



M-6007-A351R/C351R/D351R/E351R Engine INSTALLATION INSTRUCTIONS

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

Please visit www.fordracingparts.com for the most current instruction information

!!! 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 !!!

**!!! PLEASE READ ALL NOTES AND WARNINGS BEFORE STARTING ENGINE.
A BREATHER CAP MUST BE INSTALLED IN ONE VALVE COVER.
A BREAK-IN MUST BE RUN BEFORE FULL POWER PASSES ARE ATTEMPTED !!!**

OVERVIEW:

The M-6007-A/C/D/E351R engine assembly uses a combination of production and Ford Racing components including GT-40 aluminum cylinder heads and the M-6010-A351 or M-6010-A58 Sportsman cylinder block. The nominal 9.0:1 compression ratio and relatively low overlap hydraulic roller cam allow using this engine assembly in street rods or bracket race vehicles. A/D351R engines use the M-6250-Z303 cam. C/E351R engines use the M-6250-E303 cam.

Engine Specs are listed on the attached sheet. For vehicle installation advice call the Ford Racing Techline (800) 367-3788.

RECOMMENDED PARTS TO COMPLETE THE ENGINE:

1. The engine was rated with a 780 CFM Holley carb. A wood or phenolic spacer can be used to reduce the transfer of engine heat to the carb. if hood clearance is not a problem. At least 1/2" clearance between the top of the carb and the hood should be maintained.
2. A Holley high-pressure (blue) or higher volume fuel pump is recommended. The pump should be mounted near the fuel tank. The fuel line should be 3/8" diameter minimum.
3. The engine is equipped with a duraspark style distributor. The timing advance curve starts about 1500 RPM and reaches full advance (20°) at 2500 RPM. An MSD 6AL or 7AL ignition system is recommended to complete the system.
4. The engine is equipped with an M-6316-C351 crankshaft damper and M-6375-A302 flywheel. The engine is externally balanced same as production. C-4 auto trans applications will require a M-6375-F302 flexplate (157-tooth) and a D2OZ-7007-A rear cover plate (which locates the starter).
5. If vacuum boost brakes are used on the vehicle, a vacuum reservoir may be required. These are available from most auto parts stores.
6. Shorty exhaust headers are available for several vehicle applications from Ford Racing.

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



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Engine Prep:

1. AT LEAST ONE VALVE COVER BREATHER MUST BE INSTALLED before starting the engine!! Instructions are included.
2. The engine has been hot tested. The 20W50 factory fill oil should be changed after the break-in cycle. Any good quality natural or synthetic 20W50 oil may be used.
3. An engine oil cooler is highly recommended. Max recommended engine oil temp is 220° for natural oil, 240° for synthetic oil.
4. Ford Racing offers the M-8005-C aluminum, cross-flow radiator for 1979-93 Mustangs. Other applications may require radiator upgrades.
5. The nominal compression ratio is 9.0:1. Minimum recommended fuel octane is 92. For racing, 102 minimum octane race fuel is recommended.
6. The ignition timing was set during the hot test, but it should be rechecked when the engine is first started. The 351 made best power at 36° total timing.
7. **RE-TORQUE THE CYLINDER HEADS AFTER THE FIRST DAY OF OPERATION. The engine must have run under load at normal operating temperature and COOLED COMPLETELY TO AMBIENT TEMP before re-torque. See spec sheet for torque specs.**

Competition Prep:

1. The engine made best power with the camshaft at 2° timing. The 9 keyway crank sprocket allows up to 8° advance or retard. If cam timing is changed, piston to valve clearance must be checked.
2. The cast 351W crank, the sportsman block and the forged steel connecting rods, together with the cast hypereutectic pistons, form a very durable shortblock for the intended service. No special prep is required for these components. Traditional blueprinting operations may produce some gains in power. The engine has not been tested with power adders such as nitrous or superchargers.
3. Both the block and the heads could be milled to increase compression ratio. Minimum piston to cylinder head clearance is .040" (head gasket compressed thickness is .042"). GT-40 heads can be milled up to .050" (beyond .050" the milling will run into the intake valve seat). Milling .005" to .006" will reduce chamber volume approximately 1cc. Reducing chamber volume 10cc will increase the compression ratio by 1, which should result in a 4% power increase.
4. The intake and exhaust ports have been designed to provide a good balance of flow volume and flow velocity. Porting should be done with care by an experienced cylinder head porter.
5. The intake manifold can be port matched to the cylinder heads using the gasket as a guide. Use care to insure that the cylinder head port edges do not intrude in the flow path.

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M-6007-A/C/D/E351R ENGINE SPEC SHEET

April, 2001

Bore x Stroke - 4.00" x 3.50"

Piston specs - 1.615" compression height, dish + notch volume = 15 +/- .5cc

Nominal compression ratio - 9.0:1 (range is +/- .5)

Deck height - 9.50"

Piston to deck - .000" min.

| | Z303 Camshaft | | | | E303 Camshaft | | | |
|------------------------------|---------------|------|---------|------|---------------|------|---------|------|
| Camshaft - hydraulic roller, | Int. | C/L | Exh. | C/L | Int. | C/L | Exh. | C/L |
| max valve lift | .552" | 107° | .552" | 117° | .498" | 110° | .498" | 110° |
| duration @ .050" lift | 228° | | 228° | | 220° | | 220° | |
| cam timing @ .050" open | 7° BTC | | 41° BBC | | 0° BTC | | 40° ABC | |
| close | 51° ABC | | 3° ATC | | 40° BBC | | 0° BTC | |

Hydraulic roller lifters - M-6500-R302

Lifter preload - .020" to .060". Use M-6529-A302 shim kit to reduce preload or longer pushrods to increase preload.

Cylinder heads - M-6049-X303 w/64cc +/-2cc chamber volume

Valves - 1.94" int. (M-6507-J302) / 1.54" exh. (M-6505-G302)

Valve springs - M-6513-A50 single w/damper, 110 # @ 1.820" installed height

Rocker arms - 1.60 ratio, M-6564-B351

Ignition timing - 36° @ 3000 RPM

Rated HP - A/D351R - 385 HP @ 5700 RPM; C/E351R - 360 HP

Torque - A/D351R - 377 ft./lb. @ 4500 RPM; C/E351R - 350 ft./lb.

Note: Dimensions without tolerance are nominal

Recommended Clearances:

| | |
|-----------------|---|
| Main bearing | .0018" - .0024" |
| Rod side clear | .010" - .015" |
| Piston to deck | .000" min. |
| Valve to piston | .100" int., .125" exh., .060" radial (to edge of notch) |

Torque Specs - with 30 weight oil:

| | |
|-----------------------------|----------------|
| Main bearing bolts | 105 ft./lbs. |
| Connecting rod bolts w/moly | 50 ft./lbs. |
| Cylinder head bolts | 105 ft./lbs. |
| Rocker arm bolts | 18-24 ft./lbs. |
| Intake bolts | 16-18 ft./lbs. |

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