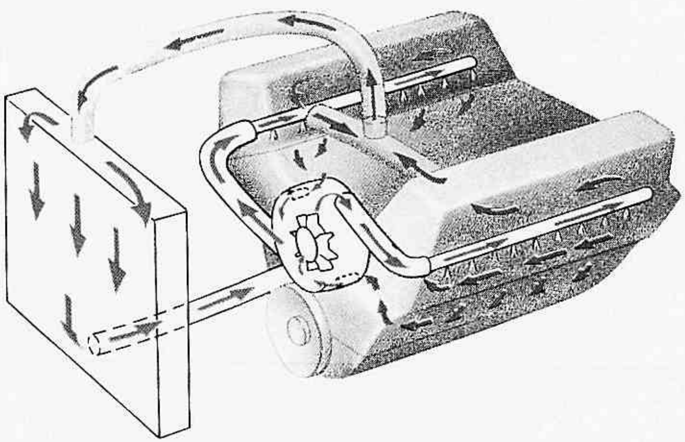
Here's how it works: Two air inlet caps, instead of the usual one seen on other competitive makes, are used, one on each side of the engine (also serve as oil filler caps). These caps admit air through filters and direct the air into the space between the cylinder heads and valve covers for complete valve chamber ventilation. At the front and rear of each cylinder head is a cast opening which permits the entry of ventilating air into the crankcase. As the air is forced into the crankshaft area, it is directed in a path under pistons #1, #2, #7 and #8 and then toward the middle of the engine where it is exhausted through an opening in a positively sealed center baffle, into an oil settling chamber and then out through a tube at the right side of the engine to exhaust under the car. Cast fins in the center of the cylinder block also serve to precipitate any particles of oil.

7 MAIN ADVANTAGES OF THIS SYSTEM:

1. Forced, filtered ventilation through two air inlet caps in direct line with engine fan blast insures ample air induction even during engine idle.
2. Complete and thorough ventilation of the rocker arm chambers and reduced corrosion of the cover.
3. Air admitted to crankcase at four main points.
4. By unique baffling, every corner of the crankcase is ventilated, including the timing chain cover.
5. Cast fins and oil settling chamber prevent oil vapor from escaping.
6. Suction type rear air outlet exhausts all vapors and fumes under the car.
7. Bent tip fan—driven slower than engine—to provide optimum effectiveness with minimum noise.

REVERSE-FLOW, GUSHER-VALVE ENGINE COOLING

Since thorough, dependable engine cooling is of the utmost importance, Pontiac engineers worked and planned many, many months to perfect the most efficient and dependable cooling system possible. As a result, we have the finest cooling system ever devised. This system, called "reverse-flow, gusher-valve cooling", has proven itself during 1955 and therefore is being used again in the new 1956 models. Here, briefly, is how the system works: Water is drawn from the radiator by a centrifugal type, pulley-driven pump whose double row of ball bearings is lubricated for life. A bellows type water seal is employed to protect its rotating precision

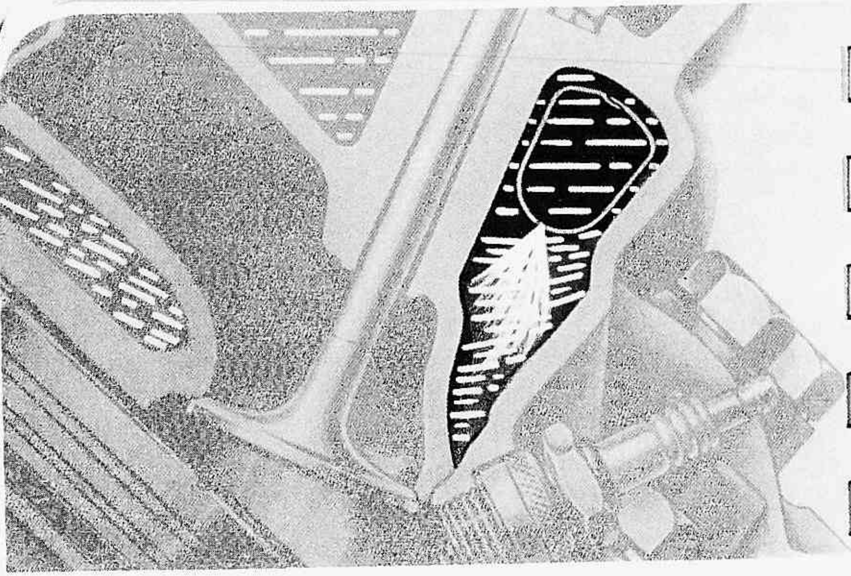


parts from rusting and corroding. A particular feature of this seal is its ability to withstand pressure rises in the coolant system without blowoff. (Servicemen will like the fact that no adjustment of the water pump is necessary and servicing is very simple.)

Water, driven by the pump, is sent through outlets to the front of each cylinder head. Entering the cylinder heads, water is carried through brass distributing tubes (one in each head) which have openings that direct coolant, in jet fashion, onto exhaust valve seats and valve guides for optimum valve cooling (see illustration). Coolant is supplied to the cylinder block through cast and drilled openings between the heads and the water jackets of the cylinder. The amount of water fed into the block is controlled by small openings which connect to the pump inlet. A portion of the water is recirculated at all times. Water which does not feed into the block is fed to the water outlet through channels provided in the intake manifold. When the thermostat is open, water flows into the radiator. Pressure in the cooling system is maintained at approximately 7 pounds per square inch (12 to 15 psi with Air Conditioning) by means of a pressure radiator cap.

Now, you see how Pontiac's reverse-flow, gusher-valve cooling system works . . . let's look at a few of its many advantages:

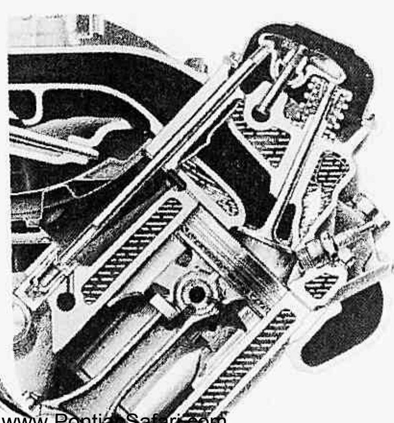
1. Embodying a feature that no other V-8 engine can boast, the Pontiac system delivers water directly to tubes in the cylinder heads which means the coolest water is played upon the hottest part of the engine at high velocity, namely, the exhaust valve seats.
2. Sludging of engine oil is minimized since highest-temperature water is retained in the cylinder block, particularly during warm-up, and condensation on the cylinder bores is thereby reduced.
3. Because of its reverse-flow feature, Pontiac's system delivers the coolest water to the cylinder head where it picks up heat and a portion then travels to the cylinder block. Thus, no cool water is thrown around the cylinder bores and cylinder distortion, which might otherwise occur, is prevented.
4. Because of the unique casting method used, "fin" restriction to water flow is prevented.
5. Full-length water jackets and water all around valves, valve seats and cylinder bores provide for optimum cooling.



GUSHER VALVE COOLING

Water from the pump enters the cylinder heads and passes through brass tubes. At the bottoms of the two brass tubes are openings which direct a jet-like flow of the coolest water from the radiator onto the exhaust valve seats and integral valve guides. By this method valve life is greatly increased, engine operation measurably enhanced.

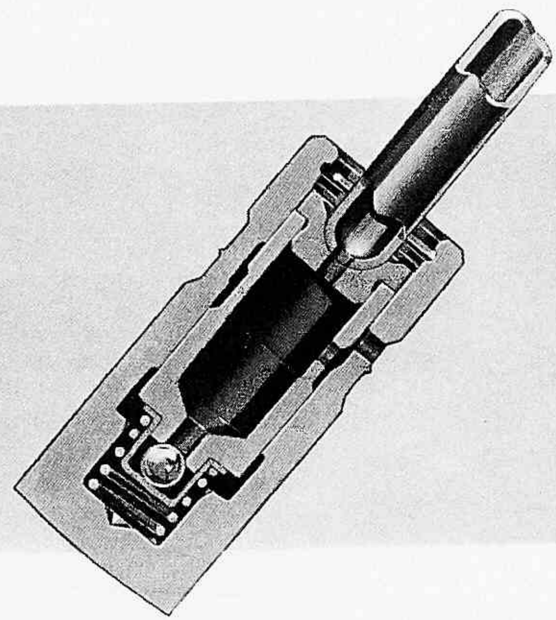
WATER CIRCULATES IN HEAD AND SURROUNDS CYLINDERS



As you will notice in the adjoining drawing, thorough water circulation is maintained in cylinder heads. Full-length water jackets and water around each and every cylinder provide maximum cooling efficiency.

Here, in this phase of engine operation, you will find some of the reasons why the new Pontiac Strato-Streak is one of the most highly developed, most efficient and dependable V-8's in the industry. With the advent of the 1955 Strato-Streak and using the vast facilities available, Pontiac's engineers set to work and developed an entirely new idea . . . a valve train with a ball pivot. This, in conjunction with new hydraulic valve lifters, tubular steel push rods, tapered integral valve guides and dual valve springs, gives proof to the fact that Pontiac's valve system and actuating mechanism are truly what is believed to be the finest devised. And highly advantageous for day-to-day operation and simplified servicing, too, is the new Pontiac system, because fewer parts are used and outstanding durability results. Briefly, here is the valve train cycle: The camshaft actuates the hydraulic valve lifters; hydraulic valve lifters move the push rods up and actuate the ball-pivoted rocker arms which in turn push down on the valve stems, opening the valve ports. As the camshaft revolves, the valves through valve lifters, push rods and rocker arms open and close allowing the fuel charge to enter, burn and exhaust. Naturally, the above explanation is greatly simplified; a thorough story on all phases of operation follows with illustration.

NEW HYDRAULIC VALVE LIFTERS AND HOLLOW STEEL PUSH RODS



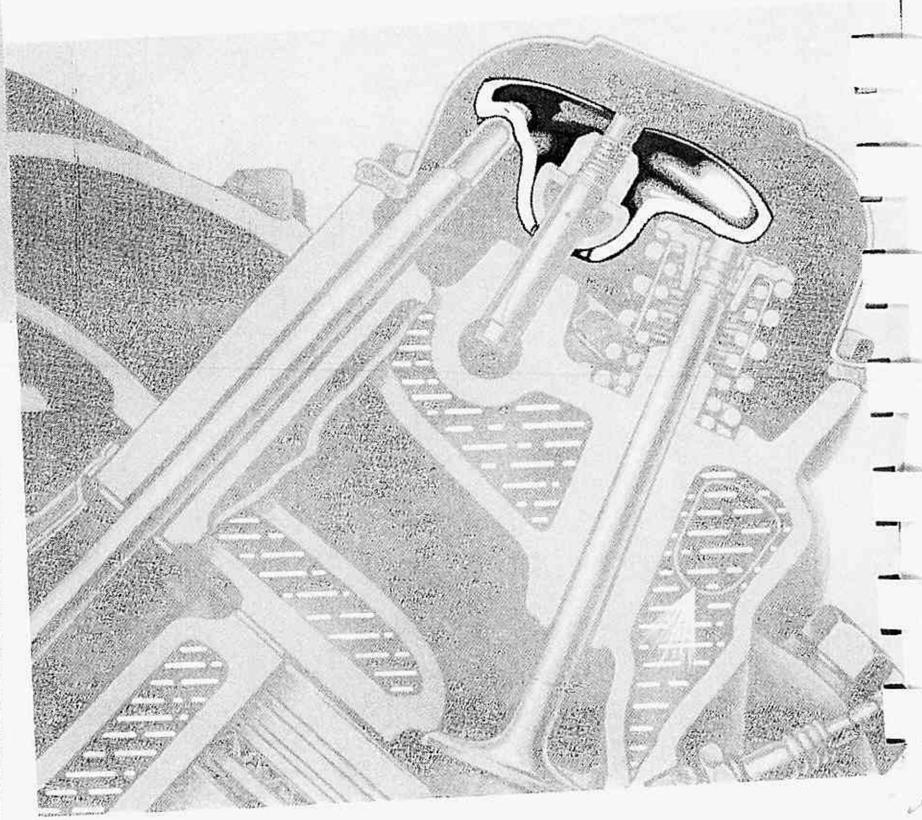
Hydraulic valve lifters of new design to facilitate operation and valve train serviceability, but embodying the same principles of operation as those used in 1955, are employed in the 1956 Pontiac Strato-Streak V-8. Inherently, hydraulic valve lifters have many advantages. With their use, constant contact is maintained between the push rods and the valve lifters, thereby insuring accurate timing, silent operation, increased valve life and elimination of the need for valve lifter adjustments. The valve lifter bodies are made of heat-treated cast iron and fit into lifter holes in the crankcase. A steel, cyanide-hardened plunger, having a seat for the push rod and an oil reservoir, fits inside the lifter body.

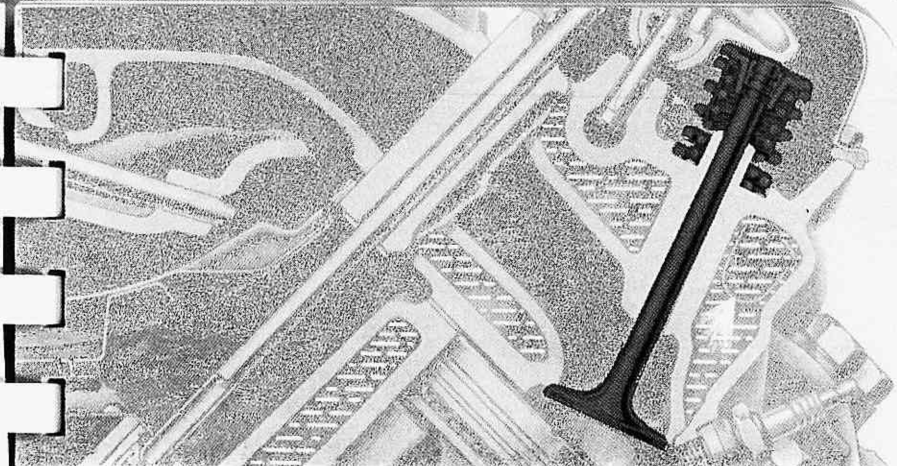
Here's the way they work: Oil, under pressure, is fed into the valve lifter reservoir through ports in the side of the lifter body. When the engine of the car is cool, the valves are reduced in length, and clearance between the lifter and push rod becomes apparent. As this occurs, the spring between the plunger and the lifter body pushes the plunger up. A check ball is unseated and the space in the lower chamber left by the ascension of the plunger is filled with oil passing down from the reservoir, through a hole in the plunger. Thus, a solid column of support is provided. This means the lifter is kept in constant contact with the push rod. Now, as the engine warms up, the valves become longer and in doing so are applying pressure to the plunger. Since the oil in the lower chamber cannot escape up through the hole in the plunger (the check ball closes the port), it releases pressure by controlled oil leakage between the plunger and the lifter body. By doing this, the plunger drops lower into the lifter body and compensates for the expansion of the valves.

As you can see by the foregoing information, both ends of the push rod are thoroughly lubricated. Oil, under pressure, sent into the valve lifter is also forced up through the hollow steel push rod and lubricates the point where the push rod top meets the ball-pivot rocker arm.

BALL-PIVOT ROCKER ARMS

The ball-pivot rocker arms are a product of sound and productive thinking and were developed by Pontiac especially for the Strato-Streak V-8 engine. They are made of cyanide-hardened, stamped steel and are mounted on the cylinder heads by hollow studs (this permits lubrication of rocker assembly—see lubrication section for explanation). Ball-pivot rocker arm arrangement notably minimizes valve cocking, valve stem wear and is exceptionally durable, easy to service; provides automatic wear compensation and is precisely adjusted to insure most efficient valve-lifter operation.

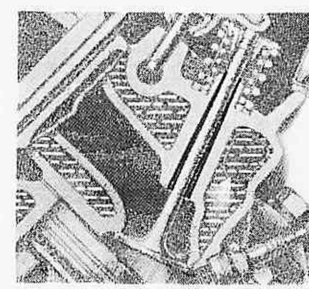




ALUMINUM TREATED INTAKE & EXHAUST VALVES

Having proved to be quite satisfactory in 1955, Pontiac again in 1956 utilizes forged and heat-treated valves . . . machined and carefully fitted to close production tolerances. Intake valves are made of aluminized, durable alloy steel, while exhaust valves are made from heat-resistant, long-lasting, high chromium-nickel alloy steel that also has been aluminized to increase valve life. Dual valve springs are used to guarantee long spring life and to obtain proper valve motion under all operation conditions.

TAPERED VALVE GUIDES



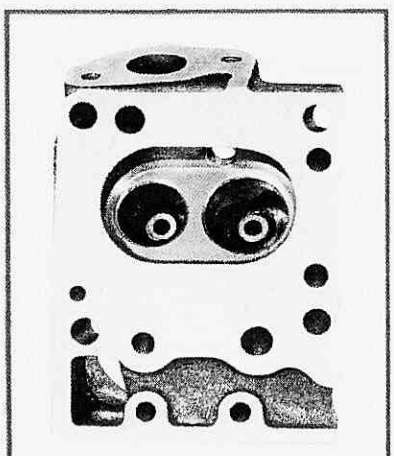
Tapered valve stem guides, long a "Pontiac First", are again being used in 1956, but are now cast integral with the cylinder head. This "taper" feature allows maximum clearance between the valve and stem at the head end to provide for expansion caused by heat from engine operation. Resultant advantages: valve sticking minimized, oil leakage down the valve stem and into combustion chamber is greatly reduced. This fact is particularly important in overhead valve engines. Also of major importance, proper valve seating is assured, which adds to valve life.

COMPLETELY MACHINED ANTIKNOCK COMBUSTION CHAMBER

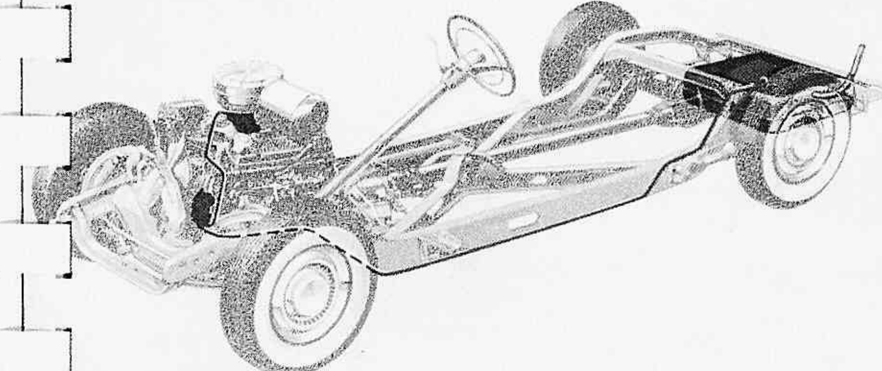
Cylinder head with correct combustion chamber shape and proper location of the spark plug is of utmost importance to the efficiency and economy of any engine. Therefore, this aspect has been the subject of exhaustive research resulting in the development of a design which gives exceptionally high gasoline economy and power without knock, even with the new high 8.9:1 compression ratio.

A wedge-shaped chamber, having its greatest height near the outer edge of the cylinder bore and its major volume offset outwardly from the center line of the piston, is used. This is completely machined to insure accurate volume control and uniform size for all cylinders. Added engine smoothness is thereby obtained, since explosion pressures on the power stroke will be virtually the same on all cylinders. Spark plug location is near the intake valve, a location selected to provide precise ignition, maximum power and to permit adequate plug cooling.

For smooth combustion the igniting gases must burn at a uniform rate. In high-compression engines this requires particular attention since the extremely high pressures will result in premature explosion of a portion of the charge unless measures are taken to prevent it. For this reason, a quench area which covers approximately 35% of the piston head is incorporated in Pontiac's design. This 55/1000" depth area is occupied by the last gases to burn, and the cooling effect of closely adjacent metal prevents premature ignition or detonation with its resultant noise, loss of power, high operating temperatures and increased mechanical stresses on engine parts. This, together with the swirling turbulence it induces, results in smooth, even, complete combustion.



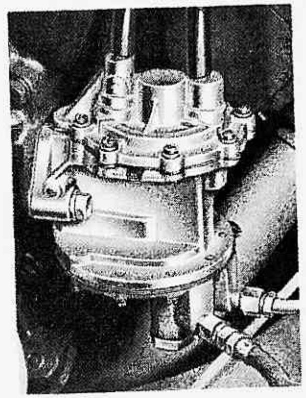
It should be noted, too, that Pontiac's valves are large, which permits easier engine breathing. Also, 30° intake valve seats—long used by Pontiac—are continued to give maximum air flow with minimum valve lift, consistent with best engine efficiency. Large passages leading to each valve are cast in the head to insure free flow of intake and exhaust gases.



FUEL DISTRIBUTION SYSTEM

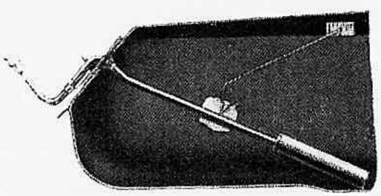
Another outstanding feature of this dynamic new Strato-Streak engine is its fuel distribution system. With the adoption of the completely new V-8 in 1955, certain advantages in fuel distribution were soon apparent, and this new system has proved to be one of the finest ever developed by Pontiac engineers. Now let us take each unit in the system and cover it thoroughly.

COMBINATION FUEL AND VACUUM PUMP



Because of its location (front left-hand side of the engine and at maximum distance from exhaust pipe), the fuel pump receives cooling blasts from the fan, which prevents vapor lock—an aspect further avoided by eliminating the settling chamber. Other features of its location are that driving forces on the actuating arm are less than would otherwise occur, thus providing longer pump life, and "lift" from the fuel tank is at a minimum. All fuel entering the pump is screened. A vacuum booster, except on cars with the accessory windshield wiper, is employed to insure dependable and consistent windshield wiper action.

NEW FUEL FILTER



Completely new for 1956, the fuel filter is now located in the fuel tank. Offering a greatly increased filtering area, the new double-wrap plastic filter is less sensitive to clogging and requires no cleaning. Another advantage of this new filter is that, because of its location, it need not be disturbed in the event that the carburetor needs servicing, as was necessary with the filter used on the 1955 models.

OIL-BATH AIR CLEANER (ACCESSORY)

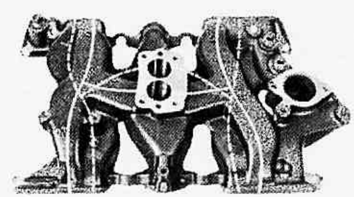
Air, as it enters the heavy-duty, oil-bath air cleaner, passes down and impinges off the oil bath which serves to collect dirt particles, which, by abrupt change in direction, are precipitated out of the air stream. From there, the air passes through a fibrous filter and then down a central tube to the carburetor.

NEW TWO-BARREL CARBURETOR

Because of the larger engine in the 1956 models, the two-barrel carburetor used as standard on 860 and 870 models in 1955 was reappraised and modified. Larger venturi are provided, and the throttle lever has been changed to improve accelerator linkage operation. Of the side bowl type, the new carburetor is short and compact, and includes an automatic choke whose operation is assisted by a baffled stove in the intake manifold and an automatic throttle opener to provide higher initial idle speed and a vacuum control of the fuel mixture to insure quick, lag-free acceleration.

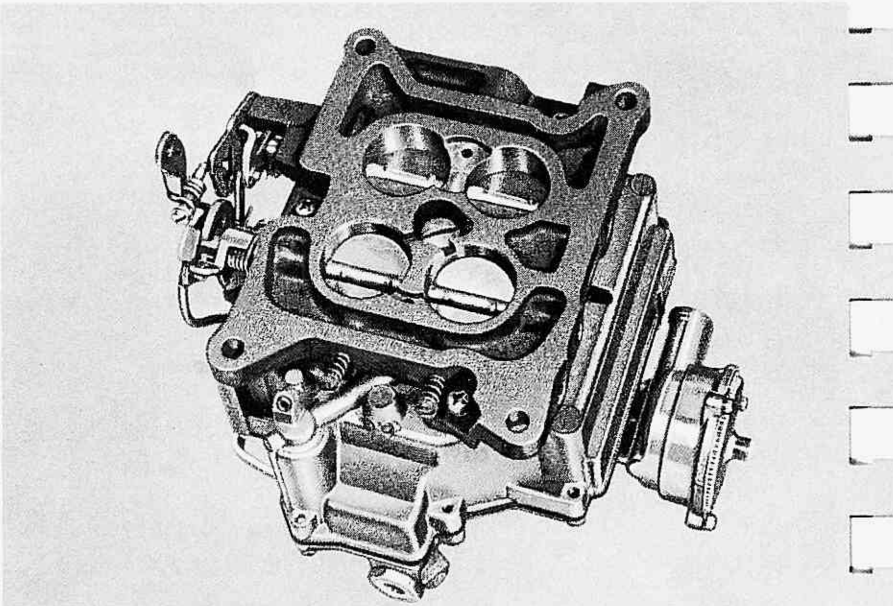
BALANCED-INTAKE MANIFOLD

Distribution of fuel and air mixture from the carburetor to the cylinders greatly affects the efficiency of each individual cylinder. Should certain cylinders receive more of the mixture and others receive less, entire engine performance is greatly deterred. In order to regulate this situation, Pontiac engineers developed a balanced-intake manifold. Fuel passages are short and practically equal in length, are extra large and have generously rounded turns to reduce surface friction. This makes a highly efficient distribution system.



To facilitate a better distribution of wet fuel, a fuel distributor has been cast in the lower header floor directly beneath and fore and aft of the risers leading to the carburetor. When the engine is cold, a temperature-sensitive heat control valve causes all exhaust gases in the right-hand manifold to stream through this stove for maximum heating. This insures quick engine "warm-up". When the engine reaches operating temperature, the valve opens allowing the exhaust gases to escape out both the right and left manifolds. Sufficient "surge" gases remain to maintain a desired preheat condition.

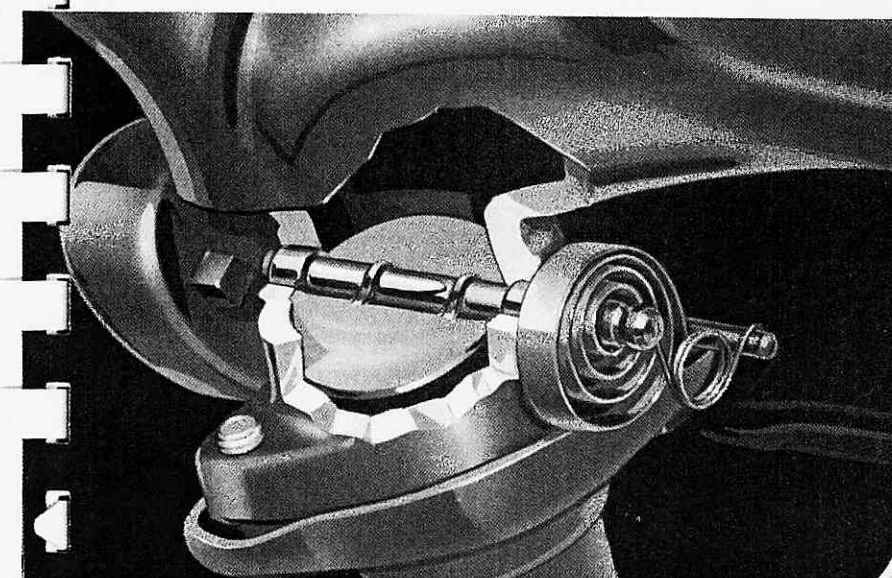
NEW FOUR-BARREL CARBURETOR

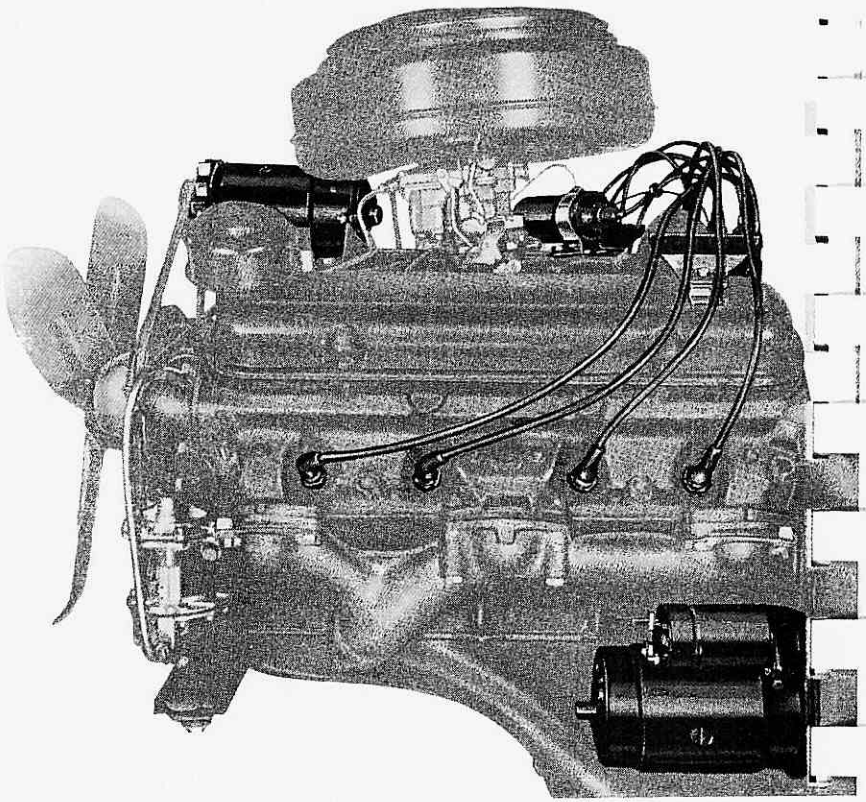


A four-barrel carburetor has now been adopted as standard equipment to add power and distinction to the Star Chief series. It offers more maneuverability and hill-climbing ability as well as augmenting acceleration. It also increases the horsepower on these models to 227, a value greater than that on the 870 and 860 models with a two-barrel carburetor. Operation of the four-barrel carburetor parallels that of the two-barrel carburetor. That is, the four-barrel carburetor, in essence, consists of two dual carburetors contained in one unit. It has two sections: the primary side and the secondary side. It is important to note in the operation of the four-barrel carburetor that the secondary side acts as a supplementary component and is brought into operation only when the accelerator pedal is depressed sufficiently. When this occurs, the secondary nozzles then will operate in parallel with the primary nozzles for maximum performance on demand. This carburetor, manifold and air cleaner package is available as an optional accessory on the 870 and 860 models.

EXHAUST SYSTEM

Illustrated below is the spring-loaded, temperature-sensitive heat control valve. When the engine is cold the valve is closed, which forces exhaust gases around a stove in the intake manifold for maximum heating for quick warm-ups. As the engine temperature rises, the valve opens allowing the exhaust gases to flow out of their normal passages; sufficient "surge" gases remain for desired preheat condition. Two cast-iron exhaust manifolds are used on the Pontiac Strato-Streak V-8 . . . one for each bank of cylinders. Each manifold services four cylinders and has three ports; individual ports service end cylinders. Exhaust passages are larger in size than last year to insure easy escape of exhaust gases, minimum back pressure and optimum operating efficiency of the engine, and a fuel distributor has been cast into the lower header floor of the intake manifold, which improves performance. A tubular steel exhaust pipe at the right-hand side of the chassis empties both exhaust manifolds, except with dual-exhaust accessory. The exhaust manifold on the left side is connected to the exhaust pipe by a pipe which passes under the engine and which is, in turn, joined by a pipe leading from the right-hand manifold. If dual exhausts (accessory) are installed, the left-side piping would be replaced by an exhaust pipe and muffler similar to that on the right side.





12-VOLT SYSTEM AND COMPONENTS

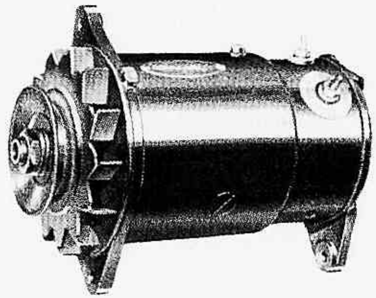
The electrical system of the 1955 Pontiac has been retained for 1956 because it has more than proved its worth. Not only is it more efficient than the 6-volt system, but it also improves the operation of the automobile. The increased use of more accessories also makes the change from the 6- to 12-volt system advantageous. When it was first decided to make the change, extensive tests were performed. The dependability of the system has been proved by the efficient way it did the job in 1955. Here are the principle advantages that were discovered:

1. Better ignition performance was attained. 2. Higher generator output was effected. 3. Faster cranking speed and, therefore, better starting in cold weather resulted.

Formerly, the primary circuit in the automobile ignition system was furnished a voltage of approximately six volts by the battery. This, then, by a coil induction arrangement was increased to many thousand volts, which, when fed across each spark plug, ignited the combustible charge. In the twelve-volt system, the primary circuit receives twelve volts from the battery. Basically, the design of the twelve-volt system is the same as that of the six-volt with the exception that a series resistor is a part of the primary circuit. This resistor is made from a type of wire which tends to keep the resistance of the primary circuit constant with variation in temperature. During engine cranking it is eliminated from the primary circuit so that maximum current and voltage exist, even though the battery voltage drops due to heavy cranking loads. This is of particular advantage during cold weather starting since a hotter spark for more positive ignition is assured.

Better ignition is augmented also by a marked increase in available energy input, which accrued from resistance and ignition coil changes coupled with the twelve-volt supply. As a consequence, appreciably greater secondary or igniting voltages are available for a given car speed. At 60 mph this gain is approximately 20%, which value may vary slightly for different car speeds and axle ratios, but throughout the operating range available ignition voltage is greater than it would be with the six-volt system. Thus, more dependable ignition performance is assured, and spark plug servicing is minimized. Included among the many other advantages attributable to the twelve-volt electrical system are: longer regulator breaker contact life, better insulation protection of the various circuit cables, improved performance of small auxiliary motors, reduction in over-all weight, and conservation of space.

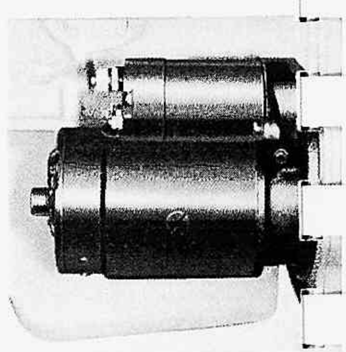
12-VOLT GENERATOR



Better generator performance is obtained, efficiency is increased and wattage or power output is greater with the use of this dependable 12-volt generator. And because of these advantages there is, in useable power, a gain of approximately 11% over the 1954 6-volt generator, even though the entire generator had the same diameter and was one inch shorter.

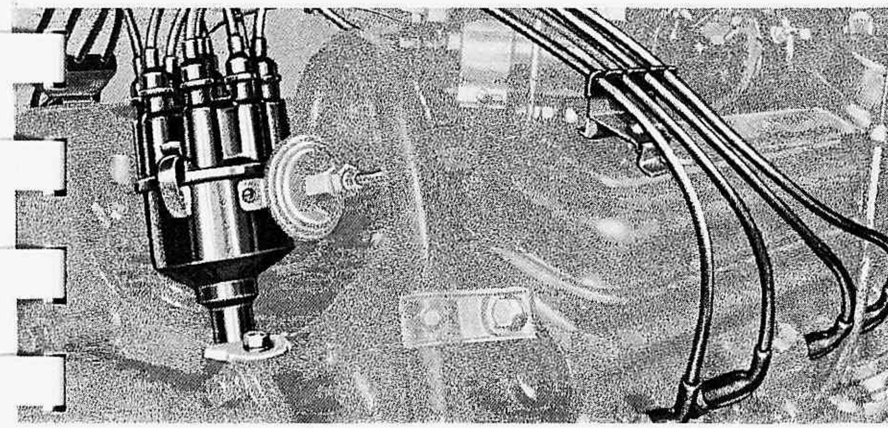
NEW 12-VOLT STARTER AND SOLENOID

For 1956, Pontiac has an entirely new starting motor and solenoid design. Since the starting motor is mounted in an exposed position on the left-hand, lower rear side of the engine, it is oftentimes subjected to road splash and dirt. For this reason, the engineers came up with a new unit that will provide a drier and cleaner starting motor and solenoid. Now a cast housing surrounds the clutch as well as the shift mechanism, which means that the starting motor and solenoid are sealed by unitary construction. Starting difficulties, which might result from freezing moisture in the linkage and solenoid plunger, are thereby eliminated and better service is assured.



12-VOLT DISTRIBUTOR

Newly designed for 1955, the twelve-volt distributor is retained for use in the 1956 models. Driven by a camshaft through a gear mounted at its lower end, this distributor provides optimum ignition and synchronization. An all-weather cap is used for better breathing and includes barriers which precipitate dirt particles carried by entering air. It also provides shielding for raised, widely separated point seats, thus giving ideal protection against energy loss due to "tracking" and is less susceptible to effect of moisture condensation.



NEW BATTERY, DUAL HORNS, CABLE INSULATION AND SPARK PLUGS

1. A new battery with improved life as its main advantage will be used in the 1956 models. It is designed to be more resistant to jarring, rough usage, high temperatures and more resistant to overcharge. New vent caps more effectively retain battery acid and keep the top of the battery cleaner. Each battery is now warranted for 36 months.

2. Dual horns are mounted ahead of the radiator for maximum signal strength, and for 1956 the horn relay was moved behind radiator baffle to minimize corrosion.

3. Cable insulation offers optimum resistance to moisture and scuffing.

4. New spark plugs have an improved construction to reduce

the possibility of misfires. Four ribs at the top facilitate sealing between the spark plug and spark plug nipple.

TAPERED-CAM CAMSHAFT

Pontiac's V-8 camshaft is 22.4" long and is cast from tough alloy iron. All cams are ground, hardened and tapered with the high side of the cam toward the rear. This fact, coupled with a spherical base on the valve lifter, insures valve lifter rotation. Since the contact surface keeps changing, longer lifter life is assured and quieter operation obtained as well.

Cams are uniformly distributed along the length of the camshaft to provide valve lift according to precise timing. Two different camshafts are specified, depending on transmission used. Cam design has been carefully worked out to insure quiet operation, optimum power output and maximum durability.

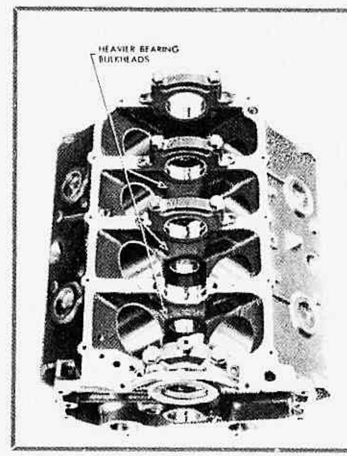
A 1-inch wide, silent chain, having 60 links, is used to drive the camshaft from the crankshaft. The camshaft drive sprocket, having 42 teeth, is made from cyanide-hardened, cast alloy iron while the crankshaft sprocket, with 21 teeth, is of case-hardened steel.

HARMONIC BALANCER

Pontiac's new Strato-Streak V-8 uses a harmonic balancer, pioneered by Pontiac in 1925, to further guarantee smooth, quiet engine operation which in turn adds to its durability. It is built into the fan-drive pulley and is mounted at the front of the crankshaft. It consists of a 3-pound 13-ounce steel weight which is retained to the crankshaft pulley assembly through three flexible banks of springs. Weight and spring tension combination are such that the balancer assembly is tuned to the critical period of the crankshaft and tends to oscillate out of phase with the crankshaft, thereby neutralizing torsional vibration.

CYLINDER BLOCK WITH RIGHT-HAND BANK FORWARD

Added strength has been built into the Strato-Streak V-8 for 1956 to handle its greater power. This has been accomplished by increasing the amount of metal at the three intermediate bearing bulkheads of the cylinder block. Engine displacement has also increased from 287.2 to 316.6 cubic inches for added performance. An important feature of the 1956 cylinder block is the fact that the right-hand bank of cylinders is forward. This permits location of the distributor in such a position that the force of the camshaft drive gear is upward. In this location, better timing results and the distributor is simpler to install and more readily serviced. Also, with the right-hand bank forward, the fuel pump can be located low on the left front side of the engine, farthest from the exhaust pipe, where cooling blasts from the fan minimize the danger of vapor lock and fuel lift is at a minimum. All this, plus better supporting arrangement for the generator, makes the right-hand bank forward a very advantageous feature.

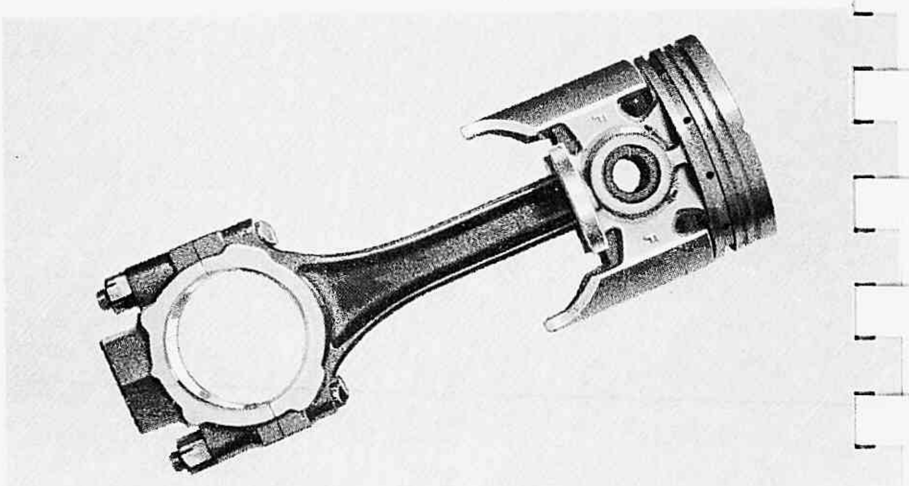


All main bearing caps are doweled to the cylinder block to insure accurate alignment and facilitate assembly. They have also been increased in thickness for more stable crankshaft anchorage. Pontiac's V-8 cylinder block is accurately cast from durable, low-friction alloy iron; bores are finish-honed to a smooth surface to which oil film clings to insure long piston and bore life.

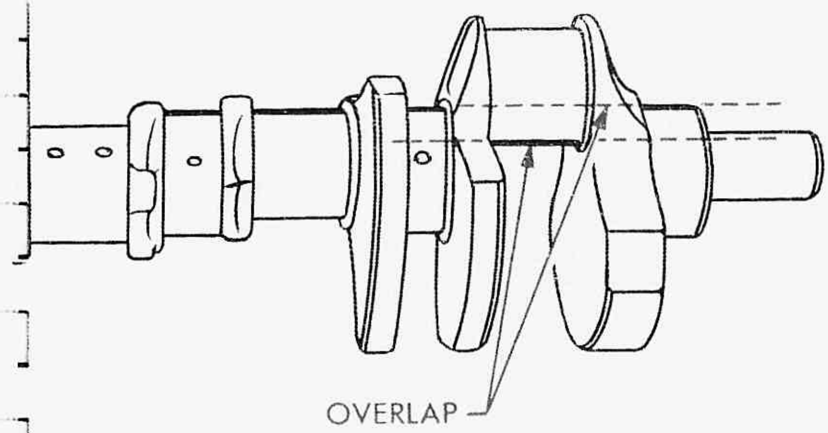
BALANCED CONNECTING RODS AND TIN-PLATED OFFSET PISTONS

Connecting rods in the Strato-Streak V-8 are steel I-beam forgings which, with bronze piston pin bushings in place, are subjected to two balancing operations to provide precise center of gravity location. Connecting rod bearings are steel-backed and can be replaced easily, if ever necessary.

Slipper skirt and cam-ground aluminum pistons with reinforcing steel struts are used in the Strato-Streak V-8 for 1956. The pistons are tin-plated, a feature in effect pioneered by Pontiac, which insures maximum wearing surface and minimizes danger of piston seizure and scuffing of the cylinder bores. Pistons are controlled for weight to within 1/16 oz.



With the high-compression-ratio engine, flat-headed pistons are used (dished-top pistons are used in low-compression engines); two compression rings and one oil ring are employed and are located above the carburized and hardened-steel piston pins. Top compression rings of centrifugally cast iron are heavily chromed for maximum life. A four-piece oil ring with chrome-plated segments insures outstanding oil economy. Floating piston pins are off set 1/16 inch, which insures gradual change in thrust pressure of the piston skirt against the cylinder wall as pistons travel in their paths.



BALANCED CRANKSHAFT AND OVERLAPPING CRANKSHAFT BEARINGS

Crankshaft in the new V-8 engine is cast or forged, heat-treated to precise specification and machined to exacting tolerances. Inherently rigid because of its short length, 25.7″ as compared to 37.8″ in the 1954 L-head engine, rigidity is further enhanced by ¾″ overlap between the main journals and crankpins.

This, in effect, means a solid section of metal extends the entire length of the crankshaft to add to its ruggedness and durability. It is supported in the crankshaft by five main bearings.

Crankshaft balance is extremely important to engine smoothness. This is true since a small amount of unbalance, though trivial compared to total weight, becomes a tremendous force when revolved at high speed. To guard against the deleterious effect of this unbalanced force on bearing life and smoothness, Pontiac specifies that the crankshaft be balanced in the engine assembly with connecting rods and pistons assembled to .5 in. oz. with the crank rotating. Six counterweights are made integral with the crankshaft for this purpose. Additional smoothness is engendered by use of a harmonic balancer and by precise balancing of all rotating engine parts.

Crosswise drilling in the crankshaft provides pressure lubrication to all bearings. Crankshaft end thrust is taken by bearing No. 4 for added durability. Main bearing journals are 2½" in diameter, while crankpin diameter is 2¼". Main bearings, of removable type, are steel-backed and overlayed with long-wearing babbitt.

SINGLE BELT FAN, WATER PUMP AND GENERATOR DRIVE

A single ⅜-inch high-capacity V-belt is used to drive fan, water pump and generator. Tests have proven this arrangement provides excellent belt durability. In addition, the belt is readily accessible, which makes servicing easier.

1956 PONTIAC STRATO-STREAK V-8 ENGINE SPECIFICATIONS

ENGINE	56-27	56-28
Type and Number of Cylinders	90° V-8	90° V-8
Valve Arrangement	In Head	In Head
Bore and Stroke	3.94 x 3.25	
Displacement—Cubic Inches	316.6	316.6
Compression Ratio Standard (Premium Fuel)	8.9:1	8.9:1
Maximum Brake Horsepower at Engine rpm (8.9:1 Compression Ratio) H.M. Transmission	205 @ 4600	227 @ 4800
Maximum Torque (lbs. ft.) at Engine rpm (8.9:1 Compression Ratio) H.M. Trans.	294 @ 2600	312 @ 3000
Compression Pressure at Cranking Speed (8.9:1 Compression Ratio) psi at rpm	145 to 155 psi @ 160 to 170 rpm	
Firing Order	1-8-4-3-6-5-7-2	

CRANKSHAFT	56-27	56-28
Weight (lbs.)—Forged Shaft	59.4	59.4
—Cast Shaft	53.7	53.7
Counterweights—Number	6	6
Main Bearings—Number	5	5
No. 1 Bearing—Diameter	2.50	2.50
Length	.94	.94
No. 2 Bearing—Diameter	2.50	2.50
Length	.94	.94
No. 3 Bearing—Diameter	2.50	2.50
Length	.94	.94
No. 4 Bearing—Diameter	2.50	2.50
Length	.91	.91
No. 5 Bearing—Diameter	2.50	2.50
Length	1.56	1.56
Projected Crankshaft Bearing Area	13.22 Sq. In.	13.22 Sq. In.
End Thrust Taken by Bearing (Number)	4	4
Main Bearing Material	Durex Steel Backed	
Interchangeable Main Bearings	Yes	Yes
Vibration Dampener Type	Harmonic Balancer	

PISTONS AND RINGS

	56-27	56-28
Piston—Material	Aluminum Alloy	
Piston—Tin Plated	Yes	Yes
Weight—Piston Only	1.46 Lb.	1.46 Lb.
Number Compression Rings	2	2
Number Oil Control Rings	1	1
Number Rings Above Piston Pin	3	3
Width Compression Ring	.078	.078
Taper on Compression Ring	Yes	Yes
Width Oil Ring	.186	.186
Length Piston	4.13	4.13
Piston Pin—Diameter	.98	.98
Length	3.13	3.13
Piston Pin Bushings—Effective Length (In Rod)	1.25	1.25
Type Piston Pins	Floating	
Pinhole Diamond Bored in Rod	Yes	Yes

CONNECTING RODS

	56-27	56-28
Connecting Rod Length (Center to Center)	6.63	6.63
Connecting Rod Assembly Weight—Bushing Included	1.86 Lb.	1.86 Lb.
Crankpin Bearing—Diameter	2.25	2.25
Length	.88	.88
Bearing Materials (Optional)	Durex Steel Backed or Micro Babbitt Steel Backed	
Interchangeable Connecting Rod Bearings	Yes	Yes

CAMSHAFT DRIVE

	56-27	56-28
Crankshaft Gear—Material	Carburized and Hardened Steel	
Camshaft Gear—Material	Alloy Iron Cyanide Hardened	
Timing Chain—Make	Morse	Morse
Number Links in Chain	60	60
Width Chain—Nominal	1	1
Pitch of Chain	.38	.38

INTAKE VALVES

	56-27	56-28
Diameter Head—Over-all	1.78	1.78
Port Diameter—At Seat	1.61	1.61
Angle of Seat	30°	30°

EXHAUST VALVE

	56-27	56-28
Diameter Head—Over-all	1.50	1.50
Port Diameter—At Seat	1.37	1.37
Angle of Seat	45°	45°

VALVE DATA

	56-27	56-28
Over-all Length Valve—Intake	5.25	5.25
Exhaust	5.23	5.23
Stem Diameter	.34	.34
Valve Lift (Synchromesh Trans. Engine)	.37	.37
Valve Lift (Hydra-Matic Trans. Engine)	.40	.40
Outer Spring Pressure and Length—Lbs. @ In.		
Valve Closed (Synchromesh Trans. Eng.)	58 @ 1.53	
Valve Closed (Hydra-Matic Trans. Eng.)	58 @ 1.53	
Valve Open (Synchromesh Trans. Eng.)	108 @ 1.16	
Valve Open (Hydra-Matic Trans. Eng.)	112 @ 1.13	
Inner Spring Pressure and Length—Lbs. @ In.		
Valve Closed (Synchromesh Trans. Eng.)	26 @ 1.48	
Valve Closed (Hydra-Matic Trans. Eng.)	26 @ 1.48	
Valve Open (Synchromesh Trans. Eng.)	61 @ 1.11	
Valve Open (Hydra-Matic Trans. Eng.)	64 @ 1.08	
Dual Valve Springs	Yes	Yes
Hydraulic Valve Lifters	Yes	Yes
Tapered Valve Guides—Integral	Yes	Yes

VALVE TIMING

	56-27	56-28
Intake Opens—		
°BTC (Synchromesh Trans. Engine)	22°	22°
°BTC (Hydra-Matic Trans. Engine)	27°	27°
Intake Closes—		
°ABC (Synchromesh Trans. Engine)	67°	67°
°ABC (Hydra-Matic Trans. Engine)	73°	73°
Exhaust Opens—		
°BBC (Synchromesh Trans. Engine)	63°	63°
°BBC (Hydra-Matic Trans. Engine)	69°	69°
Exhaust Closes—		
°ATC (Synchromesh Trans. Engine)	27°	27°
°ATC (Hydra-Matic Trans. Engine)	31°	31°

VENTILATION SYSTEM—ENGINE	56-27	56-28
Complete Pressure—Suction Type	Yes	Yes
Heavy-duty Ventilator Inlet and Oil Filler Cap	Accessory	Accessory
Heavy-duty Crankcase Ventilator Outlet Air Cleaner	Accessory	Accessory

ENGINE LUBRICATION

Pressure Lubrication	Yes	Yes
Cylinder Wall Lubrication Jet	Yes	Yes
Push Rods Hollow for Lubrication	Yes	Yes
Oil Pump Type	Gear (Helical)	
Jet Lubrication of Timing Chain	Yes	Yes
Normal Oil Pressure (Lb. @ mph)	34-45 above 40	
Capacity of Crankcase (Less Filter)—Refill (Quarts)	5	5
Quantity Oil Circulated at 60 mph—10-W Oil—Hot—GPM	3.6	3.6
Oil Filter—Full Flow—Accessory	Yes	Yes
Type Oil Intake	Floating	Floating

FUEL SYSTEM

Carburetor—Type—Standard Carburetion	Dual*	Four-Barrel
Carburetor—Model	RPD	RPD
(Synchromesh Transmission)	7008696	7007900
(Hydra-Matic Transmission)	7008695	Carter WCFB-2364S or RPD 7008697
Carburetor—Type—Safari and optional on all other 27 Models	Four-Barrel Same as 28 Model	Four-Barrel Standard (See Above)
Automatic Choke—Type	Integral	Integral
Type Metering	Mechanical and Vacuum	
Air Cleaner and Silencer Type—Standard	Vertical Oiled** Crimped Metal	Horizontal Oiled Crimped Metal

*Except Safari
**Except Safari which uses 28 Model Cleaner.

FUEL SYSTEM (Continued)	56-27	56-28
Air Cleaner Type—Accessory	Vertical** (Heavy-duty Oil Bath)	Horizontal
Fuel Pump with Vacuum Booster—except cars with accessory electric wipers	Yes	Yes
Fuel Tank Capacity (Except SWGS)	20 Gals.	20 Gals.
Intake Manifold Heat Control	Automatic	Automatic

EXHAUST SYSTEM

Muffler—Type	Reverse Flow	
Exhaust Pipe Diameter—Main	2.25	2.25
Exhaust Pipe Diameter—Branch	2.00	2.00
Tail Pipe Diameter	2.00	2.00
Optional Dual Exhaust Pipe Diameter—Right-Hand and Left-Hand—Not available on 4-Door 3-Seat Station Wagon	2.00	2.00
Optional Dual Exhaust Tail Pipe Diameter	1.75	1.75
Aluminized Tail Pipe	Yes	Yes

COOLING

Water Pump Type	Centrifugal	Centrifugal
Water Pump and Fan Drive	"V" Belt	"V" Belt
Pump Shaft Runs on Sealed Ball Bearing	Yes	Yes
Water Pump Seal—Type	Synthetic Rubber Graphite-Lead Alloy	
Water Circulation Thermostatically Controlled	Yes	Yes
Location of Thermostat	Engine Water Outlet	
Temperature Thermostat Opens Standard	160°F.	160°F.
Accessory High Opening Thermostat for Ethylene Glycol Coolant Opens	170°F.	170°F.
Bypass Recirculation—Type	Internal	
Water Around All Cylinders	Yes	Yes
Water Around All Valves	Yes	Yes
Full-length Water Jacket	Yes	Yes
Radiator Core—Type—(Standard)	Cellular	
Radiator Core—Type—(With Air Conditioning)	Tube and Center	
Core Thickness—Standard	2	2
Core Thickness—With Air Conditioning	1.75	1.75

**Except Safari which uses 28 Model Cleaner.

COOLING (Continued)

	56-27	56-28
Radiator Cap Relief Valve Pressure—Standard	6¼ to 7½ p.s.i.	
Radiator Cap Relief Valve Pressure—(With Air Conditioning)	12 to 15 p.s.i.	
Cooling System Capacity—Stand. Car—Quarts	22.7	22.7
Additional Capacity with Hydra-Matic	0*	0.6
Additional Capacity with Heater	1.6	1.6
Additional Capacity with Air Conditioning	0.1	0.1
Fan—Number of Blades (Standard)	4	4
Fan—Number of Blades (With Air Conditioning)	5	5
Fan Diameter—(Standard)	19	19
Fan Diameter (With Air Conditioning)	19.25	19.25
Ratio—Fan to Crankshaft Revolutions (Standard)	.88:1	.88:1
Ratio—Fan to Crankshaft Revolutions (With Air Conditioning)	.94:1	.94:1
Fan Shroud	Yes	Yes

IGNITION

	56-27	56-28
Maximum Automatic Engine Advance at Crankshaft	20°	20°
Vacuum Advance	Yes	Yes
Breaker Gap—(In.)	.016	.016
Spark Setting (Factory)—BUDC	5°	5°
Ignition Lock	In Switch	
Spark Plug Thread	14 mm	14 mm
Spark Plug Make and Model	AC 44	AC 44
Spark Plug Gap	.033—.038	

BATTERY

Make and Model	Delco 1890587	
Voltage Rating	12	12
Length and Width	10.19 x 6.75	
Height (Over-all)	8.81	8.81
Location	Under Hood, Left Side	
Capacity at 20-Hour Rate	53 Amp. Hours	
Number Plates per Cell	9	9
Visual Filler Neck	Yes	Yes

*Strato-Flight Hydra-Matic optional—See 56-28 Model.

GENERATOR

	56-27	56-28
Type	Shunt Wound	
Current and Voltage Regulator	Yes	Yes
Regulated Current—Room Temperature (Standard)	25 Amps.	
Regulated Current—Room Temperature (With Air Conditioning)	35 Amps.	
Regulated Voltage—Room Temperature	14.3	14.3

STARTING MOTOR

	56-27	56-28
Starter Control (Solenoid)	Ignition Key	
Engine Cranking Speed	138 rpm	138 rpm
Engagement Type	Sliding Gear, Over-running Clutch	
Gear Ratio—Starter to Engine	19.56:1	19.56:1

BALANCE TOLERANCES OF ROTATING AND RECIPROCATING PARTS

Crankshaft, Connecting Rods, Pistons, Flywheel, and Clutch Assembly Balanced in Engine	½ in. oz.	
Crankshaft Balancer Weight	.25 in. oz.	
Clutch-driven Plate	.25 in. oz.	
Connecting Rod—Balance Limit—For Center of Gravity Control (Each End)	.05 oz.	.06 oz.
Piston Weight	.05 oz.	.05 oz.
Fan	.25 in. oz.	
Generator Armature	.25 in. oz.	

RELATION OF ENGINE TO REAR WHEEL REVOLUTIONS

7.10" x 15" TIRES (24 lbs. Pressure)

Axle Ratio	3.90:1	3.64:1	3.23:1	3.08:1
Engine Revolutions per Mile	2863	2669	2371	2258
Rear Wheel Revolutions per Mile	734	734	734	734

7.60" x 15" TIRES (22 lbs. Pressure Front and 20 lbs. Rear)

Axle Ratio	3.90:1	3.64:1	3.23:1	3.08:1
Engine Revolutions per Mile	2816	2625	2333	2222
Rear Wheel Revolutions per Mile	722	722	722	722

Note: Engine revolutions per mile and revolutions per minute are the same at 60 miles per hour.