



M-6013-B514 Crank Kit INSTALLATION INSTRUCTIONS

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!!! PLEASE READ ALL OF THE FOLLOWING INSTRUCTIONS CAREFULLY PRIOR TO INSTALLATION. AT ANY TIME YOU DO NOT UNDERSTAND THE INSTRUCTIONS, PLEASE CALL THE FORD RACING TECHLINE AT 1-800-367-3788 !!!

INSTRUCTION SHEET FOR CRANK KIT:

The M-6013-B514 crank kit is designed to be used with a production 429/460-cylinder block to build a 521 cu. in. engine.

The kit includes:

- (1) M-6303-A514 cast 4.30" stroker crank
- (1) set M-6108-B514 FRPP/TRW +.030" forged aluminum pistons with .990" floating pins and pin locks
- (1) set Eagle H-beam rods with 7/16", 12 point, 190,000 psi ARP rod bolts
- (1) set Federal Mogul # 7185 CH high performance rod bearings
- (1) set Federal Mogul # 134M main bearings
- (1) set Speed Pro # R-10593 +.030 piston rings
- (1) M-6701-A460 rear main seal

Notes:

- Minimum recommended piston-to-head clearance is .040". Head gaskets available from Ford Racing have a compressed thickness of .038" - .0425". A .050" thick gasket is available from Fel Pro.
- The M-6303-A514 cast 4.300" stroke crank features stock journal sizes. For external balancing use a D9TZ-6359-A "flying counterweight" crank damper spacer and a M-6375-Z460 flywheel (24.2 oz-in. imbalance). C-6 applications use the D9TZ-6375-A flexplate. Approximately three slugs of Mallory metal are required to externally balance the crank. Some engine builders prefer internally balanced engines. For internally balanced cranks, use a neutral balance flywheel and non-counterweight damper spacer (requires lots of Mallory metal). Otherwise, the crank should not require any special prep other than cleaning.
- Mock-up the block and crank with a rod and piston assembly to locate areas that require notches for rod bolt clearance. Grind notches to provide .050" minimum clearance.
- The M-6013-B514 stroker kit includes Eagle H-beam con rods with ARP 7/16", 12 point, 190,000 psi rod bolts and AMPCO 18 bronze bushings. Use moly lube on bolt threads and under head before tightening to torque spec.
- The M-6108-B514 forged aluminum 4.390" (.030" over) pistons feature a 1.545" compression height. .990" floating pin (TRW P/N P-1450), dual C3AZ-6140-B (TRW P/N LR152) pin locks - four per piston, 28 cc +/- 1cc dish, 1/16", 1/16", 3/16" ring pack. They are weight matched to +/- 1.5 gm.
- The piston rings are Speed Pro's +.030" standard gap set. The top ring is a ductile moly positioned far enough down the piston to tolerate modest amounts of nitrous. However, if the nitrous tune-up is too aggressive (too lean or too little spark retard) and detonation occurs, it will knock little chunks of moly out of the ring face and the ring will not seal.
- The bearings are Federal Mogul high performance bearings, which should not need any prep. If necessary, the thrust bearing flanges can be sanded to increase crank end play. Mock-up the bearings in the block and rods to measure the ID for determining clearance. See the spec sheet for recommended clearance.

Factory Ford shop manuals are available from Helm Publications, 1-800-782-4356



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Assembly Tips:

- Use plenty of 30-weight engine oil or engine assembly lube during piston and rod assembly and installation of the crank, pistons and rods in the block.
- Pistons are non-directional and can be installed on the rods in either direction. There is no pin offset and an intake valve clearance notch is located on each side of the piston.
- Make sure there are four piston pin locks in each piston, two per side.
- Properly fitted piston pins will rotate in a hand held piston and rod assembly by inserting a finger in the pin ID and turning. They should be very "snug" but still able to rotate.
- Install oil rings by hand making sure the ends of the spacers do not overlap and the rail end gaps are offset. Top and second rings should be installed with a ring expander tool making sure the dimple is up and end gaps are offset.
- Tapered sleeve piston ring compressors are recommended for installing piston and rod assemblies in the block. Make sure the large chamfer at the rod crank bore faces the crank counterweight.
- Number pistons, rods and rod caps before installation. Metal stamps are available for this purpose. Uniformly orient parts before numbering so the numbers are consistently located.
- Piston and rod assemblies can be swapped between cylinders during pre-assembly mock-up to even out piston to deck variation.
- **TORQUE THE ROD BOLTS!!!** See the spec sheet. Use plenty of lube. During first assembly torque to spec, then back off and re-torque. Repeat three times to "seat" the bolts.

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FRPP B514 ENGINE SPEC SHEET

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Displacement – 521 CID

Bore x Stroke - 4.390" x 4.300"

Piston specs: 1.545" comp. height forged alum. piston w/ 28 +/- 1 cc dish, .990" full floating pin (TRW # P-1450) w/ double C3AZ-6140-B lock rings, 1/16 ductile moly, 1/16 cast iron scraper, 3/16 SS-50U Speed Pro rings.

Nominal compression ratio - 9.8:1 (range is +/- .5)

Deck height - 10.32"

Piston to deck - 0 to .030" down

Camshaft - M-6250-A514	mechanical roller	Int.	C/L	Exh.	C/L
	max. valve lift	.647"	107°	.647"	117°abc
	duration @ .050" lift	254°		258°	
	cam timing @ .050" lift, open	20° BTC		66° BBC	
	close	54° ABC		12° ATC	

Lifters - mechanical roller with oil groove, valve lash .025" (hot)

Cylinder heads - M-6049-C429 CJ w/ 72 cc +/- 2 cc chamber volume

Valves - 2.20" int. (M-6507-B429) / 1.76" exh. (M-6505-A429)

Valve springs - Comp Cams #953 dual with damper, 185# @ 1.850" installed height, 500# @ 1.225" open

Rocker arms - 1.73 ratio, M-6564-A460

Ignition timing - 32° @ 4000 RPM total

Rated HP - 600 HP @ 6000 RPM

Torque - 590 ft./lbs. @ 4750 RPM

Note: All untoleranced dimensions are nominal.

Torque Specs:

Main bearing bolts - 105 ft./lbs.

Con. Rod bolt (H-beam rods) - 63 ft./lbs. with moly lube

Cam sprocket bolt - 65 ft./lbs.

Cylinder head studs - 3 steps, 75 ft./lbs., 105 ft./lbs., step 135 ft./lbs.

Rocker arm stud - 65 ft./lbs.

Flexplate - 80 ft./lbs.

Crank damper bolt - 160 ft./lbs.

Recommended Clearances:

Piston to bore .004" - .005" @ .070" below pin c/l

Ring end gap Top .024", 2nd .020"

Piston pin .0008" - .0012"

Crank end play .004" - .008"

Main bearing .0028" - .0036" - absolute minimum clearance .0026"

Rod bearing .0024" - .0030" - absolute minimum clearance .0022"

Rod side clear .010" - .015" per pair

Piston to deck .000" min.

Valve to piston .100" int., .125" exh., .060" radial (to edge of notch)

Valve to valve .035" min.

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