



## SOLUTIONS DRIVEN EVERY DAY

As an engine specialist, you face challenges every day. Look for the Sealed Power logo and find the

**total engine system**

**solutions** you need to meet them.

Sealed Power's complete line of engine system components, precision-engineered to work together and last longer,

features exclusive

**problem-**

**solving**

**technologies**

like friction-reducing DurOshield™ skirt coated pistons, lubrication-enhancing contoured flange engine bearings and industry-leading SS-50® oil rings. Want it all? Look for the new **symbol of power:** Sealed Power. We'll change the way you look at engine systems.



PISTONS

PISTON RINGS

ENGINE BEARINGS

CAMSHAFTS

VALVE TRAIN

VALVES

TIMING

OIL PUMPS

GASKETS

ENGINE KITS





## WHY BUY SEALED POWER PISTONS?

- Designed and manufactured to meet or exceed OEM specifications
- Sets are matched by size and weight
- Tightly controlled casting and machining process
- Precision machined with diamond tooling and CNC machinery
- Exacting quality control procedures provide reliability and increased service life
- Positive groove up-tilt for optimal ring-to-ring groove sealing
- Precision pin-to-piston tolerances
- Broadest range of designs, materials and coatings



### **Sealed Power DurOshield™ Skirt Coated Pistons**

- Broadest selection of graphite anti-friction coated pistons available
- Our DurOshield skirt coat:
  - Essentially eliminates scuffing — extends engine life
  - Reduces friction — increases horsepower and improves fuel economy
  - Helps prevent damage from inadequate lubrication, especially at start-up
  - Improves cylinder sealing for less blow-by and more power
  - Requires no increase in skirt clearance

### **Sealed Power – Hypereutectic Pistons**

- Exclusive FM244 high-silicon alloy contains 16.5% silicon finely dispersed in aluminum casting
- Highly resistant to scuffing, heat and wear
- T-5 heat treatment process provides increased strength and durability

### **Sealed Power – POWERFORGED® Pistons**

- The standard for all forged pistons
- Exclusive VMS-75 aluminum alloy is “power forged” with up to 3,000 tons of force
  - Material structure and grain flow creates an extremely strong and durable piston
- Loaded/stressed skirt and pin boss reinforce load-carrying capabilities
- Available for a variety of engines and applications



## SEALED POWER PISTONS

Get the performance and quality you deserve with Sealed Power aluminum pistons featuring:

- High-quality aluminum alloy materials and heat treatment processes for strength and durability
- Precision machining with complex skirt and land profiles and contours for optimal “running clearances”
- “Up-tilt” ring grooves to improve piston-to-ring side sealing, providing exceptional blow-by control, improved efficiency and better economy
- Diamond cutting creates smoother groove surface finishes for improved piston-to-ring sealing
- T5 heat treat provides greater tensile strength and improved thermal expansion characteristics

### Cast Aluminum Pistons

Sealed Power cast aluminum pistons offer all the performance and dependability of original equipment pistons because they’re designed and manufactured to meet or exceed OEM performance requirements. High-quality aluminum alloys, carefully controlled casting, heat treatments and machining techniques with exacting quality control procedures provide reliability, durability and long service life.





## **Hypereutectic Pistons ("H" Prefix)**

These exclusive Sealed Power pistons feature our high-strength FM244 alloy material with 16.5% silicon finely dispersed throughout the aluminum casting, making our Hypereutectic pistons highly resistant to scuffing, heat and wear. Our rigidly controlled T-5 heat treat increases piston strength and durability.

### **What is Hypereutectic?**

Hypereutectic refers to an aluminum alloy having a silicon content greater than 12.5%. There are three categories of aluminum alloys containing silicon:

#### **1. Hypoeutectic**

Contains less than 12% silicon content. Not widely used today.

#### **2. Eutectic**

Contains 12% to 12.5% silicon content. Commonly used for cast pistons, 12.5% silicon content is the maximum amount that aluminum materials will contain without special melting and casting processes.

#### **3. Hypereutectic**

Contains 12.5% or more silicon content. Special melting processes are necessary to "super-saturate" the aluminum with additional silicon content. Special molds, casting and cooling techniques are required to obtain finely and uniformly dispersed silicon particles throughout the material.

Our hypereutectic material is also being used in light and medium diesel engines to replace some of the eutectic pistons with iron groove inserts used for additional heat and wear resistance of the ring groove. Heat and wear in the ring groove contribute to groove "pound-out."

In Sealed Power hypereutectic pistons, the hard, finely dispersed silicon particles serve as "micro-inserts" at the surfaces of the piston, especially in the surfaces of the precision-machined ring grooves. The increased strength, heat and wear resistance provided by the high-silicon-content hypereutectic piston material allows for elimination of the groove inserts in several piston applications.







## **DurOshield™ Skirt Coated Pistons ("CP" Suffix)**

A growing number of Sealed Power pistons are available with our exclusive factory-applied graphite anti-friction coating. This patented technological advance can extend the life of an engine and essentially eliminate piston scuffing problems. Coated pistons are ideal for severe duty performance engines and everyday applications. The coating is precisely applied to pistons with a computer-controlled application and unique curing process. There is no overspray with our process and no coating ends up in the ring grooves.

### **Sealed Power DurOshield™ Skirt Coated Pistons:**

- Improve piston life
- Reduce friction
- Essentially eliminate scuffing and wear
- Help prevent damage from inadequate lubrication, especially during start-up
- Improve cylinder sealing for less blow-by and more power
- Require no increase in skirt clearance





## **POWERFORGED® Pistons**

POWERFORGED pistons are the standard by which forged pistons are compared. The forging process begins when we extrude our exclusive VMS-75 aluminum alloy into bar stock. The bar is then cut into precise size "slugs" which are "power forged" with up to 3,000 tons of force, in precise forging dies, into the desired piston blank. The structure and grain flow in the aluminum from this process results in a piston that is extremely strong and durable. They are reliable enough for daily street use, yet strong enough to take the extreme punishment of racing.

Highly loaded and stressed skirt and pin boss areas are designed and reinforced for increased durability and load carrying capabilities. Skirt and land profiles and contours are established to provide excellent durability and scuff resistance in the most demanding applications. Precision-machined piston ring grooves provide optimal compression ring sealing and improved oil control.

POWERFORGED pistons are available for a wide variety of engine applications, ranging from low-compression "blower" and turbocharged pistons to specialized high-compression racing designs. From the OEM design replacements to all-out racing engines, POWERFORGED pistons provide the same quality and dependable performance experienced by winners of countless races every week.




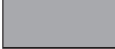

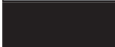


# PISTON SELECTION GUIDELINES

## Piston Selection Guidelines

Piston Type	Application							
	Standard Service	Light Truck & Towing	Moderate Street Perf.	Oval Track "Claimers"	High Perf. Street/Strip	Pro Street & Brackets	Blowers & Nitrous	Fast Ovals and Drags
Cast	Black	Light Gray	Light Gray	White	White	White	White	White
Hypereutectic	Black	Black	Black	Black	Dark Gray	Light Gray	Light Gray	Light Gray
Forged with Slotted Oil Groove	Black	Black	Black	Black	Black	Dark Gray	Light Gray	Light Gray
Forged with Drilled Oil Groove	White	White	Light Gray	Light Gray	Black	Black	Black	Black

### Application Codes

-  Not normally used for this application
-  May be marginal due to high cost or ultimate strength
-  Will work, but exercise caution with timing/mixture
-  The best choice for this application

GENERAL GUIDELINES: Modifications which dramatically increase cylinder pressure, such as very high compression, blowers or nitrous, usually require drilled-type forgings. Engines that see only occasional wide open throttle use, as in towing or moderate street performance, are best off with hypereutectics. Applications which fall between these extremes can use either piston type, with the decision based on cost, desired strength and future plans for the vehicle.



## WHY BUY SEALED POWER PISTON RINGS?

- Seats instantly on engine start up
- Uniform cylinder wall contact
- Consistent pressure under high heat
- Conforms to worn and out-of-round cylinder bores
- Meets or exceeds OEM specifications
- The right materials for every application
- Easy installation

### **Exclusive SS-50® Oil Ring Expanders**

- Uniform radial tension creates unparalleled oil control
- Angled pads ensure positive rail-to-piston-groove seal
- Electro-polished stainless steel repels dirt and prevents harmful corrosion
- Sturdy box construction eliminates oil ring flutter and deformation at all RPMs

### **Chrome Plated Steel Rails**

- Barrel lapped to provide instant seating and prevent bore marking

### **Plasma-Moly Rings**

- Denser moly surface resists flaking under demanding conditions
- High melting point protects against scuffing

### **Molybdenum Rings**

- Durable finish with less friction
- Controlled porosity enhances oil-carrying capacity, forming an effective compression seal

### **Compression Rings feature**

- Full face chrome for maximum wear resistance
- Factory lapped for fast break-in

### **Second Rings feature**

- Inside bevels, creating torsional-twist to prevent blow-by
- Tapered face, restricting oil migration into the combustion chamber

### **Performance Rings are race-proven**

- More races have been won with Sealed Power and Speed-Pro piston rings than all others combined





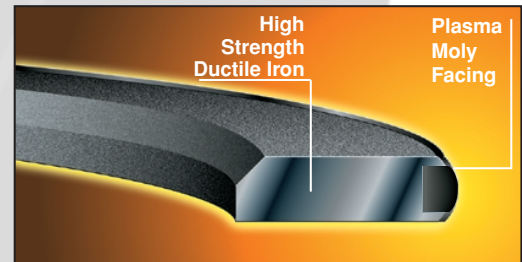
# SEALED POWER AND SPEED-PRO PISTON RING TECHNOLOGY

## Technology

Sealed Power piston rings dominate the industry with technically advanced design, dedicated research and superior quality. Our rings minimize cylinder leakage under true operating conditions, and provide maximum oil control. Speed-Pro piston rings deliver reliable sealing and dependable performance under grueling race conditions. Every weekend, our rings win on oval tracks and drag strips worldwide. Put our performance heritage, racing experience and engineering superiority to work in your car!

## Top Ring

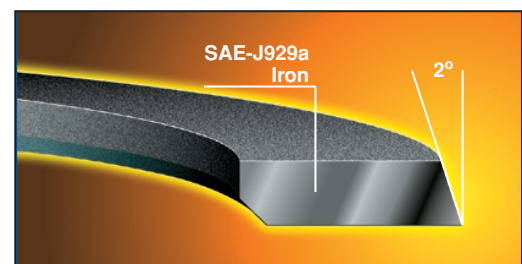
Sealed Power top rings provide reliable compression sealing and maximum power output, and control "blow-by." Sealed Power's top rings are engineered for instant seating, superior cylinder sealing and optimum durability. We offer cast iron, high-strength ductile iron and steel material choices. All premium ring sets feature moly, chrome or plasma-moly facings for enhanced performance under demanding conditions. The inherent strength of our materials provides sealing integrity at extreme pressures and RPM. We supply rings for all popular applications – passenger car, heavy-duty, agricultural and high performance.



## Second Ring

We manufacture Sealed Power second rings from SAE-J929a iron to provide excellent durability and superior oil control. The primary function of the second ring is oil control. Our tapered face design makes this ring work as a "scraper," reducing the potential for oil migration into the combustion chamber.

Our race-proven gap design creates an escape path for residual combustion gases, reducing inter-ring pressure and keeping the top ring seated against its groove. Without this escape path, trapped pressure will unseat the top ring, causing ring flutter and reduced cylinder sealing at high RPM. Our one-piece second rings are far more effective and reliable than competitive designs which attempt to retain combustion pressure lost through ineffective top rings. Beware: cylinder leakage tests are steady state; they do not account for time, piston movement or true operating pressures.



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## SEALED POWER AND SPEED-PRO PISTON RING TECHNOLOGY

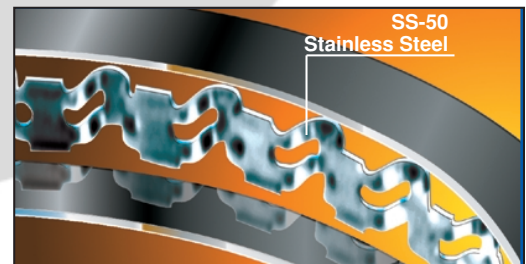
More races have been won with our rings than with all others combined. No other supplier can offer the horsepower, oil control and durability we engineer into every set. If you want to join the winning team, choose Sealed Power and Speed-Pro piston rings!

### **SS-50® Oil Control Rings**

**Our famous SS-50 stainless steel oil ring is the absolute best design in the industry for controlling oil.**

SS-50 oil rings' sturdy, box-like construction eliminates oil ring flutter and deformation in high RPM engines. SS-50 electro-polished stainless steel expanders provide a smooth, corrosion-resistant surface. Our rings do not depend upon ring groove contact for tension. The unique design maintains consistent pressure under high heat conditions, and conforms to worn or out-of-round cylinder bores. Chrome-plated oil rails are pre-seated at the factory, delivering instant oil control upon engine start-up.

We engineer standard tension oil ring assemblies to provide maximum oil control for virtually all engines. They maintain uniform contact with the cylinder wall and provide an excellent drainback path for the removed oil. Low tension Speed-Pro oil rings reduce internal engine friction while maintaining positive oil control in racing applications. Oil rings with further reductions in tension are available for use with crankcase vacuum systems.



Our unique design maintains consistent pressure under high heat conditions, and conforms to worn or out-of-round cylinder bores.



## WHY BUY FEDERAL-MOGUL ENGINE BEARINGS?

### Federal-Mogul

#### World's leading manufacturer of engine bearings

- 100 years of engine bearing manufacturing mastery - we do it better, have done it longer and produce more engine bearings than any of other manufacturer!
- Preferred supplier to prestigious aftermarket and OEM customers
- Multiple industry quality awards
- Offer appropriate lining materials for any given application - same as OEM or better
- Most rod bearings offered as pairs and sets
- QS9000-certified manufacturing facilities and extensive distribution

#### First-class catalog support

- Best-organized and easiest-to-use reference tool available
- Excellent light duty, heavy duty, import and performance coverage

#### World class research facility

- In-house computer software, test equipment and instrumentation for analysis and testing
- Computer-aided modeling for bearing design
- Scanning electron microscopes
- Advanced computer-controlled engine dynamometers





# WHY BUY FEDERAL-MOGUL ENGINE BEARINGS?

## Technology

Many popular main sets now feature our patented contoured flange bearing. The contoured flange uses a series of formed "ramp and flat" hydrodynamic profiles on the flange surface which:

- Double thrust load capacity
- Reduce friction between flange face and thrust surface
- Reduce wear dramatically
- Extend life of flange bearing
- Improve lubricity

### 3/4 groove bearing design

- Enhances lubricity without compromising load capability

### Superior bi-metal aluminum alloy

- The lining material of choice for most late model engines
- Contains silicon which resists seizure and dramatically reduces bearing wear

### Laser welded, tin-based babbitt cam bearings

- Features increased fatigue strength and is environmentally friendly
- The improved geometric design improves ease of installation and offers a more consistent and tighter cam bearing clearance

### Rod sets with oversize rod bores

- Less reconditioning steps are now required for conventional rods
- Designed for "cracked" powder metal connecting rods

## Product

### "Heavy wall" engine bearings.

- New large main and rod half-shell bearings with some specs exceeding quarter-inch wall thickness and six inches of outside diameter (OD)
- These tri-metal cast copper lead bearings are well suited for handling extreme heavy duty engine loads

### New performance cam bearing sets

- Provide double the fatigue strength of standard bearings through innovative design and manufacturing improvements

### Performance main and rod bearings

- Select fit, advanced materials and patented designs set the standard for our performance bearings
- Performance lining materials include our proven super duty copper lead (H14) and top fuel babbitt (B100) for superior performance

### Main sets feature oversize flange lengths

- Allows engine builders to compensate for worn thrust surfaces without crankshaft replacement or major machining work

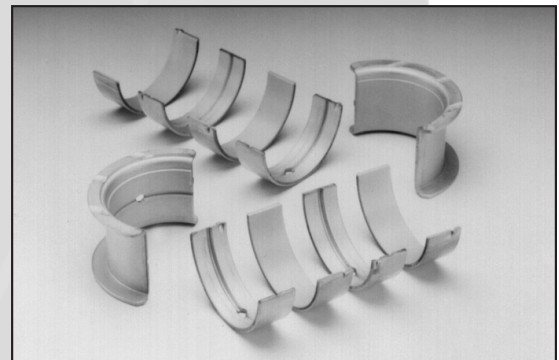


# FEDERAL-MOGUL ENGINE BEARINGS THE INDUSTRY LEADER

Federal-Mogul is the world's leading manufacturer of engine bearings. We have a reputation for superiority in design, metallurgy and quality. Our dedication to excellence extends to every part we make. Sealed Power engine bearings are manufactured to exacting tolerances for outstanding durability in all applications. Whether you are a professional remanufacturer doing thousands of engines per year, a race engine builder looking for that last increment of power or a professional machinist seeking the best combination of reliability and value – we have your parts!

## Bearing Design

The design features for engine bearings are normally determined by the engine's manufacturer. The width and diameter of the crankshaft journals, connecting rod bores and block housing bores are designed to provide adequate bearing surface area and acceptable component strength. Within these parameters, Federal-Mogul engineers work with a variety of design features to develop the optimal bearing for any given application.

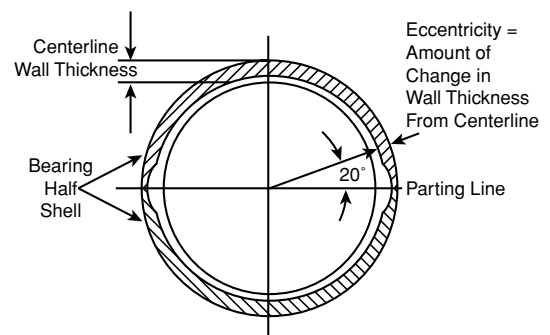


## Crush

The term "crush" refers to the outward force created by the portion of the bearing which extends above the housing bore when the bearing halves are set into place. This "extra" material holds the outside diameter of the bearings firmly against the housing bore when the assembly is torqued to specification. By increasing the surface contact between the bearing and its bore, crush minimizes bearing movement, helps to compensate for bore distortion and aids in heat transfer. Sealed Power performance bearings have additional crush built into the design for enhanced heat transfer and bearing retention.

## Eccentricity

"Eccentricity" refers to the variation in the inside diameter of a bearing assembly when it is measured at different points around its bore. A properly designed engine bearing is not truly "round" when it is installed in the connecting rod or engine block. Under operating loads, a rod or main housing bore will distort, pulling inward at the parting line between the upper and lower halves. To keep the bearing from contacting the crankshaft in these areas, our designs include additional clearance at each parting end of the bearing. As engine loads increase, so does the amount of distortion, thus race bearings require greater eccentricity than do passenger car bearings.





# FEDERAL-MOGUL ENGINE BEARINGS THE INDUSTRY LEADER

## Oversize OD Bearings

It is not possible to recondition the new style "cracked" powder metal connecting rods in the traditional manner. Sealed Power oversize OD bearings allow machinists to hone these rods to a slightly larger inside diameter, cost-effectively reconditioning them for future service. This technique requires fewer steps, and actually saves the machinist time and money when compared to prior reconditioning methods.

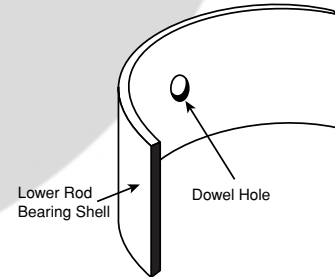
Sealed Power now supplies oversize OD bearings for many earlier design engines as well, allowing machine shops to reduce machining time and expense.

## Chamfer

Racing crankshaft designs often have a larger radius in the area where the rod journal meets the counter-weight. This rounded inside corner increases crankshaft strength, but can interfere with the rod bearing. Many performance rod bearings feature a "chamfer" to provide the side clearance necessary for these cranks. The chamfer is used on the side of the bearing alongside the crankshaft counterweight, thus maintaining as much surface area as possible. It is still important to check for adequate clearance in the chamfer area.

## Dowel Holes

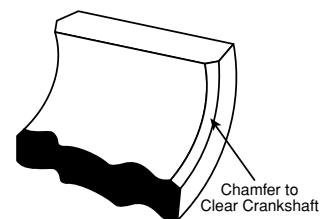
Several of our racing rod bearings incorporate a dowel hole. The dowel hole is not required with steel connecting rods. In drag racing applications that utilize aluminum connecting rods, a dowel pin is required in order to positively locate the rod bearing. Without this locating pin, the bore distortion and thermal expansion inherent in aluminum rods would reduce the bearing's crush, and allow it to spin in the rod. Since the lower shell is not as highly loaded as is the upper, the dowel hole does not affect bearing performance.



## Oil Grooves - Half, Full or 3/4?

Most original equipment main bearings use a "half groove" where the upper bearing shell is grooved but the lower shell is not. The half groove offers increased main bearing surface area for higher fatigue resistance. Full groove provides better rod bearing lubrication but compromises bearing load capacity. Either of these designs work well for most applications, providing a good combination of strength and long life.

Racing bearings must perform flawlessly under severe stress. For this reason we pioneered the 3/4 groove design, which maintains the full surface area in the most highly loaded portion of the lower main bearing, while permitting improved oil flow to the rod bearing. This unique design gives the best of both worlds – ultimate high strength with improved rod lubrication. Crankshafts running with 3/4 groove bearings do not need cross-drilling – saving you time and expense while improving crankshaft strength.







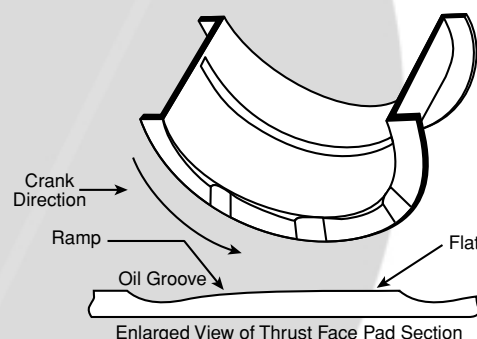
# CONTOURED FLANGE DESIGN

## Exclusive Design - Patent No. 5363557

The innovative contoured design flange bearing uses a series of formed “ramp and flat” hydrodynamic profiles on the flange surface. This contour wedges oil, via the positively sloped ramp, onto the flat surface of the flange face. Specifically, the rotating crankshaft drags a film of oil onto the flat surface where it provides hydrodynamic thrust support for the crankshaft.

### Benefits

- Doubles thrust load capability
- Reduces friction between flange face and thrust surface
- Reduces wear dramatically
- Extends longevity or life of flange bearing
- Improves lubricity between flange face and thrust surface
- Strongly benefits applications experiencing high clutch loads or frequent “on and off” throttle transitions



## Main Sets Available with Contoured Flange Bearing

Application	Part No.	Application	Part No.	Application	Part No.
Ford 5.0L V8	4125M	Chevy Perf. 262 V6	104M	Ford Perf. 4.6L DOHC V8	149M
Ford 4.6L V8	7289M	Chevy Perf. 283, 327 V8	138M	Ford Perf. 289, 302 V8	129M
Ford 4.2/3.8L V6	7295M	Chevy Perf. 350 V8	139M	Ford Perf. 351C V8	146M
Ford 2.0L Zetec L4	7193M	Chevy Perf. 400 V8	140M	Ford Perf 351 M&W, 400 V8	130M
GMC 5.7/5.0L V8	4663M	Chevy Perf. Big Blk. V8	141M	Ford Perf. 390, 427, 428 V8	125M
GMC 4.3L V6	5085M	Chevy Perf. Big Blk. (Babbitt) V8	136M	Pontiac Perf. 421, 428, 455 V8	151M
GMC 3.8L V6	7288M	Chrysler Perf. Big Blk. (Babbitt) V8	142M		
GMC 3.1L V6	7242M	Ford Perf. 4.6L SOHC V8	148M		



# FEDERAL-MOGUL ENGINE BEARINGS THE INDUSTRY LEADER

## Clearances

Vertical bearing clearance is best measured by assembling the bearing into its bore, measuring the inside diameter with a dial bore gauge, and subtracting the actual crankshaft journal diameter. Clearance specifications shown in this catalog are the arithmetic ranges possible with parts that meet factory specifications, not clearance recommendations. Always use the engine manufacturer's clearance specifications. Clearance should be measured vertically – 90 degrees from the housing parting line. The eccentricity designed into bearings will cause clearance measurements to vary at different points around the bearing's inside bore.

Plastigage can be used as a quick way to check clearance. To use plastigage correctly, first assemble the upper bearing shell into the housing, then install the crankshaft. Lay a strip of plastigage lengthwise across the center of the bearing journal. Install the lower bearing shell and cap, and tighten the fasteners to the specified torque. Loosen the bolts and remove the bearing cap and lower shell, being careful not to rotate the crankshaft. Compare the thickness of the now compressed plastigage strip to the chart on its package to determine the bearing clearance. Carefully remove all traces of plastigage from both the crankshaft journal and the bearing before final assembly.

High performance applications may require different bearing clearances than unmodified engines. Many engine builders target a clearance range between .0022" and .0027". Clearances greater than .003" are not normally recommended. Some engine builders like higher oil pressures than a standard oil pump can provide, particularly at lower engine speeds. Large bearing clearances will lower oil pressure, and may require a high volume oil pump. An engine should maintain a minimum oil pressure of 10 lbs. per 1000 RPM.

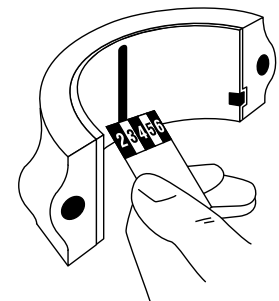
## Heavy Wall Bearings

New to our product line are select listings of heavy wall bearings (normally with specs including a quarter-inch wall thickness and 6 inches or more in OD or housing bore). These bearings are cast copper-lead alloy and produced at a Federal-Mogul heavy wall bearing plant. The applications involve several large Superior Diesel® and Waukesha® engines. Our initial offering includes approximately two dozen main and rod bearing half shells. These half shells will be available in standard size only and must be ordered as half shells (not pairs).

## Plastigage

Plastigage is a quick and easy device for checking bearing clearances. Available in four ranges to cover most applications. Twelve strips per package with a measurement gauge printed on each wrapper.

SPG-1 (green)	.001 – .003 (.025MM – .075MM) range
SPR-1 (red)	.002 – .006 (.050MM – .15MM) range
SPB-1 (blue)	.004 – .009 (.10MM – .23MM) range
SPY-1 (yellow)	.009 – .020 (.23MM – .50MM) range





# FEDERAL-MOGUL ENGINE BEARINGS THE INDUSTRY LEADER

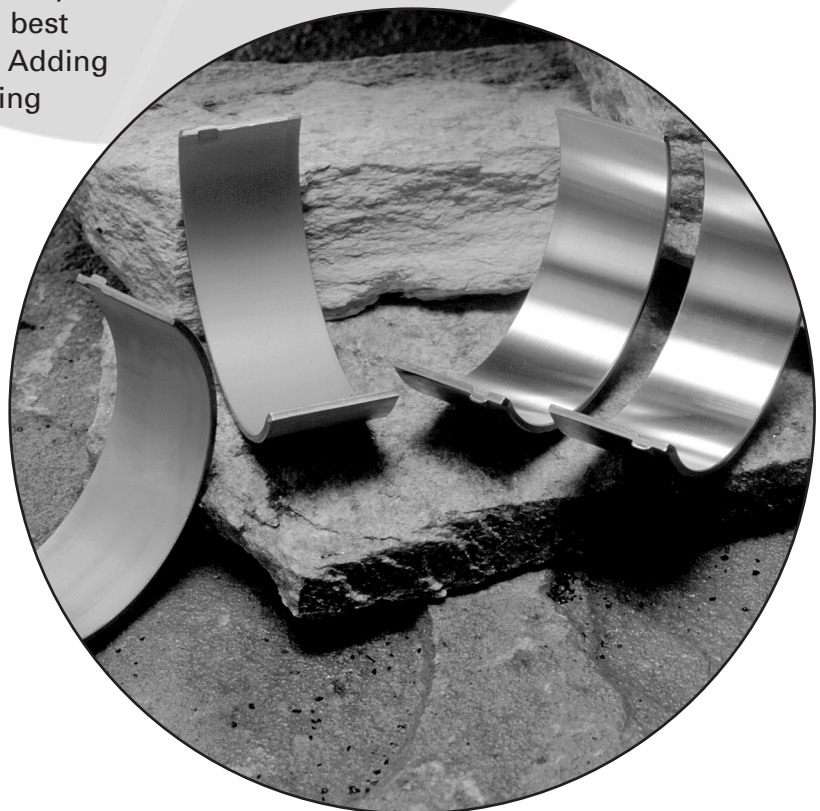
## Bearing Material Selection

When selecting bearings, most engine builders concentrate on getting the proper clearances and maintaining adequate oil pressure. Durability is expected from any bearing chosen, and the advantages of different bearing materials may not be considered. If engine operating conditions are considered and bearing materials chosen accordingly, the likelihood of success is greater. No single material can be correct for every application. Sealed Power bearings are equal to or better than the original equipment specifications for material and design. We also provide alternatives to address unique problems and special needs.

In street-driven applications there are a number of materials that will do an excellent job. Each alloy has advantages in terms of resistance to corrosion, rate of wear and fatigue strength. The latter characteristic is critical in engines that operate under high loads, generate considerable heat and may be subjected to occasional detonation.

## Bi-Metal Aluminum Alloys – Plated and Unplated

Unleaded fuels, moisture and engine "blow-by" introduce many contaminants into the crankcase. Aluminum bearing materials provide outstanding resistance to the corrosive effects of these substances, and are the product of choice for most current original equipment vehicle manufacturers. The modern bi-metal aluminum bearing contains silicon. As a result of using silicon, the alloy resists seizure and dramatically reduces or eliminates bearing wear. This contributes to today's extended vehicle life. Aluminum is often the best material for a daily-driven vehicle. Adding an overplate to an aluminum bearing will further enhance embedability and conformability. Continued efforts to remove lead from our environment guarantee that aluminum will become the preferred bearing material for most applications.





# FEDERAL-MOGUL ENGINE BEARINGS THE INDUSTRY LEADER

## **Copper-Lead (Tri-Metal) Alloys**

Tri-Metal bearings, such as our H-14 and H-24 alloys, have excellent fatigue resistance, but are less resistant to corrosion damage than are aluminum bearings. These bearing materials are accepted by engine builders worldwide, and are proven to be reliable in a wide range of uses. While OE manufacturers are moving to aluminum for their needs, many rebuilders still specify the tri-metal bearings for older engines.



## **Babbitt**

Frequently found in cam bearings, this alloy is also used in rod and main bearings for supercharged nitromethane or alcohol-fueled race engines which require high embedability and conformability. These engines require that the bearing be "sacrificial", deforming under the extreme loads, and not damaging expensive racing crankshafts. Such race engines must receive frequent bearing inspection and replacement. Babbitt is not a recommended material for rod or main bearings in engines expected to have a long service life.





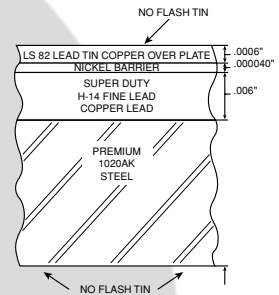
# FEDERAL-MOGUL ENGINE BEARINGS THE INDUSTRY LEADER

## H-14 Competition Series Alloy (CH)

Proven in NASCAR and NHRA Pro Stock competition, this patented, four-metal material is a Sealed Power exclusive. The unique lining is bonded to an extra-high strength steel backing for unparalleled durability. This material outperforms competitive tri-metal products by a wide margin in virtually any racing application.

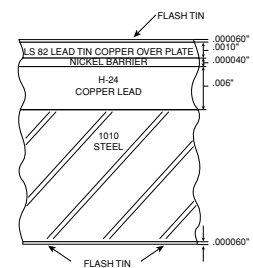
Sealed Power Competition Series bearings lack the common white/gray color because cosmetic tin plating has been eliminated. Tin plate can migrate across a bearing's steel backing under race conditions, causing high spots on the inside diameter. These high spots intrude into the oil clearance, and become concentrated load areas susceptible to premature fatigue.

These bearings feature greater dimensional accuracy, reduced overplate thickness and improved resistance to fatigue damage. The extra strong, but very thin, overplate layer does have a cost – the bearing surface is more susceptible to damage from debris. Frequent oil and filter changes are mandatory when using race bearings, a small price to pay for the increase in durability. We highly recommend Competition Series bearings for most high performance use (except for supercharged drag race applications which require babbitt bearings).



## H-24 Tri-metal Copper-Lead (CP or P)

This is our standard bearing material, and is noted for its desirable balance of fatigue resistance and strength characteristics. It provides the strength, embedability and conformability required in most applications. Suitable for street, heavy duty and moderate competitive use. H-24 bearings are comparable to competitors' "performance" bearings, but they are not as strong as our Competition Series products (in racing use).



## Aluminum Alloy (RA or A)

Specified for applications where a high degree of corrosion and wear resistance is desired. Non-plated aluminum bearing alloys contain silicon, which will actually polish the shaft journal in use. This material is ideal for handling thrust loads, and is often used for the flange bearing in applications where alternate materials are specified for the rest of the bearing set. Aluminum has proven durability for street use, and is recommended for limited high performance applications, such as circle track main bearings.

## Tri-metal Aluminum (AP or P)

Provides excellent fatigue resistance and conformability, along with the corrosion-resistant properties associated with aluminum. This bearing material is frequently used in heavy duty "off-highway" diesel engines. It is also excellent for passenger car and moderate high performance applications.



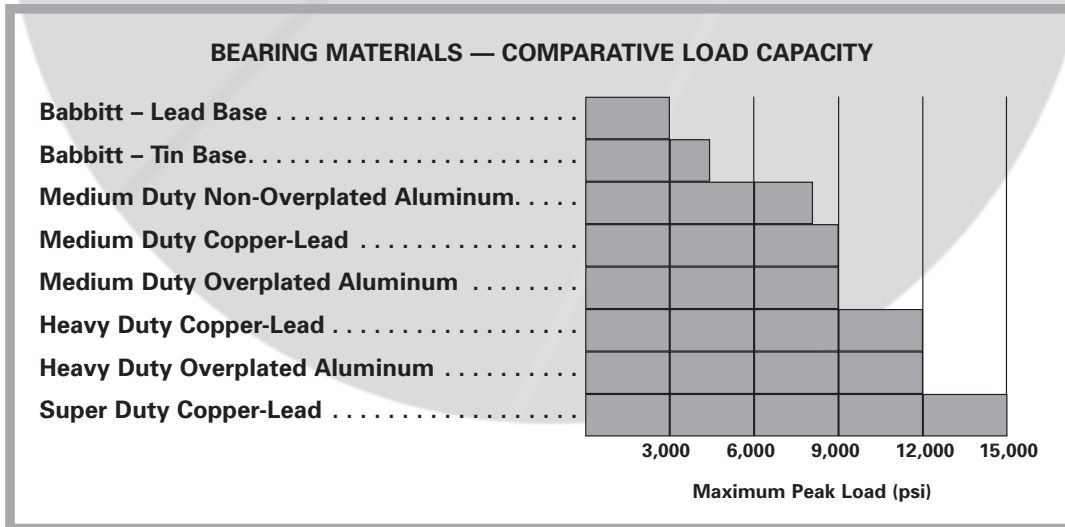


# FEDERAL-MOGUL ENGINE BEARINGS THE INDUSTRY LEADER

## Engine Bearing Material Usage Recommendations

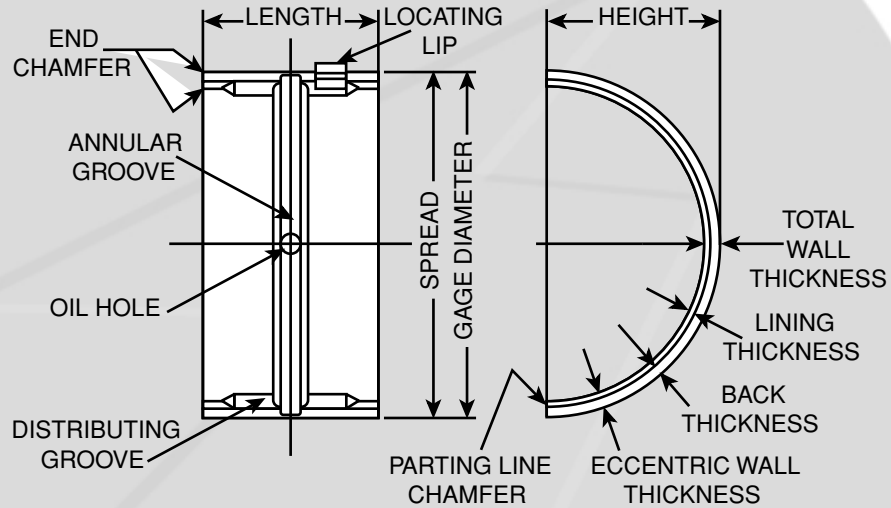
	Light Duty	Medium Duty	Heavy Duty	Super Duty	Top Fuel
Babbitt	L-200/B-100 (B) (SA,SB,SI)				B-100 (SH)
Unplated Aluminum		A-400/A-500 (RA or A)			
Plated Aluminum			A-260 (AP or P)		
Plated Copper-Lead			H-24 (CP or P)	H-14 (CH)	

( ) Bearing part number suffix

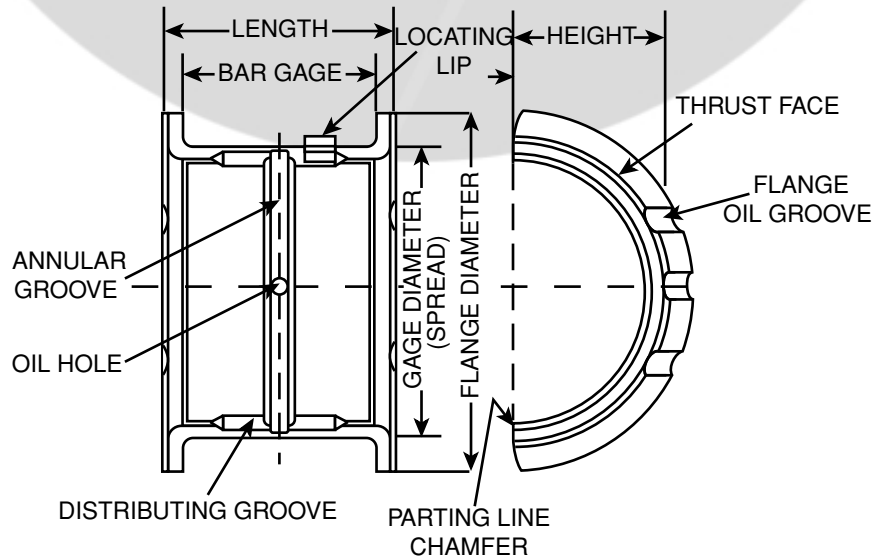


# BEARING NOMENCLATURE

## Rod and Main Bearing

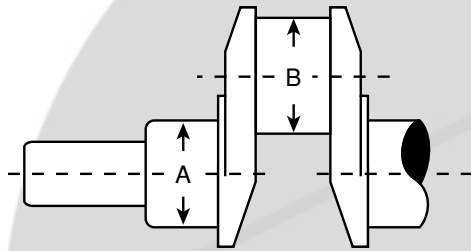


## Thrust Bearing

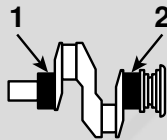


# CRANKSHAFT CLASSIFICATIONS

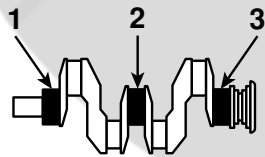
The shaded areas are Main Bearing Journals numbered to correspond with the Main Bearing position numbers shown in this diagram.



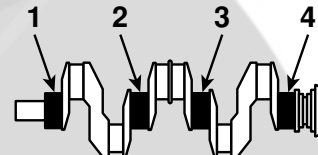
Section of Crankshaft



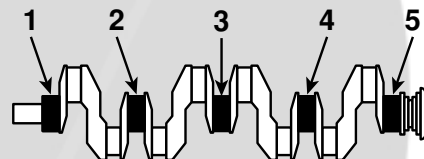
Two Main Bearing Crankshaft  
(2 Cylinders)



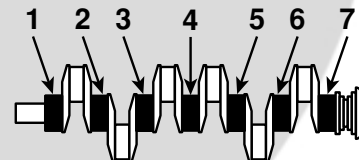
Three Main Bearing Crankshaft  
(4 Cylinders)



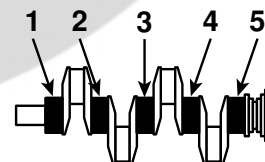
Four Main Bearing Crankshaft  
(6 Cylinders) V6



Five Main Bearing Crankshaft  
(8 Cylinders) V8

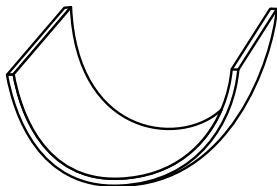


Seven Main Bearing Crankshaft  
(6 Cylinders) L6

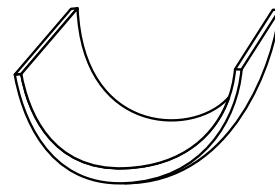


Five Main Bearing Crankshaft  
(4 Cylinders) L4

## BEARING WALL DESIGN



Concentric Wall Bearing  
(uniform wall thickness)



Eccentric Wall Bearing  
(wall heavier at crown than at parting faces)



## SEALED POWER VALVES AND VALVE TRAIN

All Sealed Power valve and valve train components meet or exceed OEM specifications. We offer a complete line of valve train parts for most domestic and import vehicles.

### Valves

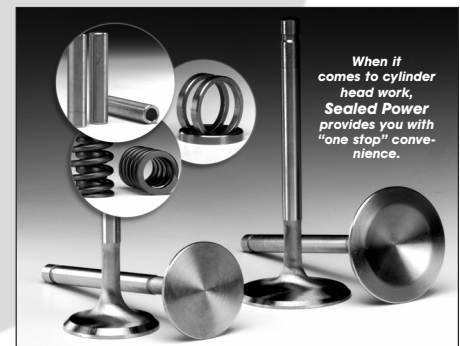
Alloys that meet or exceed the OE design requirements are precision manufactured to yield intake and exhaust valves with excellent corrosion resistance, fatigue strength and heat resistance. Many late model valves feature Stellite® facing materials to provide maximum wear resistance. When required, the stems are chrome-plated to protect the valve during break-in.

### Valve Springs

Sealed Power valve springs are manufactured from high quality spring steels and are tested for correct tension. All springs are required to meet stringent dimensional and uniformity requirements to ensure trouble-free performance.

### Valve Guides

Sealed Power replacement guides are manufactured from high quality metals and machined for a perfect fit. Inside diameter finish is engineered for optimum valve stem compatibility. Long wearing iron and bronze alloys allow our conversion guides to give new life to heads with worn guide bores. Conversion guides are available in threaded and non-threaded designs to fit a wide range of applications.



### Valve Seats

Sealed Power seats are precision machined from premium hardened alloys. A super premium valve seat (denoted by the "N" suffix) made from true cobalt non-magnetic material is available for use in severe service applications. This alloy will retain its hardness at temperatures beyond 1600 degrees Fahrenheit.

### Sealed Power Lifters

Sealed Power lifters are manufactured to exacting tolerances. The internal components are machined and gauged to 33 millionths of an inch (.000033"). The components are indexed and matched to ensure efficient performance and quiet operation. All lifters feature the Sealed Power flat disc check valve that is lighter and more accurately machined than competitor check valves. Face hardness is monitored through Rockwell hardness testing to ensure that all lifters will provide maximum service life.



In addition to the hydraulic lifters, Sealed Power also offers a broad range of adjustable lifters, fixed lifters, roller lifters and hydraulic lash adjusters for most domestic and import vehicles.



## SEALED POWER VALVES AND VALVE TRAIN

### Valve Stem Seals

As the normal wear increases clearance between the valve stem and guide, Sealed Power valve stem seals, which meet or exceed factory specifications, provide tight control of oil passage into the combustion chamber. Our positive seals feature the latest materials and are specially designed to provide superior sealing characteristics and excellent heat resistance on both intake and exhaust valves.

### Valve Spring Inserts

Grinding the valve seat and re-facing the valve can remove enough material to cause the assembled height of the valve spring to be out of specification. This leads to a reduction in the valve spring pressures and thus reduced engine performance. The correct Sealed Power spring insert installed under each valve spring will restore the installed height to factory specifications and help to ensure optimum engine performance. Four insert designs are available to cover nearly every application.

### Rocker Components

Sealed Power rocker arms are available in a variety of configurations and materials. Each rocker arm is manufactured to meet or exceed OEM design requirements for the engine. Push rod seats, pivot areas and contact pads are all hardened for long service life and optimum compatibility with associated components.

Rocker arm shafts are manufactured from premium quality steel. Induction heat treating hardens the shaft surface at critical wear points while maintaining the full tensile strength of the inner core.

### Push Rods

Sealed Power push rods are manufactured from high strength tubular steel and feature special wear and corrosion resistant surfaces. They provide extra toughness where it's needed most - the tips are hardened for long life and compatibility with mating components. Many push rods for engines with non-adjustable valve trains are offered in over- and under-sizes.







## SEALED POWER TIMING COMPONENTS

Sealed Power timing components are manufactured to meet or exceed OEM design requirements. We offer comprehensive coverage for every component from timing belts to complete kits.

### Timing Sprockets

Cam and crank sprockets are manufactured to mesh precisely with the chain for efficient, quiet operation. Cam sprockets are cast iron, sintered metal or special nylon on aluminum. Crank sprockets are steel or sintered metal. Both are manufactured for optimum performance and long life in a wide variety of applications.

### Timing Chains

Timing chains are constructed from links of selected alloy steel, connected by large pins for maximum durability. Careful dynamometer testing assures you of the highest quality and dependable, long-life performance.

### Timing Belts

Rugged replacement timing belts are available for a wide variety of domestic and import passenger car applications. The belts feature the same construction and materials as specified by the OEM manufacturer.

### Timing Gears

Timing gears are available in aluminum, close-grained cast iron, case-hardened steel and laminated fiber. Crown shaving of gear teeth equalizes heavy loads across the teeth and also accommodates minute shaft misalignments.

### Timing Component Kits

Timing sets are available for import and domestic applications. Three-piece (KT-3), multiple-piece (KT-10) and two-piece (KT-2) sets are available. All the parts you need for the repair are listed under one part number.

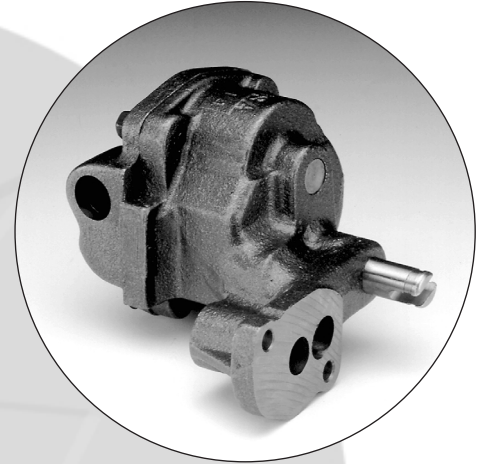


Note: Always replace timing sprockets and chains or timing gears as complete sets - never one at a time - because the wear patterns that led to one component's failure will prematurely wear its replacement.



## SEALED POWER OIL PUMPS

Sealed Power oil pumps are manufactured to meet or exceed OEM design specifications. We offer a complete line of domestic and import oil pumps. Every pump is flow pressure tested to ensure the Sealed Power quality that you've come to rely on.



## SEALED POWER CAMSHAFTS

One key to top engine performance is valve actuation. That's why one of the most critical components to check in any engine overhaul is the cam.

The camshaft controls valve timing and lift, and provides input to the distributor, oil pump and fuel pump. Specifying the correct replacement camshaft is crucial in restoring OE performance after an overhaul.

Sealed Power camshafts are manufactured from materials that are carefully selected for compatibility with today's engines and valve trains. The lobes are ground from one-piece masters, ensuring correct timing and elimination of indexing errors in cam profile. Shaft hardening is carefully controlled to provide long-wearing surfaces designed to mate with the engine's lifters or followers. Each camshaft must meet optimum performance and quality standards before it leaves the manufacturing facility.

Speed-Pro performance camshafts offer increased valve lift and duration over comparable stock units. These cams were selected to provide improved efficiency and power.

Cams designated as EP1 are considered "one step over stock" and will still provide a stock quality idle. Cams designated as EP2 are "two steps over stock" and will generate a good quality idle. These parts may not be legal for use in vehicles subject to emission control regulations. Check with your state vehicle emission regulating authorities before installing any performance camshaft.





## ENGINE KITS

The Sealed Power Engine Kit program allows you to select a kit tailored to the job at hand. Whether performing a complete overhaul, re-ring job or a complete cam change, Sealed Power Engine Kits contain all the necessary OEM-quality components to complete the repair. Over 6,000 kits are available for every level of repair on all popular domestic and import nameplates.

This comprehensive program provides you with the following:

- Concise application information
- One price look-up
- A full complement of oversizes
- Master Kits that include full gasket sets

In the catalog, engine kits are listed in the last section of each engine block. They are listed in descending chronological order (most recent coverage listed first). Use the years column and description column to find the desired application.

Listed below are the kit configurations available for engine re-build and cam change.



Kit Components	Master Kit	Master Kit w/o Pistons	Master Kit w/o Rod Brgs. & Main Set	Master Kit w/o Pistons, Rod Brgs. & Main Set	Re-ring Kit	Re-ring Kit w/Mains
	<b>MKP-</b>	<b>MK-</b>	<b>505-</b>	<b>405-</b>	<b>205-</b>	<b>205- _ _ _ M</b>
Rings	Rings	Rings	Rings	Rings	Rings	Rings
Gaskets	Gaskets	Gaskets	Gaskets	Gaskets	Gaskets	Gaskets
Cam Bearings	Cam Bearings	Cam Bearings	Cam Bearings	Cam Bearings		
Oil Pump	Oil Pump	Oil Pump	Oil Pump	Oil Pump		
Freeze Plugs	Freeze Plugs	Freeze Plugs	Freeze Plugs	Freeze Plugs		
Camshaft	Camshaft	Camshaft	Camshaft	Camshaft		
Lifters	Lifters	Lifters	Lifters	Lifters		
Prelube	Prelube	Prelube	Prelube	Prelube		
Timing Set	Timing Set	Timing Set	Timing Set	Timing Set		
Pistons	Pistons		Pistons			
Rod Bearings	Rod Bearings	Rod Bearings			Rod Bearings	Rod Bearings
Main Bearings	Main Bearings	Main Bearings				Main Bearings