



M-6007-B50/B51/XE3/XB3 Engine INSTRUCTION SHEET

NO PART OF THIS DOCUMENT MAY BE REPRODUCED WITHOUT PRIOR AGREEMENT AND WRITTEN PERMISSION OF FORD RACING PERFORMANCE PARTS

Please contact the Tech "Hot Line" for the most current instruction information (586) 468-1356

!!! PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY PRIOR TO INSTALLATION !!!

GENERAL INFORMATION:

This engine assembly is built with current production 5.0L H.O. crankshaft, rods and pistons, resulting in a 50 oz. external balance requirement. The damper & flywheel included are compatible with this balance specification. The damper and flywheel combination for your particular installation may need re-balance or some other modification for compatibility. (See #4 & #5 for more details on balance). This engine is intended for off-road applications and can be adapted to most 289-302 situations.

THIS LONG BLOCK IS FOR OFF-ROAD USE ONLY AND DOES NOT HAVE A WARRANTY

!!! WARNING: THIS ENGINE DOES NOT CONTAIN ANY CRAINKCASE OIL !!!

PARTS INCLUDED IN THIS LONG BLOCK ASSEMBLY KIT:

| | | |
|----------------------------------|-----------------------|-----------------------|
| 5.0L PRODUCTION SHORT BLOCK | <u>M-6007-B50/B51</u> | <u>M-6007-XB3/XE3</u> |
| SVO GT-40 CYLINDER HEAD ASSEMBLY | M-6049-Y303 | M-6049-X303 |
| SVO ROLLER CAM | M-6250-B303(B50) | M-6250-B303(XB3) |
| | M-6250-E303(B51) | M-6250-E303(XE3) |

Ford Racing Performance Parts engineers recommend the use of their line of performance intake systems, coupled with performance pulleys, headers and ring & pinion sets, for optimum performance.

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

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PARTS REQUIRED TO COMPLETE THE ENGINE:

Water Pump and Plate:

The front cover and water pump supplied are for a reverse rotation serpentine style system. Some serpentine systems may also require a different timing chain cover and water pump. A V-belt system may require a different front cover to use your standard rotation water pump.

Distributor:

Must be equipped with a steel drive gear for roller camshaft compatibility. Can be Duraspark or EFI depending on vehicle applications – use 1-3-7-2-6-5-4-8 firing order.

Intake Manifold/Fuel System

Just about any intake produced for 289-302 applications will fit GT-40 heads. Water transfer hole design was enlarged in 1976 on all applications. Pay attention to intake gasket fit. A Performer RPM or RPM Air Gap intake is suggested when using a carburetor. A GT-40 or Cobra intake is suggested for EFI. Suggested carburetor size 600-650 cfm. The suggested injector size with M-6007-B50/B51, is 24 lbs. The suggested injector size with M-6007-XE3/XB3, is 30 lbs.

Front Accessory Drive

Must be selected for your particular application. Since drive alignment begins with the damper, note that the 50 oz. damper supplied may not work with your application.

Flywheels

The engine is supplied with a 157-tooth (13-1/2 dia.) manual shift flywheel using the 50 oz. balance factor. This flywheel will accept a 10-1/2" diaphragm style clutch. It can be re-drilled for a long style pressure plate. If your application requires a different flywheel (C-6, C-4/A.O.D./or 164-tooth stick) call the Tech Line at (586) 468-1356 for the correct part number and application.

Valve Covers

The GT-40 is shipped with current level valve covers for top end protection. These units have no provision for the PCV system or breather caps when used for non-fuel injection applications.

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APPLICATION INFORMATION:

Depending on the date of manufacture, this engine may be equipped with either 1995 Mustang or 1996 Explorer dress components (except Explorer dressed engines will be built with F-Series M/T flywheels). These components include front cover, water pump, oil pan, pick-up tube and screen assembly, and flywheel. A list of service and FRPP components is provided to allow conversions to your particular usage. A partial listing follows. Technical questions will be answered on the Ford Racing Tech "Hot Line" at (586) 468-1356.

Mustang/Capri 1979-1995

| | | |
|-----------------------------|-------------|---------|
| Oil pan and pickup tube kit | M-6675-C302 | Chrome |
| Oil pan and pickup tube kit | M-6675-A50 | Painted |

Mustang 1994-1995

Water pump and front cover kit M-8501-A50

Mustang/Capri 1979-1993

| | |
|-------------|-------------|
| Front cover | FOAZ-6019-A |
| Water Pump | FOAA-8501-A |
| Gasket (FC) | F3TZ-6020-A |
| Gasket (WP) | E9TZ-8507-A |
| Seal (CS) | E6DZ-6700-A |

Mustang/Capri 1981-1995

| | |
|----------------------|----------------------------|
| Flywheel (manual) | M-6375-B302 (cast iron) |
| | M-6375-C302 (billet steel) |
| Flywheel (automatic) | M-6375-A50 (164 AOD/C-4) |
| | M-6375-E302 (157 C-4) |
| | M-6375-J302 (C-6) |

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PRIMING THE ENGINE LUBRICATION SYSTEM:

!!! WARNING: DO NOT ATTEMPT TO START ENGINE WITHOUT FILLING THE CRANKCASE WITH OIL AND PRIMING THE LUBRICATION SYSTEM !!!

NOTE: Prime the engine oiling system before the engine is installed into the vehicle.

- STEP 1:** Fill the crankcase with (5) five quarts of 10W-30, 10W-40 premium motor oil.
- STEP 2:** Tape a ¼" deep well socket to a long extension.
- STEP 3:** Insert the socket/extension combination into the distributor opening on the engine block.
NOTE: The socket extension combination must engage the oil pump intermediate driveshaft.
- STEP 4:** Rotate the socket/extension combo counter clockwise until oil flows from the pushrods.
NOTE: A reversible electric drill is recommended. Check pushrods for oil flow.
- STEP 5:** After oil flows from the pushrods, remove the socket/extension combination from the distributor opening.

DISTRIBUTOR PREPARATION/INSTALLATION INSTRUCTIONS:

- STEP 1:** To install the distributor correctly, the #1 piston must be at T.D.C. (Top Dead Center), with the intake and exhaust valves closed.

!!! CAUTION: THE DRIVE GEAR ON THE DISTRIBUTOR SHAFT MUST BE STEEL OR DAMAGE TO THE CAMSHAFT GEAR WILL RESULT. IF THE DISTRIBUTOR GEAR IS NOT STEEL, REPLACE IT WITH FRPP M-12390-F, WHICH CAN BE USED ON ALL 302 HYDRAULIC ROLLER TAPPET CAMSHAFTS. WHEN USING DURA-SPARK OR POINT TYPE DISTRIBUTORS, USE M-12390-B DISTRIBUTOR GEAR !!!

Note: With distributor cap installed, locate the #1 post and place a mark on the distributor base.

- STEP 2:** Rotate the distributor shaft so that the blade on the rotor is to the left of the mark, but as close to the mark as possible
- STEP 3:** Install the distributor into the engine block opening. It may be necessary to slightly rotate the rotor/shaft assembly until the drive gear "drops" into position.

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- STEP 4:** Verify rotor blade is pointing at #1 mark on the distributor base.
NOTE: If the rotor blade & the magnetic pick-up cannot be aligned by rotating the distributor in the engine block, remove the distributor enough to disengage the distributor drive gear from the camshaft gear. Rotate the rotor enough to engage the distributor gear on another camshaft gear tooth.
- STEP 5:** Repeat STEPS 3-4 if needed.
- STEP 6:** Install the distributor hold-down clamp and bolt. Tighten the bolt, but leave it loose enough to rotate the distributor.
- STEP 7:** Install the distributor cap/wires.
- STEP 8:** Set the timing. Tighten the hold-down bolt.

INTAKE INSTALLATION INSTRUCTIONS:

- STEP 1:** Check the gasket fit on the heads and intake. Install the gaskets/silicone to the block and heads.
- STEP 2:** Carefully install the lower intake. Start the intake bolts, and hand-tighten.
- STEP 3:** Torque the intake manifold bolts, in sequence, to 10 ft./lbs., starting with the center bolts, working out towards the ends, while alternating from side to side.
- STEP 4:** Repeat the same torque sequence using 18 ft./lbs. The maximum torque on aluminum heads is 18 ft./lbs.

CRANKSHAFT DAMPER BOLT INSTALLATION INSTRUCTIONS:

- STEP 1:** Check the crankshaft damper bolt. It must be torqued to 70-90 ft./lbs.

!!!CAUTION: THE CRANKSHAFT DAMPER BOLT MUST BE TORQUED CORRECTLY TO PREVENT DAMAGE TO THE ENGINE OR PERSONAL INJURY !!!

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5.0L SPECIFICATIONS:

| | | |
|------------------------------|----------------------------|---------------------------|
| Bore: | 4.0 | |
| Stroke: | 3.0 | |
| Displacement: | 302 CID | |
| Nominal Compression Ratio: | 9.0:1 | |
| Block Height: | 8.206 | |
| Piston to Deck: | .0075 below to .0135 above | |
| Camshaft: (Hydraulic Roller) | M-6250-B303 | M-6250-E303 |
| | Maximum Valve Lift .480 | Maximum Valve Lift .498 |
| | Duration at .050 lift 224 | Duration at .050 lift 220 |
| | Intake Centerline 107 | Intake Centerline 110 |
| Lifters: | Current production | |
| Valves: | M-6007-B50/B51/XB3/XE3 | M-6507-J302/M-6505-G302 |
| Valve Springs: | M-6513-A50 | |
| Rocker Arms: | Current Production 5.0L GT | |
| Combustion Chamber Volume: | M-6007-B50/B51/XB3/XE3 | 64cc nominal |

TORQUE SPECS:

| | |
|-------------------------------|--|
| Main Bearing Bolts | 60-70 ft./lbs. |
| Rod Connecting Nuts | 19-24 ft./lbs. |
| Cam Sprocket Bolt | 40-45 ft./lbs. |
| Damper Bolt | 70-90 ft./lbs. |
| Flywheel Bolts | 75-85 ft./lbs. |
| Rocker Arm Fulcrum Bolts | 18-25 ft./lbs. |
| Head Bolts (Conventional) | 1 st : 55-65 ft./lbs. 2 nd : 65-72 ft./lbs. |
| *Head Bolts (Torque to Yield) | 1 st : 35 ft./lbs. 2 nd : 55 ft./lbs. 3 rd : ¼ turn |
| Intake Bolts | 18 ft./lbs. Maximum with aluminum heads |

*Utilized in FRPP M-6051-A50 high performance gasket kits

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