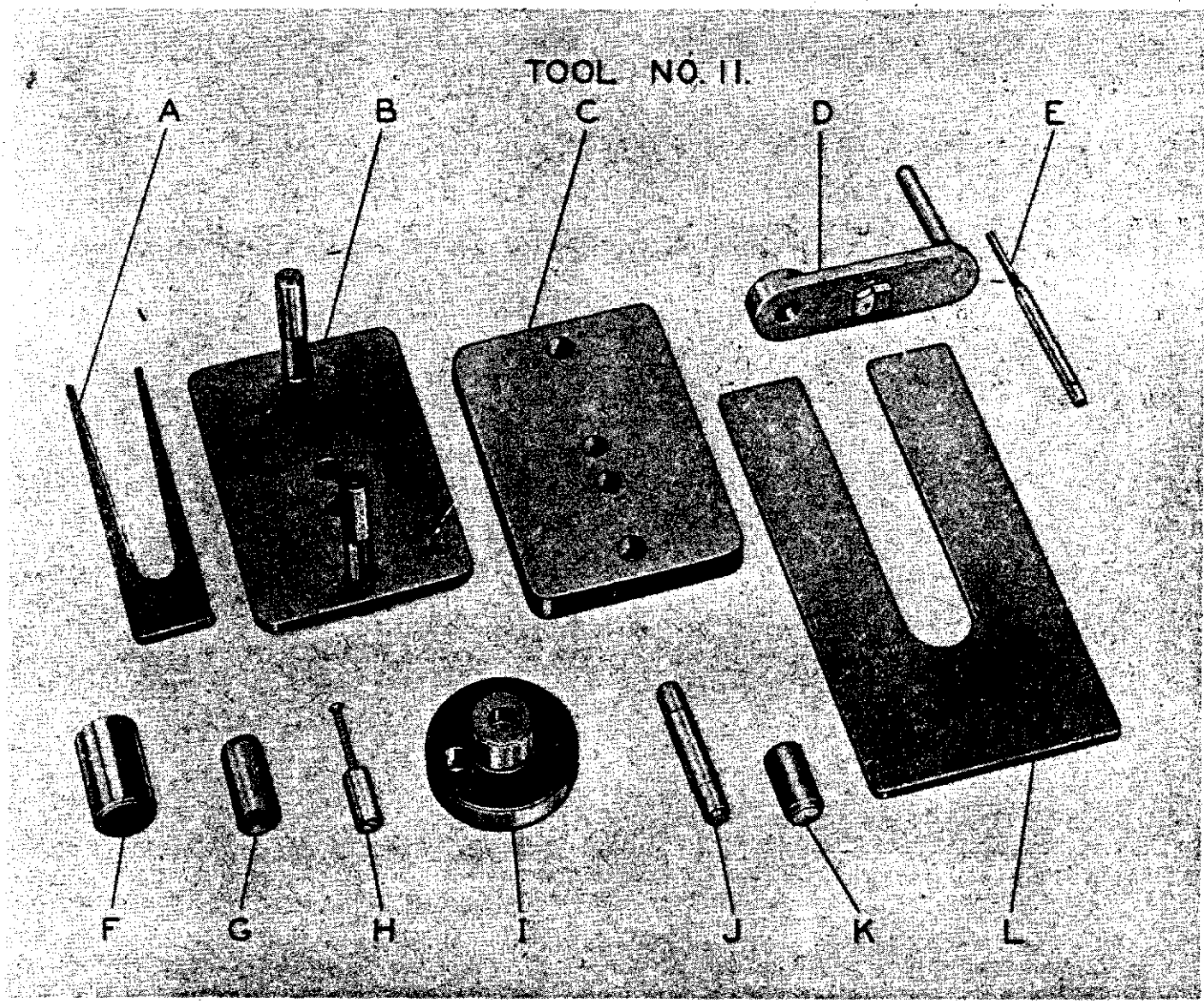
SERVICE SHOP DOPE

NO. 295 NOVEMBER 1, 1949

MODEL 125 FLYWHEEL and CONNECTING ROD ASSEMBLY TOOL SET



ASSEMBLY PART NO. 96125-49

	Part No.	Description		Part No.	Description
A.	96138-49	Flywheel Tapered Spacer.	G.	96134-49	Crank Pin Pilot Aligning Sleeve.
B.	96126-49	Armature Shaft Installing Plate.	H.	96136-49	Crank Pin Aligning Pilot.
C.		Sprocket Shaft Installing Plate.	I.	96132-49	Shaft Locating Press Block.
D.	96202-49	Recess Clean-up Tool.	J.	96130-49	Drift and Pilot Pin.
E.	96207-49	Staking Punch.	K.	96135-49	Crank Pin Press Cap.
F.	96133-49	Press Block.	L.	96137-49	Flywheel Support Plate.

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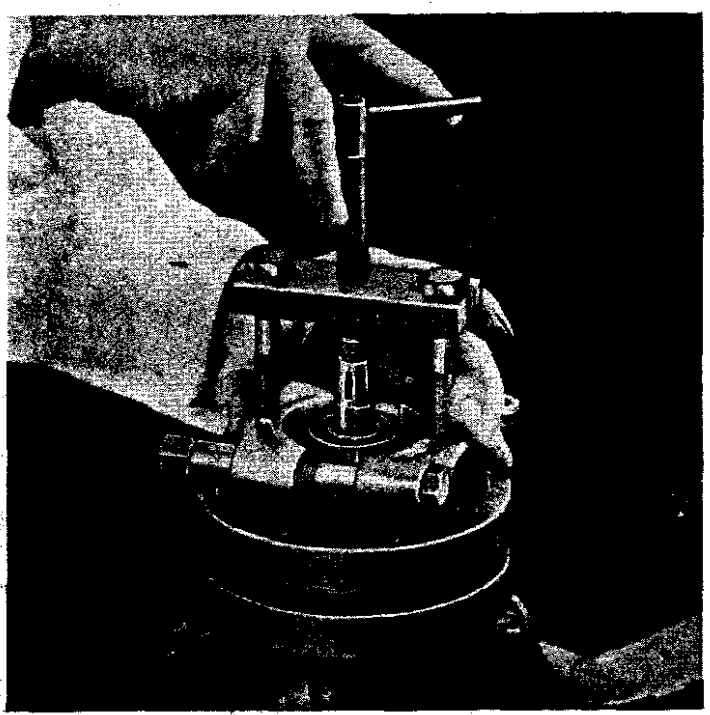
Because shafts in Model 125 flywheel assembly are a straight press fit in the flywheels, and main shafts must be pressed into wheels to a specified depth to correctly position generator armature and engine sprocket, jig and fittings described are necessary for accurate assembly. With this jig shafts can be started and pressed in, in perfect alignment with flywheel holes.

If directions are followed closely, completed assembly will require little, if any, further truing between centers as shown in Illus. 12.

These are precision tools; they can be easily damaged through rough usage; handle with care.

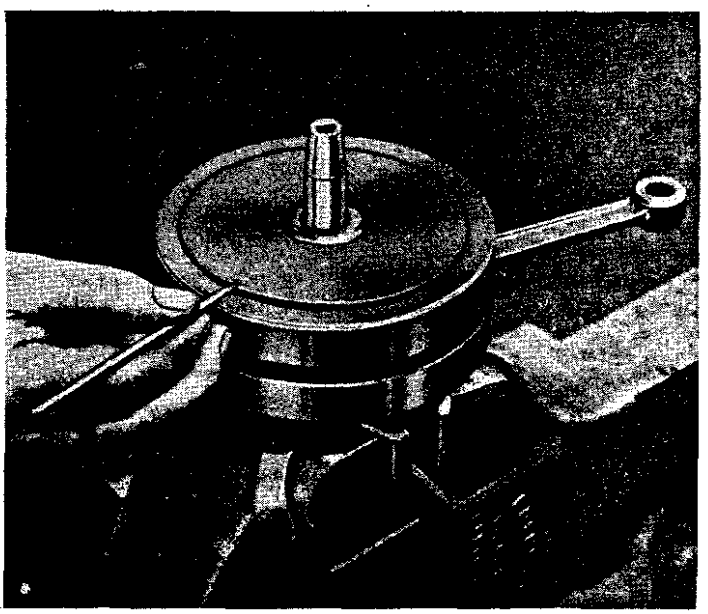


ILLUS. 1

REMOVING SHAFT BEARINGS

Make a puller bar attachment for Harley-Davidson wedge puller, Part No. 12738-48 as shown in Illus. 1. Puller bar can be made out of a piece of flat stock about 1/2" thick, 1-1/2" wide, and 4" long. Puller screw from one of several Harley-Davidson pullers can be used, size & thread 1/2" — 18. Two cap screws, 3/8" — 16 thread, about 3-1/2" long are required to attach bar to wedge. Ends of puller bar must be slotted, 7/16" wide and about 1" deep to allow for variable wedge width. With described puller available, secure flywheel shaft in a vise fitted with copper jaw caps and pull bearing; turn assembly over and pull the other bearing.

Note: When removing armature shaft bearing, insert a nut about 1/2" hex between end of shaft and puller screw, to prevent puller screw from damaging end of shaft.



ILLUS. 2

REMOVING COMPRESSION PLATES

When wedge puller is used to remove sprocket and armature shaft bearings as shown in Illus. 1, compression plates may come out of their recesses as bearings are removed. However, if they do not, remove the plates in following manner.

Drill a small hole at edge of compression plate just deep enough to permit using a sharp pointed pry below edge of plate as shown in Illus. 2. The plate will readily break through the staking which overlaps edge of plate at eight equally spaced locations. Flywheels are now ready for disassembly as in Illus. 4.

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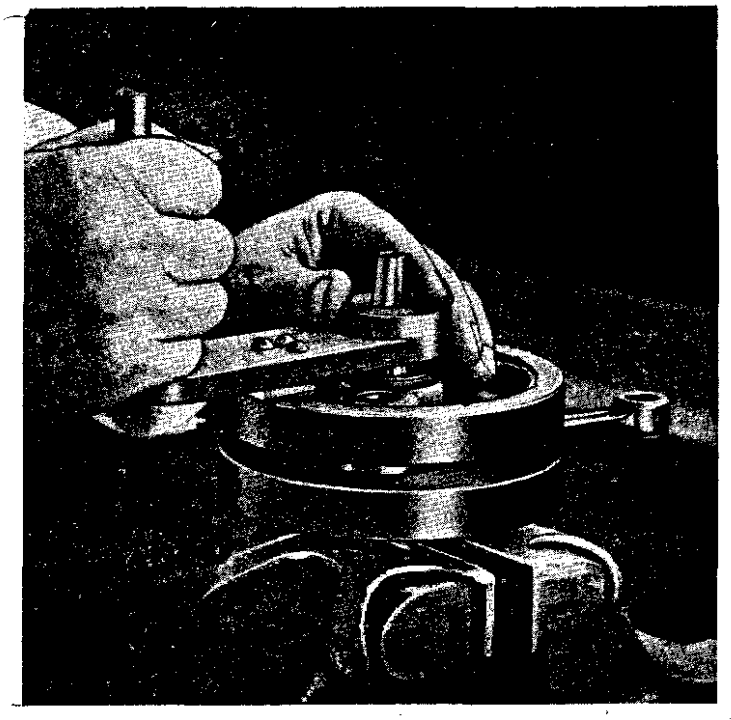


ILLUS. 3

COMPRESSION PLATE RECESS CLEAN-UP TOOL

After compression plates have been removed as shown in Illus. 2, clean up compression plate recess in each flywheel, using "Recess Clean-up Tool." (D).

First put a thin film of oil on shaft and slide tool onto it. Hold tool down firmly with one hand, and with other hand turn clockwise as shown in Illus. 3. The cutter will remove old staking from recess. Caution: Do not pull tool counter-clockwise, or a broken cutting edge will result.

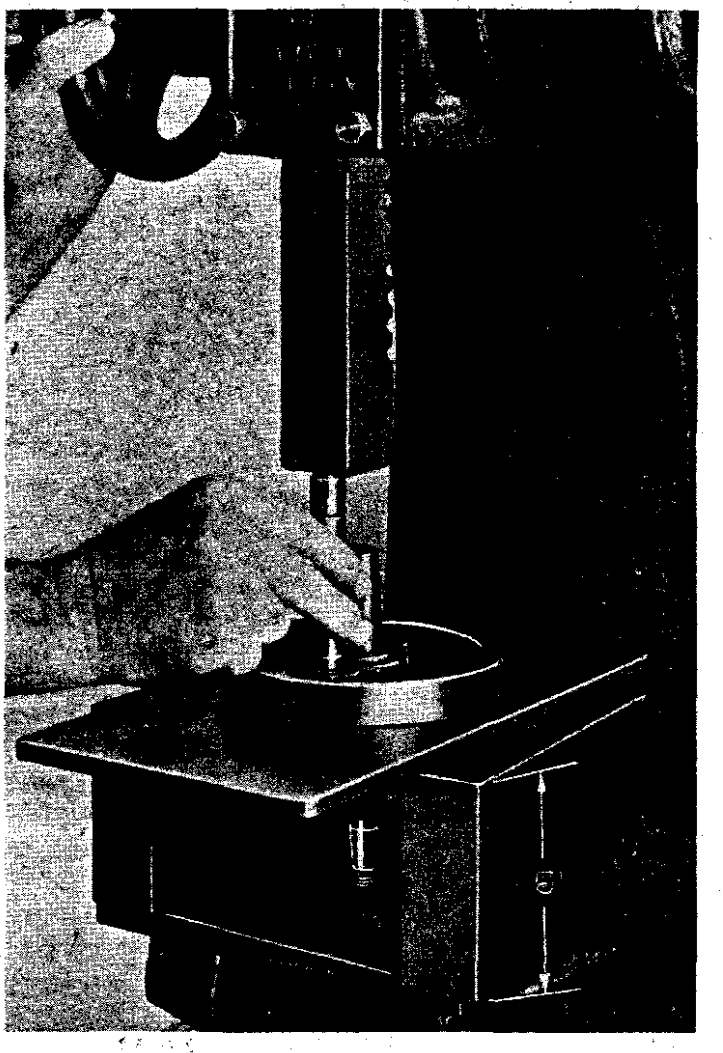
Cutter is adjustable to compensate for wear and sharpening. Adjust cutter so it completely cleans up staking around recess.

DISASSEMBLING FLYWHEELS

Slide "Flywheel Support Plate" (L), between flywheels and place on two blocks as shown in Illus. 4.

Blocks must be over 5" high so end of main shaft will not come in contact with bench before flywheels are fully separated. Then, using "Drift and Pilot Pin" (J), tapered end against crank pin, press out crank pin with connecting rod and lower flywheel attached.

Follow same procedure to remove crank pin from other flywheel.



ILLUS. 4

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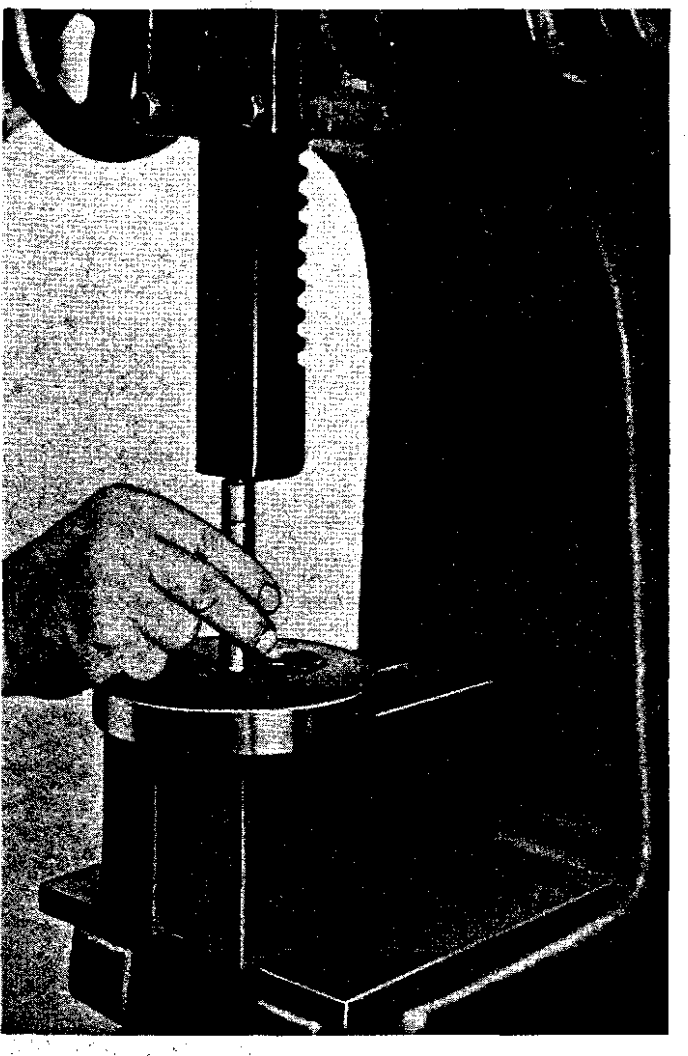

ILLUS. 5

PRESSING OUT MAIN SHAFTS

(Note: In most instances when flywheel assembly requires repair, only crank pin, connecting rod and rod bearings need be removed.

Main shafts (armature and sprocket) are seldom found worn or damaged to such extent that replacement is required. However, in any instance when flywheel assembly is removed from engine and taken apart, if there is the slightest possibility that main shafts have shifted from original specified depth, to which they were pressed into flywheels, they should be partially pressed out of wheels, then pressed back to specified depth, with jig fittings provided for that operation.

The things most likely to cause main shafts to shift from their locations as originally assembled, are hammering shafts when removing engine sprocket or generator armature, or hammering shafts or crankcases, when disassembling wheels from or into crankcases. Even though shafts are a real tight press fit in wheels, the impact of a moderate hammer blow is sufficient to move them.)

With flywheels separated as described under "Disassembling Flywheels" and shown in Illus. 4, the sprocket shaft, armature shaft, or both, can be removed for replacement, if necessary. See Illus. 5.

Place flywheel with shaft in it, on two blocks, shaft downward between blocks. Bring the two blocks as close to shaft as possible. Again use the Drift and Pilot Pin (with tapered end against end of shaft), and press out shaft.

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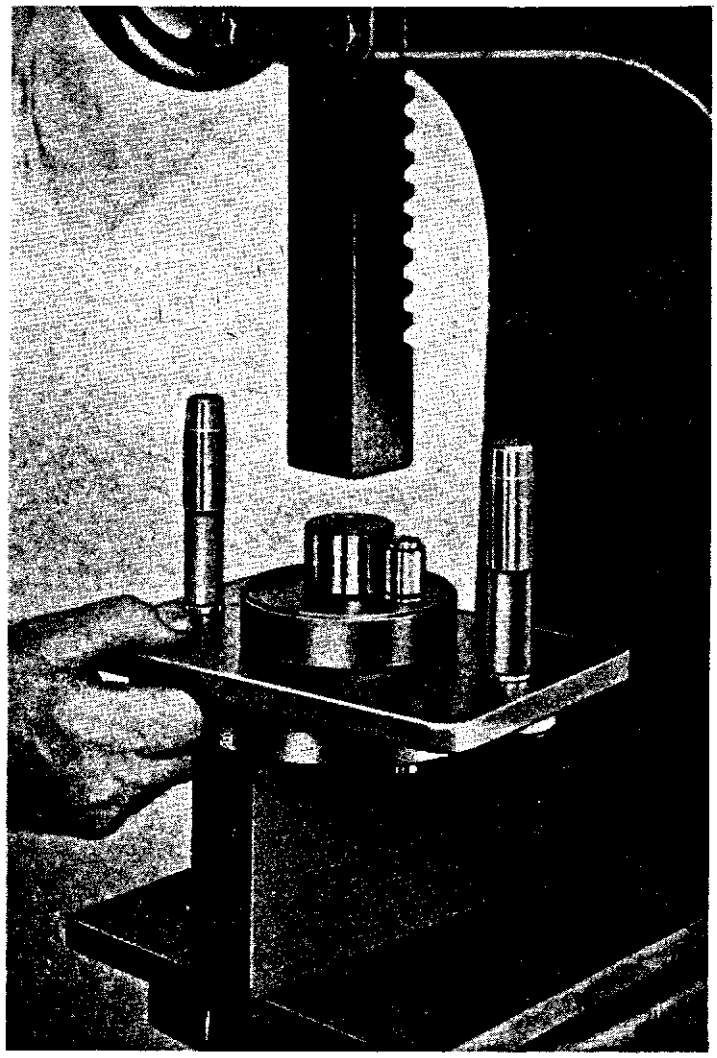

ILLUS. 6

REASSEMBLY

After flywheels have been disassembled, thoroughly cleaned, faulty parts discarded, and connecting rod serviced as necessary, oil shafts and holes in flywheels and proceed to assemble flywheels in following manner.

INSTALLING MAIN SHAFTS

First install key in armature shaft. Place tapered end of shaft in "Shaft Locating Press Block" (I). Insert straight end of shaft through "Shaft Installing Plate" (B) into flywheel. Insert "Pilot Pin" (J) through hole in Press Block, hole in Installing Plate and crank pin hole in flywheel. Support wheel with a block placed directly underneath flywheel center hole and press shaft into flywheel as shown in Illus. 6. Be sure that Press Block is pressed down tight against Installing Plate (B). This procedure presses shaft the correct depth into flywheel and locates armature shaft keyway in relation with crankpin hole so that correct ignition timing can be attained, after armature and circuit breaker cam are installed.

Shafts must be a very tight press fit in flywheels. When a shaft has only a very light press fit in flywheel it is probably because flywheel hole has become enlarged. Wheel in this condition should be discarded and new one used.

Follow this same procedure when installing sprocket shaft, using "Sprocket Shaft Installing Plate" (C); however, key way location in relation to crank pin can be disregarded.

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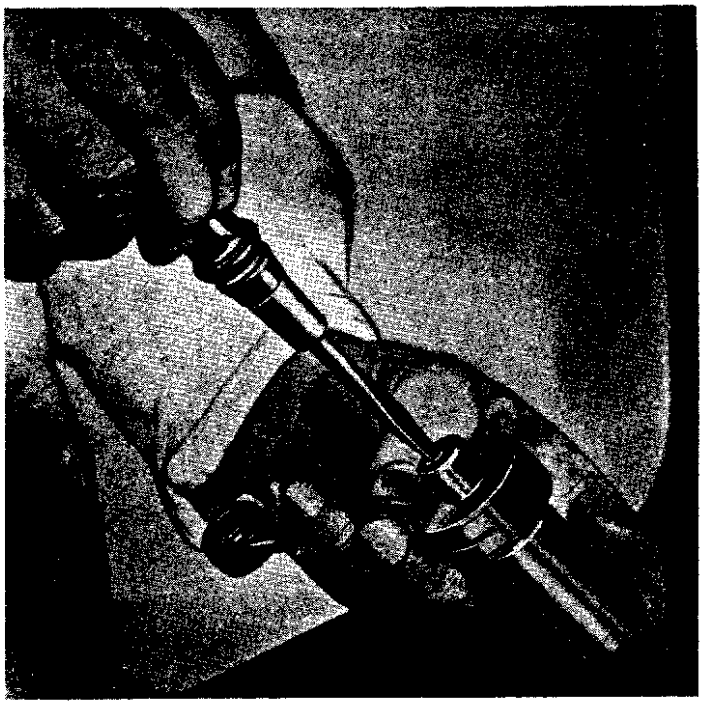
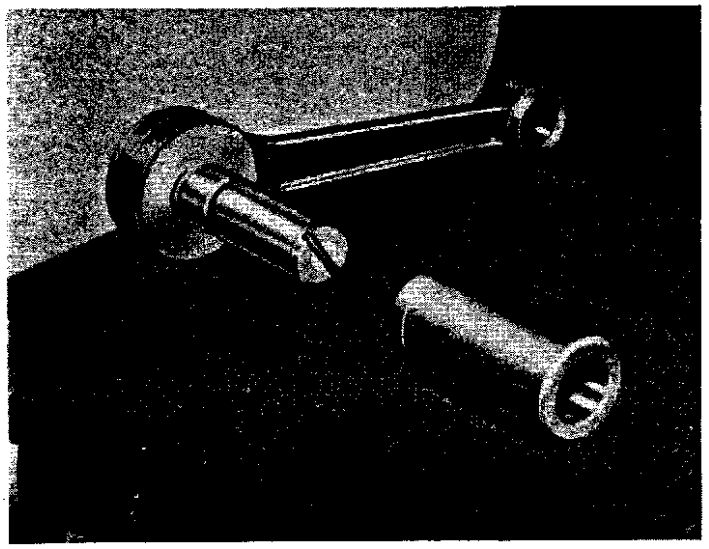


ILLUS. 7

INSTALLING CRANK PIN PILOT

Attach "Crank Pin Aligning Pilot" (H) to crank pin as shown in Illus. 7. Hold small tapered end against one end of crank pin, then pass screw through crank pin from opposite end. Do not tighten as yet.

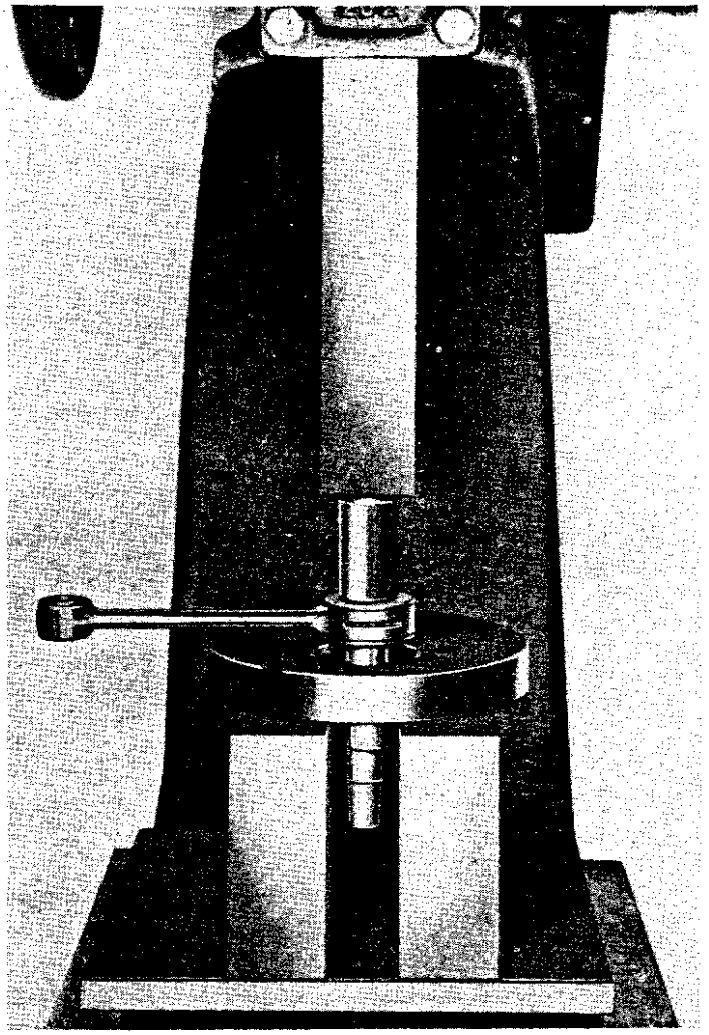
Next slide "Crank Pin Pilot Aligning Sleeve" (G) over Crank Pin Aligning Pilot and crank pin, (heavily chamfered end toward connecting rod). Tighten aligning pilot screw securely and remove sleeve.



ILLUS. 8

CRANK PIN PILOT ALIGNING SLEEVE

Illus. 7 shows the Crank Pin Pilot being secured while being held in alignment with the Crank Pin Aligning Sleeve. Illus. 8 shows Aligning Sleeve removed after Crank Pin Pilot has been secured.



ILLUS. 9

PRESSING CRANK PIN INTO FLYWHEEL

After end of crank pin has been coated with a thin film of engine oil, place flywheel in which armature shaft is installed on two blocks and insert Crank Pin Pilot into crank pin hole as shown in Illus. 9. Place "Press Cap" (K) on end of pin and press pin into flywheel until it bottoms.

Remove Press Block, also Crank Pin Pilot, and install Pilot on opposite end of crank pin in same manner as shown in Illus. 7 and explained under "Installing Crank Pin Pilot."

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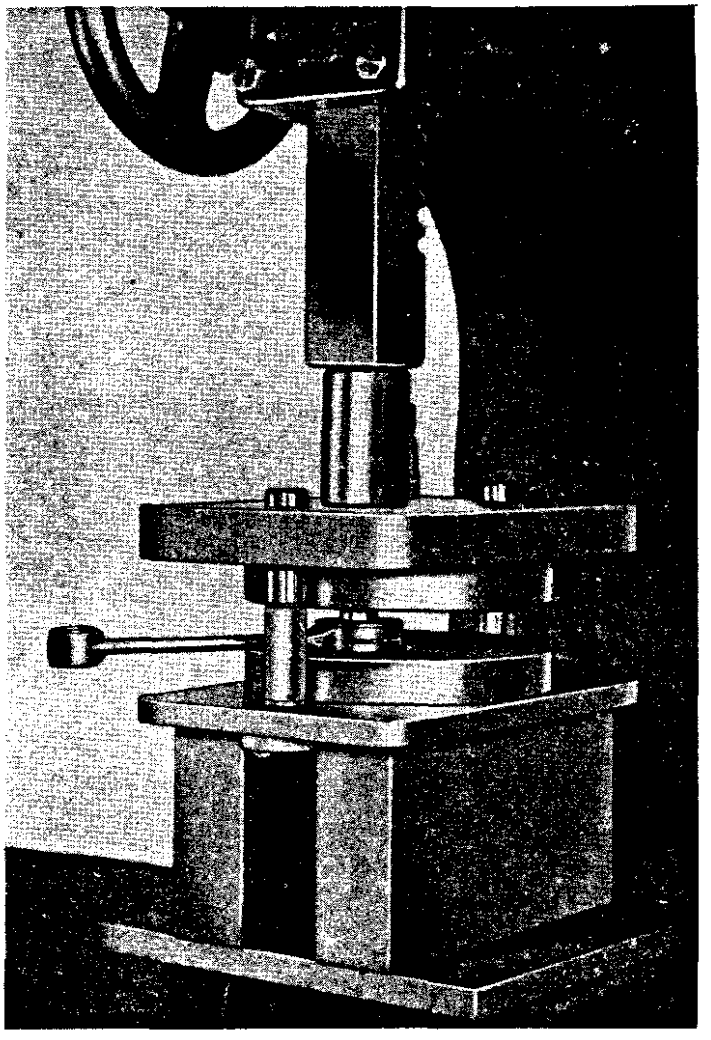


ILLUS. 10

PRESSING FLYWHEELS TOGETHER

Flywheels can now be pressed together in the following manner. See Illus. 10.

Place flywheel that has crank pin and connecting rod installed on "Armature Shaft Installing Plate" (B). Place flywheel in which sprocket shaft is installed on Sprocket Shaft Installing Plate.

Note that Sprocket Shaft Installing Plate is marked on one side "This side up." Flywheel must be held against opposite side.

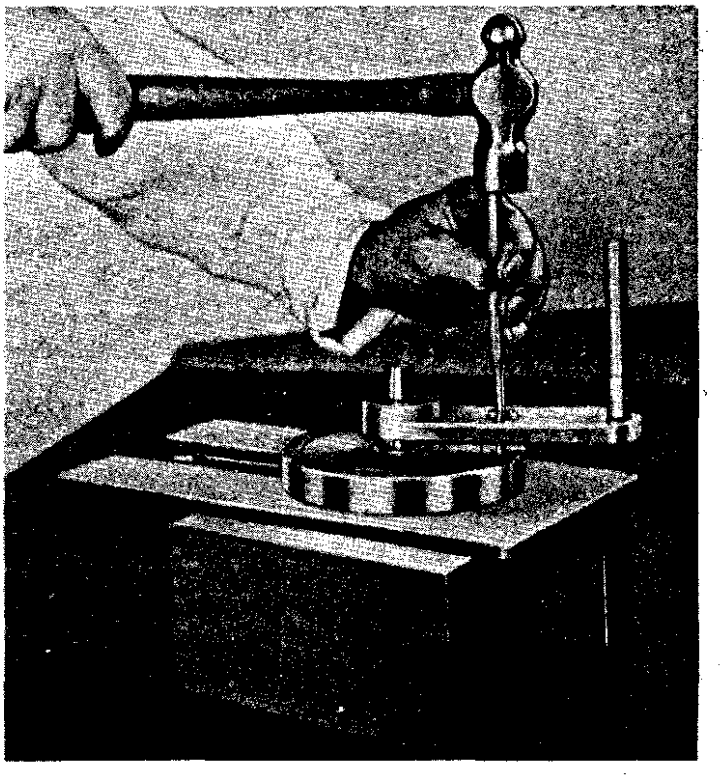
Holding flywheel against plate, start plate onto guide pins attached to Armature Shaft Installing Plate. At the same time guide Crank Pin Pilot through flywheel, then through hole in upper installing plate which corresponds with crank pin hole in flywheel. Push upper plate downward "by hand" until upper flywheel contacts end of crank pin. Using "Press Block" (F) over protruding end of Crank Pin Aligning Pilot, press down until upper flywheel bottoms against connecting rod thrust washer.

REINSTALLING COMPRESSION PLATES

Support flywheels as shown in Illus. 11 and install compression plates, preferably new plates if old plates are in the least damaged or out of shape.

Using Compression Plate Recess Clean-up Tool as a guide, stake compression plates in place by upsetting edge of flywheel recess with "Staking Punch" (E). Note that end of this punch is angled, and is to be used with longer tip outward.

Make sure compression plates are well secured. Plates have a tendency to spring, and if not securely installed may break away from staking. A loose plate is not only noisy but also lowers engine performance due to below normal crankcase compression.



ILLUS. 11

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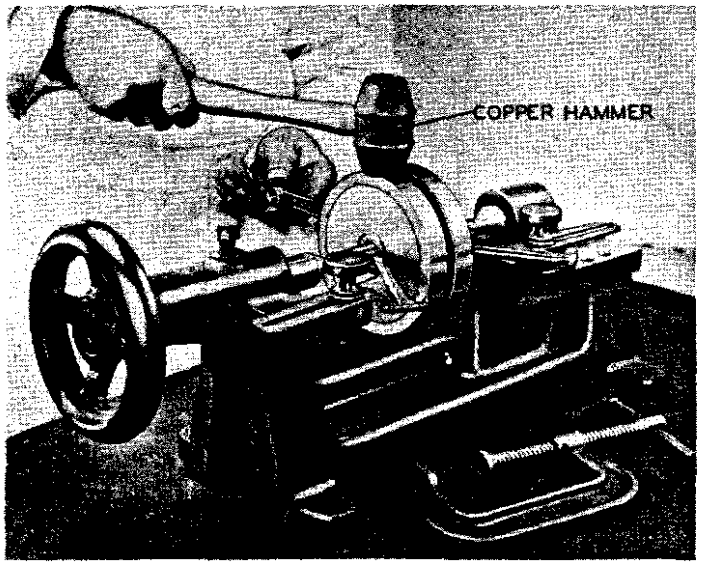


ILLUS. 12

TRUING FLYWHEELS

Using "Flywheel Truing Device" Part No. 11962-X check armature and sprocket shaft run-out as shown in Illus. 12. Shafts must run true within .001". This is one half graduation on indicator scale. If armature and sprocket shafts run high near the crank pin, install a "C" clamp above crank pin and apply light pressure. With clamp in place strike flywheels very lightly above crank pin. Take another reading, if shafts still do not run true repeat operation again. Shafts must be within specification, so armature will run true, otherwise there will be excessive "brush hop" and arcing.

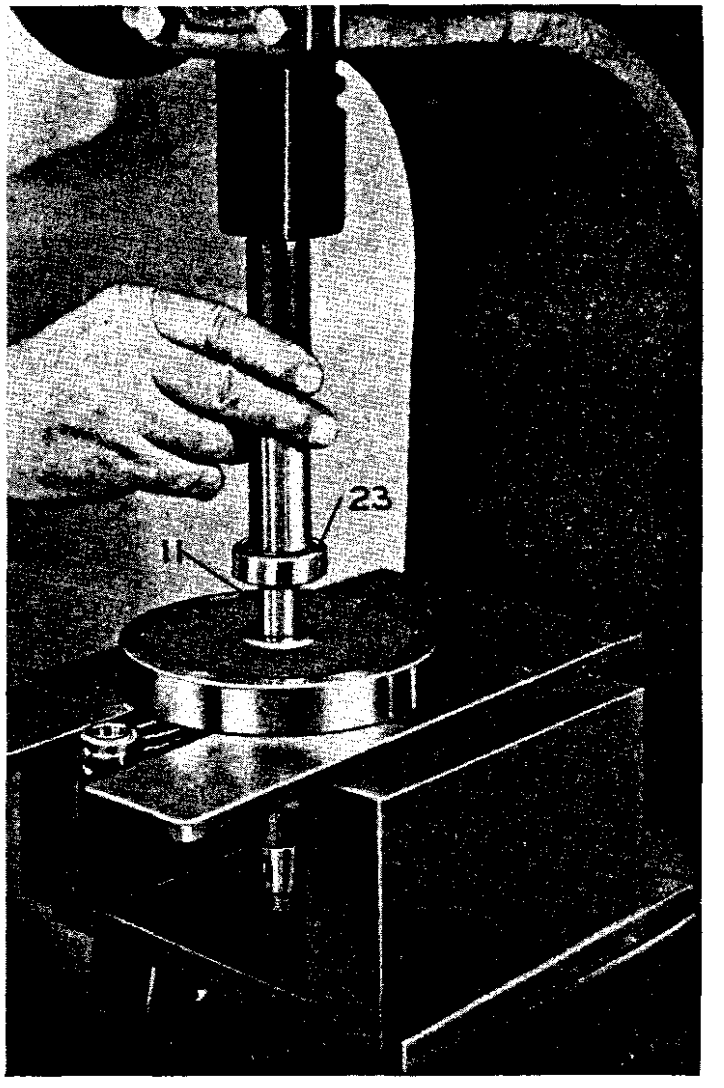
INSTALLING ARMATURE SHAFT BEARING

Again using two blocks and Flywheel Support Plate as shown in Illus. 13, press armature shaft bearing and sprocket shaft inner bearing on their respective shafts.

Place bearing on shaft. Use a sleeve or a piece of 3/4" pipe no less than 3" long, over shaft against ball bearing inner race. Press bearing on shaft until it bottoms.

Note: Shaft bearings have only a light press fit, therefore, there is little danger of moving shafts in flywheels when pressing bearings on.

Caution: When installing bearings - do not drive on with a hammer.



ILLUS. 13

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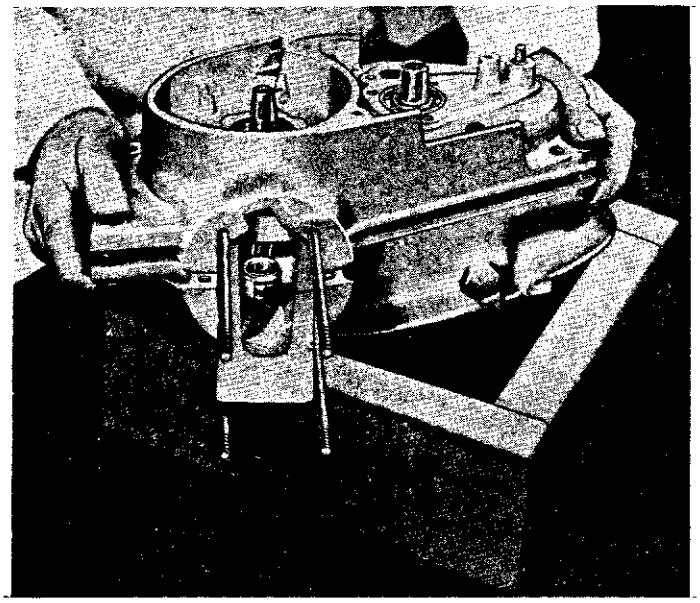

ILLUS. 14

INSTALLING FLYWHEEL ASSEMBLY IN CRANKCASES

Prepare crankcases for assembly: See that transmission and shifter parts are correctly assembled in left case. Thoroughly clean crankcase joint faces.

Insert "Flywheel Tapered Spacer" (A) between the two flywheels opposite crank pin, upper end of connecting rod between the two prongs of spacer as shown in Illus. 14. The purpose of this spacer is to prevent closing up flywheels and thus throwing wheel shafts out of alignment when installing flywheel assembly in crankcases. Do not force spacer between flywheels, just snug is all that is necessary.

Using a torch, heat left crankcase around bearing bore enough so bearing will slide easily into crankcase as flywheel assembly is installed in left case. Do not apply flame directly against oil seal. NOTE: At this point, observe that oil seal is snug against its retaining ring.

Insert flywheel assembly in left case. It is seated in left case when sprocket shaft bearing seats against oil seal retaining ring.

Next heat right crankcase around bearing bore and apply heat around open dowel pin holes. Apply sealer to joint faces of both cases.

Install right crankcase. Insert and securely tighten all crankcase clamp screws.

The next assembly operation is installing sprocket shaft outer bearing. However, before this can be done, it must be determined how many shims are required behind bearing to obtain correct clearance between bearing inner race and back face of engine sprocket.

The desired clearance is .003" to .012". To attain this clearance, shims are provided .007" thick. To determine how many shims are needed, temporarily insert, instead of bearing, a 45" model reverse gear spacing collar, part No. 2296-33A. Spacing collar is approximately the same width as bearing No. 9008. Insert this collar with large diameter inward against oil seal.

Install sprocket and securely tighten sprocket nut. Use feeler gauge to determine total clearance between back face of sprocket and collar. It can now be calculated how many .007" thick shims are required to reduce the total clearance to approximately .010". Sprocket and gauging collar can now be removed and correct number of shims inserted. Heat case around bearing hole and press bearing into place.

HARLEY-DAVIDSON MOTOR CO.

Milwaukee 1, Wis., U.S.A.

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