

SUB-SECTION 3-4
ENGINE REASSEMBLY

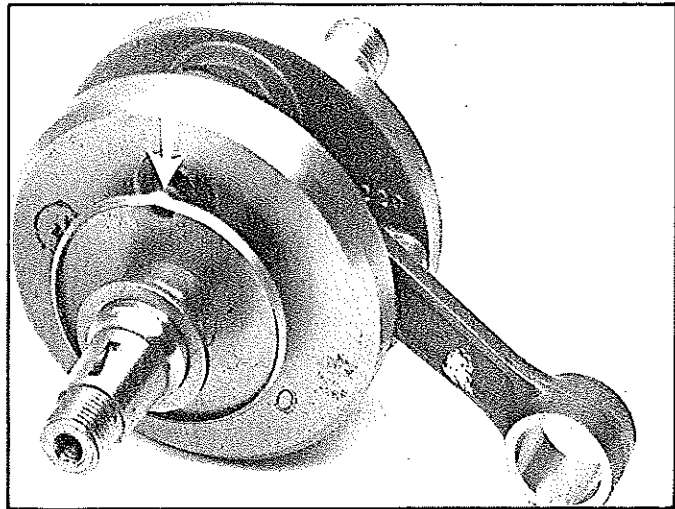
Fit the magneto side crankshaft main bearing oil slinger and spacer.

Slinger spout is inserted into the crankpin hole.

Fit the crankshaft main bearings without any shims.

NOTE: Drive (drift) center race only.

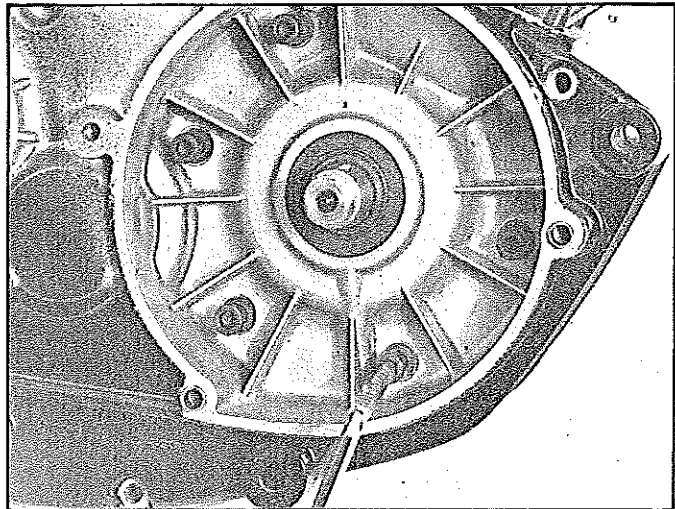
TOOLS: soft drift
hammer



Fill magneto side oil seal with high melting point grease, and coat bearing with injection oil. Insert crankshaft into magneto side crankcase and fit clutch side crankcase (without joint sealant).

Install 5 short Allen head screws and washers around crankshaft and tighten them in a criss-cross sequence.

TOOLS: soft hammer
5 mm Allen wrench

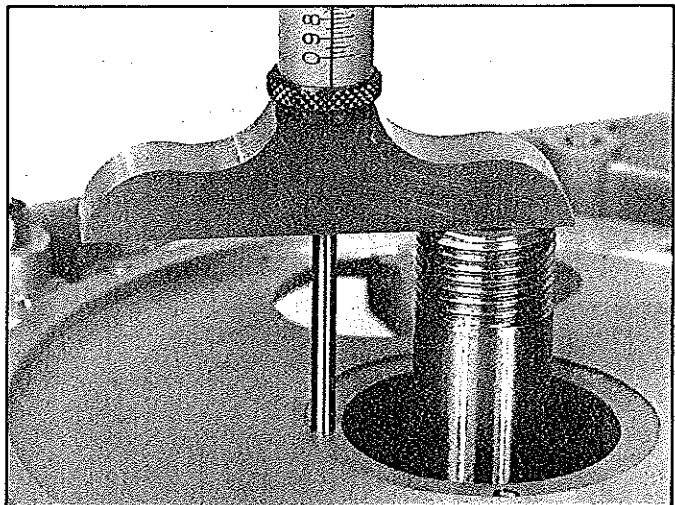


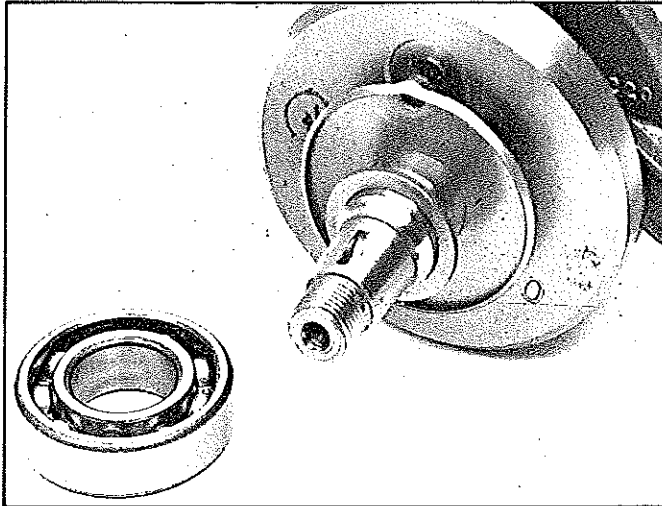
Tap the crankshaft solidly into the magneto side crankcase. Measure the distance from the clutch side crankshaft end to the machined surface of the crankcase.

Tap the crankshaft solidly into the clutch side crankcase and measure again.

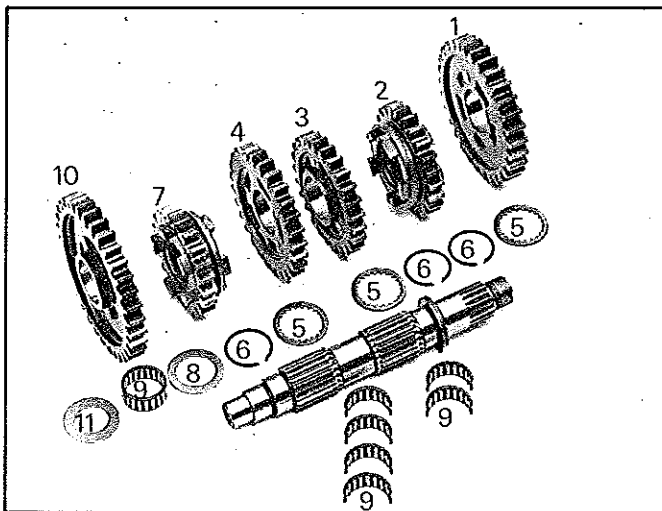
The total end float must not exceed 0.3 mm. (Shims are available in 0.1 - 0.2 - 0.3 - 0.5 - 1.00 mm sizes).

TOOLS: soft hammer
Vernier or dial indicator





Remove clutch side crankcase and place any necessary shim/s between oil slinger and main bearing.



GEARBOX

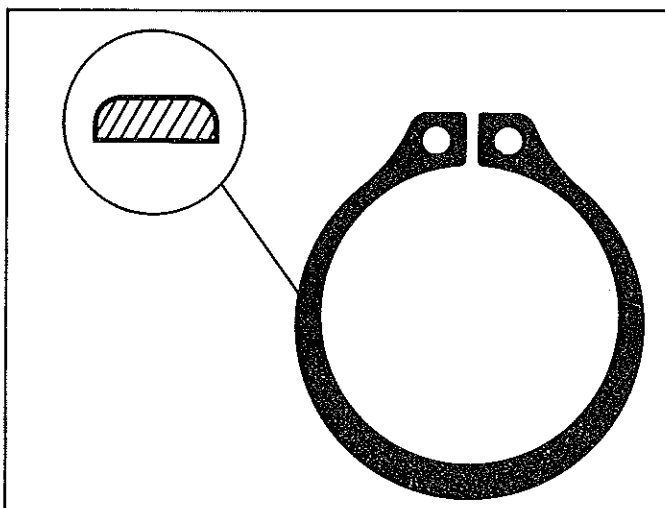
Assemble the gearbox main shaft.

1. 2nd gear (30T)
2. 5th gear (23T)
3. 4th gear (25T)
4. 3rd gear (27T)
5. Thrust washer (splined)
6. Snapping
7. 6th (21T)
8. Thrust washer
9. Needle bearing
10. 1st gear (34T)
11. Thrust washer

NOTE: The shoulder on the 1st gear (34teeth) and the shoulder on the 2nd gear (30 teeth) should face towards the ends of the output shaft.

The three (3) splined thrust washers have their smooth edge towards the gear and their sharp edge toward the circlip.

Do not overstress the circlips. Always use new ones.



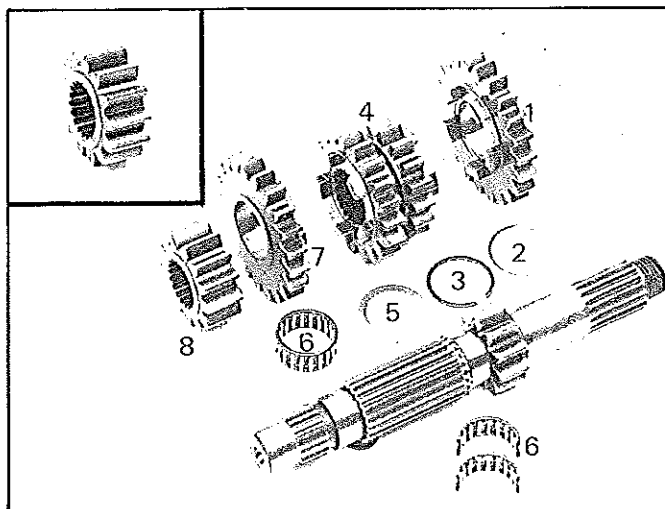
TOOLS: snapping pliers

Assemble the gearbox clutch shaft.

1. 6th gear (22T)
2. Thrust washer
3. Snapring
4. 4th & 3rd gear (19T/16T)
5. Thrust washer
6. Needle bearing
7. 5th gear (21T)
8. 2nd gear (13T)

NOTE: The shoulder on 2nd gear (shown in insert) should face towards the end of the shaft.

TOOLS: snapping pliers

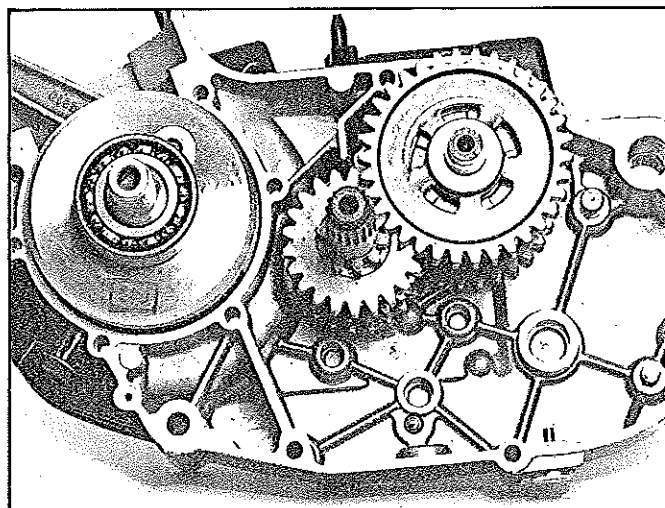


Fill the transmission mainshaft seal with high melting point grease.

Fit the gearbox cluster into the magneto side crankcase as an assembly.

NOTE: It may be necessary to tap each shaft into the bearings.

TOOLS: soft hammer

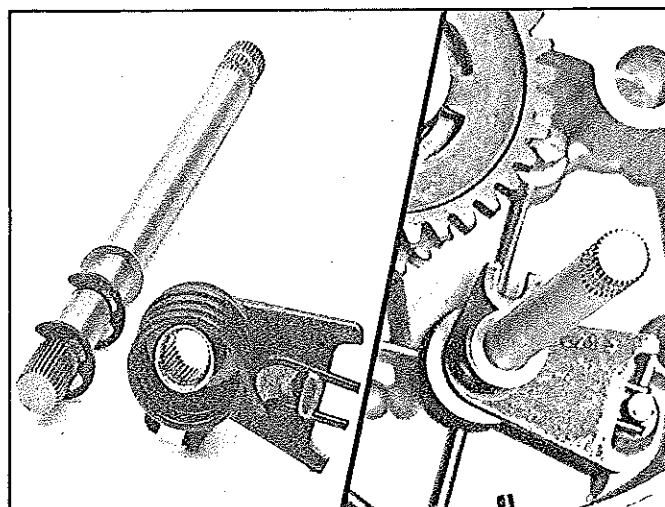


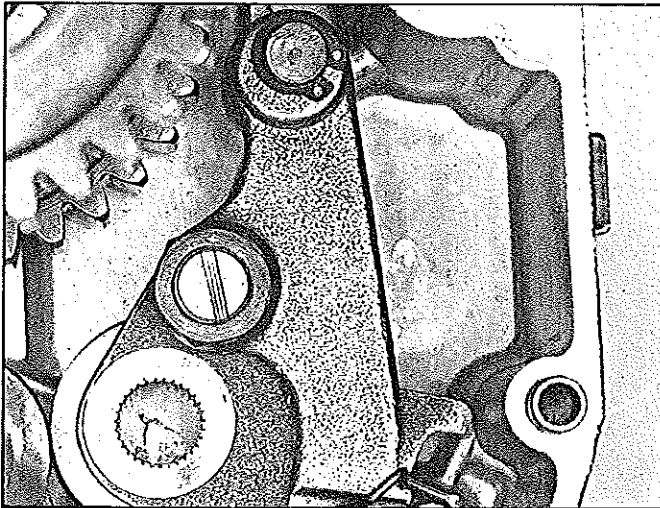
Fit the gearshift return spring and washer onto actuating lever.

NOTE: See correct position of spring arms.

Fit shift shaft with the two snaprings and thrust washers.

TOOLS: snapping pliers

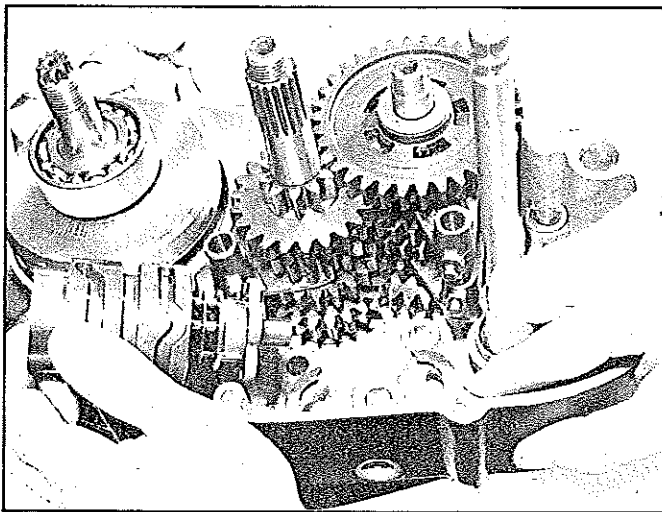




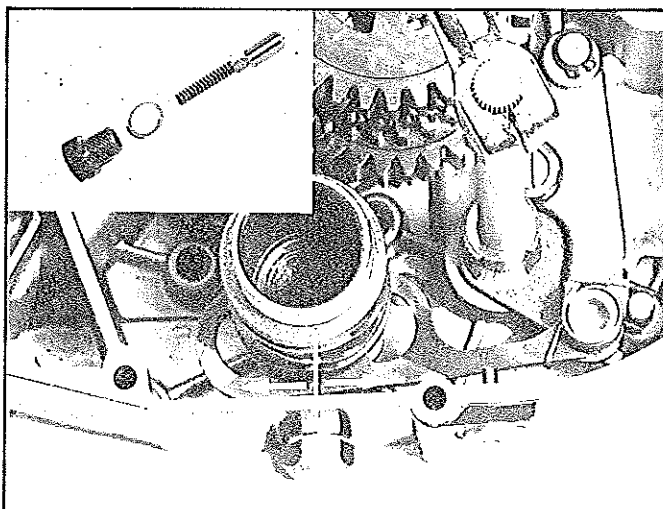
Position actuating lever and fit pawl assembly and snapping.

NOTE: Pawl positioning screw must be engaged with actuating lever.

TOOLS: snapping pliers



Depress shifter drum actuating pawl and fit shift drum assembly into place.



Adjust shifter drum actuating pawl. (in neutral)

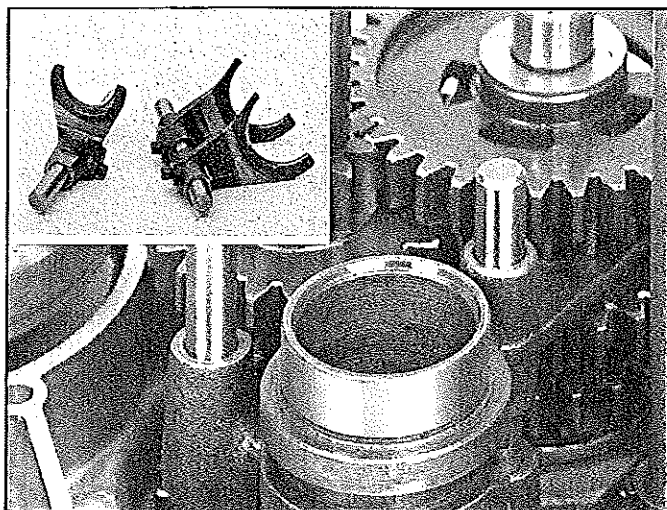
- a) Install drum index plunger assembly and washer, and shift shaft (with shift lever).
- b) Gently move shift lever in each direction from the middle position until shifter pawl contacts shifter drum pin and note the amount of movement in each direction.
- c) Movement in both directions must be equal.
- d) If not equal, adjust the pawl positioning screw.

NOTE: Lock nut must be tightened after each adjustment.

TOOLS: screwdriver
 17 mm socket

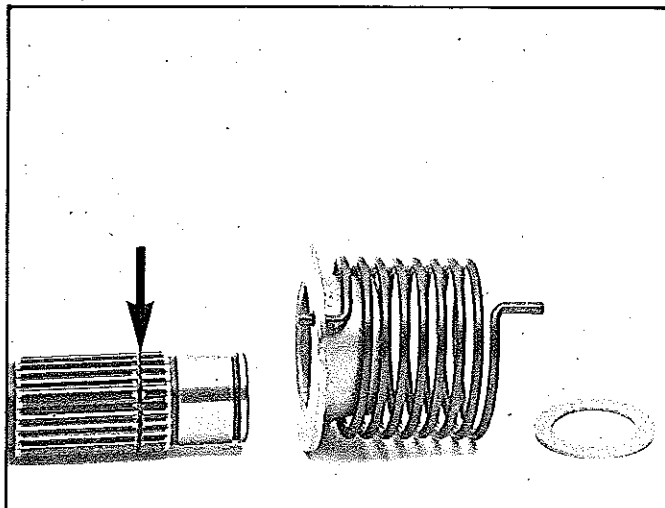
Install shifting forks and guide shafts. Remove index plunger if necessary to allow easy drum movement.

TOOLS: 19 mm socket



Fit the spring retaining hub and its locating snapping (arrow) onto the kickstart shaft.

Fit the return spring into place with one spring end in the retaining hub locating hole.

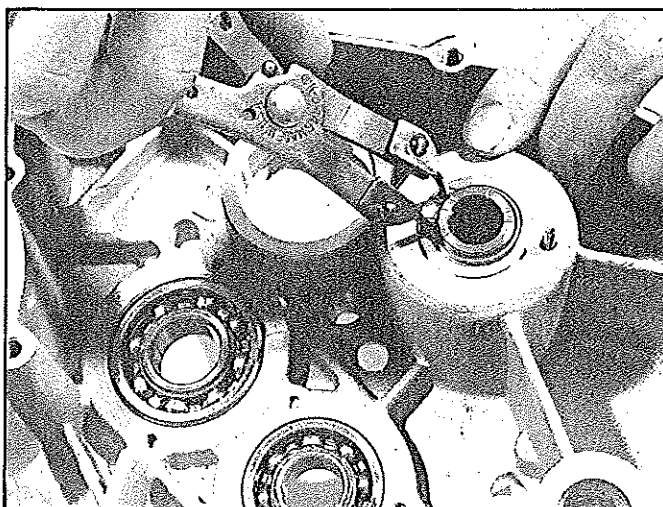


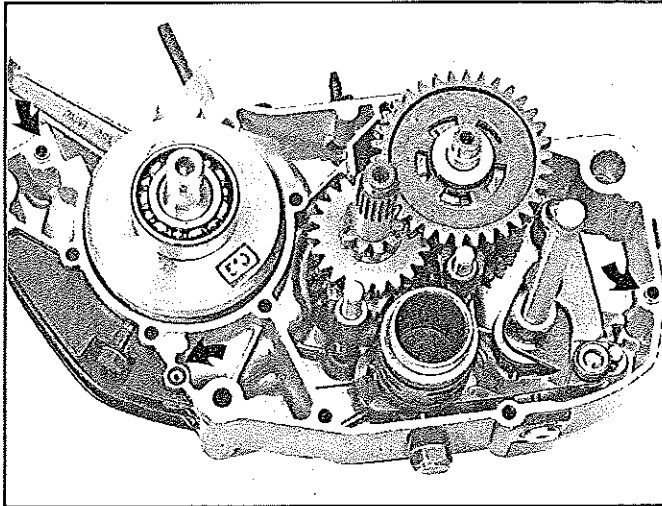
Fit the kickstart shaft retainer spring assembly into the clutch side crankcase being sure to insert the spring end into its locating hole in the crankcase.

Secure the kickstart shaft with the washer and snapping and check endplay.

NOTE: Sharp edge of snapping must face magneto side.

TOOLS: snapping pliers





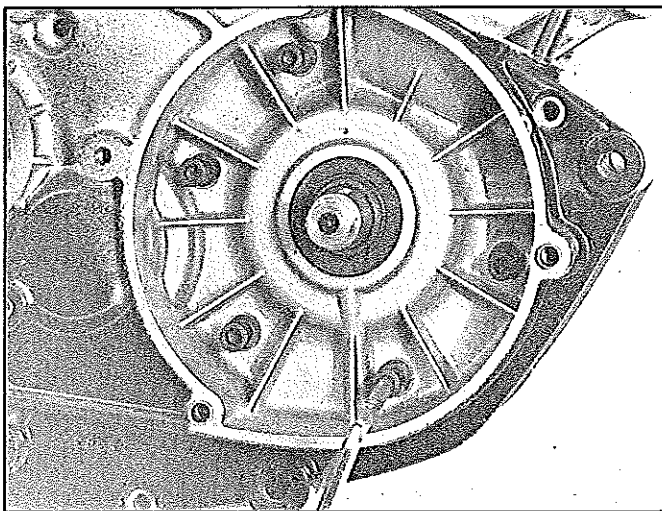
Fit the 2 dowel sleeves into the magneto side crankcase dowel holes.

On models 4841 and 4851, install the oil passage o' ring.

Apply silicone sealer to magneto side crankcase and fit clutch side crankcase.

NOTE: Ensure that oil passage hole is not and will not become blocked with sealer.

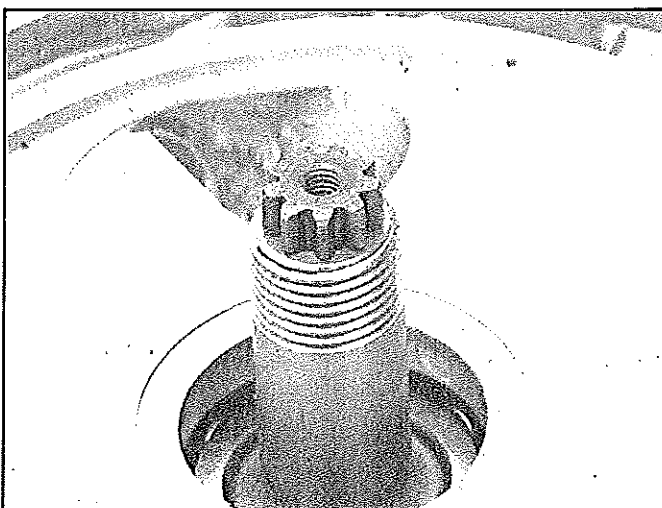
TOOLS: CAN-AM sealer no 747-002-000
soft hammer



Fit the 10 crankcase Allen screws and lock washers. Torque all screws in a criss-cross pattern.

Check shift shaft endplay.

TOOLS: 5 mm Allen wrench



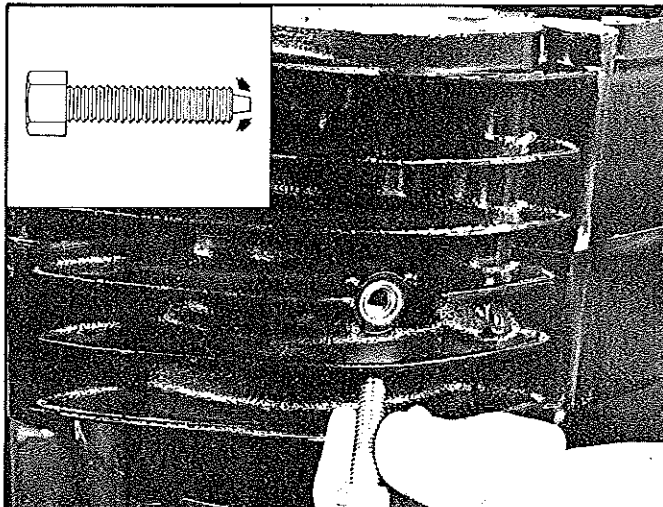
Gently tap the oil pump drive gear into the clutch side end of crankshaft.

On models 4841 and 4851, loctite the oil pump drive gear to the crankshaft.

TOOLS: soft hammer

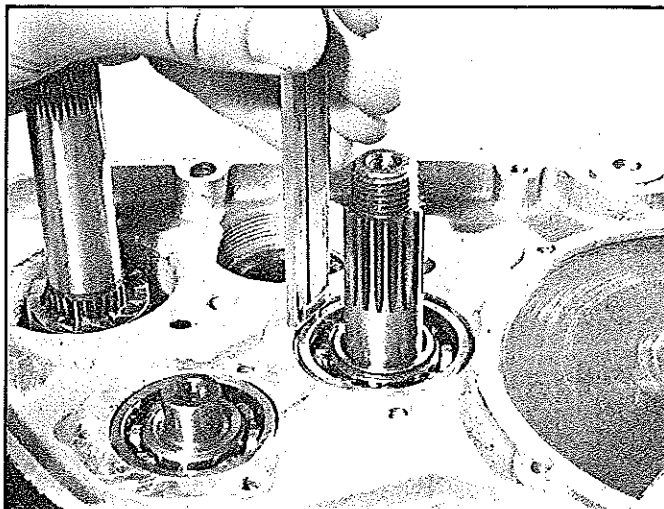
Fit the crankshaft locating bolt to lock the crankshaft and stuff a rag into the crankcase opening to prevent connecting rod damage or bearing contamination.

NOTE: Do not overtighten locating bolt.



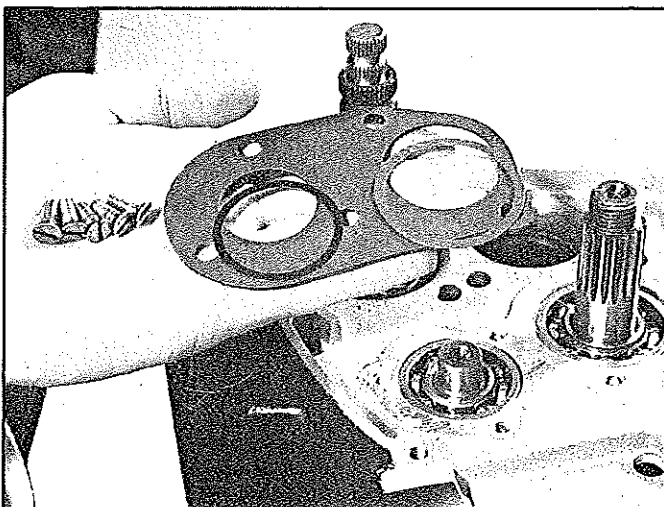
Tap both gearbox shafts towards magneto side crankcase. Tap both gearbox bearing inner races towards magneto side crankcase. Measure the distance between bearing outer race and case surface to determine shims required between bearing and retaining plate. End float must be 0.1 mm.

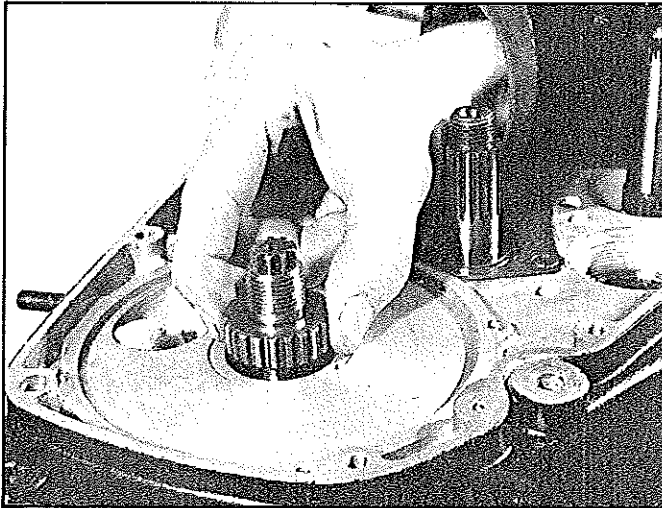
TOOLS: depth gauge



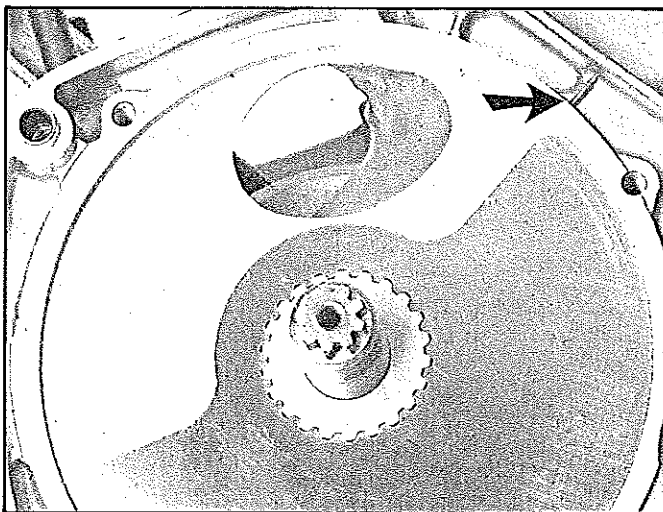
Fit bearing retaining plate and "Loctite" the 5 screws securely into place.

TOOLS: screwdriver
"Loctite" screw-lock



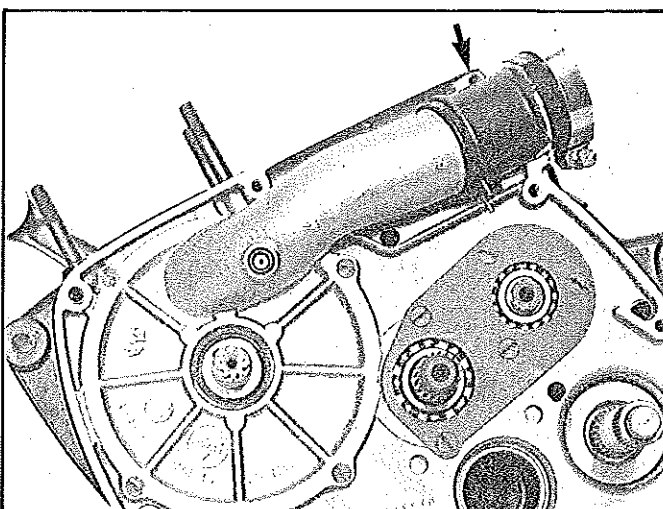


Fit woodruff key and disc valve splined hub.



Coat the disc valve with injection oil and position it so its leading edge aligns with the mark on crankcase, when crankshaft is at TDC.

NOTE: The disc is symmetrical and cannot be installed backwards.



Carefully position the large "O" ring in the disc valve cover groove.

Fit the rubber carburetor adaptor and retaining circlip to the disc valve cover.

NOTE: The relief in the adaptor must be aligned with the clutch cover bolt hole (see arrow).

Fill oil seal with high melting point grease and install disc valve cover. "Loctite" the 4 retaining screws.

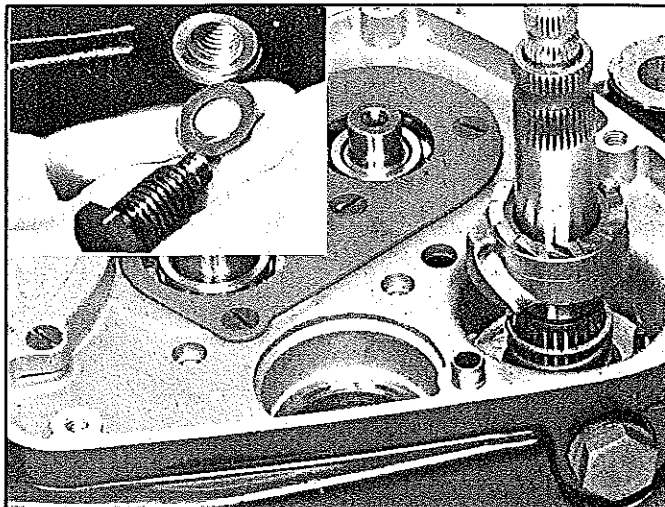
TOOLS: screwdriver
"Loctite" screw-lock

Fit the kickstart return stop screw and its sealing washer.

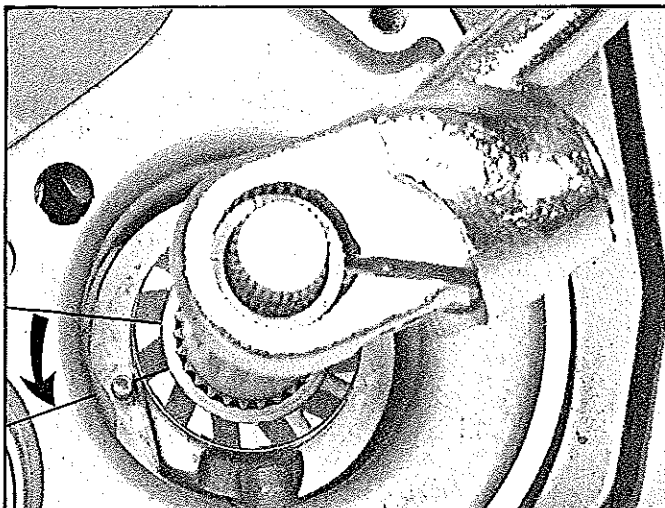
Drop the ratchet disengagement spring into place.

Drop the ratchet gear onto the kickstart shaft but do not position it yet.

TOOLS: 17 mm socket

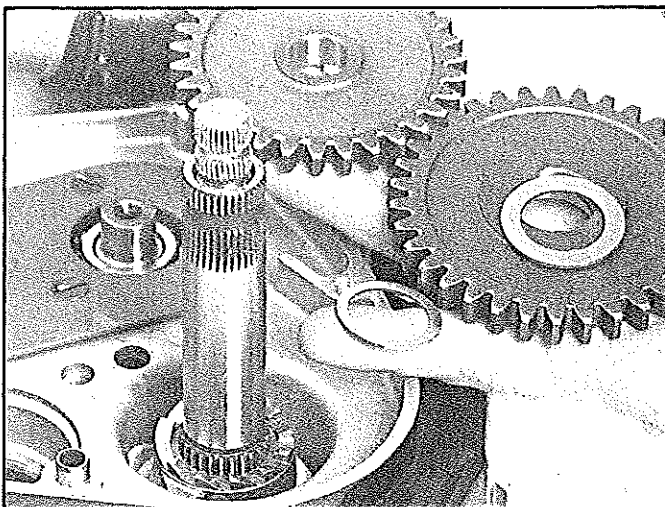


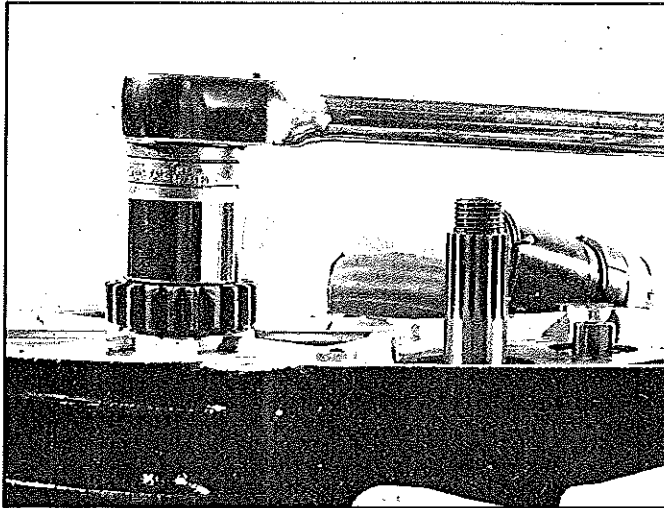
To position ratchet gear, install the kickstarter lever and preload the kickstarter spring 3/4 turn. Slide ratchet gear onto spline so the stop ramp on ratchet gear is at the 9 o'clock position. Release kickstarter lever slowly until the ratchet gear rests against its stop. The spring preload should now be correct.



Fit kickstart drive gear with small o.d. thrust washer inside and large o.d thrust washer outside.

Fit idler gear with shoulder towards magneto side.

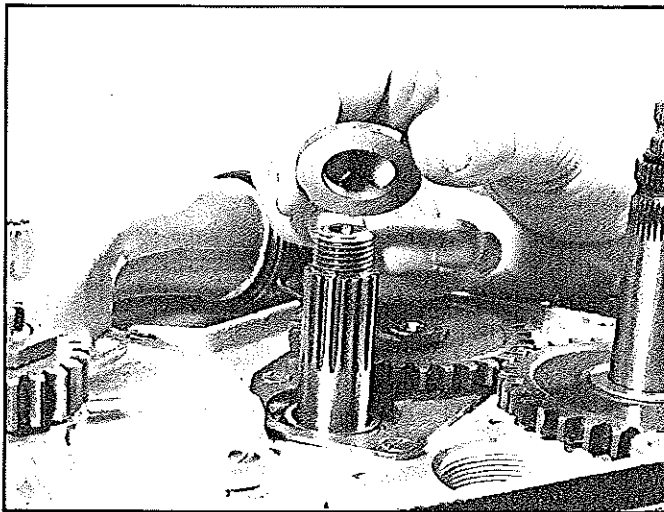




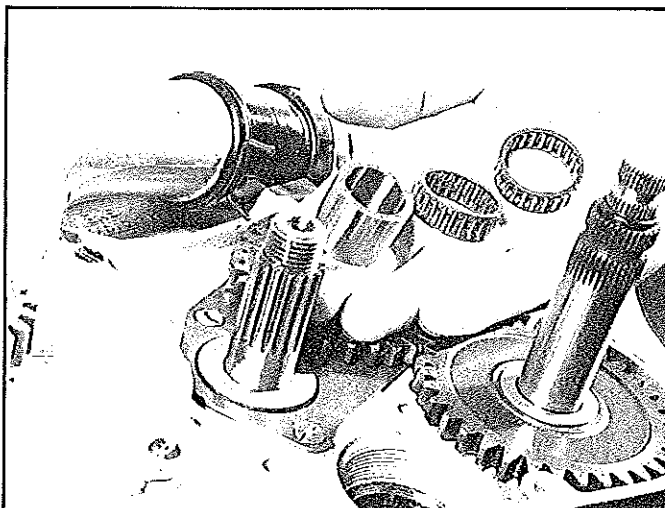
Fit crankshaft drive gear.

Carefully clean and prime crankshaft nut and crankshaft threads and apply "Loctite" screw-lock to the top 3 threads. Torque the nut into place.

TOOLS: "Loctite" primer
"Loctite" screw-lock
27 mm socket
torque wrench

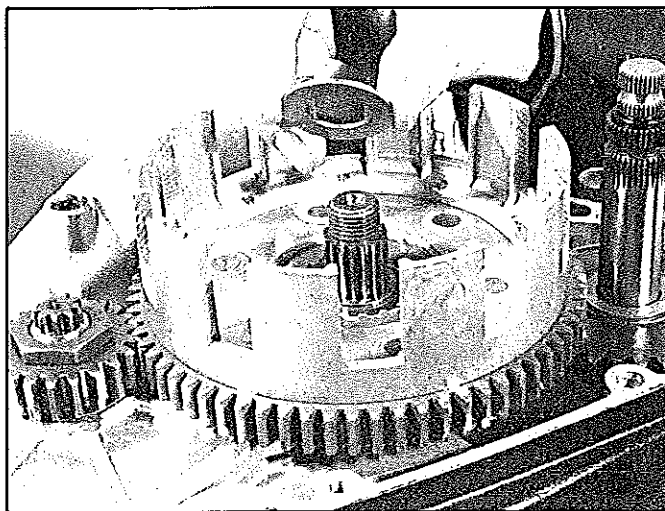


Fit the clutch drum inner thrust washer (3 mm thick).



Fit the inner race sleeve and the 2 bearings.

Fit the clutch drum and the thin thrust washer. (1.5 mm).



Fit the clutch plate on the clutch hub in the following sequence:

thick steel plate, total 1 plate, (1.5 mm)

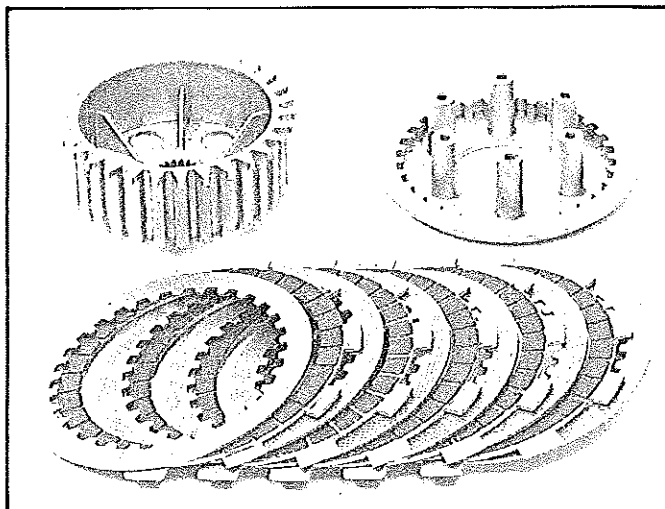
driven plate, (1.0 mm) (fibre)

drive plate, (plain)

driven plate, etc. (1.0 mm)

On models 4841 and 4851, there are six thick (1.5 mm) steel plates and 5 friction plates.

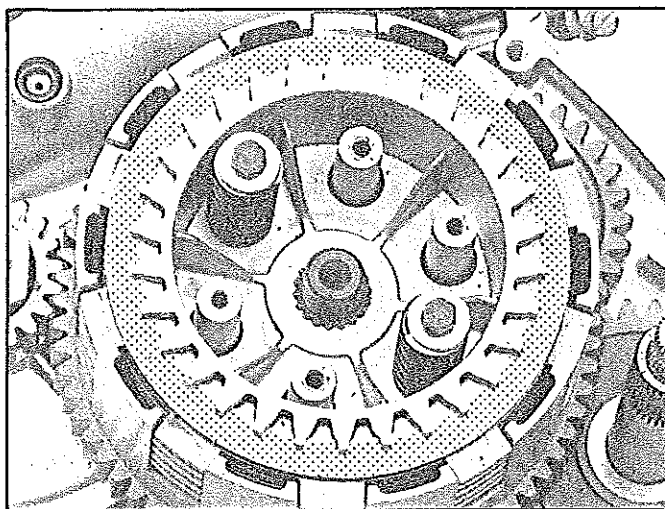
NOTE: Align the tabs on the friction plates.

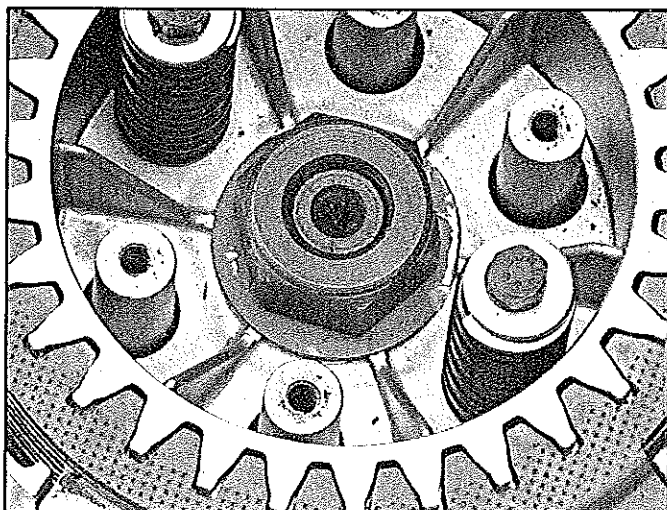


Fit clutch inner pressure plate in alignment with hub splines.

Carefully insert clutch hub/plate assembly into clutch drum and onto clutch shaft.

NOTE: Two clutch springs installed with washers will hold clutch together for easy assembly.





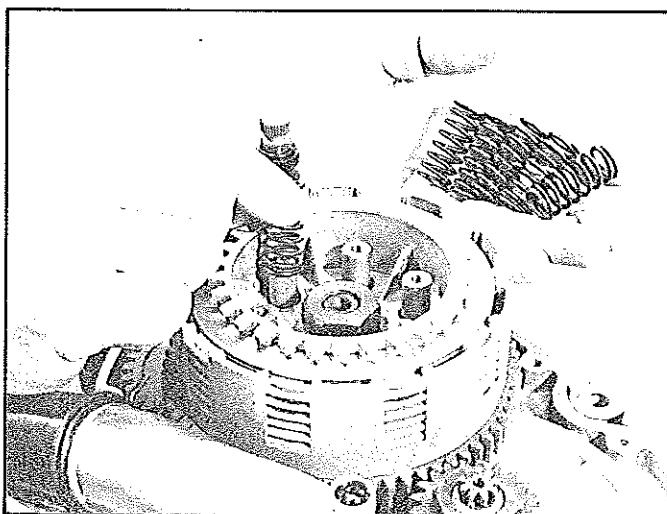
Fit lock plate and nut.

Using a CAN-AM tool no 420-277-885, lock the clutch assembly and torque the nut.

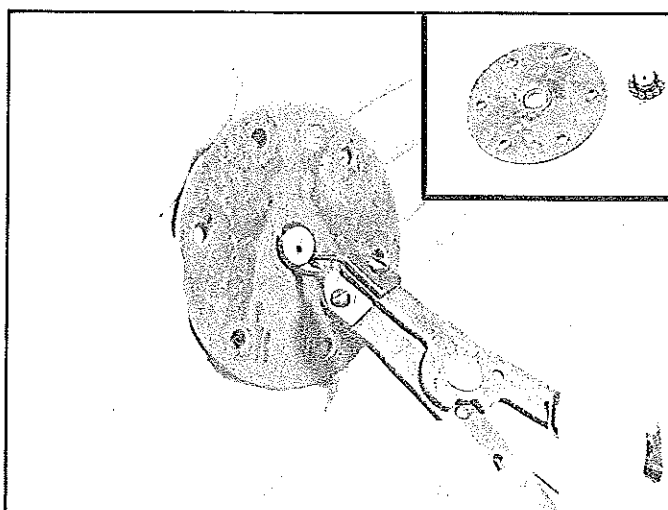
Bend the lock tab into place.

NOTE: Use "Loctite" on the clutch nut.

TOOLS: CAN-AM no 420-277-885
27 mm socket
torque wrench
"Loctite" screw-lock
water pump pliers



Insert the 6 clutch springs.



Lightly grease the clutch spring retaining plate ball race, fit the 12 balls into place and insert the retaining hub. Snap circlip into place.

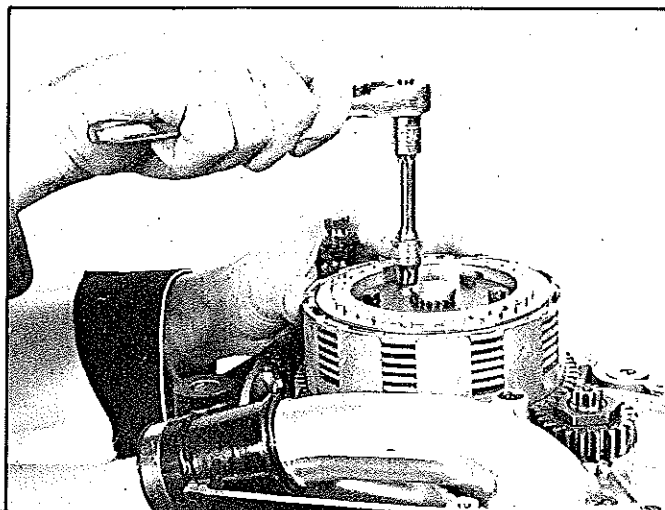
NOTE: Retaining hub circlip must face magneto side.

TOOLS: snap ring pliers

With the spring retaining plate in place, partially tighten each screw in a criss-cross pattern until all screws are tight.

NOTE: Do not fully tighten screws one at a time.

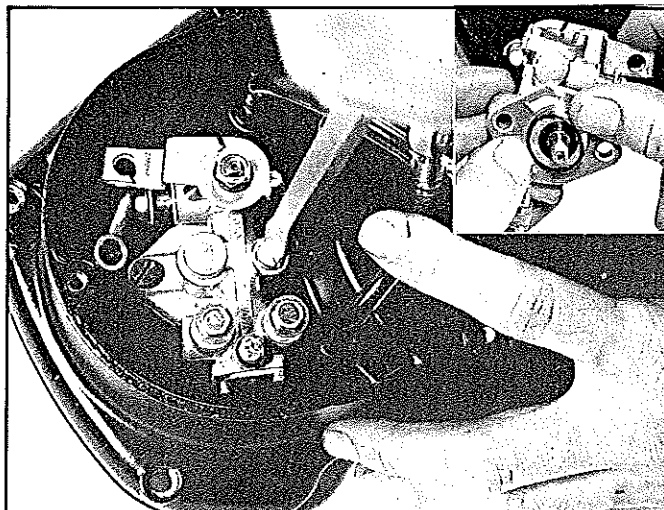
TOOLS: 8 mm socket



Fit the "O" ring to the oil pump body.

Place the oil pump in position in the clutch cover and fit the screws.

TOOLS: screwdriver

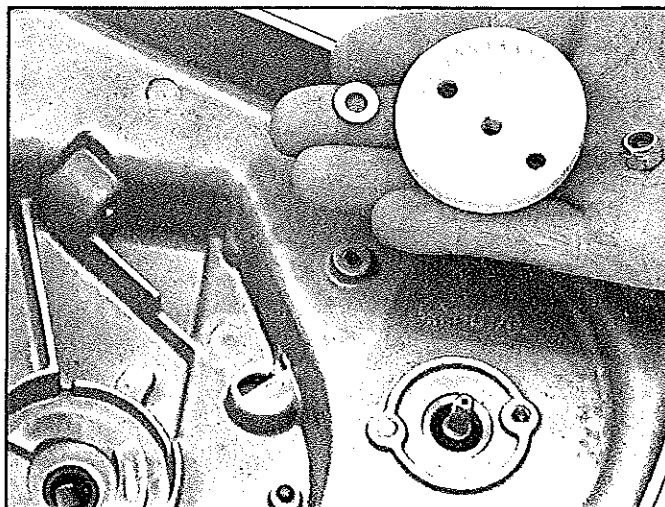


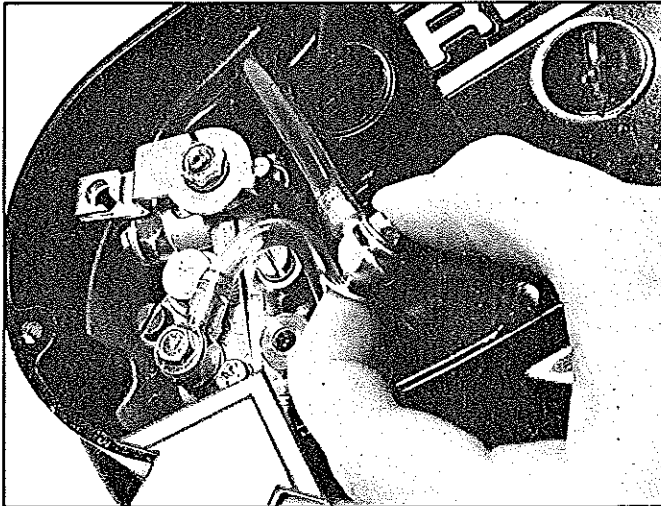
Fit 1 special locking washer onto the oil pump shaft and then the nylon gear and 1 special locking washer.

On models 4841 and 4851, install a flat washer, the gear and the nut.

Using CAN-AM tool no 420-277-900 to hold the pump gear, tighten the gear retaining nut.

TOOLS: CAN-AM no 420-277-900
10 mm socket

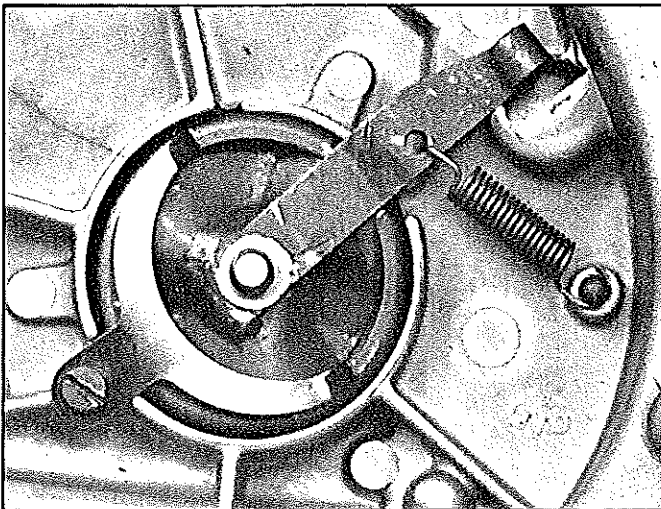




Connect the 2 oil pump banjo fittings with a special gasket washer on each side of the banjo.

NOTE: Large O.D. side of the banjo towards the oil pump.

TOOLS: 8 mm wrench

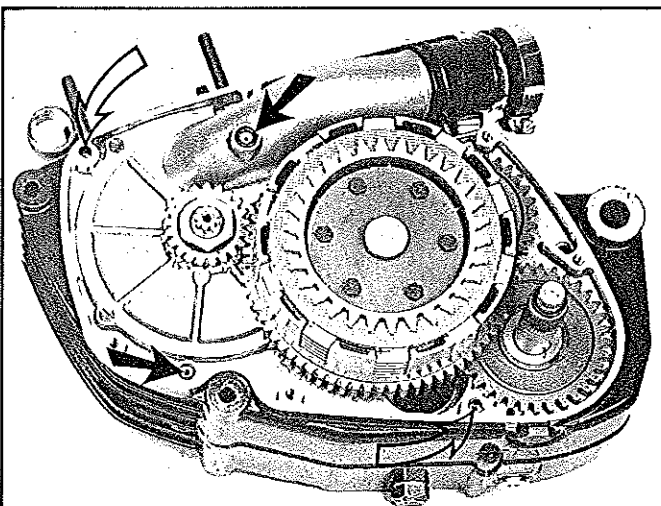


Drop the clutch release cam assembly into place and connect the spring to the cover pin.

Fit the retaining plate and screw it into place.

On models 4841 and 4851, "Loctite" replaces the lock washer.

TOOLS: screwdriver



Fit the 2 locating dowels into the crankcase.

Make sure the rotary valve cover o'ring is properly positioned.

Apply a thin coat of silicone sealant to the crankcase joint surface.

NOTE: Do not block the main bearing oil passage.

Fit the clutch cover onto the kickstart shaft and into place.

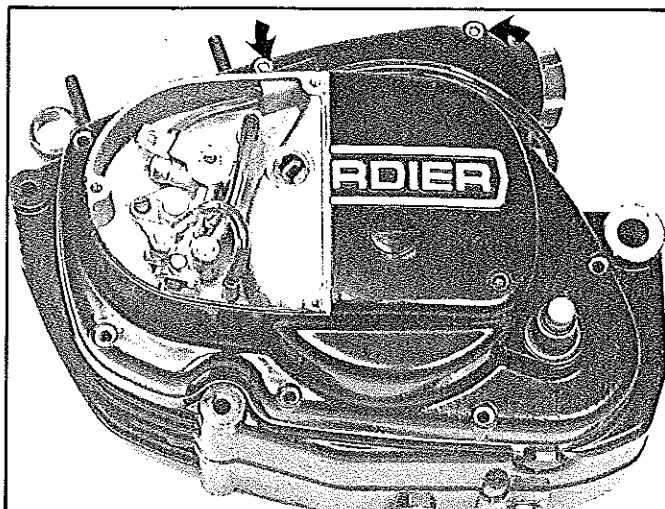
NOTE: Exercise caution to prevent oil seal damage.

Make sure the pump gear meshes with the crankshaft gear. To ensure this, remove the locating bolt and turn crankshaft slowly while tapping clutch cover on.

Fit the clutch 8 cover Allen screws.

NOTE: Do not omit the 2 aluminum washers. (See arrows).

TOOLS: 5 mm Allen wrench
soft hammer

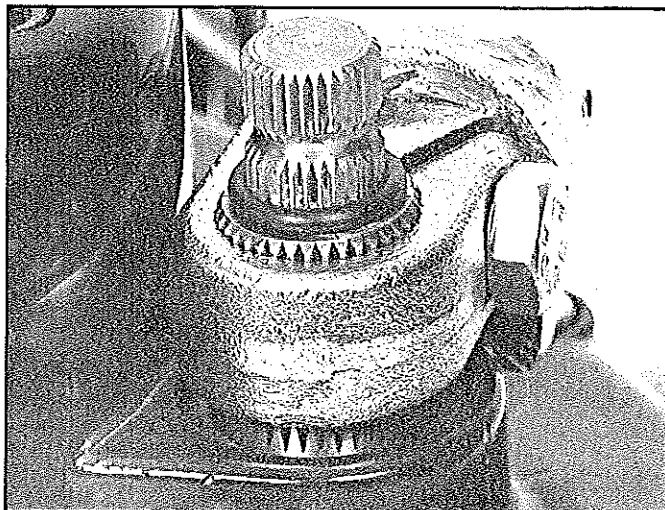


Fit the kickstart lever.

Fill 'o' ring groove with grease and fit the 'o' ring onto the gearshift shaft.

Fit the gear shift lever onto the gearshift shaft.

TOOLS: 13 mm wrench
5 mm Allen wrench



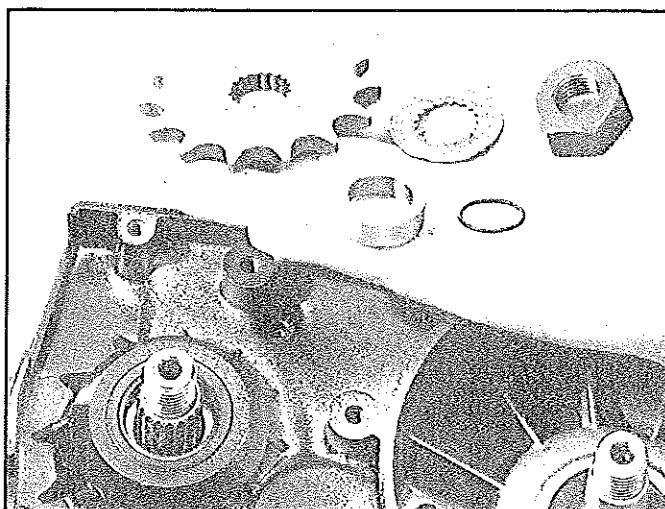
Fit the sprocket 'o' ring and the spacer on the gearbox main shaft.

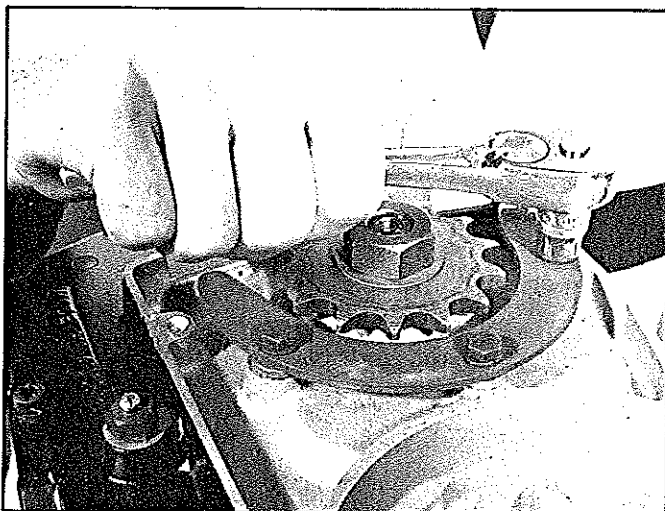
NOTE: Chamfered side of spacer must face 'o' ring.

Using "Loctite", fit the sprocket, the lock tab and the sprocket retaining nut. Reinstall crankshaft locating bolt and select a gear.

Torque nut and bend the lock tab into place.

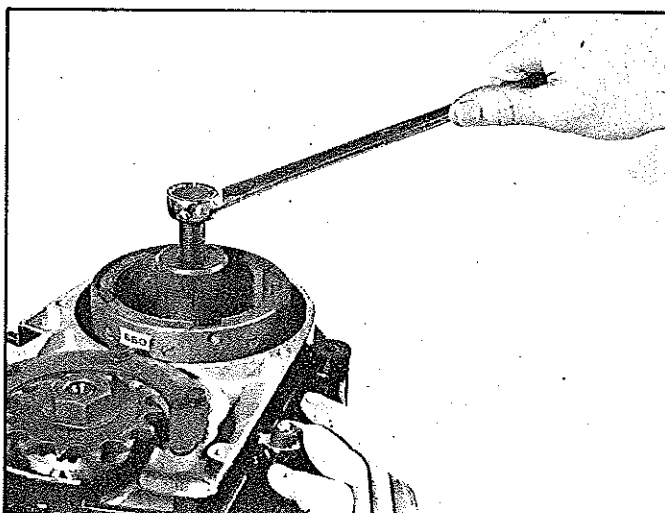
TOOLS: 27 mm socket
torque wrench
water-pump pliers
"Loctite" stud-lock





Fit the chain guard with its 3 distance spacers. Secure it with 3 bolts and lock washers.

TOOLS: 10 mm socket



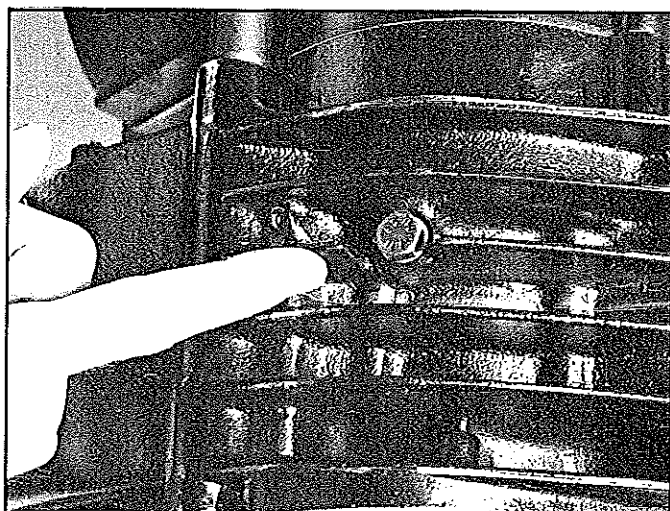
Fit the woodruff key into magneto side crankshaft keyway.

Clean the crankshaft taper and apply "Loctite" screw-lock.

Carefully slide flywheel into place, fit the lock tab, tighten the nut, and bend lock tab into place.

Fit the 3 locating dowels into place.

TOOLS: 22 mm socket
torque wrench
water pump pliers
use "Loctite" screw-lock

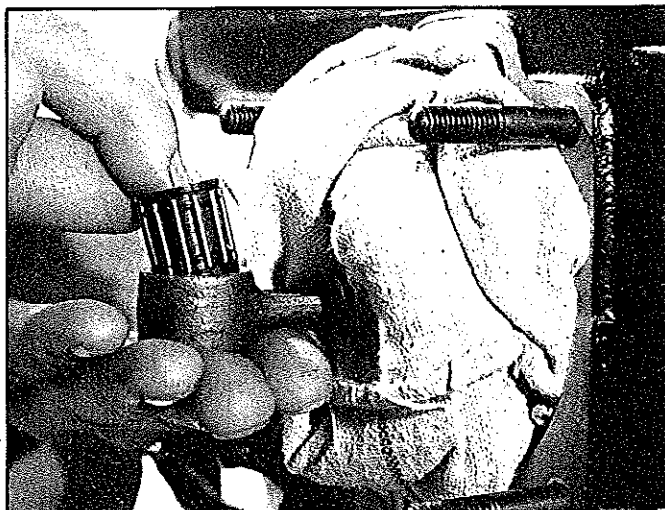


Remove the crankshaft locating bolt and install the drain plug and washer.

TOOLS: 13 mm socket

Wipe excess silicone seal from cylinder sealing surface and install the cylinder base gasket.

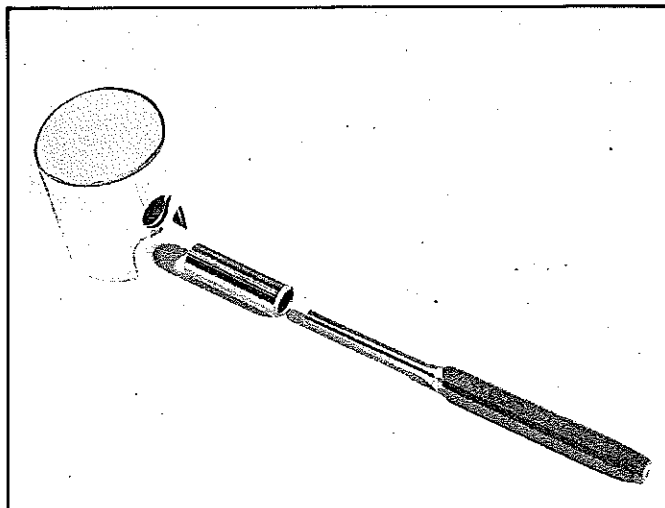
Apply injection oil to the piston pin bearing and fit it to the connecting rod.



Fit piston onto rod and insert wrist pin and circlips. Piston directional arrow must face forward.

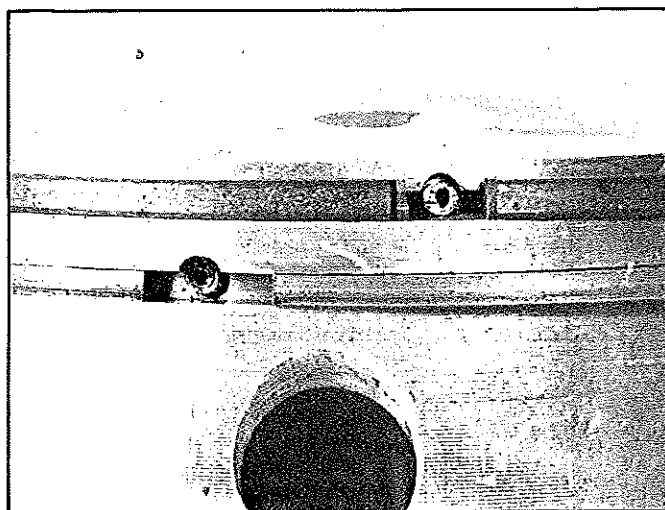
NOTE: Replace circlips if they are loose in piston. All punch impact must be absorbed by your hand - not by the rod. Refer to disassembly for picture.

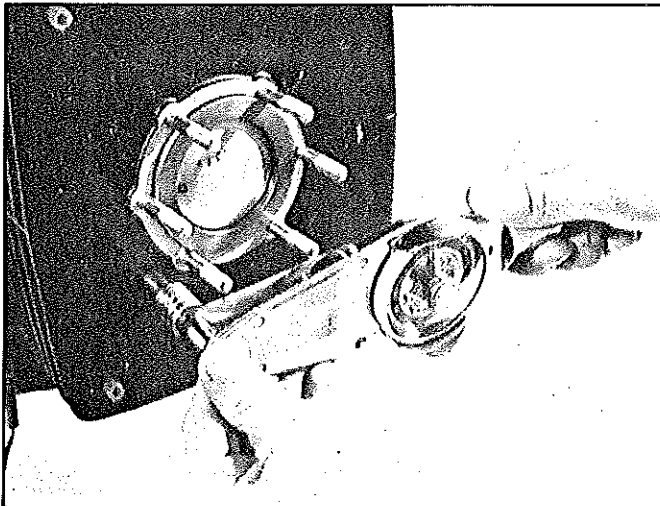
TOOLS: punch
circlip pliers



Measure ring gap in cylinder. Fit ring/s onto piston and align ring gap with locating pin/s.

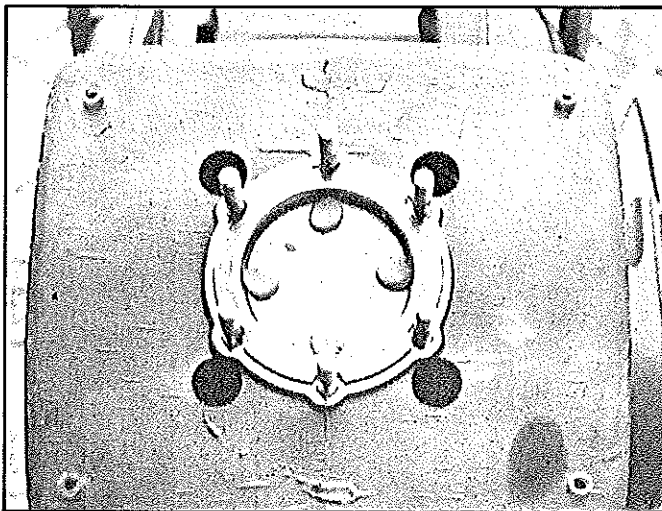
TOOLS: feeler gauges





Oil cylinder liner, piston and rings with injection oil and lower the cylinder into place. Tighten the 4 cylinder base nuts in a progressive manner.

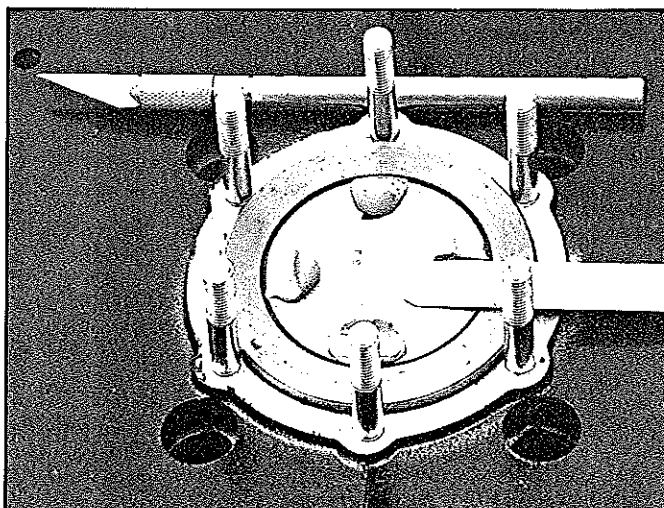
TOOLS: 11 mm socket
torque wrench



Bring the piston to 1/4" B.T.D.C. and place 4 small balls of modeling clay on the piston crown as shown.

Fit the cylinder head and washers and tighten the 6 nuts.

TOOLS: 11 mm socket



Using the magneto flywheel, rotate the engine past top dead center.

Remove the head, cut each flattened clay pad in half and measure the thickness of the pads.

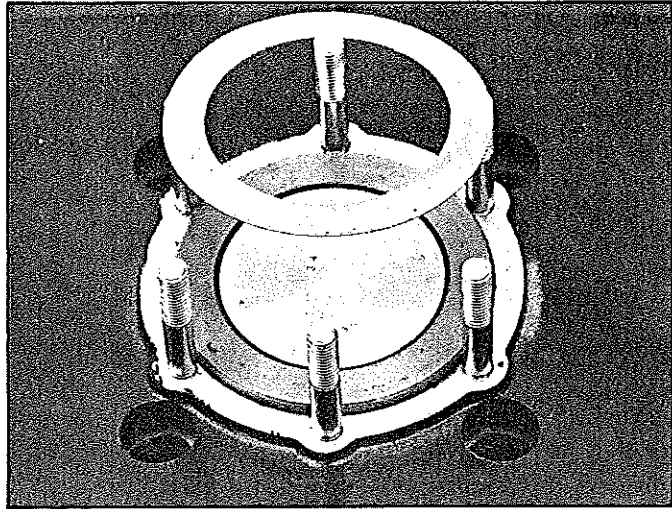
TOOLS: 11 mm socket
knife
feeler gauges

Using the aforementioned measurement, calculate the head shims necessary to adjust the squish area to min. 0.5 mm (.020") to max. 1 mm (.040")

NOTE: .75 mm (.030") is optimum. Shims are 0.2 mm thick (.008").

Fit the necessary shim/s (if any) and torque head into place.

TOOLS: 11 mm socket
torque wrench



Fit the appropriate spark plug. Do not over-tighten.

TOOLS: spark plug wrench

For engine re-installation, refer to engine removal section and reverse the sequence.