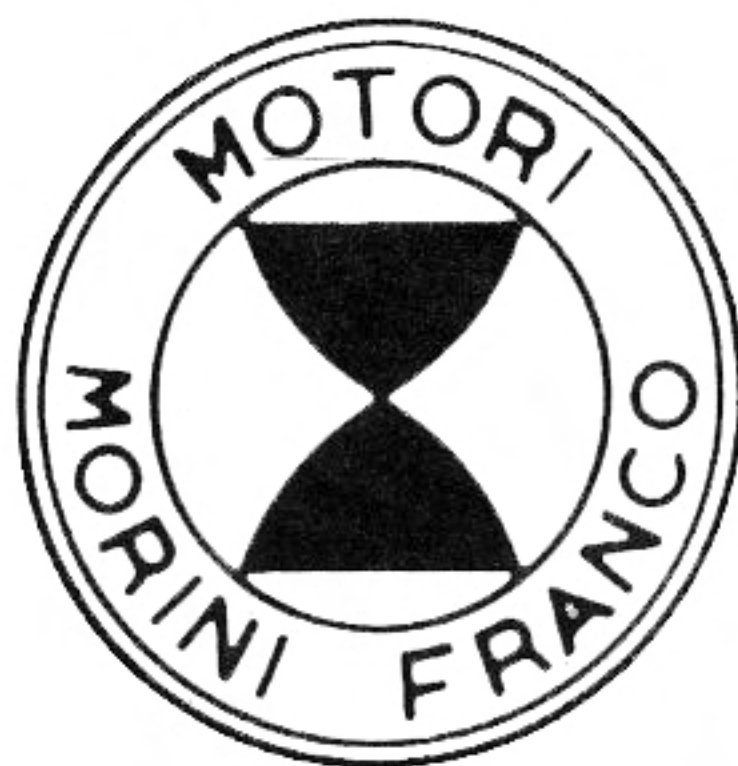




SERVICE MANUAL

M1
REED VALVE
ENGINE

1977 Mopeds
Vintage and New Mopeds and Moped Parts
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(269) 344-1977
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TECHNICAL SPECIFICATIONS

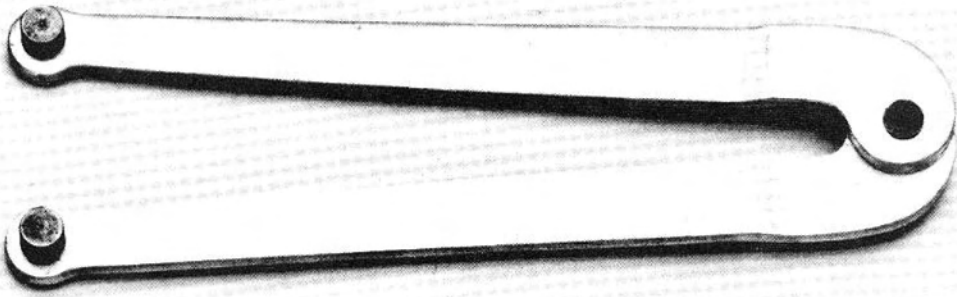
ENGINE - Franco Morini M1 Reed Valve

Type: Single cylinder, air cooled, 2-cycle, Reed Valve
Bore: 40.4MM
Stroke: 49MM
Engine Displacement: 49CC
Compression Ratio: 8:1
Carburetor: Dellorto SHA 14/12
Piston: Domed head
Ignition: Flywheel Magneto 6V-28W
Ignition Point Gap: 0.35 - 0.40MM
Ignition Timing: 2.1 - 2.3MM B.T.D.C.
Spark Plug Gap: 0.5 - 0.6MM
Spark Plug Heat Range: 225°C (Bosch W7D)
Transmission Type: Automatic, in oil bath
Transmission Capacity: 11oz. SAE 20 motor oil
Fuel Mixture: 4oz. high quality 2 cycle oil per 1 U.S. gallon of gasoline (32:1)

GEAR RATIO

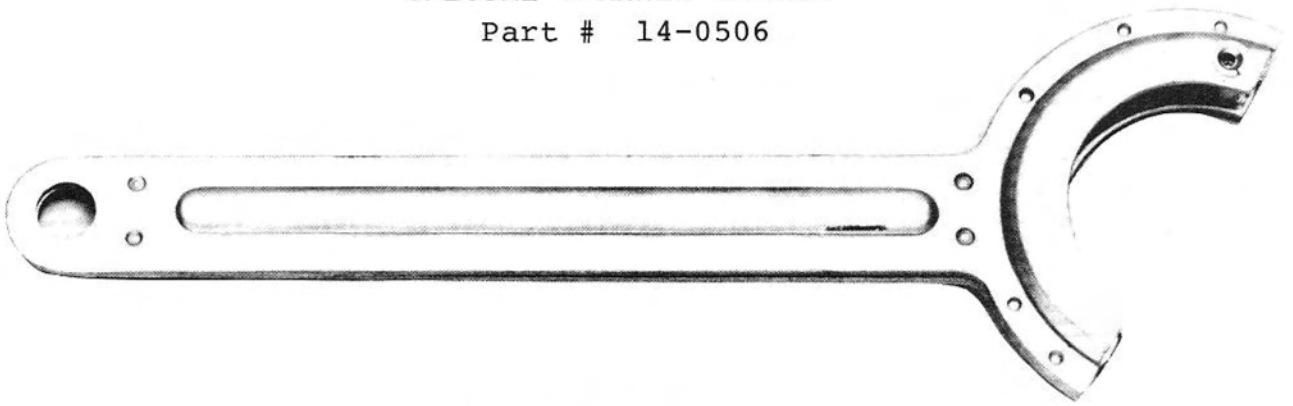
Transmission (primary): 52T/22T = 2.36:1
Internal Gears: 27T/10T = 2.70:1
Overall Gear Ratio: 6.145:1

SPECIAL SERVICE TOOLS



SPECIAL SPANNER WRENCH

Part # 14-0506



SPROCKET WRENCH

Part # 14-0507

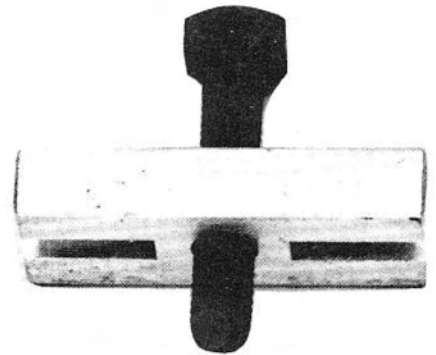


MAGNETO FLYWHEEL PULLER
(Bosch - C.E.V. - Dansi)

Part # 14-0501

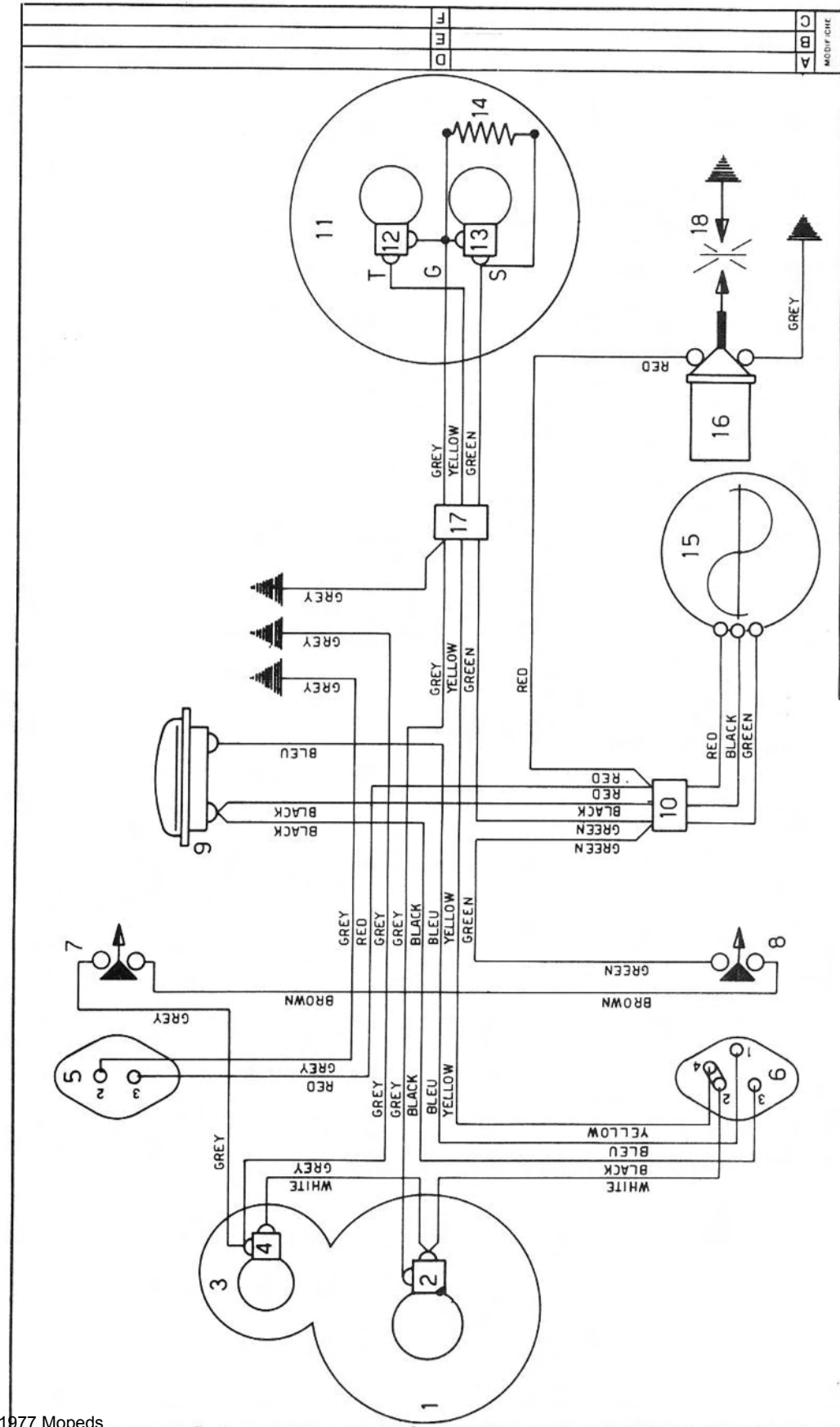
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GEAR PULLER
Part # 14-0508





6V ELECTRICAL SYSTEM
MOTOMARINA "SEBRING"

16	HIGH TENSION COIL	17	REAR LIGHT CONNECTION	18	SPARK PLUG
13	BRAKE BULB 6V - 10W	14	RESISTOR	15	FLYWHEEL
10	FLYWHEEL CONNECTION	11	REAR LIGHT	12	REAR BULB 6V - 5W
7	FRONT BRAKE SWITCH	8	REAR BRAKE SWITCH	9	HORN
4	BULB 6V - 12W	5	KILL SWITCH	6	LIGHT SWITCH
1	HEAD LAMP	2	FRONT BULB 6V - 21W	3	SPEEDO METER

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ENGINE REMOVAL

- Remove both side covers from the moped.
- Disconnect the spark plug wire and cap from the engine.
- Disconnect the clutch cable from the transmission housing on the engine.
- Unbolt the two nuts holding the exhaust header pipe to the cylinder.
(8mm wrench)
- Turn the fuel tap to the "OFF" position and disconnect the fuel line from the carburetor.
- Loosen the clamp screw which secures the carburetor to the intake manifold. (screwdriver)
- Work the carburetor off the intake manifold and leave the carburetor hanging by the throttle cable.
- Disconnect the magneto wire harness from the main harness. (If wire colors do not match, mark wires)
- Remove the engine drive chain.
- Remove the three engine mount bolts holding the engine to the frame.
(14mm wrench)
- Remove the engine from the frame.
- Remove the pedal arms and pedals from engine.

REFITTING THE ENGINE TO THE FRAME

- Reverse the removal procedure.
- Replace the exhaust manifold gasket with a "NEW" gasket.
- Replace the clutch cable if worn or frayed.
- Check that all wiring is reconnected so that it does not lay against the engine or is otherwise pinched.
- Replace carburetor intake manifold bushing if worn or cracked.

REMOVING THE CARBURETOR

- Turn the fuel tap to the "OFF" position and disconnect the fuel line from the carburetor.
- Loosen the clamp screw which secures the carburetor to the intake manifold. (screwdriver)
- Work the carburetor off the intake manifold by twisting back and forth while pulling.
- Remove the carburetor from the throttle cable by removing the two screws which hold the throttle slide cover to the carburetor body. (screwdriver)
- Remove the throttle slide cover, spring and throttle slide from the carburetor as one assembly and let hang from the moped.
- The carburetor is now free and ready for service.

REINSTALLING THE CARBURETOR

- Inspect the carburetor intake manifold bushing for wear and cracks. Replace if necessary.
- Check that the nuts securing the intake manifold to the crankcase are securely tightened (8mm wrench). If the intake manifold has been removed, inspect the reed valve assembly and replace if worn, clean the gasket surfaces thoroughly and install a "new" set of Intake Manifold/Reed Valve Gaskets.
- Install the throttle slide cover, spring and throttle slide back into the top of the carburetor. Install a new throttle slide cover gasket if gasket is deformed or torn.
- Tighten the two screws which secure the carburetor slide cover to the carburetor body. (screwdriver)
- Activate choke lever on carburetor and check that choke releases automatically when the throttle control is opened fully.
- Install carburetor back onto the intake manifold.
- Tighten the carburetor clamp while making certain that the carburetor is sitting straight and not cocked to either side on the intake manifold. (screwdriver)
- Reconnect the fuel line securely to the carburetor.

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DISASSEMBLING THE CARBURETOR: (Fig. 1)

DELL'ORTO CARBURETOR MODELS: SHA 14/9, 14/12 and 14/14

- Remove the air filter assembly by loosening the air filter cover clamp. (screwdriver)
- Remove the inner air filter element from the carburetor by gently prying.
- Remove the air filter "cork" gasket from the carburetor.
- Remove the fuel inlet. (screwdriver)
- Remove the fuel filter by prying up gently.
- Remove the float bowl by unscrewing the two screws. (screwdriver)
- Remove the float bowl "O" ring gasket.
- Remove the fuel jet. (screwdriver)
- Slide the hinge pin out of the float carefully and remove the float.
- Remove the float needle valve "carefully".

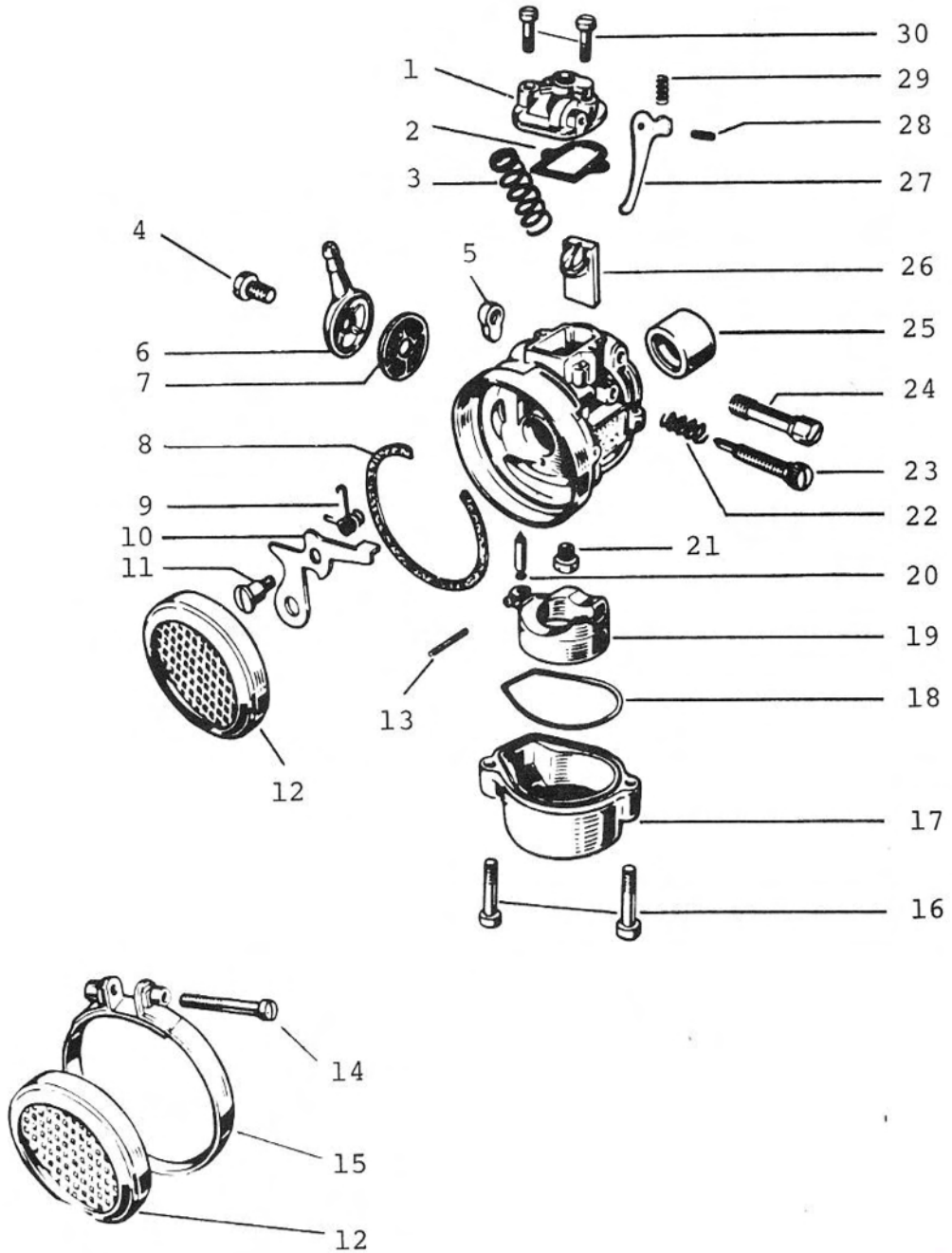
Clean all carburetor components thoroughly by soaking in an alcohol free solvent bath and dry thoroughly using compressed air.

REASSEMBLING THE CARBURETOR: (Fig. 1)

- Reverse dismantling procedure and replace all filter, gaskets.
- Replace float if warped or pourous.
- Replace float needle valve if worn.

DELL'ORTO CARBURETOR
 MODELS: SHA 14 / 9
 SHA 14 / 12
 SHA 14 / 14

Fig. #1



ENGINE DISASSEMBLY

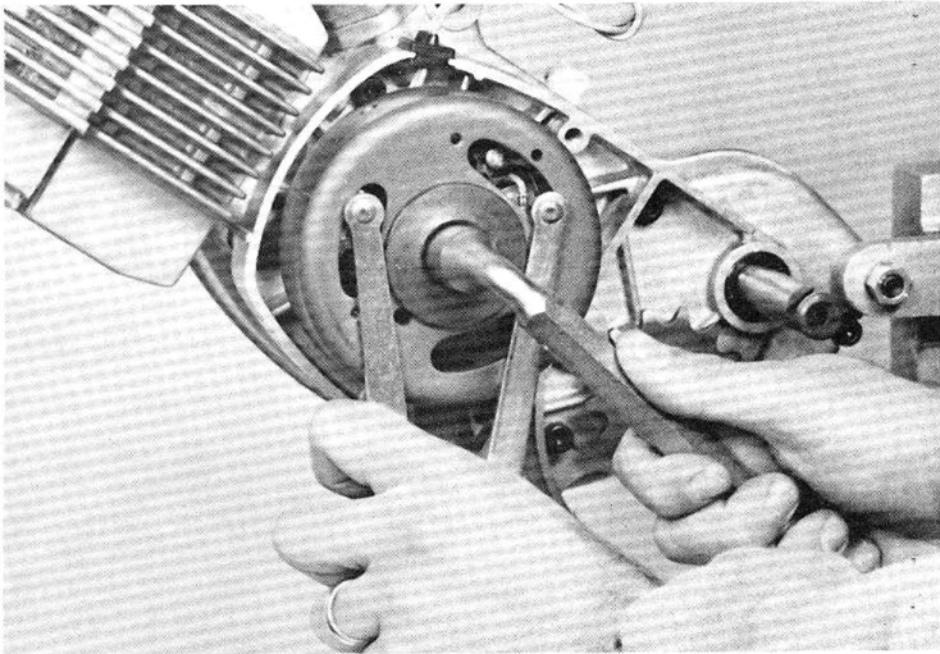
Having removed the engine from the frame, you are now ready to begin disassembling the engine.

The following is a step by step guide covering complete disassembly followed by a reassembly guide step by step.

FLYWHEEL MAGNETO REMOVAL:

- Remove the left engine cover by unscrewing the two allen head bolts. (5mm allen wrench)
- Insert the special spanner wrench (Part #14-0506) into the slots of the magneto flywheel to prevent rotation and loosen the flywheel nut (15mm wrench). (Fig. #2)

Fig. #2

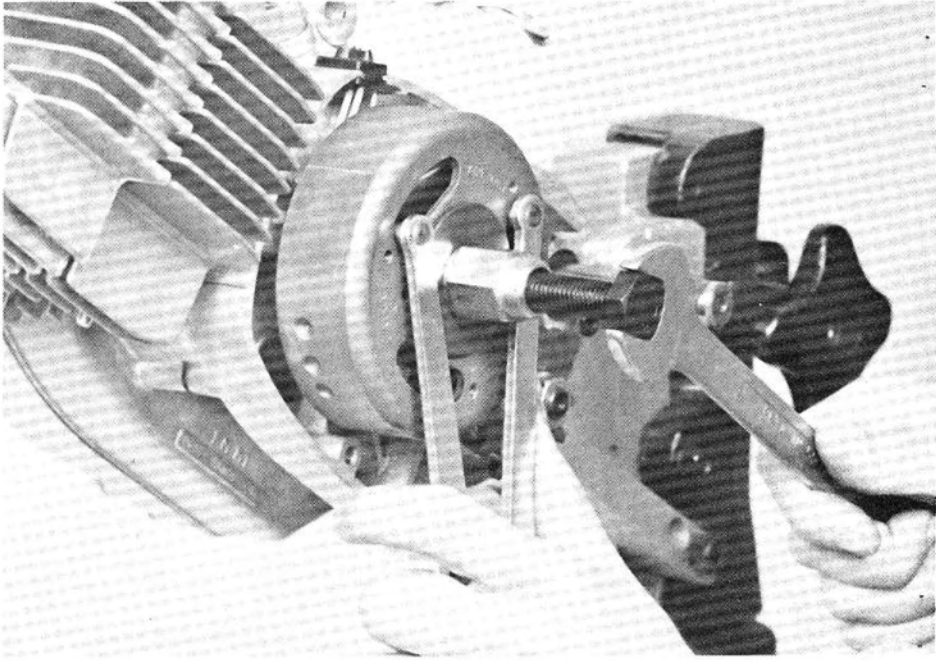


NOTE: If the flywheel nut is difficult to loosen, allow the spanner wrench to rest against the pedal shaft for better leverage.

ENGINE DISASSEMBLY

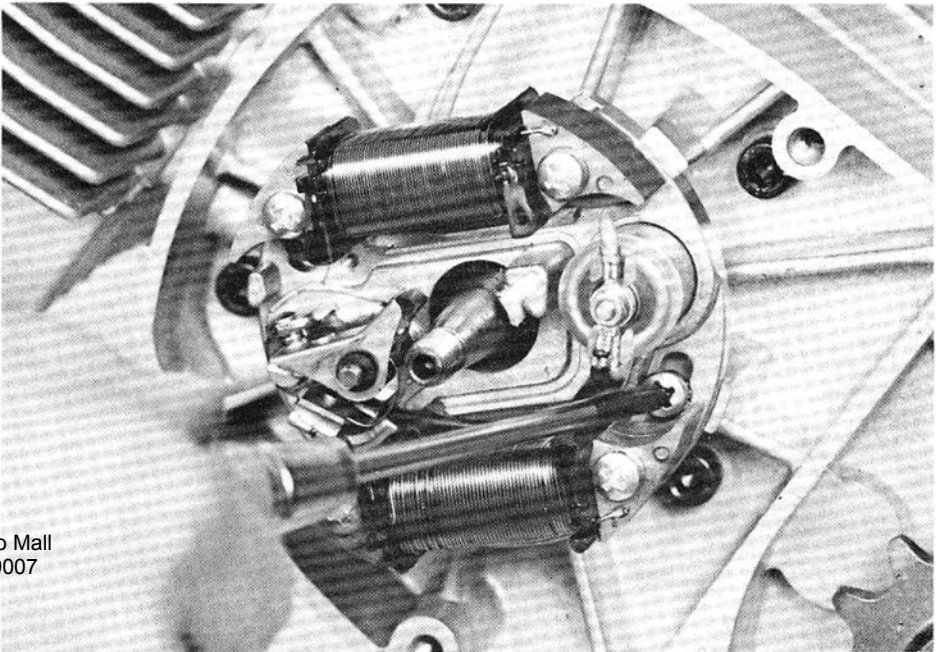
- Thread the flywheel puller (Part #14-0501) into the flywheel and tighten (22mm wrench), (Fig. #3)
- Tighten the flywheel puller center bolt (19mm wrench), (Fig. #3).
- The flywheel will break free from the crankshaft.

Fig. #3



- Remove the stator plate assembly from the engine by unscrewing the two stator plate mount screws (Phillips screwdriver), (Fig. #4).

Fig. #4



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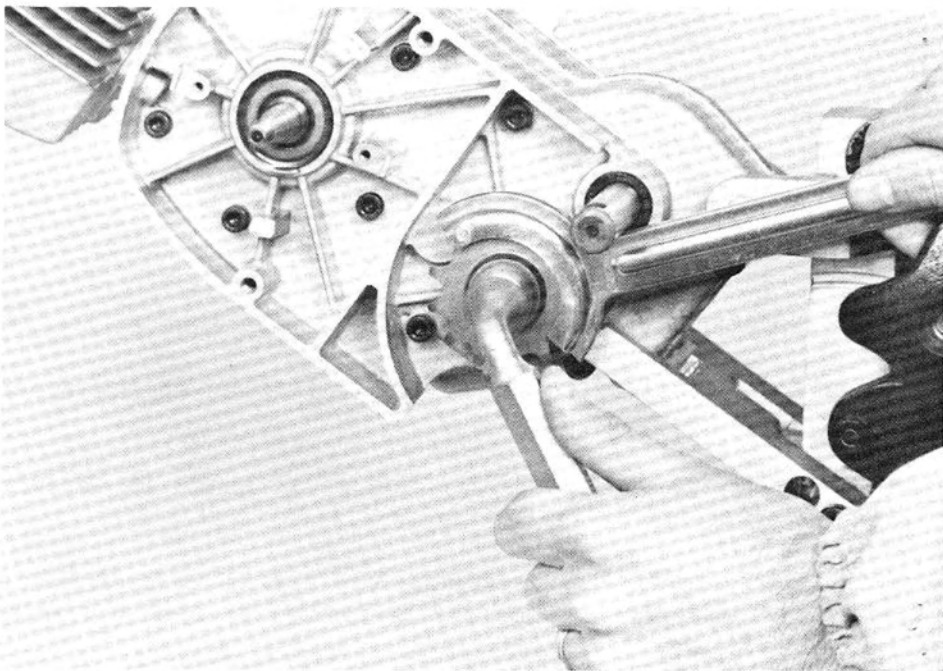
ENGINE DISASSEMBLY

- Slide the rubber wire guide off the engine case while removing the stator plate assembly.
- Place the stator plate assembly back into the magneto flywheel to prevent altering the magnetic fields.
- Remove the flywheel key from the crankshaft using a pair of needle nose pliers.

COUNTERSHAFT SPROCKET REMOVAL:

- Remove the countershaft sprocket nut using a 17mm wrench and the special sprocket wrench (Part #14-0504). Allow the sprocket wrench to come to rest against the pedal shaft to ease the removal of the sprocket nut, (Fig. #5)

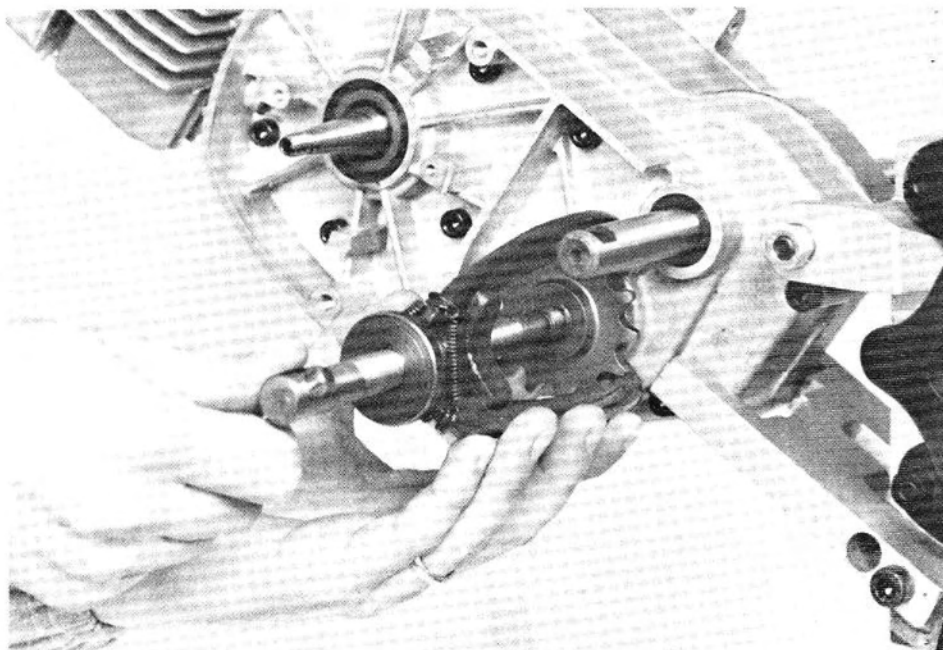
Fig. #5



ENGINE DISASSEMBLY

- Remove the countershaft sprocket from the shaft by using a universal gear puller as shown in Figure #6.

Fig. #6



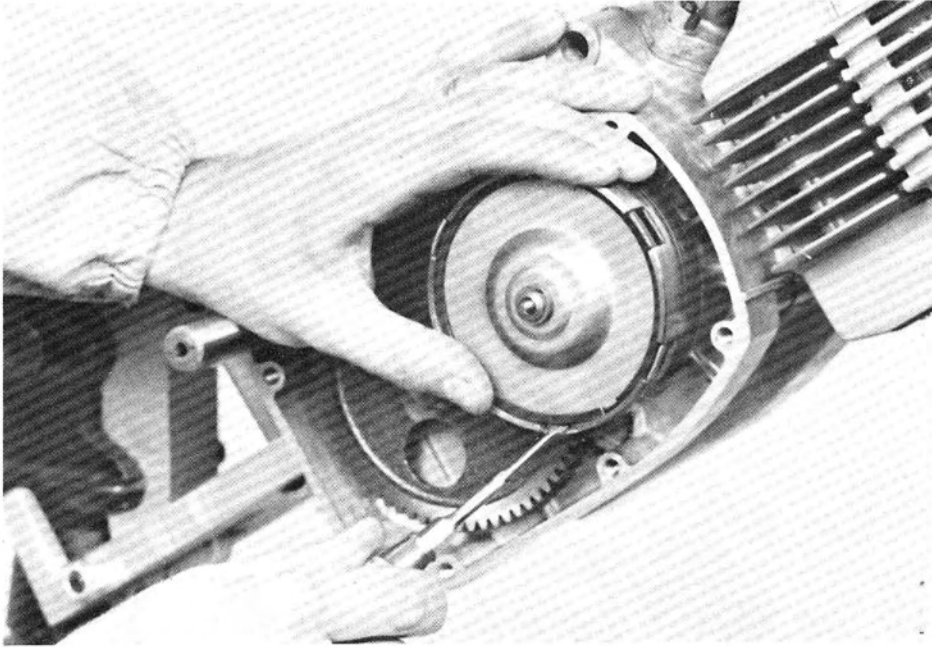
TRANSMISSION DISASSEMBLY:

- Remove the carburetor if not already done. (see page 6)
- Drain transmission oil by removing oil drain plug at lower rear section of the clutch cover. (screwdriver)
- Remove the pedal arm and pedal from the pedal shaft if not already removed. (10mm wrench)
- Remove the clutch cover by unscrewing the six Allen head bolts (5mm Allen wrench). A rubber mallet may be needed to free the clutch cover from the pedal shaft.
- Remove the clutch cover gasket.

ENGINE DISASSEMBLY

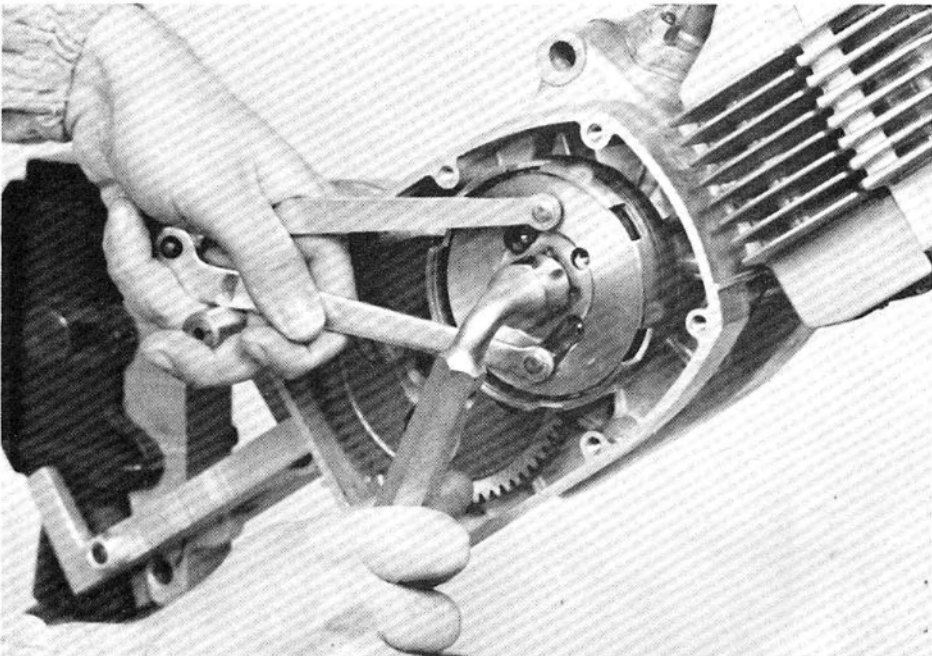
- Remove the starting clutch disc retaining clip by pushing in on the clutch disc and using a screwdriver to work the retaining clip out of the clutch drum, (Fig. #7)

Fig. #7



- Remove the starting clutch disc and spring.
- Hold the clutch assembly from rotating by using the special spanner wrench (Part #14-0506) and unscrew the clutch retaining nut and washer, (17mm wrench), (Fig. #8)

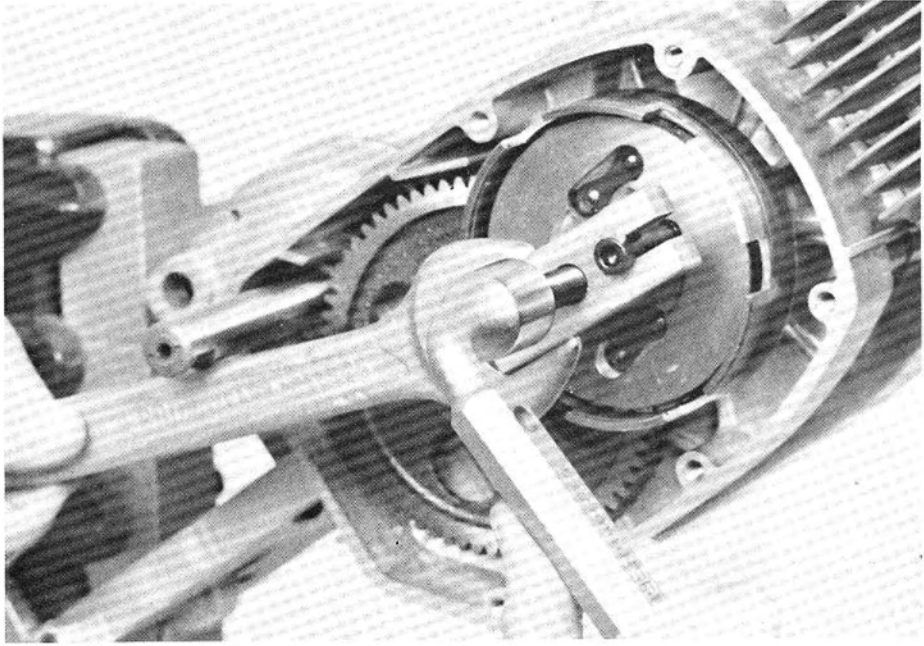
Fig. #8



ENGINE DISASSEMBLY

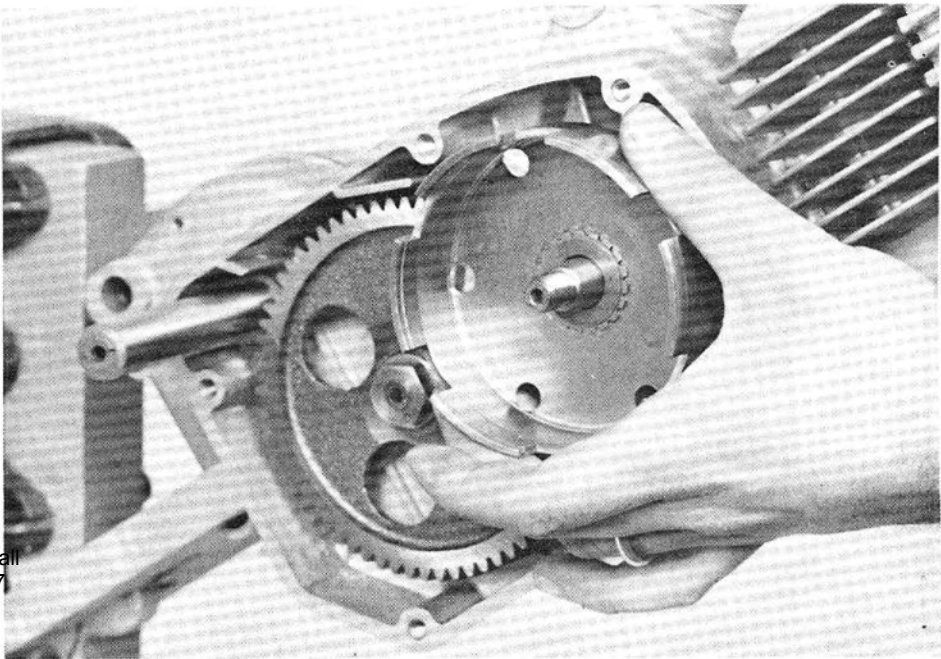
- Install the special gear puller (Part #14-0508) using two clutch cover Allen head bolts and remove the clutch assembly, (5mm Allen wrench and 17mm wrench), (Fig. #9)

Fig. #9



- Remove the clutch drum assembly and bushing taking special care to note the exact placement of the shims on the crankshaft on both the forward side and backside of the clutch drum. These shims will have to be reused in the exact placement when reassembling the clutch and transmission, (Fig. #10)

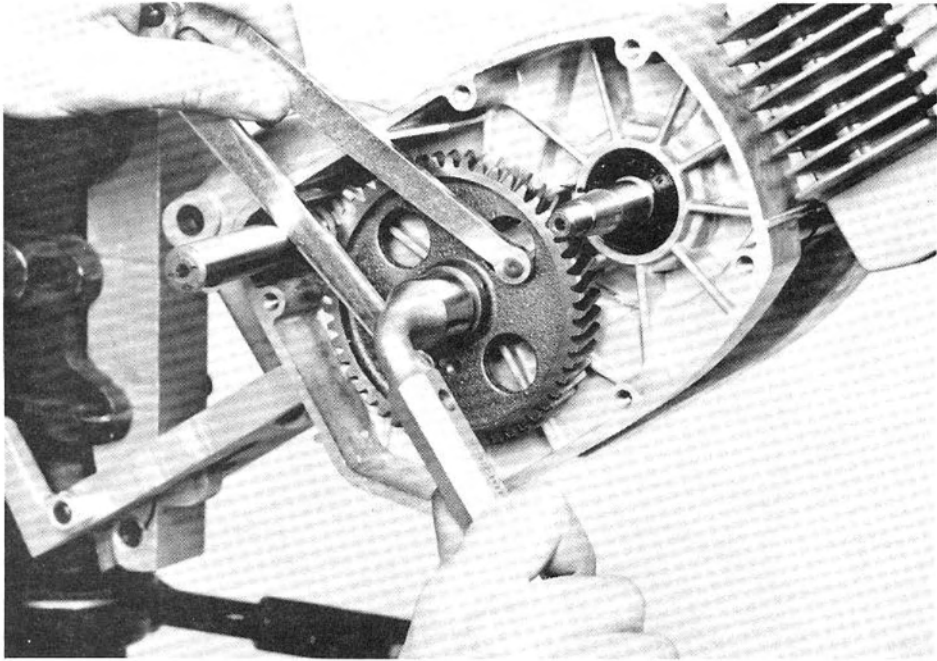
Fig. #10



ENGINE DISASSEMBLY

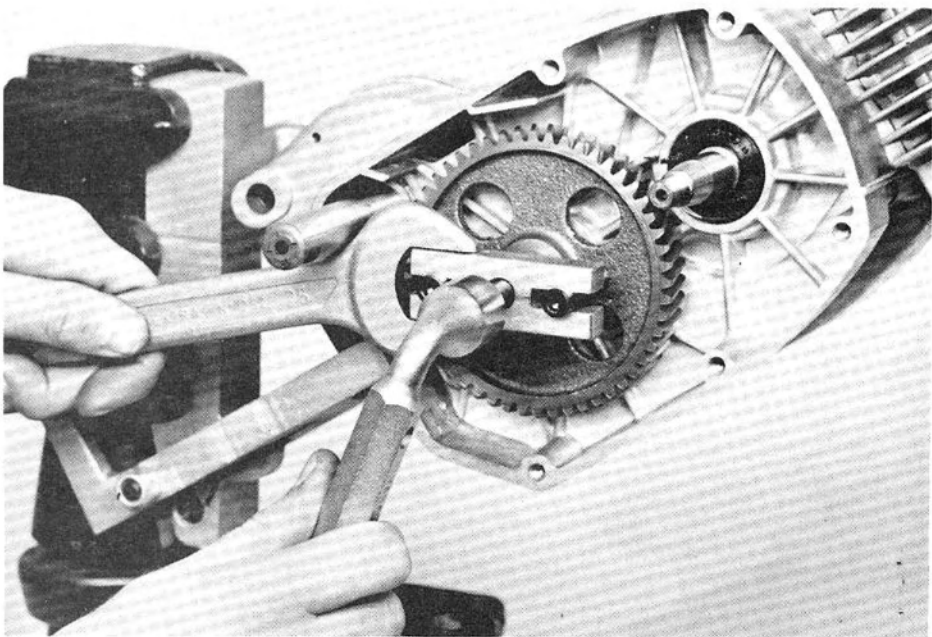
- Hold the transmission gear stationary by using the special spanner wrench (Part #14-0506). Allow the spanner wrench to rest against the pedal shaft for better leverage, (Fig. #11).
- Unscrew the transmission gear nut and remove the washer (17mm wrench), (Fig. #11).

Fig. #11



- Install the special gear puller (Part #14-0508) using two of the clutch cover Allen head bolts and remove the transmission gear, (17mm wrench), (Fig. #12).

Fig. #12

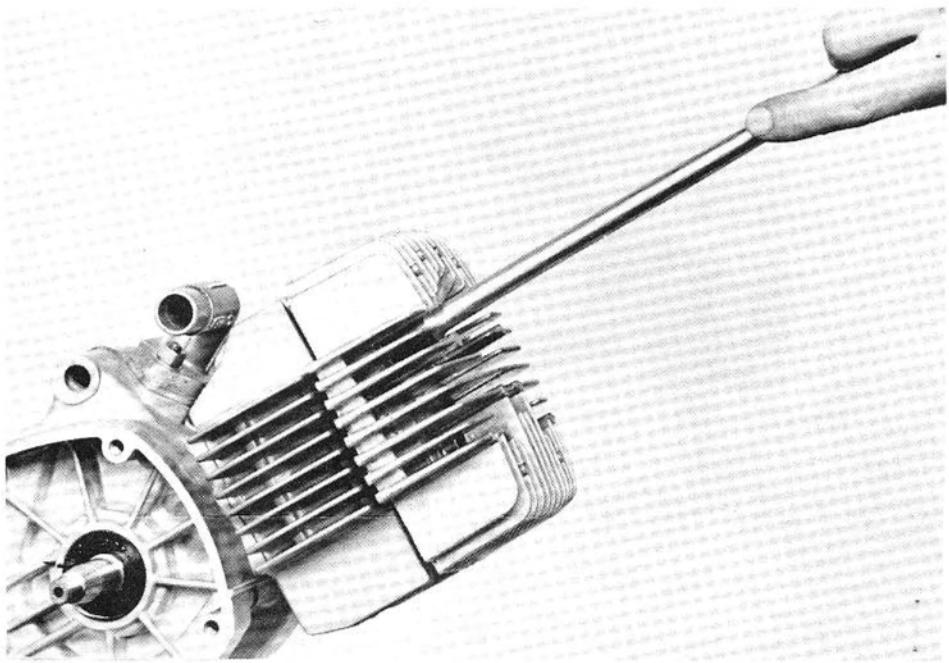


ENGINE DISASSEMBLY

CYLINDER HEAD, CYLINDER, PISTON AND REED VALVE DISASSEMBLY:

- Remove spark plug (13/16 spark plug wrench).
- Progressively loosen the four nuts securing the cylinder head to the cylinder and remove nuts (10mm socket), (Fig. #13).
- Remove the flat washers from the cylinder head.
- Remove the cylinder head.
- Remove the cylinder head gasket.

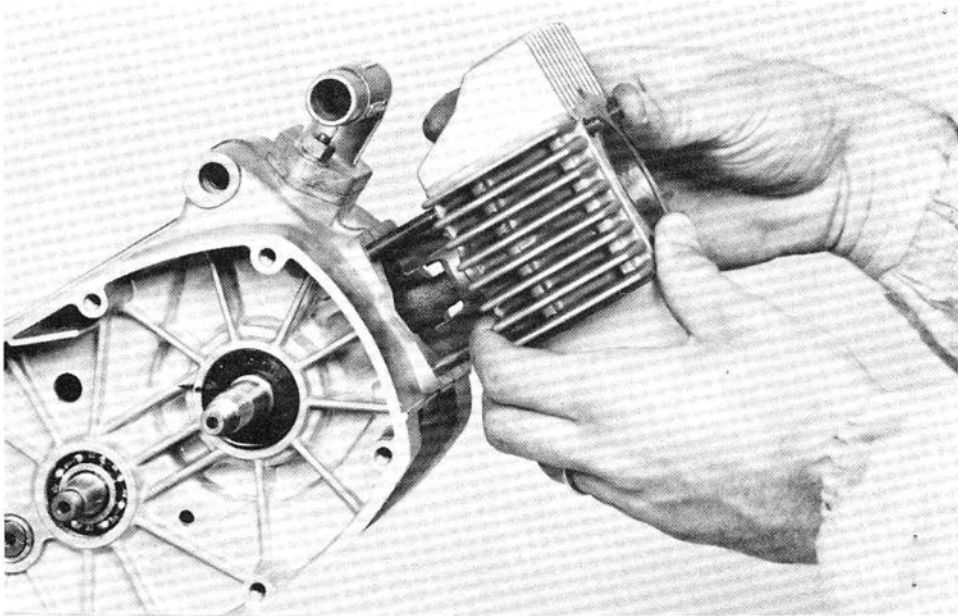
Fig. #13



ENGINE DISASSEMBLY

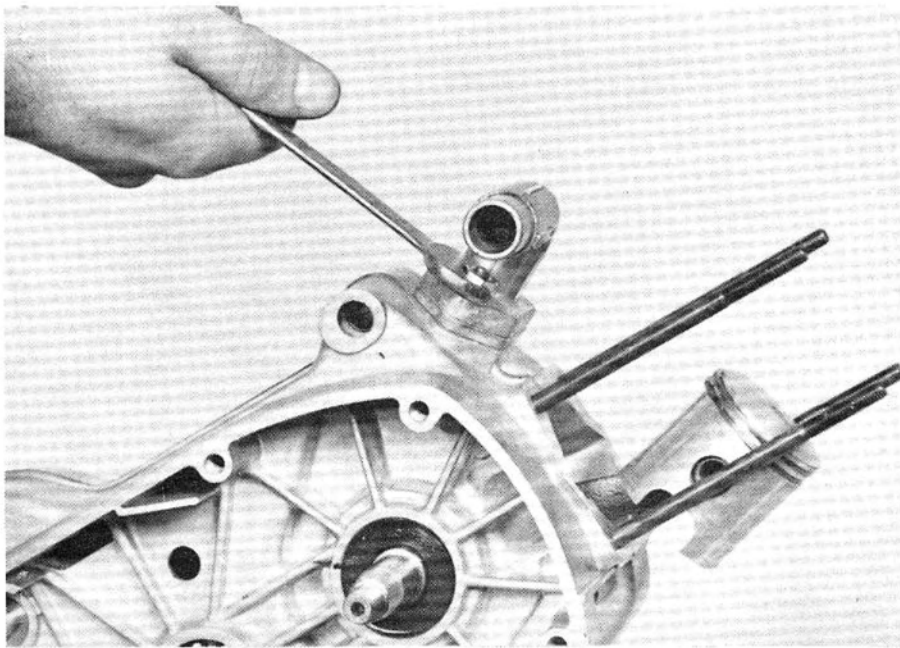
- Remove the cylinder assembly carefully so as to avoid damaging the piston, (Fig. #14).
- Remove the cylinder base gasket.

Fig. #14



- Remove the two intake manifold nuts and washers (10mm wrench), (Fig. #15).

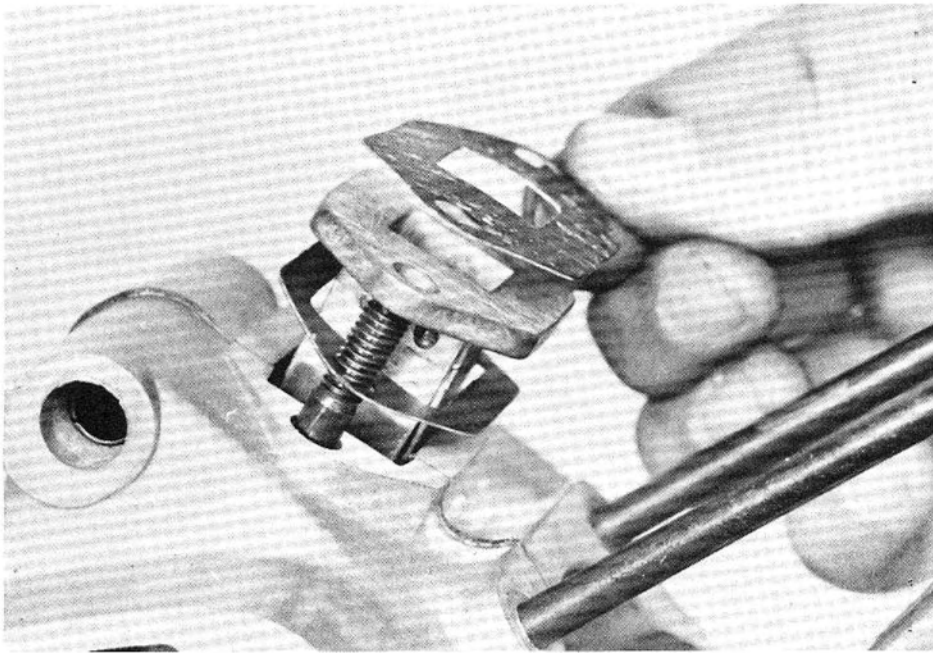
Fig. #15



ENGINE DISASSEMBLY

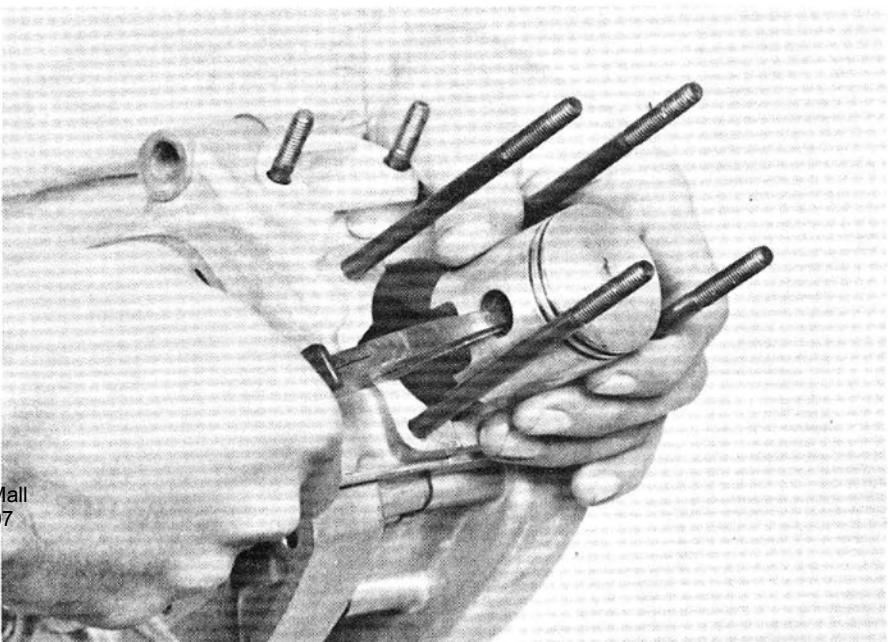
- Remove the intake manifold.
- Remove the reed valve assembly as well as the top and bottom gasket. Take special care in handling the reed valve to prevent damage, (Fig. #16).

Fig. #16



- Place a rag inside the crankcase beneath the piston to avoid dropping the piston pin retaining clips into the crankcase.
- Remove the two piston pin retaining clips from the piston using a pair of needle nose pliers, (Fig. #17).

Fig. #17



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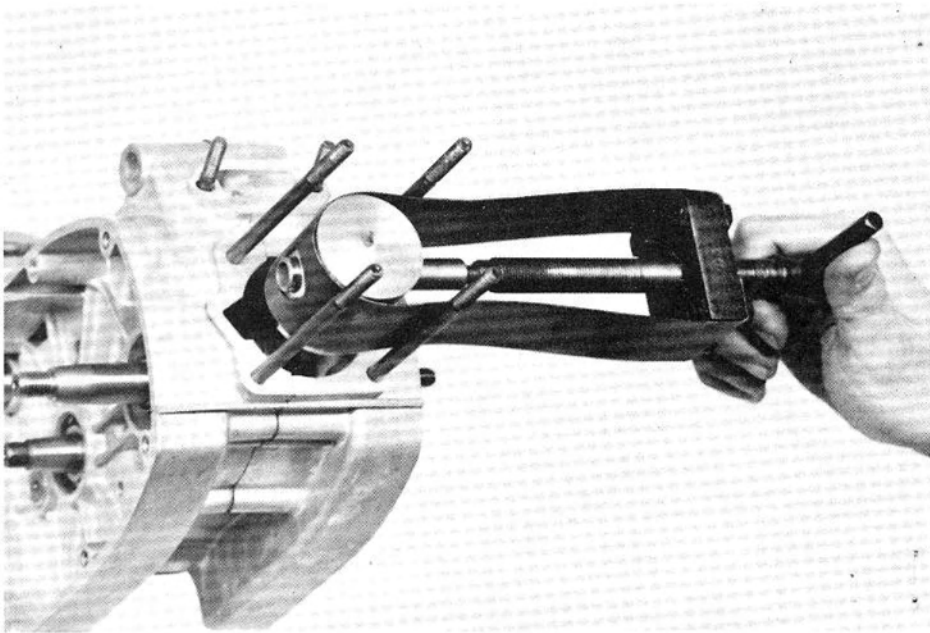
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ENGINE DISASSEMBLY

- Remove the two piston rings by gently prying the ends apart and lifting off the top of the piston.
- Extract the piston pin using the special piston pin Extractor/Installer (Part # F10025) to press the piston pin out of the piston, (Fig. #18).
- Remove the piston and piston pin bearing.

Fig. #18

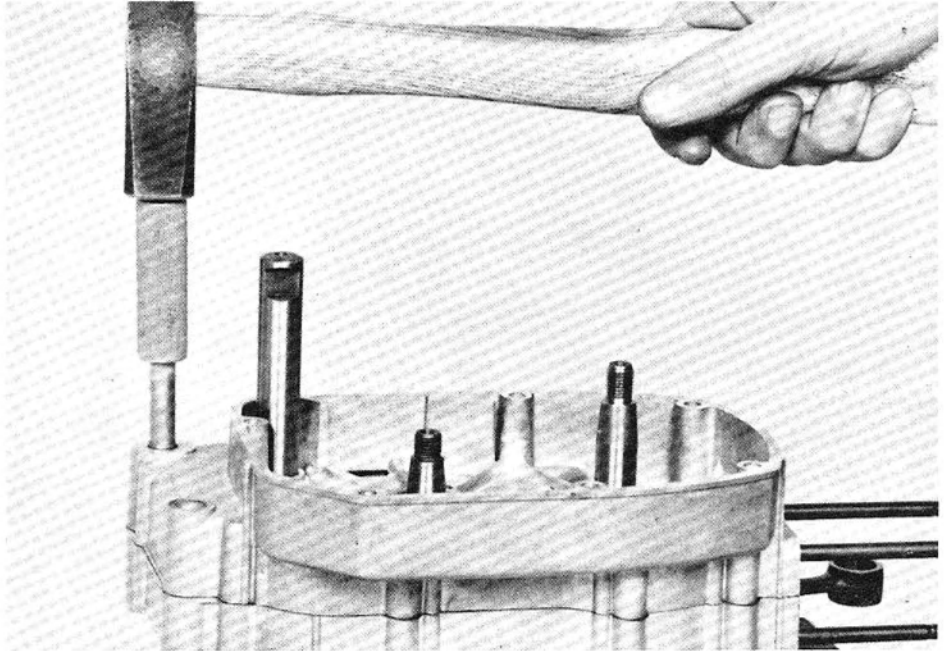


ENGINE DISASSEMBLY

CRANKCASE DISASSEMBLY

- Support the crankcase so that the magneto side is facing downward.
- Drive the crankcase joining dowels out through the magneto side of the crankcase (hammer and drift punch), (Fig. #19)

Fig. #19



ENGINE DISASSEMBLY

- Turn the crankcase over so that the magneto side is facing upward and remove the Allen head bolts holding the crankcase halves together, (5mm Allen wrench).
- Split the crankcase halves by using the special case splitter tool (Part #14-0511). If the special case splitter is not accessible, hold the crankcase above the bench and tap lightly on the crankshaft and pedal shaft alternately untill the crankcase halves separate, (Fig. #21 and #21).

Fig. #20

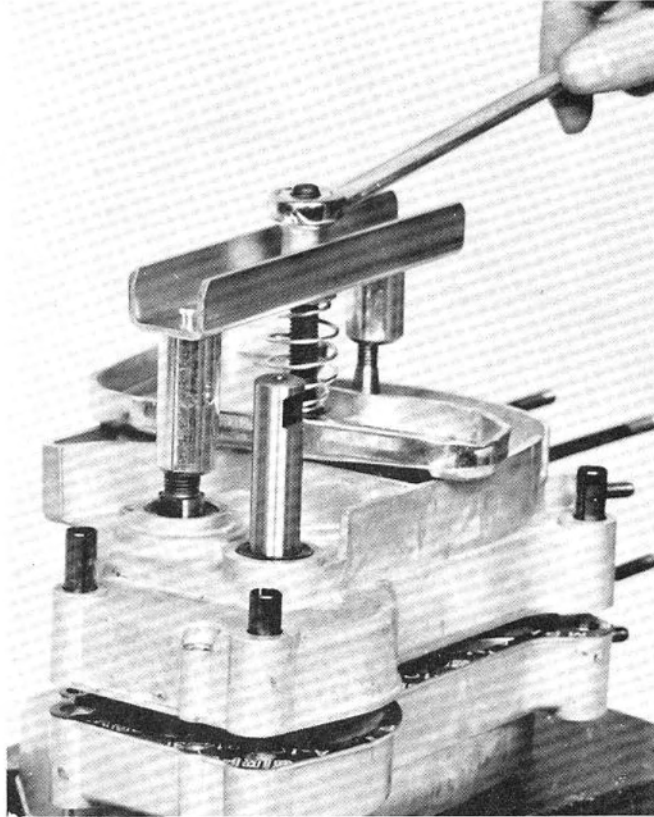
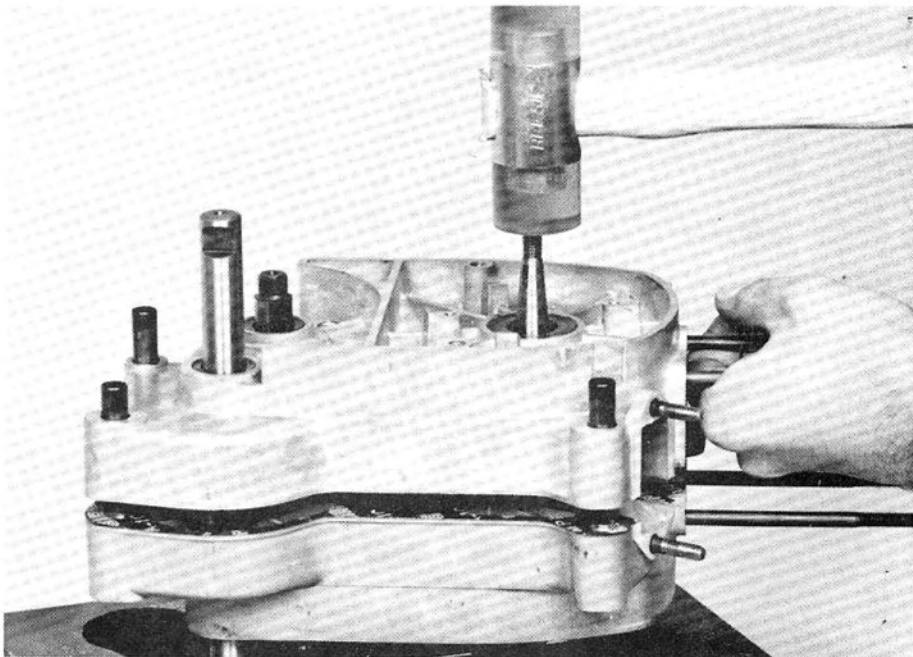


Fig. #21



ENGINE DISASSEMBLY

- Remove the crankcase gasket and clean the gasket mating surfaces thoroughly.
- Remove the primary and secondary shafts from the crankcase. Take special care to note the exact placement of the shims on the respective shafts. These shims will have to be reinstalled in the exact placement they were in when reassembling the engine (Fig. #22).
- Remove the crankshaft by gently tapping with a rubber mallet.

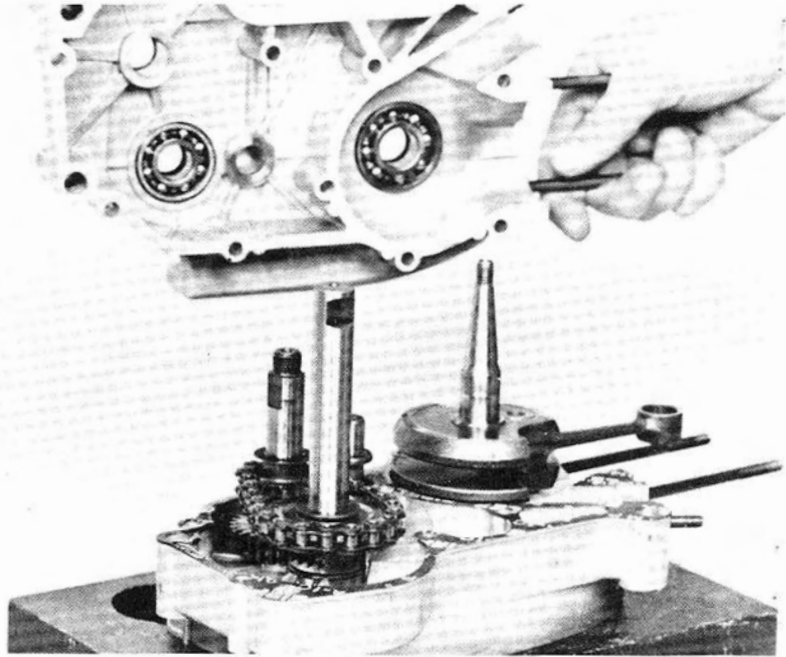


Fig. #22

To replace any bearings mounted in the crankcase, slightly heat the crankcase surface around the bearing being replaced and gently tap the bearing out. Install the new bearing by lightly heating the crankcase and gently tap the bearing fully into place.

ENGINE REASSEMBLY

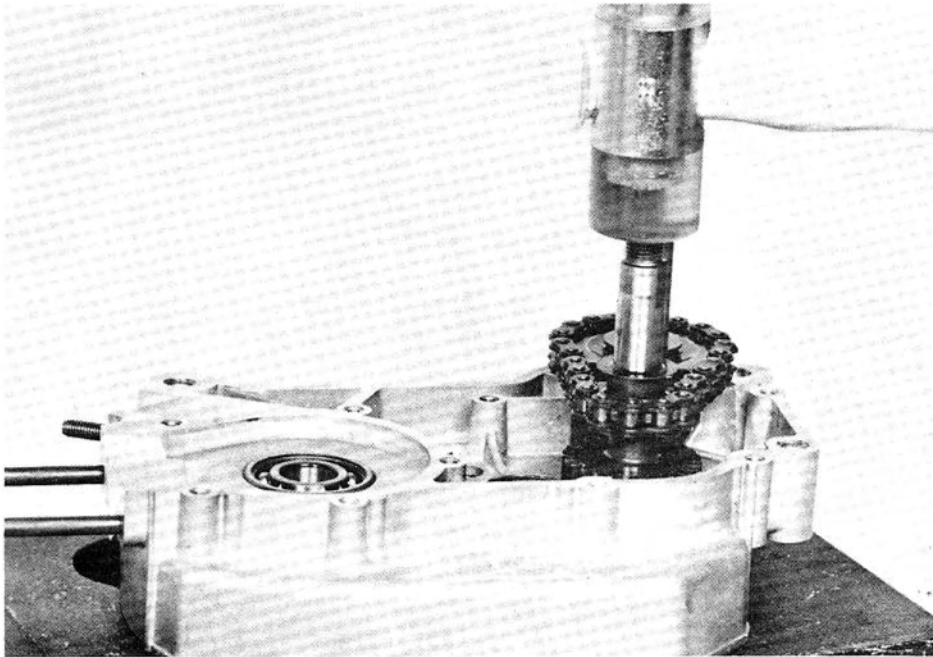
Prior to reassembling the engine, inspect all bearings and bushings and replace if worn. Never re-use gaskets, oil seals or piston rings when rebuilding the engine.

CRANKCASE REASSEMBLY

- Install the pedal shaft and secondary shaft coupled together by the chain into the clutch side of the crankcase. Make certain the proper spacing shims are installed at the same time (Fig. #23)

Pedal Shaft Shim = 0.8MM
Secondary Shaft Shim = 0.3MM

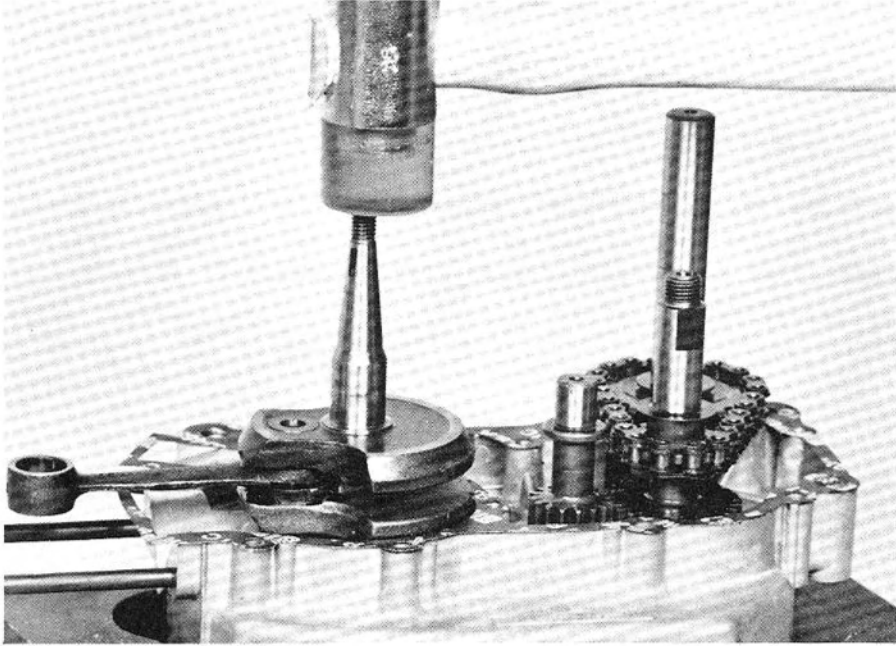
Fig. #23



ENGINE REASSEMBLY

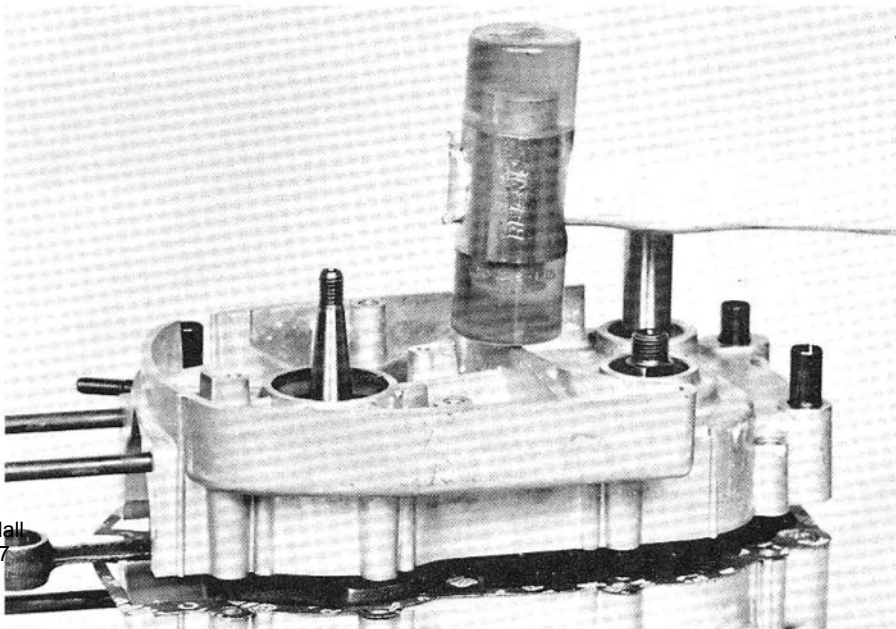
- Install the primary gear shaft and crankshaft into the crankcase by gently tapping with a rubber mallet. Make certain the crankshaft is installed with the proper end facing the correct direction as it is possible to install the crankshaft backwards. (Fig. #24).

Fig. #24



- Oil all moving parts.
- Install a new crankcase gasket.
- Install the other crankcase half and tap into place with a rubber mallet, (Fig. #25).

Fig. #25



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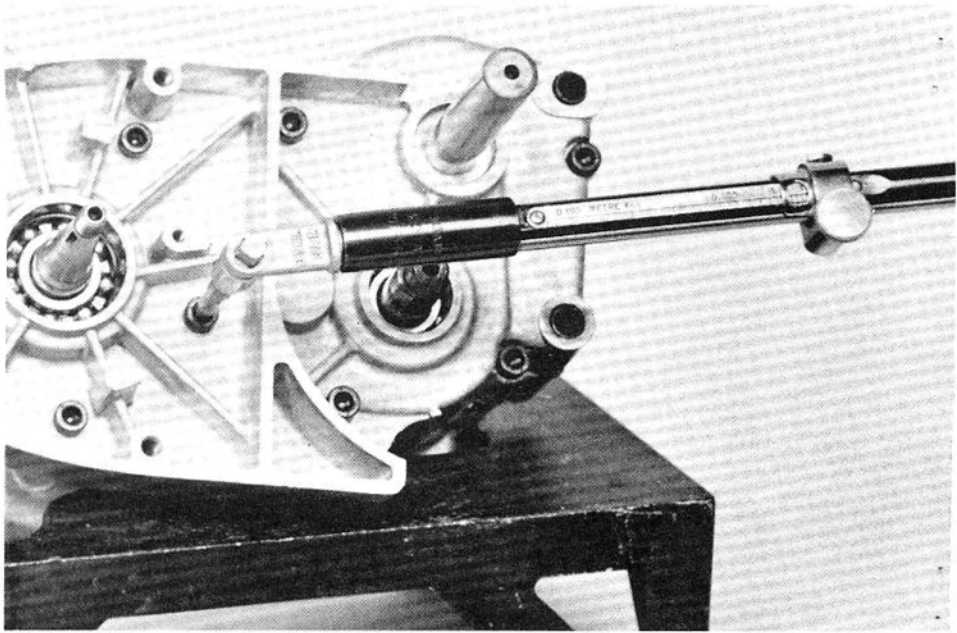
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ENGINE REASSEMBLY

- Drive the crankcase dowel pins back into the position (drift punch and hammer).
- Install the nine Allen bolts and tighten to a torque of 1-1.2 Kgm (7.2 - 8.5 Ft/Lbs), (Torque wrench and 5mm Allen wrench attachment), (Fig. #26).

Fig. #26



ENGINE REASSEMBLY

- Apply some oil to the new crankcase seals and drive into place by using a piece of tube and gently tapping into place with a hammer, (Fig. #27).

Fig. #27



- Check that all moving parts rotate freely in particular the pedal shaft.
- Trim any excess protruding crankcase gasket around the area of the reed valve and cylinder mount.

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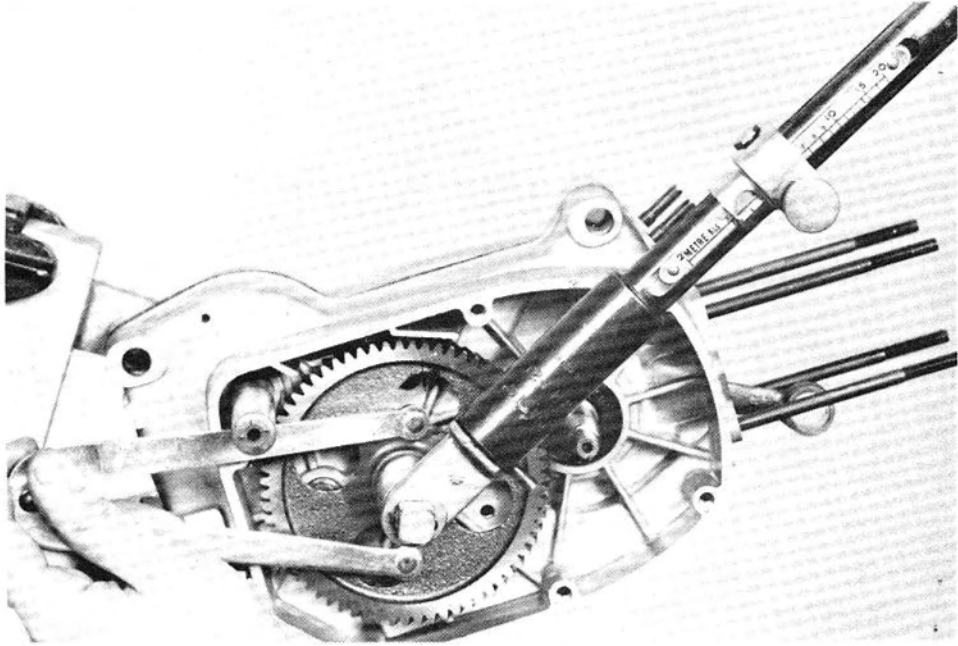
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TRANSMISSION REASSEMBLY

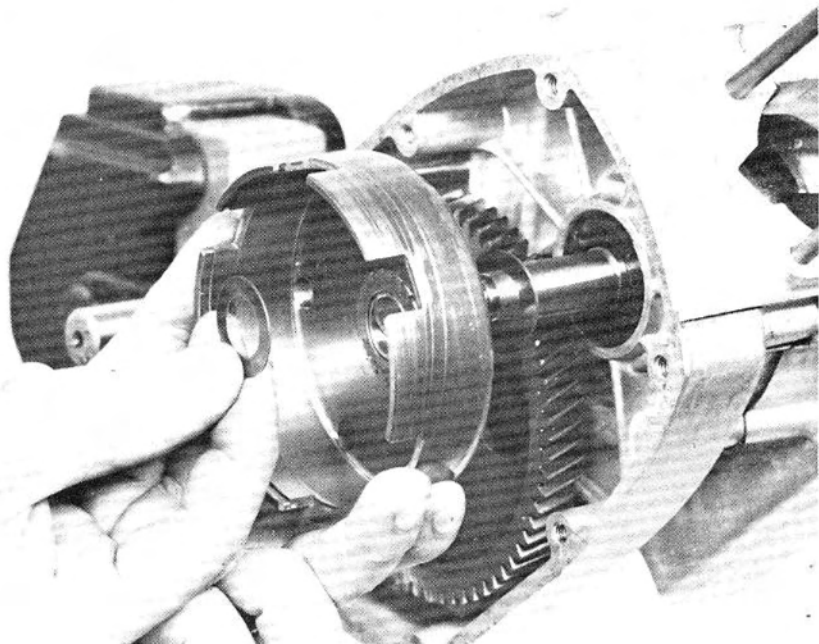
- Install the transmission gear making certain that the tapered shaft is completely clean.
- Install the washer and lock nut and tighten the nut to a torque of 3.5 - 4 Kgm. (25.3 - 28.9 Ft/Lbs), (Fig. #28).

Fig. #28



- Install the crankshaft shim onto the crankshaft, (Fig. #29).
- Install the clutch drum and bushing onto the crankshaft, (Fig. #29).
- Install the final crankshaft shim onto the crankshaft, (Fig. #29).

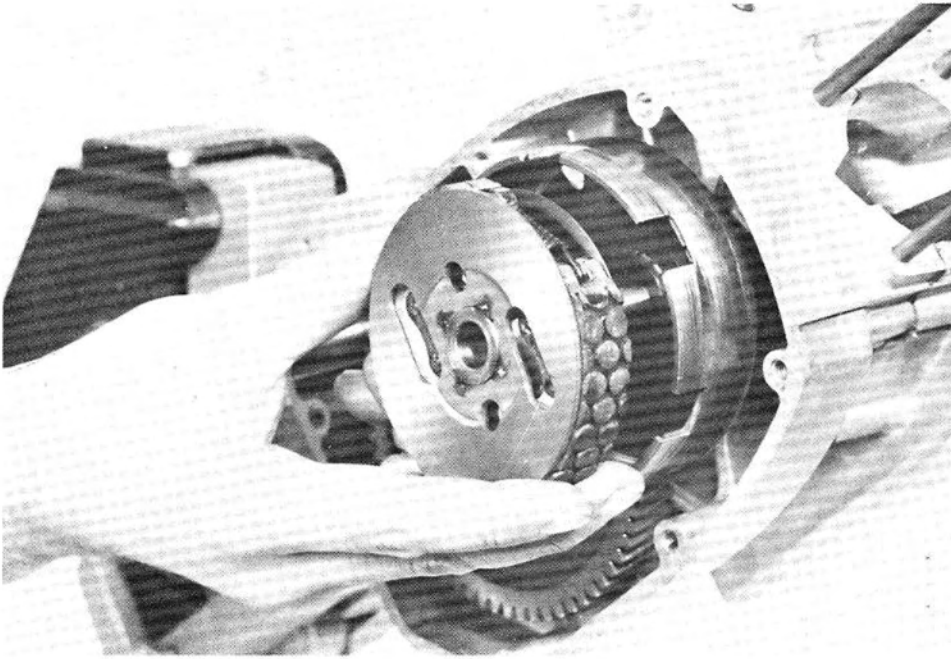
Fig. #29



ENGINE REASSEMBLY

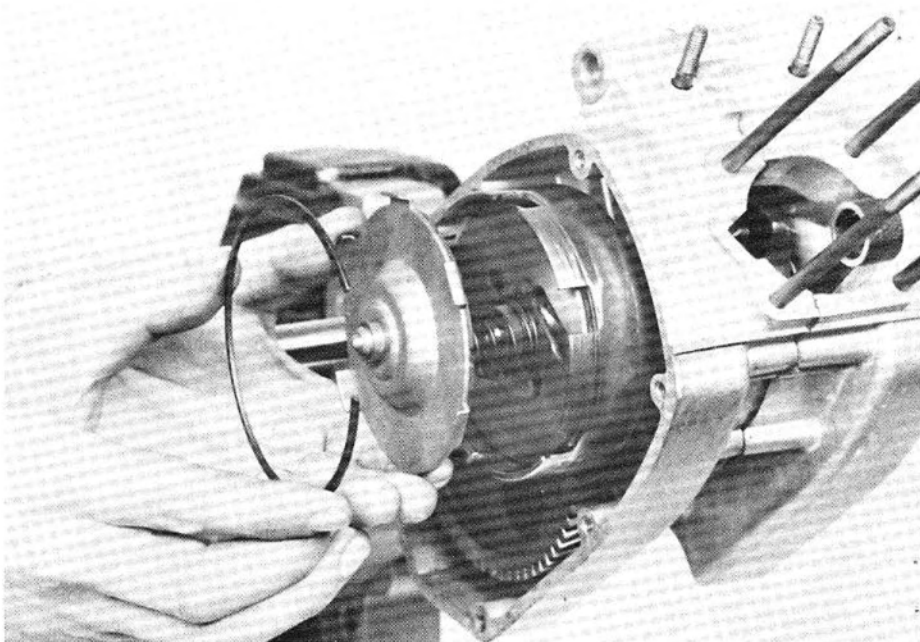
- Install the clutch assembly making certain the conical surface of the crankshaft is clean, (Fig. #30).

Fig. #30



- Install the clutch locknut and washer and tighten to a torque of 3.5 Kgm, (25 Ft/Lbs), (17mm socket and torque wrench).
- Check that the clutch drum turns freely with a minimum of lateral play.
- Install the starting clutch spring and disc, (Fig. #31).
- Install starting clutch lock clip into clutch drum, (screwdriver, (Fig. #31)).

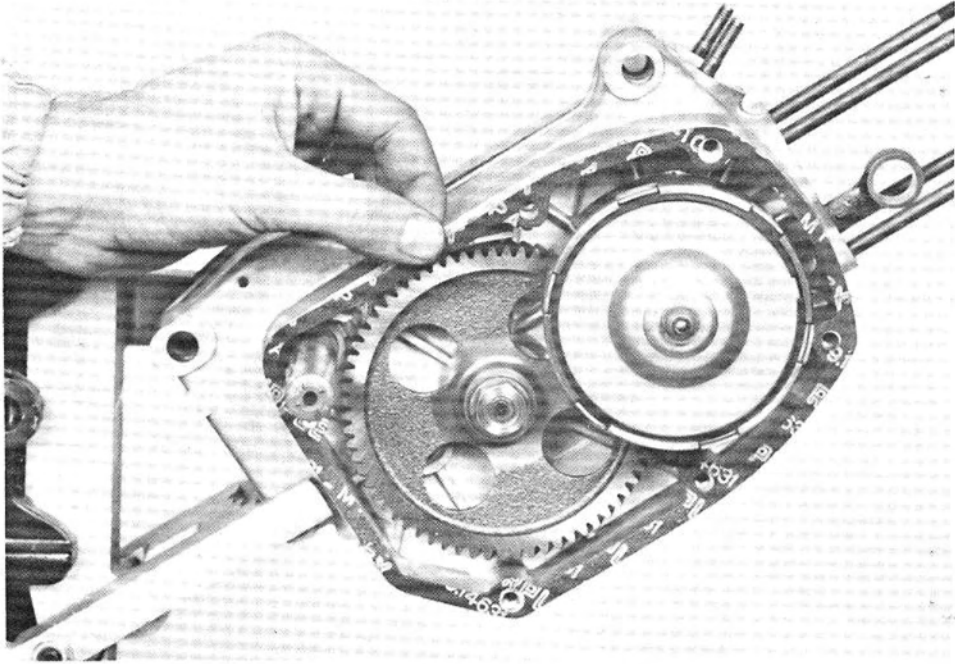
Fig. #31



ENGINE REASSEMBLY

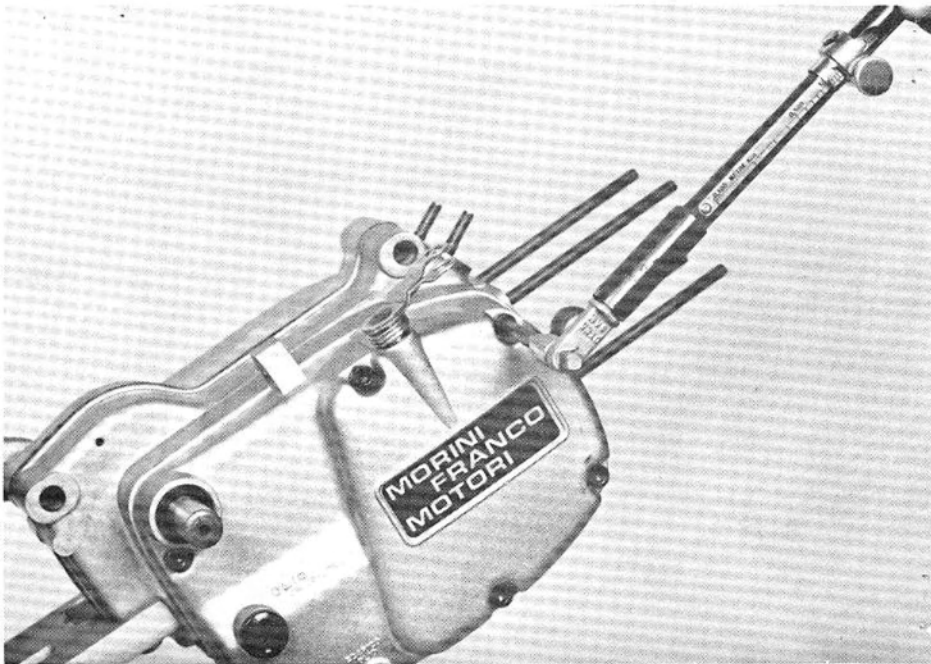
- Install a new clutch cover gasket, (Fig. #32).

Fig. #32



- Reinstall the clutch cover carefully so that the new pedal shaft seal does not tear. Tighten the clutch cover screws to a torque of 1.1 - 1.3 Kgm, (7.9 - 9.4 Ft/Lbs), (Fig. #33).

Fig. #33



ENGINE REASSEMBLY

- Install the cylinder base gasket onto the engine crankcase.

PISTON CYLINDER MATCHING

Piston and cylinder matching is very important! Each cylinder and each piston has a color reference painted onto it at the factory. The four colors in ascending size are green, neutral (no color), yellow and red. The difference in diameter between each color is .005MM. The best possible match between a cylinder and piston would be to have both the same color. However, pistons and cylinders can be matched in the following manner.

<u>Piston Color</u>	<u>"To Be Used With"</u>	<u>Cylinder Color</u>
Green or Neutral		Green
Green, Neutral or Yellow		Neutral
Neutral, Yellow or Red		Yellow
Yellow or Red		Red

IMPORTANT: Whichever piston cylinder assembly is finally chosen, the piston to cylinder clearance must be:

Minimum = 0.055MM

Maximum = 0.065MM

PISTON/CYLINDER AND HEAD REASSEMBLY

- Smear the wrist pin needle bearing with oil and insert it into the connecting rod.
- Insert the wrist pin in the connecting rod and bearing and check for excessive play.

NOTE: If excessive play is present the problem is one of the three components or a combination of the components are worn. (Eg. piston pin, bearing, connecting rod).

- Install the piston so that the piston ring locating pins face upward and away from the exhaust port.

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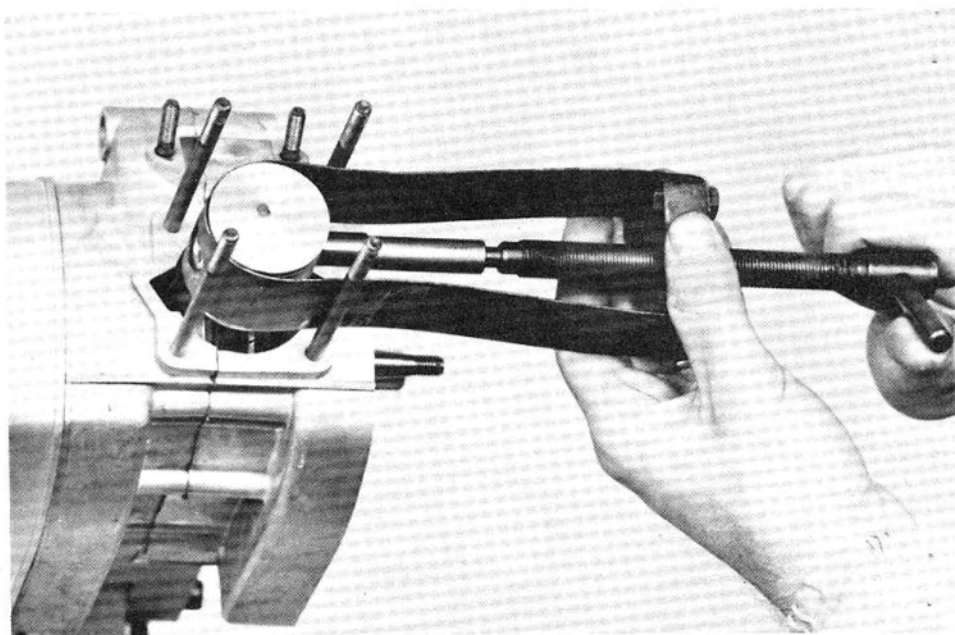
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ENGINE REASSEMBLY

- Install the piston pin using the special pin extractor/installer tool, (Part #F100025), (Fig. #34).

Fig. #34



- Install a "new" set of piston pin clips using the appropriate pliers.
- Without the piston rings mounted on the piston, slide the cylinder down over the piston.

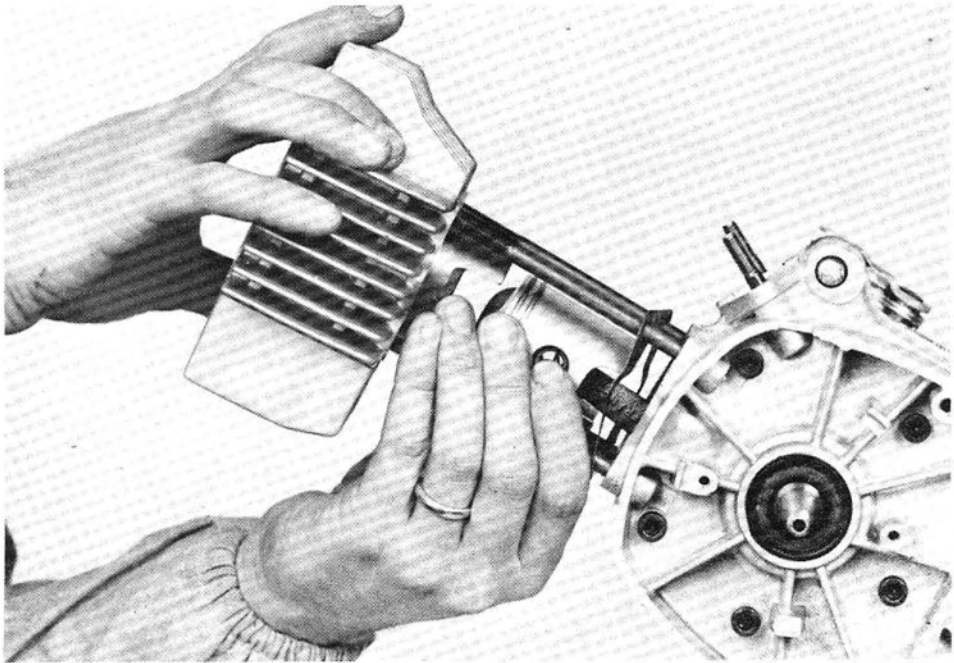
IMPORTANT: Check piston/cylinder clearance by using a feeler guage.
Minimum piston/cylinder clearance = .055MM
Maximum piston/cylinder clearance = .065MM

- Remove the cylinder and install a "new" set of piston rings.
- Install a "new" cylinder base gasket making certain that it is aligned correctly with the crankcase transfer ports.
- Check that the cylinder wall is neither scuffed nor scored.

ENGINE REASSEMBLY

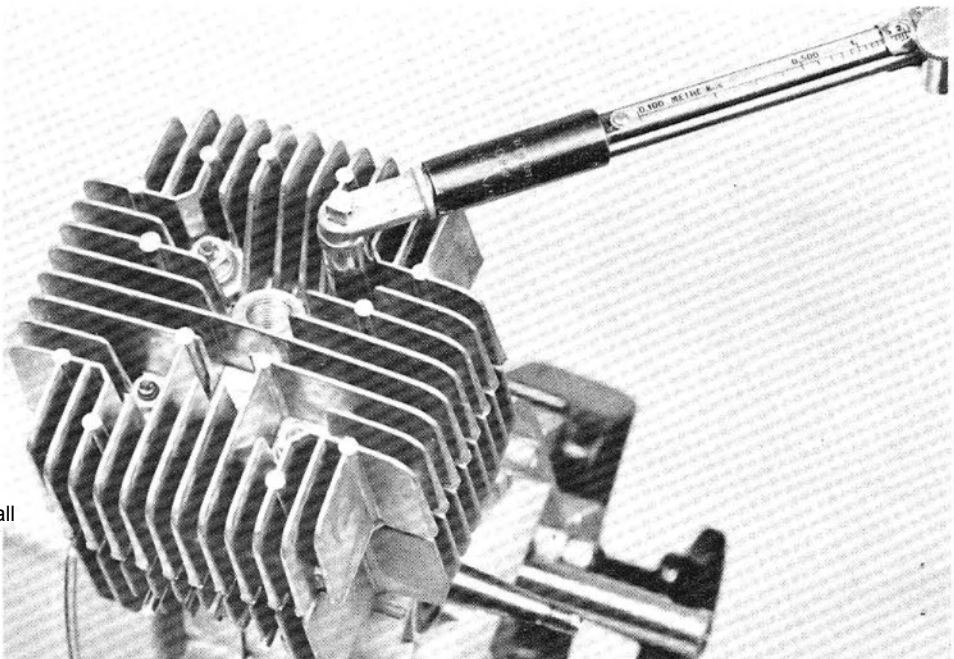
- Oil the cylinder wall and install the cylinder onto the piston while making certain that the piston rings are properly aligned with their location pins in the ring groove, (Fig. #35).

Fig. #35



- Install a new cylinder head gasket ensuring that the thin edged copper side is facing towards the cylinder head.
- Install the four cylinder head washers and nuts and tighten uniformly in a cross pattern to a torque of 1.5 Kgm, (10.8 Ft/Lbs), (Torque wrench and 10mm socket, (Fit. #36).

Fig. #36



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ENGINE REASSEMBLY

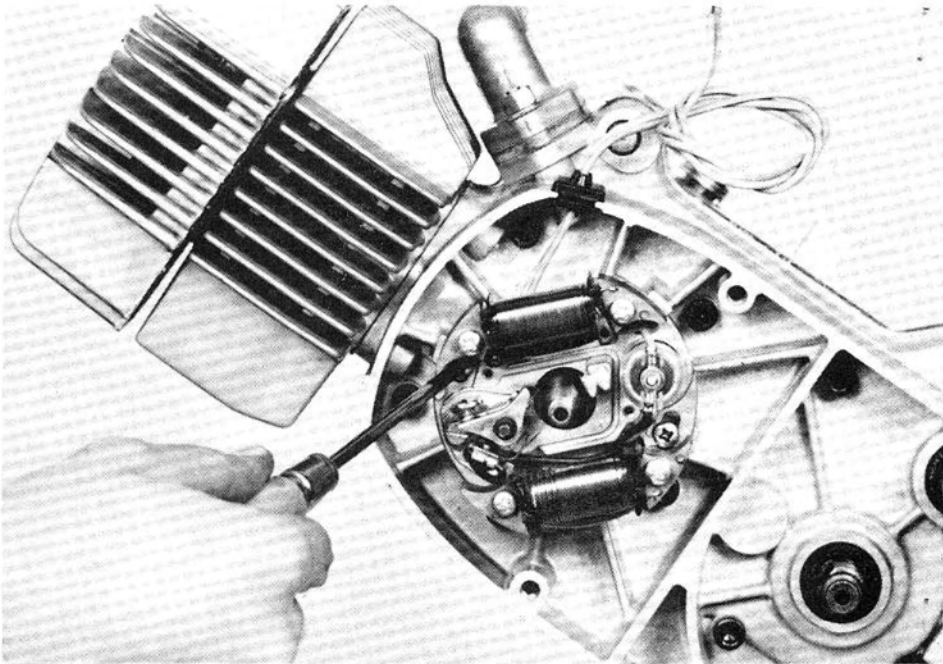
REED VALVE ASSEMBLY

- Install the reed valve assembly after having made certain that the reeds are in perfect condition. A "new" upper and lower reed valve gasket must be used to prevent any air leaks. Refer back to Fig. #16 in the engine disassembly section.
- Install the intake manifold and tighten the nuts to a torque of 1.5 Kgm, (10.8 Ft/Lbs), (Torque wrench and 10MM socket).

REFITTING THE FLYWHEEL MAGNETO

- Thoroughly clean the tapered end of the crankshaft to remove any oil or grease.
- Install the flywheel key back into the crankshaft.
- Position the stator plate assembly onto the engine case, (Fig. #37).
- Install the two phillips and tighten so that the stator plate is secured with the two screws midway in the elongated holes.
- Slide the coil wire rubber guide into its' slot ensuring that the wires do not interfere with the free movement of the flywheel, (Fig. #37).

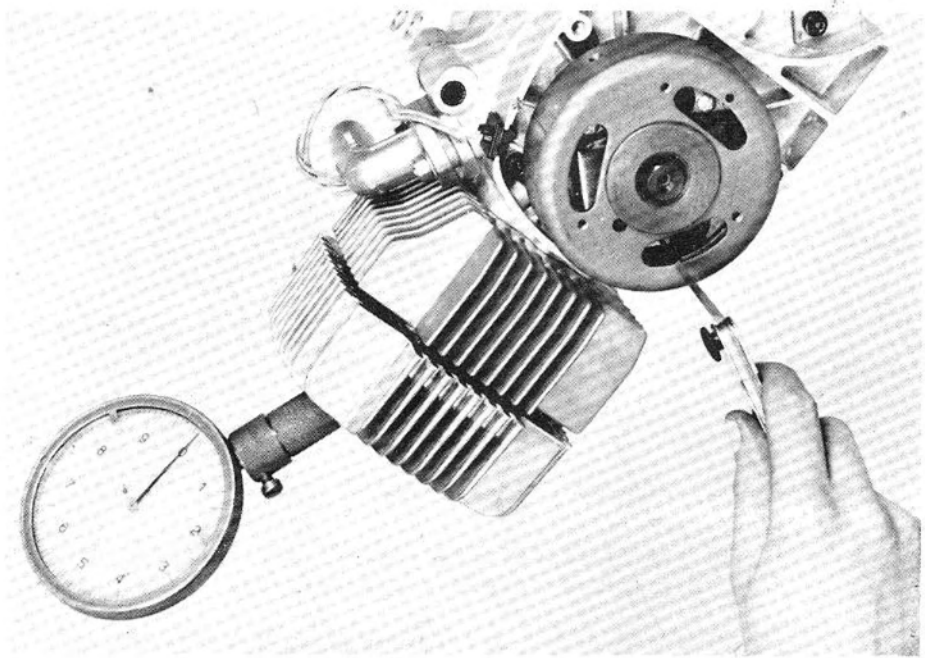
Fig. #37



ENGINE REASSEMBLY

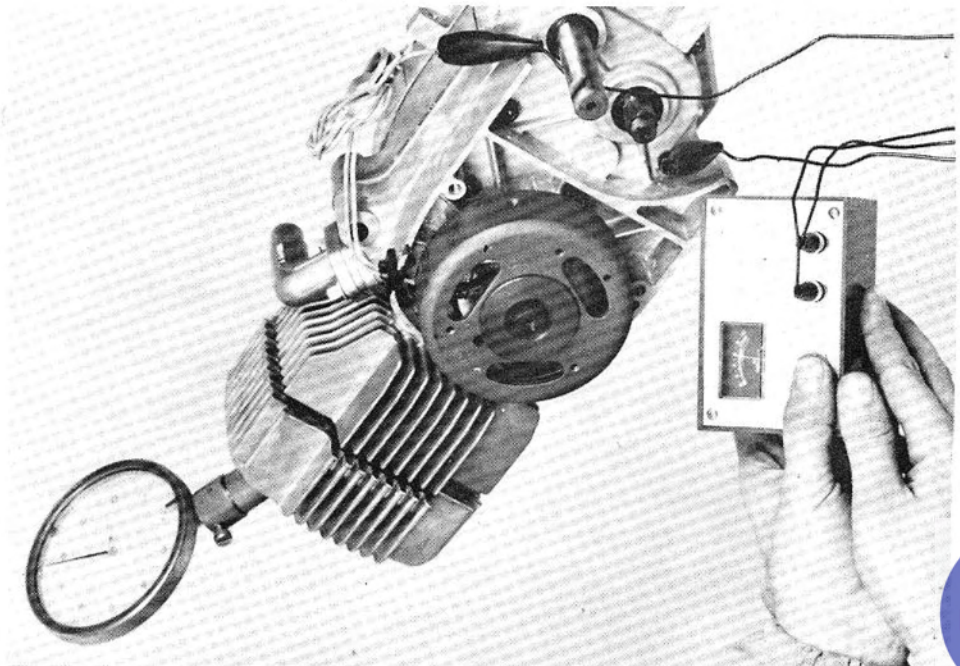
- Install the flywheel onto the crankshaft to check and adjust, if necessary, the ignition point gap. The ignition point gap should be 0.35MM to 0.40MM. If the point gap is incorrect loosen the ignition point holddown screw and adjust to the correct gap setting, (Fig. #38).

Fig. #38



The precise moment of ignition timing can be checked by using a dial indicator and a test light, Ohm meter or buzzy box. (Fig. #39).

Fig. #39



IGNITION TIMING

Viewing the engine from the magneto side, the crankshaft rotates counter-clockwise when running. The magneto flywheel has two reference lines scribed into it.

The first reference line when rotating the flywheel counter-clockwise represents the ignition firing mark or the precise moment the ignition points should just begin to open, (2.1 - 2.3MM B.T.D.C.).

The second reference line when rotating the flywheel counter-clockwise represents top dead center, (T.D.C.).

Both reference lines on the flywheel have a fixed reference point in the shape of a "V" which is located on the engine crankcase, (Fig. #40).

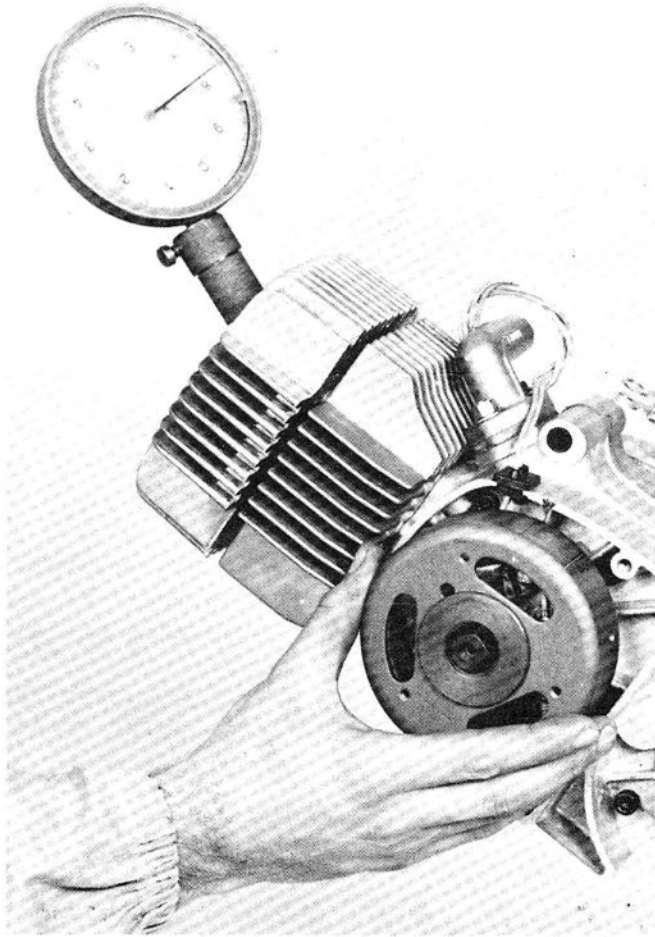


Fig. #40

To check the ignition timing, perform the following steps in order.

- Set the ignition point gap to 0.35 - 0.40MM, (feeler guage), (Fig. #38).
- Connect an ohm meter, timing light or buzzy box to the red magneto wire and to ground, (Fig. #39).
- Rotate the magneto counter-clockwise while watching your tester. When the firing reference mark on the flywheel aligns with the fixed "V" reference point on the engine case the points should just begin to break contact. Your ohm meter, timing light or buzzy box should verify this by registering an open circuit.

NOTE: It is recommended that a dial indicator be used to verify the exact position of the piston in relationship to top dead center, (Fig. #39).

ADJUSTING IGNITION TIMING

To adjust the ignition timing, perform the following steps in order.

- Set the ignition point gap to 0.35 - 0.40MM, (feeler guage).
- Connect an ohm meter, timing light or buzzy box to the red magneto wire and to ground.
- Align the flywheel firing mark with the fixed "V" reference point on the engine case.
- Loosen, but do not remove, the two screws holding the stator plate to the engine, (Phillips screwdriver).
- Using your fingers, reach through the flywheel and rotate the stator plate until your meter indicates the points are just opening while the firing mark and the fixed "V" reference mark are aligned.

NOTE: To retard the timing rotate the stator plate in the direction of flywheel rotation. To advance the timing rotate the stator plate opposite flywheel rotation.

- Tighten the two screws holding the stator plate to the engine taking care not to shift the stator plate while tightening.
- Recheck the engine timing by rotating the flywheel one full turn counter-clockwise. As the firing mark on the flywheel aligns with the fixed "V" reference mark on the engine the ignition points should just begin to open.

- Reinstall the left engine cover and gasket and tighten the two Allen head bolts, (5MM Allen wrench).

SPARK PLUG

Spark Plug Gap: 0.5 - 0.6MM
 Spark Plug Heat Range: 225°C.
 Spark Plug Type: Autolite - AG32A
 Champion - N-9Y
 Bosch - W7D
 AC - 43XLS
 NGK - BP6ES

COUNTERSHAFT SPROCKET INSTALLATION

- Install the countershaft sprocket onto the countershaft.
- Hold the countershaft sprocket stationary by using the special tool (Part #14-0507), (Fig. #41).
- Fit the washer and nut and tighten to a torque of 3.5 - 4.0 Kgm, (25.3 - 28.9 Ft/Lbs), (Fig. #41).

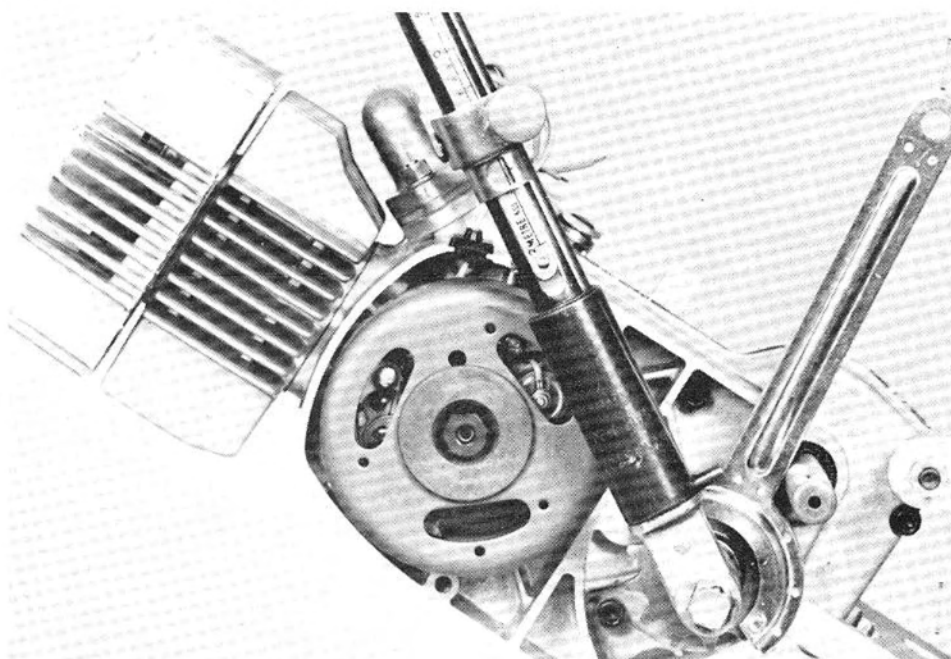


Fig. #41

REFILLING THE TRANSMISSION

- Reinstall the oil drain plug and gasket.
- Refill transmission with a 20 weight SAE non synthetic oil. "DO NOT USE AUTOMOTIVE TRANSMISSION OIL".

Transmission capacity = 11 oz.

TROUBLE SHOOTING GUIDE

M1 - REED VALVE

HELPFUL HINTS:

When trouble shooting electrical components, the quickest and easiest method is substitution.

- A) Make sure that the part being used in the substitution is known to be good.
- B) When a parts substitution is made and the problem is not solved, leave the newly substituted part in the system until the problem is found. Then, back track one component at a time. This method will enable you to more effectively trouble shoot a machine which may have multiple problems.

ENGINE

I. ENGINE WILL NOT START

- A) Check for spark at spark plug.
- B) Check for flow restrictions in the fuel system.
- C) Check engine compression with the spark plug installed.
- D) Check to see if the engine stop switch is in the "run" position.
- E) Check Reed Valve.

II. NO SPARK

- A) Faulty spark plug.
- B) Faulty radio suppressor (spark plug cover).
- C) Faulty high tension coil.
- D) Faulty ignition points and condenser.
- E) Ignition points not opening.
- F) Grounding wire inside the magneto.
- G) Magneto wiring harness burnt or broken.
- H) Poor magnetism present in rotor.
- I) Faulty exciter coil inside magneto.
- J) Wiring or ground problem in brake light circuit.

III. GOOD IGNITION SPARK, BUT THE ENGINE WILL NOT START

- A) Restriction of fuel flow (Ex. fuel tap, fuel tank, fuel line, carburetor).
- B) Faulty head gasket.
- C) Ignition timing incorrectly set.
- D) Faulty intake manifold gasket.
- E) Exhaust port and exhaust pipe clogged.
- F) Worn Reed Valve

TROUBLE SHOOTING GUIDE

M1 - REED VALVE

IV. ENGINE RUNS, BUT HAS A HIGH SPEED MISS

- A) Faulty or worn spark plug.
- B) Improper ignition timing.
- C) Faulty radio suppressor.
- D) Faulty high tension coil.
- E) Faulty or worn ignition points and condenser.
- F) Faulty head gasket.
- G) Air leak between intake manifold and crankcase.
- H) Exhaust system clogged.

V. ENGINE RUNS, BUT HAS LOW SPEED MISS

- A) Improper spark plug.
- B) Improper ignition timing.
- C) Faulty or worn out ignition points and condenser.
- D) Faulty radio suppressor (spark plug cover).
- E) Magneto rotor rubbing on internal coils.

VI. ENGINE POPS AND BACKFIRES WHEN TRYING TO START

- A) Ignition timing improperly set.
- B) Faulty cylinder head gasket.
- C) Faulty ignition points or condenser.

VII. DIFFICULT TO START WHEN COLD

- A) Carburetor choke plate not functioning sufficiently.
- B) Improper ignition timing.

VIII. DIFFICULT TO START WHEN WARM

- A) Improper ignition timing.
- B) Worn out spark plug.
- C) Exhaust system clogged.
- D) Faulty ignition points and condenser.

IX. EXCESSIVE FUEL CONSUMPTION

- A) Engine is not broken in (600 miles).
- B) Carburetor choke plate stuck in closed position.
- C) Carburetor flooding (sticky float).
- D) Leakage in fuel line.

TROUBLE SHOOTING GUIDE

M1 - REED VALVE

X. ENGINE HAS NO POWER

- A) Improper ignition timing.
- B) Clogged exhaust port or pipe.
- C) Fuel Restriction.
- D) Worn out piston rings or engine seals.
- E) Engine partially seized.
- F) Moped chain adjusted too tight.
- G) Brakes adjusted too tight.
- H) Worn Reed Valve

XI. THE ENGINE WILL RUN ONLY IF THE CHOKE IS USED

- A) Clogged fuel jet in carburetor.
- B) Clogged fuel line.
- C) Clogged fuel filter in carburetor or gas tank.
- D) Clogged filler cap vent hole.
- E) Loose or cracked intake manifold and gasket.
- F) Loose carburetor.
- G) Worn engine seals.

XII. ENGINE WILL RUN BUT WON'T IDLE

- A) Idle circuit in carburetor clogged.
- B) Idle screw not adjusted correctly.
- C) Air leak at carburetor or intake manifold mounts.
- D) Worn engine seals.

XIII. ENGINE SEIZED OR STARTS KNOCKING

- A) Insufficient oil in fuel mixture.
- B) Connecting rod looseness on crankshaft.
- C) Loose magnet in flywheel.
- D) Piston seized to cylinder.

POOR ENGINE PERFORMANCE

Very often poor engine performance may not be related to the engine itself, but to one or several frequently unsuspected secondary causes.

In such case, we suggest the following:

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Make sure that the throttle slide opens fully. Quite often the control is badly adjusted and the engine is starved even at full throttle position.

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TROUBLE SHOOTING GUIDE

M1 - REED VALVE

2. Check that there is no braking action due to chain being too tight. Tension adjustment must be performed in the running position, the machine loaded with a rider weighing about 165 lbs.
3. Make sure the brakes are not adjusted too tightly.
4. Check that the fuel cap vent hole is not clogged as this may bring about poor fuel supply.
5. Check that the spark plug is in accordance with the manufacturer's specifications.
6. Check that the exhaust is neither partially blocked nor blocked. If this is the case, clean out the complete exhaust system.
7. Very important note: Quite often poor engine performance may be caused by overtightening the cylinder head nuts and thereby distorting the cylinder.

LIGHTING CIRCUIT

I. NO LIGHTS AT ALL

- A) Faulty headlamp switch.
- B) Faulty lighting coil or coil ground.
- C) Magneto harness burnt or grounding behind engine.
- D) Wiring harness connector disconnected.
- E) Improper wire connections.
- F) Blown bulbs.

II. NO BRAKE LIGHTS

- A) Faulty brake light switch.
- B) Faulty ground at rear fender.
- C) Blown bulb.

III. DIM LIGHTS AND NO HORN WHEN HEADLAMP SWITCH IS ON

- A) Faulty lighting coil.
- B) Incorrect bulbs.

TROUBLE SHOOTING GUIDE

M1 - REED VALVE

IV. EXCESSIVE LIGHT CAUSING LAMP BURNOUT

- A) Incorrect bulbs.
- B) Faulty lighting coil.

V. NO HORN

- A) Faulty horn unit.
- B) Faulty horn switch.
- C) Faulty horn wires or connections.