347 Series Sealed Racing Engine

Sanctioning Body Specifications Handbook

S347JR

D347SR/D347SR7

Issue Date August 2, 2017 Revision #10

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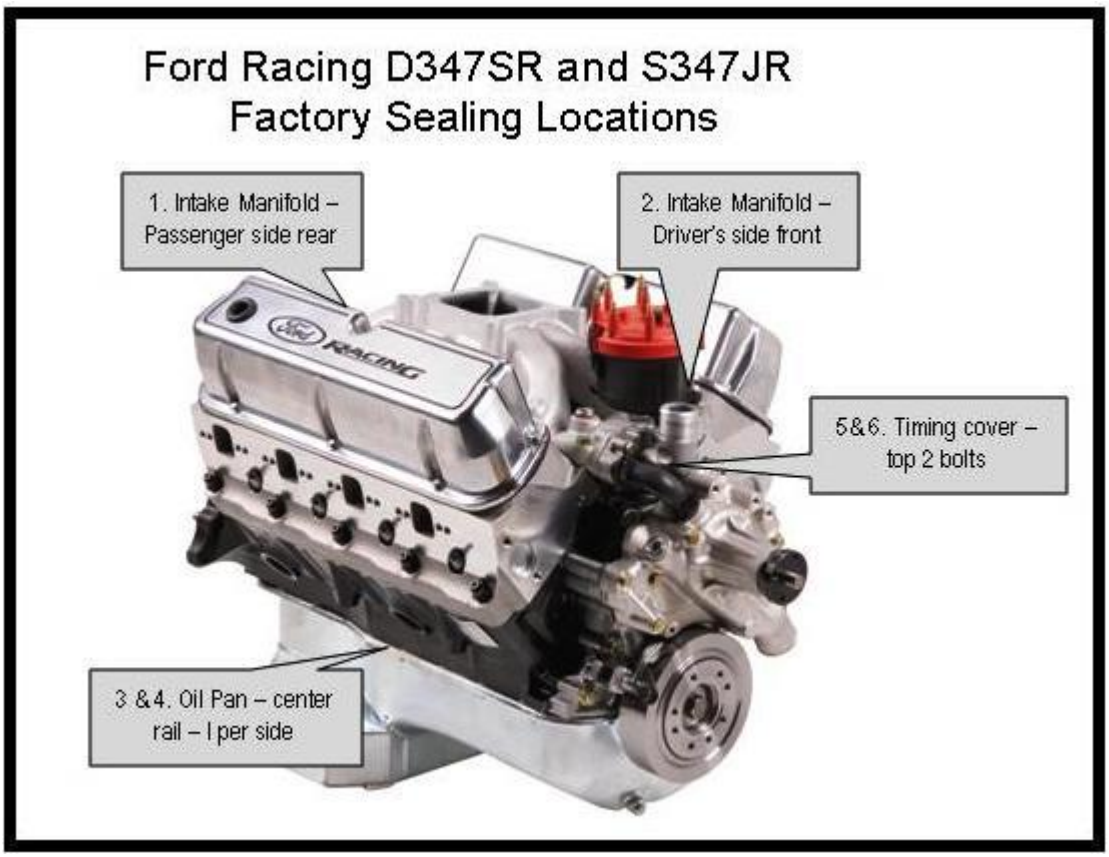
For more information on Ford Racing Sealed Racing engines, contact Mike Robins at (313) 845-1995 or mrobi258@ford.com

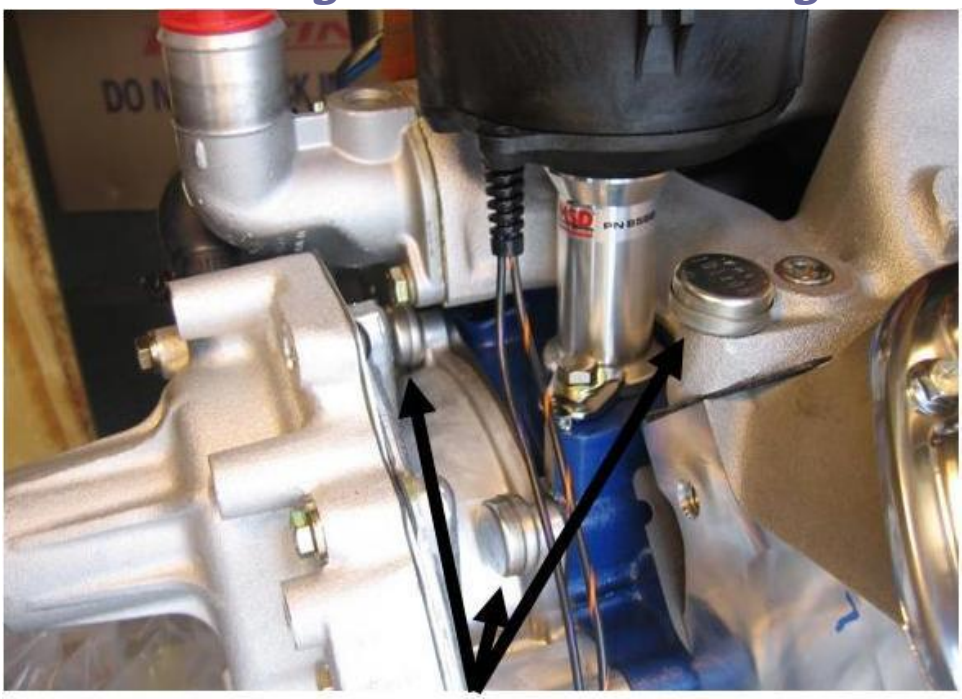
Engine Sealing

Ford Racing Circle Track engines use a 1" (25.4 mm) diameter cap seal with FRT 6-digit serial number. Factory built engines are sealed at the factory by 6 seals in 3 locations:

- Oil pan rail – left and right side
- Front cover – 2 on the top left and right of the front cover
- Intake Manifold – one on the drivers side front and one on the passenger side rear



Cap plug seals are a two piece design. The base is secured by the bolt and encapsulates the head of the bolt. This base includes fingers that interlock with the cap when installed. Any sign of tampering or removal is easy to detect.



Seals on the front of the engine – 2 on front cover and 1 on driver's side front of intake manifold

Shown below is a close-up of the Ford racing factory seal with "FRT" and 6 digit seal number with each seal having a unique number. Ford Racing maintains complete records of each Factory Original seal number, its location and the engine to which it belongs.

Oil pan seal location – one on each side of the oil pan

Sanctioning Body Sealing – Each sanctioning body is encouraged to use the Ford Racing Factory sealing process of cap seals should engine teardown or repairs be necessary. Note that Ford Racing will not issue replacement cap seals.

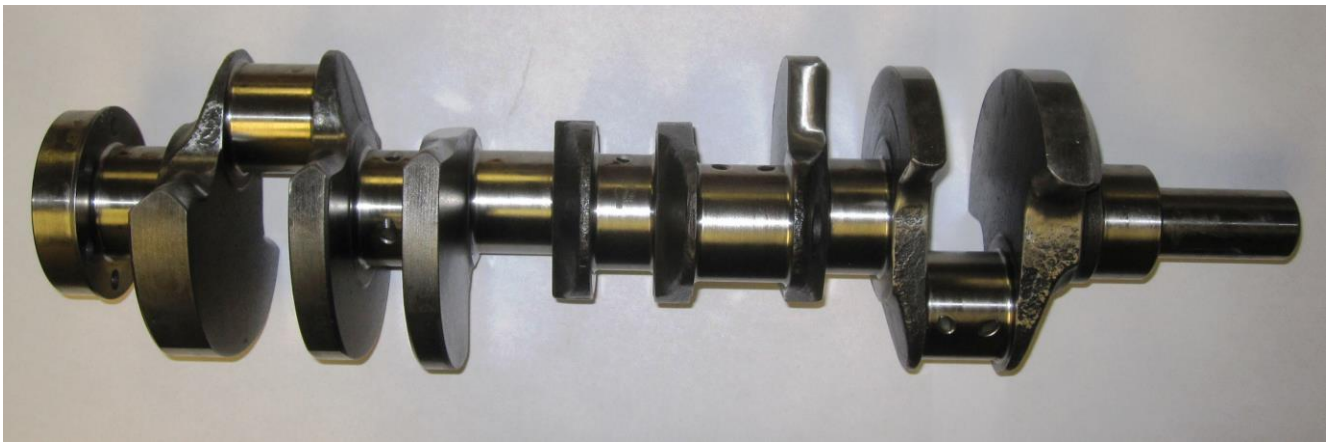
Engine Description

Block – D347SR – D347SR7– S347JR

- Block M-6010-BOSS302
- Bore diameter 4.030"
- Main bearing bore 2.248"
- Main cap torque 100 Inner 35 outer
- Main cap material Nodular Iron
- Bore spacing 4.380"
- Block deck height 8.200"
- Material Iron
- Weight 175 lbs

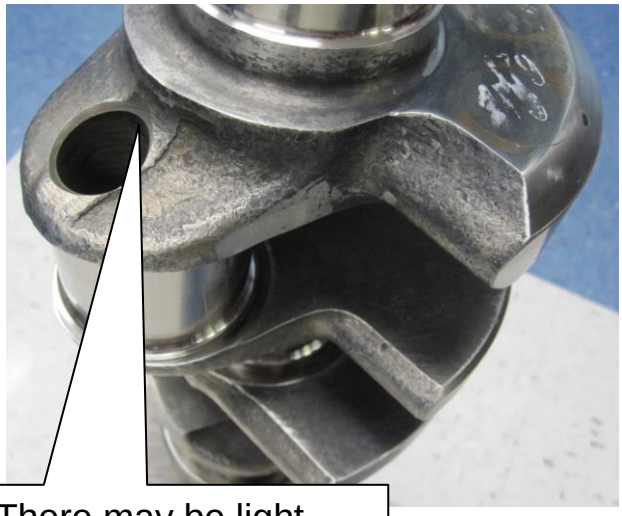
Crankshaft – D347SR - D347SR7 – S347JR

- M-6303-C340
- Main journal size 2.250"
- Rod journal size 2.123"
- Stroke 3.400"
- Material Forged Steel
- Weight 49.00 lbs. (+/- 0.5 lbs)
- Balance offset Neutral balance
- SCAT Part number 432300105090
- Crankshaft manufacturer Scat



Crankshaft Identification

The SCAT Part number is located in the first counterweight but is often partially hidden by the balancing heavy metal and the metal finishing of the area



There may be light grinding on the side of the rod throw for final balance tuning

All of the rod throws have a lightening hole as shown

See page 27 for more Crankshaft identification photos

Connecting Rod – D347SR- D347SR7 – S347JR

- Forged 4340 I-Beam manufactured by Scat (Scat PN 2-1CR5400-927)
- 5.400 Center to Center length
- 0.927" Pin
- Small end uses a bronze bushing
- Uses ARP 8740 3/8" Cap Screw Bolds

NOTE- New rod with 7/16" bolt will be phased in in 2017.Scat part number 2-ICR5400-7/16.

Piston – D347SR- D347SR7 – S347JR

- Mahle Forged Aluminum Piston – PN SBF 090030F06
- Bore - 4.030" Compression Height - 1.090" (with rail)
- Forced pin oiling and round wire locks
- Weight w/o pin - 395 grams
- 10.0 compression ratio
- 6cc piston dish volume
- Ring Pack - 1.5, 1.5, 3.0mm rings Mahle PN 4035MS-15
- Mahle 4.035" Service Piston PN SBF 090035F06

Piston w/ Revised Ring Pack (Effective 1-1-2017) D347SR- D347SR7

- Mahle Forged Aluminum Piston – PN 930244730
- Bore - 4.030" Compression Height - 1.090" (with rail)
- Forced pin oiling and round wire locks
- Weight w/o pin - 398 grams
- 10.0 compression ratio
- 6cc piston dish volume
- Ring Pack - 1.0, 1.0, 2.0mm rings Mahle PN 4030MS-112, 4035MS-112, and 4040MS-112 (add "D to PN for Drop In")
- Mahle 4.035" Service Piston PN SBF 930244701

Timing Set – D347SR - D347SR7– S347JR

- Timing set part number - M-6268-A302
- D347SR and S347JR - Factory installation is the 0 degree position on the crankshaft gear

Cylinder Heads – D347SR

- Ford Racing Aluminum - M-6049-Z304DA
- Service replacement head PN is M-6049-Z304D
- Fully machined combistion chamber
- Chamber Volume - 63cc (nominal)
- Intake Valve – 2.020" diameter. Total length – 5.340"
- Exhaust Valve – 1.600" diameter. Total length – 5.365"
- Both intake and exhaust valves are stainless steel with swirl polished heads
- Valve seals on both intake and exhaust
- Rocker arm stud – ARP 334-7203
- Stamped guide plate – M-6566-Z304D
- NOTE: 0.110”- 0.130” flat washer is used under the rocker arm stud in some production heads to achieve the correct thread engagement

Cylinder Heads – D347SR7

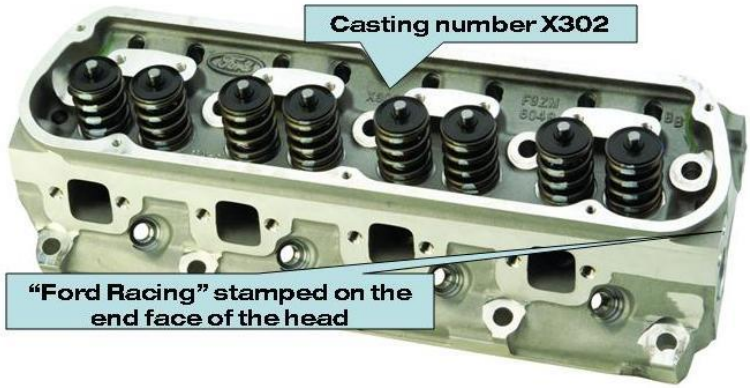
- Ford Racing Aluminum - M-6049-Z304DA7
- Service replacement head PN is M-6049-Z304D7
- Same as M-6049-Z304DA except for the 7MM valves:
  - M-6507-D3047 Intake Valve
  - M-6505-D3047 Exhaust Valve

Valve Spring – D347SR – D347SR7 – S347JR

- Beehive valve spring – Identified by silver finish for the COMP 26918 Spring, Brown for PAC 1218 Spring or the PAC 1219X Silver Spring
- Approved optional spring – COMP 26918 w/ enhanced surface finish
- Approved optional spring – PSI PN LS1511ML
- Valve spring locator .060" thick – M-6536-BH
- Retainer – M-6514-BH or PAC R310
- Valve Locks – 10 degree - M-6518-BH (STEEL) (11/32")
- Valve Locks – 10 degree - PAC-L8081 (STEEL) (7MM)
- Valve spring installed height - 1.750" – 1.800"
- Valve spring closed pressure - 145 lbs. @1.800"
- Valve spring open pressure - 358 lbs. @ 1.175"

Cylinder Heads – S347JR

- Ford Racing Aluminum - M-6049-X306 or
- Ford Racing Aluminum - M-6049-X307
- Cast combistion chamber
- Chamber Volume – 58cc (nominal)
- Intake Valve – 1.94" diameter. Total length – 5.078"
- Exhaust Valve – 1.54" diameter. Total length – 5.078"
- Both intake and exhaust valves are stainless steel with swirl polished heads with an undercut stem
- Both iron and bronze valve guides are used in the production heads
- Beehive valve spring – Identified by silver finish for the COMP 26918 Spring, Brown for PAC 1218 Spring or the PAC 1219X Silver Spring
- Retainer – M-6514-BH or PAC R310
- Valve Locks – 10 degree - M-6518-BH (STEEL) (11/32")
- Valve seals on both intake and exhaust
- Uses self aligning roller rockers – 1.6:1 ratio



Rocker Arm – D347SR & D347SR7

- Ford Racing Roller Rocker Arm M-6564-F351
- 1.65:1 ratio
- Stud mounted
- Offset intake pushrod location
- NOTE: Various rocker manufacturers are used in production production including COMP, Crane and Crower

Rocker Arm – S347JR

- Ford Racing Roller Rocker Arm M-6564-B351
- 1.6:1 ratio
- Thru bolt-pedestal mounted
- NOTE: Various rocker manufacturers are used in production including COMP, Crane, and Scorpion

Roller Lifter – D347SR – D347SR7 – S347JR

- Ford Racing hydraulic roller lifter M-6500-R302H or M-6500-R302
- Uses loose tie bar and valley mounted retainer plate
- Production lifters have come from different sources – the two external appearances are shown at right. Note that all new lifters produced since 2011 come from a single source and look like the lifter on the left.
- D347SR7 lifters use a hardened steel lifter pushrod cup

D347SR & D347SR7 - Technical Specifications

Engine Part Number	M-6007-D347SR or M-6007-D347SR7
Displacement	347 cubic inches
Block	M-6010-BOSS302 Cast Iron; 4 Bolt Main (center 3)
Bore	4.030"
Stroke	3.400"
Crankshaft	M-6303-C340 Forged Steel Internally Balanced
Main journal size	2.250"
Rod journal size	2.123"
Stroke	3.40"
Weight	49.0 lbs. +/- 0.5 lbs
Balance offset	Neutral balance
Part number/Manufacturer	432300105090/SCAT
Vibration Damper	M-6316-C351
Connecting Rod	SCAT 2-1CR5400-927 - Forged Steel - 5.400" C-C
Piston	Mahle SBF090030F06 Forged Aluminum
Bore	4.030"
Dish or dome volume	6 cc effective dish
Ring set part number	Mahle supplied
Compression height	1.090
Weight	Individually balanced
Pin oiling type	Thru ring
Pin bore diameter	0.927"
Piston material	forged aluminum 4032
Camshaft	M-6250-F303 Hydraulic Roller
Lifter part number	M-6500-R302H
Cam Timing	Position "0" (multi index crank sprocket)
Int./Ex. Lobe Centerlines	109° Int. Centerline/119° Ex. Centerline
Camshaft Duration	226° @ .050" lift (int. and ex.)
Camshaft Lift - int. and ex.	0.320" Lobe Lift - 0.528" at valve (calculated)
Cylinder Head – D347SR	M-6049-Z304DA – Aluminum
Cylinder Head – D347SR7	M-6049-Z304DA7 - Aluminum
Chamber Volume	63.0 cc
Compression Ratio	10.0:1 (maximum)
Intake Valve – 11/32"/7MM	Ford Racing M-6507-A304/M-6507-A3047, REV or CV replacement
Intake Valve Length	5.340"
Intake Valve Diameter	2.020"
Exhaust Valve– 11/32"/7MM	Ford Racing M-6505-B304/M-6505-A3047, REV or CV replacement
Exhaust Valve Diameter	1.600"
Exhaust Valve Length	5.365"
Intake & Exhaust Valve Stem Diameter	D347SR – 11/32" D347SR7 – 7MM
Valve spring/Locator PN	PAC 1219X / M-6536-BH

Approved optional spring	COMP 26918
Valve spring installed height	1.750" – 1.800"
Valve spring closed pressure	145 lbs. @1.800"
Valve spring open pressure	358 lbs. @ 1.175"
Retainer Part Number	PAC R310 (Steel)
Valve lock angle	10 degrees
Valve lock – 11/32”/7MM	M-6518-BH/13171-8
Rocker Arm	M-6564-F351 Aluminum Roller - 1.65:1
Valve lash	½ to ¾ turn maximum
Intake Manifold	Edelbrock Victor Jr. M-9424-D302

Technical Specifications M-6007-S347JR Sealed Crate Engine

Engine Part Number	M-6007-S347JR
Displacement	347 cubic inches
Block	M-6010-BOSS302 Cast Iron; 4 Bolt Main (center 3)
Bore/Stroke	4.030"/3.400"
Crankshaft	M-6303-C340 Forged Steel Internally Balanced
Main journal size	2.250"
Rod journal size	2.123"
Stroke	3.40"
Weight	49.0 lbs. +/- 0.5 lbs.
Balance offset	Neutral balance
Part number/Manufacturer	SCAT 432300105090
Connecting rod Center to center length	5.400"
Material	Forged Steel
Floating or press fit	Floating
Connecting rod PN/Manufacturer	SCAT 2-1CR5400-927
Piston manufacturer	Mahle
Bore	4.030"
Dish or dome volume	6 cc effective dish
Ring set part number	Mahle supplied
Compression height	1.090"
Weight	Individually balanced
Pin oiling type	Thru ring
Pin bore diameter	0.927"
Piston part number	SBF090030F06
Piston material	Forged aluminum 4032
Timing set part number	M-6268-A302
Cylinder head	M-6049-X306 OR M-6049-X307
Head material	Aluminum
Intake valve	Ford Racing M-6507-J302
Intake valve head diameter	1.940"
Intake valve length	5.078"
Intake valve material	stainless steel – swirl polished w/ undercut stem
Intake valve stem diameter	0.343"
Exhaust valve	Ford Racing M-6505-G302

Exhaust valve head diameter	1.540"
Exhaust valve length	5.078"
Exhaust valve material	Stainless Steel
Exhaust valve stem diameter	0.343"
Valve spring part number	PAC 1218 or PAC 1219X
Valve spring locator	M-6536-BH
Approved optional spring	COMP 26918
Valve spring installed height	1.750" – 1.800"
Valve spring closed pressure	130 lbs. @1.800"
Valve spring open pressure	313 lbs. @ 1.175"
Retainer Part Number	M-6514-BH (steel) or PAC R310 (Steel)
Valve lock angle	10 degrees
Valve lock	M-6518-BH
Camshaft #	35-410-8 (Comp Cam) Hydraulic roller
Cam Timing	Position "0" (multi index crank sprocket)
Intake Centerline/Lobe separation angle	106° / 110°
Advertised duration Intake	260° @ .002" lift
Advertised duration Exhaust	260° @ .002" lift
Duration @ .050 Intake	206°
Duration @ .050 Exhaust	206°
Valve lift intake at valve (calculated)	0.533"
Valve lift exhaust at Valve (calculated)	0.533"
Camshaft lobe lift – intake and exhaust	0.333”
Lifter part number	M-6500-R302H
Pushrod part number	M-6565-L302
Pushrod diameter	0.312"
Rocker arm part number	M-6564-B351
Rocker arm ratio	1.6:1
Valve lash	½ to ¾ turn maximum
Intake Manifold	Edelbrock 7521 Performer RPM Air Gap

Operating and Tune Up Information – D347SR – D347SR7 – S347JR

Recommended Timing	34° BTDC Total 4000 rpm
Maximum RPM	6100 rpm
Oil Pan	9 Quart plus filter/cooler w/ M-6675-D347SR Pan
Oil Filter	M-6731-FL1A
Oil Pressure	60-70 psi @ 240° F/ 4000 rpm
Recommended Oil	15w-50 Mobil 1 or 20w-50 Brad Penn
Max Oil Temperature	280° F
Coolant Temperature	195° F Thermostat recommended
Spark Plugs	AGSP-32C
Firing Order	1-3-7-2-6-5-4-8
Fuel Pressure (@ carburetor)	6-7 psi

Engine Service Information and Specifications

Standard Operating Specifications

Main Bearing Clearance	.0020" -.0025"
Rod Bearing Clearance	.0020" -.0025"
Crankshaft End Float	.005"- .007"
Wrist Pin to Rod Clearance	.0010"-.0012"
Wrist Pin to Piston Clearance	.0010"-.0012"
Piston to Deck Distance	.010" Below Deck
Piston to Bore Clearance	(follow Piston mfg. recommendations)
Intake Valve to Guide Clearance	.0014"-.0016"
Exhaust Valve to Guide Clearance	.0018"-.0022"
Valve Lash	0 Lash plus ¼ turn Pre-load – ½ to ¾ turn maximum

D347SR – D347SR7 Engine Rebuild Specifications

Crankshaft weight	49.00 lbs - +/- 0.50 lbs
Piston to Deck Distance	.010" Below Deck - +/- .0050"
Head gasket – minimum compressed thickness	.038" (M-6051-CP331)
Maximum bore size	4.045" (.015" overbore)
Stroke	3.400" +/- .007"
Valve spring installed height	1.750" – 1.800" - see note 1 below
Valve spring pressure - seat	145 lbs @ 1.800"
Valve Spring Pressure – Open	358 lbs @ 1.175"
Valve Diameter - Intake	2.020" +/- 0.005"
Valve Diameter - Exhaust	1.600" +/- 0.005"
Combustion chamber volume	63.0 cc - +/- 2.0 cc
Compression ratio	10.0:1 Maximum
Camshaft Lift - int. and ex.	0.320" Lobe Lift - 0.528" at the valve
Camshaft installation – D347SR	0° position on crank gear
Camshaft timing – D347SR	109° degree intake centerline +/- 1° Ground on 114° lobe separation angle

Note 1 – valve spring installed height achieved by +/- 0.050" valve locks or valve spring shims.

S347JR Engine Rebuild Specifications

Crankshaft weight	49.00 lbs - +/- 0.50 lbs
Piston to Deck Distance	.010" Below Deck - +/- .0050"
Head gasket – minimum compressed thickness	.038" (M-6051-CP331)
Maximum bore size	4.045" (.015" overbore)
Stroke	3.400" +/- .007"
Valve spring installed height	1.750" – 1.800" - see note 1 below
Valve spring pressure - seat	145 lbs @ 1.800"
Valve Spring Pressure – Open	358 lbs @ 1.175"
Valve Diameter - Intake	1.940" +/- 0.005"
Valve Diameter - Exhaust	1.540" +/- 0.005"
Combustion chamber volume	58.0 cc - +/- 2.0 cc
Compression ratio	10.0:1 +/- 0.2
Camshaft Lift - int. and ex.	0.323" Lobe Lift - 0.533" at the valve
Camshaft installation	0° position on crank gear
Camshaft timing	106° degree intake centerline +/- 1°

Note 1 – valve spring installed height achieved by +/- 0.050" valve locks or valve spring shims

Tech Specifications for Inspection

Hydraulic Valve Lifter

- The inner plunger diameter of all generation lifters and found that dimension to be 0.6165” +/- .0007”
- Lifter preload maximum of no more than 1/2-3/4 (0.025-0.040”) turn would be appropriate from a performance standpoint.
- Lifter plunger travel is 0.145”-0.160”
- NOTE: 0.110”-0.130” flat washer is used under the rocker arm stud in some production heads to achieve the correct poly-lock thread engagement on the rocker arm stud

Valve Spring Installed Height

- Valve spring installed height achieved by +0.050” valve locks or valve spring shims.

Pushrod Length

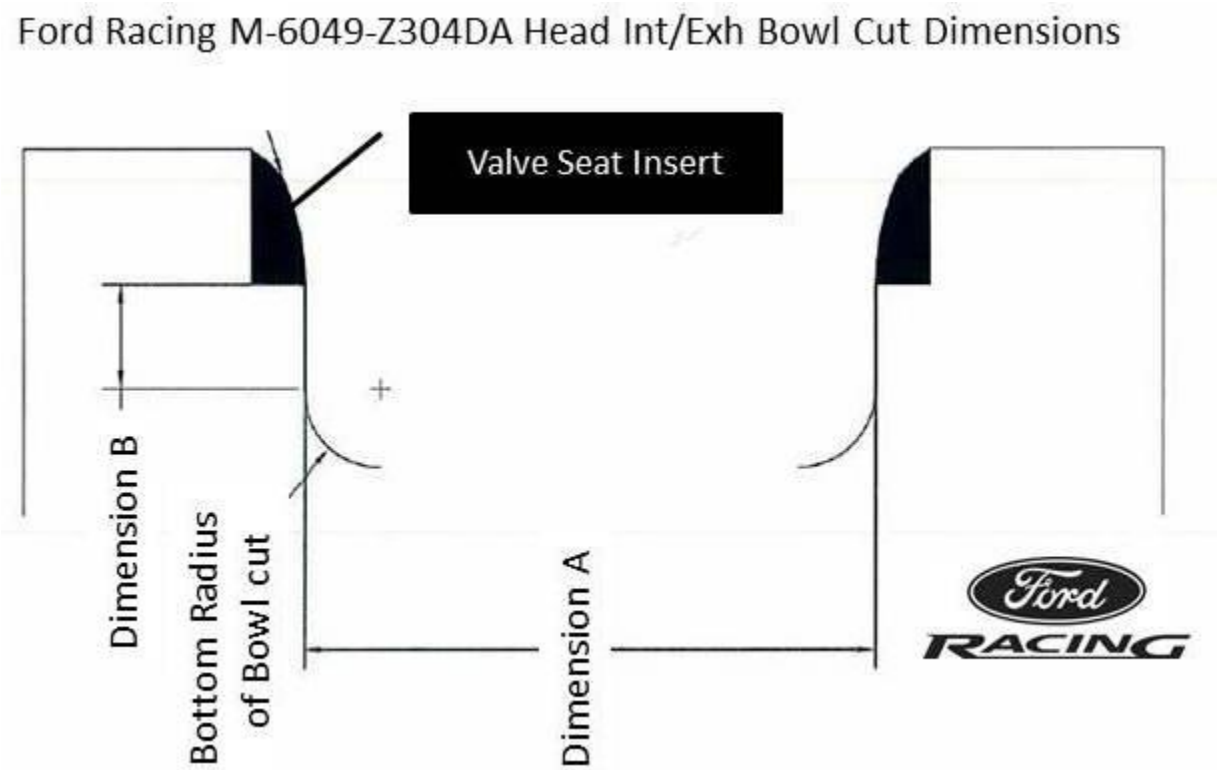
- To accommodate the different brand roller rocker arms used in production, pushrod lengths of 6.500” – 6.800” in length are used in the production D347SR engines

Typical Ford Racing Production Valve Job Characteristics

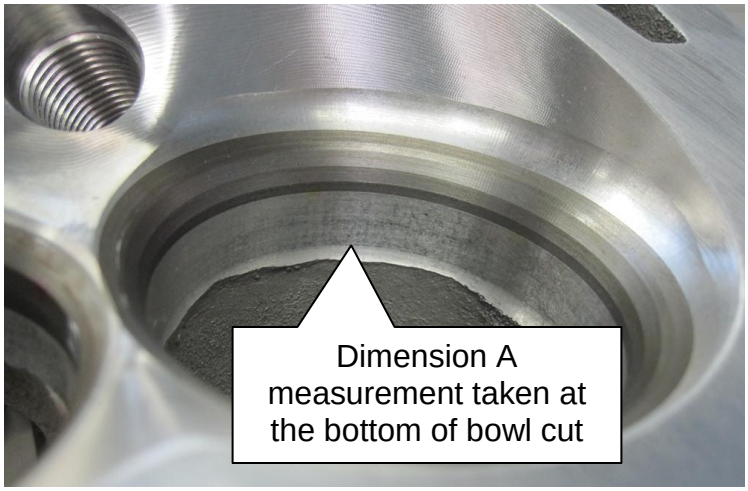
- All seat angles are confined to the seat insert with the top cut extending past the edge of the seat into the combustion chamber
- All seat cuts are concentric to the valve stem centerline

Z304DA – Z304DA7 Head Tech Specs

	Intake Port	Exhaust Port
Dimension A - Throat diameter	1.810” +/-0.020”	1.385” +/-0.020”
Dimension B – Distance from seat insert bottom to take Dimension A	0.350” +/- .020”	0.200” +/- .020”

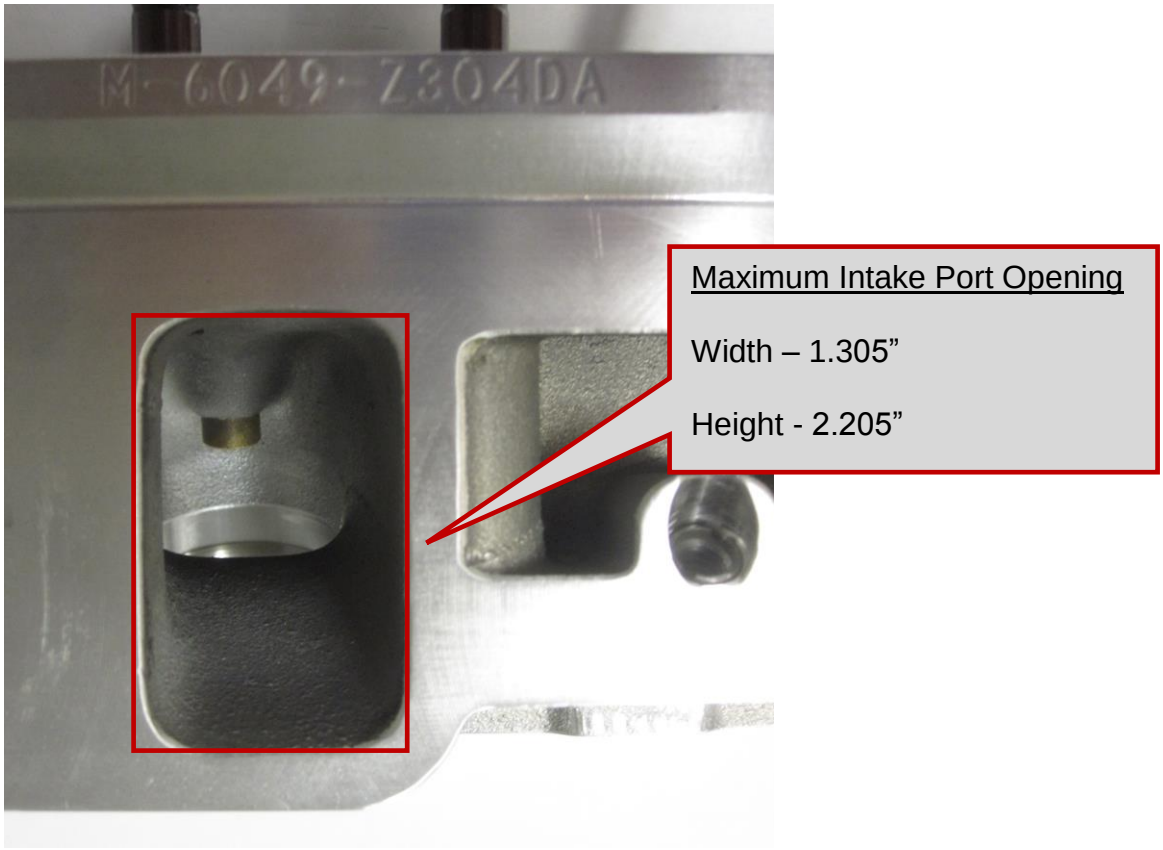


Measuring the Bowl Cut



Identification of M-6049-Z304DA Heads used on M-6007-D347SR Engines

Note that the M-6049-Z304DA Heads have been used on various Ford Racing Crate Engines since 2006. Earlier heads from these street crate engines were not factory installed on Ford Racing M-6007-D347SR Sealed Racing Engines. The heads used to build all D347SR Sealed Racing engines can be identified by the size of the intake port opening. ALL D347SR Sealed Racing Engines use a casting with the same intake port dimensions with no exception.



M-6007-D347SR Sealed Racing Engine Valve Option

Effective January 1, 2011, a 7MM intake and exhaust valve for the M-6007-D347SR engine has been added as a replacement option. It will be the option of the sanctioning body to approve the use of these valves for competition.

The approved valve is sourced only from REV and is a solid stem stainless steel valve.

The approved part numbers are:

• 7MM Intake valve - Ford Racing M-6507-D3047, REV PN X813 or CV X2SI2020-5340-3477-1
• 7MM Exhaust valve – Ford Racing M-6505-D3047, REV PN X914/X916 or CV X2SE1600-5365-3477-1
• 7MM Valve guide – Ford Racing 502-7MM-210-E6 or REV PN VG9450

7MM Head Conversion Parts List

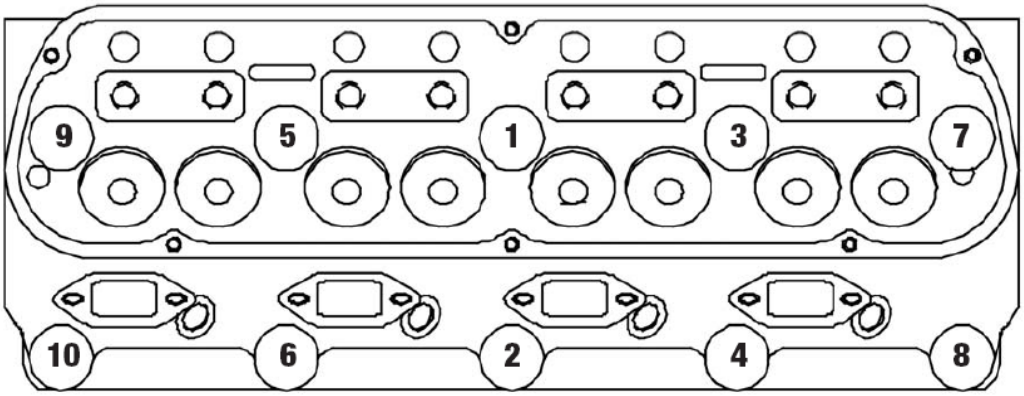
Part Number	Description	Qty. Req.	Supplier	New Parts Req'd
~~13171T-8 (titanium)~~	~~VALVE LOCKS - 10 Degree~~	~~2~~	~~Various~~	~~Yes~~
13171-8 (steel)	VALVE LOCKS - 10 Degree	2	Various	Yes
REV X914/X916	(7MM) EXHAUST VALVE FOR M-6049-Z304DA	8	REV, CV, Ford	Yes
REV X813	(7MM) INTAKE VALVE FOR M-6049-Z304DA	8	REV, CV, Ford	Yes
VSS 513	SEAL	16	Various	Yes
REV VG9450	VALVE GUIDES	16	REV	Yes

Note on Titanium 7MM Valve Locks – The 13171-8 titanium valve locks were listed in Ford Racing communications dating back to November 2011. With the introduction of the factory built D347SR7 that uses steel valve locks, the 13171-8 titanium valve lock is removed as an alternate PN in revision #7.

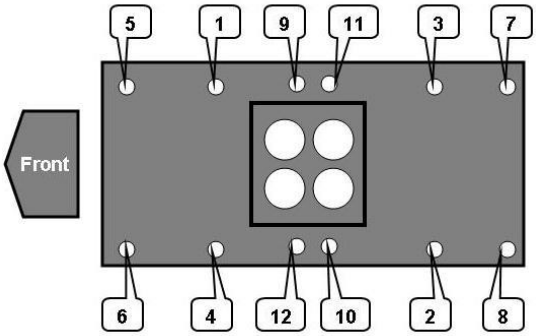
Torque Specifications

Application	Torque (lb*ft unless noted)	Recommended Lubricant
Main studs into block ½ inch	3-5	Loctite 242
Main nuts ½ inch	95-105	Engine oil
Main splayed bolts 3/8 inch	35-45	Engine oil
3/8" rod bolts	50	ARP Moly rod bolt lube
NEW 7/16" rod bolt	63	ARP Moly rod bolt lube
Head studs into block	3-5	Loctite 242
Head nuts	95-105	Engine oil
Rocker studs	60-65	Loctite PFT
Intake manifold bolts	18-20	Loctite 242
Flywheel bolts	75-80	Loctite 242 or dry-seal
Vibration damper bolt	90	Engine oil
Oil pump to block	28-35	Loctite 242
Oil pickup tube to main stud	28-35	Loctite 242
Cam bolt	40-45	Loctite 242
Cam retainer plate bolt	9-12	Loctite 242
Tappet guide retainer	9-12	Loctite 242
Oil pickup tube to oil pump	12-18	Loctite 242

CYLINDER HEAD TORQUE CHART



INTAKE MANIFOLD TORQUE SEQUENCE



D347SR – D347SR7 – Parts List

PART NUMBER	DESCRIPTION	SUPPLIER
8582	DISTRIBUTOR W/BRONZE GEAR	MSD IGNITION
2-1CR5400-927	CONNECTING ROD	SCAT ENTERPRISES
388192-S	TIMING COVER DOWEL	GENERAL FASTENERS
388448-S58	MAIN STUD	GENERAL FASTENERS
388813-S	BALANCER BOLT	GENERAL FASTENERS
AGSP-32C	SPARK PLUG	HONEYWELL/CONSUMER PRODUCT GROUP
C3AZ-6287-B	ECCENTRIC	TOWER AUTOMOTIVE
CB-634H	ROD BRG.	CLEVITE ENGINE PARTS
M-6010-BOSS302	5.0 BOSS BARE BLOCK	FORD RACING
CM-6731-FL1A	OIL FILTER	PUROLATOR PRODUCTS
CM-6766-J302	BREATHER CAP	SPECIALTY PRODUCTS COMPANY
CM-8501-F351	WATER PUMP	EDELBROCK
D8TZ-7600-A	PILOT BRG	INA USA CORP
DOOZ-8597-B	BY-PASS HOSE	GOODYEAR TIRE & RUBBER CO
E6DZ-6700-A	FRONT COVER SEAL	SKF SEALING SOLUTIONS
E7AZ-6A674-A	PAN RAIL (L)	MEANS INDUSTRIES
E7AZ-6A674-B	PAN RAIL (R)	MEANS INDUSTRIES
EAD-6397-B	TRANS DOWEL	HURON INC.
EDC-6378-A	CRANK DAMPER WASHER	GENERAL FASTENERS
EOAZ-6626-B	OIL PUMP GASKET	FREUDENBERG NOK
F1SZ-6701-A	REAR MAIN SEAL	FREUDENBERG NOK
F1TZ-6023-A	TIMING POINTER	MTI SALINE
F2AE-6890-AA	OIL FILTER INSERT	GENERAL FASTENERS
F2SE-6500-AA	HYD ROLLER LIFTER	EATON CORPORATION
F3SZ-6278-A	CAM GEAR WASHER	GENERAL FASTENERS
F3TZ-6020-A	FRONT COVER GASKET	FEDERAL MOGUEL
F5TE-6710-CB	OIL PAN GASKET	SOUTHLAND TECHNOLOGIES
F87E-8255-CA	THERM HOUS GASKET	EVERSEAL GASKET INC
FOZZ-8592-B	WATER OUTLET	J G KERN
M-12270-A302	DIST. CLAMP	FORD RACING
M-6014-Z304	HEAD STUD KIT	AUTOMOTIVE RACING PRODUCTS

M-6049-Z304DA M-6049-Z304D	CYL HEAD	FORD RACING (Z304D is the service replacement head PN)
M-6049-Z304DA7 M-6049-Z304D7	(SR7)CYL HEAD	FORD RACING (Z304D7 is the service replacement head PN)
M-6513-BH	VALVE SPRING	FORD RACING (PAC 1218 or COMP 26918 or PAC 1219X)
M-6051-CP331	CYL HEAD GASKET	FORD RACING (FelPro 1156-2)
M-6059-D351	FRONT COVER	FORD RACING
M-6250-F303	ROLLER CAMSHAFT	CAMSHAFT MACHINE COMPANY LLC.
M-6253-A50	ROLLER CAM CONV. KIT	FORD RACING
M-6268-A302	TIMING SET	FORD RACING
M-6303-C340	FORGED CRANKSHAFT	SCAT ENTERPRISES
M-6316-C351	CRANK DAMPER	CYCO SYSTEMS PTY.LTD.
M-6500-R302H	HYD ROLLER LIFTER	EATON CORPORATION
M-6564-F351	ROCKER ARM	CRANE CAMS
M-6582-E302P	VALVE COVER	FORD RACING
M-6600-D2	OIL PUMP	MELLING TOOL
M-6605-B302	OIL PUMP SHAFT	FORD RACING
M-9424-D302	INTAKE MANIFOLD	EDELBROCK
M-9439-A50	INTAKE MANIFOLD GSKT.	FEDERAL MOGUL (FelPro 1262S-3)
MS 590 H	MAIN BRG.	CLEVITE ENGINE PARTS
~~SBF090030F06~~	~~FORGED PISTON & RING SET~~	~~MAHLE MOTORSPORTS INC.~~
930244730	UPDATED PISTON & RING SET	MAHLE MOTORSPORTS INC.
6441489	WRIST OIN CLIPS	PART OF PISTON KIT
6457808	PIN - .927	PART OF PISTON KIT
~~4035MS-15~~	~~RING KIT - 4.030" + .005~~	~~PART OF PISTON KIT~~
9290024	GROOVE LOCK SPACER KIT	PART OF PISTON KIT
4030MS-112	UPDATED RING KIT 4.030" 1mm,1mm, 2mm	PART OF PISTON KIT
T650805	PUSHRODS	TREND PERFORMANCE PRODUCTS
42910-S	CAM PLATE BOLTS	
6100SB or M-6622-D347SR	OIL SCREEN	
C2OE-6A008-A2	HEAD DOWELS	
CP302LT or M-6675-D347SR	OIL PAN	CHAMP PANS CP302LT – OR Ford Racing M-6675-D347SR
JR 131	DIPSTICK & TUBE	
351HP	CAM BEARINGS	
VS13264T	RUBBER V/C GASKET	
PK-131	CRANK KEY	

S347JR Parts List

PART NUMBER	DESCRIPTION	SUPPLIER
8582	DISTRIBUTOR W/ BRONZE GEAR	MSD IGNITION
2-1CR5400-927	CONNECTING ROD	SCAT ENTERPRISES
388192-S	TIMING COVER DOWEL	GENERAL FASTENERS
388448-S58	MAIN STUD	GENERAL FASTENERS
388813-S	BALANCER BOLT	GENERAL FASTENERS
AGSP-32C	SPARK PLUG	FORD DEALER SALES
C3AZ-6287-B	ECCENTRIC	FORD DEALER SALES
CB-634H	ROD BRG.	CLEVITE ENGINE PARTS
M-6010-BOSS302	5.0 BOSS BARE BLOCK	FORD RACING
M-6731-FL1A	OIL FILTER	FORD RACING
M-6766-J302	BREATHER CAP	FORD RACING
M-8501-F351	WATER PUMP	FORD RACING
D8TZ-7600-A	PILOT BRG	FORD DEALER SALES
DOOZ-8597-B	BY-PASS HOSE	FORD DEALER SALES
E6DZ-6700-A	FRONT COVER SEAL	FORD DEALER SALES
E7AZ-6A674-A	PAN RAIL (L)	FORD DEALER SALES
E7AZ-6A674-B	PAN RAIL (R)	FORD DEALER SALES
EAD-6397-B	TRANS DOWEL	FORD DEALER SALES
EDC-6378-A	CRANK DAMPER WASHER	FORD DEALER SALES
EOAZ-6626-B	OIL PUMP GASKET	FORD DEALER SALES
F1SZ-6701-A	REAR MAIN SEAL	FORD DEALER SALES
F1TZ-6023-A	TIMING POINTER	FORD DEALER SALES
F2AE-6890-AA	OIL FILTER INSERT	FORD DEALER SALES
F2SE-6500-AA	HYD ROLLER LIFTER	FORD DEALER SALES
F3SZ-6278-A	CAM GEAR WASHER	FORD DEALER SALES
F3TZ-6020-A	FRONT COVER GASKET	FORD DEALER SALES
F5TE-6710-CB	OIL PAN GASKET	FORD DEALER SALES
F87E-8255-CA	THERM HOUS GASKET	FORD DEALER SALES
FOZZ-8592-B	WATER OUTLET	FORD DEALER SALES
M-12270-A302	DIST. CLAMP	FORD RACING
M-6065-BOSS	HEAD BOLT KIT	FORD RACING
M-6049-X306	CYL. HEAD ASSEMBLY	FORD RACING
M-6049-X307	CYL. HEAD ASSY - Optional	FORD RACING
M-6051-CP331	CYL HEAD GASKET	FORD RACING (FelPro 1156-2)
M-6513-BH	VALVE SPRING	FORD RACING (PAC 1218 or COMP 26918 or PAC 1219X)
M-6059-D351	FRONT COVER	FORD RACING
35-410-8	ROLLER CAMSHAFT	COMP CAMS
M-6253-A50	ROLLER CAM CONV. KIT	FORD RACING
M-6268-A302	TIMING SET	FORD RACING

M-6303-C340	FORGED CRANKSHAFT	SCAT ENTERPRISES
M-6316-C351	CRANK DAMPER	FORD RACING
M-6500-R302H	HYD ROLLER LIFTER	EATON CORPORATION
M-6564-B351	ROLLER ROCKER ARM SET	FORD RACING
M-6582-E302P	VALVE COVER	FORD RACING
M-6600-D2	OIL PUMP	FORD RACING
M-6605-B302	OIL PUMP SHAFT	FORD RACING
EDL-7521	INTAKE MANIFOLD	EDELBROCK
M-9439-A50	INTAKE MANIFOLD GSKT.	FORD RACING (FelPro 1262S-3)
MS 590 H	MAIN BRG.	CLEVITE ENGINE PARTS
SBF090030F06	FORGED PISTON & RING SET	MAHLE MOTORSPORTS INC.
6441489	WRIST PIN CLIPS	PART OF PISTON KIT
6457808	PIN - .927	PART OF PISTON KIT
4035MS-15	RING KIT - 4.030" + .005	PART OF PISTON KIT
9290024	GROOVE LOCK SPACER KIT	PART OF PISTON KIT
M-6565-L302	PUSHRODS (16 PACK)	FORD RACING
M-6588-A50	CHANNEL KIT ROCKER ARM	FORD RACING
M-6529-A302	ROCKER ARM SHIM KIT	FORD RACING
42910-S	CAM PLATE BOLTS	GENERAL FASTENER
6100SB or M-6622-D347SR	OIL SCREEN	
C2OE-6A008-A2	HEAD DOWELS	FORD DEALER SALES
CP302LT or M-6675-D347SR	OIL PAN	CHAMP PANS CP CP302LT – OR Ford Racing M-6675-D347SR
JR 131	DIPSTICK & TUBE	CHAMP OIL PANS
M-6261-J351	CAM BEARINGS	FORD RACING
VS13264T	RUBBER V/C GASKET	FEL-PRO

Revisions

Revision 2010-1 1/27/2010

- S347JR Camshaft Part Number corrected – was shown as 35-410-04 – corrected to 35-410-8.
- D347SR/347NST M-6250-F303 camshaft lift at the valve revised to reflect 1.65:1 rocker ratio – lift at valve is 0.528". Was shown at 0.512" which is lift w/ 1.6:1 rocker ratio. Page 10.
- D347SR/347NST Valve and valve spring dimensions added. Page 10 & 11
- Alternate MSD distributor PN 8579 (Ford Racing PN 85791) added as an optional OEM distributor. This is a running change January 2010. Pages 16 & 18.

Revision 2010-2 4/5/2010

- D347SR – Valve spring installed height revised to 1.750" – 1.800". Pages 7,10, 13 & 14

Revision 2010-3 8/3/2010

- Bronze and iron valve guides are used in production on M-6007-S347JR engines. Page 9.
- Valve spring pressure for the M-6007-S347JR engines updated due to new valve spring source. Pages 9 & 15.
- Roller lifters are sourced from 2 locations – photos of both are added. Page 9.
- Rocker arms are sourced from several suppliers including COMP, Crower, Crane and Scorpion – and may have a different visual appearance. Rocker ratios are not changed with the Mfg. Page 10.
- Added crankshaft identification photos added. Page 6.

Revision 2010-4 8/24/2010

- S347JR – Optional M-6513-BH valve spring added. Installed height revised of 1.800". Pages 8,9,13,15,and 19
- S347JR – Optional M-6049-X307 cylinder head and combustion chamber CC spec of 58cc added. Pages 9,13,15, and 19.

Revision 5 3/4/2011

- S347JR & D347SR – PAC Valve Spring 1218 replaces COMP 26918 in production engines. PAC 1218 spring is added as an optional spring in addition to the COMP 26918. Pages 8, 9, 11, 13, 18 &19
- M-6007-D347SR Sealed Racing Engine Valve Option
    - Effective January 1, 2011, a 7MM intake and exhaust valve for the M-6007-D347SR engine has been added as a replacement option. It will be the option of the sanctioning body to approve the use of these valves for competition.
    - The approved valve is sourced only from REV and is a solid stem stainless steel valve.
    - The approved part numbers are:
        - 7MM Intake valve - Ford Racing M-6507-SR7MM or REV PN X813
        - 7MM Exhaust valve – Ford Racing M-6505-SR7MM or REV PN X914
        - 7MM Valve guide – Ford Racing M-6510-SR7MM or REV PN VG9450

Revision 6 10/8/12

- SCAT Crankshaft photos added. Pages 6, 27-28.
- S347JR & D347SR – M-6500-R302H hydraulic roller lifter added as the standard roller lifter. PN M-6500-R302 lifter previously used in production is also allowed. Pages 10,11,13
- Maximum compression ratio is 10.0:1. Page 15
- Added Tech Inspection information added. Pages 16-18.
- 7MM Valve conversion parts list added. Page 19.
- M-6049-Z304D Service replacement head added. Paged 8 and 21.

Revision 7 1/25/13

- M-6007-D347SR7 engine added. This engine is the same as the M-6007-D347SR engine with the following component changes:
  - Intake and Exhaust valves are changed to 7MM valve stem sizes
  - The pushrod cup in the lifter is replaced with a hardened steel cup
- The 7MM valve titanium valve lock option is removed. Page 19

Revision 8 3/25/15

- PAC 1219X Valve Spring has replaced the PAC 1218 valve spring as the standard valve spring used in the build of M-6007-D347SR, M-6007-D347SRS7 and M-6007-S347JR engines.
- Maximum bore size increased to 4.045" for all M-6007-S347JR, M-6007-D347SR and M-6007-D347SR7 engines in an effort to keep existing blocks in operation.

Revision 9 4/18/17

- The piston ring package for the 347SR and 347SR7 changed effective January 1, 2017. The piston changed to a 1mm top, 1mm second and 2mm oil control ring package. This change was driven by the piston manufacturer-Mahle, who is phasing out the 1.5mm, 1.5mm, 3mm ring package from its line.
- Replacement ring set part numbers: 4130MS-112
41350MS-112
4140MS-112
Add "D" for drop in
- Addition of Scat rod, part number- 2-ICR5400-7/16 in 347SR, 347SR7 and 347JR. This rod transitions the rod bolt diameter from 3/8" to 7/16". This rod will be phased into sealed crate engines in 2017.
  - Torque for new rod is 63 lb * ft with moly lube
- Addition of pilot bearing that adapts to GM trans-NSK 6202 DD UC3
- Addition of Approved optional valve spring – PSI PN LS1511ML

Revision 10 8/2/17

- Include Tech Bulletin effective 5-17-16 to include PSI LS1511ML valve spring as an option for Ford Racing 347 Series Sealed Racing Engines
- Include Tech Bulletin effective 7-27-17 to formalize SCAT 2-ICR5400-7/16-A(short-26540716) or 26540716A connecting rod as an option for M-6007-D347SR and M-6007-D347SR7

Ford Racing Tech Bulletin 7-1-14

Valve Spring, Retainer and Lock Change Effective 7/1/2014

The following component changes to the M-6007-D347SR7 engine are effective with all engines built after 7/1/2014

- Valve spring - PAC-1219X
- Valve Spring Retainer - PAC-R310
- Valve Lock 7mm - PAC-L8080

Valve spring installed height spec is unchanged at 1.750” - 1.800”

Valve spring pressure specs are shown below

This change is being done to address the following issues that have been encountered during use:

- Valve lock quality issues
- Rapid pressure deterioration of the PAC-1218 valve spring
- Several instances of valve spring failures

Part#	PAC-1219X
O.D. Large End (in)	1.207”
I.D. Large End (in)	0.885”
O.D. Small End (in)	1.072”
I.D. Small End (in)	0.650”
Installed Height (Valve Closed) (in)	145 lbs. @ 1.800”
Open Valve (Valve Open)	358 lbs. @ 1.175”
Spring Rate	340
Max Coil Bind (in)	1.100

Ford Racing Tech Bulletin 2-3-16

347 Sealed Racing Engine Pistons – Ring Pack Change Effective 1-1-2017

The piston ring package for the 347SR and 347SR7 engines will change effective January 1, 2017. The piston will change to a 1mm top, 1mm second and 2mm oil control ring package. This change is being driven by the piston manufacturer Mahle who is phasing out the 1.5mm, 1.5mm, 3mm ring package from its line.

The PN for this new piston is 930244730, 930244740, 930244760. Last 2 digits indicate bore size. Note that Mahle also manufactures pistons in a number of overbore sizes like .032", .033", .035 etc. These last 2 digits will appear in the PN.

Ford Performance Tech Bulletin 5-17-16

347 Sealed Racing Engine Valve Springs

The purpose of this bulletin is to add the PSI LS1511ML valve spring as an option for the Ford Racing 347 Series Sealed Racing Engine PNs:

- M-6007-S347JR
- M-6007-D347SR
- M-6007-D347SR7

This bulletin is effective 5-17-16.

Ford Performance Tech Bulletin 7-27-17 – D347SR/SR7Connecting Rods

347 Sealed Racing Engine Connecting Rods

Ford Performance has released an optional SCAT connecting rod for the M-6007-D347SR and M-6007-D347SR7 engines. This is an I-Beam style connecting rod.

The PN is SCAT 2-ICR5400-7/16-A(short-26540716) or 26540716A

Rationale:

This connecting rod has been added to the M-6007-D347SR and M-6007-D347SR7 bill of material because its balance weight is a better fit to the original rotating design specifications. The balance weight of the original connecting rod, SCAT 2-1CR5400-927 has become out of spec (lighter) over time. To maintain the build process of the engines, it's necessary to use the 2-ICR5400-7/16-A that falls in the design spec level for the rotating assembly. This bulletin is effective 7-27-17.

SCAT Crankshaft Finishing

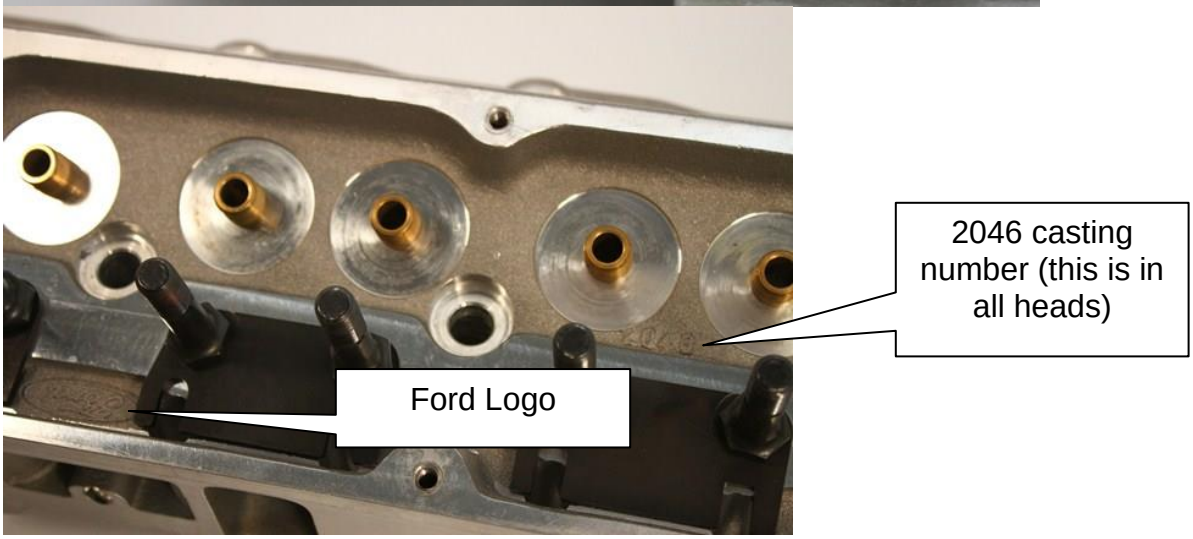
Note – Effective with all D347SR and S347JR engines build after October 2011, all SCAT crankshafts have counterweight finishing as shown in these photos. Note that this does not change the weight spec of 49.0 lbs. (+/- 0.5 lbs.). This crankshaft is also used in all D347SR7 engines.

The production SCAT Crankshaft is internally balanced and includes Mallory metal as shown.

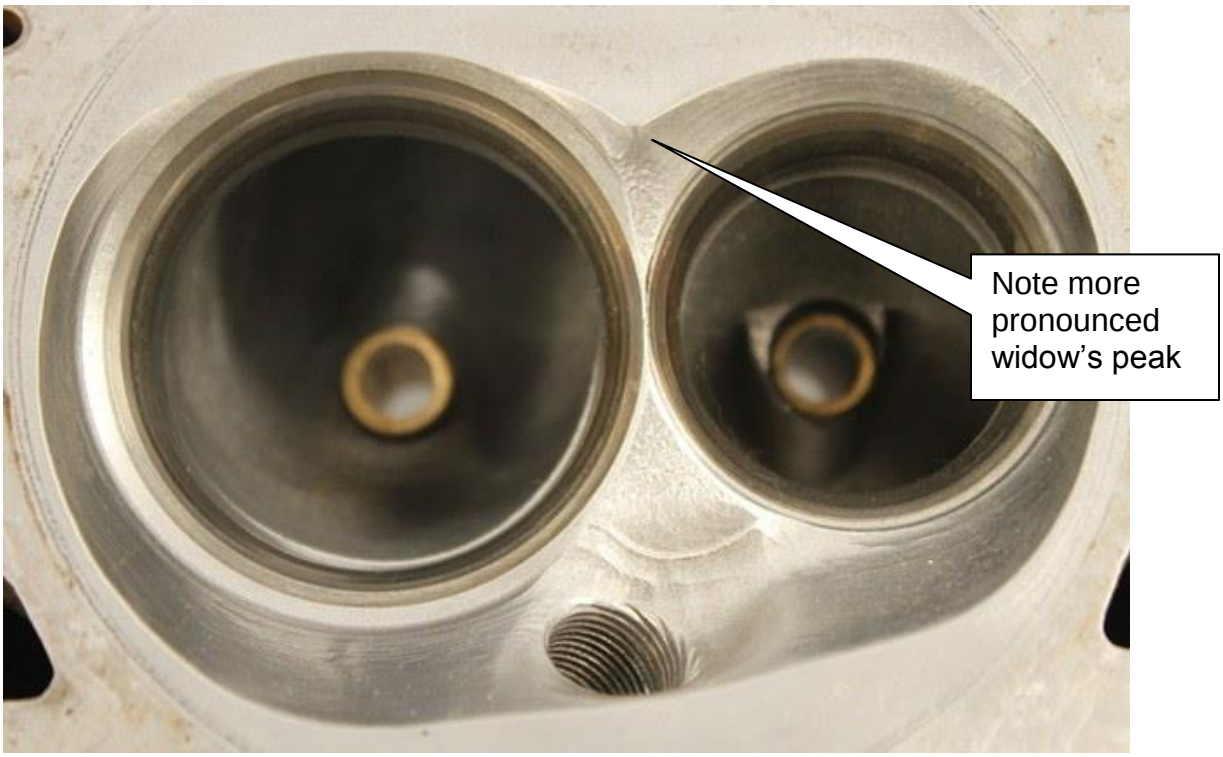
Z304DA & Z304DA7 Head Photos for Tech Purposes

PN Identification

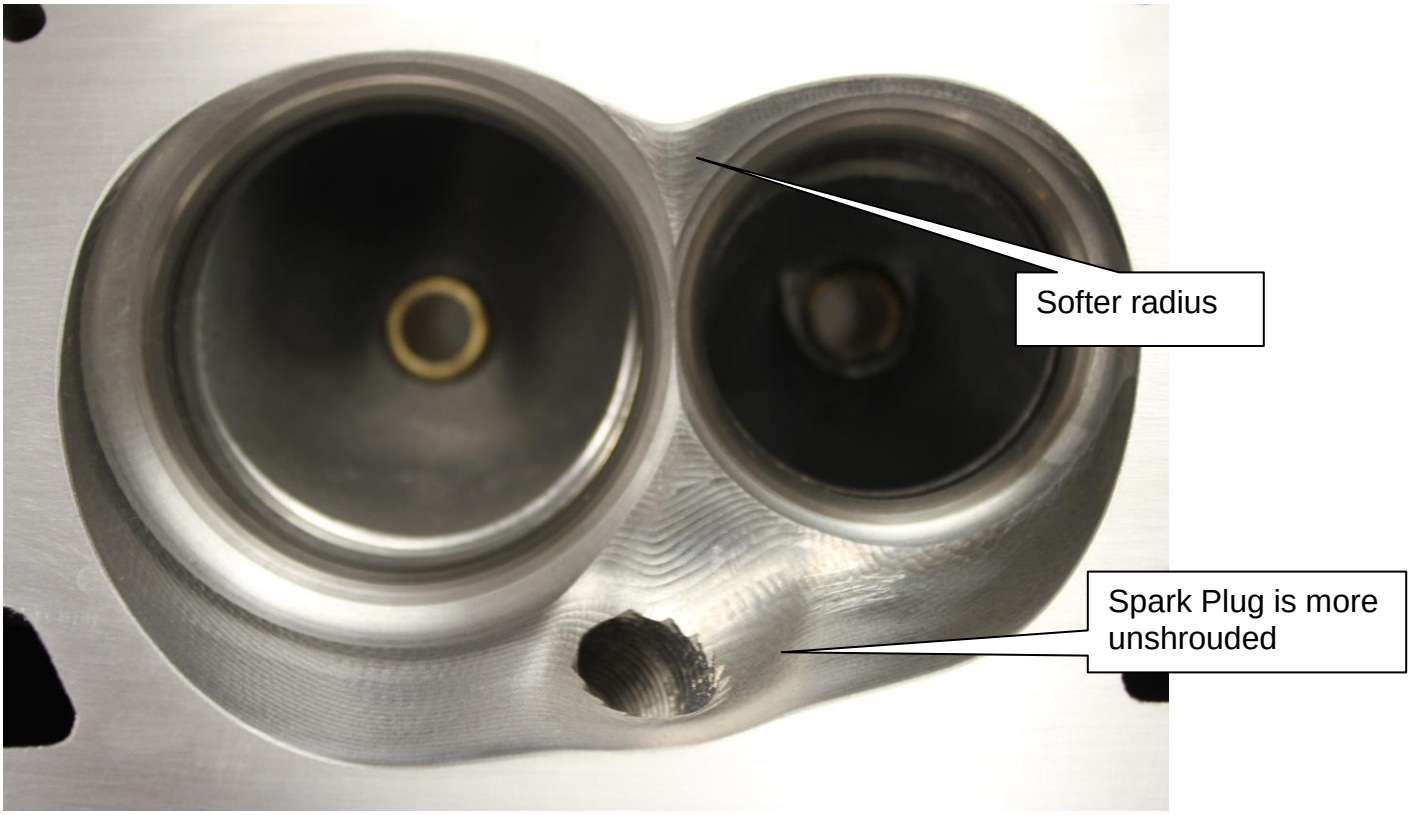
Ford Racing Z-Head Logo is on all heads produced after February 2012



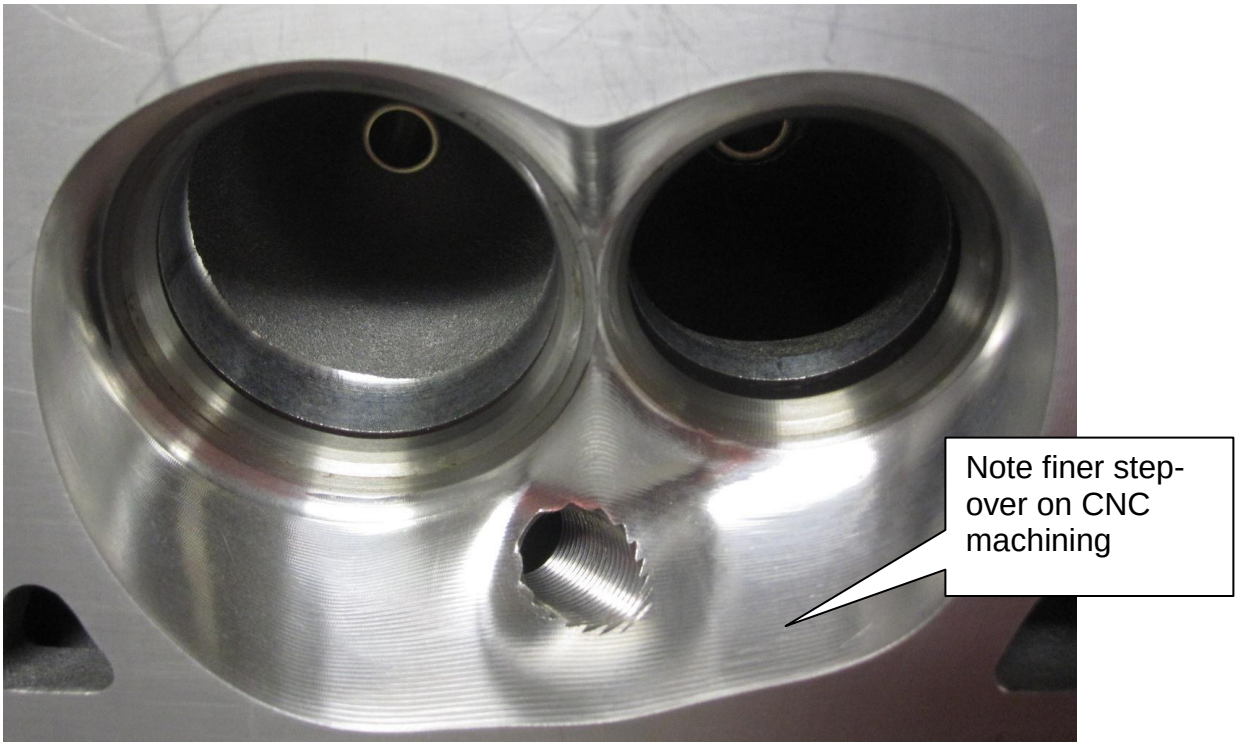
Combustion Chamber – C-Head



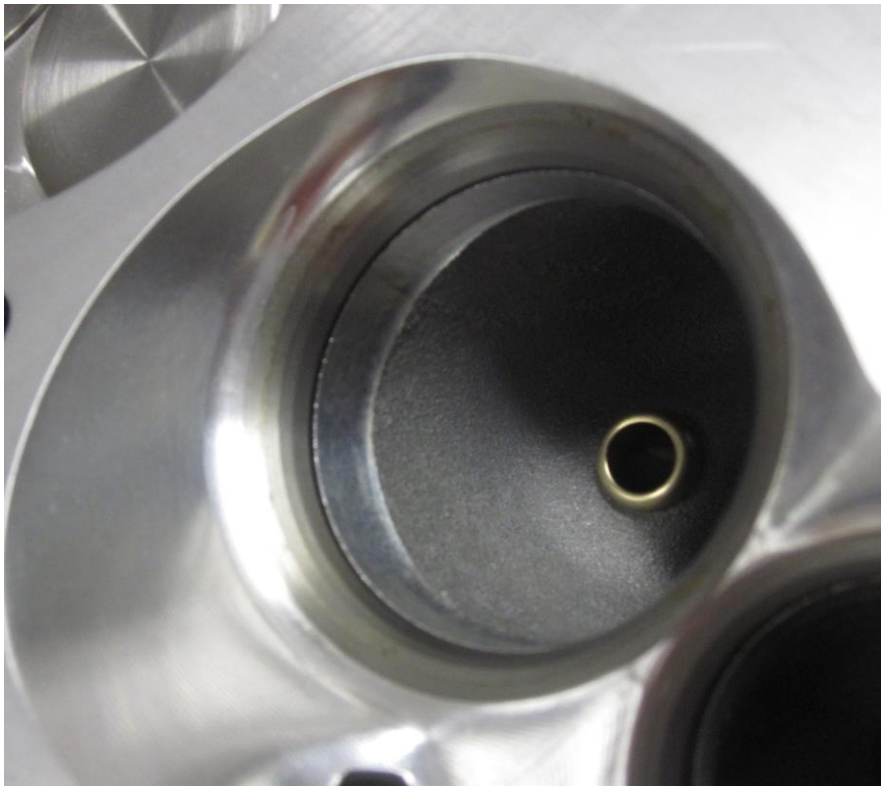
Combustion Chamber – P-Head

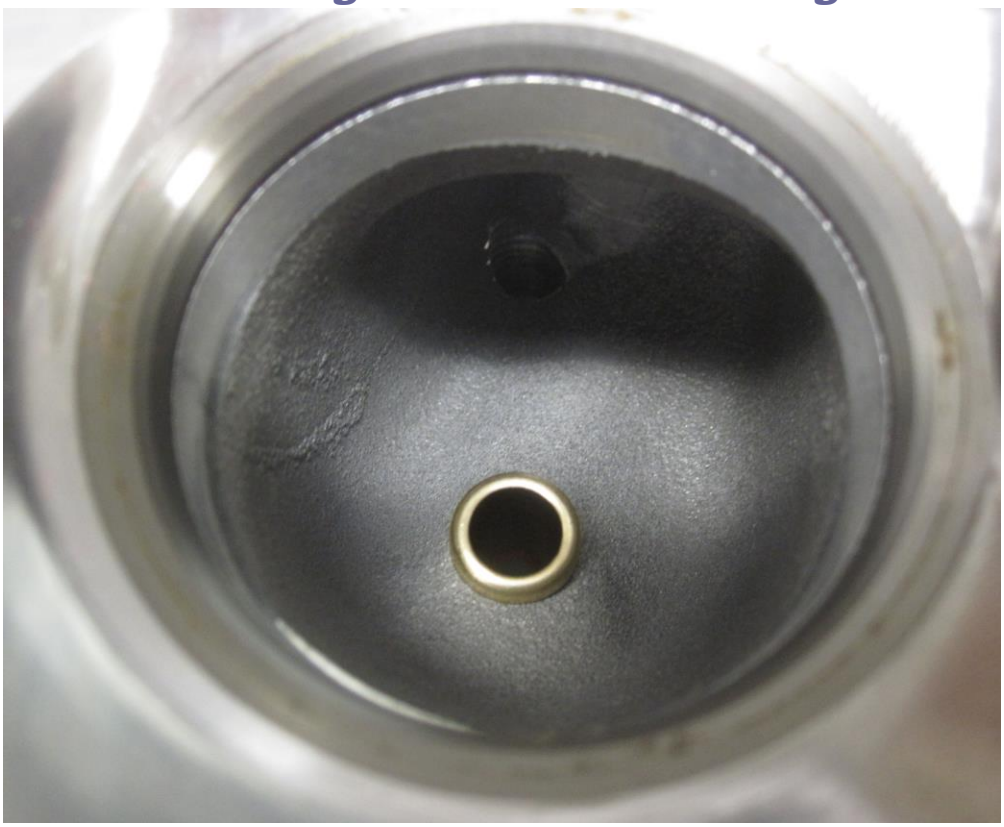


Combustion Chamber R-Head

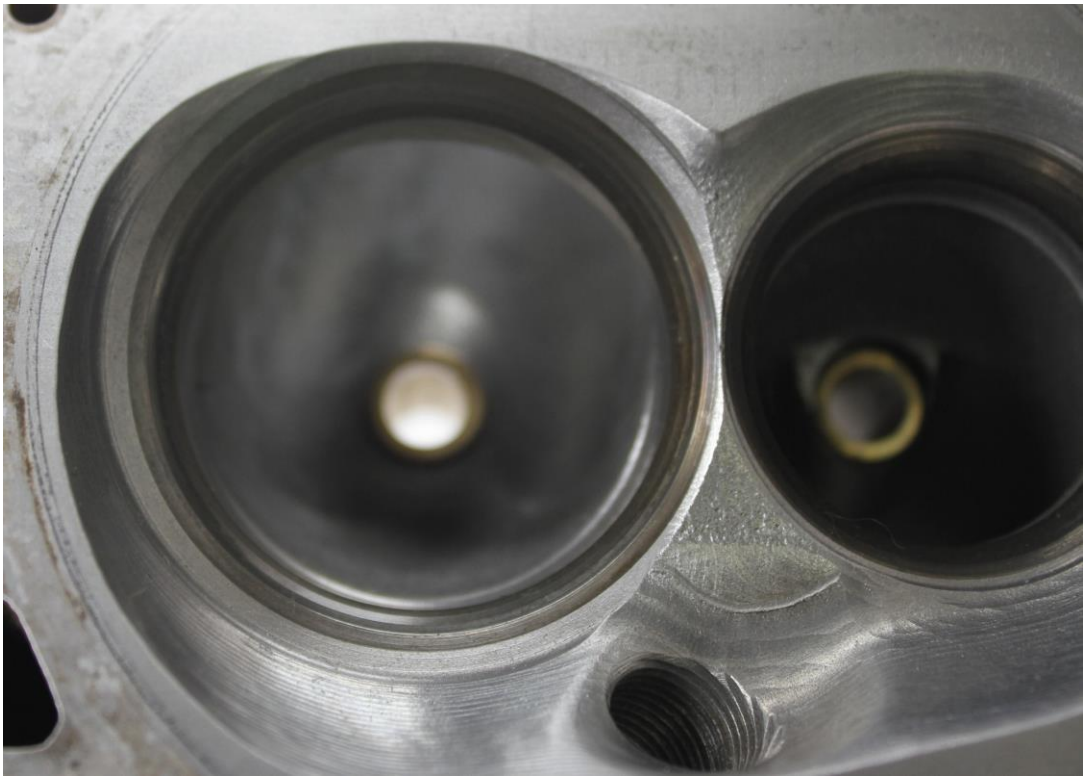


Intake Port and Bowl Cut

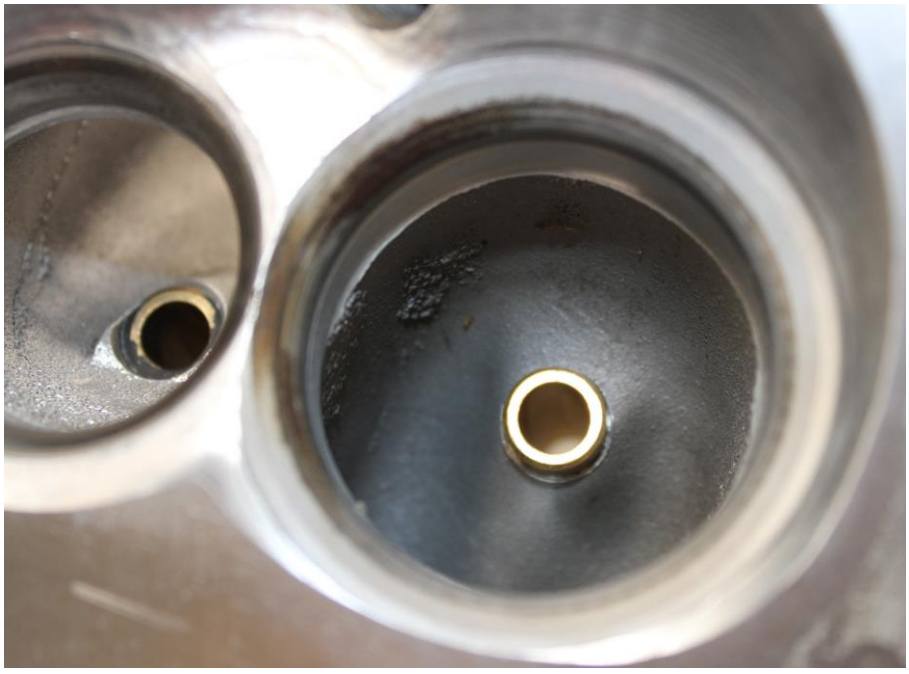




Combustion Chamber and Intake Bowl Cut



Exhaust Port and Bowl Cut



Ford Racing Tech Bulletin 2-11-13

In the machining and processing of Z304D and Z304DA heads, The machining source (Robert Yates) will “Clean Up” and casting flash or machining burrs that could enter the engine and cause damage. The photos shown here are examples of this procedure. It does not occur very often, but is done to eliminate potential engine damage vs. a performance improvement.

Tech Bulletin 6-13-13

Ford Racing M-6049-Z304DA and M-6049-Z304DA7 Head Casting Irregularities
This bulletin describes and shows the normal production irregularities that are found in the ports of the M-6049-Z304DA and DA7 cylinder heads.