

HUGHES Engines inc.



Product & Service Catalog - 2003



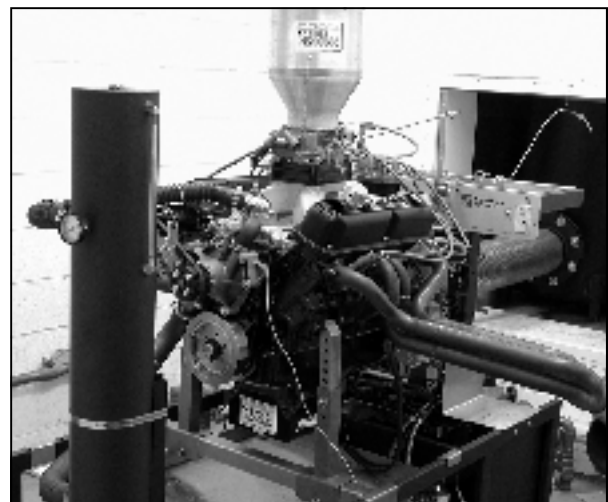
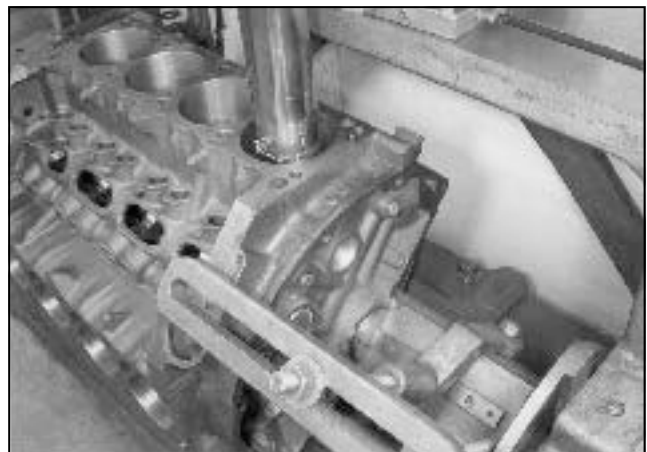
www.hughesengines.com

Who Are These Guys?

Hughes Engines Inc. was formed in 1969 as Hughes Engineering, to build stock and super /stock cylinder heads for AHRA and NHRA class racing. Since then we have grown into a complete custom engine building facility. We were one of the first ASE certified engine machine shops in the nation.

Although we have built several national champions and record holders, the majority of our market is in the restoration, hot street, oval track and bracket racing area. Our shop has been strictly Mopar for several years and we offer many very specialized parts and procedures that are either unknown or unavailable from other Mopar shops. The Mopar market is very small and the bigger manufacturers and suppliers ignore it because it does not pay to devote much time to it. For us at Hughes Engines Inc. you are a huge market, and our only market.

We are constantly developing new parts and procedures to help the Mopar racers and we have what is probably the finest engine web-site on the internet, and it's all Mopar, www.hughesengines.com. Keep an eye on it for the very latest Mopar parts, Tech and tell it like it is info. If your are looking for 21st century help and some "real" Chrysler parts, give us a call, be patient the phone is very busy.



Main Bearings:

Description	Undersizes Available	P/N
273,318 engines		
Narrow flange 3.374" (1957-1973 blocks)		
Federal Mogul aluminum alloy (1/2 groove)	STD-1-10-20-30-40-50-60	4000
Clevite Tri-Metal alloy (1/2 groove)	STD-1-10-20-30-40-60	4002
Early wide flange 3.530" (1974-1978 blocks)		
Federal Mogul aluminum alloy (1/2 groove)	STD-1-10-20-30	4004
Clevite Tri-Metal alloy (Full groove)	STD-10-20-30	4006
Clevite lead-indium alloy (Full groove)	STD-1X-1	4007
Late wide flange 3.530" (1979 - 2000 including Magnum)		
Federal Mogul aluminum alloy (1/2 groove)	STD-10-20-30	4009
340 engines		
Federal Mogul aluminum alloy (1/2 groove)	STD-1-10-20-30-40-60	4000
Clevite Tri-Metal alloy (Full groove)	STD-10-20-30	4010
360 engines		
Narrow flange 3.865" (1971-1973 blocks)		
Federal Mogul aluminum alloy (1/2 groove)	STD-10-20-30	4012
Clevite Tri-Metal alloy (1/2 groove)	STD-10-20	4014
Wide flange 3.910" (1974-2000 blocks including Magnum)		
Federal Mogul aluminum alloy (1/2 groove)	STD-1-10-20-30	4016
Clevite Tri-Metal alloy (Full groove)	STD-1-10-20-30	4018
361,383,400 engines		
Narrow flange 3.453" (1961-1971 blocks)		
Federal Mogul Tri-Metal alloy (1/2 groove)	STD-10-20-30-40-50-60	4020
Clevite Tri-Metal alloy (Full groove)	STD-10-20-30-40-60	4022
413,426W, 440 engines		
Narrow flange 3.624" (1959-1974 blocks)		
Federal Mogul aluminum alloy (1/2 groove)	STD-10-20-30	4024
Federal Mogul Tri-Metal alloy (Full Groove)	STD-10-20-30-40	4026
Clevite Tri-Metal alloy (Full groove)	STD-10-20-30	4028
Federal Mogul Tin based babbitt race material (3/4 Groove)	STD-10-20-30	4030
Federal Mogul Tri-Metal alloy (3/4 groove)	STD-1-10	4031
Wide flange 3.930" (1974-1979 blocks)		
Federal Mogul aluminum alloy (1/2 groove)	STD-10-20-30	4032

Rod Bearings:

Description	Undersizes Available	P/N
273, 318, 340, 360 engines		
Federal Mogul Tri-Metal alloy		
	STD-1-2-10-20-30-40-50	4100
Clevite Tri-Metal alloy	STD-1-2-10-20-30-40-50-60	4101
361,383, 400, 413, 426W,440 engines		
Federal Mogul Tri-Metal alloy		
	STD-1-2-10-20-30-40-50	4102
Clevite Tri-Metal alloy	STD-1-2-10-20-30-40-50-60	4103
Clevite Race Tri-Metal alloy	STD-1-10	4104

Rod bearings for stroker cranks:

273, 318, 340, 360 engines (chamfered, use with radiused fillet cranks)		
Federal Mogul Tri-Metal alloy		
	STD-1-2-10-20-30-40-50	4100C
Clevite Tri-Metal alloy	STD-1-2-10-20-30-40-50-60	4101C
361,383, 400, 413, 426W, 440 engines (narrowed with chamfer)		
Clevite babbitt material	STD-10	4106
Federal Mogul babbitt material	STD-1-2-10	4108
Federal Mogul 2.199" journal	STD-1X-1-9-10-11-20-21-30	4110

Cam Bearings:

273, 318, 340, 360 engines		
Federal Mogul aluminum alloy	STD	4150
Clevite aluminum alloy	STD	4151
361, 383, 400, 413, 426W, 440 engines		
Federal Mogul aluminum alloy	STD	4152
Clevite aluminum alloy	STD	4154

Distributor Drive Shaft Bushing:

Heavy-duty bronze bushing for extra long life All Small Block and Big Blocks	4275
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Clutch Pilot Shaft Bushings:

Heavy-duty bronze bushing. Available in two sizes. If you are converting an automatic transmission crankshaft to manual transmission, be sure and check the depth of the pilot hole.	
0.915" OD x 0.750" ID	4280
0.941" OD x 0.750" ID	4282
Roller bearing 1.815" OD x 0.750" ID (pilot nose of transmission input shaft must trimmed for clearance)	4284



Timing aids:

Small Block offset camshaft keys



This kit contains color-coded, hardened alloy keys for 1°, 2°, 3°, 4° and 5° offsets.

273-318-340-360 6006
Magnum 318-360 6007

Big Block offset cam gear bushings.



These precision bushings feature a flange on the back to prevent the bushing from working out. Available in 1°, 2°, 3°, 4°, 5°, and 6° offsets. Use with 3 bolt cams only. Specify offset when ordering.

Individual bushings 6010
Set of 6 bushings 6012

Fuel Pump Eccentric:



These eccentrics feature a special floral-carbon coating to prevent the rapid wear conditions encountered when using high volume mechanical fuel pumps.

Small Block only.

Street/Race 10004

Fuel Pump Pushrod:



Special heavy-duty pushrod. The ends of the pushrod are smooth ground and hardened to Rc 26 to prevent premature wear. 3.200" nominal length.

Big Block only 10010

Camshaft Thrust Button:



This roller thrust button is used to control camshaft end play when using a roller tappet camshaft and a 3 bolt camshaft sprocket.

Big Block only 6015



When using a roller thrust button, modify the button to allow for .005"-.010" camshaft end play.

Camshaft retaining bolts and washers:

Small Block

Heavy duty steel washer and Grade 8 bolt



Bolt and washer set (use when retaining fuel pump eccentric) 7010

Bolt and washer set (use when there is no fuel pump eccentric) 7011

Big Block



This Grade 8 bolt and extra thick washer is required when using a single bolt camshaft and high-pressure valve springs.

Camshaft bolt 7004
Camshaft washer 7006



Grade 8 3-bolt camshaft set. Kit contains enough bolts for 1 camshaft. 7008

Grade 8, 3-bolt camshaft set. 12 point, reduced head diameter. For use with cam thrust buttons. 7009



When using the Small Block bolt and washer sets, apply Loctite to the threads and torque to **55 ft-lbs.** When using the Big Block single bolt and washer set, apply Loctite to the threads and torque to **45 ft-lbs.** When using the Big Block 3 bolt set, apply Loctite to the threads and torque each bolt to **20 ft-lbs.**

Camshaft sprocket key:



Small block camshaft key
Hardened steel alloy

273-368-340-360 (3/16" x .750") 7542

Magnum 318-360 (3/16" x .650") 7543

Camshaft short snout extension:



This piece extends the length of the camshaft snout allowing you to use a fuel pump eccentric with hydraulic, roller camshafts. For use with 1987 to 2002 Magnum camshafts. Extension is supplied with a special key. This kit must be used in conjunction with #7010 cam bolt and washer (not included).

273-318-340-360 blocks with Magnum camshafts 7013



Hughes Engines “real” Chrysler cams

Our “real” Chrysler cams are specifically designed to provide very fast rates of lift, more area under the curve, higher cylinder pressure and vacuum. This is possible because they are designed for the .904” diameter stock Chrysler lifter. Other manufacturers design their cams for the smaller .842” diameter GM lifter which limit their potential. Fast rates of lift increase torque, horsepower and widen the power range, much like a roller camshaft. Both our hydraulic and solid tappet cams have fast rates of lift and are suitable for street, strip, or track use.

Maximum Velocity Camshafts (HTL Series)

Our Max Velocity cams are solid tappet type and unequalled in the camshaft business. They have more power and a wider power band than any camshaft in the industry. These Max Velocity cams have the fastest rates of lift possible with a .904” diameter flat tappet. When used with 1.6:1 ratio rocker arms, they will equal the power output of similar sized roller camshafts. All of our HTL camshafts are tight lash design for more duration at 0.200” tappet lift.

Roller Camshafts

These are the ultimate Chrysler roller cams. Like our flat tappet cams, they are designed with Chrysler engine needs in mind. The tremendous power increases of these cams are achieved with very high ramp velocities (rates-of-lift). When the 9,000-10,000 rpm engine speeds are not required, we are able to design-in even faster rates-of-lift. Super high (spring killer) valve lifts are not necessary. The Big Block engine limit is 8000 rpm and the Small Block is 8500 rpm. The opening ramps on these cams are very fast rates-of-lift and the closing ramps are of conventional design for gentle closing velocities.

Custom Camshafts

We can supply custom cam grinds for many special applications. The various lobes listed in this catalog can be mixed and matched and the lobe separation angles changed. New lobes can also be developed and ground with CNC masterless grinders. Engines possibly requiring a custom cam are nitrous oxide, turbo charged, supercharged, limited or restricted oval track. All of our lobes are “real” Chrysler lobes designed for .904” diameter lifters and can be ground for 6 cylinders and Hemi® engines also. Call for information and recommendations.

How to Choose a Camshaft

Choosing a camshaft is probably the most important part of designing an engine combination, yet it can be the most confusing and frustrating part of your engine building experience. One of the problems is the confusing and contradictory way that cams are advertised and the way the specifications are listed.

There are some basic principles that are **universal**, apply to all brands of camshafts and must be understood.

1. Camshaft size: Bigger or smaller is based on duration, not lift, more specifically duration @ 0.050” tappet lift. Advertised duration figures are not reliable numbers when trying to compare one brand to another for these reasons: first, advertised duration numbers include clearance ramps, which have no positive effect on performance. Second, advertised duration figures are not always checked at the same point with every brand, so the same cam can have several advertised duration figures depending on who or how it is checked. Third, using the duration @ 0.050” is a reliable way to compare cam size from one brand to the next, a good apples to apples comparison.

When selecting any camshaft for your engine/chassis combination, the size must be determined by the duration at .050” tappet (lifter) rise. Using a 1.5:1 rocker ratio this equals .075” valve lift. Any duration less than this has no positive effect on power.

2. Understanding the duration at 0.050” may seem confusing but the important thing that must be remembered is: as the duration at 0.050” gets larger the camshaft gets larger and vice versa.

3. The lower (or shorter) the duration at .050”, the lower the RPM use, such as RV’s, towing, stock engines, etc. As the duration at .050” increases, the power increases, however, the power band also moves up in the RPM range. This requires additional engine and chassis modifications to work best. One cam will not do everything well, you may have to make “tradeoffs”. In other words, if you want to drag race with a cam that pulls at 6800 RPM, don’t expect the engine to lug a trailer around at 2000 rpm or vice versa.

How to Choose a Camshaft (continued)

4. Cams have power bands, "sweet spots" or RPM ranges that they work best in. This power band or "sweet spot" does not mean that the cam will not work above or below this range. If, for example, the sweet spot is rated at 2000-5700 RPM, the engine will still produce power above 5700 RPM (at least ours will), but above 5700 RPM, the next larger cam will produce more power. By the same token, cams will produce power below their sweet spot, but the smaller cam will have more power there (see the power curve graph on page 7).
5. The cam size (duration at 0.050") determines where the "sweet spot" will be. All brands of cams of the same size will produce sweet spots in approximately the same rpm range.
6. The "sweet spot" will be determined for the most part by the size (duration @ 0.050") of the intake lobe. Other factors such as the lobe separation angle, center line and exhaust lobes have some effect, but these are usually for custom cam installations.
7. A change of approximately 5° duration @ 0.050" is considered one (1) size or step.
8. The power in the "sweet spot" is determined for the most part by the rate-of-lift or how quickly the valve is kicked open. The quicker the better (ours are the quickest).
9. The best engine combination is when the sweet spots of all the components (camshaft, cylinder heads, intake manifold, carburetor size, compression ratio, headers and exhaust size) are in the same RPM range. For example, an RV torque cam with a large, single plane intake is a very poor combination.
10. If you collect a very poor combination of "sweet spots" (also know as parts) and then try to pick a camshaft, you leave the cam supplier with an impossible job. We don't sell cams to people with really screwed up combinations unless they are willing to change some components.
11. The first component you should pick when you build your engine is the camshaft. Add the other parts to compliment it, not fight it. Check our list of questions on choosing a camshaft before you call.
12. Our Basic Camshaft Guidelines (pages 7-9) list general guide lines for engine/chassis combinations. There are exceptions, but "tradeoffs" are involved. The actual power ranges will vary somewhat with the engine size, compression ratio (cylinder pressure) and the intake/heads ability to flow air. If you need to call for camshaft information, we will want to know these facts:
 1. Engine size (cubic inch displacement)
 2. Weight of vehicle, with driver (if a driver is used)
 3. Use of vehicle (What do you expect it to do?)
 4. Altitude of track
 5. Desired ET or MPH
 6. Present camshaft
 7. Final gear ratio
 8. Stall speed of torque converter
 9. Tire height and width
 10. Fuel type
 11. Static or Mechanical compression ratio
 12. Iron or aluminum heads
 13. Cranking cylinder pressure - checked with a compression gauge
 14. Intake manifold
 15. Header type and size
 16. Carburetor size
 17. Rocker arm type and ratio
 18. Will nitrous oxide be used?
 19. Cylinder head air flow numbers

Note: Please try to use numbers such as: 1600 RPM stall, not "stock stall" because Chrysler provided many varieties of stock parts.

Remember, the more information you provide, the more accurate the recommendation. We can move the lobe separation angles and mix/match lobes for very special applications. If you follow these instructions, in most cases, you will choose the correct camshaft.

Cylinder pressure note:

The cylinder pressure is a result of 5 things, the static compression ratio, cylinder head material (iron or aluminum), the closing point of the intake lobe, the altitude of operation of the engine and the final displacement of the engine. When using 93 octane gasoline (good stuff, no ethanol or oxygenated junk), build your engine for 165/175 psi cylinder pressure. This is generally the maximum safe pressure and power without detonation or odd spark curves. As the camshaft gets larger (duration at .050" tappet lift), the static compression ratio must be raised to maintain the cylinder pressure. For maximum power in your engine, request our computer generated cylinder pressures/static compression ratio numbers when ordering your Real Chrysler Camshaft.

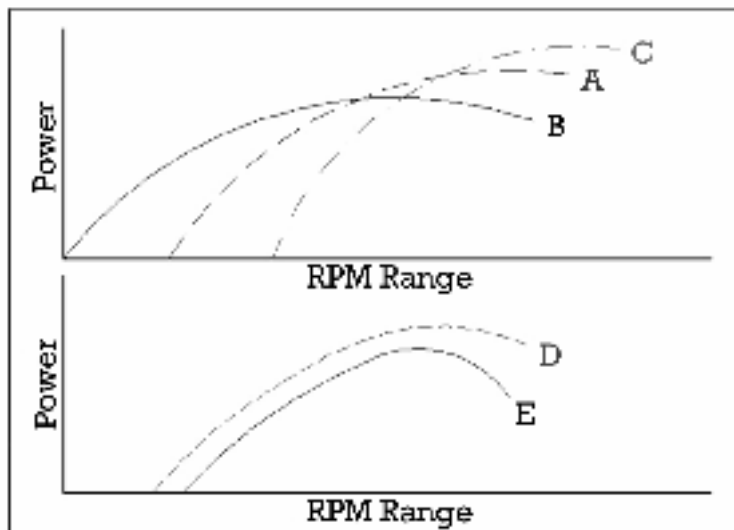
Mopar Performance camshaft note:

When replacing a Mopar Performance camshaft with a Hughes Engines Real Chrysler camshaft, use one that is 5° to 7° smaller at .050" tappet lift for increased power in all RPM ranges.

Power curve

The graph at the right describes what you should expect when you build an engine for a specific power range. If the engine breathing combination (cam, carb, intake, heads, headers and cylinder pressure) are properly matched, the duration at .050" on the intake lobe will generally dictate where the power curve will occur. This way you can compare the potential results with cams from various sources. Note that as the engine power increases, the power curve will become narrower and steeper. It will also move up in the RPM scale.

If your combination develops power in the "A" curve and you choose a smaller (duration @ .050") camshaft, you can expect to see your power curve move to the left, the "B" curve. Notice that the "B" curve is wider, but has a lower peak power. If you choose a larger (duration @ .050") camshaft, your power curve will move to the right, the "C" curve. This curve is narrower, but has higher peak power. If you pick a camshaft with the same or very close (2° to 3° duration @ .050") your power curve will be approximately the same. HOWEVER, when installing a HUGHES ENGINES "real" CHRYSLER CAMSHAFT you can expect to see the maximum power increase and the power curve widen. With a Hughes Engines camshaft (curve "D"), the power will start sooner and pull longer, resulting in more peak power. The RPM location of the peak power will remain about the same as long as the duration at .050" on the intake lobe remains the same (curve "D" vs. curve "E").



Advancing and retarding the camshaft

Advancing the camshaft, (a lower intake lobe center line number, 104° vs. 108° for example) will generally move the power band down in the RPM range and reduce maximum power somewhat. Retarding the camshaft (a higher intake lobe center line number 108° vs. 104°) will generally move the power band up in the RPM range and may increase maximum power slightly. If the camshaft is the best choice for the engine, moving the camshaft either way from the recommended position will cause a power loss.

A WARNING on computer engine designing and testing

We have many people call us requesting timing figures to enter in their computer dyno programs. We are happy to supply these figures. However, we will only supply them at .050" tappet lift because we do not consider the advertised duration figures to be relevant. Advertised duration is not checked at the same point with every manufacturer. A lot of lower priced computer dyno programs will not accept duration at .050" tappet lift figures. Most of these simulation programs are not designed with Mopar engine features, such as quench heights, longer rods, lifter diameter, etc. Therefore, the results from these types of programs are misleading. The better programs (and there are very good ones) naturally cost considerably more. If the program you are using doesn't ask much (such as flow figures, quench heights, rod lengths, cam timing at .050", etc., do not expect much accuracy. We have seen them show over 100 HP less than actual dyno results. See our web site for actual dyno results.

Small Block camshaft information

All Small Block camshafts 273ci, 318ci, 340ci, 360ci, 5.2L and 5.9L Magnum will physically interchange in all of the blocks. Flat tappet camshaft must use the proper flat tappet lifters, either hydraulic or solid. The hydraulic roller tappet camshafts must use hydraulic roller lifters. The flat tappet camshafts from the LA engines can be used in blocks originally equipped with hydraulic roller lifter camshaft. Hydraulic roller lifter camshafts can be used in LA engines originally equipped with flat tappet camshafts, but the proper lifters, pushrods, oil system and camshaft snout must match for a successful conversion.

Stroker camshafts

When a camshaft is used in a stroker engine it will "mellow out" and act smaller as engine displacement increases. Each 30 cubic inch displacement increase or decrease will equal a 5° change in camshaft size.

Basic Camshaft Guidelines

“real” Chrysler Hydraulic Flat Tappet Camshafts

Camshaft P/N Small Block / Big Block	Intake duration @ .050" tappet lift	Power Range		General engine/chassis requirements
		SB	BB	
HEH0515AL/ 0514BL	205°	IDLE to 3600	IDLE to 3600	Very stock engine, 2 bbl or small 4 bbl carb, single or dual exhaust. Light duty or stop and go driving. High rear gears. 145psi cylinder pressure. More torque for stock engines.
HEH1019AL/ 1019BL	210°	IDLE to 4200	IDLE to 4200	Light to medium towing or RV, street 4x4, dual exhaust, 2 bbl or 4 bbl carb. 150psi suggested cylinder pressure, stock idle. Lots of low end torque for heavy vehicles or medium towing.
HEH1523AL/ 1523BL	215°	1200 to 4800	IDLE to 4800	Light car, mild street; medium to heavy towing or RV. Dual exhaust or headers, 4 bbl carb. Street gearing 3.00 to 3.55:1. 150psi suggested cylinder pressure. Good idle, resto/cruiser. Hot daily driver, mileage OK.
HEH1928AL/ 1928BL	219°	1400 to 5200	IDLE to 5200	First step in to mild street performance. For HP restoration engines. Dual exhaust or headers, 4 bbl carb. Street gearing 3.00 to 3.55:1. 155psi suggested cylinder pressure. Good idle, resto/cruiser. Hot daily driver, mileage OK.
HEH2328AL/ 2328BL	223°	1600 to 5700	1600 to 5500	Mild street performance, hot resto., HP exhaust or headers, performance intake, 4 bbl or 3x2. 3.55:1+ gear. Some idle, performance head work, HP ported Stage I heads, 165psi suggested cylinder pressure. Hotter daily driver.
HEH2832AL/ 2832BL	228°	2000 to 5900	2000 to 5800	Street performance and strip: HP exhaust or headers, performance intake 3.70:1+ gears, 4 bbl or 3x2, Idles so you know its in there. HP ported Stage I heads 160psi suggested cylinder pressure 2800rpm + stall. Very hot daily driver.
HEH3237AL/ 3237BL	232°	2200 to 6000	2100 to 6000	Hotter Street performance and strip: HP exhaust or headers, performance intake 3.70:1+ gears, 4 bbl or 3x2, Idles so you know its in there. HP ported Stage I heads 160psi suggested cylinder pressure 2800rpm + stall. Very hot daily driver.
HEH3742AL/ 3742BL	237°	2400 to 6400	2400 to 6200	Serious street and strip: oval track, mud racers. 3.91:1 gears, noticeable idle, 3000rpm + stall. High rise dual plane, 3x2 or small single plane intake, headers required. Stage I or II HP ported heads. 170psi suggested cylinder pressure.
HEH4246AL/ 4246BL	242°	3000 to 6600	2600 to 6400	Serious street, and strip. 3400rpm+ stall. 4.10:1 gear. Single plane or 2x4 intake. Headers required. Stage II HP ported heads. 180psi suggested cylinder pressure. Hot street for stroker engines.
HEH4650AL/ 4650BL	246°	3000 to 6600	2600 to 6500	Strip. 3400rpm+ stall. 4.10:1 gear. Single plane or 2x4 intake. Headers required. Stage II HP ported heads. 180psi suggested cylinder pressure. Hot street for stroker engines.
HEH5055AL/ 5055BL	250°	3200 to 6800	2800 to 6600	Use where rules demand a hydraulic camshaft. 3800rpm+ stall. 4.56:1 gear, large single plane or 2x4 intake. Stage II or Stage III HP ported heads. 200psi suggested cylinder pressure. Street/Strip for stroker engines.
HEH5561AL/ 5561BL	255°	3400 to 7000	3000 to 7000	Use where rules demand a hydraulic camshaft. 4000rpm+ stall. 4.56:1 gear, large single plane or 2x4 intake. Stage II or Stage III HP ported heads. 220psi suggested cylinder pressure. Street/Strip for 500ci stroker engines.

Note: With any hydraulic camshaft larger than our HEH 1523AL/BL grind, we strongly encourage using adjustable rocker arms. The stock, stamped rockers do not have a true 1.5:1 ratio. They will check somewhere between 1.38:1 and 1.45:1 ratio. This will yield a loss of lift (up to .045"), 2°/3° duration loss and also slow the rate-of-lift resulting in a possible 25HP loss. Any camshaft using double valve springs must use adjustable rocker arms to prevent damage when the stock rocker arms break.

Power Ranges: These are the “sweet spot” in the power range. Generally we suggest shifting at 300-500 RPM above the “sweet spot” for the best ET's. If you need more power above the shown power range, select the next larger camshaft. If you need more power below the shown power range, select the next smaller camshaft. If you keep your foot in it, they will pull well past their sweet spot.

Spring Warning: Our camshafts are not comparable to other manufacturers and require special valve spring pressures to operate and live satisfactorily. ONLY USE our springs, most other springs will not work properly and may cause severe damage.

Basic Camshaft Guidelines

Hydraulic Roller Camshafts, LA and Magnum Engines

Camshaft P/N Small Block	Intake duration @ .050" tappet lift	Power Range	General engine/chassis requirements
HER9204AL	192°	IDLE to 4600	Extra power for towing, no computer change required, works well with Stage I billet throttle body.
HER0814AL	208°	IDLE to 5500	Step up from factory R/T camshaft, more power, wider power band. Computer change required for 5.2L V8. Stage I billet throttle body.
HER1418AL	214°	1400 to 5800	Mild street, works well with stock heads, Stage I billet throttle body and headers. 5.2L/5.9L V8 requires computer change. Good super charger camshaft.
HER1828AL	218°	1800 to 6100	Computer change needed for 5.2L/5.9L V8. Hot street, likes Stage II billet throttle body, intake manifold, R/T heads, roller rockers, 24lbs injectors, 420 HP potential at the fly-wheel.
HER2228AL	222°	2000 to 6300	Street/strip, Stage I R/T heads, Stage II billet throttle body, intake manifold, headers, 2800+ RPM stall, programmable computer, inline fuel pump, 460+ HP potential at flywheel.
HER2836AL	228°	2300 to 6600	Serious street/strip, 490+ HP at rear wheels potential. Stage II R/T heads, Stage II Billet throttle body, M1 2 bbl modified intake manifold. Good fuel system and programmable computer, 3200+ RPM stall.
HER3644AL	236°	2600 to 6800	Strip and limited street use, R/T Stage II heads, Stage III Billet throttle body, modified M/P 2 bbl intake manifold, programmable computer, good fuel system, 3400+ RPM stall. 500+ HP potential at flywheel.

Power Ranges: These are the "sweet spot" in the power range. Generally we suggest shifting at 300-500 RPM above the "sweet spot" for the best ET's. If you need more power above the shown power range, select the next larger camshaft. If you need more power below the shown power range, select the next smaller camshaft. If you keep your foot in it, they will pull well past their sweet spot.

Spring Warning: Our camshafts are not comparable to other manufacturers and require special valve spring pressures to operate and live satisfactorily. **ONLY USE** our springs, most other springs will not work properly and may cause severe damage. Valve spring pressures and installed heights are supplied with each camshaft.



Basic Camshaft Guidelines HTL Series - Maximum Velocity Solid Camshafts - Tight Lash

Camshaft P/N Small Block / Big Block	Intake duration @ .050" tappet lift	Power Range		General engine/chassis requirements
		SB	BB	
HTL3742AS/ 3742BS	237°	1800 to 5600	1600 to 5600	Street performance. High rise dual plane intake, headers, minimum 3.55:1 rear gears. 3000rpm stall. HP ported Stage I cylinder heads. 160psi suggested cylinder pressure. Replace small street roller.
HTL4248AS/ 4248BS	242°	2000 to 6000	2000 to 5800	Street/strip. High rise dual plane or small single plane intake, headers, minimum 3.70:1 rear gears. 3400rpm stall. HP ported Stage I cylinder heads. 170psi suggested cylinder pressure.
HTL4652AS/ 4652BS	246°	2100 to 6100	2100 to 5900	Street/strip. High rise dual plane or small single plane intake, headers, minimum 3.70:1 rear gears. 3400rpm stall. HP ported Stage I cylinder heads. 170psi suggested cylinder pressure.
HTL4852AS/ 4852BS	248°	2100 to 6100	2100 to 5900	Street/strip. High rise dual plane or small single plane intake, headers, minimum 4.10:1 rear gears. 3400rpm stall. HP ported Stage I cylinder heads. 170psi suggested cylinder pressure.
HTL5256AS/ 5256BS	252°	2400 to 6200	2200 to 6200	Hot street/bracket racing. Large dual plane or small single plane intake manifold. 1 7/8" Big Block and 1 3/4" Small Block primary tube headers. 3.91:1 minimum rear gear ratio. 3600+rpm stall speed. HP ported Stage I or II cylinder heads. 180psi suggested cylinder pressure.
HTL5660AS/ 5660BS	256°	2600 to 6400	2400 to 6300	Hot street/bracket racing. Single plane intake manifold. 1 7/8" Big Block and 1 3/4" Small Block primary tube headers. 4.10:1 rear gear ratio. 4000rpm stall speed. HP ported Stage II cylinder heads. 190psi suggested cylinder pressure.
HTL6064AS/ 6064BS	260°	2900 to 6700	2700 to 6600	Drag strip. Single plane or 3x2bbl intake manifold. Maximum vehicle weight 3700lbs. (Big Blocks), 3400lbs. (Small Blocks) automatics with 4200rpm stall or 4000lbs 4 speed cars. HP ported Stage II or III cylinder heads. 200psi suggested cylinder pressure. 2" Big Block and 1 3/4" Small Block primary tube headers.
HTL6468AS/ 6468BS	264°	3000 to 6800	2800 to 6600	Drag strip. Maximum vehicle weight 3100lbs. (Big Blocks), 2900lbs. (Small Blocks) automatics with 4400rpm stall or 4000lbs, 4 speed cars. High rise single plane intake. HP ported Stage II or III cylinder heads. 4.10:1 minimum gear. 215+psi suggested cylinder pressure. 2" Big Block and 1 3/4" Small Block primary tube headers.
HTL6872AS/ 6872BS	268°	3200 to 7000	3000 to 6800	Drag strip. Maximum vehicle weight 2800lbs. (Big Blocks), 2500lbs. (Small Blocks) automatics with 5000+rpm stall. High rise single plane intake. HP ported Stage III cylinder heads. 225+psi suggested cylinder pressure. 2 1/8" Big Block and 1 7/8" Small Block primary tube headers.
HTL7276AS/ 7276BS	272°	3400 to 7200	3200 to 7200	Drag strip. Very light cars or dragsters. 5000rpm minimum stall. HP ported Stage III cylinder heads or ported aluminum racing heads. 2 1/8" Big Block and 1 7/8" Small Block primary tube headers. 240+psi suggested cylinder pressure.
HTL7680AS/ 7680BS	276°	3600 to 7400	3300 to 7300	Drag strip. Very light cars or dragsters or large displacement engines. 5000rpm minimum stall. HP ported Stage III cylinder heads or ported aluminum racing heads. 2 1/8" Big Block and 1 7/8" Small Block primary tube headers. 240+psi suggested cylinder pressure.
HTL8087AS/ 8087BS	280°	3700 to 7500	3400 to 7400	Drag strip. Very light cars or dragsters or large displacement engines. 5000rpm minimum stall. HP ported Stage III cylinder heads or ported aluminum racing heads. 2 1/8" Big Block and 1 7/8" Small Block primary tube headers. 240+psi suggested cylinder pressure.
HTL8287AS/ 8287BS	282°	3800 to 7500	3600 to 7400	Very light vehicles, very high stall speed, very low gears, very wide tires and hold on!

Note: The HTL series of camshafts give the maximum performance available with a flat tappet camshaft and .904" diameter lifter. When used with 1.6:1 ratio rockers they will achieve lift rates and performance of a roller tappet camshaft. Also similar to a roller camshaft, the HTL cams give very wide, flat power curves, but piston to valve clearances must be checked closely.

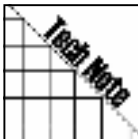
Power Ranges: These are the "sweet spot" in the power range. Generally we suggest shifting at 300-500 RPM above the "sweet spot" for the best ET's. If you need more power above the shown power range, select the next larger camshaft. If you need more power below the shown power range, select the next smaller camshaft. If you keep your foot in it, they will pull well past their sweet spot.

Spring Warning: Our camshafts are not comparable to other manufacturers and require special valve spring pressures to operate and live satisfactorily. ONLY USE our springs, most other springs will not work properly and may cause severe damage.



Small Block - Hydraulic Flat Tappet

Grind Number	Valve Lift 1.5	Valve Lift 1.6	Camshaft Size Duration at .050" tappet lift	Lobe Separation Angle	Opening at .050" tappet lift	Closing at .050" tappet lift
HEH 0515 AL	INT. .446" EXH. .470"	INT. .475" EXH. .501"	205° 215°	114°	-8.5° BTC 44.5° BBC	33.5° ABC -9.5° ATC
HEH 1019 AL	INT. .461" EXH. .489"	INT. .491" EXH. .522"	210° 219°	112°	-4° BTC 44.5° BBC	34° ABC -5.5° ATC
HEH 1523 AL	INT. .470" EXH. .506"	INT. .501" EXH. .539"	215° 223°	112°	-1.5° BTC 46.5° BBC	36.5° ABC -3.5° ATC
HEH 1928 AL	INT. .489" EXH. .524"	INT. .522" EXH. .558"	219° 228°	111°	1.5° BTC 48° BBC	37.5° ABC 0° BTC
HEH 2328 AL	INT. .506" EXH. .524"	INT. .539" EXH. .558"	223° 228°	111°	3.5° BTC 48° BBC	39.5° ABC 0° ATC
HEH 2832 AL	INT. .524" EXH. .540"	INT. .558" EXH. .576"	228° 232°	110°	7° BTC 49° BBC	41° ABC 3° ATC
HEH 3237 AL	INT. .540" EXH. .548"	INT. .576" EXH. .584"	232° 237°	110°	9° BTC 51.5° BBC	43° ABC 5.5° ATC
HEH 3742 AL	INT. .548" EXH. .555"	INT. .584" EXH. .592"	237° 242°	108°	13.5° BTC 52° BBC	43.5° ABC 10° ATC
HEH 4246 AL	INT. .555" EXH. .569"	INT. .592" EXH. .606"	242° 246°	108°	16° BTC 54° BBC	46° ABC 12° ATC
HEH 4650 AL	INT. .569" EXH. .576"	INT. .606" EXH. .614"	246° 250°	108°	18° BTC 56° BBC	48° ABC 14° ATC
HEH 5055 AL	INT. .576" EXH. .593"	INT. .614" EXH. .632"	250° 255°	108°	20° BTC 58.5° BBC	50° ABC 16.5° ATC
HEH 5561 AL	INT. .593" EXH. .606"	INT. .632" EXH. .646"	255° 261°	108°	22.5° BTC 61.5° BBC	52.5° ABC 19.5° ATC



Minimum piston-to-valve clearance is .060" intake and .100" exhaust. If your clearance is not adequate, we have tooling to cut deeper valve reliefs. Check our tooling section or call us. Maximum lift with stock guide height is 0.450", more lift requires shortening the valve guides.

4.7L V8 Magnum - Hydraulic Roller

Grind Number	Valve Lift with stock followers	Camshaft Size Duration at .050" tappet lift	Lobe Separation Angle	Opening at .050" valve lift	Closing at .050" valve lift
Stock factory	INT. .450" EXH. .450"	192° 198°	115°	° BTC ° BBC	° ABC ° ATC
Factory HO HER 4700T	INT. .465" EXH. .450"	200° 206°	119.5°	-20° BTC 42.5° BBC	39° ABC -16.5° ATC
HER 0820T	INT. .490" EXH. .502"	206° 220°	116°	-12° BTC 46° BBC	40° ABC -6° ATC

Matched components - Small Block - Hydraulic Flat Tappet

Minimum suggested cylinder psi	Normal RPM Range	Springs See page 125	Retainers See page 107	Valve locks See page 124	Lifters See page 74	Rocker Arms See pages 108-109
145	Idle - 4000	1110	11/32" 1202 3/8" 1252	11/32" 1302 3/8" 1304	5001	STD 1408 ALUM 1500/04
150	Idle - 4600	1110	11/32" 1201 3/8" 1252	11/32" 1302 3/8" 1304	5001	STD 1408 ALUM 1500/04
155	1200 - 4900	1110	11/32" 1201 3/8" 1252	11/32" 1302 3/8" 1304	5001	STD 1408 ALUM 1500/04
155	1400 - 5200	1110	11/32" 1201 3/8" 1252	11/32" 1302 3/8" 1304	5001	STD 1408 ALUM 1500/04
160	1800 - 5400	1110 w/1.5 1102 w/1.6	11/32" 1201 3/8" 1252	11/32" 1302 3/8" 1304	5001	STD 1408 ALUM 1500/04
160	2200 - 5600	1102 w/1.5 1111 w/1.6	11/32" 1202 3/8" 1254	11/32" 1302 3/8" 1304	5003	ALUMINUM 1500/1504
165	2300 - 5700	1102 w/1.5 1111 w/1.6	11/32" 1202 3/8" 1254	11/32" 1302 3/8" 1304	5003	ALUMINUM 1500/1504
175	2500 - 5900	1102 w/1.5 1111 w/1.6	11/32" 1202 3/8" 1254	11/32" 1322 3/8" 1324	5003	ALUMINUM 1500/1504
175	2500 - 6000	1111	11/32" 1202 3/8" 1254	11/32" 1322 3/8" 1324	5003	ALUMINUM 1500/1504
185	2800 - 6100	1111	11/32" 1202 3/8" 1254	11/32" 1322 3/8" 1324	5003	ALUMINUM 1500/1504
200+	3000 - 6200	1111	11/32" 1202 3/8" 1254	11/32" 1322 3/8" 1324	5003	ALUMINUM 1500/1504
220+	3200 - 6300	1111	11/32" 1202 3/8" 1254	11/32" 1322 3/8" 1324	5003	ALUMINUM 1500/1504

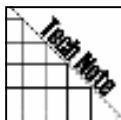
Spring Warning: Our camshafts are not comparable to other manufacturers and require special valve spring pressures to operate and live satisfactorily. ONLY USE our springs, most other springs will not work properly and may cause severe damage.

Matched components - 4.7L V8 Magnum - Hydraulic Roller

Minimum suggested cylinder psi	Normal RPM Range	Springs See page 125	Retainers See page 107	Valve locks See page 124	Lifters See page 74	Rocker Arms See page 109
CALL	Idle - 4000	CALL	CALL	7mm 1301	5115	Not required
CALL	1000 - 5100	CALL	CALL	7mm 1301	5115	Not required
CALL	1400 - 5400	1115	7mm 1278	7mm 1301	5115	Not required

Hydraulic Roller Cams - LA and 3.9L/5.2L/5.7L Hemi/5.9L Magnum Truck

Grind Number	Valve Lift 1.5	Valve Lift 1.6	Duration at .200" tappet lift	Camshaft Size Duration at .050" tappet lift	Lobe Separation Angle	Opening at .050" tappet lift	Closing at .050" tappet lift
Available in a new or reground core	HER9204AL	INT. .459" EXH. .471"	112° 122°	192° 204°	114°	-14° BTC 40° BBC	26° ABC -16° ATC
	HER0814AL	INT. .480" EXH. .489"	126° 135°	208° 214°	114°	-7° BTC 44° BBC	35° ABC -10° ATC
	HER1418AL	INT. .489" EXH. .510"	135° 139°	214° 218°	114°	-4° BTC 46° BBC	38° ABC -8° ATC
	HER1828AL	INT. .510" EXH. .510"	139° 148°	218° 228°	114°	-2° BTC 51° BBC	40° ABC -3° ATC
Made from new cam-shaft cores only	HER2228AL	INT. .488" EXH. .510"	141° 148°	222° 228°	114°	0° BTC 51° BBC	42° ABC -3° ATC
	HER2836AL	INT. .510" EXH. .533"	148° 156°	228° 236°	114°	3° BTC 55° BBC	45° ABC 1° ATC
	HER3644AL	INT. .533" EXH. .540"	156° 163°	236° 244°	114°	7° BTC 59° BBC	49° ABC 5° ATC



Timing specifications shown above are for fuel injected engines. For larger camshafts or carbureted engines, call us for details. Minimum piston-to-valve clearance is .060" intake and .100" exhaust. If your clearance is not adequate, we have tooling to cut deeper valve reliefs. Check our tooling section on page 122.

Big Block - Hydraulic Roller Cams

Grind Number	Valve Lift 1.5	Valve Lift 1.6	Duration at .200" tappet lift	Camshaft Size Duration at .050" tappet lift	Lobe Separation Angle	Opening at .050" tappet lift	Closing at .050" tappet lift
HER9204BL	INT. .459" EXH. .471"	INT. .490" EXH. .502"	112° 122°	192° 204°	112°	-13° BTC 37° BBC	25° ABC -13° ATC
HER0814BL	INT. .480" EXH. .489"	INT. .512" EXH. .520"	126° 135°	208° 214°	110°	-3° BTC 40° BBC	31° ABC -6° ATC
HER1418BL	INT. .489" EXH. .510"	INT. .520" EXH. .544"	135° 139°	214° 218°	110°	0° BTC 42° BBC	34° ABC -4° ATC
HER1828BL	INT. .510" EXH. .510"	INT. .544" EXH. .544"	139° 148°	218° 228°	108°	4° BTC 45° BBC	34° ABC 3° ATC
HER2228BL	INT. .488" EXH. .510"	INT. .520" EXH. .544"	141° 148°	222° 228°	108°	6° BTC 45° BBC	36° ABC 3° ATC
HER2836BL	INT. .510" EXH. .533"	INT. .544" EXH. .568"	148° 156°	228° 236°	108°	9° BTC 49° BBC	39° ABC 7° ATC
HER3644BL	INT. .533" EXH. .540"	INT. .568" EXH. .576"	156° 163°	236° 244°	108°	13° BTC 53° BBC	43° ABC 11° ATC

Hydraulic Roller Cams - LA and 3.9L/5.2L/5.7L Hemi/5.9L Magnum Truck

Minimum suggested cylinder psi	Normal RPM Range	Springs* See page 125	Retainers See page 107	Valve locks* See page 124	Lifters See page 74	Rocker Arms See page 110
165	IDLE - 4500	1110 w/1.5 1110 w/1.6 1111 w/1.7	5/16" 1276 11/32" 1202	OE 5/16" 1307 Round 1 grv 5/16" 1300 Square 11/32" 1302 Square	5006	1532-16
165	1800 - 5500	1110 w/1.5 1110 w/1.6 1111 w/1.7	5/16" 1276 11/32" 1202	OE 5/16" 1307 Round 1 grv 5/16" 1300 Square 11/32" 1302 Square	5006	1532-16
165	2000 - 5800	1110 w/1.5 1110 w/1.6 1111 w/1.7	5/16" 1276 11/32" 1202	OE 5/16" 1307 Round 1 grv 5/16" 1300 Square 11/32" 1302 Square	5006	1532-16
165	2300 - 6100	1110 w/1.5 1110 w/1.6 1111 w/1.7	5/16" 1276 11/32" 1202	OE 5/16" 1307 Round 1 grv 5/16" 1300 Square 11/32" 1302 Square	5006	1532-16
175	2500 - 6400	1102 w/1.5 1102 w/1.6 1111 w/1.7	5/16" 1276 11/32" 1202	1 grv 5/16" 1300 Square 11/32" 1302 Square	5006	1532-16
185	2800 - 6600	1102 w/1.5 1111 w/1.6 1111 w/1.7	5/16" 1276 11/32" 1202	1 grv 5/16" 1300 Square 11/32" 1302 Square	5006	1532-16
200	2800 - 6800	1102 w/1.5 1111 w/1.6 1111 w/1.7	5/16" 1276 11/32" 1202	1 grv 5/16" 1300 Square 11/32" 1302 Square	5006	1532-16

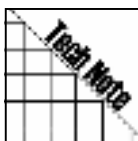
*Note: When using our #1102 or #1111 springs on Magnum iron heads, the valve spring base MUST be machined deeper to get the correct installed height. Use our #1276 retainers for the Magnum iron head applications. When using #1111 valve springs, use either #1320 machined valve locks (5/16" stem) or #1322 machined valve locks (11/32" stem). A #1111 valve spring kit may need an inner spring shim kit, #1714.

Matched components - Big Block- Hydraulic Roller Cams

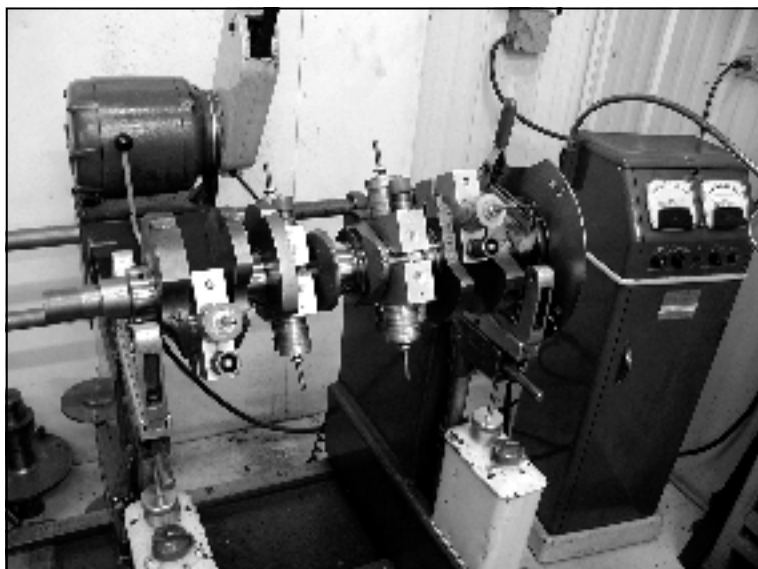
Minimum suggested cylinder psi	Normal RPM Range	Springs See page 126	Retainers See page 107	Valve locks See page 124	Lifters See page 74	Rocker Arms See page 109
150	Idle - 4500	1105	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5009	ALUMINUM 1508/12
165	1800 - 5500	1105	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5009	ALUMINUM 1508/12
165	2000 - 5800	1106	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5009	ALUMINUM 1508/12
165	2300 - 6100	1106	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5009	ALUMINUM 1508/12
175	2500 - 6400	1106	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5009	ALUMINUM 1508/12
185	2800 - 6600	1106	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5009	ALUMINUM 1508/12
200	2800 - 6800	1107	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5009	ALUMINUM 1508/12

Big Block - Hydraulic Flat Tappet

Grind Number	Valve Lift 1.5	Valve Lift 1.6	Camshaft Size Duration at .050" tappet lift	Lobe Separation Angle	Opening at .050" tappet lift	Closing at .050" tappet lift
HEH 0515 BL	INT. .446" EXH. .470"	INT. .475" EXH. .501"	205° 215°	114°	-8.5° BTC 44.5° BBC	33.5° ABC -9.5° ATC
HEH 1019 BL	INT. .461" EXH. .489"	INT. .491" EXH. .522"	210° 219°	112°	-4° BTC 44.5° BBC	34° ABC -5.5° ATC
HEH 1523 BL	INT. .470" EXH. .506"	INT. .501" EXH. .539"	215° 223°	112°	-1.5° BTC 46.5° BBC	36.5° ABC -3.5° ATC
HEH 1928 BL	INT. .489" EXH. .524"	INT. .522" EXH. .558"	219° 228°	111°	1.5° BTC 48° BBC	37.5° ABC 0° BTC
HEH 2328 BL	INT. .506" EXH. .524"	INT. .539" EXH. .558"	223° 228°	111°	3.5° BTC 48° BBC	39.5° ABC 0° ATC
HEH 2832 BL	INT. .524" EXH. .540"	INT. .558" EXH. .576"	228° 232°	110°	7° BTC 49° BBC	41° ABC 3° ATC
HEH 3237 BL	INT. .540" EXH. .548"	INT. .576" EXH. .584"	232° 237°	110°	9° BTC 51.5° BBC	43° ABC 5.5° ATC
HEH 3742 BL	INT. .548" EXH. .555"	INT. .584" EXH. .592"	237° 242°	108°	13.5° BTC 52° BBC	43.5° ABC 10° ATC
HEH 4246 BL	INT. .555" EXH. .569"	INT. .592" EXH. .606"	242° 246°	108°	16° BTC 54° BBC	46° ABC 12° ATC
HEH 4650 BL	INT. .569" EXH. .576"	INT. .606" EXH. .614"	246° 250°	108°	18° BTC 56° BBC	48° ABC 14° ATC
HEH 5055 BL	INT. .576" EXH. .593"	INT. .614" EXH. .632"	250° 255°	108°	20° BTC 58.5° BBC	50° ABC 16.5° ATC
HEH 5561 BL	INT. .593" EXH. .606"	INT. .632" EXH. .646"	255° 261°	108°	22.5° BTC 61.5° BBC	52.5° ABC 19.5° ATC



Minimum piston-to-valve clearance is .060" intake and .100" exhaust. If your clearance is not adequate, we have tooling to cut deeper valve reliefs. Check our tooling section or call us. Maximum lift with stock guide height is 0.450", more lift requires shortening the valve guides.



Matched components - Big Block - Hydraulic Flat Tappet

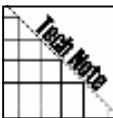
Minimum suggested cylinder psi	Normal RPM Range	Springs See page 126	Retainers See page 107	Valve locks See page 124	Lifters See page 74	Rocker Arms See pages 108-109
145	Idle - 4000	1104	11/32" 1203 3/8" 1256	11/32" 1302 3/8" 1304	5001	STD 1410 or ALUM 1508/12
150	Idle - 4600	1105	11/32" 1203 3/8" 1256	11/32" 1302 3/8" 1304	5001	STD 1410 or ALUM 1508/12
155	1200 - 4800	1105	11/32" 1203 3/8" 1256	11/32" 1302 3/8" 1304	5001	STD 1410 or ALUM 1508/12
160	1400 - 5100	1105	11/32" 1203 3/8" 1256	11/32" 1302 3/8" 1304	5001	STD 1410 or ALUM 1508/12
160	1600 - 5300	1105	11/32" 1203 3/8" 1256	11/32" 1302 3/8" 1304	5001	STD 1410 or ALUM 1508/12
165	1800 - 5400	1106	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1302 7° -3/8 1304 10° -11/32 1332 10° -3/8 1334	5003	ALUMINUM 1508 or 1512
165	2000 - 5500	1106	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1302 7° -3/8 1304 10° -11/32 1332 10° -3/8 1334	5003	ALUMINUM 1508 or 1512
175	2300 - 5600	1106	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1302 7° -3/8 1304 10° -11/32 1332 10° -3/8 1334	5003	ALUMINUM 1508 or 1512
175	2500 - 5700	1106	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1302 7° -3/8 1304 10° -11/32 1332 10° -3/8 1334	5003	ALUMINUM 1508 or 1512
185	2600 - 5900	1106	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5003	ALUMINUM 1508 or 1512
200+	2800 - 6000	1107	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5003	ALUMINUM 1508 or 1512
220+	3000 - 6200	1107	7° -11/32 1203 7° -3/8 1256 10° 1270	7° -11/32 1322 7° -3/8 1324 10° -11/32 1332 10° -3/8 1334	5003	ALUMINUM 1508 or 1512

Spring Warning: Our camshafts are not comparable to other manufacturers and require special valve spring pressures to operate and live satisfactorily. ONLY USE our springs, most other springs will not work properly and may cause severe damage.



Small Block - Maximum Velocity Solid Cams - Tight Lash

Grind Number	Valve Lift 1.5	Valve Lift 1.6	Camshaft Size Duration at .050" tappet lift	Lobe Separation Angle	Opening at .050" tappet lift	Closing at .050" tappet lift
HTL 3742 AS	INT. .534" EXH. .543"	INT. .569" EXH. .579"	237° 242°	107°	14.5° BTC 51° BBC	42.5° ABC 11° ATC
HTL 4248 AS	INT. .543" EXH. .563"	INT. .579" EXH. .600"	242° 248°	106°	18° BTC 53° BBC	44° ABC 15° ATC
HTL 4652 AS	INT. .555" EXH. .572"	INT. .591" EXH. .610"	246° 252°	106°	20° BTC 55° BBC	46° ABC 17° ATC
HTL 4852 AS	INT. .563" EXH. .572"	INT. .600" EXH. .610"	248° 252°	106°	21° BTC 55° BBC	47° ABC 17° ATC
HTL 5256 AS	INT. .572" EXH. .579"	INT. .610" EXH. .614"	252° 256°	106°	23° BTC 57° BBC	49° ABC 19° ATC
HTL 5660 AS	INT. .579" EXH. .587"	INT. .614" EXH. .626"	256° 260°	106°	25° BTC 59° BBC	51° ABC 21° ATC
HTL 6064 AS	INT. .587" EXH. .594"	INT. .626" EXH. .633"	260° 264°	106°	27° BTC 61° BBC	53° ABC 23° ATC
HTL 6468 AS	INT. .594" EXH. .611"	INT. .633" EXH. .651"	264° 268°	106°	29° BTC 63° BBC	55° ABC 25° ATC
HTL 6872 AS	INT. .611" EXH. .620"	INT. .651" EXH. .657"	268° 272°	106°	31° BTC 65° BBC	57° ABC 27° ATC
HTL 7276 AS	INT. .620" EXH. .629"	INT. .657" EXH. .671"	272° 276°	106°	33° BTC 67° BBC	59° ABC 29° ATC
HTL 7680 AS	INT. .629" EXH. .633"	INT. .671" EXH. .675"	276° 280°	106°	35° BTC 69° BBC	61° ABC 31° ATC
HTL 8087 AS	INT. .633" EXH. .644"	INT. .675" EXH. .687"	280° 287°	106°	37° BTC 72.5° BBC	63° ABC 34.5° ATC
HTL 8287 AS	INT. .638" EXH. .644"	INT. .680" EXH. .687"	282° 287°	106°	38° BTC 72.5° BBC	64° ABC 34.5° ATC



Minimum piston-to-valve clearance is .060" intake and .100" exhaust. If your clearance is not adequate, we have tooling to cut deeper valve reliefs. Check our tooling section or call us. Maximum lift with stock guide height is 0.450", more lift requires shortening the valve guides.

Max Velocity Tight Lash
Intake .010" HOT
Exhaust .012" HOT

Roller Cams Valve Lash
Intake .018" HOT
Exhaust .020" HOT

Solid Roller Camshafts

These types of camshafts are available on a custom order basis. We offer them for LA Small Blocks, and all "W" engines. Call us for more details.



Matched components - Small Block- Maximum Velocity Solids

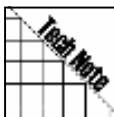
Minimum suggested cylinder psi	Normal RPM Range	Springs See page 125	Retainers See page 107	Valve locks See page 124	Lifters See page 75	Rocker Arms See pages 108-109
160+	1800 - 5600	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
160+	2000 - 6000	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
165+	2200 - 6000	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
165+	2400 - 6200	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
175+	2600 - 6400	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
190+	2800 - 6600	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
210+	3000 - 6800	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
215+	3100 - 7000	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
220+	3200 - 7200	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
225+	3300 - 7300	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
225+	3400 - 7400	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
230+	3400 - 7500	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504
235+	3600 - 7600	1111	11/32" 1203 3/8" 1254	11/32" 1322 3/8" 1324	5010	ALUMINUM 1500 or 1504

Spring Warning: Our camshafts are not comparable to other manufacturers and require special valve spring pressures to operate and live satisfactorily. ONLY USE our springs, most other springs will not work properly and may cause severe damage.



Big Block - Maximum Velocity Solid Cams - Tight Lash

Grind Number	Valve Lift 1.5	Valve Lift 1.6	Camshaft Size Duration at .050" tappet lift	Lobe Separation Angle	Opening at .050" tappet lift	Closing at .050" tappet lift
HTL 3742 BS	INT. .534" EXH. .543"	INT. .569" EXH. .579"	237° 242°	109°	12.5° BTC 53° BBC	44.5° ABC 9° ATC
HTL 4248 BS	INT. .543" EXH. .563"	INT. .579" EXH. .600"	242° 248°	108°	16° BTC 55° BBC	46° ABC 13° ATC
HTL 4652 BS	INT. .555" EXH. .572"	INT. .591" EXH. .610"	246° 252°	108°	18° BTC 57° BBC	48° ABC 15° ATC
HTL 4852 BS	INT. .563" EXH. .572"	INT. .600" EXH. .610"	248° 252°	108°	19° BTC 57° BBC	49° ABC 15° ATC
HTL 5256 BS	INT. .572" EXH. .579"	INT. .610" EXH. .614"	252° 256°	108°	21° BTC 59° BBC	51° ABC 17° ATC
HTL 5660 BS	INT. .579" EXH. .587"	INT. .614" EXH. .626"	256° 260°	108°	23° BTC 61° BBC	53° ABC 19° ATC
HTL 6064 BS	INT. .587" EXH. .594"	INT. .626" EXH. .633"	260° 264°	108°	25° BTC 63° BBC	55° ABC 21° ATC
HTL 6468 BS	INT. .594" EXH. .611"	INT. .633" EXH. .651"	264° 268°	108°	27° BTC 65° BBC	57° ABC 23° ATC
HTL 6872 BS	INT. .611" EXH. .620"	INT. .651" EXH. .657"	268° 272°	108°	29° BTC 67° BBC	59° ABC 25° ATC
HTL 7276 BS	INT. .620" EXH. .629"	INT. .657" EXH. .671"	272° 276°	108°	31° BTC 69° BBC	61° ABC 27° ATC
HTL 7680 BS	INT. .629" EXH. .633"	INT. .671" EXH. .675"	276° 280°	108°	33° BTC 71° BBC	63° ABC 29° ATC
HTL 8087 BS	INT. .633" EXH. .644"	INT. .675" EXH. .687"	280° 287°	108°	35° BTC 74.5° BBC	65° ABC 32.5° ATC
HTL 8287 BS	INT. .638" EXH. .644"	INT. .680" EXH. .687"	282° 287°	108°	36° BTC 74.5° BBC	66° ABC 32.5° ATC



Minimum piston-to-valve clearance is .060" intake and .100" exhaust. If your clearance is not adequate, we have tooling to cut deeper valve reliefs. Check our tooling section or call us. Maximum lift with stock guide height is 0.450", more lift requires shortening the valve guides.

Max Velocity Tight Lash
Intake .010" HOT
Exhaust .012" HOT

Roller Cams Valve Lash
Intake .018" HOT
Exhaust .020" HOT

Solid Roller Camshafts

These types of camshafts are available on a custom order basis. We offer them for all wedge Big Block and Hemi® engines. Call us for more details.



Matched components - Big Block - Maximum Velocity Solids

Minimum suggested cylinder psi	Normal RPM Range	Springs See page 126	Retainers See page 107		Valve locks See page 124		Lifters See page 75	Rocker Arms See pages 108-109
			7 th lock	10 th lock	11/32" valve stem	3/8" valve stem		
160+	1600 - 5500	1106	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
160+	2000 - 5900	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
165+	2200 - 6200	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
165+	2200 - 6300	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
175+	2400 - 6400	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
190+	2800 - 6600	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
210+	3000 - 6800	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
215+	3100 - 7000	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
220+	3200 - 7100	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
225+	3300 - 7200	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
230+	3400 - 7300	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
235+	3450 - 7400	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512
235+	3500 - 7500	1107	11/32 1203 3/8 1256	1270	7° - 1322 10° - 1332	7° - 1324 10° - 1334	5010	ALUMINUM 1508 or 1512

Spring Warning: Our camshafts are not comparable to other manufacturers and require special valve spring pressures to operate and live satisfactorily. ONLY USE our springs, most other springs will not work properly and may cause severe damage.



Engine Paint:

No, this is not the factory thin, watery stuff that runs and takes months to dry. This is a high quality, high temperature (-50°F to 600°F), oil and gasoline resistant paint especially designed for engines. Can be used with or without primer. Priced per 16oz. spray can. Gloss finish.



Black	3650
Hemi Orange	3652
Chrysler Red	3654
Chrysler Turquoise	3656
Medium Blue	3657

Assembly Chemicals:

Gasgacinch Gasket Sealer

This sealer is absolutely the best for oil pans, timing covers, valve covers, etc. Plus, you can actually get it off during disassembly without using dynamite.

12 oz. can with brush

3660



Schneider Camshaft Break-in lube

This high-pressure grease will stay in place forever. Use on cam lobes, lifters, pushrod ends and rocker arms. Basically any high-pressure point. Best for engines that may sit awhile.

1 oz. cup

3664

Redline Camshaft Break-in and assembly lube

This is a premium synthetic product, providing 3 times the film strength of standard black moly based lubricants. It can be used on all metal surfaces during engine service for superior wear and corrosion protection. This lubricant will not solidify, clump up, or plug your engine's smallest oil passages like a moly based lube will. It can be used with petroleum or synthetic engine oils.

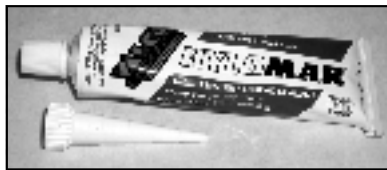


1/2 oz. Cup

3680

Hylomar gasket maker/sealant

This is a gasket dressing/sealant used to seal gaps up to .010" (25mm) between machined surfaces. It is also used as a thread sealant. Though not a thread locker, HYLOMAR is an excellent anti-loosening compound. Originally invented for sealing jet engines, HYLOMAR brings superior qualities to automotive applications. Withstands constant temperatures from -60°F to 600°F. Never hardens. Impervious to most automotive fluids (including fuels and glycol). Will not drip or run. Will adhere through a thin oil film, minimum surface preparation needed. Use with copper head gaskets.



100 gram tube

3658

ARP Fastener lube

Use this lube on all ARP fasteners to precisely duplicate the manufacturer recommended tightening specifications.



1.69 fl. oz. tube

3670



Lubriplate Engine Assembly lube

This lube is a very light grease (like hand cream) but won't run off, separate, or get hard. We use it on all our engines. Caution: Do not use this lube to break-in a camshaft.

10 oz. tube

3666

Sealed Power Engine Lube

This is a high-pressure lubricant that can be used anywhere in the engine for either assembly or camshaft break-in. We recommend this as an additive to replace the zinc phosphates that have been removed from oils with an SJ rating. 1 bottle per 5 quarts of oil.

6 oz. bottle

3668



Permatex silicone adhesive/sealant

All-purpose black adhesive and sealant. Provides a protective seal around metal, glass and rubber. Designed for interior/exterior use. Waterproof and flexible.

3 oz. tube

3662

Permatex Ultra-Copper Sealer

High Temperature Silicone RTV Gasket. This is the 700°F good stuff that is excellent for sealing exhaust manifolds.

3 oz tube

3672

Cooling System Chemicals:

Irontite All Weather Seal

The original ceramic sealer for cooling systems. This is THE BEST cooling system sealer available. We suggest you by-pass your heater during treatment.

16oz. Bottle

3674



Redline Water Wetter

This amazing cooling system additive has lowered the temperature of some systems as much as 40°F. It works best in a fresh cooling system or one that has recently been flushed. One treats up to 5 gallons.

12 oz bottle

3676



Weber Street-Twin, twin disc clutch and flywheel assembly

Part number: 64403



Eagle I-Beam connecting rods

These forged, OEM replacement connecting rods are manufactured from 5140 chrome moly steel, which features higher strength and better corrosion resistance than OEM materials.

- Bronze wrist pin bushings with pin oilers.
- Both the pin end and crank end are final honed to size.
- Weight is +/- 2.0g in each set.
- ARP Wave-Loc bolts are installed.
- Lighter than factory connecting rods, Small Block 130g less.
- Multi-stage heat-treated to relieve stress and internal strain.
- Designed for use in engines up to 500HP on the Small Block engines

318-340-360 engines, 6.123" length, 620g (set of 8)

Part number: 10050

383-400-440 engines, 6.765" length (set of 8)

Part number: 10052



H-Beam Racing connecting rods

These racing connecting rods are manufactured from 4340 steel and are the lightest possible without sacrificing any strength. The rod bodies and caps are forged in separate processes for optimum internal grain flow and structural integrity.

- All surfaces are CNC machined, shot peened and stress relieved.
- Bronze wrist pin bushings with pin oilers.
- Both the pin end and crank end are final honed to size.
- 7/16", 8740 chromoly steel rod bolts. 190,000psi tensile strength, Made in the USA
- For use in engines up to 650HP in Small Blocks and 800HP in Big Blocks.
- Sold in sets of 8

Small Block applications

318-340-360 engines, 5.700" length
0.927" wrist pin, 2.000" rod journal, 640g
Part number: 10114

318-340-360 engines, 5.700" length
0.927" wrist pin, 2.100" rod journal, 635g
Part number: 10110

318-340-360 engines, 6.000" length
0.927" wrist pin, 2.000" rod journal, 655g
Part number: 10115

318-340-360 engines, 6.000" length
0.927" wrist pin, 2.100" rod journal, 650g
Part number: 10111

318-340-360 engines, 6.123" length
0.984" wrist pin, 2.124" rod journal, 725g
Part number: 10100

318-340-360 engines, 6.125" length
0.927" wrist pin, 2.100" rod journal, 660g
Part number: 10112

318-340-360 engines, 6.250" length
0.927" wrist pin, 2.100" rod journal, 670g
Part number: 10113

Big Block applications

383-400-440 engines, 6.135" length
0.990" wrist pin, 2.200" rod journal, 780g
Part number: 10105

383-400-440 engines, 6.385" length
0.990" wrist pin, 2.200" rod journal, 790g
Part number: 10106

383-400-440 engines, 6.535" length
0.990" wrist pin, 2.200" rod journal, 800g
Part number: 10107

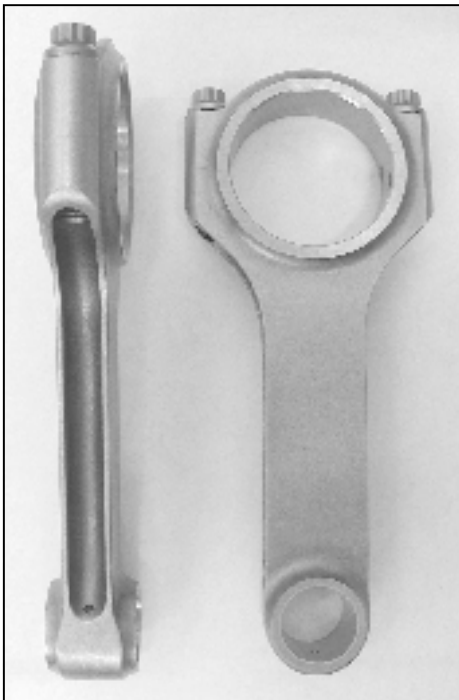
383-400-440 engines, 6.760" length
0.990" wrist pin, 2.375" rod journal, 850g
Part number: 10101

383-400-440 engines, 6.760" length
1.094" wrist pin, 2.375" rod journal, 855g
Part number: 10102

383-400-440 engines, 6.800" length
0.990" wrist pin, 2.200" rod journal, 820g
Part number: 10108

383-400-440 engines, 6.900" length
0.990" wrist pin, 2.375" rod journal, 900g
Part number: 10104

383-400-440 engines, 7.100" length
0.990" wrist pin, 2.200" rod journal, 840g
Part number: 10109



Small Block (stock stroke) Street, Oval Track, Modified and Claimer

340ci

Kit contains:

- Keith Black pistons
- Moly piston rings (file fit)
- Federal Mogul main and rod bearings
- Forged crankshaft. Cleaned shot blasted, ground, chamfered oil holes and polished journals
- Forged, I beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts
- Crank assembly is internally balanced. The finished assembly does not require balance weights on the torque converter
- This kit is ready to drop-in

10.75:1 (Based on 62cc head .019" negative deck height and .039" compressed gasket)

Part number: 340-10.75

360ci

Kit contains:

- Keith Black pistons
- Moly piston rings (file fit)
- Federal Mogul main and rod bearings
- New, SFI approved flexplate (360-9.0 and 360-10.0 kits only)
- Cast crankshaft. Cleaned shot blasted, ground, chamfered oil holes and polished journals
- Forged, I beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts (360-9.0 and 360-10.0 kits only)
- Billet, H-beam, 4340 chrome moly steel connecting rods with 3/8", 8740 chromoly steel rod bolts and bronze wrist pin bushings (360-11.0 and 360-13.0 kits only)
- New, BHJ steel damper (360-9.0 and 360-10.0 kits only)
- Crank assembly is dynamic balanced with damper and flexplate. The finished assembly does not require balance weights on the torque converter
- These kits are ready to drop-in

8.9:1 (Based on 65cc head .011" deck height and .039" compressed gasket)

Part number: 360-9.0

10.2:1 (Based on 65cc head .011" deck height and .039" compressed gasket)

Part number: 360-10.0

11.2:1 (Based on 65cc head .011" deck height and .039" compressed gasket)

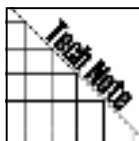
Part number: 360-11.0

12.9:1 (Based on 65cc head .011" deck height and .039" compressed gasket)

Part number: 360-13.0



Part number 360-10.0



These kits are excellent for Claimer and Modified classes. Internal balance, racing rods, race dampers and custom piston/rings combinations are available. Compression ratios from 8.5:1 to 14:1 available.

Small Block (strokers)

KB Street Kit for Magnum and LA engines:

- Keith Black hypereutectic pistons with quench dome (suitable for nitrous use up to 12SHP. Call us if you want to run more.)
- Quench dome is milled to achieve the proper head clearance when using closed chamber heads
- Narrow, plasma-moly piston rings (file fit)
- Federal Mogul main and rod bearings
- Heavy duty cast, 4.00" stroke crankshaft
- Forged, I beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts
- Crank assembly is internally balanced
- These kits are ready to drop-in
- Crank is balanced for automatic transmission applications. Call for stick shift pricing



Diamond Street Kit shown



All stroker kits are internally balanced and will require neutral balanced flywheels and dampers

340ci blocks 416ci stroker

9.55:1 compression ratio (open chamber heads)
(Based on +020" oversize, 65cc head, zero deck height and .039" compressed gasket)
Part number: 416-KStreet-STD (4.040" bore)
416-KStreet-20 (4.060" bore)
416-KStreet-30 (4.070" bore)

Same kit as above, but using the H-Beam, billet 4340 steel connecting rods with MSA chromoly steel rod bolts
Part number: 416-KStreet-H-STD (4.040" bore)
416-KStreet-H-20 (4.060" bore)
416-KStreet-H-30 (4.070" bore)

10.0:1 compression ratio (closed chamber heads)
(Based on +020" oversize, 60cc head, zero deck height and .039" compressed gasket)
(includes dome milling for head clearance)
Part number: 416-KStreet-C-STD (4.040" bore)
416-KStreet-C-20 (4.060" bore)
416-KStreet-C-30 (4.070" bore)

Same kit as above, but using the H-Beam, billet 4340 steel connecting rods with MSA chromoly steel rod bolts
Part number: 416-KStreet-CH-STD (4.040" bore)
416-KStreet-CH-20 (4.060" bore)
416-KStreet-CH-30 (4.070" bore)

360ci blocks 408ci stroker

9.4:1 compression ratio (open chamber heads)
(Based on +030" oversize, 65cc head, zero deck height and .039" compressed gasket)
Part number: 408-KStreet

Same kit as above, but using the H-Beam, billet 4340 steel connecting rods with MSA chromoly steel rod bolts
Part number: 408-KStreet-H

9.9:1 compression ratio (closed chamber heads)
(Based on +030" oversize, 60cc head, zero deck height and .039" compressed gasket)
(includes dome milling for head clearance)
Part number: 408-KStreet-C

Same kit as above, but using the H-Beam, billet 4340 steel connecting rods with MSA chromoly steel rod bolts
Part number: 408-KStreet-CH

Small Block (strokers)

Diamond Street Kits for Magnum and LA engines:

- Diamond Racing forged pistons (641g with pin) (suitable for nitrous use up to 125HP. Call us if you want to run more.) Dished, lower compression for pump gas.
- Speed Pro narrow, plasma-moly piston rings (file fit)
- Federal Mogul main and rod bearings
- Cast steel, 4.00" stroke crankshaft
- Forged, I-beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts
- Crank assembly is internally balanced
- The finished assembly does not require balance weights on the torque converter or flexplate/flywheel
- These kits are ready to drop-in
- Crank is balanced for automatic transmission applications. Call for stick shift pricing

318ci blocks 390ci stroker

8.9:1 compression ratio

(Based on +0.30" oversize, 65cc head, zero deck height and .039" compressed gasket)

9.4:1 compression ratio

(Based on +0.30" oversize, 65cc head, zero deck height and .039" compressed gasket)

Part number: 390-DA (0.030" oversize)

390-DB (0.010", 0.020" and 0.040" oversizes)

Same kit as above, but using the H-Beam, billet 4340 steel connecting rods with chromoly steel rod bolts (These rods require slight notching of the bottom of the cylinder bores for clearance)

Part number: 390-DHA (0.030" oversize)

390-DHB (0.010", 0.020" and 0.040" oversizes)

340ci blocks 416ci stroker

10.0:1 compression ratio

(Based on +0.30" oversize, 65cc head, zero deck height and .039" compressed gasket)

10.5:1 compression ratio

(Based on +0.30" oversize, 60cc head, zero deck height and .039" compressed gasket)

Part number: 416-Dstreet-A (0.030" oversizes only)

416-Dstreet-B (Standard, 0.040", 0.060" and 0.070" oversizes)

Same kit as above, but using the H-Beam, billet 4340 steel connecting rods with chromoly steel rod bolts (These rods require slight notching of the bottom of the cylinder bores for clearance)

Part number: 416-DStreet-HA (0.030" oversizes only)

416-DStreet-HB (Standard, 0.040", 0.060" and 0.070" oversizes)

360ci blocks 408ci stroker

10.0:1 compression ratio

(Based on +0.30" oversize, 65cc head, zero deck height and .039" compressed gasket)

10.5:1 compression ratio

(Based on +0.30" oversize, 60cc head, zero deck height and .039" compressed gasket)

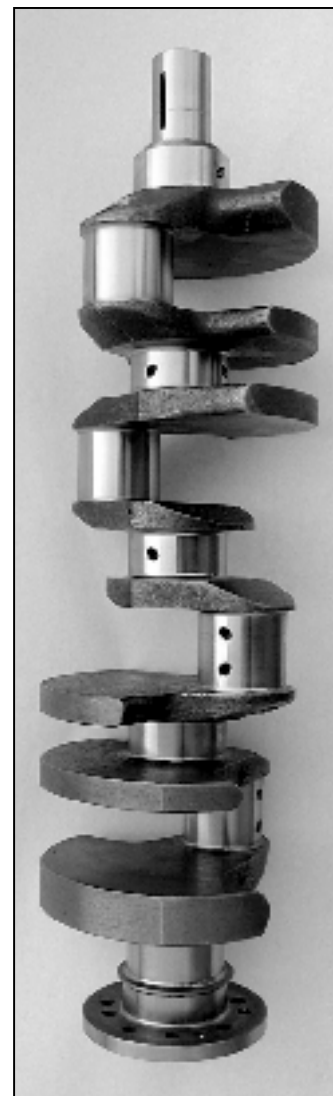
Part number: 408-Dstreet-A (Standard and 0.030" oversizes only)

408-Dstreet-B (0.010", 0.020" and 0.040" oversizes)

Same kit as above, but using the H-Beam, billet 4340 steel connecting rods with chromoly steel rod bolts (These rods require slight notching of the bottom of the cylinder bores for clearance)

Part number: 408-DStreet-HA (Standard and 0.030" oversizes only)

408-DStreet-HB (0.010", 0.020" and 0.040" oversizes)



4.00" Stroker crank



318/390 Piston-rod combination

A note about custom, stroker crank kits:

We can supply custom pistons for any of our stroker crank kits for most applications including:

- Supercharged Magnum engines
- Heavy nitrous oxide use
- Very low compression ratios for farm, towing heavy loads or marine use
- Forged, 4.00" stroker cranks are available for extreme duty applications

Contact us for more information

Small Block (strokers)

Diamond Race Kits for Magnum and LA engines:

Race kits contain:

- Diamond Racing flat-top, high compression, forged pistons (suitable for nitrous use up to 125HP. Call us if you want to run more.)
- Narrow, plasma-moly piston rings (file fit)
- Federal Mogul main and rod bearings
- Cast, 4.00" stroke crankshaft
- H-beam, billet, 4340 steel connecting rods with 7/16", 8740 chromoly steel rod bolts. 190,000psi tensile strength, Made in the USA (These rods require slight notching of the bottom of the cylinder bores for clearance)
- Crank assembly is internally balanced
- The finished assembly does not require balance weights on the torque converter or flexplate/flywheel
- Crank is balanced for automatic transmission applications. Call for stick shift pricing

340ci blocks 416ci stroker

11.7:1 compression ratio

(Based on +030" oversize, 65cc head, zero deck height and .039" compressed gasket)

12.4:1 compression ratio

(Based on +030" oversize, 60cc head, zero deck height and .039" compressed gasket)

Part number: 416-Race-A (0.030" oversize only)
416-Race-B (0.005", 0.010", 0.020", 0.040" and 0.060" oversizes)

360ci blocks 408ci stroker

11.5:1 compression ratio

(Based on +030" oversize, 65cc head, zero deck height and .039" compressed gasket)

12.2:1 compression ratio

(Based on +030" oversize, 60cc head, zero deck height and .039" compressed gasket)

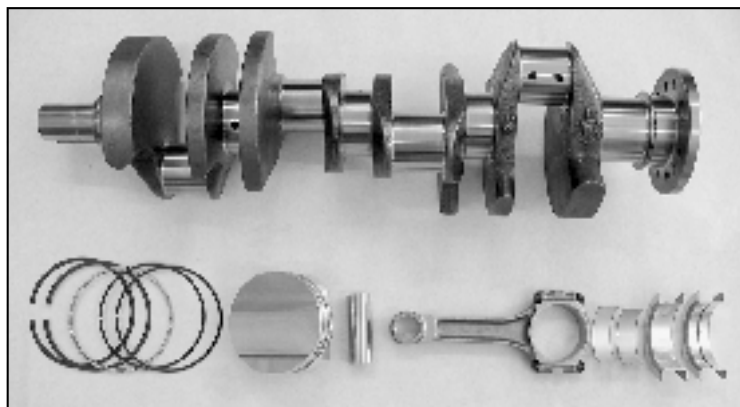
Part number: 408-Race-A (0.030" oversize only)
408-Race-B (0.005", 0.010", 0.020", 0.040" and 0.060" oversizes)

Options available with these stroker crank kits:

- Clevite 77 bearings
- SFI approved flexplates
- Weber clutches
- Weber lightweight aluminum or steel flywheels
- ATI, Fluidampr or Cyco, SFI approved, dampers
- Forged crankshafts



All stroker kits are internally balanced and will require neutral balanced flywheels and dampers



Part number
390DA

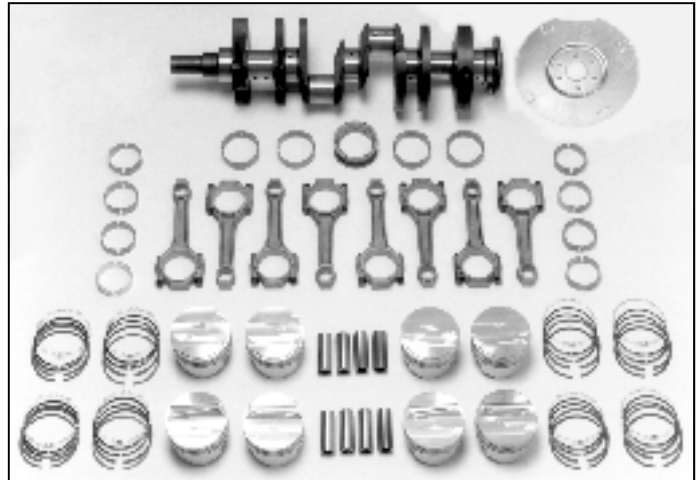
383ci

Kit contains:

- Keith Black pistons
- Moly piston rings (file fit)
- Federal Mogul main and rod bearings
- Forged crankshaft. Cleaned, shot blasted, ground lightened, chamfered oil holes and polished journals
- Connecting rods. Cleaned, magna-fluxed, shot blasted straightened and reconditioned with ARP rod bolts
- Crank assembly is internally balanced. The finished assembly does not require balance weights on the torque converter, damper or flexplate
- Pistons are installed on the rods
- This kit is ready to drop-in

9.6:1 compression ratio (Based on 73cc head .027" deck height and .039" compressed gasket)

Part number: 383-9.6



440 crank kit shown above

400ci

Kit contains:

- Keith Black pistons
- Moly piston rings (file fit)
- Factory damper
- Cast crankshaft. Cleaned shot blasted, ground, lightened, chamfered oil holes and polished journals
- Crank assembly is dynamic balanced with damper and flexplate. The finished assembly does not require balance weights on the torque converter
- This kit is ready to drop-in
- Federal Mogul main and rod bearings
- New, SFI approved flexplate
- Pistons are installed on the rods
- Connecting rods. Cleaned, magna-fluxed, shot blasted, straightened and reconditioned with ARP rod bolts

9.0:1 compression ratio (Based on 82cc head .024" deck height and .039" compressed gasket)

Part number: 400-9.0

440ci

Kit contains:

- Keith Black pistons
- Moly piston rings (file fit)
- Pistons are installed on the rods
- Cast crankshaft. Cleaned shot blasted, ground, lightened, chamfered oil holes and polished journals
- Crank assembly is dynamic balanced with flexplate. The finished assembly does not require balance weights on the torque converter
- Optional H-beam connecting rods available
- Optional forged crankshaft available
- Optional BHJ or ProRace performance dampers available
- Federal Mogul main and rod bearings
- New, SFI flexplate
- Connecting rods. Cleaned, magna-fluxed, shot blasted, straightened and reconditioned with ARP rod bolts
- This kit is ready to drop-in

9.0:1 compression ratio (Based on 85cc head .096" deck height and .039" compressed gasket, for use with open chamber heads)

Part number: 440-9.0

9.9:1 compression ratio (Based on 85cc head .025" deck height and .039" compressed gasket, for use with open chamber heads)

Part number: 440-10.0

9.7:1 compression ratio (Based on 85cc head .015" deck height and .039" compressed gasket, for use with closed chamber heads)

Part number: 440-9.7

Big Block

451ci Stroker Kits

- Keith Black pistons
- Federal Mogul main and rod bearings
- Factory damper
- Optional internal balancing
- Cast crankshaft. Cleaned, shot blasted, and counterweights machined to fit 400 block. Also ground, lightened, chamfered oil holes and polished journals. 400 main journal size.
- Connecting rods. Cleaned, magna-fluxed, shot blasted, straightened and reconditioned with ARP rod bolts
- Crank assembly balanced with damper and flexplate. The finished assembly does not require balance weights on the torque converter or specialized machine work on the block. It drops right in, no block machining required.

- Moly piston rings (file fit)
- New, SFI flexplate
- Pistons are installed on the rods
- Optional H-beam connecting rods available

10.0:1 This kit uses the 383/400 rod (Based on 85cc head .025" deck height and .039" compressed gasket)

10.2:1 This kit uses the 440 rod (Based on 85cc head, .010" deck height .039" compressed gasket, price includes machining the piston dome)

Part number: 451-10.0

Part number: 451-10.2

474ci Stroker Kit (using 400ci blocks)

- Diamond Racing pistons
- Narrow, moly piston rings (file fit)
- A harmonic balancer and flexplate can be added, but are not included
- Offset ground, 3.900" stroke, forged 440 crankshaft.
- H-beam, billet 6.700" length connecting rods with .990" wrist pin
- Federal Mogul main and rod bearings
- Index crankshaft to equalize stroke and journal phasing
- Kits are available in .030", .040" oversize (.060" - Call)
- Crank is also shot blasted, lightened, and counterweights are machined to fit 400 block. It also features chamfered oil holes and polished journals.
- Crank assembly is internally balanced. The finished assembly does not require balance weights on the torque converter or a counter-weighted harmonic balancer

474ci kit (any compression ratio)

Part number: 474S

500ci Stroker Kits (using 440ci and 400ci blocks)

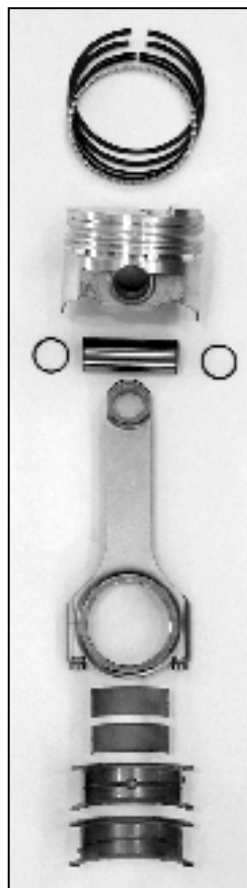
Street kits contain:

- Final displacement depends on bore size
- Diamond, forged, flat top pistons (11.0:1 compression ratio with 85cc combustion chambers)
- Federal Mogul Tri-Metal full groove main bearings
- Federal Mogul narrowed, stroker rod bearings
- Narrow, moly piston rings (file fit)
- 4.150" stroke, forged crankshaft, fully radiused
- Crank assembly is internally balanced. The finished assembly does not require balance weights on the torque converter or a counter-weighted harmonic balancer
- H-beam, billet 6.760" length connecting rods, with 0.990" wrist pins
- Kits are based on auto trans crankshafts, STD trans cranks extra
- A harmonic balancer and flexplate can be added, but are not included
- Kits are available in .020", .030", .040" and .060" oversizes

Part number: 500STK-440 (for use with 440 blocks)
500STK-400 (for use with 400 blocks)

Race kit option:

- Diamond Racing forged pistons (any compression ratio)



HP ported cylinder iron heads

RV/Restoration

This level of porting is for very high torque and towing applications. Engines should have 8:1 to 9.25:1 compression and camshafts of 208° to 216° duration at .050" tappet lift. Dual exhaust and 4bbl carburetion are nice but not mandatory. Desired engine power is idle to 4500rpm. These heads work nicely pulling 16,000 lbs.

Stage I

This is for the mild performance engine. Using 9:1 to 10:1 compression and cams in the 214° to 236° duration at .050" tappet lift. Torque converters up to 2600rpm stall and 3.23 to 3.91 gears. HP exhaust manifolds or headers, a dual plane intake manifold and 4bbl carburetor should be used. This level of porting is for the serious 4x4, street or resto-cruiser, because low end and midrange torque is very strong yet throttle response is not sacrificed. Power is gained at all RPM levels. The Small Block heads will match W-2 flow up to .500" valve lift. Equals Edelbrock aluminum street heads flow, velocity and performance. Good choice for Small Blocks up to 475HP and Big Blocks up to 545HP.

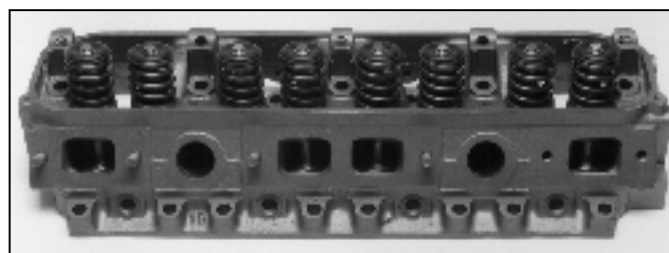
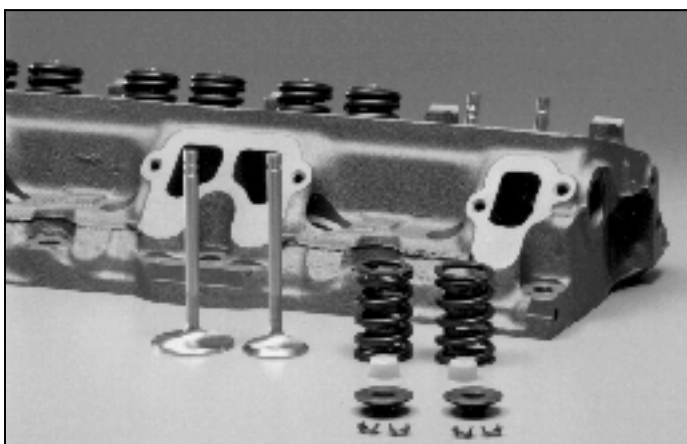
Stage II

Heads for the serious street engine, or dual-purpose race car. Compression ratios 10.5:1 to 13:1. Hydraulic camshafts of 240° @ .050" and larger, or solid camshafts up to 260° @ .050". Headers and a high-rise dual plane or single plane intake manifold are necessary. 3.91 gear or more and at least 3200rpm stall torque converter are recommended. This level of porting is excellent for oval track cars, pullers and bracket racing. The Small Block heads will out flow the W-2, but with much more velocity. The Big Block heads equal aftermarket aluminum head flow with a smaller port volume. Excellent for Small Blocks up to 575HP and Big Blocks up to 625HP.

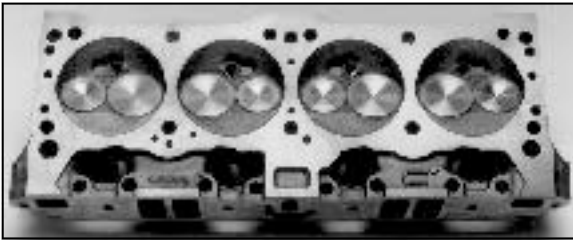
Stage III

Maximum effort large cubic inch engines. At least 12.5:1 compression ratio, 264° @ .050" solid or roller camshafts. Larger single plane intake manifolds or tunnel ram intakes and large tube headers. The Small Block heads will exceed stock W-2 intake flow with 50% more velocity (for the racers who don't want to turn the engine 9000 rpm to make power!). The Big Block heads work very well compared to aftermarket iron or aluminum heads on engines under 500CID and cams of less than .680" lift. Designed for Small Block engines needing above 575HP and Big Blocks above 625HP.

Porting levels are constantly being improved and upgraded. Check our web site for the latest details.



Small Block HP Ported Iron Heads



All HP cylinder heads are jet cleaned, crack checked and shot blasted. Bronze guide liners are installed which reduce the valve stem diameter to 11/32". All heads include valves. After porting the heads are pressure tested, the valve seats are finished machined with 3 angles and a light mill cut is performed on the head gasket surface. Valve stem heights are equalized for more accurate rocker arm geometry. All head package prices are based on customer supplied cores. Valve springs, retainers, locks and seals are optional.

RV/Restoration	Part Number
This level of porting for the 340/360 heads uses the 2.02" nail head intake valve (#1006) and 1.625" semi-tulip exhaust valve (#1014).	HPRV-SB
The 318 heads use the 1.94" nail head intake valves (#1005) and 1.60" exhaust valves (#1013).	HPRV-SB318
Stage I	
The 340/360 heads use the 2.02" nail head intake valve (#1006) and 1.625" semi-tulip exhaust valve (#1014). The 318 heads use the 1.94" nail head intake valves (#1005) and 1.60" exhaust valves (#1013).	
340/360 heads '974,'915 (J,U),'894 (X),'596,'587 castings	HPS1-SB
Early 318 heads '973,'593,'163 castings	HPS1-SB318
318 Small valve (1.94"/1.60") late model, roller cam, shaft mount rockers. '646, '302 castings (This package includes sleeving of the pushrod tubes)	HPS1-SB318L
Large valve (2.02"/1.625") late model, roller cam heads shaft mount rockers. '576 or '308 castings	HPS1-SB360L
Stage II	
This level also includes the 2.05" (#1007) intake valves and 1.625" exhaust valves on the 340/360 heads. The 318 heads use the 1.94" nail head intake valves (#1005) and 1.60" exhaust valves (#1013).	
340/360 heads '974,'915 (J,U),'894 (X),'596,'587 castings	HPS2-SB
Large valve (2.02"/1.625") late model, roller cam, shaft mount rockers.	HPS2-SB360L
NO Stage II on small valve (1.94"/1.60") late model , roller cam heads '646, '302 castings or early 318ci heads '973,'593,'163 castings	
Stage III	
This level of porting is only available for the 340/360 heads. This package uses the 2.08" nail head intake valves (#1009) and the 1.625" tulip exhaust valves (#1014).	
340/360 heads '974,'915 (J,U),'894 (X),'596,'587 castings	HPS3-SB
Large valve (2.02"/1.625") late model, roller, shaft mount rockers '576 or '308 castings (This package includes sleeving of the tubes)	HPS3-SB360L
NO Stage III on small valve (1.94"/1.60") late model , roller cam heads '646, '302 castings or early 318ci heads '973,'593,'163 castings	
Valve spring packages installed on heads. Includes labor, springs, retainers, locks and Viton positive seals.	
• For cams using P/N 1101 springs	1101VSK
• For cams using P/N 1110 springs	1110VSK
• For cams using P/N 1102 springs	1102VSK
• For cams using P/N 1111 springs (includes machined valve locks)	1111VSK
• For cams using P/N 1103 springs (includes machined valve locks)	1103VSK

Combustion chamber sizes and milling information

Head casting number (last 3 digits)	Factory combustion chamber size	HP Ported combustion chamber size	To reduce the combustion chamber volume by 1cc, mill the following amount	For each .010" of milling on the head gasket surface, remove the following on the intake gasket surface
'974, '915, '894, '596, '587, X, J, U	68cc to 72cc	62cc to 64cc	0.0048"	0.0063"
'973, '593, '163	68cc to 72cc	62cc to 64cc	0.0048"	0.0063"
'646, '302	62cc to 74cc	58cc to 62cc	0.00625"	0.0063"
'671, '714, '466	62cc to 68cc	58cc to 62cc	0.00625"	0.0063"
'576, '308	62cc to 72cc	58cc to 64cc	0.0048"	0.0063"
'051, '345	78cc to 82cc	72cc to 76cc	0.0048"	0.0063"

Labor options on HP Ported cylinder heads:

- No lead exhaust valve seat conversion (per pair of heads)
- Machine spring bases for double valve springs (per pair of heads)
- Machine valve guides for positive seals (per pair of heads)
- Milling for extra compression, up to .030" (per pair of heads)
- Milling up to .060" (per pair of heads, includes intake side corrections)
- Super mill to flat quench (per pair of heads, includes intake side corrections)
- Deep port match intake manifold to cylinder heads (call for instructions)
- Install pushrod tube sleeves (late model 318/360 heads)

Part Number

NOLEADSB
H430
H440
H374
H375
H377
I310
H390

HP Ported cylinder head porting updates:

Stage I to Stage II (porting, seat work, and spring set-up)

Stage II to Stage III (porting, seat work, new intake valves and spring set-up)

CALL
CALL

Cores for HP Ported cylinder heads (priced per pair):

318/360 heads - early style, '915, '894 (used) (no-lead exhaust seats installed)

318/360 heads - late style, factory hardened exhaust seats (used)

Non-roller '646, '596, '587, '974, '051 castings (used)

Roller cam (shaft mount rockers '646, '302) (used)

Roller cam (stud mount rockers, Magnum heads '714, '671, '466) (New)

Roller cam (shaft mount rockers '576) (New)

9001
9002
9003
9007
9008

Cylinder head dowel pins:

Factory replacement cylinder head to block alignment pins. Sold each.

- Small Block .3125" x .625" 7504
- Small Block .3125" x .500" (use if the block or heads have been excessively milled) 7505

Cylinder head exhaust port A.I.R. plugs:

Use these plugs to prevent exhaust leaks when your headers do not cover the small holes above the exhaust ports. 2 types are available Sold each. Small Block only.

Type 1 - 0.219" major diameter, 1.0" long pound in, trim to fit
0.250" major diameter, 1.5" long pound in, trim to fit

7502
7511

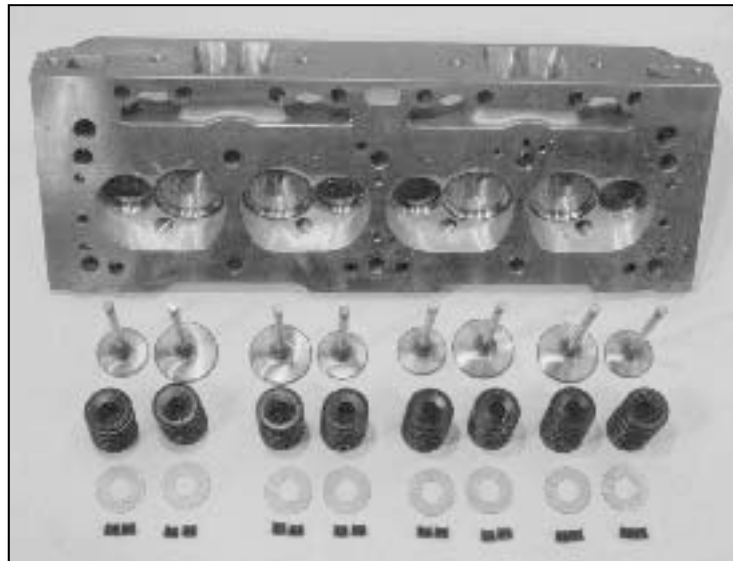
Type 2 - Tap the holes and screw them in with a little Loctite on the threads.
¼"- 20 x 5/16" set screws

7503

Small Block Edelbrock Aluminum Cylinder Heads

All Edelbrock cylinder heads feature the following:

- Phosphor-bronze valve guides
- Interlocking, ductile iron valve seats
- One piece, stainless steel 2.02" intake valves (11/32" stem)
- One piece, stainless steel 1.60" exhaust valves (11/32" stem)
- Heat treated, machined steel retainers
- Pressure testing after porting to ensure no thin spots exist
- After porting, valve seats are finish machined with 3 angles
- Light-weight aluminum castings (approximately 29.5lbs each, assembled)
- Accepts standard "A" engine intakes and exhaust manifolds/headers
- Accepts standard "A" engine rocker arms and shafts
- 360 closed chamber heads have approximately 65cc combustion chamber sizes
- If you need a combination not shown here please call
- Valve springs, retainers, locks and seals are optional (See the Valve Spring Kit section to the right for more info)



Recommended components:

Edelbrock cylinder heads cannot be used with factory head bolts. You must use a bolt or stud set that utilizes washers.

ARP head bolt sets (6 point):

Part number 7181

ARP stud sets (6 point):

Part number 7321

Fel-Pro Racing intake gasket set:

Part number 3210

The Edelbrock heads also require the use of the Fel-Pro Racing head gasket with the pre-flattened, steel o-ring. Ask for Part number 3104 when ordering.

Customer supplied heads:

We can also port customer supplied Small Block Edelbrock heads. The part numbers listed to the right include the porting and valve seat work per pair of heads. It does not include any replacement parts, cleaning or repair work.

Porting level	Part number
Prepped	4600PC
Stage II	4600-S2-C
Stage III	4600-S3-C

Stock Heads (original ports)

This package includes untouched cylinder heads directly from Edelbrock. The heads are stock "out-of-box" with no additional modifications. The heads are assembled and include Edelbrock valve springs.
Note: Additional labor to install Hughes Valve Spring Kits, Part Number: H1006

Horsepower
Potential:
475HP

Part number: 4600 (closed chamber)

Prepped Heads

Prepped heads have a racing valve and seat grind that corrects This improves valve and seat sealing and airflow. This level of modification works well with Hot Street and some bracket racing.

Horsepower
Potential:
523HP

Part number: 4600-P (closed chamber)

Stage II

This level is a fully ported cylinder head to achieve maximum airflow with the stock size valves (2.02" intake / 1.60"). This package is best used on well built Hot Street and serious bracket racers as well as Oval Track engines.

Horsepower
Potential:
564HP

Part number: 4600-S2 (closed chamber)

Stage III

The Stage III porting level feature new, replacement, 2.08" diameter (#1009) high flow intake valves and the maximum amount of porting without welding. These heads are recommended for very high horsepower 360ci or Stroker applications. Also see check Page 35 for information on our Super Exhaust Port for use on these heads.

Horsepower
Potential:
625HP

Part number: 4600-S3 (closed chamber)

Small Block Edelbrock Aluminum Cylinder Heads

Valve spring packages installed on heads. Includes labor, springs, retainers, locks and Viton positive seals.

- For cams using P/N 1110 springs 1110VSK-A
- For cams using P/N 1102 springs 1102VSK-A
- For cams using P/N 1111 springs (includes machined valve locks) 1111VSK-A

Super Exhaust Ports

The biggest shortcoming on Edelbrock cylinder heads is not in the intake port (as promoted by some shops by using offset intake pushrods). The exhaust port is the horsepower limited factor in these heads. Our Super Exhaust Port is filled-in (welded) and reconfigured to increase exhaust flow about 35CFM.
Part Number: SX4600ED

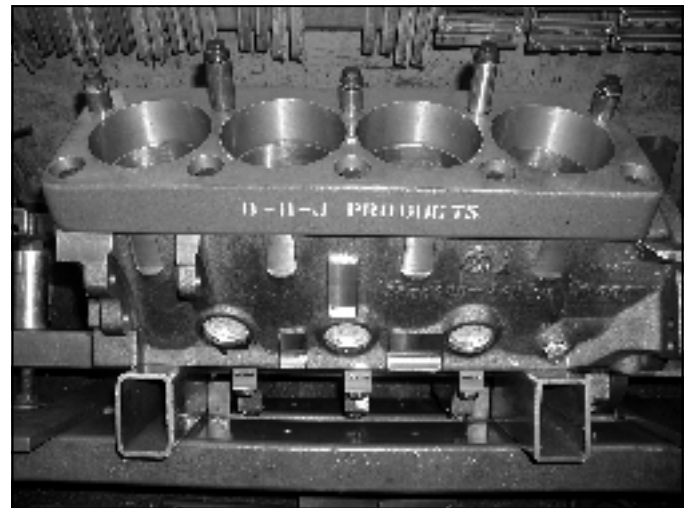
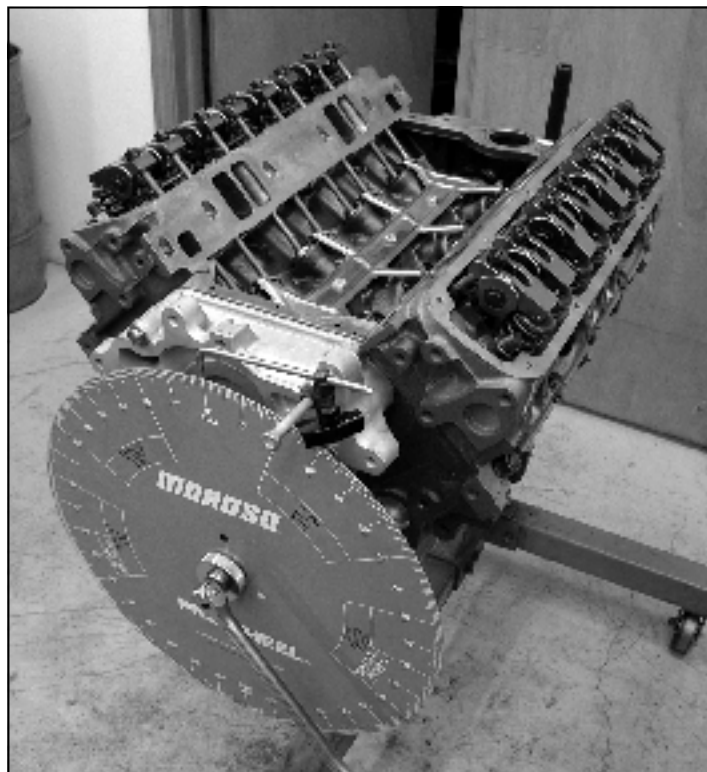
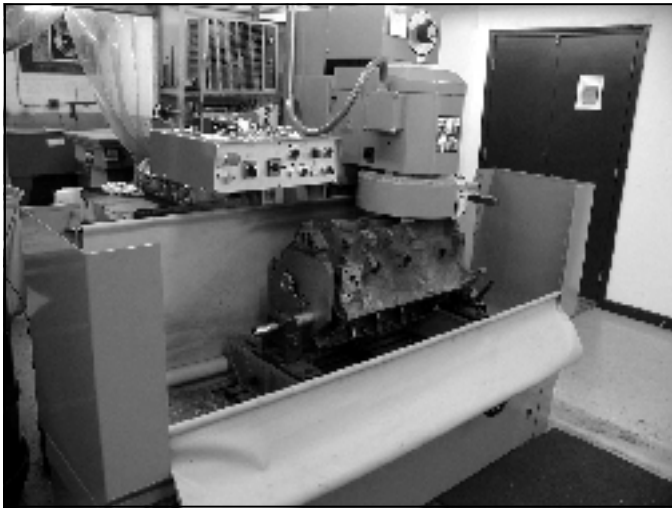
Small Block Edelbrock head milling info:

Closed chamber #4600	0.006" per 1 cc
Counter bore	0.010" depth = 1.50 cc

Additional Small Block porting services:

		<u>Part number</u>
Brodix B1-BA	Stage II using standard valves 2.02"/1.625" (porting only) Stage III using 2.08" intake valves (Intake valves and porting only)	HPBRODIX-2 HPBRODIX-3
Mopar Performance Aluminum LA heads "Commando"	Stage II using standard valves, 2.02"/1.625" (porting only) Stage III using 2.08" intake valves (Intake valves and porting only)	HPCOMMANDO-2 HPCOMMANDO-3
Factory aluminum Magnum heads	Stage II using standard valves, 2.02"/1.625" (porting only) Stage III using 2.05" intake valves (Intake valves and porting only)	HPALMAG-2 HPALMAG-3
Super exhaust	Edelbrock heads, weld-up and reconfigure exhaust port. Must use 1 3/4" or larger headers	SX4600ED



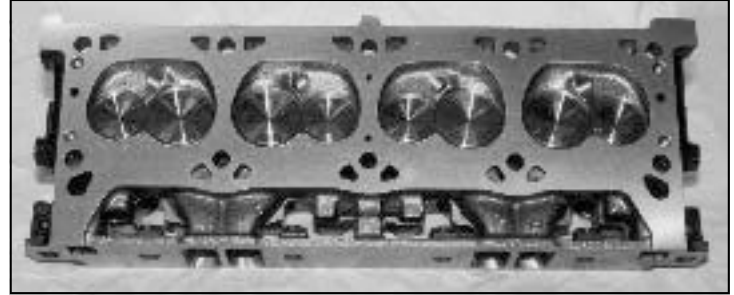




Ported 5.2L/5.9L Magnum Cylinder Heads

All Ported Magnum cylinder heads include the following:

- Pressure cleaned
- Magna-fluxing for cracks
- Shot blasted with stainless steel
- Bronze guide liners installed
- Intake and exhaust runner porting
- Pressure testing after porting to ensure no thin spots exist
- Valve seats are finish machined with 3 angles
- A light mill cut is performed on the head gasket surface (0.004" – 0.008"). You can also specify the final combustion chamber size
- Normal finished combustion chamber sizes 58cc to 62cc
- Valve stem heights are equalized for more accurate rocker arm geometry
- All cylinder head packages and pricing are based on customer supplied cylinder head cores
- Valve springs, retainers, locks and seals are optional (See the Valve Spring Kit section for more info)



Stage I

The level of porting uses racing, 5/16" stem, 1.92" (#1038) intake valves and 1.625" (#1040) exhaust valves and includes modifications to the bowl and runners of both the intake and exhaust ports.

318/360 Magnum heads, '92-'99 roller cam, stud mount rocker type. '671,'714, and '466 castings Part number: HPS1-MAG

Stage II

In this level the factory valves are replaced with 5/16" stem, 2.02" (#1003) racing intake valves and 1.650" (#1012) racing exhaust valves. More extensive bowl and runner modifications are made to increase flow, resulting in more power output.

318/360 Magnum heads, '92-'99 roller cam, stud mount rocker type. '671,'714, and '466 castings Part number: HPS2-MAG

Valve spring packages installed on heads. Includes labor, springs, retainers, locks and Viton positive seals.

- For cams using P/N 1110 springs on Magnum heads (includes spring seat milling)
- For cams using P/N 1102 springs on Magnum heads (includes spring seat milling)
- For cams using P/N 1111 springs on Magnum heads (includes spring seat milling)

Part Number: 1110VSK-M
Part Number: 1102VSK-M
Part Number: 1111VSK-M

Drill and tap Magnum heads for LA intake manifold bolt pattern (dual pattern)

Part Number: LA-DRL



Ported 5.2L/5.9L Magnum R/T Cylinder Heads

The good news:

These heads are a direct bolt-on replacement for the Magnum truck engines (both 5.2L and 5.9L) and have beautiful ports designed for performance. With our Stage I HP porting, they flow enough air to pull a good 360ci up to 600HP (270CFM). The Stage II heads should easily have the potential to push the 408/416ci strokers above 600HP. These are the best iron, non-W2 heads available. They can even be adapted to fit the older LA block. We can supply the heads with springs to fit any flat tappet or roller camshaft. These are the only Magnum heads we consider worth the expense of installing on the older LA blocks.....We like these heads!

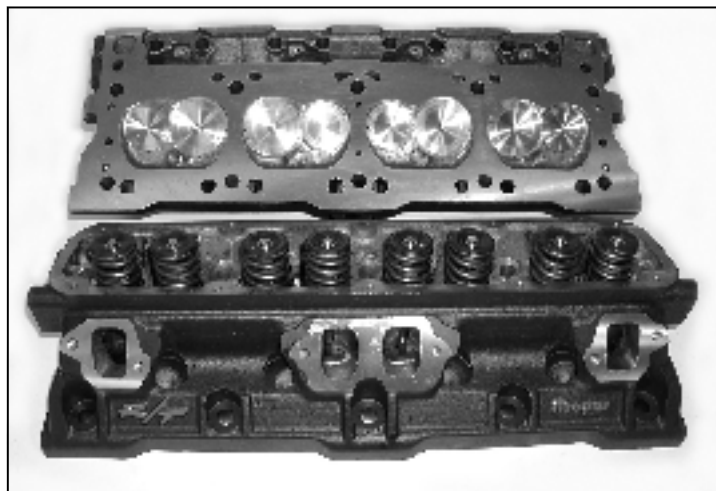
The bad news:

As these heads come out of the box, the surface finish of the ports is very rough...maybe too rough, especially on the exhaust side. Future problems to deal with will be the intake manifolds and header sizes. Everything is designed for older LA 360ci engines. One solution to the intake problem is the addition of a dual intake bolt pattern that allows for the use of either LA or Magnum intake manifolds, see below.

All Ported Magnum R/T cylinder heads include the following:

- Bronze guide liners are installed
- Intake and exhaust runner porting
- Pressure testing after porting to ensure no thin spots exist
- Valve seats are finish machined with 3 angles
- Normal finished combustion chamber sizes 58cc to 62cc
- Approximately 57lbs each (assembled)
- Valve stem heights are equalized for more accurate rocker arm geometry
- Valve springs, retainers, locks and seals are optional (See the Valve Spring Kit section for more info)

Note: All of the part numbers below are based on customer supplied cylinder head cores. We modify the cylinder heads you send us. We can also supply new, bare R/T head castings. Add part number 4660. To do porting work on customer supplied heads add the following labor: Clean, crack check & surface mill, part number H1198.



Stage I

The level of porting uses racing, 5/16" stem, 2.02" (#1003) intake valves, 1.650" (#1012) exhaust valves and includes modifications to the bowl and runners of both the intake and exhaust ports.

318/360 Magnum R/T heads

Part number: HPS1-MAGR/T

Stage II

Just like the Stage I R/T head, we use 5/16" stem, 2.02" (#1003) racing intake valves and 1.650" (#1012) racing exhaust valves. More extensive bowl and runner modifications are made to increase flow, resulting in more power output.

318/360 Magnum R/T heads

Part number: HPS2-MAGR/T

Stage III

This level upgrades the intake valve to the 5/16" stem, 2.055" size and retains the 1.650" (#1012) racing exhaust valves. This level expands the Stage II porting to increase airflow and power potential of the cylinder heads.

318/360 Magnum R/T heads

Part number: HPS3-MAGR/T

Valve spring packages installed on heads. Includes labor, springs, retainers, locks and Viton positive seals.

For cams using P/N 1110 springs on Magnum heads (includes spring seat milling)

Part Number: 1110VSK-MR/T

For cams using P/N 1102 springs on Magnum heads (includes spring seat milling)

Part Number: 1102VSK-MR/T

For cams using P/N 1111 springs on Magnum heads (includes spring seat milling)

Part Number: 1111VSK-MR/T

Drill and tap Magnum heads for LA intake manifold bolt pattern (dual pattern)

Part Number: LA-DRL

Ported 4.7L Magnum Cylinder Heads

Stage I

Part number: HPS1-MAG47

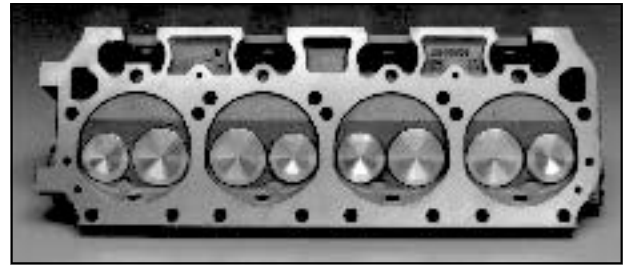
Ported 5.7L Hemi Cylinder Heads

Stage I

Part number: HPS1-HEMI57

Big Block HP Ported Iron Heads

All HP Ported cylinder heads are jet cleaned, crack checked, shot blasted and bronze guide liners are installed. All heads include valves. After porting, the heads are pressure tested, the valve seats are finished machined with 3 angles and a light mill cut is performed on the head gasket surface. Valve stem heights are equalized for more accurate rocker arm geometry. All head package prices are based on customer supplied cores. Valve springs, retainers, locks and seals are optional.



		<u>Part Number</u>
RV/Restoration	These heads use the 2.14" intake valve (#1018) and 1.81" exhaust valve (#1024). Both valves are 11/32" stem diameter.	
	'906,'902,'452,'346,'213 casting heads	HPRV-BB
Stage I	These heads use the same 2.14" nail head intake valve (#1018) and 1.81" nail head exhaust valve (#1024) as the RV/Resto heads.	
	'902,'516,'452,'346,'213 casting heads	HPS1-BB
	'906 casting heads	HPS1-BB906
Stage II	This level also includes the nail head 2.14" intake valves (#1018) and 1.81" exhaust valves (#1024). No Stage II on '516 heads	
	'902,'452,'346,'213 casting heads	HPS2-BB
	'906 casting heads	HPS2-BB906
Stage III	These heads use the 2.19" nail head intake valves (#1034) and the 1.81" exhaust valves (#1024). Both valves are 11/32" stem diameter. No Stage III on '516 heads	
	'902,'452,'346,'213 casting heads	HPS3-BB
	'906 casting heads	HPS3-BB906

Valve spring packages installed on heads. Includes labor, springs, retainers, locks and Viton positive seals.

• For cams using P/N 1104 springs	1104VSK
• For cams using P/N 1105 springs	1105VSK
• For cams using P/N 1106 springs	1106VSK
• For cams using P/N 1107 springs (includes machined valve locks)	1107VSK
• For cams using P/N 1107 springs (includes 10° jumbo locks and retainers)	1107VSK-10
• For cams using P/N 1109 springs (includes machined valve locks)	1109VSK
• For cams using P/N 1109 springs (includes 10° jumbo locks and retainers)	1109VSK-10

Average Combustion Chamber Sizes

Head casting number (last 3 digits)	Factory chamber size	HP Ported chamber size	To reduce the combustion chamber volume by lcc, mill the following amount	For each .010" of milling on the head gasket surface, remove the following on the intake gasket surface
'906, '902, '452, '346, '213	85cc to 95cc	83cc to 88cc	.0042"	.0063"
'915, '516	78cc to 84cc	72cc to 78cc	.0062"	.0063"

Big Block HP Ported Heads

Labor options on HP Ported cylinder heads:

- No lead exhaust valve seat conversion
- Machine spring bases for double valve springs
- Machine valve guides for positive seals
- Milling for extra compression, up to .030" (per pair of heads)
- Milling up to .060" (per pair of heads, includes intake manifold corrections)
- Super mill to flat quench (per pair of heads, includes intake side corrections)
- Deep port match intake manifold to cylinder heads (call for instructions)
- Equalize combustion chamber quench depths
- Machine for motor home style spark plug coolant passages
 - Cylinder heads (per pair)
 - Cylinder block
- Machine quench domes and valve reliefs (TRW pistons)
- Install fuel distribution vanes in M1 "B" block single plane intake manifold

Part Number

NOLEADBB
 H430
 H440
 H374
 H375
 H377
 I310
 H382

 H386
 B421
 P322
 I352

HP Ported cylinder head porting updates:

- Stage I to Stage II with valve seats re-cut
- Stage II to Stage III (porting, seat work, new intake valves and spring set-up)

CALL
 CALL

Cores for HP Ported cylinder heads:

- '516, '906, '346 casting heads - early style (per pair) (no-lead exhaust seats installed)
- '213, '346, '452, '902 casting heads - late style, factory hardened exhaust seats (per pair)

9010
 9011

Cylinder head dowel pins:

Factory replacement cylinder head to block alignment pins. Sold each.

- Big Block .250" x .625" solid, OE type
- .250" x .625" split, roll pin type (easier to remove if needed)

7506
 7507



Big Block Edelbrock Aluminum Cylinder Heads

All Edelbrock cylinder heads feature the following:

- Phosphor-bronze valve guides
- Interlocking, ductile iron valve seats
- One piece, stainless steel 2.14" intake valves (11/32" stem)
- One piece, stainless steel 1.81" exhaust valves (11/32" stem)
- Heat treated, machined steel retainers
- Pressure testing after porting to ensure no thin spots exist
- After porting, valve seats are finish machined with 3 angles
- Light-weight aluminum castings (approximately 29.0lbs each, assembled)
- Accepts standard "B/RB" engine intakes and exhaust manifolds/headers
- Accepts standard "B/RB" engine rocker arms and shafts
- Open or closed combustion chamber design (open chamber for use with quench dome pistons). Please specify when ordering
- Open chamber heads are approximately 88cc
- Closed chamber heads are approximately 84cc (#4650)
- Valve springs, retainers, locks and seals are optional (See the Valve Spring Kit section below for more info)



Recommended components:

Edelbrock cylinder heads cannot be used with factory head bolts. You must use a bolt or stud set that utilizes washers.

ARP head bolt sets (6 point):	Part number 7184
ARP stud sets (6 point):	Part number 7312
Fel-Pro Racing intake gasket set:	Part number 3258

The Edelbrock heads also require the use of the Fel-Pro Racing head gasket with the pre-flattened, steel o-ring. Ask for Part number 3112 when ordering.

Customer supplied heads:

We can also port customer supplied Big Block Edelbrock heads. The part numbers listed to the right include the porting and valve seat work per pair of heads. It does not include any cleaning, replacement parts or repair work.

Porting level	Part number
Prepped	4650PC
Stage II	4650-S2-C
Stage III	4650-S3-C

Stock Heads (original ports)

This package includes untouched cylinder heads directly from Edelbrock. The heads are stock "out-of-box" with no additional modifications. The heads are assembled and include Edelbrock valve springs.
Note: Additional labor to install Hughes Valve Spring Kits, Part Number: H1305

Horsepower
Potential:
566HP

Part number: 4650 (closed chamber)

Prepped Heads

Prepped heads have a racing valve and seat grind that corrects "as cast" flaws. This improves valve and seat sealing and airflow. This level of modification works well with Hot Street and some bracket racing.

Horsepower
Potential:
627HP

Part number: 4650-P (closed chamber)

Stage II

Stage II heads are fully ported for maximum flow with the stock 2.14"/1.81" valves. This level is a good choice for 440ci to 451ci engines and hydraulic camshafts. This level is also designed for bracket racers and heavy vehicles.

Horsepower
Potential:
672HP

Part number: 4650-S2 (closed chamber)

Stage III

This level of ported heads replaces the intake valve with a new, 2.19" diameter (#1034) high flow unit. The heads are fully ported and designed for higher RPM, solid camshaft engines. Use with 440ci, 451ci or 500ci strokers.

Horsepower
Potential:
725+HP

Part number: 4650-S3 (closed chamber)

Big Block Edelbrock Aluminum Cylinder Heads

Valve spring packages installed on heads. Includes labor, springs, retainers, locks and Viton positive seals.

- | | |
|---|-----------|
| • For cams using P/N 1105 springs | 1105VSK-A |
| • For cams using P/N 1106 springs | 1106VSK-A |
| • For cams using P/N 1107 springs (includes machined valve locks) | 1107VSK-A |

Big Block Edelbrock head milling info:

Closed chamber #4600	0.0043" per 1 cc
----------------------	------------------

Bulldog heads coming soon!
Stock replacement, like an
Edelbrock, but outflows a 440-1

Additional Big Block porting services:

Part number

Mopar Performance
Stage VI aluminum

Stage II, 2.14"/1.81" valves (porting only)
Stage III 2.19"/1.81" valves (porting only)
Intake manifold spacers pinned and port matched

HP6AL-2
HP6AL-3
HP6SPAC

Mopar Performance
383/440 aluminum
replacement head
(Part number '311)

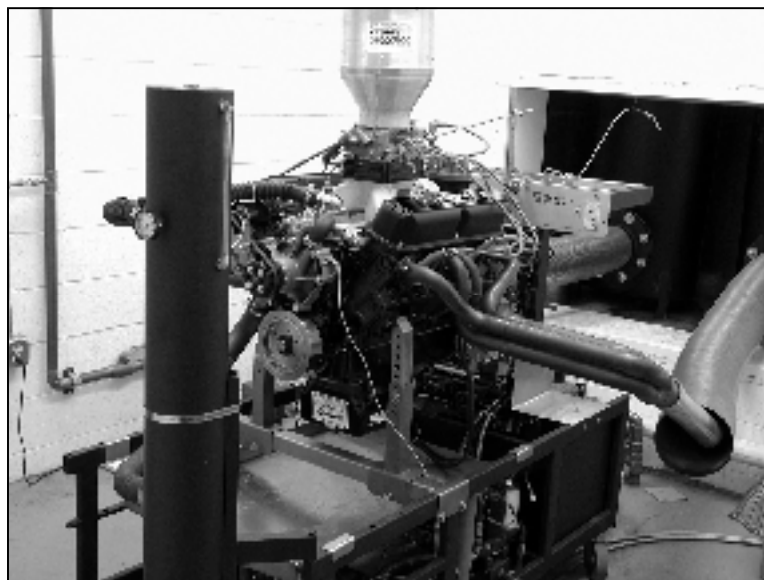
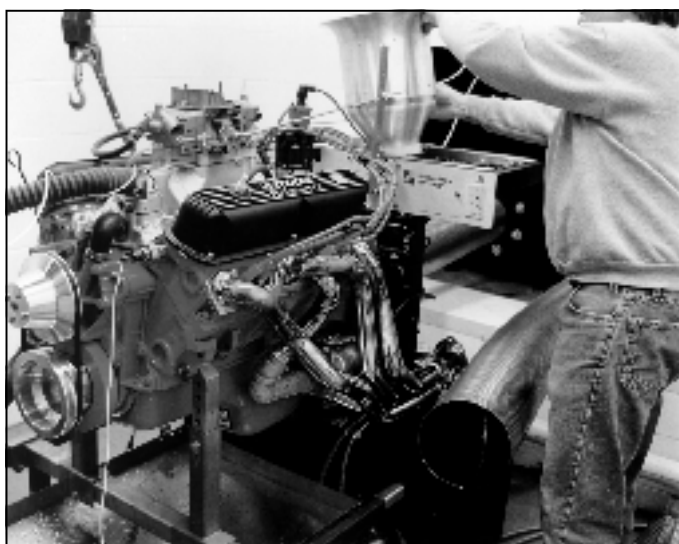
Stage II, 2.14"/1.81" valves (porting only)
Stage III 2.19"/1.81" valves (porting only)

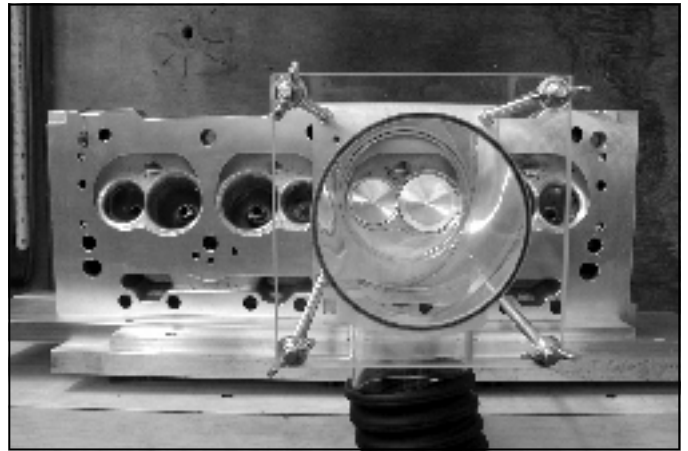
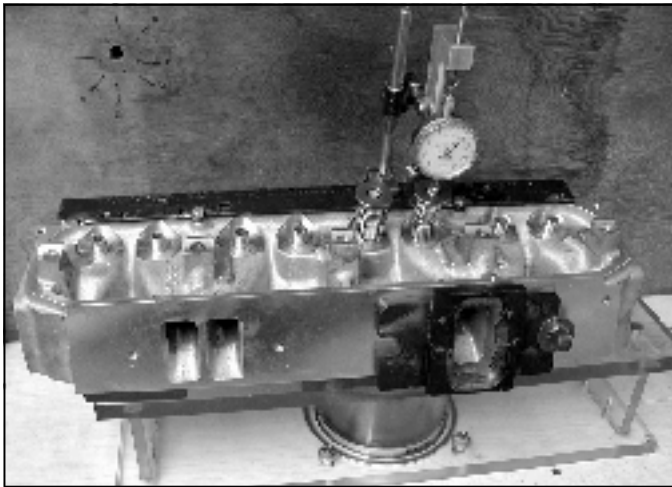
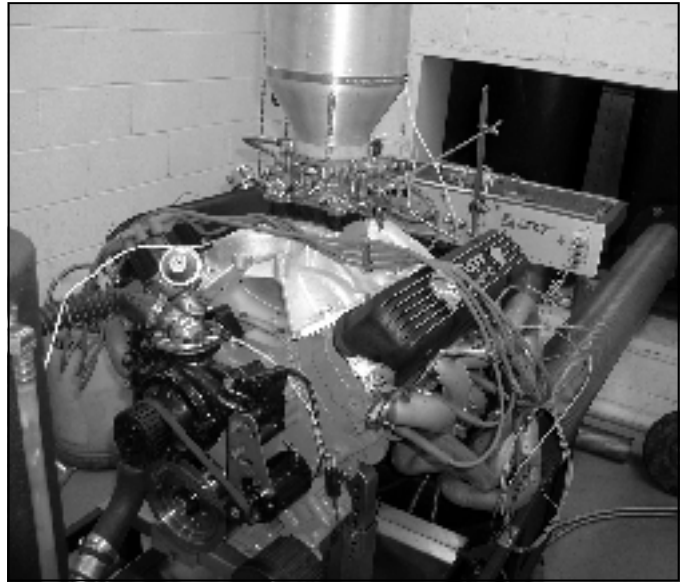
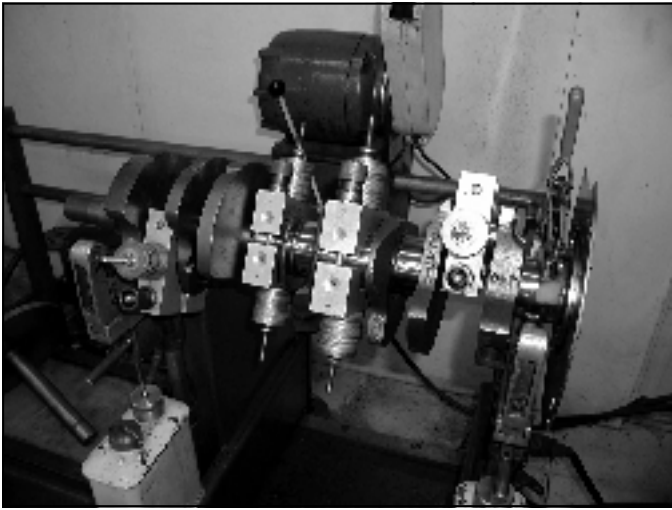
HP440AL-2
HP440AL-3

Indy S/R

Stage II, 2.14"/1.81" valves (porting only)
Stage III 2.19"/1.81" valves (porting only)

HPS/R-2
HPS/R-3



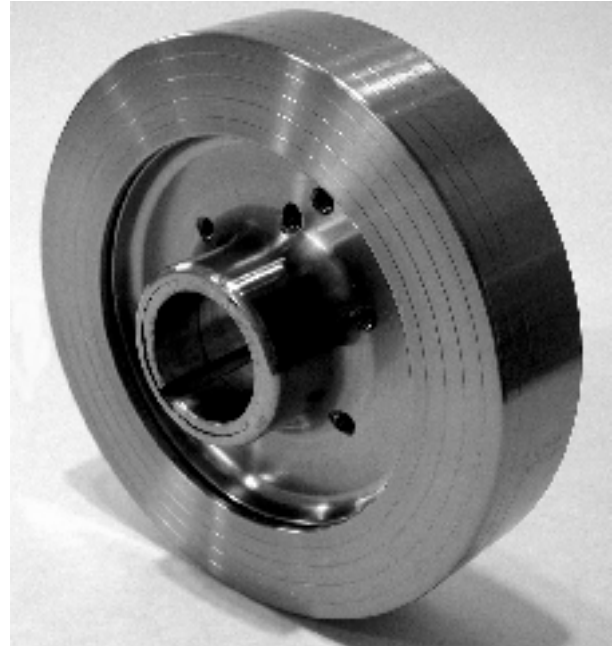




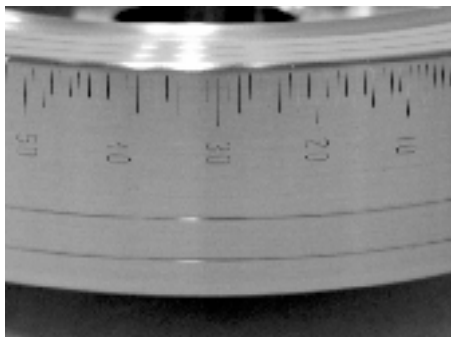
Performance Harmonic Dampers (SFI approved)

Cyco System's Pro/Race

- "All Steel" construction
- Bonded elastomer
- Forged steel inertia ring
- Billet or forged steel hub
- Splined inertia ring and hub
- 60° of engraved timing marks
- Exceeds SFI specification #18-1
- Direct replacement of the stock damper
- Accessory pulleys line up without modification
- Works with Moroso and MSD Crank Trigger ignitions



Small Block engines	
318-340-360 engines, internal balance Weight: 11.34 lbs OD: 7.01 inches Part number: 64277	318-340-360 engines, external balance Includes removable counterweight Weight: 12.26 lbs OD: 7.01 inches Part number: 64278 Note: This damper is not a direct replacement for the OEM external balance damper
Big Block engines	
383-400-440 engines, internal balance Weight: 11.03 lbs OD: 7.01 inches Part number: 64279	



Performance Harmonic Dampers

BHJ Dynamics

- Ductile, nodular iron hub and ring construction
- Oil proof elastomer
- Engraved timing marks from 0° to 50°
- Timing mark every 90° for easy valve adjustment
- Direct replacement of the stock damper
- Accessory pulleys line up without modification

Small Block engines 318-340-360 engines, internal balance

Weight: 7.10 lbs

OD: 6.90 inches

Part number: 64816



Big Block engines

383-400-440 engines, internal balance

Weight: 7.00 lbs

OD: 6.90 inches

Part number: 64183



Head bolt sets



Description

Small Block

273-318-340-360ci

Original equipment, Grade 8

ARP head bolt kit, 170,000 psi tensile strength

Hex head bolts with washers

Hex head bolts, Edelbrock aluminum heads

Hex head, Magnum 318 -360 engines

W-2 heads

ARP head bolt kit, 170,000 psi tensile strength

Hex head bolts with washers

Big Block

361-383-400-413-426W-440ci

Original equipment, Grade 8

ARP head bolt kit, 170,000 psi tensile strength For use with both iron OEM, and Edelbrock aluminum heads

Hex head bolts with washers

12 point head bolts with washers

Part Number

7102

7180

7181

7183

7182

7100

7184

7186

Head stud sets



Small Block

273-318-340-360ci

ARP head stud kit, 190,000 psi tensile strength

Hex nuts with washers

Hex nuts, Magnum 318-360 engines

Hex nuts, Edelbrock aluminum heads

12 point nuts with washer

W-2 heads

ARP head stud kit, 190,000 psi tensile strength

Hex nuts with washers

12 point nuts with washers

W-5 heads

ARP head stud kit, 190,000 psi tensile strength

Hex nuts with washers

12 point nuts with washers

B1-BA heads

ARP head stud kit, 190,000 psi tensile strength

Hex nuts with washers

12 point nuts with washers

Big Block

361-383-400-413-426W-440ci

ARP head stud kit, 190,000 psi tensile strength

Hex nuts with washers

12 point nuts with washers

B1 heads (not B1-BS)

ARP head stud kit, 190,000 psi tensile strength

Hex nuts with washers

12 point nuts with washers

7300

7320

7321

7302

7301

7303

7304

7306

7308

7310

7312

7314

7316

7318

Main bolt sets

Description

Small Block

273-318-340-360ci

Original equipment, Grade 8

ARP main bolt kit, 190,000 psi tensile strength

Hex head bolts with washers

Big Block

361-383-400-413-426W-440ci

Original equipment, Grade 8

ARP main bolt kit, 190,000 psi tensile strength

Hex head bolts with washers

Main stud sets

Small Block

273-318-340-360ci

ARP main stud kit, 190,000 psi tensile strength

Hex head nuts with washers (includes custom fastener at #5 main cap for oil pump clearance)

Use with Magnum truck oil pans also.

Hex head nuts with washers (same as #7400,

but designed for use with a windage tray)

Big Block

361-383-400-413-426W-440ci

ARP main stud kit, 190,000 psi tensile strength

Hex head nuts with washers

Rod bolt sets



Small Block

273-318-340-360ci

Original equipment, Grade 8

ARP rod bolt kit, 190,000 psi tensile strength

Hex head nuts

ARP Pro Series Wave Loc 220,000 psi tensile

Big Block

361-383-400-413-426W-440ci

Original equipment, Grade 8

ARP rod bolt kit, 190,000 psi tensile strength

Hex head nuts

ARP Pro Series Wave Loc 220,000 psi tensile

Header bolt sets



Small Block

273-318-340-360ci

ARP bolt kit, black oxide coated,

170,000 psi tensile strength. .750" under head length

12 point head bolts w/washers

Big Block

361-383-400-413-426W-440ci

ARP bolt kit, black oxide coated, 170,000 psi tensile strength. 1.00" under head length

12 point head bolts w/washers

12 point head bolts w/washers (stainless steel)

7350

7352

7354

7352

7400

7404

7406

7200

7204

7206

7210

7214

7216

7420


7422

7423


Header stud sets

Description	Part Number
Small Block 273-318-340-360ci	7430
Big Block 361-383-400-413-426W-440ci ARP stud kit, black oxide coated, 170,000 psi tensile strength. 1.670" length 12 point head nuts with washers	7432


Flywheel bolt sets

Small Block 273-318-340-360ci		Grade 8, cadmium plated. Hex head (torque to 55 ft-lbs with Loctite) with star lock washers 6 bolt crankshafts	7170
Big Block 361-383-400-413-426W-440ci		Grade 8, cadmium plated. Hex head (torque to 55 ft-lbs with Loctite) with star lock washers 6 bolt crankshafts 8 bolt crankshafts	7170 7172

Flexplate bolt sets

Small Block 273-318-340-360ci		Grade 8, black oxide coated. Hex head (torque to 55 ft-lbs with Loctite) with star lock washers 6 bolt crankshafts	7174
Big Block 361-383-400-413-426W-440ci		Grade 8, black oxide coated. Hex head (torque to 55 ft-lbs with Loctite) with star lock washers 6 bolt crankshafts	7174

Damper bolts

Small Block and Big Block		Grade 8, 150,000psi tensile strength, gold, zinc dichromate plate bolt. Parallel ground, case hardened to Rc 47, black oxide coated washer.
Damper bolt and washer sets (135 ft-lbs with Loctite)		Thin Dampers (1.25" under head length bolt) 7150 Thick Dampers (2.25" under head length bolt) 7152
8740 Chromoly billet bolt w/integral washer		Thin Dampers (1.25" under head length bolt) 7154 Square drive with 12pt head

Pressure plate bolt sets

Description	Part Number
All Small Block and Big Block	
Grade 8, hex head bolts with lock washers (torque to 35 ft-lbs with Loctite)	
3/8" x 1.00" under head length, 9/16" socket head	7160
3/8" x 1.00" under head length, 1/2" socket head	7162

Block dowel pins

Cylinder block to transmission bellhousing Fits all Small Block and Big Block .500" x .750"	7508
Timing cover alignment dowel Fits Big Block only .250" x .500"	7510

Oil pan drain plug

Small Block and Big Block	
1/2"-20 threads. Magnetic tip.	7604

Torque converter bolts

All Small Block and Big Block	
Grade 8, zinc dichromate plated, hex head bolts	
5/16" - 24 bolt set (4) (torque to 25 ft-lbs with Loctite)	7164
7/16" - 20 bolt set (4) (torque to 55 ft-lbs with Loctite)	7166

Valve cover studs

All Small Block and Big Block (Not for use with Magnum cylinder heads)	
ARP stud kit, black oxide coated, 170,000 psi tensile strength. Bullet nose studs for quick assembly. 12 point head nuts with washers	7450

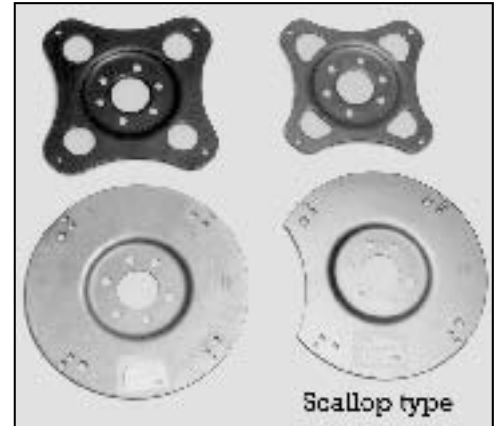
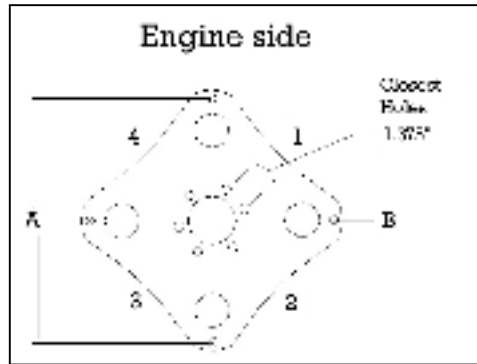
Carburetor studs

All Small Block and Big Block intake manifolds	
Stud kit, black oxide coated 4 studs, 1.25" length	7802

Intake bolt sets

All Small Block and Big Block	
ARP bolt kit, stainless steel, 170,000 psi tensile strength. 12 point head bolts with washers Hardened, flange head, hex head kit with Grade 8 washers	7704 7702
Magnum Torque-to-Yield factory replacement bolt set. Torque as per enclosed instructions	7700

<u>Application/Description</u>	<u>spacing (A)</u>	<u>Bolt Location</u>	<u>Cutout crank bolts</u>	<u>Number of diameter (B)</u>	<u>Hole Part Number</u>
Small Block 273-318-340-360ci					
Stock replacement: (no counterweight)					
Most engines with 727 transmission	11.100"	N/A	6	.356"	6300
Most engines with 904 transmission	10.010"	N/A	6	.356"	6302
Magnum engines					
Internal balance	10.010"	N/A	6	.356"	6303
External balance	10.010"	N/A	6	.356"	6309



B+M SFI certified: (All SFI flexplates have both 11.100" and 10.010" bolt patterns unless noted)

Most engines with 727 trans No counterweight	Both	N/A	6	.356"+ .467"	6304
340ci with 727 transmission large cutout (scallop) type	Both	4	6	.356"+ .467"	6305
340ci with 904 transmission small cutout (scallop) type	10.010" only	4	6	.356"+ .467"	6306
360ci with 727 transmission large cutout (scallop) type	Both	4	6	.356"+ .467"	6307
360ci with 904 transmission small cutout (scallop) type	Both	4	6	.356"+ .467"	6308
360ci (1993-95) with 727 trans counterweighted type	10.010" only	4	6	.356"+ .467"	6310
360ci (1993-95) with 904 trans counterweighted type	10.010" only	4	6	.356"+ .467"	6312

Big Block 361-383-400-413-426W-440ci
Stock replacement: (no counterweight)

Most engines with 727 transmission	11.100"	N/A	6	.356"	6300
Most engines with 904 transmission	10.010"	N/A	6	.356"	6302

B+M SFI certified: (All SFI flexplates have both 11.100" and 10.010" bolt patterns unless noted)

Most engines with 727 trans No counterweight	Both	N/A	6	.356"+ .467"	6304
Most engines with 727 trans No counterweight	10.010" only	N/A	8	.356"+ .467"	6314
Cast crank with 727 trans large cutout (scallop) type	Both	4	6	.356"+ .467"	6316
Forged crank with 727 trans small cutout (scallop) type	Both	4	6	.356"+ .467"	6318

<u>Application/Description</u>	<u>Ring Gear O.D.</u>	<u># of Ring Gear Teeth</u>	<u>Number of crank bolts</u>	<u>Clutch Pattern</u>	<u>Part Number</u>
Small Block 273-318-340-360ci					
No counterweight Steel (approx. 35lbs.) Aluminum with steel insert (approx. 10lbs.)	14.568"	143	6	A,B,C	464202 564202
With counterweight Steel (approx. 37lbs.) Aluminum with steel insert (approx. 10lbs.)	14.568"	143	6	A,B,C	464205 564205
No counterweight Steel (approx. 35lbs.) Steel Super Light (approx. 18.5lbs.) Aluminum with steel insert (approx. 10lbs.)	13.195"	130	6	A,D	464102 464122 564102
With counterweight Steel (approx. 37lbs.) Steel Super Light (approx. 18.5lbs.) Aluminum with steel insert (approx. 10lbs.)	13.195"	130	6	A,D	464105 464125 564105

Big Block
361-383-400-413-426W-440ci

No counterweight Steel (approx. 35lbs.) Aluminum with steel insert (approx. 10lbs.)	14.568"	143	6	A,B,C	464202 564202
No counterweight Steel (approx. 35lbs.) Steel Super Light (approx. 18.5lbs.) Aluminum with steel insert (approx. 10lbs.)	13.195"	130	6	A,D	464102 464122 564102
No counterweight Steel (approx. 35lbs.) Aluminum with steel insert (approx. 10lbs.)	14.568"	143	8	A,B,C	464200 564200
With counterweight Steel (approx. 37lbs.) Aluminum with steel insert (approx. 10lbs.)	13.195"	130	8	A,D	464100 564100



Available clutch patterns:

- A 10.0", 10.5", 10.95" Borg & Beck or diaphragm
- B 11.0", 12.0" Borg & Beck or diaphragm
- C 11.0" Borg & Beck or long style with 3/8" bolts
- D 10.0", 10.5" long style

WEBER®

5.2L/5.9L Magnum Induction System Modifications

First:

Look at our cool air intake systems on our web site. They are easy to install, look very nice, and they do give you more power and mileage. Our 14" air filters P/N 11000 are not a K&N® product. You can use K&N® products to clean and oil our filters though. We have reports of up to 8 HP increase at the rear wheels on some installations. Designed to replace the smaller filter in most cool air systems.

Second:

Regarding throttle bodies, you must know what an "improved" throttle body flows to know if it was any performance advantage to you. The airflow is checked at a regulated test pressure measured in inches. You must know what this pressure is! For example, if a throttle body flows 450CFM when tested at 10" of pressure, it will flow 700CFM when tested at 25" of pressure. Knowing only the CFM and not the test pressure means nothing. For comparison purposes, we have listed the Hughes Engines throttle bodies with flow figures at both 10" and 25" of pressure and 1.5" Hg (same as 4 barrel carburetor). Both stock, modified, and billet are shown. Before you buy a throttle body from a competitor, check the numbers!

Throttle plate diameter does not determine the final airflow! A throttle body that flows "dry" air versus a carburetor that flows "wet" air are two very different and unrelated situations. A carburetor that flows wet air relies on velocity in the carburetor to achieve the proper air/fuel mixing and optimum mixture conditions for proper burning and power. A fuel injection system uses fuel pressure and the injector spray pattern to achieve the same conditions. Velocity through the throttle body has little if anything to do with power input. The CFM and test pressure is what is important for making a wise choice. Check our flow numbers against all of the competitors throttle bodies before you buy!

Third:

The stock Magnum "barrel" type intake manifolds have individual runners (ports) that are identical for all the cylinders and are fed by a common plenum. A system like this creates a power increase in the power curve at an RPM range that is determined by the size (area) and length of the runner. The longer and smaller the runner, the lower the RPM range in which the power increase occurs. Conversely, the shorter and larger runners effect the power at higher RPMs. There is also a negative effect when the runner size and length is tuned for the extreme end of the RPM range. In these cases some power will be lost in the other end of the power range. With Magnum intakes we see both situations. The stock intake has long, small runners and is snappy in the idle to 2500 range. The power available at higher RPM, 3,000 and up is severely limited by this intake. On the other hand, there is the M-1 single plane intake both in 2bbl and 4bbl versions. The 2bbl version is for higher RPM use than our modified Stage II OEM intake. The four barrel single plane intake is designed for high RPM drag racing speeds of 4,500 RPM and above. This is why we offer two levels of modified stock "barrel" intakes. Both levels have enlarged and shortened runners.

The Stage I is designed for engines that need a power boost in the 2,000 to 4,000 RPM range. This level performs well on V6 and V8s with a Stage I or Stage II throttle body and minor or no internal engine modifications. It lets the engine pull better above 3,000 RPM.

The Stage II is designed for a power boost from 3,000 to 5,000 RPM. This intake works well when high performance camshafts and/or modified heads are used (hot street).

There will be some increase in power for about 500 RPM on either side of the boost area. Both levels will allow increased power at RPMs considerably above the stock manifold. Our modified intakes also feature a heavy duty, 1/4" thick, billet aluminum cover plate to help eliminate gasket blow-out.

Like most other engine modifications, the intake manifolds work best and produce the most power when used with other high performance parts, especially heads and camshafts. Most vehicles will find our modified intakes much more street friendly than the M-1 single plane manifold, especially on heavier or towing vehicles.

Electronic Control Units (ECU)

By the time this catalog is printed, we should have programmable piggyback computers available. Please call use for more details.

Modified Magnum Throttle Bodies

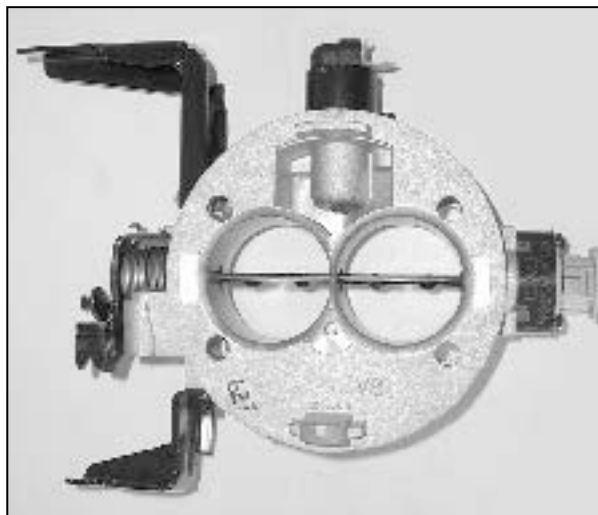
These modified throttle bodies are designed to eliminate the bottleneck in the intake system caused by the small, restricted OEM throttle bores. Large bore throttle bodies increase power, similar to installing a large carburetor. The increased air-flow allows the engine to develop more power at higher RPM.

Here are some basic guidelines for choosing the proper throttle body. Use the Stage I on high performance (Warm Street) V6s and V8s that do towing and need more passing power and mileage. Use the Stage II level on high performance (Hot Street) V8 applications that have internal engine modifications such as heads or a camshaft change or mild strokers. The Stage III level of modification should be used on engines that are serious race efforts with lots of stall and gear.

What size throttle body do you want? Our selection of 3 different sizes leads to confusion for some customers. The decision of which one to choose becomes easier when you compare them to a four barrel carburetor.

Airflow through throttle bodies

Due to the confusion over what size throttle body is best for a particular application we are adding an additional method of rating air flow. We will now show air flow at 1.5" Hg pressure drop. This is the same pressure that 4bbl carburetors are rated with. This will give more flow numbers (CFM) and make selecting a throttle body easier. Note: Normally 2bbl carburetors are rated at 3" Hg pressure drop.



Modified OEM throttle bodies	Stock 50mm	Stage I 50mm	Stage II 52mm	Stage III 53mm
3.9L V6	328 CFM	469 CFM	N/A	N/A
5.2L/5.9L	633 CFM	728 CFM	823 CFM	928 CFM
4.7L V8 (65mm)	565 CFM	683 CFM	N/A	N/A
4.7L V8 (68mm)	608 CFM	617 CFM	N/A	N/A

Always choose your throttle body by airflow, **NOT** throttle plate size. The throttle plate size is not an indication of what the unit flows -- just ask the carburetor people. Note: Our billet throttle bodies flow more air than modified OEM throttle bodies with the same throttle plate size.

Can a throttle body be too big? When a carburetor is too big for an application the engine can have problems at low RPM because the carburetor relies on air speed (velocity) to atomize the fuel for proper combustion. A fuel injection system uses a high-pressure pump and injectors to atomize the fuel and these low speed-fueling problems do not exist. Call or email us if you need more help in selecting the proper throttle body.

We can supply new, OEM throttle bodies for those customers who need a modified stock throttle body and want to keep their original throttle body. Or we can supply a modified exchange OEM throttle body and credit you when you return your original throttle body to eliminate your downtime. New OEM throttle bodies come with cable brackets, idle air control valve and throttle position sensor. All throttle bodies are supplied with new, low profile Allen head mounting bolts and a new base gasket. Our new, billet throttle bodies are supplied less cable bracket, IAC valve and throttle position sensor. All of our throttle bodies are shipped with installation instructions and tuning tips.

See our Magnum Induction System Modifications on the previous page for more info on choosing the proper throttle body.

Billet Magnum Throttle Bodies

Our new, billet aluminum throttle bodies are a direct, factory bolt-on replacement for 1996* and newer Dodge trucks. They are offered in 3 sizes.

Stage I Street (50mm)
Blue anodized throttle plates
For use in engines up to 500HP
Part number: 5950
866cfm at 1.5" Hg

Stage II Hot Street/Strip (52mm)
Red anodized throttle plates
For use in engines up to 600HP
Part number: 5952
972cfm at 1.5" Hg

Stage III Strip (55mm)
Gold anodized throttle plates
For use in engines up to 650+HP
This model requires modifying the intake manifold opening to accept the larger throttle plates.
Part number: 5955
1050cfm at 1.5" Hg "The Biggin"



These beautiful new throttle bodies were designed to flow more air than is possible with the limits of the OEM units. They are made from 6061 billets and CNC machined to exacting tolerances, exclusively for Hughes Engines Inc. The throttle plates are also designed and CNC machined exclusively for us. These new throttle bodies are a direct replacement* for the OEM units and will accept all of the factory hookups without modification. They are beautifully black powder-coated for appearance and durability. They also feature the Hughes Engines Racing logo milled into the air horn. These units are the ultimate in 2bbl throttle body adaptability, appearance, performance and tune-ability.

* The throttle lever is designed for 1996 and later, stock cable hookups. Earlier trucks will require a cable change. Order part number 5960 for these applications. Jeeps require cable part number 5962 and slight modifications to the mounting bracket.

Magnum Air Filters

Hughes Engines does offer a larger air filter element to use with the K&N Gen II system that is worth up to 8HP at the rear wheels over the K&N supplied filter. This filter element is a direct replacement for the K&N® Gen II systems on 5.2L/5.9L V8 engines. This includes 1997-2001 Dodge Dakotas, the 1998-2001 Dodge Durango and 1994-2001 Full Size Dodge Ram trucks. **Note:** Some minor trimming of the Gen II heat shield may be necessary on the Dakota and Durango applications 14" overall length 12" length filter element 6.00" to 5.25" tapered OD4.00" ID inlet.

Air filter element
Part number: 11000



Modified Magnum Throttle Bodies

Stage I

V6 (3.9L) engines

The V6 flows an amazing 43% more than stock. These throttle bodies feature:

- Narrowed throttle shafts
- Low profile throttle shaft screws
- Modified venturi area
- Polished air horns and throttle bores



Test Pressure	Stock Throttle Body	Stage I
1.5" Hg	328 CFM (V6)	469 CFM (V6)
10" H ₂ O	231 CFM (V6)	406 CFM (V6)
25" H ₂ O	365 CFM (V6)	641 CFM (V6)

Modifications performed on your throttle body

Part number: **5500**

Please see the throttle body ordering information on page 59 before placing your order.

Hughes Engines can supply a throttle body for modification for an additional charge as listed below:

Engine Size	Linkage Type (see page 57)	New throttle body	Used throttle body (when available)
3.9L V6	All	5500V6-NC	5500V6-UC

Note: If you purchase a new or used, modified throttle body from us we will buy your good, used stock throttle body. Call for current pricing.



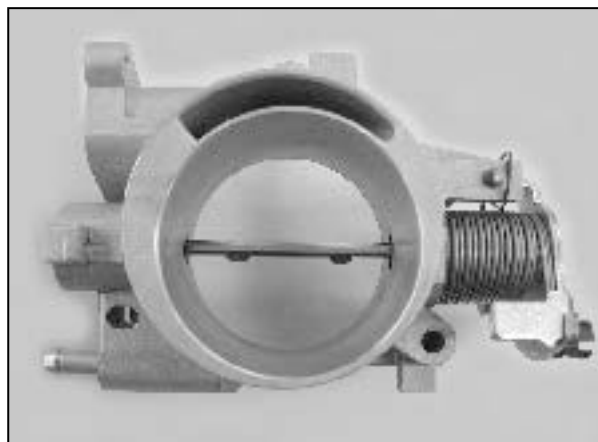
Stage I (Year 2000 only)

V8 (4.7L) engines (65mm throttle plates)

The modifications for this throttle body features:

- Oversized venturi and polished throttle bores
- Narrowed throttle shafts
- Low profile throttle shaft screws
- 20% increase in airflow over a stock (65mm) throttle body
- New attaching bolts and base gasket are NOT supplied with this unit (they are not required)

Test Pressure	Stock Throttle Body	Stage I
1.5" Hg	565 CFM	683 CFM
10" H ₂ O	398 CFM	481 CFM
25" H ₂ O	627 CFM	760 CFM



Modifications performed on your throttle body

Part number: **5506**

Please see the throttle body ordering information on page 59 before placing your order.

Additional charges:

New throttle body core (4.7L V8 2000-2002)

Part number: **5506-NC**

Used throttle body core, when available (4.7L V8 2000-2002)

Part number: **5506-UC**

Note: If you purchase a new or used, modified throttle body from us we will buy your good, used stock throttle body. Call for current pricing.

Stage I (2001 and later)

V8 (4.7L) engines (68mm throttle plates)

The modifications for this throttle body features:

- Oversized venturi and polished throttle bores
- Narrowed throttle shafts
- Low profile throttle shaft screws
- 15% increase in airflow over a stock (68mm) throttle body
- New attaching bolts and base gasket are NOT supplied with this unit (they are not required)

Test Pressure	Stock Throttle Body	Stage I
1.5" Hg	608 CFM	717 CFM
10" H ₂ O	426 CFM	502 CFM
25" H ₂ O	673 CFM	793 CFM

Modifications performed on your throttle body

Part number: **5506**

Please see the throttle body ordering information on page 59 before placing your order.

Additional charges:

New throttle body core (4.7L V8 2000-2002)

Part number: **5507-NC**

Used throttle body core, when available (4.7L V8 2000-2002)

Part number: **5507-UC**

Note: If you purchase a new or used, modified throttle body from us we will buy your good, used stock throttle body. Call for current pricing.

Modified Magnum Throttle Bodies

Stage I

V8 (5.2L/5.9L) engines

This unit flows 15% more than stock. These throttle bodies feature:

- Narrowed throttle shafts
- Low profile throttle shaft screws
- Modified venturi area
- Polished air horns and throttle bores



Test Pressure	Stock Throttle Body	Stage I
1.5" Hg	633 CFM (V8)	728 CFM (V8)
10" H ₂ O	446 CFM (V8)	513 CFM (V8)
25" H ₂ O	704 CFM (V8)	811 CFM (V8)

Modifications performed on your throttle body

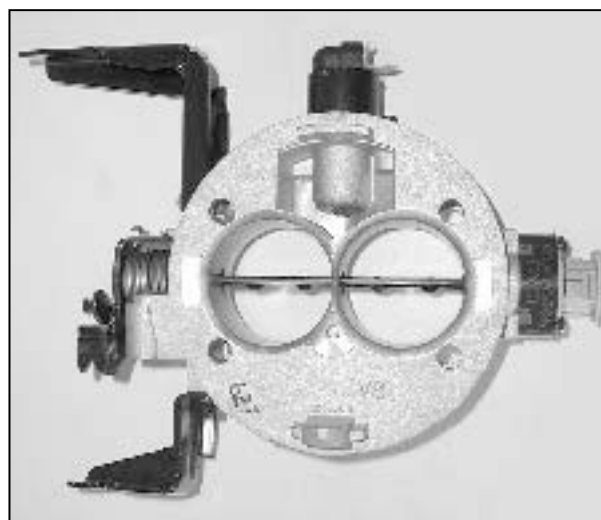
Part number: **5500**

Please see the throttle body ordering information on page 59 before placing your order.

Stage II

This stage is available for the 5.2L/5.9L V8 engines with Hot Street modification. Flow is 30% more than stock. These throttle bodies feature:

- Narrow throttle shafts
- Low profile throttle shaft screws
- Over-sized throttle bore and 52mm throttle plates
- Narrowed throttle plates
- Air horns modified for maximum air flow
- Modified locating lugs to properly position air horn but not obstruct flow



New Stage II unit shown

Test Pressure	Stock Throttle Body	Stage II
1.5" Hg	633 CFM	823 CFM
10" H ₂ O	446 CFM	580 CFM
25" H ₂ O	704 CFM	915 CFM

Modifications performed on your throttle body

Part number: **5502**

Please see the throttle body ordering information on page 59 before placing your order.

Hughes Engines can supply a throttle body for modification for an additional charge as listed below:

Engine Size	Linkage Type (see page 57)	New throttle body	Used throttle body (when available)
5.2L/5.9L V8	Type 1	5500V8-NC-1	5500V8-UC-1
	Type 2	5500V8-NC-2	5500V8-UC-2
	Type 3	5500V8-NC-3	5500V8-UC-3

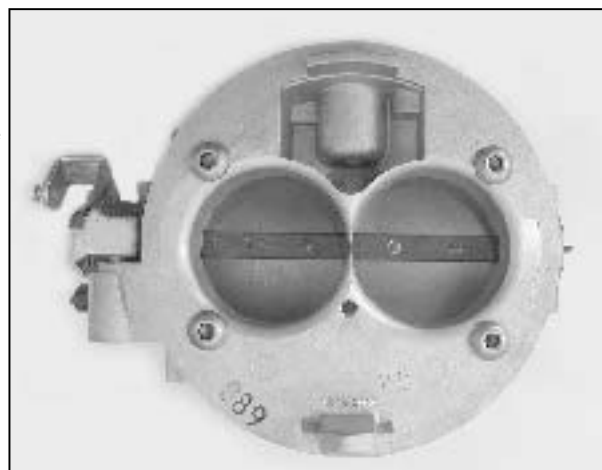
Note: If you purchase a new or used, modified throttle body from us we will buy your good, used stock throttle body. Call for current pricing.

Modified Magnum Throttle Bodies

Stage III

This level of modification is only available for the 5.2L/5.9L V8 engines, 1996 and later. 45% more flow, for highly modified engines. These throttle bodies feature:

- Narrow throttle shafts
- Low profile throttle shaft screws
- Over-sized throttle bore and 53+mm throttle plates
- Narrowed throttle plates
- Air horns modified for maximum air flow
- Modified locating lugs to properly position air horn but not obstruct flow



Test Pressure	Stock Throttle Body	Stage III
1.5" Hg	633 CFM	918 CFM
10" H ₂ O	446 CFM	647 CFM
25" H ₂ O	704 CFM	1028 CFM

Modifications performed on your throttle body Part number: **5504**

Please see the throttle body ordering information on page 59 before placing your order.

Hughes Engines can supply a throttle body for Stage II and III modification for an additional charge as listed below:

Engine Size	Model Year	New throttle body price	Used throttle body price (when available)
5.2L/5.9L V8	Type 1	5500V8-NC-1	5500V8-UC-1
	Type 2	5500V8-NC-2	5500V8-UC-2
	Type 3	5500V8-NC-3	5500V8-UC-3

Note: If you purchase a new or used, modified throttle body from us we will buy your good, used stock throttle body. Call for current pricing.

Automatic Knock Sensor

The answer for Magnum truck knock problems!

Dodge trucks, unlike Fords and Chivvys, do not have knock sensors. The knock sensors detect knock and automatically retard the timing until the knocking stops. The Mopar ECUs, both stock and Mopar Performance, automatically advance the timing to predetermined points and have no capability to retard it. To compound this problem, all ECUs do not advance the timing the same amount. We have seen ECUs that advance the timing to 45 degrees. This is a guaranteed problem; blown head gaskets, broken pistons, broken rings, rods and/or cracked blocks and heads! Spark advance is a necessary part of engine performance but it must be controlled. These sensors also work with standard distributors and carbureted engines too.

NOW YOU CAN DO IT!

We now offer the SafeGuard Knock Controller System. This unit wires directly into your ignition system and allows you to control the sensitivity to knock and the amount of retard you need. Once you have everything set, it works automatically. Now, you can even tow with a high performance engine. We suggest the SafeGuard unit be used with a Mopar Performance ECU, which will advance the timing, raise the RPM, change the top speed limiter and adjust the pulse width on the injectors. The SafeGuard unit will sense the any knock conditions and individually control the amount of spark advance in each cylinder. It does this by automatically retarding engine timing out of a knock situation. Now octane levels and loads on the engine are all compensated for automatically. Set it and forget it. Use all of the power you built into your engine. This system comes complete with knock sensor, wiring, wire loom, and detailed installation manual.



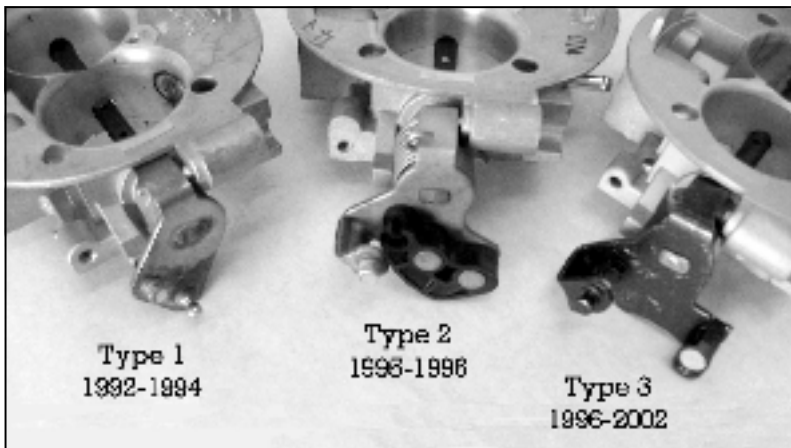
Part number: 22004

Throttle Body ordering information

Before you order:

To ensure you receive the proper OEM Magnum throttle body we will need 2 pieces of information about your current throttle body.

1. Magnum V8 throttle bodies are available with 3 different linkage types. When ordering, please refer to the picture at the right in determining which linkage type you will need. (Note: V6 linkages are similar, but the years will not match the photo to the right)



2. We will need year of the throttle body and the casting number, see below. We can only modify the following casting numbers:

5.2L/5.9L V8
12R10896B
12R15041B



3.9 V6, 4.7L V8
Call for details

Fuel injectors



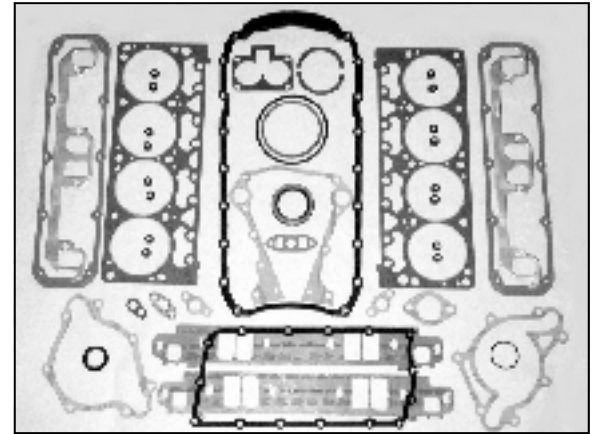
High volume fuel injectors for 5.2L/5.9L V8 Magnum engines. Drop-in, no machining required.

21 pound per hour	Part number: 5522
24 pound per hour	Part number: 5524
26 pound per hour	Part number: 5526
30 pound per hour	Part number: 5530
32 pound per hour	Part number: 5532
34 pound per hour	Part number: 5534
36 pound per hour	Part number: 5536
38 pound per hour	Part number: 5538
40 pound per hour	Part number: 5540

Full Gasket sets

Small Block

Description	Part Number
273ci - 318ci	CALL
340ci Standard Fel-Pro set main pieces included:	3010
3102 head gasket 3204 and 3208 intake gaskets 3306 exhaust gaskets 3406 oil pan gasket 3502 valve cover gaskets	
340ci Racing Fel-Pro (partial set) Set includes the remainder of gaskets needed to assemble a complete engine. This set must be used with the individual racing head gaskets, intake gaskets, exhaust gaskets and valve cover gaskets.	3011
360ci 1971-1980 Standard Fel-Pro set main pieces included:	3012
3102 head gasket 3204 and 3208 intake gaskets 3306 exhaust gaskets 3412 oil pan gasket 3502 valve cover gaskets	
360ci 1971-1980 Racing Fel-Pro (partial set) Set includes the remainder of gaskets needed to assemble a complete engine. This set must be used with the individual racing head gaskets, intake gaskets, exhaust gaskets and valve cover gaskets.	3011
360ci 1993-1996 Dodge Magnum Standard Fel-Pro set main pieces included:	3013
3106 head gasket 3414 one piece oil pan gasket 3214 intake gasket 3516 molded rubber, steel core, valve cover gaskets 3308 exhaust gaskets	

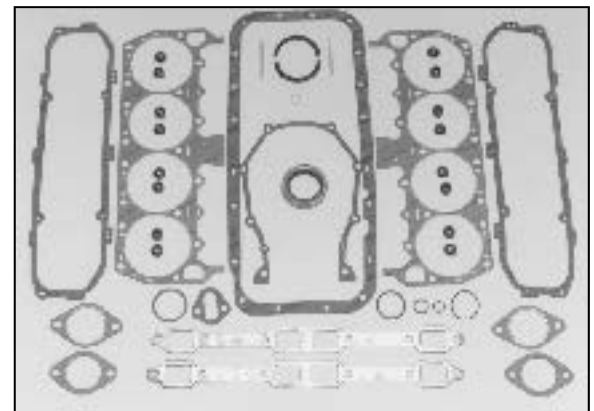


5.9L Magnum

Description	Part Number
5.9L 360ci 1997 only Factory Mopar gasket set includes new torque-to-yield intake bolts	3018
5.9L 360ci 1998-2002 Factory Mopar gasket set includes new torque-to-yield intake bolts	3019
360ci 1981-1996 Standard Fel-Pro gasket set	Call for price
360ci 1981-1996 Racing Fel-Pro gasket set	Call for price

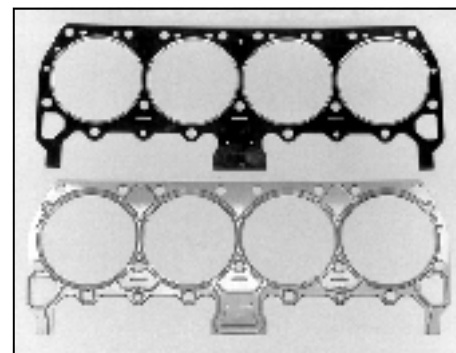
Big Block

361ci - 413ci	CALL
383 - 400 - 426W - 440ci Standard Fel-Pro (does not include intake manifold gasket) main pieces included:	3014
3108 head gaskets 3418 oil pan gasket 3312 exhaust gaskets 3524 valve cover gaskets	
383 - 400 - 426W - 440ci Racing Fel-Pro (partial set) Set includes the remainder of gaskets needed to assemble a complete engine. This set must be used with the individual racing head gaskets, intake gaskets, exhaust gaskets and valve cover gaskets.	3016



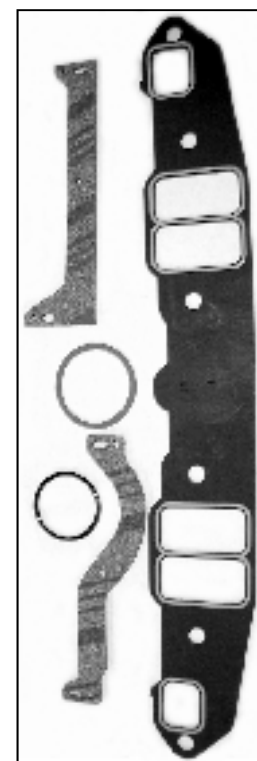
Head gaskets

<u>Description</u>	<u>Bore size</u>	<u>Compressed Volume</u>	<u>Thickness</u>	<u>Part Number</u>
Small Block	273ci - 318ci 1964-1990 and 340ci - 360ci 1968-1992			
Standard Fel Pro	4.180"	12.136cc	.054"	3102
Standard Mopar Performance	4.140"	5.73cc	.026"	3103
Racing Fel Pro	4.180"	8.77cc	.039"	3104
Racing Detroit	4.149"	8.63cc	.039"	3105
318ci 1991-1997 Magnum truck 360ci 1993-1997 Magnum truck				
Standard Fel Pro	4.172"	12.096cc	.054"	3106
Cometic multiple layer steel	4.100"	8.90cc	.040"	3107
Big Block	361 - 383 - 400 - 413 - 426W - 440ci			
Standard Fel Pro	4.410"	11.01cc	.044"	3108
Racing McCord	4.465"	10.70cc	.042"	3110
Racing Fel Pro	4.410"	9.76cc	.039"	3112
Racing Fel Pro (oversize bore)	4.540"	13.70cc	.051"	3113
Steel shim (use with Hylomar)	4.440"	5.07cc	.020"	3116
Cometic multiple layer steel	4.410"	10.40cc	.040"	3117



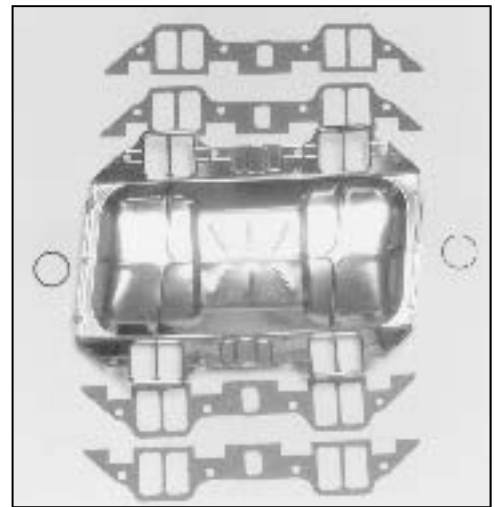
Intake gaskets

<u>Description</u>	<u>Port size and thickness</u>	<u>Part Number</u>
Small Block		
273ci 1964-1965		
Standard Fel Pro set (composition over steel core)	1.05" x 2.03" x .040"	3202
273ci 1966-1969		
Standard Fel Pro set (composition over steel core)	1.05" x 2.03" x .040"	3204
273ci 1966-1969		
Racing Fel Pro set (composition with Printoseal and blocked water cross-over)	1.05" x 2.03" x .060"	3206
318ci 1967-1990 340ci 1968-1973 360ci 1971-1988		
Standard Fel Pro set (steel core) 2 bbl heads	1.05" x 2.03" x .040"	3204
(composition over steel core) 4 bbl heads	1.14" x 2.24" x .040"	3208
Racing Fel Pro set (composition with Printoseal and blocked water cross-over) 2 bbl heads	1.05" x 2.08" x .060"	3206
4 bbl heads	1.16" x 2.27" x .060"	3210
318ci 1991 Magnum truck		
Standard Fel Pro set (composition over steel core)		3212
318ci 1992 - 1998 Magnum truck 360ci 1993 - 1998 Magnum truck (composition over steel core)		
Standard Fel Pro set, includes plenum plate gasket	1.15" x 2.14" x .054"	3214
Mopar Performance set, includes new TTY intake bolts	1.15" x 2.14" x .049"	3205
Mopar plenum gasket only V6		3201
Mopar plenum gasket only V8		3203



Intake gaskets

<u>Description</u>	<u>Port size and thickness</u>	<u>Part Number</u>
Small Block continued		
360ci 1989 - 1992		
Standard Fel Pro set (composition over steel core)		3216
W-2 heads up to 1991		
Mopar Performance .030" thick (composition type)		3218
Mopar Performance .045" thick (composition type)		3220
Mopar Performance .060" thick (composition type)		3222
Big Block		
LB - 383 - 400ci		
Standard Fel Pro set (steel bathtub type with open crossover)	1.23" x 2.27" x .014"	3250
Racing Fel Pro set (steel bathtub type with blocked crossover and 1/32" thick paper facings)	1.23" x 2.27" x .014"	3252
Paper facings only (4)	1.23" x 2.27" x 1/32"	3254
RB - 413 - 426W - 440ci		
Standard Fel Pro set (steel bathtub type with open crossover)	1.23" x 2.27" x .014"	3256
Racing Fel Pro set (steel bathtub type w/blocked crossover and 1/32" thick paper facings)	1.23" x 2.27" x .014"	3258
Paper facings only (4)	1.23" x 2.27" x 1/32"	3254
Mr. Gasket Ultra Seal (blocked crossover and anti-stick graphite coating)		
Paper facings only (2)	1.18" x 2.24" x 1/16"	3260



Exhaust gaskets



<u>Description</u>	<u>Port size</u>	<u>Part Number</u>
Small Block		
273ci		
Standard Fel Pro set (High temp fiber w/perforated steel core)	1.14" x 1.87"	3302
Racing Fel Pro (High temp fiber w/perforated steel core and anti-stick coating)	1.14 x 1.59"	3304
318ci		
Standard Fel Pro set (High temp fiber w/perforated steel core)		
1967 - 1974	1.14" x 1.87"	3302
1975 - 1991	1.19" x 1.87"	3306
1992 - 1999 Magnum truck	1.19" x 1.87"	3308
318ci		
Racing Fel Pro header gaskets (High temp fiber w/perforated steel core and anti-stick coating)		
2 bbl heads	1.14" x 1.59"	3304
4 bbl heads	1.25" x 1.75"	3310
340ci 1968 - 1973		
360ci 1971 - 1992		
Standard Fel Pro set (High temp fiber w/perforated steel core)	1.19" x 1.87"	3306
Racing Fel Pro (High temp fiber w/perforated steel core and anti-stick coating)	1.25" x 1.75"	3310
W-2 Race Mopar Performance (High temp fiber)	1.43" x 1.43"	3309
360ci 1993 - 1999 Magnum truck		
Standard Fel Pro set (High temp fiber w/perforated steel core)	1.19" x 1.87"	3308
Mopar Performance set (High temp fiber)	1.19" x 1.87" x 0.115" thick	3311

Exhaust gaskets

<u>Description</u>	<u>Port size</u>	<u>Part Number</u>
Big Block		
361 - 383 - 400 - 413 - 426W - 440ci Standard Fel Pro set (High temp fiber w/perforated steel core)	1.20" x 1.67"	3312
Racing Fel Pro (High temp fiber w/perforated steel core and anti-stick coating)	1.33" x 1.84"	3314
Racing embossed copper header gaskets	1.48" x 1.70"	3316

Oil pan gaskets

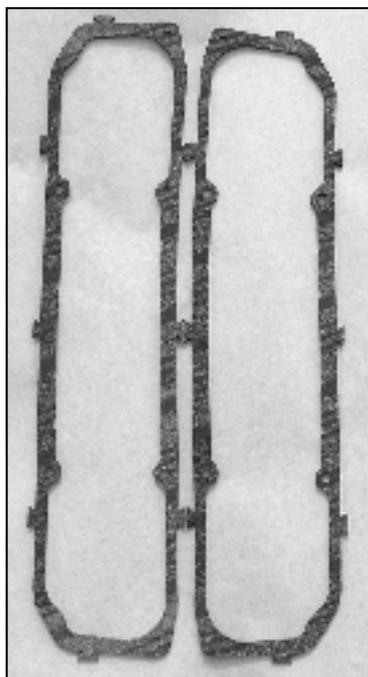
<u>Description</u>	<u>Material</u>	<u>Part Number</u>
Small Block		
273 - 318ci 1964-1969 Standard Fel Pro set (3 piece)	cork-rubber	3402
Racing Fel Pro set (3 piece)	rubber-fiber	3404
318 - 340ci 1970-1991 Standard Fel Pro set (3 piece)	cork-rubber	3406
Racing Fel Pro set (3 piece)	rubber-fiber	3408
318ci 1992-1998 Magnum Standard Fel Pro set (1 piece)	molded rubber with steel core	3410
360ci 1971-1992 Standard Fel Pro set (3 piece)	cork-rubber	3412
Racing Fel Pro set (3 piece)	rubber-fiber	3416
360ci 1993-1999 Magnum Standard Fel Pro set (1 piece)	molded rubber with steel core	3414
Big Block		
361 - 383 - 400 - 413 - 426W - 440ci Standard Fel Pro set (3 piece)	cork-rubber	3418
Racing Fel Pro set (3 piece)	rubber-fiber	3420



When using a windage tray, we recommend using one gasket only. Place the gasket between the oil pan and the windage tray. Use a small bead of silicone seal between the block and the windage tray.



Valve cover gaskets



<u>Description</u>	<u>Material</u>	<u>Part Number</u>
Small Block		
273ci - 318ci 1967-1991	340ci 1968-1973	360ci 1971-1992
Standard Fel Pro set	rubber	3502
	cork	3504
	rubber-fiber	3506
Racing Fel Pro set	cork-rubber (3/16" thick)	3508
	rubber (1/8" thick)	3510
	rubber-fiber (3/16" thick)	3512
	cork-rubber with steel core (5/16" thick)	3514
318ci 1992-1997		
360ci 1993-1997		
Standard Fel Pro set	molded rubber with steel core	3516
Big Block		
361ci 1958-early 1961, 4 bolt		
413ci 1959-early 1961, 4 bolt		
Standard Fel Pro set	rubber	3520
361ci late 1961-1971, 6 bolt		
383 - 400ci		
413ci late 1961-1965, 6 bolt		
426W - 440ci		
Standard Fel Pro set	cork	3522
	rubber	3524
	rubber-fiber	3526
Racing Fel Pro set (late 6 bolt only)	cork-rubber (3/16" thick)	3530
(late 6 bolt only)	rubber (1/8" thick)	3532
(late 6 bolt only)	rubber-fiber (3/16" thick)	3534

Rear main seals

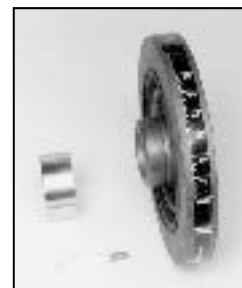
<u>Description</u>	<u>Material</u>	<u>Part Number</u>
Small Block		
273ci		
318ci 1957-2002		
340ci 1968-1973		
Pro-Fit high performance	2-piece fluoroelastomer	3604
360ci 1971-2002 LA and Magnum		
Pro-Fit high performance	2-piece fluoroelastomer	3606
Big Block		
361ci late 1963-1971		
383 - 400ci		
413ci late 1963-1965		
426W - 440ci		
Pro-Fit high performance	2 piece fluoroelastomer	3612



Harmonic Balancer Sleeve Kit

If your balancer has a groove worn in it where the seal rides (and most do), the front timing cover seal may leak. This kit includes a thin chrome plated sleeve and sealer. The sleeve can be pressed over the snout of the damper and a standard front seal can be used.

All Big Block V8 wedge engines	2122
All Small Block V8 wedge engines	2124



Valve stem seals

- Full, metal clad outer shell
- Ultra blend fluoroelastomer (commonly known as Viton®) sealing material
- Fluoroelastomer rubber seal ID which provides worry free seal retention to the valve guide boss and also controls oil creep
- Low drag single lip wiper with low tension stainless garter spring to control seal lip throughout valve motion
- Unlike Teflon® ('PC' style seals), Viton® material stays soft, flexible and offers excellent abrasion resistance
- Viton® material will perform well at 400° F continuously and will live with intermittent temperatures up to 550° F
- Available in 4 valve stem sizes
- Available in 6 guide boss sizes
- A protective valve stem sleeve for use during installation is provided with complete sets of seals
- Either tap in place with a deep well socket or twist on by hand with light oil on the valve guide
- Sold each

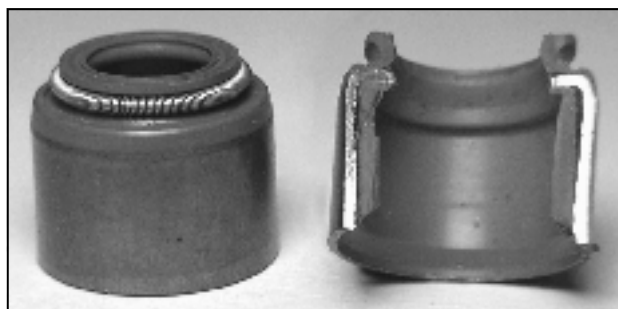


7mm valve stems	Part number
.465" guide diameter	3801

5/16" valve stems	Part number
.415" guide diameter	3802
.500" guide diameter	3804
.530" guide diameter	3806

1 1/32" valve stems	Part number
.500" guide diameter	3808
.530" guide diameter	3810
.562" guide diameter	3812

3/8" valve stems	Part number
.500" guide diameter	3814
.530" guide diameter	3816
.562" guide diameter	3818
.625" guide diameter	3820

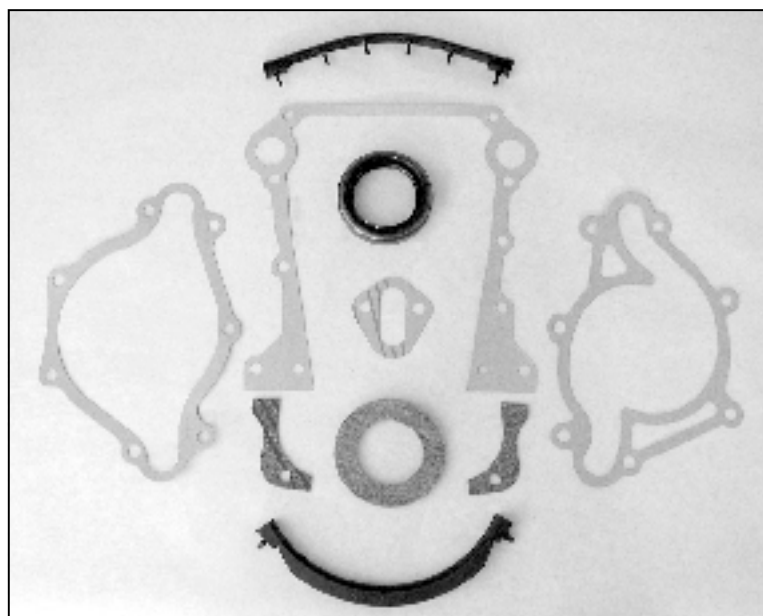


All valve stem seals must be installed with the protective sleeves and the proper installation tools. Failure to use the protective sleeve may result in tearing of the seal. Valve spring shims or cups should be installed before the seals are installed. Valve stem seals should never be reused. The failure rate of re-used seals is very high.

Timing cover gasket sets

Contains all parts necessary to replace the timing cover.

Description	Part Number
Small Block	
273ci, 318ci 1957-1991 LA	
340ci 1968-1973	
360ci 1971-1992 LA	
Standard Fel Pro set	3002
Cover gasket only	3005
318ci 1992-2002 Magnum	
360ci 1993-2002 Magnum	
Standard Fel Pro set	3003
Cover gasket only	3005
Big Block	
361ci late 1963-1971	
383 - 400ci	
413ci late 1963-1965	
426W - 440ci	
Standard Fel Pro set	3001
Cover gasket only	3007



Small Block Intake Manifolds

340-360 Engines (not for use on 318 cylinder heads unless otherwise noted)

Edelbrock Performer (low rise dual plane):

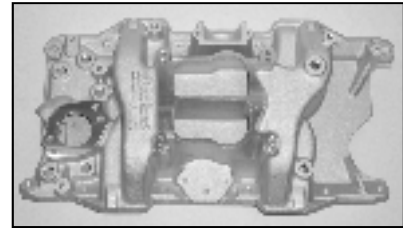
OK for use with 318 heads/ports, works best with the HEH0515AL, HEH1019AL, HEH1523AL, HEH1923AL, and HEH2328AL hydraulic camshafts. This intake manifold has 318 sized intake ports. When using it with 340 or 360 cylinder heads, it **must** be port matched to achieve proper alignment.

Part number: **5304**

Deep port match this intake manifold

Part number: **i321** (Labor only on Hughes Engines supplied manifold)

Part number: **i324** (Labor only on customer supplied manifold)



Edelbrock Performer RPM (high rise dual plane):

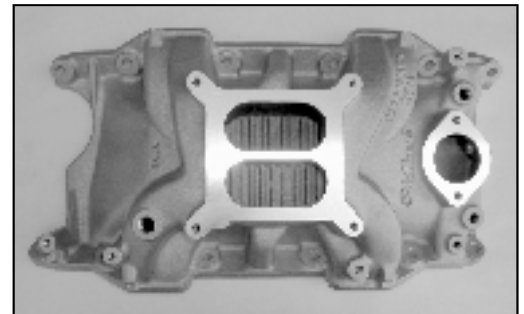
This intake works best with the HEH2832AL, HEH3237AL, HEH3742AL, HEH4246AL, and HEH4650AL hydraulic camshafts. Good solid camshaft choices are the HTL3742AS, HTL4248AS, HTL4652AS, HTL4852AS and HTL5256AS.

Part number: **5302**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Edelbrock Performer RPM Air Gap (high rise dual plane):

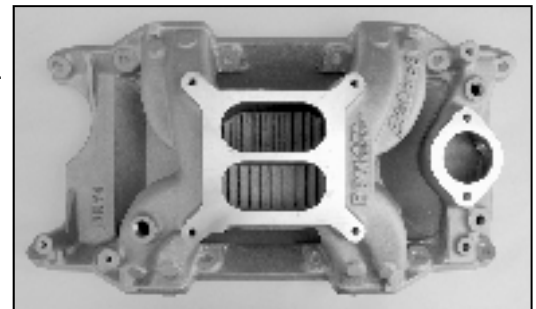
This intake is similar to the Performer RPM but it has no heat cross-over and works best for race track operation. Use with the same camshafts as the Performer RPM listed above. Warning, without a heat cross-over throttle plate freezing can be encountered at lower ambient temperatures.

Part number: **5303**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Edelbrock Torker II (single plane):

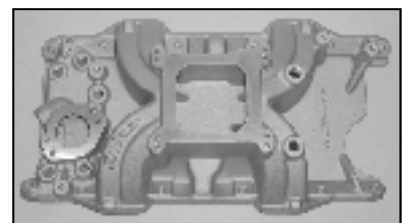
Use this intake in place of the Performer RPM and Air-Gap intakes for a slightly higher RPM range. Camshaft choices are similar also. It works well with the HEH2832AL, HEH3237AL, HEH3742AL, HEH4246AL, and HEH4650AL hydraulic camshafts. Good solid camshaft choices are the HTL3742AS, HTL4248AS, HTL4652AS, HTL4852AS and HTL5256AS.

Part number: **5306**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



340-360 Engines (not for use on 318 cylinder heads unless otherwise noted)

Edelbrock Victor 340 (high rise single plane):

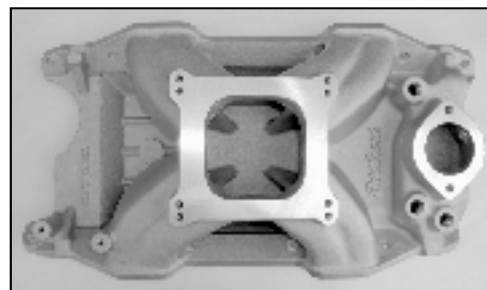
This intake is best paired with our hydraulic grinds HEH4650AL, HEH5055AL, HEH5561AL and our solid camshafts HTL5256AS and larger.

Part number: **5308**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Mopar Performance M1 (single plane):

Similar to the Victor 340, this manifold is best paired with our hydraulic grinds HEH4650AS and larger hydraulic camshafts. Use with our solid camshafts HTL5256AS and larger. Note: See page 86 for modifications to this manifold.

Part number: **5300**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Weiland Action Plus (low rise dual plane):

OK for use with 318 heads/ports, works best with the HEH0515AL, HEH1019AL, HEH1523AL, HEH1928AL and HEH2328AL hydraulic camshafts. When using it with 340 or 360 cylinder heads, it **must** be port matched to achieve proper alignment.

Part number: **5310**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Weiland Stealth (high rise dual plane):

This intake works best with the HEH2832AL, HEH3237AL, HEH3742AL, HEH4246AL and HEH4650AL hydraulic camshafts. Good solid camshaft choices are the HTL3742AS, HTL4248AS, HTL4852AS and HTL5256AS.

Part number: **5312**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



340-360 Engines (not for use on 318 cylinder heads unless otherwise noted)

Weiand X-Celerator (single plane):

This intake is best paired with our hydraulic grinds HEH3742AL, HEH4246AL, HEH4650AL, HEH5055AL, HEH5561AL and our solid camshafts HTL4652AS and larger.

Part number: **5314**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Custom intake manifold modifications

(These prices are labor only and based on a Hughes Engines supplied intake)

Mopar Performance M1 single plane modifications:

This modification changes the shape and volume of the plenum to work best with the Holley carburetors. It also includes deep port matching of the runners themselves. Approximately 18HP to 22HP gain on a 360ci at 5000RPM over a standard intake. These modifications make this the most powerful intake available for Small Block Mopars.

Part number: **i350**

Edelbrock Performer, Performer RPM and Air-Gap modifications:

This modification changes the shape and finish of the plenum area to aid in air flow and fuel distribution. It also includes port matching of the runners. Approximately 8HP to 12HP gain over a standard intake.

Part number: **i356**

Septum modifications (any aluminum intake):

The septum (wall) in the plenum is cut down to increase the top end power.

Part number: **i325**

Factory, cast iron intake modifications:

For use with performance/restoration engine combinations. Includes plenum modifications and port matching.

Part number: **i358**



Drill and tap Magnum heads for LA intake manifold bolt pattern (dual pattern)

Part Number: LA-DRL

Mopar Performance 2bbl Magnum Truck intake:

Works best with camshafts of 223° duration @ 0.050" and larger, vehicles under 4000lbs. Power from 3400RPM and up.

Part number: **5520** (intake only)

5518 (installation kit)



3.9L/5.2L/5.9L Magnum Intake Manifolds



You cannot tell from the outside appearance, but this stock looking manifold is milled, filled and ported. So what, you may ask. Porting is easy.

For those of you with our Stage I, Stage II or Stage III throttle bodies or our ported Magnum heads, the intake manifold is the next restriction in the system. We modify the intake with porting and extended port matching (not gasket matched....there is a difference). This extended port matching eliminates the bottleneck of the original intake and matches the ports to our Stage I and Stage II Magnum heads. This means the intake can now supply all the air the heads can handle. The milling refers to the port runners being cut to a shorter length. This tunes the intake ram length to a higher RPM and the boost in cylinder filling will move up in the RPM range, which more

closely matches the power ranges of performance cams, ported cylinder heads and larger throttle bodies.

Filling the plenum area creates a stronger vacuum signal to the fuel injection. This manifold is the next step in increasing the power potential of all Magnum engines from towing to Hot Street performance engines.

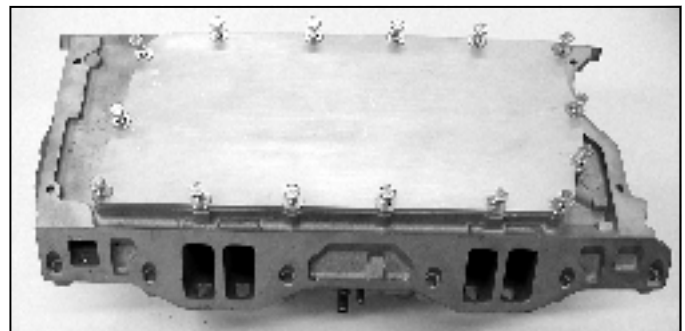
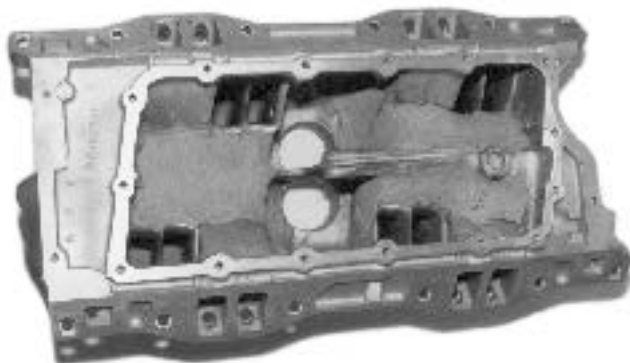
The intake is supplied with a 1/4" thick aluminum, billet plenum cover plate installed to help prevent blowing the gasket out. When ordering, please specify casting number or year and whether the intake has the EGR attachment.

Stage I (approximately 14" runner length) This is best choice for heavy trucks and/or towing

Engine size	Part number with billet plenum cover installed
5.2L/5.9L V8	5514-R
3.9L V6	5516-R

Stage II (approximately 12" runner length) For use on engines with Hot Street cams

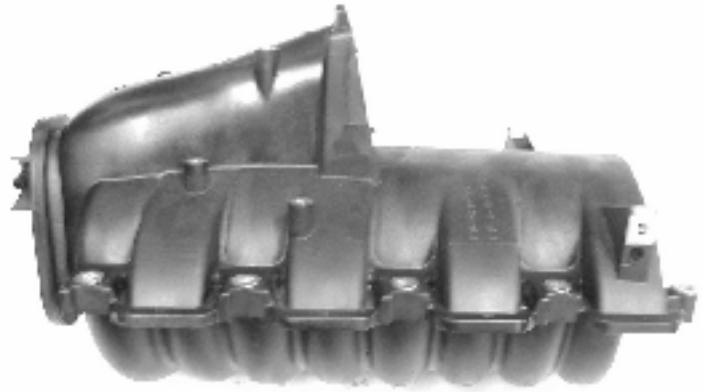
Engine size	Part number with billet plenum cover installed
5.2L/5.9L V8	5515-R
3.9L V6	5517-R



4.7L Magnum Intake Manifolds

These are stock exterior intakes that are internally modified to flow more air to the cylinders. The runners are shorter than the HO manifold to provide an increased ram effect at higher RPM. These work well with our HER 4700T camshaft, Stage I throttle bodies and HP Ported cylinder heads. Sold on an exchange basis.

Part number: 5519 (factory HO)
5521 (modified)



Intake plenum cover kit

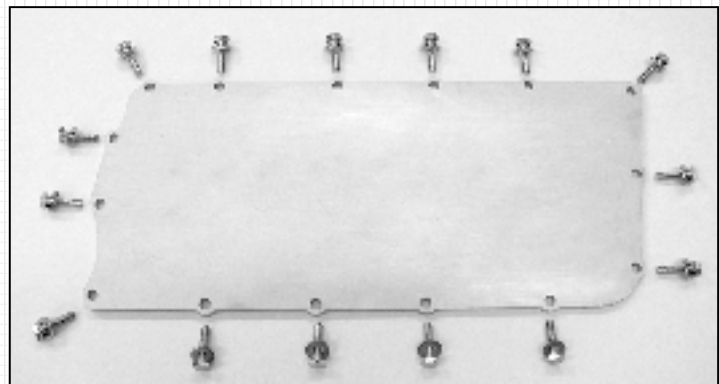
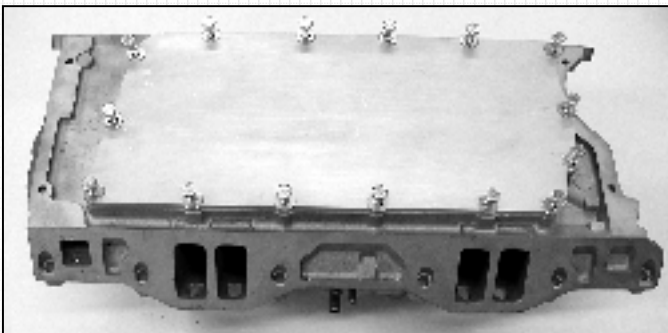
Tired of the gasket blowing out on your plenum cover? Don't want to weld the cover to the intake? Worried about turning up the boost on your supercharger? This is the answer. This kit will replace the plenum plate with a one piece, high strength, 1/4" thick aluminum plate. It is supplied with all new, Grade 8 fasteners, new plenum gasket and detailed instructions. No factory fasteners are reused.

3.9L Magnum engines using the factory barrel type intake

Part number: 7712

5.2L/5.9L Magnum engines using the factory barrel type intake

Part number: 7714

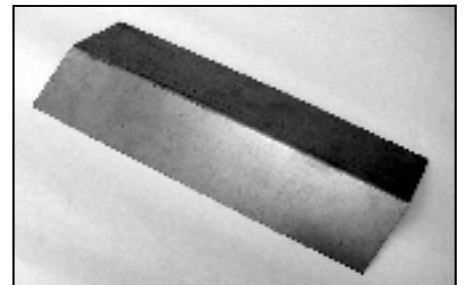


Plenum cover oil shield

This shield can be tack welded to your OEM plenum cover to The oil shield keeps hot engine oil off the intake manifold, helping to reduce intake charge temperatures.

5.2L/5.9L Magnum engines using the factory barrel type intake

Part number: 5521



361-383-400 Engines

Edelbrock Performer 383 (low rise dual plane):

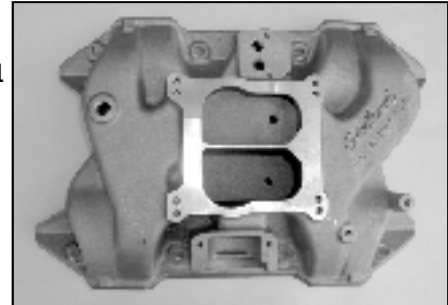
This intake works best with the HEH0515BL, HEH1019BL, HEH1523BL, HEH1928BL and HEH2328BL hydraulic camshafts.

Part number: **5454**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Edelbrock Performer RPM 383 (high rise dual plane):

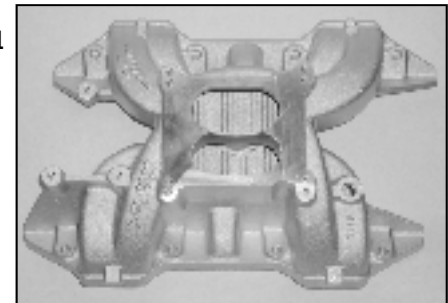
This intake works best with the HEH2832BL, HEH3237BL, HEH3742BL, HEH4246BL and HEH4650BL hydraulic camshafts. Good solid camshaft choices are the HTL3742BS, HTL4248BS, HTL4652BS and HTL4852BS.

Part number: **5452**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Edelbrock Torker 383 (low rise single plane):

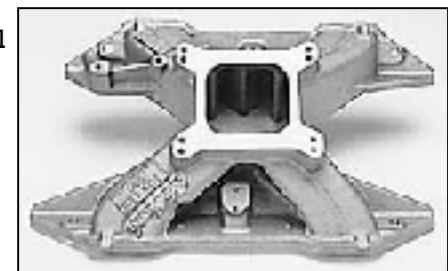
Use this intake in place of the Performer RPM when hood clearance is a problem. Offers a slightly higher RPM range. Camshaft choices are similar also. It works well with the HEH2832BL, HEH3237BL, HEH3742BL, HEH4246BL and HEH4650BL hydraulic camshafts. Good solid camshaft choices are the HTL3742BS, HTL4248BS, HTL4652BS, HTL4852BS and HTL5256BS.

Part number: **5456**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Mopar Performance M1 (single plane):

This manifold is best paired with our hydraulic grinds HEH4650BL and larger. Use our solid camshafts HTL4852BS and larger.

Part number: **5450**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



361-383-400 Engines

Weiland Action Plus (low rise dual plane):

This intake works best with the HEH0515BL, HEH1019BL, HEH1523BL, HEH1928BL and HEH2328BL hydraulic camshafts.

Part number: **5458**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Edelbrock Victor 383 (high rise single plane):

This high rise intake is best suited for use with our hydraulic grinds HEH4650BL and larger. Use our solid camshafts HTL5256BS and larger.

Part number: **5462**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



413-426W-440 Engines

Edelbrock Performer 440 (low rise dual plane):

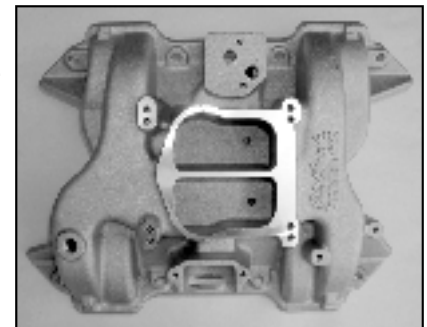
This intake works best with the HEH0515BL, HEH1019BL, HEH1523BL, HEH1928BL and HEH2328BL hydraulic camshafts.

Part number: **5412**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Edelbrock Performer RPM 440 (high rise dual plane):

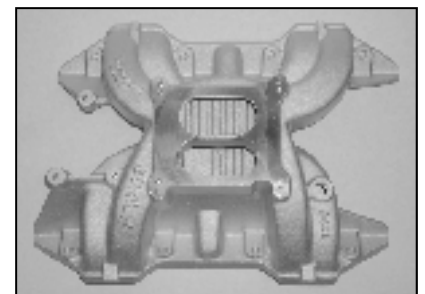
This intake works best with the HEH2832BL, HEH3237BL, HEH3742BL, HEH4246BL and HEH4650BL hydraulic camshafts. Good solid camshaft choices are the HTL3742BS, HTL4248BS, HTL4652BS and HTL4852BS.

Part number: **5400**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



413-426W-440 Engines

Edelbrock Torker II 440 (low rise single plane):

Use this intake in place of the Performer RPM when hood clearance is a problem. Offers a slightly higher RPM range. Camshaft choices are similar also. It works well with the HEH2832BL, HEH3237BL, HEH3742BL, HEH4246BL and HEH4650BL hydraulic camshafts. Good solid camshaft choices are the HTL3742BS, HTL4248BS, HTL4652BS, HTL4852BS and HTL5256BS.

Part number: **5414**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Edelbrock Victor 440 (high rise single plane):

This high rise intake is best suited for use with our hydraulic grinds HEH4650BL and larger. Use our solid camshafts HTL5256BS and larger.

Part number: **5415**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Mopar Performance M1 (single plane):

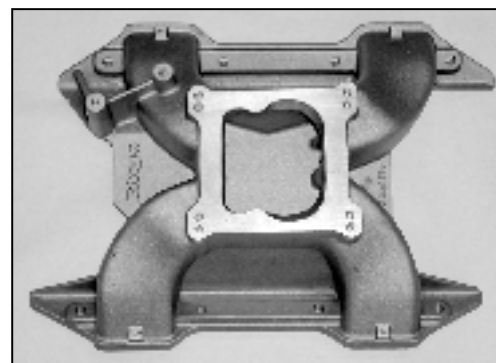
This manifold is best paired with our hydraulic grinds HEH4650BL and larger. Use our solid camshafts HTL4852BS and larger.

Part number: **5410**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



Weiland Action Plus (low rise dual plane):

This intake works best with the HEH0515BL, HEH1019BL, HEH1523BL, HEH1928BL and HEH2328BL hydraulic camshafts.

Part number: **5418**

Deep port match this intake manifold

Part number: **i320** (Labor only on Hughes Engines supplied manifold)

Part number: **i323** (Labor only on customer supplied manifold)



413-426W-440 Engines

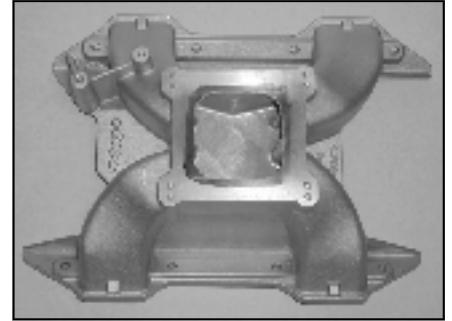
Custom intake manifold modifications

(These prices are labor only and based on a Hughes Engines supplied intake, add \$20.00 if you supply the intake manifold)

Mopar Performance M1 single plane modifications:

This modification changes the shape and volume of the plenum to work best with the Holley carburetors. It also includes deep port matching of the runners themselves. Approximately 15HP to 25HP gain on a 600HP+ applications when compared to a standard intake. The dyno shows more torque and horsepower than an Edelbrock dual plane intake, check our web site for more details.

Part number: **i350**



Edelbrock Performer and Performer RPM modifications:

This modification changes the shape and finish of the plenum area to aid in air flow and fuel distribution. It also includes port matching of the runners. Approximately 8HP to 12HP gain over a standard intake.

Part number: **i356**

Septum modifications (any aluminum intake):

The septum (wall) in the plenum is cut down to increase the top end power.

Part number: **i325**

Factory, cast iron intake modifications:

For use with performance/restoration engine combinations. Includes plenum modifications and port matching.

Part number: **i358**



Hydraulic Lifters



Original equipment replacement lifters

Small Block engines 1968 to 1986
 Big Block engines 1968 to 1978

Note: This lifter is an oil metering type. It can be used in engines that oil through the pushrods. It can be used in engines prior to 1968 if custom length pushrods are used. See page 80 for details on custom pushrods.

Part number: **5001**



If you are converting an OEM roller lifter engine 1987-1991 to a conventional flat tappet camshaft use P/N 5001 or 5003, along with the proper length pushrods. Do not fill or pump up hydraulic lifters before assembly. They may hold the valves open causing difficult starting and/or engine damage.

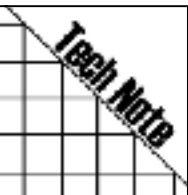
Racing hydraulic lifters

for use with an adjustable valve train

Small Block engines 1964 to 1986
 Big Block engines 1958 to 1978

Note: This lifter is an oil metering type. It can be used in engines that oil through the pushrods. Type of retaining ring may vary from photo.

Part number: **5003**



Any tappet adjusted to .000" preload will operate as an "anti-pump up" lifter. However, when using a lifter with a small wire retaining ring such as OEM lifter (shown as #5001), there is a higher probability of the retainer ring failing with this lack of pre-load. Anytime maximum RPM is necessary and a minimum tappet preload or lash is used, racing lifters with heavy duty retaining rings (#5003) are strongly suggested.

Hydraulic Roller Lifters

Magnum and late LA stock replacement with oil metering

Note: For use in Magnum blocks only.

Part number: **5006** (as shown in photo)

Small Block retro-fit for use in LA blocks. Sets include link bars.

Part number: **5008**

Big Block retro-fit for use in B and RB blocks. Sets include link bars.

Part number: **5009**



Solid Lifters



Solid lifters for use with an adjustable valve train and flat tappet (mechanical) camshafts. 123g each.

Small Block engines 1964 to 1986
Big Block engines 1958 to 1978

Part number: **5010**



Lightweight, racing solid lifters for use with an adjustable valve train and flat tappet (mechanical) camshafts. This design is for serious competition and maximum performance. Lighter lifters allow for quicker revving engine. These are an excellent choice for use with our Maximum Velocity series of camshafts. 88g each.

Small Block engines 1964 to 1986
Big Block engines 1958 to 1978

Part number: **5011**

Special solid lifters for Small Block and Big Block engines that oil the rocker arms/shafts through the pushrods.

Part number: **5012**



OEM style, dumbbell shaped mechanical tappet. For use in 273ci and slant '6' style engines only. Use in engines other than these may cause the oil passages to become uncovered, losing oil pressure. If lifter bores are sleeved, this lifter can be used. Lightweight design.

Part number: **5014**

Solid Roller Lifters

Mechanical type roller tappets for racing camshafts. Vertical link bar design. These are solid wall type and do not require "tubing" of the oil galley or sleeving of the lifter bores.

Small Block engines (will require lifter valley relieving for clearance)
Standard rocker arm oiling (through the block and heads)

Part number: **5102**

Rocker arm oiling through the pushrods

Part number: **5103**

Big Block engines

Part number: **5100**



340ci Stage I long block assembly Pump premium gas – 420HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Square deck cylinder block
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oil system modifications
- Factory forged crankshaft
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Dynamic balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ steel damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Modified, Speed-Pro® high volume oil pump
- Federal Mogul brass freeze plugs
- Block is primed and ready for paint
- Degree in camshaft
- Federal Mogul oil pump drive shaft
- Melling oil pump screen
- Fel-Pro® gasket set
- Hughes Engines hydraulic camshaft
HEH 3742AL .584"/.592" 237°/242° @ .050"
- Hughes Engines racing lifters
- Roller timing set, 9 keyway adjustable
- Mopar Performance windage tray
- Rear sump, factory oil pan

Connecting Rods

- Forged, I-beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts

Cylinder heads

- '587/'596/'915/'974 casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- HP Stage I porting
- 2.02"/1.625" stainless steel, one piece chrome stem racing valves
- Full set of bronze guide liners
- Hardened steel, single groove valve locks
- Chromoly valve spring retainers

Cylinder heads continued

- Hughes Engines racing valve springs
- Ultra-high temp, positive, Viton valve stem seals
- New carbo-nitrided rocker arm shafts with banana groove oil slots
- Aluminum, adjustable, roller tip, 1.6:1 rocker arms
- Billet steel rocker arm hold down set
- Custom length 4130 chromoly pushrods
- Mopar Performance aluminum valve covers
- Edelbrock Performer RPM Air-Gap dual plane intake manifold
- New factory head bolts
- Check intake manifold alignment and correct as needed

Assembly

- Long block is assembled complete with oil pan, timing cover, intake, and valve covers.

Part number: 10.2:1 CR 340LONG-S1

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a block, crank, '587/'596/'915/'974 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long block

- Clevite 77 engine bearings
- Weber clutches
- ATI, Pro/Race or Fluidampr balancers
- Weber lightweight aluminum or steel flywheels
- H-beam connecting rods
- Mask and paint engine
- Dyno test engine



360ci RV/Towing long block assembly Pump premium gas – 275HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoffTool stones
- Main bearing bores are align honed
- Square deck cylinder block
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oil system modifications
- Factory cast crankshaft
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Dynamic, internal balance crankshaft assembly
- New, SFI approved flexplate
- New OEM replacement damper
- File fit piston rings
- Sterling hypereutectic pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling oil pump
- Federal Mogul brass freeze plugs
- Block is primered and ready for paint
- Degree in camshaft
- Federal Mogul oil pump drive shaft
- Melling oil pump screen
- Fel-Pro® gasket set
- Hughes Engines hydraulic camshaft
HEH 1019AL .491”/.522” 210°/219° @ .050”
- Hughes Engines lifters
- Roller timing set, 9 keyway adjustable
- Mopar Performance windage tray
- Center sump, factory oil pan

Connecting Rods

- Forged, I-beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts

Cylinder heads

- '587/'596/'915/'974 casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- Racing 3 angle valve job
- 1.88”/1.60” OEM type stainless steel valves
- Full set of bronze guide liners
- Hardened steel, multiple groove valve locks
- Chromoly valve spring retainers
- Hughes Engines valve springs

Cylinder heads continued

- Ultra-high temp, positive, Viton valve stem seals
- Carbo-nitrided rocker arm shafts
- 6 pack heavy-duty rocker arms
- Custom length 4130 chromoly pushrods
- Mopar Performance aluminum valve covers
- Edelbrock Performer dual plane intake manifold
- New factory head bolts
- Check intake manifold alignment and correct as needed

Assembly

- Long block is assembled complete with oil pan, timing cover, intake, and valve covers.

Part number: 9.2:1 CR 360LONG-RV

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a block, crank, '587/'596/'915/'974 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long block

- Clevite 77 engine bearings
- Weber clutches
- ATI, Pro/Race or Fluidampr balancers
- Weber lightweight aluminum or steel flywheels
- H-beam connecting rods
- Mask and paint engine
- Dyno test engine



360ci Stage I long block assembly Pump premium gas – 450HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Square deck cylinder block
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oil system modifications
- Factory cast crankshaft
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Dynamic, internal balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ steel damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Custom high volume oil pump
- Brass freeze plugs
- Block is primed and ready for paint
- Degree in camshaft
- New oil pump drive shaft
- Fel-Pro® gasket set
- Hughes Engines hydraulic camshaft
HEH 3742AL .584"/.592" 237°/242° @ .050"
- Hughes Engines racing lifters
- Roller timing set, 9 keyway adjustable
- Crankshaft windage tray
- New center sump, factory oil pan and pickup

Connecting Rods

- Forged, I-beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts

Cylinder heads

- '587/'596/'915/'974 casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- HP Stage I porting
- 2.02"/1.625" stainless steel, one piece chrome stem racing valves
- Full set of bronze guide liners
- Hardened steel, single groove valve locks
- Chromoly valve spring retainers

Cylinder heads continued

- Hughes Engines racing valve springs
- Ultra-high temp, positive, Viton valve stem seals
- New, carbo-nitrided rocker arm shafts with banana groove oil slots
- Aluminum, adjustable, roller tip, 1.6:1 rocker arms
- Billet steel rocker arm hold down set
- Custom length 4130 chromoly pushrods
- Mopar Performance aluminum valve covers
- Edelbrock Performer RPM Air-Gap dual plane intake manifold
- New factory head bolts
- Check intake manifold alignment and correct as needed

Assembly

- Long block is assembled complete with oil pan, timing cover, intake, and valve covers.

Part number: 10.2:1 CR 360LONG-S1

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a block, crank, '587/'596/'915/'974 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long block

- Clevite 77 engine bearings
- Ported Edelbrock aluminum heads
- Weber clutches
- ATI, Pro/Race or Fluidampr balancers
- Weber lightweight aluminum or steel flywheels
- H-beam connecting rods
- Mask and paint engine
- Dyno test engine

Popular option with this long block

- With M1 intake, HEH4650AL cam, the specs are close to the Mopar Performance Magnum 380HP engine and we are close to 500HP.



360ci Stage II Street long block assembly Race/pump gas – 535HP

Cylinder block

- Same as the Stage I long block, but with following changes:
- Mopar Performance heavy-duty oil pump drive
- ARP main studs
- Stage II modified oil system
- Moroso 8 quart oil pan and screen
- Keith Black pistons
- Hughes Engines Max Velocity solid camshaft HTL 5660AS .614"/.626" 256°/260° @ .050"
- Pro/Race all steel, SFI approved damper
- ProGear billet timing set

Connecting Rods

- H-beam, billet, 4340 steel connecting rods with MSA chromoly steel rod bolts

Cylinder heads

- Same as the Stage I long block, but with following changes:
- HP Stage II porting
- Extruded aluminum, adjustable 1.6:1 rocker arms
- ARP head bolts
- Billet steel rocker arm hold down set
- Hughes Engines racing double valve springs
- Machined steel, single groove valve locks
- Edelbrock Victor 340 single plane intake manifold
- Port match intake manifold
- Mopar Performance wrinkle black, cast aluminum valve covers
- Fel-Pro® Racing head gaskets

Assembly

- Long block is assembled complete with the oil pan, intake manifold, and stock timing cover

Part number: 11.5:1 CR 360LONG-S2S

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a block, crank, '587/'596/'915/'974 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with the Small Block long blocks

- Clevite 77 engine bearings
- Ported Edelbrock aluminum heads
- Weber clutches
- ATI, or Fluidampr balancer
- Weber lightweight aluminum or steel flywheels
- H-beam connecting rods
- Lighten crankshaft
- Mask and paint engine
- Dyno test engine

360ci Stage II Race long block assembly Race gas – 585HP

Cylinder block

- Same as the Stage II long block, but with following changes:
- Diamond custom racing pistons
- Speed Pro plasma-moly, narrow, file fit rings
- Hughes Engines Maximum velocity solid camshaft HTL 7680AS .671"/.675" 276°/280° @ .050"
- Fel-Pro® Racing gasket set

Connecting Rods

- H-beam, billet, 4340 steel connecting rods with MSA chromoly steel rod bolts

Cylinder heads

- Same as the Stage II long block, but with following changes:
- Race pushrods
- Modified Mopar M1 single plane intake manifold

Assembly

- Long block is assembled complete with the oil pan, intake manifold, and stock timing cover

Part number: 13.5:1 CR 360LONG-S2R

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a block, crank, '587/'596/'915/'974 casting heads, and timing cover. We can supply these cores for an additional charge.



440ci RV/Towing long block assembly Pump premium gas – 385HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Blueprint oiling system
- Factory cast crankshaft
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Lighten and dynamic balance crankshaft assembly
- New flexplate
- New, BHJ steel damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- Federal Mogul brass freeze plugs
- Block is primed and ready for paint
- Federal Mogul oil pump drive shaft
- Melling oil pump screen
- Fel-Pro® gasket set
- Hughes Engines hydraulic camshaft
HEH 1019BL .461"/.498" 210°/219° @ .050"
- Degree in camshaft
- Hughes Engines hydraulic lifters
- Roller timing set, 9 keyway adjustable
- New center sump, factory oil pan
- Factory dipstick and tube
- Crankshaft windage tray
- Quick disconnect oil dipstick tube

Connecting Rods

- Magna-flux, shot blast, straighten, resize the connecting rods. Install new ARP 190,000psi racing rod bolts
- Equalize rod center-to-center length

Cylinder heads

- '452/'902 casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- Racing 3 angle valve job
- New, 2.08"/1.74" OEM type stainless steel valves
- Full set of bronze guide liners
- Hardened steel, multiple groove valve locks
- Chromoly valve spring retainers
- Hughes Engines valve springs

Cylinder heads continued

- Ultra-high temp, positive, Viton valve stem seals
- New rocker arm shafts
- 6 pack heavy-duty rockers
- Custom length 4130 chromoly pushrods
- Mopar Performance wrinkle black, cast aluminum valve covers
- New factory head bolts
- Weiand Action Plus intake manifold
- Check intake manifold alignment and correct as needed

Assembly

- Long block is assembled complete with oil pan, timing cover and intake.

Part number: 9.0:1 CR 440LONG-RV

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a 440 block, crank, rods, '452/'902 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long block

- Clevite 77 engine bearings
- Iron or aluminum adjustable 1.5 or 1.6 rocker arms
- Weber clutches
- H-beam, billet, 4340 steel connecting rods with MSA chromoly steel rod bolts
- ATI, Pro/Race or Fluidampr balancers
- Forged crankshaft
- Weber lightweight aluminum or steel flywheels
- Port match intake manifold
- Square deck cylinder block
- Mask and paint engine
- Dyno test engine



440ci Restoration long block assembly Pump premium gas – 425HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Square deck block
- Blueprint oiling system
- Factory cast crankshaft
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Lighten and internal, dynamic balance crankshaft assembly
- New flexplate
- New, BHJ steel damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- Federal Mogul brass freeze plugs
- Block is primered and ready for paint
- Degree in camshaft
- Federal Mogul oil pump drive shaft
- Fel-Pro® gasket set
- Hughes Engines hydraulic camshaft
HEH 2328BL .506"/.524" 223°/228° @ .050"
- Hughes Engines hydraulic lifters
- Roller timing set, 9 keyway adjustable
- New center sump, factory oil pan and pickup
- Factory dipstick and tube
- Crankshaft windage tray
- Quick disconnect oil dipstick tube

Connecting Rods

- Magna-flux, shot blast, straighten, resize the connecting rods. Install new ARP 190,000psi racing rod bolts
- Equalize rod center-to-center length

Cylinder heads

- '452/'902 casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- RV Porting on cylinder heads
- 2.14"/1.81" stainless steel, one piece chrome stem valves
- Full set of bronze guide liners
- Hardened steel, single groove valve locks

Cylinder heads continued

- Chromoly valve spring retainers
- Hughes Engines valve springs
- Ultra-high temp, positive, Viton valve stem seals
- New rocker arm shafts
- 6 pack heavy-duty rockers
- Mopar Performance wrinkle black, cast aluminum valve covers
- Custom length 4130 chromoly pushrods
- New, factory head bolts
- Weiand Action Plus intake manifold
- Check intake manifold alignment and correct as needed

Assembly

- Long block is assembled complete with oil pan, timing cover and intake.

Part number: 9.0:1 CR 440LONG-RESTO

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a 440 block, crank, rods, '452/'902 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long block

- Clevite 77 engine bearings
- Ported Edelbrock aluminum heads
- Iron or aluminum adjustable 1.5 or 1.6 rocker arms
- Weber clutches
- H-beam, billet, 4340 steel connecting rods with MSA chromoly steel rod bolts
- ATI, Pro/Race or Fluidampr balancers
- Forged crankshaft
- Weber lightweight aluminum or steel flywheels
- Port match intake manifold
- Square deck cylinder block
- Mask and paint engine
- Dyno test engine
- This combo can be ordered in a 400 block/440 crank (451ci stroker) configuration



440ci Stage I long block assembly Pump premium gas – 525HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Square deck cylinder block
- Install cam bearings, freeze plugs and distributor bushing
- Blueprint oiling system
- Factory cast crankshaft
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Lighten and internal, dynamic balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ steel damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- Federal Mogul brass freeze plugs
- Block is primed and ready for paint
- Notch top of cylinder bores to unshroud the valves
- Degree in camshaft
- Federal Mogul oil pump drive shaft
- Melling oil pump screen
- Fel-Pro® gasket set
- Hughes Engines hydraulic camshaft
HEH 3237BL .576"/.585" 232°/237° @ .050"
- Hughes Engines racing lifters
- Roller timing set, 9 keyway adjustable
- New center sump, factory oil pan
- Factory dipstick and tube
- Crankshaft windage tray
- Quick disconnect oil dipstick tube

Connecting Rods

- Magna-flux, shot blast, straighten, and resize the connecting rods. Install new ARP 190,000psi racing rod bolts
- Equalize rod center-to-center length

Cylinder heads

- '452/'902 type casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- HP Stage I porting
- 2.14"/1.81" stainless steel, one piece chrome stem racing valves
- Full set of bronze guide liners
- Hardened steel, single groove valve locks

Cylinder heads continued

- Chromoly valve spring retainers
- Hughes Engines racing valve springs
- Ultra-high temp, positive, Viton valve stem seals
- Aluminum, adjustable 1.6:1 rocker arms
- Carbo-nitrided rocker shafts with banana grooves
- Billet steel rocker arm hold down set
- Custom length 4130 chromoly pushrods
- Mopar Performance wrinkle black, cast aluminum valve covers
- New factory head bolts
- Edelbrock Performer RPM intake manifold
- Check intake manifold alignment and correct as needed
- Additional head milling to achieve maximum cylinder pressure with pump premium gasoline

Assembly

- Long block is assembled complete with oil pan, timing cover and intake.

Part number: 440LONGS1

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a 440 block, crank, rods, '452/'902 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long block

- Clevite 77 engine bearings
- Ported Edelbrock aluminum heads
- Weber clutches
- H-beam, billet, 4340 steel connecting rods
- Pro/Race or Fluidampr balancers (SFI approved)
- Forged crankshaft
- Weber lightweight aluminum or steel flywheels
- Port match intake manifold
- Mask and paint engine
- Dyno test engine
- This combo can be ordered in a 400 block/440 crank (451ci stroker) configuration
- Solid camshaft with lifter and spring kit. HTL 3742BS suggested. Approximately 16 HP and 20 ft-lbs torque increase



440ci Stage II long block assembly Pump premium gas – 553HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Square deck cylinder block
- Install cam bearings, freeze plugs and distributor bushing
- Modified “Hemi” style oil system
- Factory cast crankshaft
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Lighten and internal, dynamic balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ steel damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- Federal Mogul brass freeze plugs
- Block is primered and ready for paint
- Notch top of cylinder bores to unshroud the valves
- Degree in camshaft
- New, heavy-duty oil pump drive
- Melling oil pump screen
- Fel-Pro® gasket set
- Hughes Engines hydraulic camshaft
HEH 3742BL .585”/.592” 237°/242° @ .050”
- Hughes Engines racing lifters
- Roller timing set, 9 keyway adjustable
- New center sump, factory oil pan
- Factory dipstick and tube
- Crankshaft windage tray
- Quick disconnect oil dipstick tube

Connecting Rods

- H-beam, steel connecting rods, 6.760” length

Cylinder heads

- ‘452/’902 type casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- HP Stage II porting
- 2.14”/1.81” stainless steel, one piece chrome stem racing valves
- Full set of bronze guide liners

Cylinder heads continued

- Hardened steel, single groove valve locks
- Chromoly valve spring retainers
- Hughes Engines racing valve springs
- Ultra-high temp, positive, Viton valve stem seals
- Aluminum, adjustable 1.6:1 rocker arms
- Carbo-nitrided rocker shafts with banana grooves
- Billet steel rocker arm hold down set
- Custom length 4130 chromoly pushrods
- Mopar Performance wrinkle black, cast aluminum valve covers
- New factory head bolts
- Port matched M1 single plane intake manifold with modified plenum area and porting
- Check intake manifold alignment and correct as needed
- Additional head milling to achieve maximum cylinder pressure with pump premium gasoline

Assembly

- Long block is assembled complete with oil pan, timing cover and intake.

Part number: 440LONGS2

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a 440 block, crank, ‘452/’902 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long block

- Clevite 77 engine bearings
- Ported Edelbrock aluminum heads
- Weber clutches
- Pro/Race or Fluidampr balancers (SFI approved)
- Forged crankshaft
- Weber lightweight aluminum or steel flywheels
- Port match intake manifold
- Mask and paint engine
- Dyno test engine
- Solid camshaft with lifter and spring kit. HTL4650BS suggested. Approximately 18 HP and 18 ft-lbs torque increase
- Edelbrock Torker II intake when hood clearance is an issue
- This combo can be ordered in a 400 block/440 crank (451ci stroker) configuration

440ci Stage III long block assembly Race/pump gas – 602HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Square deck cylinder block
- Install cam bearings, freeze plugs and distributor bushing
- Modified “Hemi” style oil system
- Factory forged crankshaft
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Lighten and internal, dynamic balance crankshaft assembly
- New, SFI approved flexplate
- Pro/Race all steel, SFI approved damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- Federal Mogul brass freeze plugs
- Block is primered and ready for paint
- Notch top of cylinder bores to unshroud the valves
- Degree in camshaft
- New, heavy-duty oil pump drive
- Melling oil pump screen
- Fel-Pro® gasket set
- Hughes Engines hydraulic camshaft
HEH 5055BL .614”/.632” 250°/255° @ .050”
- Hughes Engines racing lifters
- Roller timing set, 9 keyway adjustable
- Hemi 6 quart or Moroso 8 quart oil pan and screen
- Factory dipstick and tube
- Crankshaft windage tray
- ARP main studs
- Quick disconnect oil dipstick tube

Connecting Rods

- H-beam, steel connecting rods, 6.760” length

Cylinder heads

- ‘452/’902 type casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- HP Stage II porting
- 2.14”/1.81” stainless steel, one piece chrome stem racing valves
- Full set of bronze guide liners

Cylinder heads continued

- Hardened steel, single groove valve locks
- Chromoly valve spring retainers
- Hughes Engines racing valve springs
- Ultra-high temp, positive, Viton valve stem seals
- Aluminum, adjustable 1.6:1 rocker arms
- Carbo-nitrided rocker shafts with banana grooves
- Billet steel rocker arm hold down set
- Custom length 4130 chromoly pushrods
- Mopar Performance wrinkle black, cast aluminum valve covers
- New factory head bolts
- Port matched Edelbrock Victor 440 single plane intake manifold
- Check intake manifold alignment and correct as needed
- Additional head milling to achieve maximum cylinder pressure with pump premium gasoline

Assembly

- Long block is assembled complete with oil pan, timing cover and intake.

Part number: 440LONGS3

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a 440 block, crank, ‘452/’902 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long block

- Clevite 77 engine bearings
- Ported Edelbrock aluminum heads
- Weber clutches
- Fluidampr balancer (SFI approved)
- Forged crankshaft
- Weber lightweight aluminum or steel flywheels
- Port match intake manifold
- Mask and paint engine
- Dyno test engine
- Solid camshaft with lifter and spring kit. HTL5660BS suggested. Approximately 20 HP and 20 ft-lbs torque increase
- Edelbrock Torker II intake when hood clearance is an issue
- This combo can be ordered in a 400 block/440 crank (451ci stroker) configuration

451ci Stage I long block assembly Pump premium gas – 525HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Blueprint oiling system
- Factory cast crankshaft with counterweights machined to fit 400 block
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Lighten and internal, dynamic balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ steel damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- New brass freeze plugs
- Block is primered and ready for paint
- Degree in camshaft
- New, oil pump drive shaft
- Fel-Pro® gasket set
- Hughes Engines hydraulic camshaft
HEH 3237BL .576"/.584" 232°/237° @ .050"
- Hughes Engines hydraulic, racing lifters
- Roller timing set, 9 keyway adjustable
- Crankshaft windage tray
- Square deck cylinder block
- New center sump, factory oil pan and pickup
- Factory dipstick and tube

Connecting Rods

- H-beam, steel connecting rods, 6.760" length

Cylinder heads

- '452/'902 type casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- HP Stage I porting
- 2.14"/1.81" stainless steel, one piece chrome stem racing valves

Cylinder heads continued

- Full set of bronze guide liners
- Hardened steel, single groove valve locks
- Chromoly valve spring retainers
- Hughes Engines racing valve springs
- Ultra-high temp, positive, Viton valve stem seals
- Aluminum, adjustable 1.6:1 rocker arms
- Carbo-nitrided rocker shafts with banana grooves
- Billet steel rocker arm hold down set
- Custom length 4130 chromoly pushrods
- Mopar Performance wrinkle black, cast aluminum valve covers
- New factory head bolts
- Edelbrock Performer RPM intake manifold
- Check intake manifold alignment and correct as needed
- Machine piston domes to clear heads
- Additional head milling to achieve maximum cylinder pressure with pump premium gasoline

Assembly

- Long block is assembled complete with the oil pan, timing cover and intake manifold

Part number: 451LONG-S1

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a 400 block, crank, '452/'902 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long blocks

- Clevite 77 engine bearings
- Ported Edelbrock aluminum heads
- Weber clutches
- Fluidampr or Pro/Race balancers
- Forged crankshaft
- Weber lightweight aluminum or steel flywheels
- Mask and paint engine
- Dyno test engine



451ci Stage II long block assembly Race/Pump gas – 605HP

Cylinder block

- Jet clean and prep cylinder block
- Magna-flux and inspect block for cracks
- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- ARP main studs
- Install cam bearings, freeze plugs and distributor bushing
- Modified “Hemi” style oil system
- Factory cast crankshaft with counterweights machined to fit 400 block
- Magna-flux, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Lighten and internal, dynamic balance crankshaft assembly
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- New brass freeze plugs
- Block is primered and ready for paint
- Notch top of cylinder bores to unshroud the valves
- Degree in camshaft
- New, heavy-duty oil pump drive
- Fel-Pro® gasket set
- Hughes Engines solid camshaft
HTL 5660BS .614”/.626” 256°/260° @ .050”
- Hughes Engines lightweight, racing solid lifters
- ProGear roller timing set, 9 keyway adjustable
- Crankshaft windage tray
- Square deck cylinder block
- Hemi 6 quart or Moroso 8 quart oil pan and screen
- New, SFI approved flexplate
- Pro/Race all steel SFI approved damper

Connecting Rods

- H-beam, steel connecting rods, 6.760” length

Cylinder heads

- ‘452/’902 casting heads with factory hardened exhaust valve seats
- Clean and magna-flux cylinder heads for cracks
- Pressure testing heads for coolant leaks and porosity
- HP Stage II porting
- 2.14”/1.81” stainless steel, one piece chrome stem racing valves

Cylinder heads continued

- Full set of bronze guide liners
- Machined steel, single groove valve locks
- Chromoly valve spring retainers
- Hughes Engines racing double valve springs
- Ultra-high temp, positive, Viton valve stem seals
- Carbo-nitrided rocker shafts with banana grooves
- Aluminum adjustable 1.6:1 rocker arms with steel spacers
- Custom length 4130 chromoly pushrods
- Mopar Performance wrinkle black, cast aluminum valve covers
- Billet steel rocker arm hold down set
- ARP head bolts
- Modified Mopar M1 single plane intake manifold
- Check intake manifold alignment and correct as needed
- Port match intake manifold
- Additional head milling to achieve desired CR
- Fel Pro® Racing head gaskets
- Machine piston domes to clear heads

Assembly

- Long block is assembled complete with the oil pan, timing cover and intake manifold

Part number: 11.8:1 CR 451LONG-S2

This part number includes engine start-up and break-in. It is also based on a customer supplied rebuildable core engine consisting of a 400 block, crank, ‘452/’902 casting heads, and timing cover. We can supply these cores for an additional charge.

Options available with this long blocks

- Clevite 77 engine bearings
- Ported Edelbrock aluminum heads
- Weber clutches
- ATI or Fluidampr balancers
- Forged crankshaft
- Weber lightweight aluminum or steel flywheels
- Mask and paint engine
- Dyno test engine

500ci Street/Strip and Racing long block assemblies

All assemblies include the following:

Cylinder block

- Deburr interior of the cylinder block
- Bore and hone block with stress plate
- Sonic test cylinder wall thickness
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- ARP main studs
- Square deck cylinder block
- Install cam bearings, freeze plugs and distributor bushing
- Modified "Hemi" style oil system
- 4.15" stroke, forged, internal balanced crankshaft
- New, SFI approved flexplate
- Pro/Race all steel SFI approved damper
- Diamond Racing forged pistons
- Moly piston rings
- File fit piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- New brass freeze plugs
- Block is primed and ready for paint
- Notch top of cylinder bores to unshroud the valves
- Degree in camshaft
- New, heavy-duty oil pump drive
- Deep, 8 quart oil pan and screen
- Fel-Pro® gasket set
- Roller timing set, 9 keyway adjustable
- Crankshaft windage tray
- Hughes Engines racing lifters

Stage I Long Block 611HP

- Cylinder pressures designed for premium pump gas
- Prepped Edelbrock aluminum cylinder heads
- Hughes Engines hydraulic camshaft
HEH 5055BL .614"/.632" 250°/255° @ .050"

Part number: 500LONG-1

Stage II Long Block 663HP

- Cylinder pressures designed for premium pump gas
- Stage II ported Edelbrock aluminum cylinder heads
- Steel, cross-bolted, center main caps
- Hughes Engines solid camshaft
HTL 6468BS .633"/.651" 264°/268° @ .050"

Part number: 500LONG-2

Stage III Long Block 727HP

- Custom, high compression pistons designed for racing gas
- Stage III ported Edelbrock aluminum cylinder heads
- Steel, cross-bolted, center main caps
- Hughes Engines solid camshaft
HTL 8287BS .680"/.687" 282°/287° @ .050"

Part number: 500LONG-3

Cylinder heads

- Edelbrock aluminum cylinder heads
- Chromoly valve spring retainers
- Custom length 4130 chromoly pushrods
- Ultra-high temp, positive, Viton valve stem seals
- Aluminum adjustable 1.6:1 rocker arms
- Billet steel rocker arm hold down set
- Hard chrome plated rocker shafts with banana grooves
- Hughes Engines racing valve springs
- Machined steel, single groove valve locks
- Mopar Performance wrinkle black, cast aluminum valve covers
- ARP head bolts
- Deep port match intake manifold
- Edelbrock Victor 440 single plane intake manifold

Connecting Rods

- H-beam, steel connecting rods, 6.760" length, 0.990" wrist pin

Assembly

- Long block is assembled complete. The engine is run- in, tested and inspected.

These part numbers are based on a customer supplied rebuildable 440 block. We can supply a block for an additional charge.

Options available with these long blocks

- Clevite 77 engine bearings
- Weber Street Twin clutches
- ATI or Fluidampr balancers
- Weber lightweight aluminum or steel flywheels
- Mask and paint engine
- Dyno test engine
- Build this engine using a 400 block



Street/ Strip Oil Pans



Part number 6110

Small Block

	<u>Part Number</u>
318ci - 340ci center sump 7" depth, 6 quart capacity (use screen #6901)	6103
318ci - 340ci center sump 10" depth, 8 quart capacity, painted black (use screen #6907)	6104
360ci center sump 7" depth, 6 quart capacity (use screen #6901)	6105
360ci center sump 10" depth, 8 quart capacity, painted black (use screen #6907)	6107

Big Block

All Big Blocks center sump 5.5" depth, slosh baffles, 6 quart capacity, (use screen #6910)	6110
Most Big Blocks center sump 7" depth, 7 quart capacity, painted black . For 3/8" inlets use screen #6919 and for 1/2" inlets use screen #6920	6112
Hemi pan, center sump, 4.75" depth, 6 quart capacity, primer gray paint. Use screen #6910, #6916, or #6918	6118



We suggest using Permatex #3662 sealer between the cylinder block and windage tray and one gasket between the windage tray and the pan.



Part number 6112

Drag Race Oil Pans

Small Block

360ci Rear sump 8.25" depth, 7 quart capacity, painted black, will not fit stock K-frame cars (use screen #6909)

- Features:
- Kicked-out sump area
 - Trap door baffling
 - Full-length uni-directional screened windage tray
 - Bolt in crankshaft scraper
 - Uses factory dipstick location

Part number

6120

360ci Rear sump 8.25" depth, 7 quart capacity, painted black, will not fit stock K-frame cars (use screen #6905)

- Features:
- Kicked-out sump area
 - Trap door baffling
 - 3/4-length uni-directional screened windage tray
 - Crankshaft scraper
 - Gold iridite coated

6121

Big Block

383-440ci Rear sump 6" depth, 6 quart capacity, painted black, will not fit stock K-frame cars, dry sump only

- Features:
- Screen (#6922) uses dual -12 AN pump inlets
 - Fabricated from 16 gauge steel
 - Trap door baffling
 - Full length uni-directional screened windage tray

6122

Windage trays:

Part Number

Windage trays are an inexpensive way to "free" horsepower. They prevent the crankshaft from pulling oil out of the pan and slowing down the crankshaft assembly. They also aid in stripping oil from the crankshaft assembly.

Small Blocks (not for use with Magnum truck oil pans)

Type 1 (includes replacement main bolts) 6501

Type 2 (use with #7404 stud kit, not included) 6503

Big Blocks

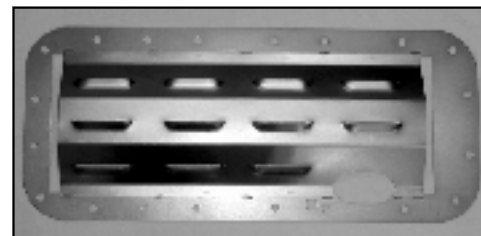
Standard (includes 2 oil pan gaskets) 6502

High Performance 6505

Stroker (for use with large stroke cranks) Milodon brand. 6506

Must be used with Milodon oil pump screen.

Stroker (for use with large stroke cranks) Mopar Performance brand 6507

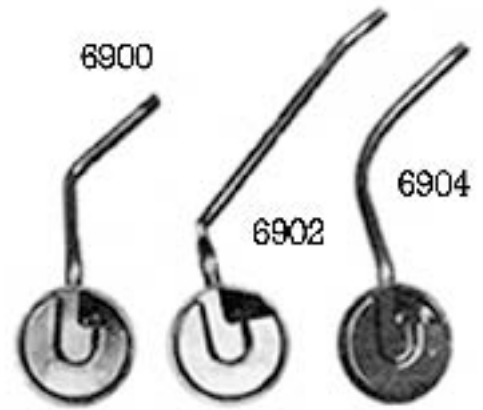


Part number 6605

Oil pump screens:

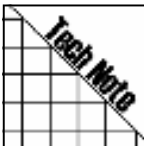
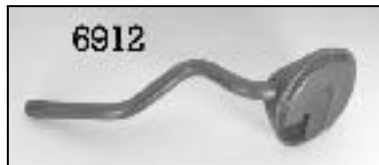
Small Block

	<u>Part Number</u>
Center sump, 3/8" inlet	6900
Center sump, 3/8" inlet, 340ci OEM pans	6901
Front sump, 3/8" inlet	6902
Rear sump, 3/8" inlet, 318/360 OEM Magnum truck pans	6903
Front sump, 3/8" inlet	6904
Rear sump, 3/8" inlet, use with #6121 pan	6905
Rear sump, 3/8" inlet	6906
Center sump, 3/8" inlet, for use with #6107 and #6104 oil pans	6907
Rear sump, 3/8" inlet, 360ci van OEM pans	6908
Rear sump, 3/8" inlet, for use with #6120 oil pan	6909



Big Block

		<u>Part Number</u>
383,440ci	Center sump, 3/8" inlet, 5 1/2" pan depth	6910
440ci	Center sump, 3/8" inlet, 5 1/2" pan depth	6912
440ci	Front sump, 3/8" inlet, 6 1/2" pan depth	6914
361-440ci	Center sump, 1/2" inlet, 5" pan depth (short) 'B' blocks	6916
361-440ci	Center sump, 1/2" inlet, 5" pan depth (long) 'RB' blocks	6918
361-440ci	Center sump, 3/8" inlet, 7" pan depth (fits pan #6112)	6919
361-440ci	Center sump, 1/2" inlet, 7" pan depth (fits pan #6112)	6920
361-440ci	Rear sump, -12 AN, 6" pan depth (fits pan #6122)	6922



The oil pump pick-up should be parallel to the bottom of the oil pan and approximately 1/4" to 5/16" from the bottom of the pan. This oil pump pick-up clearance is most easily measured with modeling clay. Be sure and make this measurement with all oil pan gaskets and windage trays in place.



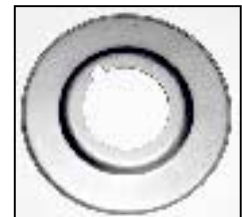
Oil slinger:

This slinger installs between the crankshaft sprocket and the timing cover. It helps distribute oil to the timing chain and camshaft sprocket.

All Small Block and Big Block engines

Part Number

6940



Oil pump drive shafts:



Small Block (273-318-340-360ci)

Standard (steel gear and hardened tip)

Part Number

6200

Heavy Duty (drive gear is pinned to the shaft, steel gear and hardened tip)

6204

Roller Camshaft (drive gear is pinned to the shaft, aluminum-bronze gear and hardened tip)

6206

Big Block (361-383-400-413-426W-440ci)

Standard (steel gear and hardened tip)

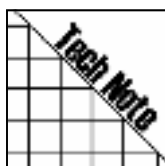
6208

Heavy Duty (drive gear is pinned to the shaft, steel gear and hardened tip)

6210

Roller Camshaft (drive gear is pinned to the shaft, aluminum-bronze gear and hardened tip)

6212



When hand priming your oil system, use the TDC mark on the damper as a reference point. The Big Block cylinder heads will receive oil when the timing mark corresponds to the 10 o'clock and 1 o'clock positions. The Small Block cylinder heads will receive oil at the 10 o'clock and 7 o'clock positions.

Oil pumps:

Manufactured by Melling and Speed-Pro. 100% pressure tested to assure quality. We recommend using the high volume pumps only with a properly modified oil system. Call for details.

Small Block

273-318ci 1962-1995

340-360ci 1971-1995

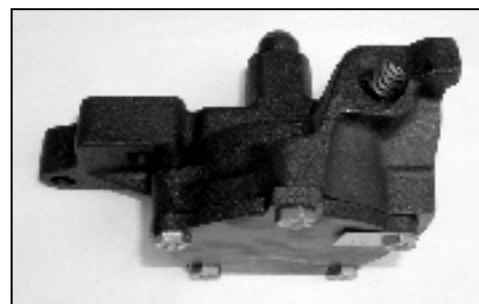
Standard volume

Part Number

6602

Speed Pro Racing high volume (25% more). Black oxide finish, large intake and exit ports, high torque gear shaft. Modified for increased oil pan and oil pump clearance.

6606



Big Blocks

361-383-400-413-426W-440ci

Standard volume

High volume (25% more)

Part Number

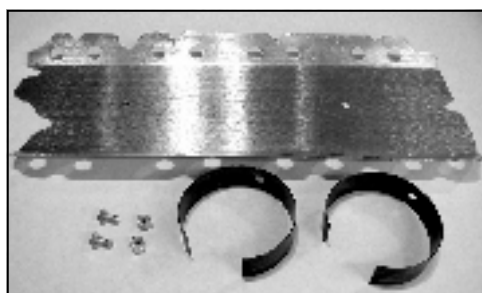
6610

6612

Shim kit. This kit reduces excessive oil pressure when using high volume oil pumps. Contains two 0.030" and 0.050" shims

6620

Lifter valley oil baffle:



This baffle increases horsepower by shielding the bottom of the intake manifold from hot engine oil. Also keeps surplus oil out of the valve covers by eliminating oil splash. In the event of pushrod or rocker arm failure, this baffle keeps the lifters in their bore to maintain oil pressure. Due to variations in block castings, the baffle may have to be trimmed to fit in place. Not for use with roller lifters.

Part Number

Small Block engines only

6950

"Piercy" quick disconnect oil dipstick kit:

This easy to install kit converts your factory dipstick into a quickly removable piece. No more fighting it to get those headers on and off, no more bending it up when you pull the engine. This kit uses a ferrule type fitting that threads in to your block.

Part Number

6960



All Small Block and Big Block engines

Hughes Engines has many specialized parts and services for oval track racing, especially for the limited, restricted and "stock" classes. For the open and unrestricted classes the parts and services in our regular listings will work very well. If you are unsure of what to order give us a call. The long and short block build-ups will give you an idea of what parts and operations are used. The actual parts will differ depending on the track and your needs, but it will get you into the ballpark. If you need something in the 600 HP range we can do that with iron heads and flat tappet camshaft. If you need over 625 HP, expect to use the 340 resto block, aluminum heads and a roller cam: all of which we can supply. If you don't see what you need give us a call!



The needs for the limited and restricted or stock classes, are entirely different and require some very specialized parts. It may be hard to believe but these classes are made for Mopar engines and properly built, they can be dominate winners. We have customers who run at tracks where they are penalized if they run a Mopar because they are "too strong", these tracks make the Mopars run up to 150 lbs more on the right-front corner "to make things equal".

"Real" Chrysler cams are available for special classes and rules such as: limited lift, either solid or hydraulic, vacuum and/or idle speed limits, and cylinder pressure limits. These cams can be tailored for any rules that you might run into. "Master-less" C.N.C. ground cams ground on computer controlled grinders are now available. These are the next step beyond computer designed cams and they are ground from a computer program not from a master cam. There cost is only a few dollars more than our standard cams. Call for details and pricing. Some examples of our standard oval track class cams are listed below.

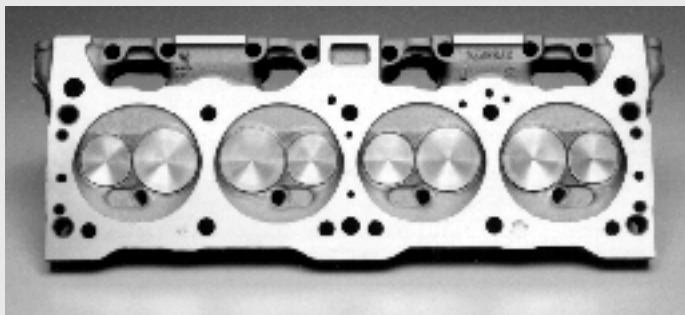
Carburetor	Engine Displacement	Track	Intake Type	Exhaust Type	Part Number	Specs with 1.5:1 ratio rocker	Lobe Separation Angle
Hydraulic Camshafts							
2 barrel	318ci	Tight 1/4 mile	Iron	Iron	HEH 1515AL-6	215°/215° .470"/.470"	106°
2 barrel	340ci	Tight 1/4 mile	Iron	Iron	HEH 1919AL-6	219°/219° .489"/.489"	106°
2 barrel	340ci	Tight 1/4 mile	Iron	Iron	HEH 2323AL-6	223°/223° .506"/.506"	106°
2 barrel	360ci	Tight 1/4 mile	Iron	Iron	HEH 2323AL-6	223°/223° .506"/.506"	106°
2 barrel	360ci	Medium 1/4 mile	Iron	Iron	HEH 3232AL-6	232°/232° .540"/.540"	106°
2 barrel	360ci	1/4 mile - 5/16 mile	Iron	Iron	HEH 3737AL-6	237°/237° .548"/.548"	106°
2 barrel	360ci	5/16 mile	Iron	Iron	HEH 4246AL-6	242°/246° .555"/.569"	106°
4 barrel	318ci	Tight 1/4 mile	Iron	Iron	HEH 1523AL-6	215°/215° .470"/.470"	106°
4 barrel	340/360ci	Tight 1/4 mile	Iron	Iron	HEH 2328AL-6	223°/228° .506"/.524"	106°
4 barrel	340/360ci	Fast 1/4 mile	Iron	Iron	HEH 3237AL-6	232°/237° .540"/.548"	106°
4 barrel	360ci	Fast 1/4 mile	Iron	Iron	HEH 3742AL-6	237°/242° .548"/.555"	106°
4 barrel	360ci	Fast 3/8 mile	Iron	Iron	HEH 4246AL-6	242°/246° .555"/.569"	106°
Solid Camshafts							
2 barrel	340/360ci	1/4 mile	Iron	Iron	HTL 3737AS-6	237°/237° .534"/.534"	106°
2 barrel	340/360ci	Fast 1/4 mile	Iron	Iron	HTL 4242AS-6	242°/242° .543"/.543"	106°
2 barrel	360ci	5/16 mile	Iron	Iron	HTL 4848AS-6	248°/248° .563"/.563"	106°
2 barrel	360ci	3/8 mile	Iron	Iron	HTL 5656AS-6	256°/256° .579"/.579"	106°

Cylinder Heads:

Our oval track Sportsman Special heads are the highest flowing "stock" heads when the rules specify "stock heads and valve job". Included are new, bronze valve guides, new, 11/32" stem, 2.02"/1.60" valves, and a flow bench designed, "stock" valve job that flows about 14-18 CFM more air than a "bowl hog" valve job in the critical .100"-.350" lift area. This can equal 12 to 26 HP more depending on the camshaft, compression ratio, intake, etc. The '308 or '576 casting cylinder heads respond best to the Sportsman valve job, and we can supply new '576 heads if needed.

Part number: **PP-SPORT** (cylinder head cores not included)

We also offer "stealth" porting. The ports are "helped" in certain areas that will allow them to flow more air in the higher lift areas (from .300" and up). This "help" is designed to be very difficult to detect. This "help" is not guaranteed to pass every tech inspector, but we have no complaints to date. The intake ports on the '308/'576 casting heads will flow about 240-250 CFM at .450" lift. This is a tremendous help even with limited lift camshafts.



Part number: **PP-SPORTPLUS** (cylinder head cores not included)

Custom Iron Rocker Arm Kits:

When the rules specify "stock" rocker arms, but they will accept the stock 273ci type adjustable, iron rockers, we have "THE" answer. Unlike some iron rockers, ours are not bored out to install the bushing, which weakens the rocker. Our bushings are pressed into the original bore and a smaller diameter, extra thick walled, shaft is used. Thin sleeves are used to allow the shafts to fit correctly into the head saddles. The rockers are machined to use the more common adjusting screws and lock nuts. The kits come complete with our billet steel hold-downs, spacers and shims to properly position each rocker. The kits also feature a revised oiling system and all fastening hardware. These very special rocker kits are available in 1.5:1 and 1.6:1 ratios. Also see page 108.

Part number: 1420-16 (1.5:1 ratio)
1425-16 (1.6:1 ratio)



If the rules allow aluminum, roller tip rockers look at our "corrected" rockers on page 109.

Lightweight Connecting Rods:

We offer new, forged 5140 steel, bushed rods that are stronger and about 130 grams lighter than the stock unit. The rods are 6.123" length and supplied with ARP bolts. We try to keep a stock of 273 and 318 poly rods in stock if you must use OEM rods, call for availability and pricing.

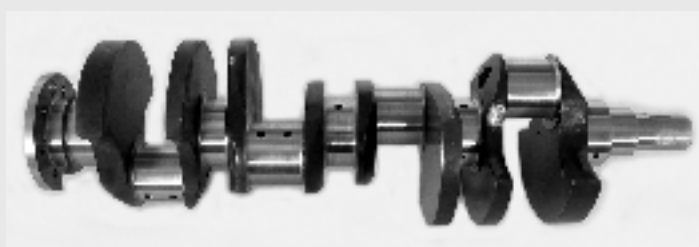
Part number: 10050

Pistons:




We stock all of the Keith Black pistons and even custom modified them for special classes when required. If custom forged pistons are needed we use DIAMOND RACING PISTONS. Their quality is the best, they are more understanding of the Mopar racer needs, and will build anything we design.

Crankshaft Kits:

Light weight crank spinning assembling are available in many combinations based on various track rules and power requirements. Call for more information. See page 25 for more details.







Small Block Pistons

Engine Size	Description	Specifications	Compression ratio with head cc size			
			58cc	62cc	70cc	74cc
273	Cast flat top with no valve reliefs. 780g w/pin	Effective Dome Volume: 0cc Compression Height: 1.781" Deck clearance (See Note below): .042" Piston part number: 2002 Piston ring part number: 2100	8.9	8.5	7.7	7.5
318	Cast flat top with 2 valve reliefs. Ready for full floating rods. 770g w/pin	Effective Dome Volume: -5cc Compression Height: 1.798" Deck clearance (See Note below): .023" Piston part number: 2004 Piston ring part number: 2104	9.8	9.3	8.6	8.2
318 and 3.9L V6	 Keith Black flat top with 2 valve reliefs. 636g w/pin	Effective Dome Volume: -5cc Compression Height: 1.810" Deck clearance (See Note below): .011" Piston part number: 2005 Piston ring part number: 2101 (V6) Piston ring part number: 2104 (V8)	10.2	9.7	8.9	8.5
340	 Keith Black Hypereutectic. Flat top with 2 valve reliefs. Ready for full floating wrist pins. 715g w/pin	Effective Dome Volume: -6cc Compression Height: 1.840" Deck clearance (See Note below): -.019" Piston part number: 2006 Piston ring part number: 2110	11.3	10.8	9.8	9.4
360	 Sterling hypereutectic cast piston. Flat top with 4 valve reliefs. 744g w/pin	Effective Dome Volume: -10cc Compression Height: 1.637" Deck clearance (See Note below): .049" Piston part number: 2008 Piston ring part number: 2114	9.7	9.3	8.6	8.3
360	Sterling hypereutectic cast piston with low friction, dry film coated skirts. Flat top with 2 valve reliefs. 764g w/pin	Effective Dome Volume: -5cc Compression Height: 1.670" Deck clearance (See Note below): .016" Piston part number: 2010 Piston ring part number: 2114	11.1	10.5	9.7	9.3



Note: All compression ratios are based on a .030" oversize and a .039" compressed gasket thickness. Piston deck clearance is based on a block, crank and rods with factory perfect measurements (which, due to poor factory quality control, never happens). All Keith Black pistons have generous valve reliefs to clear most high-lift camshafts. However, always check piston-to-valve clearance prior to final assembly. All Keith Black pistons can be used with either press-fit or full floating wrist pins. All pistons use 5/64", 5/64", 3/16" rings, except for Diamond Racing pistons which use 1/16", 1/16", 3/16" rings, unless ordered otherwise. All piston prices are quoted for a set of 8 with wrist pins included.

Small Block Pistons

Engine Size	Description	Specifications	Compression ratio with head cc size			
			58cc	62cc	70cc	74cc
360	 <p>Keith Black Hypereutectic .053" D shaped quench dome with dish. 675g w/pin. The pin end of the rod must be narrowed to 1.00" to use this piston. For closed chamber head use #2022.</p>	<p>Effective Dome Volume: -18cc Compression Height: 1.675" Deck clearance (See Note below): .011"</p> <p>Piston part number: 2012 Piston ring part number: 2114</p>	9.7	9.3	8.6	8.3
360	 <p>Keith Black Hypereutectic .085" D shaped quench dome with dish. 679g w/pin. The pin end of the rod must be narrowed to 1.00" to use this piston. For closed chamber head use #2022.</p>	<p>Effective Dome Volume: -17.35cc Compression Height: 1.675" Deck clearance (See Note below): .011"</p> <p>Piston part number: 2013 Piston ring part number: 2114</p>	9.72	9.33	8.65	8.35
360	<p>Keith Black Hypereutectic. This piston is designed for use with closed chamber heads such as Magnum, Magnum R/T (iron and aluminum) and Edelbrock, using a 360 block with a stock crank, and 6.123" rod length (stock). D shaped quench dome with dish. 600g w/pin. The pin end of the rod must be narrowed to 1.00" to use this piston.</p>	<p>Effective Dome Volume: -26.0cc Compression Height: 1.377" Deck clearance (See Note below): -.000"</p> <p>Piston part number: 2022 Piston ring part number: 2114</p>	9.6	9.25	8.6	8.3
360	 <p>Keith Black Hypereutectic. Flat top with 2 valve reliefs. 640g w/pin</p>	<p>Effective Dome Volume: -5cc Compression Height: 1.675" Deck clearance (See Note below): .011"</p> <p>Piston part number: 2014 Piston ring part number: 2114</p>	11.2	10.7	9.8	9.4
360	 <p>Keith Black Hypereutectic. Flat top with 2 valve reliefs and 0.085" quench dome. 640g w/pin</p>	<p>Effective Dome Volume: 3.10cc Compression Height: 1.675" Deck clearance (See Note below): -.011"</p> <p>Piston part number: 2015 Piston ring part number: 2114</p>	11.46	10.91	9.96	9.55




Note: All compression ratios are based on a .030" oversize and a .039" compressed gasket thickness. Piston deck clearance is based on a block, crank and rods with factory perfect measurements (which, due to poor factory quality control, never happens). All Keith Black pistons have generous valve reliefs to clear most high-lift camshafts. However, always check piston-to-valve clearance prior to final assembly. All Keith Black pistons can be used with either press-fit or full floating wrist pins. All pistons use 5/64", 5/64", 3/16" rings, except for Diamond Racing pistons which use 1/16", 1/16", 3/16" rings, unless ordered otherwise. All piston prices are quoted for a set of 8 with wrist pins included.

Small Block Pistons

Engine Size	Description	Specifications	Compression ratio with head cc size			
			58cc	62cc	70cc	74cc
360	 <p>Keith Black Hypereutectic. .050" full round dome with 2 valve reliefs. 654g w/pin</p>	<p>Effective Dome Volume: 1.2cc Compression Height: 1.675" Deck clearance (See Note below): .011"</p> <p>Piston part number: 2016 Piston ring part number: 2114</p>	12.1	11.5	10.4	10.0
360	<p>Keith Black Hypereutectic. Part number 2016, modified for use with Edelbrock closed chamber cylinder heads. 2 valve reliefs. 644g w/pin. Custom machined by Hughes Engines.</p>	<p>Effective Dome Volume: 0.0cc Compression Height: 1.675" Deck clearance (See Note below): .011"</p> <p>Piston part number: 2017 Piston ring part number: 2114</p>	11.8	11.3	10.2	9.8
360	 <p>Keith Black Hypereutectic .050" quench dome with 2 valve reliefs and .200" pop-up dome. 682g w/pin</p>	<p>Effective Dome Volume: 11.7cc Compression Height: 1.675" Deck clearance (See Note below): .011"</p> <p>Piston part number: 2018 Piston ring part number: 2114</p>	14.2	13.2	11.9	11.3
360	<p>Keith Black Hypereutectic. Part number 2018, modified for use with Edelbrock closed chamber cylinder heads. Small dome with 2 valve reliefs. 682g w/pin. Custom machined by Hughes Engines.</p>	<p>Effective Dome Volume: 8.5cc Compression Height: 1.675" Deck clearance (See Note below): .011"</p> <p>Piston part number: 2019 Piston ring part number: 2114</p>	13.7	12.7	11.5	10.9
(318) 390 stroker	<p>Diamond Racing forged piston. Step head design. (0.125" dome) Top of step is zero deck. For use with 318 blocks and 4.00" stroke cranks. Uses ring package: 5/64", 5/64", 3/16". 579g w/pin Looks similar to part number 2034 (page 98).</p>	<p>Effective Dome Volume: -22.4cc Compression Height: 1.465" Deck clearance (See Note below): .000"</p> <p>Piston part number: 2036 Piston ring part number: 2104</p>	9.6	9.2	8.6	8.3
408/ 416 stroker	<p>Keith Black Hypereutectic. This piston is designed for use with closed chamber heads such as Magnum, Magnum R/T (iron and aluminum) and Edelbrock, using a 340/360 block with a 4.00" stroke crank, and 6.123" rod length (stock). D shaped quench dome with dish. Use the 0.070" oversize piston for the 340 applications. 600g w/pin. The pin end of the rod must be narrowed to 1.00" to use this piston. Custom machined by Hughes Engines. Looks similar to part number 2020 (page 95).</p>	<p>Effective Dome Volume: -26.5cc Compression Height: 1.377" Deck clearance (See Note below): .000"</p> <p>Piston part number: 2024 Piston ring part number: 2114</p>	9.9	9.55	8.9	8.6





Note: All compression ratios are based on a .030" oversize and a .039" compressed gasket thickness. Piston deck clearance is based on a block, crank and rods with factory perfect measurements (which, due to poor factory quality control, never happens). All Keith Black pistons have generous valve reliefs to clear most high-lift camshafts. However, always check piston-to-valve clearance prior to final assembly. All Keith Black pistons can be used with either press-fit or full floating wrist pins. All pistons use 5/64", 5/64", 3/16" rings, except for Diamond Racing pistons which use 1/16", 1/16", 3/16" rings, unless ordered otherwise. All piston prices are quoted for a set of 8 with wrist pins included.

Small Block Pistons

Engine Size	Description	Specifications	Compression ratio with head cc size			
			58cc	62cc	70cc	74cc
408/ 416 stroker	 <p>Keith Black Hypereutectic. Stroker piston for use in a 340/360 block with a 4.00" stroke crank, 6.123" rod length (stock) and open chamber, LA style head. .085" D shaped quench dome with dish. Dish is 0.171" down in the bore. 610g w/pin. Use the 0.070" over-size piston for the 340 applications. The pin end of the rod must be narrowed to 1.00" to use this piston.</p>	<p>Effective Dome Volume: -26.5cc Compression Height: 1.465" Deck clearance (See Note below): .000"</p> <p>Piston part number: 2020 Piston ring part number: 2114</p>	10.0	9.65	8.99	8.7
408/ 416 stroker	 <p>Diamond Racing forged flat top with 2 valve reliefs. Stroker piston for use in a 340/360 block with a 4.00" stroke crank and 6.123" rod length (stock). Can be used with closed chamber heads. 640g w/pin.</p>	<p>Effective Dome Volume: -6.8cc Compression Height: 1.457" Deck clearance (See Note below): .010"</p> <p>Piston part number: 2030 Piston ring part number: 2118</p>	12.4	12.0	11.2	10.8
408/ 416 stroker	 <p>Diamond Racing forged, dish piston. Stroker piston for use in a 340/360 block with a 4.00" stroke crank and 6.123" rod length (stock). Can be used with closed chamber heads. 647g w/pin.</p>	<p>Effective Dome Volume: -21.5cc Compression Height: 1.457" Deck clearance (See Note below): .010"</p> <p>Piston part number: 2032 Piston ring part number: 2118</p>	10.7	10.3	9.5	9.1





Note: All compression ratios are based on a .030" oversize and a .039" compressed gasket thickness. Piston deck clearance is based on a block, crank and rods with factory perfect measurements (which, due to poor factory quality control, never happens). All Keith Black pistons have generous valve reliefs to clear most high-lift camshafts. However, always check piston-to-valve clearance prior to final assembly. All Keith Black pistons can be used with either press-fit or full floating wrist pins. All pistons use 5/64", 5/64", 3/16" rings, except for Diamond Racing pistons which use 1/16", 1/16", 3/16" rings, unless ordered otherwise. All piston prices are quoted for a set of 8 with wrist pins included.

Small Block Pistons

Engine Size	Description	Specifications	Compression ratio with head cc size			
			58cc	62cc	70cc	74cc
408/ 416 stroker	 <p>Custom Diamond Racing forged supercharger piston. For use with 340/360 blocks and 4.00" stroke cranks. Low compression ratio applications.</p>	<p>All custom specifications</p> <p>Piston part number: 2034 Piston ring part number: Call</p>	Any compression ratio			
All Small Block dish	 <p>Custom Diamond Racing forged piston. We can create a dish piston to fit any application needed.</p>	<p>All custom specifications</p> <p>Piston part number: 2038 Piston ring part number: Call</p>	Any compression ratio			
All Small Block flat top	 <p>Custom Diamond Racing forged piston. We can create a flat top piston to fit any application needed.</p>	<p>All custom specifications</p> <p>Piston part number: 2039 Piston ring part number: Call</p>	Any compression ratio			
All Small Block dome	 <p>Custom Diamond Racing forged piston. We can create a dome piston to fit any application needed.</p>	<p>All custom specifications</p> <p>Piston part number: 2040 Piston ring part number: Call</p>	Any compression ratio			





Note: All compression ratios are based on a .030" oversize and a .039" compressed gasket thickness. Piston deck clearance is based on a block, crank and rods with factory perfect measurements (which, due to poor factory quality control, never happens). All Keith Black pistons have generous valve reliefs to clear most high-lift camshafts. However, always check piston-to-valve clearance prior to final assembly. All Keith Black pistons can be used with either press-fit or full floating wrist pins. All pistons use 5/64", 5/64", 3/16" rings, except for Diamond Racing pistons which use 1/16", 1/16", 3/16" rings, unless ordered otherwise. All piston prices are quoted for a set of 8 with wrist pins included.

Big Block Pistons

Engine Size	Description	Specifications	Compression ratio with head cc size			
			68cc	73cc	85cc	90cc
383	 <p>Keith Black Hypereutectic. Flat top with trough valve relief 893g w/pin. This piston also available in a custom, forged, Diamond Racing configuration. Call for details.</p>	<p>Effective Dome Volume: -5.0cc Compression Height: 1.908" Deck clearance (See Note below): -.027"</p> <p>Piston part number: 2050 Piston ring part number: 2142</p>	10.0	9.6	8.5	8.2
400	 <p>Cast flat top, no valve reliefs. 1070g w/pin .010", .020" .040" oversizes only.</p>	<p>Effective Dome Volume: 0cc Compression Height: 1.919" Deck clearance (See Note below): .015"</p> <p>Piston part number: 2054 Piston ring part number: 2148</p>	11.2	10.6	9.5	9.0
400	 <p>Keith Black Hypereutectic. Flat top with trough valve relief 853g w/pin. This piston also available in a custom, forged, Diamond Racing configuration. Call for details.</p>	<p>Effective Dome Volume: -5cc Compression Height: 1.908" Deck clearance (See Note below): .024"</p> <p>Piston part number: 2058 Piston ring part number: 2148</p>	10.3	9.8	8.8	8.4
413	 <p>Cast, flat top, no valve reliefs. 1035g w/pin</p>	<p>Effective Dome Volume: 0cc Compression Height: 2.000" Deck clearance (See Note below): .082"</p> <p>Piston part number: 2060 Piston ring part number: 2156</p>	10.0	9.5	8.6	8.3




Note: All compression ratios are based on a .030" oversize and a .039" compressed gasket thickness. Piston deck clearance is based on a block, crank and rods with factory perfect measurements (which, due to poor factory quality control, never happens). All Keith Black pistons have generous valve reliefs to clear most high-lift camshafts. However, always check piston-to-valve clearance prior to final assembly. All Keith Black pistons can be used with either press-fit or full floating wrist pins. All pistons use 5/64", 5/64", 3/16" rings, except for Diamond Racing pistons which use 1/16", 1/16", 3/16" rings, unless ordered otherwise. All piston prices are quoted for a set of 8 with wrist pins included.

Big Block Pistons

Engine Size	Description	Specifications	Compression ratio with head cc size			
			68cc	73cc	85cc	90cc
440	 <p>Keith Black Hypereutectic .145" quench dome with valve reliefs. For open chamber heads. 957g w/pin</p>	<p>Effective Dome Volume: 3.5cc Compression Height: 1.986" Deck clearance (See Note below): -.096"</p> <p>Piston part number: 2064 Piston ring part number: 2160</p>	10.4	9.9	9.0	8.7
440	 <p>Keith Black Hypereutectic .075" quench dome with valve reliefs.. For open chamber heads. 978g w/pin</p>	<p>Effective Dome Volume: 1.8cc Compression Height: 2.057" Deck clearance (See Note below): -.025"</p> <p>Piston part number: 2068 Piston ring part number: 2160</p>	11.7	11.1	9.9	9.5
440	 <p>Keith Black Hypereutectic. Flat top with trough valve reliefs. For closed chamber heads. 933g w/pin</p>	<p>Effective Dome Volume: -5.0cc Compression Height: 2.067" Deck clearance (See Note below): -.015"</p> <p>Piston part number: 2070 Piston ring part number: 2160</p>	11.6	11.0	9.7	9.5
440	 <p>Diamond Racing forged piston. Light weight replacement for the TRW L2295F part number. Valve reliefs cut for 0.700" lift roller cams. 1.094" wrist pin diameter, 885g w/pin</p>	<p>Effective Dome Volume: 9.0cc Compression Height: 2.030" Deck clearance (See Note below): -.030"</p> <p>Piston part number: 2073 Piston ring part number: 2162/2164</p>	14.0	13.6	11.8	10.9




Note: All compression ratios are based on a .030" oversize and a .039" compressed gasket thickness. Piston deck clearance is based on a block, crank and rods with factory perfect measurements (which, due to poor factory quality control, never happens). All Keith Black pistons have generous valve reliefs to clear most high-lift camshafts. However, always check piston-to-valve clearance prior to final assembly. All Keith Black pistons can be used with either press-fit or full floating wrist pins. All pistons use 5/64", 5/64", 3/16" rings, except for Diamond Racing pistons which use 1/16", 1/16", 3/16" rings, unless ordered otherwise. All piston prices are quoted for a set of 8 with wrist pins included.

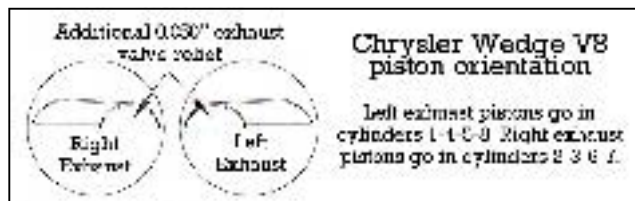
Big Block Pistons

Engine Size	Description	Specifications	Compression ratio with head cc size			
			68cc	73cc	85cc	90cc
440	Diamond Racing forged piston. Light weight flat top design. Valve reliefs cut for 0.700" lift roller cams. 1.094" wrist pin diameter, 891g w/pin	Effective Dome Volume: -4.0cc Compression Height: 2.065" Deck clearance (See Note below): .000" Piston part number: 2071 Piston ring part number: 2162/2164	12.2	11.7	10.5	10.1
451	 Keith Black Hypereutectic STROKER. Use with 440 crank, 383/400 rods, and 400 block. .095" quench dome with valve reliefs 900g w/pin	Effective Dome Volume: 1.5cc Compression Height: 1.722" Deck clearance (See Note below): -.025" Piston part number: 2074 Piston ring part number: 2148	11.8	11.2	10.0	9.6
451	 Keith Black Hypereutectic STROKER. Use with 440 crank, 440 rods, and 400 block. .155" quench dome with valve reliefs. Quench dome must be milled to use this piston. 754g w/pin	Using factory dome height Effective Dome Volume: 0cc Compression Height: 1.327" Deck clearance (See Note below): .010" Piston part number: 2076 Piston ring part number: 2148	12.5	11.8	10.3	9.8
498/ 510	 Keith Black Hypereutectic STROKER. Flat top with trough valve relief 853g w/pin. Actual bore sizes available: 4.342", 4.362", 4.372", 4.382"	Using 4.15" stroke crankshaft Effective Dome Volume: 4.5cc Compression Height: 1.722" Deck clearance (See Note below): .160" Piston part number: 2078 Piston ring part number: 2148	10.0	9.6	8.8	8.5

Note: All compression ratios are based on a .030" oversize and a .039" compressed gasket thickness. Piston deck clearance is based on a block, crank and rods with factory perfect measurements (which, due to poor factory quality control, never happens). All Keith Black pistons have generous valve reliefs to clear most high-lift camshafts. However, always check piston-to-valve clearance prior to final assembly. All Keith Black pistons can be used with either press-fit or full floating wrist pins. All pistons use 5/64", 5/64", 3/16" rings, except for Diamond Racing pistons which use 1/16", 1/16", 3/16" rings, unless ordered otherwise. All piston prices are quoted for a set of 8 with wrist pins included.

Big Block Pistons

Engine Size	Description	Specifications	Compression ratio with head cc size			
			68cc	73cc	85cc	90cc
All Big Block dish	 <p>Custom Diamond Racing forged piston. We can create a dish piston to fit any application needed.</p>	<p>All custom specifications</p> <p>Piston part number: 2080 Piston ring part number: Call</p>	Any compression ratio			
	 <p>Custom Diamond Racing forged piston. We can create a flat top piston to fit any application needed.</p>	<p>All custom specifications</p> <p>Piston part number: 2081 Piston ring part number: Call</p>				
All Big Block dome	 <p>Custom Diamond Racing forged piston. We can create a dome piston to fit any application needed.</p>	<p>All custom specifications</p> <p>Piston part number: 2082 Piston ring part number: Call</p>	Any compression ratio			



Note: All compression ratios are based on a .030" oversize and a .039" compressed gasket thickness. Piston deck clearance is based on a block, crank and rods with factory perfect measurements (which, due to poor factory quality control, never happens). All Keith Black pistons have generous valve reliefs to clear most high-lift camshafts. However, always check piston-to-valve clearance prior to final assembly. All Keith Black pistons can be used with either press-fit or full floating wrist pins. All pistons use 5/64", 5/64", 3/16" rings, except for Diamond Racing pistons which use 1/16", 1/16", 3/16" rings, unless ordered otherwise. All piston prices are quoted for a set of 8 with wrist pins included.

Small Block Piston Rings

Engine Size	Standard Bore Size	Ring Type	Oil Ring Tension See Note	Ring Width		Oversizes available	Part Number
				Comp	Oil		
3.9L V6	3.910"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	Std	(12) 5/64"	(6) 3/16"	Std, .020", .030", .040", .060"	2101
273	3.625"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	Std	(16) 5/64"	(8) 3/16"	Std, .020", .030", .040", .060"	2100
318 1957-1991	3.910"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	Std	(16) 5/64"	(8) 3/16"	Std, .020", .030", .040", .060"	2104
318 Magnum 1992-2002	3.910"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	Std	(16) 5/64"	(8) 5/32"	Std, .020", .030", .040", .060"	2106
318	3.910"	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	Low	(16) 1/16"	(8) 3/16"	.005", .035", .065"	2108
340	4.040"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	Std	(16) 5/64"	(8) 3/16"	Std, .030", .040", .060" (use #2114+.060" for the 340 +.020")	2110
340	4.040"	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	Low	(16) 1/16"	(8) 3/16"	.005", .035", .065"	2112
340	4.040"	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	Low	(16) 1/16"	(8) 3/16"	.045", .075"	2113
360 1971-1992	4.000"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	Std	(16) 5/64"	(8) 3/16"	Std, .020", .030", .040", .060"	2114
360 Magnum 1993-2002	4.000"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	Std	(16) 1.50mm	(8) 4.00mm	Std, .030", .040", .060"	2115
360	4.000"	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	Low	(16) 1/16"	(8) 3/16"	.005", .010", .020", .025", .035", .045", .065"	2116
360	4.000"	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	Std	(16) 1/16"	(8) 3/16"	.005", .010", .025", .035", .045", .065"	2118
360	4.000"	Moly top ring, regular iron 2nd ring, stainless steel oil ring	Std	(16) 1/16"	(8) 3/16"	Std, .030", .040", .060"	2120
360	4.000"	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	Low	(16) 1/16"	(8) 3/16"	.005", .025", .035", .045", .065"	2122

Notes: Oil rings are available in 2 general types, standard (Std) or low tension. Standard tension oil rings (approximately 19-22lbs tangential tension) provide maximum oil control for street driven engines and high output engines exhibiting cylinder bore distortion during operation. Low-tension oil rings (approximately 15-18lbs tangential tension) provide reduced internal engine friction while affording positive oil control. High horsepower, short oval track engines can generally benefit from using the Standard tension ring assemblies. Special light tension oil ring assemblies (5-10lbs) are also available. These assemblies should be used only with an effective vacuum oil control system. Call for more information. All piston ring sets will require file fitting when used with Keith Black pistons. Sets using 1/16" compression rings will also require file fitting regardless of the piston type. Custom file fitting instructions are included with each piston set.

Big Block Piston Rings

Engine Size	Standard Bore Size	Ring Type	Oil Ring Tension See Note	Ring Width		Oversizes available	Part Number
				Comp	Oil		
383	4.250"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	STD	(16) 5/64"	(8) 3/16"	STD, .020", .030", .040", .060"	2142
383	4.250"	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	Low	(16) 1/16"	(8) 3/16"	STD, .020", .030", .040"	2146
400	4.342"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	STD	(16) 5/64"	(8) 3/16"	STD, .020", .030", .040"	2148
400	4.382"	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	Low	(16) 1/16"	(8) 3/16"	.040"	2162+065
413	4.188"	Regular iron top and 2nd ring, stainless steel oil ring	STD	(16) 5/64"	(8) 3/16"	STD, .030", .040" .060"	2156
426W	4.250"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	STD	(16) 5/64"	(8) 3/16"	STD, .020", .030", .040", .060"	2142
440	4.320"	Moly coated top ring, regular iron 2nd ring, stainless steel oil ring	STD	(16) 5/64"	(8) 3/16"	STD, .020", .030", .040", .060"	2160
440	4.320	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	Low	(16) 1/16"	(8) 3/16"	.005", .035", .065"	2162
440	4.320	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	STD	(16) 1/16"	(8) 3/16"	.005", .035", .065"	2164
440	4.375	Plasma-moly top ring, regular iron 2nd ring, stainless steel oil ring	STD	(16) 1/16"	(8) 3/16"	.005"	2166

Notes: Oil rings are available in 2 general types, standard (Std) or low tension. Standard tension oil rings (approximately 19-22lbs tangential tension) provide maximum oil control for street driven engines and high output engines exhibiting cylinder bore distortion during operation. Low-tension oil rings (approximately 15-18lbs tangential tension) provide reduced internal engine friction while affording positive oil control. High horsepower, short oval track engines can generally benefit from using the Standard tension ring assemblies. Special light tension oil ring assemblies (5-10lbs) are also available. These assemblies should be used only with an effective vacuum oil control system. Call for more information. All piston ring sets will require file fitting when used with Keith Black pistons. Sets using 1/16" compression rings will also require file fitting regardless of the piston type. Custom file fitting instructions are included with each piston set.



OEM style, factory replacement

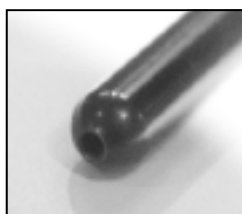
For use with stock or very mild camshafts. 260lbs is the suggested maximum open spring pressure. Use with hydraulic cams only. Sold individually.

Description	Length	Rocker end type	Part number
1968-1989 Small Block 318-360ci (5/16" diameter tube)	7.500"	Ball	5250
1989-1992 Small Block 318-360ci (5/16" diameter tube)	6.780"	Ball	5251
1992 + up Magnum engines 318, 360ci (5/16" diameter tube)	6.925"	Ball	5256
Big Block engines 383-400LB (Hardened, 3/8" diameter tube)	8.575"	Ball	5252
Big Block engines 426W-440RB (3/8" diameter tube)	9.315"	Ball	5254

H/P Chrome moly pushrod sets

4130 chrome moly, tubular construction. For use with hydraulic roller camshafts and adjustable, roller rocker arms. 4130 chrome moly, tubular construction. Use with valve springs having a maximum open pressure of 450lbs. Pushrods come assembled. Not for use with aftermarket guide plates unless otherwise noted. Sold in sets of 16.

Description	Effective Length	Rocker end type	Part number
318/360 engines with Magnum heads, hydraulic roller camshafts, adjustable, roller rocker arms and aftermarket guide plates . (5/16" diameter tube with oil holes, 0.083" wall thickness, heat-treated)	6.900"	Ball	5255
318/360 engines with Magnum heads, hydraulic roller camshafts and adjustable, roller rocker arms. (5/16" diameter tube with oil holes)	6.925"	Ball	5257
318/360 engines with Magnum heads, flat tappet hydraulic camshafts and adjustable, roller rocker arms. (5/16" diameter tube with oil holes)	Call	Ball	5258
318/360 engines with Magnum heads, flat tappet solid camshafts and adjustable, roller rocker arms. (5/16" diameter tube with oil holes)	Call	Ball	5259



Adjustable pushrod sets

4130 chrome moly, tubular construction. Use with non-adjustable rocker arms and hydraulic camshafts. Not for use with valve springs having an open pressure above 350lbs. Sold in sets of 16.

Description	Effective Length	Rocker end type	Part number
Small block engines 318-360ci (5/16" diameter tube)	7.435"-7.735"	Ball	5475A
Big block engines 383-400LB (3/8" diameter tube)	8.480"-8.780"	Ball	5485A
Big block engines 426W-440RB (3/8" diameter tube)	9.210"-9.510"	Ball	5490A

Street/Race cut-to-fit pushrod kit

Chrome moly, tubular construction. For use with adjustable rocker arms and hydraulic or solid camshafts. One end is loose. Pushrods are extra long. Use with valve springs having a maximum open pressure of 400lbs. Sold individually Specify end type when ordering. Length shown is overall unfinished. Magnum pushrods have oil holes in the ends.

Description	Length	Rocker end type	Part number
Small block engines 318-360ci (.049" wall, 5/16" tube)	7.900"	Specify	5479
Magnum engines 318, 360ci (.049" wall, 5/16" tube)	7.000"	Ball	5470
Magnum engines 318, 360ci with flat tappet cam and stock rockers. Oil through (.049" wall, 5/16" tube)	7.900"	Ball	5479M
Magnum engines 318, 360ci with flat tappet cam & adj. rockers. Oil through (.049" wall, 5/16" tube)	7.000"	Cup	5470MC
Big block engines 383-400LB (.042" wall, 3/8" tube)	8.900"	Specify	5489
Big block engines 426W-440RB (.042" wall, 3/8" tube)	9.600"	Specify	5496

Pushrod assembly labor (per set of 16)	Part number: P500
Pushrod assembly setup fee (for less than sets of 16)	Part number: P502



The proper pushrod length ensures that you can obtain maximum lift from your camshaft and have the most stable valve train for high RPM operation. If you are unsure about what pushrod length you need, use our length-checking-pushrod tools (Contact us for details). Remember, just because your rocker arms may have an adjusting screw it does not mean the screw is there to make up for a pushrod that is too long or short. The adjusting screw is only to set lifter preload or valve lash.

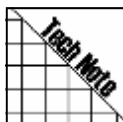
Race cut-to-fit pushrod kit

Hard tempered 4130 chrome moly, tubular construction. For use with adjustable rocker arms and hydraulic or solid camshafts. One end is loose. Pushrods are extra long. Use with valve springs having a maximum open pressure of 400-550lbs (550lbs+ see below). Sold individually. Specify end type when ordering. Length shown is overall unfinished.

Description	Length	Rocker end type	Part number
Small block engines 318-360ci (.049" wall, 5/16" tube)	7.900"	Specify	5679
Big block engines 383-400LB (.042" wall, 3/8" tube)	8.900"	Specify	5689
Big block engines 426W-440RB (.042" wall, 3/8" tube)	9.600"	Specify	5696

Big block engines 426W-440RB (.083" wall, 3/8" tube) Special material for use with valve spring pressures up to 850lbs.	9.600"	Specify	5896
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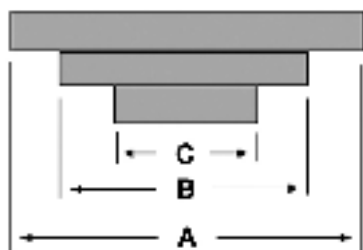
Pushrod assembly labor (per set of 16)	Part number: P500
Pushrod assembly setup fee (for less than sets of 16)	Part number: P502



We recommend you purchase 18 pushrods instead of just the set of 16. 18 now is cheaper than just 16 now and 2 later on.

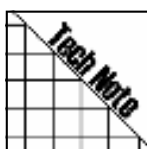
Valve spring retainers

All valve spring retainers are machined from 4140 chromoly steel and then hardened for extra strength. They are then black oxide coated for rust protection.



Valve stem size	Dimension			Change in installed height	Part Number
	A	B	C		
7° Lock angle					
7mm (0.273")	1.050"	"	"	+0.150"	1278
5/16" (0.308")	1.375"	1.060"	0.700"	+0.125"	1276
11/32"	1.375"	1.035"	0.700"	+0.100"	1201
11/32"	1.375"	1.060"	0.700"	+0.100"	1202
11/32"	1.370"	1.065"	0.700"	+0.150"	1203
3/8"	1.375"	1.025"	0.700"	+0.075"	1252
3/8"	1.375"	1.060"	0.700"	+0.150"	1254
3/8"	1.375"	1.130"	0.730"	+0.075"	1256
3/8"	1.375"	1.130"	0.730"	+0.115"	1258
10° Lock angle (For use with Jumbo style locks only)					
5/16", 11/32", 3/8"	1.400"	1.050"	0.690"	+0.075"	1270
5/16", 11/32", 3/8"	1.500"	1.095"	0.710"	+0.075"	1272

The change in installed height listed above tells you approximately how much the installed spring height will be affected by using the listed retainer vs. an average of several stock retainers.



Valve spring retainers do not need to be the same diameter as the valve spring used. The retainer OD should be approximately 1/8" smaller than the OD of the valve spring. The retainer should also fit easily onto the valve spring, but not so loosely that the retainer is sloppy on the spring. When using a retainer that offers more installed height than normal, make sure there is a minimum of 0.010" clearance between the rocker arm and the retainer when the valve is in the closed position.

7° vs. 10° locks. We do not recommend 10° locks unless you are using extremely high valve spring pressures (such as 650lbs or more open pressure). The clamping action (clamping) of 7° is much tighter than the 10°. If you should encounter valve float, 10° locks will unlock much easier than 7° locks.

Blueprinted, Forged Iron Rocker Arms (Oval Track specials)

These are based on the original 273 OEM rocker arms but vary in 11 important areas:

1. Mopar, not Crane, rockers are used for correct geometry.
2. They use a bronze bushing for long life of both the rocker and the shaft.
3. The shaft size is reduced to allow the bushing to be installed in the rocker without boring it out and weakening the rocker.
4. The oil groove and oil passages are modified for better oil control and longer life.
5. The shaft is extra thick wall, 0.250". No springs are used. Shims and spacers are used for better alignment and control.
6. The process of installing the bushings corrects the rocker arm ratio.
7. The original interference fit adjusting screws (which are a pain to adjust) are replaced by the more conventional screw and jamb nut arrangement.
8. Kit includes billet hold-downs and hardware.
9. They are ideal for oval track applications that require "stock" rockers. Requires custom length ball and cup type pushrods.
10. When the rules call for stock rockers, these are the only answer.
11. This kit will work and live with any of our flat tappet springs.



Small Block engines only:

All sets include reduced diameter shafts for increased rocker strength, #7062 hold-downs and spacers.

1.50:1 ratio kit Part number: 1420-16

1.60:1 ratio kit Part number: 1425-16

Heavy-Duty, OEM style Rocker Arm Kits (6-pack, thick cross section)

One kit contains 16 rockers, 8 spacers, OEM hold-downs and bolts.

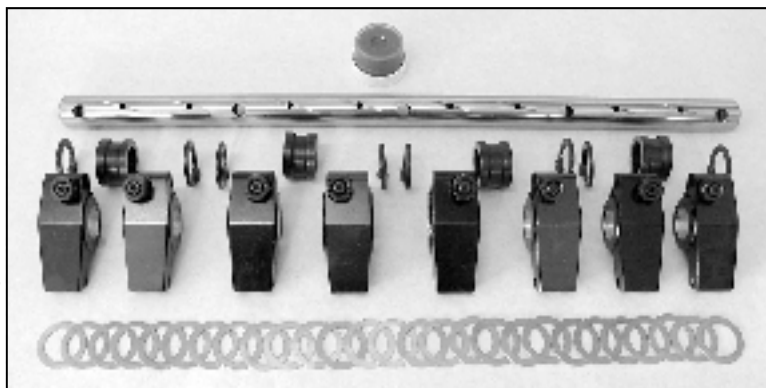
Small Block engines Part number: 1408

Big Block engines Part number: 1410



Extruded aluminum, roller tip rocker arm kits (corrected dimensions)

- Machined from 7129-T5 extruded and heat treated alloy
- 4140 chromoly steel locking nut and adjusting screw.
- 8620 chromoly steel roller tip.
- Guaranteed for life against breakage
- True 1.5:1 and 1.6:1 ratios
- These rockers require custom length ball and cup type pushrods
- Excellent valve train geometry when compared to other Mopar rockers
- Rocker body dimensions designed exclusively for the Chrysler engines and not a "modified" Small Block Chevy rocker.
- Machined to clear larger diameter valve springs (Small Block only)
- Honed aluminum, shaft surface. No anodized surface riding against the rocker shaft.
- Designed to work with our Super-Duty, Billet Steel hold-downs (not included).
- Engineered for tight side clearance using shims and spacers—no weenie springs
- Compatible with hydraulic, mechanical, or roller camshafts



Small Block engines



Can be used with factory iron heads, Edelbrock aluminum heads, or Brodix B1-BA heads (not for use with Magnum heads).

Corrected rocker arm and shaft kit. This kit includes the rockers, #1600 banana groove rocker shafts, machined rocker spacers (no weenie springs), fine adjustment shims (#1700), assembly lube and installation instructions.

1.5:1 ratio kit Part number: 1500S-16 1.6:1 ratio kit Part number: 1504S-16

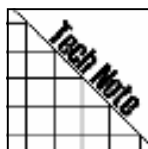
Big Block engines



Can be used with factory iron heads, Mopar Performance Stage V and VI heads, or Edelbrock aluminum heads.

Rocker arm and shaft kit. This kit includes the rockers, #1620 banana groove rocker shafts, machined rocker spacers (no weenie springs), fine adjustment shims (#1700), assembly lube and installation instructions.

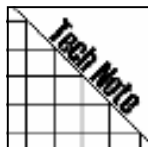
1.5:1 ratio kit Part number: 1508S-16 1.6:1 ratio kit Part number: 1512S-16



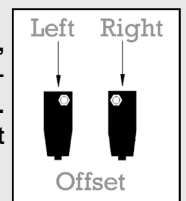
Due to production tolerances, OEM stamped and many ductile iron adjustable rocker arms end up with a ratio of 1.37:1 to 1.43:1 instead of the 1.5:1 design ratio. This means:

1. You can lose .025"-.045" lift at the valve
2. You can lose 3°-4° duration at .050" lift
3. You can lose rate-of-lift
4. You can lose up to 25 horsepower

Our roller tip aluminum rockers are a true 1.5 or 1.6 ratio, as you ordered.



When ordering replacement aluminum rocker arms for the Big Block, please specify the location of the replacement required, as in #6 cylinder exhaust or #1 cylinder intake. This will tell us which offset you need. If you are unable to get the location, please use the diagram at the right to specify a right hand or left hand offset.



Magnum cylinder head rocker arms

These are the latest Magnum rocker arm design but are manufactured to same high tolerances as our shaft mount rockers. They feature a body made of 7129-T5 extruded alloy, and a 8620 chromoly steel roller tip. Just like our shaft mount rockers, the Magnum rockers are guaranteed not to break. They offer true, "bolt-on" installation with no cylinder head machining.



This ease of assembly is made possible with a special pedestal that is bolted firmly to the cylinder head using a Grade 8 fastener. This design increases the strength and stiffness over any normal stud type mounting because the trunion is firmly secured to the head and the rocker mount cannot flex like a stud. This solid mounted trunion increases the rigidity like shaft mounted rockers used on Pro-Stock engines and older Mopar engines.

We have engineered these anodized beauties to use stock length, ball end pushrods, factory pushrod guide plates and have correct rocker arm geometry. All lifter preload changes are made possible with an adjustable, chromoly pushrod cup. The underside of the rockers are also notched for large diameter valve springs, making them suitable for use with racing, roller camshaft valve springs. We can also supply heavy-duty, chromoly tube pushrods when needed.

Note: Factory, Magnum valve covers can be used with these rocker arms, but the baffling will need to be modified. You may also use our rockers with the Mopar Performance, aluminum valve covers or similar aftermarket tall valve covers.

These premium quality, racing rockers are the price leader because the expensive extras required with other brands are not required. Things such as studs, poly locks, stud girdles, hardened guide plates and in many cases pushrods, are not needed with our rockers. The rockers are available in 1.6:1 ratio. The kits include 16 rockers and mounting pedestals with fasteners. Go faster for less money!

1.6:1 ratio kit

Part number: 1532-16



Rocker shafts

Stock replacement shafts

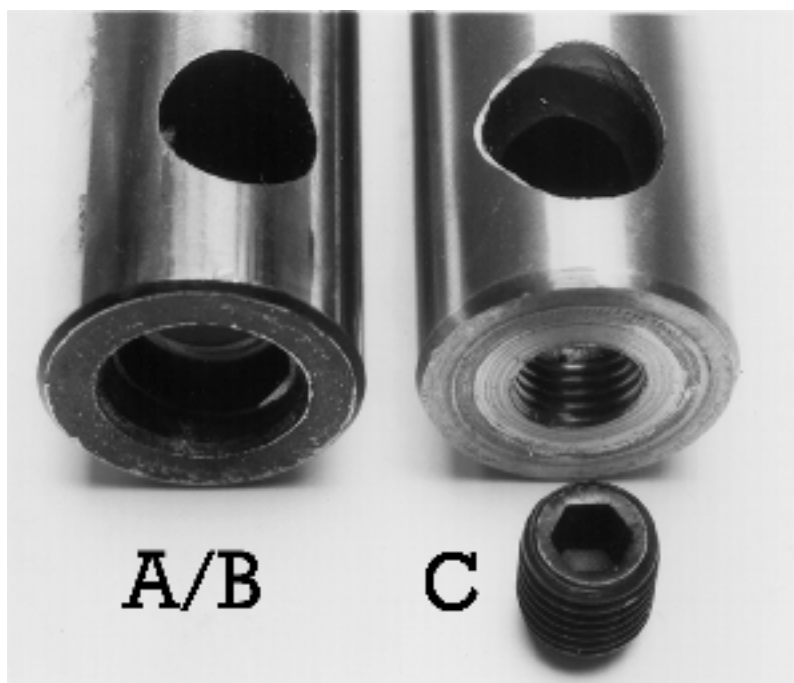
These are new rocker shafts suitable for use with stock stamped rocker arms only. Sold individually. Type A

Small Block engines

Part number: 1590

Big Block engines

Part number: 1592



Carbon-nitrided shafts

Performance pieces with a wall thickness of 0.165". For use with all types of rocker arms except full rollerized rockers (Harland Sharp). The shafts feature "banana" grooves for greatly improved oiling. Sold individually. Type B

Small Block engines

Part number: 1600

Big Block engines

Part number: 1620

Heavy-duty chromoly billet rocker shaft

These are the ultimate in strength and durability. Heat treated, hard chromed, 0.210" wall thickness with banana grooves for improved oiling. These shafts also feature a removable plug for ease of cleaning. For use with all types of rocker arms except full rollerized rockers (Harland Sharp). Sold in sets of 2. Type C

Big Block engines only

Part number: 1624



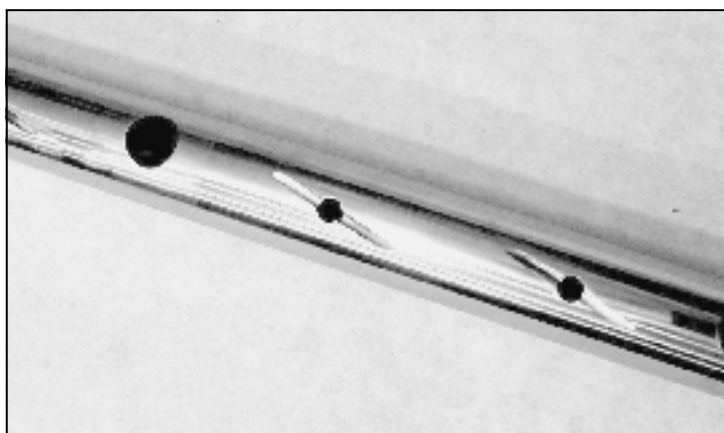
When assembling the rocker shafts, install the shafts so that the 3/16" diameter oil holes point downward and so that the 15 degree angle of these holes point outward towards the exhaust flange of the head. It is very easy to over-torque rocker arm shafts. This will distort the shaft and cause premature wear and possibly failure of the rocker arms. Follow these torque recommendations:

All Small Block shafts

16 ft-lbs

All Big Block shafts

30 ft-lbs



Rocker shaft hold-downs

OEM/Stock style

These are factory replacement, stamped steel hold-downs. Sets are supplied with grade 5, plated bolts. Sold in complete sets.

Small Block engines

Part number: 7050

Big Block engines

Part number: 7052



Super-duty, billet, steel

These hold downs offer more surface area for improved clamping and are 4 times stiffer than aluminum or stamped, OEM type. Recommended for use with all adjustable rocker engines. Set is supplied with new, grade 8, plated bolts and rocker shims (#1700) for precise alignment and side clearance.

Small Block engines

Part number: 7062

Big Block engines

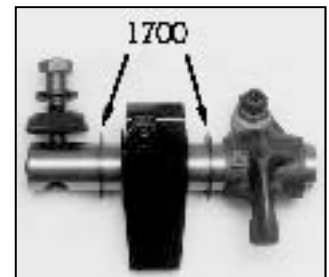
Part number: 7060

Rocker arm spacer shims

Fine adjustment set

This shim set allows you to correct the rocker arm to valve tip geometry. The set works with most aftermarket rocker arms and all stock diameter shafts. Not for use with stock stamped rocker arms. Set includes 16 of both .015" and .030".

All Small Block and Big Block engines Part number: 1700



Factory OE type rocker spacer set

For use with Small Block factory, iron adjustable rockers and Big Blocks with factory stamped steel rockers. Set of 8 spacers. Each spacer is .200" wide.

Part number: 1702

Billet steel rocker spacers



These spacers replace the springs separating the iron rocker arms on Crane, Mopar Performance, Erson, and Isky brands. (Note: The body width on the Isky rockers is approximately .090" too wide. For proper rocker arm geometry, the Isky rocker will need to be modified.) Also fits Harland Sharp aluminum Small Block rocker arms. Use with #1700 shims for the best results. Fits most Small Block and Big Block engines. Each part includes 8 shims.

Part number: 1703-8 (0.125" width)

Part number: 1704-8 (0.600" width)

Part number: 1705-8 (0.825" width)

Rocker Shaft Saddle Shims

These shims raise the rocker shaft to correct poor rocker arm geometry. Shims can be stacked to achieve more height. Fit either Small Block or Big Block. Made of aluminum for good conformability.

Set of .020" shims (package of 10 pieces) (Type A)

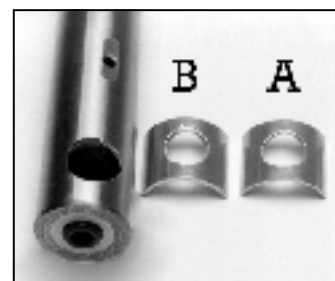
Part number: 1708

Set of .040" shims (package of 10 pieces) (Type B)

Part number: 1709

Package of 20 shims, 10 of each thickness

Part number: 1710



318ci Small Block short block assembly

9.5:1 CR with 62cc heads

- Jet clean and prep cylinder block
- Magnaflux® and inspect block for cracks
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oil system modifications
- Factory cast crankshaft
- Magnaflux®, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Dynamic balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ nodular iron damper
- Keith Black pistons
- Moly piston rings
- File fit piston rings
- Federal Mogul main, rod and camshaft bearings
- Modified, Speed-Pro® high volume oil pump
- Federal Mogul brass freeze plugs
- Forged, I-beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts
- Viton® rear main seal set
- New, Grade 8, 150,000psi damper bolt and hardened washer
- Block is primered and ready for paint
- Square deck cylinder block
- Deburr interior of the cylinder block

Part number: 318SHRT

318ci Race short block assembly

Any compression ratio

- Same as STD short block but Diamond custom racing pistons are added
- H-beam, steel connecting rods, 6.123" length
- Stage II oil system modifications
- ARP main studs
- Pro/Race, all steel, SFI approved damper

Part number: 318SHRT-R

Options available with the 318/340 kits

- Clevite engine bearings
- Billet, roller timing set
- Hughes Engines camshaft
- Install camshaft, lifters and degree-in camshaft
- Weber clutch, ATI or Fluidampr balancers
- Weber lightweight aluminum or steel flywheels

These part numbers are based on customer supplied rebuildable cores consisting of a block, crank and rods. We can supply these cores for an additional charge.

340ci Small Block short block assembly

10.8:1 CR with 62cc heads

- Jet clean and prep cylinder block
- Magnaflux® and inspect block for cracks
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oil system modifications
- Factory forged crankshaft
- Magnaflux®, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Dynamic balance crankshaft assembly
- New, BHJ nodular iron damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- New, SFI approved flexplate
- Federal Mogul main, rod and camshaft bearings
- Modified, Speed-Pro® high volume oil pump
- Federal Mogul brass freeze plugs
- Forged, I-beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts
- Viton® rear main seal set
- New, Grade 8, 150,000psi damper bolt and hardened washer
- Block is primered and ready for paint
- Square deck cylinder block
- Deburr interior of the cylinder block

Part number: 340SHRT

340ci Race short block assembly

Any compression ratio

- Same as STD short block but Diamond custom racing pistons are added
- H-beam, steel connecting rods, 6.123" length
- Stage II oil system modifications
- ARP main studs
- Pro/Race, all steel, SFI approved damper

Part number: 340SHRT-R

These part numbers are based on customer supplied rebuildable cores consisting of a block, crank and rods. We can supply these cores for an additional charge.

360ci Small Block short block assembly

9.3 or 10.7:1 CR with 62cc heads

- Jet clean and prep cylinder block
- Magnaflux® and inspect block for cracks
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oil system modifications
- Factory cast crankshaft
- Magnaflux®, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Dynamic balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ nodular iron damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Modified, Speed-Pro® high volume oil pump
- Federal Mogul brass freeze plugs
- Forged, I-beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts
- Viton® rear main seal set
- New, Grade 8, 150,000psi damper bolt and hardened washer
- Block is primered and ready for paint
- Square deck cylinder block
- Deburr interior of the cylinder block

Part number: 9.3:1 CR **360SHRT-9.3**
 10.7:1 CR **360SHRT-10.7**

360ci Race short block assembly

11.5 or 13.2:1 CR with 62cc heads

- Same as above with the following changes:
- Stage II oil system modifications
- H-beam, steel connecting rods, 6.123" length
- ARP main studs
- Pro/Race, all steel, SFI approved damper

Part number: 11.5:1 CR **360SHRT-11.5**
 13.2:1 CR **360SHRT-13.2**

These part numbers are based on customer supplied rebuildable cores consisting of a block, crank and rods. We can supply these cores for an additional charge.

383ci Big Block short block assembly

9.6:1 CR with 73cc heads

- Jet clean and prep cylinder block
- Magnaflux® and inspect block for cracks
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oiling system
- Factory forged crankshaft
- Magnaflux®, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Dynamic balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ nodular iron damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- Federal Mogul brass freeze plugs
- Magnaflux®, shot blast, straighten, resize the connecting rods. Install new ARP 190,000psi racing rod bolts
- Equalize rod center-to-center length
- Viton® rear main seal set
- New, Grade 8, 150,000psi damper bolt and hardened washer
- Block is primered and ready for paint
- Notch top of cylinder bores to unshroud the valves
- Deburr interior of the cylinder block
- Square deck cylinder block

Part number: **383SHRT**

383ci Race short block assembly

Any compression ratio

- Same as above with the following changes:
- Diamond Racing pistons with custom quench domes
- H-beam, billet 4340 steel connecting rods with MSA chromoly steel rod bolts
- Stage II oiling system with "Hemi" style modifications
- ARP main studs
- Pro/Race, all steel, SFI approved damper

Part number: **383SHRT-R**

These part numbers are based on customer supplied rebuildable cores consisting of a block, crank and rods. We can supply these cores for an additional charge.

408/416ci Small Block stroker short block assemblies

Street kits with Keith Black pistons:

- 408ci kits are based on a 360 block
- 416ci kits are based on a 340 block
- Jet clean and prep cylinder block
- Magnaflux® and inspect block for cracks
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oil system modifications
- 4.00" stroke, cast steel crankshaft
- Dynamic, internal balance crankshaft assembly
- New, SFI approved flexplate
- New, OEM flexplate (Magnum engines only)
- New, BHJ nodular iron damper
- New, OEM damper (Magnum engines only)
- Keith Black pistons (suitable for nitrous up to 125HP)
- Moly piston rings
- File fit piston rings
- Federal Mogul main, rod and camshaft bearings
- Modified, Speed-Pro® high volume oil pump
- Federal Mogul brass freeze plugs
- Forged, I-beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts
- Viton® rear main seal set
- New, Grade 8, 150,000psi damper bolt and hardened washer
- Block is primered and ready for paint
- Square deck cylinder block
- Deburr interior of the cylinder block
- Machine piston domes for proper quench height (Magnum engines only)

9.4:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

Part number: **408SHRT-KBI**

10.0:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket) (specify if a windage tray is to be used with the Magnum kits)

Part number: **408SHRT-M-KBI (Magnum)**

9.55:1 compression ratio

(Based on +0.020" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

Part number:

416SHRT-KBI (340 block, 0.020" oversize only)

These part numbers are based on a customer supplied rebuildable core block. We can supply this core for an additional charge.

The following kits are the same as the KB street kits at the left, but we replace the I-beam rods with H-beam, billet 4340 steel connecting rods using MSA chromoly steel rod bolts

9.4:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

Part number: **408SHRT-KBH**

10.0:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket) (specify if a windage tray is to be used with the Magnum kits)

Part number: **408SHRT-M-KBH (Magnum)**

9.55:1 compression ratio

(Based on +0.020" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

Part number:

416SHRT-KBH (340 block, 0.020" oversize only)

These part numbers are based on a customer supplied rebuildable core block. We can supply this core for an additional charge.

Options available with the 408/416 kits

- Clevite 77 engine bearings
- Billet, ProGear roller timing set
- Hughes Engines camshaft
- Install camshaft, lifters and degree-in camshaft
- Weber clutch, BHJ or Pro/Race balancers
- Weber lightweight aluminum or steel flywheels

390ci Small Block stroker (using a 318 block)

These kits are the same as the 408/416 street kits listed on page 116.

9.6:1 compression ratio

(Based on +0.030" oversize, 58cc head, zero deck height and 0.039" compressed gasket)

9.2:1 compression ratio

(Based on +0.030" oversize, 62cc head, zero deck height and 0.039" compressed gasket)

8.6:1 compression ratio

(Based on +0.030" oversize, 70cc head, zero deck height and 0.039" compressed gasket)

8.4:1 compression ratio

(Based on +0.030" oversize, 74cc head, zero deck height and 0.039" compressed gasket)

Part number: **390SHRT-DSI**

408/416ci Small Block stroker short block assemblies

Street kits with Diamond Racing pistons:

- 408ci kits are based on a 360 block
- 416ci kits are based on a 340 block
- Jet clean and prep cylinder block
- Magnaflux® and inspect block for cracks
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oil system modifications
- 4.00" stroke, cast steel crankshaft
- Dynamic, internal balance crankshaft assembly
- New, SFI approved flexplate
- New, OEM flexplate (Magnum engines only)
- New, BHJ nodular iron damper
- New, OEM damper (Magnum engines only)
- Diamond Racing pistons (Nitrous suitable up to 125HP)
- Plasma-moly piston rings
- File fit piston rings
- Federal Mogul main, rod and camshaft bearings
- Modified, Speed-Pro® high volume oil pump
- Federal Mogul brass freeze plugs
- Forged, I-beam, 5140 chrome moly steel connecting rods with ARP Wave-Loc rod bolts
- Viton® rear main seal set
- New, Grade 8, 150,000psi damper bolt and hardened washer
- Block is primed and ready for paint
- Square deck cylinder block
- Deburr interior of the cylinder block
- Machine piston domes for proper quench height (Magnum engines only)

10.0:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

Part number: **408SHRT-DSI**

10.5:1 compression ratio

(Based on +0.030" oversize, 60cc head, zero deck height and 0.039" compressed gasket) (specify if a windage tray is to be used with the Magnum kits)

Part number: **408SHRT-M-DSI (Magnum)**

10.0:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

Part number: **416SHRT-DSI (340 block)**

These part numbers are based on a customer supplied rebuildable core block. We can supply this core for an additional charge.

The following kits are the same as the Diamond Racing street kits but, we replace the I-beam rods with H-beam, billet 4340 steel connecting rods using MSA chromoly steel rod bolts

10.0:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

Part number: **408SHRT-DSH**

10.5:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket) (specify if a windage tray is to be used with the Magnum kits)

Part number: **408SHRT-M-DSH (Magnum)**

10.0:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

Part number: **416SHRT-DSH (340 block)**

These part numbers are based on a customer supplied rebuildable core block. We can supply this core for an additional charge.

Race kits with Diamond Racing pistons:

- These kits are the same as the Diamond Racing street kit with the following changes:
- H-beam, billet 4340 steel connecting rods with MSA chromoly steel rod bolts
- Stage II oiling system
- Pro/Race, billet steel, SFI approved balancer

11.5:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

12.2:1 compression ratio

(Based on +0.030" oversize, 60cc head, zero deck height and 0.039" compressed gasket)

Part number: **408SHRT-DRH**

11.7:1 compression ratio

(Based on +0.030" oversize, 65cc head, zero deck height and 0.039" compressed gasket)

12.4:1 compression ratio

(Based on +0.030" oversize, 60cc head, zero deck height and 0.039" compressed gasket)

Part number: **416SHRT-DRH**

These part numbers are based on a customer supplied rebuildable core block. We can supply this core for an additional charge.

400ci Big Block short block assembly 9.8:1 CR with 73cc heads

- Jet clean and prep cylinder block
- Magnaflux® and inspect block for cracks
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oiling system
- Factory cast crankshaft
- Magnaflux®, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Dynamic balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ nodular iron damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- Federal Mogul brass freeze plugs
- H-beam, billet 4340 steel connecting rods with MSA chromoly steel rod bolts
- Block is primered and ready for paint
- Notch top of cylinder bores to unshroud the valves
- Square deck cylinder block
- Deburr interior of the cylinder block
- Viton® rear main seal set
- New, Grade 8, 150,000psi damper bolt and hardened washer

Part number: 400SHRT

400ci Race short block assembly Any compression ratio

- Same as STD short block but Diamond custom racing pistons are added
- 0.990" wrist pin diameter
- Stage II oiling system with "Hemi" style modifications
- ARP main studs
- Pro/Race, billet steel, SFI approved balancer

Part number: 400SHRT-R

Options available with all Big Block kits

- Clevite engine bearings
- Billet, ProGear roller timing set
- Install camshaft, lifters and degree-in camshaft
- Weber clutch, BHJ or Pro/Race balancers
- Forged crankshafts (in 440 kits)
- Weber lightweight aluminum or steel flywheels

These part numbers are based on customer supplied rebuildable cores consisting of a block and crank. We can supply these cores for an additional charge.

440ci High Performance short block assembly 9.0:1 or 9.9:1 CR with 85cc heads

- Jet clean and prep cylinder block
- Magnaflux® and inspect block for cracks
- Bore and hone block with stress plate
- Final hone cylinder walls with SoftTool stones
- Main bearing bores are align honed
- Square deck cylinder block
- Install cam bearings, freeze plugs and distributor bushing
- Stage I oiling system
- Factory cast crankshaft
- Magnaflux®, shot blast, grind, polish and chamfer crankshaft
- Index crankshaft to equalize stroke and journal phasing
- Lighten and dynamic balance crankshaft assembly
- New, SFI approved flexplate
- New, BHJ nodular iron damper
- File fit piston rings
- Keith Black pistons
- Moly piston rings
- Federal Mogul main, rod and camshaft bearings
- Melling high volume oil pump
- Federal Mogul brass freeze plugs
- H-beam, billet 4340 steel connecting rods with MSA chromoly steel rod bolts
- Block is primered and ready for paint
- Notch top of cylinder bores to unshroud the valves
- Deburr interior of the cylinder block
- Viton® rear main seal set
- New, Grade 8, 150,000psi damper bolt and hardened washer

Part number: 9.0:1 CR 440SHRT-9.0
 9.9:1 CR 440SHRT-9.9

440ci Race short block assembly Any compression ratio

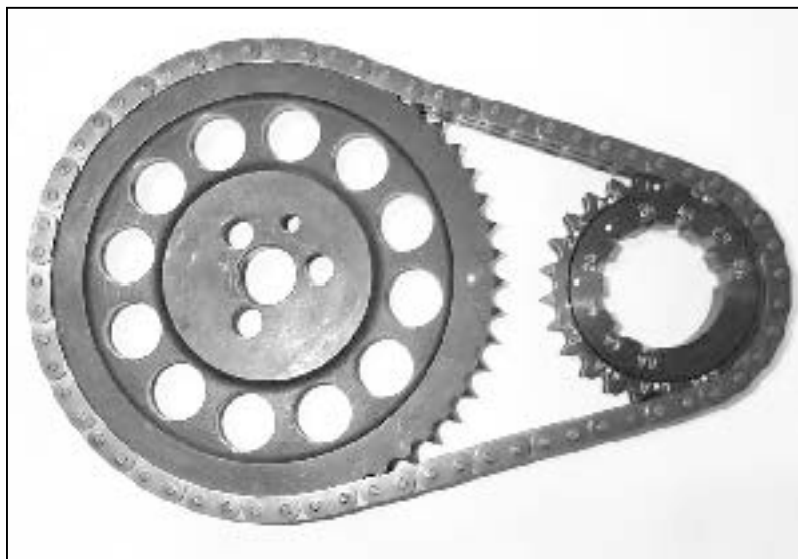
- Same as STD short block but Diamond custom racing pistons are added
- Factory, forged steel crankshaft
- H-beam, billet 4340 steel connecting rods with MSA chromoly steel rod bolts
- Stage II oiling system with "Hemi" style modifications
- ARP main studs
- Pro/Race, billet steel, SFI approved balancer

Part number: 440SHRT-R

These part numbers are based on customer supplied rebuildable cores consisting of a block and crank. We can supply these cores for an additional charge.

Our Premium Timing Chain Set

How often have you removed a timing chain cover after a short run time only to find the timing chain already loose? If you are like most of us, too many times. Can't anyone make a timing chain that doesn't stretch? Well...it isn't the chain!! At least it isn't the chain to start with.



The reason the chain is loose is because the gears are soft. Even some of the so-called "heat treated" lower sprockets that look like they have been heat treated are soft. Here is the test, try to file the teeth. If you can't file the teeth, the gear is hardened. The soft teeth wear and reshape very quickly creating a different pitch for the chain, forcing it to stretch. ProGear has timing sets with both gears hardened. Test them with a file!

Some oval track racers use gear drives because of the loose chain and sprockets causing retarded timing. Many have gone back to the Premium ProGear 4000 Series. These guys have 250lbs seat valve spring pressure, 700lbs open pressure and turn 8000 RPM. We have oval track racers with 3 seasons using the same chain and sprockets.

These timing sets are supplied with a top-of-the-line Tsubaki (ask your buddy with a motorcycle how good

this chain is) double roller timing chain. Both sprockets are double tumbled to get rid of those tiny burrs that end up floating around in the oil. Then they are black anodized so the highlighted timing marks jump out at you. Correct timing is centered on the tooth or space so there is no confusion when degree-ing in the camshaft. All sets feature a 9 keyway crank gear (0, 2°, 4°, 6°, 8° at the camshaft).

Small Block and V6 engines

(hardened iron camshaft and crank gear)

Fits all 3.9L/V6-318-340-360 to 2002 (including Magnum engines)

STD Center-to-center

Part number: **6432**

-0.005" Center-to-center

Part number: **6432-5**

Big Block engines:

1 bolt camshaft applications

All 361-383-400-413-426W-440

(hardened iron camshaft and hardened steel crank gear)

STD Center-to-center

Part number: **6434**

-0.005" Center-to-center

Part number: **6434-5**

3 bolt camshaft applications

All 361-383-400-413-426W-440

(billet, hardened steel camshaft and crankshaft gear)

STD Center-to-center

Part number: **6430**

-0.005" Center-to-center

Part number: **6430-5**



Crankshaft woodruff keys

Case hardened, steel alloy key. 3/16" wide x 1 13/16" long

Fits all **Small Block** and **Big Block** crankshafts

Part number: **7540**



ProGear 3000 Series

Each set features:

- Specially hardened camshaft sprockets
- Hardened STEEL crankshaft sprockets
- Black oxide coated crankshaft sprockets
- 3 keyway crank gear (0, 4° at the camshaft)
- Timing marks, numbers and letters are highlighted in white for easier alignment, and are accurate
- Super-duty, independent, double roller chains with seamless, extruded rollers
- Sets are available in under sizes for line bored/honed blocks. Please specify the undersize when ordering



Small Block and V6 engines

Fits all 3.9L/V6-318-340-360 to 2002 (including Magnum engines)

STD Center-to-center

Part number: **6418**

Under sizes available: -.004", -.006", and -.010"

Part number: **6418-U**

Big Block engines:

1 bolt camshaft applications

All 361-383-400-413-426W-440

STD Center-to-center

Part number: **6427**

Under sizes available: -.004", -.006", and -.008"

Part number: **6427-U**

3 bolt camshaft applications (billet, hardened steel camshaft and crankshaft gear)

All 361-383-400-413-426W-440

STD Center-to-center

Part number: **6428**

Under sizes available: -.004", -.006", and -.008"

Part number: **6428-U**

3 bolt camshaft applications with integral Torrington bearing on camshaft gear and thrust button. NO block machining required.

All 361-383-400-413-426W-440

STD Center-to-center

Part number: **6428T**

Under sizes available: -.004", -.006", and -.008"

Part number: **6428T-U**



Timing chain tensioner for Small Block and V6 engines

Reduces chain whip, especially useful for oval track and road race use.

Fits all 3.9L/V6-318-340-360 to 2002 (including Magnum engines)

Part number: **6450**

Sealed Power camshaft gear. This double roller camshaft gear replaces your single bolt cam gear allowing you to use a 3 bolt camshaft.

All 361-383-400-413-426W-440

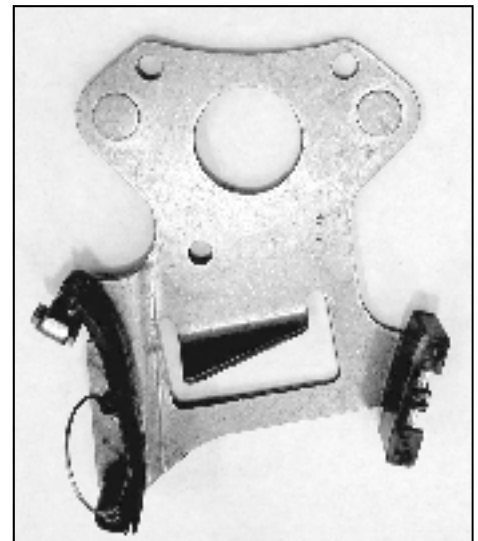
Part number: **6420**

Speed-Pro Silent Link Series. This set features a silent chain design which maintains an extremely positive contact with the sprockets. 3 keyway crank sprocket (0, 4° at the crank).

All 361-383-400-413-426W-440

Single bolt cam gear only

Part number: **6423**



On engine valve spring compressors:

This heavy-duty valve spring compressor is specifically designed for the high open pressures of double valve springs used on solid and roller camshafts. The long handle gives extra leverage and makes removing the springs a breeze. It comes with a bolt in shaft that attaches to the rocker shaft pedestals. You can also rent these tools. Rental fee must be paid via credit card and compressor must be returned within 3 weeks time.



Small Block	318-340-360 and W-2 heads	8312
	Tool rental	8312R
Big Block	361-383-400-413-426W-440 and Brodix B-1 heads	8314
	Tool rental	8314R

Sparkplug Adapter:



This adapter screws into a spark plug hole allowing you to attach your air compressor hose. Pressurizing the cylinder will hold the valves closed while you remove the springs. The adapter fits both Small Block and Big Block engines.

Part Number: 8320

Length Checking Pushrods:

Use these adjustable pushrods to find the correct length pushrod for your engine. Each kit contains detailed instructions on setting the proper pushrod length and rocker arm geometry. The price of this pushrod is refunded with the purchase of a custom length pushrod set.



Engine type	End type	P/N
273-318-340- 360ci engines	ball + cup	8200
	ball + ball	8200B
318-360 Magnum with Magnum heads and roller camshaft	ball + ball	8200B
	ball + ball	8206B
318-360 Magnum with Magnum heads and flat tappet camshaft	ball + cup	8202
	ball + ball	8202B
361-383-400ci engines	ball + cup	8204
	ball + ball	8204B
413-426W-440ci engines		

Adjustable Lifter:



With its screw adjustable plunger, this tool can be used to simulate the preload on a hydraulic lifter. Detailed instructions for the proper preload for your application are included. The price of the lifter is refunded with the purchase of a set of custom length pushrods. Fits all Small Block and Big Block engines.

Part Number: 8100

Lifter broaching ball:

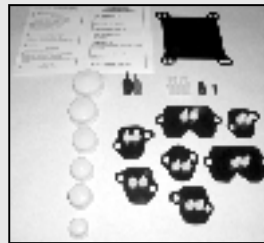
This tool is used to smooth and straighten the lifter bores during an engine rebuild. This promotes lifter rotation and is one of your best guarantees for a successful camshaft break-in. We use this tool on every cylinder block that goes through our shop. It is driven through the lifter bores with a slide hammer (not included).

All Small Block and Big Block engines



8319

Painting Mask Kit:



This reusable masking kit made by Unusual Automotive Solutions provides all the plugs, caps and covers to mask your engine for professional paint job. No need to get out the masking tape. Kit includes plugs for spark-plug, exhaust ports, 4 bbl carb, oil sending unit, distributor, water pump and many others.

Small Block	8330
Big Block	8332

Oil system reamers:

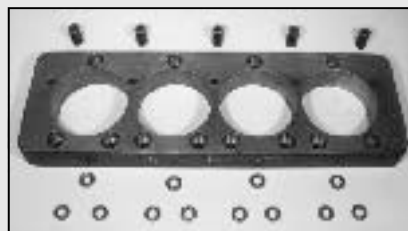
Chucking, HSS, straight flute reamers for use in oil system modifications. Used for both Small Block and Big Block engines. Includes detailed instructions.



1/4" OD x 6" length
Part number: 8350

9/32" OD x 6" length
Part number: 8352

Block torque plates:



Does your local shop have a torque plate? How do they make sure the bores are straight once the engine is assembled? If you are not sure, rent our torque plates, BHJ racing model. Plates include spacers, washers and instructions. Rental fee must be paid via credit card and plate must be returned within 3 weeks time.

Small Block	273-318-340-360	8360
Big Block	361-383-400-413-426W-440	8362

Valve pocket cutting fixture:



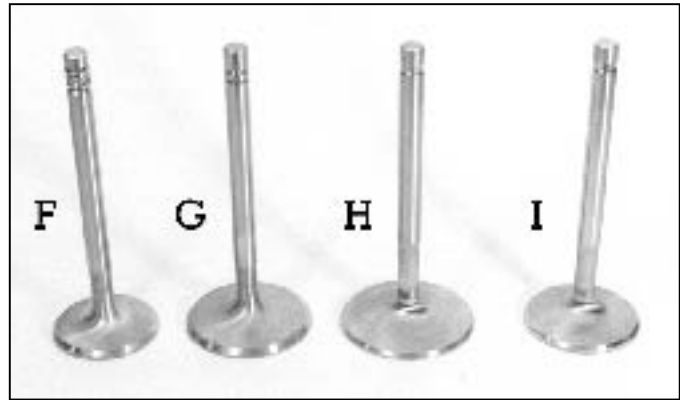
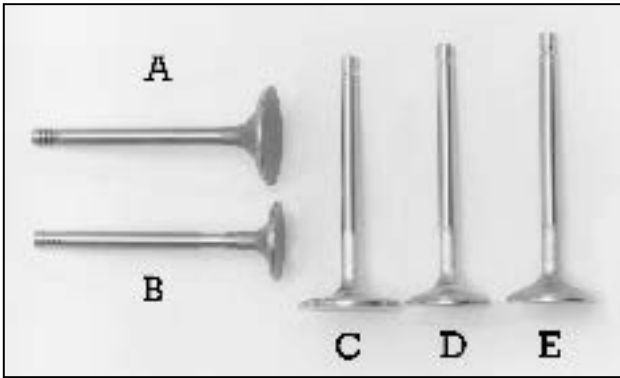
This tool allows you to machine deeper valve notches in your pistons with the short block assembled. Fixtures come with necessary bolts, washers to attach the fixture to your short block. Detailed instructions are also included. Rental fee must be paid via credit card and fixture must be returned within 3 weeks time.

Small Block	273-318-340-360	8340
Big Block	361-383-400-413-426W-440	8342

Oil Pump Priming Shaft:

Use this 14" long shaft to prime your oil pump prior to the initial engine startup. Shaft fits all Small Block and Big Block engines (B/RB).

Priming shaft	6214
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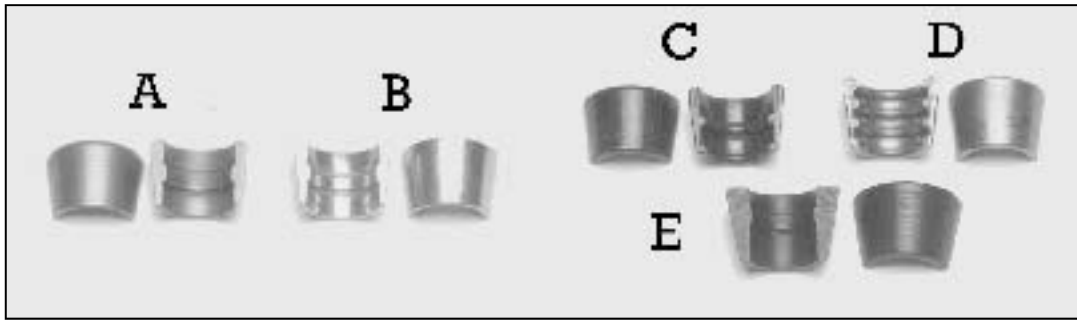
High Performance Racing Valves

These valves are one-piece, chrome stem, 21-4N stainless steel. They feature stellite valve tips and undercut stems with swirl polishing. Sold individually.

	<u>Head Size</u>	<u>Length</u>	<u>Stem diameter</u>	<u>Type</u>	<u>Part Number</u>	
Small Block	Intake Valves					
	Nail head, round groove valve lock (Magnum)	1.92"	4.910"	0.308"	C	1038
	Nail head, single groove valve lock	1.94"	5.021"	11/32"	C	1005
	Nail head, single groove valve lock (Magnum)	2.02"	5.000"	0.308"	C	1003
	Nail head, single groove valve lock	2.02"	5.011"	11/32"	C	1006
	Nail head, single groove valve lock	2.02"	5.030"	3/8"	C	1042
	Nail head, single groove valve lock	2.055"	5.021"	11/32"	C	1007
	Nail head, single groove valve lock	2.08"	5.026"	11/32"	C	1009
	Exhaust Valves					
	Tulip head, single groove valve lock	1.50"	5.011"	11/32"	E	1015
	Nail head, single groove valve lock	1.60"	5.011"	11/32"	D	1013
	Nail head, single groove valve lock	1.60"	5.075"	3/8"	D	1043
Nail head, single groove valve lock (Magnum)	1.650"	5.035"	0.308"	D	1012	
Semi-tulip head, round groove lock (Magnum)	1.625"	4.930"	0.308"	D	1040	
Semi-tulip head, single groove valve lock	1.625"	5.021"	11/32"	E	1014	
Big Block	Intake Valves					
	Nail head, 2 groove valve lock	2.08"	4.870"	3/8"	G	1016
	Nail head, single groove valve lock	2.08"	4.870"	3/8"	H	1020
	Nail head, single groove valve lock	2.14"	4.873"	3/8"	H	1017
	Nail head, single groove valve lock	2.14"	4.873"	11/32"	H	1018
	Nail head, single groove valve lock	2.19"	4.875"	3/8"	H	1019
	Nail head, single groove valve lock	2.19"	4.873"	11/32"	H	1034
	Exhaust Valves					
	Nail head, 4 groove valve lock	1.74"	4.890"	3/8"	F	1021
	Nail head, single groove valve lock	1.74"	4.890"	3/8"	I	1025
	Nail head, single groove valve lock	1.81"	4.908"	3/8"	I	1022
	Nail head, single groove valve lock	1.81"	4.908"	11/32"	I	1024
Nail head, single groove valve lock	1.88"	4.908"	3/8"	I	1023	
Nail head, single groove valve lock	1.88"	4.908"	11/32"	I	1036	

Stock Replacement valves. These valves are made to OEM specs featuring stainless steel materials, chrome stems and tulip heads. Sold individually.

Small Block	Intake Valves					
	4 groove valve lock	1.88"	4.985"	3/8"	A	1002
	1 groove valve lock (Magnum)	1.92"	4.920"	5/16"	N/A	1030
	4 groove valve lock	2.02"	4.985"	3/8"	A	1004
	Exhaust Valves					
	1 groove valve lock (Magnum)	1.60"	4.920"	5/16"	N/A	1032
	4 groove valve lock	1.60"	5.010"	3/8"	B	1010
Big Block	Intake Valves					
	2 groove valve lock	2.08"	4.865"	3/8"	A	1026
	Exhaust Valves					
	4 groove valve lock	1.60"	4.890"	3/8"	B	1027
	4 groove valve lock	1.74"	4.890"	3/8"	B	1028



Description	Type	Part Number
7° Case hardened, stamped steel		
7mm (0.273") valve stem	1 groove (sold in sets of 32 pieces)	N/S 1301
5/16" valve stem size	1 groove (sold each)	B 1300
5/16" valve stem size	1 round groove, Magnum truck replacement (sold each)	N/S 1307
11/32" valve stem size	1 groove (sold each)	B 1302
3/8" valve stem size		
1 groove (in valve) (sold each)	B	1304
2 groove (in valve) (sold each)	C	1305
4 groove (in valve) (sold each)	D	1306
7° Forged, heat treated, steel (sold in sets of 32 pieces)		
11/32" valve stem size	1 groove (+.050" installed height)	B 1340
3/8" valve stem size	1 groove (+.050" installed height)	B 1342
7° Case hardened, machined steel		
5/16" valve stem size	1 groove (sold in sets of 32 pieces)	A 1320
11/32" valve stem size	1 groove (sold each)	A 1322
3/8" valve stem size	1 groove (sold each)	A 1324
3/8" valve stem size +.040" installed height	1 groove (sold in sets of 32 pieces)	A 1325
10° Case hardened, machined alloy steel (sold in sets of 32 pieces)		
5/16" valve stem size	1 groove with lash cap recess	E 1330
11/32" valve stem size	1 groove with lash cap recess	E 1332
3/8" valve stem size		
1 groove with lash cap recess	E	1334
2 groove	N/S	1335
4 groove	N/S	1336

Jumbo Style



Valve lash caps:

Made from 4140 heat-treated alloy steel, adds 0.084" to overall valve length. Each size requires a minimum valve tip length of 0.250". Sold in sets of 16.

	Part Number
5/16" valve stems	1350
11/32" valve stems	1352
3/8" valve stems	1354

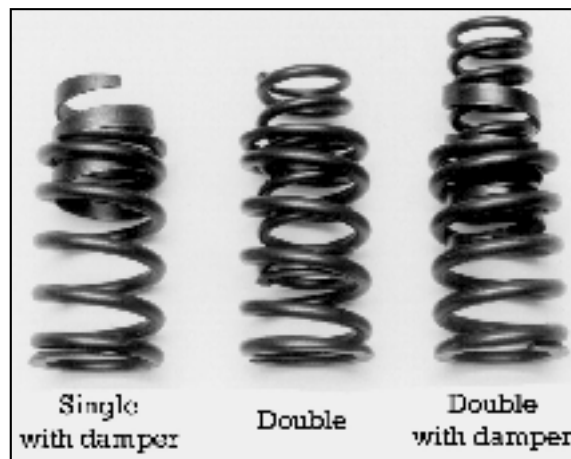
Valve spring cups:

Use these case hardened, steel spring cups to control valve spring movement on cylinder heads. Required on aluminum cylinder heads.

Thickness	Overall OD	Spring Pad OD	Spring Pad ID	Type	Part Number
0.060"	1.640"	1.530"	0.645"	Outer lip	1370
0.060"	1.640"	1.520"	1.031"	Outer lip	1372
0.062"	1.550"	1.440"	0.680"	Outer lip	1375
0.062"	1.650"	1.525"	0.640"	Outer lip	1373
0.054"	1.610"	0.736" (inner lip OD)	0.636"	Inner lip	1376



Our valve springs are manufactured from high quality chrome silicon or chrome vanadium wire, shot peened, heat-treated and heat set. Single valve springs are supplied with a damper to remove harmonics, while double springs feature interference fit to dampen harmonics.



Small Block

P/N	Installed Height/ Pressure	Pressure at .450" Lift	Pressure at .500" Lift	Pressure at .550" Lift	Pressure at .600" Lift	Pressure at .650" Lift	Pressure at .700" Lift	Coil Bind	Inner Spring ID/OD	Outer Spring ID/OD	Type of Spring
1100	1.630" 105 lbs	260 lbs	N/A	N/A	N/A	N/A	N/A	.500" Lift	N/A	0.880"/ 1.240"	Single with damper
1101	1.650" 130 lbs	235 lbs	250 lbs	260 lbs	N/A	N/A	N/A	.600" Lift	N/A	1.084"/ 1.440"	Single with damper
1110	1.660" 120 lbs	280 lbs	300 lbs	310 lbs	N/A	N/A	N/A	.620" Lift	N/A	1.033"/ 1.440"	Single with damper
1102	1.750" 135 lbs	280 lbs	300 lbs	315 lbs	N/A	N/A	N/A	.600" Lift	N/A	1.068"/ 1.465"	Single with damper
*1111	1.800" 140 lbs	275 lbs	295 lbs	315 lbs	330 lbs	345 lbs	N/A	.700" Lift	0.809"/ 1.087"	1.087"/ 1.440"	Double
1113	1.800" 165 lbs	295 lbs	300 lbs	325 lbs	345 lbs	365 lbs	N/A	.700" Lift	0.795"/ 1.087"	1.087"/ 1.440"	Double
1103	1.850" 210 lbs	380 lbs	445 lbs	490 lbs	570 lbs	590 lbs	615 lbs	.780" Lift	0.754"/ 1.140"	1.440"/ 1.525"	Double with damper
1115	1.850" 210 lbs	380 lbs	445 lbs	490 lbs	570 lbs	590 lbs	615 lbs	.780" Lift	0.754"/ 1.140"	1.440"/ 1.525"	Double with damper

* Note: #1111 inner spring base should be 0.125" taller than the outer spring base. If you inner spring base is already cut down, order our spacer kit, part number 1714.



To use valve springs #1103 and #1113, the cylinder head must be machined to remove the step at the spring base and the guide must be cut for positive type seals. Valve spring #1111 must be used with the spring base step, but must have the guide cut for a positive type seal. When open pressure on double valve springs exceeds 350lbs, new camshafts should be "broken-in" by running the engine at 2000RPM for 30 minutes and using the outer spring only. To get the proper installed height using stock or 3/8" stem valves, machining of the spring seat may be necessary. We suggest cutting the spring seat no more than .030".

Spring Warning: Our camshafts are not comparable to other manufactures and require special valve spring pressures to operate and live satisfactorily. **ONLY USE** springs meeting the specifications listed here or on the provided cam cards. Valve spring pressures and installed heights are supplied with each camshaft.

Big Block

P/N	Installed Height/ Pressure	Pressure at .450' Lift	Pressure at .500' Lift	Pressure at .550' Lift	Pressure at .600' Lift	Pressure at .650' Lift	Pressure at .700' Lift	Coil Bind	Inner Spring ID/OD	Outer Spring ID/OD	Type of Spring
1104	1.850" 125 lbs	230 lbs	245 lbs	255 lbs	270lbs	285lbs	300lbs	.750" Lift	N/A	1.130"/ 1.510"	Single with damper
1105	1.830" 130 lbs	285 lbs	300 lbs	315 lbs	335 lbs	350lbs	365lbs	.700" Lift	N/A	1.130"/ 1.540"	Single with damper
1106	1.880" 150 lbs	315 lbs	325 lbs	335 lbs	350 lbs	365lbs	N/A	.680" Lift	N/A	1.130"/ 1.540"	Single with damper
1107	1.880" 155 lbs	330 lbs	345 lbs	365 lbs	370 lbs	380 lbs	410 lbs	.720" Lift	0.800"/ 1.130"	1.130"/ 1.510"	Double
1109	1.950" 185 lbs	390 lbs	420 lbs	450 lbs	475 lbs	505 lbs	530 lbs	.800" Lift	0.730"/ 1.125"	1.125"/ 1.540"	Double with damper
1112 Vasco Jet	1.950" 240 lbs	550 lbs	590 lbs	625 lbs	665 lbs	700 lbs	755 lbs	.800" Lift	0.730"/ 1.130"	1.130"/ 1.540"	Double with damper



To use valve springs #1107, #1109, and #1112, the cylinder head must be machined at the spring base and the guide must be cut for positive type seals. When open pressure on double valve springs exceeds 300lbs, new camshafts should be "broken-in" by running the engine at 1800rpm for 30 minutes and using the outer spring only.

Spring Warning: Our camshafts are not comparable to other manufactures and require special valve spring pressures to operate and live satisfactorily. **ONLY USE** springs meeting the specifications listed here or on the provided cam cards. Valve spring pressures and installed heights are supplied with each camshaft.



Ordering

Business Hours: Monday-Friday 8:00am to 5:00pm CDT
Saturday 9:00am to 12:00pm CDT

Phone orders: Call 309-745-9558, this number is also the tech line, so it is frequently busy, please be patient.

Fax orders: Fax 309-296-9990. Make sure you include your name, address, zip code and phone number. Clearly state what you want, including part numbers if possible. You will be notified if there is any delay in shipment.

Email orders: Orders should be sent to information@hughesengines.com. Make sure you include your name, address, zip code and phone number. Clearly state what you want, including part numbers if possible. You will be notified if there is any delay in shipment.

Mail orders: Make sure you include your name, address, zip code and phone number. Clearly state what you want, including part numbers if possible. You will be notified if there is any delay in shipment. Address orders to the following address:

Hughes Engines inc.
23334 Wiegand Lane
Washington, IL 61571-9589

Foreign orders: We ship all over the world. All foreign and overseas orders must be paid for with Western Union money transfers and paid in advance. No CODs on foreign shipments.

COD orders: First time orders will not be shipped Cash On Delivery. We will only accept money orders and certified checks, no cash or personal checks. If you refuse a COD shipment you will be billed for the shipping both ways and future orders will not be shipped until the bill is paid.

Special orders: If you have a special request or need for an item not listed in our catalog, call us to check its availability. We are constantly developing new products and it may not be listed in our catalog. All special orders must be prepaid in full. No exceptions. No returns. Deposit on custom orders will be forfeited if the order is cancelled.

Methods of payment

We accept cash, certified checks or money orders. Visa and MasterCard drawn from banks in the United States. All foreign and overseas orders must be paid for with Western Union money transfers. Personal checks from US banks will be accepted. Please allow 10-12 business days for personal checks to clear the banks. Only money orders and certified checks will be accepted on COD orders. No exceptions. All final payments must be made with cash, credit cards, certified checks or money orders. Western Union is the quickest and least expensive method to transfer money. We encourage Western Union payments in the US too. Call or check our web site for details. A 2% discount will be applied to any order paid with cash, certified check, money order or Western Union Quick Pay.

Refunds

We will gladly refund your money if you return parts in both unused and undamaged condition. Refunds made to credit card purchasers are made the day we receive the parts back from you. Refunds for COD orders are given whenever the shipper gives us your money.

When you receive your order

Check your order carefully as soon as you receive it. If the package is damaged or opened, immediately notify the shipping company or call us. **DO NOT INSTALL, USE OR MODIFY THE PARTS IN ANY WAY BEFORE CHECKING THEM.** A part that is modified or used in any way cannot be accepted for return regardless of fault. If any parts are backordered this will show on your invoice. If you are not notified otherwise, your order will be shipped when available. Failure to accept a backorder will result in your account being charged for the freight. On backorders greater than 60 days we will notify you at the time of availability and give you the option of accepting the parts.

Shipping

UPS or FedEx are our preferred method of shipping. Both offer shipping to all 50 states. UPS shipping to Canada and most international locations is also available. We can offer Next Day, 2 Day and Saturday guaranteed delivery. 3 Day guaranteed delivery is also available. Call for rates and delivery areas.

Shipments in excess of 200lbs for a single package are shipped via Roadway Express truck shipping. Call for rates and delivery areas.

Tips for shipping your parts to us

- Do not use any Styrofoam peanuts to ship heavy parts
- Do not use any shredded paper to ship heavy parts
- Ship heads in individual boxes, not together
- Ship via FedEx or UPS. Do not use the Postal Service
- Call (800) 742-5877 for your local UPS depot
- Insure your parts for their replacement value
- Magna-flux your cylinder heads before you send them

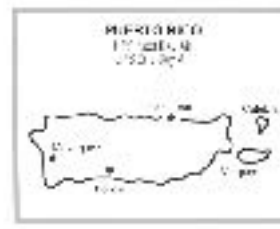
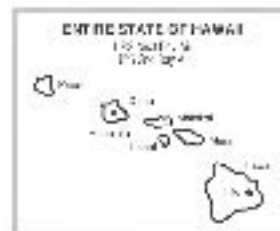
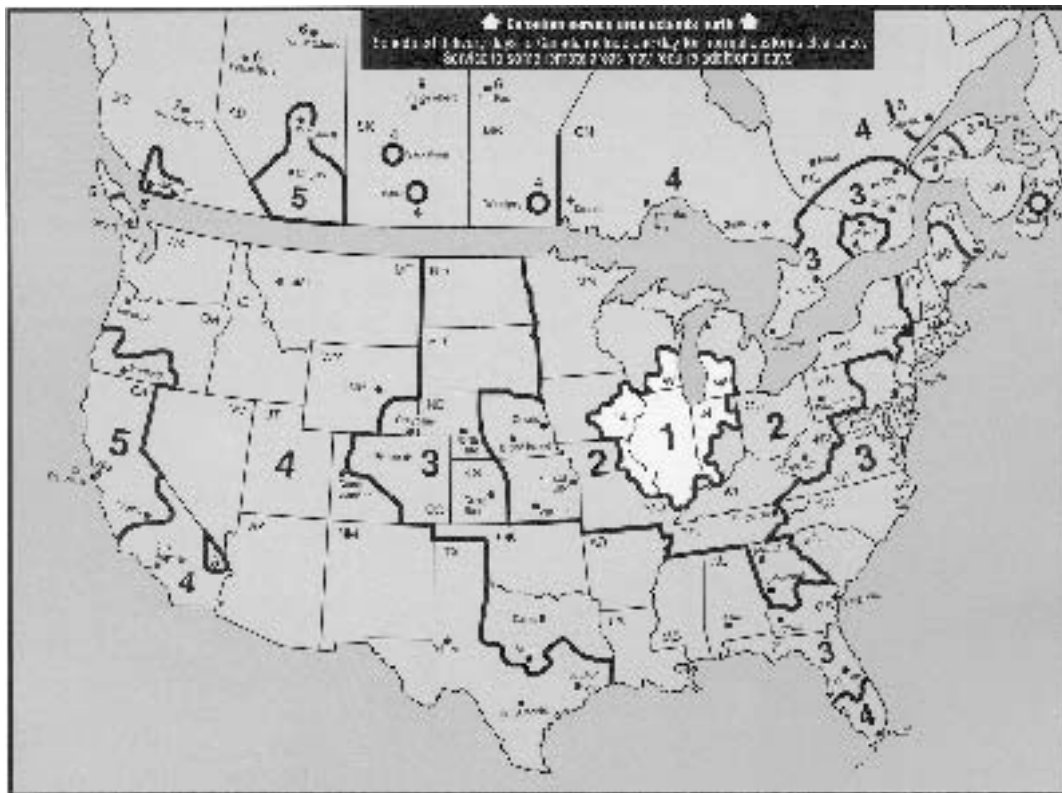
Return guarantee

What can be returned: Hughes Engines Inc. will accept anything purchased from us for a refund or exchange for up to 30 days from the invoice date. You will receive a refund for the parts only. We do not refund shipping charges. All returned parts are subject to a 20% restocking fee. After 30 days, we will accept only defective parts for repair or exchange at our option. This may not match the policy printed in the catalog but this is the correct return policy and takes precedence over any other written material.

What cannot be returned: Hughes Engines Inc. will not accept for return any special order, custom built parts, or any item built to customer specifications. Items that have been used, modified, altered, or allowed to deteriorate to a condition where they cannot be re-sold as new, will not be accepted.

Exchanges: When returning parts for exchange, we must have the returned part in our possession before we can send out the exchange parts without charging you for them. If you absolutely must have a part before returning another part, we will be glad to ship the new item to you COD or credit card and issue you a refund when your return arrives in good condition.

Approximate delivery times from Hughes Engines via Regular Ground UPS



For Express shipping, see your address in Canada.

If you have a problem

If you receive a defective or wrong part, contact us immediately BEFORE returning the part and we will issue you a Return Materials Authorization (RMA) number. To speed your refund, you must have this RMA number printed on the outside of the package. The shipping charges on all returns MUST be pre-paid, we do not accept COD returns. After inspecting the parts, we will determine if the fault was with Hughes Engines Inc., if so you will be reimbursed for the freight charges.

Disclaimer of Representation

Hughes Engines inc. is not a representative of any automobile manufacturer and the parts we sell are not necessarily recommended by any automobile manufacturer. All wording used in this catalog denoting Mopar®, Hemi®, Chrysler®, or Mopar Performance®, and/or other model names of DaimlerChrysler Corporation are intended for use only as reference. We are not an authorized DaimlerChrysler dealer and in no way do we have, or intend to imply any kind of business relationship with DaimlerChrysler Corporation. Our intention is to provide products and services that can be used in a DaimlerChrysler Corporation engine.

Warning!

Parts sold by Hughes Engines Inc. have been designed or are intended for OFF-HIGHWAY application only. Installation in vehicle intended for use on public roads may violate US, Canadian, state or provincial laws and regulations including those relating to emission requirements and motor vehicle safety standards.

Disclaimer of Warranty

Purchaser understands and recognizes that racing parts equipment and services by or manufactured and/or sold by Hughes Engines, Inc. are subject to varied conditions due to the manner in which they are to be installed and used. Purchaser further recognizes and agrees that suitability of any part sold or manufactured by Hughes Engines, Inc. for a particular application is the purchaser's decision and that the purchaser is not relying on the skill or judgment of Hughes Engines, Inc. regarding suitability of any product or service. Hughes Engines, Inc. makes no warranties whatsoever, expressed or implied, oral or written to purchasers. There is no warranty of merchantability made to purchasers with regard to racing and racing equipment.

Liability is limited to repair or replacement of defective parts to original purchaser. Hughes Engines, Inc. is not liable for any consequential damages, expense or injury arising from the use, misuse, or improper installation of any product manufactured or sold by Hughes Engines, Inc. Hughes Engines, Inc. reserves the right to make changes in design or add to or improve on their product without incurring any obligation to install the same on products previously manufactured. This warranty shall not apply to any product which has been repaired or altered in any way so as in our judgment to affect its performance; nor which has been subject to misuse, abuse, negligence or any other occurrence beyond the control of Hughes Engines, Inc.

Engine Size	Standard Bore	Rod Stroke	Crank to Deck	Rod Length	STD Main Journal Size	STD Rod Journal Size
3.9L V6	3.910"	3.313"	9.599"	6.123"	2.4995"/2.5005"	2.1240"/2.1250"
4.7L V8	3.660"	3.400"	9.090"	6.120"	2.4996"/2.5005"	2.0076"/2.0082"
318 LA & Poly	3.910"	3.313"	9.599"	6.123"	2.4995"/2.5005"	2.1240"/2.1250"
340 Small Block	4.040"	3.313"	9.599"	6.123"	2.4995"/2.5005"	2.1240"/2.1250"
360 Small Block	4.000"	3.580"	9.599"	6.123"	2.8095"/2.8105"	2.1240"/2.1250"
361 Big Block	4.125"	3.375"	9.980"	6.358"	2.6245"/2.6255"	2.3740"/2.3750"
383 1961-1971 Big Block	4.250"	3.380"	9.980"	6.358"	2.6245"/2.6255"	2.3740"/2.3750"
400 Big Block	4.342"	3.380"	9.980"	6.358"	2.6245"/2.6255"	2.3740"/2.3750"
413 Big Block	4.1875"	3.75"	10.725"	6.768"	2.7495"/2.7505"	2.3740"/2.3750"
426W Big Block	4.250"	3.75"	10.725"	6.768"	2.7495"/2.7505"	2.3740"/2.3750"
440 Big Block	4.320"	3.75"	10.725"	6.768"	2.7495"/2.7505"	2.3740"/2.3750"

Torque Specifications	Fastener Type	
	Factory fastener using 30W oil	Aftermarket fastener using moly lube
Small Block engines 273-318-340-360 (including Magnum engines)		
Connecting rods		
Factory	45 ft.-lbs.	50 ft.-lbs. (ARP and MSA)
Hughes and Eagle I-beam	N/A	50 ft.-lbs. (ARP and MSA)
Hughes and Eagle H-beam	N/A	63 ft.-lbs. (ARP and MSA)
Main bearings		
Bolts	85 ft.-lbs.	85 ft.-lbs. (ARP)
Studs	N/A	90 ft.-lbs. (ARP)
Cylinder heads		
Bolts	95 ft.-lbs.	85 ft.-lbs. (iron heads) 75 ft.-lbs. (aluminum heads)
Studs	N/A	95 ft.-lbs. (iron heads) 85 ft.-lbs. (aluminum heads)
Big Block engines 361-383-400-413-426W-440		
Connecting rods		
Factory	45 ft.-lbs.	50 ft.-lbs. (ARP and MSA)
Hughes and Eagle I-beam	N/A	63 ft.-lbs. (ARP and MSA)
Hughes and Eagle H-beam	N/A	63 ft.-lbs. (ARP and MSA)
Main bearings		
Bolts	85 ft.-lbs.	85 ft.-lbs. (ARP)
Studs	N/A	90 ft.-lbs. (ARP)
Cylinder heads		
Bolts	70 ft.-lbs.	65 ft.-lbs. (iron heads) 60 ft.-lbs. (aluminum heads)
Studs	N/A	63 ft.-lbs. (iron heads) 58 ft.-lbs. (aluminum heads)

Engine Types:

"A"	273, 318 (1967 & later), 340, 360ci
"Magnum"	3.9L V6, 4.7L, 5.2L, 5.9L V8
"5.7L Hemi®"	5.7L V8
"B"	361, 383, 400ci
"RB"	413, 426Wedge, 426Hemi®, 440ci

Approximate weights:

318 crank	54 lbs.
340 crank (forged)	56 lbs.
360 crank	58 lbs.
4.00" stroke, Small Block M/P crank	58 lbs.
383 crank (forged)	66 lbs.
400 crank (cast and forged)	64 lbs.
440 crank (cast and forged)	69 lbs.
451 crank (cast and forged)	67 lbs.
4.15" stroke, Big Block M/P crank	75 lbs.
4.25" stroke crank (HEI steel)	63 lbs.
318 block (bare)	162 lbs.
340 block (bare)	165 lbs.
360 block (bare)	165 lbs.
383 block (bare)	214 lbs.
400 block (bare)	214 lbs.
426W block (bare)	219 lbs.
440 block (bare)	219 lbs.
Small Block iron head (assembled)	56 lbs.
Small Block Edelbrock head (assembled)	32 lbs.
Small Block short block (in shipping case)	350 lbs.
Magnum R/T iron head (assembled)	57 lbs.
Magnum R/T aluminum head (assembled)	32 lbs.
Magnum long block (in shipping case)	540 lbs.
Big Block iron head (assembled)	52 lbs.
Big Block Edelbrock head (assembled)	29 lbs.

Engine Specifications

Date:

Engine:

Toque Specifications

Cylinder heads:
 Connecting Rods:
 Main Caps:
 Harmonic Balancer:

Cylinder Block Specs

Bore:
 Stroke:
 Rod Length:
 Compression Ratio:
 Piston Number:
 Clearance:
 Dome configuration:
 Piston-to-valve clearance:
 Oil pan-to-pickup clearance:
 Ring gap :
 Top :
 2nd :

Camshaft Specs

Part Number :

Cam lift:

Valve lift 1.5:
 1.6:

Duration at 0.050":

Opening point:

Closing point:

Intake

Exhaust

Main Bearing Clearances

Bearing Undersize:

Journal Clearances	# 1:
	# 2:
	# 3:
	# 4:
	# 5:

Crank End Play :

Rod Bearing Clearances

Bearing Undersize:

Side Clearances:

1st pair:
 2nd pair:
 3rd pair:
 4th pair:

Journal Clearances	# 1:
	# 2:
	# 3:
	# 4:
	# 5:
	# 6:
	# 7:
	# 8:

Cylinder Head Specs

Valve springs # :

Seat pressure :

Open pressure :

Coil bind :

Intake size + type :

Exhaust size + type :

Head type :

Milling :

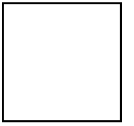
Combustion chamber size :

Head gasket :

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