

SHOP MANUAL



KZ 400

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KZ400D(1974~1977)

KZ400S(1975~1977)



KZ 400

Foreword

This manual is designed primarily for use by motorcycle mechanics in a properly equipped shop although it contains enough detail and basic information to make it useful to the motorcycle user who desires to carry out his own basic maintenance and repair work. Since a certain basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily, the adjustments, maintenance, and repair should be carried out only by qualified mechanics whenever the owner has insufficient experience or has doubts as to his ability to do the work so that the motorcycle can be operated safely.

In order to perform the work efficiently and to avoid costly mistakes, the mechanic should read the text, thoroughly familiarizing himself with the procedures before starting work, and then do the work carefully in a clean area. Whenever special tools or equipment is specified, makeshift tools or equipment should not be used. Precision measurements can only be made if the proper instruments are used, and the use of substitute tools may adversely affect safe operation of the motorcycle.

This manual is divided into the following four sections:

(1) Adjustment

The adjustment section gives the procedure for all adjustments which may become necessary periodically and which do not involve major disassembly.

(2) Disassembly

This section shows the best method for the removal, disassembly, assembly, and installation which are necessary for maintenance and repair. Since assembly and installation are usually the reverse of disassembly and removal, assembly and installation are not explained in detail in some cases. Instead, assembly notes and installation notes are provided to explain special points.

(3) Maintenance and Theory of Operation

The procedures for inspection and repair are described in detail in this section. An explanation of the structure and functioning of each of the major parts and assemblies is given to enable the mechanic to understand better what he is doing.

(4) Appendix

The appendix in the back of this manual contains miscellaneous information, including a special tool list, a torque table, a table for periodic maintenance, and a troubleshooting guide.

Since this Shop Manual is based on units of the KZ400 presently on the market, there may be minor discrepancies between some vehicles and the illustrations and text in this manual. Major changes and additions pertaining to later year units will be explained in a supplement following the appendix or by a new edition.

Places marked with an asterisk (*) indicate where the latest revisions or additions have been made in the text.



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Specifications

		KZ400D	KZ400S
Dimension			
Overall length	US	2,080 mm	*
Overall width	US	810 mm	790 mm
	European	775 mm	—
Overall height	US	1,120 mm	1,100 mm
	European	1,050 mm	—
Wheelbase	US	1,360 mm	*
	European	1,370 mm	—
Road clearance		125 mm	*
Dry weight		170 kg	166 kg
Fuel tank capacity		14 ℓ	*
Performance			
SS ¼ mile (0~400 m)	US	14.4 sec	14.9 sec
	European	14.6 sec	—
Climbing ability		24°	*
Braking distance		13.5 m @50 kph	*
Minimum turning radius		2.3 m	*
Engine			
Type		SOHC 2 cylinder, 4 stroke, air-cooled	*
Bore and stroke		64 x 62 mm	*
Displacement		398 cc	*
Compression ratio		9.4 : 1	*
Maximum horsepower	US	36 HP @8,500 rpm	34 HP
			@8,500 rpm
Maximum torque	US	3.3 kg-m @7,500 rpm	3.1 kg-m
			@7,500 rpm
Valve timing			
Inlet	Open	26° BTDC	*
	Close	74° ABDC	*
	Duration	280° Total	*
Exhaust	Open	68.5° BBDC	*
	Close	31.5° ATDC	*
	Duration	280° Total	*
Carburetors		Keihin VB32 x 2	*
Lubrication system		Forced lubrication (wet sump)	*
Engine oil		SE class SAE 10W40, 10W50, 20W40, or 20W50	*
Engine oil capacity	Less filter	2.6 ℓ	*
	Total incl. filter	3.0 ℓ	*
Starting system		Electric and kick	Kick
Ignition system		Battery and coil	*
Ignition timing		From 10° BTDC @1,100 rpm to 40° BTDC @2,800 rpm	*
Spark plugs		ND W24ES or NGK B8ES	*
Transmission			
Type		5-speed, constant mesh, return shift	*
Clutch		Wet, multi disc	*
Gear ratio: 1st		2.571 (36/14)	*
2nd		1.684 (32/19)	*
3rd		1.273 (28/22)	*
4th		1.040 (26/25)	*
5th		0.889 (24/27)	*

6 SPECIFICATIONS

		KZ400D	KZ400S
Primary reduction ratio		2.435 (56/23)	*
Final reduction ratio	US ①	3.000 (45/15)	*
	European	2.933 (44/15)	
Overall drive ratio	US ①	6.493 (5th)	*
	European	6.348 (5th)	
Electrical Equipment			
Generator (Dynamo)		Nippon Denso 021000-3560	*
Regulator		Nippon Denso 026000-2490	*
Ignition coil		Nippon Denso 029700-3430	*
Battery		Yuasa 12N 12A-4A-1 (12V 12AH)	Furukawa 12N 5.5-4A (12V 5.5AH)
Starter		Mitsuba SM242	—
Headlight type	US	Seald beam	*
	European	Semi-sealed	
Headlight	US	12V 50/35W	*
	European	12V 35/35W ⑤ 12V 36/36W	
Tail/Brake light	US	12V 8/27W	*
	European	12V 5/21W	
Speedometer light		12V 3.4W x 2	*
Tachometer light		12V 3.4W x 2	*
Neutral indicator light		12V 3.4W	*
High beam indicator light		12V 1.7W	*
Turn signal lights	US	12V 23W x 4	*
	European	12V 21W x 4	
Turn signal indicator light		12V 3.4W	*
Oil pressure indicator light		12V 3.4W	*
Brake light failure indicator light		12V 3.4W	*
Horn		12V 2.5A	*
City light	European	12V 4W	
Frame			
Type		Tubular, double-cradle	*
Steering angle		41° to either side	*
Castor		27°	*
Trail		102 mm	*
Tire size	Front	3.25S-18 4PR, ribbed tread	*
	Rear	3.50S-18 4PR, universal tread	*
Suspension	Front	Telescopic fork	*
	Rear	Swing arm	*
Suspension stroke	Front	135 mm	*
	Rear	80 mm	*
Front fork oil capacity (each fork)		155 ~ 165 cc	161 ~ 166 cc
Front fork oil type		SAE 5W20	*
Brakes			
Type	Front	Disc brake	Internal expansion, two leading
	Rear	Interbal expansion, leading-trailing	*
Brake drum inside dia. and width	Front	—	180 x 30 mm
	Rear	180 x 30 mm	*
Disc diameter		277 mm	

* : Identical to KZ400D

⑤ : France

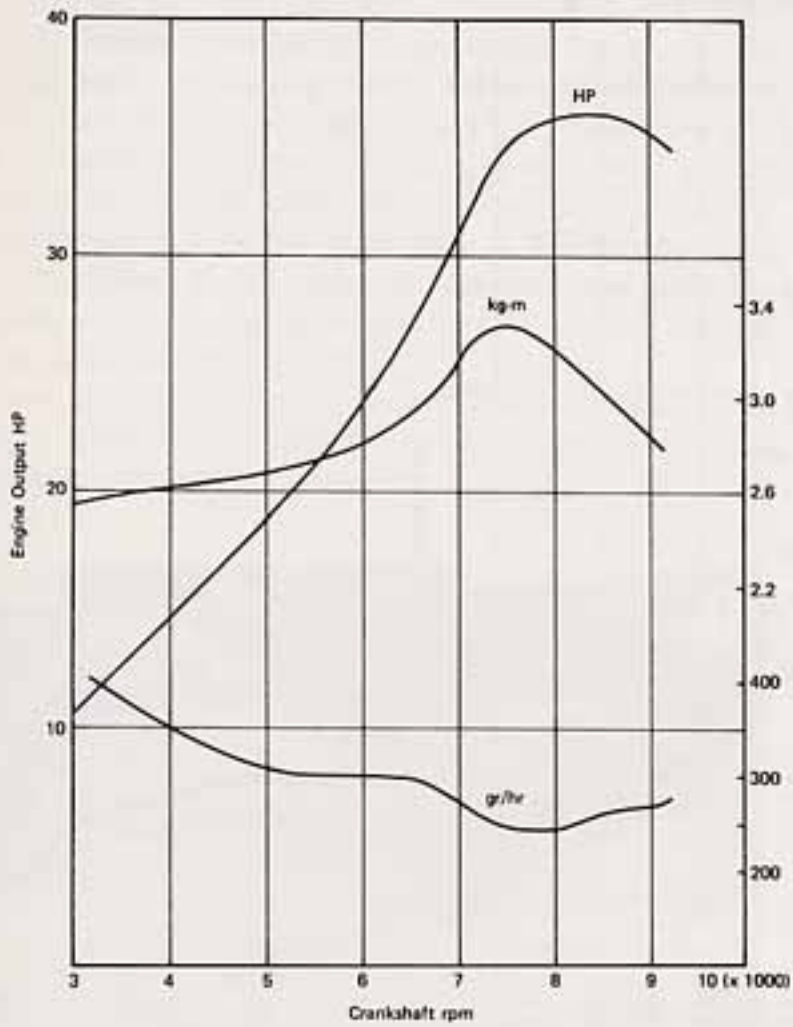
① : Italy

Specifications subject to change without notice, and may not apply to every country.

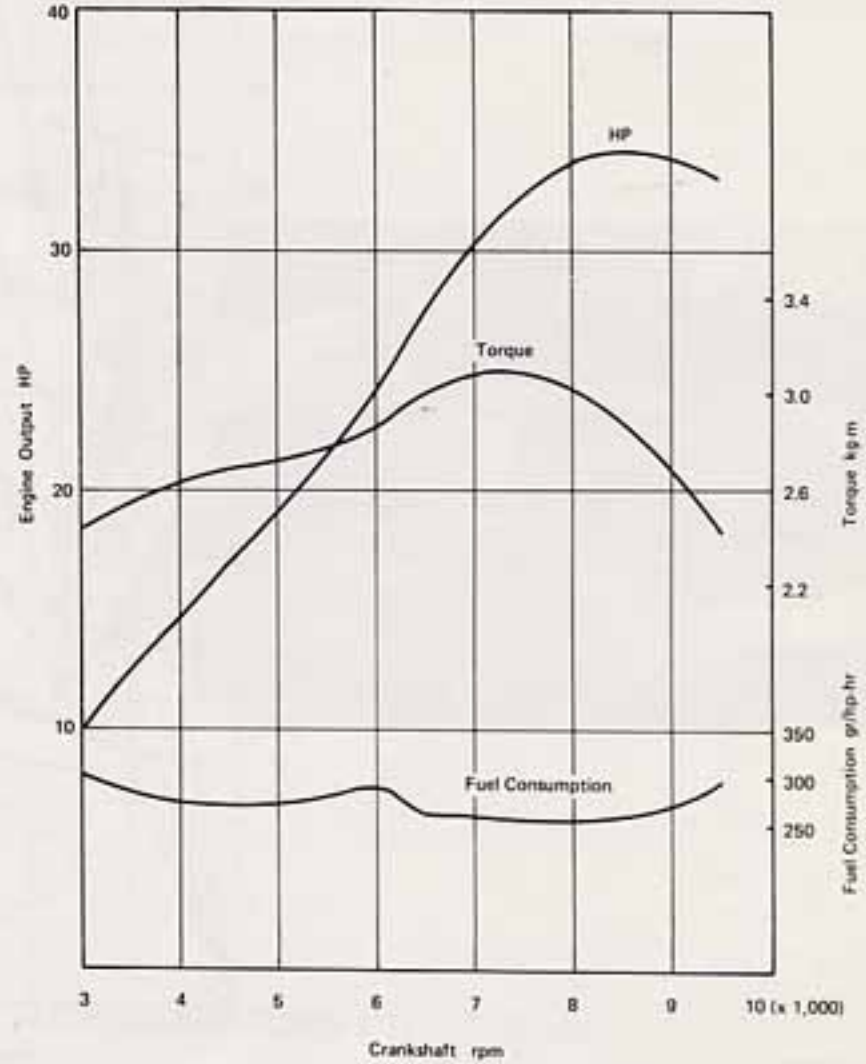
Engine Performance Curves

US model

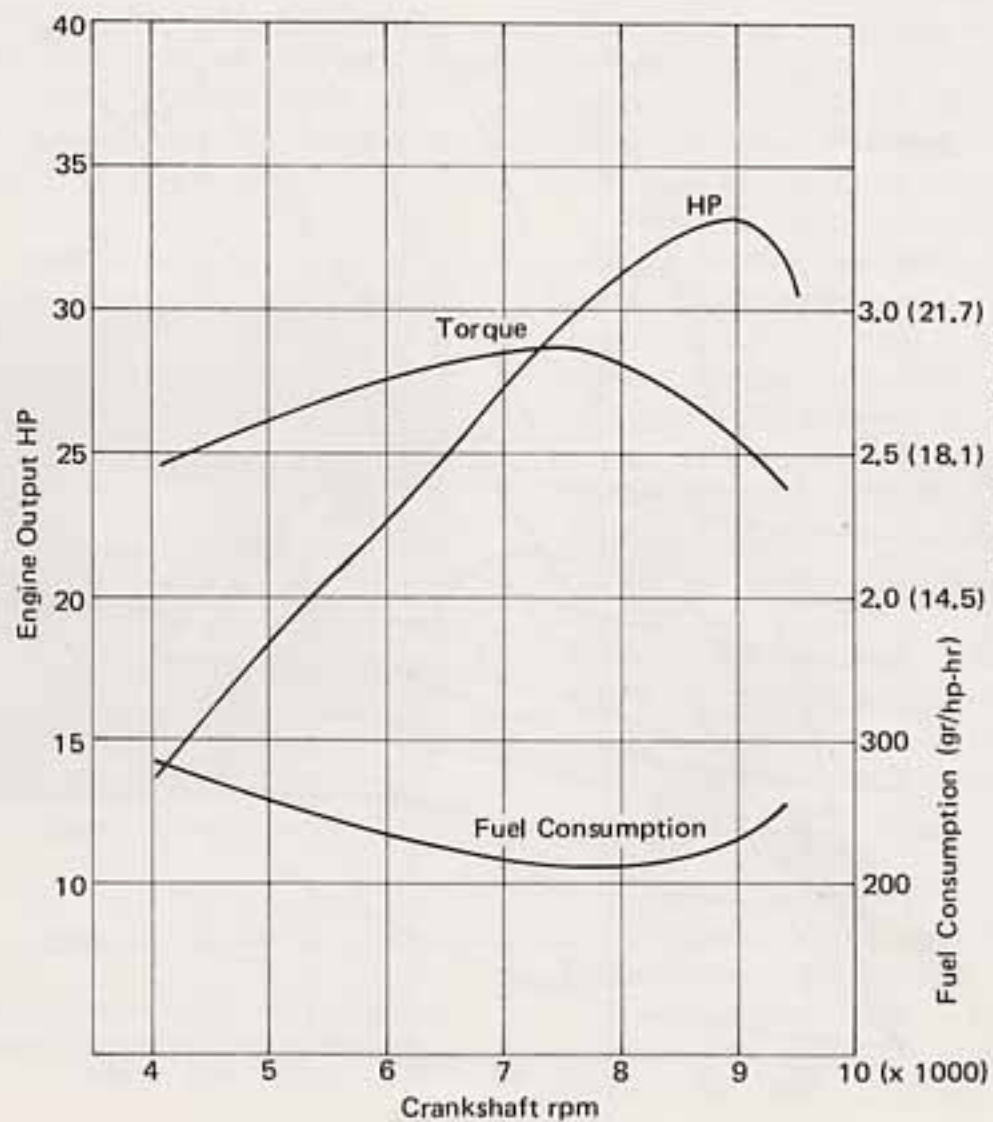
KZ400D



KZ400S

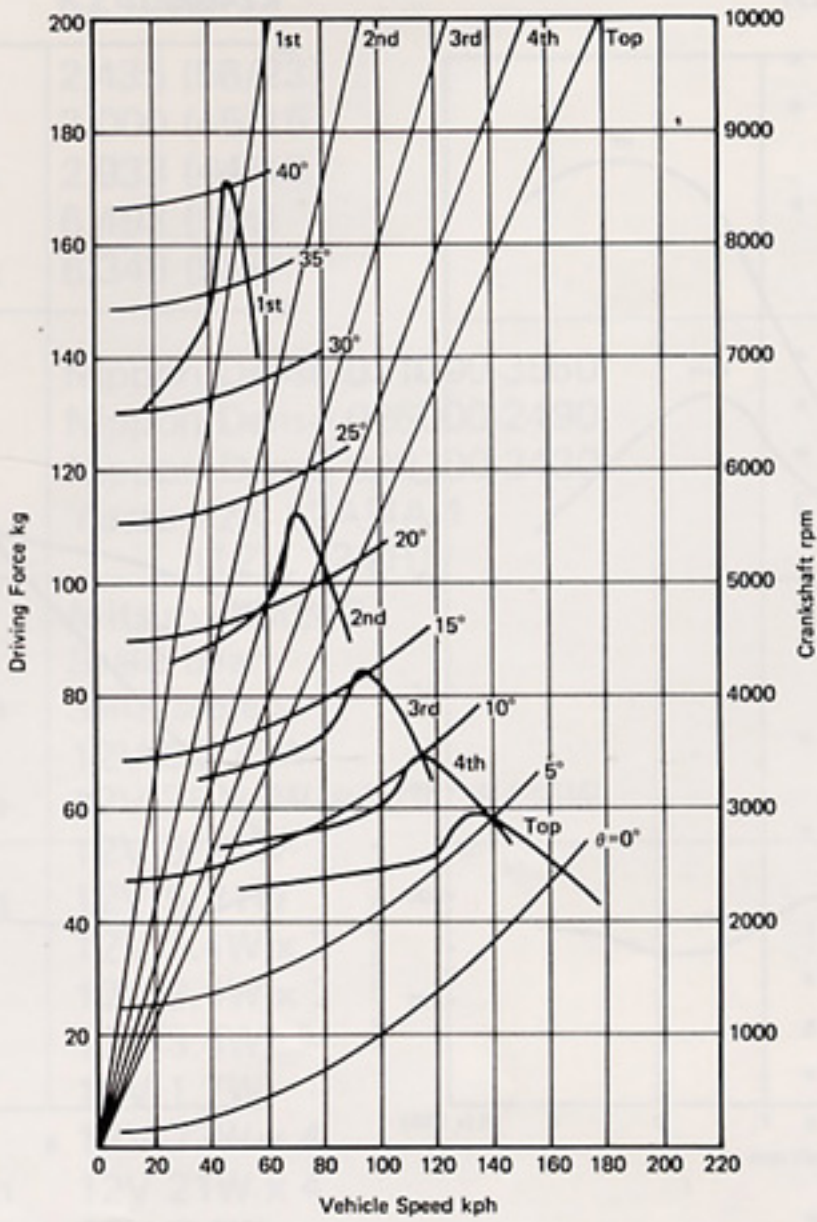


European model

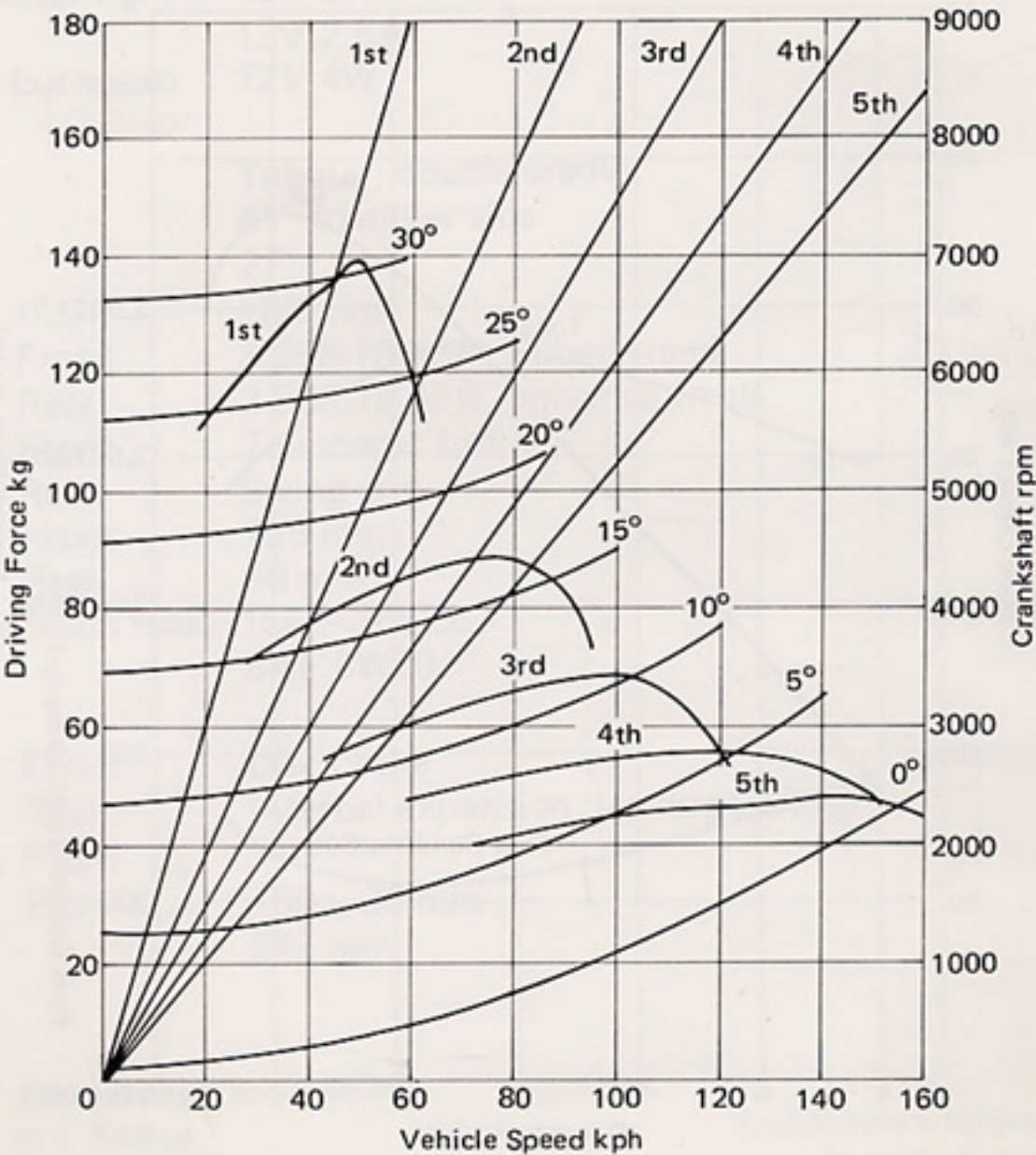


Running Performance Curves

US model



European model

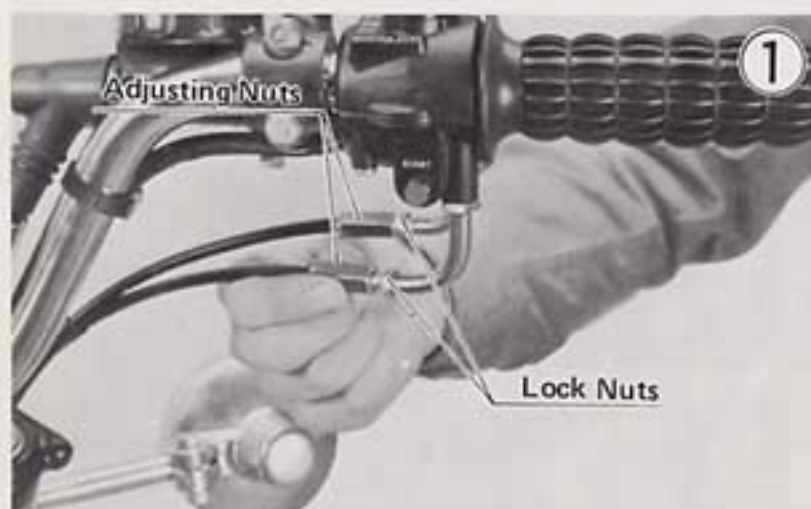


Adjustment

THROTTLE CABLES

There are two throttle cables, the accelerator throttle cable for opening the butterfly valves and the decelerator throttle cable for closing them. If the cable adjustment is too loose from either cable stretch or maladjustment, the excessive play in the throttle grip will mean a delay in throttle response, especially at low rpm. Also, the butterfly valves may not open fully at full throttle. On the other hand, if the cable adjustment is too tight, the throttle will be too sensitive and hard to control, and the idling speed will be too high.

- Screw in fully the lock nuts and adjusting nuts at the upper end of the throttle cables so as to give the throttle grip plenty of play.



- Turn back the decelerator throttle cable adjusting nut 3 turns. There must still be play in the throttle grip; if there is not, loosen the lock nut at the lower end of the decelerator throttle cable, turn the adjuster to create a small amount of play, and retighten the lock nut.



- Turn back the accelerator throttle cable adjusting nut until just where the throttle grip play is virtually gone, and tighten the lock nut.

- Turn in the decelerator throttle cable adjusting nut until the desired amount of throttle grip play is obtained. Tighten the lock nut.



CARBURETORS ('74~'77 Model)

Although some internal carburetor parts can be adjusted by replacement, repositioning, etc., these adjustments are covered in the Maintenance Section of this manual. The following procedure covers the idling adjustment, which is the adjustment necessary in periodic maintenance and whenever the idling setting has been disturbed. This procedure also includes the necessary steps for obtaining proper carburetor synchronization.

When the idling speed is too low, the engine may stall, and when the idling speed is too high, the fuel consumption becomes excessive, and a resulting lack of engine brake may make the motorcycle difficult to control. Poor carburetor synchronization will cause unstable idling, sluggish throttle response, and reduced engine power and performance.

The following procedure consists of four parts: preliminary checks, preliminary adjustment (sometimes necessary), idling adjustment, and carburetor synchronization.

Preliminary Checks

- In order to obtain correct idling adjustment, first check and then correct, if necessary, the following:
 - Valve clearance (Pg. 14)
 - Engine oil (Pg. 181)
 - Spark plugs (Pg. 12)
 - Ignition timing (Pg. 12)
 - Cylinder compression (Pg. 114)

Preliminary Adjustment

If the engine idling is especially rough, it may be necessary to make the following adjustment before making the idling adjustment:

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- With the carburetors removed (Pg. 28, cable removal not necessary), change the position of the pulley stop screw if necessary so that the pulley rotation is stopped at the point where the butterfly valves are parallel to the carburetor bore. Tighten the lock nut after alteration of the screw position.



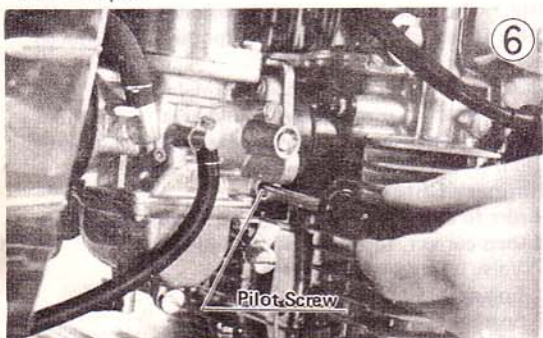
- Install the carburetors (Pg. 29), and check the throttle grip play (Pg. 9).

Idling Adjustment

- Start the engine, and warm it up for 5 minutes.
- Back out the idling screw until the engine is at the lowest rpm that it turns over smoothly.



- Turn both pilot screws to where engine rpm is highest. In this time, pilot screw opening is $1\frac{1}{2}$ turns from 0 throttle open.



- Adjust idling speed to 1,100 ~ 1,300 rpm by turning the idling screw.
- See if the engine rpm rises when the pilot screw positions are altered. If it rises, repeat the last three steps.

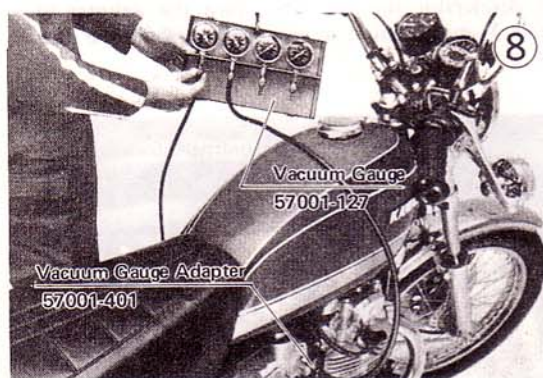
- Screw in each pilot screw $1/16$ turn after the highest idle position has been determined.
 - Turn the throttle grip a few times to make sure that the idling speed does not change. Readjust if necessary.
- NOTE:** With the engine idling, turn the handlebar to either side. If handlebar movement changes idling speed, then the throttle cables may be improperly adjusted or incorrectly routed, or else they may be damaged. If cable adjustment does not clear up the problem, find the cause and repair it.

Carburetor Synchronization

- Remove the vacuum plugs from each carburetor, and attach the vacuum gauge and adapter (special tools).



- With the engine running at idling speed, close down the vacuum gauge intake valves until gauge needle flutter is less than 3 cm Hg. Normal vacuum gauge reading is 22 ~ 27 cm Hg.



- If there is a difference of more than 1 cm Hg between the two gauges, stop the engine, remove the fuel tank (Pg. 28), and use the balance adjuster (special tool) on the balance adjusting screw to alter screw position to where the difference in readings is below 1 cm Hg. Run the engine with the fuel left in the float bowls. When the screw is properly positioned, tighten the lock nut, stop the engine, and install the fuel tank (Pg. 28).



- With the engine running, turn both pilot screws so that the vacuum gauge reading is 22~27 cm Hg, and then turn each pilot screw in 1/16 turn.
- Detach the vacuum gauges, and screw in the vacuum plugs.
- Adjust the idling speed to 1,100~1,300 rpm with the idling screw.

If a set of vacuum gauges is not available, carry out the following steps for carburetor synchronization.

- Listen to exhaust noise, and place your hands at the rear of the mufflers to feel exhaust pressure.



- If there is a difference in noise or exhaust pressure between the cylinders, stop the engine, remove the fuel tank (Pg. 28), and use the balance adjuster (special tool) on the balance adjusting screw to alter screw position to where the difference is minimized. Run the engine with the fuel left in the float bowls. When the screw is properly positioned, tighten the lock nut, stop the engine, and install the fuel tank (Pg. 28).



- Adjust the idling speed to 1,100~1,300 rpm with the idling screw.

CLUTCH

Stretching of the clutch cable causes the clutch lever to develop excessive play. Too much play will prevent the lever from fully disengaging the clutch and will result in shifting difficulty and possible clutch or transmission damage. Most of the play must be adjusted out, but a small amount has to be left so that the clutch release lever will function properly.

Besides cable stretch, clutch plate wear also causes the clutch to go out of adjustment. This wear causes the play between the push rod and the adjusting screw gradually to diminish until the push rod touches the adjusting screw. When this play is lost, the clutch will not engage fully, causing the clutch to slip.

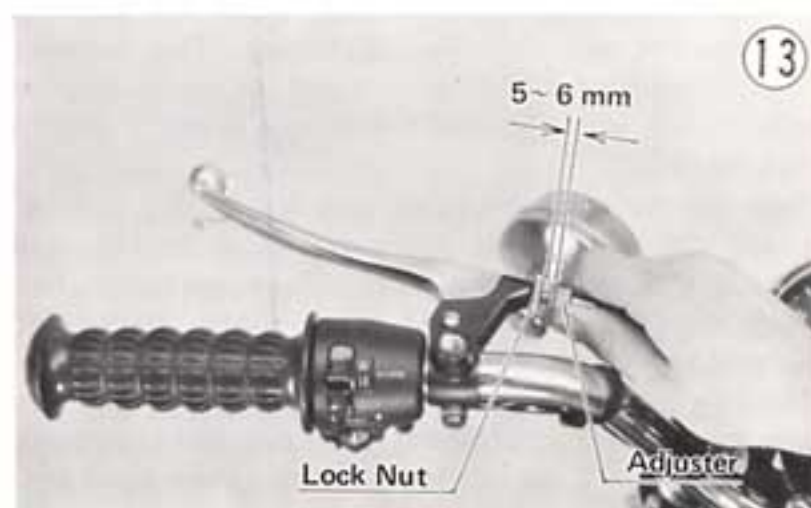
NOTE: Even though there is the proper amount of play at the clutch lever, clutch lever play alone cannot be used to determine whether or not the clutch requires adjustment.

The adjustment procedure which follows compensates for both cable stretch and plate wear.

- Slide up the dust cover off the adjusting nut at the center of the clutch cable.
- Screw in fully the lock nut and adjusting nut at the center of the clutch cable to give the cable plenty of play.

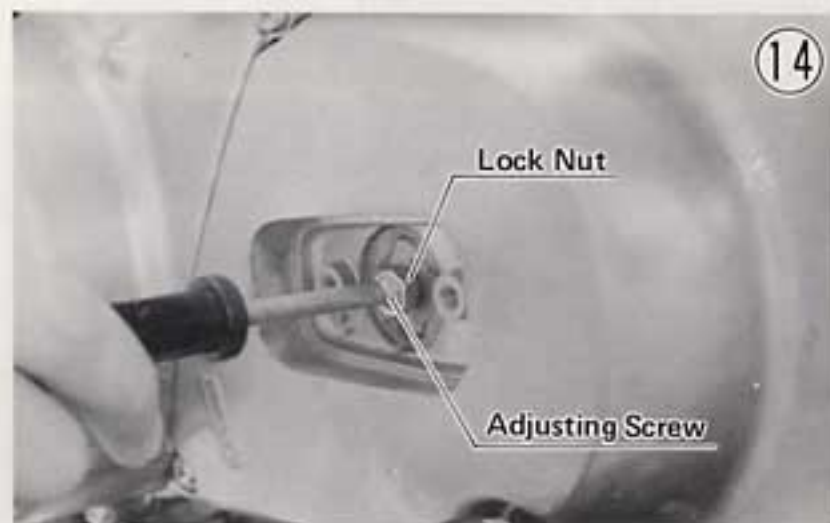


- Loosen the lock nut at the clutch lever just enough so that the adjuster will turn freely, and then turn the adjuster to make a 5~6 mm gap between the adjuster and lock nut.

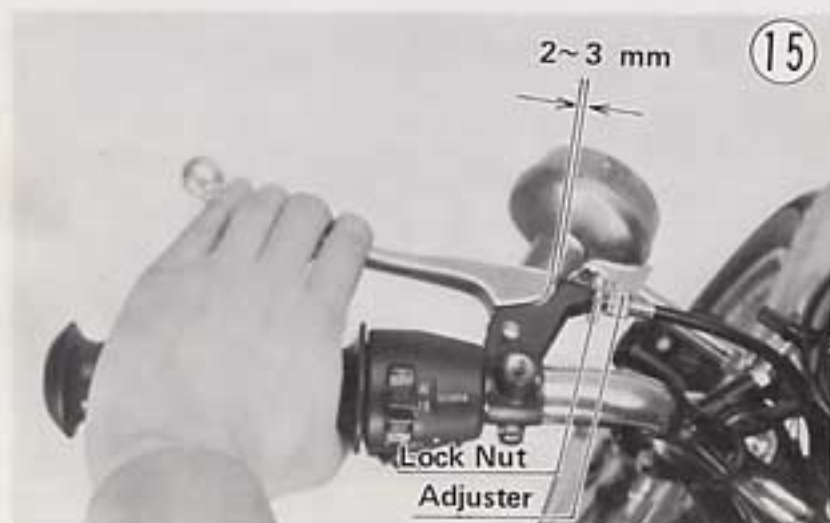


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- Remove the clutch adjusting cover.
- Loosen the lock nut, and back out the clutch adjusting screw 3 or 4 turns.



- Turn in the adjusting screw to where it becomes suddenly hard to turn. This is where the clutch begins to engage.
- Back out the adjusting screw $\frac{1}{2}$ turn from that point, and tighten the lock nut.
- Take up all the cable play with the adjusting nut at the center of the cable, and then tighten the lock nut. Slide the dust cover back down.
- Turn the adjuster at the clutch lever so that the clutch lever will have 2~3 mm of play as shown in Fig. 15, and then tighten the lock nut.

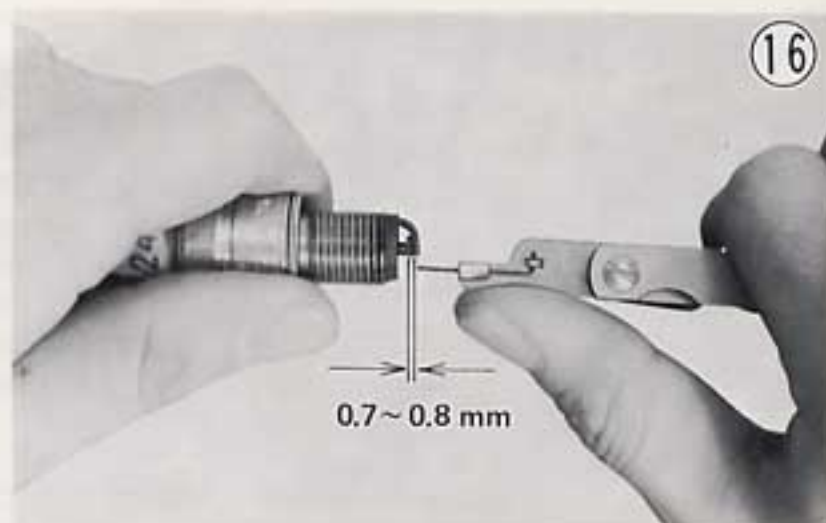


- Replace the clutch adjusting cover.

SPARK PLUGS

Spark plug electrode wear will widen the gap and cause missing and difficulty in starting. Too narrow a gap as a result of maladjustment will also result in poor performance since the small gap will produce only a weak spark.

- Remove the spark plugs using a spark plug wrench.
- Clean the spark plug preferably in a sand-blasting device, and then clean off any abrasive particles. The plug may also be cleaned using a high flash-point solvent and a wire brush or other suitable tool.
- Measure the gap with a wire-type thickness gauge. The gap should be 0.7~0.8 mm; if it is not, bend the outer electrode with a suitable tool to obtain the correct gap.



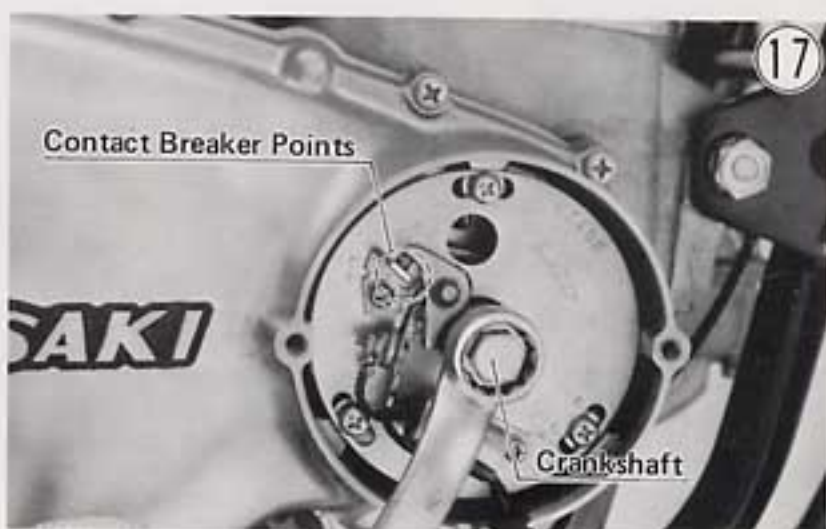
- Tighten the spark plugs into the cylinder head with 2.5~3.0 kg-m (18.5~22.0 ft-lbs) of torque.

IGNITION TIMING

Incorrect ignition timing can cause poor performance, knocking, overheating, and serious engine damage. Periodic adjustment will be necessary to compensate for wear of parts, and the ignition timing must be checked whenever ignition related parts have been disassembled or replaced.

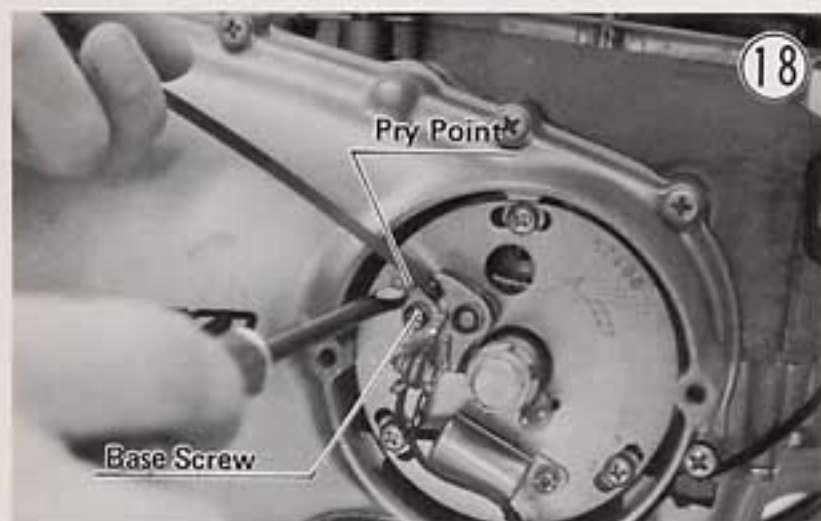
Correct ignition timing is achieved by first obtaining the correct maximum contact breaker point gap and then adjusting the position of the adjusting plate. Often the first step returns the timing very close to the correct original setting. Once the timing has been adjusted, it may be checked for accuracy by the use of a strobe light.

- Leaving the ignition switch turned off, turn the engine stop switch to one of the OFF positions.
- Remove the contact breaker cover.
- Using a 17 mm wrench on the crankshaft, turn the engine until the contact breaker points are at their widest opening.

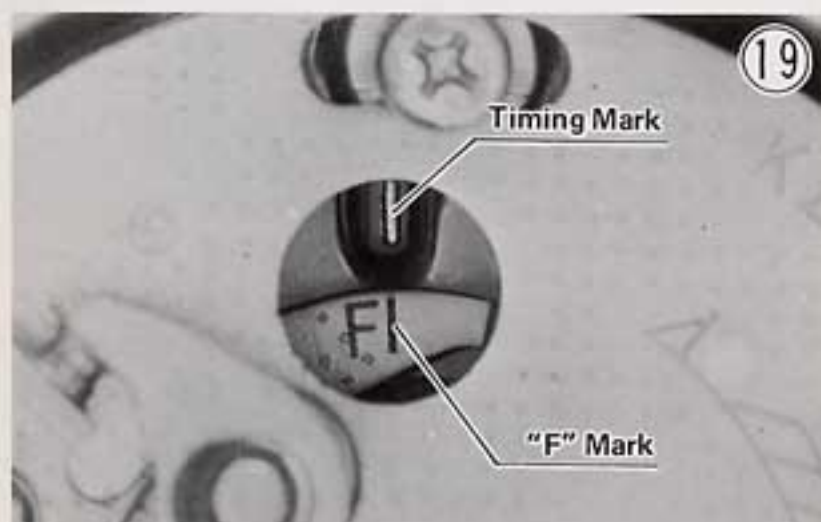


- Determine the size of the point gap with a thickness gauge. The proper gap is 0.3~0.4 mm.
- If the gap is incorrect, loosen the contact breaker base screw, open the points using a slot screwdriver on the contact breaker base pry point, and insert a blade thickness of 0.35 mm between the points. Remove the slot screwdriver, tighten the contact breaker base screw, and

remove the blade(s). Again turn the crankshaft, and recheck the maximum point gap.



- Turn the crankshaft so that the "F" mark on the timing advancer is aligned with the timing mark as shown in Fig. 19.



- Connect an ohmmeter set to the R x 1 range across the contact breaker points by securing one lead to chassis ground (such as the crankcase) and attaching or holding the other lead firmly on the contact breaker spring or to the contact breaker lead.



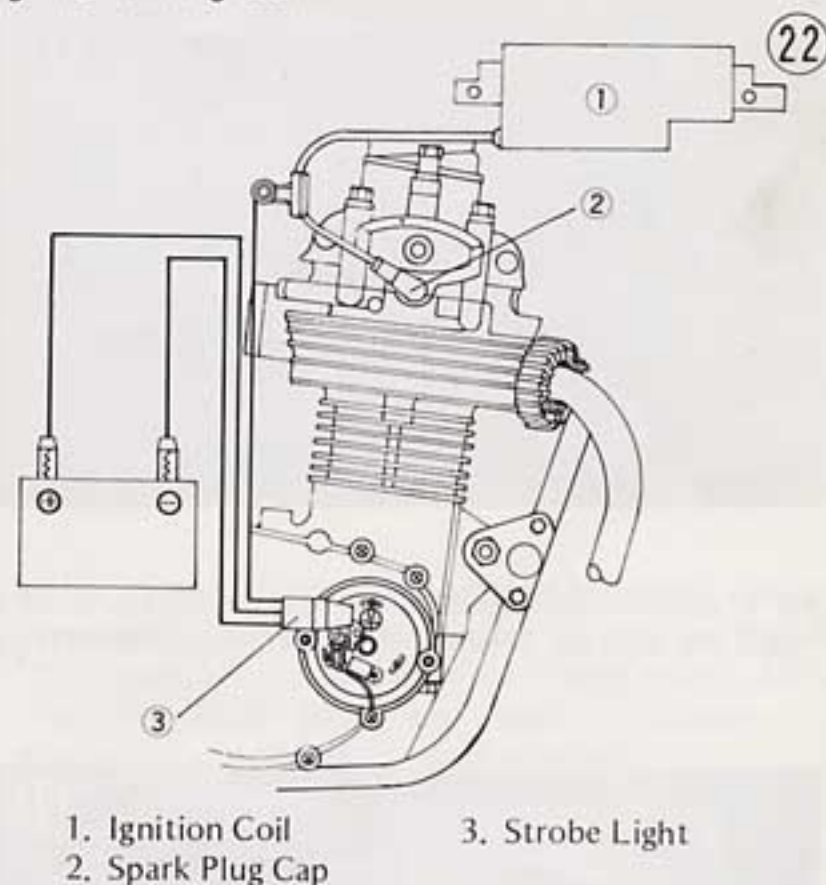
- Loosen the contact breaker plate screws (3) just enough to allow the plate to move.
- Using a screwdriver on the contact breaker plate pry point, turn the plate until the contact breaker points are just at the point of opening. The ohmmeter needle

starts to rise when the points just begin to open. At this point, tighten the contact breaker plate screws (3).



- Turning the crankshaft counterclockwise, check to see if, when the needle jumps, the "F" mark is aligned with the timing mark. If not, readjust.
- Check the point gap after ignition timing adjustment.
- Disconnect the ohmmeter leads, and turn the engine stop switch back to the RUN position.
- Connect up a strobe light in the manner prescribed by the manufacturer in order to check the ignition timing under operating conditions. One example is shown in Fig. 22.

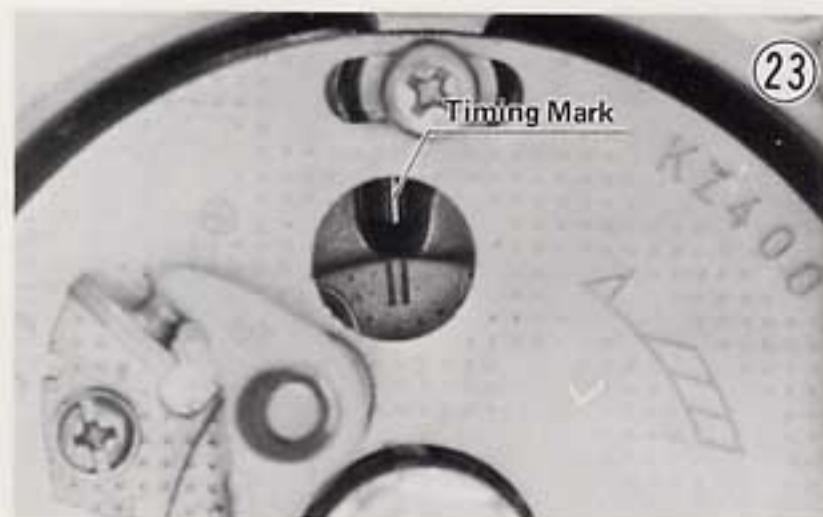
Ignition Timing Test



- Start the engine, and direct the light at the timing mark. At idling speed the timing mark and the "F" mark on the timing advancer must be aligned for correct low rpm ignition timing. At 3,000 rpm or higher the timing mark and the pair of lines on the timing advancer as shown in Fig. 23 must be aligned for correct high rpm ignition timing. If both low and high rpm ignition timing are incorrect, adjust the timing as just explained. If either low or high rpm ignition

14 ADJUSTMENT

timing is correct but the other is not, examine the timing advancer mechanism (Pg. 166).



The most precise means to set the maximum point gap is to use a dwell angle tester instead of a thickness gauge. If a dwell angle tester is used to set the gap, substitute the following steps for the first five steps in the above procedure:

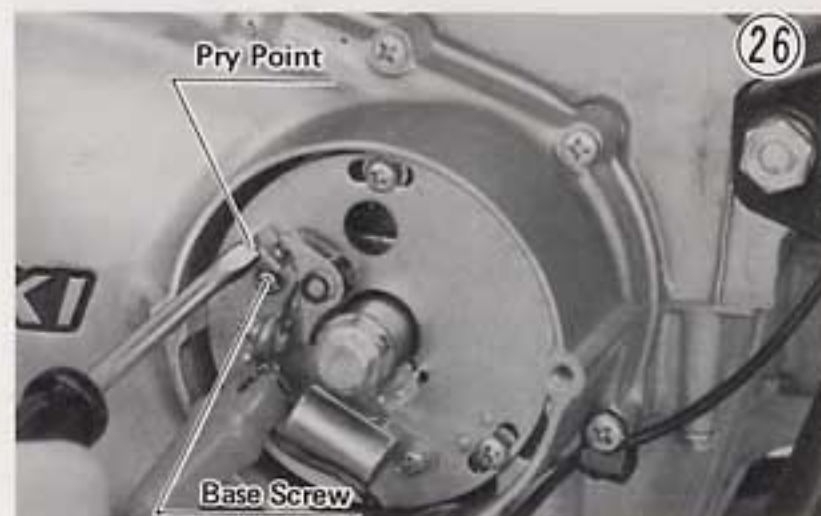
- Remove the contact breaker cover.
- Connect the dwell angle tester—lead to chassis ground (such as the frame or crankcase) and the + lead to the contact breaker spring or some exposed part of the contact breaker lead.



- If a dwell angle tester calibrated in degrees is used, turn the selector knob to the lowest cam lobe setting.



- Start the engine, and let it idle.
- Note the reading on the tester. The dwell angle specification is $185 \sim 195^\circ$ for a tester calibrated in degrees and $51 \sim 54\%$ for one calibrated in percentage. If the tester setting is for more than one cam lobe, the reading on the tester must be multiplied by the cam lobe number to obtain the correct dwell angle.
- If the dwell angle is not the same as the specification, loosen the contact breaker base screw just enough so that a slot screwdriver at the contact breaker pry point will be able to change the gap, adjust the gap until the dwell angle specification is obtained, and then tighten the screw.



- Stop the engine, disconnect the tester, and replace the contact breaker cover.
- NOTE:** The dwell angle is the angular range for which the contact breaker heel is off the cam lobe allowing the current to flow to the ignition coil primary winding.

VALVE CLEARANCE

Valve and valve seat wear decreases valve clearance, upsetting valve timing. If valve clearance is left unadjusted, the wear will eventually cause the valves to remain partly open, which lowers performance, burns the valves and valve seats, and may cause serious engine damage.

Valve clearance for each valve should be checked and, if incorrect, adjusted in accordance with the periodic maintenance chart (Pg. 180) and anytime that clearance may have been affected by disassembly.

When carrying out adjustment, be careful to adjust within the specified clearance. Adjusting to a larger value will both disturb valve timing and cause engine noise.

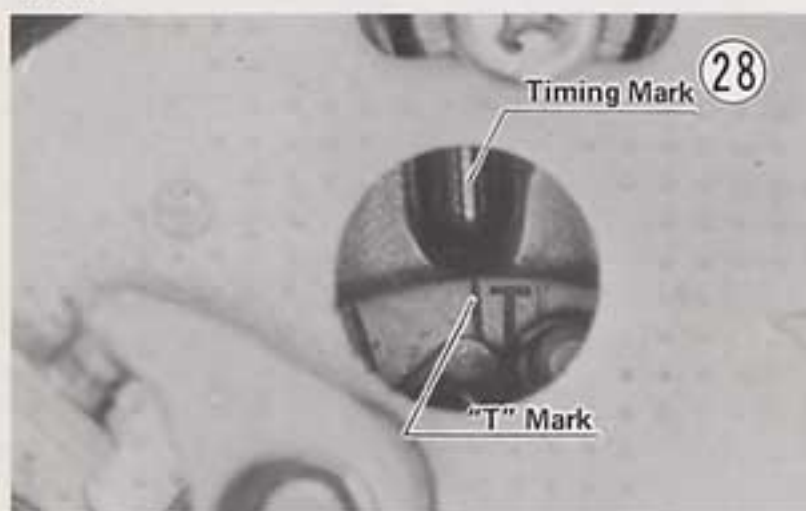
NOTE: Valve clearance must be checked when the engine is cold.

- Remove the contact breaker cover.

- Remove the valve clearance adjuster plugs (4) and the cylinder head cover caps (2).



- Using a 17 mm wrench, turn the crankshaft counterclockwise while watching the movement of the inlet valve (the valve to the rear) on the right side. When the valve has just finished opening and closing (moving downward and returning upward), turn the crankshaft in the same direction (counterclockwise) for about another $\frac{1}{4}$ turn until the "T" mark (the line adjoining the "T") on the timing advancer aligns with the timing mark.



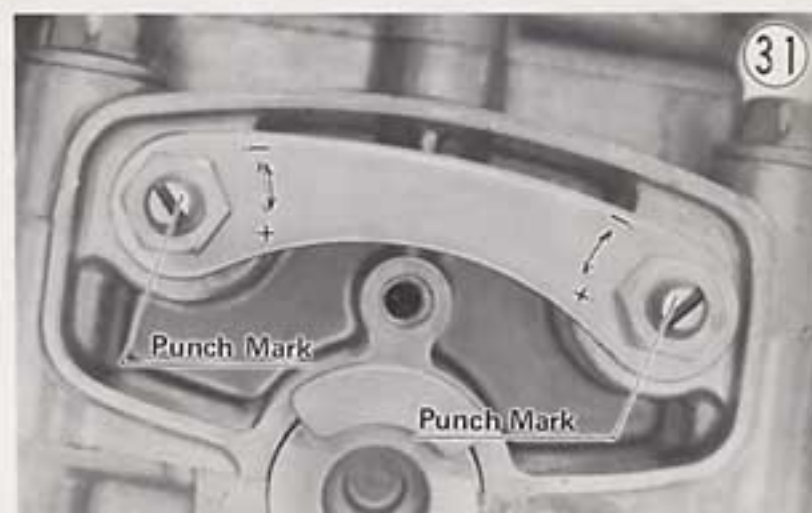
- At this crankshaft position, the piston in the right cylinder is at the end of its compression stroke such that the inlet and exhaust valve for the right cylinder can be checked for clearance and then adjusted if necessary. The correct clearance for the inlet and exhaust valves is 0.10~0.15 mm.
- Check the valve clearance by slipping a 0.13 mm thickness gauge blade between the rocker arm and the tip of the valve stem. If the clearance is correct, there will be a slight resistance as the blade is moved.



- If the valve clearance is incorrect, loosen its rocker shaft lock nut, and turn the shaft with a screwdriver towards (+) for extra clearance. Slip the thickness gauge blade between the valve and rocker arm, and turn the rocker shaft towards (-) so that the valve and rocker arm are separated only by the blade. Pull out the blade, and tighten the lock nut with 2.5 ~ 3.0 kg-m (18~22 ft-lbs) of torque while using the valve clearance adjuster (special tool) to keep the rocker shaft from turning. Recheck the clearance, and readjust if necessary.



NOTE: When adjusting valve clearances, always keep the rocker shaft punch mark on each shaft positioned inward facing the (+) (-) marks.



- After finishing with the right cylinder valves, turn the crankshaft counterclockwise one full turn so that the "T" mark again aligns with the timing mark. Check the left cylinder valves, and adjust if necessary.
- Replace the parts which were removed.

CAMSHAFT CHAIN

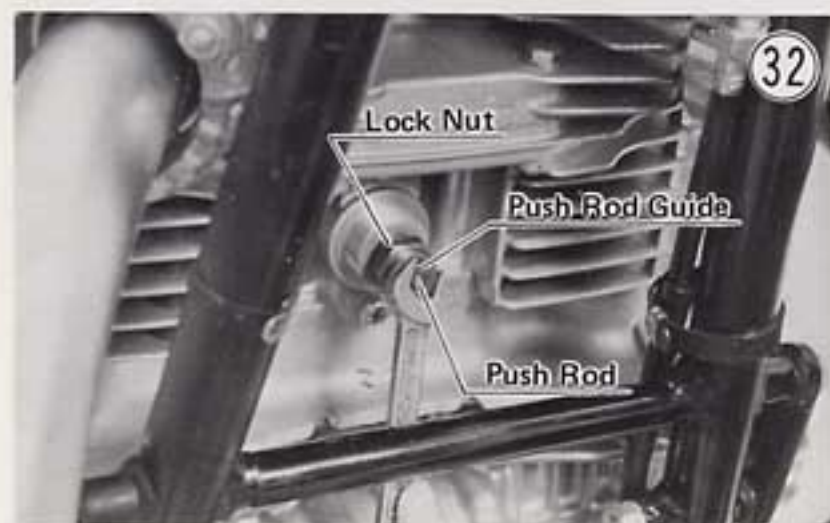
Camshaft chain and chain guide wear causes the chain to develop slack, which will cause noise and may result in engine damage. To keep the chain from making noise, periodic adjustment is necessary in accordance with the periodic maintenance chart (Pg. 180). However, if the adjustment fails to keep the chain from making noise, the chain guides have probably worn past the service limit and will need to be replaced.

16 ADJUSTMENT

- Remove the contact breaker cover.
- Remove the chain tensioner cap and O ring.
- Turn the crankshaft counterclockwise while watching the push rod (in the center of the push rod guide) move in and out. Continue turning the crankshaft counterclockwise until the push rod again reaches the inner most position, and then stop.

CAUTION: Don't turn the crankshaft backwards (clockwise). Turning the crankshaft backwards may cause improper adjustment.

- Loosen the lock nut, and screw in the push rod guide until the ends of the push rod guide and push rod are flush.



CAUTION: Be sure that the ends are flush. If the push rod guide is overtightened so that the push rod sticks out even only 0.5 mm, the tensioner or chain may become damaged.

- Tighten the lock nut, and replace the chain tensioner cap and O ring.
- Replace the contact breaker cover.

STEERING

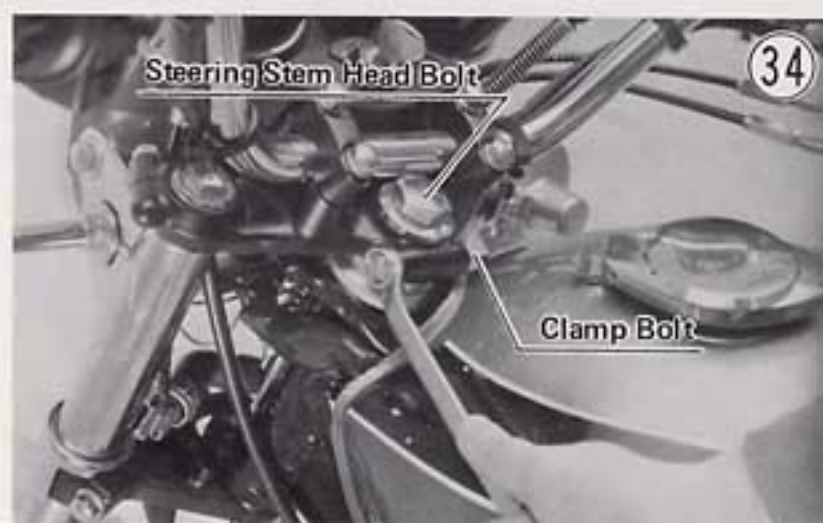
For safety, the steering should always be kept adjusted so that the handlebar will turn freely but not have excessive play.

If the steering is too tight, it will be difficult to turn the handlebar quickly, the motorcycle may pull to one side, and the steering stem bearings may become damaged. If the steering is too loose, the handlebar will vibrate, and the motorcycle will be unstable and difficult to steer in a straight line.

To check the steering adjustment, first place a stand or block under the engine so that the front wheel is raised off the ground. Push the handlebar lightly to either side; if it continues moving under its own momentum, the steering is not too tight. Squatting in front of the motorcycle, grasp the lower ends of the front fork at the axle, and push and pull the front end back and forth; if no play is felt, the steering is not too loose.



- Put the motorcycle up on its center stand, and jack or prop up the engine so that the front wheel will be off the ground.
- Loosen the steering stem head bolt and the clamp bolt.



- Using the stem nut wrench (special tool), turn the steering stem lock nut down (clockwise) to tighten the steering or up (counterclockwise) to loosen it.



- Tighten down the steering stem head bolt with 5.5 kg-m (40 ft-lbs) of torque.
- Tighten the clamp bolt with 1.6 ~ 2.2 kg-m (11.5 ~ 16.0 ft-lbs) of torque.
- Loosen the lower clamp bolts on the left and right shock absorbers to let the tubes reseal themselves, and then tighten the bolts with 2.0 ~ 3.0 kg-m (14.5 ~ 22 ft-lbs) of torque.



- Check the steering again, and readjust if necessary.

WHEEL BALANCE

To improve stability and decrease vibration at high speed, the front and rear wheels must be kept balanced.

Check and balance each wheel as follows:

- Remove the wheel (Pgs. 72, 74, 77).
- Check that all the spokes are tightened evenly.
- Suspend the wheel so that it can be spun freely.
- Spin the wheel lightly, and mark the spoke at the top when the wheel stops.
- Repeat this procedure several times. If the wheel stops of its own accord in various positions, it is well balanced.
- However, if the wheel always stops in one position, attach a balance weight loosely to the marked spoke.



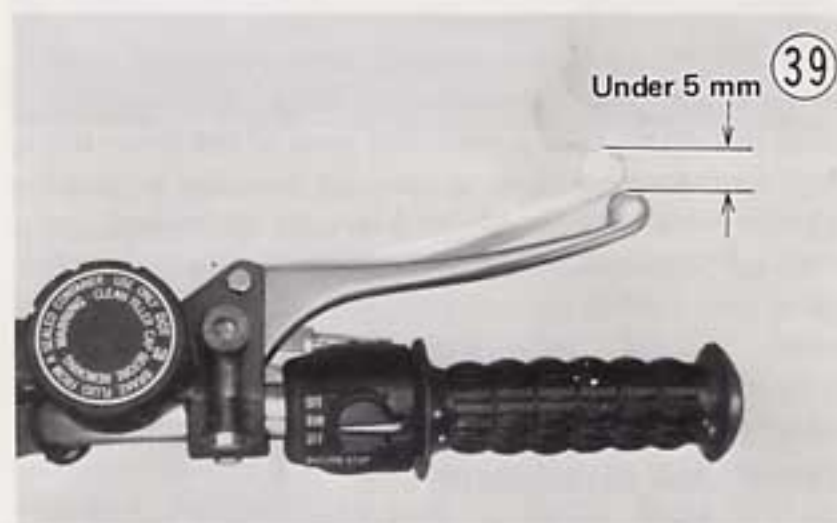
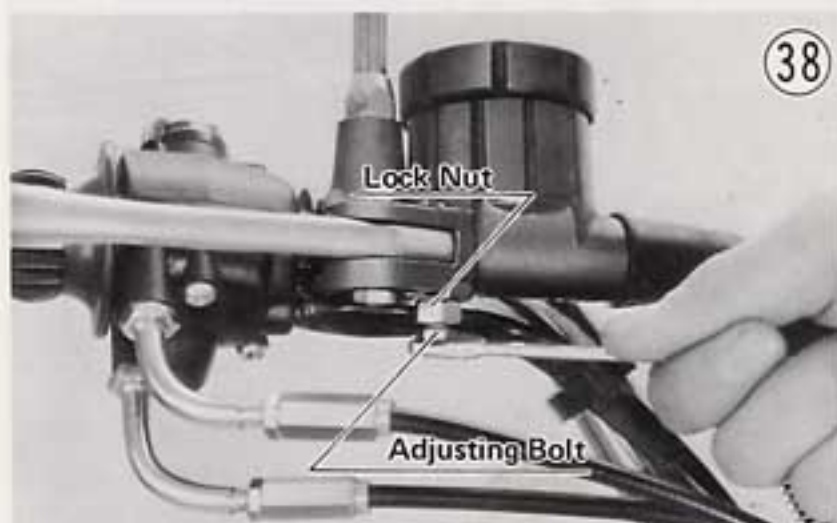
- Rotate the wheel $\frac{1}{4}$ turn, and see whether or not the wheel stops in its new position. If it does, the correct balance weight is being used.
- If it does not, try other balance weights until the wheel stays in position when rotated $\frac{1}{4}$ turn.
- Rotate the wheel another $\frac{1}{4}$ turn and then another $\frac{1}{4}$ turn to see if the wheel is correctly balanced.
- Repeat the entire procedure as many times as necessary to achieve correct wheel balance, and then clamp on the balance weights firmly using pliers.
- Mount the wheel back onto the motorcycle (Pgs. 72, 74, 77).

NOTE: Balance weights are available from Kawasaki Dealers in 10, 20, and 30 gram sizes. An imbalance of less than 10 grams will not usually affect running stability.

FRONT BRAKE LEVER (Only on KZ400D)

Disc and disc pad wear is automatically compensated for and has no effect on brake lever action. However, the brake lever may occasionally require adjustment due to wear inside the lever assembly itself or in case of lever disassembly. Excessive play must be taken up to keep the lever from vibrating, but enough play must be left to ensure a full braking stroke.

- Straighten the part of the washer that is bent over the side of the adjusting bolt lock nut.
- Loosen the lock nut, turn the adjusting bolt a fraction of a turn so that lever play is under 5 mm, and retighten the lock nut with 1.8 ~ 2.3 kg-m (13 ~ 16.5 ft-lbs) of torque.



- Bend back part of the washer over the side of the lock nut.

FRONT BRAKE (Only on KZ400S)

Brake lining wear, drum wear, and cable stretch cause the brake to go out of adjustment, increasing lever play and decreasing braking effectiveness. Brake adjustment to compensate for this consists of three successive adjustments: cam lever angle, brake shoe synchronization, brake lever.

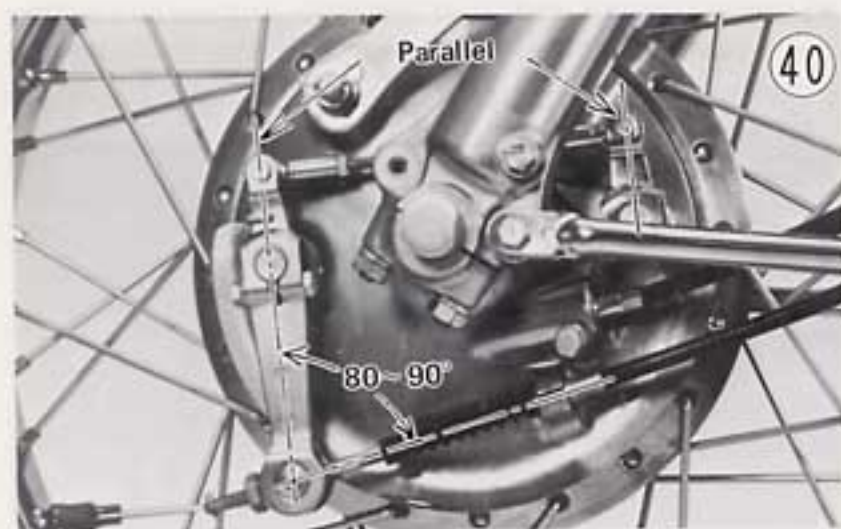
If brake drag is detected during brake adjustment, or if the brake does not return to its rest position quickly upon release, disassemble the brake (Pg. 75) and inspect for wear or damage (Pg. 145).

On the outside of the front brake panel there is a brake lining wear indicator. Whenever the indicator has gone past **USABLE RANGE**, the brake shoes must be replaced immediately and the other brake parts examined. Adjustment alone cannot compensate for the wear of a brake worn past the usable range.

18 ADJUSTMENT

Cam Lever Angle

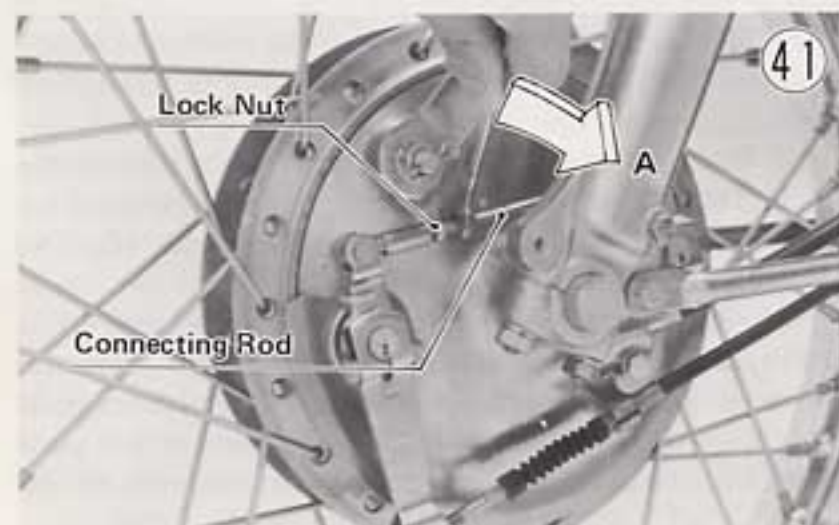
- When the brake is fully applied, the primary brake cam lever should be at an $80^{\circ} \sim 90^{\circ}$ angle with the threaded extension of the brake cable, at the same time as which the secondary brake cam lever should be parallel with the primary brake cam lever. If they are not, remove the cam levers and then remount them at new positions on the shafts to achieve the proper angle, or loosen the lock nut and turn the connecting rod to make the two cam levers parallel.



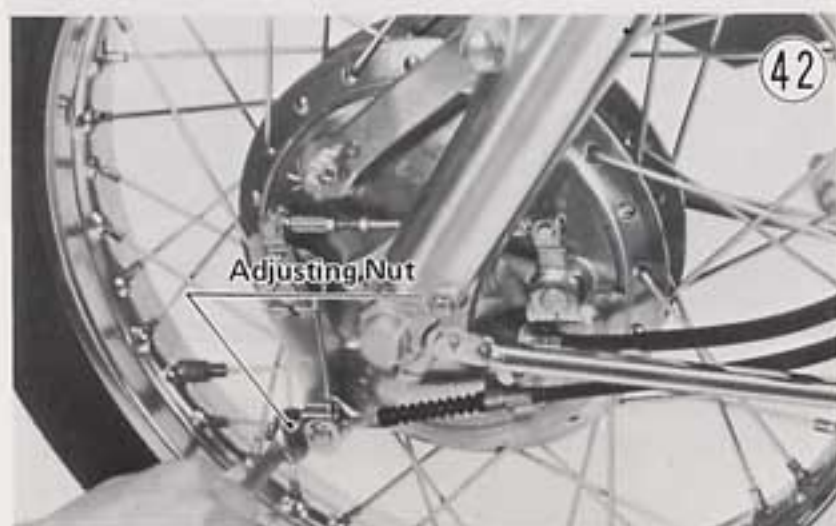
CAUTION: Since a cam lever angle greater than 90° reduces braking effectiveness, this adjustment should not be neglected. When remounting the cam, be sure that the position of the indicator on the serrated shaft is not altered. The change in cam lever angle is caused by wear of internal brake parts. Whenever the cam lever angle is adjusted, also check for shoe drag and proper lever operation, taking particular note of the brake lining wear indicator position. In case of doubt as to braking effectiveness, disassemble and inspect all internal brake parts. Worn parts could cause the brake to lock or fail.

Brake Shoe Synchronization

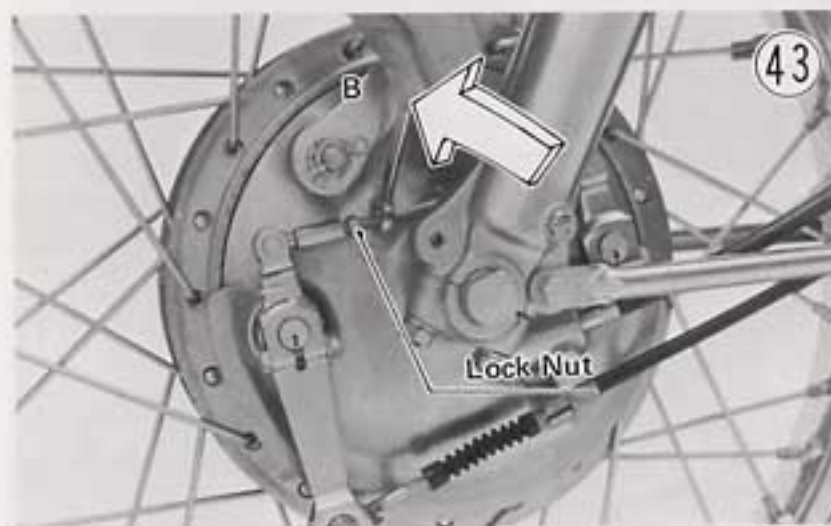
- Put the motorcycle up on its center stand, and jack up or prop up the engine so that the front wheel is off the ground.
- Loosen the lock nut and turn the connecting rod one turn in direction "A". This procedure backs off the secondary brake shoe so that it will not operate when the primary shoe contacts the inside surface of the drum.



- While spinning the wheel lightly, turn in the adjusting nut until the primary shoe just starts touching the drum. When the shoe starts touching the drum, light dragging can be felt or heard.

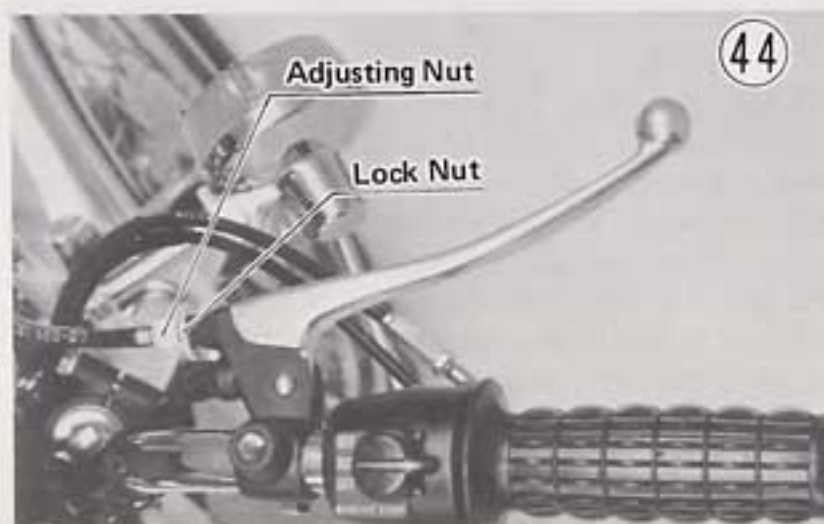


- Spinning the wheel lightly, turn the connecting rod in direction "B" until the secondary brake shoe just starts dragging on the drum, and then tighten the lock nut.

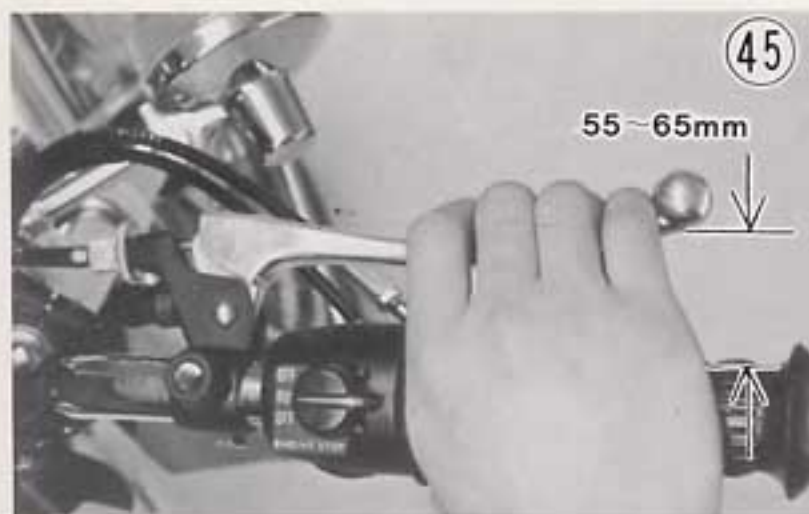


Front Brake Lever

- Loosen the lock nut at the front brake lever, screw the adjuster fully in, and tighten the lock nut.



- Turn the adjusting nut on the lower end of the front brake cable so that when the brake is fully applied, there is $55 \sim 65$ mm space left between the throttle grip and the end of the brake lever.



REAR BRAKE

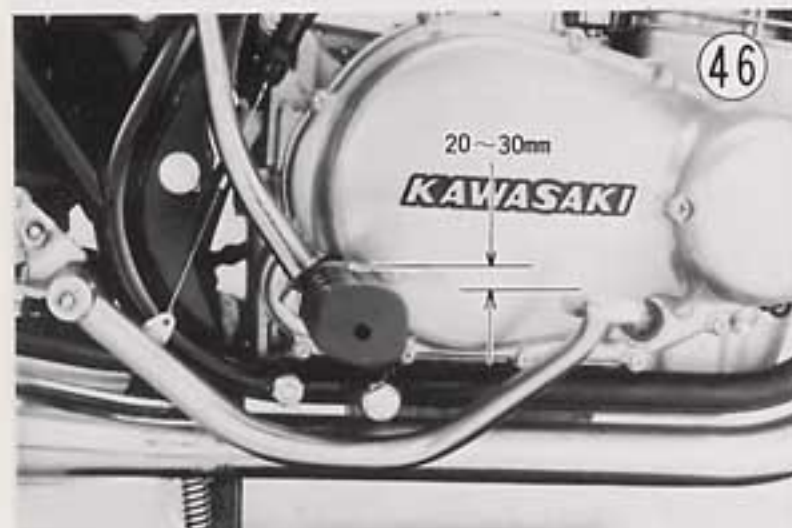
Brake lining and drum wear causes the rear brake to go out of adjustment, increasing pedal play and decreasing braking effectiveness. Rear brake adjustment to compensate for this actually consists of three successive adjustments: brake pedal position, cam lever angle, and brake pedal travel.

If brake drag is detected during brake adjustment, disassemble the brake (Pg. 78), and inspect for wear or damage (Pg. 145). Also, if the brake pedal does not return to its rest position quickly upon release, inspect the brake for wear or damage.

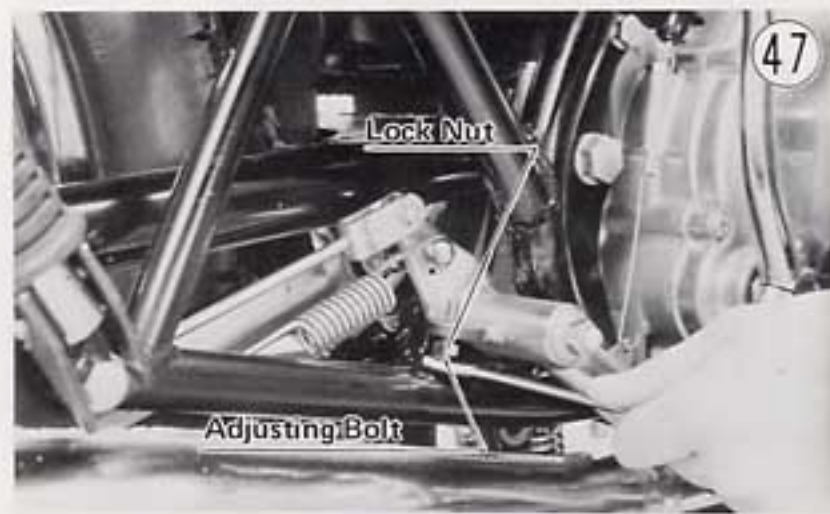
On the outside of the rear brake panel there is a brake lining wear indicator. Whenever the indicator has gone past **USABLE RANGE**, the brake shoes must be immediately replaced and the other brake parts examined. Adjustment alone cannot compensate for the wear of a brake worn past **USABLE RANGE**.

Brake Pedal Position

- When the brake pedal is in its rest position, it should be 20~30 mm lower than the upper surface of the right front foot rest. If it is not, first loosen the adjusting nut on the end of the brake rod to give the brake pedal plenty of play.

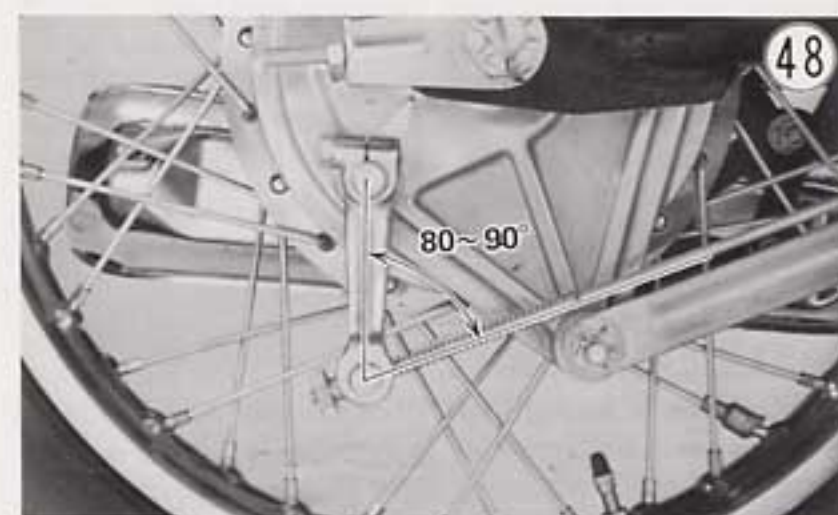


- Loosen the brake pedal adjusting bolt lock nut, turn the adjusting bolt to obtain the correct pedal position, and tighten the lock nut.



Cam Lever Angle

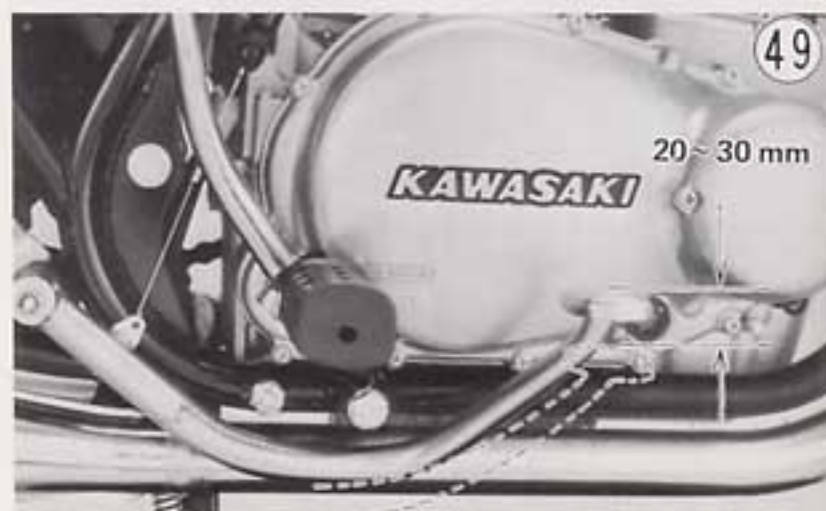
- When the brake is fully applied, the brake cam lever should come to an 80~90° angle with the brake rod. If it does not, remove the cam lever, and then remount it at a new position on the shaft for the proper angle.

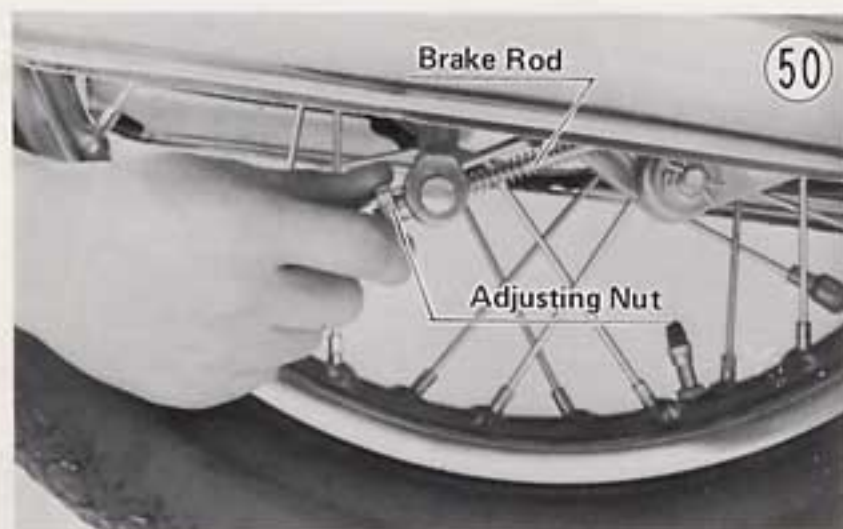


CAUTION: Since a cam lever angle greater than 90° reduces braking effectiveness, this adjustment should not be neglected. When remounting the cam, be sure that the position of the indicator on the serrated shaft is not altered. The change in cam lever angle is caused by wear of internal brake parts. Whenever the cam lever angle is adjusted, also check for drag and proper pedal operation, taking particular note of the brake lining wear indicator position. In case of doubt as to braking effectiveness, disassemble and inspect all internal brake parts. Worn parts could cause the brake to lock or fail.

Brake Pedal Travel

- Turn the adjusting nut on the end of the brake rod so that the brake pedal has 20~30 mm of travel from the rest position to the fully applied position when the brake pedal is pushed down lightly by hand.



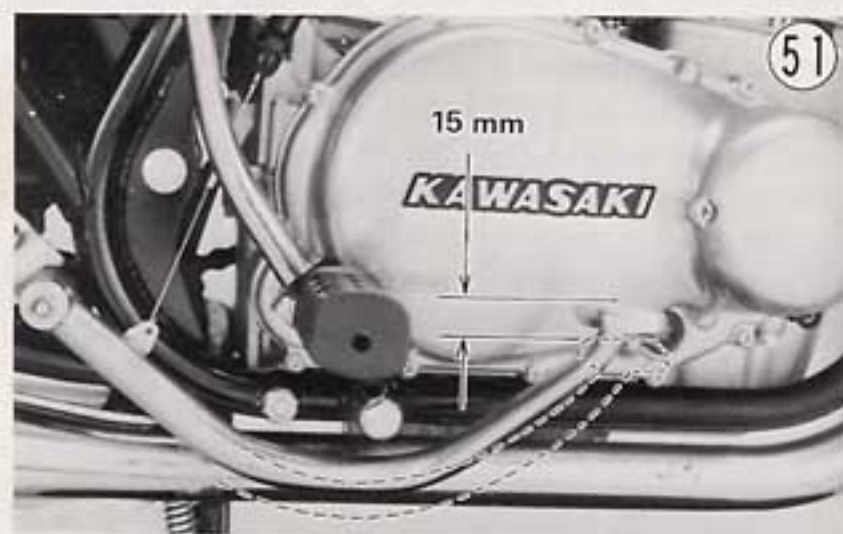


- Rotate the rear wheel to check for brake drag.
- Operate the pedal a few times to see that it returns to its rest position from the fully applied position immediately upon release.
- Check the rear brake light switch adjustment.

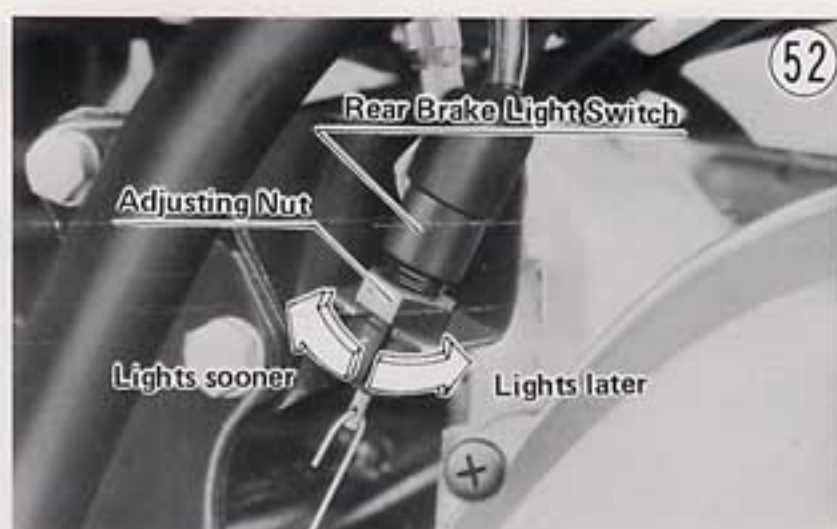
BRAKE LIGHT SWITCH

The front brake light switch of the KZ400D, mounted in the stem base, operates hydraulically and is not adjustable. The front brake light switch of the KZ400S, mounted on the front brake lever, is operated by simple electrical contact and should not need adjustment. However, the rear brake light switch, activated by a spring attached to the brake pedal, requires periodic adjustment to compensate for any change in spring shape or tension.

Check the operation of the switch by turning on the ignition switch and depressing the brake pedal. The brake light should go on after 15 mm of pedal travel or shortly before the brake pedal reaches the fully applied position.



- Turn the switch adjusting nut up or down so that the brake light will go on after the correct amount of brake pedal travel. A higher switch position will make the light go on after less travel.



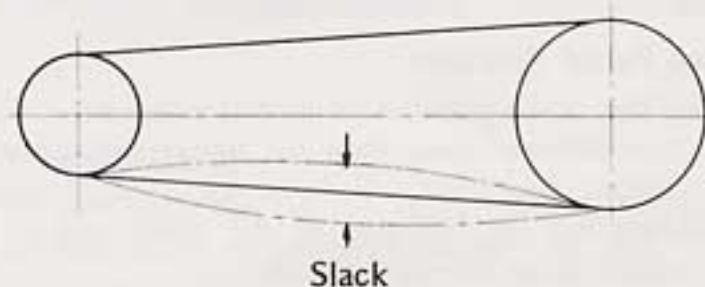
CAUTION: To avoid damaging the electrical connections inside the switch, be sure that the switch body does not turn during adjustment.

DRIVE CHAIN

Chain and sprocket wear causes the chain to lengthen, which results in power loss, accelerated chain and sprocket wear, and increased noise. A lengthened chain which is not adjusted properly may possibly be thrown off the sprockets or break. A chain that has been adjusted too tight will wear excessively and possibly break.

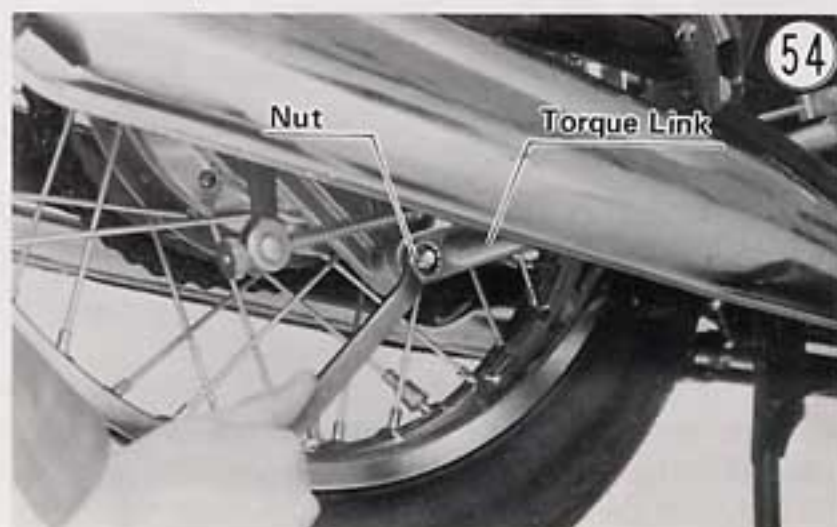
To determine whether or not the chain requires adjustment, first set the motorcycle up on its center stand (on the side stand in the case of KZ400S), rotate the rear wheel to obtain the location of the least slack, and measure the vertical movement midway between the sprockets. If it is less than 15 mm or more than 30 mm (less than 10 mm or more than 25 mm in the case of KZ400S), adjust the chain so that the vertical movement will be about 20 ~ 25 mm (15 ~ 20 mm in the case of KZ400S).

Chain Slack



CAUTION: A chain worn past the service limit (Pg. 139) should be replaced. Such wear cannot be adequately compensated by adjustment.

- Remove the clip, and loosen the nut at the rear end of the torque link.



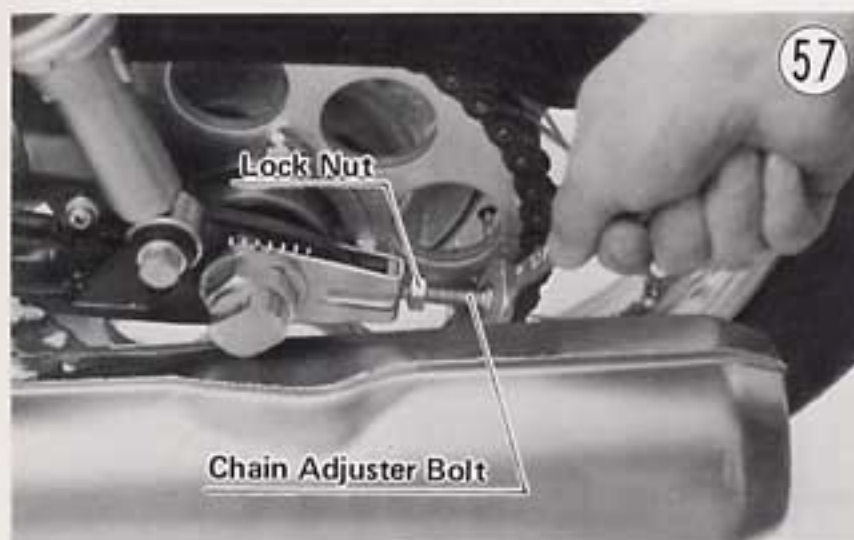
- Remove the axle cotter pin, and loosen the axle nut.



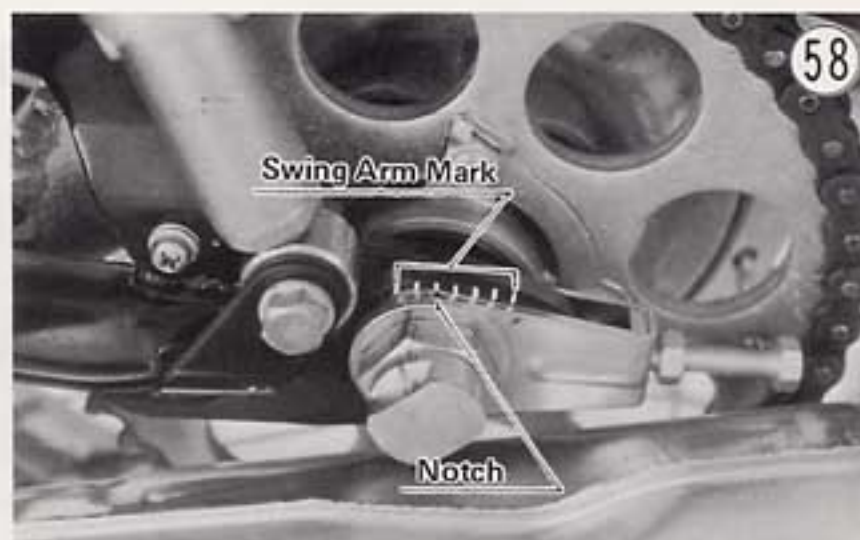
- Loosen the coupling sleeve nut.



- Loosen the left and right chain adjuster lock nuts.
- If the chain is too tight, back out the left and right chain adjuster bolts, and then kick the wheel forward until the chain is too loose.



- Turn in the left and right chain adjuster bolts evenly until the drive chain has the correct amount of slack. To keep the chain and wheel aligned, the notch on the left chain adjuster should come to the same swing arm mark that the right chain adjuster notch comes to.

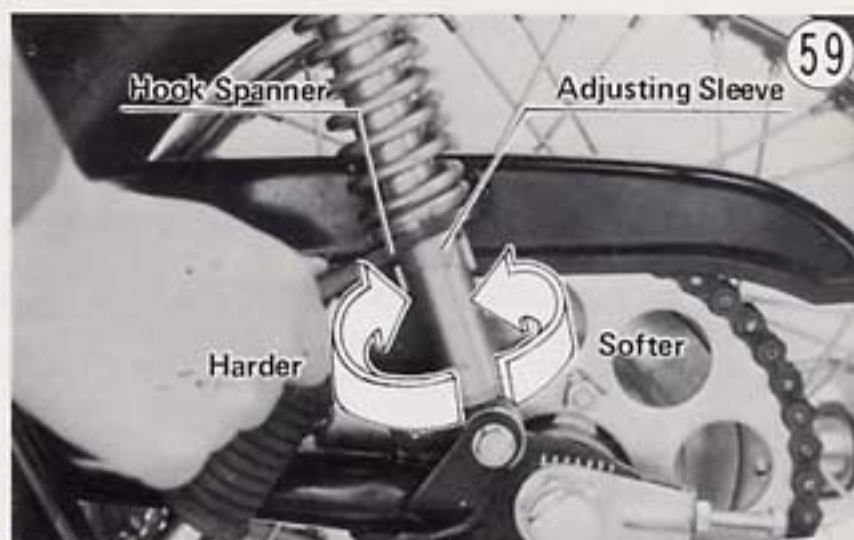


- Tighten both chain adjuster lock nuts, and then tighten the coupling sleeve nut securely.
- Tighten the axle nut with 10~14 kg-m (72~101 ft-lbs) of torque.
- Rotate the wheel, measure the vertical movement again, and readjust if necessary.
- Insert a new cotter pin through the axle nut and axle.
- Tighten the torque link rear nut with 2.6~3.5 kg-m (19~25 ft-lbs) of torque, and replace the clip.
- Check the rear brake adjustment (Pg. 19) and the rear brake light switch adjustment (Pg. 20).

REAR SHOCK ABSORBERS

The rear shock absorbers can be adjusted to one of five positions to suit riding conditions. They can be left soft for average riding but should be adjusted harder for high speed riding or riding on bad roads. Shock absorbers adjusted either too soft or too hard adversely affect riding comfort and stability.

- Turn the adjusting sleeve on each shock absorber to the desired position with a hook spanner. The higher the adjusting sleeve is positioned, the stronger the spring tension, and the harder the ride.



- Check to see that both adjusting sleeves are turned to the same relative position.

HEADLIGHT

The headlight beam is adjustable both horizontally and vertically. If not properly adjusted horizontally, the beam will point to one side rather than straight ahead. If adjusted too low vertically, neither low nor high beam will illuminate the road far enough ahead. If adjusted too high vertically, high beam will fail to illuminate the road close ahead, and low beam will blind oncoming drivers.

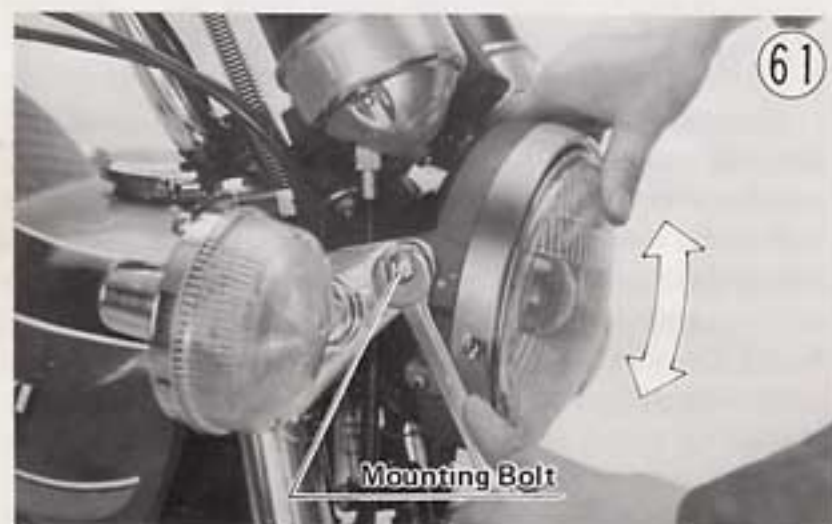
Horizontal Adjustment (Only on US model):

- Turn in or out the small screw on the headlight rim until the beam points straight ahead.



Vertical Adjustment:

- Loosen the headlight housing mounting bolts.



- Move the headlight up or down by hand to where the vertical aim is correct.
- Tighten the headlight housing mounting bolts.

HORN

The horn contacts wear down after long use and will need to be adjusted from time to time. Turning in the adjusting screw compensates for contact wear. If satisfactory horn performance cannot be obtained by this adjustment when the rest of the electrical system is functioning properly, the horn must be replaced. It can not be disassembled.

CAUTION: Do not turn the adjusting screw in too far since doing so will increase horn current possibly burning out the horn coil.

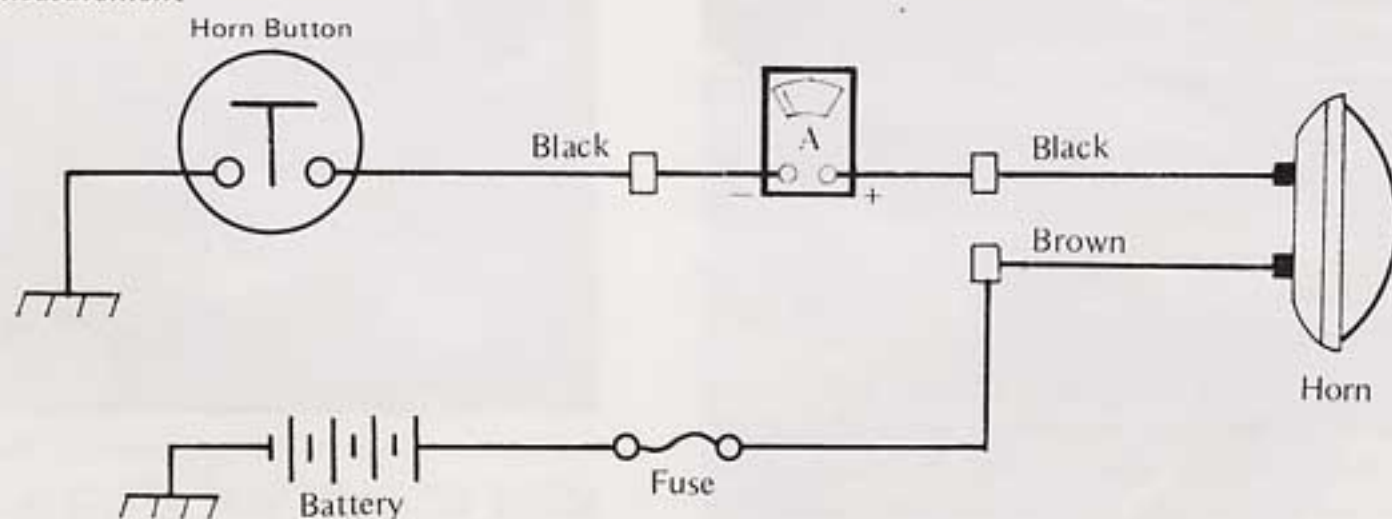
- Disconnect the black horn leads, and connect an ammeter in series to the horn circuit. The + ammeter lead goes to the horn terminal lead and the - ammeter lead to the remaining lead.
- Fully loosen the adjusting screw lock nut.
- Turn on the ignition key, and keep the horn button pressed while turning the horn adjusting screw. Adjust for the best horn sound while keeping the current between 1.8 ~ 2.5 amperes.



- Tighten the adjusting screw lock nut.

NOTE: The horn will not sound properly if it is mounted incorrectly or if any cable or other part is touching it.

Horn Current Measurement



Disassembly

INTRODUCTION TO DISASSEMBLY

Detail has not been spared in this section in order that the motorcycle can be not only taken apart but also put back together properly as well. Photographs, diagrams, notes, cautions, and detailed descriptions have been included wherever felt necessary. Nevertheless, even a detailed account has limitations; a certain amount of basic knowledge is also required for successful work.

Especially note the following:

(1) Force

Common sense should dictate how much force is necessary in assembly and disassembly. If a part seems especially difficult to remove or install, stop and examine what may be causing the problem. Whenever tapping is necessary, tap lightly using a plastic hammer. Use an impact driver for screws — particularly for the removal of screws held by a locking agent in order to avoid damaging the screw heads.

(2) Torque

The torque values given in this Shop Manual should always be adhered to. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.

(3) Lubricant

Don't use just any oil or grease. Some oils and greases in particular should be used only in certain applications and may be harmful if used in an application for which they are not intended.

(4) Lubrication

Engine wear is generally at its maximum while the engine is warming up and before all the rubbing surfaces have an adequate lubricative film. During assembly oil should be applied to any bearing surface which has lost its lubricative film. Old grease and dirty oil should be cleaned off. Deteriorated grease has lost its lubricative quality and may contain abrasive foreign particles.

(5) Press

A part installed using a press or driver, such as a wheel bearing, should first be coated with oil on its outer or inner circumference so that it will go into place smoothly.

(6) Oil Seals

An oil seal guide is required for certain oil seals during installation to avoid damage to the oil seal lips. Before a shaft passes through an oil seal, apply a little oil on the lips to reduce rubber to metal friction.

(7) Gasket

When in doubt as to the condition of a gasket, replace it with a new one. The fitting surfaces around the gasket should be free of foreign matter and perfectly smooth to avoid oil or compression leaks.

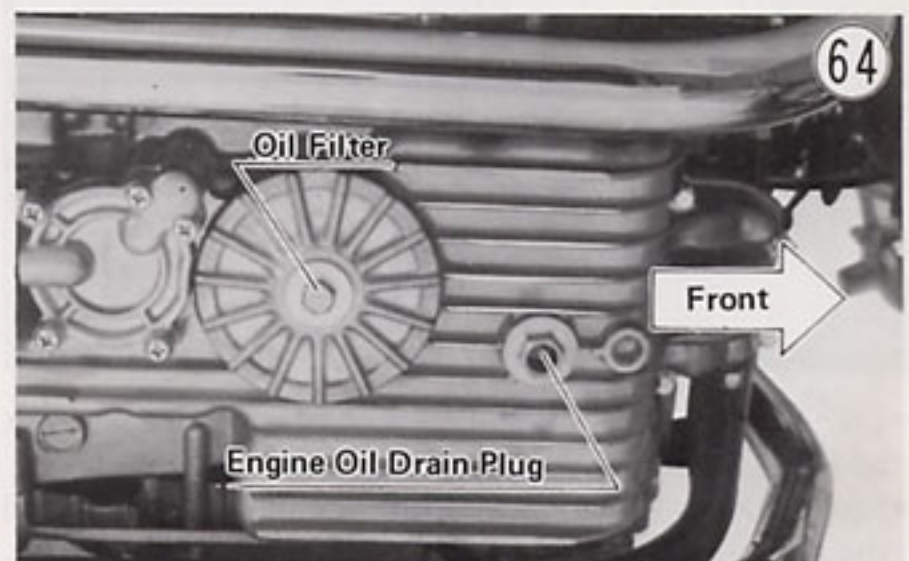
(8) Edges

Watch for sharp edges, especially during major engine disassembly and assembly. Use a clean piece of thick cloth when lifting the engine or turning it over.

ENGINE

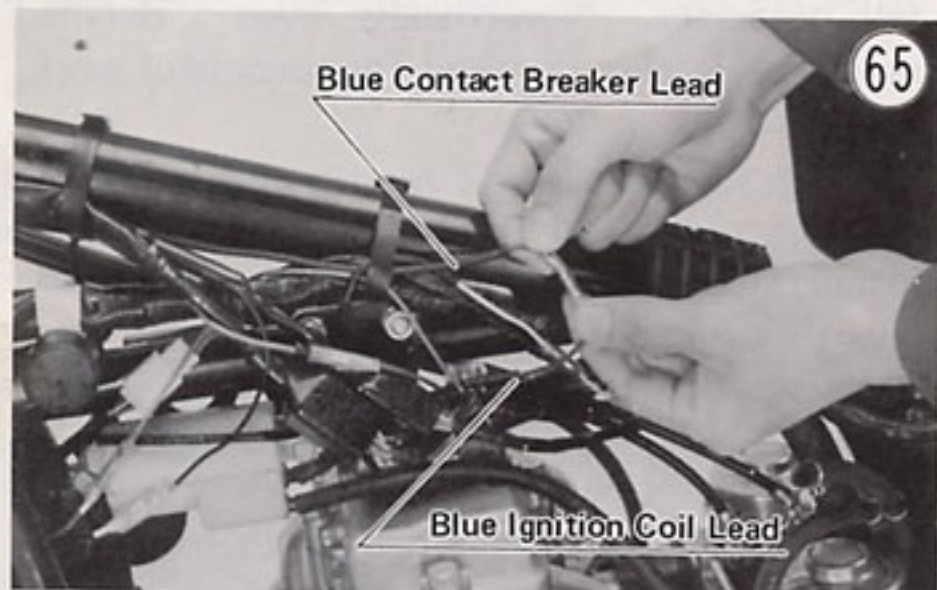
Removal:

- With the motorcycle on its center stand, place an oil pan beneath the engine, and remove the engine oil drain plug and oil filter to drain out the oil. The drain plug and oil filter may be replaced once all the oil has drained out or later during engine installation.

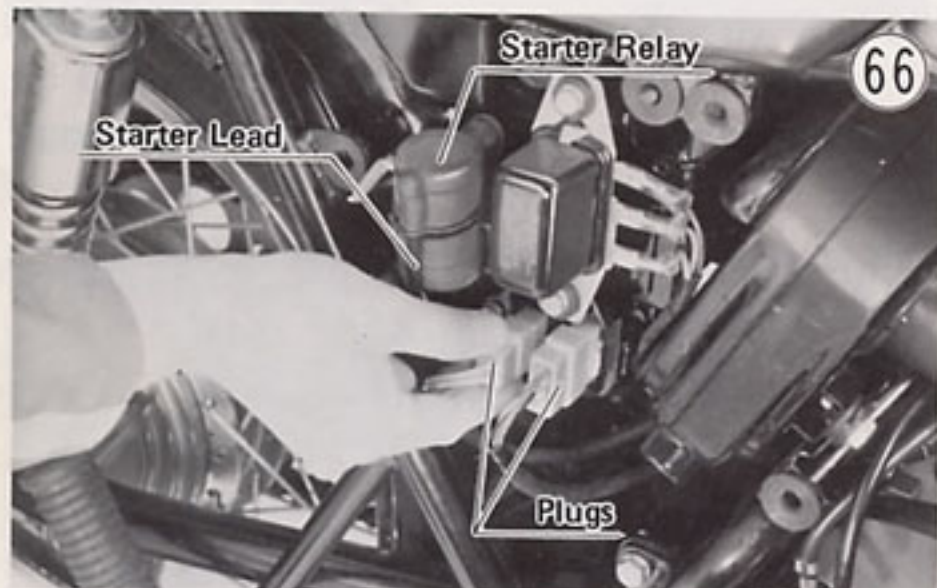


24 DISASSEMBLY

- Remove the fuel tank (Pg. 28).
- Pull off the spark plug lead from each spark plug.
- Disconnect the blue contact breaker lead from where it connects to the blue ignition coil lead, loosen slightly the straps (4) which hold the lead to the frame, and slide the lead free from the frame.



- Unscrew the tachometer cable from the cylinder head cover (KZ400D).
- Pull off the right and left side covers.
- Disconnect the plugs (2) from their sockets under the voltage regulator.

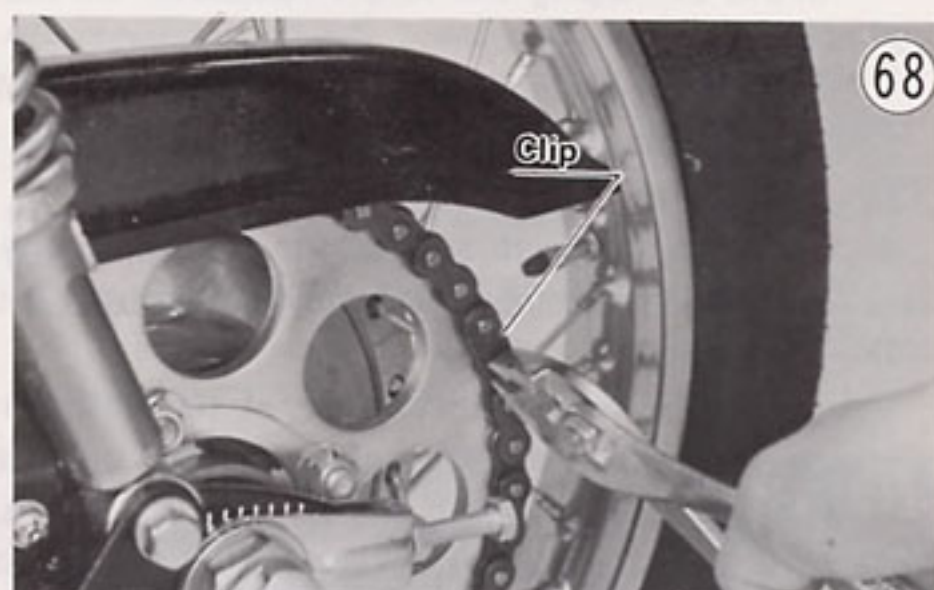


- Remove the starter lead from the starter relay terminal (KZ400D).
- Loosen the engine intake duct clamp for each carburetor.



- Loosen the clamp that connects each air cleaner duct to its carburetor, and slip it out of place.
- Slip the carburetors down and out of their ducts, pull the carburetors free, and set them on top of the frame.

- Remove the muffler collar nuts and lock washers (4 ea), and slide each muffler collar off its cylinder head studs.
- Remove each rear foot peg to complete muffler removal. Also, remove the muffler gasket from each exhaust port.
- Check to see that the transmission is in neutral, then take out the shift pedal bolt, and remove the shift pedal.
- Remove the left foot peg bolt, left foot peg, and side stand spring.
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.
- Remove the clip carefully from the drive chain master link with pliers, remove the master link, and remove the drive chain from the engine sprocket.



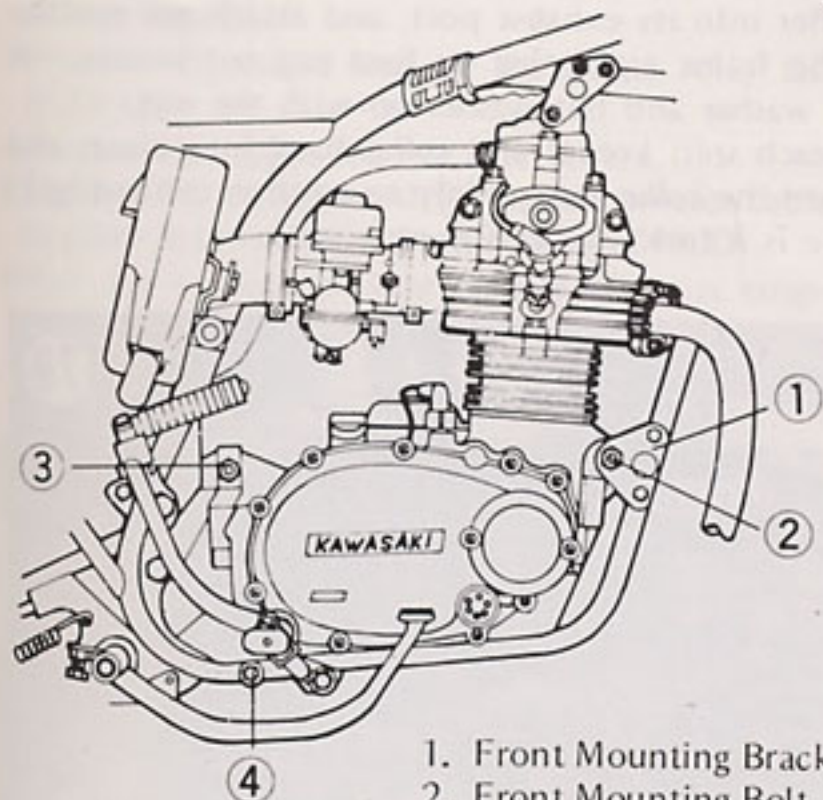
- Remove the bracket connecting the breather cover to the frame.
- Remove the breather cover bolts (4), and remove the cover.
- Remove the rear brake light switch spring.
- Hold the rear brake light switch body steady, and turn the adjusting nut counterclockwise until the lower portion can be pressed inward.
- Pressing inward on the lower portion of the adjusting nut, push the switch up and out of its bracket.



- Remove the nuts from the engine mounting bolts (3), and remove each mounting bolt. Be careful not to damage the threads upon removal, raising the engine up a little as necessary. A spacer comes off each of the rear bolts.

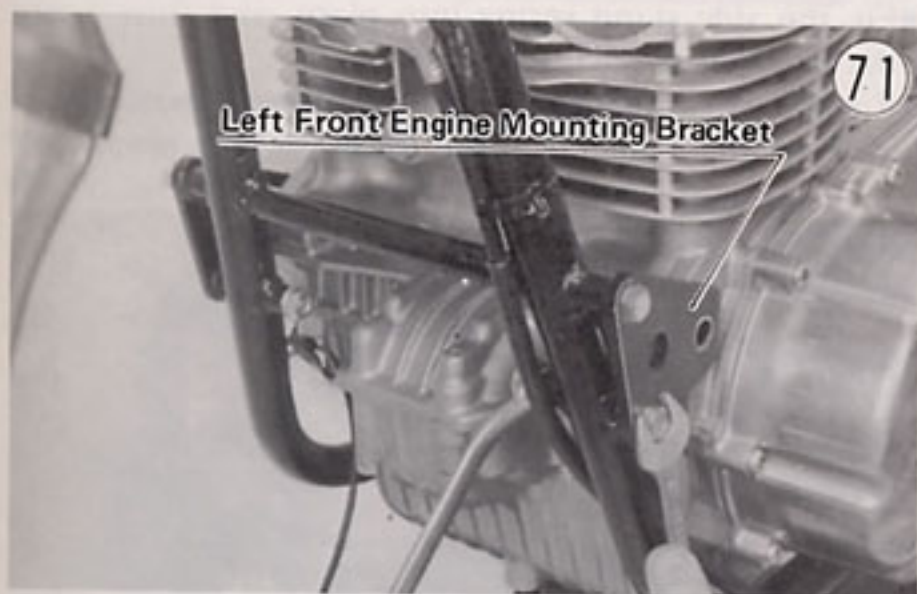
Engine Mountings

70

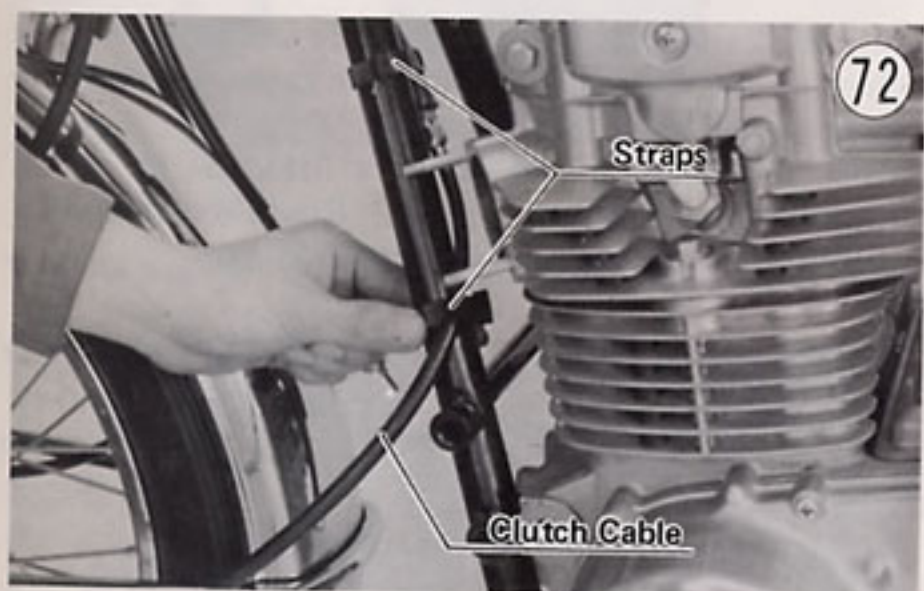


1. Front Mounting Bracket
2. Front Mounting Bolt
3. Rear Upper Mounting Bolt
4. Rear Lower Mounting Bolt

- Remove the left front engine mounting bracket.



- Loosen the clutch cable straps (2), slide the straps up, and situate the engine sprocket cover so that the clutch cable will not get damaged during engine removal.

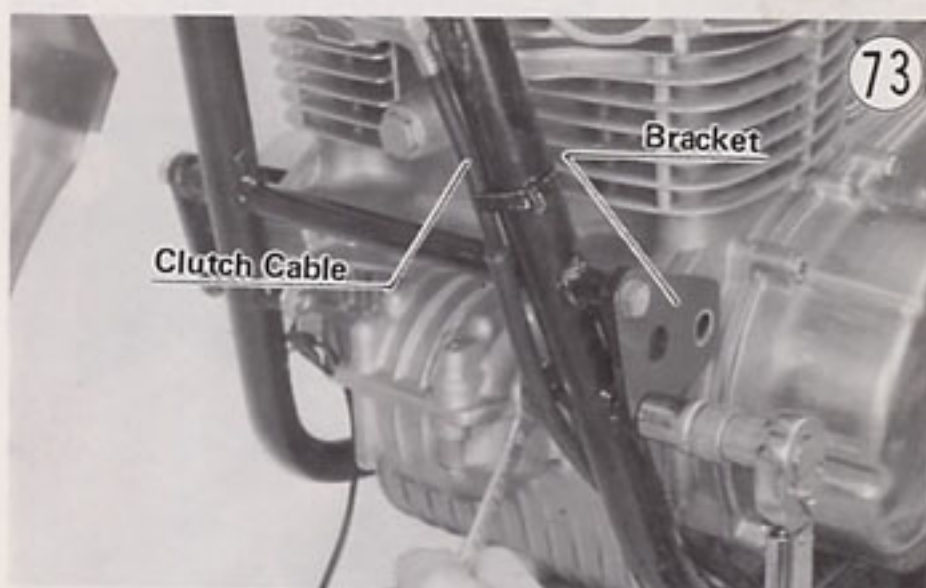


- Lift up on the front of the engine, and then remove it from the left side of the frame, top first and rear last.

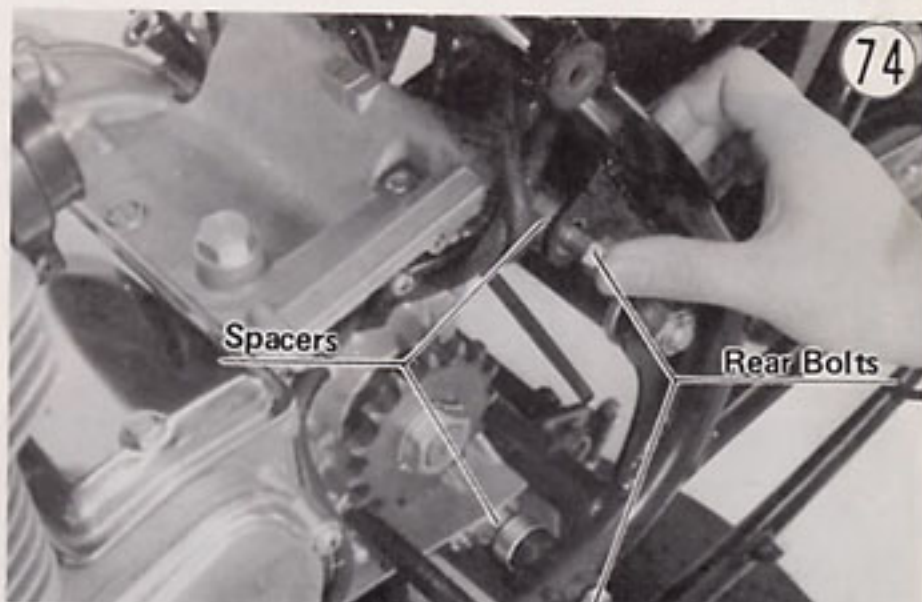
Installation:

- Place the engine into the frame the reverse of how it was removed.

- Replace the left front engine mounting bracket, and tighten first the upper bolt and then the lower with 2.0~2.8 kg-m (14.5~20 ft-lbs) of torque. Each bolt has a lock washer. The clutch cable goes as shown in Fig. 73.



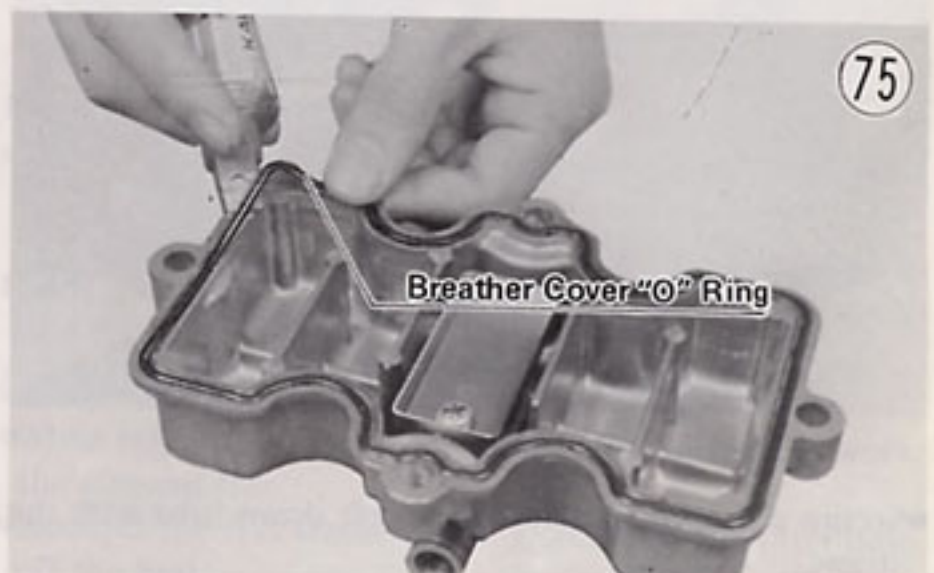
- Lifting the engine as necessary so that the mounting bolt threads do not get damaged, insert the engine mounting bolts. Both rear bolts run through a spacer on the left side.



- Replace the lock washers and nuts with the spring side of the nuts facing out, and tighten each nut with 3.4~4.6 kg-m (25~33 ft-lbs) of torque.

NOTE: Some machines have one or more shims added to the lower spacer. After the nuts are tightened to the proper torque, check to see whether or not the spacer takes up all the space. If not, add one or more shims.

- Replace the rear brake light switch, and fit its spring back in place.
- Apply liquid gasket if necessary to the breather cover O ring groove to hold the O ring in place for installation.

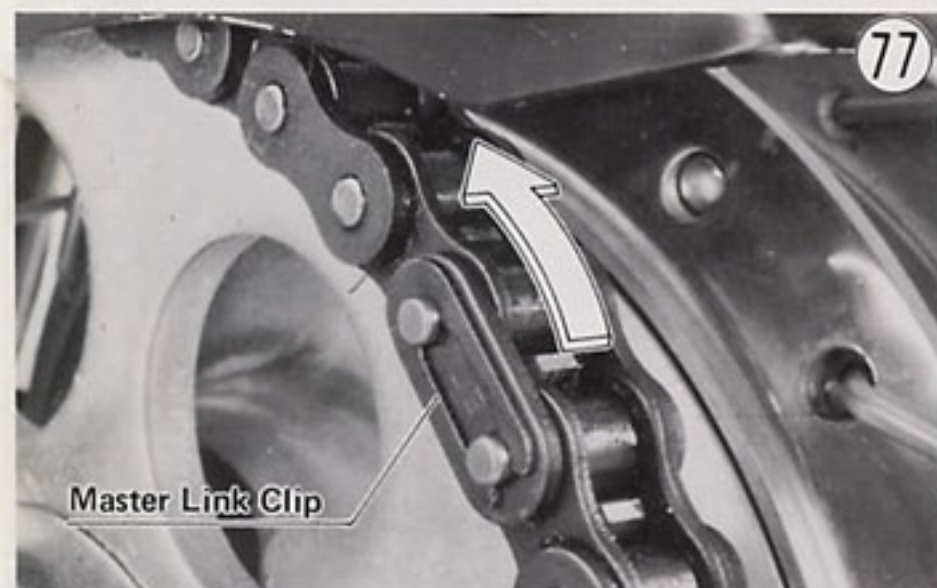


26 DISASSEMBLY

- Replace the breather cover, and tighten its bolts with 1.8~2.3 kg-m (13~16.5 ft-lbs) of torque. Each bolt has a flat washer.
- Replace the breather cover bracket. Each bolt has a lock washer.
- Fit the drive chain back on the sprockets with the ends on the rear sprocket as shown in Fig. 76.



- Replace the chain master link with pliers. The direction of the master link clip should be as shown in Fig. 77.

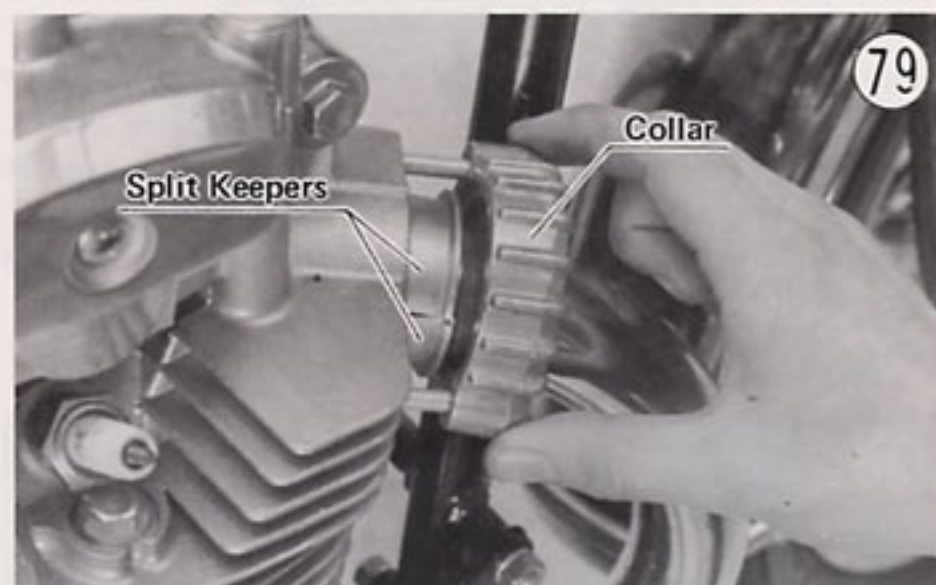


- Replace the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the oil seal in the cover, and tighten its screws. The wiring is routed in front of the upper mounting bolt spacer.

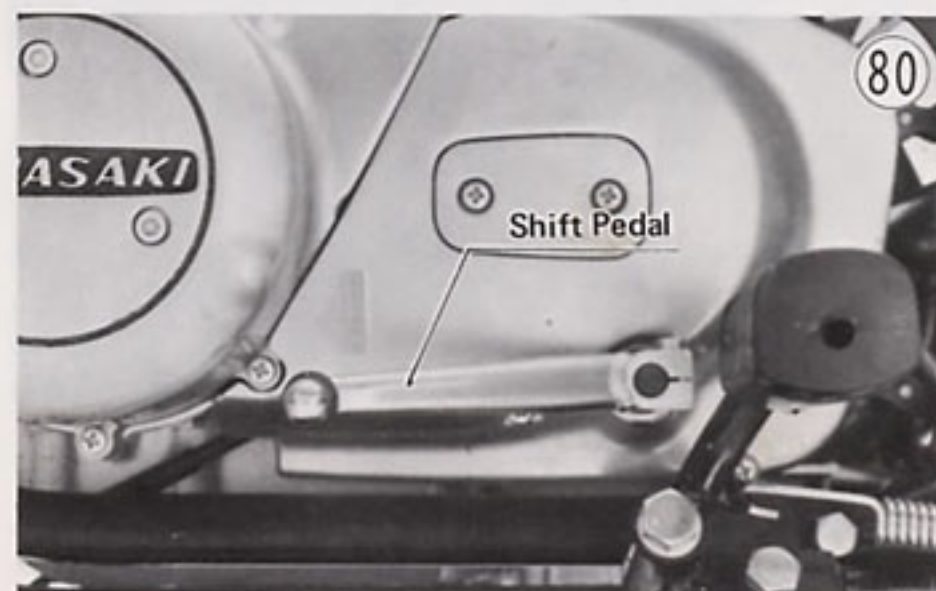


- Secure the clutch cable to the left down tube with the straps.

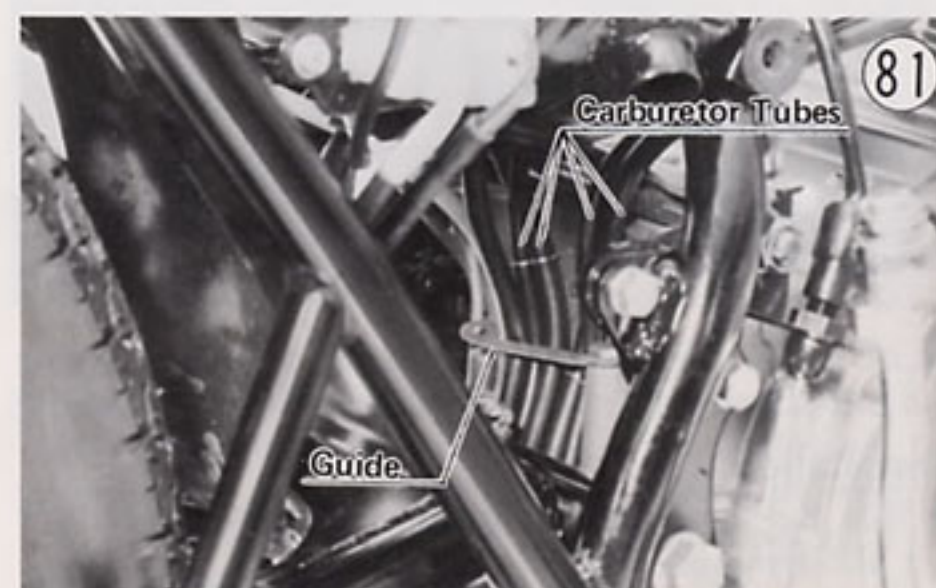
- For each muffler, fit its gasket and the end of the muffler into its exhaust port, and attach the muffler to the frame tightening its foot peg nut loosely. A lock washer and flat washer go with the nut.
- Fit each split keeper and collar back into place, and tighten the collar nuts evenly to avoid an exhaust leak. There is a lock washer for each nut.



- Tighten the foot peg bolts securely.
- Fit the side stand spring into place, and then secure the left foot peg with its bolt.
- Replace the shift pedal so that its end matches the level of the dynamo cover lower right screw.



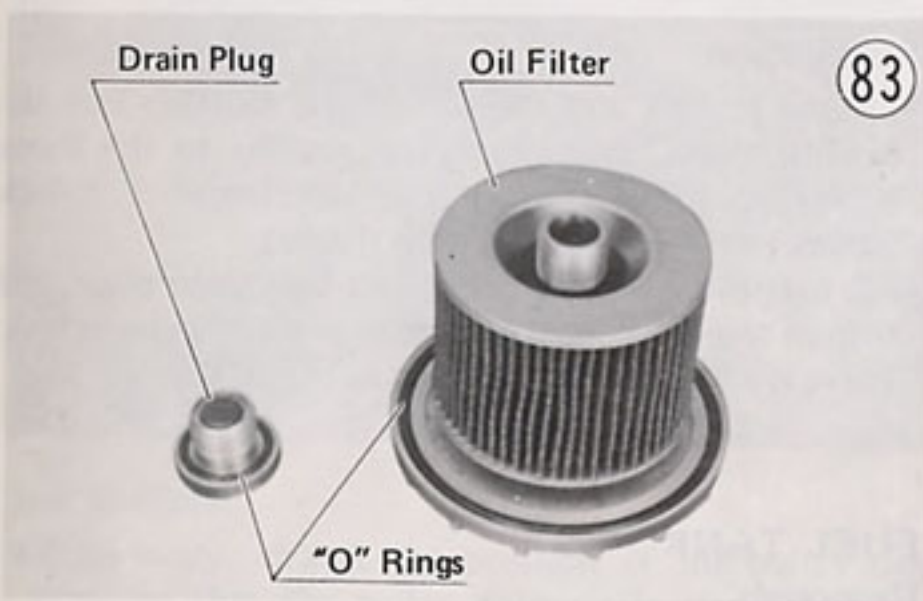
- Slip the carburetors back into place the reverse of how they were removed. The throttle cables go along the right side of the top tube.
- Once the ducts are all properly fitted on the carburetors, tighten all four clamps. Route the carburetor tubes (4) to the rear through their guide.



- Reconnect the plugs (2) to their sockets under the voltage regulator.
- Replace the starter lead on the starter relay terminal (KZ400D).
- Replace the right and left side covers.
- Tighten the bottom end of the tachometer cable into its place in the cylinder head cover (KZ400D).
- Run the contact breaker lead through its straps (4), and connect it to the blue ignition coil lead. Tighten the straps.



- Connect each spark plug lead onto its spark plug.
- Install the fuel tank (Pg. 28).
- Make sure the O rings are in place, and replace the oil filter and drain plug. Tighten the oil filter with 1.5 ~ 2.0 kg-m (11 ~ 14.5 ft-lbs) of torque and the drain plug with 2.7 ~ 3.3 kg-m (19.5 ~ 24 ft-lbs).



- Fill the engine with oil, check the level (Pg. 181), and add more if necessary.
- Check the drive chain slack, and adjust (Pg. 20) if necessary.
- Adjust the rear brake light switch (Pg. 20).

AIR CLEANER ELEMENT

Removal:

- Pull off the left side cover.
- Remove the air cleaner housing side cover screw, and pull off the side cover. The screw has a lock washer and flat washer.



- Pull out the element.

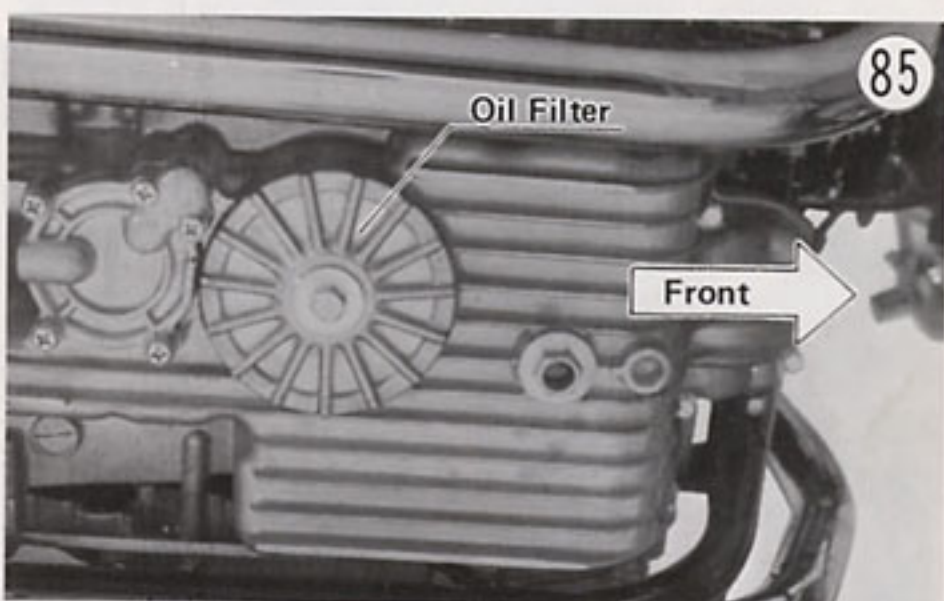
Installation Note:

- Replace the element so that the element holes match the air cleaner ducts.

OIL FILTER

Removal:

- With the motorcycle on its center stand, place an oil pan beneath the engine, and remove the oil filter.

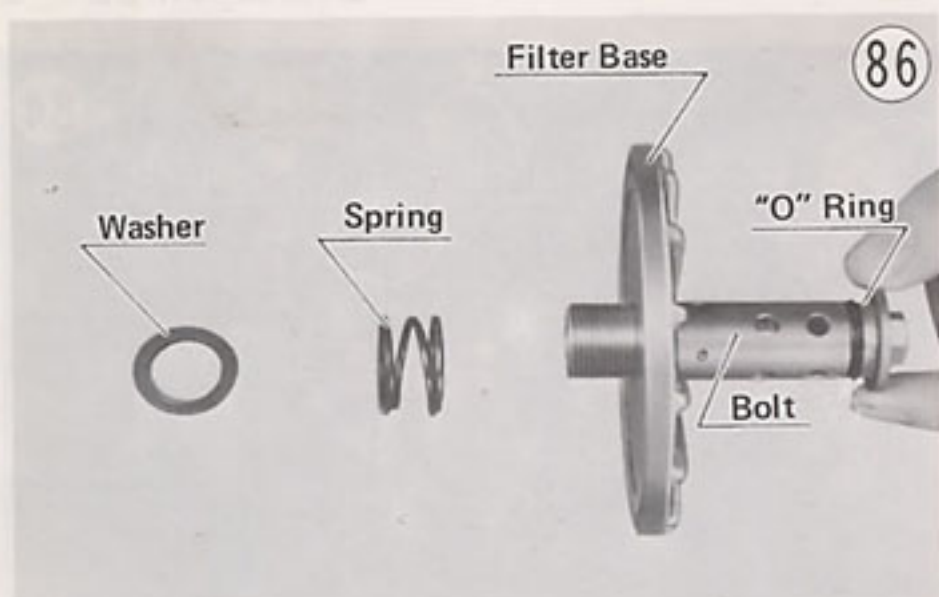


Installation:

- Make sure that the O ring is properly in place, and replace the oil filter tightening its bolt with 1.5 ~ 2.0 kg-m (11 ~ 14.5 ft-lbs) of torque.
- Pour the oil back in, check the level (Pg. 181), and add more if necessary.

Disassembly:

- While holding the element steady, turn the bolt to work the element free.
- Remove the flat washer, spring, and pull the filter base off the bolt.



- To remove the bypass valve, drive out the pin, and drop out the spring and piston.

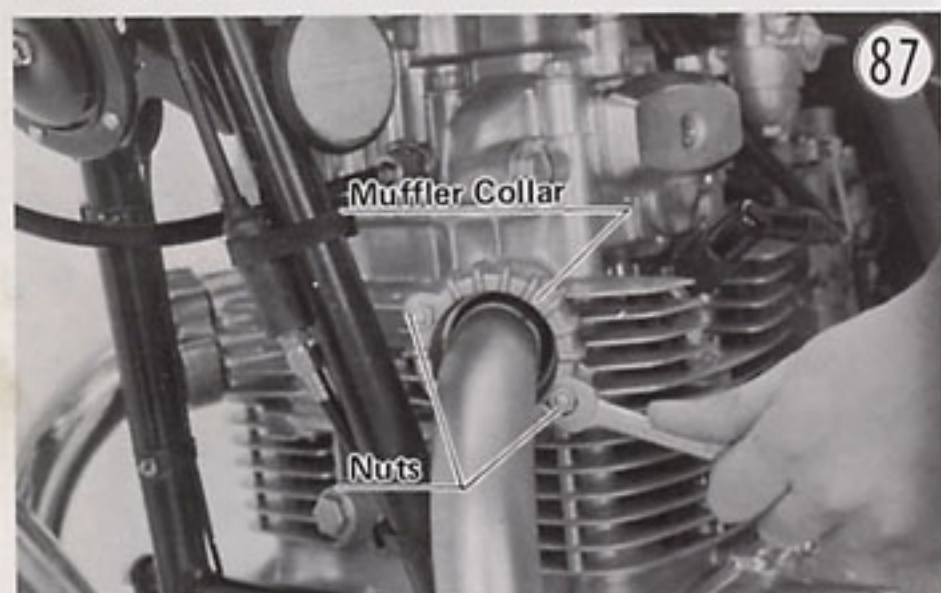
Assembly:

- Fit in the piston and spring, and drive in the pin while pressing the spring down.
- Replace either O ring with a new one if deteriorated or damaged.
- Fit the filter base on the bolt, and replace the spring and flat washer.
- Holding the element steady, turn the bolt to work the element into place. Be careful that the element grommets do not slip out of place.

MUFFLERS (Only on KZ400D)

Removal (per muffler):

- Remove the muffler collar nuts and lock washers, and slide the muffler collar off its cylinder head studs.

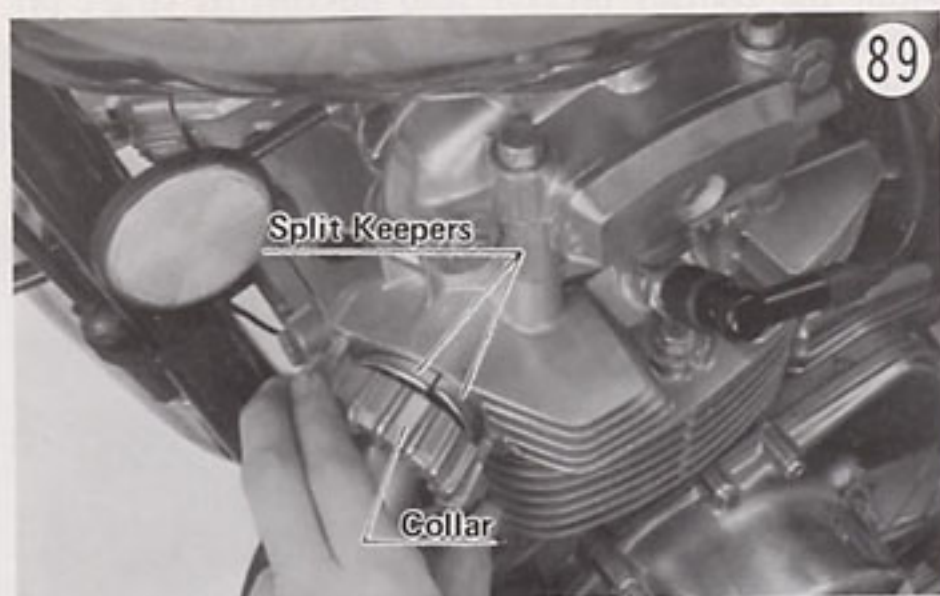


- Remove the rear foot peg to complete muffler removal. Also, remove the muffler gasket from the exhaust port.



Installation (per muffler):

- Fit the gasket and the end of the muffler into the exhaust port, and attach the muffler to the frame tightening the foot peg nut loosely. A lock washer and flat washer go with the nut.
- Fit the split keeper and collar back into place, and tighten the collar nuts evenly to avoid an exhaust leak. There is a lock washer for each nut.



- Tighten the foot peg bolt securely.

MUFFLERS (Only on KZ400S)

Removal:

- Remove the muffler collar nuts and lock washers, and slide the muffler collars off its cylinder head studs (Fig. 83).
- Remove the right rear foot peg to complete mufflers removal. Also, remove the muffler gaskets from the exhaust ports.

Installation:

- Fit the gaskets and the end of the mufflers into the exhaust ports, and attach the muffler to the frame tightening the right foot peg nut loosely. A lock washer and flat washer go with the nut.
- Fit the split keepers and collars back into place, and tighten the collar nuts evenly to avoid an exhaust leak. There is a lock washer for each nut (Fig. 89).

FUEL TANK

Removal:

- Turn the fuel tap to OFF, slide down the hose clamps, and pull the fuel hoses (2) off the tap.
- Unlock the seat, and swing it open.
- Unhook the rubber retaining band, and pull the fuel tank off towards the rear.

Installation:

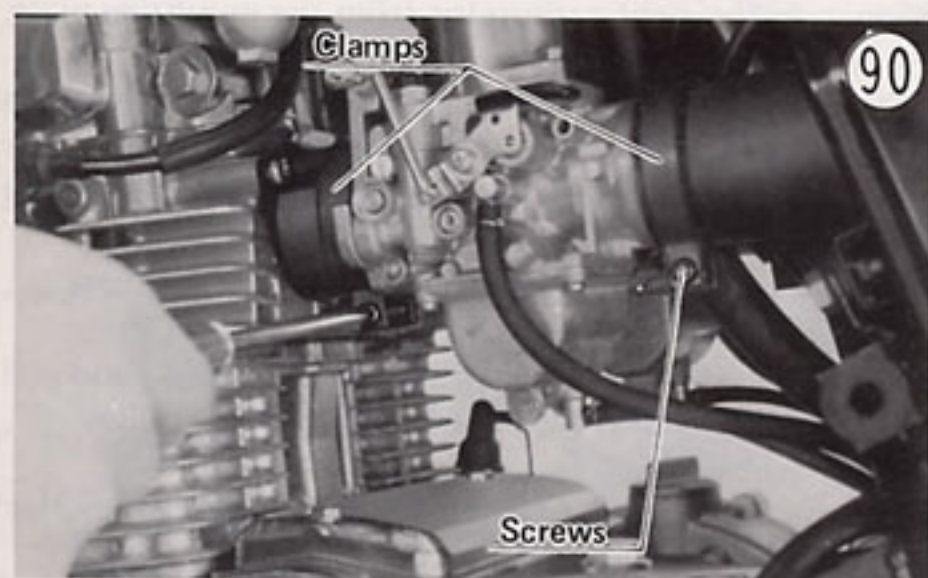
- Replace the fuel tank, and hook its retaining band.
- Fit the fuel hoses back onto the fuel tap, and slide the clamps back into place.
- Push the seat back down.

CARBURETORS

Removal:

- Take off the right and left side covers.

- Turn the fuel tap to OFF, slide down the hose clamps, and pull the fuel hoses (2) off the tap.
- Loosen the engine intake duct clamp for each carburetor.
- Loosen the clamp that connects each air cleaner duct to its carburetor, and slip it out of place.



- Slip the carburetors down and out of their ducts to the right side of the motorcycle.
- Screw in fully the lock nuts and adjusting nuts at the upper end of the throttle cables so as to give the throttle grip plenty of play.
- Screw one of the cable adjusters out of its bracket, slip the tip of its inner cable out of the pulley, and then do the same with the other throttle cable to complete carburetor removal.

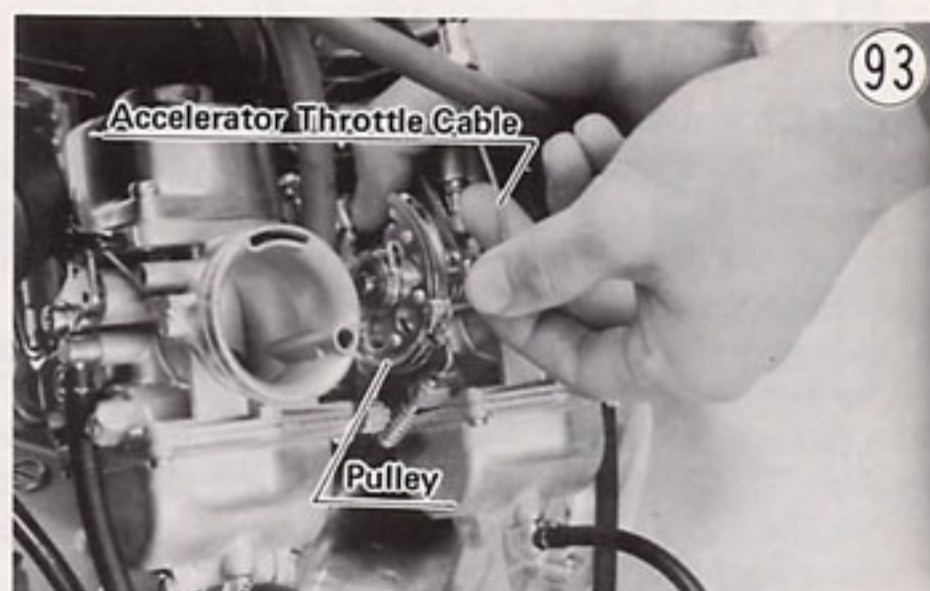


Installation:

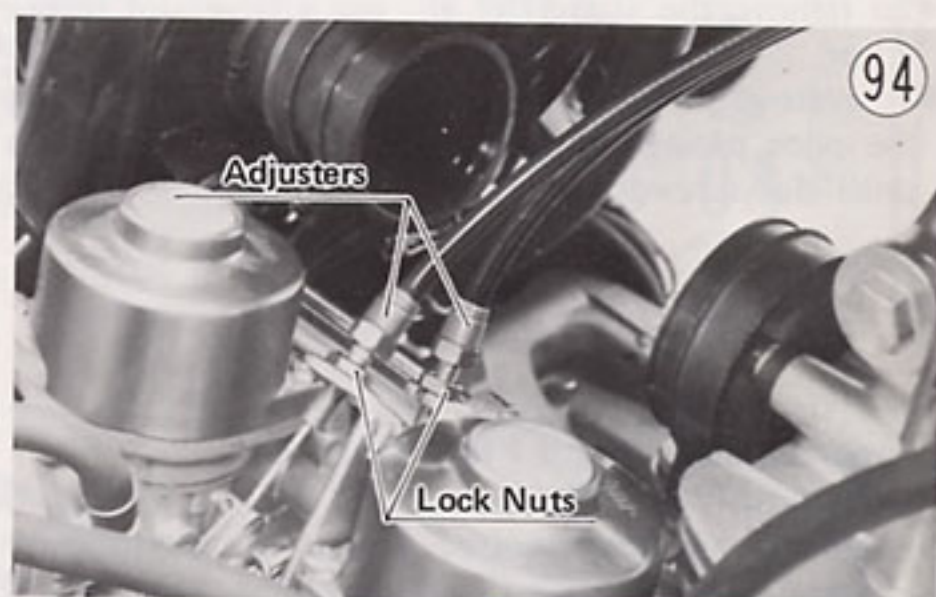
- If necessary, change the position of the pulley stop screw so that the pulley rotation is stopped at the point where the butterfly valves are parallel to the carburetor bore. Tighten the lock nut after alteration of the screw position.



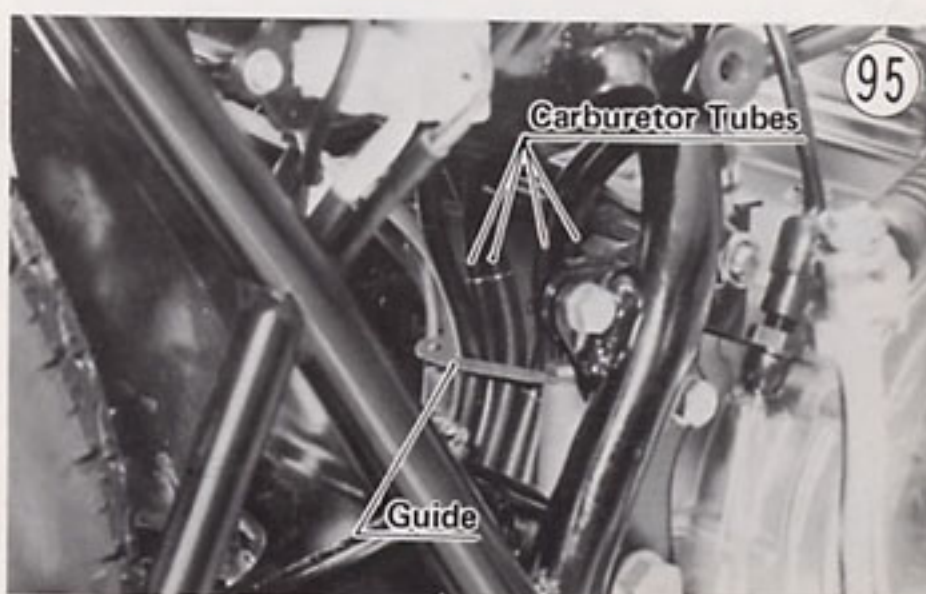
- Fit the tip of the accelerator throttle cable into the rear catch in the pulley, and screw its adjuster down into the bracket all the way.



- Fit the tip of the other cable into the other catch, and lift its adjuster onto the bracket turning the throttle grip at the same time if necessary.
- Center each adjuster in its place in the bracket, and tighten the lock nuts.



- Slip the carburetors back into place the reverse of how they were removed.
- Once the ducts are all properly fitted on the carburetors, tighten all four clamps.
- Route the carburetor tubes (4) to the rear through their guide.



30 DISASSEMBLY

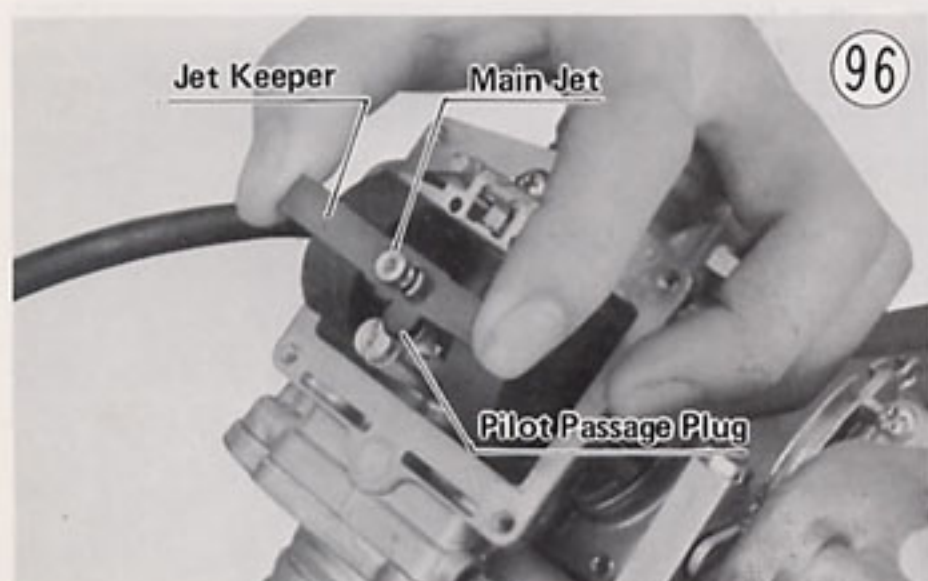
- Fit the fuel hoses back onto the fuel tap, and slide the clamps back into place.
- Replace the right and left side covers.
- Adjust the throttle cables (Pg. 9).

Upper Chamber and Float Chamber Disassembly:

- Remove the upper chamber screws, and take off the carburetor cap (13).
- Pull out the vacuum piston (13), and take out the vacuum piston gasket (12).
- To remove the jet needle (15), take out the screw (14) and drop out the jet needle.
- To remove the air jets, remove the screw (16) and lock washer (17) and take out the plate (18) and plate gasket (19). The main air jet (20) and slow air jet (21) may be removed with a small slot screwdriver.
- Remove the screws (4) (50), and pull off the float bowl (97).
- Remove the jet keeper (45).
- Push out the float pin (47), remove the float (46), and pull out the float valve needle (37).
- To remove the float valve seat (37), remove its screw and retainer (35), and pull it out.
- To remove the main jet (44) and needle jet (42), pull out the main jet and then drop out the needle jet.
- To remove the starter jet (41), use a large slot screwdriver.
- To remove the pilot jet (39) and slow jet (40), pull out the pilot passage plug (38), and remove them using a small slot screwdriver.

Upper Chamber and Float Chamber Assembly Notes:

1. Replace any deteriorated gaskets or rubber parts (vacuum piston gasket, air jet gasket, valve seat O ring (34), upper main jet groove O ring (43), pilot passage plug, and float bowl ring (33)) for new ones.
2. Be sure that the float is replaced facing the right way (Pg. 103 Fig. 388).
3. Replace the jet keeper as shown in Fig. 96, and then screw on the float bowl. The jet keeper is used to keep the main jet and pilot passage plug in place.



Linkage Mechanism and Starter Plunger Unit

Disassembly:

- Remove the left carburetor from the mounting plate (1), taking out its screws (2) (87) (88) and slipping it out of its balance adjusting screw connection and choke lever linkage.
- Separate the right carburetor from the mounting plate, removing its screws (2).
- To disassemble the linkage mechanism, first straighten back the linkage bar washer sides which are bent over the bolt, and remove the bolt (81), washer (80), spring (79), and pusher (78).
- Remove the linkage bar C rings (76) and washers (75), and pull off the bar (74).
- Remove the C ring (73) from the pulley screw (62), and pull off the flat washer (72), plastic washer (65), pulley (71), and plastic washer (65).
- Remove the cable bracket (70) and then the pulley spring (64).
- To disassemble the starter plunger unit, unscrew the cap (7), pull out the unit, and slide off the plunger (11). Removal of the right carburetor starter plunger unit requires removal of the cable bracket.

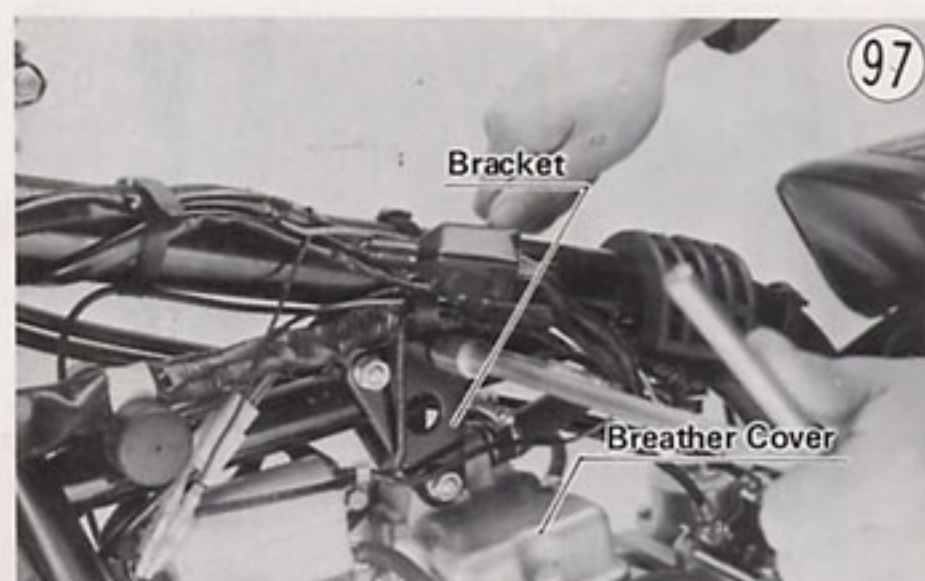
Linkage Mechanism and Starter Plunger Unit Assembly Note:

- To mount the left carburetor, first fit the choke linkage together, connect the balance adjusting screw connection (98) with the bracket between the washers, and fit the spring between the carburetors. Then fit the choke linkage in place, and replace the mounting plate screws. Use a non-permanent locking agent on each mounting plate screw.

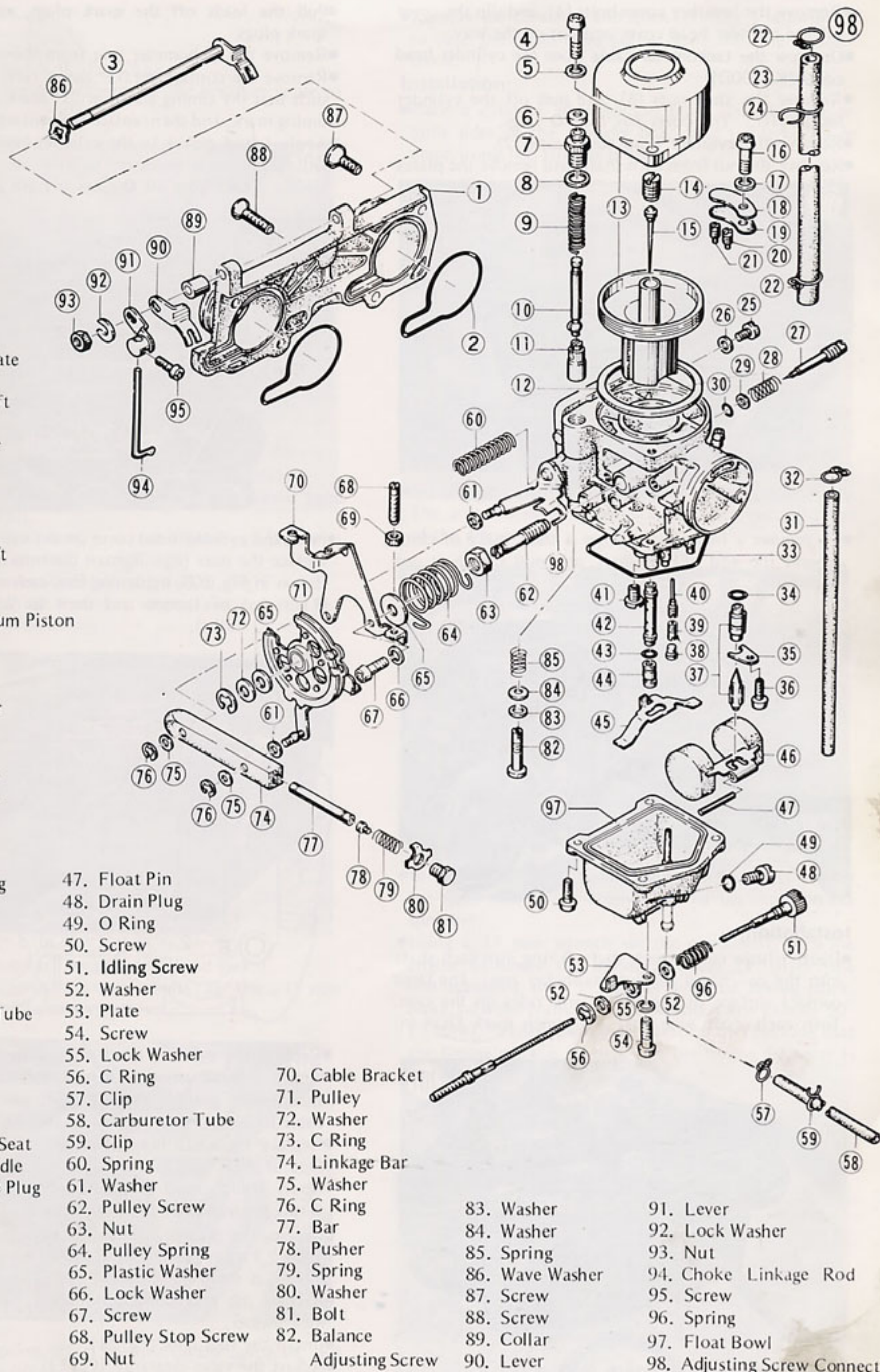
ROCKER ARMS

Removal:

- Remove the fuel tank (Pg. 28).
- Remove the bracket connecting the breather cover to the frame.

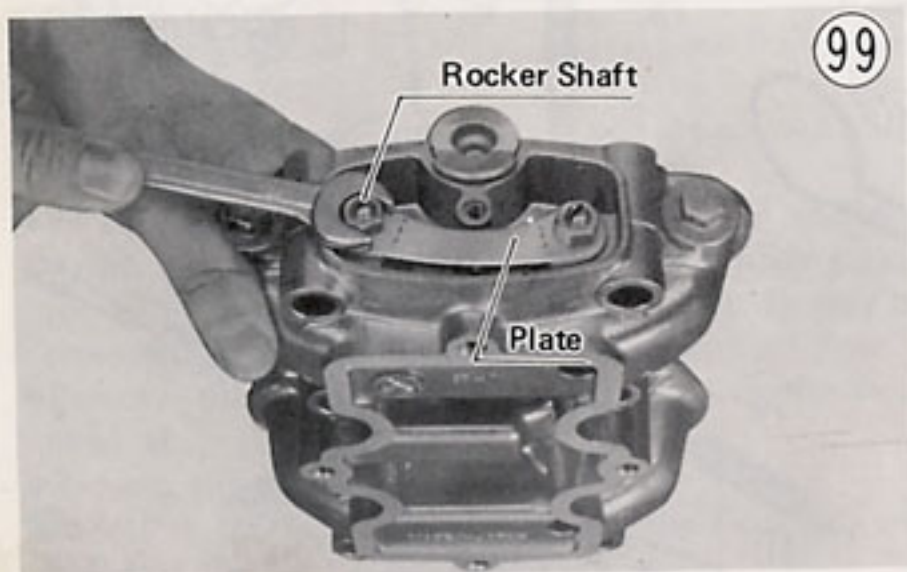


Carburetor

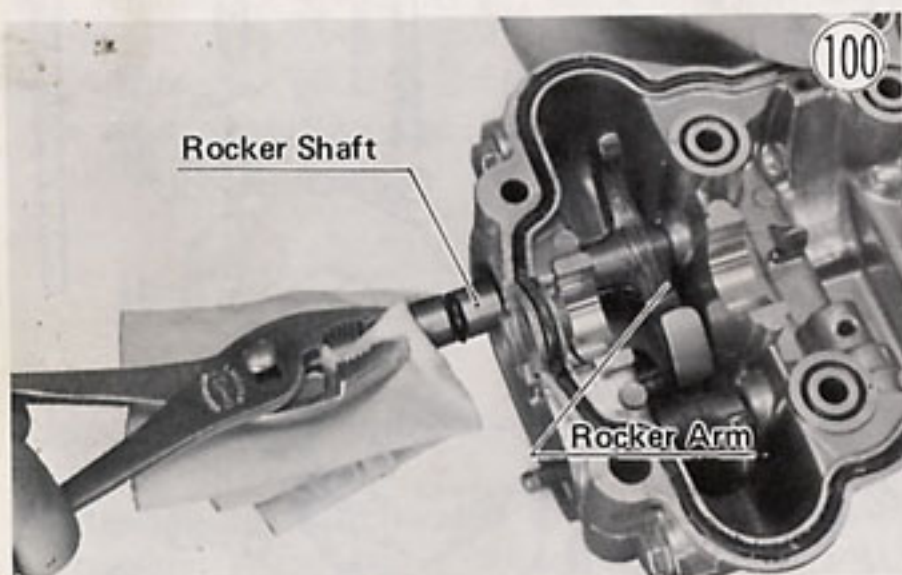


32 DISASSEMBLY

- Remove the breather cover bolts (4), and slip the cover off the cylinder head cover and out of the way.
- Unscrew the tachometer cable from the cylinder head cover (KZ400D).
- Remove the stud nuts (8), and pull off the cylinder head cover. The cover has four O rings.
- Remove the cylinder head cover caps (2).
- Remove the nut from each shaft, and remove the plates (2).

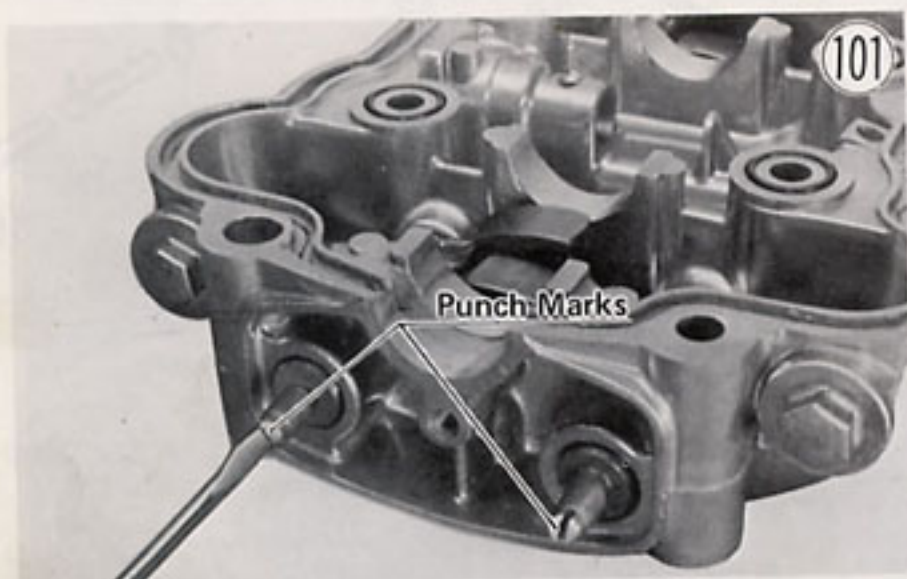


- To remove a rocker arm, wrap a thick piece of cloth around the end of the shaft, and pull the shaft out with pliers.



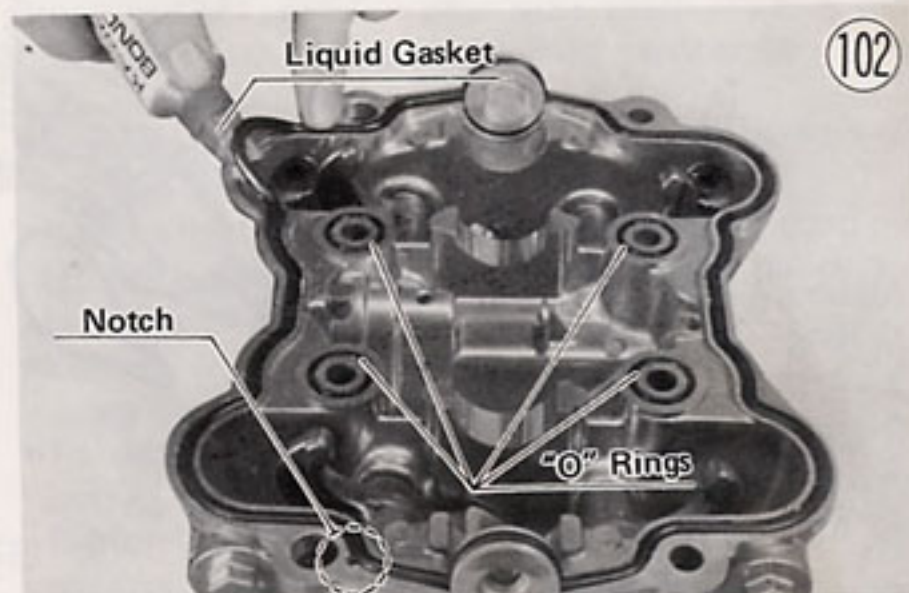
Installation:

- Daub a little oil on each shaft O ring, run each shaft into the cover and through its rocker arm. The large contact surface of the rocker arm rides on the cam. Turn each shaft such that the punch mark faces in.



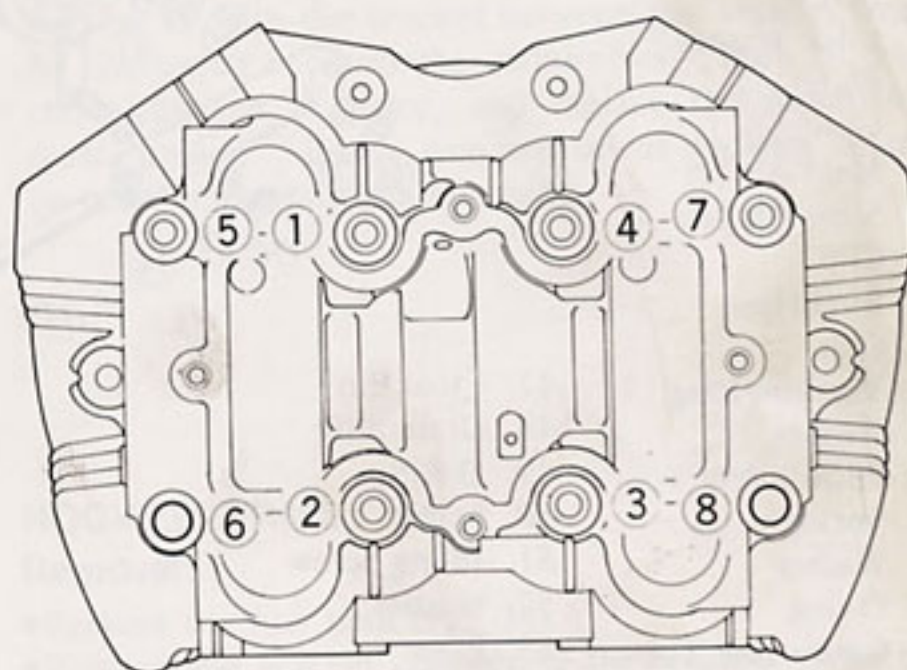
- Replace the plates and each shaft nut.

- Pull the leads off the spark plugs, and remove the spark plugs.
- Remove the tachometer gear from the cover (KZ400).
- Remove the contact breaker cover, turn the crankshaft such that the timing advancer "T" mark aligns with the timing mark, and then replace the contact breaker cover.
- Apply liquid gasket to the cylinder head cover O ring fitting surface if necessary to hold the O ring to the cover. Check that all O rings (4) are in place.



- Place the cylinder head cover on the cylinder head, and replace the nuts (8). Tighten the nuts in the sequence shown in Fig. 103, tightening first each nut to 1.5 kg-m (11 ft-lbs) of torque and then to 2.5 ~ 3.0 kg-m (18 ~ 22 ft-lbs).

Cylinder Head Cover Tightening Order

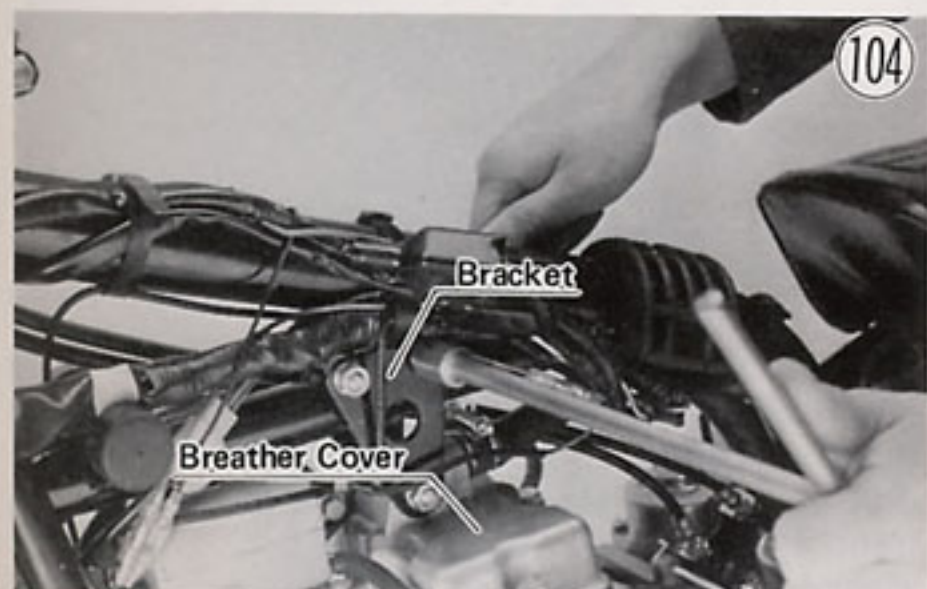


- Replace the cylinder head cover caps (2).
- Apply a small amount of heat durable grease to the tachometer gear, insert the gear, and reconnect the cable to the cylinder head cover (KZ400D).
- Replace the spark plugs, and connect each spark plug lead onto its plug.
- Apply liquid gasket if necessary to the breather cover O ring groove to hold the O ring in place for installation.
- Replace the breather cover tightening its bolts (4) with 1.8 ~ 2.3 kg-m (13 ~ 16.5 ft-lbs) of torque. Each bolt has a flat washer.
- Replace the breather cover bracket. Each bolt has a lock washer.
- Install the fuel tank (Pg. 28).
- Adjust the valve clearance (Pg. 14).

CAMSHAFT

Removal:

- Remove the fuel tank (Pg. 28).
- Remove the bracket connecting the breather cover to the frame.



- Remove the breather cover bolts (4), and slip the cover off the cylinder head cover and out of the way.
- Unscrew the tachometer cable from the cylinder head cover (KZ400D).
- Remove the stud nuts, and pull off the cylinder head cover. The cover has four O rings.
- Remove the chain tensioner cap and O ring.
- Remove the chain tensioner screws, and pull out the entire tensioner assembly.



- Remove the contact breaker cover and gasket.
- Remove the camshaft sprocket bolts (2). Use a 17 mm wrench to turn the crankshaft.

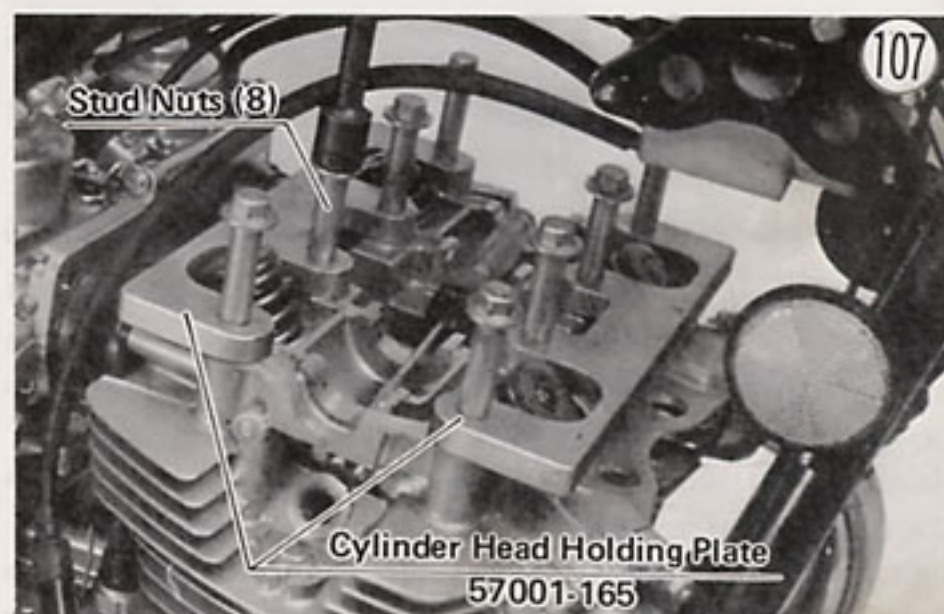


- Slide the sprocket off its position on the camshaft, and slip the chain off the sprocket.

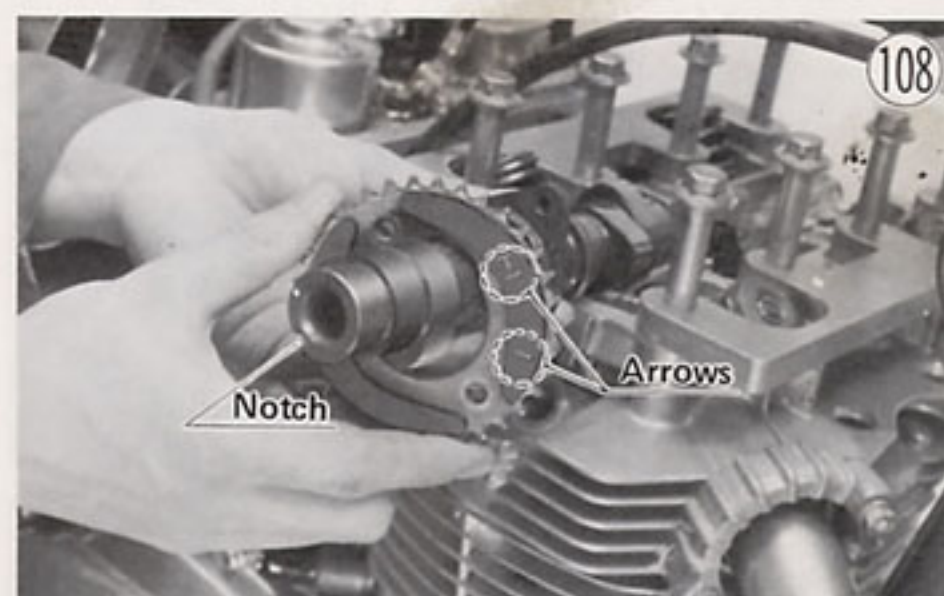
- Remove the camshaft and sprocket. Use a screwdriver to keep the chain from falling down into the cylinder block.

Installation:

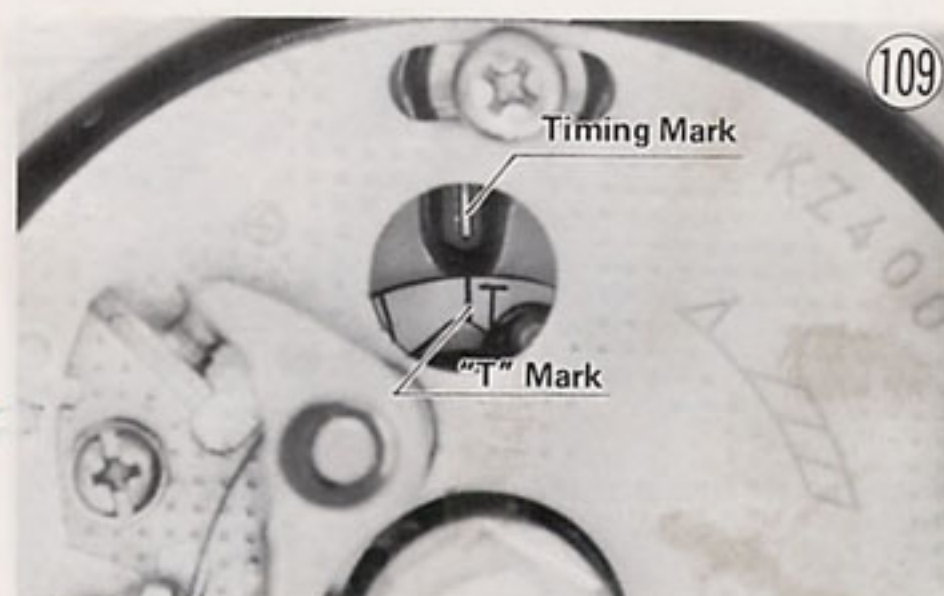
- Place a cylinder head holding plate (special tool) on both sides of the cylinder head, and tighten both in place using the stud nuts (8).

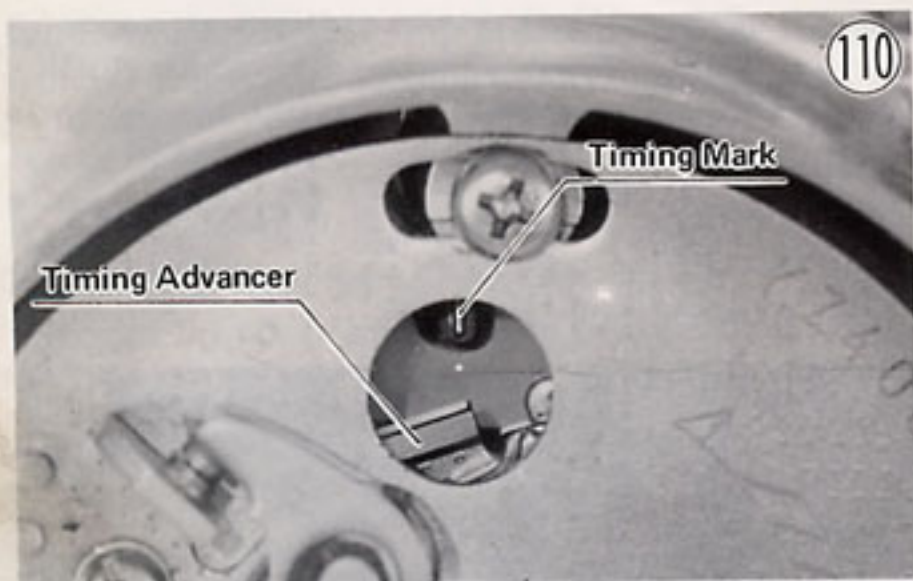


- Set the sprocket on the camshaft near where it fits. The arrowed side of the sprocket faces the right side of the engine.

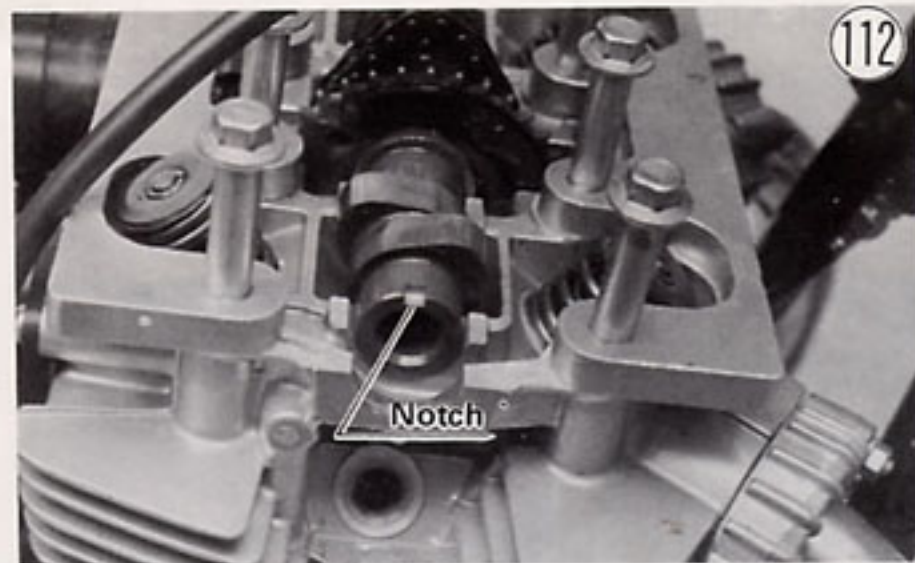


- Run the camshaft through the camshaft chain from the right side of the engine, and fit the chain on the sprocket.
- Using a 17 mm wrench on the crankshaft, turn the engine to where the timing advancer "T" mark (the line adjoining the "T") aligns with the timing mark. Next, turn the crankshaft counterclockwise exactly 90° (¼ turn). Verify crankshaft position by checking that the timing mark is aligned with the timing advancer as shown in Fig. 110.

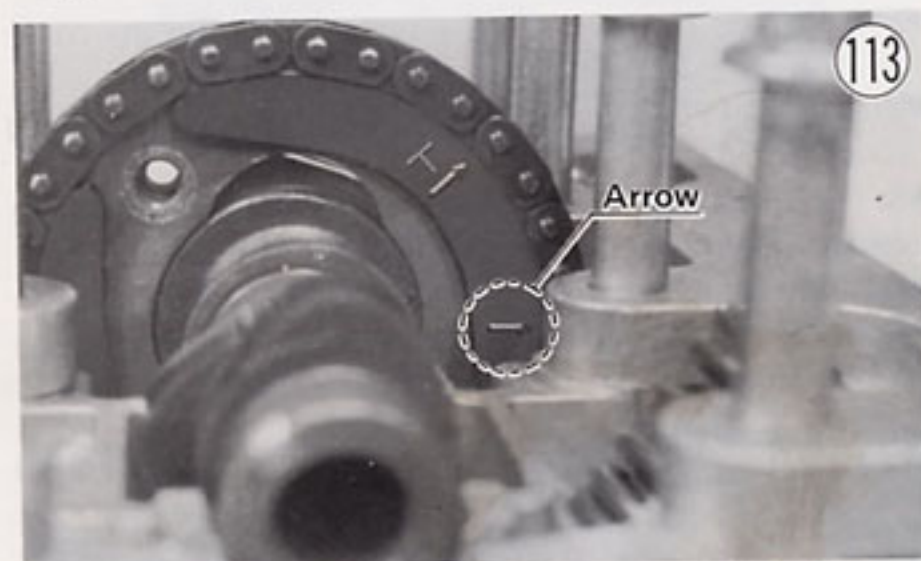




Camshaft Timing

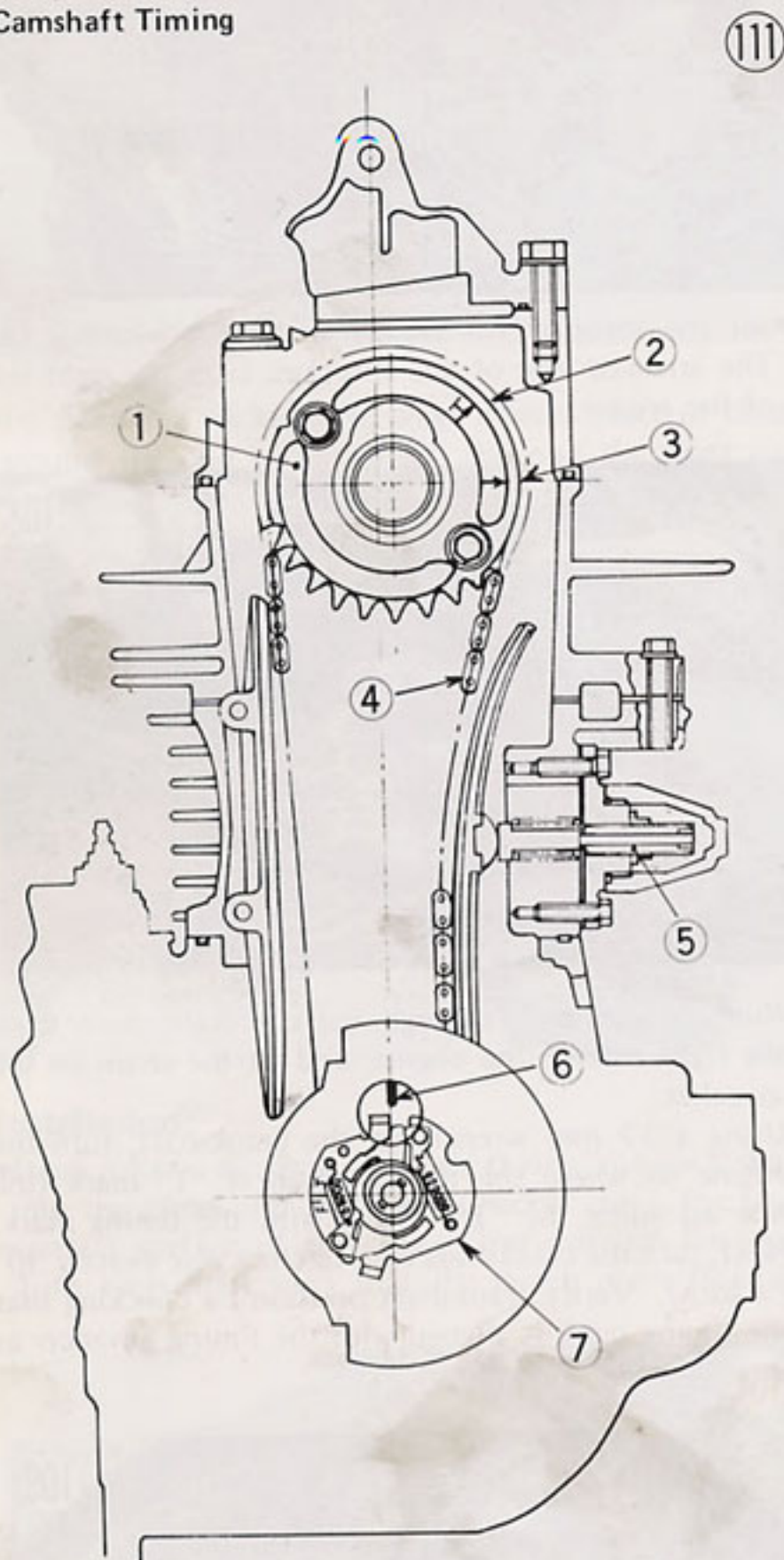
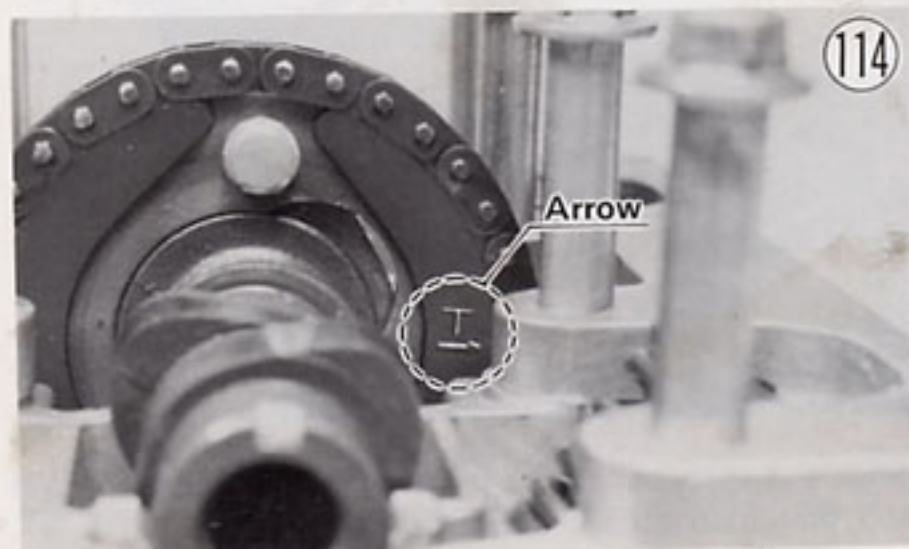


- Turn the sprocket such that the arrow which has no letter adjoining it points to the front of the engine (points parallel to the cylinder head fitting surface), slip the chain back on the sprocket, and fit the sprocket up into place (the bolt holes will not be aligned at this time).



NOTE: The camshaft chain must be fitted with the crankshaft, sprocket, and camshaft positioned as just described. Otherwise, the valve timing will be incorrect. The reason for fitting the chain on the sprocket before turning the crankshaft is to avoid kinking the chain on the lower sprocket.

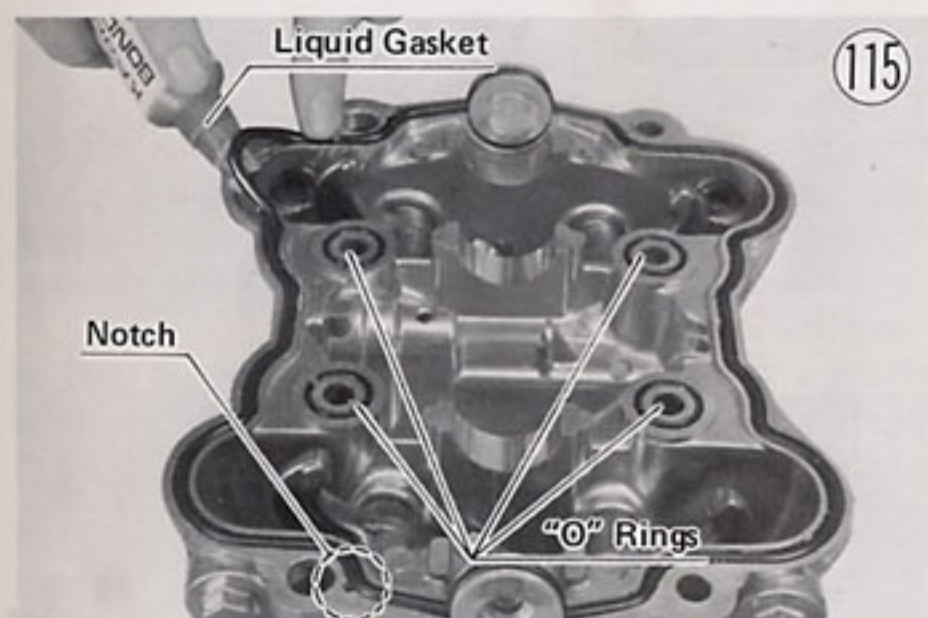
- Turn the crankshaft while holding the camshaft steady such that the bolt holes align.
- Apply a non-permanent locking agent to both sprocket bolts, and replace both bolts tightening them with 1.4 ~ 1.6 kg-m (10 ~ 11.5 ft-lbs) of torque.
- To verify that the valve timing will be correct, turn the crankshaft to where the timing advancer "T" mark aligns with the timing mark, and check that the sprocket arrow which has the "T" adjoining it points to the front of the engine (points parallel to the cylinder head fitting surface).



- | | |
|-------------------------|------------------------------|
| 1. Camshaft Sprocket | 5. Chain Tensioner |
| 2. TDC Mark | 6. Timing Mark |
| 3. Camshaft Timing Mark | 7. Automatic Timing Advancer |
| 4. Camshaft Chain | |

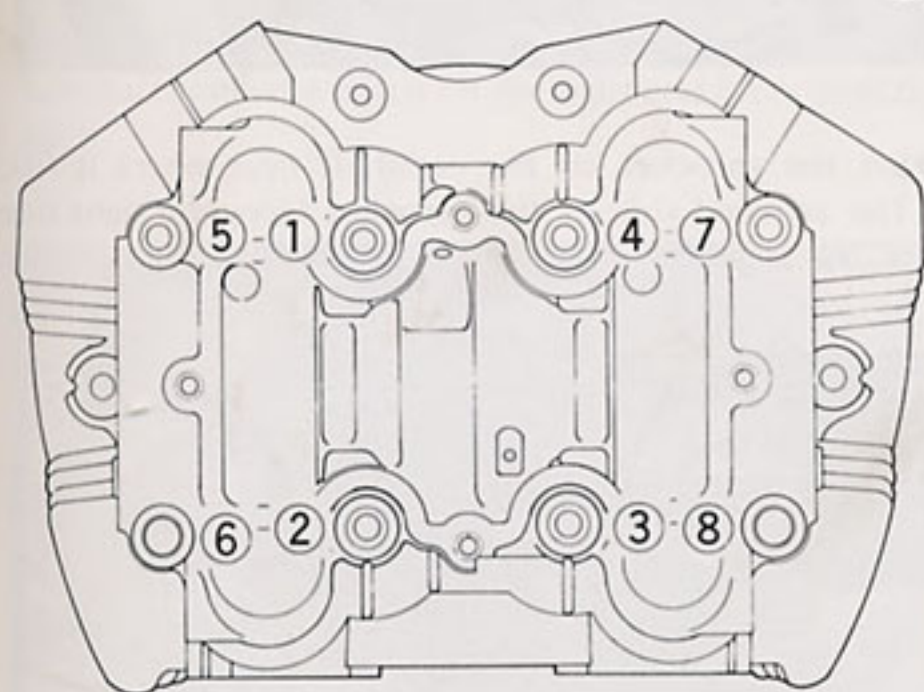
- Slip the chain off the sprocket, and then turn the camshaft until the notch on the right end faces directly

- Remove the stud nuts (8), and remove the cylinder head holding plates.
- Remove the tachometer gear and the caps (2) from the cylinder head cover (KZ400D).
- Turn the crankshaft such that the timing advancer "T" mark aligns with the timing mark.
- Apply liquid gasket to the cylinder head cover O ring fitting surface if necessary to hold the O ring to the cylinder head cover. Check that all O rings (4) are in place.



- Place the cylinder head cover on the cylinder head, and replace the nuts (8). Tighten them in the sequence shown in Fig. 116, tightening each nut first to 1.5 kg-m (11 ft-lbs) of torque and then to 2.5 ~ 3.0 kg-m (18 ~ 22 ft-lbs).

Cylinder Head Cover Tightening Order



- Replace the cylinder head cover caps.
- Apply a small amount of heat durable grease to the tachometer gear, insert the gear, and reconnect the cable to the cylinder head cover (KZ400D).
- Replace the tensioner assembly. The sequence is push rod, spring, gasket, holder, push rod guide, and lock nut. Tighten its screws, adjust it (Pg. 15), and replace the cap and O ring.

- Apply liquid gasket if necessary to the breather cover O ring groove to hold the O ring in place for installation.
- Replace the breather cover tightening its bolts (4) with 1.8 ~ 2.3 kg-m (13 ~ 16.5 ft-lbs) of torque. Each bolt has a flat washer.
- Replace the breather cover bracket. Each bolt has a lock washer.
- Install the fuel tank (Pg. 28).
- Replace the contact breaker cover and gasket.

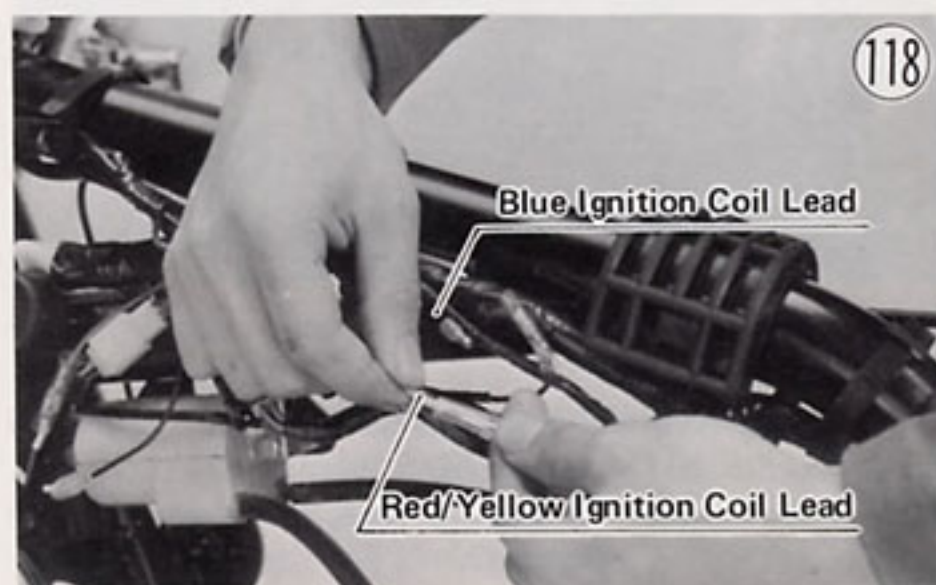
CYLINDER HEAD

Removal:

- Remove the camshaft (Pg. 33).
- Remove the muffler collar nuts and lock washers, and slide each muffler collar off its cylinder head studs.
- Remove each rear foot peg to complete muffler removal. Also, remove the muffler gasket from each exhaust port.
- Remove the right and left side covers.
- Loosen the engine intake duct clamp for each carburetor.
- Loosen the clamp that connects each air cleaner duct to its carburetor, and slip it out of place.

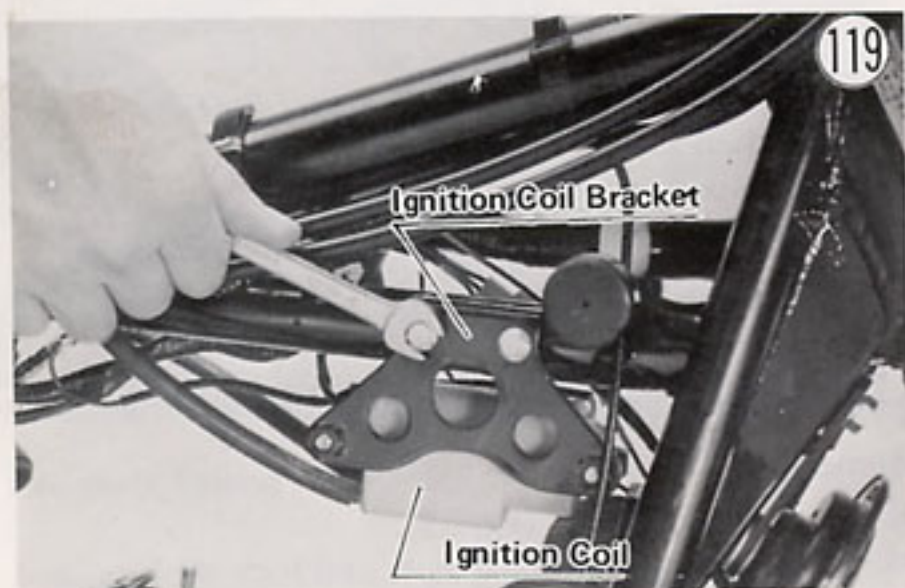


- Slip the carburetors down and out of their ducts, pull the carburetors free, and set them on top of the frame.
- Pull the leads off the spark plugs, and remove the spark plugs.
- Disconnect the blue and the red/yellow ignition coil leads.



36 DISASSEMBLY

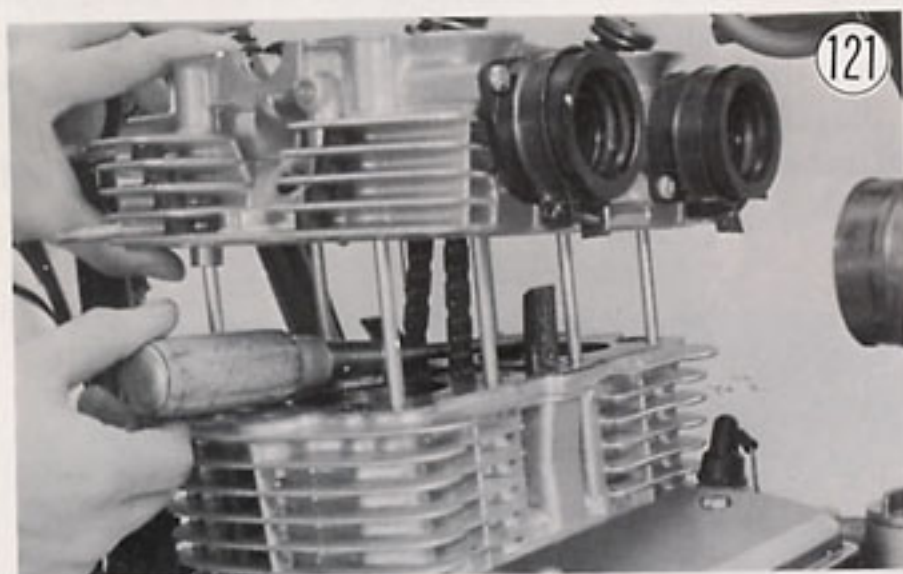
- Remove the ignition coil bracket together with the ignition coil.



- Remove the cylinder head bolts (4) using special 10 mm and 13 mm sockets and the cylinder head bolt wrench handle (special tools).

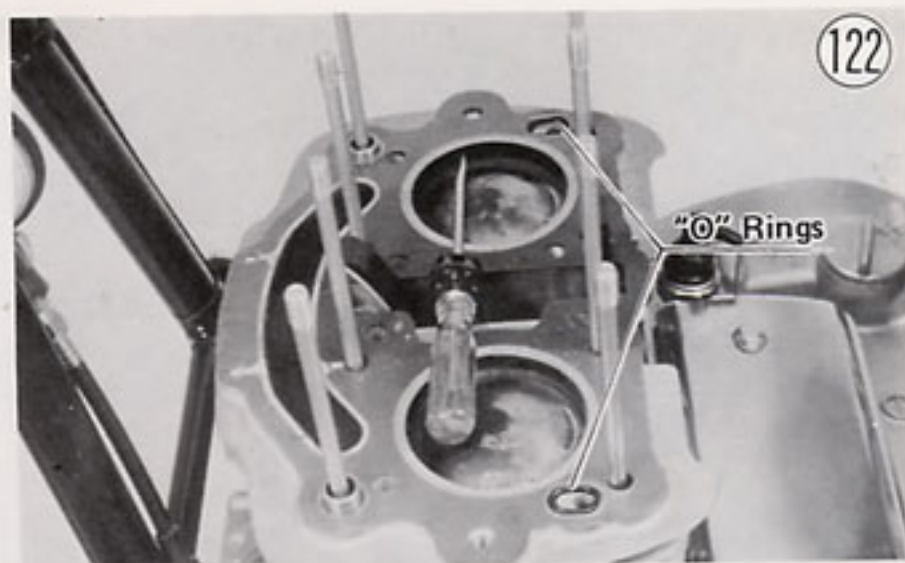


- Pull off the cylinder head, and remove the cylinder head gasket. When the cylinder head is part of the way up, insert a screwdriver between the cylinder head and cylinder block through the camshaft chain, and remove the screwdriver which is on top of the cylinder head.

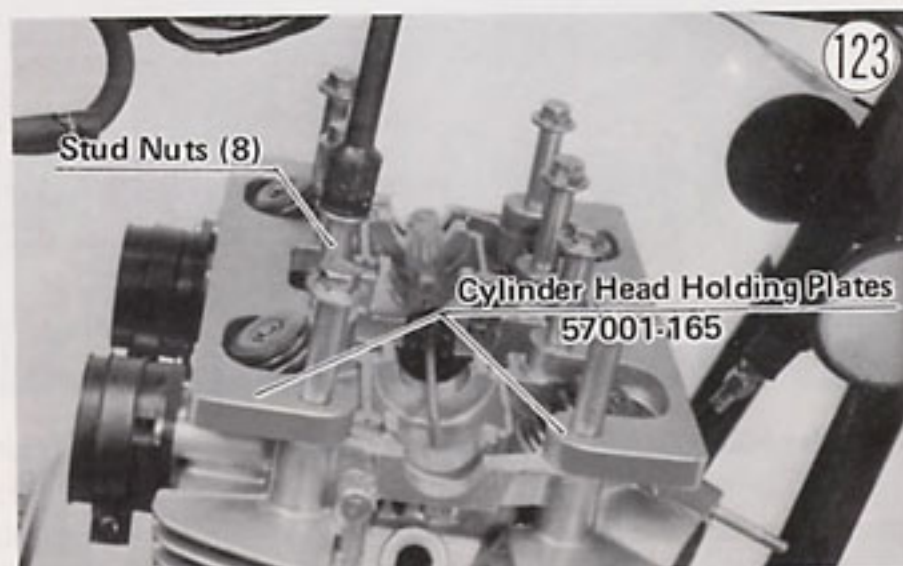


Installation:

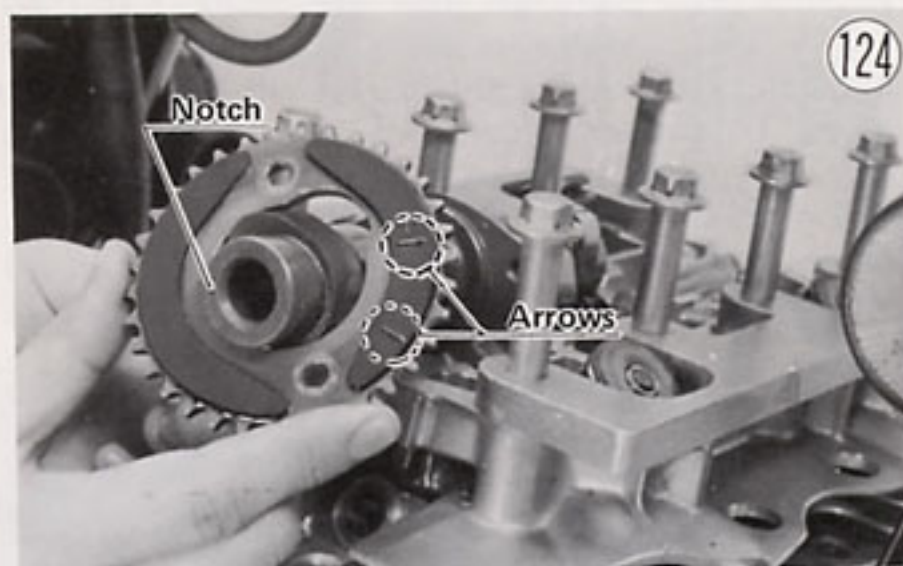
- Replace the cylinder head gasket, using a new one if it is deteriorated or damaged.
- Check to see that the oval O rings are in place in the gasket.



- Fit the cylinder head on the cylinder block while at the same time running the camshaft chain through the cylinder head using a length of cord. Remove the cord, and use a screwdriver resting on the cylinder head to keep the chain from falling.
- Place a cylinder head holding plate (special tool) on both sides of the cylinder head, and tighten both in place using the stud nuts (8).

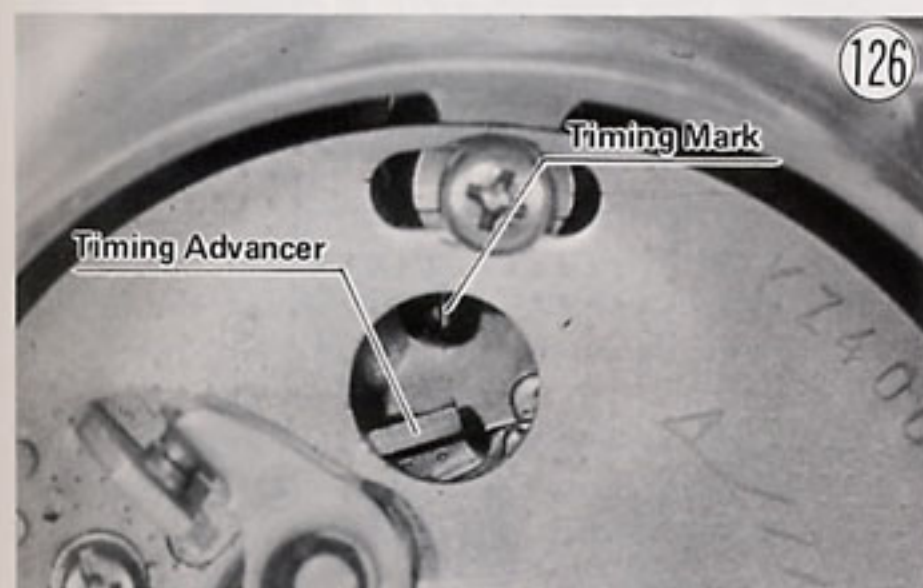
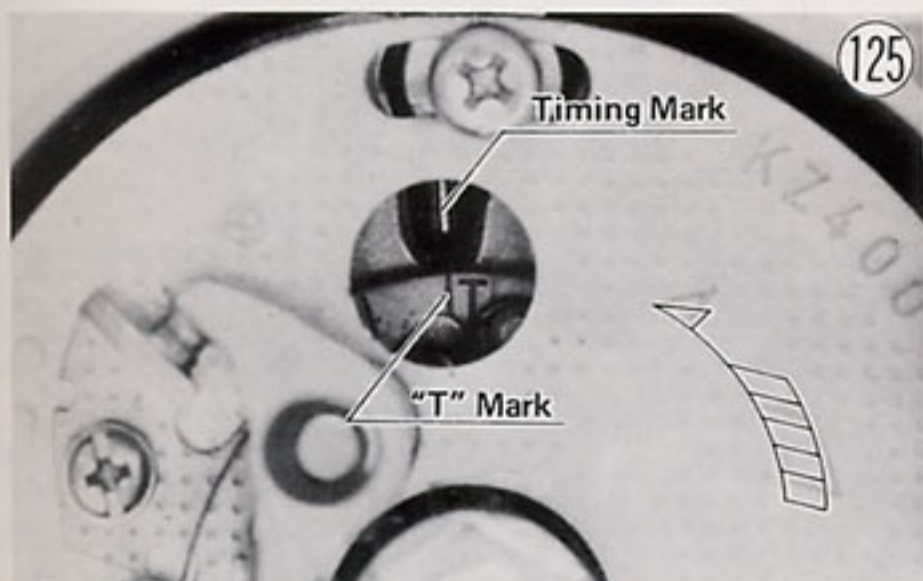


- Set the sprocket on the camshaft near where it fits. The arrowed side of the sprocket faces the right side of the engine.

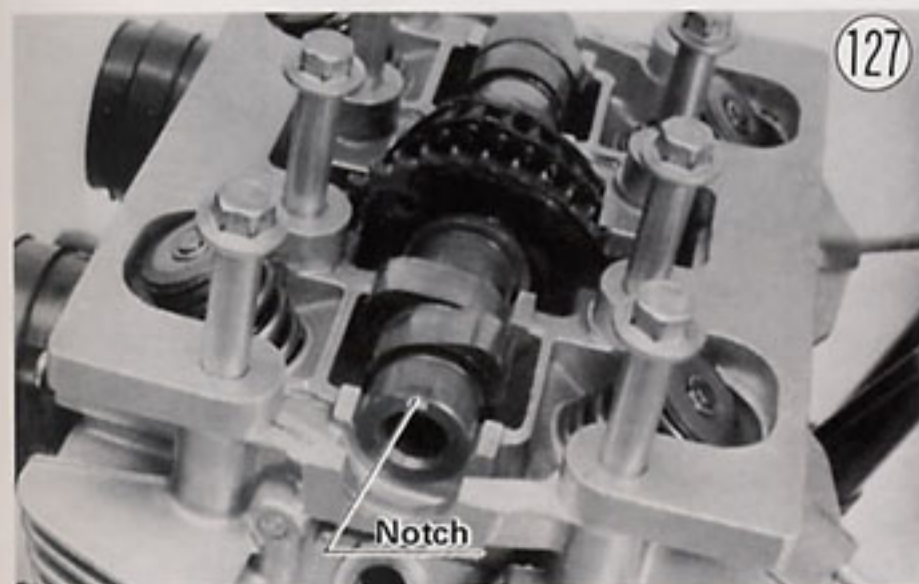


- Run the camshaft through the camshaft chain from the right side of the engine, and fit the chain on the sprocket.
- Using a 17 mm wrench on the crankshaft, turn the engine to where the timing advancer "T" mark (the line adjoining the "T") aligns with the timing mark.

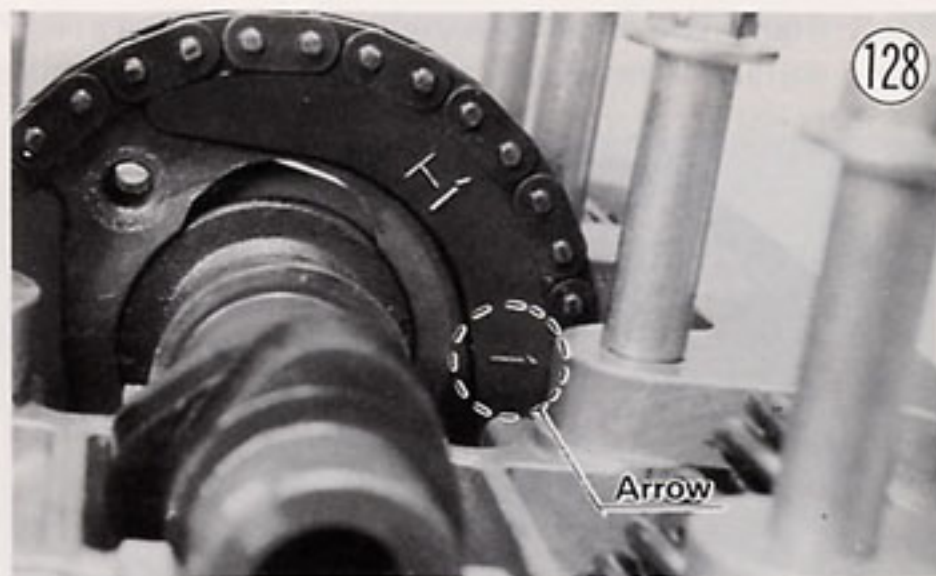
Next, turn the crankshaft counterclockwise exactly 90° ($\frac{1}{4}$ turn). Verify crankshaft position by checking that the timing mark is aligned with the timing advancer as shown in Fig. 126.



- Slip the chain off the sprocket, and then turn the camshaft until the notch on the right end faces directly up.

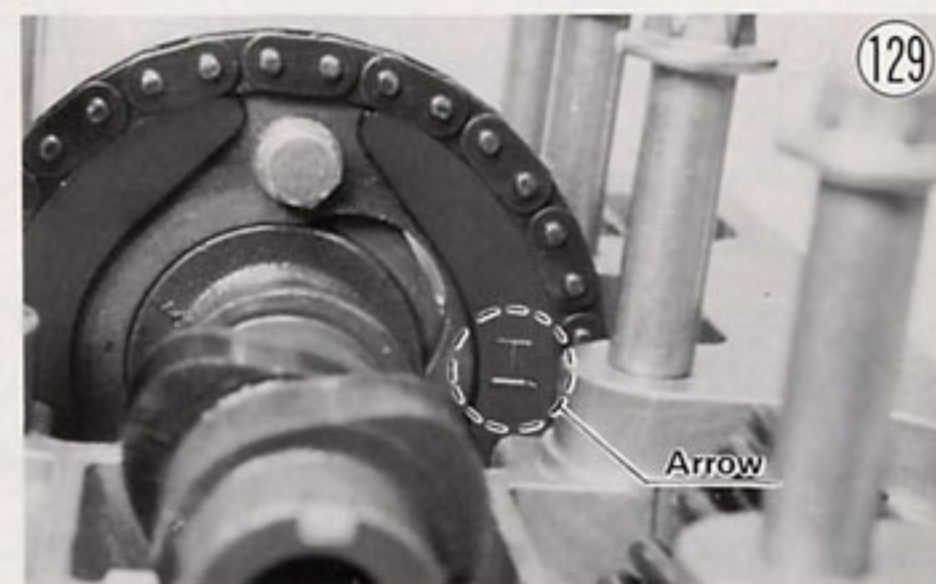


- Turn the sprocket such that the arrow which has no letter adjoining it points to the front of the engine (points parallel to the cylinder head fitting surface), slip the chain back on the sprocket, and fit the sprocket up into place (the bolt holes will not be aligned at this time).



NOTE: The camshaft chain must be fitted with the crankshaft, sprocket, and camshaft positioned as just described. Otherwise, the valve timing will be incorrect. The reason for fitting the chain on the sprocket before turning the crankshaft is to avoid kinking the chain on the lower sprocket.

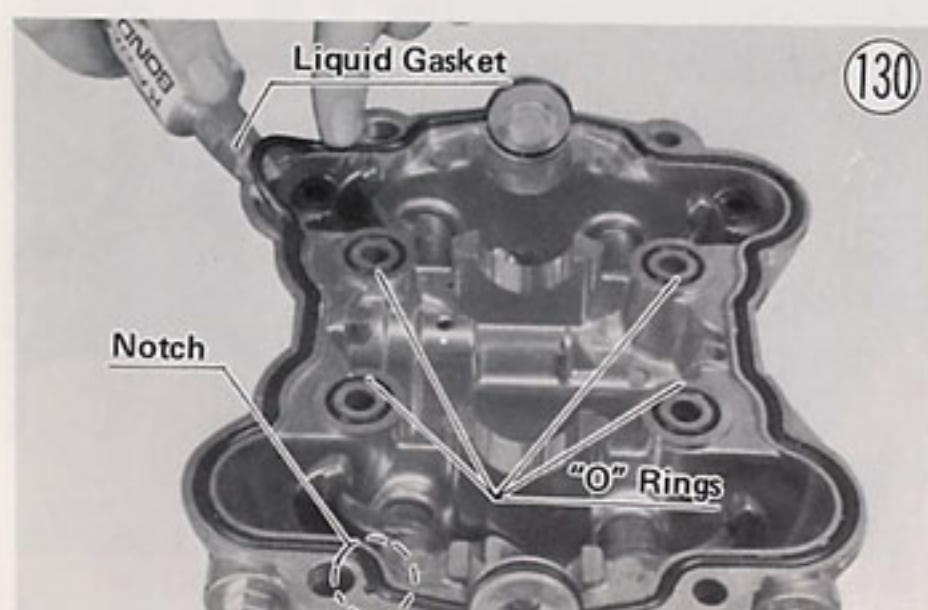
- Turn the crankshaft while holding the camshaft steady such that the bolt holes align.
- Apply a non-permanent locking agent to both sprocket bolts, and replace both bolts tightening them with 1.4 ~ 1.6 kg-m (10 ~ 11.5 ft-lbs) of torque.
- To verify that the valve timing will be correct, turn the the crankshaft to where the timing advancer "T" mark aligns with the timing mark, and check that the sprocket arrow which has the "T" adjoining it points to the front of the engine (points parallel to the cylinder head fitting surface).



- Remove the stud nuts (8), and remove the cylinder head holding plates.
- Remove the tachometer gear (KZ400D) and the caps (2) from the cylinder head cover.
- Turn the crankshaft such that the timing advancer "T" mark aligns with the timing mark.

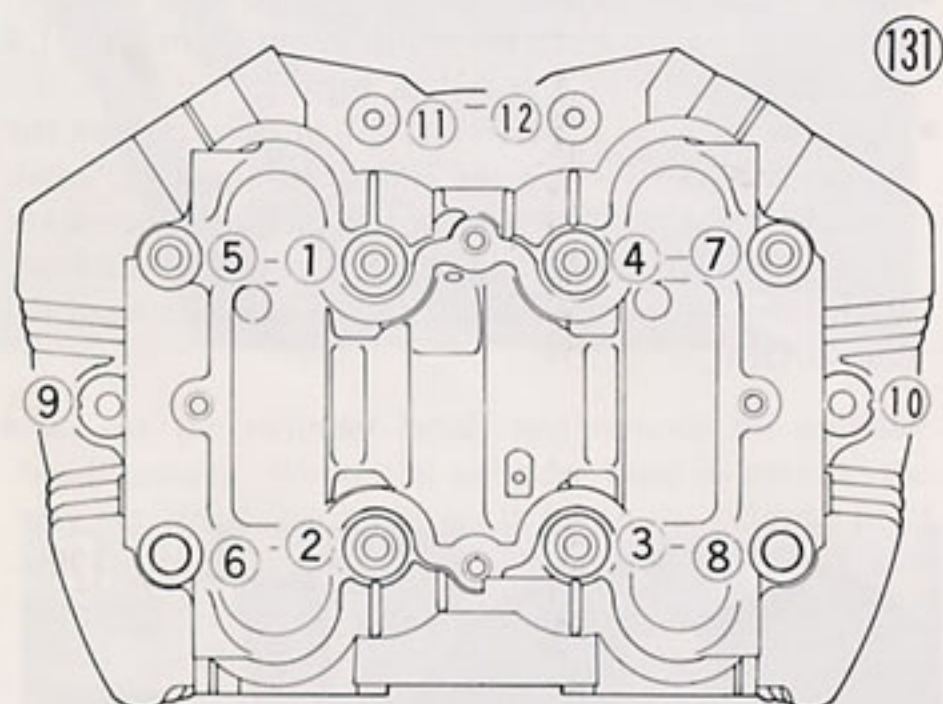
38 DISASSEMBLY

- Apply liquid gasket to the cylinder head cover O ring fitting surface if necessary to hold the O ring to the cylinder head cover. Check that all O rings (4) are in place.



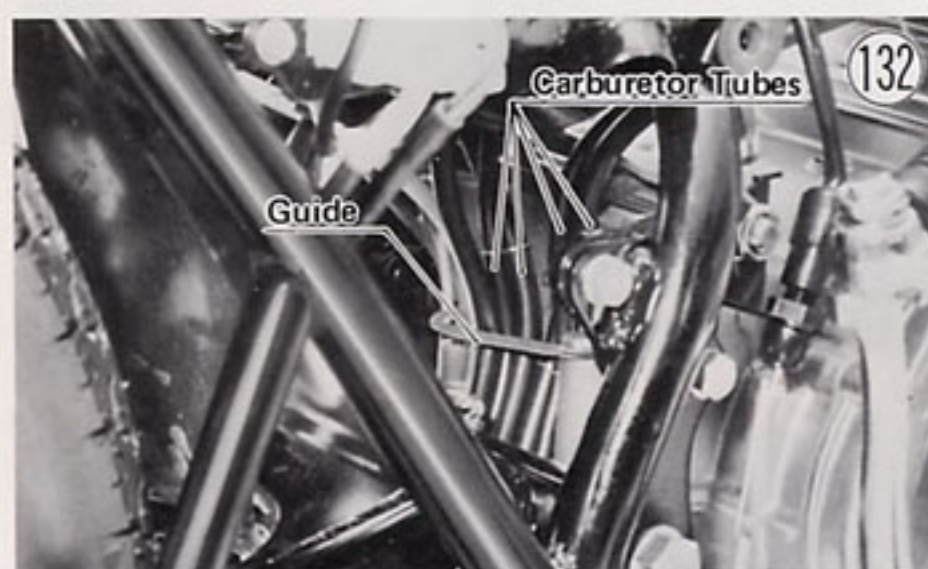
- Place the cylinder head cover on the cylinder head, and replace the nuts (8). Tighten them in the sequence shown in Fig. 131, tightening each nut first to 1.5 kg-m (11 ft-lbs) of torque and then to 2.5 ~ 3.0 kg-m (18 ~ 22 ft-lbs).

Cylinder Head, Cylinder Head Cover Tightening Order

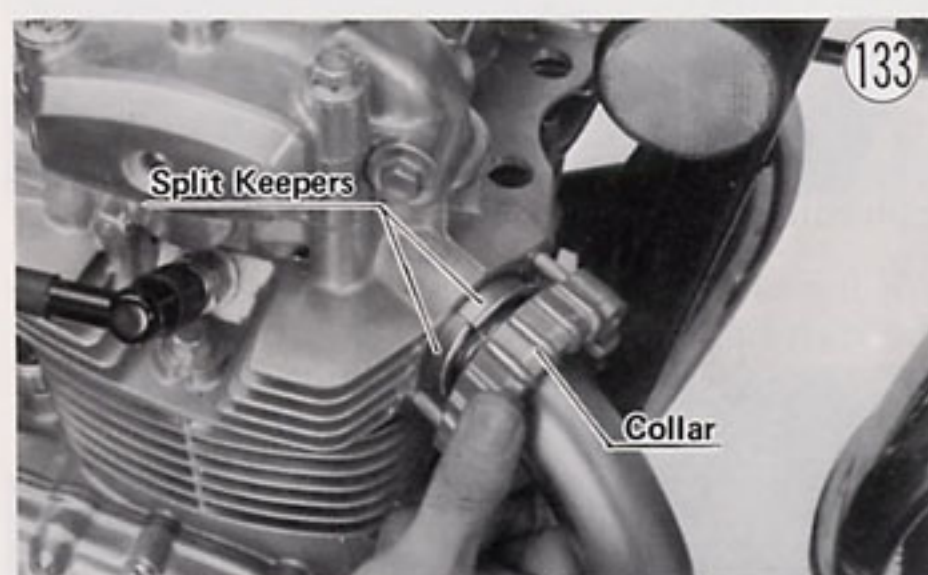


- Replace the cylinder head bolts (4) using special 10 mm and 13 mm sockets (special tools). Tighten in the sequence shown in Fig. 131, tightening the 8 mm bolts with 2.5 ~ 3.0 kg-m (18 ~ 22 ft-lbs) of torque and then the 6 mm bolts with 1.1 ~ 1.3 kg-m (9.5 ~ 11.3 in-lbs).
- Replace the cylinder head cover caps.
- Apply a small amount of heat durable grease to the tachometer gear, insert the gear, and reconnect the cable to the cylinder head cover.
- Replace the tensioner assembly. The sequence is push rod, spring, gasket, holder, push rod guide, and lock nut. Tighten its screws, adjust it (Pg. 15), and replace the cap and O ring.
- Install the ignition coil bracket together with the ignition coil.
- Connect the blue and the red/yellow ignition coil leads.

- Replace the spark plugs, and connect each spark plug lead onto the plug.
- Slip the carburetors back into place the reverse of how they were removed. Have the breather tube routed between the air cleaner ducts. The throttle cables go along the right side of the top tube.
- Once the ducts are all properly fitted on the carburetors, tighten all four clamps.
- Route the carburetor tubes (4) to the rear through their guide.



- Replace the right and left side covers.
- For each muffler, fit the gasket and the end of the muffler into its exhaust port, and attach the muffler to the frame tightening its foot peg nut loosely. A lock washer and flat washer go with the nut.
- Fit each split keeper and collar back into place, and tighten the collar nuts evenly to avoid an exhaust leak. There is a lock washer for each nut.



- Tighten the foot peg bolts securely.
- Apply liquid gasket if necessary to the breather cover O ring groove to hold the O ring in place for installation.
- Replace the breather cover tightening its bolts (4) with 1.8 ~ 2.3 kg-m (13 ~ 16.5 ft-lbs) of torque. Each bolt has a flat washer.
- Replace the breather cover bracket. Each bolt has a lock washer.
- Install the fuel tank (Pg. 28).
- Replace the contact breaker cover and gasket.

VALVES, VALVE GUIDES

Removal (per valve and valve guide):

- Remove the cylinder head (Pg. 35).
- Using the valve spring compressor assembly (special tool) to press down the valve spring retainer ②, remove the split keeper ①.

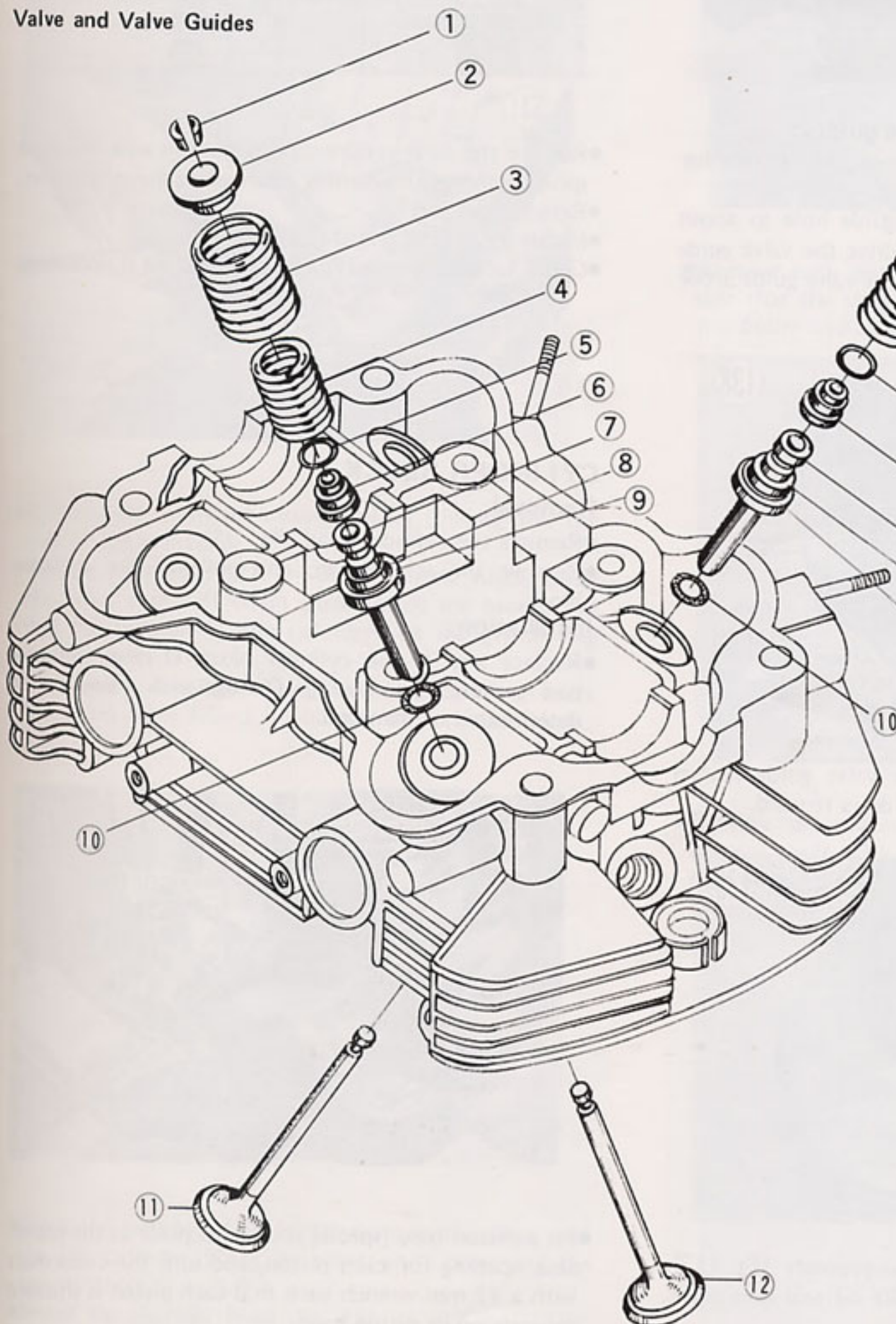
134



Valve Spring Compressor Assembly
57001-241

- Remove the tool, and then remove the spring retainer, outer spring ③, and inner spring ④.
- Push out the valve ⑪ or ⑫.

Valve and Valve Guides



- Being careful not to damage the oil seal, remove the clip ⑤ and pull off the oil seal ⑥.

135



Oil Seal

136

1. Split Keeper
2. Spring Retainer
3. Outer Spring
4. Inner Spring
5. Clip
6. Oil Seal
7. Valve Guide
8. Washer
9. Washer
10. O Ring
11. Exhaust Valve
12. Inlet Valve

40 DISASSEMBLY

- Remove the washers (8) (9) (2)
- Heat the area around the guide to about 120~150°C (250~300°F), and hammer lightly on the valve guide arbor (special tool) to remove the guide out the top of the head.



Installation (per valve and valve guide):

- Apply oil to the valve guide. Replace the O ring for a new one if deteriorated or damaged.
- Heat the area around the valve guide hole to about 120~150°C (250~300°F), and drive the valve guide in from the top of the head using the valve guide arbor (special tool).

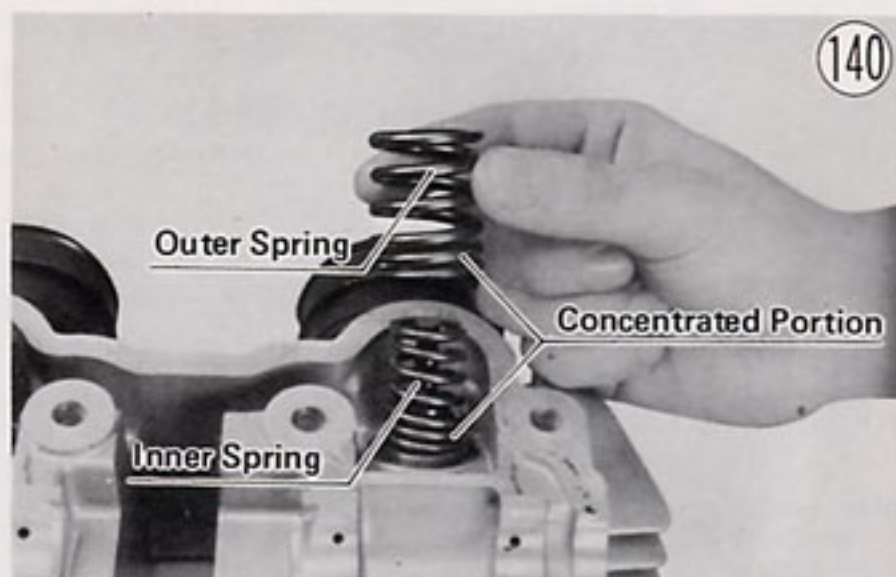


- Ream the valve guide with the valve guide reamer (special tool) even if the old guide is re-used.



- Lap the valve so that it will seat properly (Pg. 112).
- Replace the washers (2), push the oil seal into place, and replace its clip.

- Apply a thin coat of heat durable grease to the valve stem, insert the valve, and replace the outer and inner springs. The relatively concentrated portion of each spring should face the cylinder head.



- Replace the valve retainer, press it down with the valve spring compressor assembly, and replace the split keeper.
- Remove the tool.
- Install the cylinder head (Pg. 36).
- Check valve clearance (Pg. 14), and adjust if necessary.

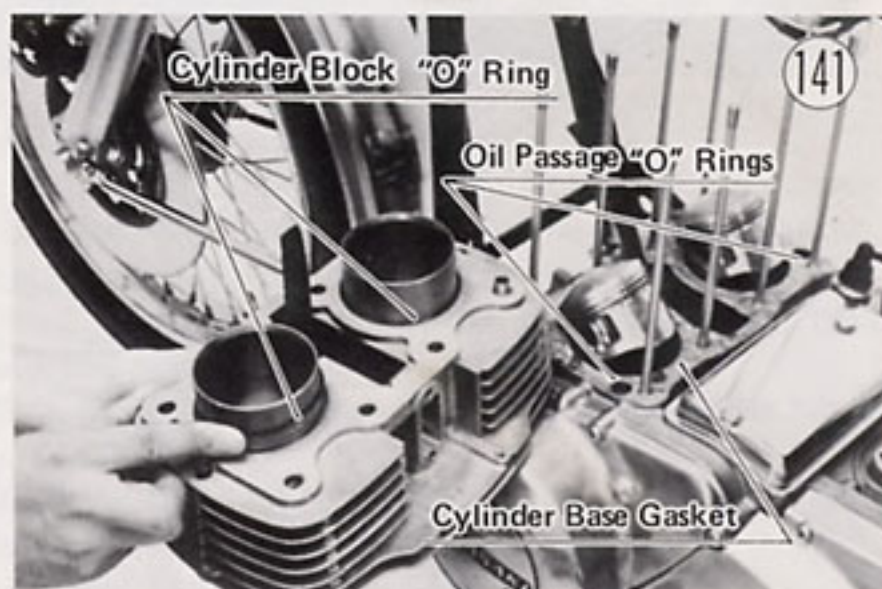
CYLINDER BLOCK

Removal:

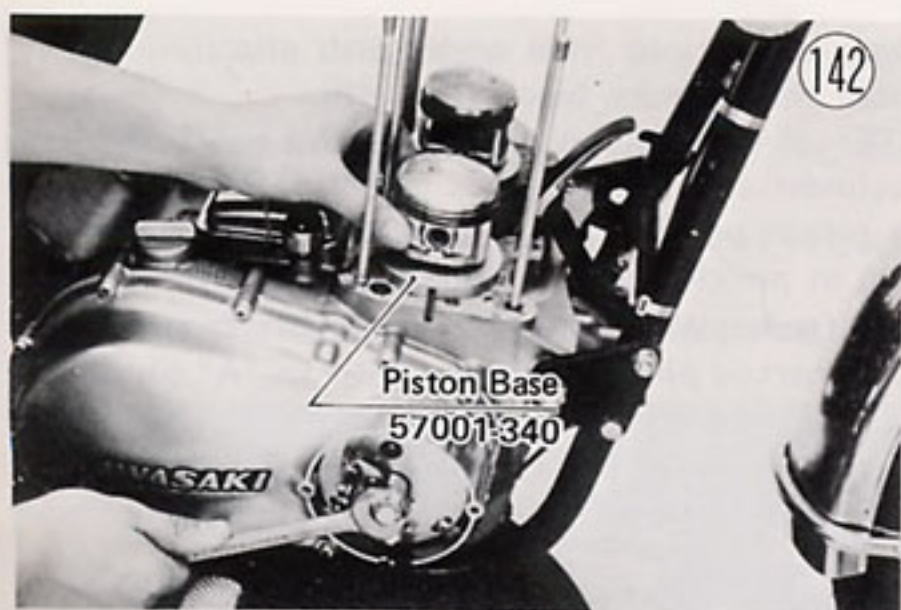
- Remove the cylinder head (Pg. 35).
- Remove the screwdriver, and pull off the cylinder block.

Installation:

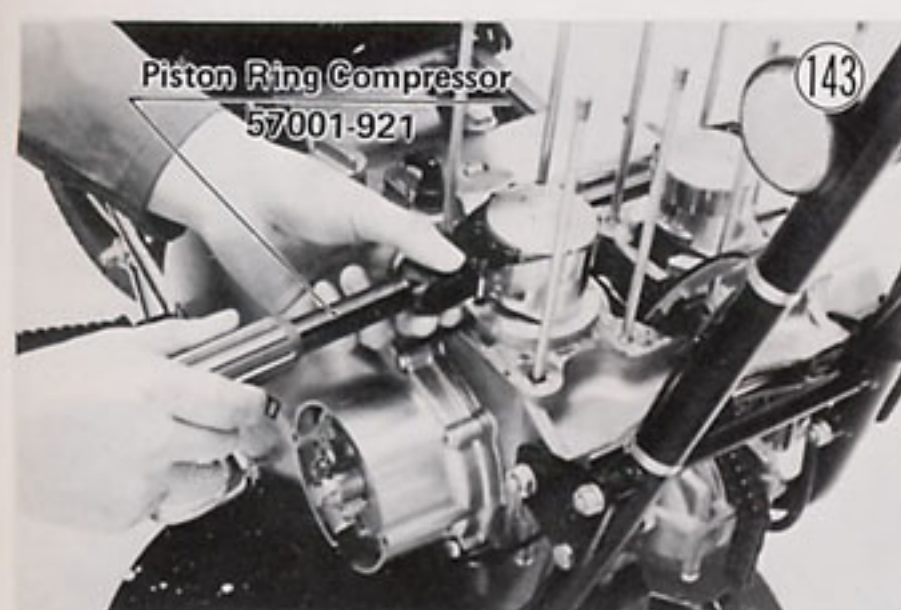
- Replace any of the cylinder block O rings, cylinder base gasket, or oil passage O rings with a new one if deteriorated or damaged.



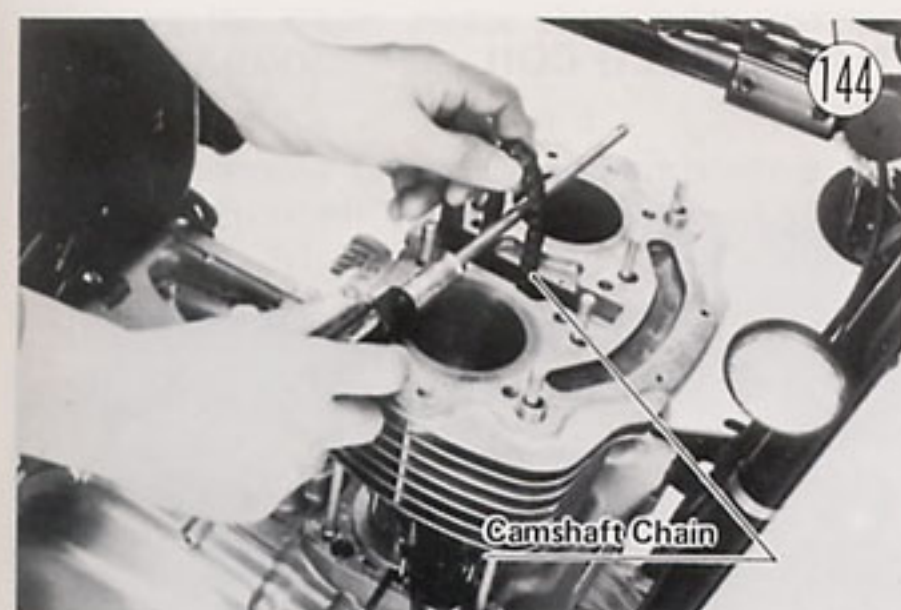
- Fit a piston base (special tool) into place at the crankcase opening for each piston, and turn the crankshaft with a 17 mm wrench such that each piston is situated squarely on its piston base.



- Compress the piston rings using a piston ring compressor assembly (special tool) for each piston.



- Pull out the camshaft chain, and let it hang over the side of the crankcase.
- Fit the cylinder block on the crankcase studs, guide the front camshaft chain guide inside the block, and rest the bottom of the cylinders on the piston ring compressors.
- Lift up the camshaft chain, use a screwdriver to keep the chain from falling down into the cylinder block.



- Work the bottom of each cylinder past the rings, and set the cylinder block in place while removing the special tools.
- Install the cylinder head (Pg. 35).

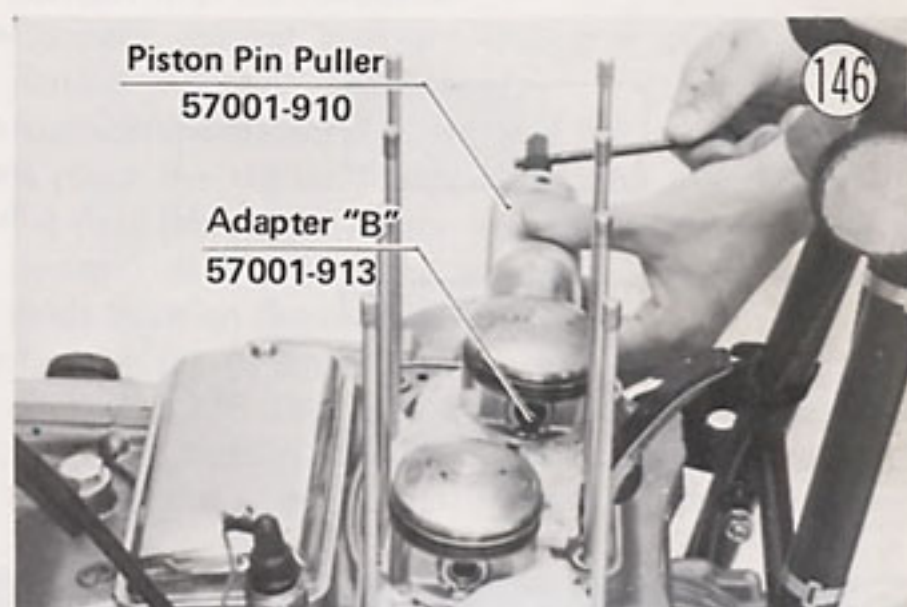
PISTON, PISTON RINGS

Removal:

- Remove the cylinder block (Pg. 40).
- Wrap clean cloth around the base of each piston to secure it in position for removal and so that no parts will fall into the crankcase.
- Remove one of the piston pin snap rings from each piston.



- Remove each piston by pushing its piston pin out the side that the snap ring was removed. Use the piston pin puller and adapter "B" (special tools) if necessary.

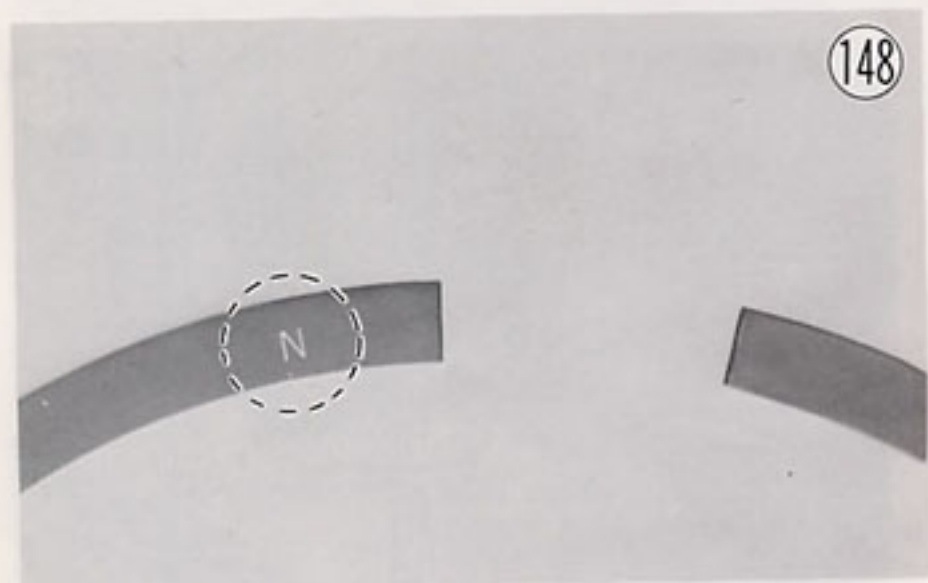


- Remove the piston rings with the piston ring pliers (special tool). To remove a ring by hand, spread the ring opening with both thumbs, and then push up on the opposite side.



Installation:

- Install the piston rings so that the correct side (marked "N") faces up (Fig. 148). Don't mix up the top and second rings. The outer edges of the top ring are oblique; the lower outer edge of the second ring is notched. Insert the rings so that the gaps of the top ring and the oil ring face the exhaust side and the gap of the 2nd ring faces the inlet side.



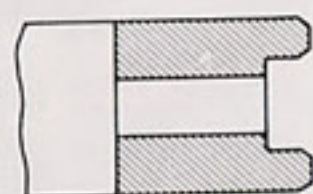
148

Piston Rings

Top Ring



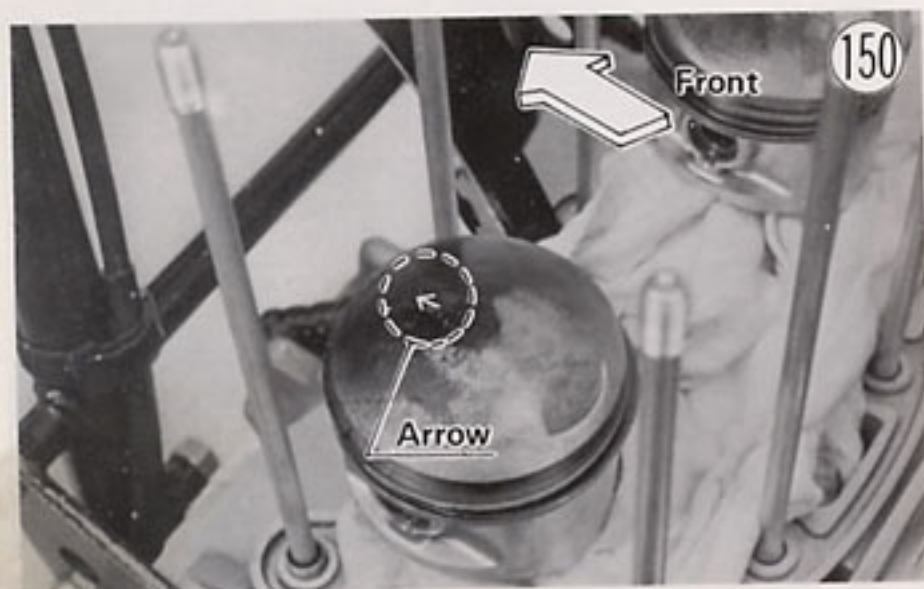
Second Ring



Oil Ring

149

- Apply a little oil to the piston pins, and replace the piston and piston pins. The arrow on the top of each piston must point towards the front.



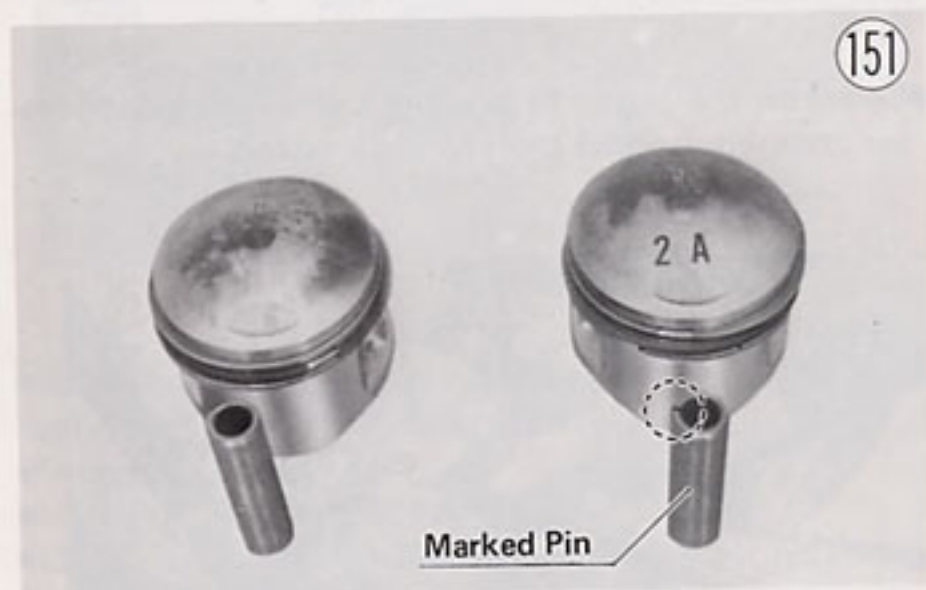
150

- Fit a new piston pin snap ring into the side of each piston.

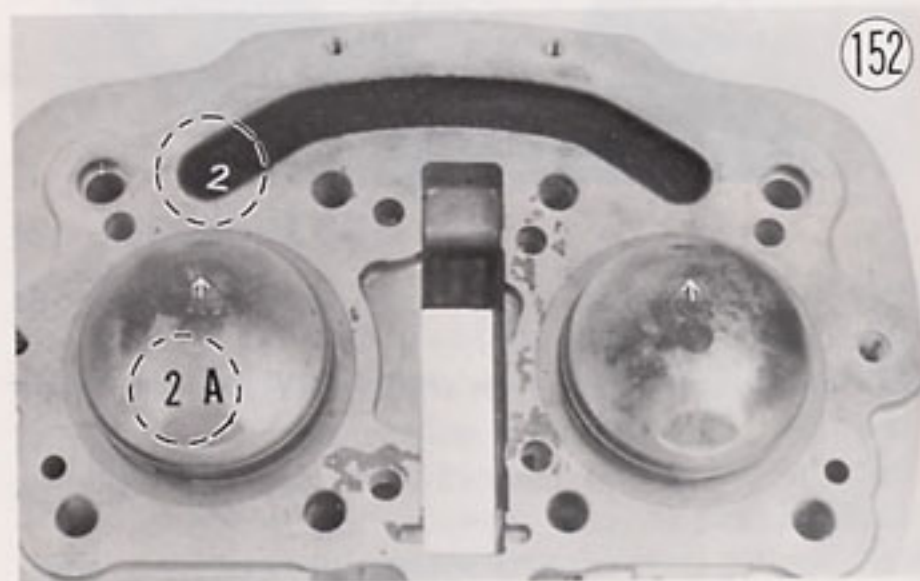
- Remove the cloth from under each piston.
- Install the cylinder block (Pg. 40).

NOTE: If the piston is replaced with a new one, piston to cylinder clearance changes (Pg. 115). Also, when a new piston or piston pin is installed, check that the piston to pin clearance is 0.006 ~ 0.013 mm.

To the Dealer: When possible, match parts from stock so that a marked pin is assembled with an "A" piston and an unmarked pin with an unmarked piston. Also, when possible, use a "2" piston with a "2" cylinder bore and an unnumbered piston with an unnumbered cylinder bore.



151



152

DYNAMO FIELD COIL**Removal:**

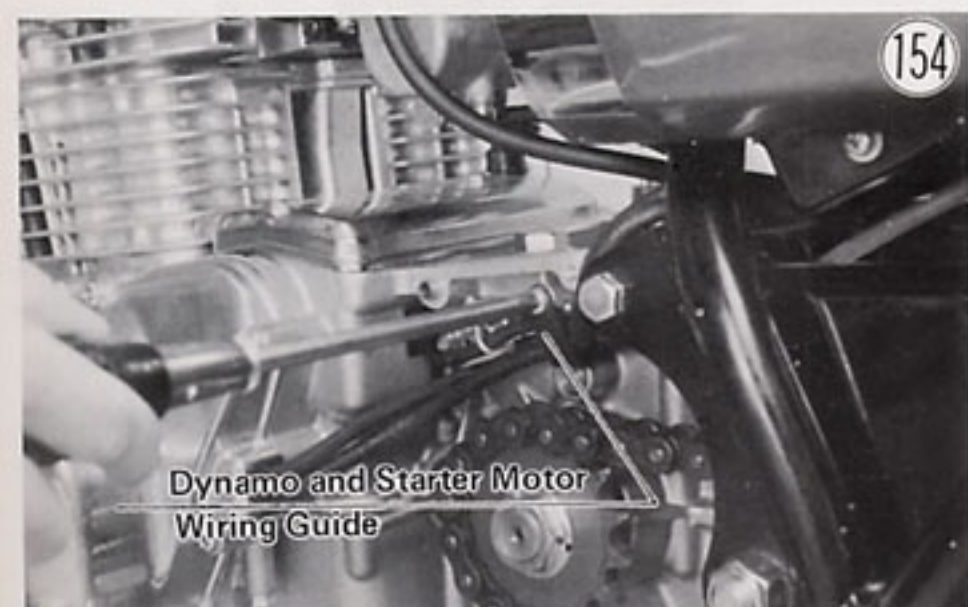
- Remove the right side cover, and disconnect the field coil plug from its socket under the voltage regulator.



153

Field Coil Plug

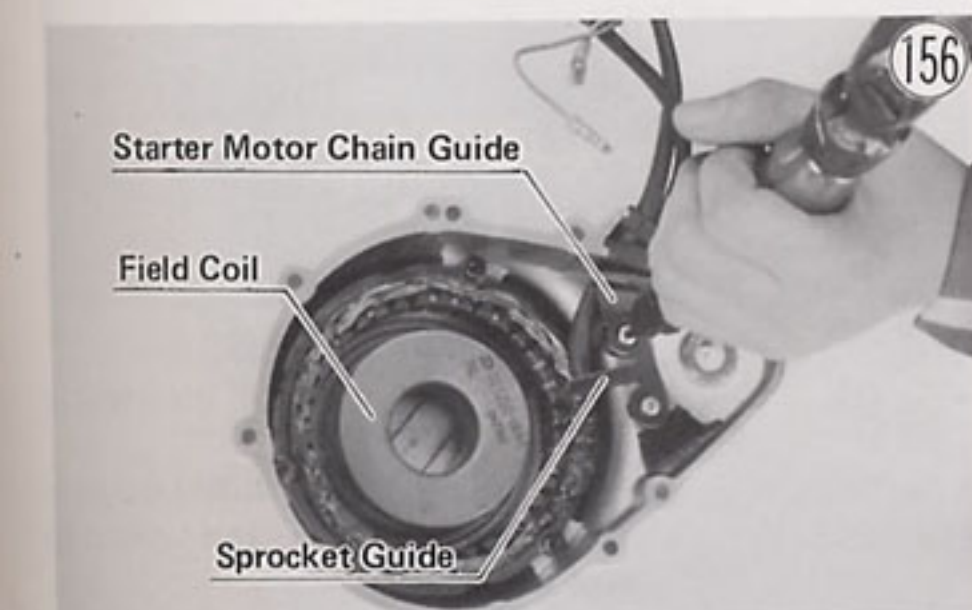
- Take out the shift pedal bolt, and remove the shift pedal.
- Remove the left foot peg bolt, left foot peg, and side stand spring.
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.
- Remove the dynamo and starter motor wiring guide.



- Remove the starter motor cover and gasket.
- Remove the dynamo cover screws (8), and pull off the dynamo cover.

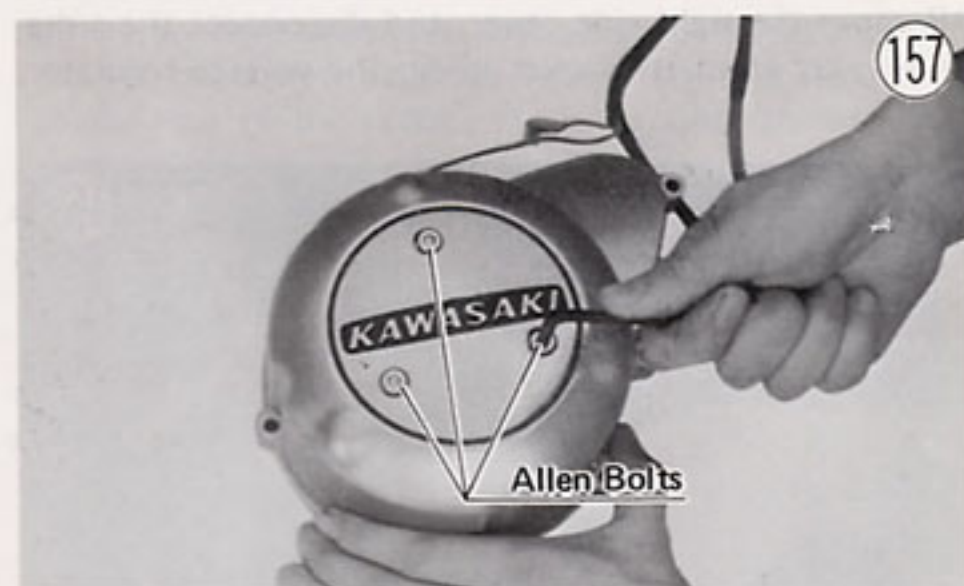


- Disconnect the oil pressure indicator switch lead and the neutral indicator switch lead.
- Remove the starter motor chain guide and sprocket guide (KZ400D).



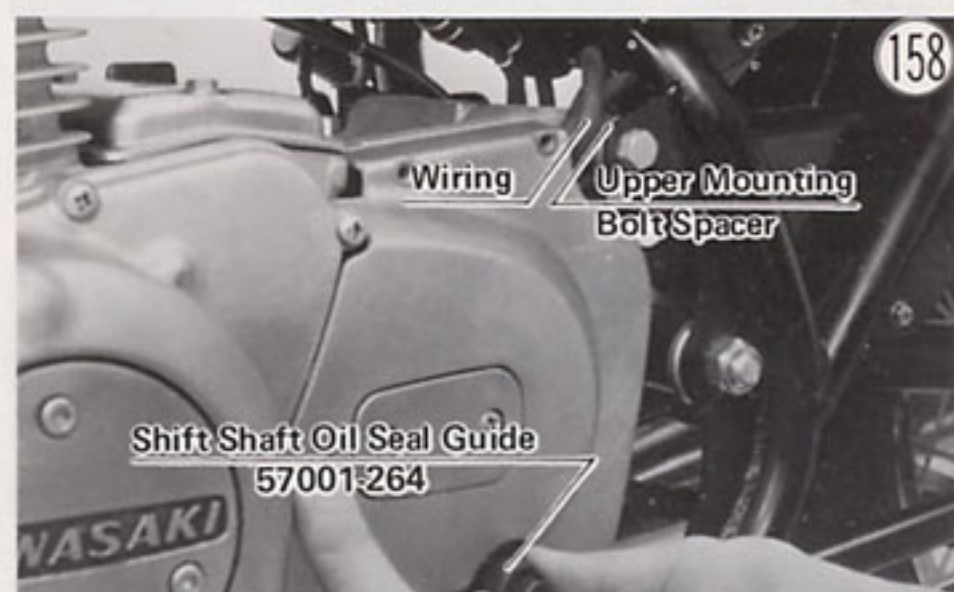
- Remove the armature Allen bolts (3), and pull out the armature.

- Remove the field coil mounting Allen bolts (3), and remove the field coil.



Installation:

- Set the field coil into place, and tighten its Allen bolts (3). Use a non-permanent locking agent on each bolt, and tighten the bolts to 0.7~0.8 kg-m (61~69 in-lbs).
- Fit the armature into place, and tighten its Allen bolts (3). Use a non-permanent locking agent on each bolt, and tighten the bolts to 0.7~0.8 kg-m (61~69 in-lbs).
- Fit the wiring into the dynamo cover grommets, and push the grommets back into the cover.
- Apply a non-permanent locking agent to the screws, and replace the starter motor chain guide and sprocket guide (KZ400D). The sprocket guide bends out for contact with the sprocket.
- Connect the oil pressure indicator switch lead and neutral indicator switch lead.
- Replace the dynamo cover, and tighten its screws (8).
- Replace the starter motor cover and gasket.
- Fit first the starter motor lead (KZ400D) and then the dynamo wiring into the wiring guide, and screw the guide back on the crankcase.
- Replace the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the cover oil seal, and tighten its screws. The wiring is routed in front of the upper mounting bolt spacer.



- Fit the side stand spring into place, and then secure the left foot peg with its bolt.
- Replace the shift pedal so that its end matches the level of the dynamo cover lower right screw, and tighten its bolt.
- Reconnect the plug to its socket under the voltage regulator.
- Replace the right side cover.

DYNAMO ARMATURE

Removal:

- Remove the right side cover, and disconnect the armature plug from its socket under the voltage regulator.



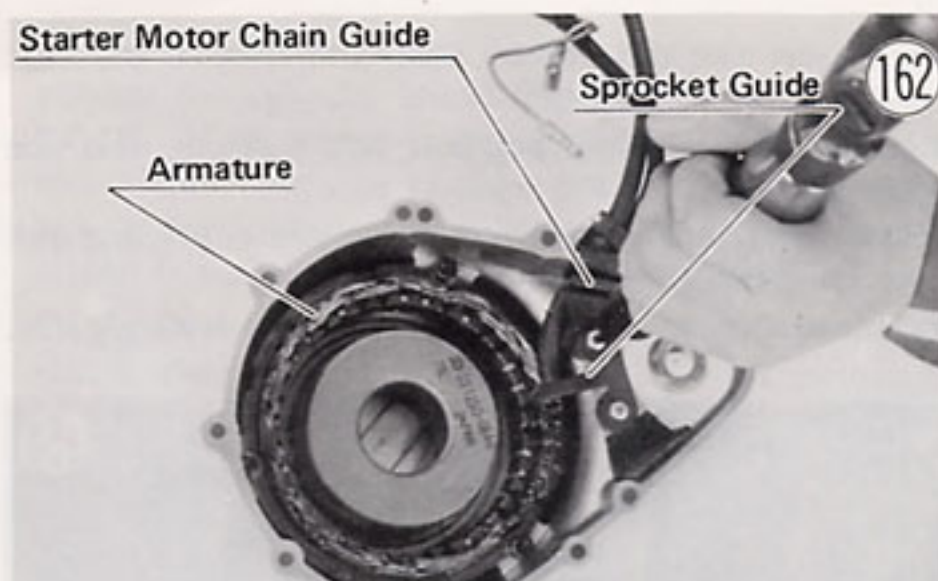
- Take out the shift pedal bolt, and remove the shift pedal.
- Remove the left foot peg bolt, left foot peg, and side stand spring.
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.
- Remove the dynamo and starter motor wiring guide (KZ400D).



- Remove the dynamo cover screws (8), and pull off the dynamo cover.



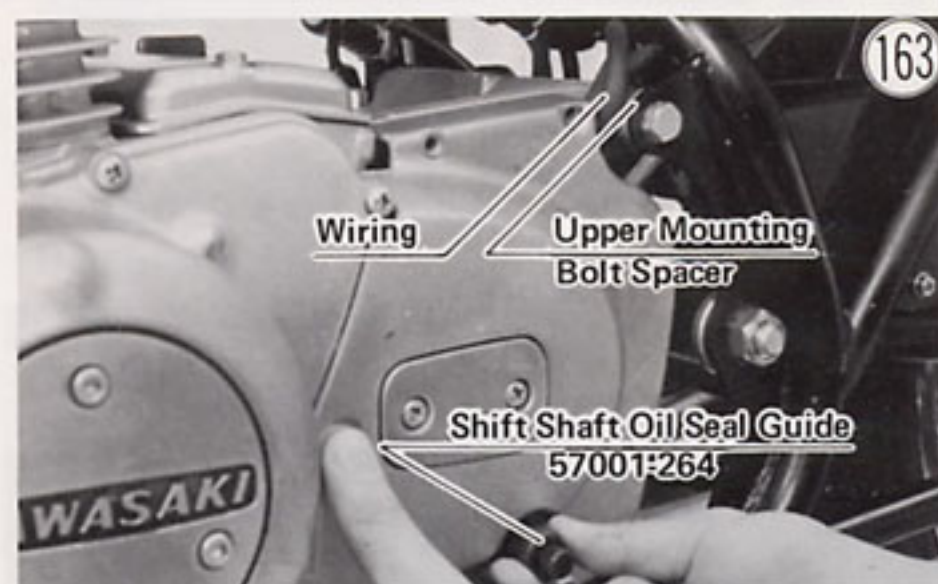
- Remove the starter motor chain guide and sprocket guide (KZ400D).



- Remove the armature Allen bolts (3), and pull out the armature.

Installation:

- Fit the armature into place, and tighten its Allen bolts. Use a non-permanent locking agent on each bolt, and tighten the bolts to 0.7 ~ 0.8 kg-m (61 ~ 69 in-lbs).
- Fit the wiring into its dynamo cover grommets, and press the grommets back into the cover.
- Apply a non-permanent locking agent to the screws, and replace the starter motor chain guide and sprocket guide (KZ400D). The sprocket guide bends out for contact with the sprocket.
- Replace the dynamo cover, and tighten its screws (8).
- Fit first the starter motor lead (KZ400D) and then the dynamo wiring into the wiring guide, and screw the guide back on the crankcase.
- Replace the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the cover oil seal, and tighten its screws. The wiring is routed in front of the upper mounting bolt spacer.

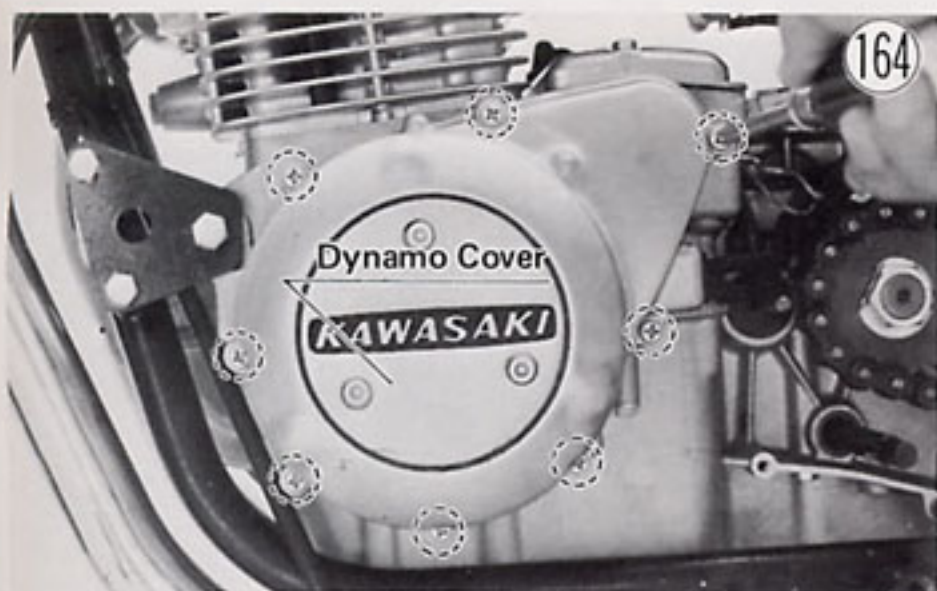


- Fit the side stand spring into place, and then secure the left foot peg with its bolt.
- Replace the shift pedal so that its end matches the level of the dynamo cover lower right screw, and tighten its bolt.
- Reconnect the plug to its socket under the voltage regulator.
- Replace the right side cover.

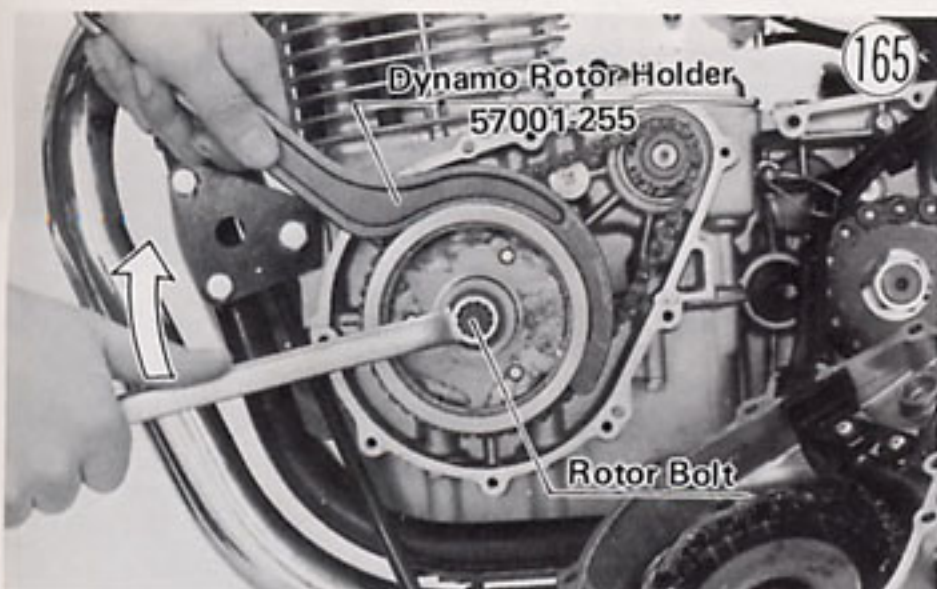
STARTER MOTOR CLUTCH (Only on KZ400D), DYNAMO ROTOR

Removal:

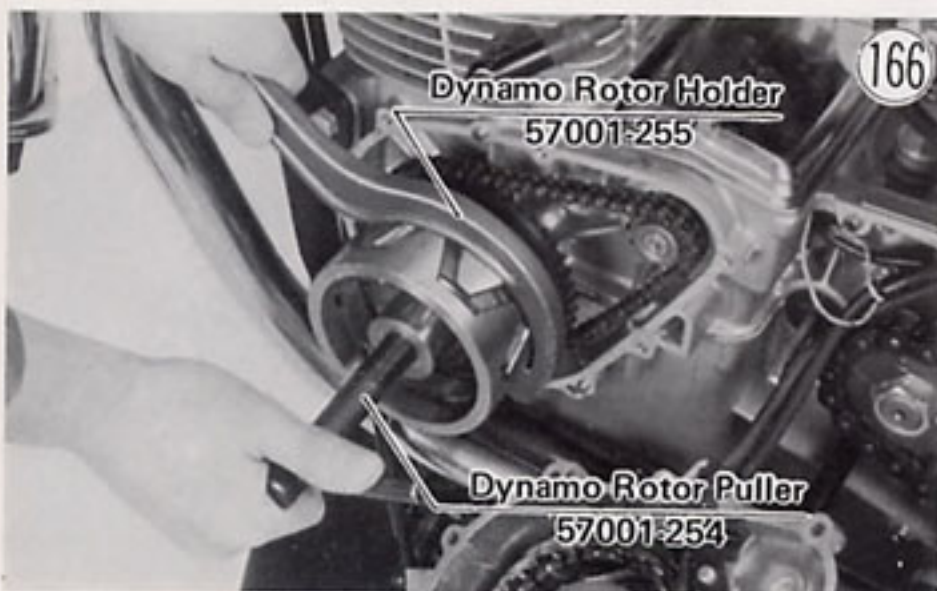
- Take out the shift pedal bolt, and remove the shift pedal.
- Remove the left foot peg bolt, left foot peg, and side stand spring.
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.
- Remove the dynamo cover screws (8), and pull off the dynamo cover and gasket.



- Hold the dynamo rotor steady with the dynamo rotor holder (special tool), and remove the rotor bolt. The bolt must be turned clockwise for removal.

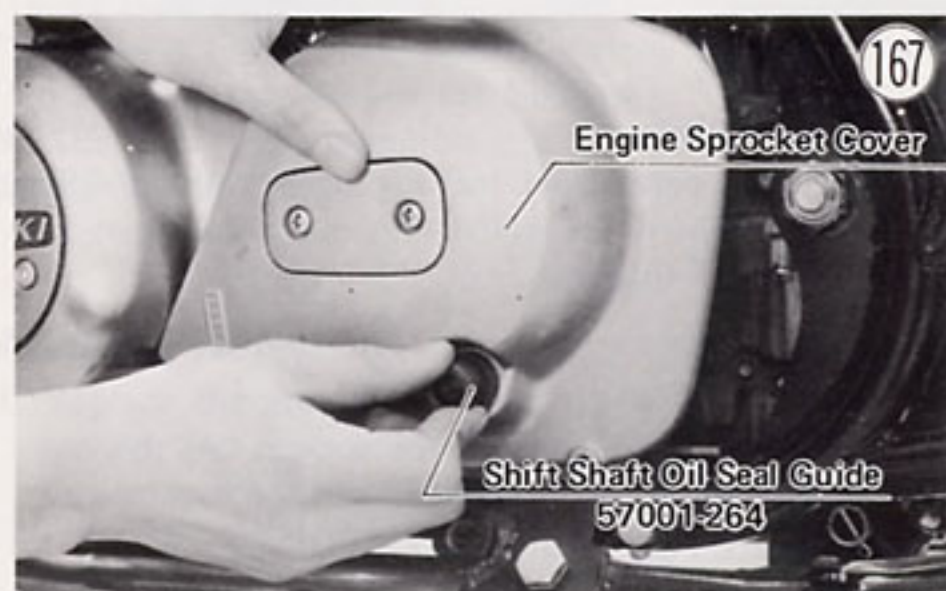


- Using the special tool to hold the rotor steady, remove the rotor and starter motor clutch assembly with the dynamo rotor puller (special tool). There is a thrust washer at the rear of the rotor.



Installation:

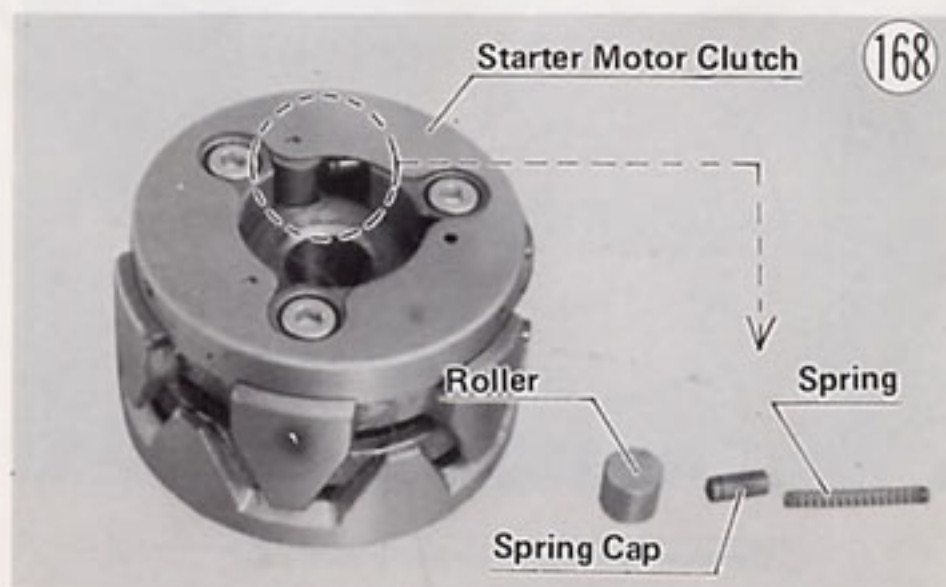
- Apply a small amount of heat durable grease to the thrust washer, clean off any oil or dirt that may be on the crankshaft taper or rotor hub, and replace it to the rear of the rotor. Place the assembly back on the crankshaft.
- Apply a non-permanent locking agent to the rotor bolt threads, and then tighten the bolt to 6.5~7.0 kg-m (47~51 ft-lbs) of torque while holding the dynamo rotor steady with the dynamo rotor holder (special tool).
- Replace the dynamo cover, gasket, and screws (8).
- Replace the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the cover oil seal, and tighten its screws.



- Fit the side stand spring into place, and then secure the left foot peg with its bolt.
- Replace the shift pedal so that its end matches the level of the dynamo cover lower right screw, and tighten its bolt.

Disassembly:

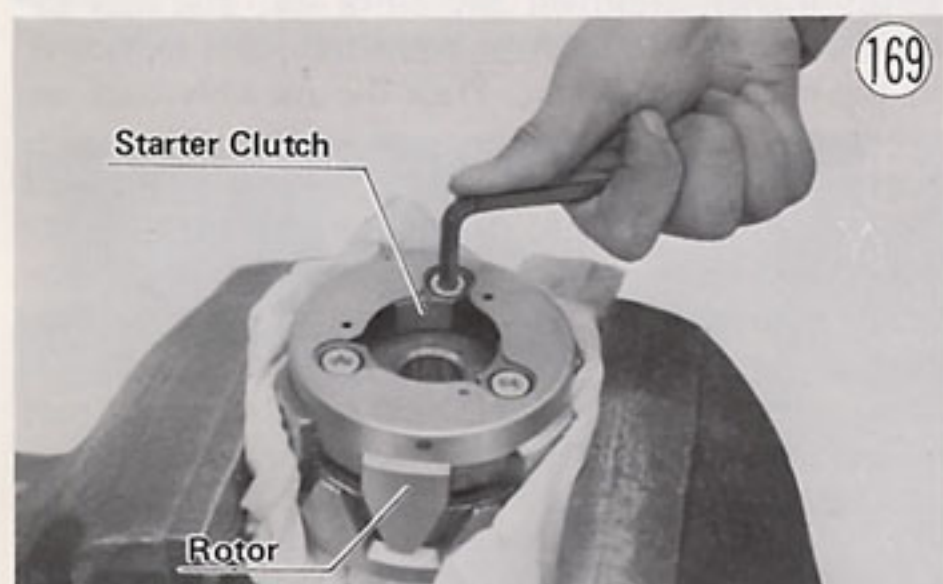
- Remove the rollers, springs, and spring caps (3 ea) from the starter motor clutch.



- Wrap the rotor with cloth, and clamp it in a vise.

46 DISASSEMBLY

Remove the Allen bolts to separate the rotor and starter motor clutch.



Assembly Note:

- Apply a non-permanent locking agent to the Allen bolts, and tighten the bolts with 3.3 ~ 3.7 kg-m (24 ~ 27 ft-lbs) of torque.

STARTER MOTOR CHAIN, SPROCKETS (Only on KZ400D)

Removal:

- Remove the dynamo rotor and starter motor clutch (Pg. 45).
- Pull off the starter motor chain and sprockets.

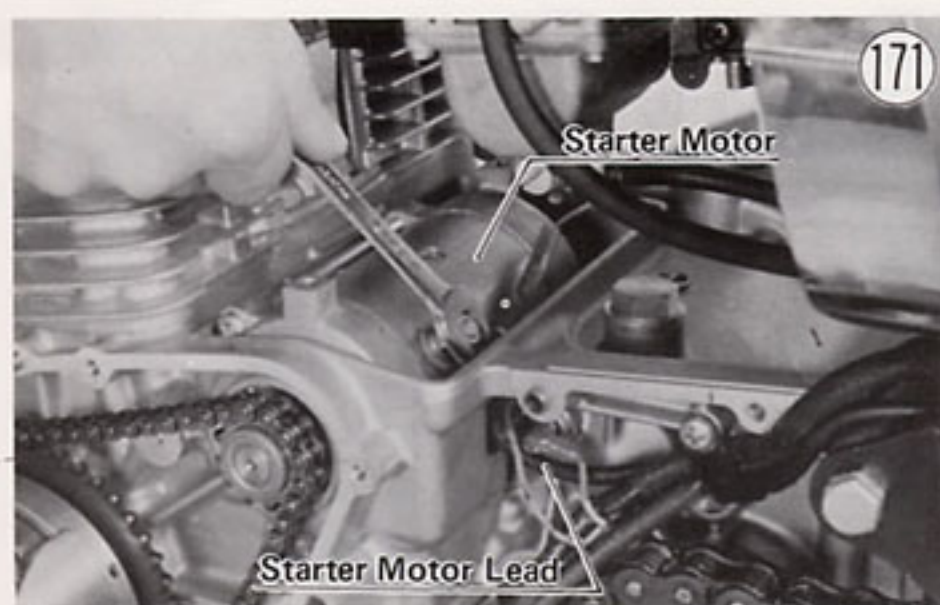
STARTER MOTOR (Only on KZ400D)

Removal:

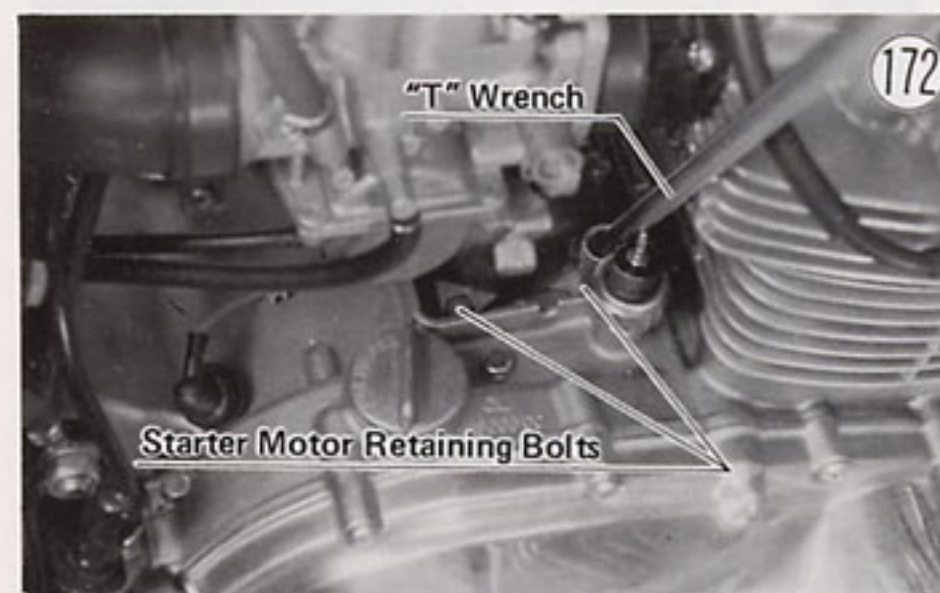
- Take out the shift pedal bolt, and remove the shift pedal.
- Remove the left foot peg bolt, left foot peg, and side stand spring.
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.
- Remove the dynamo cover screws (8), and pull off the dynamo cover and gasket.



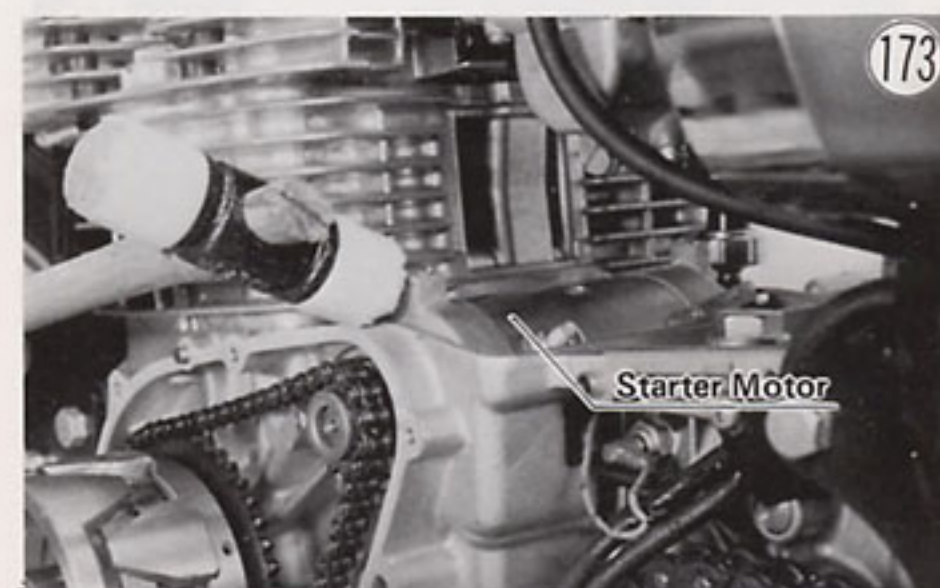
- Remove the starter motor cover and gasket.
- Remove the starter motor terminal nut and washer, and remove the lead from the motor.



- Using a 10 mm T wrench with a pivoted socket, remove the starter motor retaining bolts (2).



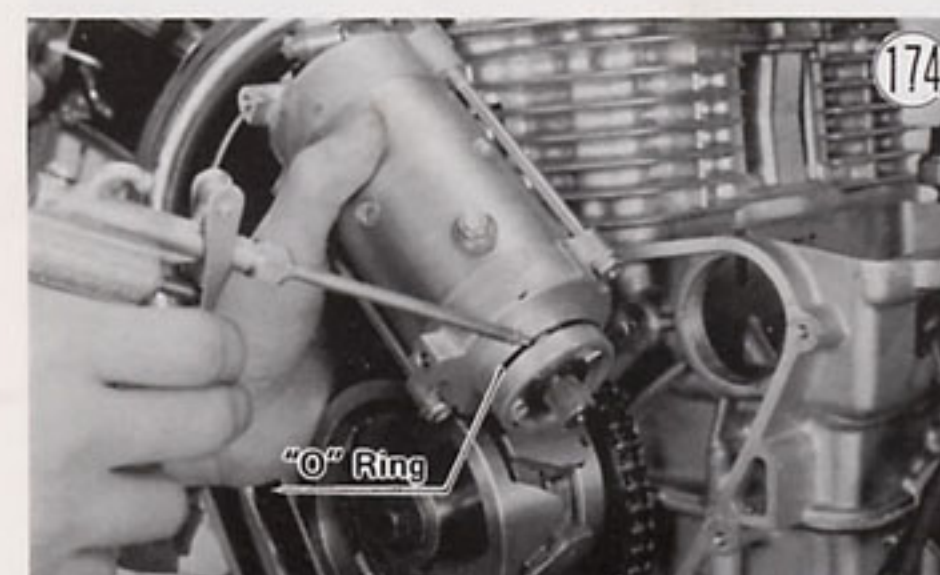
- Tap lightly on the starter motor body as shown in Fig. 173 to free the motor, and then pull it out.



CAUTION: Do not tap on the starter motor shaft. Tapping on the shaft may damage the motor.

Installation:

- Daub a little oil on the O ring.



- Place the starter motor back into position fitting the shaft through the sprocket.
- Reconnect the motor lead onto the terminal. A lock washer goes with the nut.
- Apply a non-permanent locking agent to the starter motor retaining bolts, and tighten the bolts. Each bolt has a flat washer.
- Replace the starter motor cover and gasket.
- Replace the dynamo cover, gasket, and screws (8).
- Replace the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the cover oil seal, and tighten its screws.



- Fit the side stand spring into place, and then secure the left foot peg with its bolt.
- Replace the shift pedal so that its end matches the level of the dynamo cover lower right screw, and tighten its bolt.

Disassembly:

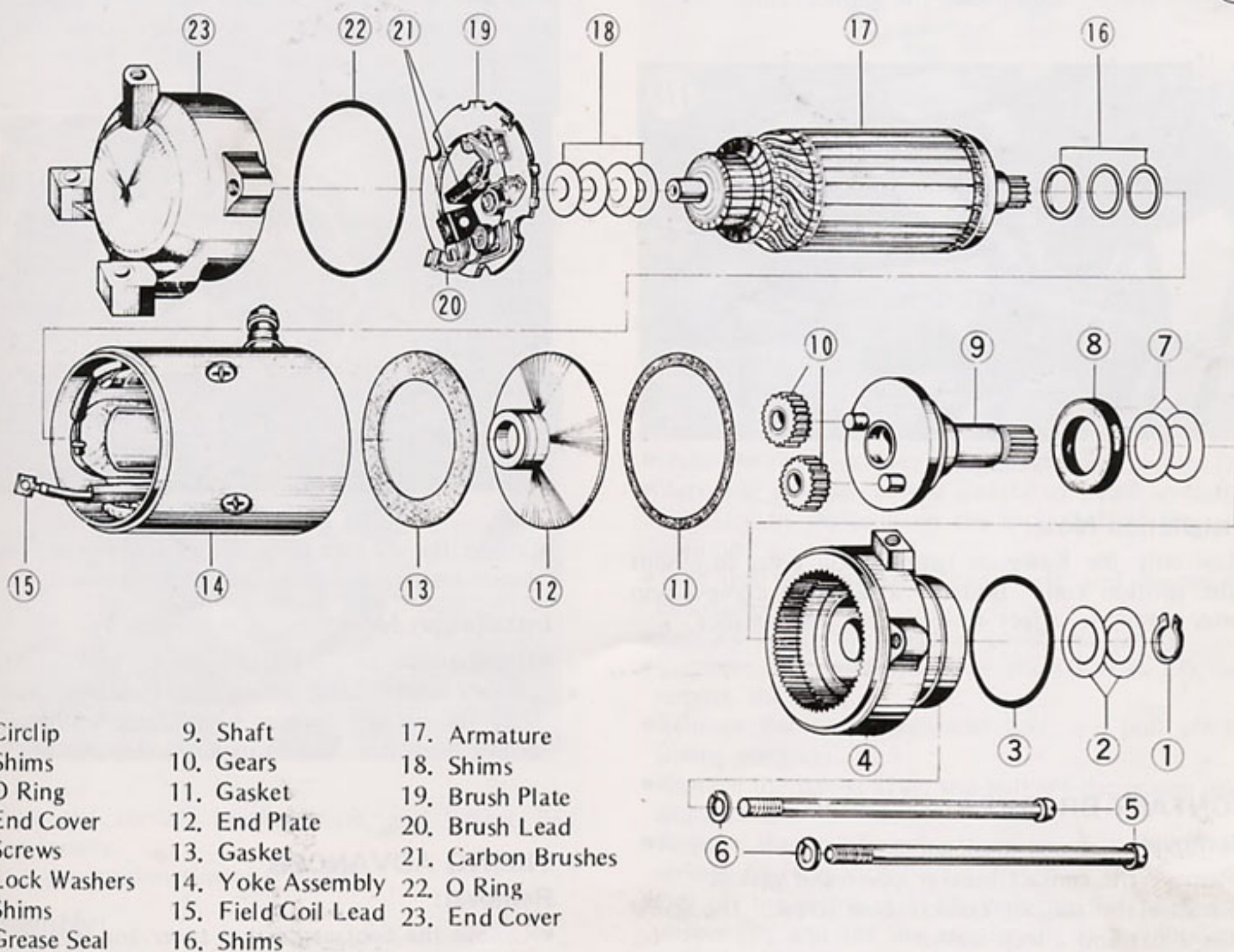
- Remove the starter motor shaft circlip (1) and shims (2).
- Remove the screws (5) (2), and remove the end covers (4) (23) (2), shaft (9), and gears (10) (2). The grease seal (8) and O ring (3) may be removed with a hook.
- Remove the end plate (12), gaskets (11) (13), and armature (17) from the shaft side.
- Remove the screw which connects the brush lead (20) to the field coil lead (15), and remove the brush plate (19). The screw has a lock washer. There is an O ring (22) at the brush side of the housing.

NOTE: The yoke assembly (14) is not meant to be disassembled.

Assembly Notes:

1. Replace the grease seal with a new one if it was removed, and replace any O rings that are deteriorated or damaged with new ones.

Starter Motor



48 DISASSEMBLY

- Align the notch on the end plate with the nub on the housing, and align the line on each end cover with its line on the housing.



IGNITION COIL

Removal:

- Remove the fuel tank (Pg. 28).
- Pull off the lead from each spark plug.
- Disconnect the blue and the red/yellow ignition coil leads.
- Remove the bolts (2) that connect the ignition coil to the frame, and remove the ignition coil.



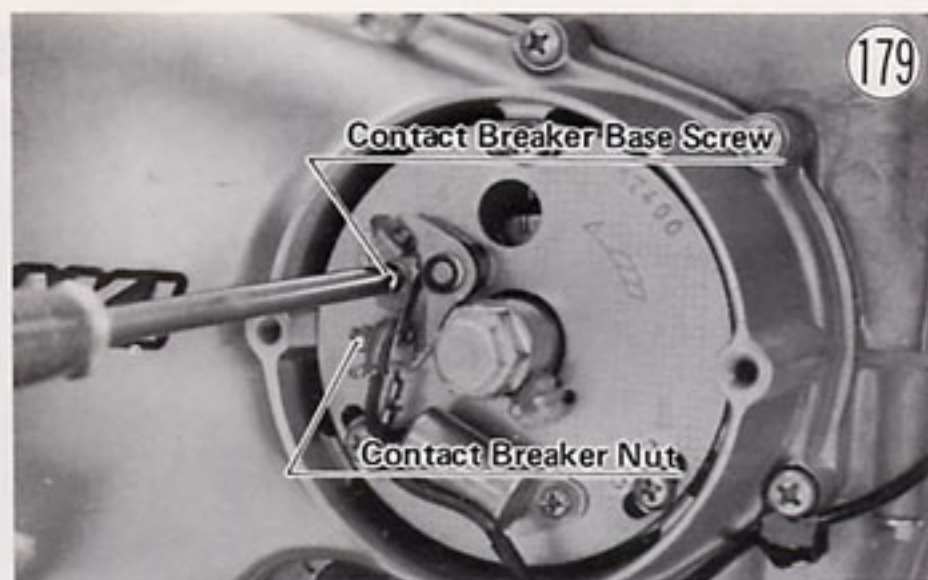
Installation Note:

- Use only the Kawasaki ignition coil bolts to mount the ignition coil. Bolts of a different composition may adversely affect ignition coil performance.

CONTACT BREAKER

Removal:

- Remove the contact breaker cover and gasket.
- Remove the contact breaker base screw. The screw has a flat and a lock washer.



- Loosen the contact breaker nut, and remove the two leads.

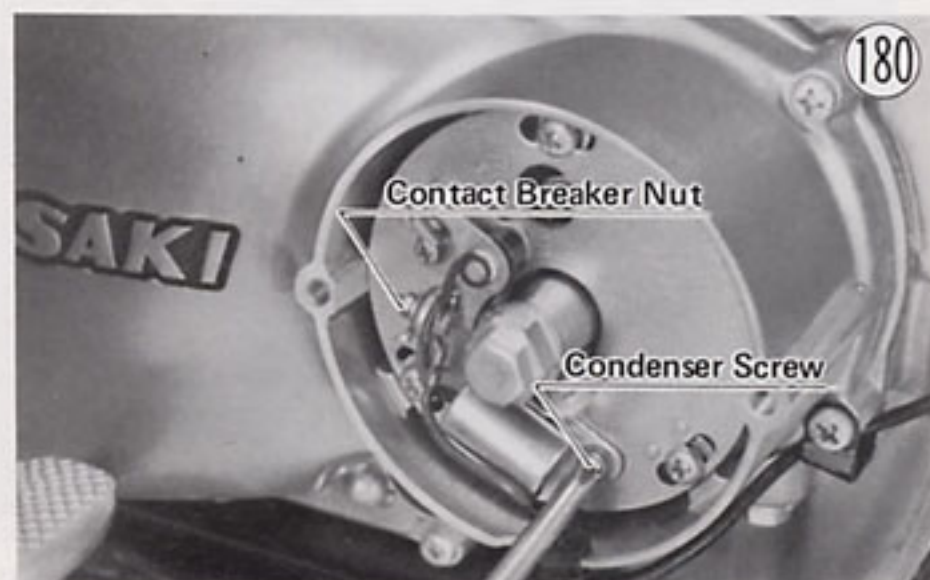
Installation Notes:

- The sequence on the contact breaker bolt is bolt head, contact breaker lead, spring, large insulator, small insulator (in contact breaker hole), large insulator, condenser lead, flat washer, lock washer, and nut.
- After installation, adjust the ignition timing (Pg. 12).

CONDENSER

Removal:

- Remove the contact breaker cover and gasket.
- Remove the condenser screw. The screw has a lock washer.



- Loosen the contact breaker nut, and remove the condenser lead to complete condenser removal.

Installation Note:

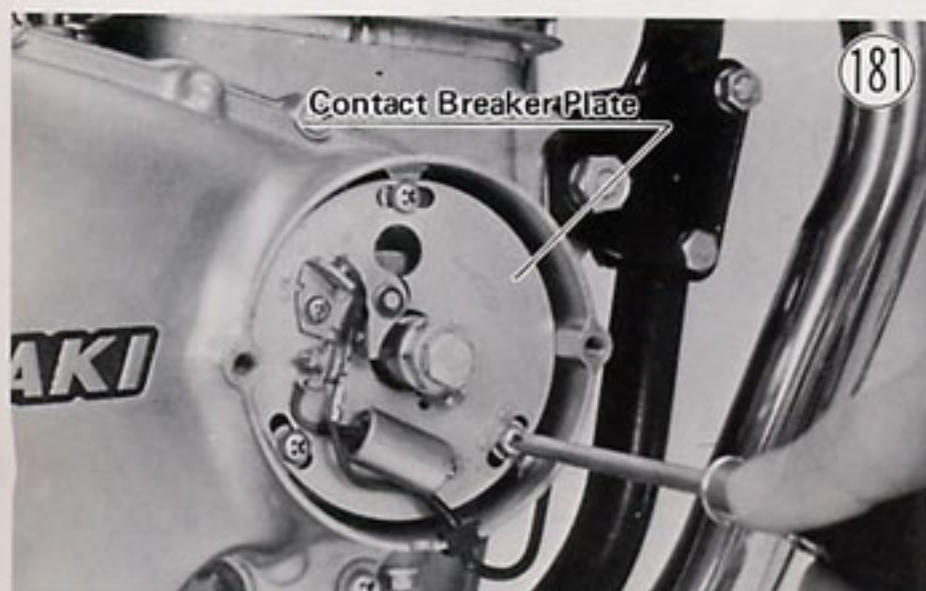
- The sequence on the contact breaker bolt is bolt head, contact breaker lead, spring, large insulator, small insulator (in contact breaker hole), large insulator, condenser lead, flat washer, lock washer, and nut.

TIMING ADVANCER

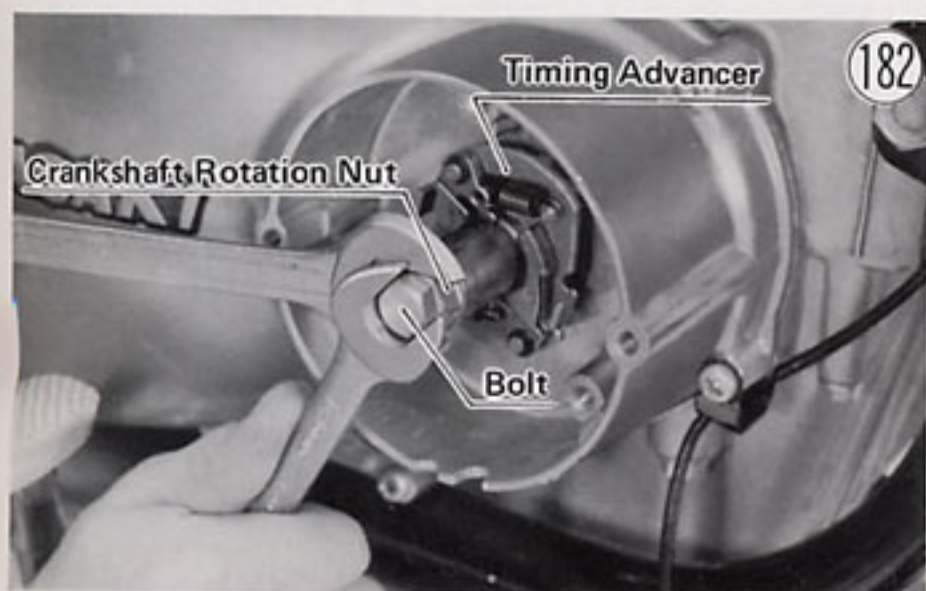
Removal:

- Remove the contact breaker cover and gasket.

- Take out the contact breaker plate screws (3), and remove the plate.

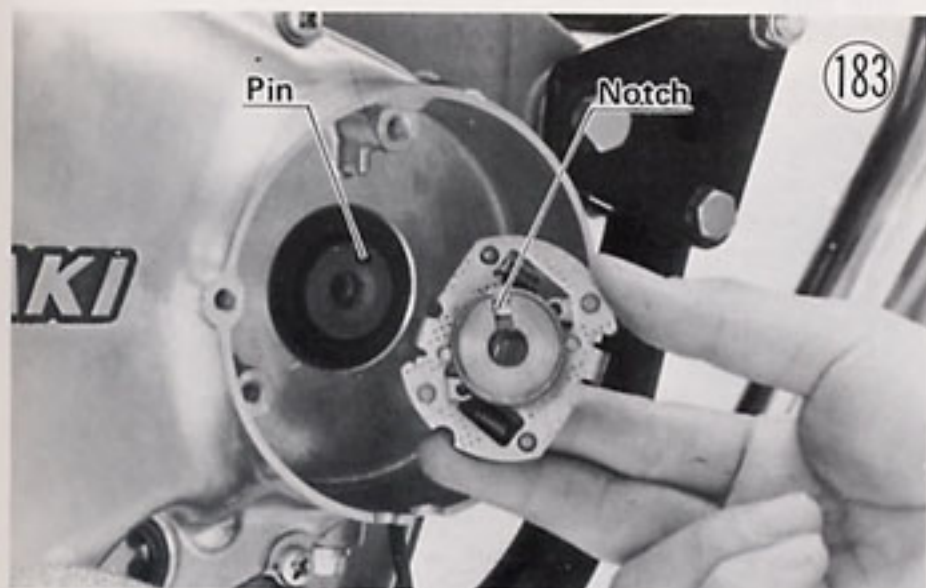


- With one wrench on the crankshaft rotation nut to keep the shaft from turning, remove the bolt, and take off the timing advancer.



Installation:

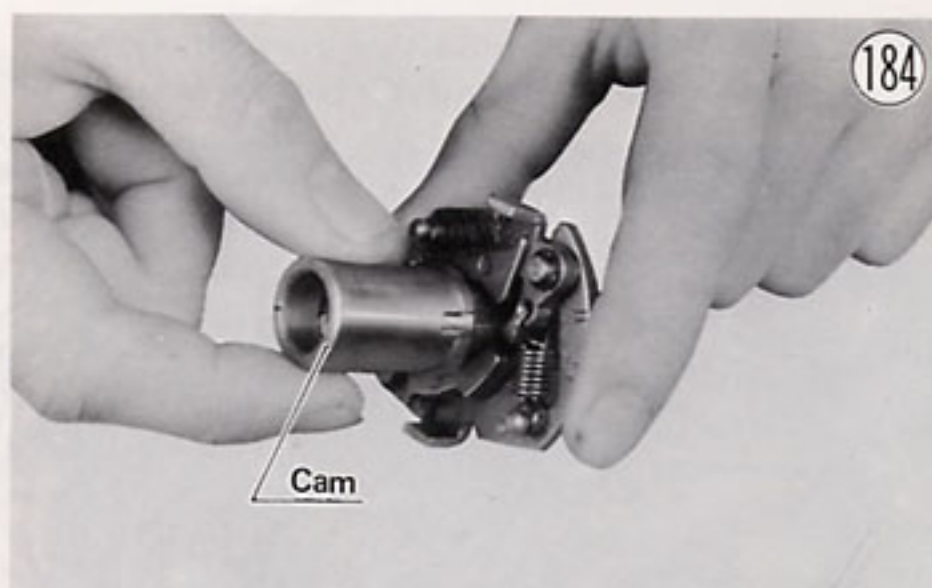
- Fit the timing advancer onto the crankshaft matching its notch with the pin in the end of the crankshaft, and replace the crankshaft rotation nut and the bolt. Tighten the bolt with 2.3~2.7 kg-m (16.5~19.5 ft-lbs) of torque.



- Replace the contact breaker plate, and tighten its screws loosely.
- Adjust the ignition timing (Pg. 12).

Disassembly:

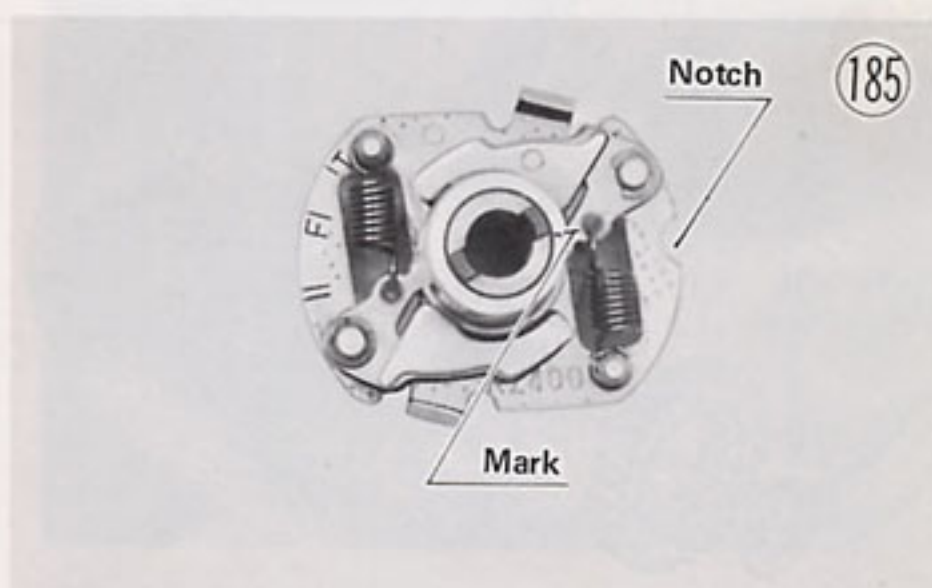
- Pull off the cam.



- Remove the two C rings, washers, and weights.
- Remove the thrust washer from each weight shaft.

Assembly Note:

- When installing the cam, align the mark on the cam with the notch on the advancer body.

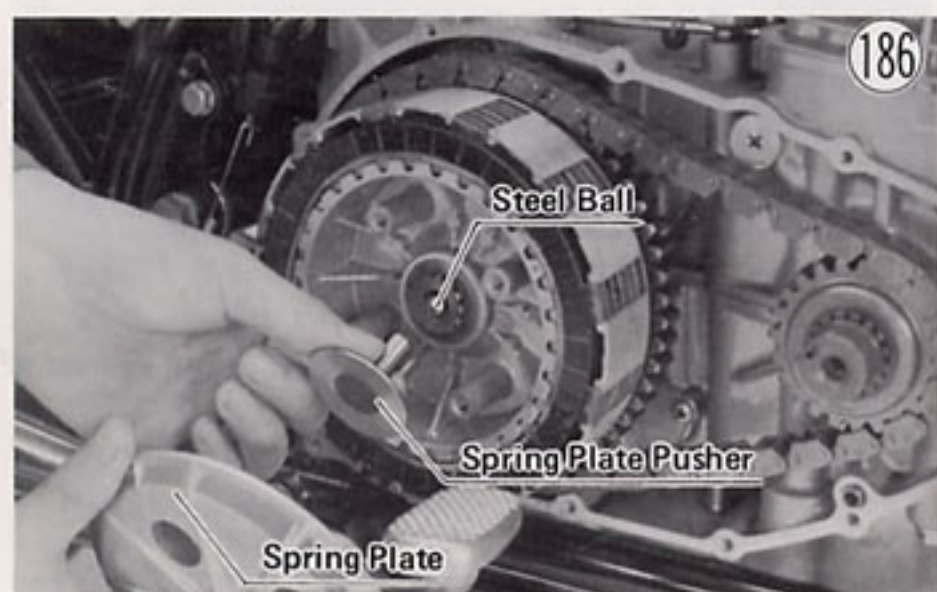
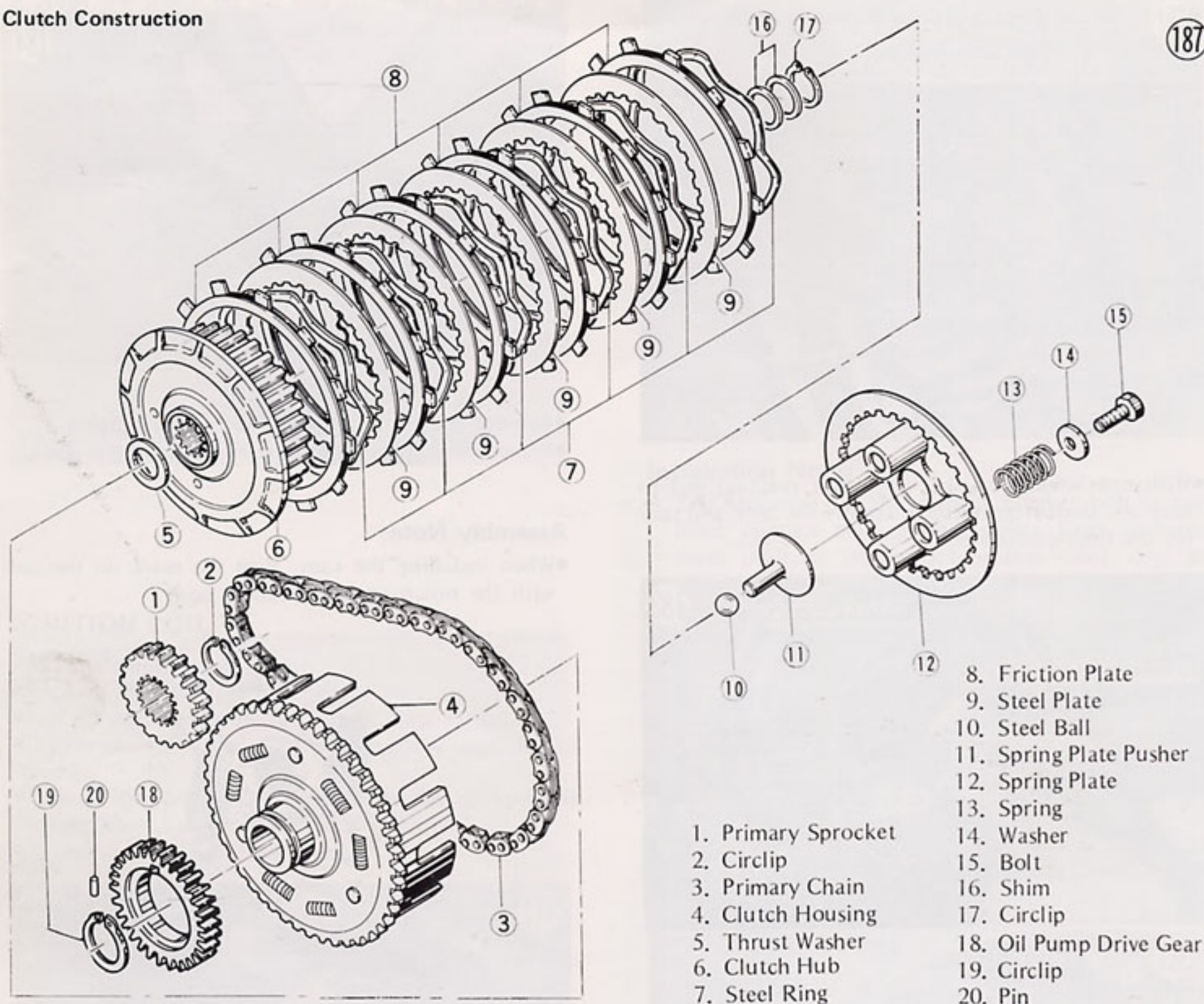


CLUTCH, PRIMARY CHAIN

Removal:

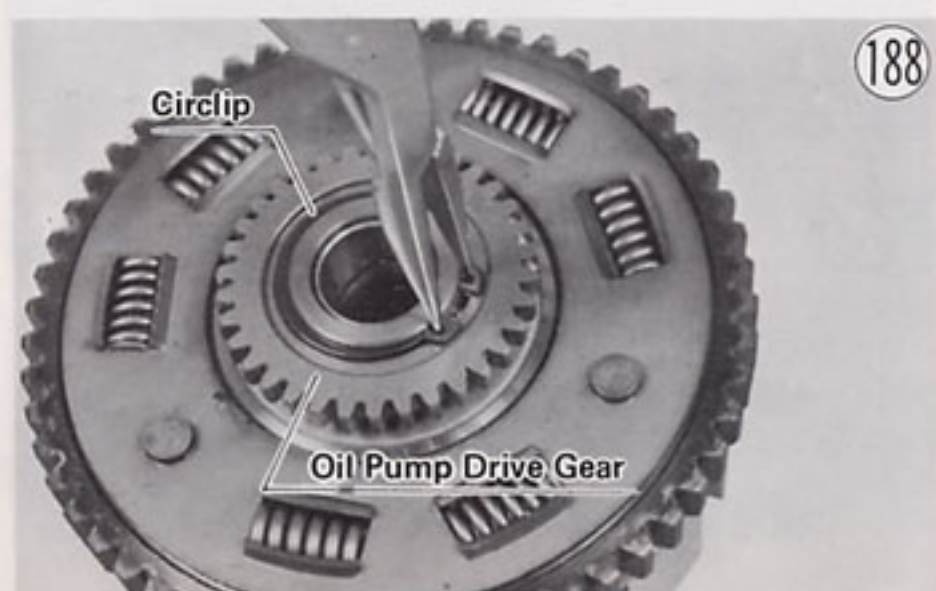
- With the motorcycle on its center stand, place an oil pan beneath the engine, and remove the engine oil drain plug and oil filter to drain out the oil.
- Undo the right foot peg bolt, and remove the foot peg.
- Mark the position of the kickstarter pedal so that it can later be replaced on the kick shaft in the same position.
- Take out the kickstarter pedal bolt, and remove the kickstarter pedal.
- Remove the contact breaker cover and gasket.
- Remove the contact breaker plate screws (3), and remove the plate.
- Remove the timing advancer bolt, and pull off the timing advancer.
- Remove the screws (12), and pull off the engine cover and gasket.
- Remove the clutch spring bolts (15), washers (14), and springs (13) (4 ea).
- Pull off the spring plate (12), pull out the spring plate pusher (11), and tilt the motorcycle so that the steel ball (10) will fall out.

Clutch Construction



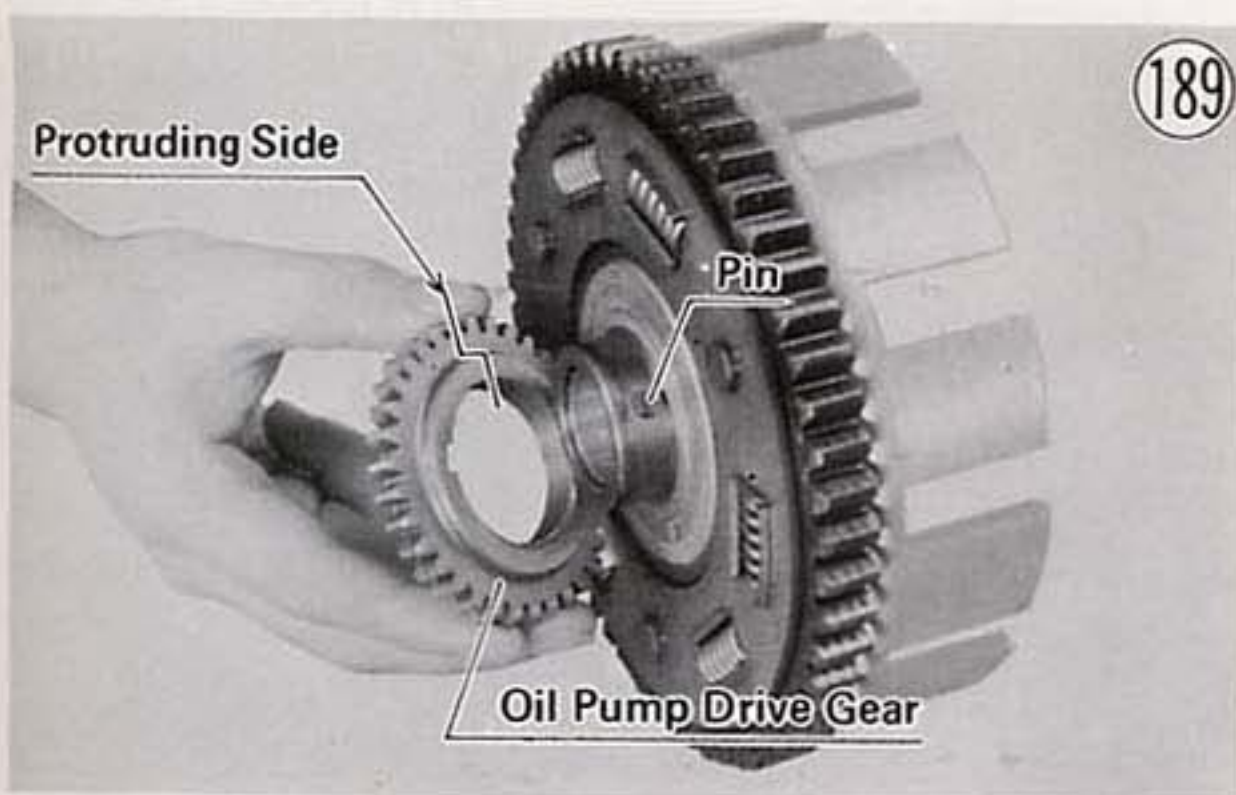
- Remove the clutch hub circlip 17 and shim(s) 16.
- Remove the friction plates 8 (6), steel plates 9 (5), steel rings 7 (6), and clutch hub 6. There is a thrust washer 5 at the rear of the clutch hub.
- Remove the primary sprocket circlip 2.
- Pull off the clutch housing 4, primary sprocket 1, and primary chain 3 together.

- To remove the oil pump drive gear 18 and pin 20, remove the circlip 19, pull off the gear, and pull out the pin.

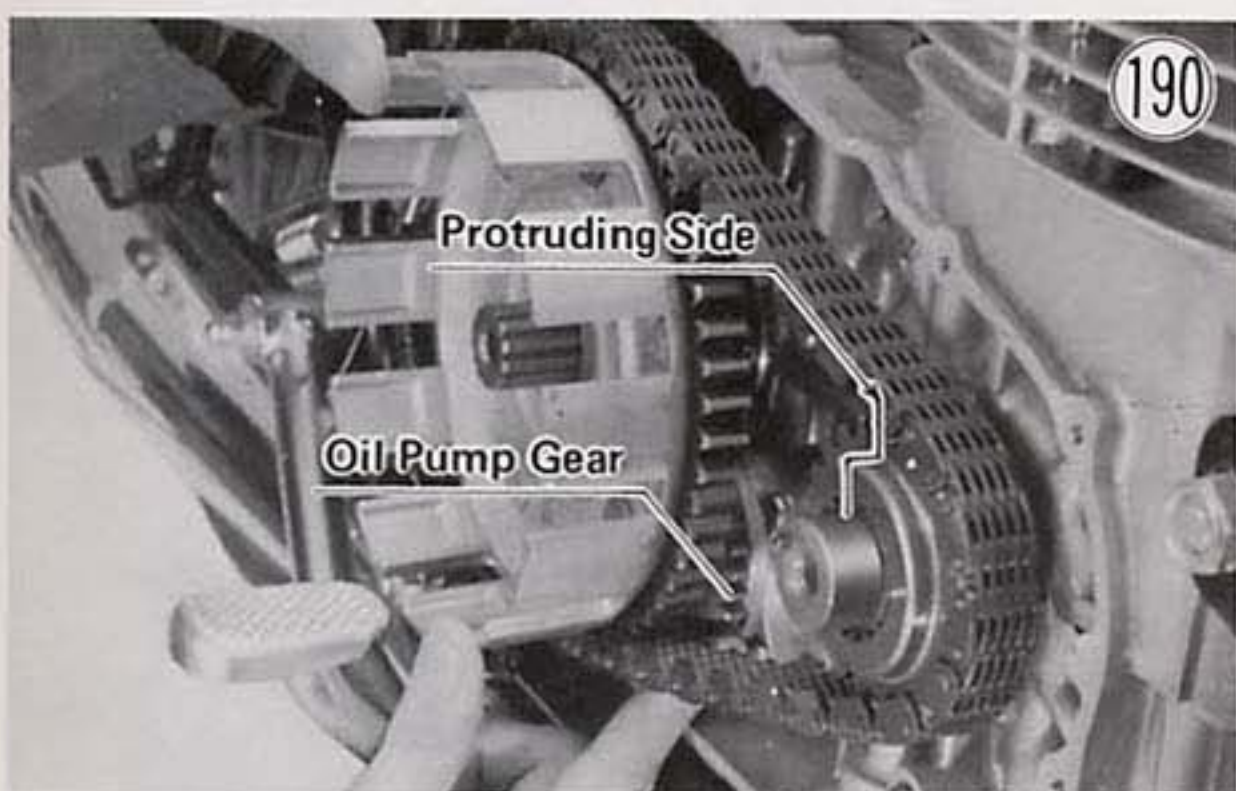


Installation:

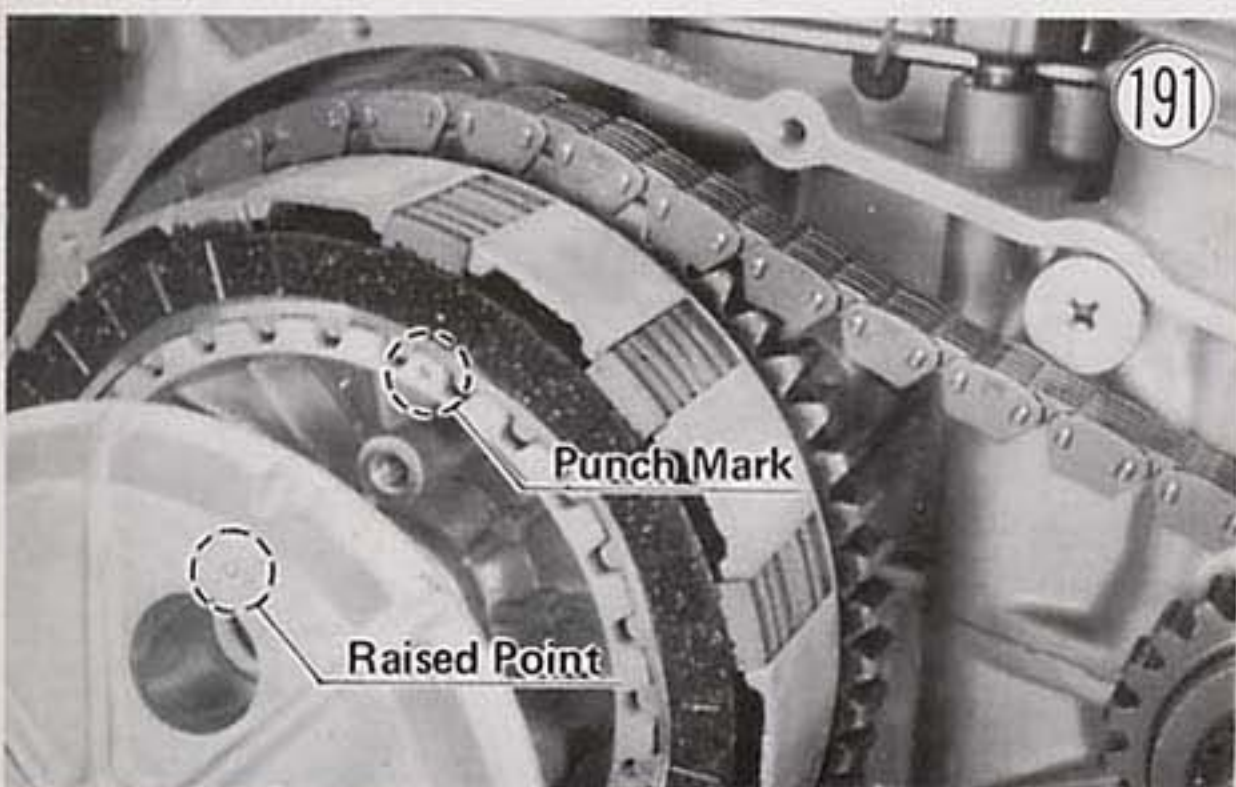
- If the oil pump drive gear was removed, replace its pin, fit on the gear, and replace the circlip. The protruding side of the hub faces the housing.



- Fit the primary chain on the clutch housing and primary sprocket, and fit the assembly into place. The protruding side of the primary sprocket faces out. Turn the oil pump gear by hand if necessary so that it meshes with the oil pump drive gear.

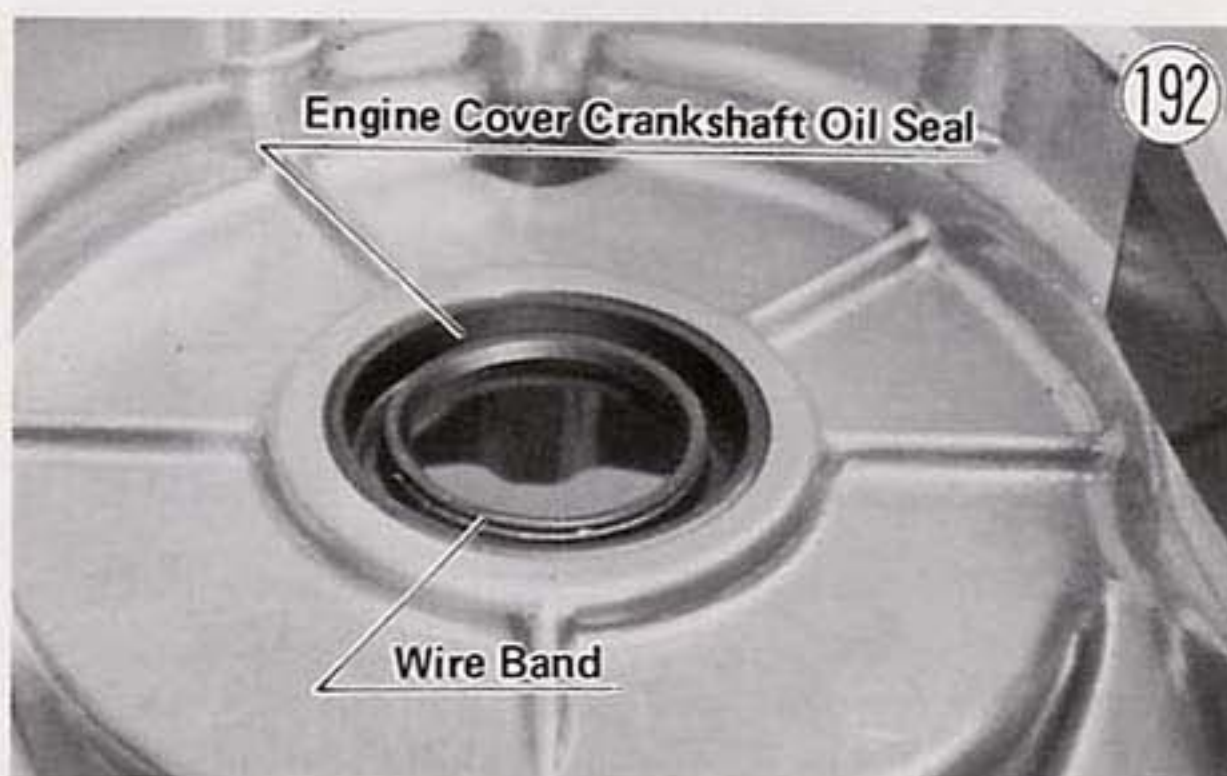


- Replace the primary sprocket circlip.
- Replace the thrust washer (thick) and the clutch hub.
- Replace the shim(s) and clutch hub circlip. The shim(s) should take up all the play between the hub and circlip. If not, add more shim(s).
- Replace the friction plates (6), steel rings (6), and steel plates (5). The sequence is friction plate, steel ring, steel plate, friction plate finishing with a steel ring.
- Insert the steel ball and spring plate pusher.
- Replace the spring plate aligning the raised points on the plate with the punch marks on the hub.



- * • Replace the spring bolts (4), each with its washer and spring. Tighten them with 0.9 ~ 1.1 kg-m (78 ~ 113 in-lbs) of torque in a cross pattern by hand rather than use compressed air, which might make spring pressure uneven.

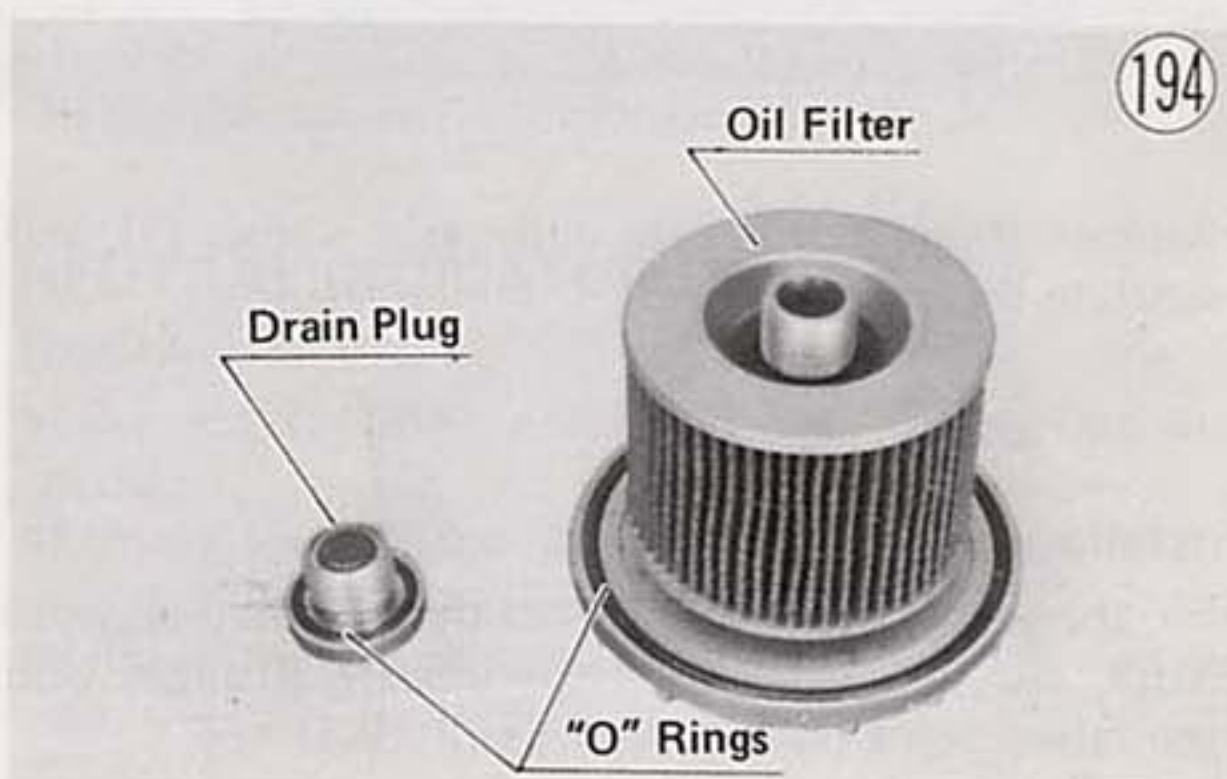
- Check that the wire band in the engine cover crankshaft oil seal has not slipped out of its proper position.

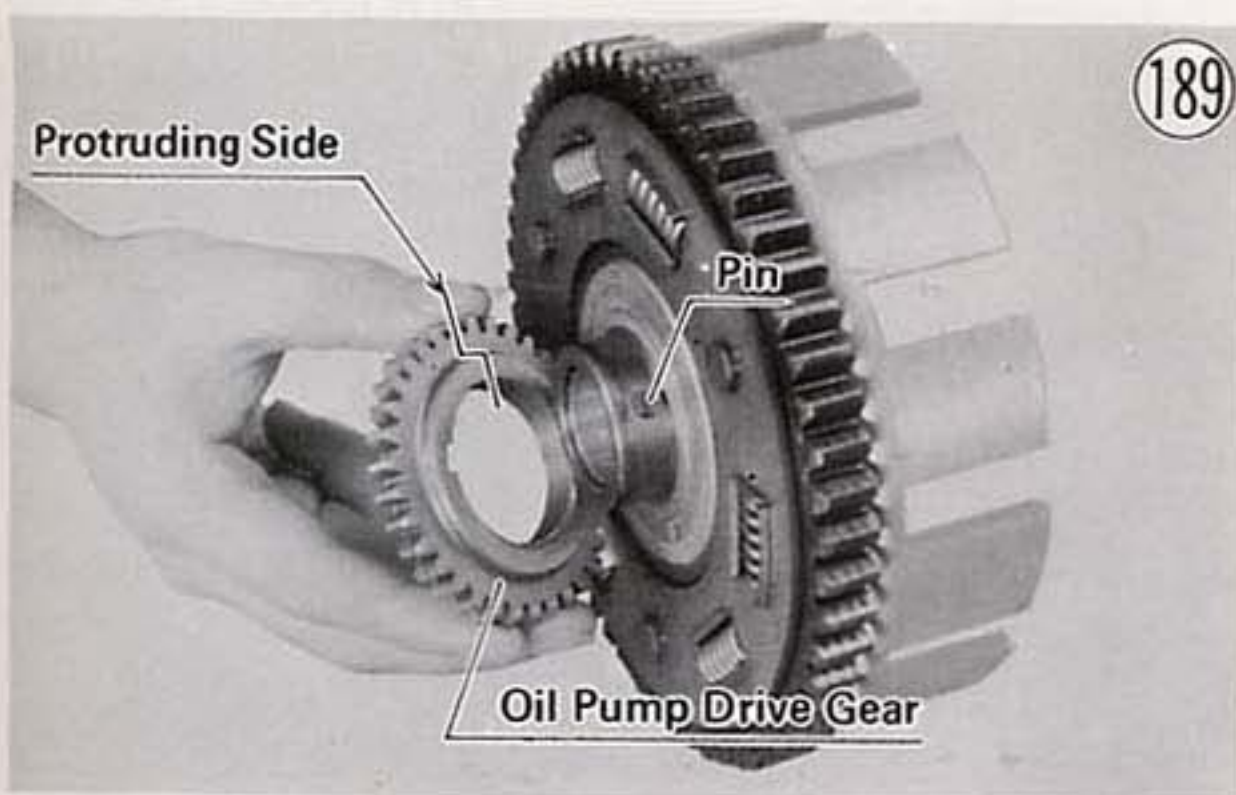


- Using a new engine cover gasket, fit the engine cover onto the crankcase. Use the kick shaft oil seal guide (special tool) to protect the kick shaft oil seal. Tighten the screws (12) firmly. Be sure to include the contact breaker lead clamp with its engine cover screw.

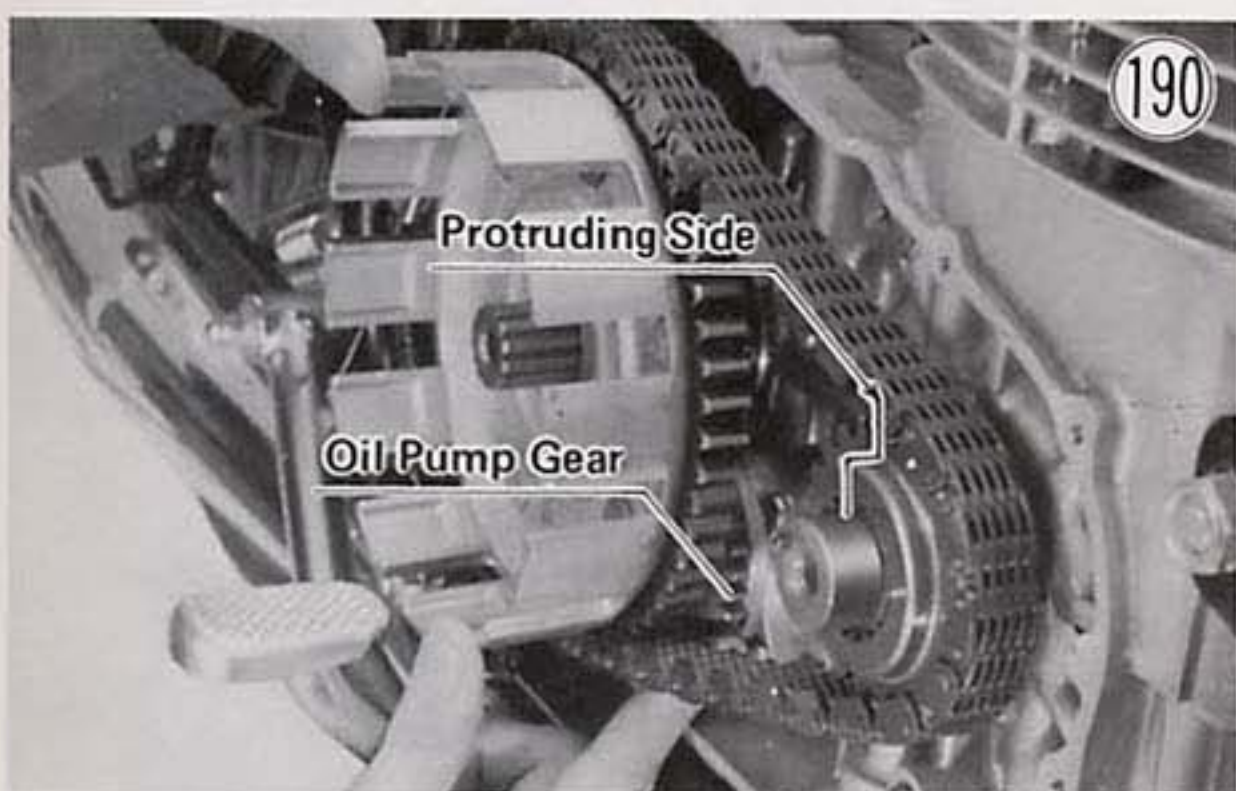


- Fit the timing advancer onto the crankshaft matching its notch with the pin on the end of the crankshaft, and tighten its bolt with 2.3 ~ 2.7 kg-m (16.5 ~ 19.5 ft-lbs) of torque.
- Replace the contact breaker plate, and tighten its screws (3) loosely.
- Replace the kickstarter pedal back on the kick shaft in its original position, and tighten its bolt.
- Replace the right foot peg. A lock washer goes with the bolt.
- Make sure the O rings are in place, and replace the oil filter and drain plug. Tighten the oil filter with 1.5 ~ 2.0 kg-m (11 ~ 14.5 ft-lbs) of torque and the drain plug with 2.7 ~ 3.3 kg-m (19.5 ~ 24 ft-lbs).

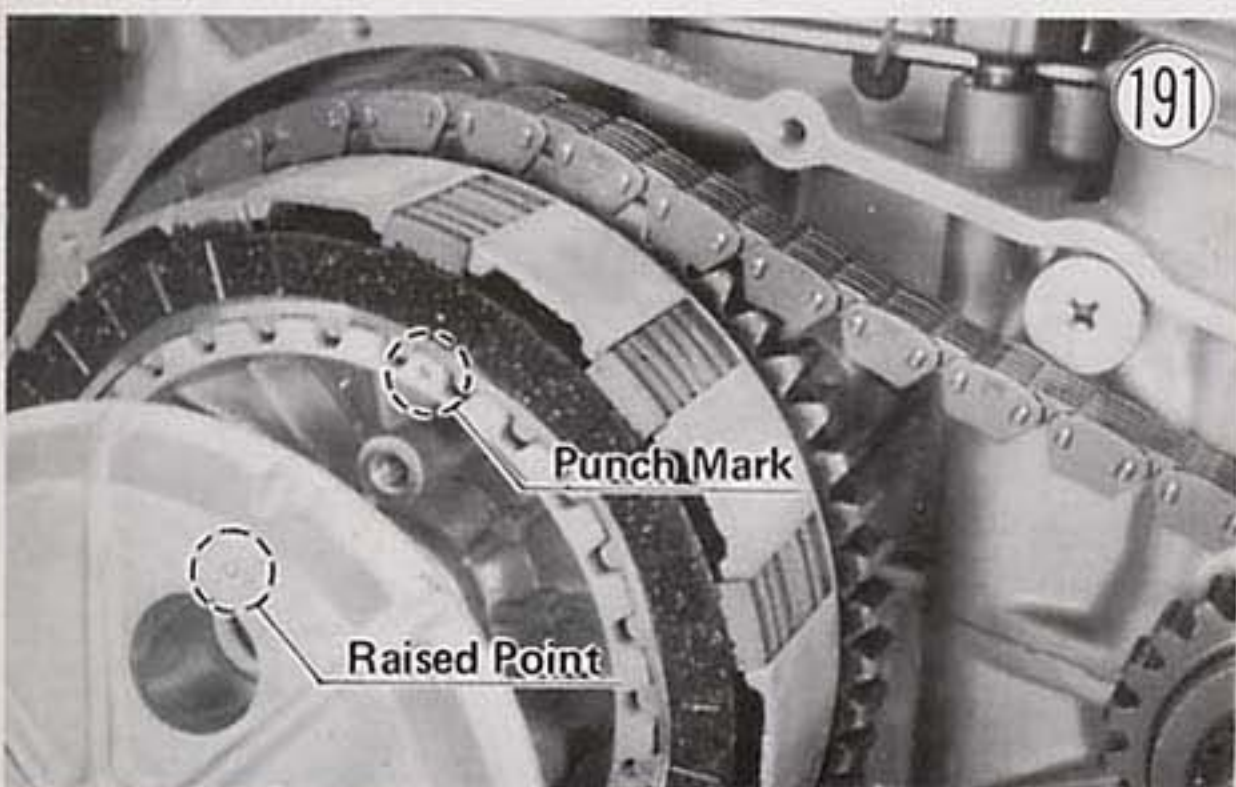




- Fit the primary chain on the clutch housing and primary sprocket, and fit the assembly into place. The protruding side of the primary sprocket faces out. Turn the oil pump gear by hand if necessary so that it meshes with the oil pump drive gear.

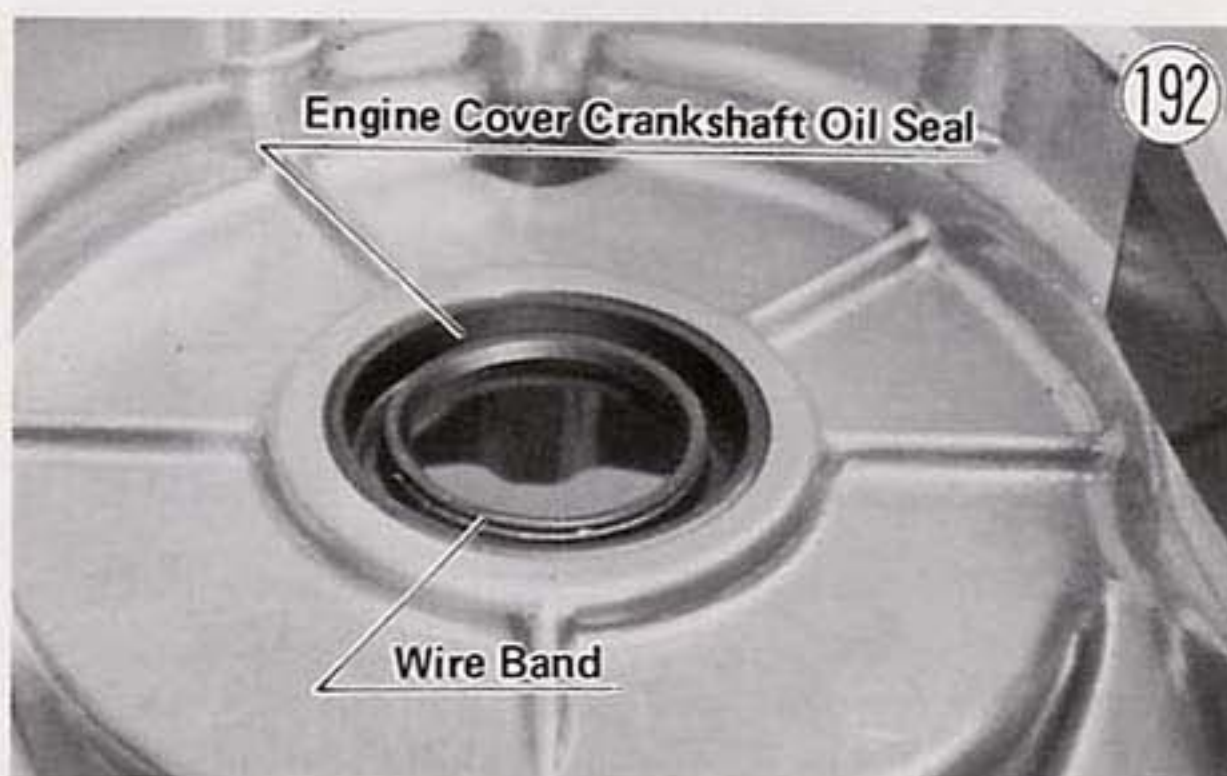


- Replace the primary sprocket circlip.
- Replace the thrust washer (thick) and the clutch hub.
- Replace the shim(s) and clutch hub circlip. The shim(s) should take up all the play between the hub and circlip. If not, add more shim(s).
- Replace the friction plates (6), steel rings (6), and steel plates (5). The sequence is friction plate, steel ring, steel plate, friction plate finishing with a steel ring.
- Insert the steel ball and spring plate pusher.
- Replace the spring plate aligning the raised points on the plate with the punch marks on the hub.



- *• Replace the spring bolts (4), each with its washer and spring. Tighten them with 0.9 ~ 1.1 kg-m (78 ~ 113 in-lbs) of torque in a cross pattern by hand rather than use compressed air, which might make spring pressure uneven.

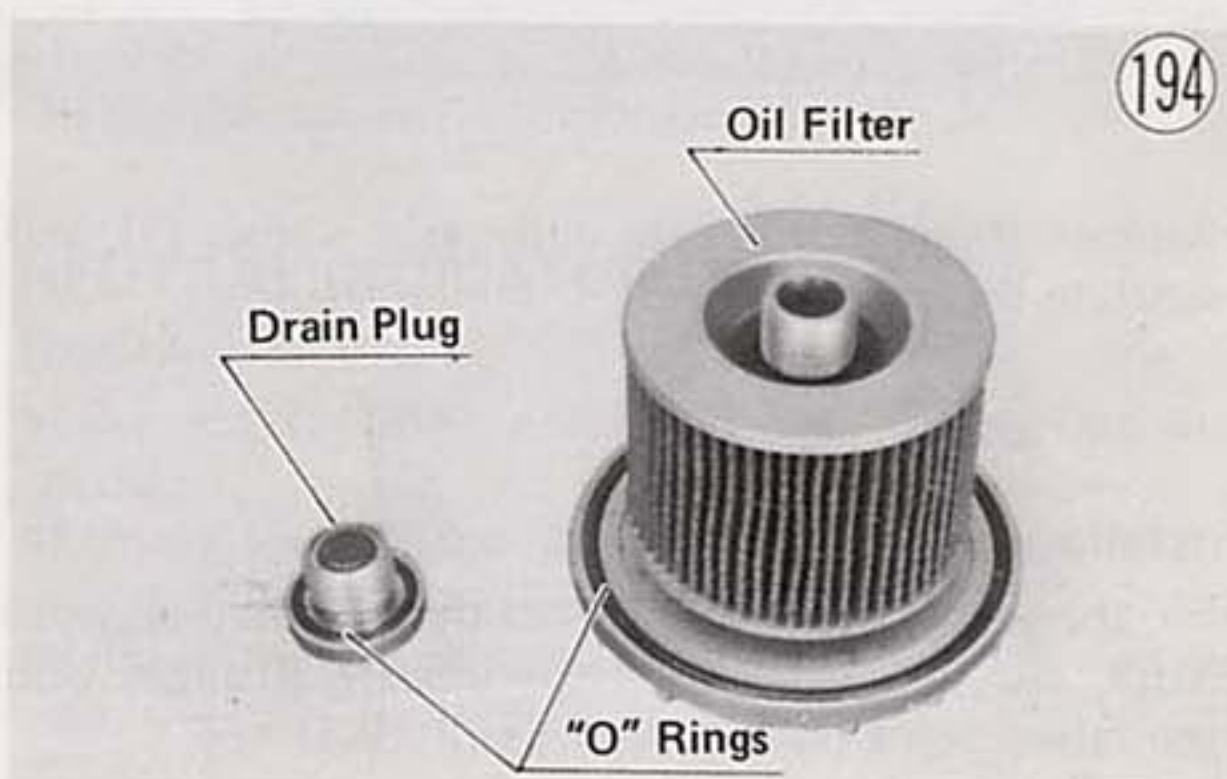
- Check that the wire band in the engine cover crankshaft oil seal has not slipped out of its proper position.



- Using a new engine cover gasket, fit the engine cover onto the crankcase. Use the kick shaft oil seal guide (special tool) to protect the kick shaft oil seal. Tighten the screws (12) firmly. Be sure to include the contact breaker lead clamp with its engine cover screw.



- Fit the timing advancer onto the crankshaft matching its notch with the pin on the end of the crankshaft, and tighten its bolt with 2.3 ~ 2.7 kg-m (16.5 ~ 19.5 ft-lbs) of torque.
- Replace the contact breaker plate, and tighten its screws (3) loosely.
- Replace the kickstarter pedal back on the kick shaft in its original position, and tighten its bolt.
- Replace the right foot peg. A lock washer goes with the bolt.
- Make sure the O rings are in place, and replace the oil filter and drain plug. Tighten the oil filter with 1.5 ~ 2.0 kg-m (11 ~ 14.5 ft-lbs) of torque and the drain plug with 2.7 ~ 3.3 kg-m (19.5 ~ 24 ft-lbs).



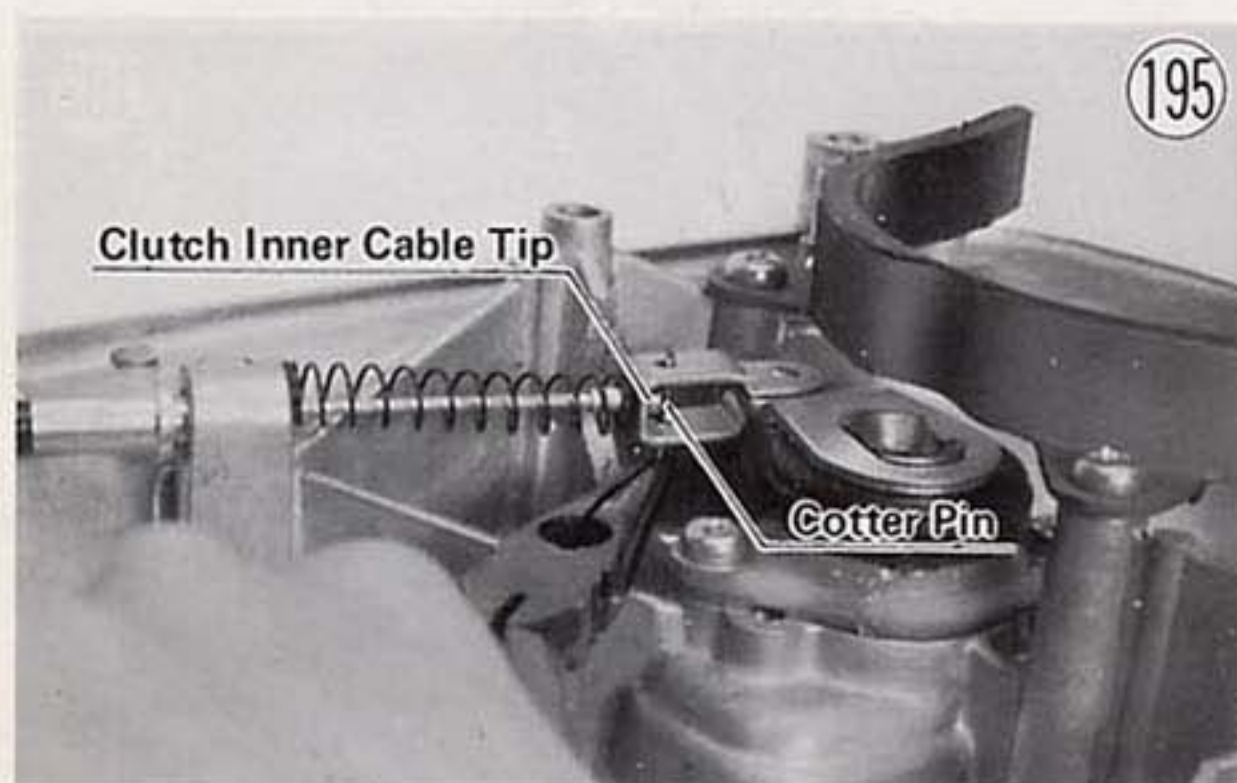
52 DISASSEMBLY

- Fill the engine with oil, check the level (Pg.181), and add more if necessary.
- Adjust the ignition timing (Pg. 12).

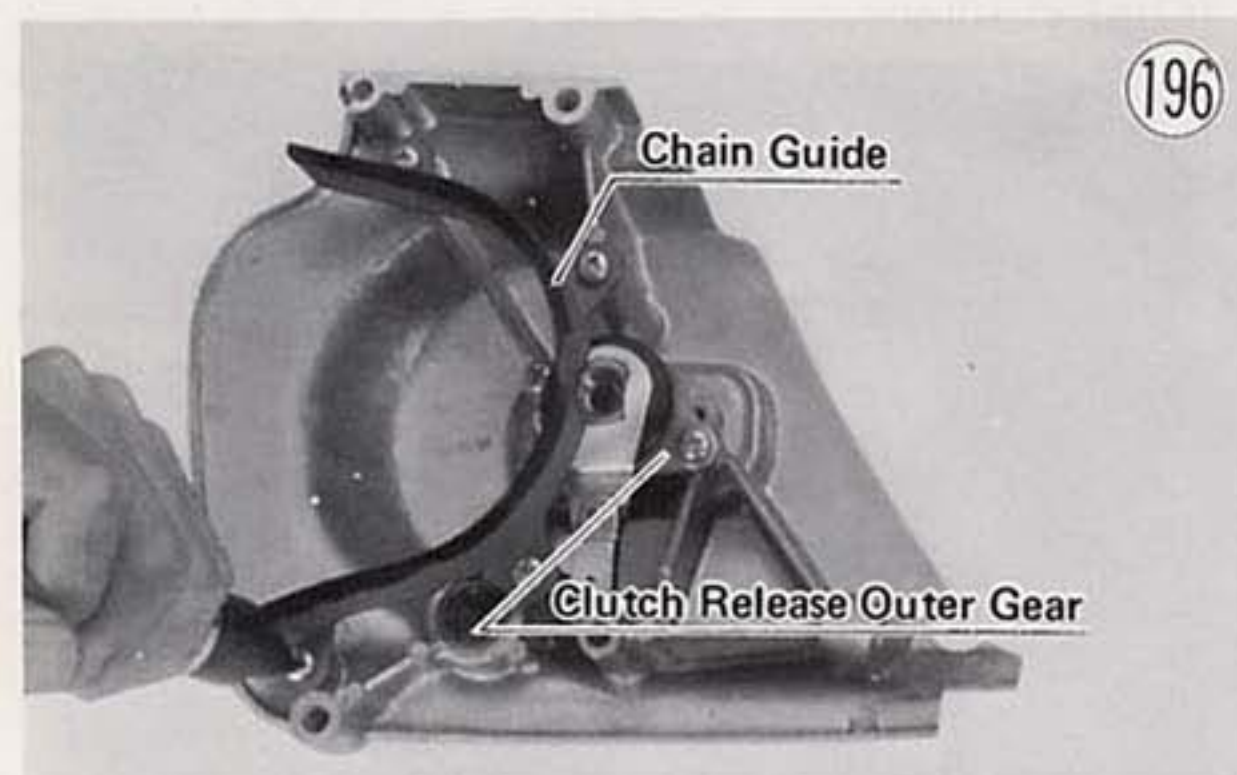
CLUTCH RELEASE

Removal:

- Take out the shift pedal bolt, and remove the shift pedal.
- Remove the left foot peg bolt, left foot peg, and side stand spring.
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.
- Remove the cotter pin from the clutch release lever, and free the clutch inner cable tip from the lever and engine sprocket cover.



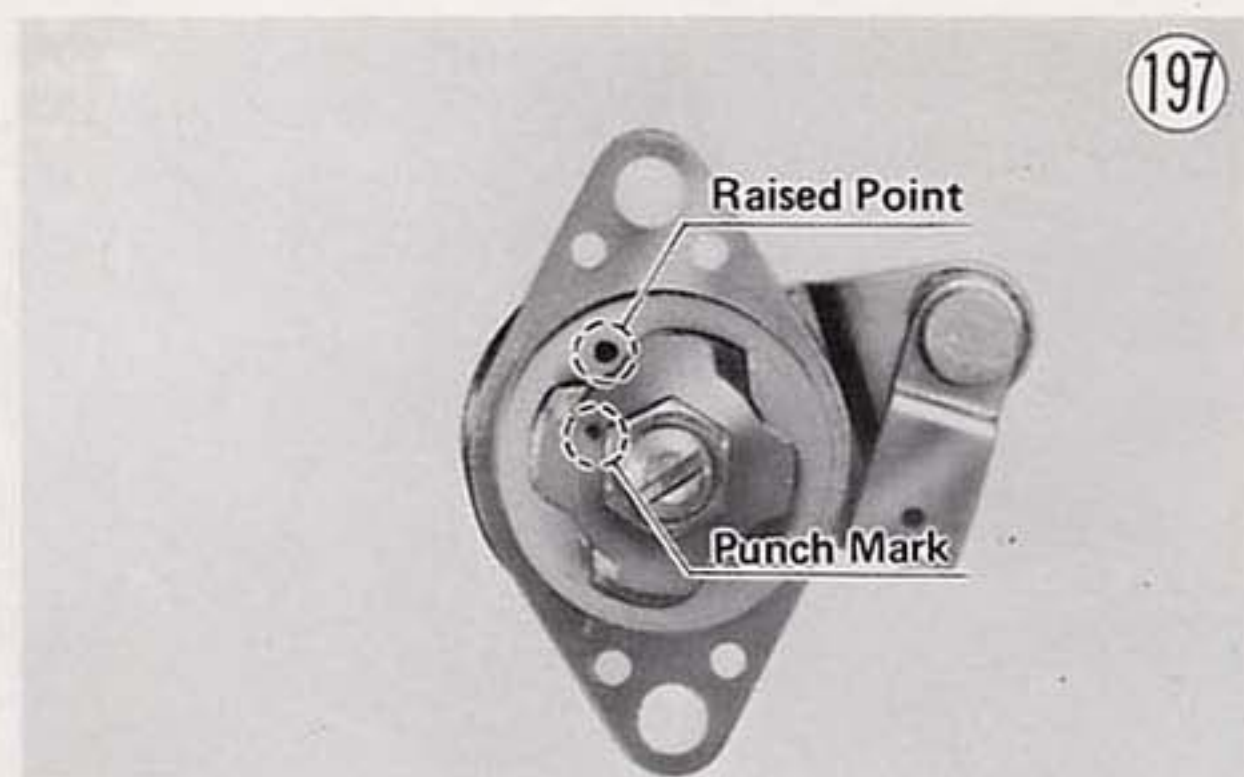
- Remove the chain guard screws (4) to remove the chain guard.



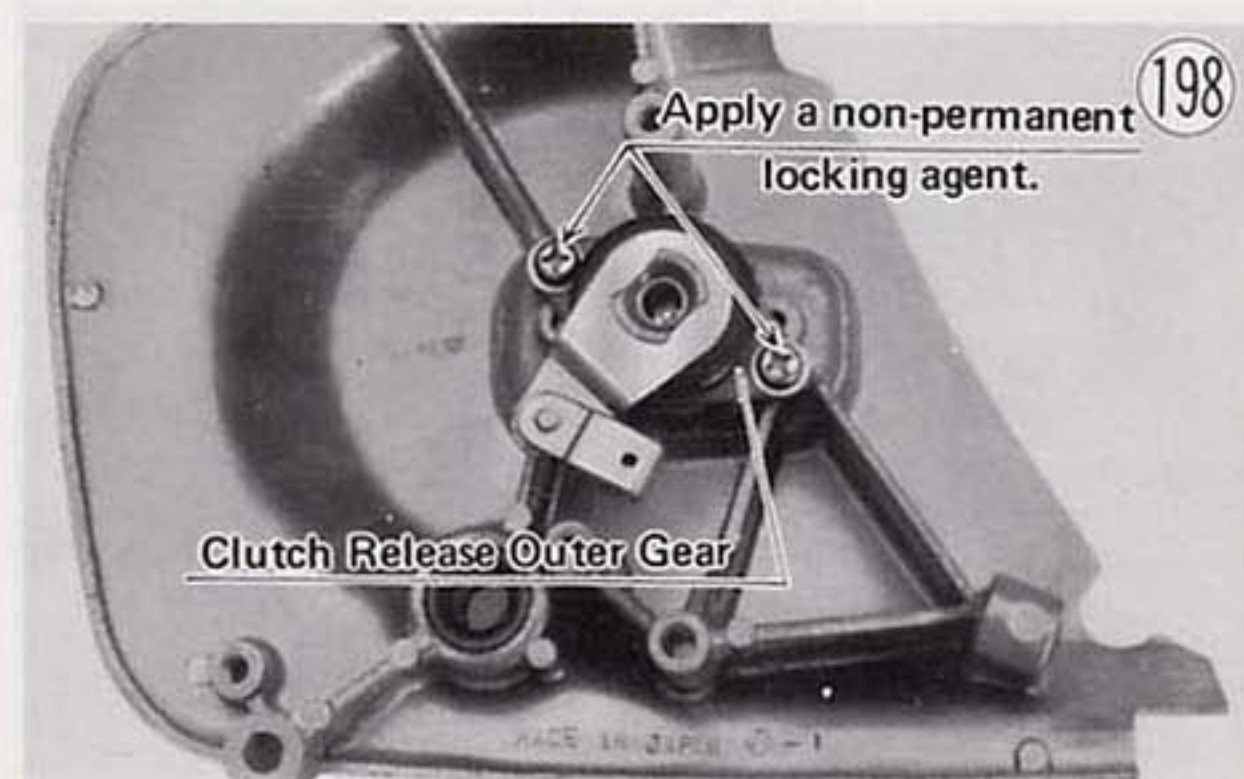
- Remove the clutch release outer gear screws (2), and separate the two gears.

Installation:

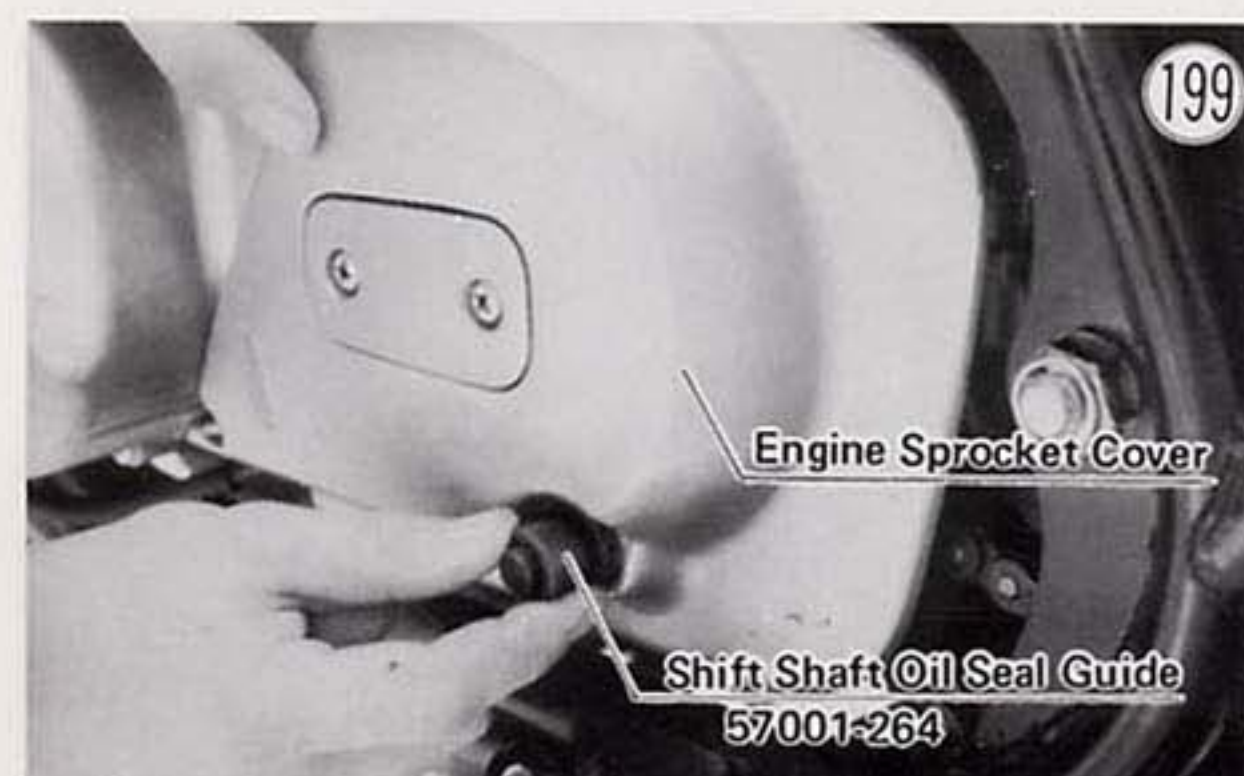
- Fit the worm gears together so that, as they begin to mesh, the punch mark on the inner gear aligns with the raised point on the outer gear.



- Fit the clutch release gears back into the engine sprocket cover, apply a non-permanent locking agent to the screws, and then tighten the screws. When the gears are fully meshed, their position should be as shown in Fig. 198.



- Apply a non-permanent locking agent to the chain guard screws, and replace the chain guard.
- Run the clutch cable into the engine sprocket cover and spring, and fit the tip of the inner cable into the clutch release lever.
- Using a new cotter pin, secure the cable tip to the release lever.
- Replace the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the oil seal in the cover, and tighten its screws.

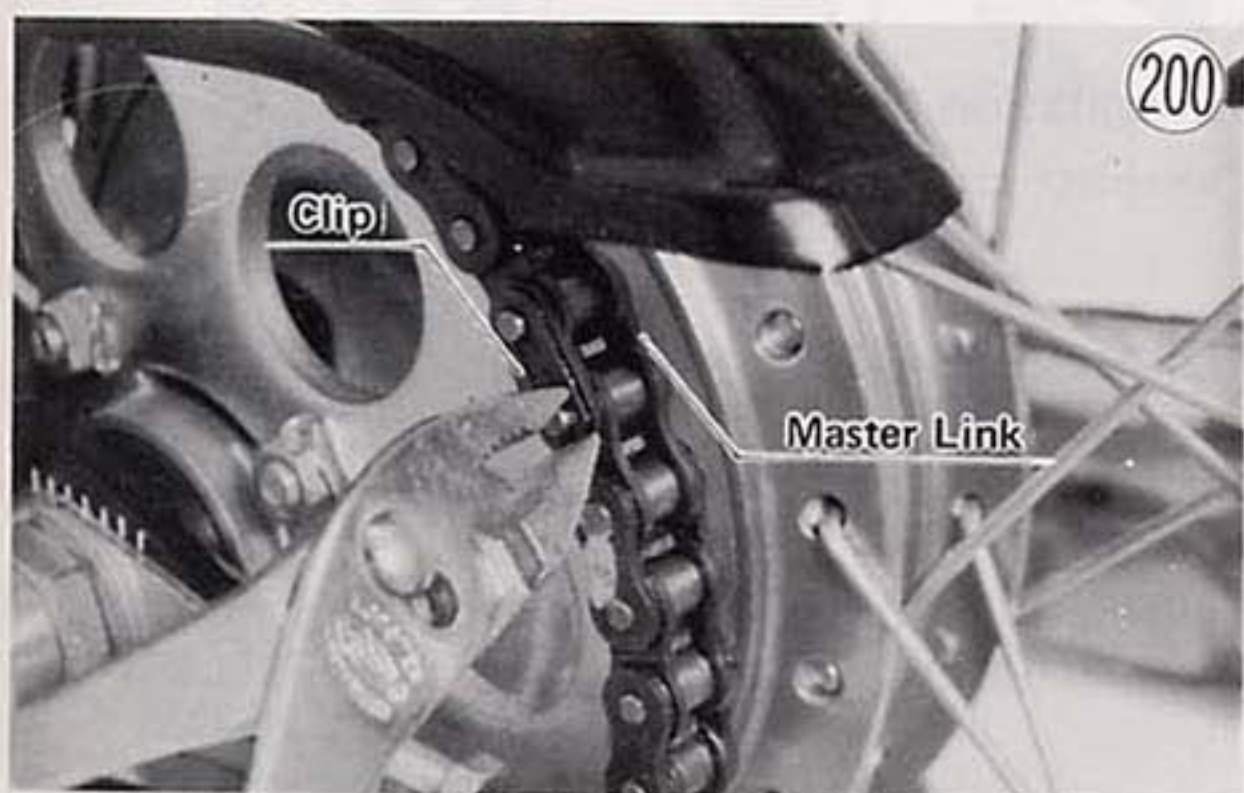


- Fit the side stand spring into place, and then secure the left foot peg with its bolt.
- Replace the shift pedal so that its end matches the level of the dynamo cover lower right screw.

ENGINE SPROCKET

Removal:

- Check that the transmission is in neutral.
- Take out the shift pedal bolt, and remove the shift pedal.
- Remove the left foot peg bolt, left foot peg, and side stand spring.
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.
- Remove the clip carefully from the drive chain master link with pliers, remove the master link, and remove the drive chain from the engine sprocket.



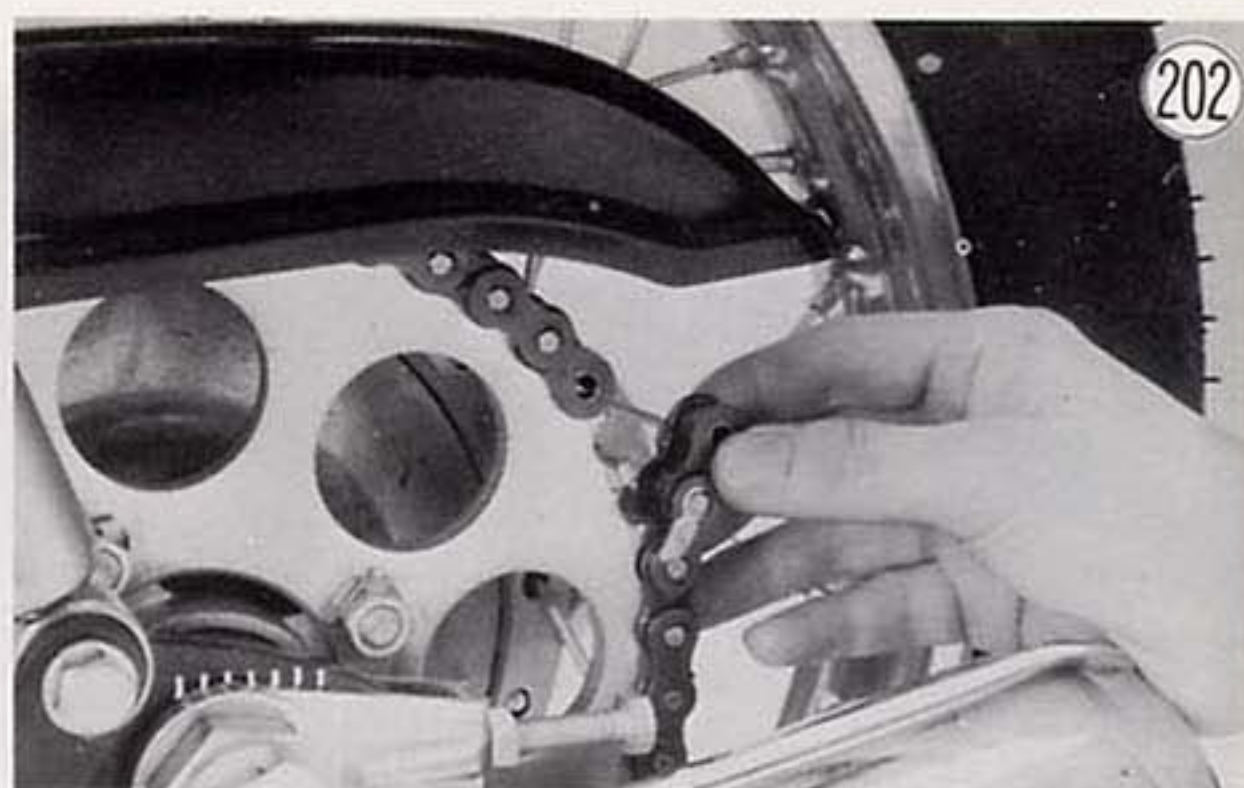
- Straighten the side of the splined washer that is bent over the side of the engine sprocket nut.
- Hold the engine sprocket steady using the engine sprocket holder (special tool), and remove the engine sprocket nut.



- Pull off the splined washer and the engine sprocket.

Installation:

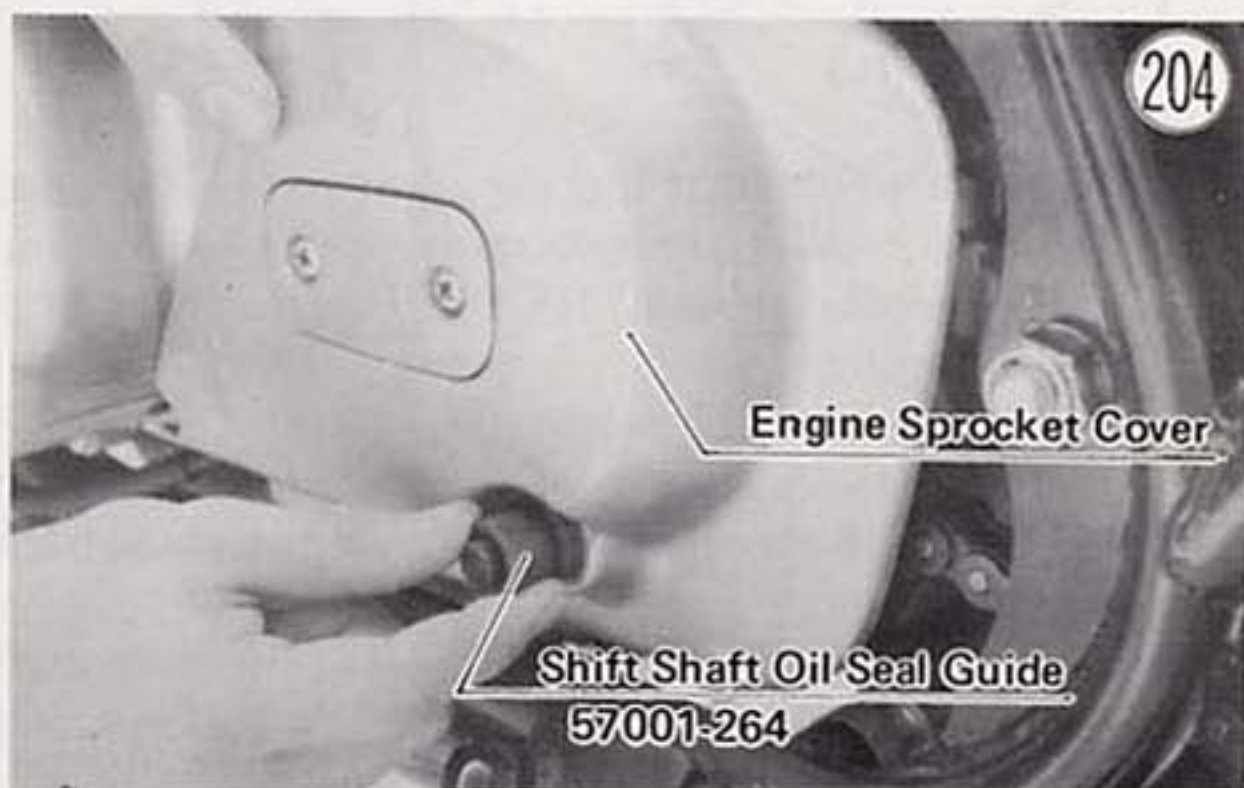
- Replace the engine sprocket and splined washer, and then tighten the engine sprocket nut with 12~15 kg-m (87 ~ 108 ft-lbs) of torque while using the engine sprocket holder to keep the sprocket steady.
- Bend back one side of the splined washer over the side of the nut.
- Fit the drive chain back on the sprockets with the ends on the rear sprocket as shown in Fig. 202.



- Replace the chain master link with pliers. The direction of the master link clip should be as shown in Fig. 203.



- Replace the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the oil seal in the cover, and tighten its screws.



- Fit the side stand spring into place, and then secure the left foot peg with its bolt.
- Replace the shift pedal so that its end matches the level of the dynamo cover lower right screw.

NEUTRAL INDICATOR SWITCH

Removal:

- Take out the shift pedal bolt, and remove the shift pedal.
- Remove the left foot peg bolt, left foot peg, and side stand spring.
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.

- Remove the dynamo and starter motor wiring guide.



- Pull off the neutral indicator switch lead from the switch.
- Remove the neutral indicator switch and gasket.



Installation:

- Apply a non-permanent locking agent to the threaded portion, and replace the neutral indicator switch and gasket tightening it with 1.5 ~ 2.0 kg-m (11 ~ 14.5 ft-lbs) of torque.
- Fit the lead back on the switch.
- Fit first the starter motor lead and then the dynamo wiring into the wiring guide, and screw the guide back on the crankcase.
- Replace the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the oil seal, and tighten its screws.



- Fit the side stand spring into place, and then secure the left foot peg with its bolt.
- Replace the shift pedal so that its end matches the level of the dynamo cover lower right screw.

ENGINE OIL PUMP

Removal:

- Remove the clutch and primary chain (Pg. 49).
- Remove the oil pump screws (4), and pull off the oil pump. There are three O rings in the crankcase.

Installation Note:

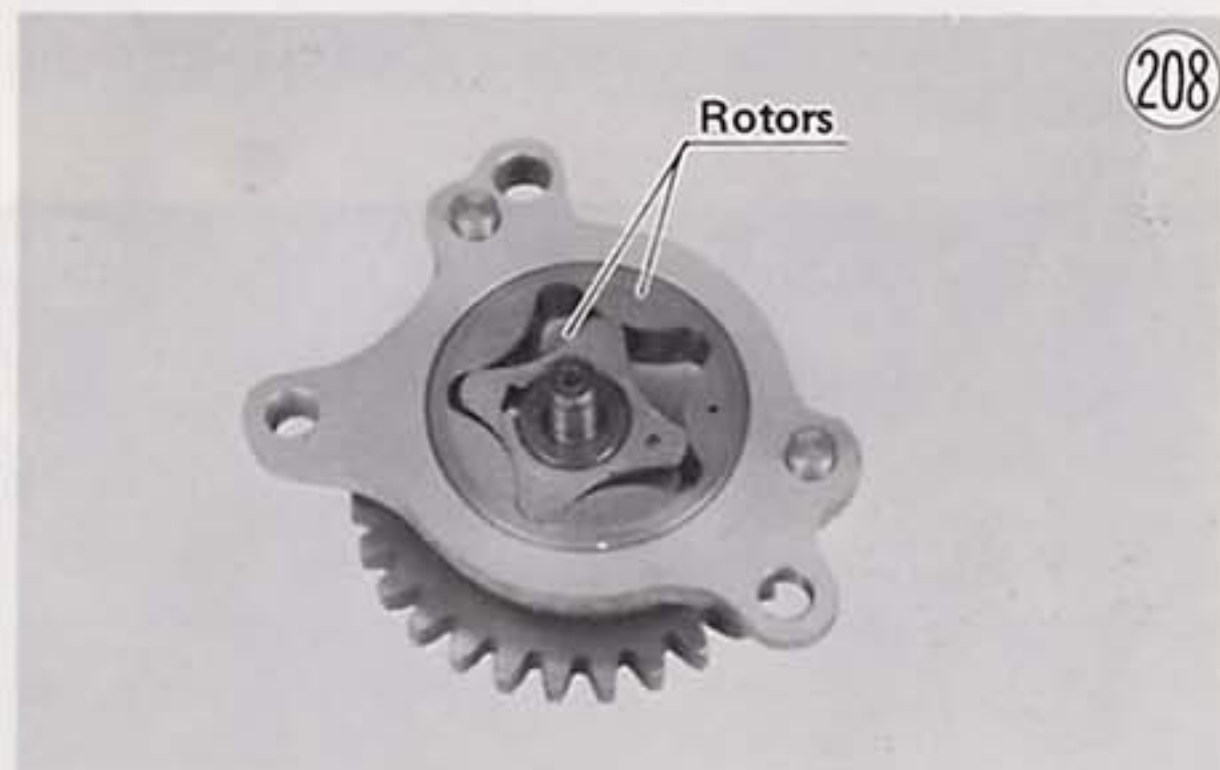
- Replace any O rings that are deteriorated or damaged.

Disassembly:

- Remove the C ring (1) and washer (2).
- Separate the oil pump halves (3) (7), and remove the rotors (4) (5).
- Remove the pin (8), and separate the gear (9) and oil pump half (7).

Assembly Note:

- Check whether or not the rotors rotate smoothly.



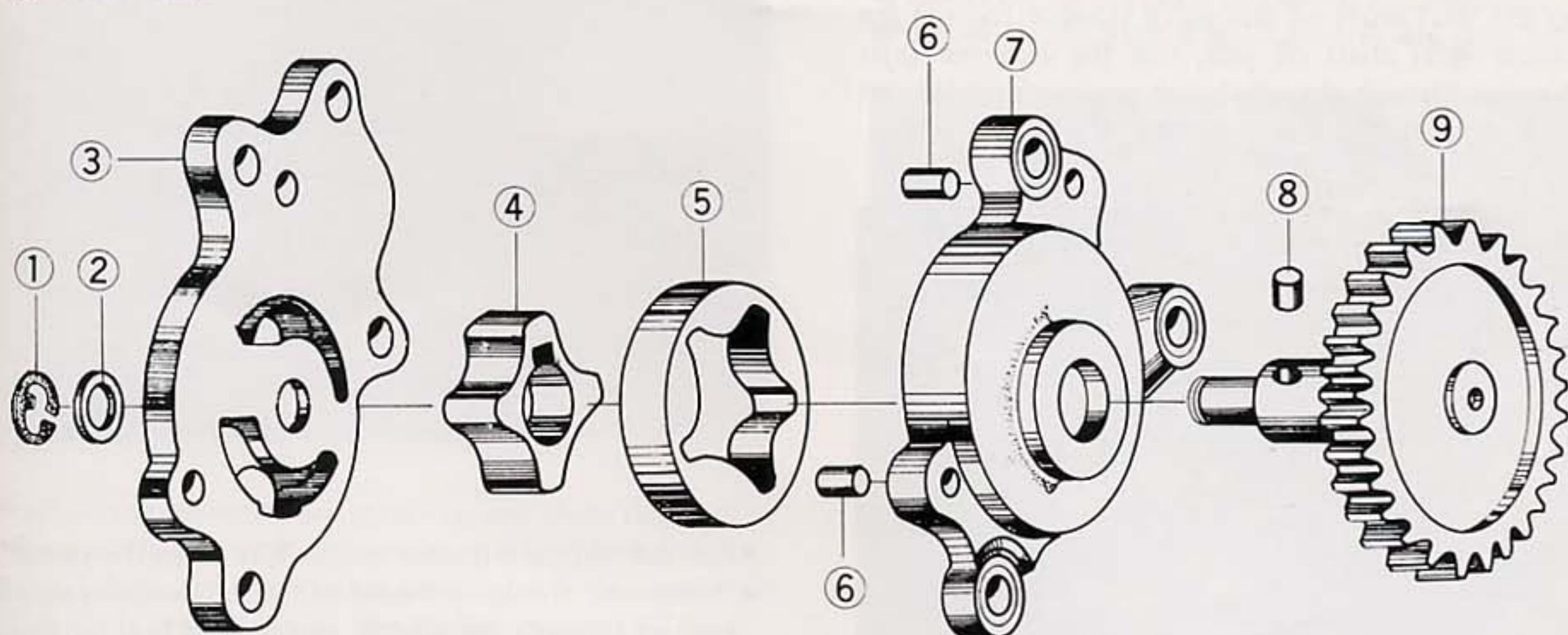
EXTERNAL SHIFT MECHANISM

Removal:

- Remove the clutch and primary chain (Pg. 49).
- Take out the shift pedal bolt (3), and remove the shift pedal (1).
- Remove the left foot peg bolt, left foot peg, and side stand spring.
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.
- Remove the external shift mechanism stopper (9).
- Move the external shift mechanism pawl (11) out of its position on the end of the shift drum, and pull out the external shift mechanism (7).

Engine Oil Pump

(209)

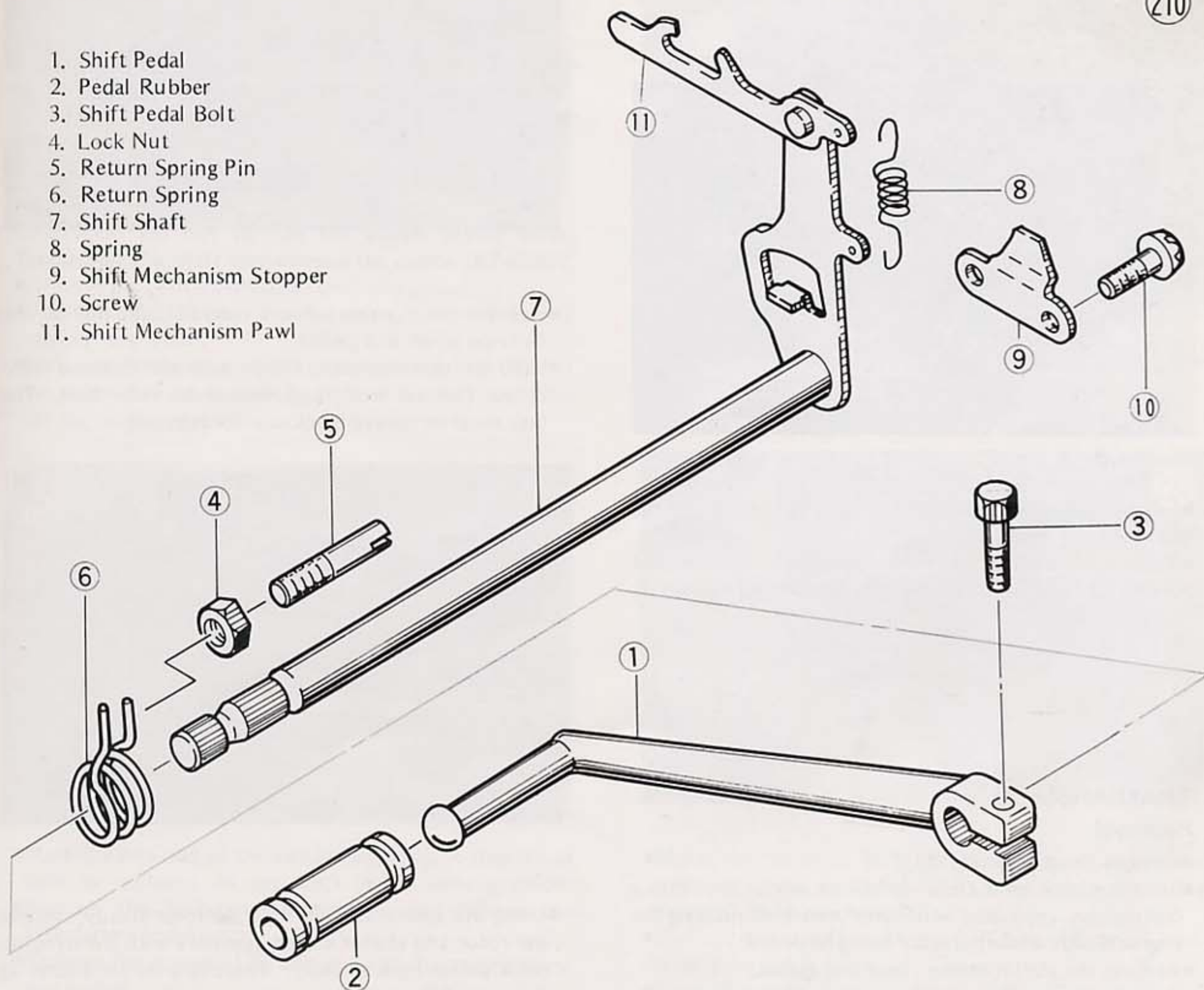


- | | | |
|------------------|----------------|------------------|
| 1. C Ring | 4. Inner Rotor | 7. Oil Pump Half |
| 2. Washer | 5. Outer Rotor | 8. Pin |
| 3. Oil Pump Half | 6. Nock Pin | 9. Oil Pump Gear |

Shift Mechanism

(210)

1. Shift Pedal
2. Pedal Rubber
3. Shift Pedal Bolt
4. Lock Nut
5. Return Spring Pin
6. Return Spring
7. Shift Shaft
8. Spring
9. Shift Mechanism Stopper
10. Screw
11. Shift Mechanism Pawl



56 DISASSEMBLY

Installation:

- Insert the shift shaft oil seal guide (special tool) in the crankcase shift shaft oil seal, run the external shift mechanism through the crankcase, and place its arm on the shift drum pins.



- Apply non-permanent locking agent to the screws, and replace the external shift mechanism stopper.
- Replace the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the oil seal in the cover and tighten its screws.

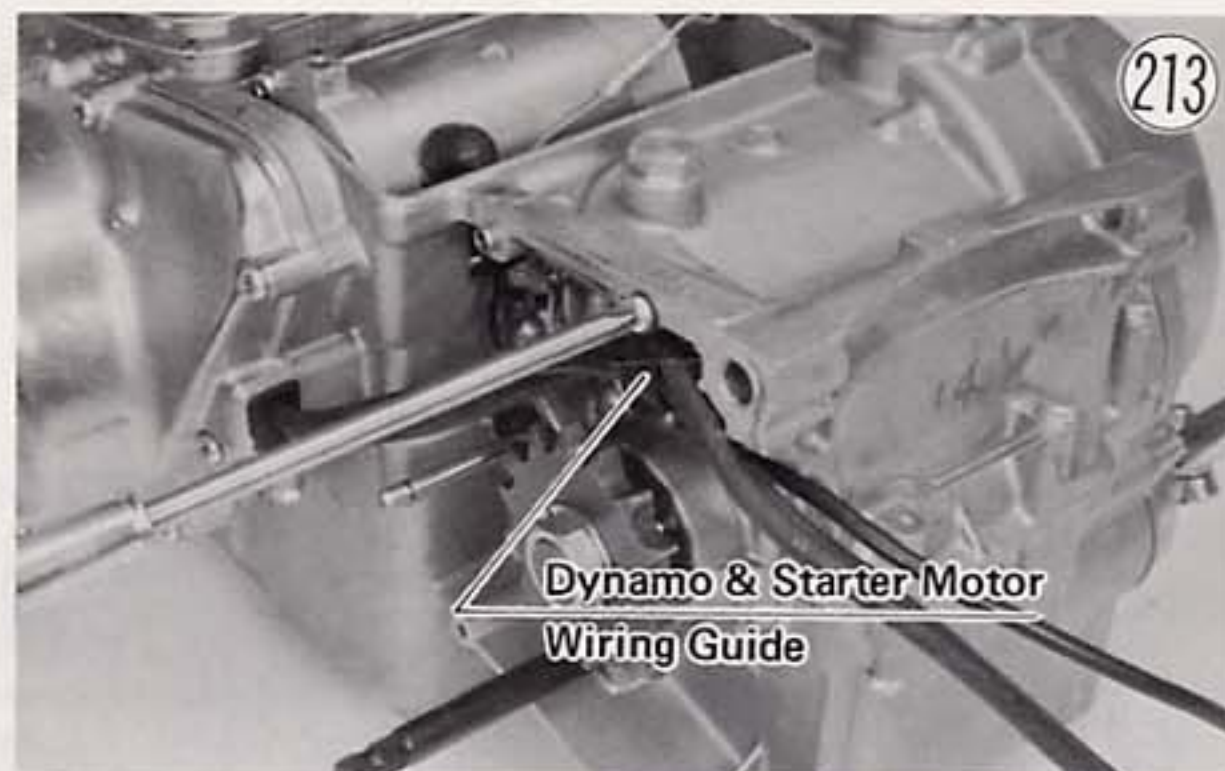


- Fit the side stand spring into place, and then secure the left foot peg with its bolt.
- Replace the shift pedal so that its end matches the level of the dynamo cover lower right screw, and tighten its bolt.
- Install the clutch and primary chain (Pg. 50).

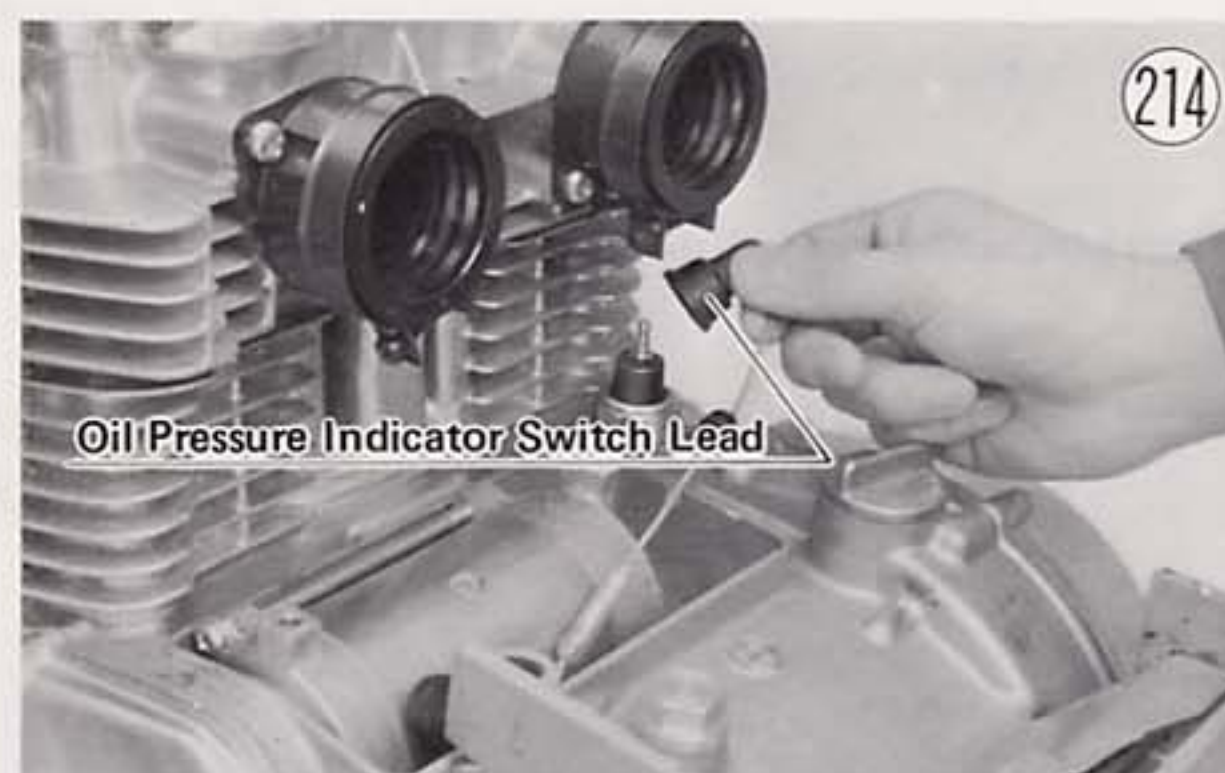
TRANSMISSION

Removal:

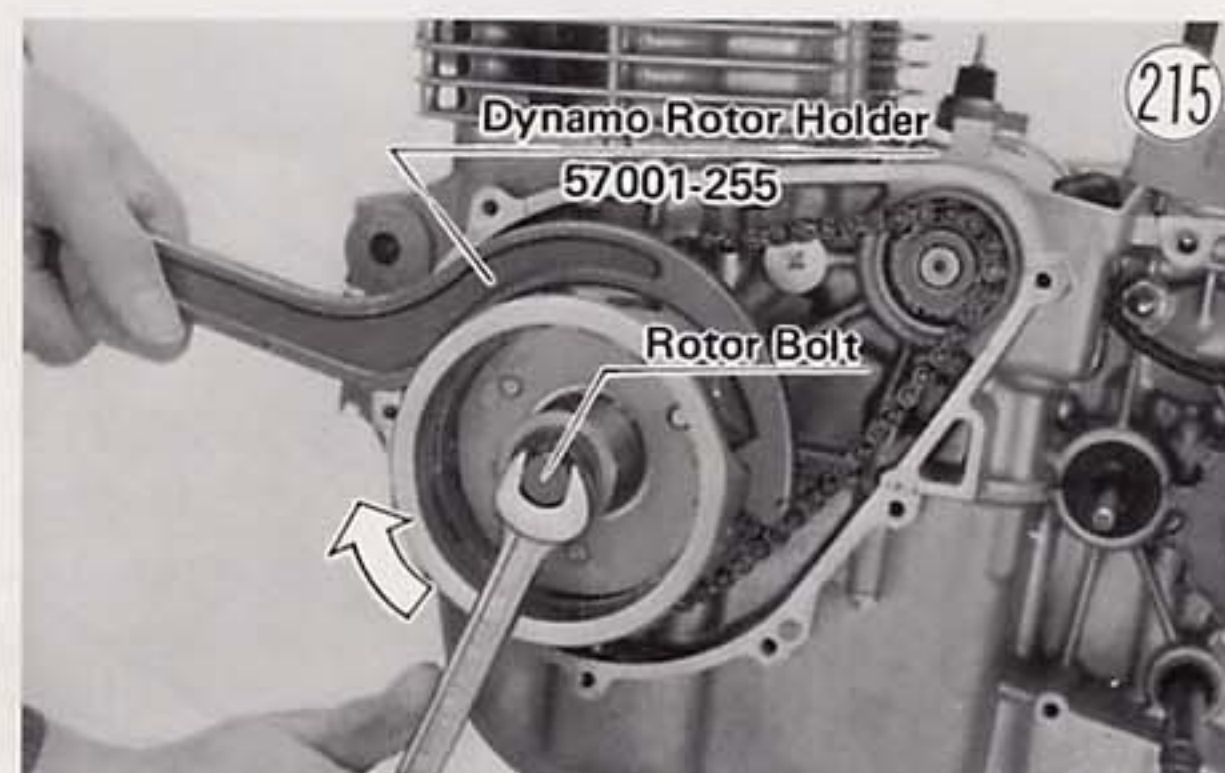
- Remove the engine (Pg. 23).
- Set the engine on a clean surface or, preferably, into a disassembly apparatus with some means of holding the engine steady while parts are being removed.
- Remove the starter motor cover and gasket.
- Remove the dynamo and starter motor wiring guide.



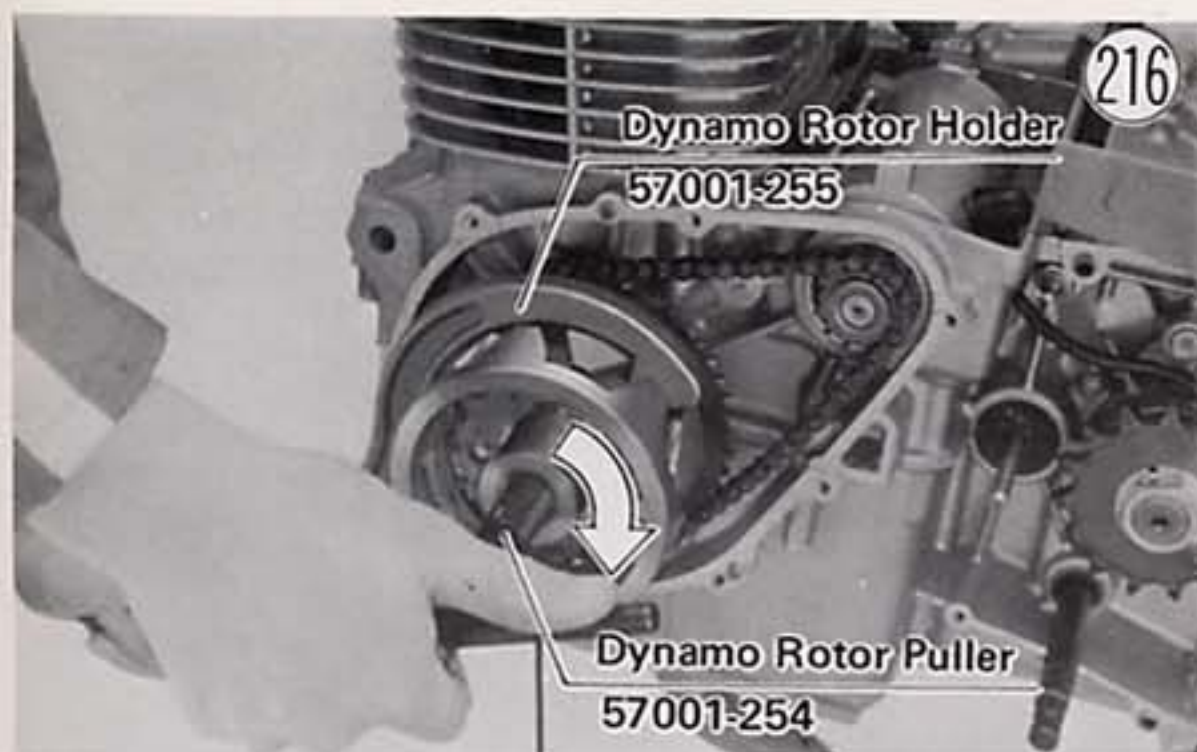
- Pull the neutral indicator switch lead from the switch.
- Disconnect the oil pressure indicator switch lead, and push it through the starter motor lead hole to free it from the crankcase.



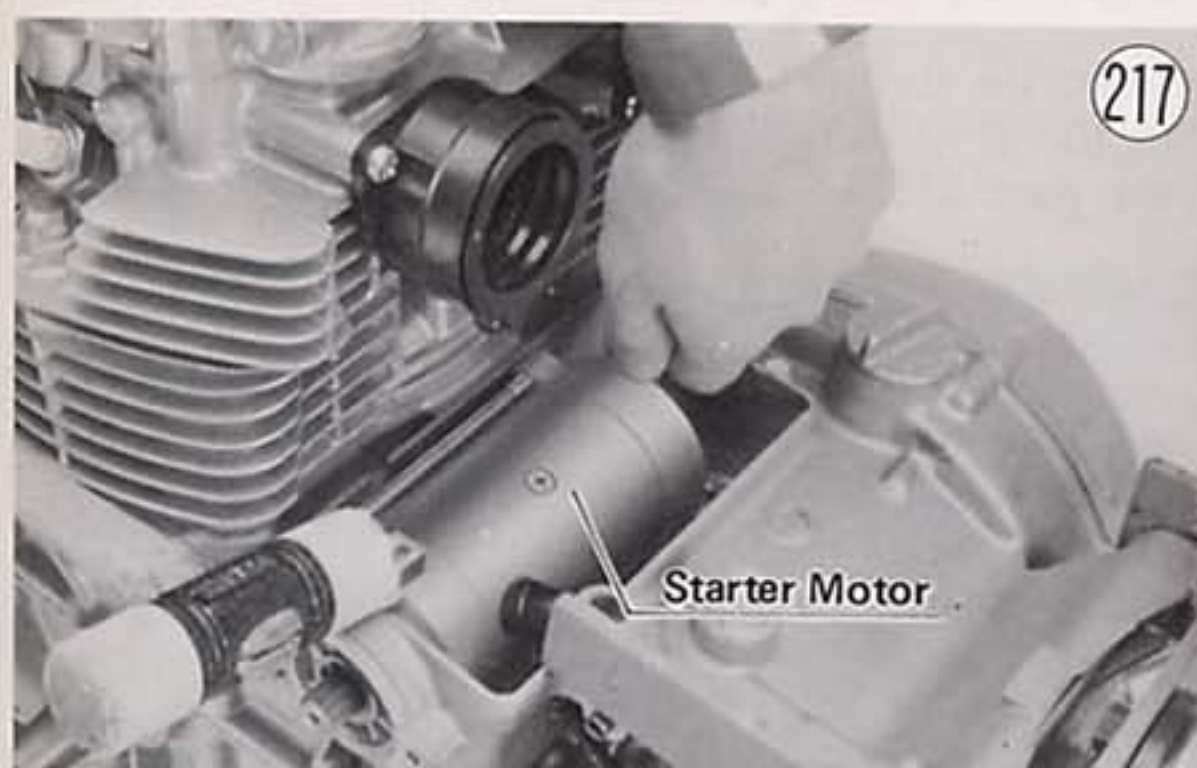
- Remove the dynamo cover screws (8), and pull off the dynamo cover and gasket.
- Hold the dynamo rotor steady with the dynamo rotor holder (special tool), and remove the rotor bolt. The bolt must be turned clockwise for removal.



- Using the special tool to hold the rotor steady, remove the rotor and starter clutch assembly with the dynamo rotor puller (special tool). There is a thrust washer at the rear of the rotor.

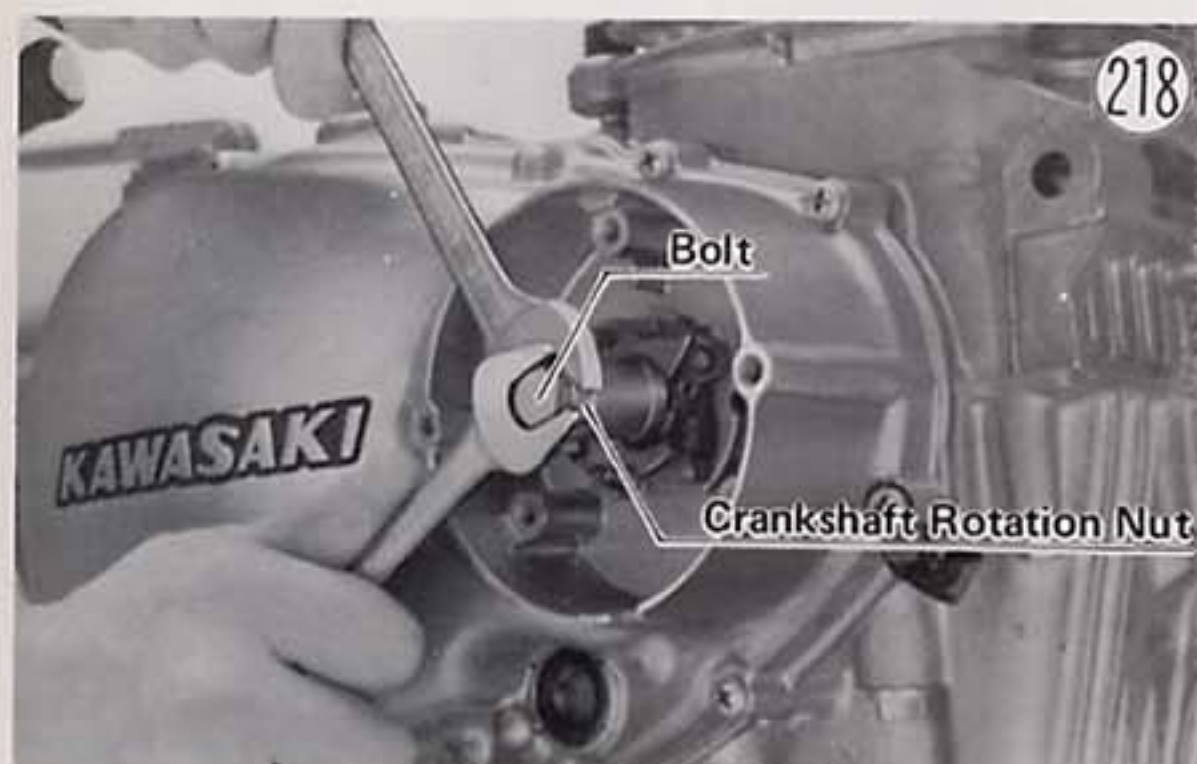


- Pull off the starter motor sprockets and chain (KZ400D).
- Remove the starter motor retaining bolts (2) (KZ400D).
- Tap lightly on the starter motor body as shown in Fig. 217, and pull out the starter motor (KZ400D).



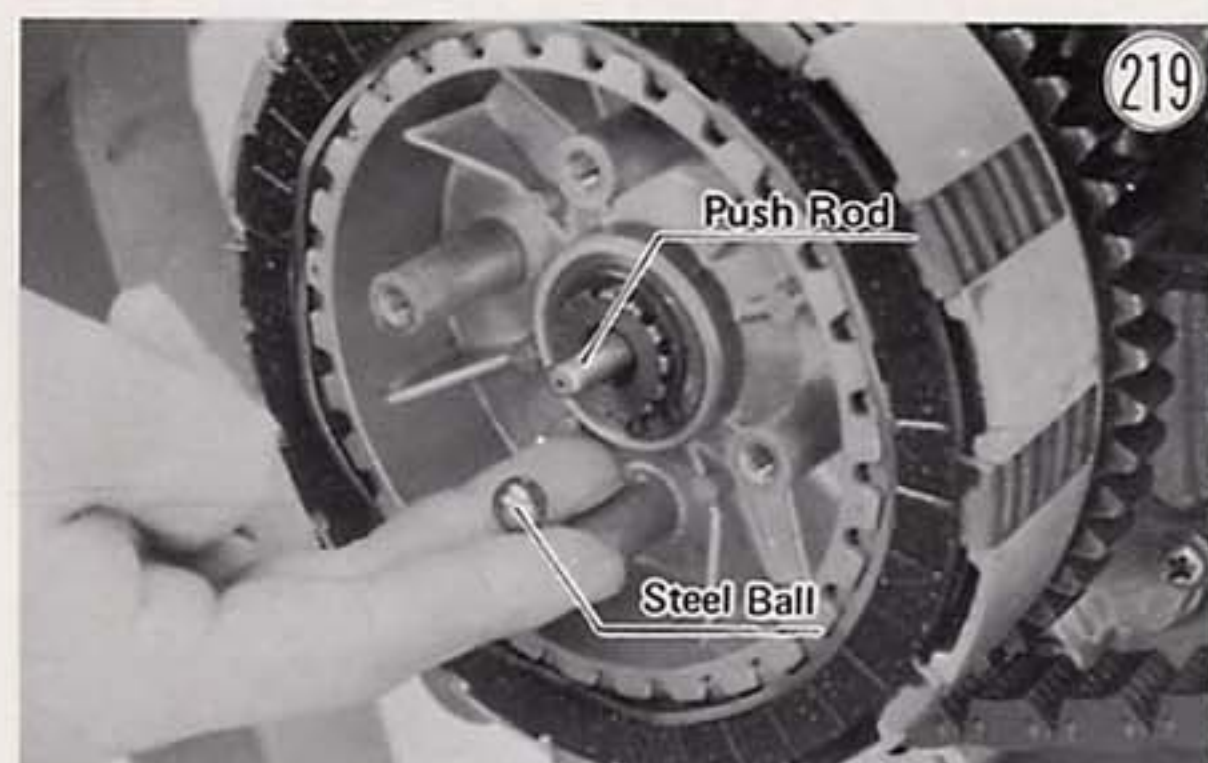
CAUTION: Do not tap on the starter motor shaft. Tapping on the shaft may damage the motor (KZ400D).

- Remove the contact breaker cover and gasket.
- Take out the contact breaker plate screws (3), and remove the plate.
- With one wrench on the crankshaft rotation nut to keep the shaft from turning, remove the bolt, and take off the timing advancer.

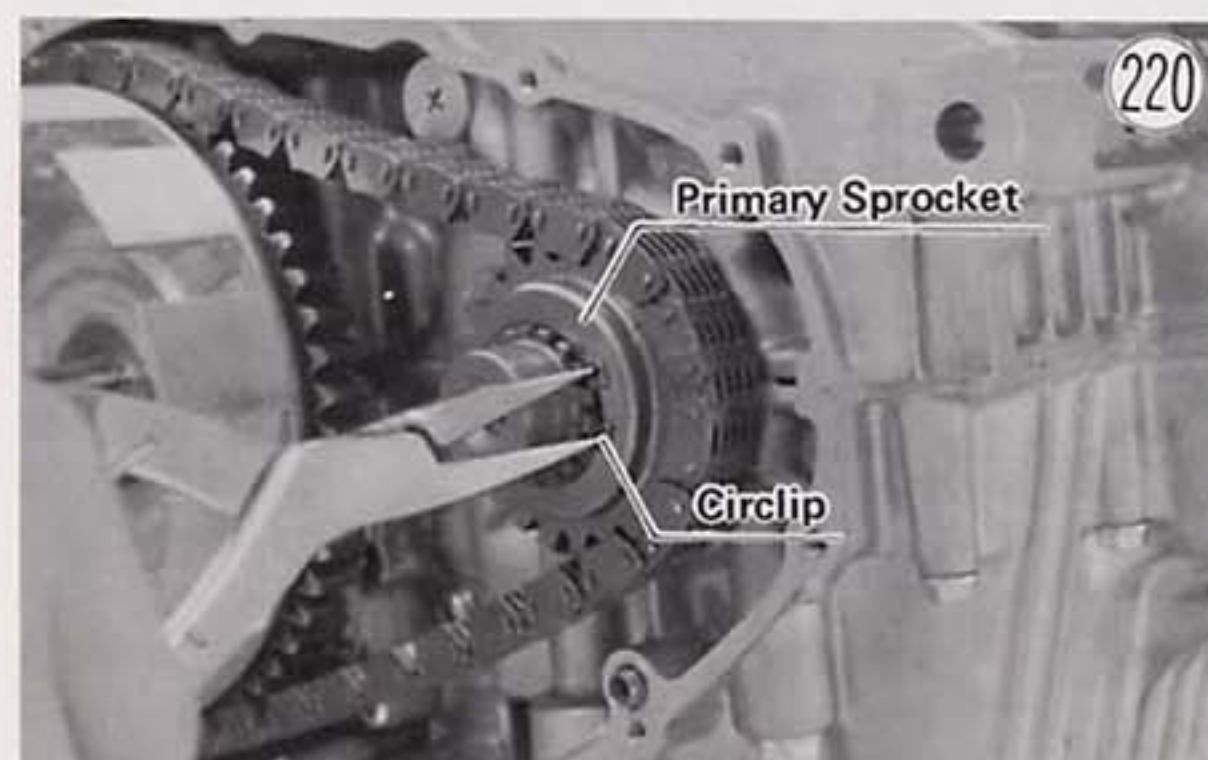


- Mark the position of the kickstarter pedal so that it can later be replaced on the shaft in the same position.
- Remove the kickstarter pedal bolt, and remove the kickstarter pedal.
- Remove the screws (12), and pull off the engine cover and gasket.
- Remove the clutch bolts, washers, and springs (4 ea).

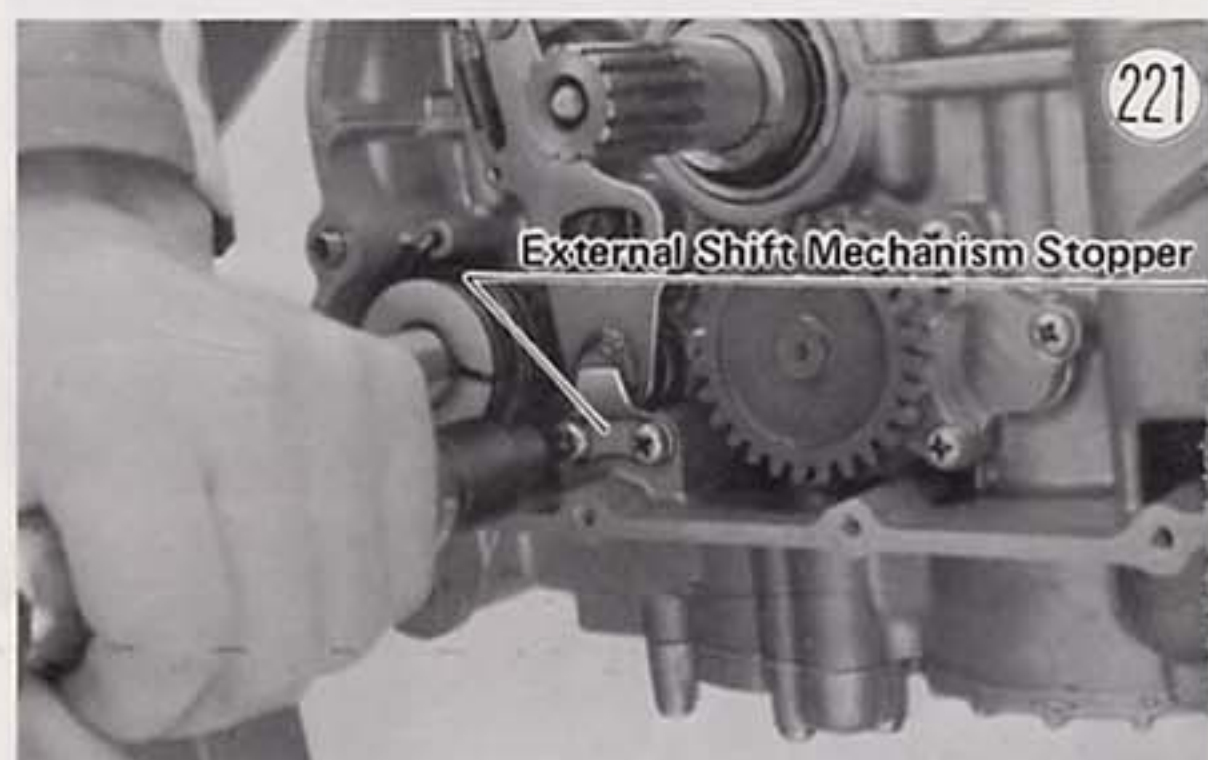
- Pull off the spring plate and spring plate pusher.
- Push in on the push rod to remove the steel ball.



- Remove the clutch hub circlip and shim(s).
- Remove the friction plates (6), steel rings (6), steel plates (5), and clutch hub. There is a thrust washer at the rear of the clutch hub.
- Remove the primary sprocket circlip.



- Pull off the clutch housing, primary sprocket, and primary chain together.
- Remove the external shift mechanism stopper.



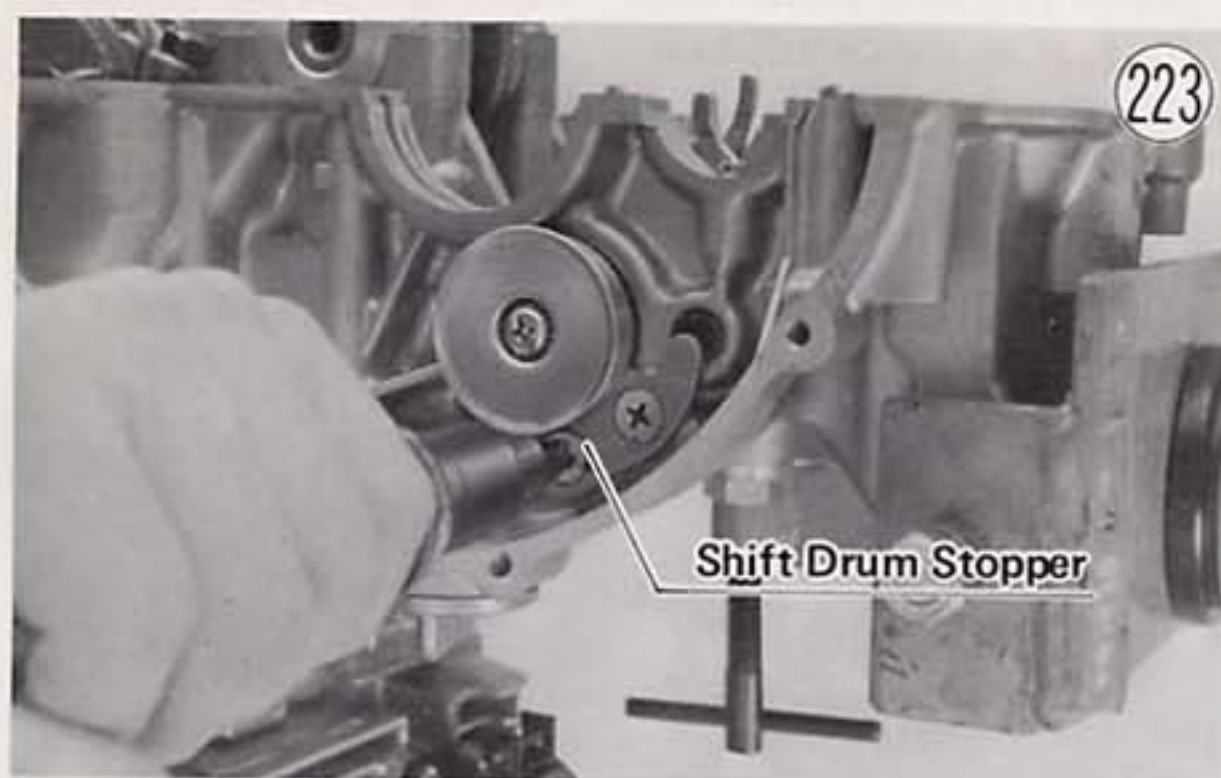
- Move the external shift mechanism pawl out of its position on the end of the shift drum, and pull out the external shift mechanism.
- Remove the upper crankcase half bolts (6) and carburetor tube guide.
- Turn the engine upside down, and remove the lower crankcase half bolts (14).

58 DISASSEMBLY

- Lift off the lower crankcase half.
- Remove the oil passage O ring.



- Take out the drive shaft and output shaft assemblies.
- Remove the shift drum stopper.



- Remove the shift drum positioning bolt, O ring, spring, and pin.

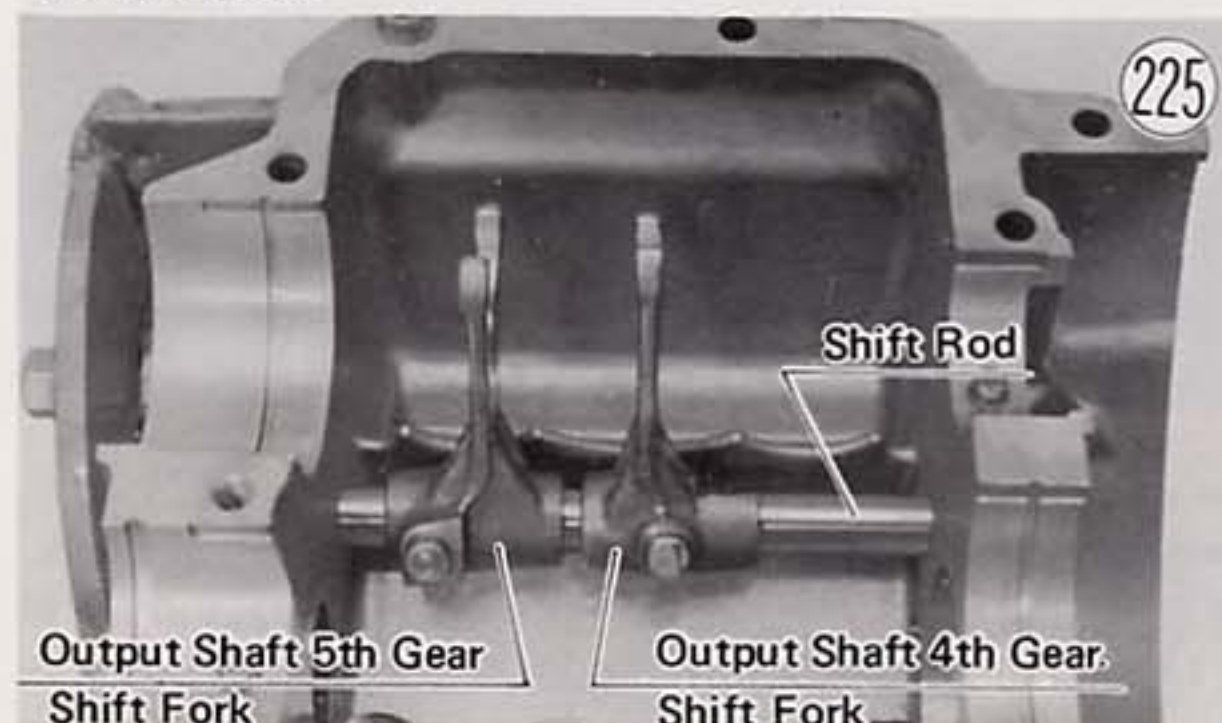


- Remove the drive shaft 3rd gear shift fork cotter pin, and pull out the shift fork guide pin.
- Remove the operating plate circlip.
- Pull out the shift drum, and remove the operating plate and drive shaft 3rd gear shift fork.
- Remove the circlip, pull out the shift rod, and remove the two remaining shift forks.

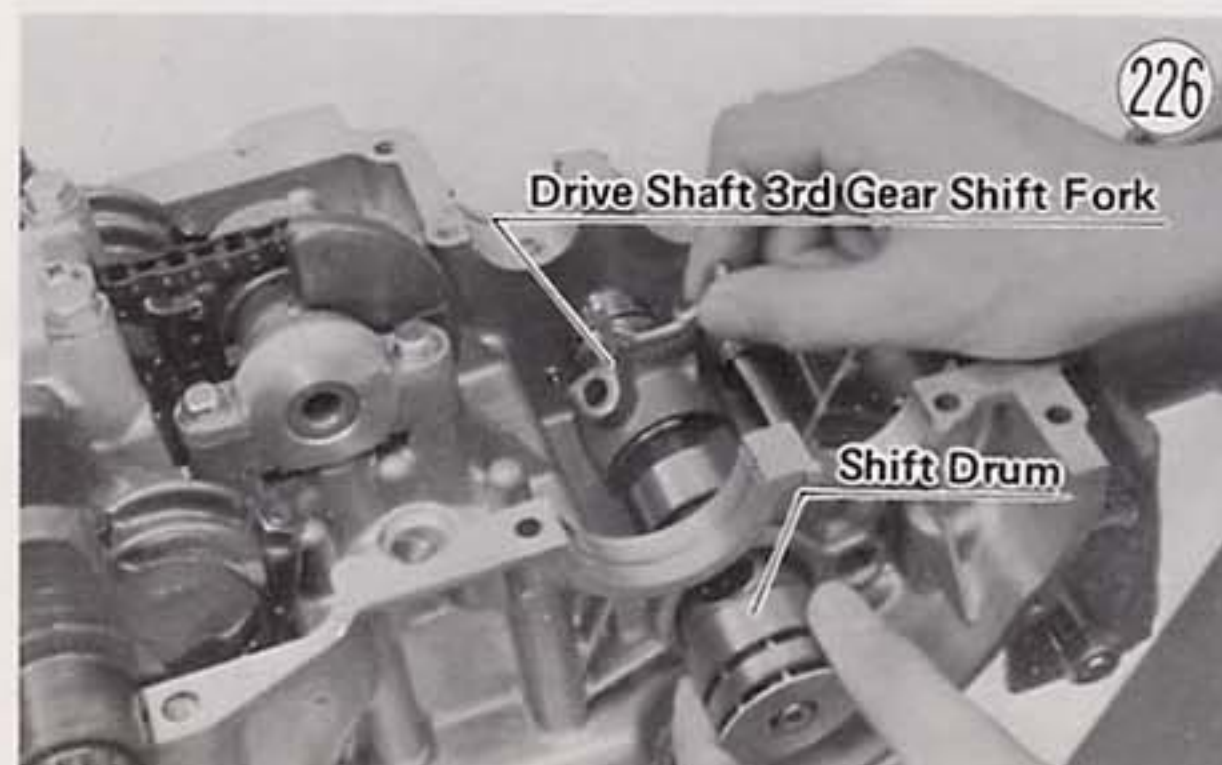
Installation:

- Remove the sump plate, clean out the lower crankcase half thoroughly, and then replace the sump plate. Use a non-permanent locking agent on the sump plate screws.

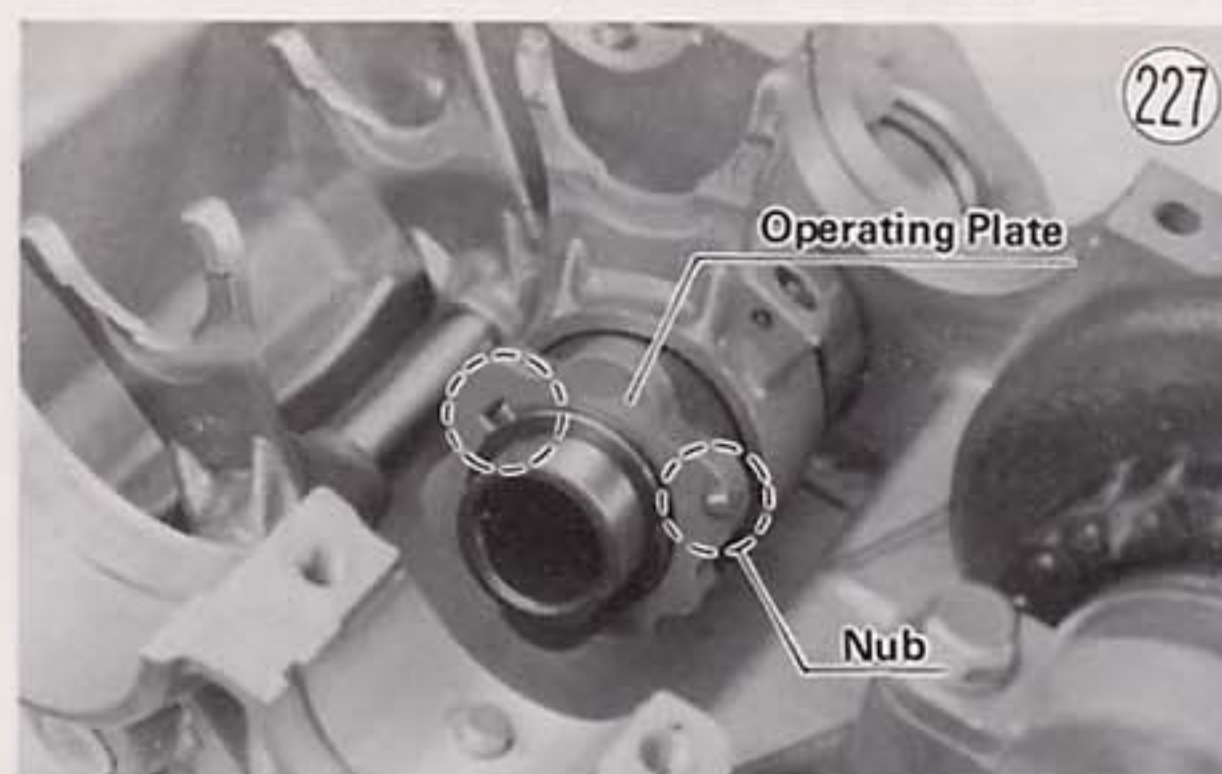
- Insert the shift rod running it through the output shaft 4th gear shift fork and then through the output shaft 5th gear shift fork. The output shaft 4th gear shift fork guide pin is more centrally located than on the other shift fork. Install the circlip in the groove on the shift rod.



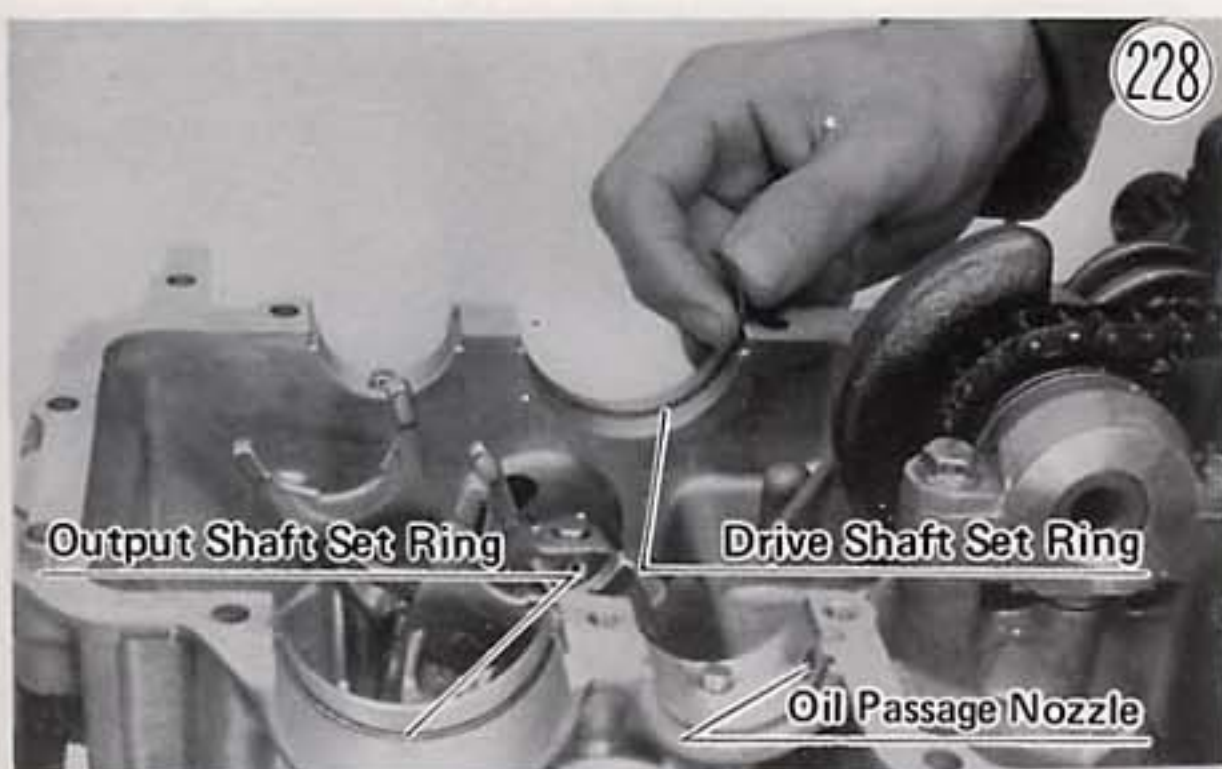
- Insert the shift drum into the crankcase part way, and fit the drive shaft 3rd gear shift fork on the drum with the part which houses the pin facing the crankshaft.



- Check to see that the operating plate pin is in place, fit the operating plate onto the end of the shift drum with the nub facing out, and replace the circlip.



- Insert the shift fork guide pin and cotter pin and bend back the ends of the cotter pin.
- Push the shift drum in the rest of the way, and have each shift fork guide pin riding in its drum groove.
- Check that the drive shaft and output shaft set rings and the oil passage nozzle are in place, and daub a little engine oil on the set rings, blow the oil passage nozzle clean with compressed air.

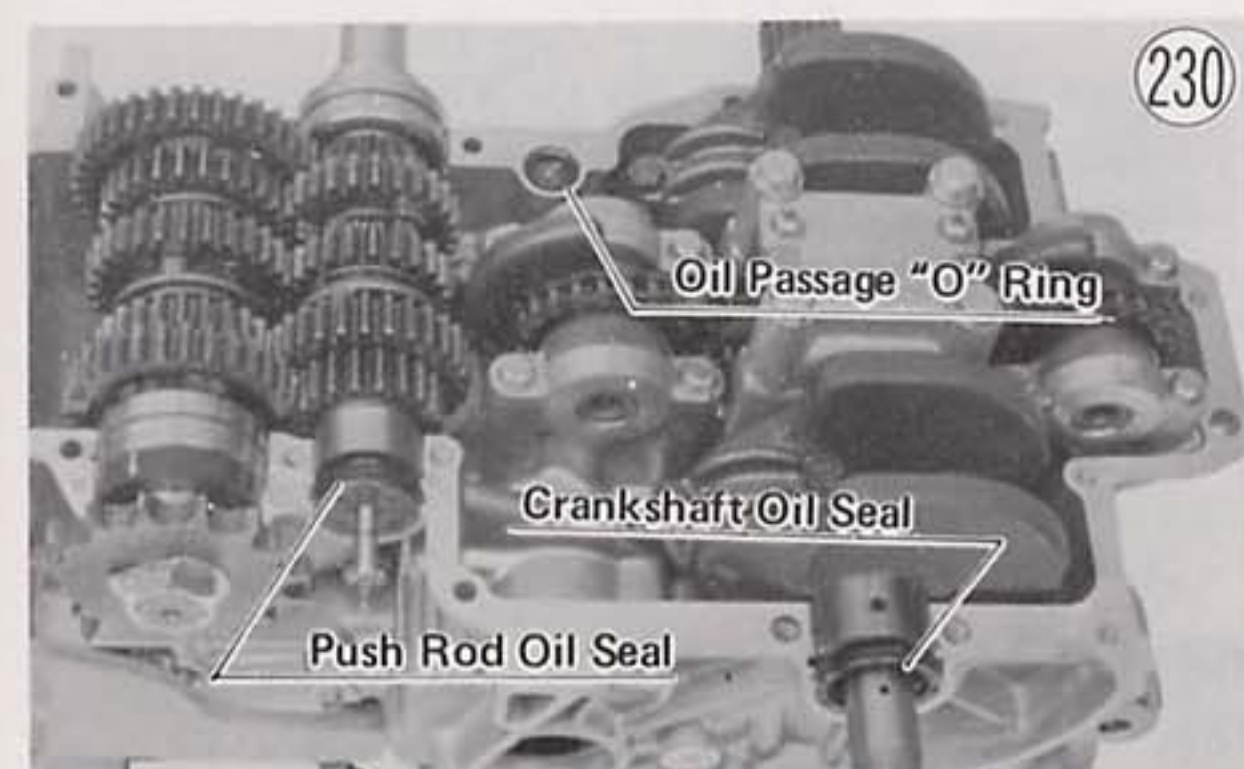


- Fit the output shaft and drive shaft assemblies fully into place.
- Replace the shift drum stopper, and punch the screws after tightening its screws.
- Replace the shift drum positioning pin, spring, O ring, and bolt.
- Check that the drive shaft assembly, output shaft assembly, and shift drum all turn easily.
- Replace the oil passage O ring.
- Check to see that the following parts are in place: oil pressure relief valve, output shaft oil cup, crankshaft bushing halves (2), push rod oil seal, crankshaft oil seal (wire band side facing in). Apply a little engine oil to all bushings.

Lower Crankcase Half



Upper Crankcase Half

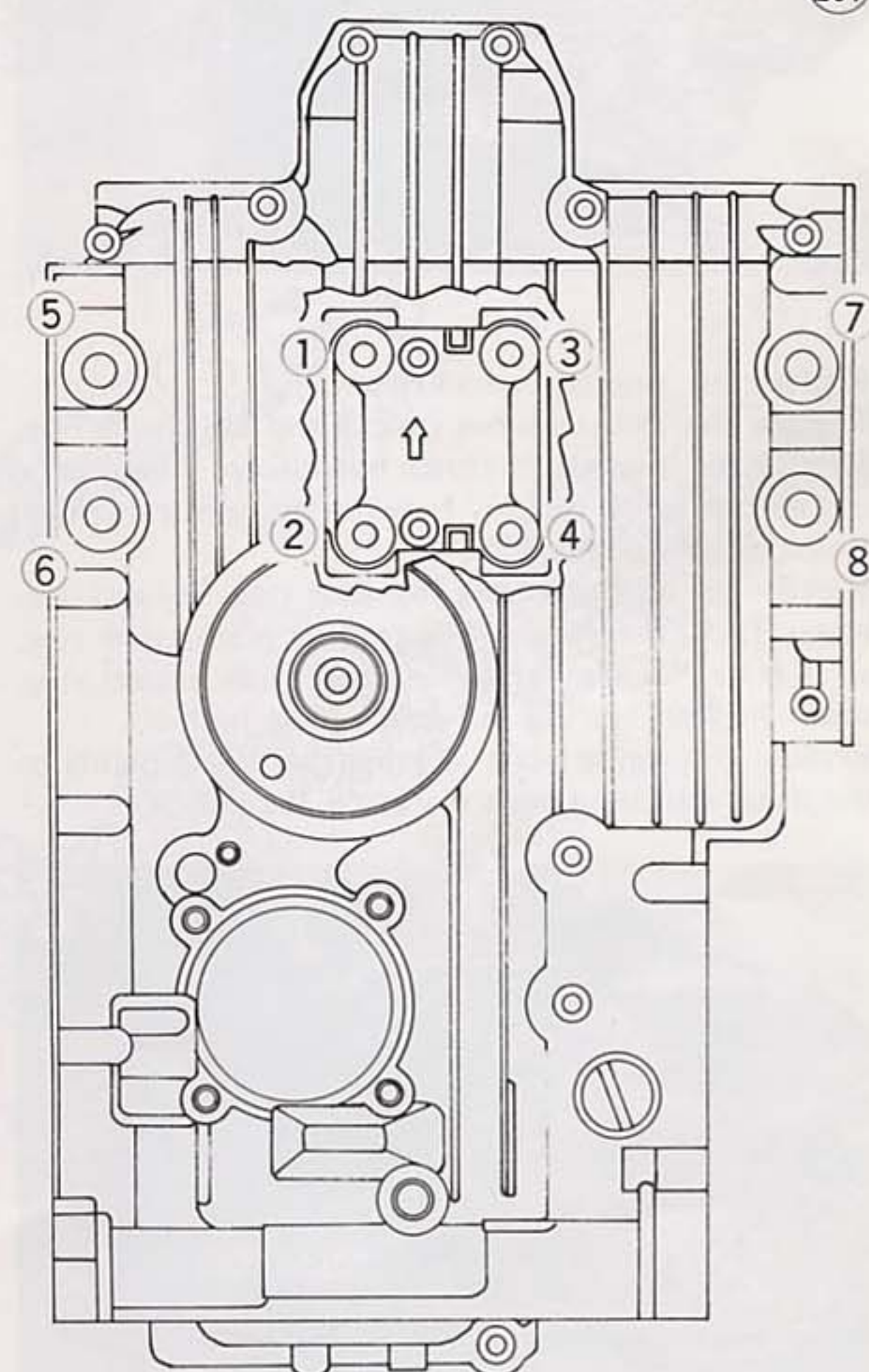


- Clean off and wipe dry the fitting surfaces of the crankcase halves, and apply liquid gasket to the fitting surface of the upper crankcase half.
- Fit the lower crankcase half on the upper crankcase half, and replace the lower crankcase half bolts (14).

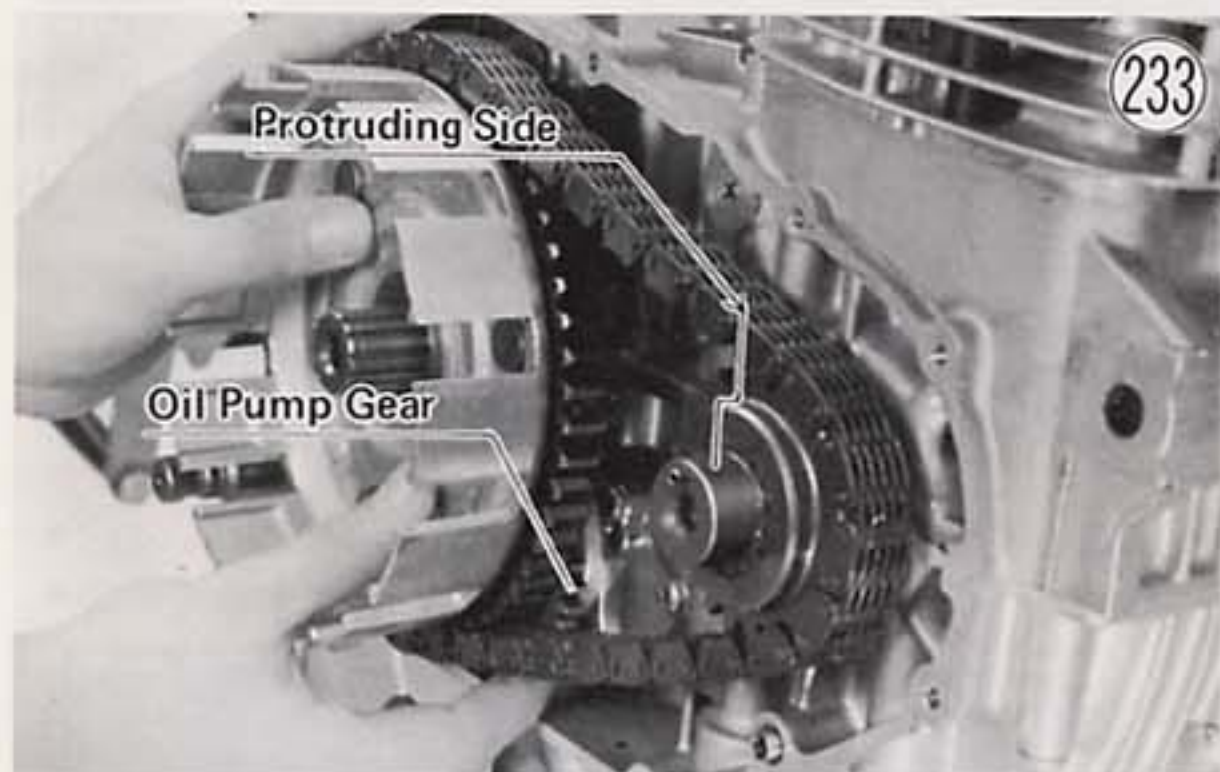
Tighten first the 8 mm bolts (4) in the sequence shown in Fig. 231, tightening first each bolt to 1.5 kg-m (11 ft-lbs) of torque and then 2.5~3.0 kg-m (18~22 ft-lbs). Next, tighten the 6 mm bolts all lightly and then with 0.8~1.0 kg-m (69~87 in-lbs).

- Turn the engine right side up, and then tighten the upper crankcase half bolts (6) with 0.8~1.0 kg-m (69~87 in-lbs) of torque. Include the carburetor tube guide with its bolt.
- Insert the shift shaft oil seal guide (special tool) in the crankcase shift shaft oil seal, run the external shift mechanism shaft through the crankcase, and place its arm on the shift drum pins.

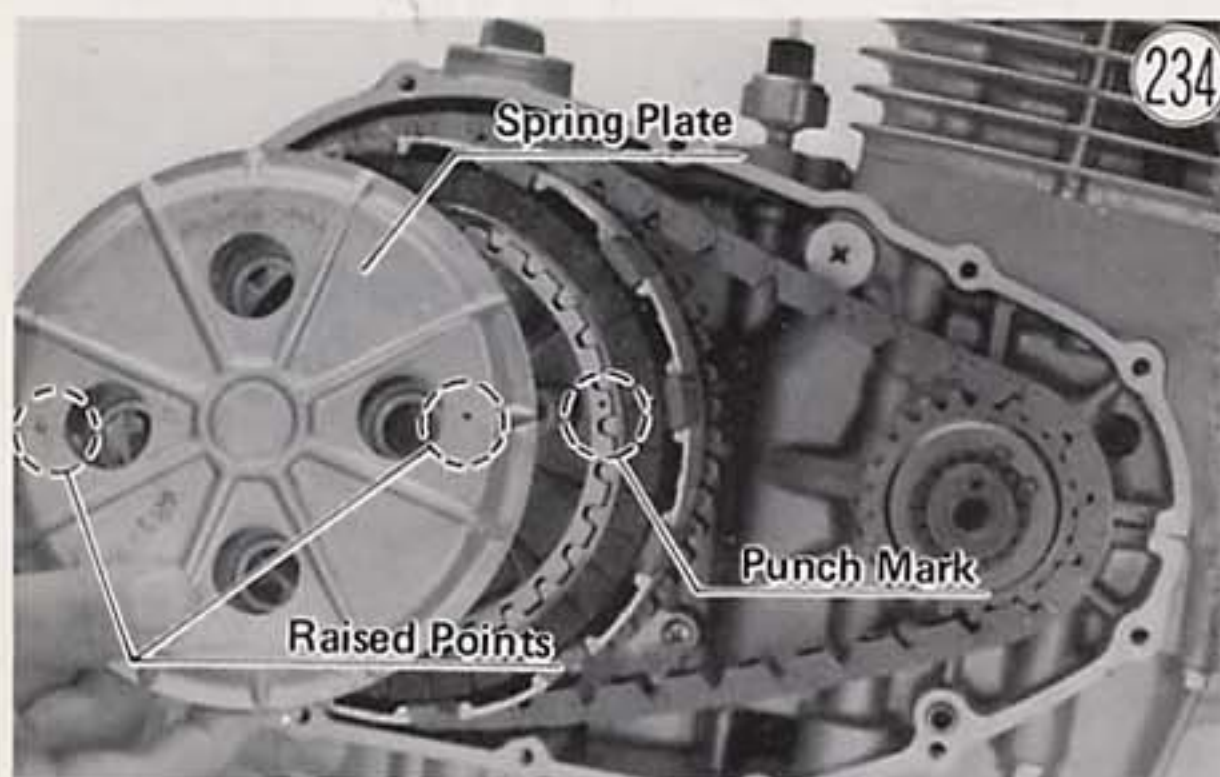
Crankcase Bolts Tightening Order



- Apply a non-permanent locking agent to the screws, replace the external shift mechanism stopper, and tighten the screws.
- Fit the primary chain on the clutch housing and primary sprocket, and fit the assembly into place. The protruding side of the primary sprocket faces out. Turn the oil pump gear by hand if necessary so that it meshes with the oil pump drive gear.



- Replace the primary sprocket circlip.
- Replace the thrust washer (thick) and the clutch hub.
- Replace the shim(s) and clutch hub circlip. The shim(s) should take up all the play between the hub and circlip. If not, add more shim(s).
- Replace the friction plates (6), steel rings (6) and steel plates (5). The sequence is friction plate, steel ring, steel plate, friction plate finishing with a steel ring.
- Insert the ball bearing and spring plate pusher.
- Replace the spring plate aligning the raised points on the plate with the punch marks on the hub.



- *• Replace the spring bolts (4), each with its washer and spring. Tighten them with 0.9 ~ 1.1 kg-m (78 ~ 113 in-lbs) of torque in a cross pattern by hand rather than use compressed air, which might make spring pressure uneven.

shaft oil seal has not slipped out of its proper position.

- Using a new engine cover gasket, fit the engine cover onto the crankcase. Use the kick shaft oil seal guide (special tool) to protect the kick shaft oil seal. Tighten the engine cover screws (12) firmly. Be sure to include the contact breaker lead clamp with its engine cover screw.



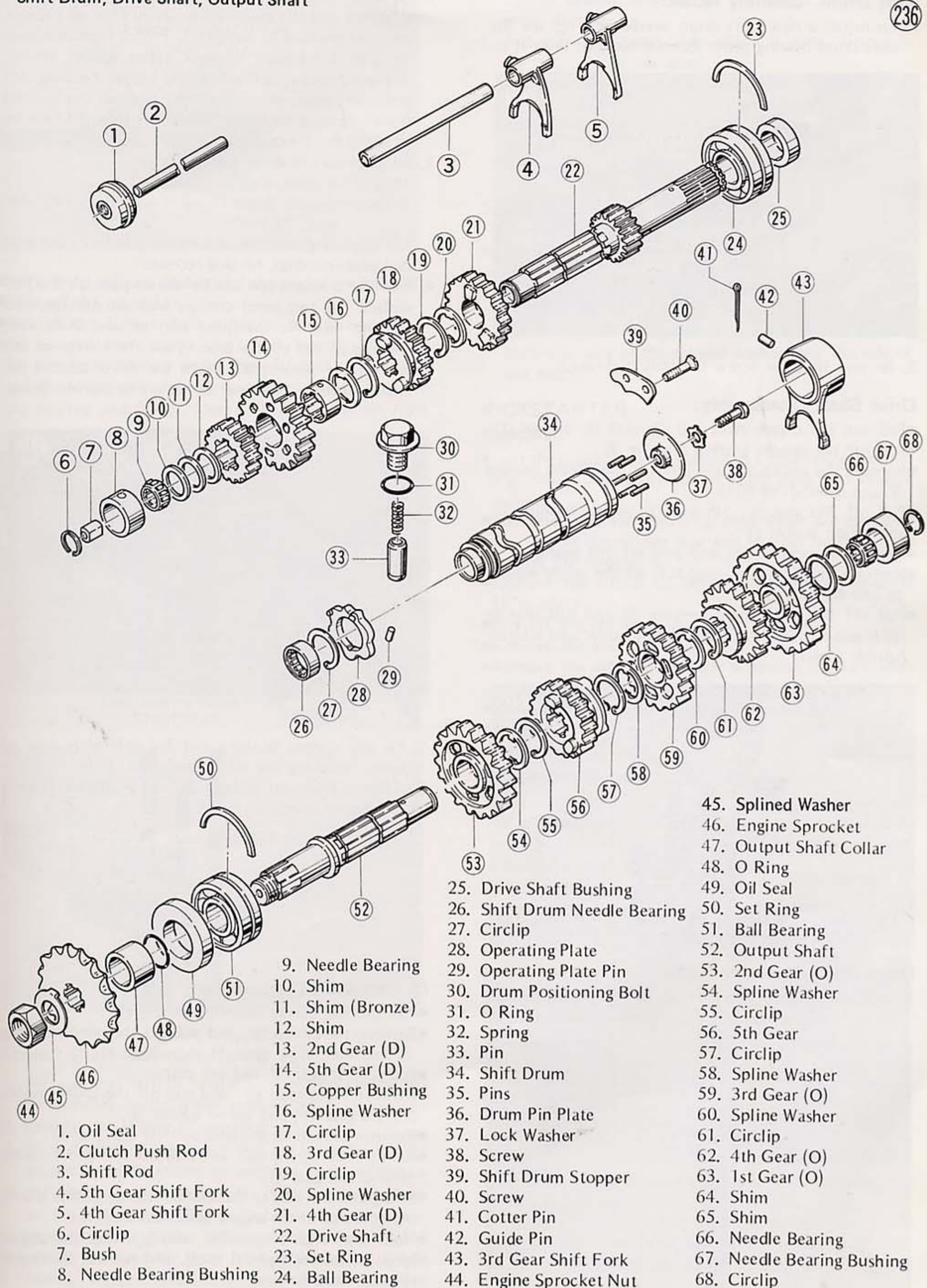
- Fit the timing advancer onto the crankshaft matching its notch with the pin on the end of the crankshaft, and tighten its bolt with 2.3 ~ 2.7 kg-m (16.5 ~ 19.5 ft-lbs) of torque.
- Replace the contact breaker plate, and tighten its screws (3) loosely.
- Replace the contact breaker cover and gasket.
- Place the kickstarter pedal into its original position, and tighten its bolt.
- Run the starter motor lead through its crankcase hole, daub a little oil on the starter motor O ring, and place the starter motor back into position (KZ400D).
- Apply a non-permanent locking agent to the starter motor retaining bolts, and then tighten the bolts. Each bolt has a flat washer (KZ400D).
- Fit the starter motor chain on its sprockets, and push the sprockets back into place (KZ400D).
- Apply a small amount of heat durable grease to the thrust washer, clean off any oil or dirt that may be on the crankshaft taper or rotor hub, and replace it to the rear of the rotor. Place the assembly back on the crankshaft.
- Apply a non-permanent locking agent to the rotor bolt threads, and then tighten the bolt to 6.5 ~ 7.0 kg-m (47 ~ 51 ft-lbs) of torque while holding the dynamo rotor steady with the dynamo rotor holder (special tool).
- Replace the dynamo cover, gasket, and screws (8).
- Run the oil pressure indicator switch lead through the starter motor lead hole, and connect it to the switch lead.
- Connect the neutral indicator switch lead to the switch.
- Fit first the starter motor lead and then the dynamo wiring into the wiring guide, and screw the guide back on the crankcase.
- Replace the starter motor cover and gasket.
- Install the engine (Pg. 25).
- Adjust the ignition timing (Pg. 12).

Shift Drum Disassembly:

- Drop out the operating plate pin (29).
- Remove the shift drum pin plate (36). The screw has a lock washer (37).
- Pull out the pins (35) (6).
- To remove the shift drum needle bearing (26), use a hook or some other tool to pull it out of the crankcase wall. Removal necessitates replacement for a new one.

Shift Drum, Drive Shaft, Output Shaft

236



Shift Drum Assembly Notes:

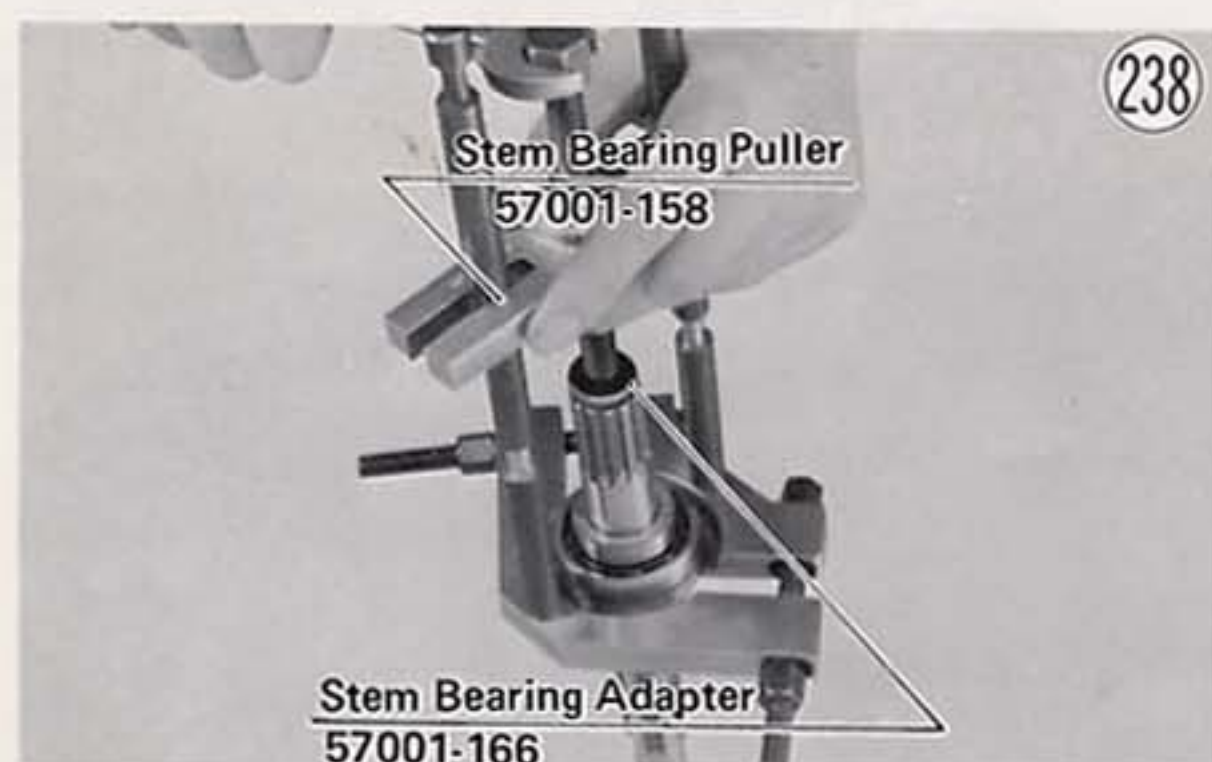
1. To install a new shift drum needle bearing, use the shift drum bearing driver (special tool) to drive it in.



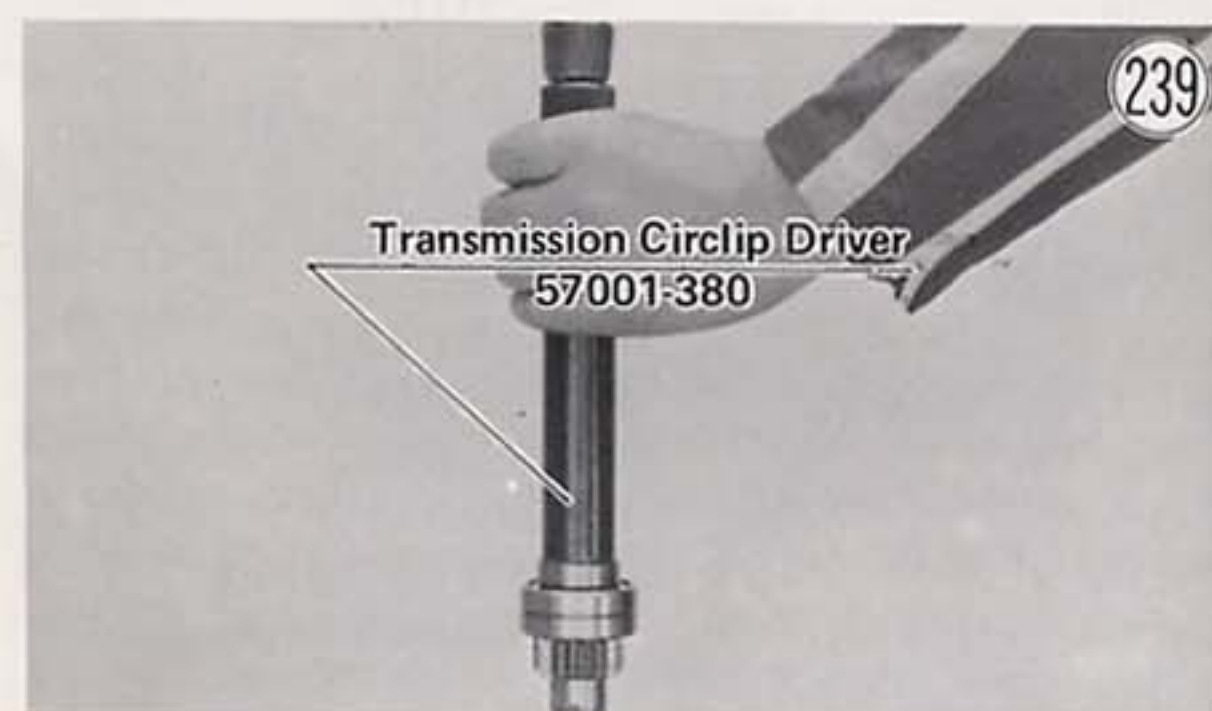
2. Be sure that the screw is firmly tightened.

Drive Shaft Disassembly:

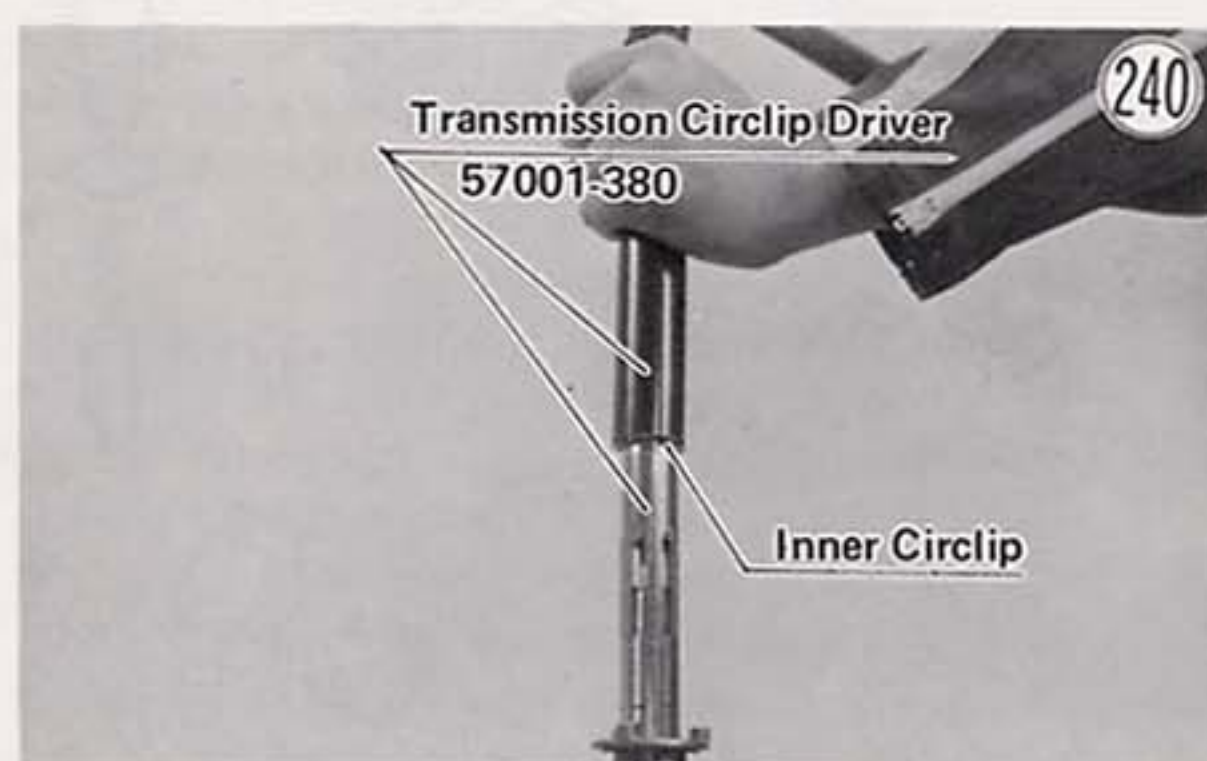
- Pull out the clutch push rod ② with its oil seal ①.
- Pull off the needle bearing bushing ⑧.
- Remove the circlip ⑥, and pull off the needle bearing ⑨ and shim(s) ⑩ ⑪ ⑫.
- Pull off 2nd gear ⑬, 5th gear ⑭, copper bushing ⑮, and spline washer ⑯.
- Remove the circlip ⑰, and pull off 3rd gear ⑱.
- Remove the circlip ⑲, and pull off the spline washer ⑳ and 4th gear ㉑.
- Pull off the drive shaft bushing ㉔ and ball bearing ㉕ together using the stem bearing puller and adapter (special tools).

**Drive Shaft Assembly Notes:**

1. Replace the drive shaft ball bearing and bushing using the transmission circlip driver (special tool).



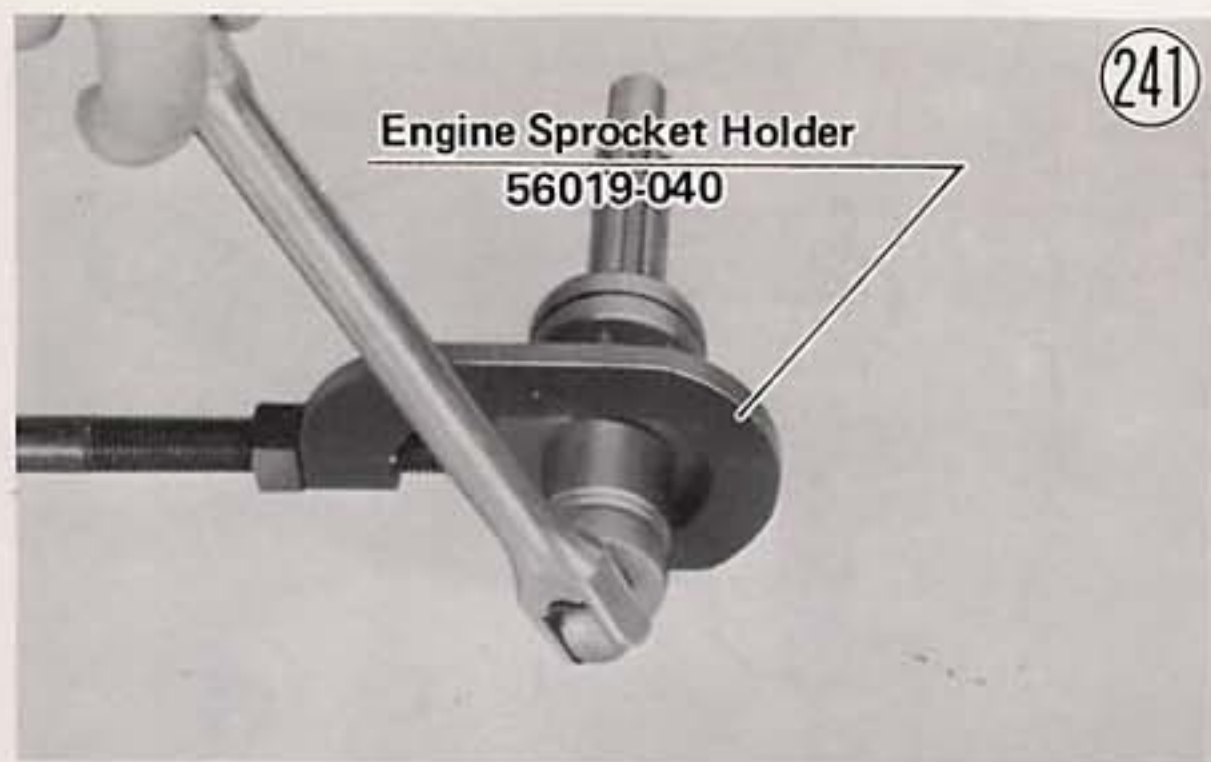
2. Be sure that all parts are put back in the correct sequence and all circlips are properly in place (replace any that are bent or damaged). Proper sequence from 1st gear is 1st gear, 4th gear, spline washer, circlip, 3rd gear, circlip, spline washer, copper bushing, 5th gear, 2nd gear, shim(s), needle bearing, circlip, and needle bearing bushing. The shim(s) should take up all the play. If not, add more shim(s).
3. 1st gear—part of drive shaft
4th gear—dogged, dogs face 3rd gear
3rd gear—double dogged, tooth side dogs face 4th gear, 22 teeth
5th gear—dog recesses, dog recess side faces 3rd gear
2nd gear—no dogs, no dog recesses
4. Use the transmission circlip driver (special tool) to replace the two inner circlips without damage. To use the tool, fit the inner part on the shaft with the end at the circlip groove, set the circlip on the end of the inner part, place the driver against the circlip, and use a hammer to tap the circlip into place.



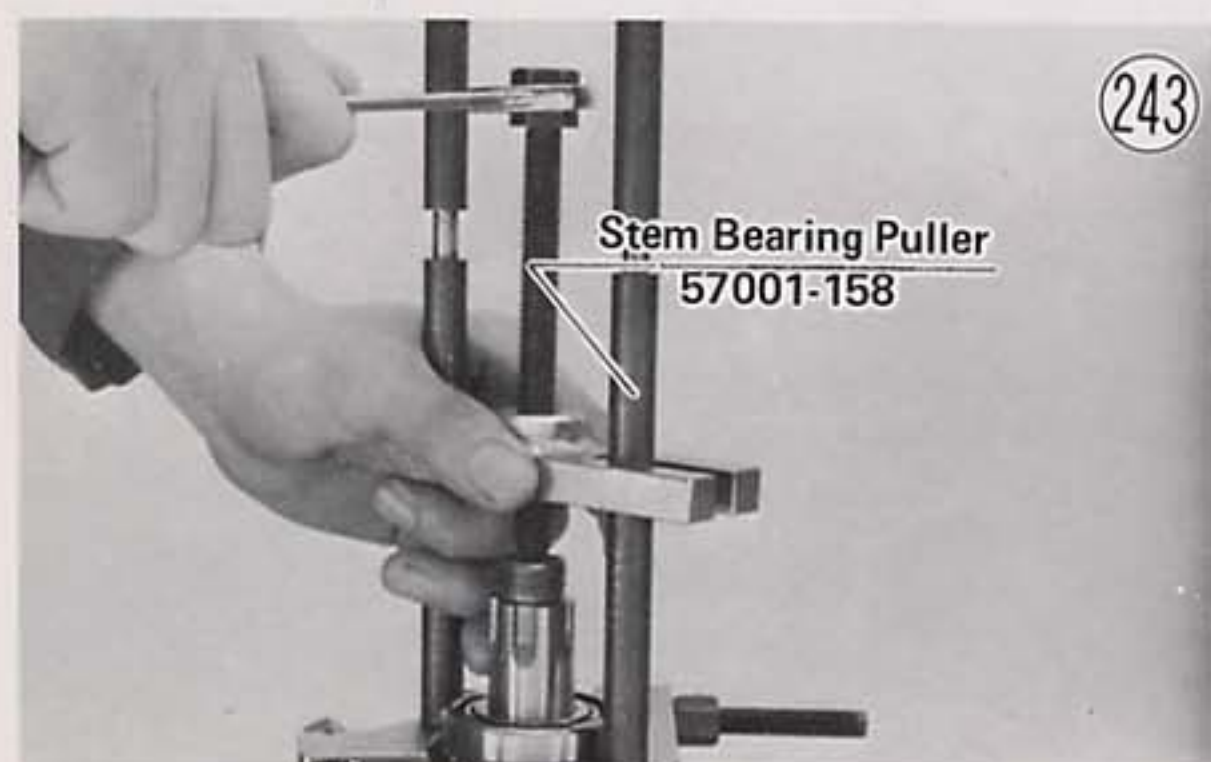
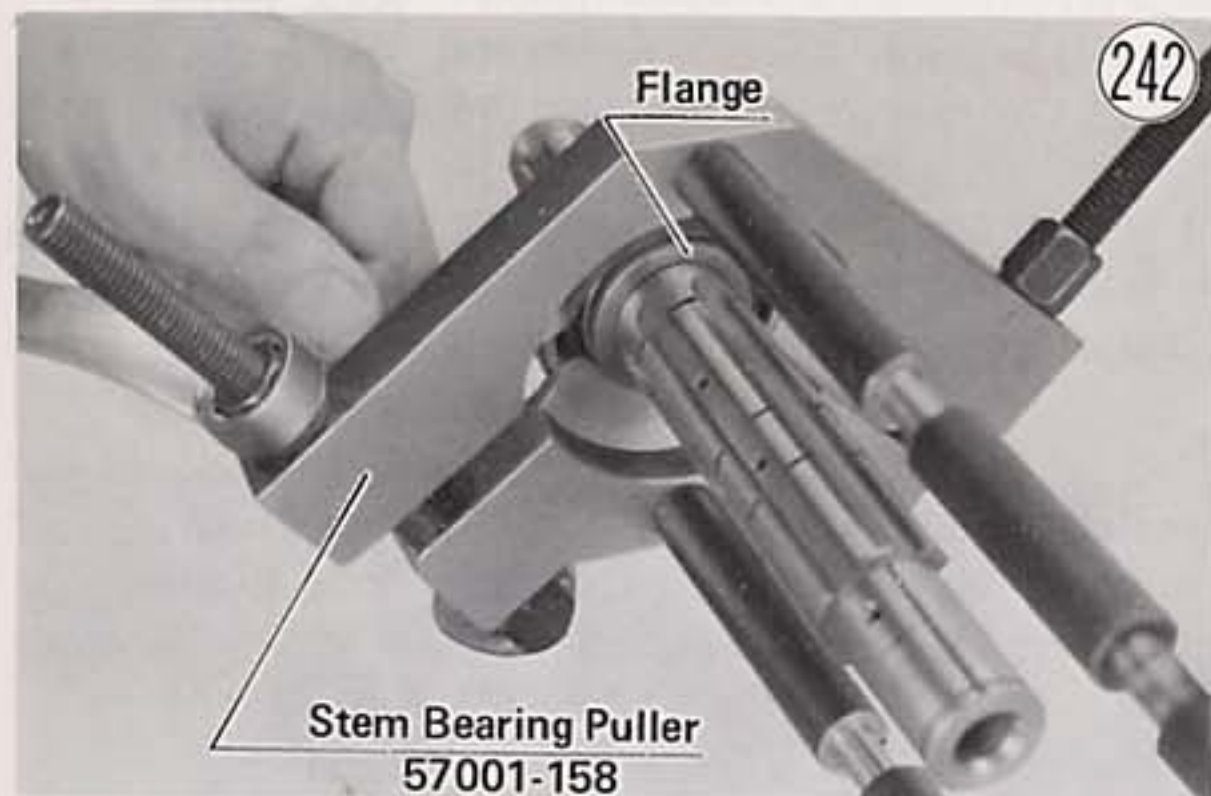
5. Fit the copper bushing and 3rd gear with their oil holes matching the oil holes in the shaft.
6. Apply a thin coat of heat durable grease to the push rod before insertion.

Output Shaft Disassembly:

- Pull off the needle bearing bushing ⑥⑦.
- Remove the circlip ⑥⑧, and pull off the needle bearing ⑥⑥ and shim(s) ⑥④ ⑥⑤.
- Pull off 1st gear ⑥③ and 4th gear ⑥②.
- Remove the circlip ⑥①, and pull off the spline washer ⑥⑩, 3rd gear ⑤⑨, and spline washer ⑤⑧.
- Remove the circlip ⑤⑦, and pull off 5th gear ⑤⑥.
- Remove the circlip ⑤⑤, and pull off the spline washer ⑤④ and 2nd gear ⑤③.
- Straighten the side of the splined washer ④⑤ that is bent over the side of the engine sprocket nut ④④.
- Hold the engine sprocket steady using the engine sprocket holder (special tool), and remove the engine sprocket nut.



- Pull off the splined washer and the engine sprocket ④⑥.
- Slide off the oil seal ④⑨.
- Pull off the output shaft collar ④⑦ and O ring ④⑧.
- To remove the output shaft ball bearing ⑤①, first fit the stem bearing puller (special tool) into place upside down, and tighten to create a space between the bearing and flange. Next, fit the puller on right side up, and pull off the bearing.



Output Shaft Assembly Notes:

1. Replace the output shaft ball bearing using the transmission circlip driver (special tool).
2. Replace the O ring if damaged.
3. Be sure that all parts are put back in the correct sequence and all circlips are properly in place (replace any that are bent or damaged). Proper sequence from the engine sprocket side is 2nd gear, spline washer, circlip, 5th gear, circlip, spline washer, 3rd gear, spline washer, circlip, 4th gear, 1st gear, shim(s), needle bearing, circlip, and needle bearing bushing. The

shim(s) should take up all the play. If not, add more shim(s).

4. 2nd gear—dog holes, side which is sunk further in faces 5th gear
5th gear—double dogged, tooth side dogs face 2nd gear
3rd gear—dog recesses, recess side faces 5th gear
4th gear—single dogged, dog side faces 1st gear
1st gear—dog holes, side which is sunk further in faces 4th gear
5. Use the transmission circlip driver (special tool) to replace the three inner circlips without damage.
6. Be sure that the ball bearing oil seal wire band side faces in.
7. Tighten the engine sprocket nut to 12 ~ 15 kg-m (87 ~ 108 ft-lbs) of torque, using the engine sprocket holder to keep the sprocket steady. Be sure to bend back one side of the splined washer over the side of the nut.

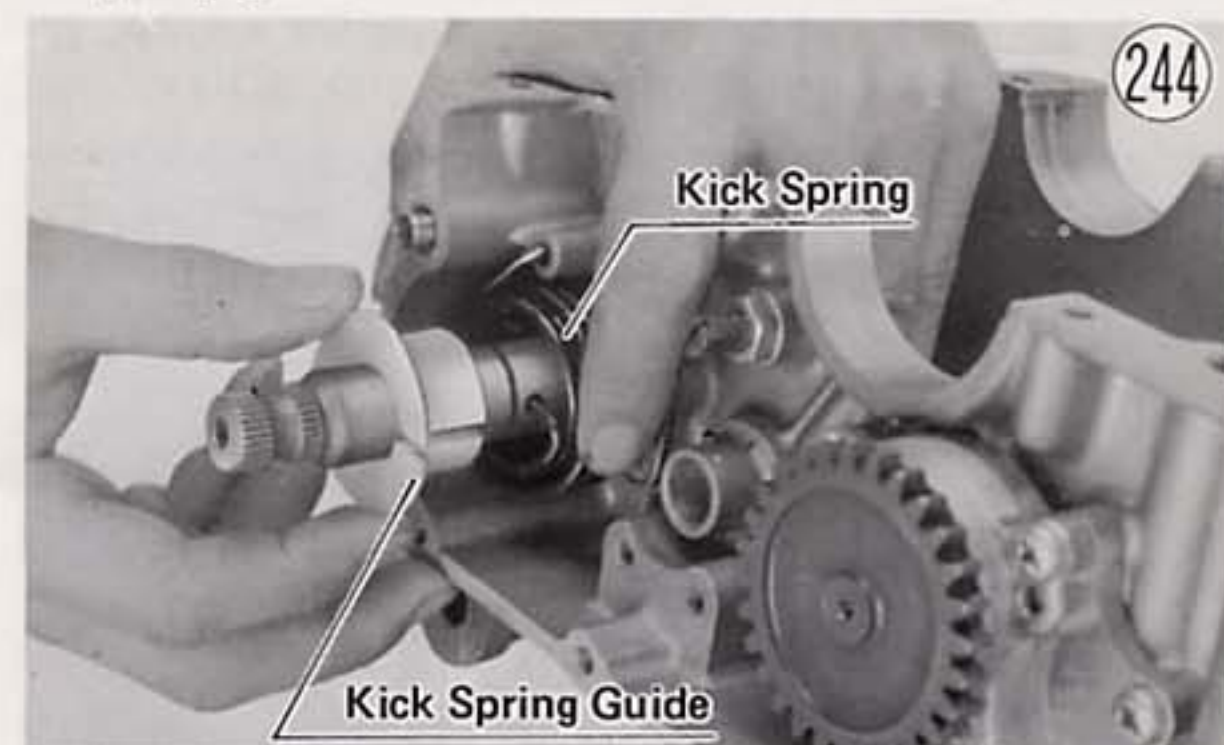
KICKSTARTER

Removal:

- Split the crankcase as explained in transmission removal (Pg. 56). The transmission itself does not require removal.
- Straighten out the washer ② ends which are bent over the side of the ratchet gear arm stopper bolts ①, and remove the stopper ③.
- Remove the circlip ②⑤ which holds the spring guide ①④ in place.
- Pull off the spring guide.
- Remove the kick spring ①③.
- Remove the circlip ①② which is against the kick shaft collar ①①.
- Remove the kick shaft stopper ①⑦ and collar.
- Remove the rest of the kickstarter from the lower crankcase half.

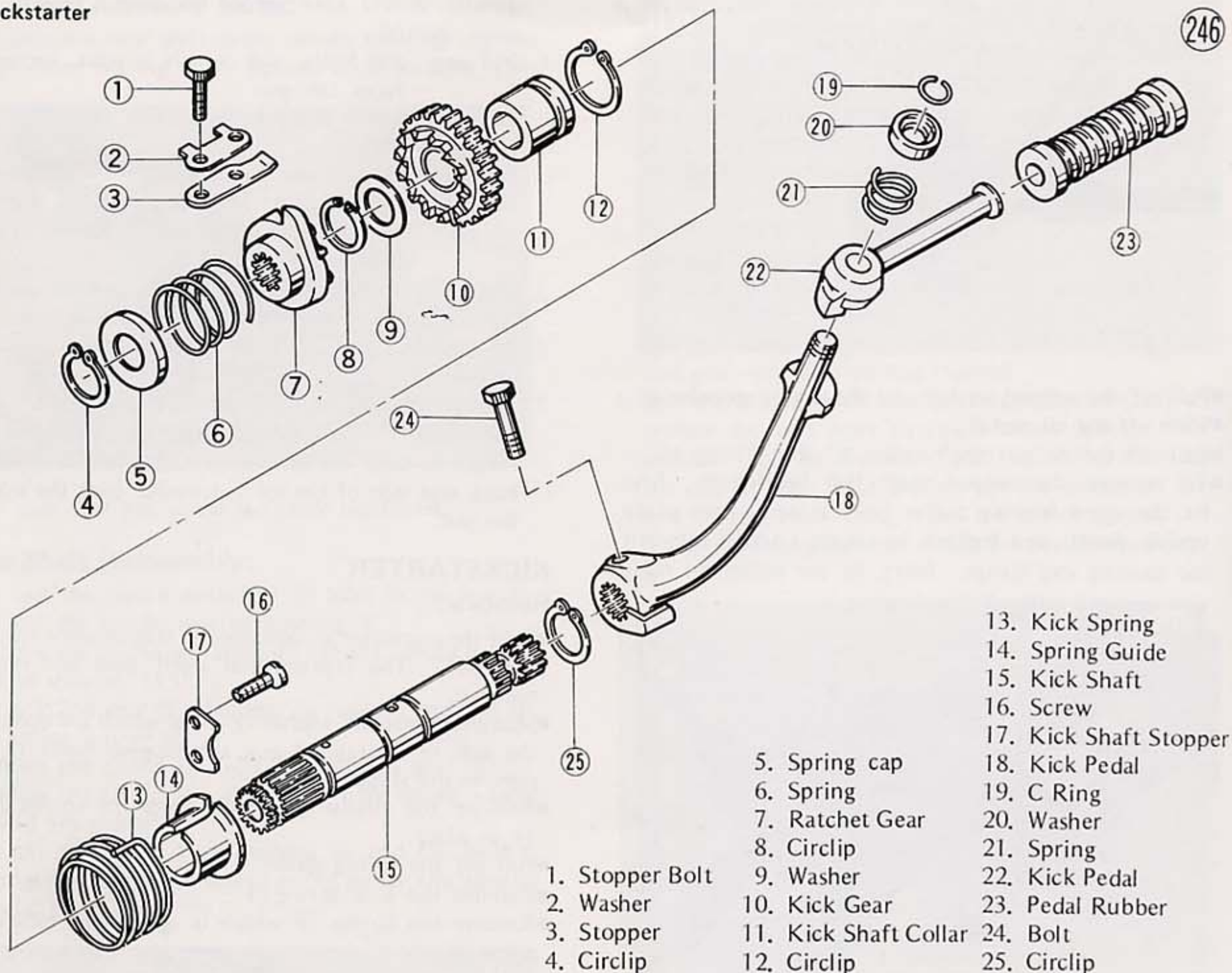
Installation Notes:

1. To replace the kick spring, turn the shaft all the way clockwise, insert one end of the spring into the crankcase, insert the other end into the kick shaft, and, while holding the spring in place, insert the kick spring guide.



2. Be sure to bend back the ends of the washer over the stopper bolts.
3. Apply a thin coat of heat durable grease to the inside of the collar before replacement.
4. Punch the screws ①⑥ after installing the kick shaft stopper.

Kickstarter

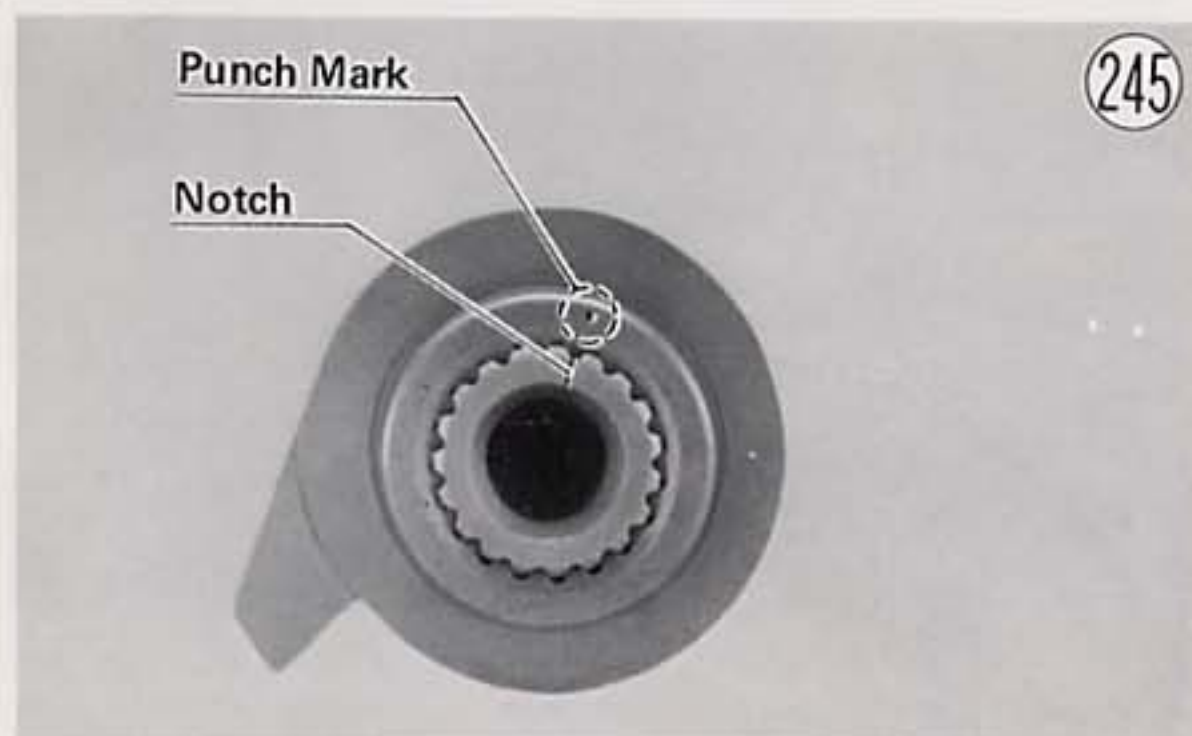


Disassembly:

- Pull off the kick gear ⑩ and thrust washer ⑨.
- Remove the circlip ④ on the spring side, and take off the spring cap ⑤, and spring ⑥.
- Pull off the kick ratchet gear ⑦.
- Remove the remaining circlip ⑧.

Assembly Note:

- For replacing the ratchet gear, align the ratchet gear punch mark with the notch on the kick shaft.



OIL PRESSURE RELIEF VALVE

Removal:

- Split the crankcase as explained in transmission removal

(Pg. 56). The transmission itself does not require removal.

- Unscrew the valve from the lower crankcase half.

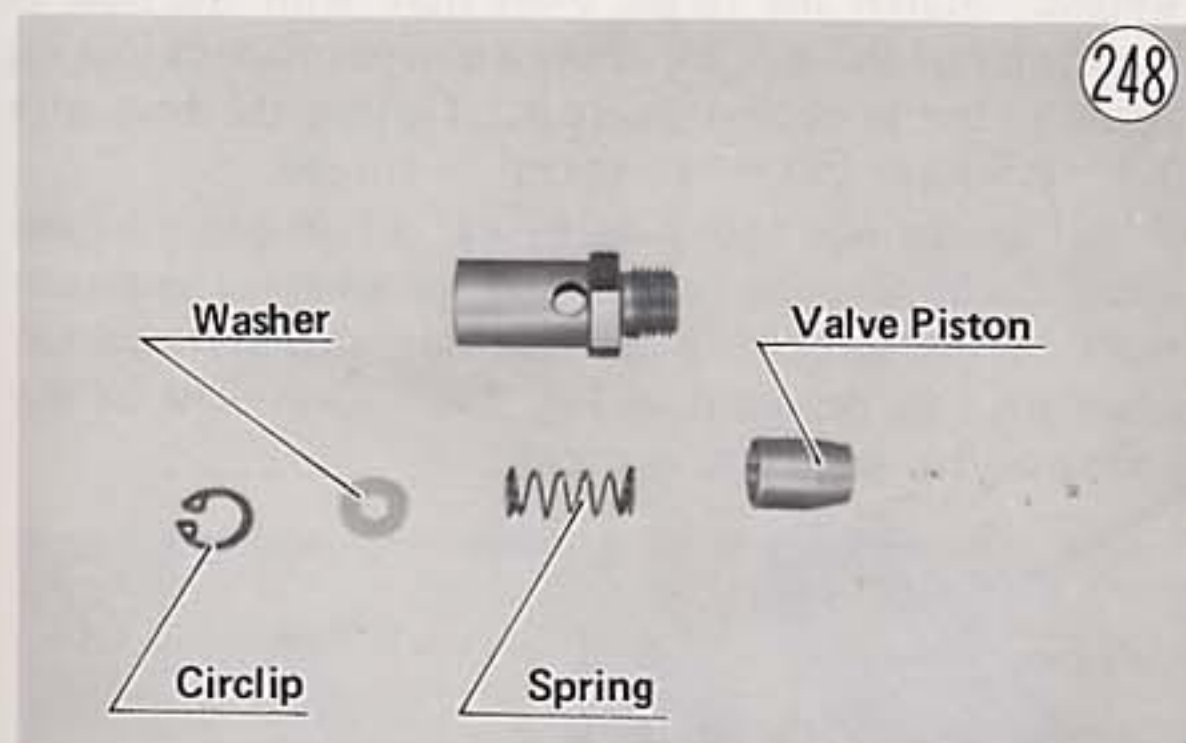


Installation Note:

- Use a non-permanent locking agent on the valve threads.

*NOTE: From engine number K4E095256 on for KZ400D, and from K4SE027556 on for KZ400S, a ball type relief valve is used in place of the piston type relief valve. Do not disassemble the ball type relief valve for inspection. Replacement parts are not available.

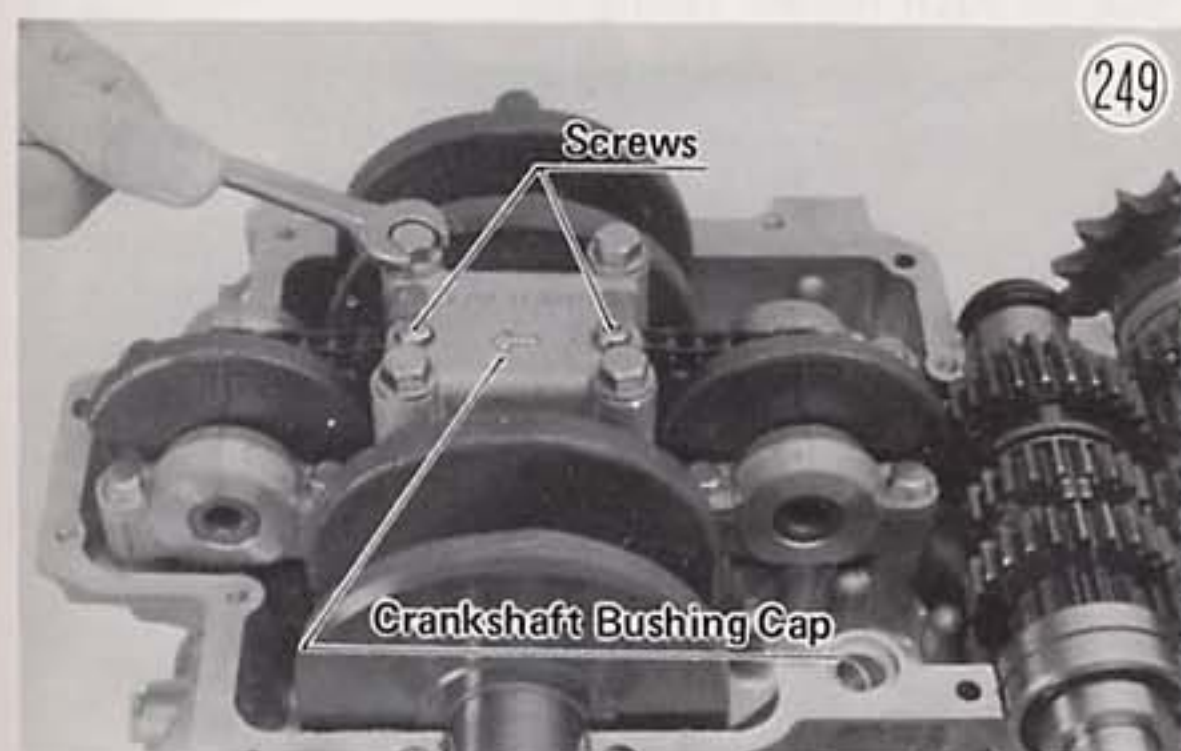
- Remove the circlip, and take out the washer, spring, and valve piston.



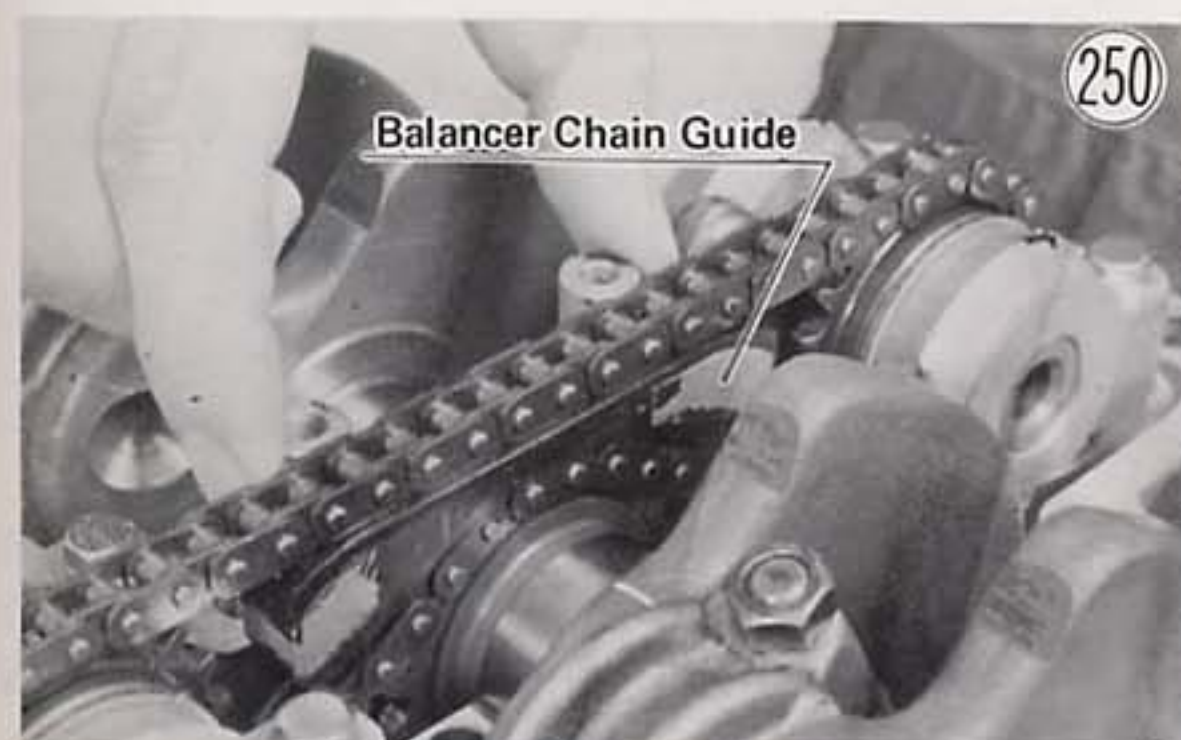
BALANCER MECHANISM

Removal:

- Split the crankcase as explained in transmission removal (Pg. 56). The transmission itself does not require removal if only the balancer mechanism is to be removed.
- Remove the bolts (4) and screws (2), and lift off the crankshaft bushing cap. Tap lightly on the sides of the cap with a plastic hammer if necessary to facilitate removal.



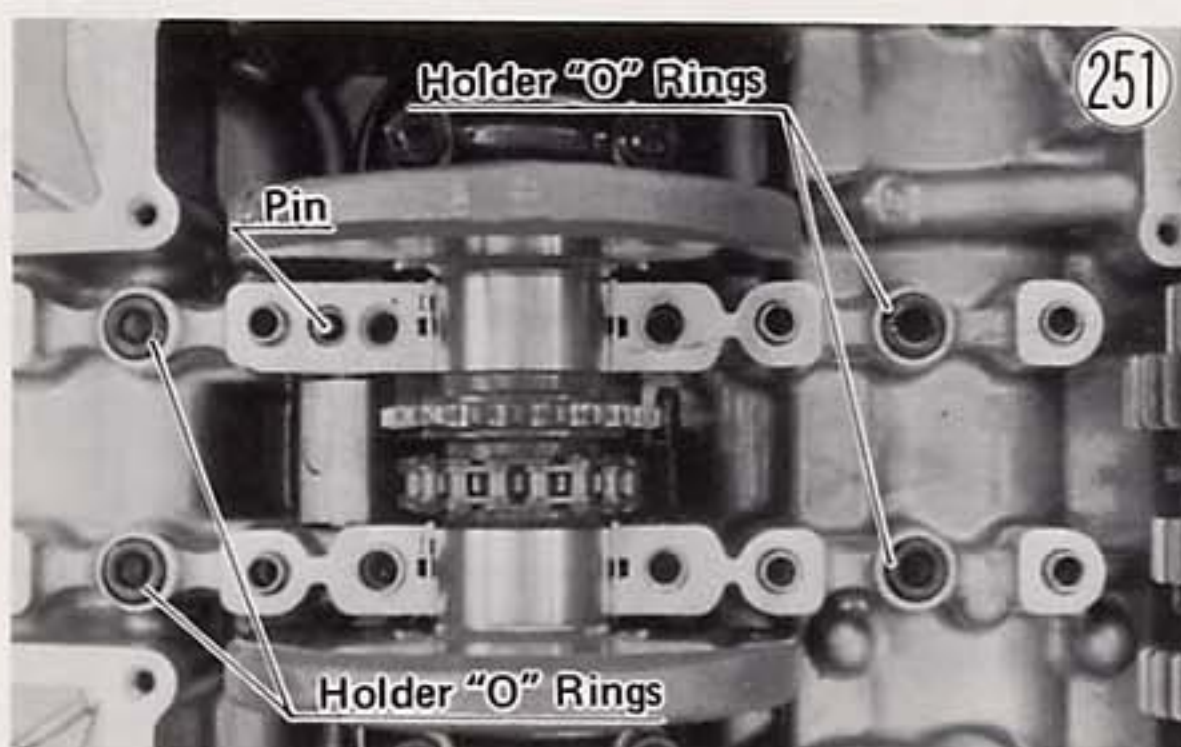
- Remove the balancer chain guide from the chain.



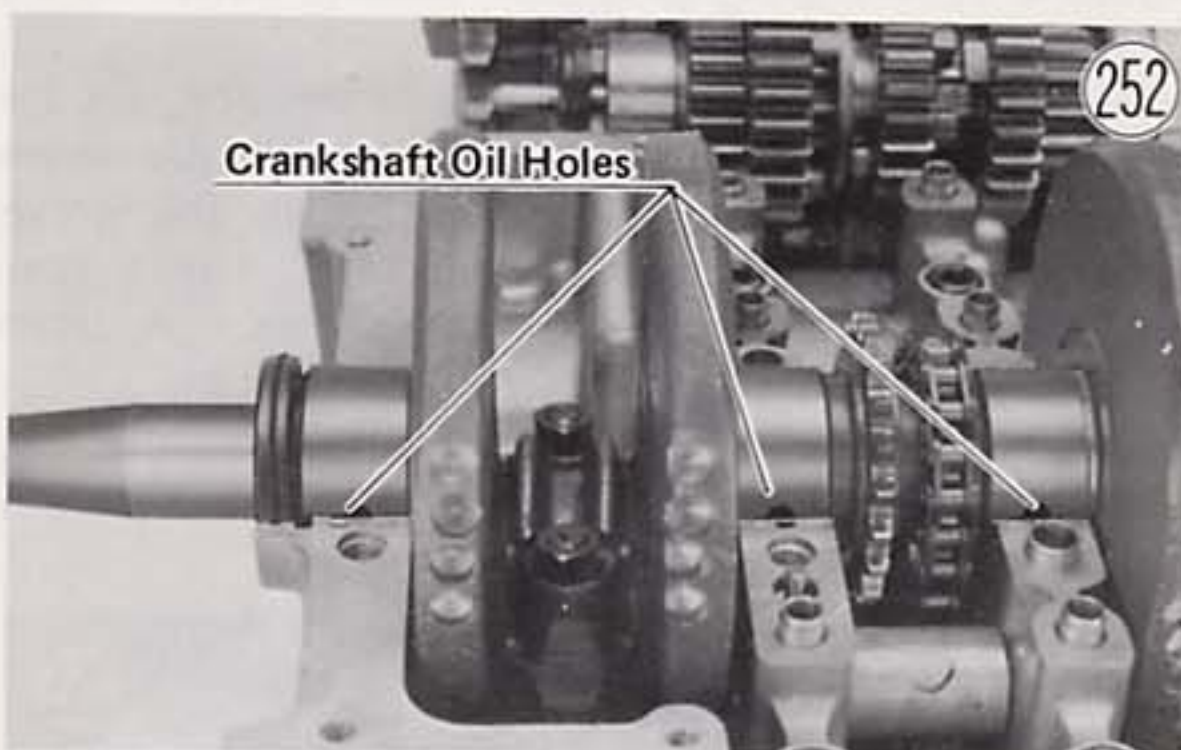
- Remove the balancer mechanism holder bolts (8).
- Tap lightly on the sides of each holder, and then lift off the entire balancer mechanism.

Installation:

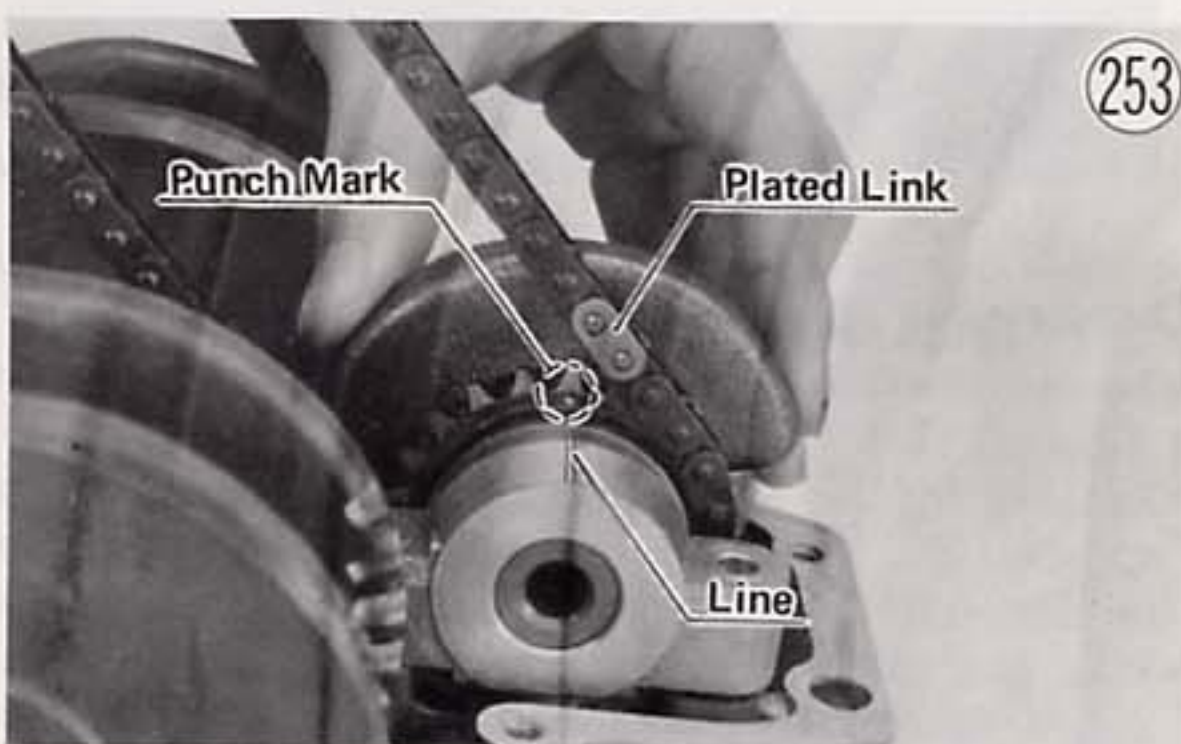
- Check to see that the holder O rings (4) and the pin are all in place.



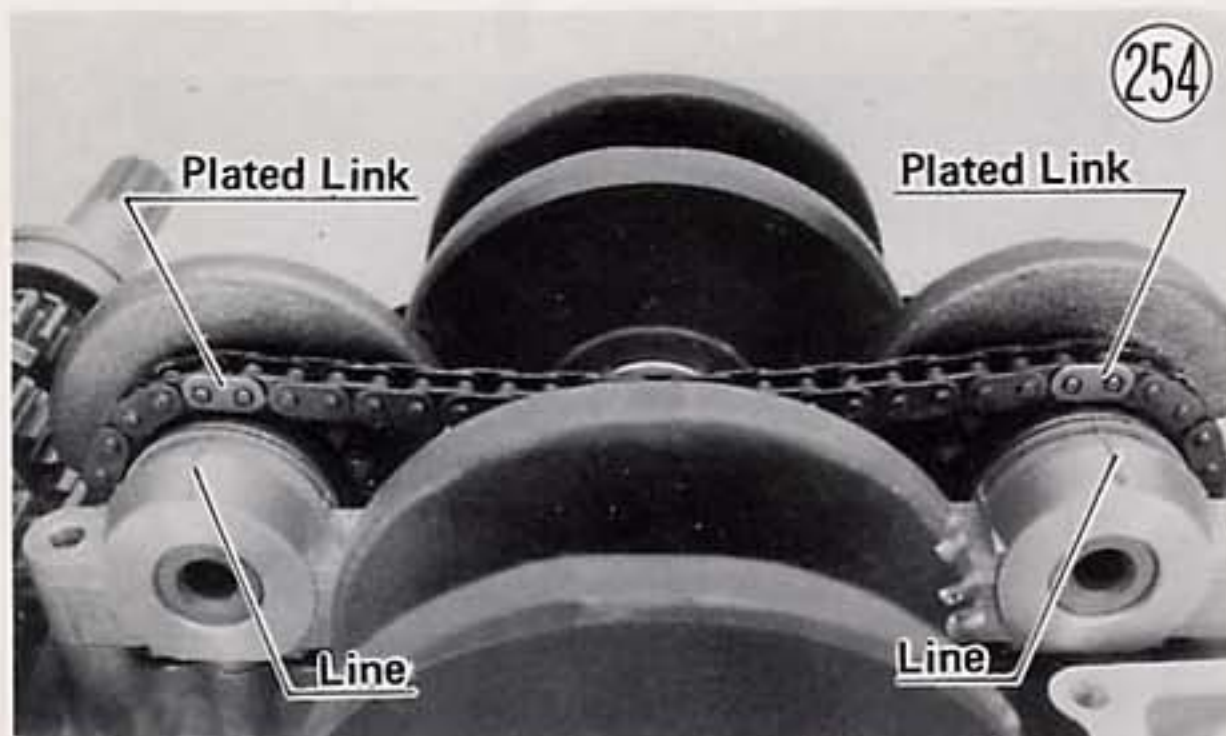
- Turn the crankshaft so that the crankshaft oil holes are even with the upper crankcase half surface with the flywheels positioned up as shown in Fig. 252. If necessary, temporarily replace the timing advancer and use a 17 mm wrench to turn the crankshaft.



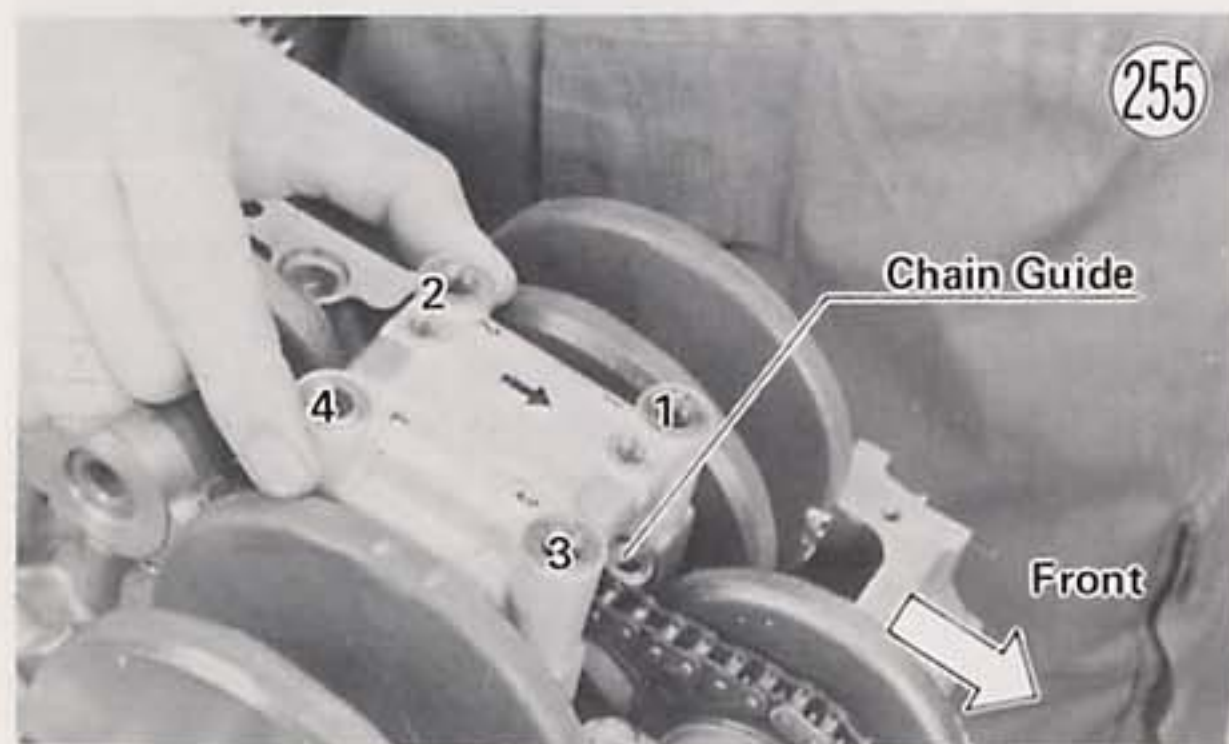
- Check to see that the mechanism is correctly assembled.
- Holding the chain taut, pick up the balancer mechanism, place one of the units into position, and match the sprocket punch mark with the line on the holder. Keeping the chain in its proper position on the sprockets, let the chain fall in place on the crankshaft balancer sprocket, and fit the other unit into place.



- Check to see that the chrome plated link aligns with the holder line for each balancer unit, and that the balancer weights face up, not cocked to either side.



- If the weights are cocked to one side, alter the position of the chain on the crankshaft balancer sprocket until the weights are positioned properly.
- Whenever the balancer unit are disassembled, replace the balancer holder bolts with a new one, and tighten the bolts for each unit with 2.3 ~ 2.7 (16.5 ~ 19.5 ft-lbs) of torque. Make sure that each holder fits all the way down on its knock pins.
- Daub a little engine oil on the bushing halves on the crankshaft bushing cap.
- Place the balancer chain guide into position, set the crankshaft bushing cap into place with the arrow pointing to the front, and then tighten the screws (2) to secure the guide to the cap. Use a non-permanent locking agent on the screws. A chain guide and two bushing halves go with the cap.
- Tighten the bolts (4) in the sequence shown in Fig. 255 first to 1.5 kg-m (11 ft-lbs) of torque and then to 2.5 ~ 3.0 kg-m (18 ~ 22 ft-lbs).



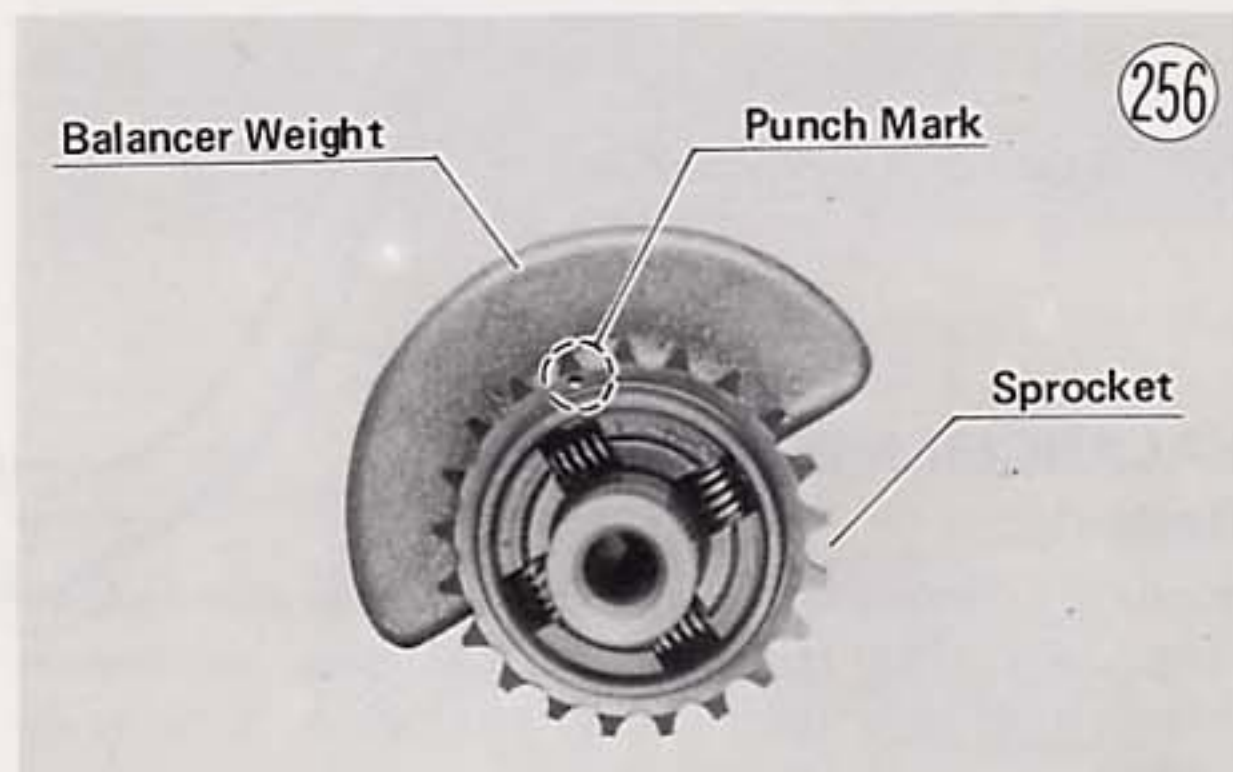
- Fit the crankcase as explained transmission installation (Pg. 58).

Disassembly (per balancer unit):

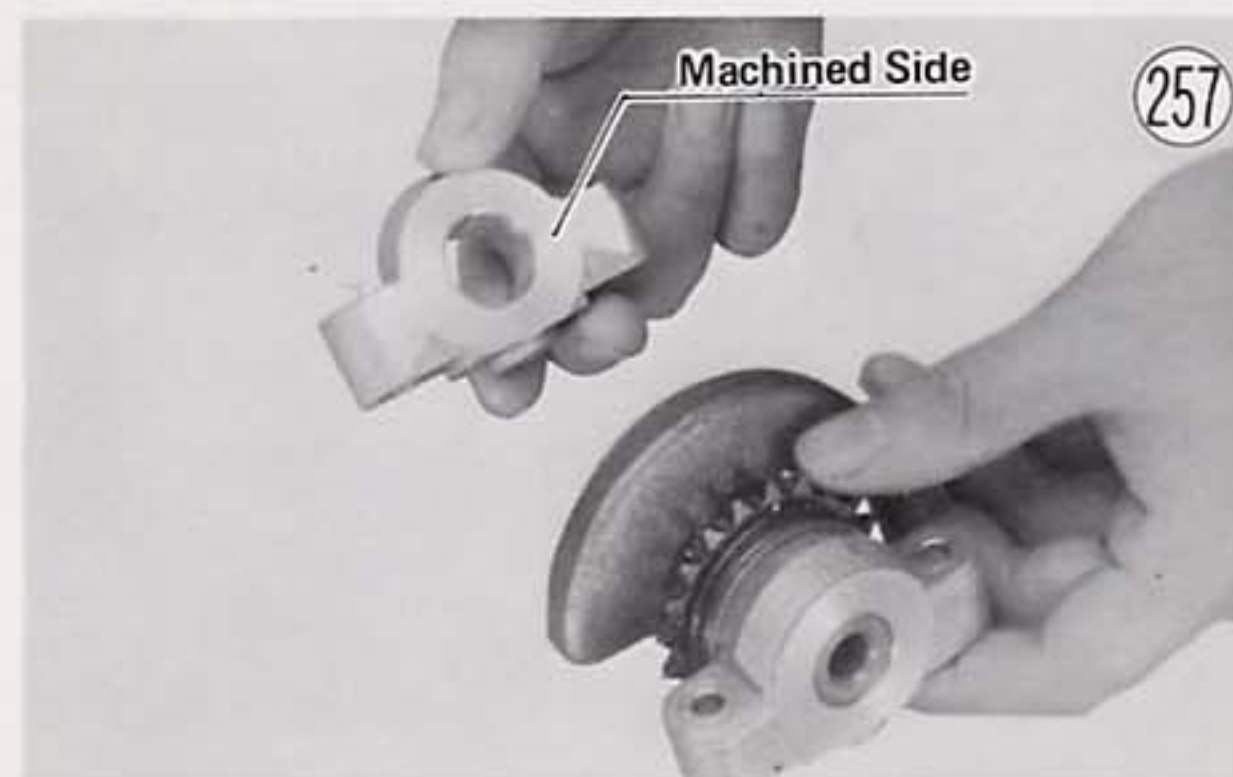
- Remove the chain (12).
- Slide off each holder (2) (11) and the shims (3) (4).
- Tapping lightly with a plastic hammer, remove the sprocket (5). The springs (8) and pins (7) (4 ea) may be removed.
- Take out the balancer weight bolt (9), and slide the weight (10) off the shaft (6).

Assembly (per balancer unit):

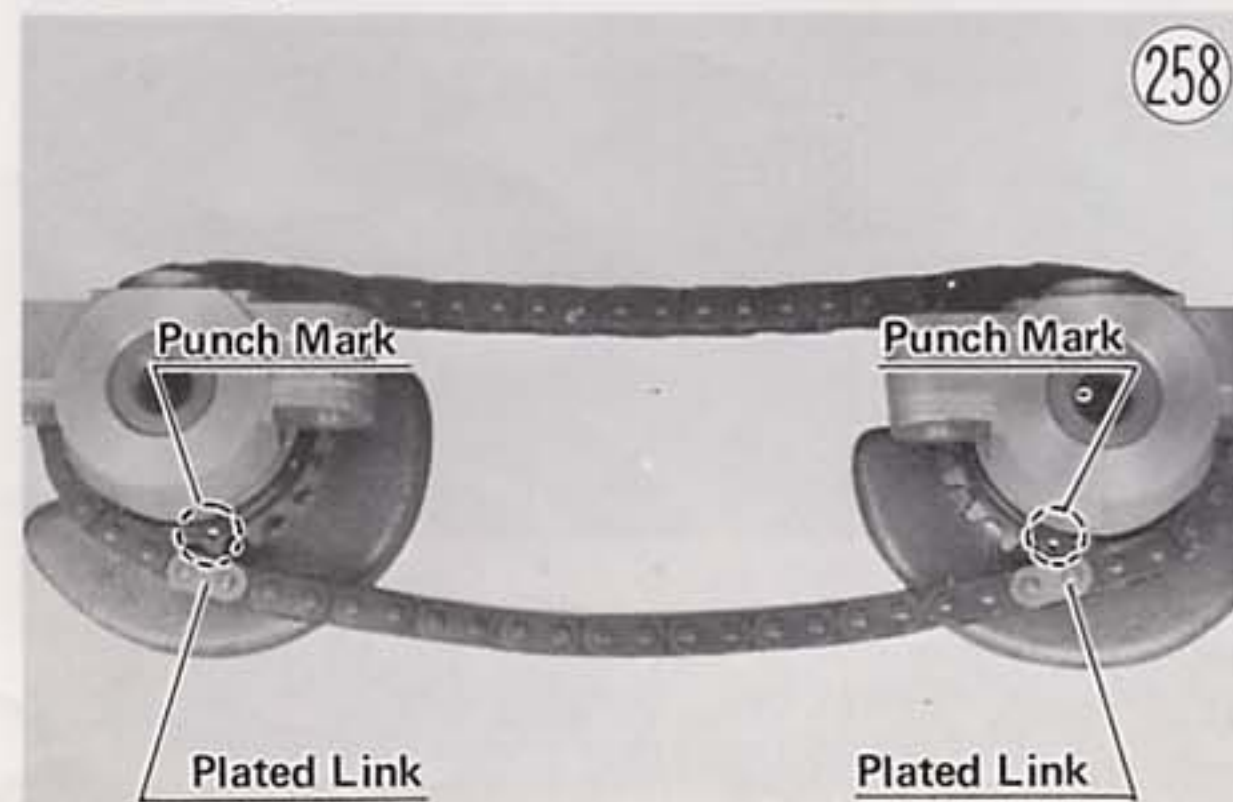
- Apply oil to the shaft, and insert it into the balancer weight. Match the larger shaft hole with the hole in the center of the weight, apply a non-permanent locking agent to the bolt, and insert it. Tighten the bolt with 1.1 ~ 1.3 kg-m (95 ~ 113 in-lbs) of torque.
- With the springs and pins (4 ea) all in place in the inner circumference, replace the sprocket. The punch mark on the sprocket must face out, and the sprocket positioned as depicted in Fig. 256. Only one of the four possible positions is correct.



- Replace the shims on the sprocket side. The smaller diameter shim goes on first.
- Replace the holders onto the shaft with the machined side of each holder facing in.

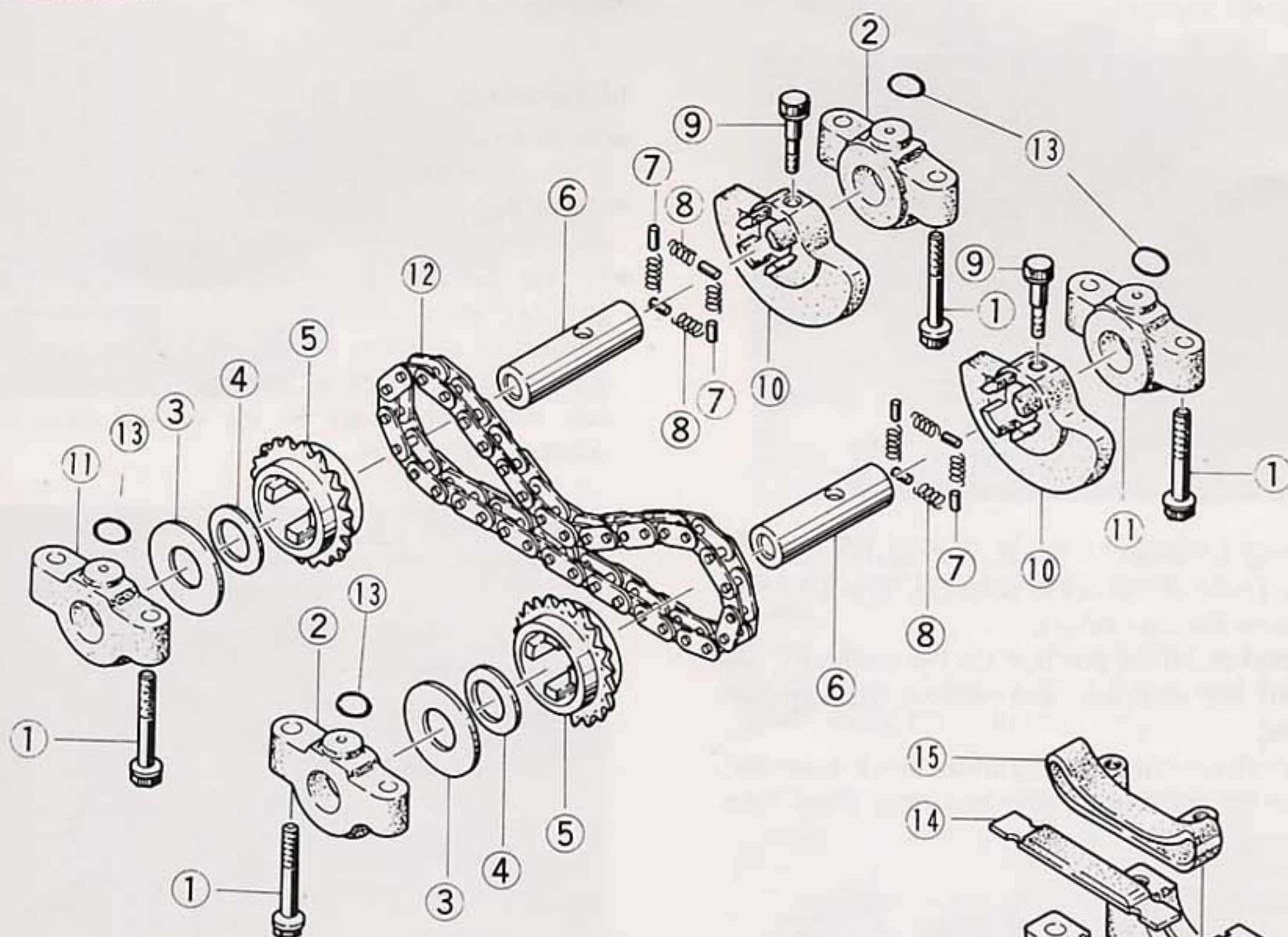


- Replace the chain on the sprockets. For each sprocket, the chrome plated link must fit on the sprocket tooth with the punch mark. Also, the arrows on the holders must point so that they will point away from the crankshaft.

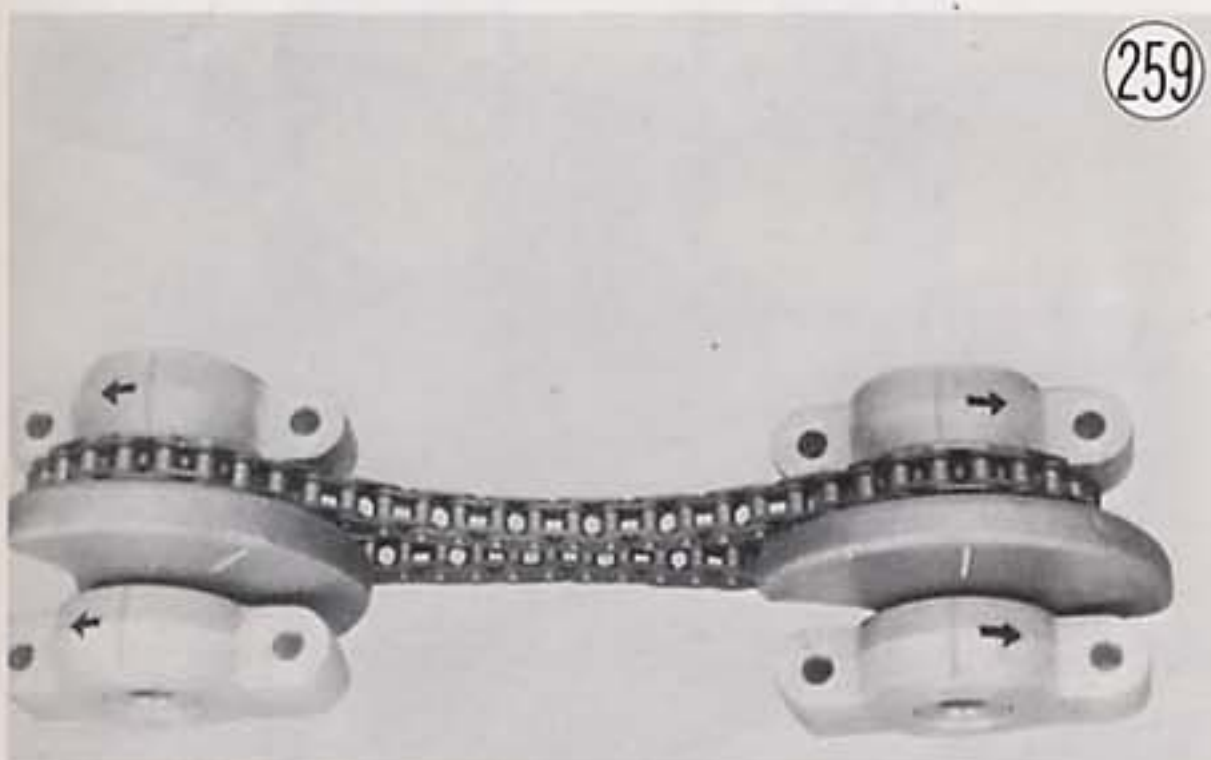
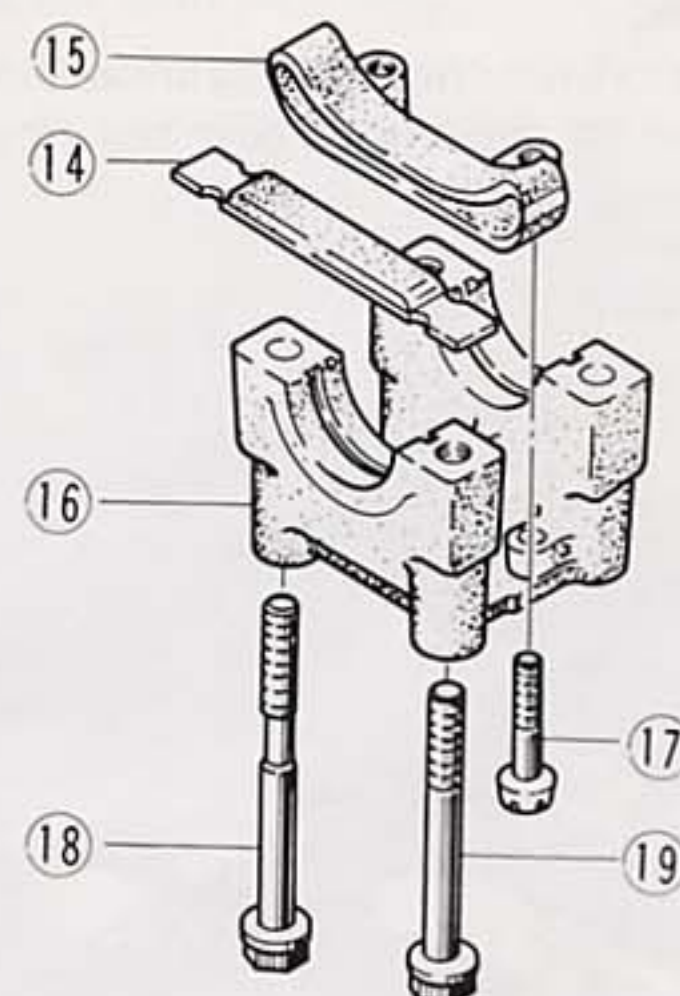


Balancer Mechanism

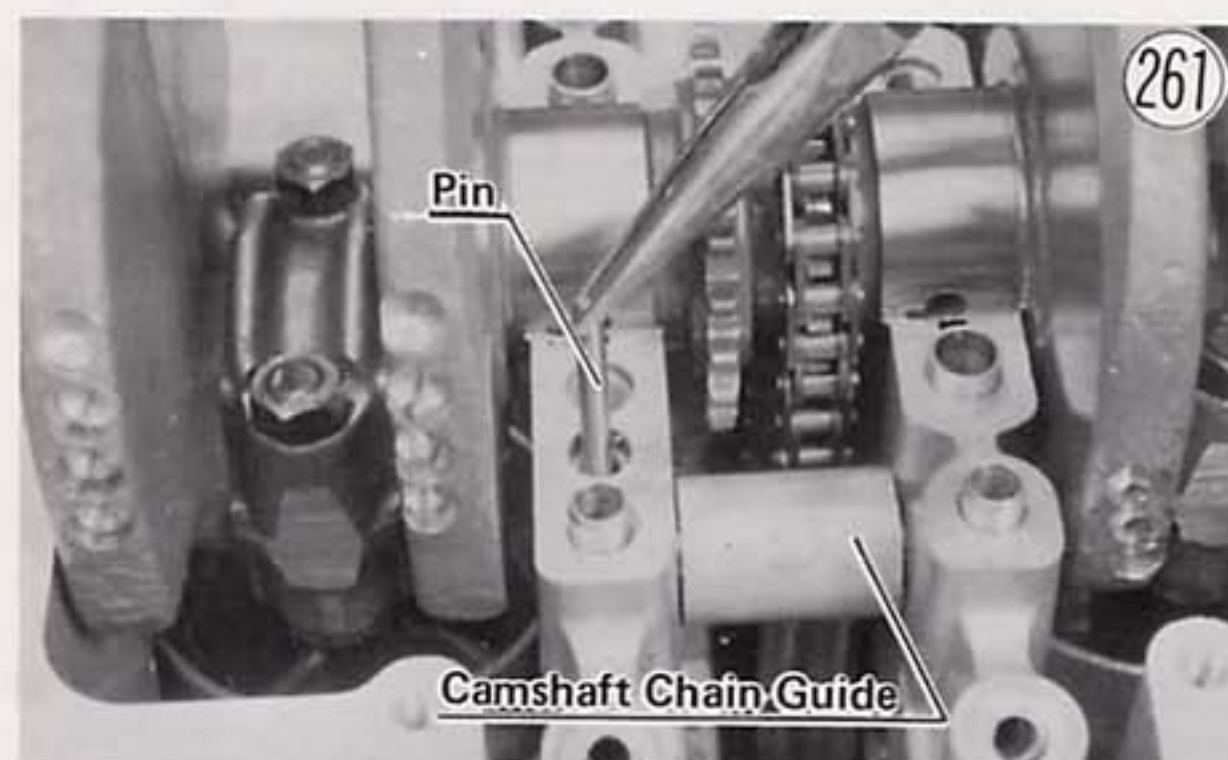
(260)



- | | |
|-------------------------|----------------------------|
| 1. Bolt | 11. Holder |
| 2. Holder | 12. Balancer Chain |
| 3. Shim | 13. O Ring |
| 4. Shim | 14. Chain Guide |
| 5. Sprocket | 15. Chain Guide |
| 6. Balancer Shaft | 16. Crankshaft Bearing Cap |
| 7. Pin | 17. Screw |
| 8. Spring | 18. Bolt |
| 9. Balancer Weight Bolt | 19. Bolt |
| 10. Balancer Weight | |



(259)



(261)

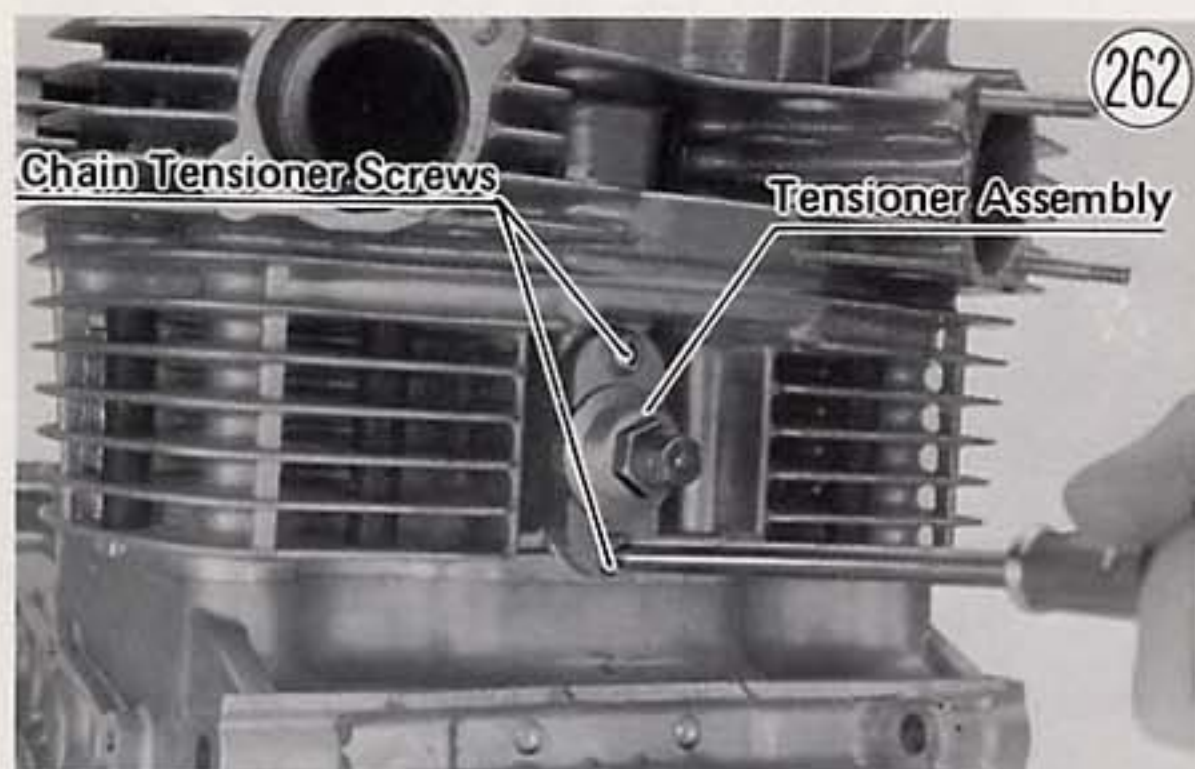
CRANKSHAFT, CAMSHAFT CHAIN

Removal:

- Remove the transmission (Pg. 56).
- Remove the balancer mechanism (Pg. 65).
- Remove any balancer mechanism holder O rings which are loose.
- Remove the pin which holds the camshaft chain guide pin in place.

- Replace the crankshaft bushing cap with its arrow pointing to the front, and tighten its bolts (4).
- Remove the drive shaft set ring and output shaft set ring.
- Turn the engine right side up.
- Remove the spark plugs.
- Remove the stud nuts (8), and pull off the cylinder head cover. The cover has four O rings.
- Remove the chain tensioner cap and O ring.

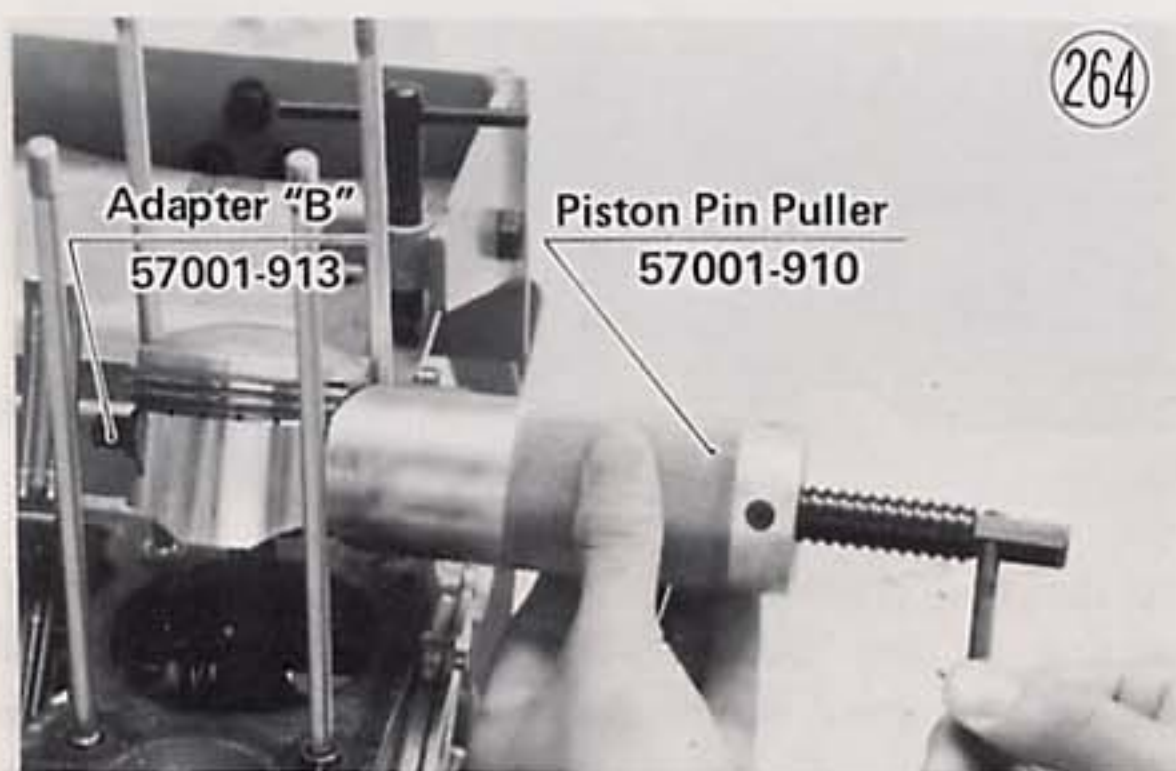
- Remove the chain tensioner screws, and pull out the entire tensioner assembly.



- Fit the timing advancer in place, and tighten its bolt.
- Remove the camshaft sprocket bolts (2). Use a 17 mm wrench to turn the crankshaft.
- Pull the sprocket off its position on the camshaft, slip the chain off the sprocket, and remove the camshaft and sprocket.
- Lift off the cylinder head and cylinder block assembly.
- Remove one of the piston pin snap rings from each piston.



- Remove each piston by pushing the piston pin out the side the snap ring was removed. Use the piston pin puller and adapter "B" (special tools) if necessary.

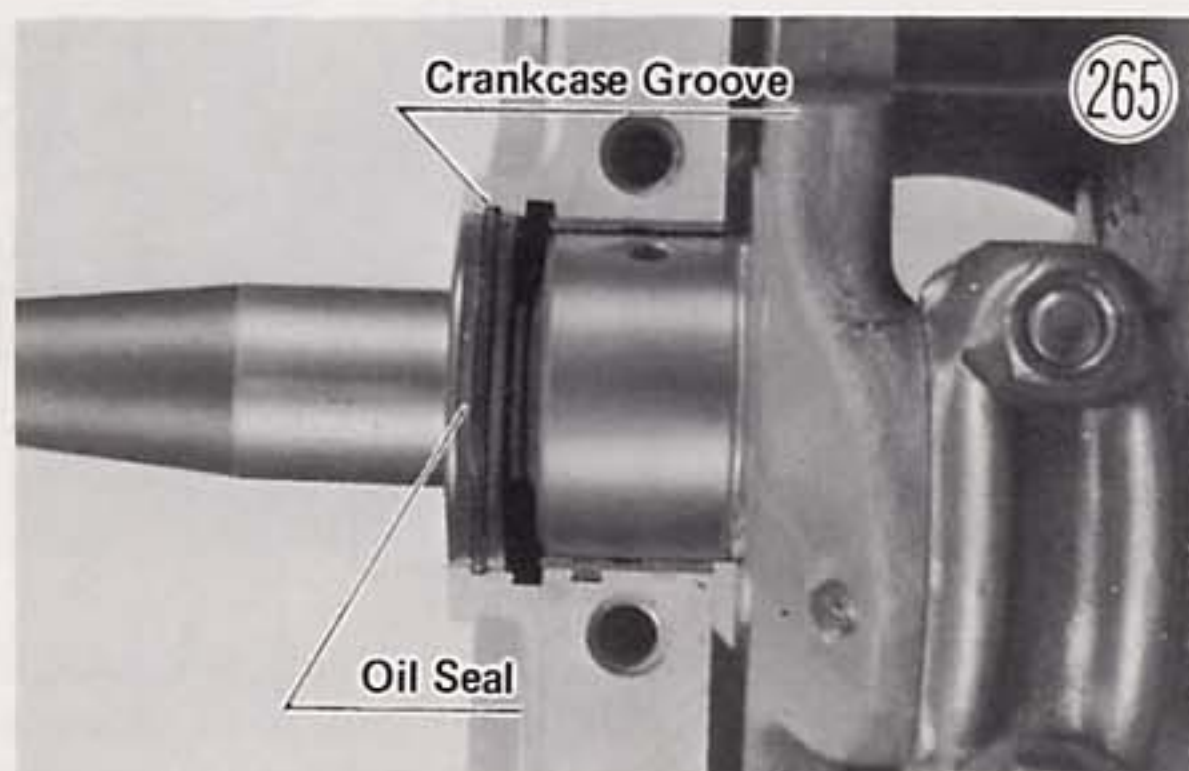


- Remove the timing advancer.
- Turn the upper crankcase half upside down.
- Remove the bolts (4), and take off the crankshaft bushing cap.

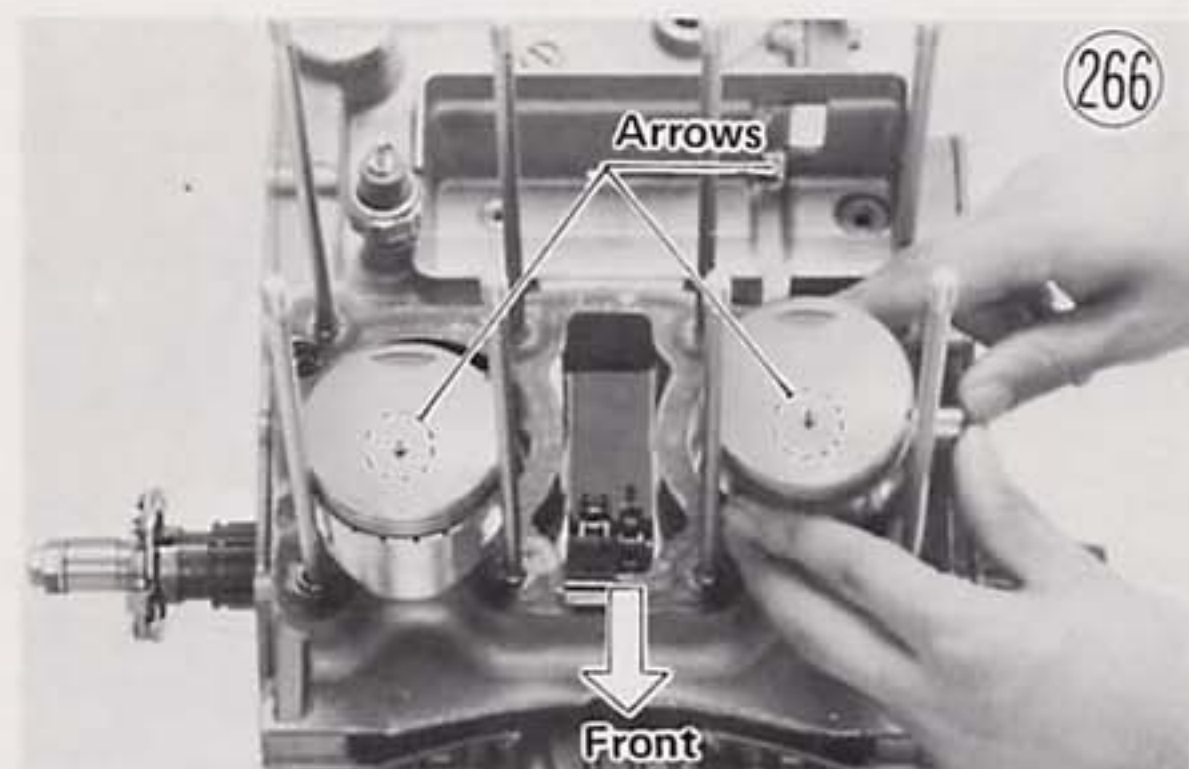
- Lift off the crankshaft, and remove the camshaft chain and the oil seal.

Installation:

- Check to see that all crankshaft bushing halves (4) are in place, and daub a little engine oil on each bushing.
- Check that the wire band in the crankshaft oil seal has not slipped out of its proper position.
- Fit the camshaft chain back on the lower camshaft sprocket, place the oil seal on the dynamo end of the crankshaft with the wire band side facing in, and set the crankshaft back in its place on the upper crankcase half. The ridge on the oil seal must fit in its crankcase groove.



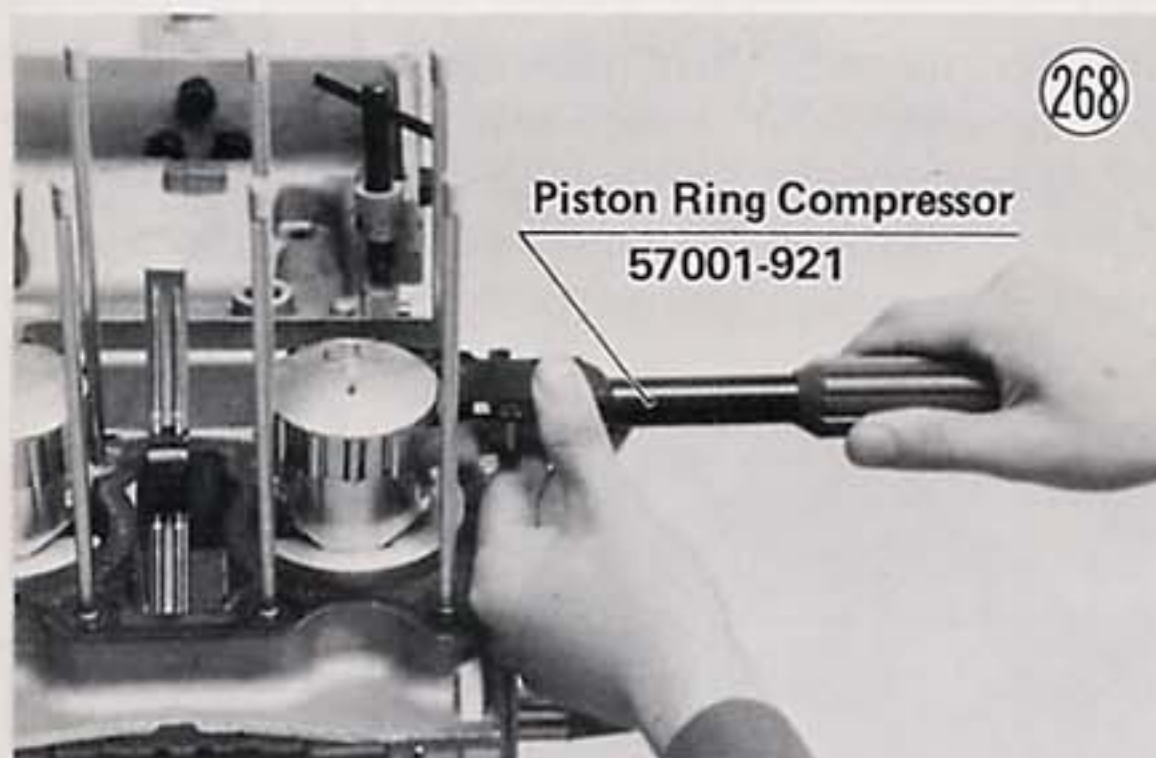
- Replace the crankshaft bushing cap with its arrow pointing to the front, and tighten its bolts (4).
- Turn the upper crankcase half right side up.
- Apply a little oil to the piston pins, and replace both pistons and piston pins. The arrow on the top of each piston must point towards the front.



- Fit a new piston pin snap ring into the side of each piston.
- Fit the timing advancer on the end of the crankshaft, and tighten its bolt.
- Apply a small amount of oil to the piston rings and the inside of each cylinder.
- Replace any of the cylinder base gasket or oil passage O rings with a new one if deteriorated or damaged.
- Fit a piston base (special tool) on the crankcase opening for each piston, and turn the crankshaft using a 17 mm wrench such that each piston is situated squarely on its piston base.



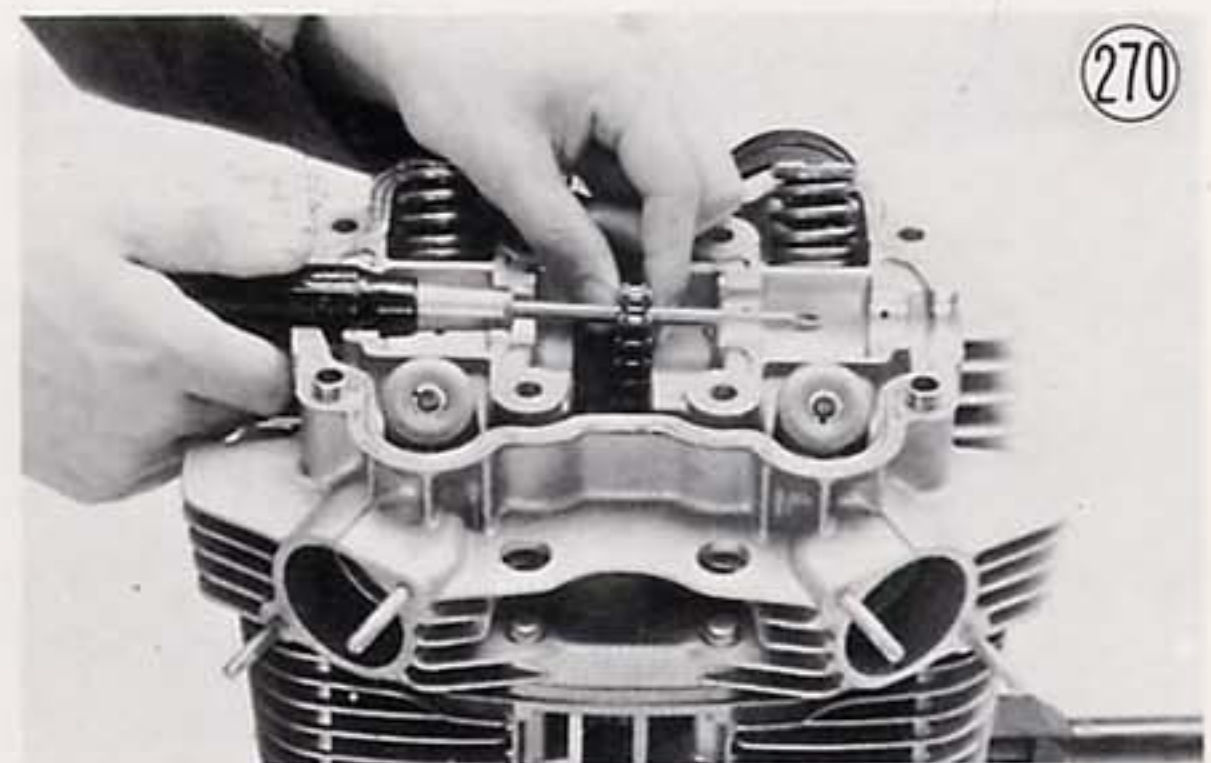
- Compress the piston rings using the piston ring compressor assembly (special tool) for each piston.



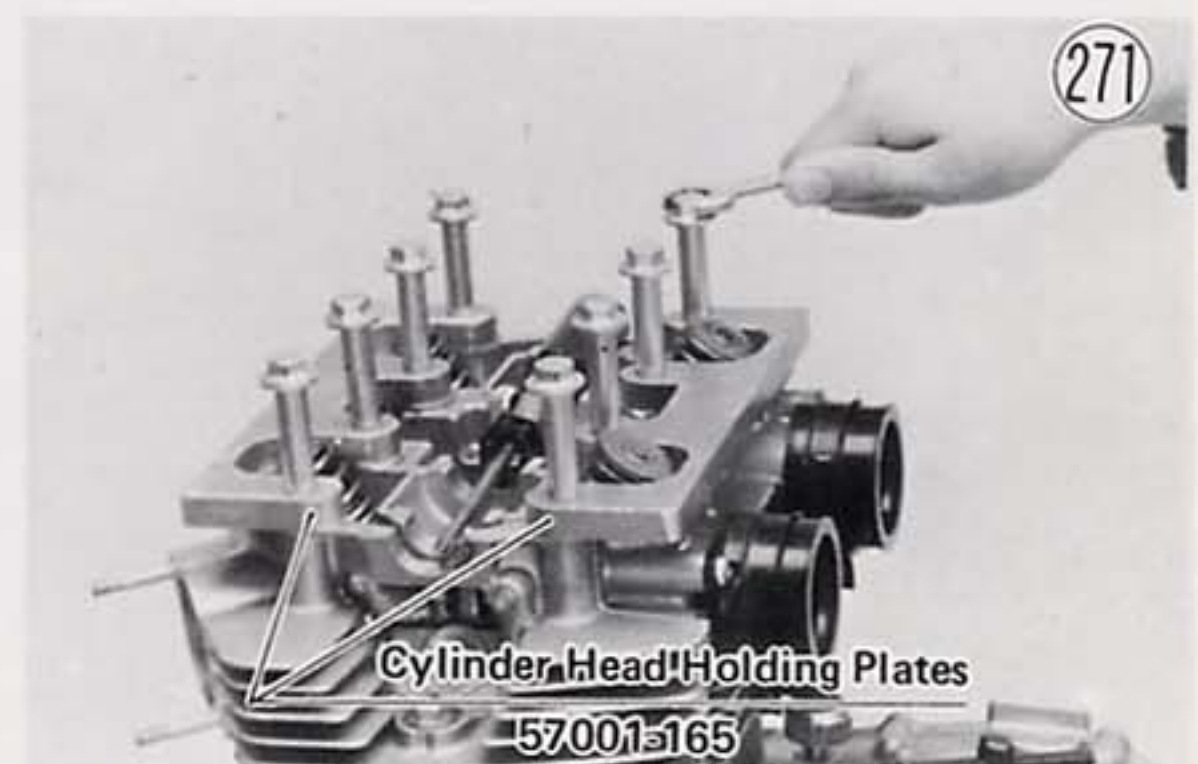
- Replace the cylinder block O rings with a new one if it is deteriorated or damaged.
- Pull out the camshaft chain, and let it hang over the side of the crankcase.
- Fit the cylinder head and cylinder block assembly on the crankcase studs, guide the front camshaft chain guide inside the block, and rest the bottom of the cylinders on the piston ring compressors.



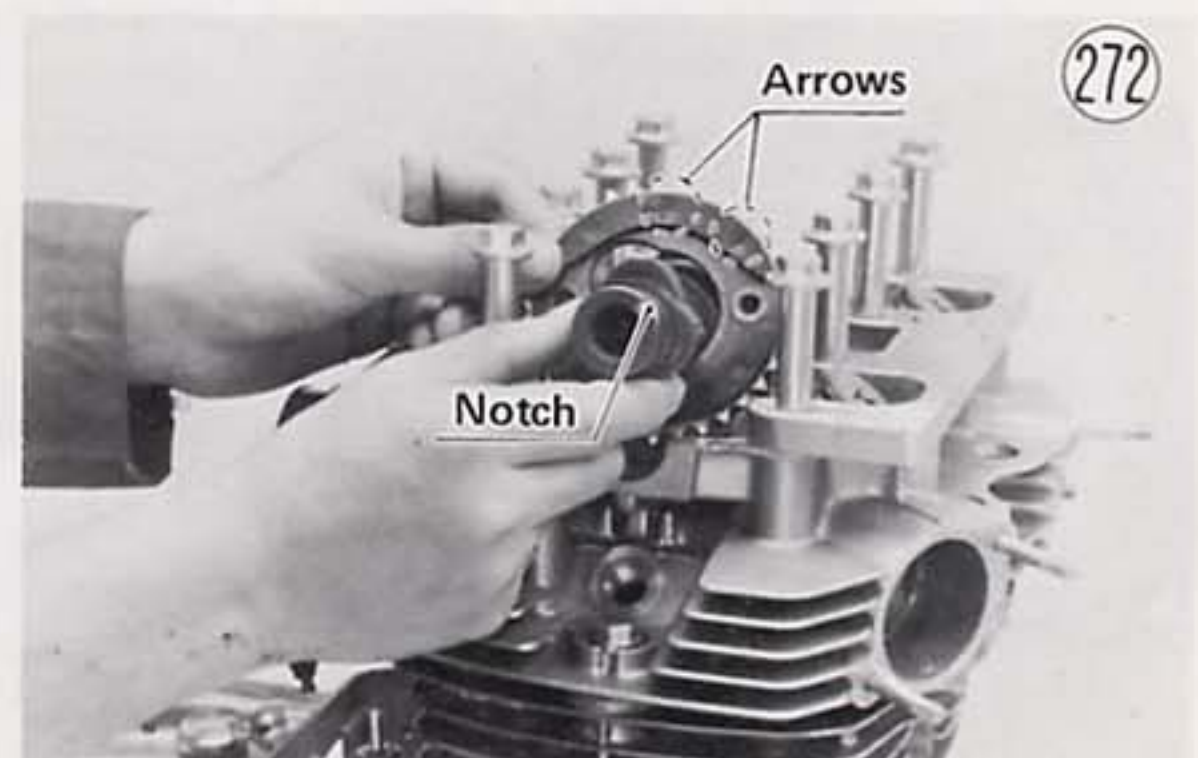
- Lift up the camshaft chain, use a screwdriver to keep the chain from falling down into the cylinder block.



- Work the bottom of each cylinder past the rings, and set the assembly in place while removing the special tools.
- Place the cylinder head holding plate (special tool) on both sides of the cylinder head, and tighten both in place using the stud nuts (8).



- Set the sprocket on the camshaft near where it fits. The arrowed side of the sprocket faces the right side of the engine.

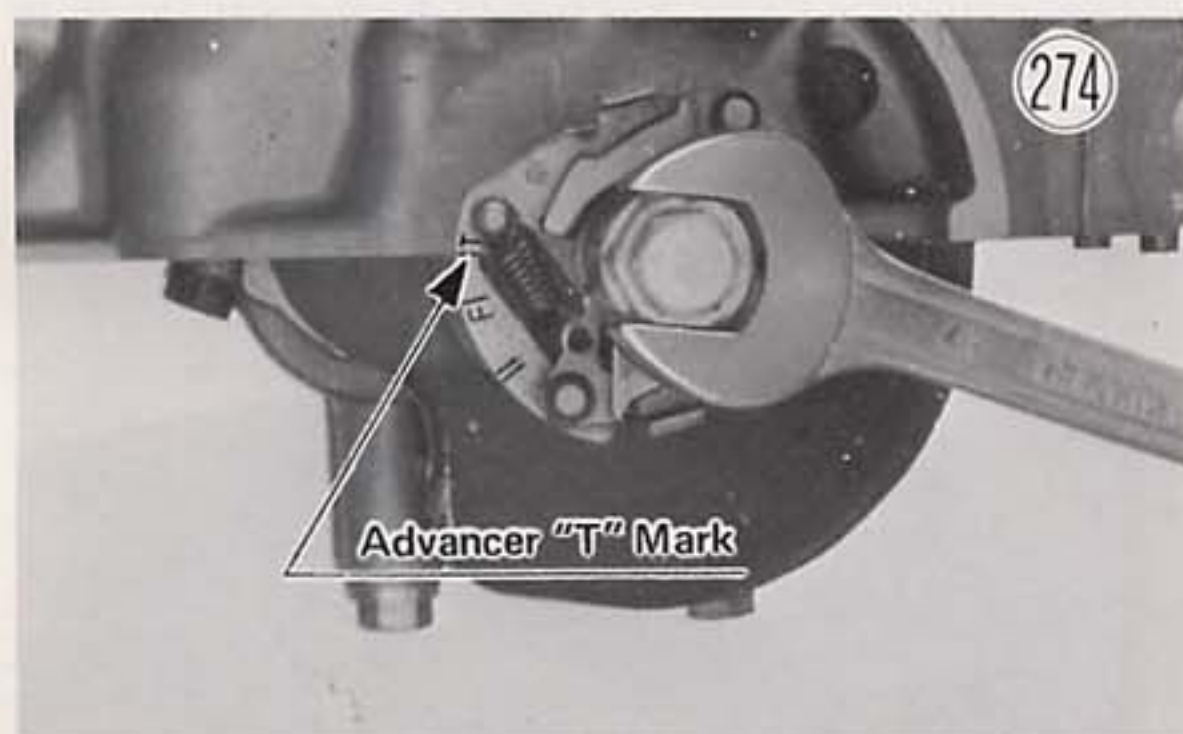


- Run the camshaft through the camshaft chain from the right side of the engine.



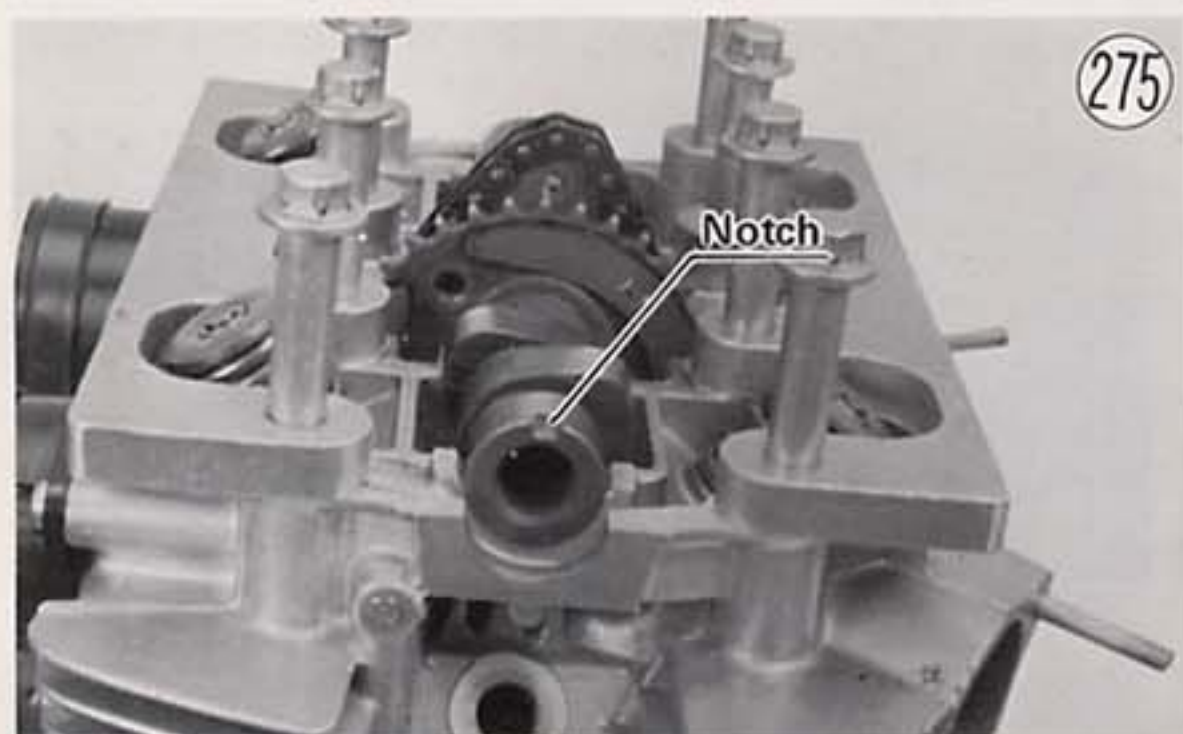
273

- Turn the crankshaft to where the timing advancer "T" mark (the line adjoining the "T") is directly up. Next, turn the crankshaft counterclockwise exactly 90° ($\frac{1}{4}$ turn). At this point the "T" mark should align with the upper crankcase half fitting surface.



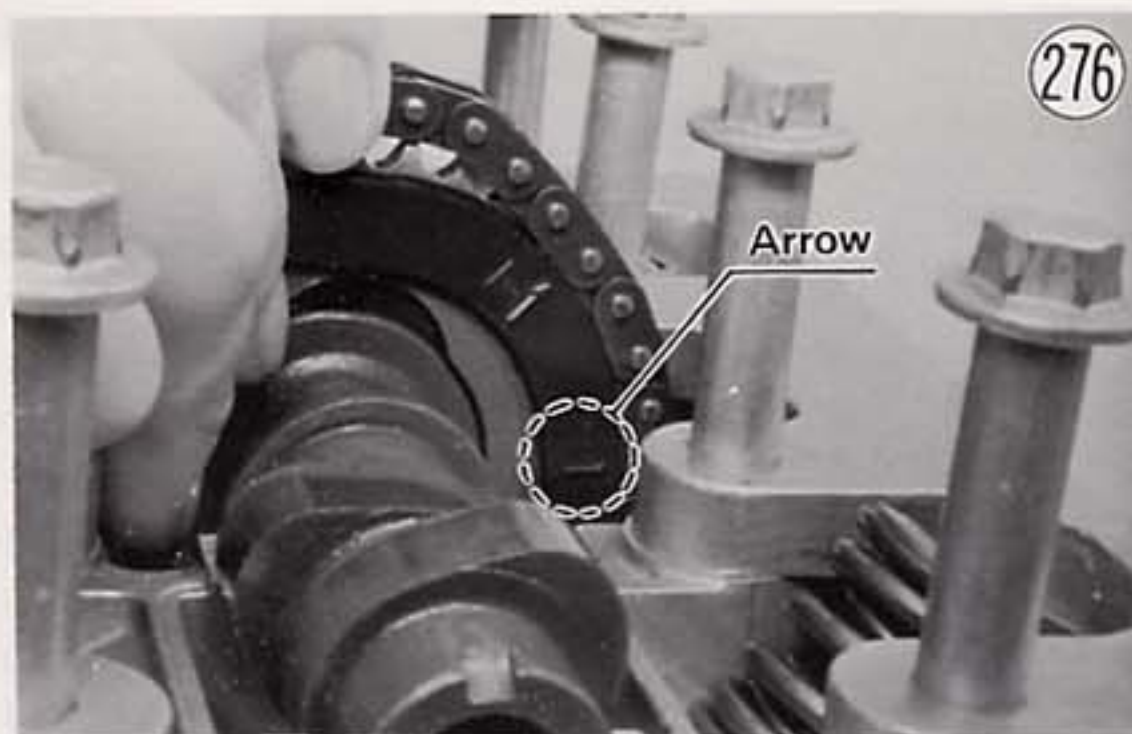
274

- Turn the camshaft until the notch on the right end faces directly up.



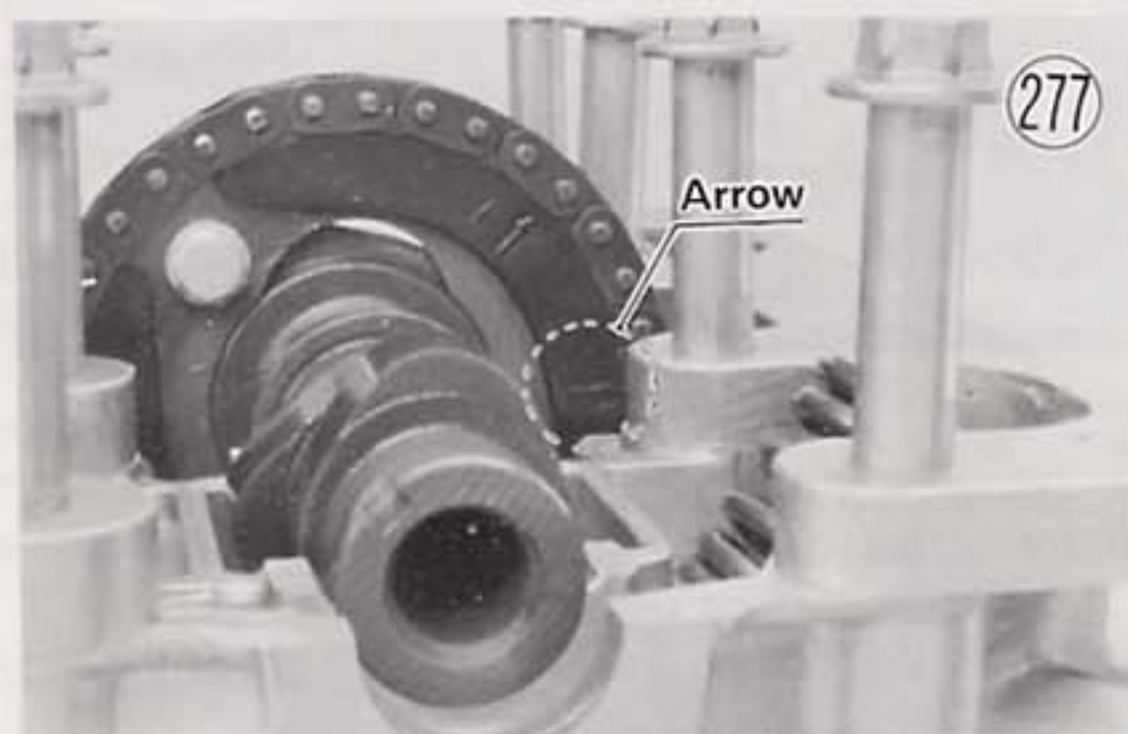
275

- Turn the sprocket such that the arrow which has no letter adjoining it points to the front of the engine (points parallel to the cylinder head fitting surface), and fit the chain on the sprocket.



276

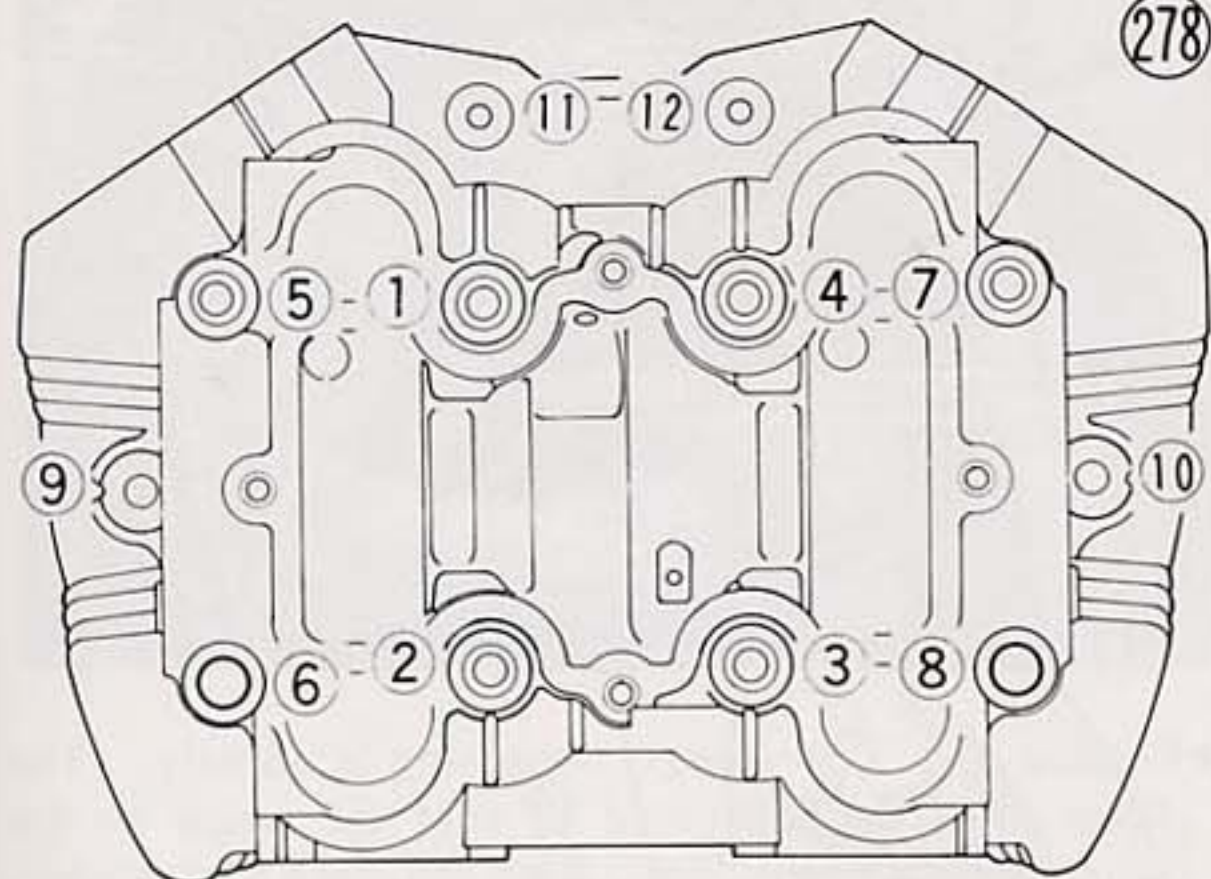
- Fit the sprocket up into place (the bolt holes will not be aligned at this time), and turn the crankshaft while holding the camshaft steady such that the bolt holes align.
- Apply a non-permanent locking agent to one of the sprocket bolts, and replace and tighten it with 1.4 ~ 1.6 kg-m (10 ~ 11.5 ft-lbs) of torque.
- Check that the timing advancer "T" mark and the sprocket arrow are still properly positioned.



277

- Turn the crankshaft 180° , and replace the other sprocket bolt. Use a non-permanent locking agent, and tighten with 1.4 ~ 1.6 kg-m (10 ~ 11.5 ft-lbs) of torque.
- Remove the stud nuts (8), and remove the cylinder head holding plates.
- Remove the tachometer gear (KZ400D) and the cylinder head cover caps (2) from the cylinder head cover.
- Turn the crankshaft to where the timing advancer "T" mark is directly up.
- Apply liquid gasket to the cylinder head cover O ring fitting surface if necessary to hold the O ring to the cylinder head cover. Check that all O rings (4) are in place.
- Place the cylinder head cover on the cylinder head, and replace the nuts (8). Tighten them in the sequence shown in Fig. 278, tightening first each nut to 1.5 kg-m (11 ft-lbs) of torque and then to 2.5 ~ 3.0 kg-m (18 ~ 22 ft-lbs).
- Check to see that the 8 mm cylinder head bolts are at 2.5 ~ 3.0 kg-m (18 ~ 22 ft-lbs) of torque and the 6 mm bolts at 1.1 ~ 1.3 kg-m (9.5 ~ 11.3 in-lbs).

Cylinder Head, Cylinder Head Cover Tightening Order



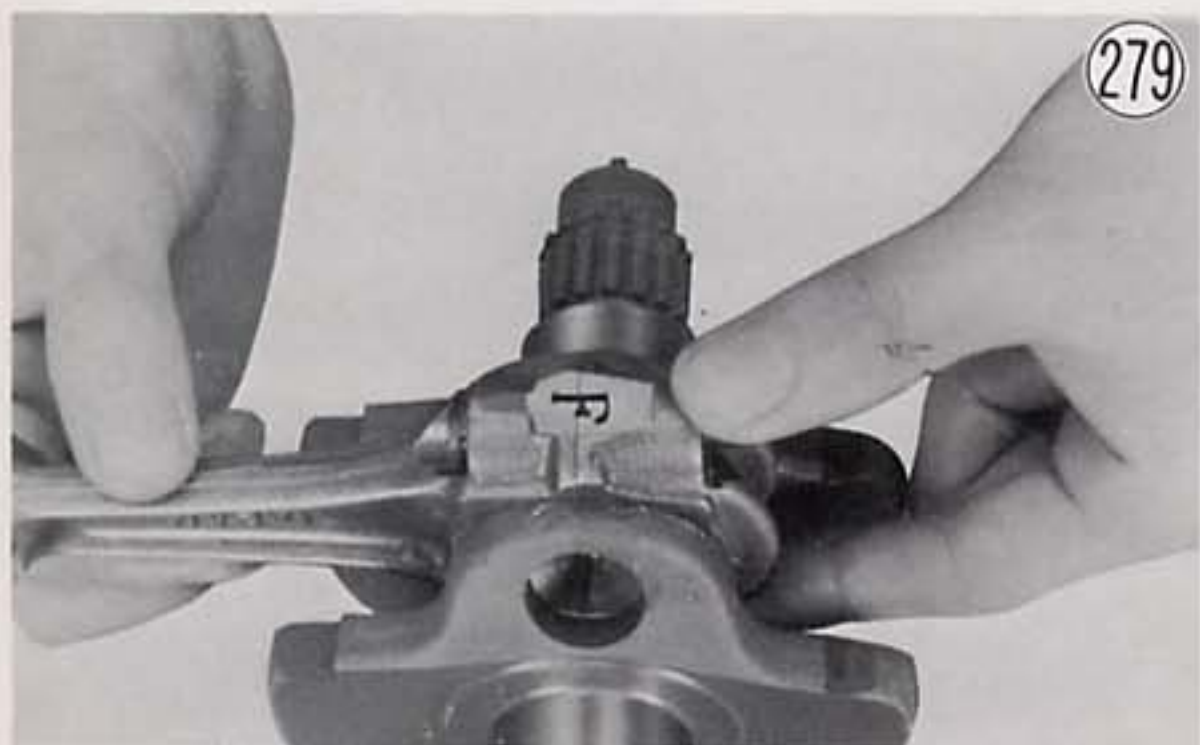
- Apply a small amount of heat durable grease to the tachometer gear, and replace the tachometer gear and the cylinder head cover caps (KZ400D).
- Replace the tensioner assembly. The sequence is push rod, spring, gasket, holder, push rod guide, and lock nut. Tighten its screws, adjust it (Pg. 15), and replace the cap and O ring.
- Replace the spark plugs.
- Turn the engine upside down.
- Replace the drive shaft set ring and output shaft set ring.
- Remove the crankshaft bushing cap.
- Replace the pin which holds the camshaft chain guide pin in place.
- Replace the balancer mechanism holder O rings which were removed.
- Install the balancer mechanism (Pg. 65).
- Install the transmission (Pg. 58).

Disassembly

- Remove the nuts (4) and connecting rods (2). Each connecting rod has a bushing half in its big end.

Assembly Notes:

1. Fit the connecting rod big end together so that the marks align.

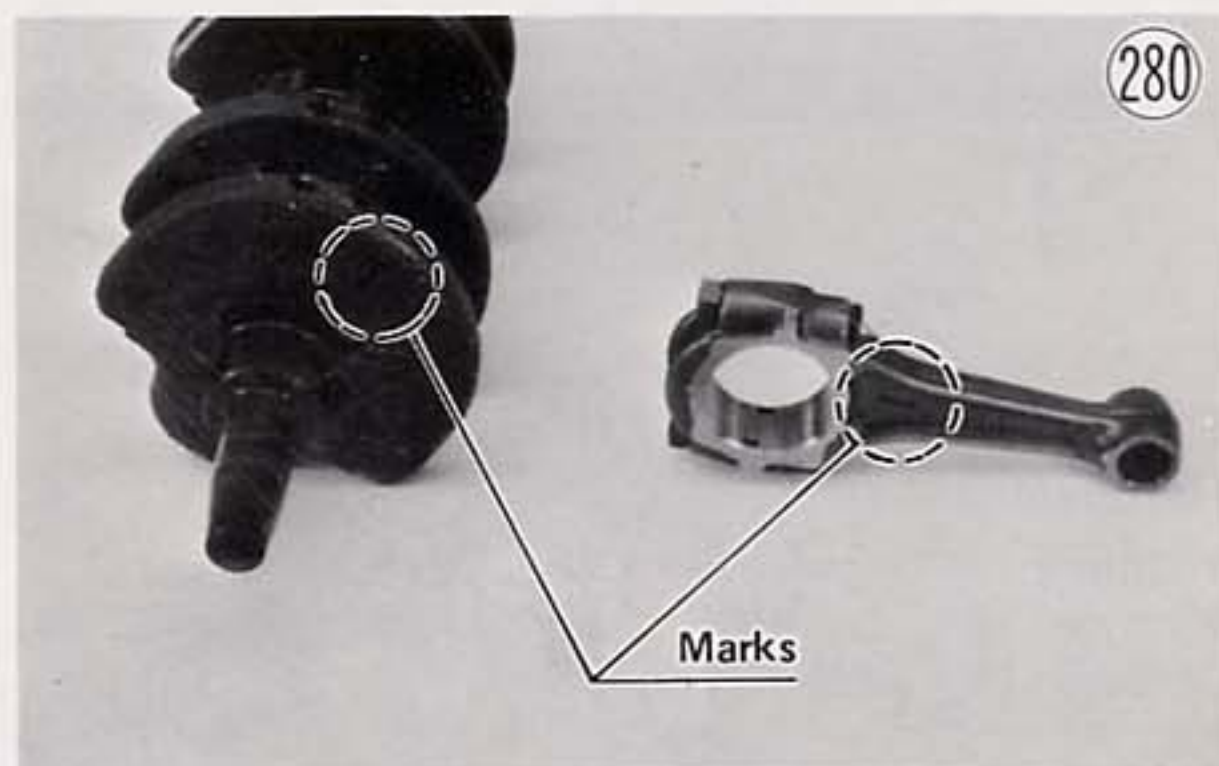


2. Apply oil to the connecting rod big end bolts. Tighten the nuts first loosely and then tighten each nuts with 3.5 ~ 3.8 kg-m (25 ~ 27 ft-lbs) of torque.

3. If a new crankshaft and/or connecting rod is used, select the right bushing in accordance with the combination of the connecting rod and the crankshaft marks (Fig. 280, 281).

Table 1 Bushing Selection

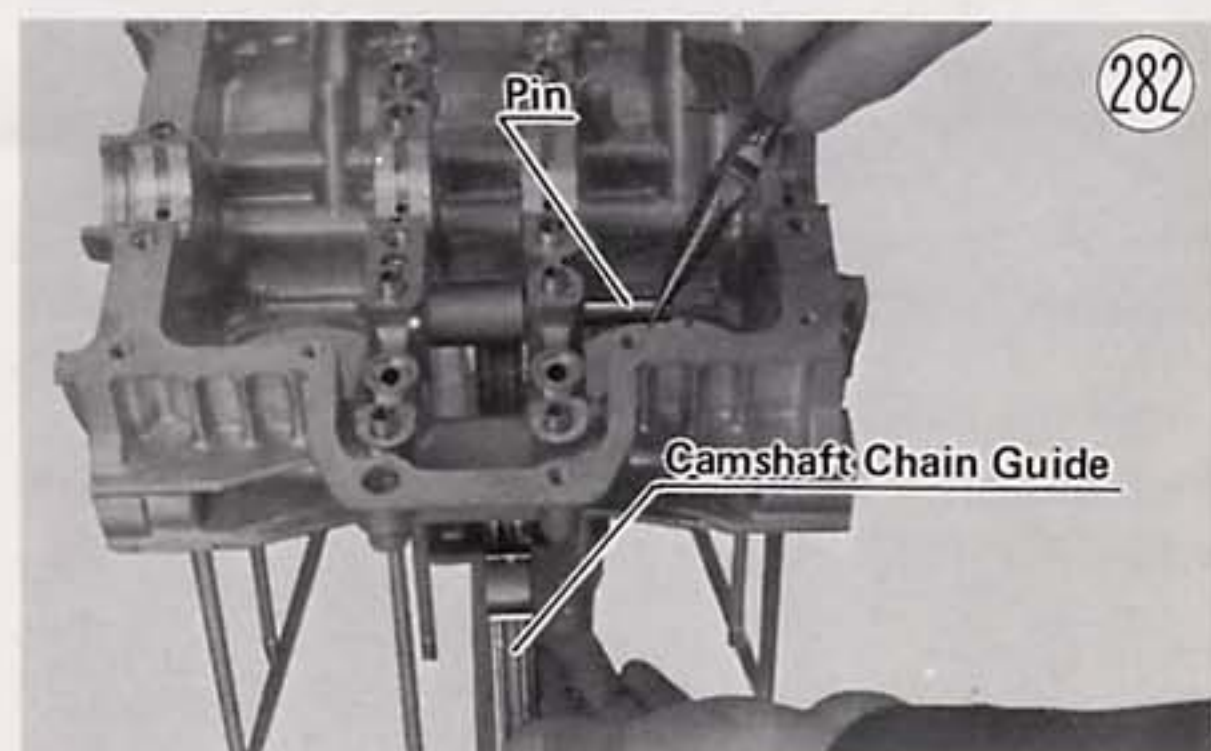
Crank-shaft marking \ Con-Rod marking	1	Unmarked
1	Black PN 13034-037	Brown PN 13034-048
Unmarked	Blue PN13034-047	Black PN 13034-037



CAMSHAFT CHAIN GUIDE (FRONT)

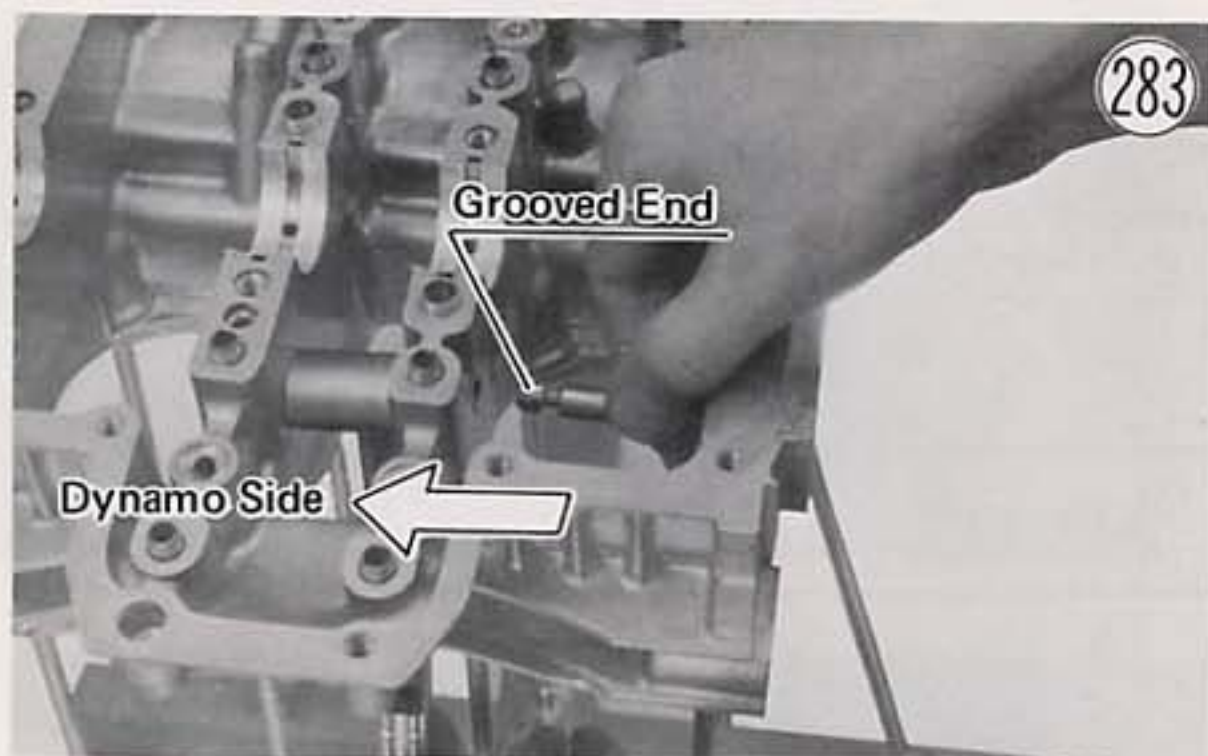
Removal:

- Remove the crankshaft (Pg. 67).
- Push the pin out, and remove the guide.

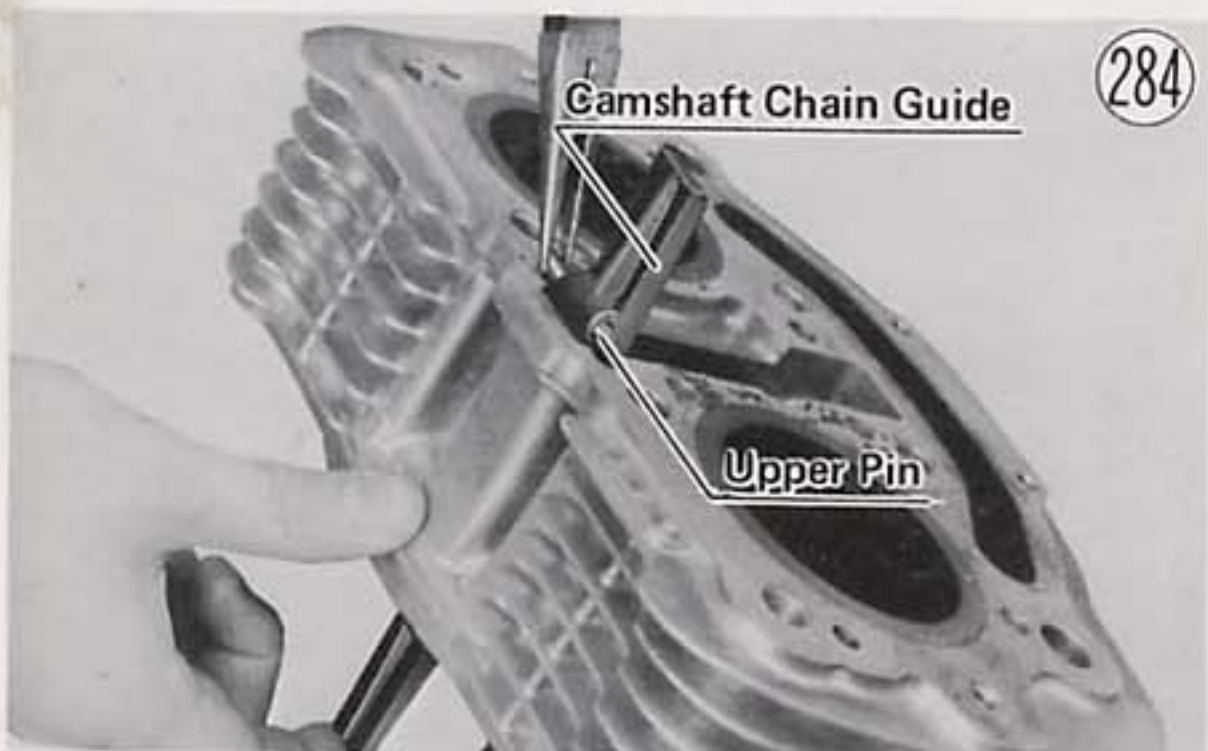


Assembly Note:

- The grooved end of the pin goes to the dynamo side.

**CAMSHAFT CHAIN GUIDE (REAR)****Removal:**

- Remove the cylinder block (Pg. 40).
- Remove the camshaft chain guide upper pin, and remove the guide.

**FRONT WHEEL (Only on KZ400D)****Removal:**

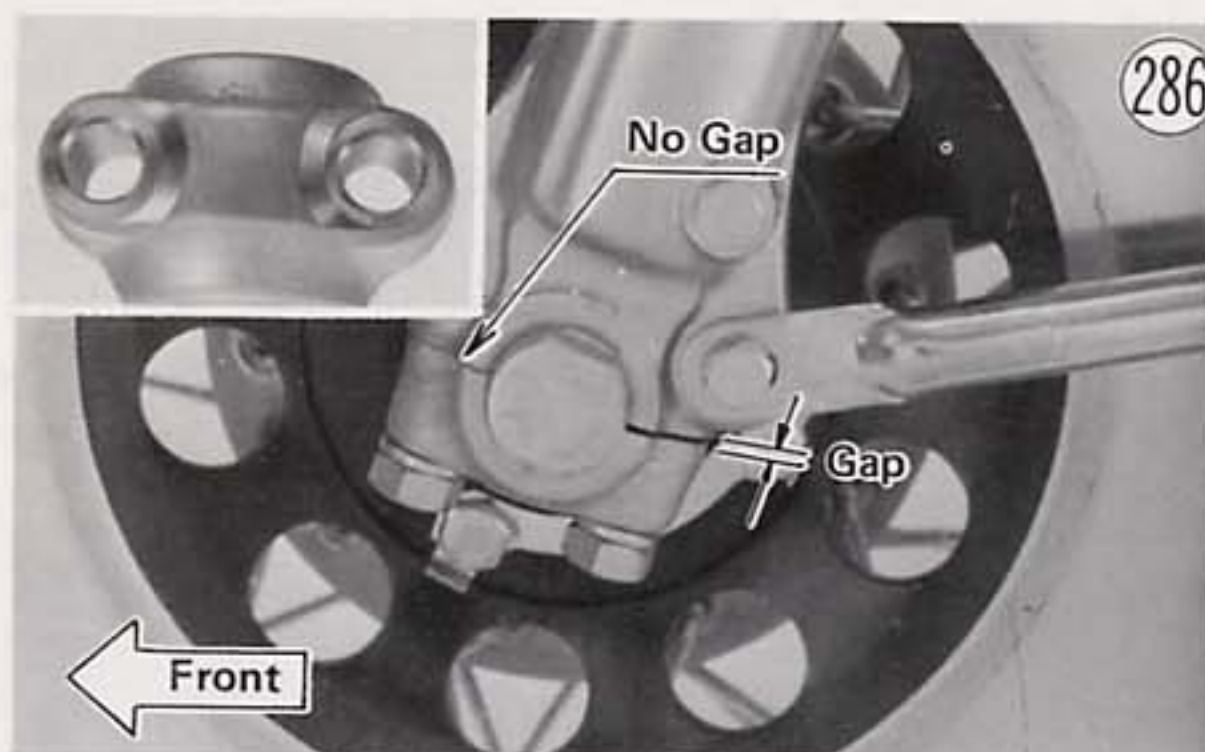
- Put the motorcycle up on its center stand, and jack or prop up the engine so that the front wheel will be off the ground.
- Remove the axle cotter pin, nut, and washer.
- Remove the front axle clamp nuts (2), lock washers (2), and clamp.
- Holding the wheel to facilitate axle removal, pull out the axle, and then remove the wheel from the motorcycle. The speedometer gear housing easily separates from the hub.

Installation:

- With the speedometer cable running above the fender stay, fit the speedometer gear housing into the hub, hold the front wheel in its place between the front shock absorbers, and insert the axle from the disc side.



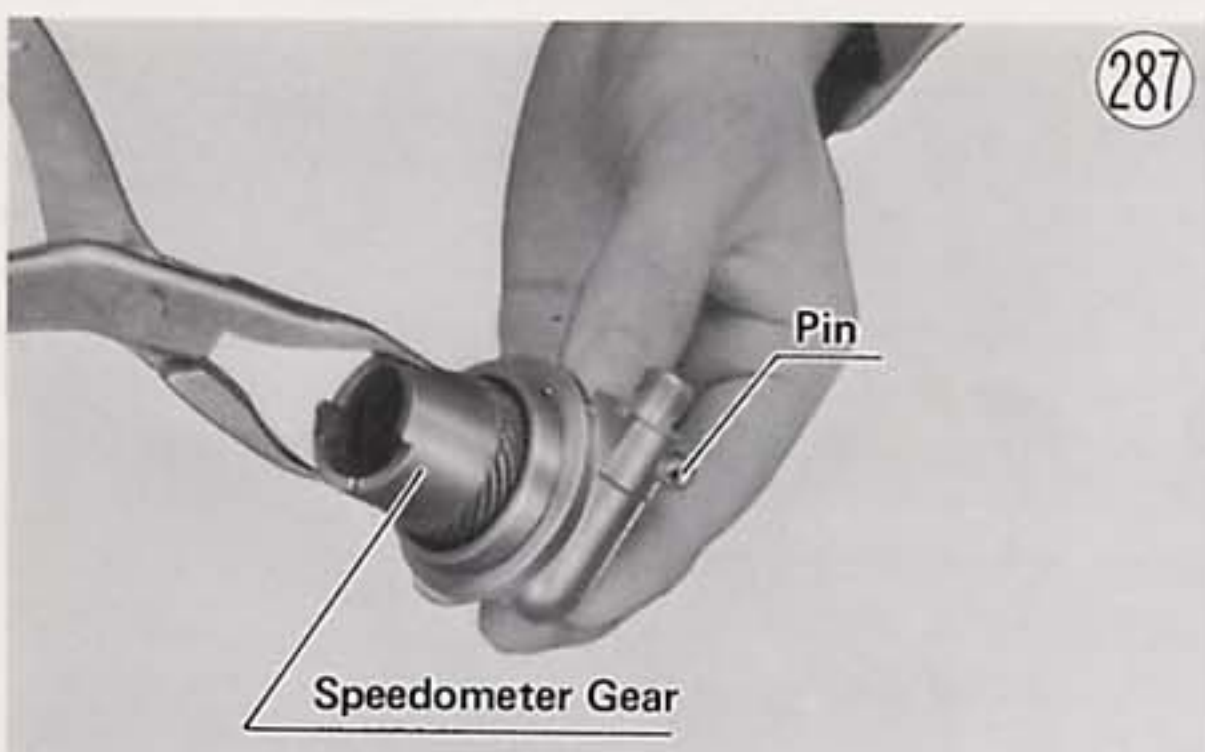
- Replace the axle clamp, tightening it loosely. The clamp must be positioned so that the arrow on the bottom points to the front. Each nut has a lock washer.



- Replace the axle washer and nut. Tighten the axle nut with 7 ~ 9 kg-m (51 ~ 65 ft-lbs) of torque while making sure that the speedometer gear housing does not move out of its proper position.
- Install a new axle cotter pin.
- Tighten the axle clamp nuts, first the front one and then the rear with 1.6 ~ 2.2 kg-m (11.5 ~ 16 ft-lbs) of torque. The front end of the clamp is the one which fits squarely on the bottom of the fork outer tube.

Speedometer Gear Housing Disassembly:

- Disconnect the lower end of the speedometer cable with pliers.
- Pull out the speedometer gear ⑱ with close-in circlip pliers or some other suitable tool.



- To remove the speedometer gear bush or speedometer pinion, first drill out the pin in the speedometer gear housing.