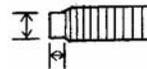



DART **Small Block - Technical Notes**

Deck Height	.....	9.025	9.325
Bore	.....	4.000	4.125
Main Bearing Size	.....	350 (2.45)	400 (2.65)
Weight	.....	210 lbs	
Largest Recommended Bore	.....	4.185	
Largest Recommended Crank Stroke	.....	4.125	
Camshaft Bearing Diameter	.....	SBC - 2.00", BBC - 2.120"	
Camshaft Position Raised	.....	.391	
Cylinder Wall Thickness, min.	.....	.275"	
Deck Thickness, min	.....	.625 (5/8)	
Torque Specs - Main Caps		3/8" bolts	40 ft lbs
		7/16" studs	75 ft lbs
		7/16" bolts	65 ft lbs
		1/2" studs	100 ft lbs

Blocks with cam shaft diameters above 50mm require the use of Dart lifter bushings.
 Actual deck height can be .002" - .005" taller for additional machining requirements.
 With BBC cam diameter, camshaft snout must be machined to SBC size for gear or sprocket.
 Special Timing gear is required for raised camshaft.
 Cam bearing OD should be deburred before installation.
 When initially removing main caps, the caps & block should be deburred before reinstalling. This will insure that correct main size is maintained.
 Pan rails are spread .800", requiring a WIDE oil pan.
 Additional rod clearance may be necessary at bottom of cylinders.
 Head stud holes are blind. They do not go into the water jacket.
 A sealant/antiseize *must* be used on the head studs. Loctite # 620 is recommended.
 Studs should *never* be torqued into block. They should only be lightly snugged.
 It is preferred that a bullet be machined on the end of the head stud where it bottoms in the block to center the stud before tightening.

.350" OD x .150" Deep



Press-in freeze plugs are provided.
 Press-in cam plug dia = 2 3/8".
 When a mechanical fuel pump is used, a +.200 SBC push rod is required (5.950" OA)
 When a wet sump oiling system is used, a BBC oil pump driveshaft or Moroso 22077 (Preferred) is needed.
Note: Be sure to check distributor to oil pump shaft clearance with distributor, intake manifold and oil pump installed on block.
 When using a wet sump you must plumb oil into inlets at front or rear of block. (1/2" NPT)
 Oil pump dowel pins should be .250" OD. Stock GM pins are only .246" OD.

Honing: Hone block to finished size with 220 grit @ 40 amps of load on sunnen hone.
 Make 3 strokes on each cylinder with 280 grit @ 20 amps.
 Make 3 strokes on each cylinder with 400 grit @ 20 amps.

When rehonon start with 220 grit, get cylinder straight and round or just deglaze. Then do same procedure as above.

With some intake manifolds the distributor will not fit into the block. The distributor hole is at 5 degrees instead of the stock 4 degrees for extra clearance for the larger oil pump driveshaft.

Solution: Machine hole in manifold, then re-machine top surface to match. Use collar on distributor if possible. Do not use o-ring on distributor to seal it. Always remove the o-ring.

Note: Make sure that distributor groove is lined up with lifter supply hole. If distributor is too high or too low it will expose the oil galley at the bottom.

DRY SUMP

If a dry sump oiling system is used you must plug the oil inlet hole in the rear main cap or in the block, underneath the rear main cap. (1/4" NPT)

Block has provisions for dry sump scavenge in the valley area. If no scavenge is used at this location or a wet sump is used a minimum 9/16" drain hole, centered in the rear of the valley, must be drilled to insure sufficient oil return. In some cases additional holes may be needed.

NOTE: The fuel pump pushrod bore is machined for a .500" rod. Be sure to check the clearance because of the inconsistencies in the diameters of push rods.

PRIORITY MAIN OIL SYSTEM

Oil feed can be directed through the front or the rear oil inlet.

Oil is directed to the main bearings first, then to the cam bearings.

If lifter oiling is restricted, restrictors must be installed in the front and rear lifter galleys to prevent oil from bypassing and feeding from opposite end.

FOR ADDITIONAL INFORMATION SEE DIAGRAM ON BACK

NOTE: Due to variations in lifter sizes and clearance preferences, most of our Engine Builder customers prefer the lifter bores sized on the small end of the specification. Sometimes these bores will need to be lightly honed.

SPECIAL NOTE: With a multitude of different crank, rod and piston combinations available it is important to check clearance of all moving parts (especially crankshaft counterweight to block) before attempting any type of assembly.

It is good engine building procedure to ALWAYS check the fit of the distributor before any machining or cleaning is done.

We Also Stock Parts that are Unique to this Block.

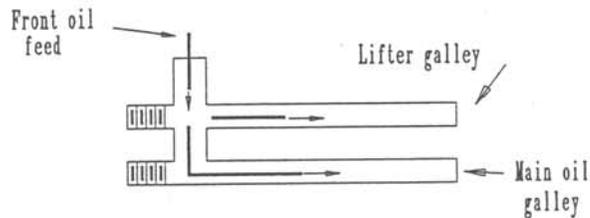
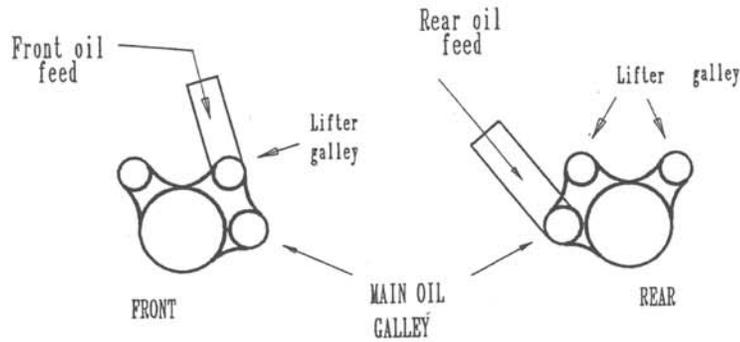
Timing Chain Set	67110002
Gear Drive assembly	67130002
Belt Drive assembly	67120002
Mag Front Cover w/mounting holes	67140002
Head Stud Sets (specify cyl head type)	

Dart  **SBC Iron Block**

Part#	31121111 thru 31122223
Material:	Superior iron alloy
Bore:	4.00" & 4.125"
Bore & stroke:	4.185" x 4.125" max recommended
Cam bearing bore ID:	SBC - 2.00" BBC - 2.120" 50mm Roller Brg – 2.2819"- 2.2831"
Cam bearings:	Special coated, grooved, w/3 oil holes
Cam Bearing O.S.	+ .010", +.020", +.030"
Cam bearing press:	.002"
Camshaft position:	Raised .391"
Camshaft to Crank Ø	4.912"
Camshaft snout:	SBC on all
Cam Drive:	Timing chain, Gear drive & Belt drive for raised cam
Cam Plug:	2.375" dia. cup plug
Cubic inch:	455" max recommended
Cyl. Wall Thickness:	.275" min @ 4.185" bore
Deck Height:	9.025" & 9.325"
Deck Thickness:	.625" min.
Fuel Pump:	Mechanical pump provision
Fuel Pump Pushrod:	+ .200" long 5.950" OA
Freeze Plugs:	Press in cup plugs
Lifter Bores:	SBC .8427" - .8437"
Main bearing size:	2.450" (350) 2.650" (400)
Main bearing bore:	(350) 2.6405 – 2.6415 (400) 2.8405 – 2.8415
Main cap press:	.004" - .005"
Main caps:	Steel - 4 bolt #2, #3, #4 / 2 bolt frt & rear
Oil system:	Wet or Dry Sump - Main Priority Oiling
Oil Pump shaft:	BBC shaft with wet sump
Oil Filter:	No provision
Oil Pan:	Pan rails spread .400" each side
Rear Main Seal	350 main - std seal / 400 main - Fel-Pro# 2909
Serial No.	Left front & main caps
Starter:	Mounts on either side
Studs holes, Head:	Blind holes
Timing chain/gears	Must use raised cam components
Timing Cover:	Can use stock cover / Mag w/fuel pump provision avail.
Torque Specs:	7/16" studs - 75 ft lbs 7/16" bolts - 65 ft lbs 1/2" studs - 100 ft lbs
Weight:	205 lbs @ 4.00" bore

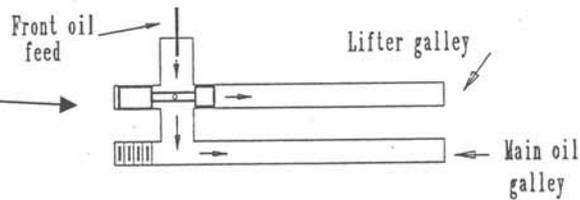


ALUMINUM & CAST IRON BLOCKS



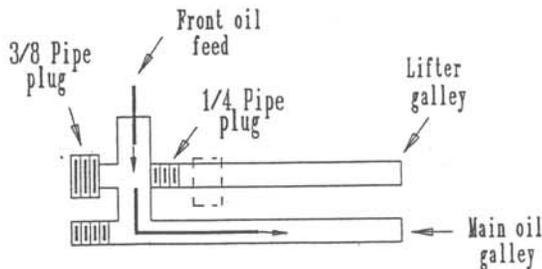
NOTE

Conventional restrictor will block Main oil feed before it reaches the main oil galley. This could restrict oil supply to main oil galley.



SOLUTION

1/4" pipe plug can be drilled for desired flow to lifters. Plugs should be installed flush so they don't restrict oil flow in the passage.

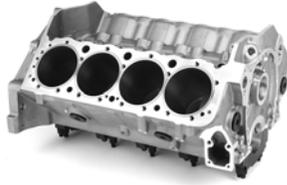


All threaded plug holes in blocks are National Pipe thread and use tapered pipe plugs. We recommend using female allen socket plugs. Various length plugs are available from Pioneer for adjusting the depth of the plug.

Pioneer Automotive Parts - pipe plugs

1/4" NPT (restrictors)	PP584	.325" OA	3/8" NPT (outer)	PP554	.375" OA
	PP625	.333"		PP560	.410"
	PP567	.375"		PP637	.460"
	PP507	.460"			

IMPORTANT



This Block should be assembled only by experienced, professional engine builders.

INSPECTION

Upon receiving this block it should be thoroughly inspected for shipping damage.

Prior to machining and assembly please inspect the following items:
Cylinder bores - Oil passages - Deck surfaces - All threads

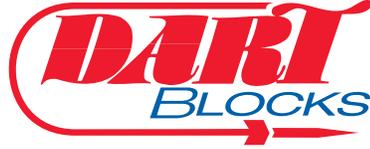
MEASURING & MACHINING

- ❑ All initial measuring should be done before any machining has begun.
- ❑ Decks are CNC machined to standard deck heights. If you need a particular deck height always measure before machining.
- ❑ Main journals are finish line honed to the low to middle of the specification. They should be measured for your preference. If you have need for a different diameter you must realign hone this yourself.
- ❑ Crankshaft & rod clearance should always be checked before any machining is started. You need .060" clearance for rotating counterweights and rods.
- ❑ Due to variations in OD dimensions of the numerous lifter manufacturers, lifter bores are finish honed on the tight side of the tolerance to leave room for lifters that are larger than the standard.

WASHING

- ❑ Final washing should be very thorough, paying particular attention to all oil galleys. Use hot soapy water and rinse with hot water first, followed by cold water which helps reduce rust.

Honing Procedures for



- **HONING OIL** Sunnen MAN 845-55
- **SPEED & FEED** CK-10 (C&E) Pulleys
CV-616 185 rpm 50 strokes per minute
- **HONING**
 - 1) **Rough** .003" from size Sunnen C30A-25
 - 2) **220** to size Sunnen C30A-55
 - 3) **280** 3 strokes Sunnen C30J-65
 - 4) **400** 3 strokes Sunnen C30J-85
- **REHONE (deglaze)**
 - 1) **220** 3 strokes Sunnen C30A-55
 - 2) **280** 3 strokes Sunnen C30J-65
 - 3) **400** 3 strokes Sunnen C30J-85

- **RA should be 26 - 28**

- **SHOE ASSEMBLY TECHNIQUE**

Titanium or hard shoe (part# CK-3570) from Sunnen on one side of honing head.

Delrin (engineering plastic) attached to brass shoe holder & trimmed to size on other side. (Delrin bars can also be purchased from your local plastic supplier)

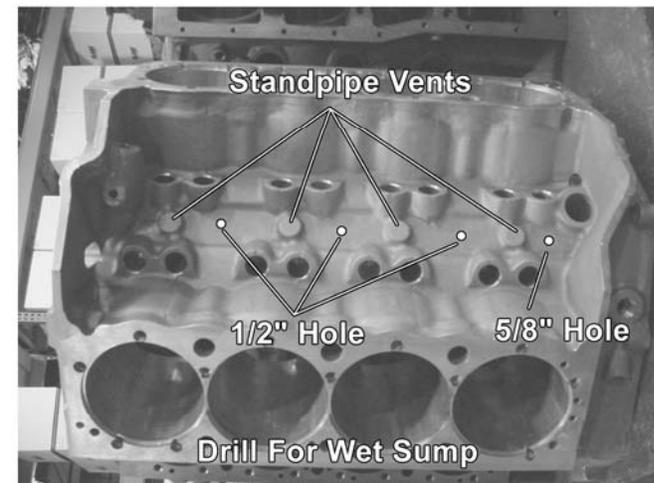
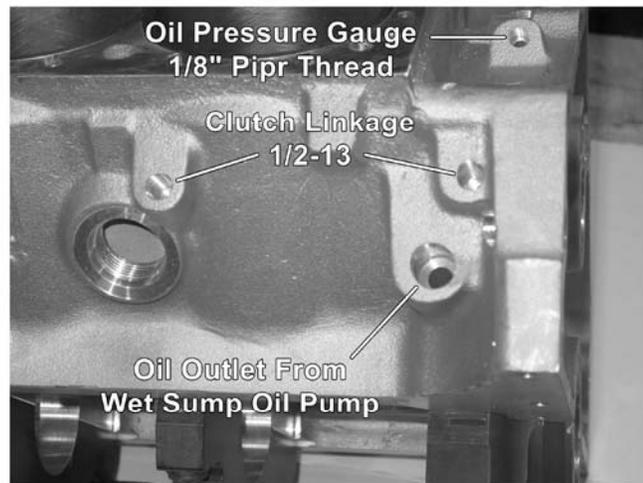
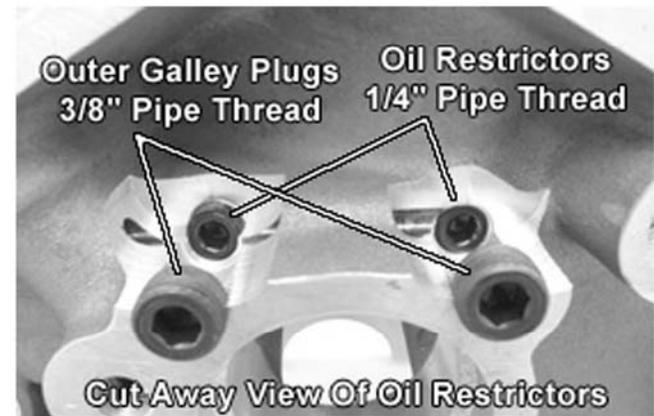
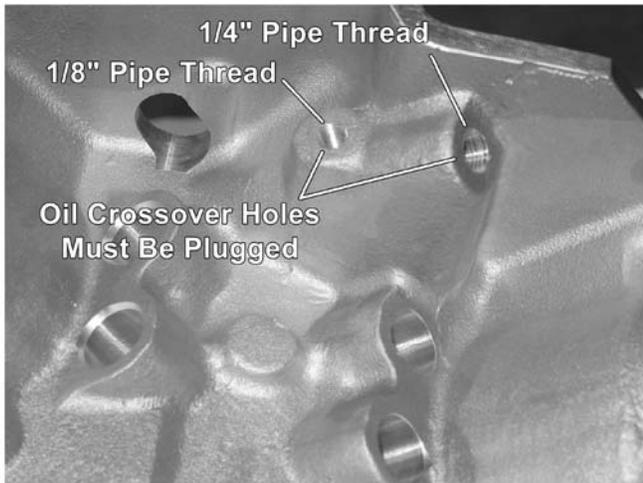
***** DO NOT use bronze shoe *****

- **FRESH OIL IS CRITICAL**

These are only recommended procedures we have developed through our Pro Stock program. Some engine builders have their own procedures for honing our blocks.

All supplies from Sunnen Products

2/8/2008



Iron Eagle Small Block Chevy Aluminum Race Series Small Block Chevy