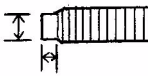
DART Technical Notes:

SPORTSMAN COMP

Deck Height	.....	**9.025"**
Bore	.....	**4.00" or 4.125" unfinished**
Main Bearing Size	.....	**350 (2.45") 400 (2.65")**
Main Caps	.....	**Comp – Steel Sportsman – Ductile**
Weight	.....	**197 - 205**
Largest Recommended Bore	.....	**4.185"**
Camshaft Bearing Diameter	.....	**SBC - 2.000"**
Camshaft Position	.....	**Standard SBC**
Cylinder Wall Thickness, min.	.....	**.275" @ 4.185" bore**
Deck Thickness, min	.....	**.675"**

Early stock SBC 2 hole oil filter adaptor is needed.
Standard SBC timing chain, timing cover, gear or belt drive can be used.
Actual deck height will be .005"- .010" taller for additional machining requirements.
Standard SBC oil pan can be used.
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.
Standard SBC head studs or bolts may be used.
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 with comp series blocks only.
Press-in cam plug dia = 2 3/8".
Timing cover and Oil pump dowel pins are .246" O.D. in dart blocks
The block is machined for a left hand dipstick. The boss is provided for a right hand dipstick but it must be drilled if needed.

Dipstick Tube installation: If an oil dipstick tube is used, after installation, fill the engine with oil and remark the dipstick indicator Full mark if necessary. In certain applications you may need to modify or bend tube to properly install it. The recommended part number is Trans-Dapt 9420

OIL PUMP DRIVESHAFT

On blocks with 400 main sizes you MUST use a 400 oil pump shaft which has a diameter of .425". If you are using an after market HD shaft or a 350 shaft, which are .481" diameter, you MUST machine the center of the shaft to .425" to clear the hole in the block. If this is not done, you may experience oil pump and/or distributor gear problems. The 400 main blocks have a hole .062" smaller than a 350 so the shaft hole will not break through to the rear main bore.

Note: Be sure to check distributor to oil pump shaft clearance with distributor, intake manifold and oil pump installed on block.

DRY SUMP SYSTEM

If a dry sump oiling system is used you must plug the inlet hole in the rear main cap or the hole in the block underneath the rear main cap. The Little M Comp block has threaded inlets for dry sump oil feed machined in the front and rear. There is also a boss provided for dry sump scavenge in the lifter valley area. The hole must be drilled & tapped for valley scavenging.

PRIORITY MAIN OIL SYSTEM
Oil 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 restriction is needed, the restrictors must be installed in the front or rear lifter galleys, depending on what end you feed oil to. You will plug the end you feed oil to completely off and restrict the opposite end. This will prevent oil from bypassing and feeding from opposite end.

NOTE: If a high volume oil pump is used it is highly recommended to restrict the oil feed to the top of the engine.

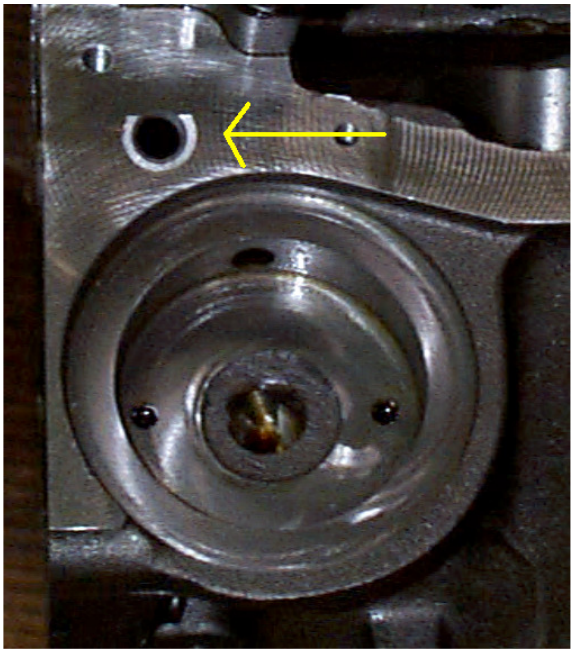
NOTE: The fuel pump pushrod bore is machined for a .500" rod. Be sure to check the clearance because of the inconsistencies in the diameters of push rods.

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.

OIL PANS: Most GM & aftermarket oil pans should fit on this block. Due to the massive size of our front & rear main caps we have machined the corners of the caps for oil pan clearance but with some oil pans you may still experience clearance problems. This will require additional machining or grinding on the corner of the cap. Oil pan clearance should be checked before assembly.

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 and connecting rod to block. All parts must be checked before any type of machining or assembly is attempted.
It is good engine building procedure to ALWAYS check the fit of the distributor before any machining or cleaning is done.

NOTE: Be sure to plug this oil feed hole in block.

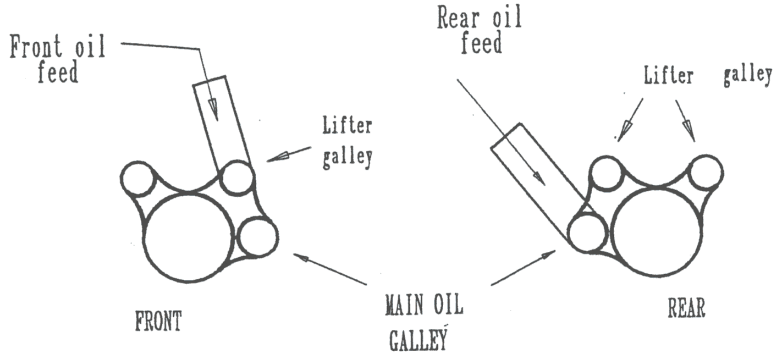


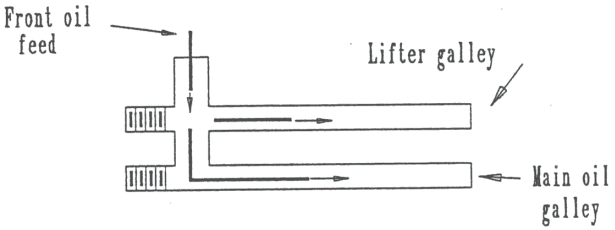
NOTE: If you are using aftermarket cam profiles you must use the correct components for the application.

Dart Little "M" Technical Notes:

Part#	**31151111 - 31152211 & 31131111 - 31132211**
Material:	**Superior iron alloy**
Bore:	**4.00"or 4.125" unfinished**
Bore & stroke:	**4.185" x 4.000" max with clearance machining & small base cam.**
Cam bearing bore ID:	**SBC - 2.00"**
Cam bearings:	**Special coated, grooved, w/3 oil holes**
Cam Bearing O.S.	**+ .010", +.020", +.030"**
Cam bearing press:	**.002"**
Cam journal OD:	**Standard SBC - 1.869"**
Cam Plug:	**2.375" dia. Cup plug**
Cylinder Wall Thickness:	**.275"min @ 4.185" bore**
Deck Height:	**9.025" +.005"to .008"/ – 0.00"**
Deck Thickness:	**.675" min.**
Fuel Pump:	**Mechanical pump provision**
Fuel Pump Pushrod:	**Standard Length**
Freeze Plugs:	**Press in cup plugs**
Lifter Bores:	**SBC .8427" - .8437"**
Lifters:	**Note: Serial #'s 22016- up must use +.300" tall lifters if using link bar Lifters**
Main bearing size:	**2.450" (350) 2.650" (400)**
Main bearing bore:	**(350) 2.6401" / -.001" (400) 2.8401" / -.001"**
Main Cap bolts:	**Comp - 7/16" & 3/8" dia. Sportsman – 7/16"dia.**
Main Stud Kit:	**Dart PN# 66311400**
Main Bolt Kit:	**Dart PN#**
Main cap press:	**.005"**
Main caps:	**Comp - Steel 4 bolt on all 5 Sportsman – Ductile 2 bolt front & rear.**
Main cap register:	**Deep stepped register on each side (no need for dowels)**
Oil system:	**Wet Sump - Priority main oiling (can use dry sump)**
Oil Pump shaft:	**350 main = Stock shaft (.481"OD)**
	400 main = Stock shaft (.425"OD) MUST machine aftermarket shaft
Oil Filter:	**Standard SBC filter and uses 2 bolt filter adapter.**
Oil Pan:	**Standard SBC oil pan**
Rear Main Seal	**350 main - STD seal / 400 main - Felpro# 2909**
Serial No.	**Left front & main caps**
Starter:	**Standard SBC**
Stud holes, Head:	**Blind holes**
Timing chain/gears	**Standard SBC components**
Timing Cover:	**Can use stock style cover**
Torque Specs:	**Comp - 1-5 7/16" bolts - 65 ft lbs 1 & 5 3/8" bolts 35 ft lbs**
w/ high pressure lube	**Sportsman – 1 – 4 7/16" bolts – 65 ft lbs Rear – 1/2" bolts 100 ft lbs.**
Weight:	**197-205**

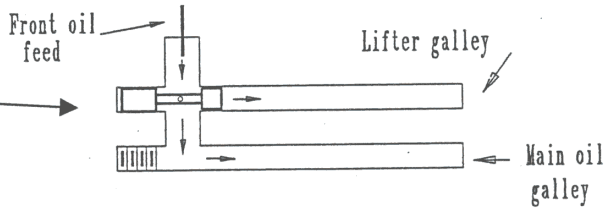
ALUMINUM & CAST IRON BLOCKS





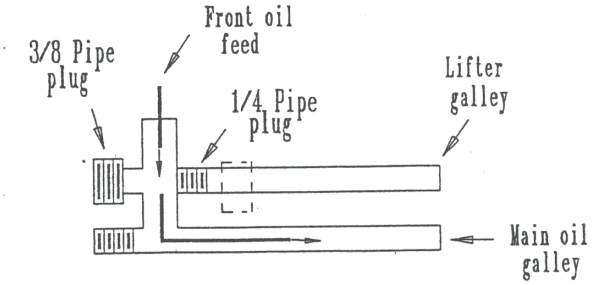
NOTE

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



SOLUTION

¼" 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.

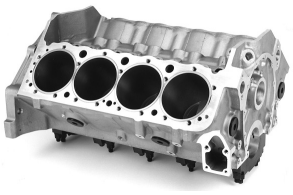


All threaded plug holes in blocks are National Pipe thread and use tapered pipe plugs. We recommend using female allen socket plugs. Various length plugs are available from Pioneer for adjusting the depth of the plug.

<u>Pioneer Automotive Parts - pipe plugs</u>

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.

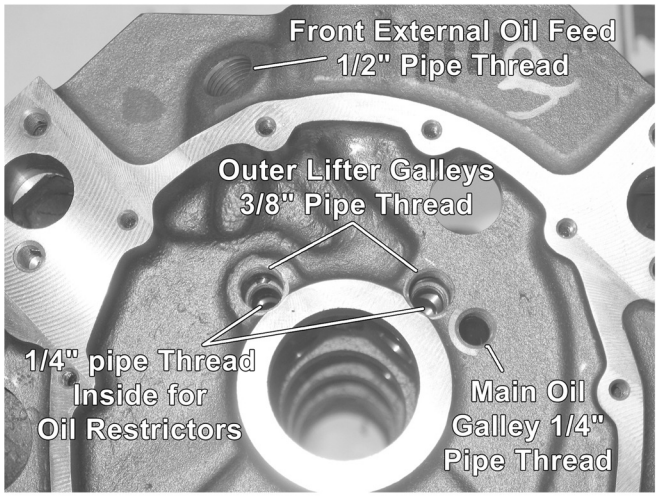
Prior to machining and assembly please inspect the following items:
Cylinder bores - Oil passages - Deck surfaces - All threads

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

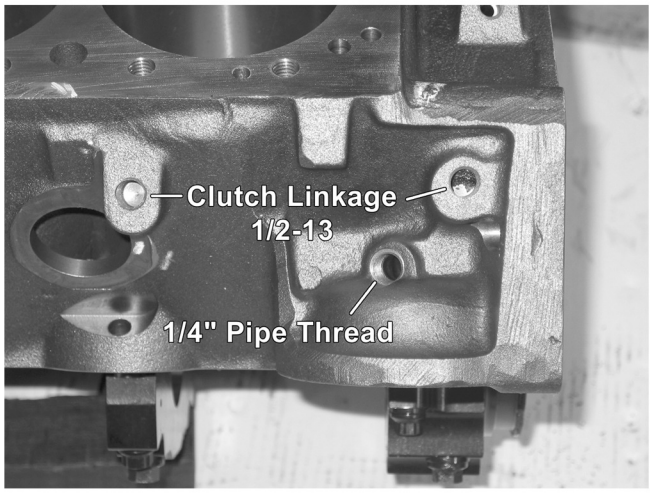
- Final washing should be very thorough, paying particular attention to all oil galleys. Use hot soapy water and rinse with hot water first, followed by cold water which helps reduces rust.


Front External Oil Feed
1/2" Pipe Thread
Outer Lifter Galleys
3/8" Pipe Thread
1/4" pipe Thread
Inside for
Oil Restrictors
Main Oil
Galley 1/4"
Pipe Thread


No Front
External Oil Fed
1/4" Pipe Thread
No Threaded
Oil Restrictors
SPORTSMAN BLOCK


1/4" Pipe Thread
1/8" Pipe Thread
Oil Crossover Holes
Must Be Plugged


No Oil Crossovers
SPORTSMAN BLOCK

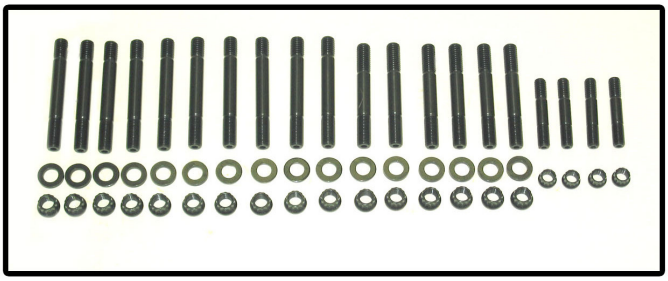

Clutch Linkage
1/2-13
1/4" Pipe Thread


External Oil Feed 1/2" Pipe Thread
Main Oil Galley
1/4" Pipe Thread
1/8" Pipe Thread
Oil Pressure
Lifter Galleys
3/8" Pipe Thread
1/4" Pipe Thread
Inside for Oil Restrictor
Can Be Drilled
for Dry Sump
Scavenge 3/8"
Pipe Thread

Make Sure You Have Everything You Need For Your New Block!

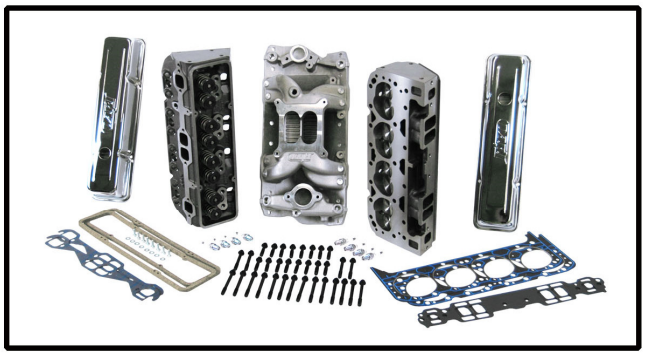
Assembly Lubricant
 # 70000009

SBC Block Parts Kit
 # 32000001



Little M Main Stud Kit
 # 66311400

Block Prep
Final lifter and hone spec.
Finish machined to your specs.
Final prepped and washed.
Pipe plugs, cam bearings and freeze plugs installed.
 # BLOCK PRP



SBC Top End Kits
 # 01111111 - 01210004

Call Or Visit Our Website!

Dart Machinery 248-362-1188 www.DartHeads.com

CHAMPIONSHIP ENGINE COMPONENTS

Here at Dart we are constantly improving upon our products to ensure that you are receiving the latest and most technologically advanced products in the industry. Through our extensive R&D we have found that valvetrain oil is crucial in a high performance engine. The following modification will correct oil volume to the valvetrain that may occur when using solid roller lifters in any block.

Figure 1:
Stock un-modified solid roller lifters

Figure 2:
Dart oil galley modification from band to pushrod oil hole

We recommend a .020”deep x .080”radius wide groove from the pushrod feed hole to the oil band / machined feed hole in your solid lifters (**Front hole only** as shown in Figure 2 above) depending on your tooling & method. You can also do this with a cutoff wheel or a dremel. This allows you to use the restrictor provisions provided in your Dart block to tune oil volume to the lifter oil galley. This allows you to control the oil going to the pushrods, rocker arms and valve springs.

CAUTION!

The use of lifters that are heavily lightened should not be used in Dart Blocks. The lightening holes will cause lifter oil to leak into the valley instead of oiling the pushrod, rocker arm and valvespring.

Please call our technical staff with any questions Mon-Fri 9am-6pm E/T (248)-362-1188