

ENGINE

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CYLINDER HEAD: Tightening Torque and Cylinder Head Diagram—See *Ford Shop Notes*.

Re-working Head for Improved Cooling: See *Ford Shop Notes for instructions (and new Head Gaskets)*.

PISTONS:—Steel alloy (Pass. Cars), Aluminum alloy (Trucks), Domed, cam ground type. Recondition cylinders for finished replacement pistons.

Weight—304-308 grams (stripped), 408-416 grams with rings and pin.

Removal—Pistons and rods removed from above.

Clearance—See *Fitting New Pistons*.

Replacement Pistons:—See *Ford Special Shop Notes*.

Fitting New Pistons:—Use .0025" feeler inserted between piston and cylinder wall at right angles to pin. Pull required to withdraw feeler must be 7-12 lbs. NOTE—If aluminum pistons (split skirt type) used, fit pistons with .002" feeler to 6-10 lbs. pull. On engines with inserted hardened sleeves, use .003" feeler (steel pistons), .0025" feeler (aluminum pistons) with same pull as above.

PISTON RINGS:—Two compression, one oil control ring per piston, all above pin. Oil ring groove drilled with oil drain holes. Rings furnished standard and .005", .015", .030", .045", .060" oversize.

Ring	Width	End Gap	Side Clear.
Comp. (Top)	.0915-.092"	.012-.017"	.003"
Comp. (#2)	.0915-.092"	.012-.017"	.0015"
Oil Cont.	.1545-.155"	.012-.017"	.0015"

PISTON PIN:—Diameter—.7501-.7504". Length—2.847-2.850". Pin floats in rod and piston. Held by locking ring at each end. Pin hole in rod is bronze-bushed. Pin Fit in Piston—.0005" clearance (steel pistons), .0001" tight to .0001" loose (aluminum pistons).

Pin Fit in Rod Bushing—.0001" clearance. Bushing diamond-bored to diameter of .7503-.7506". See *Ford Shop Notes for Pin Fitting directions*.

CONNECTING ROD:—Length 7". Weight 451-455 grams.

Rod Lower Bearing Diameter—2.2195-2.220".

Crankpin Journal Diameters—1.999".

Bearing Type—Steel-backed, special alloy type. Bearing surface on outer face (in rod) and inner face (on crankpin). Bearings extend through both rods (rods mounted side-by-side) and are free to rotate. Bearings furnished standard and .003", .010" undersize.

Bearing Dimensions—Thickness .1095". Length 1.933".

Clearance—.0005-.0025" (total diametrical), .010-.022" (total sideplay).

Bearing Adjustment:—None (no shims). Replace bearings. Do not file caps. Bearings must turn freely with caps tight. Use V-131 tool to check bearings.

Replacement Bearings:—See *Ford Shop Notes for Bearings for Oversize Rods and undersize crankpins*.

Installing Rods:—Rods and caps marked 'R1', 'L1' etc. Install rods in same numbered cylinders with marks on rods and caps together and pointing down.

CRANKSHAFT:—Cast-steel, three bearing type with integral counterweights. Weight 63.5 lbs.

Journal Diameters—2.399" (all bearings).

Bearing Type—Removable steel-backed, babbitt-lined. Furnished standard and .005", .010", .015" undersize.

Clearance—.0005-.0025".

Bearing Adjustment:—None (no shims). Replace bearings. Do not file bearing caps.

End Thrust:—Taken by #3 (rear) main bearing. Endplay .002-.006". Adjusted by replacing bearing (special .015" undersize bearing furnished .015" longer for this purpose).

Replacement Bearings:—See *Ford Shop Notes for Undersize and special long rear bearings*.

CAMSHAFT:—Three bearing. Helical gear drive.

Journal Diameters—1.797" (all bearings).

Bearing Type—Steel-backed, babbitt-lined bushings.

Clearance—.002".

End Thrust:—Taken by gear hub and front bearing and by hub and cover plate. Endplay .005". Adjusted by replacing bearing or cover plate.

Timing Gears:—Crankshaft gear cast alloy-steel. Camshaft gear Bakelized fabric.

Backlash—.004" maximum.

Camshaft Setting:—Mesh crankshaft gear tooth marked '0' with camshaft gear space marked '/'. Camshaft gear hub similarly marked and both marks should be in line.

VALVES:— Head Diam. Stem Diam. Length

All valves1.537".....3105-.3115".....4.750-4.751"

Seat Angle Lift Stem Clearance

All valves45°......292"......0015-.0035"

NOTE—Valve Seat inserts used for Exhaust Valves.

See *Ford Special Shop Notes for Valve Servicing data*.

Valve Guides:—Split type. See *Valve Assembly Removal*.

Valve Lifters:—Alloy iron type operating in reamed holes in block.

Diameter—.999-.9995". Clearance—.0005-.001".

Valve Springs:—See *Valve Assembly Removal*.

Spring Pressure Spring Length

Valve Closed37-40 lbs.....2.13"

Valve Open76-80 lbs.....1.84"

Valve Assembly Removal:—Insert end of V-78 bar type valve lifter between spring coils and engage flanged lower end of guide, pry down on guide until 'C' washer at upper end can be removed, remove valve assembly from above. Use special fixture V-130 to compress spring and remove spring retainer. Install valves in same manner.

VALVE TIMING

Tappet Clearance: .011-.012" Intake, .014-.016" Exhaust. No adjustment provided. Replace valves if clearance excessive, grind off end of valve stem if clearance insufficient.

Valve Timing: See *Camshaft Setting* above.

Early 1937

Intake Valves—Open 9°30' BTDC, Close 54°30' ALDC

Exh. Valves—Open 57°30' BLDC, Close 6°30' ATDC.

Late 1937 & 1938

Intake Valves—Open at TDC, Close 44° ALDC.

Exhaust Valves—Open 48° BLDC, Close 6° ATDC.

To Check Valve Timing—No flywheel marks or other means provided to check timing. If dead center for any piston is established on flywheel, intake valve opening for this cylinder will be approximately 2.96 teeth before this point with piston .0327" before top dead center (Early 1937), with piston at top dead center (Late 1937 and 1938).

LUBRICATION

LUBRICATION:—Pressure. Gear type oil pump located in crankcase at rear of engine.

Normal Oil Pressure—30 lbs. at 2000 RPM.

Oil Pressure Regulator—Located under plug directly above front camshaft bearing. Operates at 30 lbs. Not adjustable.