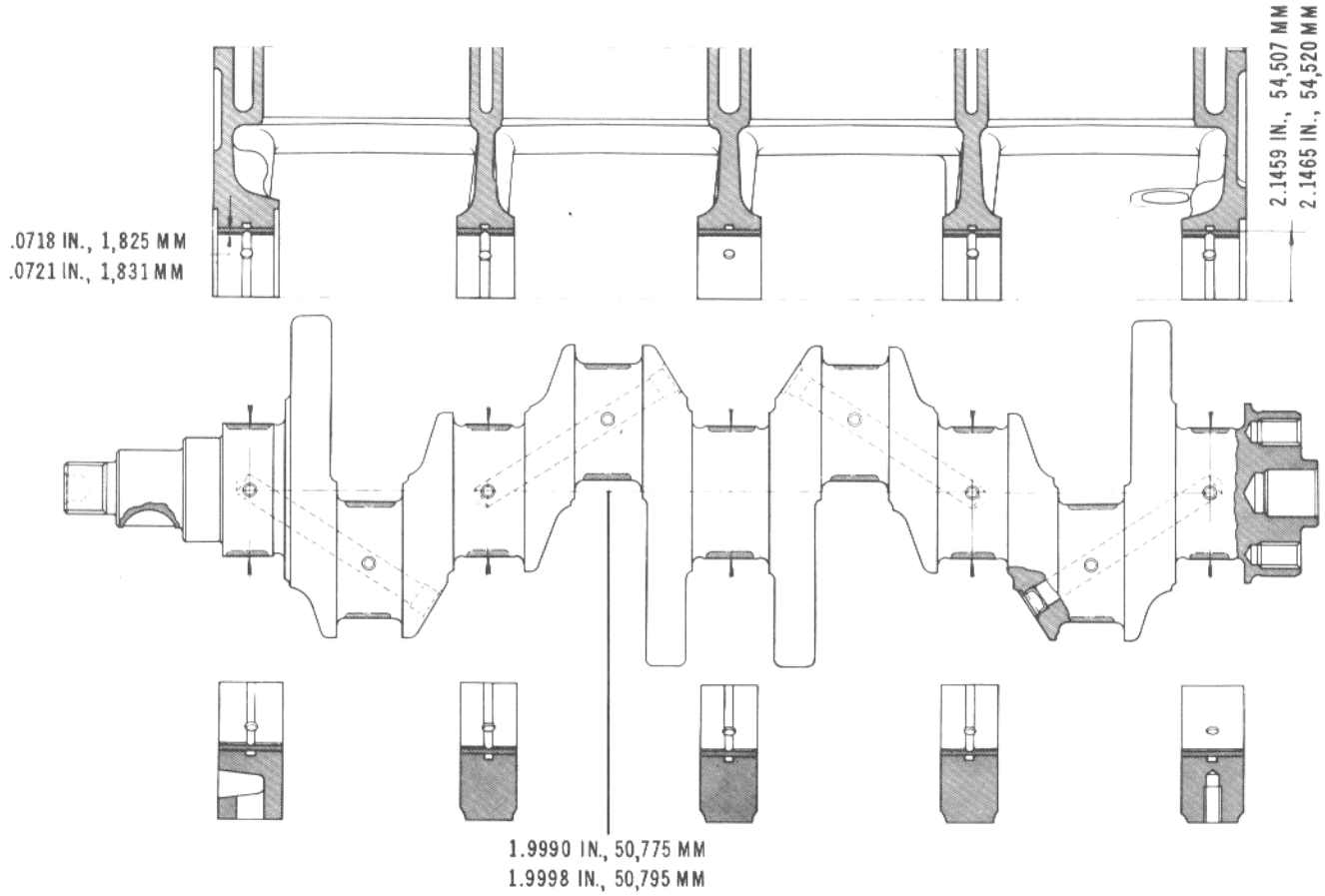
MAIN BEARING JOURNALS AND CRANKPINS

INSPECTION

Carefully inspect crankshaft for cracks on main bearing journals and crankpins as well as on crank arms. If any are detected, crankshaft should be replaced to prevent failure. Should journals show light traces of scuffing, these can be dressed off by using an extra-fine carborundum stone.

If deep scoring is discovered, or if micrometer measurements of journals show an out-of-round condition in excess of .0002 in. (.005 mm), journals will have to be reground to next undersize.



When regrinding journals, be sure to pay special attention to specified fit clearances in relationship to undersize bearing range available for service. Depending on amount of wear, main bearing journals and crankpins should be reground to undersize diameter shown in tables.

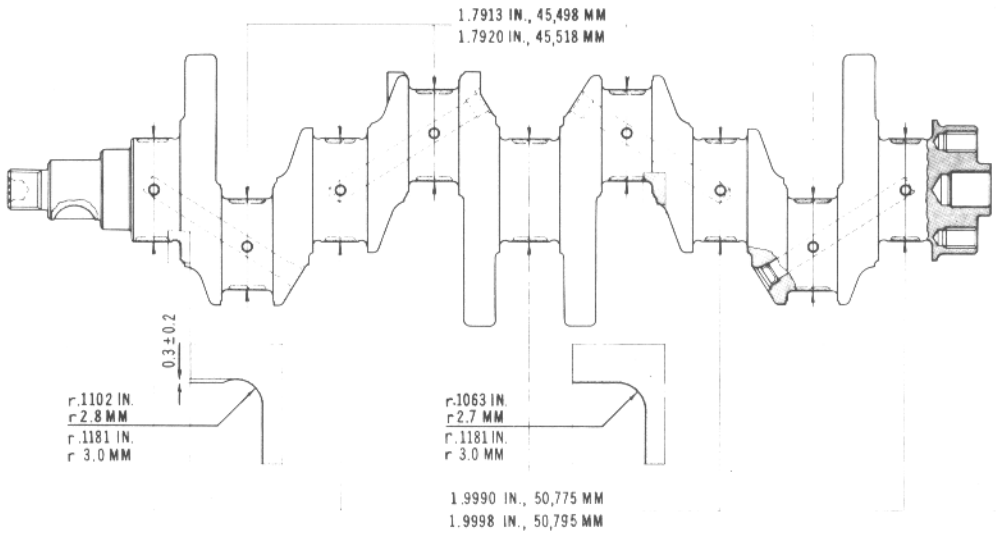
The same journal radius that existed originally should be maintained.

MAIN BEARING THICKNESSES

Standard bearings	Undersize bearings			
	.01 in (0.254 mm)	.02 in (0.508 mm)	.03 in (0.762 mm)	.04 in (1.016 mm)
.0718 in (1.825 mm) to .0721 in (1.831 mm)	.0768 in (1.952 mm) to .0771 in (1.968 mm)	.0818 in (2.079 mm) to .0821 in (2.085 mm)	.0868 in (2.206 mm) to .0871 in (2.212 mm)	.0918 in (2.333 mm) to .0921 in (2.339 mm)

MAIN BEARING JOURNAL DIAMETERS

Standard	Undersize			
	.01 in (0.254 mm)	.02 in (0.508 mm)	.03 in (0.762 mm)	.04 in (1.016 mm)
1.9990 in (50.775 mm) to 1.9998 in (50.795 mm)	1.9890 in (50.521 mm) to 1.9898 in (50.541 mm)	1.9790 in (50.267 mm) to 1.9798 in (50.287 mm)	1.9690 in (50.013 mm) to 1.9698 in (50.033 mm)	1.9590 in (49.759 mm) to 1.9597 in (49.779 mm)



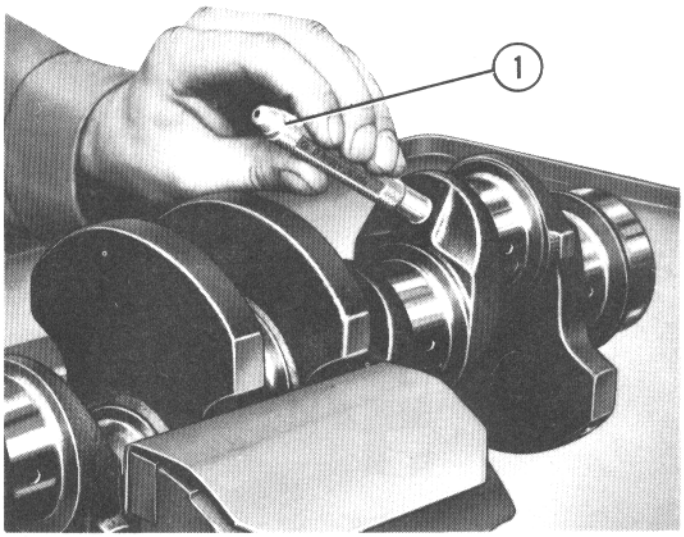
SPECIFICATIONS OF CRANKSHAFT JOURNALS, CRANKPINS AND SHOULDER RADII

After journals have been ground to size and polished, crankshaft must be thoroughly cleaned to remove all metal and abrasive particles.

To clean oilways properly, welch plugs must be removed. Then ream plug bores using reamer A.94016. Thoroughly flush oilways with solvent and blow dry with compressed air.

After completing above operations, drive new welch plugs into place with driver A.86010 (1) and stake them with a punch.

1. Driver A.86010



Checking Crankshaft Balance

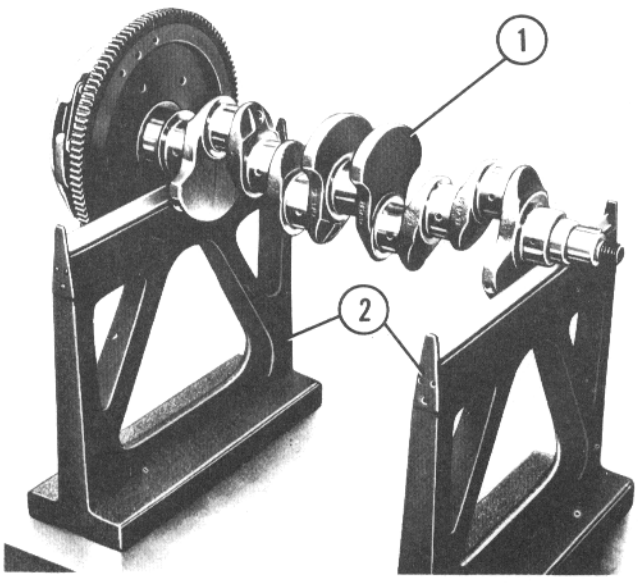
Place two parallel blocks (2) on a surface plate.

Set crankshaft-flywheel-clutch assembly (1) on parallel blocks.

If assembly shows a tendency to roll towards one side, stick some putty on opposite side until assembly stops moving. Weighing amount of putty used will provide an indication of unbalanced weight.

To correct situation, drill holes on flywheel at point D (next figure) as required to remove corresponding weight of metal.

1. Crankshaft-flywheel-clutch assembly 2. Parallel blocks



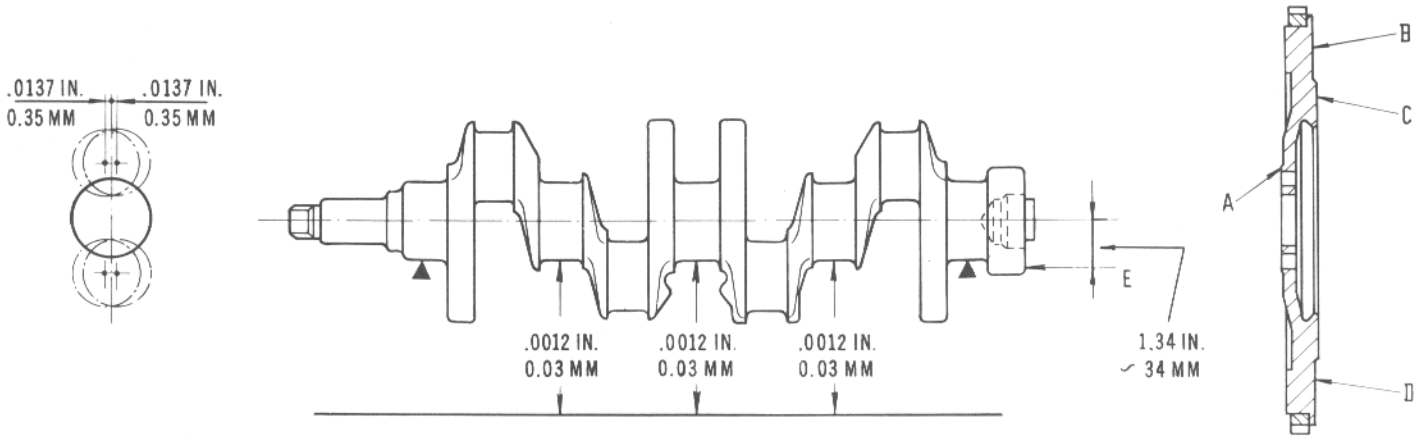
Flywheel and Ring Gear

Inspect condition of ring gear teeth. If there is any obvious damage, replace ring gear.

A hydraulic press should be used to install new ring gear onto flywheel, after heating gear to 176° F (80° C) in an oil bath.

Make sure flywheel contact surfaces with crankshaft and clutch driven disc are smooth and free from scratches or scores. Surfaces should also be perfectly flat and at right angles to flywheel rotation axis.

Rotate flywheel centered on crankshaft: a dial indicator resting at points B and C should not show variations in excess of .004 in. (0.1 mm).



Maximum allowable misalignment of journals and crankpins, and diagram for checking flywheel contact surfaces with clutch disc and crankshaft flange.

(A-B-C-E = points for checking alignment and squareness with respect to rotation axis; D = crankshaft-flywheel-clutch assembly balancing holes.)

Checking Main Bearing Journals and Crankpins for Misalignment

Rest crankshaft ends on two parallel blocks and check the following with a dial indicator.

Main journal misalignment: maximum allowable tolerance .0012 in. (0.03 mm) (total dial gauge reading).

Crankpin misalignment: maximum allowable tolerance, with respect to journals, ± .0137 in. (± 0.35 mm).

Main bearing journal and crankpin out-of-round: maximum allowable tolerance after regrinding, .0002 in. (0.005 mm).

Main bearing journals and crankpins taper: maximum allowable tolerance after regrinding, .0002 in. (0.005 mm).

Squareness of flywheel resting face to crankshaft centerline: when rotating crankshaft, a dial indicator resting laterally some 1.34 in. (34 mm) from crankshaft centerline, should not show variations in excess of .001 in. (0.025 mm).

If inspection of main bearing journals and crankpins alignment reveals distortions, the shaft should be straightened using a hydraulic press, taking care not to subject shaft to excessive stress which could damage its internal structure.

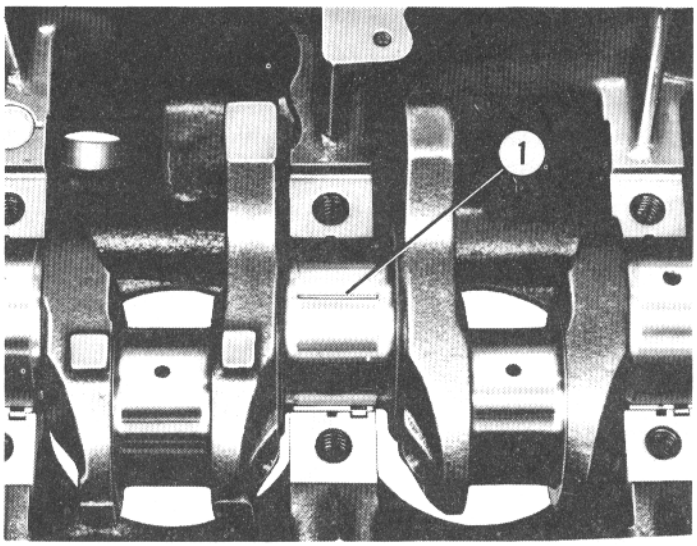
Main Bearings

If inspection shows bearings to be scored or have signs of seizure or abnormal wear, they should be replaced. No reconditioning or adaptation of damaged bearings is possible.

If inspection proves their condition to be satisfactory and fit for further service, check clearances between bearings and journals as follows.

Place a length of calibrated wire (1), such as "Plastigage", along journal being checked.

1. Plastigage wire



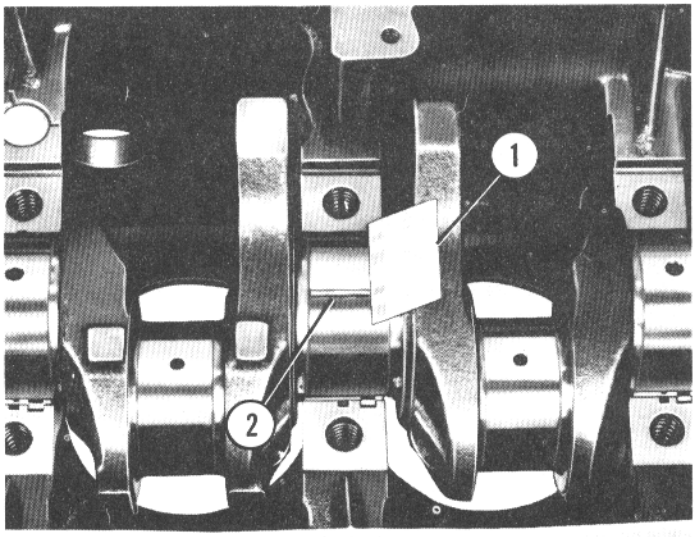
Install caps, complete with bearing shells. Tighten cap mounting screws to a torque of 59 ft. lbs. (8.2 kgm).

Remove caps and using scale on Plastigage envelope (1) measure width of flattened wire (2).

Numbers on envelope show value of existing clearance. Normal clearance between main bearings and crankshaft journals is .0019 to .0037 in. (0.050 to 0.095 mm).

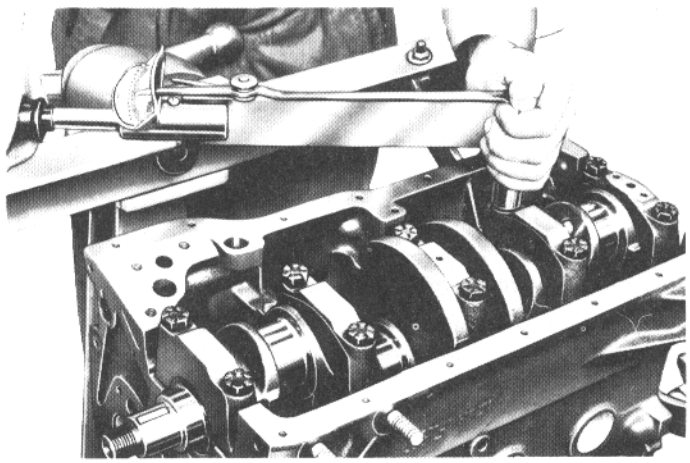
If clearance does not fall within maximum allowable limit of .006 in. (0.15 mm), bearings must be replaced with undersize ones after regrinding crankshaft journals.

1. Measuring envelope 2. Plastigage wire



When checking and replacement procedures have been carried out, install caps and tighten bolts to 59 ft. lbs. (8.2 kgm) torque.

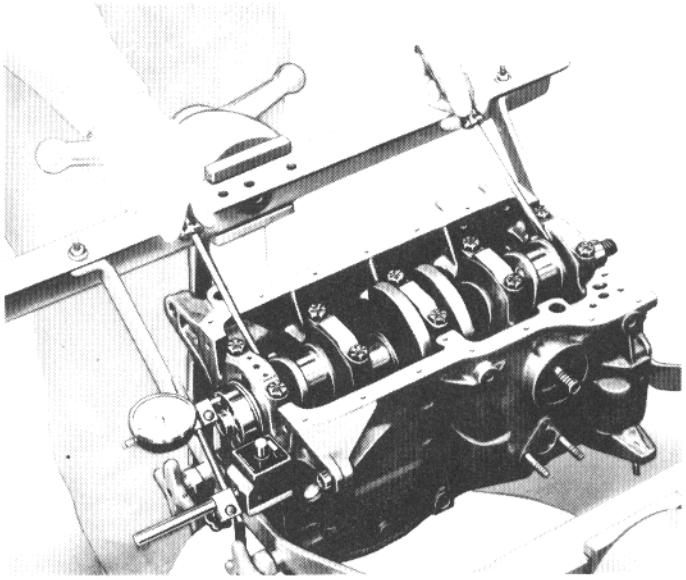
Free crankshaft rotation is an indication that assembly has been performed correctly and bearing clearances conform to specifications.



Crankshaft End Play

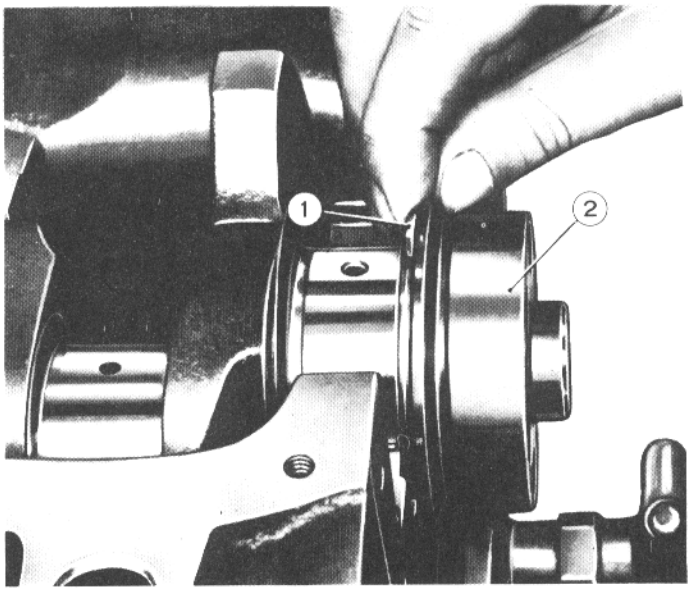
Once crankshaft has been installed, check end play between thrust rings on rear saddle bore and crankshaft shoulders.

Install magnetic base dial gage and wedge two screwdrivers as shown. Using screwdrivers, pry crankshaft back and forth and check dial gage to see if endwise movement falls within .0021 to .104 in. (0.055 to 0.265 mm).



Should end play prove to be more than maximum allowable limit of .0137 in. (0.35 mm), replace thrust rings with .005 in. (0.127 mm) oversize rings.

When installing service thrust rings, make sure that grooves cut on one ring side are facing crankshaft shoulder.



1. Thrust ring 2. Crankshaft

Oil Seals

Two metal cased spring loaded rubber seals are fitted at both crankshaft ends. Whenever crankshaft is being serviced, it is advisable to replace both oil seals.