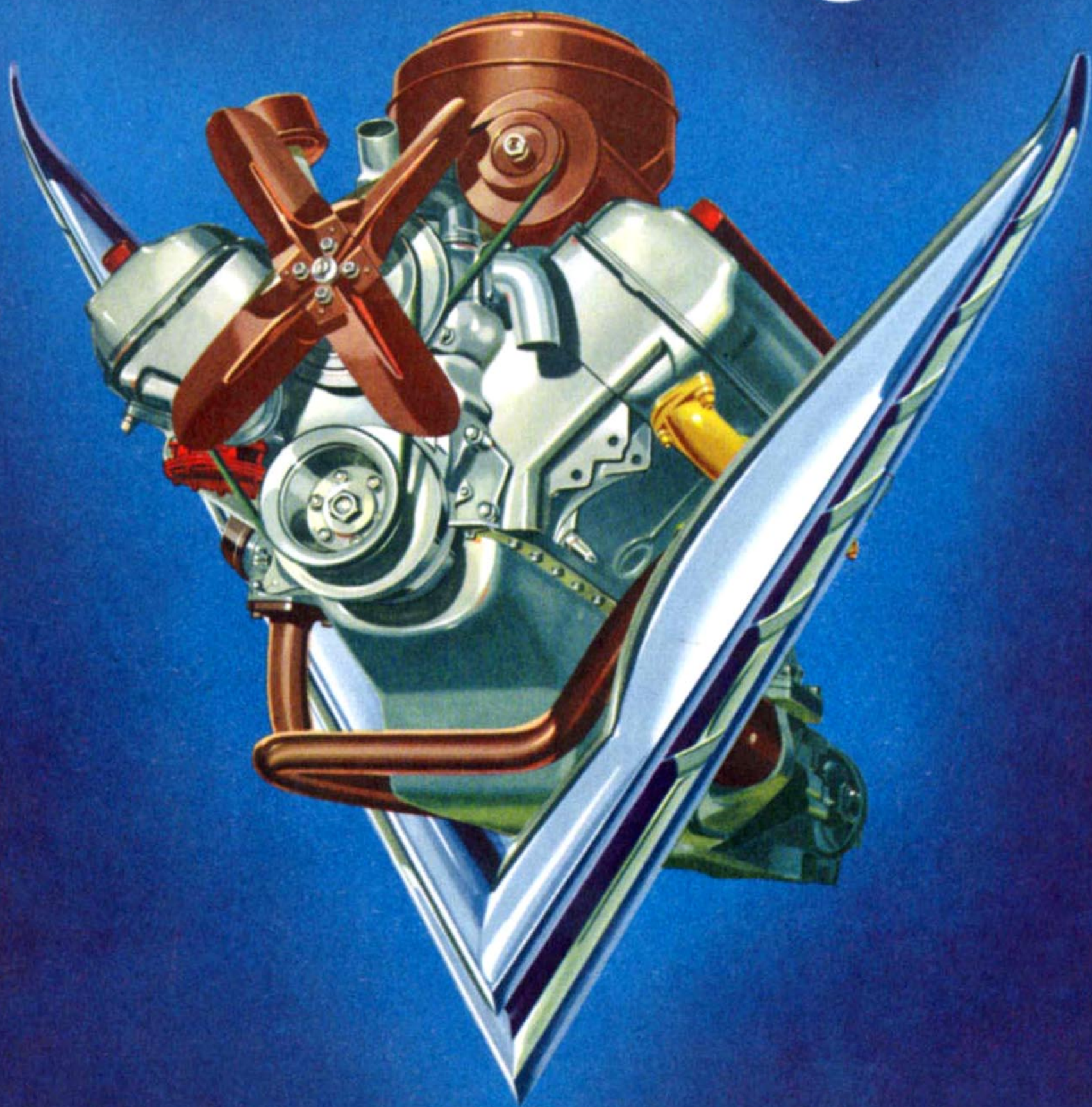


the great, new Chrysler

# *FirePower Engine*



the sensation of the century!

# 1800

## HORSEPOWER



# FirePower

**the most powerful...  
the most efficient engine  
ever developed**

---



With the introduction of the sensational 180 horsepower FirePower Engine, Chrysler Designers and Engineers have again made automotive history.

Many, we believe, will remember the first high compression engine introduced in the original Chrysler in 1924. It was a revolutionary engine. It had a new kind of performance . . . pep . . . speed . . . power . . . and pick-up. It had economy, dependability, and long life, too. It set the pace . . . and became the standard by which all other engines were compared and judged.

The new FirePower V-8 is even more outstanding . . . more sensational . . . more amazing than the first Chrysler engine. It is the most powerful . . . the most efficient and the most economical engine ever designed for a motor car. It is the greatest engine development in the past 27 years—another outstanding Chrysler engineering achievement.



Speaking of history, let us review some of the facts in the history of the development of the FirePower Engine.

Many may not realize it, but engineering research and development is a long-haul proposition. For many years, Chrysler Designers and Engineers have been working on V engines . . . on all types of multi-cylinder engines . . . on rear-engined cars . . . and on many, many ideas and designs for engine and car improvement and perfection.

The FirePower V-8 has, as a matter of fact, been the Top Secret "Operation FirePower" of Chrysler Engineers for more than five years. During this time, and actually for years before that, many V-8 engines, made both here and abroad, were studied and endlessly tested, with the one idea of finding out wherein they fell short and wherein they contributed something to the "ideal" engine.

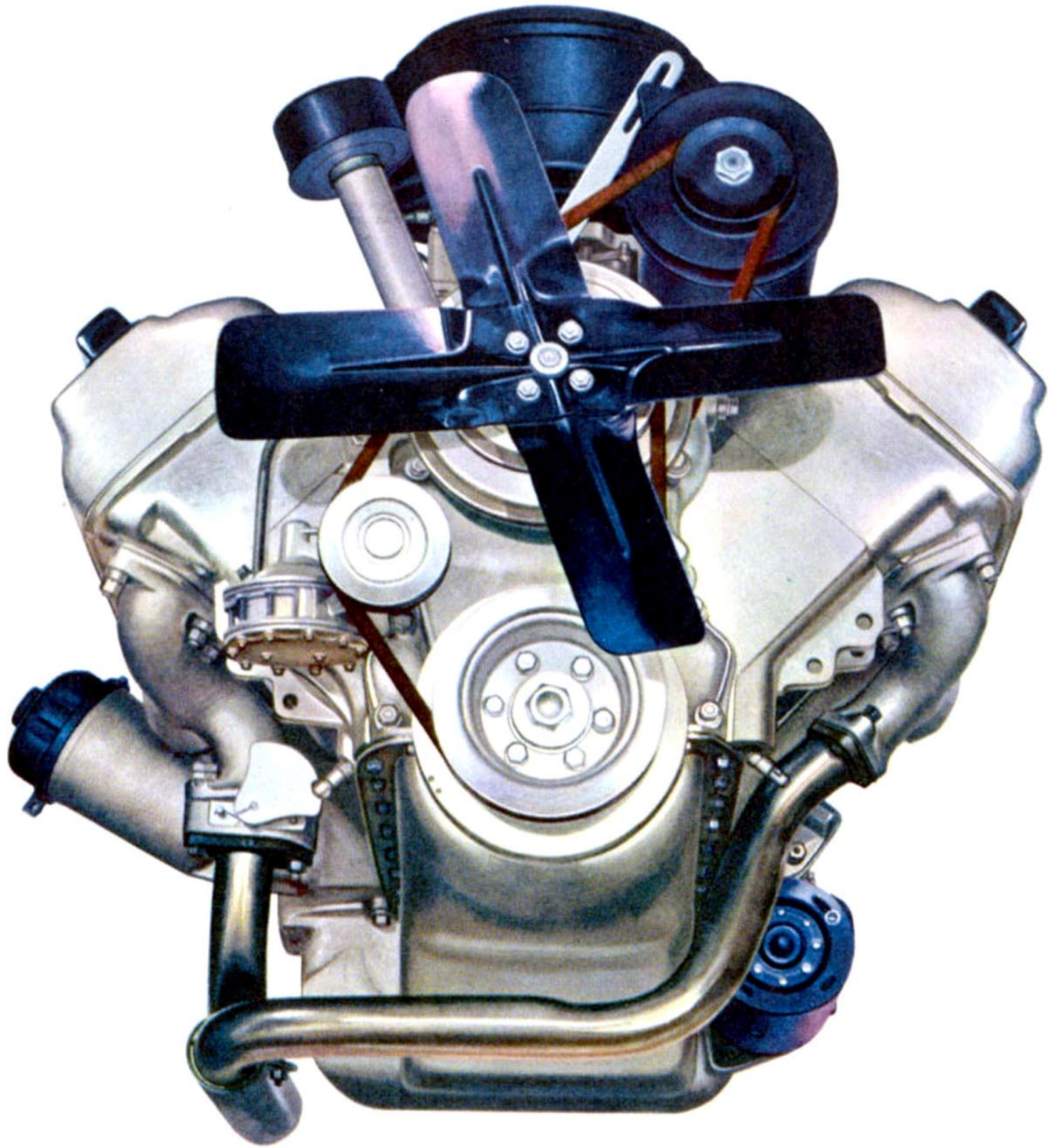
### **Tested For More Than One Million Miles!**

During the five years of the designing, developing and perfecting of the FirePower Engine, it has been tested for more than one million miles on the dynamometers in the laboratory, and on all kinds of roads, under all conditions, in every section of the country.

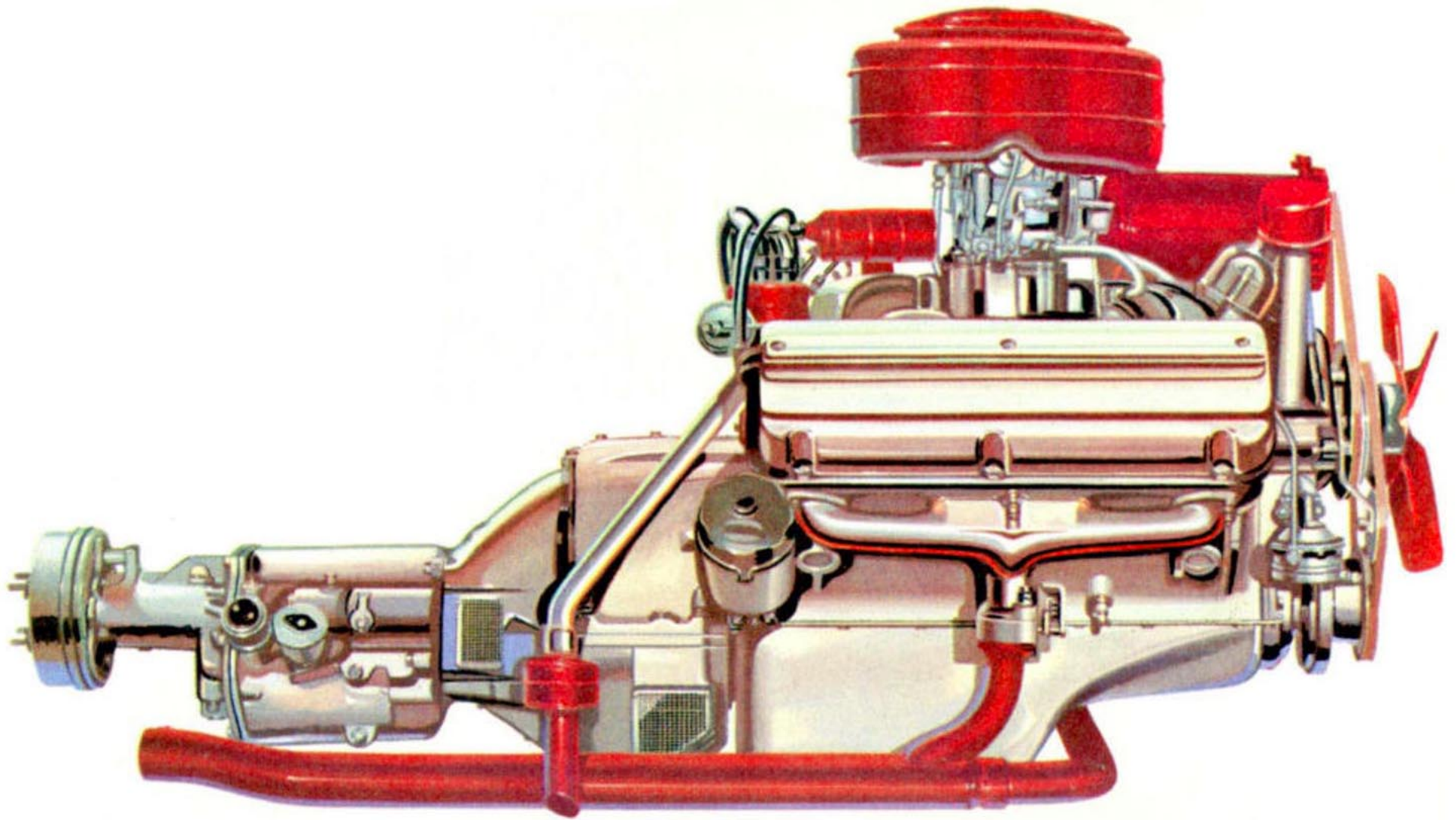
It has been tested for more than eight thousand hours on the dynamometer. Thousands of these hours were at speeds from sixty to well over *one hundred miles an hour*. And hundreds of hours were at speeds *faster* than any other competitive car *can travel*.

So, when we make the statements we do about this engine, we are not letting our enthusiasm run away with us, we are stating facts because the tests back up every statement. Moreover, the engine itself will prove each and every claim, regardless of how exaggerated it may sound to the person who has had no experience with the engine and, consequently, does not know what it will do out on the road.





*Head-on view of the Chrysler FirePower V-8 Engine . . . the greatest engine achievement and advancement since the introduction of the original Chrysler high compression engine 27 years ago. Develops 180 horsepower at 4,000 revolutions per minute.*



**Amazing Performance—Power—  
Speed—Economy—Long Life**

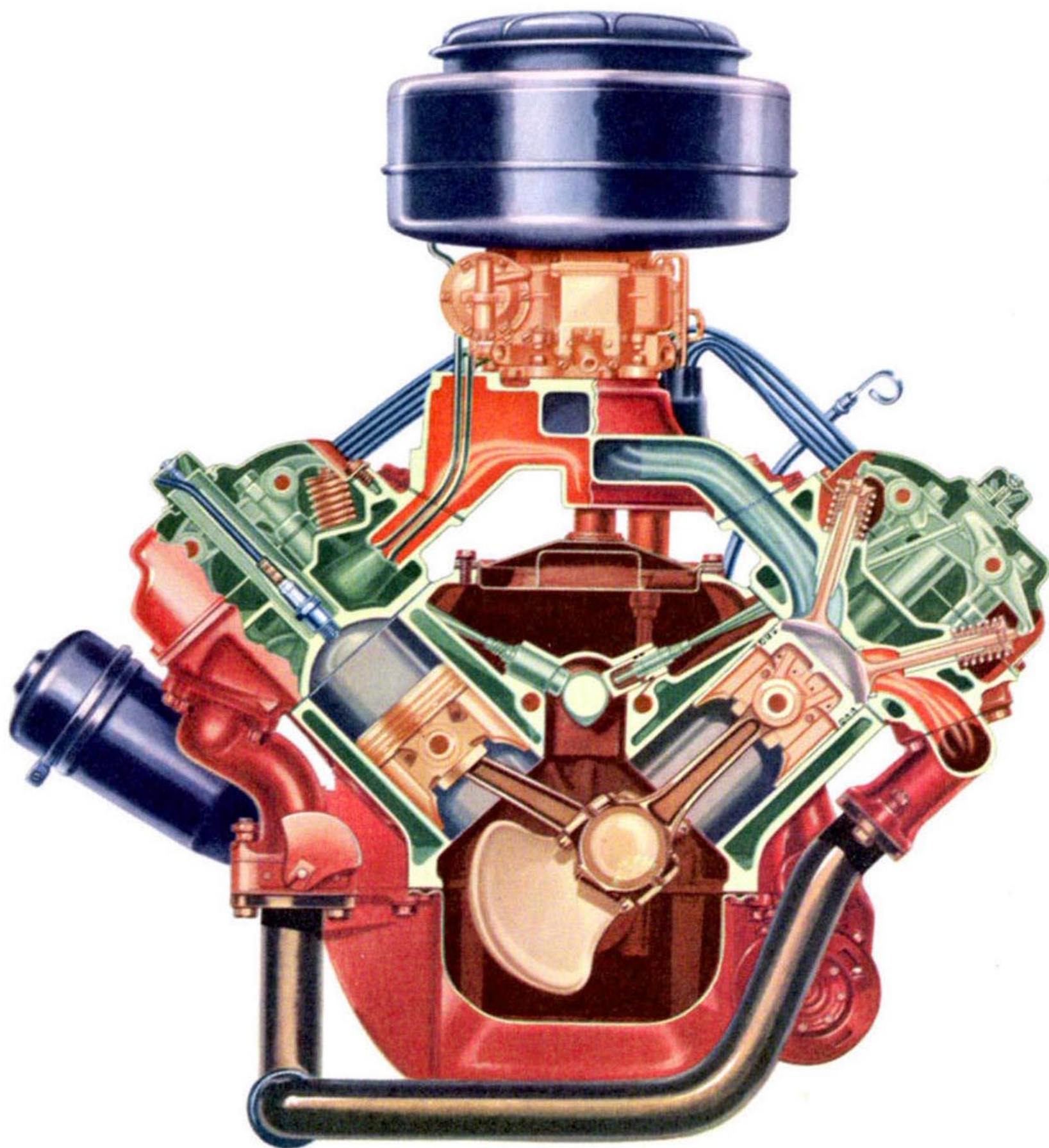
Developing 180 horsepower at 4,000 revolutions per minute, Chrysler FirePower is the most powerful automobile engine in America today.

It will outperform any other engine.

It is capable of speeds well in excess of one hundred miles an hour. And it will cruise, all day long, at highway speeds so smoothly, so quietly, with so little effort you hardly believe the engine is running.

It has reserve power for the pinches, with amazing acceleration, or pick-up, that is a great safety factor in highway driving.

Despite its abundance of power, it has amazing fuel economy. The FirePower engine will out-perform other competitive engines today using *regular* fuel while the others are using *premium* fuel. But, of course, like other engines, it gives better performance and greater economy with premium fuel. However, the big point is, FirePower does



*Cutaway view showing the Hemispherical Combustion Chamber; overhead lateral valve arrangement; central location of spark plug; free flow of gas into, and exhaust gases out of the cylinder; and other design features which make this engine so outstanding.*

not require premium fuel, even with a compression ratio of 7.5 to 1, although competitive engines of the same compression ratio do.

### **The heart of the engine . . .**

## **THE HEMISPHERICAL COMBUSTION CHAMBER**

The heart of any engine is the combustion chamber because it is here that the energy of the fuel is converted into usable power, and the efficiency and uniformity with which it performs this function determine the basic quality of the engine.

The secret of the FirePower engine lies in the Hemispherical Combustion Chamber, which was developed and perfected by Chrysler Engineers.

This type of combustion chamber is used in aircraft engines, and it has been used in racing cars and in several expensive, low production cars of foreign make. It has, for many years, been regarded as the ideal combustion chamber, but it remained for Chrysler designers and engineers to *perfect* it by developing the ideal valve arrangement and the most practical and efficient method of actuating the valves.

Through extensive research and design studies, Chrysler engineers developed an ingenious and very practical, efficient arrangement, involving the use of push rods and rocker arms operating on twin rocker shafts to actuate the widely separated valves.

The illustration on the opposite page shows the Chrysler Hemispherical Combustion Chamber. This is a cross-section of the cylinder and combustion chamber from the front of the engine.

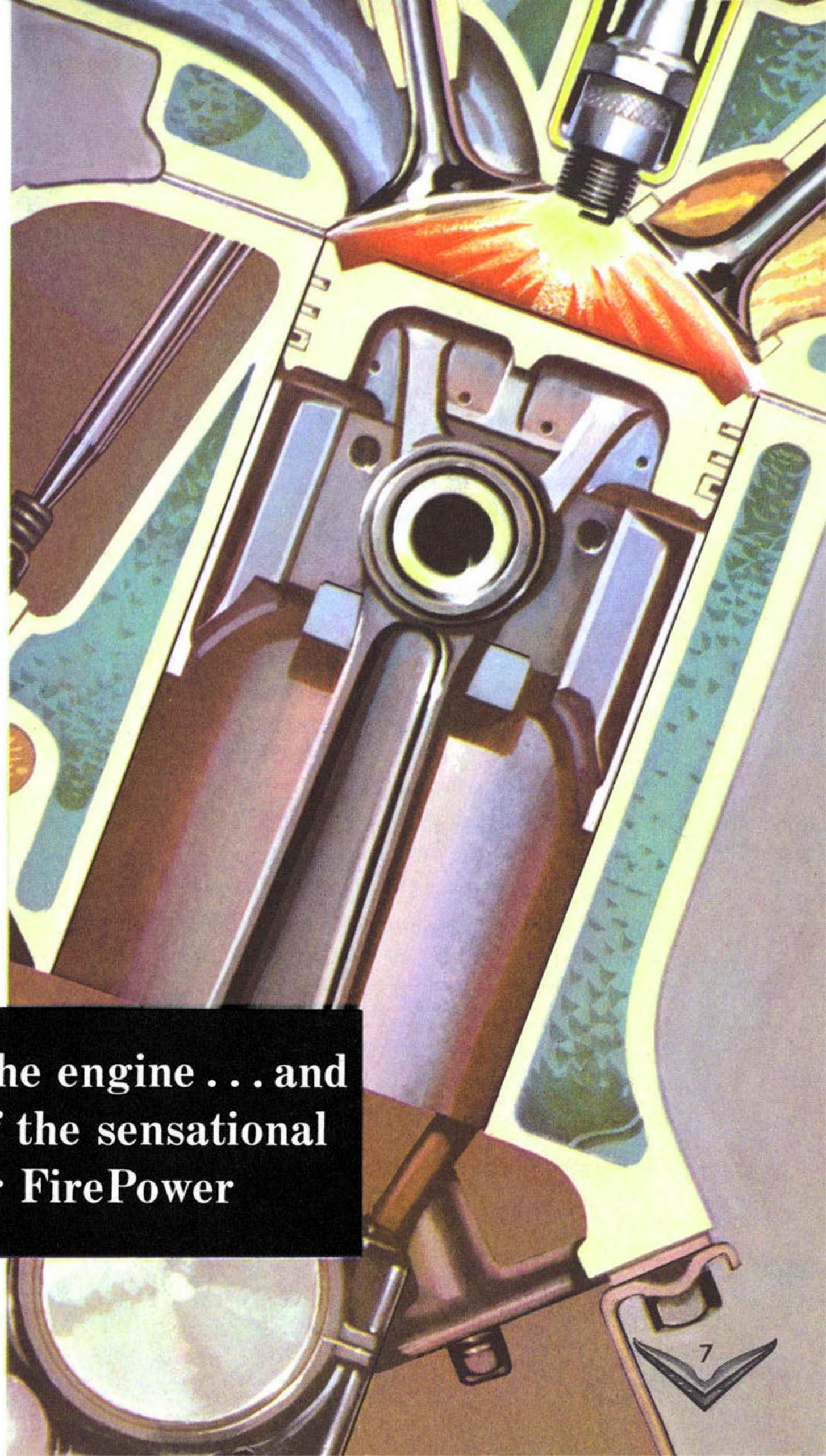
Note the spherical shape of the combustion chamber, the lateral arrangement of the large valves, and the central location of the spark plug.

Note also, the short length of the piston, the large bore, the short stroke, and the strong, rigid, drop-forged, I-beam connecting rod.

Developing 180 horsepower, the V-8 FirePower engine not only produces more power than any other passenger car engine in the world,







the heart of the engine . . . and  
the secret of the sensational  
**Chrysler FirePower**

but also develops more power for its piston displacement than any competitive engine, which is conclusive proof of its efficiency.

The Chrysler 1950 In-line 8-cylinder engine was known as one of the finest engines in the automotive industry from the standpoints of both performance and durability. And yet, the Chrysler FirePower engine, with only 2.3 percent more piston displacement, has a maximum horsepower 33 percent greater and a maximum torque 16 percent greater.

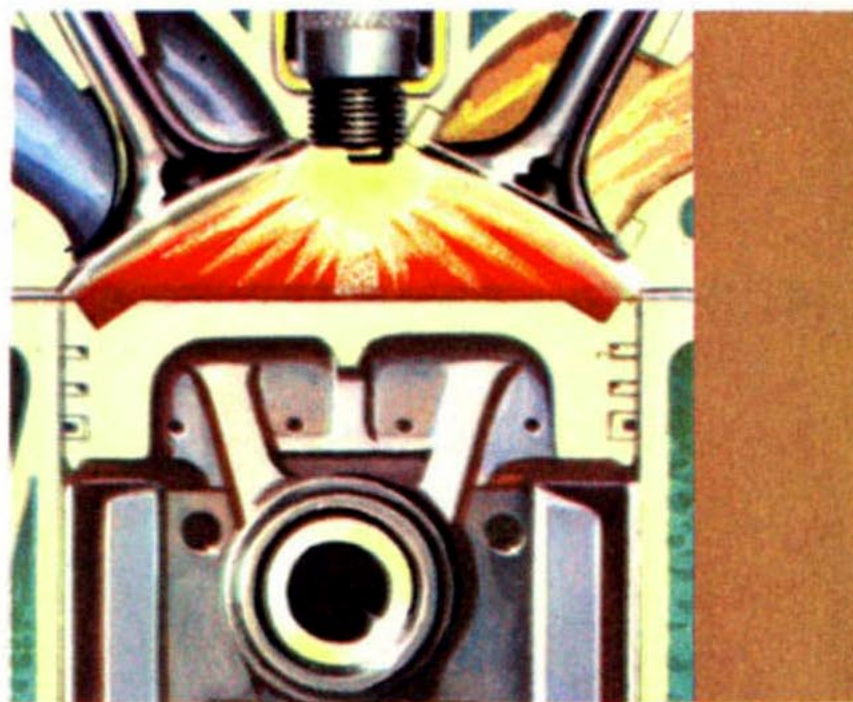
The exceptionally high power output of the FirePower V engine is due principally to its Hemispherical Combustion Chamber, the lateral valve arrangement, and to the V-8 cylinder arrangement with its large bore and short stroke, which results in high mechanical efficiency.

The inherent advantages of the Hemispherical Combustion Chamber are . . .

1. High volumetric efficiency is attained because of the very large valves; free-flowing intake and exhaust ports; the almost complete absence of carbon formation; the efficient valve timing; and the effective cooling system that completely surrounds the valve ports.

2. High thermal efficiency, which is the engine's ability to utilize the heat energy available in the fuel mixture, is obtained because of the complete combustion of fuel; the minimum heat loss through the surface of the chamber; and the short flame travel, which significantly reduces the time required for combustion.

3. The third outstanding feature is its inherently good combustion characteris-



*Close-up of the Hemispherical Combustion Chamber as perfected by Chrysler Engineers, showing the large lateral valves and central location of spark plug.*

tics which are primarily due to the size and shape of the chamber, and to the location of the valves and spark plug. The widely separated valves make it possible to locate the spark plug near the center of the compact, symmetrical chamber, which results in a very short flame travel through the fuel following ignition.

4. Another feature of the hemispherical chamber, with its overhead valves, is its excellent adaptability to high compression ratios. This is due, in part, to the very compact chamber design, which has ample space within the chamber for a significant increase in valve size, should this be desired in the future. In other words, the compression ratio can be increased to practically any ratio, if and when high octane fuels become available.

### **Smooth, Quiet Operation At All Speeds**

Another outstanding design feature of the FirePower engine is the unique and efficient manifolding of each cylinder, including, of course, both the intake and the exhaust manifolds.

The illustration on the next page is a cross section of the intake and exhaust manifolds and cylinder, looking from the front of the engine.

Notice how the air and fuel mixture flows downhill from the carburetor into the Hemispherical Combustion Chamber and then downhill again out the large exhaust port and into the exhaust manifold.

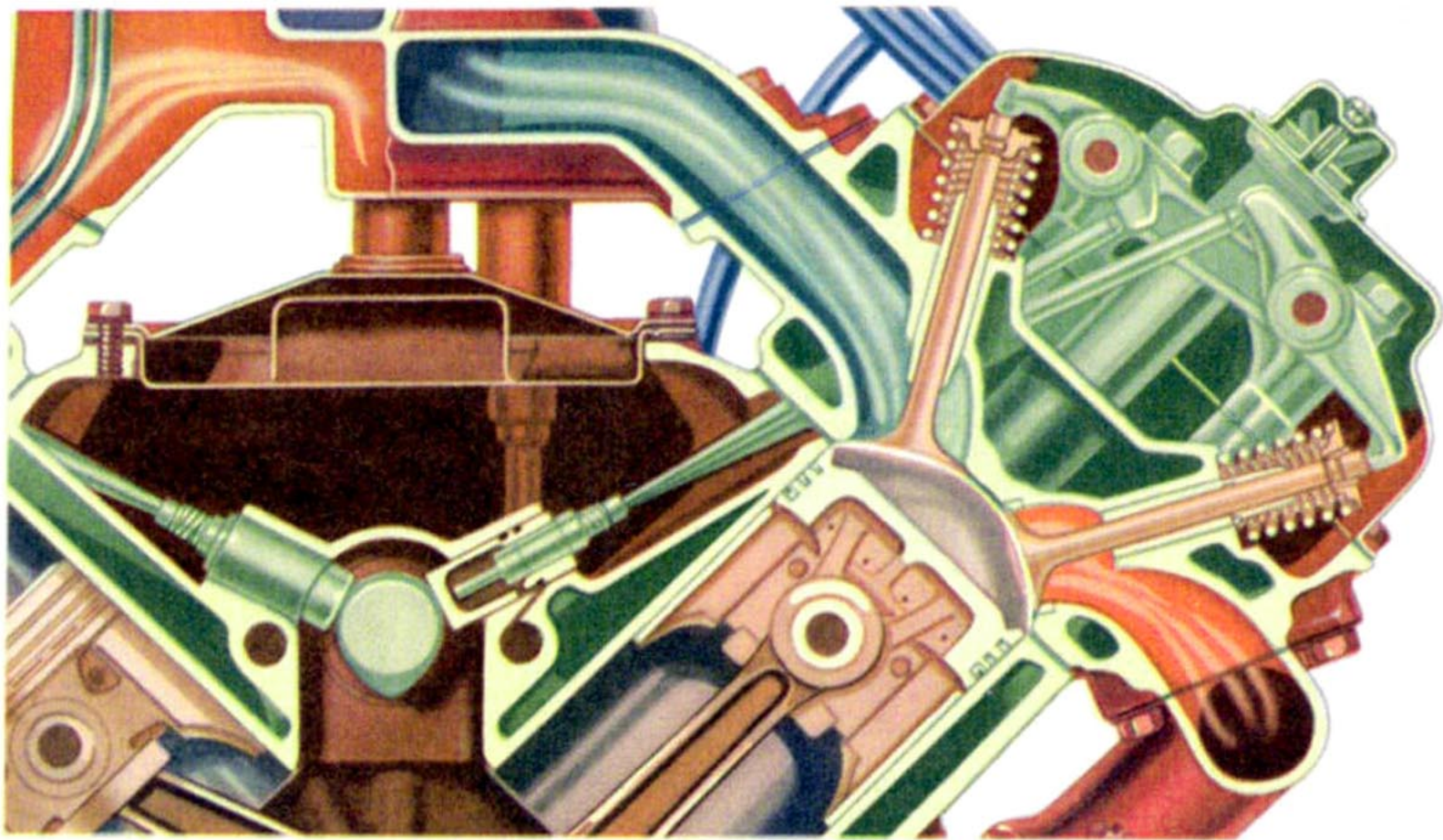
As you can readily see, there is a free flow of gas into the chamber and an unrestricted flow of the exhaust gases out the other side.

The intake manifold is divided into two principal sections, each with a separate riser supplied by one side of the dual-throated carburetor. Each section distributes the fuel mixture through individual branches to the two center cylinders in one bank and the two outer cylinders in the opposite bank.

The various branches are of approximately equal length to enhance the distribution of an equal quantity of mixture to each cylinder, which insures full power and smooth operation at all speeds.

The exhaust manifolding has the same high degree of efficiency. Separate exhaust ports for each cylinder pass the exhaust gases from the head passages into the manifolds extending the full length of each bank. Large tubes connect near the center of each manifold and convey the gases to a large junction pipe located at the right side of the engine. This pipe is connected to the straight-through muffler which finally discharges the exhaust out the tail pipe.

This superior manifolding is one of the reasons for the amazing smoothness, quietness, and power flow of the engine at all speeds.



*Fuel and air mixture travels downhill all the way from the carburetor through the intake manifold into the domed cylinder head and then out the exhaust valve through the manifold to the muffler.*

## The Finest Valve Train Ever Developed

One of the reasons for the brilliant performance of the FirePower engine is the valve train, which is the finest and most efficient that has ever been designed for a V-8 engine . . . and it is another Chrysler engineering achievement.

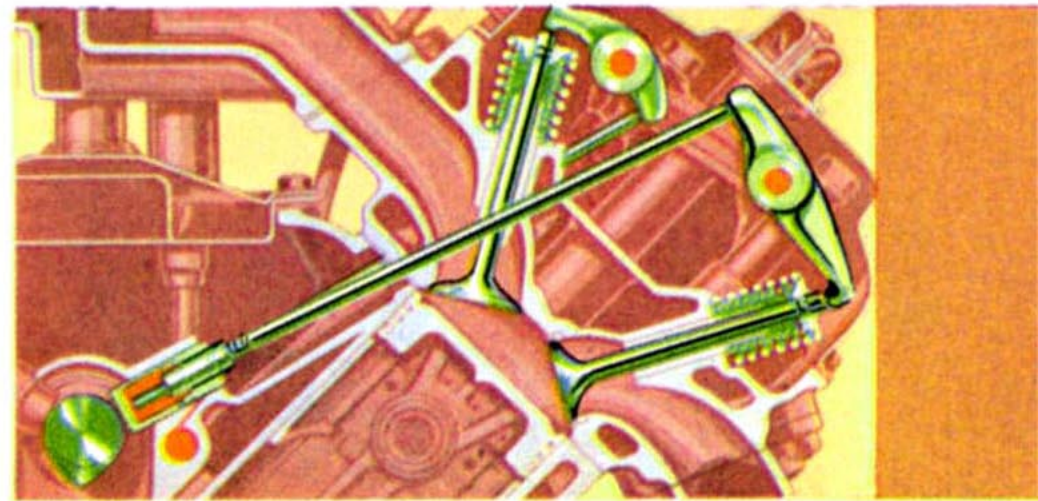
The lateral valve arrangement (shown in the illustration below), in contrast with the longitudinal arrangement used on other V-8 engines, provides the maximum amount of space for large valves and also permits design of direct-flow and unrestricted intake and exhaust valve porting. The illustration is a cross-section of the engine from the front . . . the right-hand side of the V.

The overhead valves are actuated by push rods and rocker arms, operating on twin rocker shafts to drive the widely separated valves. Note that one push rod and rocker arm operate the intake valve, and another the exhaust valve.

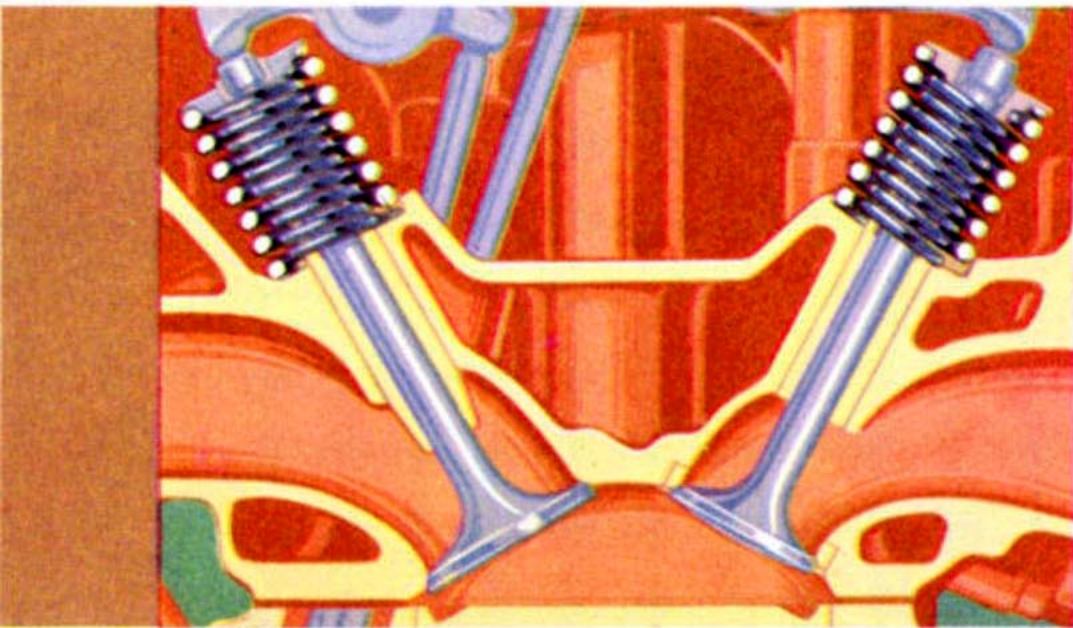
The push rods are actuated by hydraulic tappets, which insure quiet, positive valve action at all speeds.

A further contribution to the fine volumetric efficiency, and, therefore, to the exceptional power output of the FirePower engine is the unusually high valve lift. The lift of both the intake and exhaust valves is the highest in the industry for an overhead valve design. This extra lift is particularly advantageous in the FirePower engine because of the direct, unrestricted porting through the manifolds and cylinder heads.

The exhaust valve has a super-hard alloy steel insert, a Chrysler engineering feature of long standing, which gives extra protection against burning or pitting.



*The ingenious and efficient valve train uses push rods and rocker arms operating on twin rocker shafts. Push rods are actuated by hydraulic tappets for quiet operation at all speeds.*



*Twin concentric valve springs give better high-speed performance and longer valve life.*

## **Twin Concentric Valve Springs**

Another noteworthy feature of the valve train is the Twin Concentric Valve Springs, shown in the illustration on the left. They make possible a more compact cylinder head design. At high speeds, the twin springs decrease the possibility of spring "surging," which results in the valve not closing completely. Also, they encourage controlled rotation of the valves at high

speeds, increase valve life, and decrease frequency of valve regrinds. They are cadmium-plated to reduce corrosion and increase valve spring life.

## **Efficient Cooling**

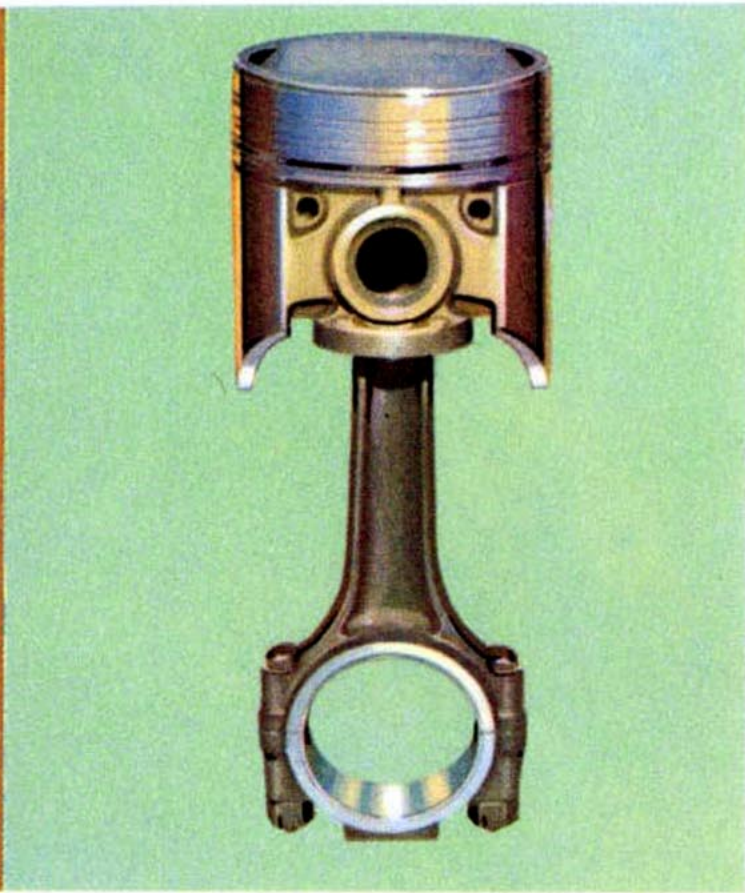
The hemispherical combustion chamber design offers several features which increase valve life and contribute to the quiet, smooth, efficient operation of the engine.

The illustration below shows a cross-section of the cylinder head with the large cooling water passages over the chamber surface, around the valve guide bosses, and on both sides of the cylinder walls.

The resultant lower valve operating temperatures produce a marked increase in valve life . . . a growing problem in many high output engines. Furthermore, the valves are widely spaced in the rigid dome of the chamber which greatly decreases the possibility of valve seat distortion and, thus, also adds to valve durability.

*Large water jackets lower operating temperature which increases valve life and gives smoother operation.*





*The new slipper design, steel-strut piston gives smoother, quiet, vibrationless engine operation at all speeds.*

### **Large Bore and Short Stroke**

One of the reasons for the exceptionally fine performance, economy and long life of the FirePower Engine is the large-bore, short-stroke, V-type cylinder arrangement which provides a rigid, compact engine of maximum displacement for a given weight.

The new steel-strut, cam ground piston, with controlled expansion, permits closer piston fit which gives much quieter operation in a cold engine.

The new slipper design is lighter weight, which reduces friction, and contributes to the smooth operation of the engine at all speeds.

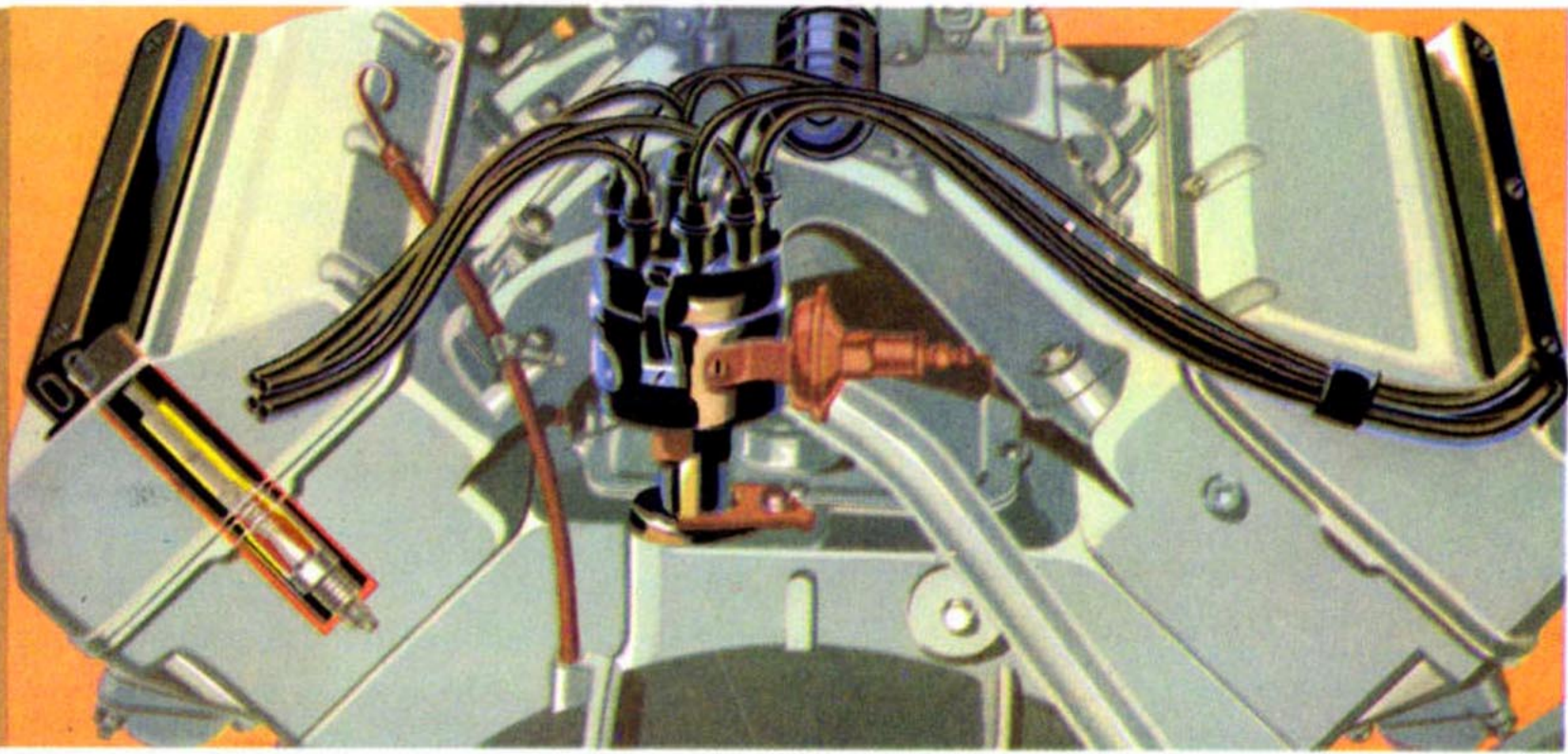
The short stroke of the rigid connecting rod means low piston speed

and less friction, resulting in longer piston life and higher mechanical efficiency of the engine.

In comparison to  $4\frac{7}{8}$ -inch stroke of the Chrysler 1950 In-line 8-cylinder engine, the stroke of the FirePower is  $3\frac{5}{8}$  inches, which means the maximum piston speed has been reduced 26 percent. Consequently, with the same rear axle ratio, the piston in the FirePower engine will travel only 148,500 feet in 100 miles of driving, as compared to 199,500 feet for the piston on the In-line 8.

The piston has three rings . . . two narrow compression rings to insure proper sealing against loss of compression, and a single oil ring designed with narrow contact and wide drain groove. This single ring provides better oil control than the two oil rings used in the In-line 8 engine.





*All vital parts of the ignition system, including spark plugs, wiring, coil and distributor are completely waterproofed, insuring quick starting in damp or rainy weather. No stalling.*

### **Waterproof Ignition**

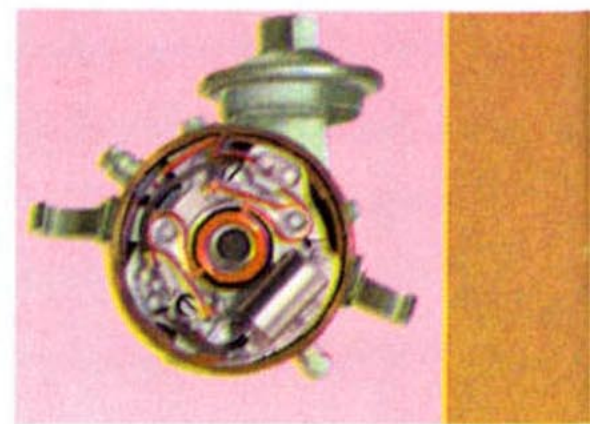
Another famous Chrysler engineering feature that has been incorporated in the FirePower engine is waterproof ignition. This feature assures quick starting in damp and rainy weather, regardless of how long the car has been parked out in the weather. The spark plugs, ignition wiring, coil and distributor are completely waterproofed, resulting in sure starts and smoother performance in wet weather.

### **Double Breaker Distributor**

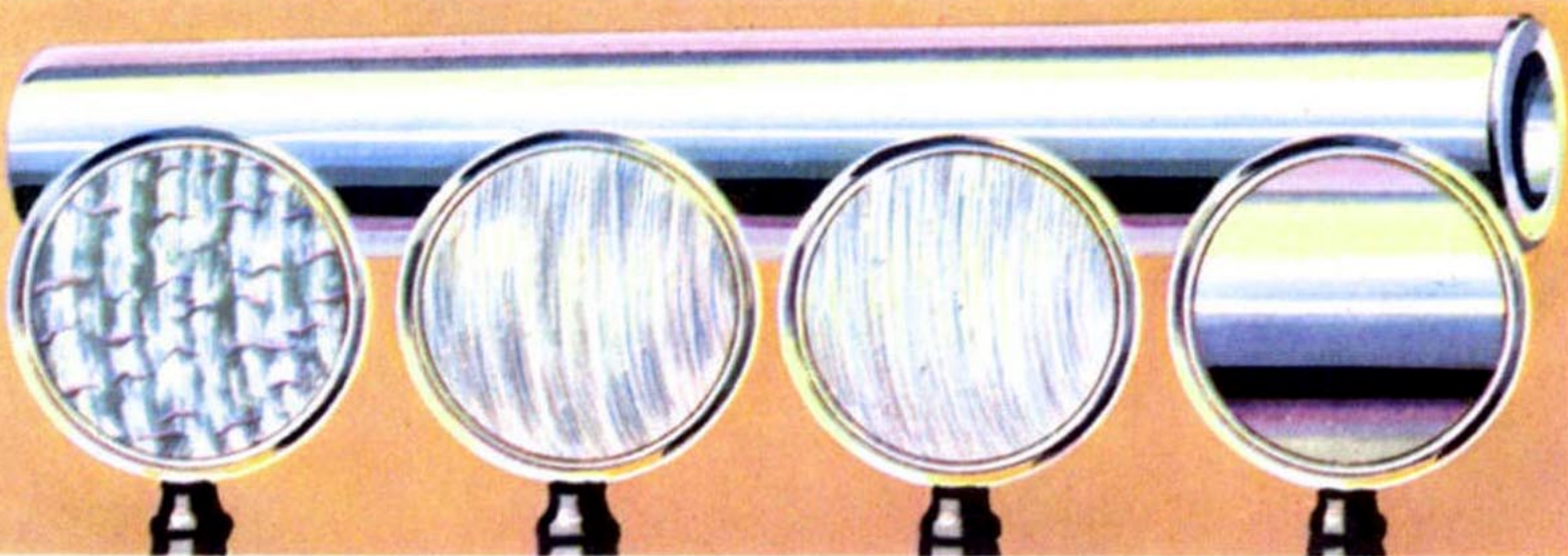
An important part of the ignition system is the double breaker distributor. This new development provides a hotter spark which assures smooth operation and full power at higher speeds.

The distributor has improved waterproof construction with shielded vents, which insure adequate ventilation and prevent splash water from grounding the ignition circuit in the distributor.

*Smoother operation of the engine at high speeds is assured by the double breaker distributor.*







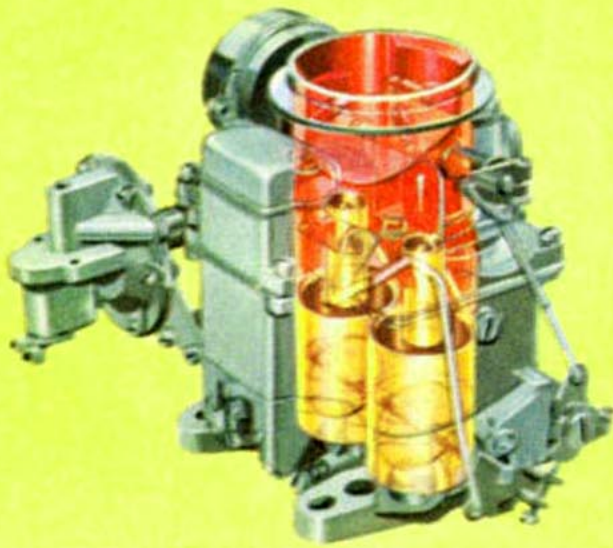
### **SUPERFINISHED PARTS**

Fine engineering and fine manufacturing are the combination upon which the Chrysler reputation for fine cars has been built. And one of the outstanding examples of Chrysler's manufacturing genius is Superfinish . . . a process of metal finishing that produces surfaces of unbelievable smoothness . . . smooth to as little as one-millionth of an inch—literally, as smooth as glass.

One-millionth of an inch is, of course, beyond human comprehension, but you can actually see and, with your fingernail, feel the difference between a ground, honed, lapped, or Superfinish surface, as graphically illustrated in the picture above.

All vital parts of the FirePower Engine, such as crankshaft main bearing journals; camshaft journals; wrist pins; barrels and heads of the valve tappets, valve stems; etc., are Superfinished so as to insure the smoothest working surfaces possible where metal contacts metal.

The results of Superfinish to the car owner are better performance . . . smoother and quieter operation . . . reduced wear of parts . . . greater gas and oil economy . . . lower operating maintenance costs . . . longer car life . . . and greater satisfaction with, and pride of ownership in your Chrysler.



*Dual-throated carburetor, with water-heated throttle and integral automatic choke.*

Another important feature is the new advanced design, Down-draft dual-throated carburetor that was developed expressly for this engine.

The carburetor is dual-throated, with each section supplying the gas-air mixture to the two center cylinders in one bank and the two outer cylinders in the opposite bank. This insures equal distribution to every cylinder.

Another feature is the water-jacketed throttle body which utilizes the engine cooling water to prevent the forming of ice on the throttle blades, and gives better idle operation in a hot engine.

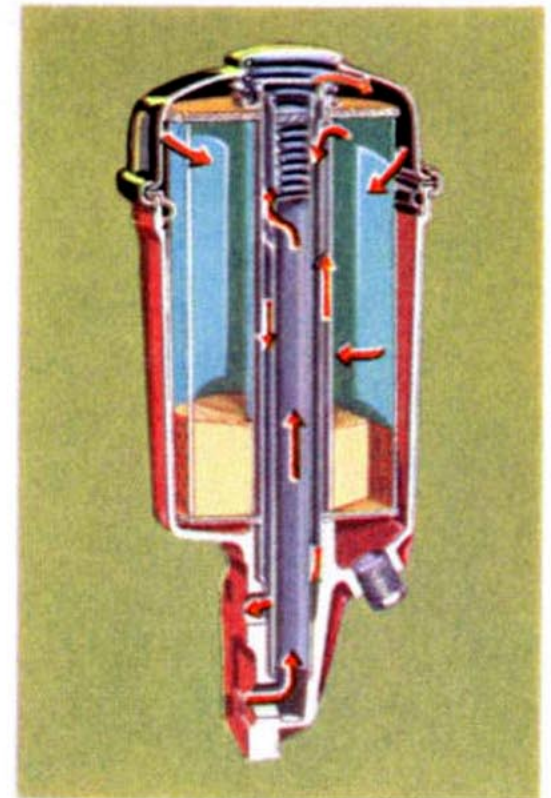
A new and improved automatic choke, integral with the carburetor, insures superior starting and smoother operation during warm-up.

### **Chrysler Full-Flow Oil Filter**

The exclusive Chrysler Full-Flow Oil Filter, which filters all of the oil before it goes into the engine, is another feature which contributes to the outstanding performance and economy of the FirePower engine.

With this exceptionally efficient filter, all dust, dirt, and foreign matter is removed from the oil before it enters the engine, insuring longer life of all moving parts.

With hydraulic tappets, the Full-Flow oil filter is of even greater importance. It gives positive protection against the entrance of foreign matter into the hydraulic fluid (which comes direct from the lubricating system). This clean oil at all times insures quiet operation and the complete opening and closing of the valves.



*Sectional view of the exclusive Chrysler Full-Flow Oil Filter . . . the finest ever designed.*

## **Outstanding Fuel Economy**

The high efficiency of the FirePower engine is evidenced by the excellent fuel economy. This is a result of both the high thermal efficiency developed in the Hemispherical Combustion chamber and in the exceptionally low frictional power losses in the engine.

Many things, of course, affect the fuel economy of an automobile, but, in general terms of road fuel economy, or miles per gallon, the FirePower engine shows an average improvement of approximately ten percent better than the Chrysler 1950 In-line 8. This increase in gasoline mileage becomes especially significant when it is considered that the power of the new engine is 33 percent greater than the former engine.

It is pertinent, we believe, to repeat that the FirePower engine does not require premium fuel, as is the case of other engines with the same compression ratio.

## **Smooth, Quiet Operation**

One of the primary requirements of a high-quality engine designed for automotive application is that of smooth, quiet operation. As a result of the very definite objectives set up by Chrysler Engineers on this requirement, the FirePower engine develops its exceptional power very smoothly and with remarkable quietness and freedom from vibration.

While these highly desirable qualities are quite evident throughout the entire speed range, they will be most readily recognized and sincerely appreciated by the Chrysler driver during acceleration and at the higher speeds.

A significant contribution to the smooth power flow of the FirePower engine is the inherent dynamic balance of a sound 90-degree V-8 design. Other important factors include the short, rigid cylinder block, the stiff, well-supported statically and dynamically balanced crankshaft, and the highly refined cam and valve train design.

The compact cylinder arrangement of the V-type engine permits the design of a short, rigid block. As a result the new Chrysler cylinder block is extremely stiff in all planes. The two banks of cylinders are tied into the crankcase by five reinforced webs, which also carry the camshaft and crankshaft main bearings.

The short, stiff crankshaft is fully counterbalanced by six large counterweights. Five main bearings provide generous support for the shaft in the block.

The over-all crankshaft length is 26-9/32 inches, as compared with 37-17/32 inches for the 1950 In-line 8 engine. In addition, the center-line distance between the rear two main bearings is 5<sup>3</sup>/<sub>8</sub> inches as compared with 7-29/32 inches for the former engine. This short bearing span is particularly important because the maximum crankshaft deflection, resulting from flywheel action, occurs at this point.

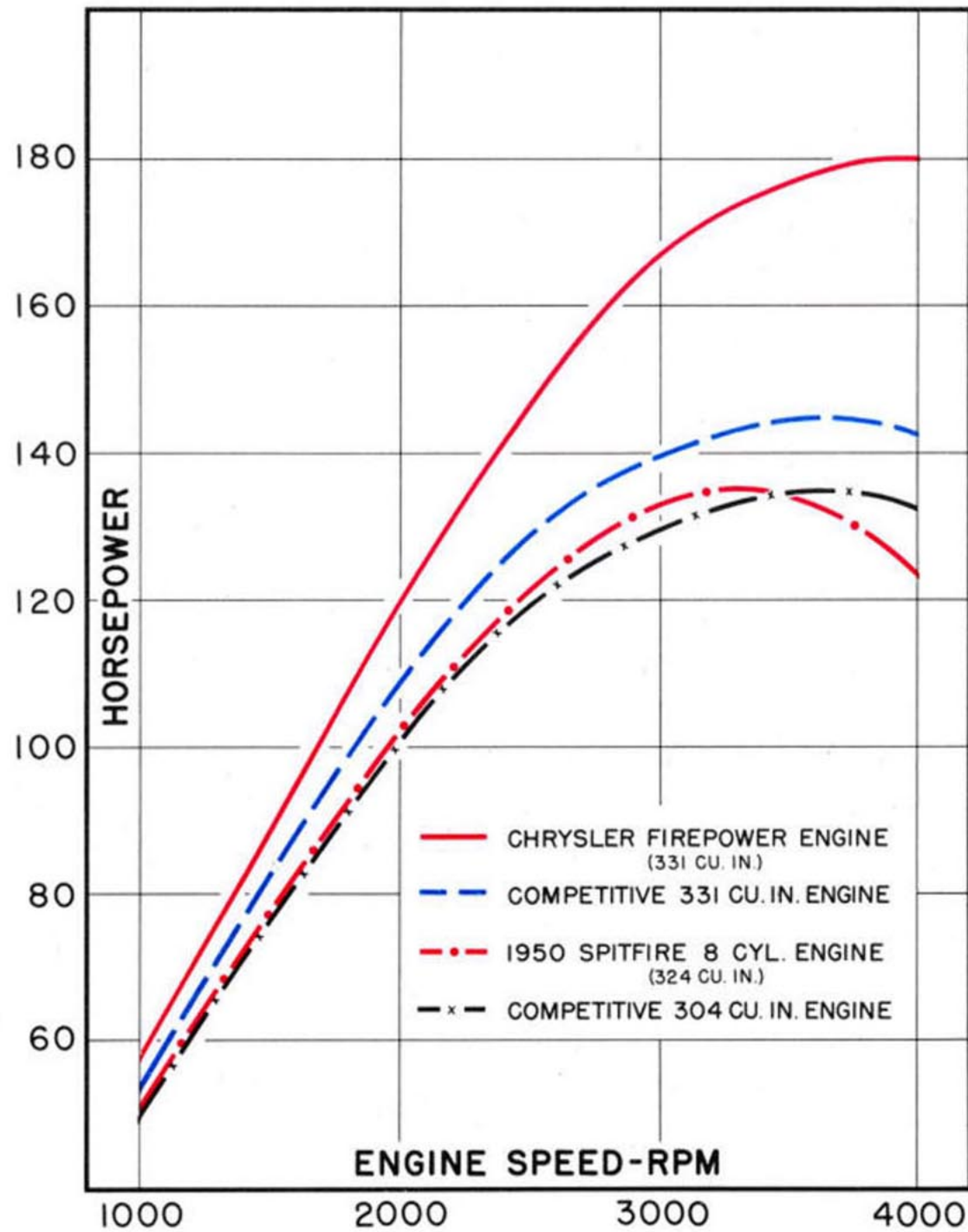
The short stroke requires a much smaller crankpin circle, which means that the connecting rod journals overlap the main bearing journals to a greater degree, further increasing the stiffness of the crankshaft.

These design features have resulted in a crankshaft which is extremely rigid torsionally. The maximum torsional stresses in the shaft are relatively insignificant throughout the operating speed range of the engine.

Quietness is also insured by a torsional damper incorporated at the front end of the crankcase to eliminate audible effects of minor torsional vibrations.

The camshaft, also, is short and very stiff. Fine precision bearings, located in the cylinder block webs, support the shaft insuring minimum flexure. Cam contours and valve spring characteristics were carefully designed and developed to secure high valve lift and reliable, positive valve action at all speeds. The relatively long opening and closing ramps of both the intake and exhaust cams greatly reduce any operating noises in the valve train.

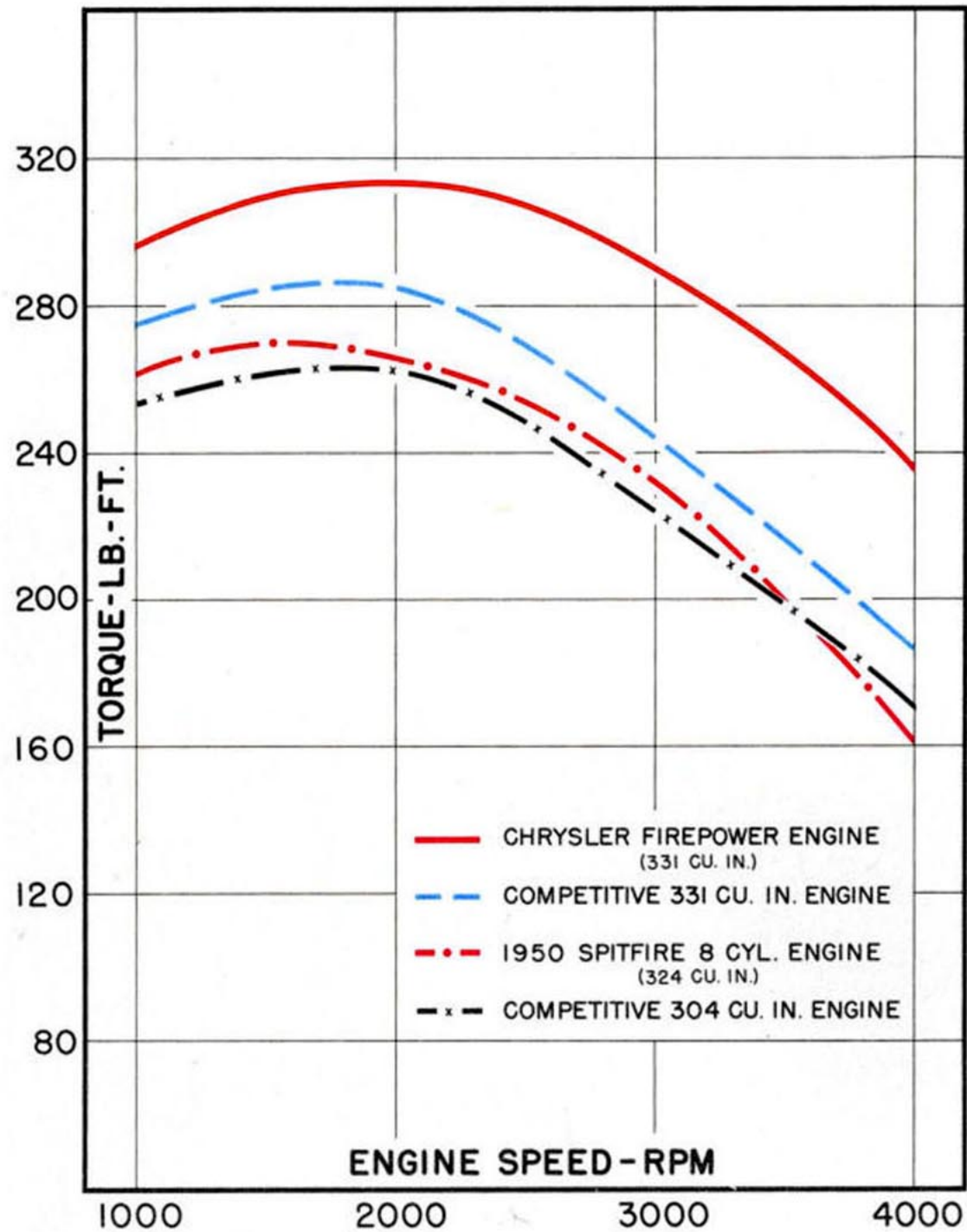
# GROSS HORSEPOWER



The FirePower V-8 Engine, developing 180 horsepower at 4,000 revolutions per minute, not only produces *more power* than any other passenger car engine in the world, but also develops more power for its piston displacement than any other competitive engine.

A graphic comparison of the gross horsepower developed by the FirePower engine, the 1950 Chrysler In-line 8, and two other V-8 engines is shown in the chart above.

## GROSS TORQUE



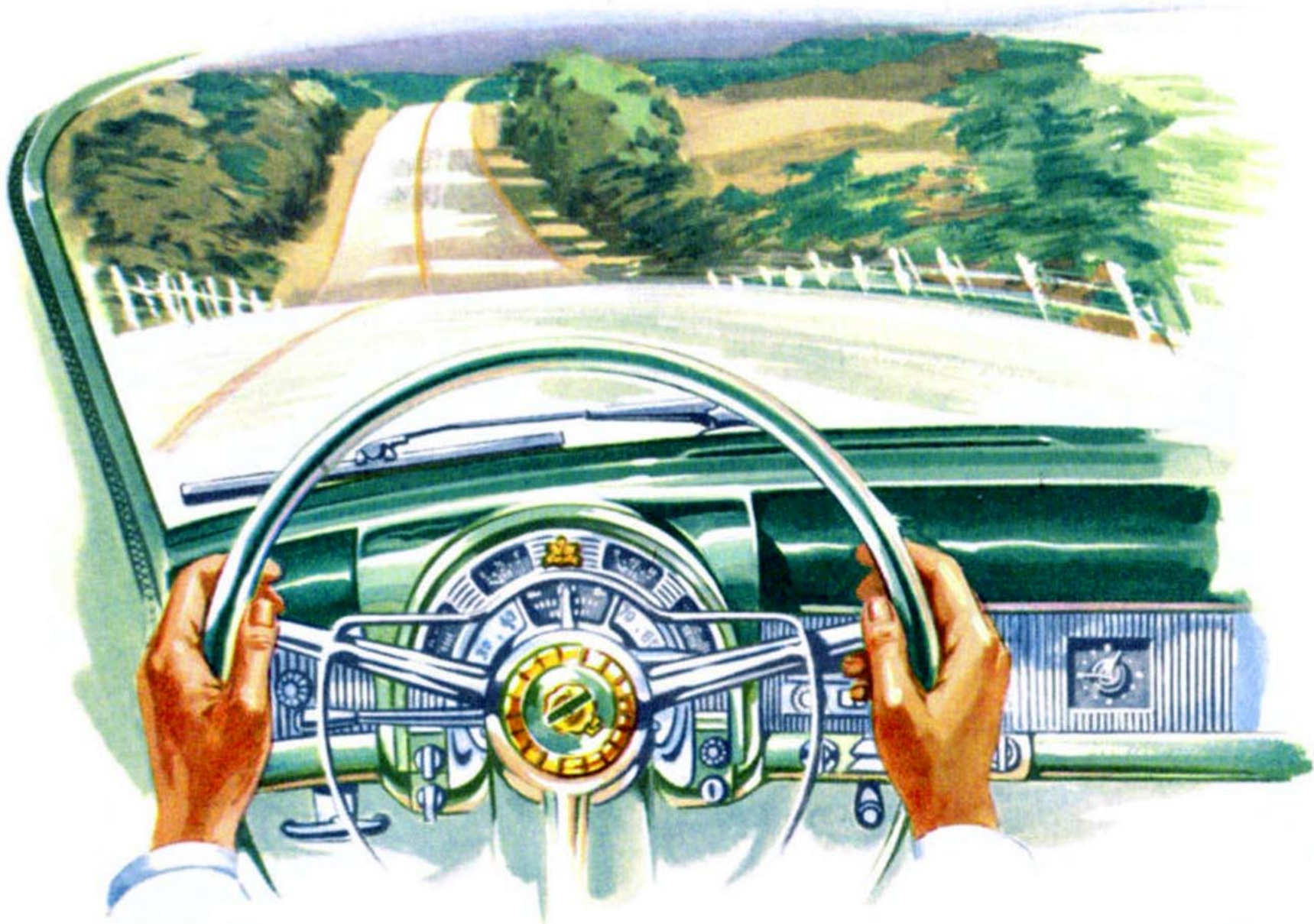
Another interesting comparison is the Gross Torque chart shown above. Note that at 3200 rpm the 1950 Chrysler In-line 8 peak output is 135 horsepower, while the FirePower engine develops 172 horsepower. Comparisons at other points within the speed range reveal similar FirePower superiorities in both horsepower and torque.

All tests on the different engines were made under exactly the same conditions, using the same fuel, and with the same equivalent equipment.

# FirePower Specifications

Type .....	90° V-8
No. cylinders .....	8
Valve arrangement .....	Overhead
Bore .....	3-13/16 in.
Stroke .....	3 <sup>5</sup> / <sub>8</sub> in.
Piston displacement .....	331.1 cu. in.
Compression ratio .....	7.5 to 1
Maximum brake horsepower .....	180 at 4000 r.p.m.
SAE horsepower—(taxable) .....	46.5 h.p.
Torque—(lb. ft. at r.p.m.) .....	312 at 2000





# For the thrill of a lifetime!

---

Come get behind the wheel of a Chrysler and take command of 180 horsepower! Through traffic and out on the open road, drive the most powerful car in the world today. Go as slowly as you please, or as fast as you please, over the highway or the byways. Flatten out the hills with unbelievable power and smoothness. Measure the miles against the minutes. *For the thrill of a lifetime . . .* come drive a Chrysler with the sensational FirePower V-8 Engine!

CHRYSLER SALES DIVISION, DETROIT