

TECH REPORT: SPECIAL HIGH PERFORMANCE BLOCK

The Inside Story on Dart's Small-Block Breakthrough

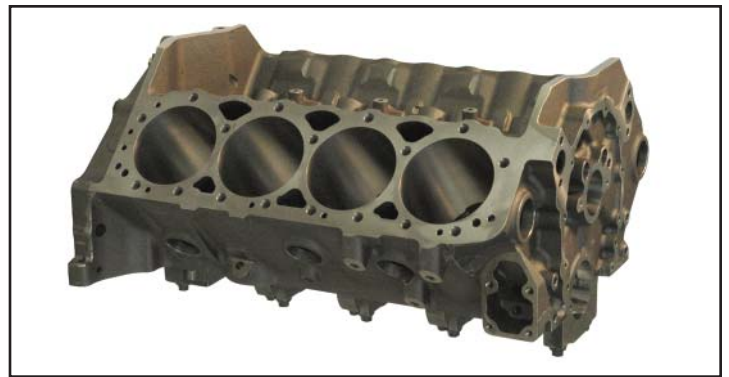
The Special High Performance small-block meets the need for an affordable, precision-machined cast iron block. The SHP block is the ideal starting point for hot rodders, drag racers, circle track competitors, off-roaders, and high-performance marine enthusiasts. Designed for high-performance and heavy-duty applications requiring up to 600 horsepower, the SHP block is priced hundreds of dollars less than a full-race block. The SHP block is the best value in engine building!

Conceived, designed and developed by championship-winning engine builders Richard Maskin and Dick Arons, the SHP block combines the traditional virtues of the first-generation small-block with advanced technology developed in competition. The SHP block retains the small-block's original dimensions and is compatible with all stock components – but it's far superior to any OEM block. The SHP block delivers advanced performance features that are not available in any production casting.

Dart's Special High Performance Group rethought the entire manufacturing process, taking cost out and putting value in. Using the latest precision casting techniques, brand-new tooling, and the power of CNC machining, Dart virtually re-invented the classic small-block. The result: more block for less money!

The SHP block is tailored to the most popular performance and racing applications, with a choice of 4.00" and 4.125" siamesed cylinder bores and 350 main bearings. Just two part numbers cover the vast majority of small-block engine combinations: 31161111 (4.00" bore) and 31161211 (4.125" bore).

The SHP is not your father's small-block. It's been upgraded with a true priority-main oiling system, ductile iron main bearing caps (with splayed four-bolt caps on the center mains), thicker decks with blind head bolt holes, and clearance for long-stroke crankshafts. The decks are even and parallel,



PRECISION MACHINED

The Special High Performance block combines the traditional design of the first-generation small-block with advanced performance features that simply aren't available in any production casting. The SHP block is made in the USA on all-new tooling, and precision machined on Dart's dedicated CNC machining centers. The SHP block eliminates the time and expense of finding, cleaning, machining and prepping a junkyard block – which may turn out to be unusable. The SHP block is virtually ready to assemble out of the box after honing the cylinder bores for piston clearance.



SIAMESED CYLINDER BORES

The SHP block is available with a choice of cylinder bore diameters: 4.00" (PN 31161111) and 4.125" (PN 31161211). Both versions have siamesed cylinder walls for strength, providing a .230" minimum wall thickness at 4.165" diameter, the recommended maximum bore size. The cylinder bores are semi-finished to allow the engine builder to hone for piston clearance and preferred wall finish. The stock 9.025" deck height is compatible with most off-the-shelf pistons.

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Continued....

and the lifter bores, camshaft and main bearing tunnels are finish machined. Assembled short blocks (crankshaft, rods, and pistons) and top-end kits (cylinder head assemblies, intake manifold, valve covers, fasteners, gaskets and spark plugs) are also available from Dart's Special High Performance Group. These pre-engineered, dyno-developed combinations make it easy to build powerful and durable performance engines at a very affordable price.

The SHP block eliminates the expense, time, and frustration of scouring the junkyards for a block. The supply of usable cores is exhausted in salvage yards, and 400ci small-blocks are virtually extinct. In contrast, the SHP block is a brand-new, American-made casting, manufactured to precision tolerances on CNC machining centers. And it's available today!

Take a close look at the SHP block and discover what it delivers. You'll never go to a junkyard for a small-block again.

PRIORITY MAIN OILING SYSTEM

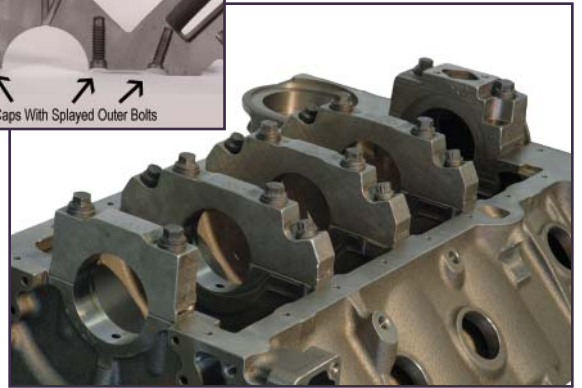
The SHP block has a true priority main oiling system. In a production block, the main oil gallery is located above the camshaft tunnel. Pressurized oil is routed through annular grooves around the camshaft bearings before it goes to the main bearings. This OEM design causes a loss of pressure as the oil is forced through several 90-degree turns, and reduces volume as oil sprays out of the cam bearings.

The SHP block replaces this restrictive and inefficient system with a main oil gallery located alongside the camshaft tunnel. Oil is routed directly from the main oil gallery to the main bearings first through drilled passages, ensuring optimum lubrication for the crankshaft at high rpm. The camshaft and valvetrain, which have lower lubrication requirements, are fed by secondary passages from the upper main bearings. The SHP block's refined oil system eliminates the need for a high-volume oil pump, which requires more horsepower to drive and accelerates wear on the camshaft gear.



RIGID DECK AND BLIND BOLT HOLES

The SHP block's minimum deck thickness is .625", providing an extremely rigid surface that enhances head gasket sealing. The head bolt holes are blind-tapped, so sealant is not needed on the head bolts to prevent coolant leaks.



DUCTILE IRON FOUR-BOLT MAIN BEARING CAPS

The SHP block's main bearing caps are made from ductile iron, the same high-strength material found on many full-race blocks. The three center main caps have splayed outer bolts that anchor the caps to the strongest part of the block. The center bolts are 7/16" diameter for maximum clamping power, and the splayed outer bolts are 3/8" diameter to clear stock-type oil pans. Deep steps on both sides of the block register the caps accurately without dowel pins. The main bearing bores are machined for readily available 350-type inserts (2.450" I.D.), reducing friction and eliminating the need for expensive spacer bearings that are required with production 400ci blocks.



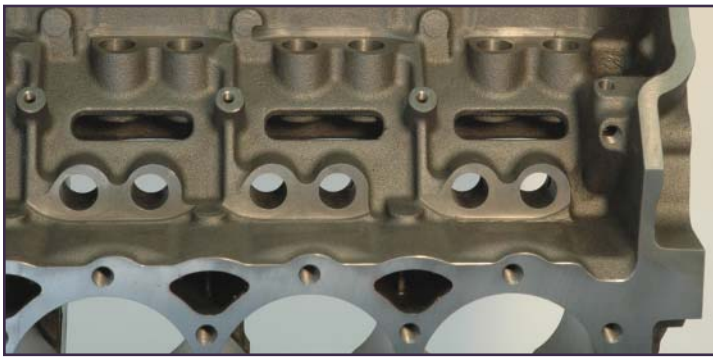
TWO-PIECE REAR SEAL

The SHP block and rear main bearing cap are machined for a two-piece rear seal. This seal design is compatible with most high-performance crankshafts, and permits the use of a counterweighted flywheel flange to balance the crankshaft. The cap mounts a standard small-block pump driven by a stock .481" diameter shaft.



STROKER CRANK CLEARANCE

The cylinder barrels are notched at the bottom to clear a 3.750" stroke crankshaft with steel connecting rods. The main bearing bulkheads are machined for crankshaft counterweight clearance.

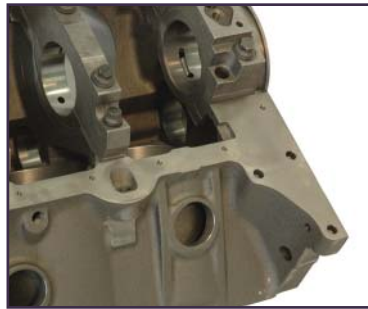


VALVETRAIN VERSATILITY

The SHP block can use virtually any small block cam and lifters, including standard hydraulic lifters, mechanical solid lifters, solid roller lifters and hydraulic roller lifters. The lifter bosses are machined flat to accommodate OEM-style hydraulic roller lifter alignment bars, and the valley has provisions to mount a "spider" lifter retainer. Engine builders can use inexpensive OEM-style hydraulic roller lifters to take advantage of the fast valve acceleration and low maintenance offered by these lifters.

STARTER MOUNT

The SHP block mounts a standard small-block starter for a small- or large-diameter flywheel. The outer water jacket walls are scalloped to improve coolant circulation around the cylinder barrels, and reinforcing ribs add strength to the casting. The SHP uses standard 1.625" press-in freeze plugs.



FRONT COVER

The SHP block has provisions for a camshaft thrust washer when using a hydraulic roller cam. A stamped steel or plastic front cover can be installed on the SHP block.

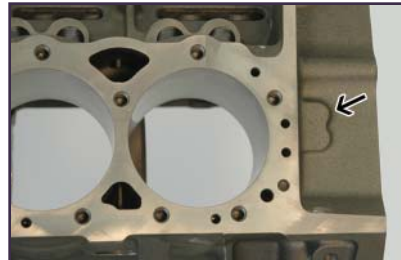


OIL PAN AND DIPSTICK

The SHP block uses a readily available 1981-85 small-block oil pan and passenger-side dipstick.

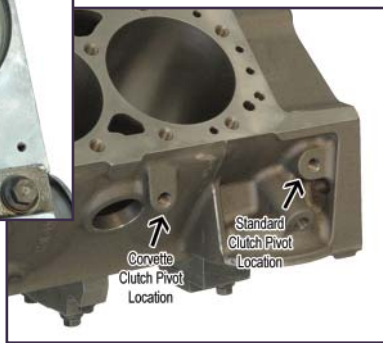
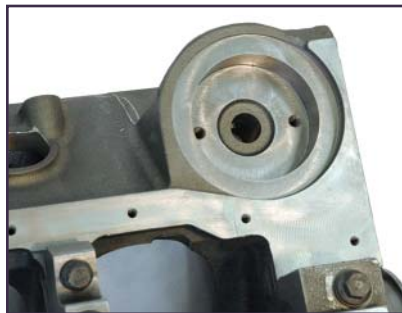
DETONATION SENSORS

Pads at the rear of the SHP block can be drilled and tapped for detonation sensors when using an electronic engine management system.



MOTOR MOUNTS

Installing an SHP block is easy with bosses for standard side and front engine mounts.



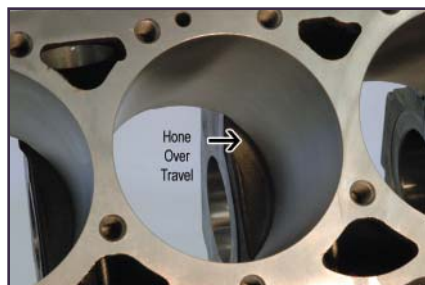
OIL FILTER & CLUTCH PIVOTS

The SHP block uses a standard spin-on two-bolt oil filter adapter. The filter boss is drilled and tapped for a pressure sender or an auxiliary oil line. The block has two drilled and tapped bosses for clutch linkage pivot balls.



MECHANICAL FUEL PUMP

Unlike late-model production blocks, the SHP block has a mount for a mechanical fuel pump. The fuel pump uses a standard length pushrod.



HONE OVER TRAVEL

The SHP block is clearanced for hone over travel to make your final honing easier.



SHP

Special High Performance

ASSEMBLED SHORT BLOCKS & TOP END KITS



Simplify engine building and save time with pre-engineered, dyno tested short-block combinations from Dart's Special High Performance group. These quality component packages are designed to allow you to build powerful and durable engines at a very affordable cost.

ASSEMBLED SHORT BLOCKS - 372 Cubic Inches

Internally Balanced

Special High Performance Dart Block

4.125" Bore x 3.480" Stroke

Plate Honed

Cast Steel Crankshaft - Forged 4340 Upgrade Available

Forged 4340 I-Beam Rods w/ 3/8" Cap Screws

Hypereutectic Flat Top Pistons w/ Full Floating Pin - Forged

Hastings Moly Rings

Upgrade

Clevite Bearings

Available

Coated Cam Bearings

TOP END KITS

Dart 180cc Iron Eagle or PRO1 Aluminum Heads

Assembled With Stainless Steel Valves, Springs, etc.

Dart Dual Plane Intake Manifold

Chrome Valve Covers

Fasteners, Gaskets and Spark Plugs

ENGINE PERFORMANCE

With Hydraulic Flat Tappet Cam (224 @ .050)

750 cfm Carburetor

470 HP @ 5600 RPM

470 Ft. Lbs. @ 4000 RPM

CR: 9.9:1 w/ 64cc Chambers & .045" Gasket

9.1:1 w/ 72cc Chambers & .045" Gasket

ASSEMBLED SHORT BLOCKS - 400 Cubic Inches

Internally Balanced

Special High Performance Dart Block

4.125" Bore x 3.750" Stroke

Plate Honed

Cast Steel Crankshaft - Forged 4340 Upgrade Available

Forged 4340 I-Beam Rods w/ 3/8" Cap Screws

Hypereutectic Flat Top Pistons w/ Full Floating Pin - Forged

Hastings Moly Rings

Upgrade

Clevite Bearings

Available

Coated Cam Bearings

TOP END KITS

Dart 200cc Iron Eagle or PRO1 Aluminum Heads

Assembled With Stainless Steel Valves, Springs, etc.

Dart Dual Plane Intake Manifold

Chrome Valve Covers

Fasteners, Gaskets and Spark Plugs

ENGINE PERFORMANCE

With Hydraulic Roller Cam (230 @ .050)

750 cfm Carburetor

525 HP @ 6000 RPM

525 Ft. Lbs. @ 4000 RPM

CR: 10.7:1 w/ 64cc Chambers & .045" Gasket

10.0:1 w/ 72cc Chambers & .045" Gasket



COMPLETE ENGINE PACKAGES ALSO AVAILABLE

248-362-1188

www.DartHeads.com