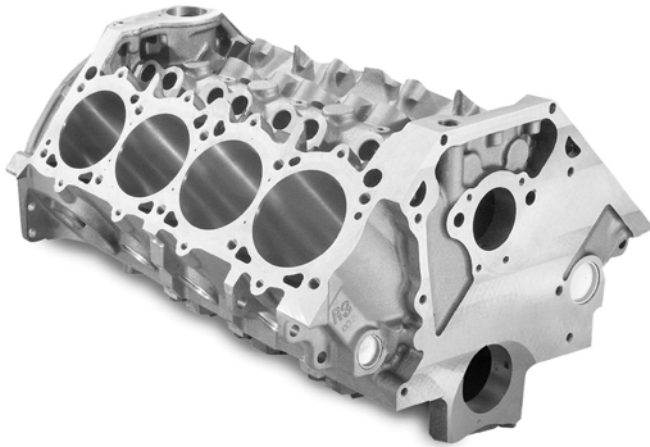




INFORMATION SHEET R3/R4 RACE BLOCKS, 340 REPLACEMENT BLOCKS, AND MAGNUM RACE BLOCKS

PART NUMBERS P4876381AB, P4876671AD, P4876791AD, P4876673AD, P5007552AB, P5153478AB, P5153743, P5153579, P5153452, P5007270AC, and P5007151AC.



Block Components

This package includes the engine block assembly with main caps, main cap fasteners, and the block hardware kit. Some of the block hardware is installed in the block and some is included in a separate package w/ the block.

The R3 and R4 blocks are designed for use in racing where the engine builder does most of the final machine work (i.e. boring, honing, and camshaft bearing installation).

The 340 Replacement and Magnum Race blocks are designed for customers who assemble the engine in their own workshop (i.e. blocks are honed to standard bore size, and the cam bearings are installed).

Read all instructions before beginning machining or assembly.

Note: Please check your machined part number and casting number and compare to the features shown in the chart (see Figure #1 and Figure #2) to confirm that you have the proper block prior to performing any machining, or assembly of the engine.

General Information

Mopar offers 4 types of cast iron small block engine blocks:

- R3 Race Blocks
- R4 Race Blocks
- 340 Replacement Blocks
- Magnum Race Blocks

These blocks are made from high strength cast iron and are heavy duty pieces w/ extra stock for improved strength. All of the blocks include 4-bolt main caps on the center 3 caps (w/ ARP main cap bolts). Most of the blocks come with a Siamese bore water jacket and some have the full water jacket. The 48 degree tappet bore blocks come with a 6-bolt cylinder head bolt pattern. The 59 degree blocks have a 4 bolt pattern for the cylinder head. The deck on these blocks is approximately .700" thick and they can be milled if desired (see the chart for recommended minimum deck heights).

R3 Race Blocks

R3 race blocks are generally used in racing applications since some versions are designed for dry sump oiling systems, and some have shorter than stock deck heights. Some versions have the 48 degree tappet bores that must be used with racing cylinder heads. These blocks now come with dual motor mounts – both "LA" 318 and Magnum style motor mounts. The short deck versions of these blocks require a special timing cover (P4876631 or P4876632). These blocks are typically used in Late Models, 360 sprint cars, and drag racing.

R4 Race Blocks

R4 blocks are generally used in racing applications and have a very short deck height. The short deck height requires the use of a custom timing cover (i.e. dry timing belt setup) and custom water pump since it cannot mount to the stock timing cover. A fabricated intake manifold or individual runner injection system must be used since the deck height is so short (cast 4 barrel type intakes do not fit). These blocks require a custom crankshaft that has smaller than stock mains (otherwise the same as a small block LA). These blocks require the use of a motor plate to mount the engine since they do not have stock style motor mounts. These blocks are now machined for use with a distributor, but this requires modifications w/ the short deck height. These blocks now use a stock 340 rear main oil seal. These blocks are normally used in racing applications like Competition Eliminator drag racing or USAC Silver Crown.

340 Replacement Blocks

340 Replacement blocks are designed for general HP use and entry level racing. These blocks are a heavy duty "LA" 340 block that will work with mostly stock style engine components (i.e. 1968-1973 340 & most other "LA" 318/360 parts – up to



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1992). These blocks will not work with the production style 1987-1992 LA 318/360 hydraulic roller tappet camshaft & tappets w/ dog bone. These blocks come w/ the stock bore size for a 340 and are honed to size for use with stock pistons. There are two version of this block, one with the Siamese bore (P5153478AB), and the other with a full water jacket (P5007552AB).

Magnum Race Blocks

Magnum race blocks are designed for general HP use and entry level racing. These blocks are a heavy duty 5.2L (318) Magnum (P5153579) or 5.9L (360) Magnum block (P5153452). These blocks have provisions to work with all stock Magnum components (i.e. 1992-2001 5.2L and 1993-2003 5.9L w/ crank trigger for MPI, stock style hydraulic roller camshaft, etc). These blocks come with the stock bore size for a 5.2L or 5.9L Magnum and are honed to size for use with stock pistons. These blocks have an extra oil hole from the camshaft up to the deck, so they can also be used with "LA" cylinder heads (if desired). This extra oil hole is covered up by the Magnum head and head gasket when it is not needed (w/ Magnum cylinder heads). The 5.2L block can also be used as a "LA" 318 block with a flat tappet camshaft and LA style heads. The 5.9L block can also be used as a "LA" 360 block with a flat tappet camshaft and LA style heads. These two blocks have a Siamese bore design.

Oil Pan and Oil Pump

The R3, 340, and Magnum blocks w/ 2.500" (318/340) mains are machined for use with 1967-1991 318/340 oil pans (w/ large hoop on the rear of the pan). The Magnum 5.9L block P5153452 is machined for a 1971-1992 360 oil pan (w/ a smaller hoop on the rear of the pan).

A deep sump oil pan is recommended for stroker applications since this will reduce windage with the longer stroke and increase HP.

Engine Mounting

The R3, 340, and Magnum blocks include dual engine mounts (both the standard "LA" 318 mounting ears and late model Magnum 5.2L / 5.9L Dakota mounts on the side of the block). If your vehicle was originally equipped with a 340 or 360 "LA" engine you will need to use a 318 motor mount (late 1970's 318) on the left hand side. The right side "LA" 318/340/360

motor mount is the same. Obtain the proper motor mounts for your model vehicle, if it was available with one of these engines. If your vehicle did not come with a 318, 5.2L, or 5.9L it may be necessary to change the K-Frame in your vehicle. It is strongly recommended that you use new engine mounts. For other applications please consult the Mopar Performance Chassis Modifications Manual (P5007160) for full details on K-Frame change requirements and interchangeability, or call the Direct Connection Hotline at (888) 528- HEMI (4364).

Camshaft Lube

Flat tappet camshafts require a special additive to provide proper lubrication to the lobes and tappets. Add Comp Cams additive (# 159) to the engine oil before initial start up and at each oil change.

Tappet Angle / Cams / Cam Bearings

Some of the blocks come with 48 degree tappet bores. These blocks must be used with W2 (P5007445AB, and P5007708AB), W7, W8, or W9 cylinder heads. Use the 59 degree tappet (stock production angle) for stock or stock style heads (i.e. "LA", Magnum, Magnum R/T, Aluminum Magnum, Commando, W2 (P5249769), W5, etc).

48-degree blocks require the use of a special cam bearings and camshaft UGL cores. The tappets are moved away from the intake ports forward and backward in the block. The cam journal size is different on 48 degree blocks, so they require special cam bearings. Figure #2 shows the recommended cam bearings and camshaft UGL core for each block. UGL (Un-Ground Lobe) camshaft cores must be custom ground by a cam grinder before use (P5007932, P4876633, P4876634, P5007437, and P5007134).

For more detailed information on the 48 degree tappet bore blocks / engines see book P5153775.

Roller Tappets

Mechanical roller tappets are not recommended with the 59 degree tappet bore blocks. The walls and other areas of the block are heavy duty and are thicker and interfere with the guide bar on most roller tappets. It is suggested that flat tappet cams be used on 59 degree R3 and 340 blocks. Do not machine around the tappet bores and the walls of the 59



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degree block for tie bar clearance since you will likely hit the water jacket and ruin the block.

The Magnum blocks are machined for the stock production style Magnum hydraulic roller camshaft that uses dog bones, and a special retainer kit (P5155275). The production Magnum Hydraulic roller camshaft is designed for use with Magnum cylinder heads only since they provide oil to the rocker arms and valve springs through the pushrod (this will not work with LA heads since they use a different oiling method).

Tappet Valley / China Walls / Oiling System

The 59 degree blocks now have slots machined into the valley to allow the oil to drain back to the oil pan with a wet sump oiling system. The 48 degree blocks do not have these slots machined in the valley since most engine builders use these blocks for racing with a dry sump oiling system (w/ an oil scavenge to remove oil from the valley). Most 48 degree R3 blocks (except for P4876381AB) can be modified for wet sump use by drilling 5 or 6 1/2" holes or by machining slots in the valley. Take care not to machine into the oil galleys, water jacket, or cam bearings when drilling or machining in the valley.

R3 blocks have an optional oil feed hole in the front china wall that can be used to feed oil from the dry sump pump to the main oil galley (this is instead of through the oil filter plate on the side of the block). This passage can be plugged if it is not used (in dry sump or wet sump oiling system).

The oil filter pad is not machined on blocks P4876381AB, P5007270AC, and P5007151AC, so these blocks must use a dry sump oiling system and feed oil into the passage on the front china wall. All other blocks use a Magnum style oil filter boss. Use the Magnum Style oil filter (P4529190), filter plate (53021053), filter plate fitting (53007563), and gasket (53020461AB).

Recommended Engine Components & Technical Information

Mopar offers a number of books that may be helpful in selecting parts, assembling your block into a complete engine, and installing it into your vehicle.

- P4876826 – Small Block "A" Engines
- P5007610 – Magnum Engines
- P5007521 – Mopar Crate Motor Installation Manual
- P5153770 – How to Modify Your Magnum V-8
- P5153775 – How to Build Big-Inch Mopar Small Blocks
- P5007160 – Mopar Chassis Manual
- P5007450 – Late Model Oval Track Engine Build-Up Manual
- P5007373 – Mopar 358 Oval Track Engine Build-Up Manual
- P5007520 – Mopar Sprint Car Engine Built-Up Manual

Four sample engine packages are shown at the bottom of this I-sheet (see Figure #3). These are examples of common engine packages that use these blocks. This information is for reference only. The parts shown (other than the engine block) are not included with the block.

For technical assistance, please contact the Direct Connection Tech Hotline - Monday-Friday, 7:00am - 3:00pm EST at 1(888) 528-HEMI or 1(888) 528-4364.

NO PARTS WARRANTY – "AS IS"

Mopar Performance parts beginning with a "P" prefix are sold "as is" unless otherwise noted. This means that parts sold by Mopar Performance carry no warranty whatsoever. **Implied warranties, such as warranties of merchantability, are excluded.** (An implied warranty of merchantability means that the part is reasonably fit for the general purpose for which it was sold). The entire risk as to quality and performance of such parts is with the buyer. Should such parts prove defective following their purchase, the buyer and not the manufacturer, distributor or retailer, assumes the entire cost of all necessary servicing or repair. Chrysler, Dodge and Jeep® vehicle and parts warranties are voided if the vehicle or parts are used for competition. The addition of performance parts does not by itself void a vehicle's warranty. However, added performance parts (parts not originally supplied on the vehicle from the factory) are not covered by the vehicle's warranty, and any failure that they may cause is also not covered by the vehicle's warranty.



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**Mopar Small Block Cast Iron Engine Blocks – Specifications and Recommendations.
Figure #1**

Part Number	Block Type	Casting Number	Tappet Angle	Deck Height Nom.	Deck Height Min.	Water Jacket Type	Main Cap Design	Main Journal Size	Oiling System Type
P4876381AB	R3	P4532907	48	9.025"	8.900"	Siamese	Steel 4-bolt	318/340	Dry Sump
P4876671AD	R3	P4532907	48	9.200"	8.900"	Siamese	Ductile 4-bolt	318/340	Dry Sump
P4876791AD	R3	P4532907	59	9.200"	8.900"	Siamese	Ductile 4-bolt	318/340	Wet Sump
P4876673AD	R3	P5153477	48	9.600"	9.300"	Siamese	Ductile 4-bolt	318/340	Dry Sump
P5007552AB	340 Repl.	2780930-340M	59	9.600"	9.300"	Non-Siam.	Ductile 4-bolt	318/340	Wet Sump
P5153478AB	340 Repl.	P5153477	59	9.600"	9.300"	Siamese	Ductile 4-bolt	318/340	Wet Sump
P5153743	340 Repl.	P5153477	59	9.600"	9.300"	Siamese	Ductile 4-bolt	318/340	Wet Sump
P5153579	Mag 5.2L	P5153477	59	9.600"	9.300"	Siamese	Ductile 4-bolt	318/340	Wet Sump
P5153452	Mag 5.9L	P5153477	59	9.600"	9.300"	Siamese	Ductile 4-bolt	360	Wet Sump
P5007270AC	R4	P4532982	48	8.575"	8.445"	Siamese	Steel 4-bolt	2.25"	Dry Sump
P5007151AC	R4	P4532982	45/59	8.575"	8.445"	Siamese	Steel 4-bolt	2.25"	Dry Sump

Figure #2

Part Number	Cam Bearing Type	Cam Bearings Included	Recom. Cam Bearing	UGL Core Roller Tappet	UGL Cam Core Flat Tappet	Motor Mount Type	Bore Size and Finish	Recom. Cylinder Heads	Cyl. Head Valve Angle
P4876381AB	50 mm	No	P4876707	P5007932	N/A	LA/Mag	4.050" Rough Bore	W9	15 deg
P4876671AD	Babbitt 2.00"	No	P4876372	P4876633	P4876634	LA/Mag	3.998" Rough Bore	W2	15 deg
P4876791AD	Babbitt Std	Yes	Std	N/A	Std "LA"	LA/Mag	3.998" Rough Bore	W2	18 deg
P4876673AD	Babbitt 2.00"	No	P4876372	P4876633	P4876634	LA/Mag	3.998" Rough Bore	W2/W9	15 deg
P5007552AB	Babbitt Std	Yes	Std	N/A	Std "LA"	LA/Mag	4.040"-4.042" Honed	LA/W2	18 deg
P5153478AB	Babbitt Std	Yes	Std	N/A	Std "LA"	LA/Mag	4.040"-4.042" Honed	LA/W2	18 deg
P5153743	Babbitt Std	No	Std	N/A	Std "LA"	LA/Mag	4.175" Rough Bore	LA/W2	18 deg
P5153579	Babbitt Std	Yes	Std	Mag. Hyd	Std "LA"	LA/Mag	3.910"-3.912" Honed	Mag/LA	18 deg
P5153452	Babbitt Std	Yes	Std	Mag. Hyd	Std "LA"	LA/Mag	4.000"-4.002" Honed	Mag/LA	18 deg
P5007270AC	60 mm	No	P5007361	P5007437	N/A	Motor Plate	4.050" Rough Bore	W8/W9	15 deg
P5007151AC	60 mm	No	P5007361	Custom	N/A	Motor Plate	4.050" Rough Bore	P5	-



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P5153478AB, P5153743, P5153579, P5153452, P5007270AC, and
P5007151AC.

Typical Engine Packages - Reference Only - Figure #3

Application Engine Block	General HP - Carb 5.9L Magnum Block	General HP - Carb 340 Replacement Block	Competition Eliminator R4 Race Block	Late Model R3 Race Block
Deck Height	9.600"	9.600"	8.575"	9.200"
Cylinder Head Chamber Size (cc)	58 cc	65 cc	62 cc	62 cc
Cubic Inch Displacement	360 C.I.D	340 C.I.D	-	363 C.I.D
Connecting Rod Length	6.123"	6.123"	-	6.000"
Camshaft Type	Hydraulic Roller Tappet	Hydraulic Flat Tappet	Mech. Roller Tappet	Mech. Flat Tappet
Lift / Duration @ .050	.501"/.513" 230/234	.508"/.508" 248/248	-	-
Intake Valve Size	2.020"	2.020"	-	2.020"
Exhaust Valve Size	1.600"	1.600"	-	1.600"
Stroke Length	3.58"	3.310"	-	3.580"
Bore Size	4.000"	4.040"	-	4.035"
Short Block:	Quantity	Part Number	Part Number	Part Number
Engine Block	1	P5153452	P5007552AB	P4876791AD
Crankshaft	1	P5007259	LA 340	P5007253AB
Connecting Rods	8	Magnum	LA	After-market
Pistons	8	Magnum	LA 340 (no dome)	Custom Forged
Piston Rings	1	Magnum	LA	-
Timing Cover	1	LA or P5249930	LA or P5249930	Modern Muscle
Timing Set	1	Magnum or P5249267	LA or P5249267	Modern Muscle
Timing Chain Tensioner	1	P5007709	P5007709	-
Gasket Set	1	Magnum or P4876249	LA or P4120692	Cometic Gasket
Head Bolt Set	1	Magnum P4876759	P5153851	ARP
Crankshaft Damper Bolt Set	1	Magnum or P5249556	LA or P5249556	-
Oil Pan w/ Pickup (center sump)	1	P5249059	P5249061	Dry Sump
Oil Pump	1	Magnum or P5249589	LA or P5249589	Dry Sump
Distributor/Oil Pump Driveshaft w/ Gear	1	P3690715	P3690715	-
Oil Pan Bolt Set	1	Magnum or P4529260	LA or P4529260	-
Harmonic Balancer	1	Magnum or P5007187	LA or 53020229	ATI
Cooling System:				
Water Pump	1	LA or P5249558	LA or P5249558	Electric
Pulley & V-Belt Setup	1	LA	LA	-
Cylinder Head Assembly:				
Cylinder Head	2	Alum. Magnum P5153847	Alum. Commando P5153849	W9 P5007065AB
Valves	8	w/ head assy	w/ head assy	-
Rocker Arm Kit	1	P5153852	P4529742	T & D
Rocker Shaft	2	N/A	P4510636	N/A
Valve Cover Set	1	P5007617	P5007611	Fabricated Aluminum
Camshaft:				
Camshaft w/ tappets	1	P4876348	P4120233	P5007437
Tappet Set	1	w/ cam	w/ cam	Crane or Jesel
Lifter Aligning Yoke	8	Magnum or 04483045	N/A	N/A
Tappet Retainer	1	P5155275	N/A	N/A
Pushrod Set	1	P5153848	LA	Custom Order
Induction System:				
Intake Manifold	1	P5007380	P4876334	Fabricated Aluminum
Intake Manifold Bolt Set	1	Magnum or P4876772	LA or P4876771	-
Fuel Pump	1	LA or P4007040	LA or P4007040	-
Ignition System:				
Distributor & Electronic Ignition	1	P3690426	P3690426	MSD Belt Drive

Note: Magnum = Stock Production Part for 1993-2003 5.9L Magnum engine
LA = Stock Production Part for 1967-1991 318/340/360 "LA" engine