ROSS ROY

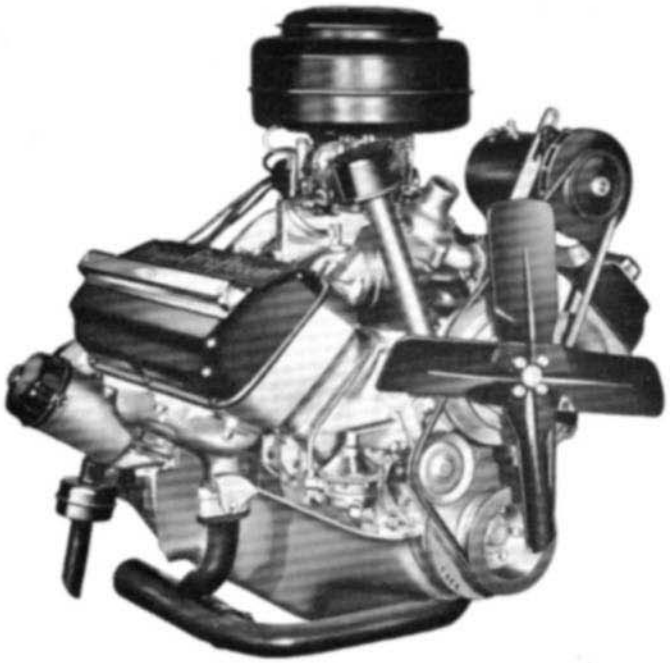
RETAIL SALESMAN'S BULLETIN

Chrysler

KNOWLEDGE OF THE PRODUCT IS THE FIRST REQUIREMENT OF SALESMANSHIP

The NEW Chrysler FirePower Engine

most powerful and efficient built for American cars!



The most exciting story to come from the auto industry in many years is that of FirePower—Chrysler's entirely new design concept in production-built, overhead-valve V-8 engines.

During the development of this great engine, it was subjected to a series of exhaustive tests to determine not only its efficiency, but also its ability to stand up under the hardest kind of usage. The engineers deliberately tried to "run it to death."

But the FirePower engine did more than *meet every demand* of the engineering group—it *surpassed* even their most optimistic expectations!

In test engines, run the equivalent of *five times around the world*, the FirePower engine showed *less wear, less power loss, less deterioration* than did the best competitive engines under comparable tests.

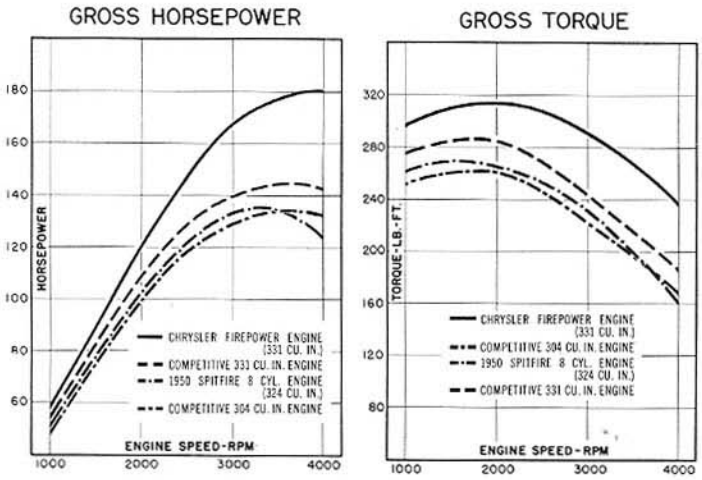
TESTING PROVES FIREPOWER SUPERIOR

The two graphs at the right are dynamometer proof that the FirePower V-8 engine not only *produces more horsepower* than the highest rated competitor, but *produces greater torque* (pulling power) as well.

Note in the Horsepower Curve that at 2500 rpm, the FirePower engine develops as much gross horsepower as a leading competitive engine does at 3500 rpm.

This means that at any speed and under any load, the Chrysler engine will never have to work as near its limit as the competitive engine would under the same circumstances.

It also means that FirePower has more power in reserve—to meet unexpected emergencies—than any other engine. However, both FirePower and its highest rated competitor *have the same piston displacement.* The fact that FirePower develops more horsepower and torque, as indicated in the charts at right, is additional proof of Chrysler's claim of unmatched engine performance.



Note: In the tests charted here, all engines were tested under identical conditions.

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Chrysler Bulletins Nos. 10 & 11

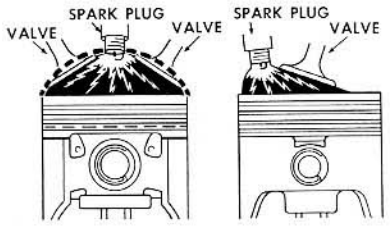
THREE MAJOR REASONS FOR FIREPOWER EFFICIENCY

The efficiency of an internal combustion engine depends primarily on the way the fuel mixture is brought into the combustion chamber, the evenness of the burning process, and the way the exhaust gases are discharged. As a starting point, then, let's consider the FirePower combustion chamber and also that of a leading competitor.

HEMISPHERICAL COMBUSTION CHAMBER

The Chrysler hemispherical combustion chamber permits central positioning of the spark plug. This, in turn, produces even, regular burning of the fuel mixture because of the short, direct flame travel. In addition, because of the smaller surface area of the hemispherical combustion chamber, there is less heat loss. As a consequence, *more* power, *more* heat energy is directed against the piston. Also, there is less likelihood for "hot spots" to develop, thus reducing the possibilities of detonation or pre-ignition.

As you can see in the illustration, there are no pockets or restrictions in the FirePower design. The competitive chamber, however, is severely restricted on the right-hand side. These restrictions can cause detonation and tend to collect fuel residue and carbon not removed by the exhaust system. This, in turn, may reduce power output by as much as 10% after only 10,000 miles of motoring!



FirePower Competitive

The hemispherical combustion chamber also permits the use of *regular* fuel without any significant lowering of performance or power output. However, in the other type of chamber, with the same 7.5 to 1 compression ratio, engine performance will be noticeably poor unless premium fuels are burned.

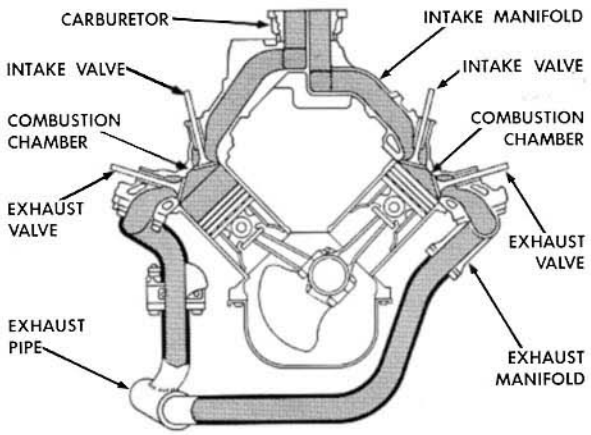
FIREPOWER'S "BREATHING" STEPS UP EFFICIENCY

In order to take full advantage of the power potential, an internal combustion engine must be able to "breathe" efficiently. This means both the *taking in* of fuel mixture and thorough *discharge* of all by-products of combustion.

Chrysler FirePower engine's intake efficiency stems from its double-throated carburetor which feeds four cylinders from each throat, unrestricted intake manifold, clean valve port design, and large intake valves. Due to the symmetrical design of the intake manifold system, there is little possibility of starving some cylinders while over-supplying others, as is the case in some engines.

Exhaust efficiency in the FirePower is particularly high for two reasons: (1) Each cylinder has its own individual exhaust port to the exhaust manifold. (The middle cylinders in each bank do not share a single port as do the cylinders of the highest-rated competitive engine.) (2) Each manifold is connected to the exhaust outlet tube directly and *individually*. (Exhaust gases from the left manifold are *not* required to pass through the right manifold as in some competitive engines, thereby eliminating an exhaust system restriction common to many V-8 engines.)

Also contributing to the FirePower engine's intake and exhaust breathing efficiency is its lateral valve arrangement.

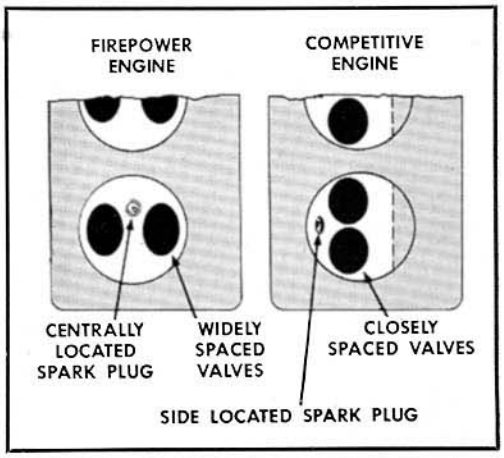


LATERAL VALVE ARRANGEMENT

FirePower performance and efficiency are largely due to a combination of the hemispherical combustion chamber and the lateral valve arrangement.

Notice how the valve location permits large valve diameters and also a minimum of restriction at both intake and exhaust ports. Also, the flow is almost straight through from intake manifold to combustion chamber to exhaust manifold—another factor in this engine's efficient breathing. Also important are the multiple water passages which completely surround valve seats and combustion chamber for more effective cooling.

In competitive valve arrangements, there is not enough space between the valves to permit such thorough cooling. In addition, with closely spaced valves there is no room to increase valve diameters, should future developments make greater power output desirable.



Sketch of undersides of cylinder heads

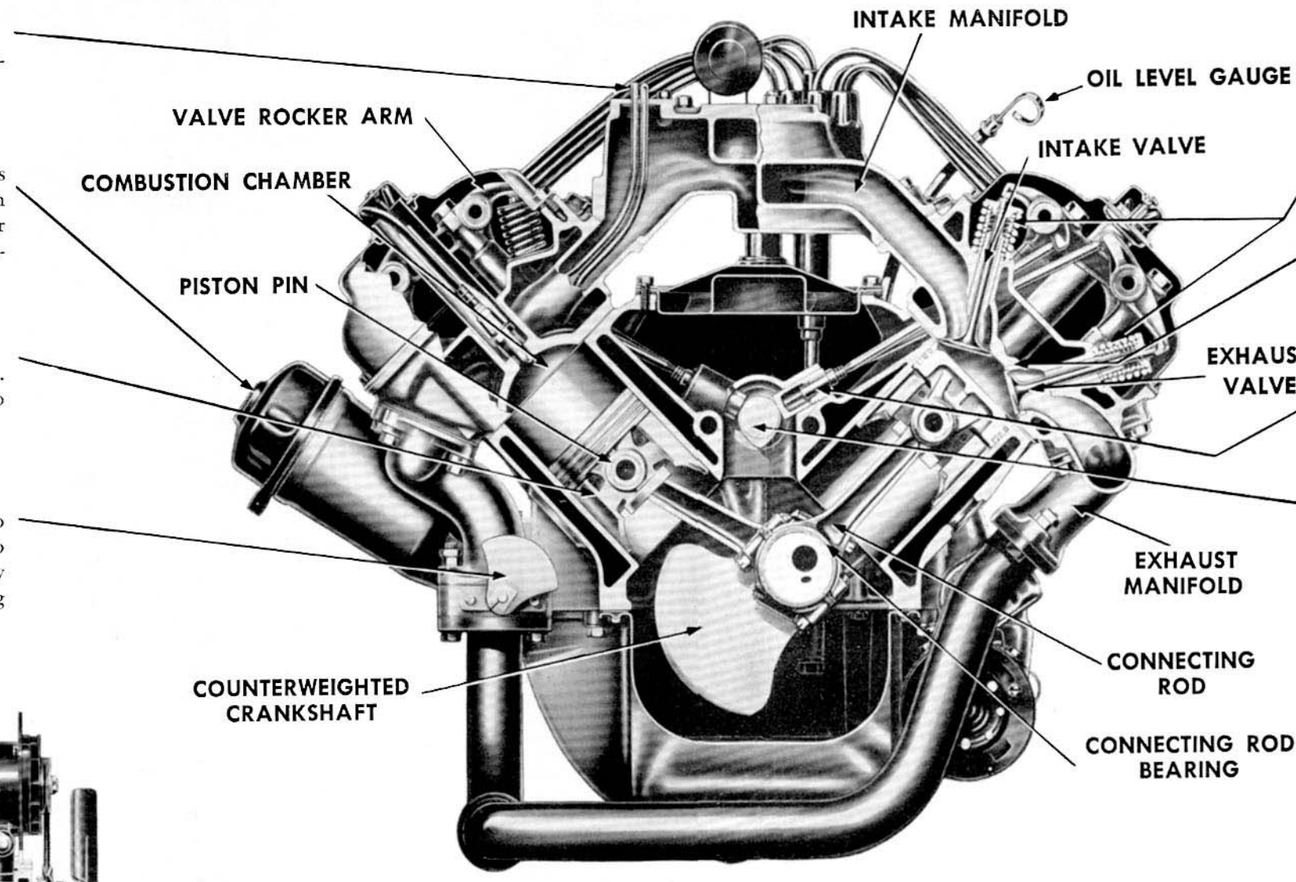
ADDITIONAL FEATURES OF THE SENSATIONAL FirePower ENGINE

CHOKE AIR-HEATER TUBE
Located in the right-hand cylinder head provides heated air to operate choke control.

FULL-FLOW OIL FILTER
Continually removes grit and foreign particles from all the oil before it is pumped through the engine lubricating system. This keeps wear at a minimum and insures trouble-free operation of the hydraulic tappets.

SLIPPER-SKIRT PISTONS
Are light to reduce reciprocating weight . . . skirt design reduces frictional area, adding to over-all engine efficiency.

MANIFOLD HEAT CONTROL
Utilizes heat from the exhaust manifold to preheat the fuel-air mixture being drawn into the intake manifold, thus providing thoroughly vaporized fuel and even distribution during engine warm-up.

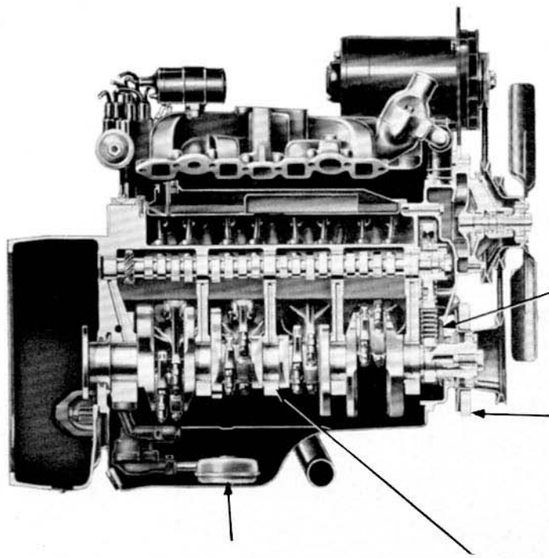


TWIN CONCENTRIC VALVE SPRINGS
Promote moderate valve rotation, thus prolonging valve and valve seat life . . . also provide a safety measure in the event one spring should ever break.

SUPER-HARD EXHAUST VALVE SEAT INSERTS
Retard valve seat wear caused by hot, corrosive exhaust gases.

HYDRAULIC TAPPETS
Provide zero clearance in valve operating linkage at all times . . . eliminate tappet noise and insure complete seating of valves under all operating conditions and temperatures.

CAMSHAFT
Is designed to impart a high lift to both intake and exhaust valves, thus increasing breathing efficiency.



TIMING CHAIN is particularly rugged—25% wider than that of highest rated competitor, to provide long, trouble-free life and quiet operation. It is also equipped with a plastic silencer.

VIBRATION DAMPER serves to smooth out engine firing impulses, thus reducing strain on the crankshaft and other moving parts of the engine. The over-all result is smoother engine performance through the entire speed and load range.

FLOATING OIL INTAKE takes only the cleanest oil—that just below the surface—to help keep the lubrication system free of any sludge which may collect in the bottom of the oil pan.

CRANKSHAFT CENTER BEARING takes the thrust load to eliminate any end thrust on the rear crankshaft bearing that might reduce the life of the rear oil seal.

More Reasons Why the FirePower Engine Leads in Long, Efficient Operation

FIVE MAIN BEARINGS give rigid support to the crankshaft, with a bearing placed on each side of every throw, thus minimizing strain on the crankshaft and any tendency to whip, or deflect.

HIGH-CAPACITY FUEL PUMP—The new *high-capacity fuel pump* is mounted directly in the air stream of the fan, and away from the exhaust manifold, to reduce possibilities of vapor lock.

OILITE FUEL FILTER—A self-cleaning *Oilite fuel filter* in the 20-gallon gas tank keeps impurities from entering the fuel lines. It also keeps water from entering the fuel lines, and thus minimizes the possibility of frozen gas lines.

HEAVY-DUTY OIL-BATH AIR CLEANER—Chrysler's time-proved *heavy-duty, oil-bath air cleaner* is included in the system to prevent dust and foreign particles from entering the carburetor. It provides quiet operation as there is a silencing chamber built into the air cleaner body.

NEW CARBURETOR—The new dual-throated, downdraft carburetor is equipped with an exclusive water-jacketed throttle body to maintain proper carburetor temperatures. This jacket serves to eliminate the common experience of stalling caused by ice forming on the throttle blades. This icing can occur even during mild weather if humidity is high and the engine is not completely warmed up. The water jacket also helps prevent hard starting of a hot engine.

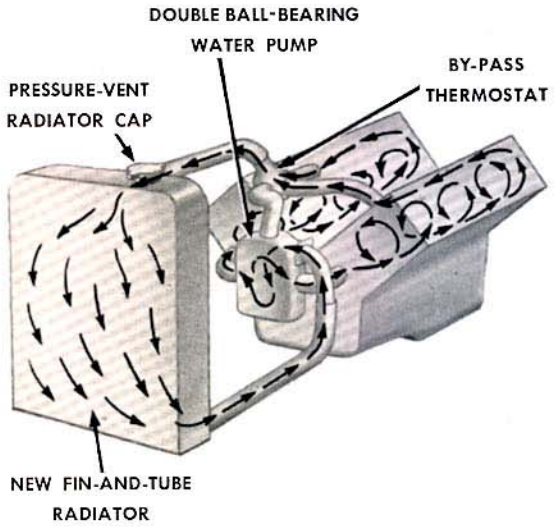
NEW AUTOMATIC CHOKE—Also new is the *climatic control automatic choke* which automatically adjusts fuel-air ratio to the proper mixture for starting the engine. Particularly notable is the heat retention device which prevents overchoking when an already warm engine is restarted.

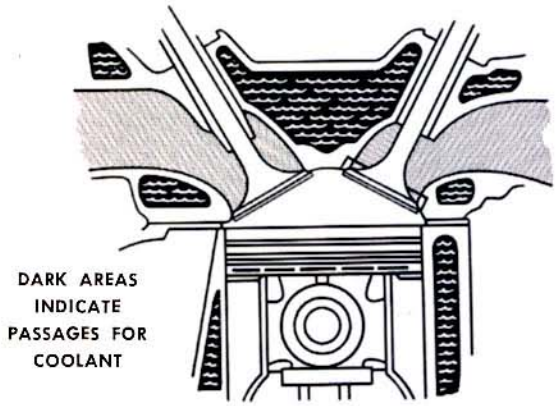
HIGH-CAPACITY OIL PUMP—A *rotary-type oil pump* delivers oil in ample volume from the crankcase reservoir through the oil galleries to every frictional surface of the engine. This pump maintains high oil pressure to assure positive lubrication of every bearing surface.

FirePower Engine Cooling System Features

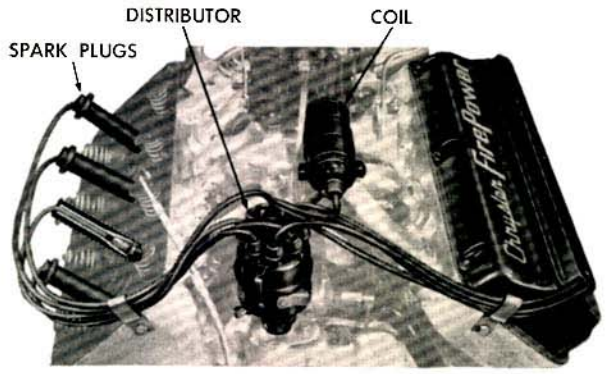
The over-all design of the new Chrysler FirePower engine has resulted in an engine that runs very cool. The fact that an unusually large share of the heat of combustion is converted into mechanical energy (i.e., low heat loss) permits a simple, more compact cooling system. Here are some of the features:

1. **New fin-and-tube radiator** with 17% less core area than that of the 1950 in-line 8-cylinder engine.
2. **Double-ball-bearing water pump** keeps the 25-quart water supply flowing at the desired rate under all speeds and conditions.
3. **By-pass thermostat** decreases warm-up time effectively by recirculating the cooling water back through the engine block rather than allowing it to pass through the radiator core where it would normally be cooled. After engine warms up, the thermostat opens and permits water to circulate through the radiator in a normal manner.
4. **New pressure-vent radiator cap.** This new-type cap gives all the advantages of a "sealed" cooling system under unusual driving temperature conditions, yet permits the system to operate at atmospheric pressure under normal conditions. For extreme speeds, continued heavy engine load, or high altitudes, the sealed-system feature goes into effect. That is, the pressure within the system is raised, thus raising the boiling point of the coolant, and thereby guarding against loss of coolant and possible engine damage.





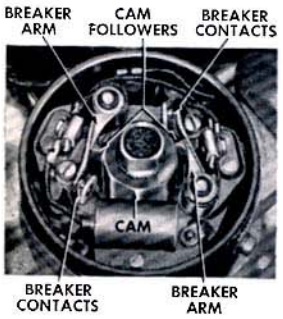
FirePower Electrical System Features Waterproof Ignition



The FirePower electrical system is designed with the same thought to performance and operating economy as other parts of the new engine.

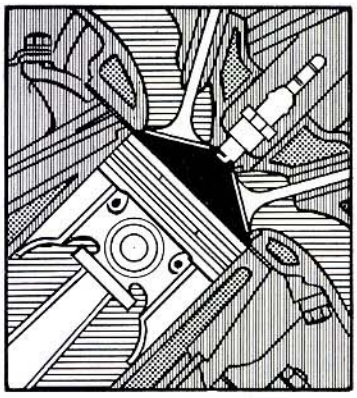
Take, for instance, the FirePower *waterproof ignition system* which has four-way protection against possible failure due to moisture condensation, and water splashing. Coil and distributor, located high and in the rear center of the engine, are protected from water splash by the hood panel and by the cylinder banks. Spark plugs with ceramic jackets are set deep in the head and are surrounded by tubular metal sleeves to provide additional shielding. Spark plugs and synthetic rubber-covered, high-tension cables are enclosed by metal covers.

New Distributor



The new *double-breaker distributor* contributes to smooth operation and development of power potential. The double-breaker system permits current to flow through the coil for a longer time than does the single-breaker type distributor. Thus, the FirePower ignition system always provides a "hot" spark, even at high speeds. Another benefit of the double-breaker design is protection against roughness and power loss at high speeds caused by "point bounce"—a common problem with single-breaker distributors.

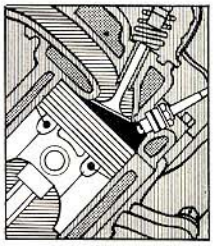
COMPARISON EMPHASIZES FIREPOWER LEADERSHIP



FirePower Combustion Chamber

ENGINE SPECIFICATIONS	FIREPOWER	CADILLAC	OLDS-MOBILE	LINCOLN	BUICK 70	PACKARD 400
TYPE.....	90°V	90°V	90°V	90°V	IN-LINE	IN-LINE
Valve Arrangement.....	OVERHEAD 60° INCLINED (Positioned laterally)	OVERHEAD (Positioned longitudinally)	OVERHEAD (Positioned longitudinally)	L-HEAD	OVERHEAD (Positioned longitudinally)	L-HEAD
No. of cylinders...	8	8	8	8	8	8
Bore and Stroke...	3 13/16" x 3 5/8"	3 13/16" x 3 5/8"	3 3/4" x 3 7/16"	3 1/2" x 4 3/8"	3 7/16" x 4 5/16"	3 1/2" x 4 1/4"
Piston Displacement	331 cu. in.	331 cu. in.	303.7 cu. in.	336.7 cu. in.	320.2 cu. in.	327 cu. in.
Compression Ratio.	7.5 to 1	7.5 to 1	7.5 to 1	7.0 to 1	7.2 to 1	7.8 to 1
Maximum Brake Horsepower (Advertised)....	180 at 4000 R.P.M.	160 at 3800 R.P.M.	135 at 3600 R.P.M.	154 at 3600 R.P.M.	152 at 3600 R.P.M.	155 at 3600 R.P.M.

CADILLAC OVEHEAD-VALVE V-8



Cadillac Combustion Chamber

An overhead-valve V-8, the Cadillac engine, has several characteristics which prevent it from reaching the extra power, efficiency and performance of the new Chrysler FirePower engine.

The Cadillac combustion chamber is wedge-shaped, and the spark plug is placed at the side. This means that the flame front moves *across* the piston face from the side rather than spreading evenly from a centrally placed spark plug, as in FirePower's hemispherical combustion chamber. Also, the location of the valves limits the valve and port diameters. This restricts breathing, with a consequent loss in power and efficiency.

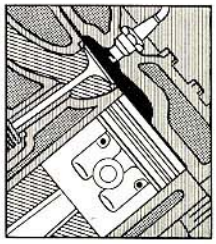
The Cadillac exhaust manifold presents still further interference, as the left bank is connected to the right bank, offering a chance for back pressure to build up in the right-hand manifold.

Additional evidence that the Cadillac engine cannot measure up to FirePower's standard of efficiency is the fact that, although the two engines are the same size in piston displacement, FirePower produces considerably more horsepower.

A final point—although both engines have 7.5 to 1 compression ratio, Chrysler FirePower engine will perform well on either regular or premium fuel. Cadillac, however, recommends exclusive use of premium fuel.

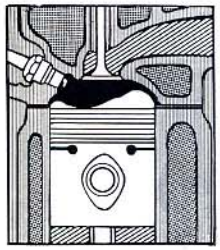
LINCOLN L-HEAD V-8

The diagram of Lincoln's combustion chamber and valves shows some of the limitations of the Lincoln engine. Notice how fuel-air mixture is ignited over valves. The flame front must travel the full width of the combustion chamber. This condition is similar to that of Cadillac, only more exaggerated—with a consequent greater loss of potential power. To illustrate more clearly Lincoln's relatively low specific output or efficiency, consider that although piston displacement is slightly larger than that of Chrysler FirePower, maximum horsepower is over 15% less.



Lincoln Combustion Chamber

BUICK OVERHEAD-VALVE STRAIGHT-8



Buick Combustion Chamber

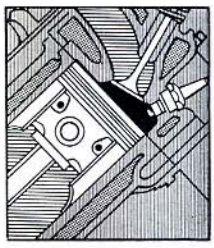
While its engine is of the valve-in-head design, Buick, like Cadillac and others, has not taken full advantage of the benefits made possible by valve-in-head construction.

In an attempt to achieve the effects of a hemispherical combustion chamber, Buick uses a contoured piston head. While this does permit a better flame pattern than many wedge-shaped combustion chambers, it also brings about a very important disadvantage.

The contour-shaped piston face is a natural collector of carbon and other by-products of combustion. The constantly accumulating carbon severely impairs efficiency, and power loss may be considerable.

Another disadvantage is poor engine breathing. Neither intake nor exhaust manifold is as free of restrictions as that of Chrysler FirePower. Therefore, what little Buick is able to accomplish with its simulated hemispherical combustion chamber, it loses because of less efficient breathing.

OLDSMOBILE OVERHEAD-VALVE V-8



Oldsmobile Combustion Chamber

Although the Oldsmobile engine is generally considered to be an efficient power plant, it still does not measure up to the Chrysler standard. The reason for this is that Oldsmobile designers, like those at Cadillac, used a wedge-shaped combustion chamber with an in-line, side by side valve lay-out which restricts breathing.

In addition, the combustion chamber is shaped so fuel-air mixture is not burned with a maximum efficiency. It is such elements as these that keep Oldsmobile from equaling the high efficiency of Chrysler's new FirePower engine.

PACKARD 400 L-HEAD STRAIGHT-8

A comparison with the Packard 400 engine is interesting, because Packard represents a high-output development of the L-head, in-line engine. It is similar in combustion-chamber design to the Lincoln engine pictured at left and also, like Lincoln, it cannot measure up to the FirePower engine in performance and efficiency.