Kawasaki

KZ400



Motorcycle Service Manual

QUICK REFERENCE GUIDE

To use, bend the manual back and match the desired section below against the black spot showing at the edge of these pages.

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Model Identification

KZ400-B1



KZ400-C1



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A

Specifications

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SPECIFICATIONS

		KZ400-B1	KZ400-C1
Dimensions			
Overall length		2,045 mm	*
Overall width		810 mm	790 mm
Overall height		1,130 mm	1,100 mm
Wheelbase		1,365 mm	*
Road clearance		135 mm	160 mm
Dry weight		168 kg	155 kg
Fuel tank capacity		14 ℓ	*
Performance			
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		9.5	*
Maximum horsepower		36 HP @8,500 rpm	34.5 HP 8,500 rpm
Maximum torque		3.28 kg-m @7,000 rpm	3.21 kg-m @6,500 rpm
Valve timing			
Inlet	Open	27° BTDC	*
	Close	73° ABDC	*
	Duration	280°	*
Exhaust	Open	70° BBDC	*
	Close	30° ATDC	*
	Duration	280°	*
Carburetors		Keihin VB32 x 2	*
Lubrication system		Forced lubrication (wet sump)	*
Engine oil		SE class SAE 10W40, 10W50, 20W40, 20W50	*
Engine oil capacity		2.9 ℓ	*
Starting system		Electric and kick	Kick
Ignition system		Battery and coil	*
Ignition timing		From 10° BTDC @1,100 rpm to 35° BTDC @3,200 rpm	*
Spark plugs		NGK B7ES or ND W22ES-U	*
Transmission			
Type		6-speed, constant mesh, return shift	5-speed, constant mesh, return shift
Clutch		Wet, multi disc	*
Gear ratio:	1st	2.54 (33/13)	2.57 (36/14)
	2nd	1.75 (28/16)	1.68 (32/19)
	3rd	1.32 (25/19)	1.27 (28/22)
	4th	1.10 (23/21)	1.04 (26/25)
	5th	0.96 (22/23)	0.89 (24/27)
	6th	0.88 (21/24)	—
Primary reduction ratio		2.43 (56/23)	*
Final reduction ratio		3.00 (45/15)	*
Overall drive ratio		6.39 (Top gear)	6.49 (Top gear)

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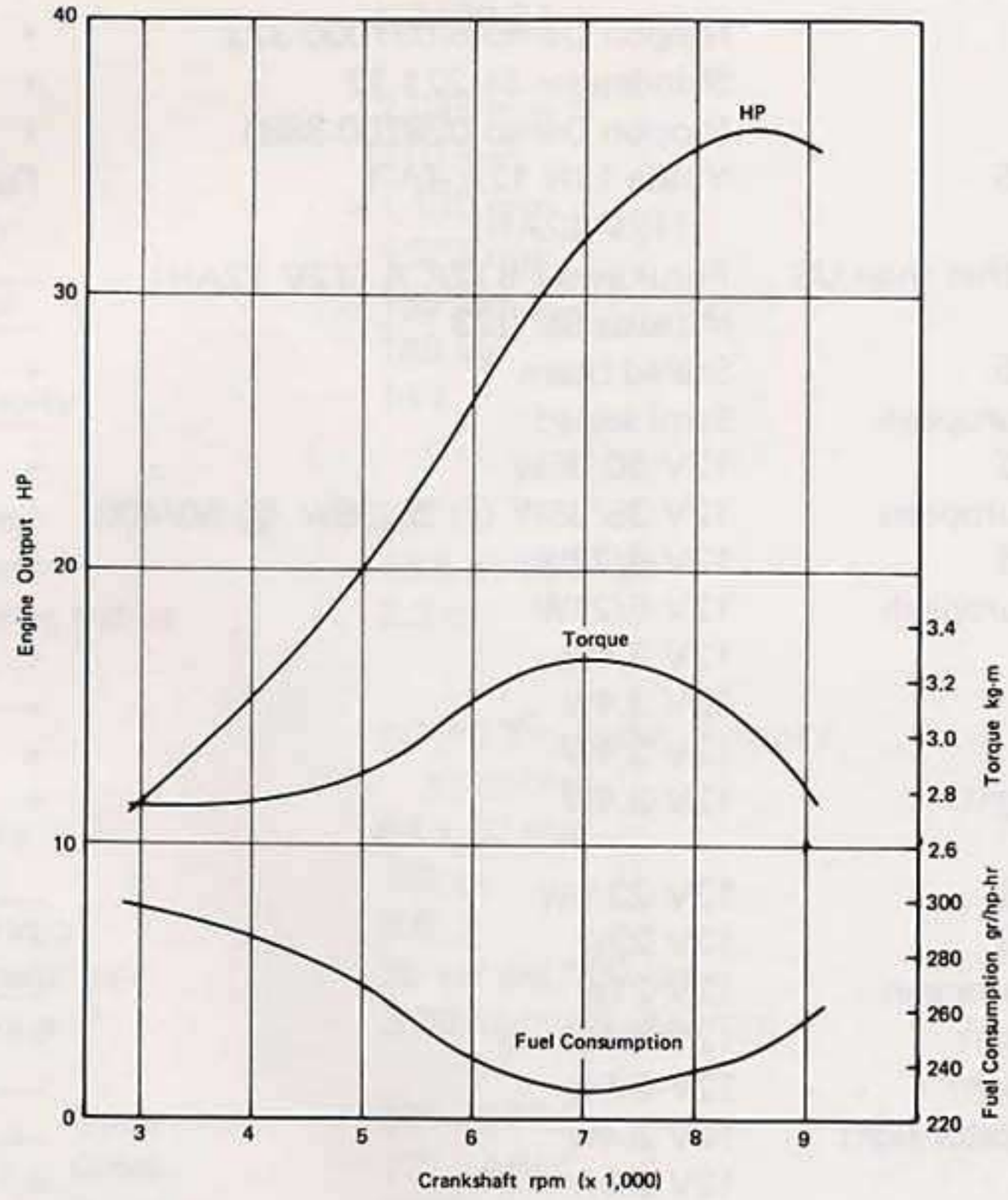
		KZ400-B1	KZ400-C1
Electrical Equipment			
Generator (Dynamo)		Nippon Denso 5-037000-373	*
Regulator/Rectifier		Shindengen SH221-12	*
Ignition coil		Nippon Denso 029700-3881	*
Battery	US	Yuasa 12N 12A-4A-1 (12V 12AH)	Furukawa 12N 5.5-4A (12V 5.5AH)
	Other than US	Furukawa FB12A-A (12V 12AH)	—
Starter		Mitsuba SM-223	—
Headlight type	US	Sealed beam	*
	European	Semi-sealed	—
Headlight	US	12V 50/35W	*
	European	12V 35/35W Ⓕ 36/36W Ⓖ 50/40W	—
Tail/Brake light	US	12V 8/27W	*
	European	12V 5/21W	—
Speedometer light		12V 3.4W	*
Tachometer light		12V 3.4W	—
Neutral indicator light		12V 3.4W	*
High beam indicator light		12V 3.4W	*
Turn signal/Running position lights	US	12V 23/8W	—
Turn signal lights	US	12V 23W	*
	European	12V 21W	—
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		100 mm	*
Tire size	Front	3.00S-18 4PR	*
	Rear	3.50S-18 4PR	*
Suspension	Front	Telescopic fork	*
	Rear	Swing arm	*
Suspension stroke	Front	150 mm	*
	Rear	95 mm	*
Front fork oil capacity (each fork)		145 ~ 155 cc	*
Front fork oil type		SAE 5W20	*
Brakes			
Type	Front	Disc brake	Internal expansion, two-leading
	Rear	Internal expansion, leading-trailing	*
Effective disc diameter		231 mm	—
Brake drum inside diameter and width	Front	—	180 x 30 mm
	Rear	160 x 30 mm	*

* : Identical to KZ400-B Ⓕ : France Ⓖ : General

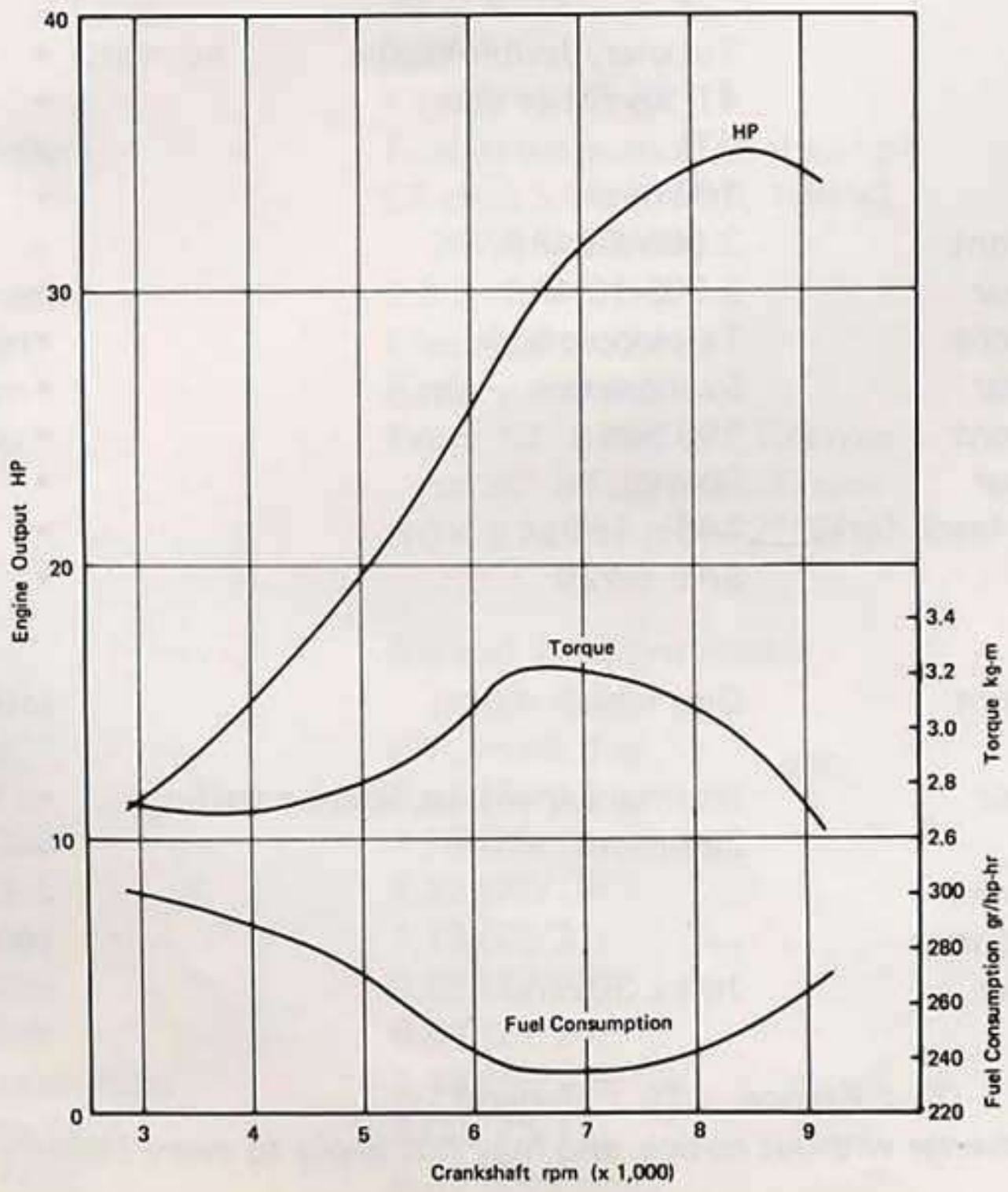
Specifications subject to change without notice, and may not apply to every country.

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ENGINE PERFORMANCE CURVES (KZ400-B1)

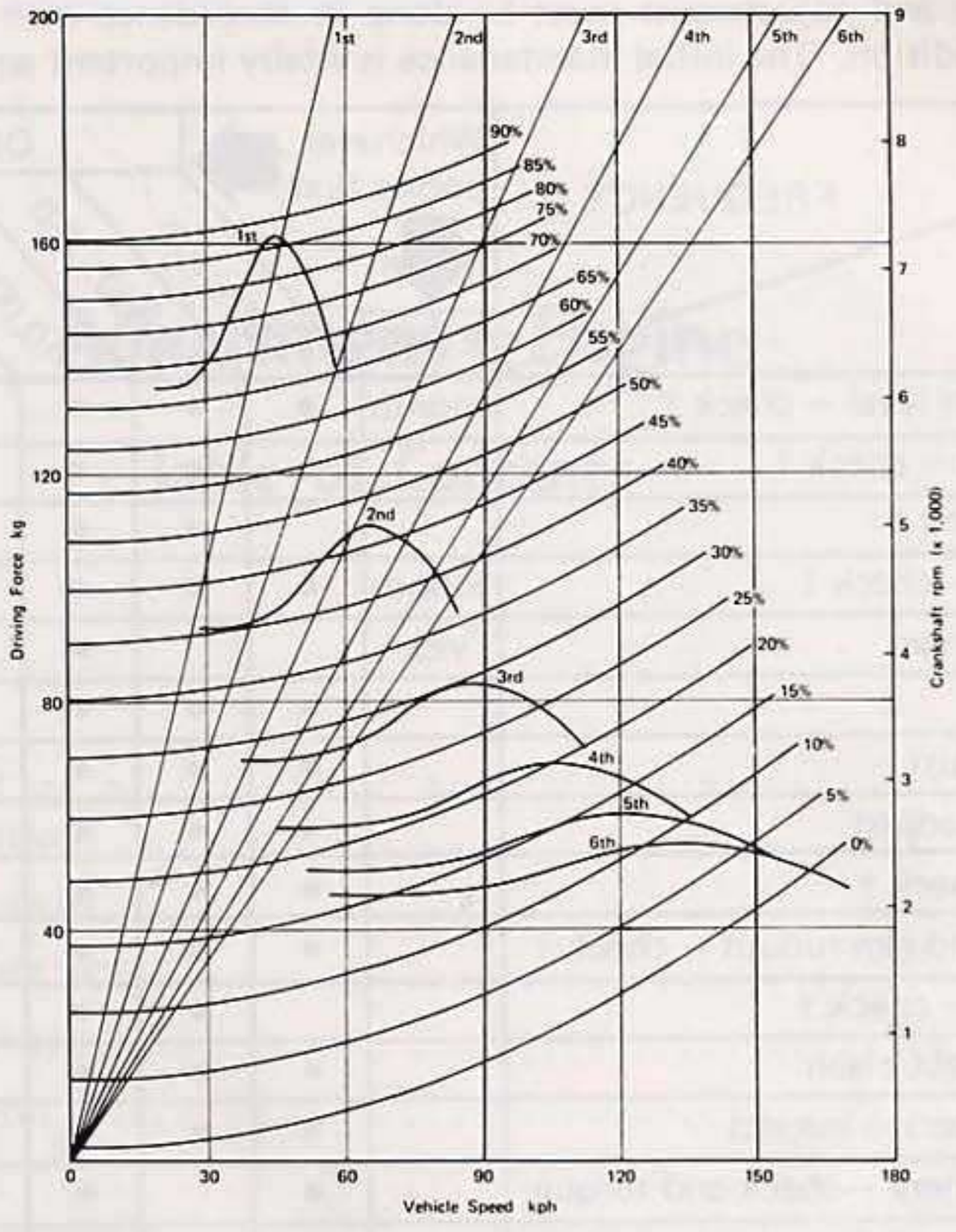


ENGINE PERFORMANCE CURVES (KZ400-C1)

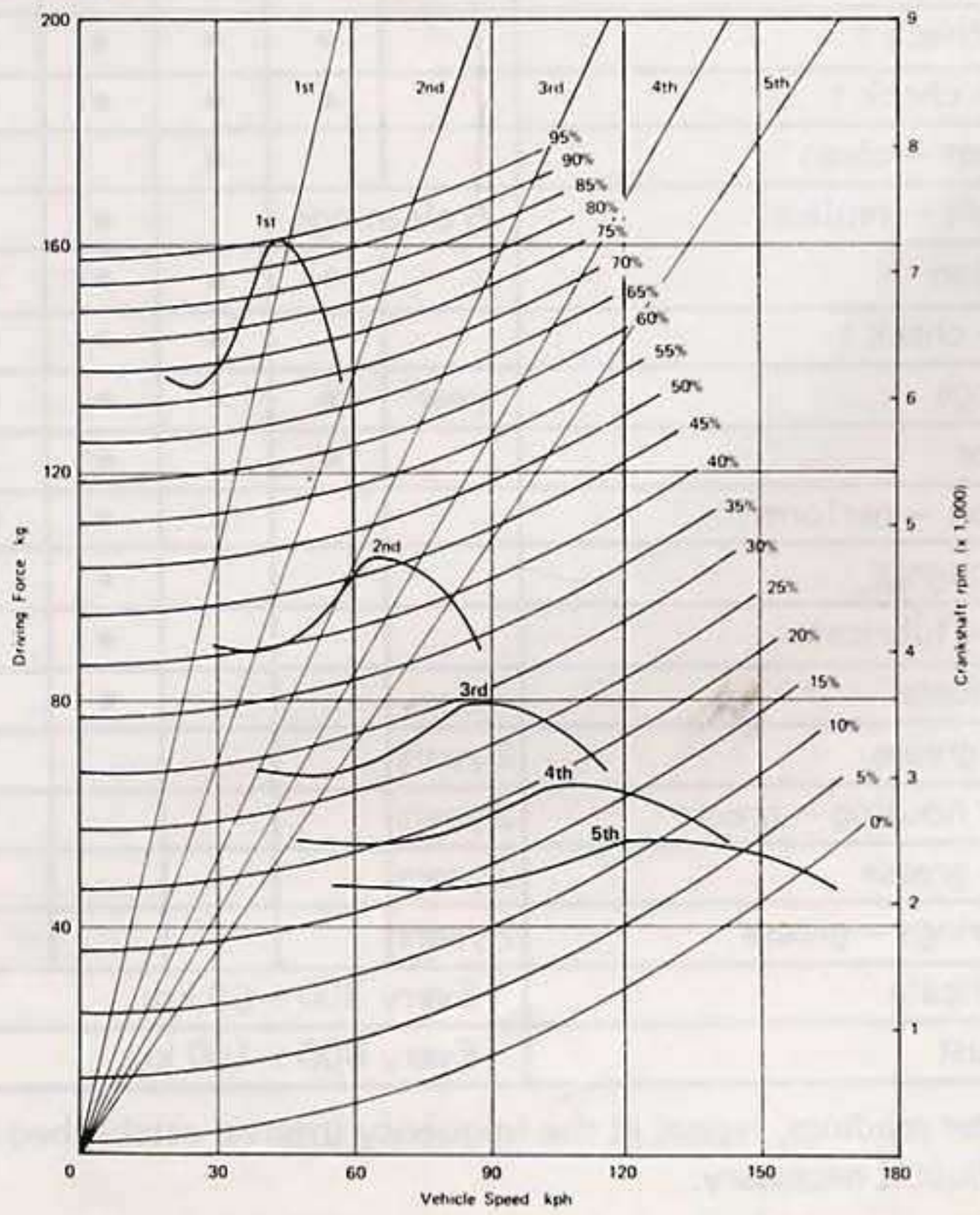


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RUNNING PERFORMANCE CURVES (KZ400-B1)



RUNNING PERFORMANCE CURVES (KZ400-C1)



PERIODIC MAINTENANCE CHART

The maintenance and adjustments must be done in accordance with this chart to keep the motorcycle in good running condition. **The initial maintenance is vitally important and must not be neglected.**

OPERATION \ FREQUENCY	Whichever comes first — Every	ODOMETER READING* km: 800±100	5,000±250	10,000±250	15,000±250	20,000±250	25,000±250	30,000±250	See Page
Battery electrolyte level — check †	month	•	•	•	•	•	•	•	218
Brake adjustment — check †		•	•	•	•	•	•	•	25
Brake wear — check †			•	•	•	•	•	•	205,206
Brake fluid level — check †	month	•	•	•	•	•	•	•	203
Brake fluid — change	year			•		•		•	202
Clutch — adjust		•	•	•	•	•	•	•	19
Carburetors — adjust		•	•	•	•	•	•	•	16
Throttle cables — adjust		•	•	•	•	•	•	•	15
Steering play — check †		•	•	•	•	•	•	•	28
Spoke tightness and rim runout — check †		•	•	•	•	•	•	•	196
Drive chain wear — check †			•	•	•	•	•	•	24
Front fork — inspect/clean		•	•	•	•	•	•	•	211
Rear shock absorbers — inspect		•	•	•	•	•	•	•	212
Nuts, Bolts, Fasteners — check and torque		•		•		•		•	37 ~ 40
Spark plugs — clean and gap †		•	•	•	•	•	•	•	12
Camshaft chain — adjust		•	•	•	•	•	•	•	14
Points, timing — check †		•	•	•	•	•	•	•	12
Valve clearance — check †		•	•	•	•	•	•	•	15,162
Air cleaner element — clean			•		•		•		149
Air cleaner element — replace	5 cleanings		•		•		•		149
Fuel system — clean		•	•	•	•	•	•	•	21
Tire tread wear — check †			•	•	•	•	•	•	195
Engine oil — change	year	•	•	•	•	•	•	•	20
Oil filter — replace		•		•		•		•	20,189
General lubrication — perform			•	•	•	•	•	•	31 ~ 33
Front fork oil — change				•		•		•	211
Timing advancer — lubricate				•		•		•	226
Swing arm — lubricate				•		•		•	214
Wheel bearings — grease	2 years					•			196
Speedometer gear housing — grease	2 years					•			197
Brake camshaft — grease	2 years					•			207
Steering stem bearings — grease	2 years					•			208
Drive chain — lubricate	Every 300 ± 50 km								198
Drive chain — adjust	Every 800 ± 100 km								24

*For higher odometer readings, repeat at the frequency interval established here.
†Replace, add or adjust if necessary.

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Adjustment—Engine

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SPARK PLUGS

Neglecting the spark plugs eventually leads to difficult starting and poor performance. During normal operation, the electrodes gradually burn away and carbon builds up along the insulator. In accordance with the Periodic Maintenance Chart (Pg. 10), the plugs should be removed for inspection, cleaning, and to reset the gaps. If the center electrodes are fairly worn down, install new ones with the proper gap.

- Remove the spark plugs using a spark plug wrench.
- Clean the spark plugs, 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. If the spark plug electrodes are corroded or damaged, or if the insulator is cracked, replace the plug. Use the standard plug or its equivalent.
- Measure the gap with a wire-type thickness gauge. If the gap is incorrect, carefully bend the side electrode with a suitable tool, to obtain the correct gap.

Spark Plug Gap

B1

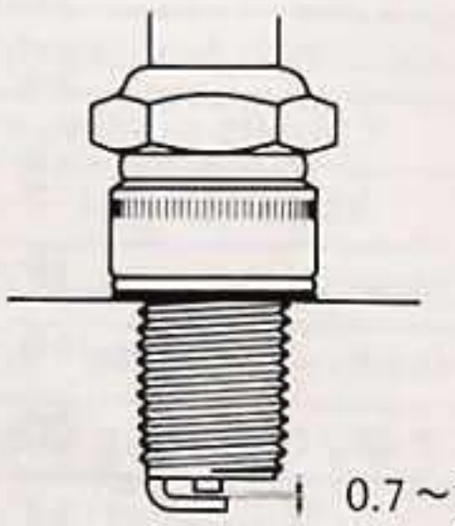


Table B1 Spark Plugs

Type	NGK B7ES or ND W22ES-U
Gap	0.7 ~ 0.8 mm
Tightening Torque	2.8 kg-m (20 ft-lbs)

- Tighten the spark plugs in the cylinder head to the specified torque.

NOTE: Refer to electrical maintenance section, Pg. 226, for detailed spark plug information.

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.

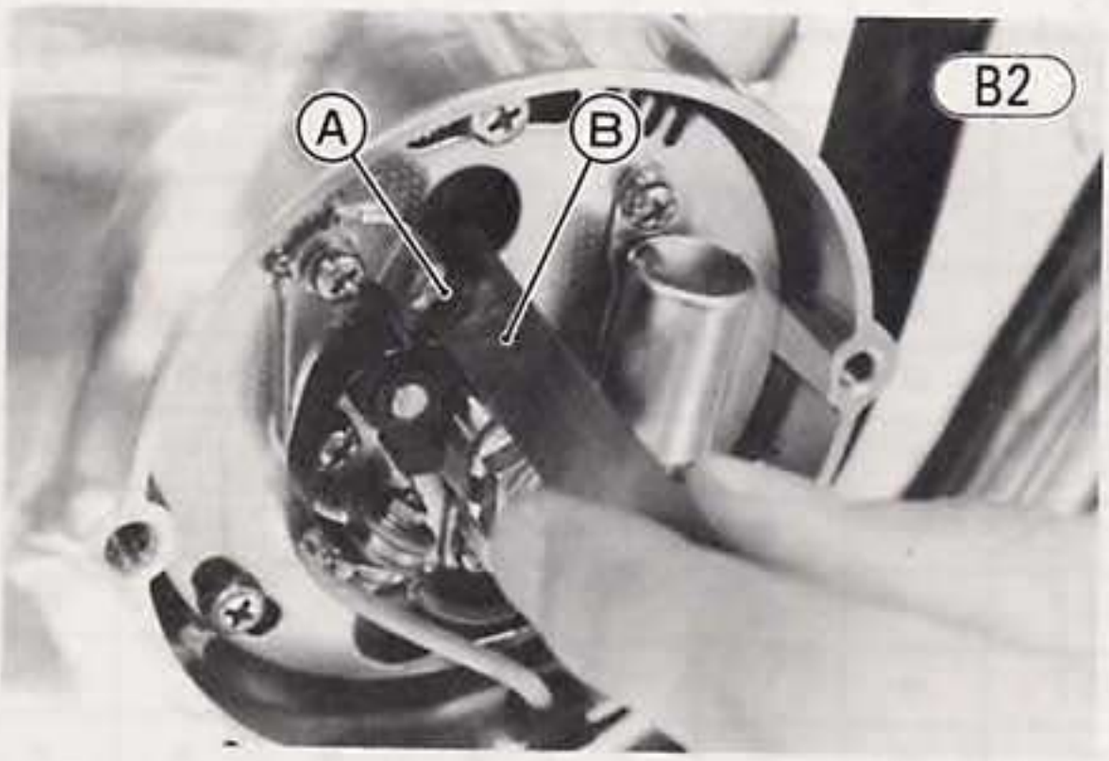
Correct ignition timing is achieved by first obtaining the correct contact breaker point gap (this can also be achieved by adjusting the dwell angle to the specified amount) and then changing the position of the contact breaker mounting plate. Often the first step returns the timing very close to the correct original setting. Once the timing has been adjusted, it may be checked for accuracy by the use of a strobe light.

NOTE: The dwell angle is the angular range for which the contact breaker points are closed. This allows the current to flow in the ignition coil primary winding.

Point Gap/Dwell Angle Adjustment

To check the point gap:

- Remove the screws (2), and remove the contact breaker cover.
- Clean the points with clean paper or cloth using an oil-free solvent. A business card soaked in trichloroethylene can be used to remove traces of oil. To repair light damage, use emery cloth or an oilstone. If the points are badly worn down or damaged, or if the spring is weak, replace the contact breaker.
- Lubricate the point cam felt sparingly with suitable point cam lubricant. Do not overlubricate. Replace the felt if it is worn.
- Check to see that the ignition switch is turned off.
- Using a 17 mm wrench on the crankshaft, turn the engine counterclockwise until the contact breaker points are at their widest opening.
- Determine the size of the point gap with a thickness gauge, or measure the dwell angle using a dwell angle tester.



B2

A. Contact Breaker Points **B. Thickness Gauge**

Table B2 Contact Breaker

	Standard
Point Gap	0.3 ~ 0.4 mm
Dwell Angle	185 ~ 200° (51.5 ~ 55.5%)

NOTE: The point gap is set more precisely using a dwell angle tester instead of a thickness gauge. Connect a dwell angle tester in the manner prescribed by the manufacturer in order to check the dwell angle.

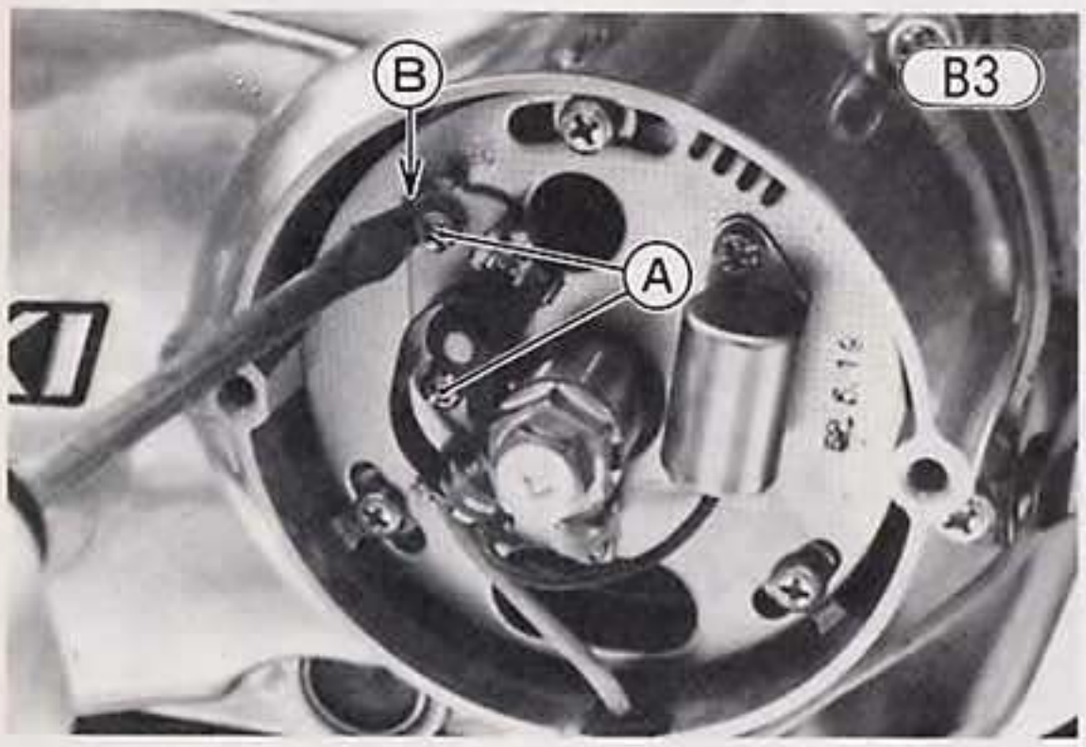
WARNING **When measuring the dwell angle, make sure that no tools, clothes, or meter leads touch the spinning crankshaft. Touching the crankshaft of a running engine could cause an injury.**

To adjust the point gap:

- If the gap or dwell angle is not the same as the specification, loosen the contact breaker base screws (2) just enough so that a slot screwdriver can be used at the

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contact breaker pry point to change the gap or dwell angle. Adjust the contact breaker until the correct point gap or dwell angle specification is obtained.



A. Base Screws B. Pry Point

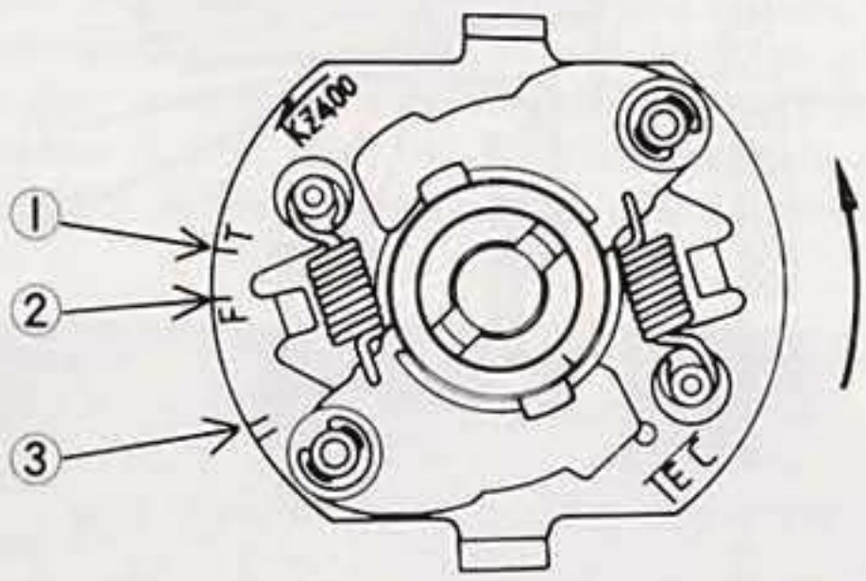
- Tighten the screws (2).
- Perform the timing test.

Timing Test

To inspect the ignition timing there are two marks on the automatic timing advancer. One ("F" mark) is for checking the timing before advancing, and the other (a pair of lines) for checking the timing after it has advanced.

Timing Advancer

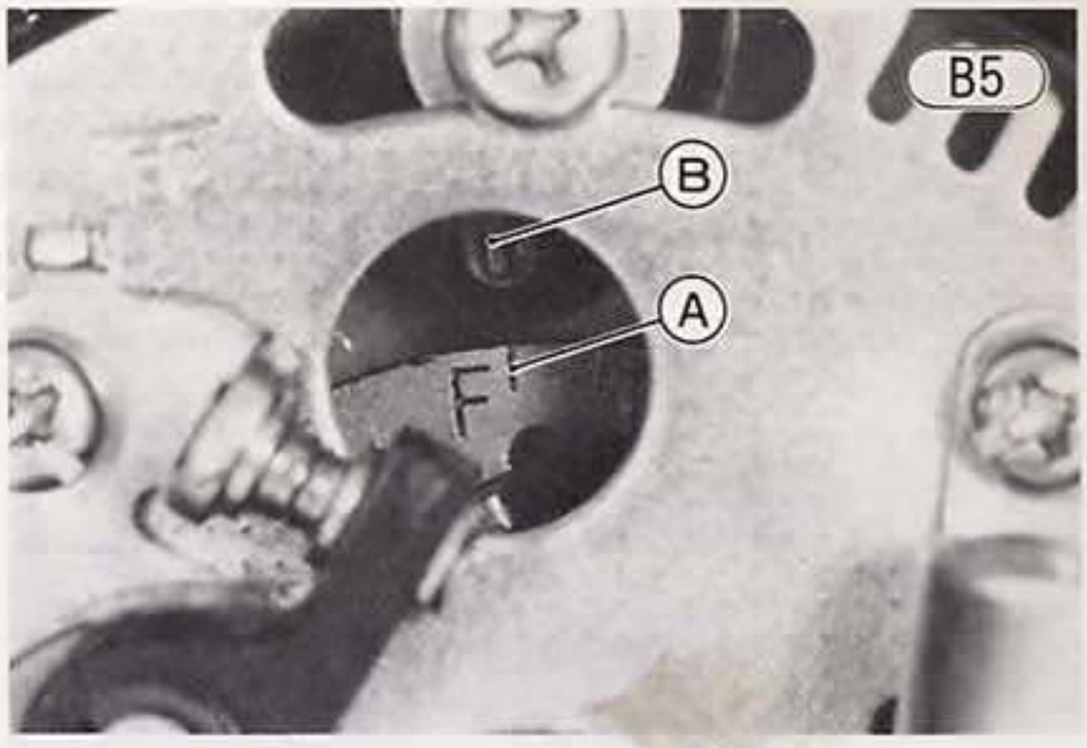
B4



1. "T" Mark 2. "F" Mark 3. Advanced Mark

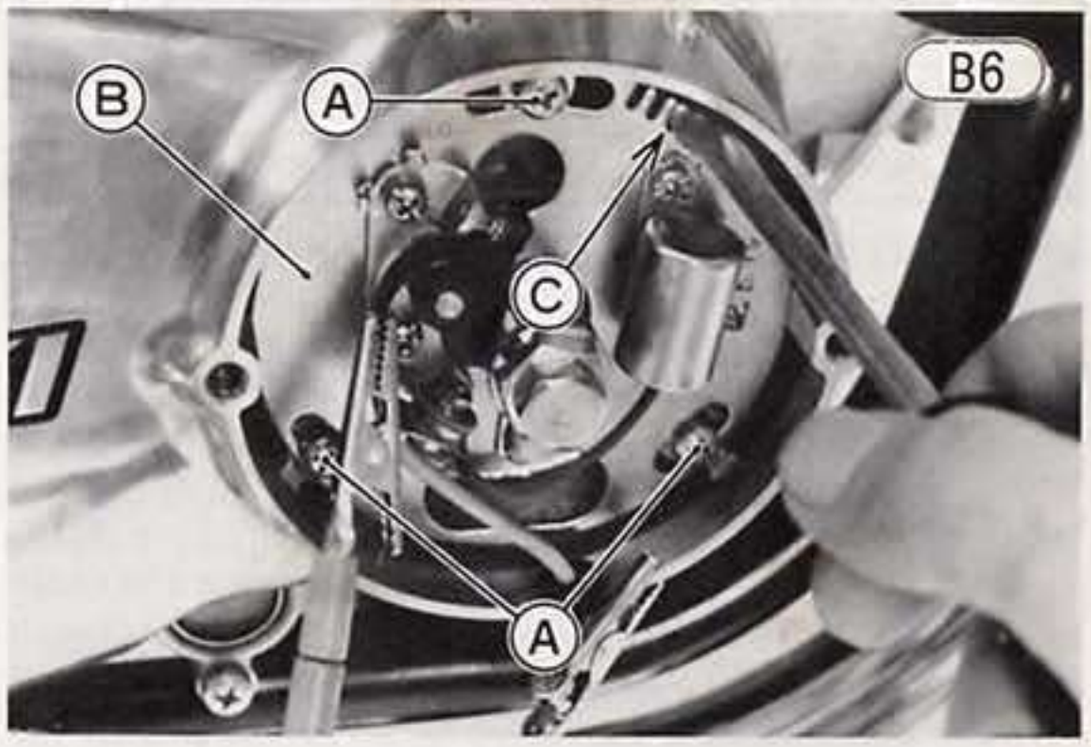
To check and adjust the timing (static):

- Check the point gap, and adjust if necessary.
- With the ignition switch turned off, turn the engine stop switch to one of the "OFF" positions to make the ohmmeter flicker easier to read.
- Set an ohmmeter to the x 1 Ω range and connect it across the points, one lead to the wire coming from the points (or to the spring leaf), and the other ohmmeter lead to chassis ground (engine, frame, contact breaker mounting etc.). Make sure that both leads are securely connected.
- Turning the cranksahft counterclockwise, check to see if the "F" mark is aligned with the timing mark when the needle jumps.



A. "F" Mark B. Timing Mark

- If the timing is incorrect, turn and stop the crankshaft so that the "F" mark (the line adjoining the "F") on the timing advancer is aligned with the timing mark.
- Loosen the contact breaker mounting plate screws (3), and turn the mounting plate (using a screwdriver in the pry points) so that the contacts are just at the point of opening. This point can be found by watching the ohmmeter needle, which will flicker just when the points begin to open or close.



A. Mounting Plate Screws C. Pry Points
B. Mounting Plate

- Tighten the mounting plate screws (3).
- Check the point gap again, and adjust if it was disturbed.
- Disconnect the ohmmeter leads.
- Install the contact breaker cover and its gasket.

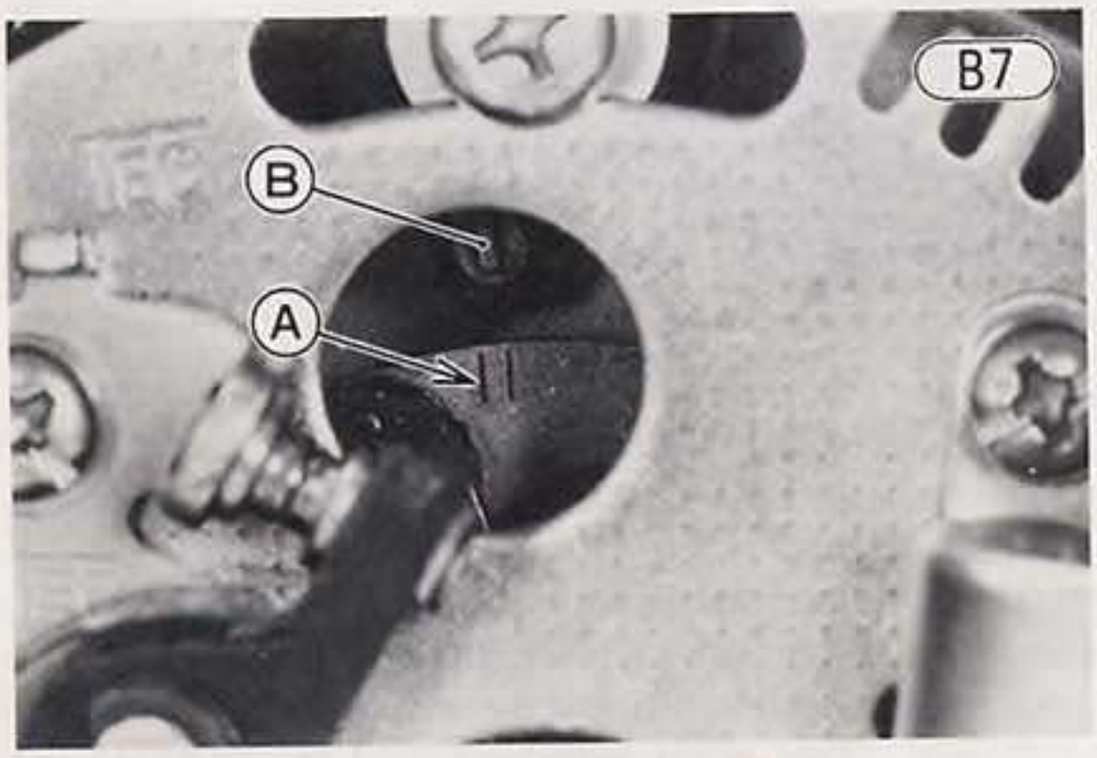
To check the timing (dynamic):

Timing advance begins at 1,400 ~ 1,600 rpm, and reaches the maximum advance at 3,000 ~ 3,400 rpm. So timing must be checked at idle below 1,400 rpm, and then above 3,400 rpm when it is fully advanced.

- Check the point gap, and adjust if necessary.
- Connect a strobe light in the manner prescribed by the manufacturer in order to check the ignition timing under operating conditions.

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•Start the engine, and direct the light at the timing mark through the inspection window. Below 1,400 rpm, the timing mark and the "F" mark on the timing advancer must be aligned for correct low rpm ignition timing (Fig. B5). Above 3,400 rpm, the timing mark and the pair of lines on the timing advancer must be aligned for correct high rpm ignition timing as shown in Fig. B7. If both low and high rpm ignition timing are incorrect, adjust the timing as just explained. If either low or high rpm ignition timing is correct but the other is not, examine the timing advancer mechanism (Pg. 225).



A. Advanced Mark **B. Timing Mark**

Table B3 Timing Advancing

	Engine Speed
Advance Begins	1,400 ~ 1,600 rpm
Full Advance	3,000 ~ 3,400 rpm

•Check the point gap again, and adjust if it was disturbed.
•Install the contact breaker cover and its gasket.

CAMSHAFT CHAIN

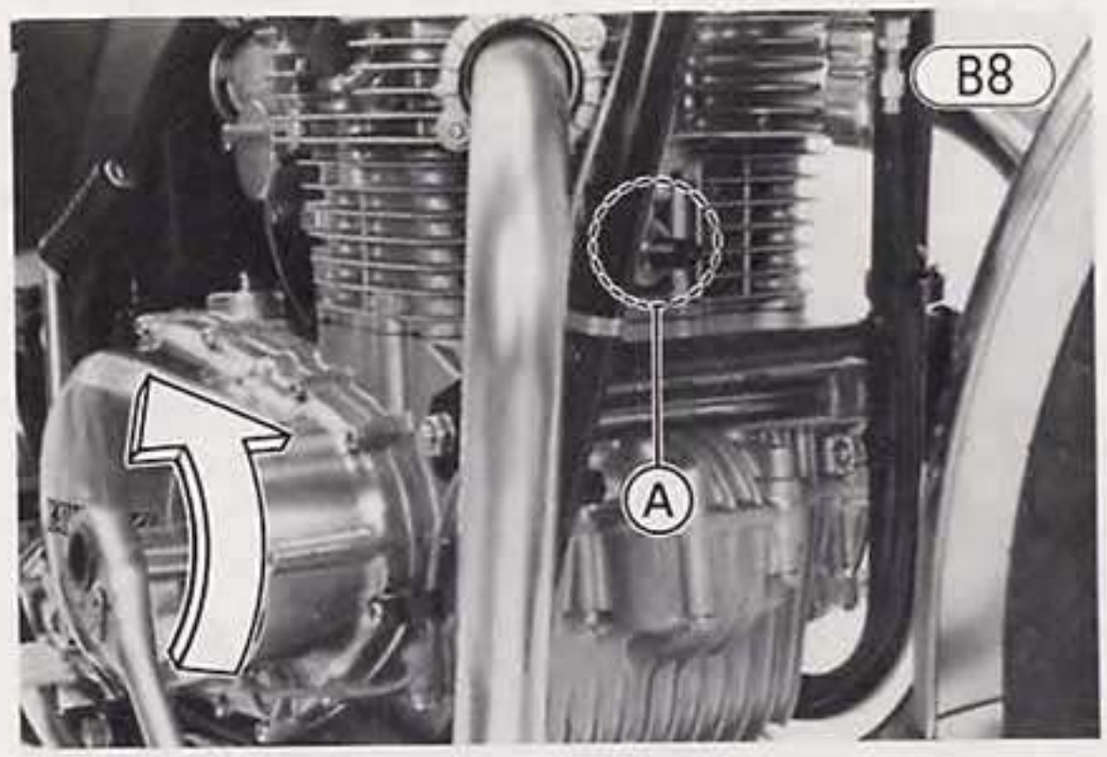
Camshaft chain and chain guide wear cause the chain to develop slack, which will cause noise and may result in engine damage. To keep the chain from making noise, periodic adjustment is necessary in accordance with the Periodic Maintenance Chart (Pg. 10).

However, if the adjustment fails to keep the chain from making noise, the camshaft chain or chain guides have probably worn past their service limits and will need to be replaced.

WARNING **To avoid a serious burn, never touch a hot engine or exhaust pipes during camshaft chain adjustment.**

To adjust the camshaft chain:
•Remove the chain tensioner cap and O ring.
•Remove the contact breaker cover.
•Check to see that the ignition switch is turned off.
•*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 innermost position, and then stop.

NOTE: Do not turn the crankshaft backwards (clockwise). Turning the crankshaft backwards may cause improper adjustment.

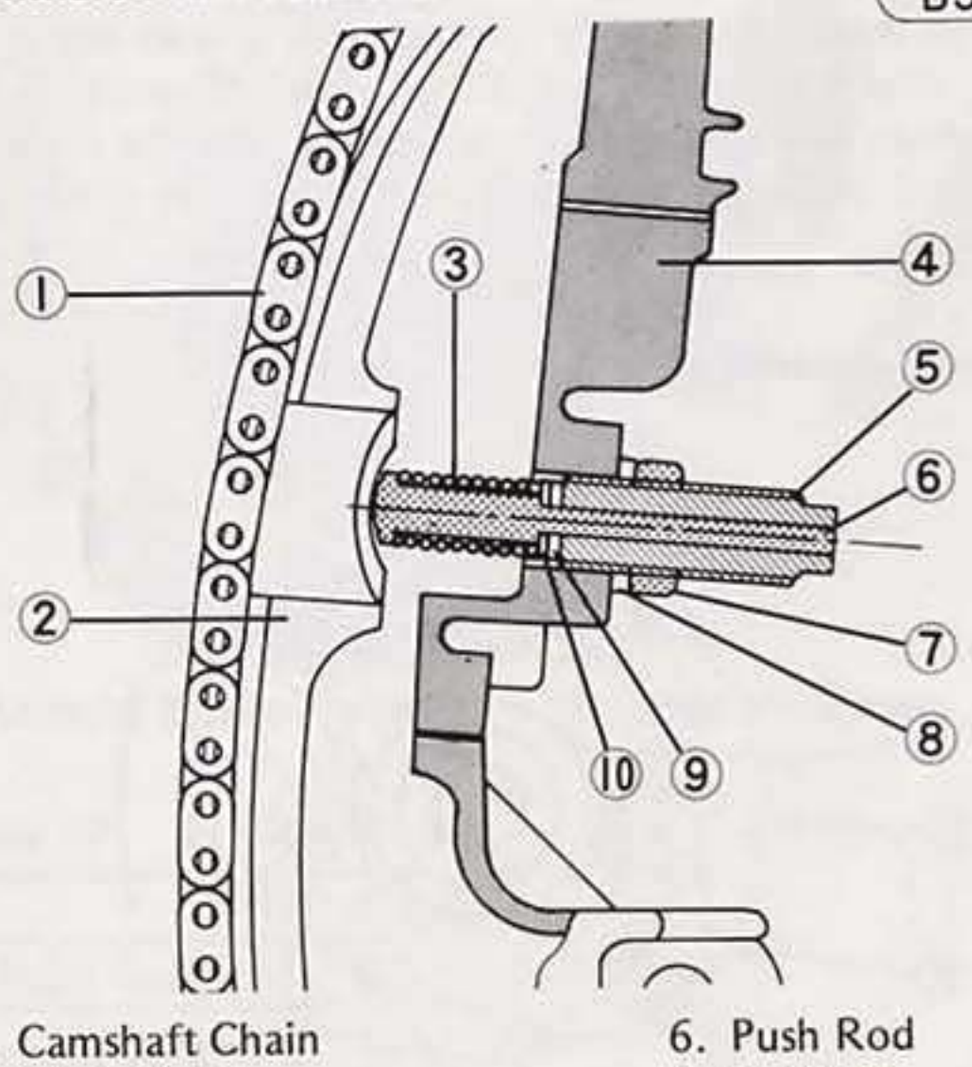


A. Camshaft Chain Tensioner

•Loosen the locknut, and turn in the push rod guide carefully until the ends of the push rod guide and push rod are flush.

CAUTION **Be sure that the ends are flush. Never overtighten the push rod guide after the ends are just flush, or the tensioner and chain may become damaged.**

Camshaft Chain Tensioner B9



1. Camshaft Chain
2. Chain Guide
3. Spring
4. Cylinder Block
5. Push Rod Guide
6. Push Rod
7. Locknut
8. Washer
9. Nylon Washer
10. Steel Washer

•Tighten the locknut to 1.5 kg-m (11.0 ft-lbs) of torque, and install the chain tensioner cap and O ring to 1.5 kg-m (11.0 ft-lbs) of torque.
•Install the contact breaker cover and its gasket.

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.

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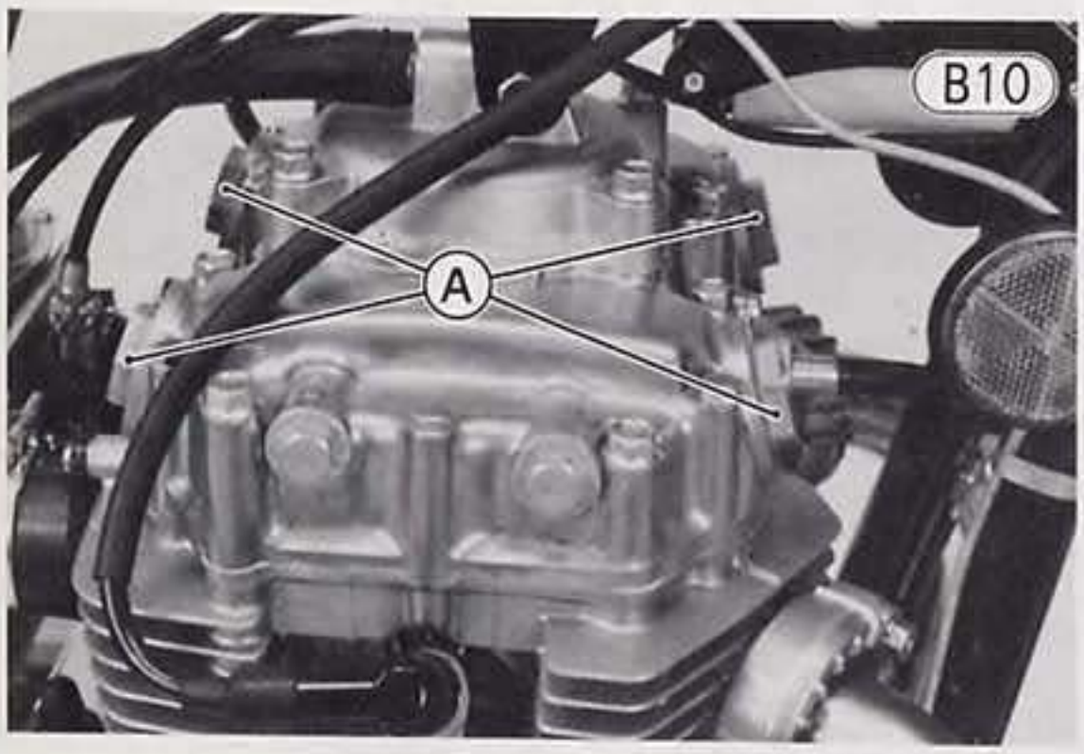
Valve clearance for each valve should be checked and adjusted if incorrect, in accordance with the Periodic Maintenance Chart (Pg. 10) and any time clearance may have been affected by disassembly.

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.

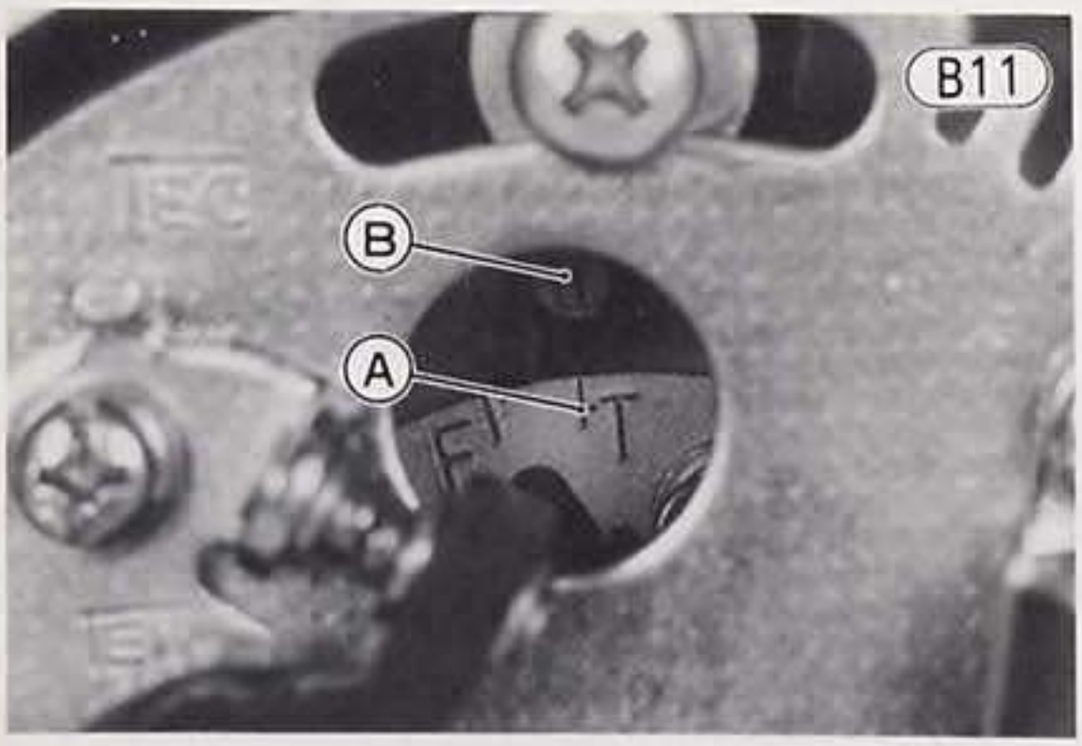
To check and adjust the valve clearance:

- Remove the fuel tank (Pg. 43).
- Remove the valve adjusting caps.



A. Valve Adjusting Caps

- Remove the screws (2), and remove the contact breaker cover.
- 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 ¼ turn until the "T" mark (the line adjoining the "T") on the timing advancer aligns with the timing mark.



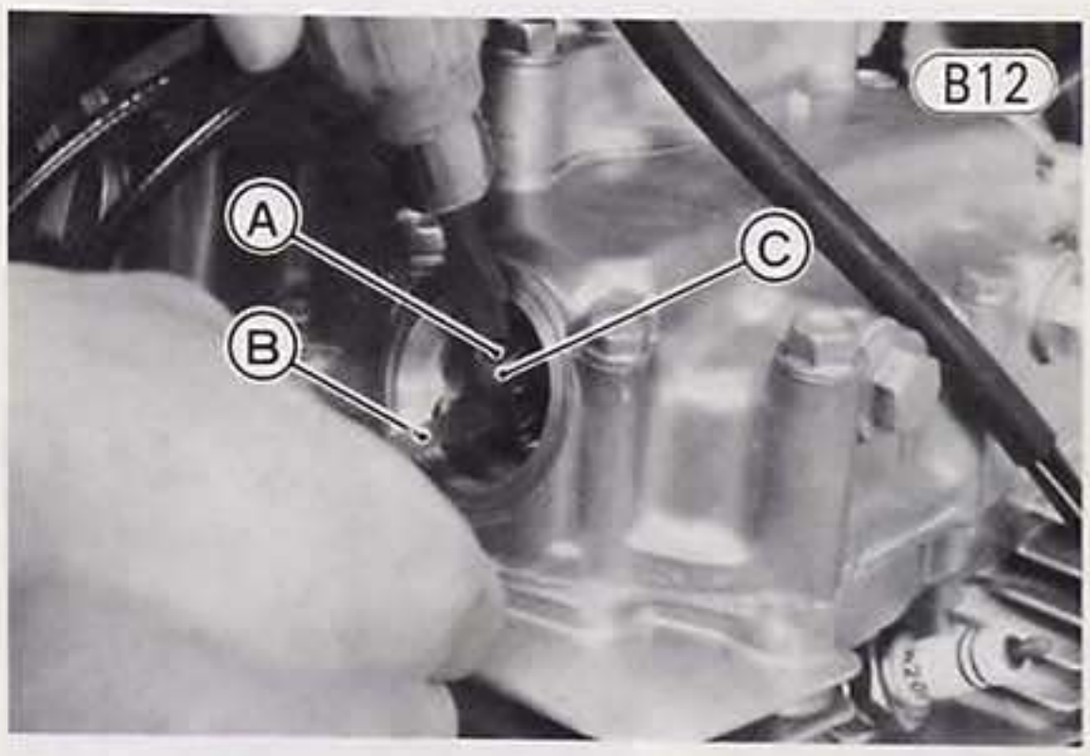
A. "T" Mark **B. Timing Mark**

- 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.
- Measure the clearance of each valve by inserting a thickness gauge (special tool) between the adjusting screw and the valve stem.

Table B4 Valve Adjustment (When cold)

Valve Clearance (for both inlet and exhaust)	0.17~0.22 mm
Locknut Tightening Torque	1.5 kg-m 11.0 ft-lbs

- If a valve clearance is incorrect, loosen its adjusting screw locknut, and turn the adjusting screw until correct clearance is obtained.



A. Adjusting Screw **C. Locknut**
B. Thickness Gauge (57001-1013)

- Tighten the locknut to the specified torque.
- 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.
- Install the valve adjusting caps together with O rings.
- Install the contact breaker cover and its gasket.
- Install the fuel tank (Pg. 43).

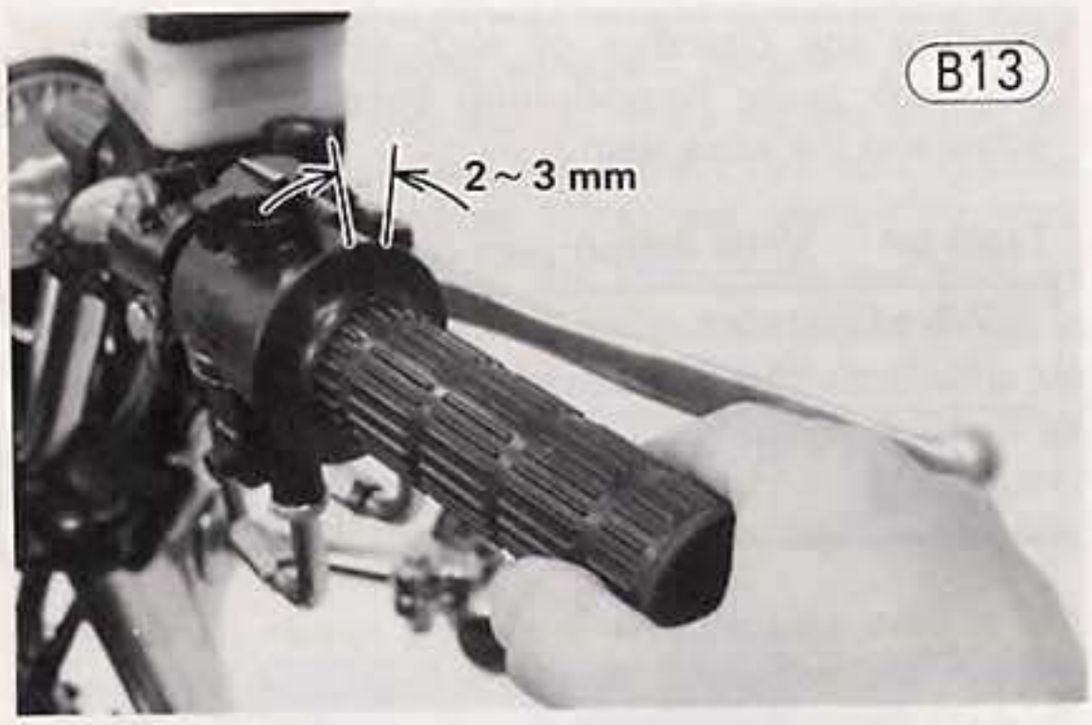
THROTTLE CABLES

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

To check the throttle cable adjustment:

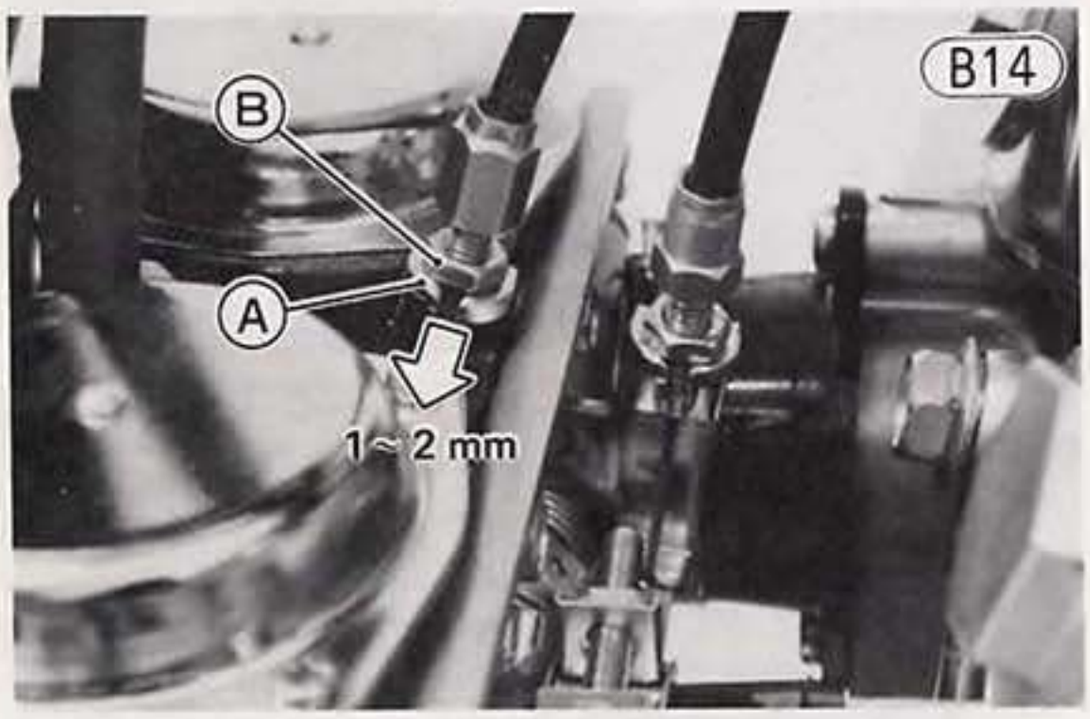
- Check that there is 2 ~ 3 mm throttle grip play (Fig. B13).

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●Push the throttle grip completely closed. At this time the decelerator throttle cable bracket should be pushed down 1~2 mm. When the throttle grip is released, the cable bracket should be returned to its rest position by the spring tension.

NOTE: This assures that the stress of throttle grip return will be taken by the throttle grip, protecting the carburetor linkage mechanism.

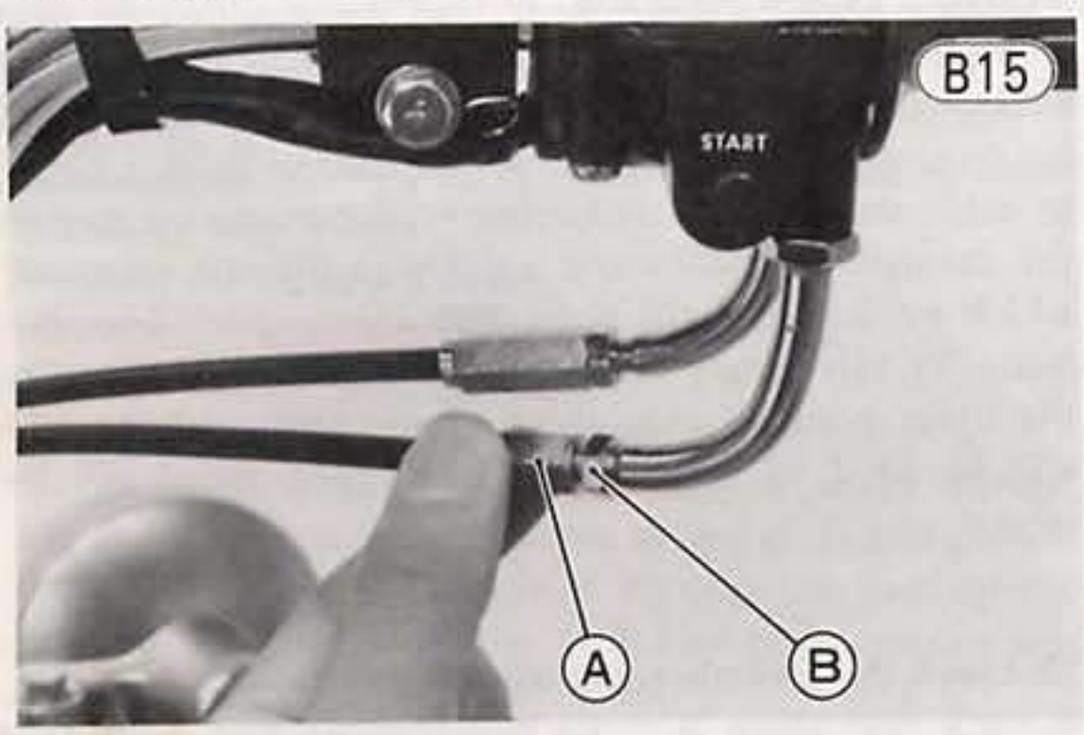


A. Decelerator Throttle Cable Bracket
B. Locknut

If any one of the above checks shows improper adjustment, adjust the throttle cables as follows:

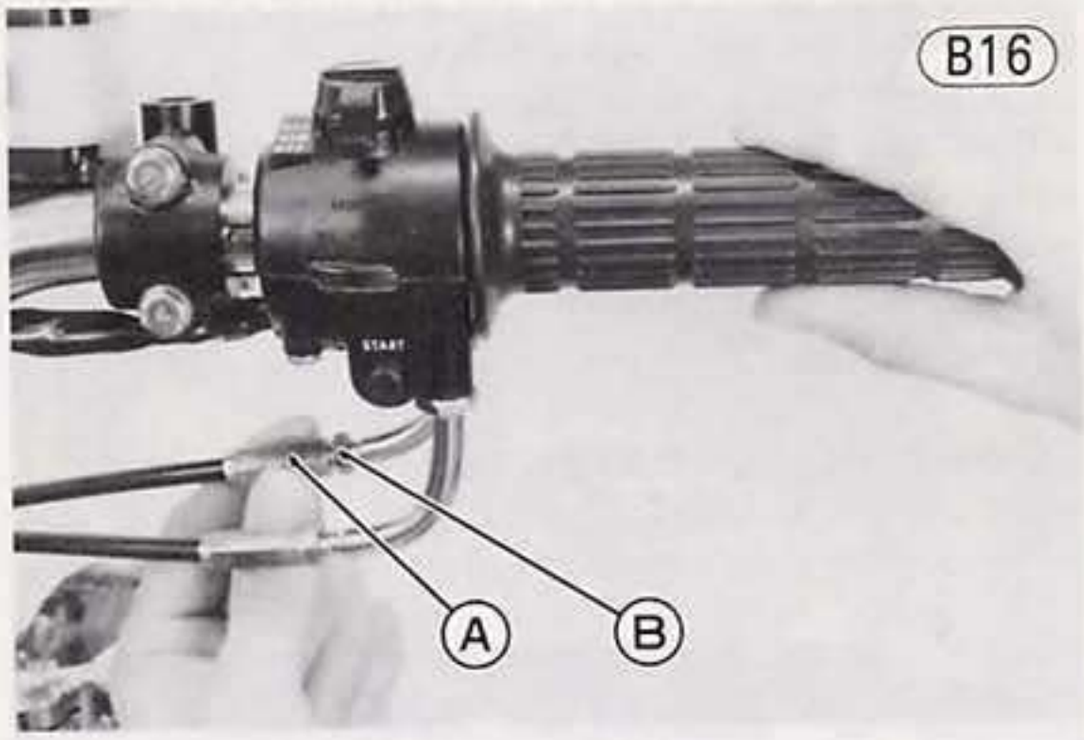
●Loosen the locknuts, and screw both throttle cable adjusting nuts in fully at the upper end of the throttle cables so as to give the throttle grip plenty of play.

●Turn out the decelerator cable adjusting nut until the cable bracket is pushed down 1~2 mm when the throttle grip is completely closed. Tighten the locknut.



A. Decelerator Cable Adjusting Nut **B. Locknut**

●Turn the accelerator cable adjusting nut until 2~3 mm of throttle grip play is obtained. Tighten the locknut.



A. Accelerator Cable Adjusting Nut
B. Locknut

NOTE: If the throttle cables can not be adjusted by using the cable adjusting nuts at the upper end of the throttle cables, use the cable adjusters at the lower ends of the throttle cables. Do not forget to securely tighten the adjuster locknuts.

CARBURETORS

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 idle speed is too low, the engine may stall; when the idle speed is too high, the fuel comsumption becomes excessive, and the resulting lack of engine braking 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 carburetor adjustment, first check the following and adjust if necessary:

Engine Oil (Pg. 20)
Spark Plugs (Pg. 12)
Ignition Timing (Pg. 12)
Throttle Cables (Pg. 15)
Cylinder Compression (Pg. 167)
Air Cleaner Element (Pg. 149)
Air Cleaner Duct and Carburetor Holder Leakage
Camshaft Chain (Pg. 14)
Valve Clearance (Pg. 14)

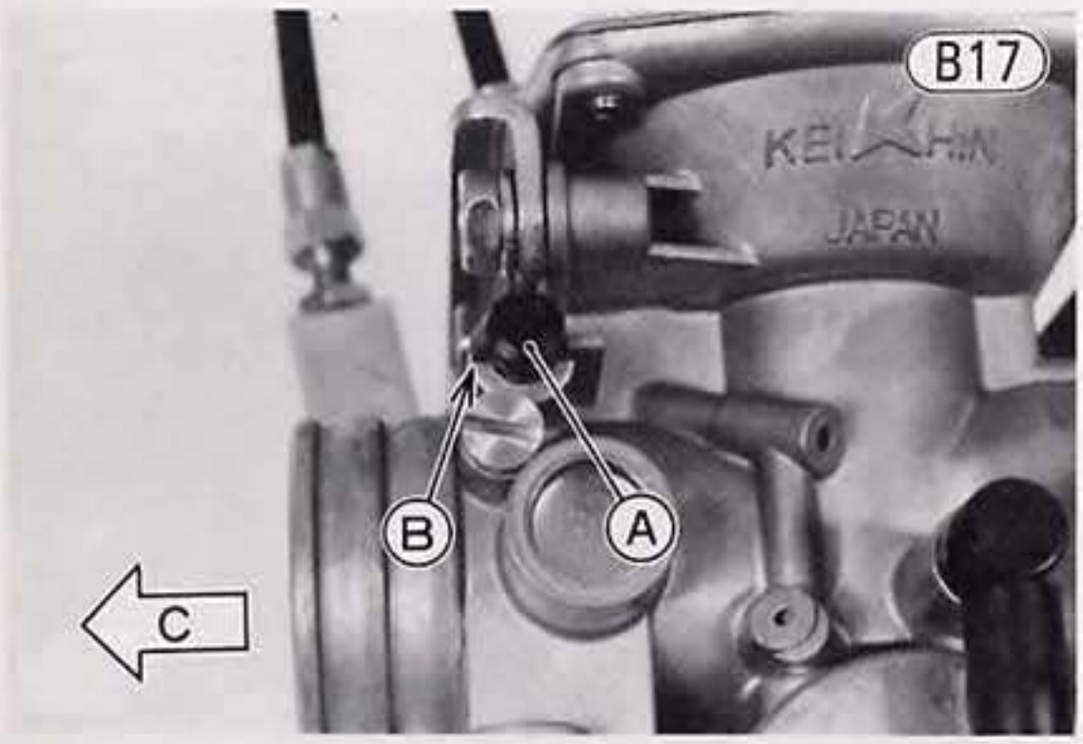
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Preliminary Adjustment

If the engine idling is especially rough or the carburetors have been disassembled, it is necessary to pre-adjust the butterfly valves, pilot screws, and choke mechanism before making the idling adjustment and the fine synchronization. First remove the carburetors from the engine (Pg. 45) leaving the throttle cables connected, and adjust the following.

Pilot screws

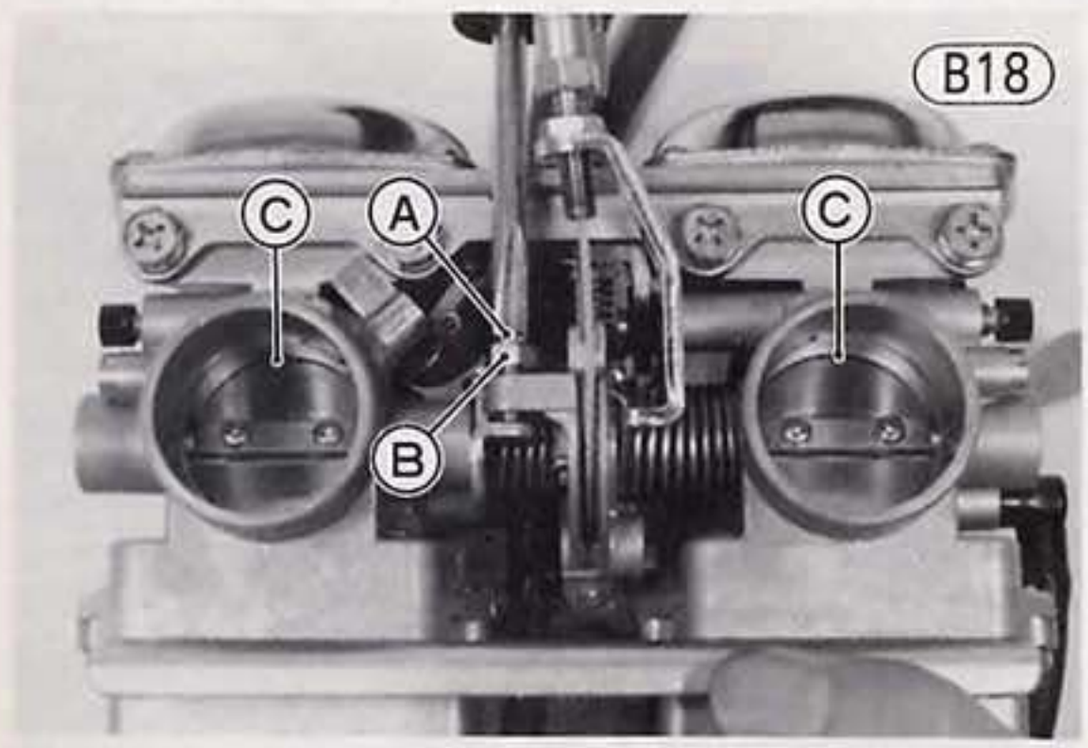
- If the carburetors were disassembled, turn in the pilot screw until it seats lightly, and then back it out 1¼ turns. Remount the pilot screw limiter to the pilot screw so that the ridge of its points towards the front.



A. Pilot Screw Limiter C. Front
B. Ridge

Butterfly valves

- Check to see that both butterfly valves open and close smoothly without no binding when turning the throttle grip.
- If the butterfly valves do not close at the same time by visual inspection, synchronize them using the following procedure.
- Loosen the locknut and turn the balance adjusting screw to obtain the same gap between the butterfly valve and the bore in each carburetor.

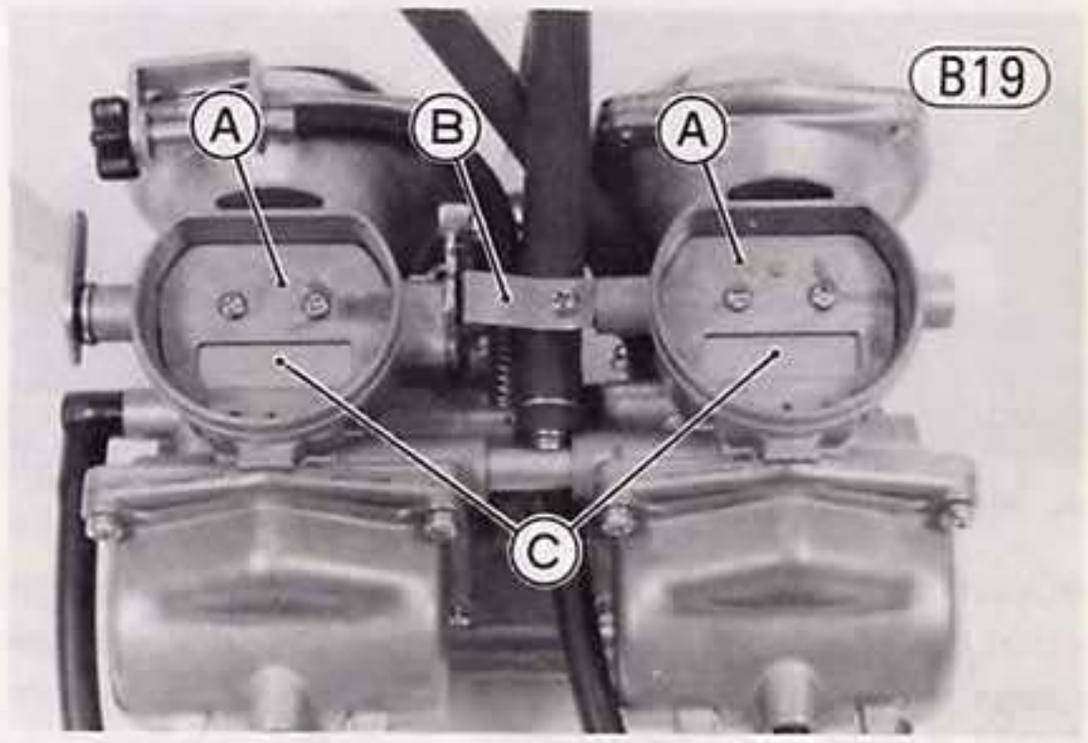


A. Balance Adjusting Screw C. Gap
B. Locknut

- Tighten the locknut.

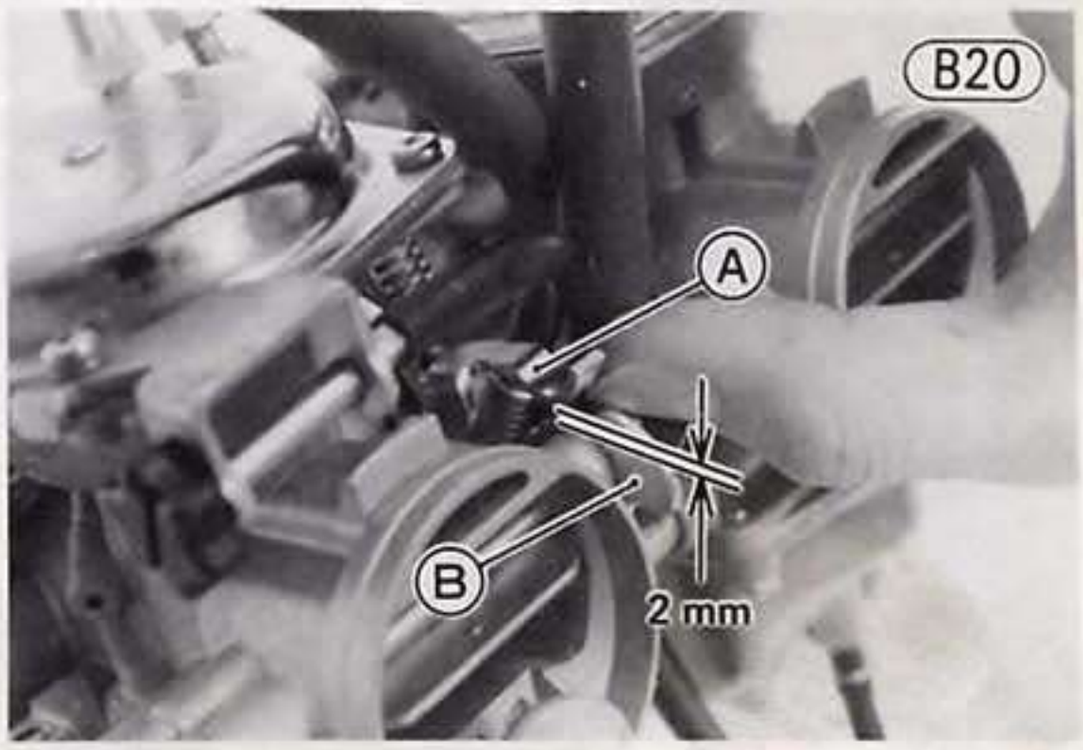
Choke linkage

- Check to see that the choke valve in each carburetor closes completely when the choke lever is pulled up. If they do not, adjust them by bending the link plate carefully.



A. Choke Valve C. Relief Valves
B. Link Plate

- Check to see that the relief valve in each carburetor opens easily and closes under spring tension. If it does not, replace the damage parts.
- Turn out the idle adjusting screw until both butterfly valves close fully.
- Check whether or not there is a slight clearance (about 2 mm) between the idling link and the idling cam when the idling link is pushed up with the choke valve fully opened (choke lever pushed down).



A. Idling Link B. Idling Cam

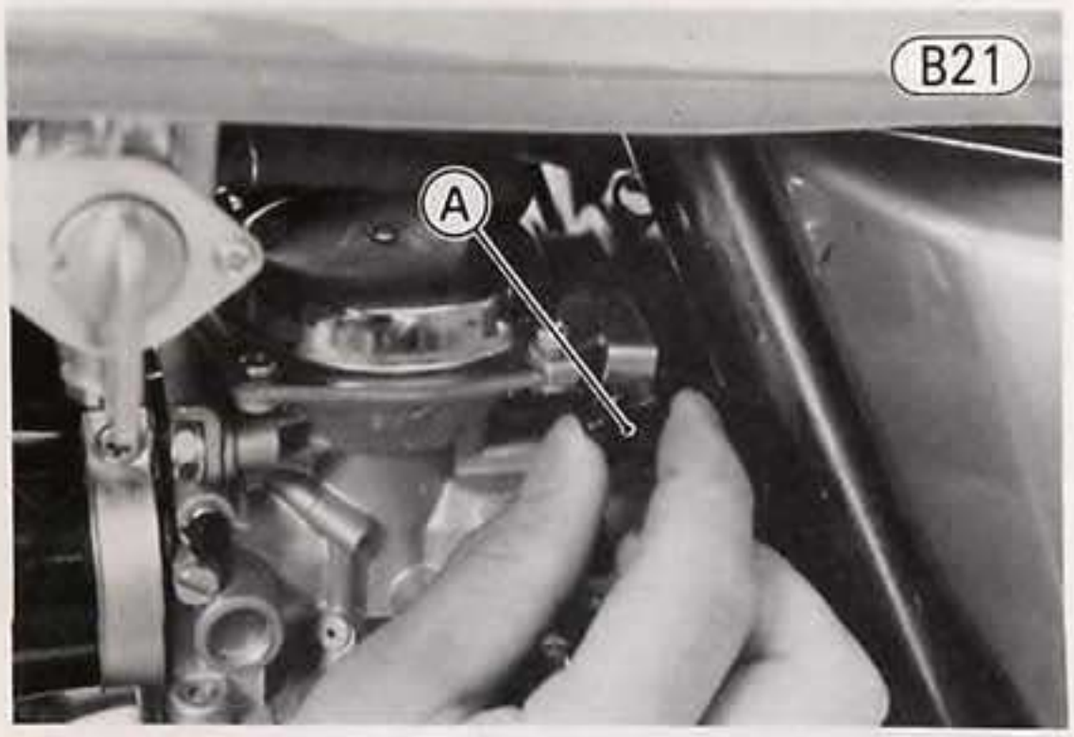
- If there is not proper clearance, adjust the clearance by bending the idling link carefully.
- Install the carburetors (Pg. 46), and check the play in the throttle cables (Pg. 15).

Idling Adjustment

- If the carburetors were disassembled, set the pilot screws as explained in Preliminary Adjustment.
- Start the engine, and warm it up for 5 minutes.

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- Adjust the idle speed to 1,000 ~ 1,200 rpm by turning the idle adjusting screw (KZ400-B).
- Back out the idle adjusting screw until the engine is at the lowest rpm that it turns over smoothly (KZ400-C).



A. Idle Adjusting Screw

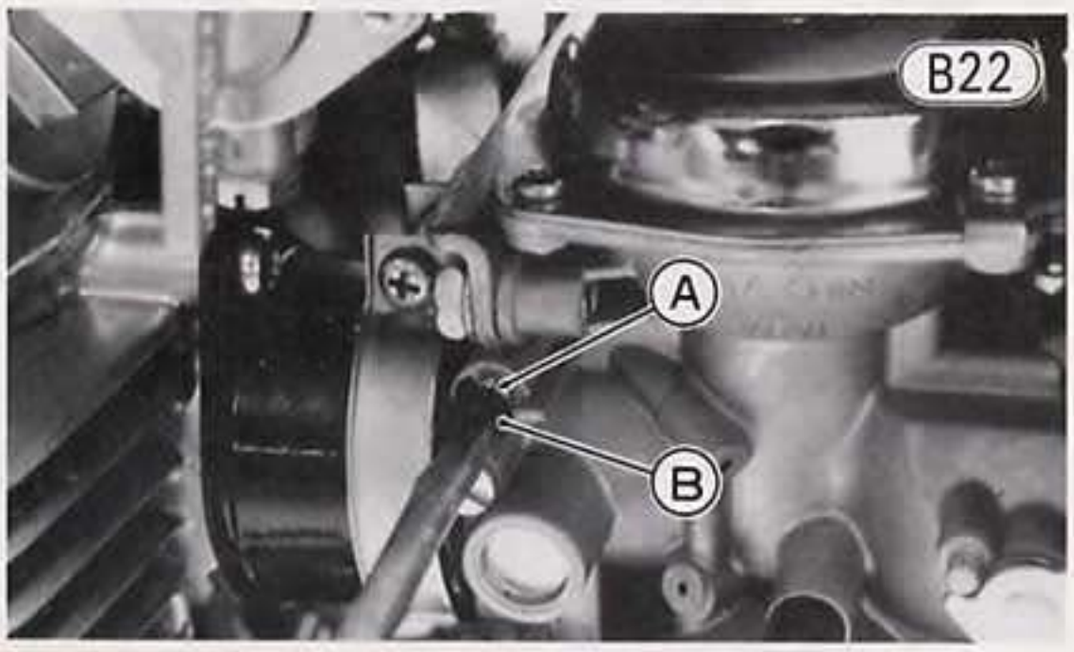
- Open and close the throttle a few times to make sure that the idle speed does not change. Readjust if necessary.

NOTE: With the engine idling, turn the handlebar to either side. If handlebar movement changes idle speed, the throttle cables may be improperly adjusted or incorrectly routed, or they may be damaged.

WARNING **Operation with improperly adjusted, incorrectly routed, or damaged cables could result in an unsafe riding condition.**

NOTE: A satisfactory result may be obtained by using the procedure just described, but an experienced mechanic can get a more precise adjustment of engine idle mixture by using the following 3 steps.

- Turn both pilot screws, one at a time, to obtain the highest engine rpm. Turn the pilot screw only within the range allowed by the ridge on the pilot screw limiter.



A. Pilot Screw **B. Pilot Screw Limiter**

- Adjust the idle speed to the specified rpm by turning the idle adjusting screw (KZ400-B).
- Turn the idle adjusting screw to set the idle speed to the lowest stable speed obtainable (KZ400-C).
- Check to see if the engine rpm rises when the pilot screw positions are altered. If it rises, repeat the last two steps alternately until the engine is idling satisfactorily, and engine speed cannot be increased by further adjustment of the pilot screws.

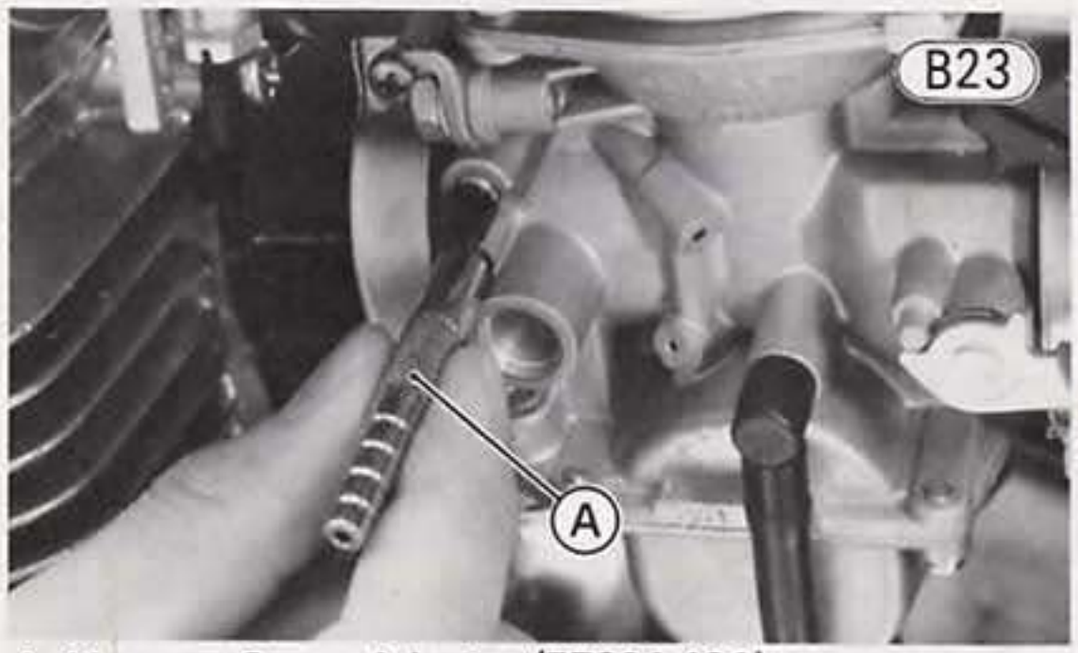
Carburetor Synchronization

Fine adjustment of carburetor synchronization, necessary for smooth engine operation, requires the use of vacuum gauges. Differences between the left and right cylinders might be found from exhaust noise and exhasut pressure; but to accurately synchronize each carburetor, the use of vacuum gauges is essential.

NOTE: During carburetor synchronization, the fuel tank will be removed. In most cases, it will be necessary to temporarily replace the standard fuel line with line long enough to reach the fuel tank while it is located on your workbench. Plug the open end of the vacuum hose during carburetor synchronization so that no extra air can be drawn into the carburetor.

WARNING **Use extreme caution when working with gasoline, open fuel lines, etc. to avoid a fire or explosion.**

- Start the engine, and warm it up for 5 minutes.
- Perform idling adjustment (Pg. 17).
- Stop the engine.
- Remove the vacuum plugs from each carburetor, and attach the vacuum gauge and adapter (special tools).

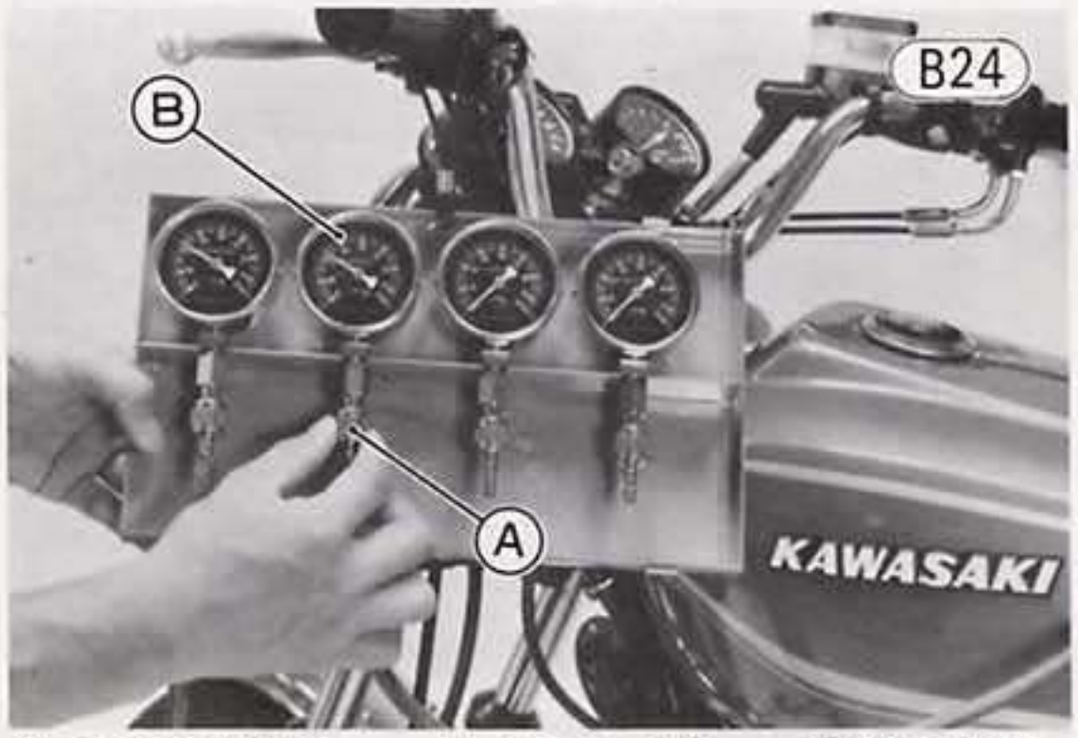


A. Vacuum Gauge Adapter (57001-401)

- Completely close the vacuum gauge damper valves, and then start the engine.
- With the engine running at idle speed, slowly open the vacuum gauge damper valves until gauge needle flutter is less than 3 cm Hg and note the gauge readings.

Table B5 Engine Vacuum

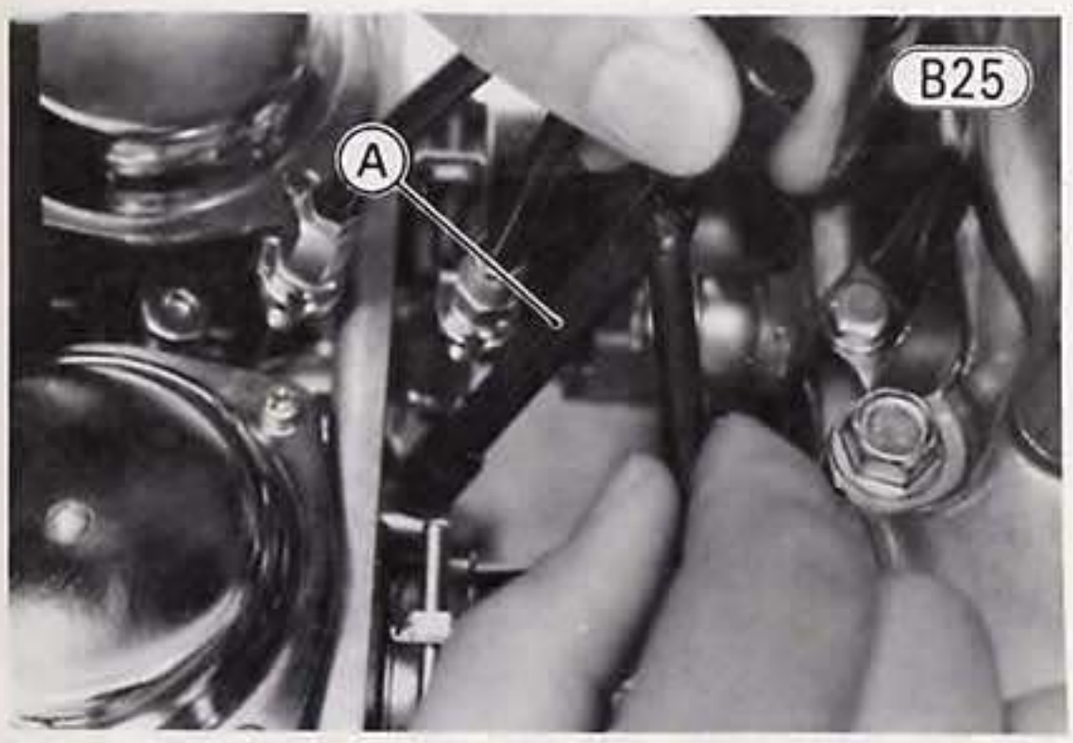
Engine Vacuum	21 ~ 27 cm Hg
Difference between two cylinders	less than 3 cm Hg



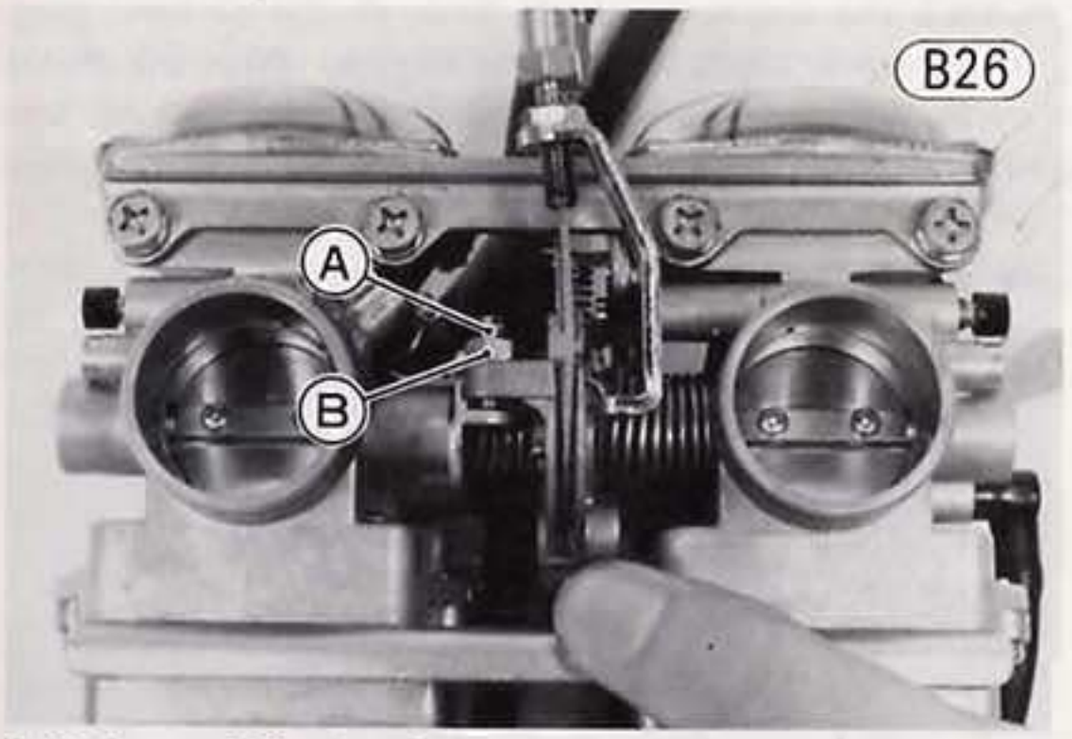
A. Damper Valve **B. Vacuum Gauge (57001-226)**

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- If there is a differnece of more than the specified value between the two gauges, stop the engine, and synchronize the carburetors according to the following procedure.
- Remove the fuel tank (Pg. 43), and supply fuel for the carburetors by some means during adjustment.
- With the engine running at idle speed, loosen the locknut and alter the balance adjusting screw position using the balance adjuster (special tool) to obtain a difference in readings which is less than the specified value. Tighten the locknut.



A. Balance Adjuster (57001-351)



A. Balance Adjusting Screw B. Locknut

- Perform idling adjustment again.
- Open the throttle grip and let it snap shut a few times. Make sure the vacuum readings stay within the specified vacuum reading. If they do not, repeat the last two steps.
- If any gauge reads 5 cm Hg or more below the specified pressure after synchronizing the carburetors; recheck the points listed in Preliminary Checks (Pg. 17).
- After the carburetors are properly synchronized, tighten the locknut without changing the position of the adjusting screw.
- Detach the vacuum gauges and adapter, and install the vacuum plugs.
- Install the fuel tank (Pg. 43).

CLUTCH

Clutch cable stretch causes the clutch lever to develop excessive play. Too much play will prevent complete disengagement and may result in shifting difficulty and possible clutch and transmission damage. Most of the play must be adjusted out, but a small amount must remain so that the clutch release lever will function properly.

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

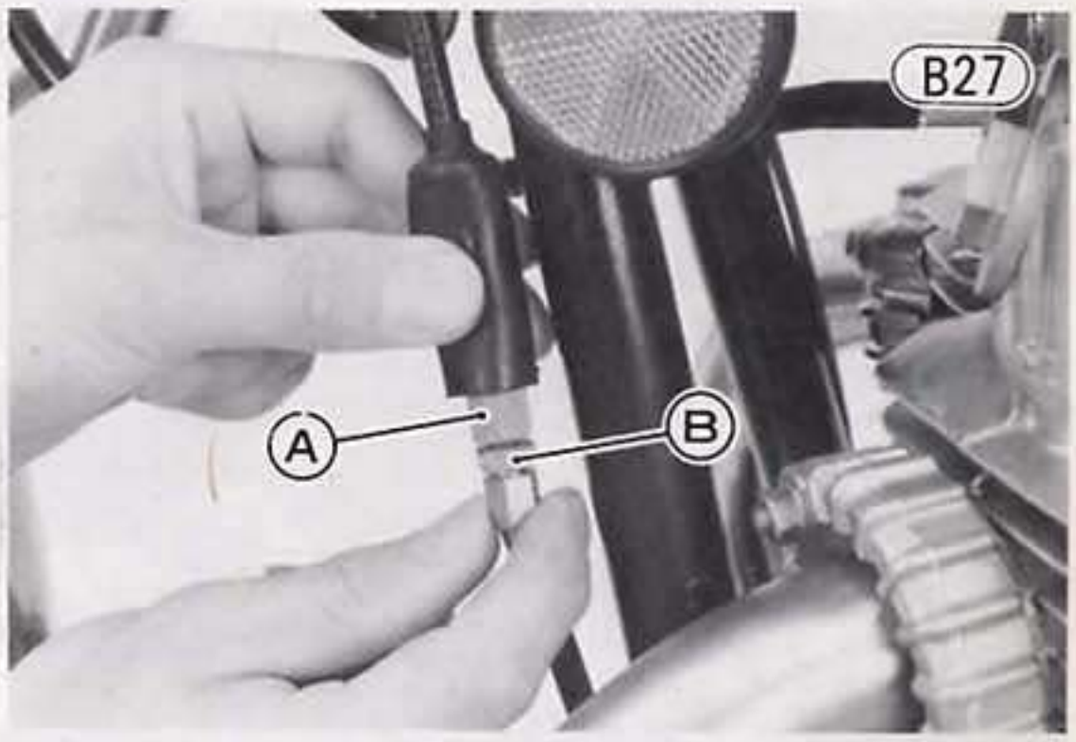
NOTE: Even though the proper amount of play exists at the clutch lever, clutch lever play alone cannot be used to determine whenever or not the clutch requires adjustment.

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

WARNING **To avoid a serious burn, never touch a hot engine or exhaust pipe during clutch adjustment.**

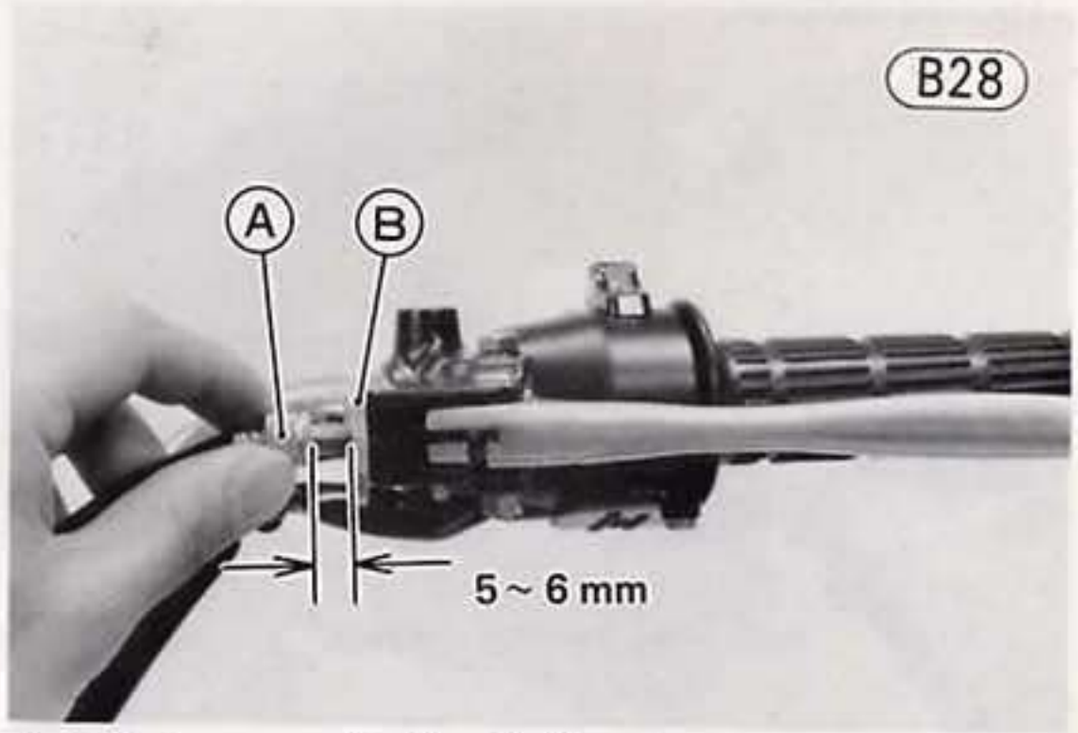
To adjust the clutch:

- Slide up the adjuster dust cover out of place.
- Loosen the locknut, and turn in fully the adjusting nut at the center of the clutch cable to give the cable plenty of play.



A. Adjusting Nut B. Locknut

- Loosen the knurled locknut 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 knurled locknut.

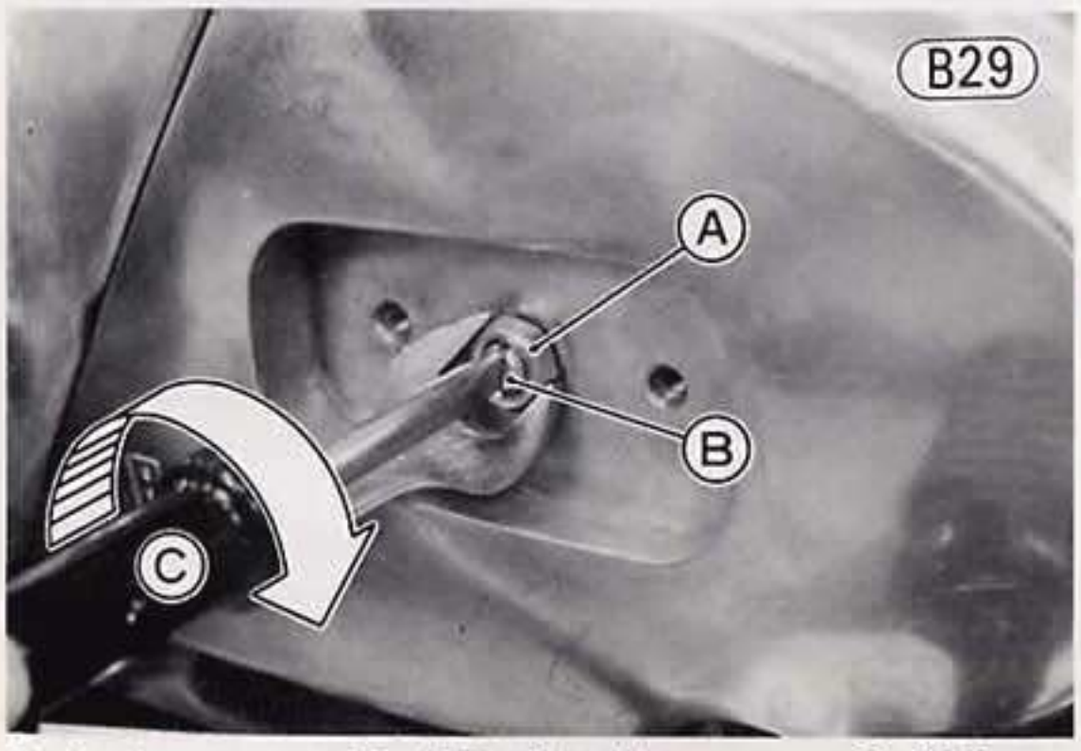


A. Adjuster B. Knurled Locknut

- Remove the clutch release adjusting cover.

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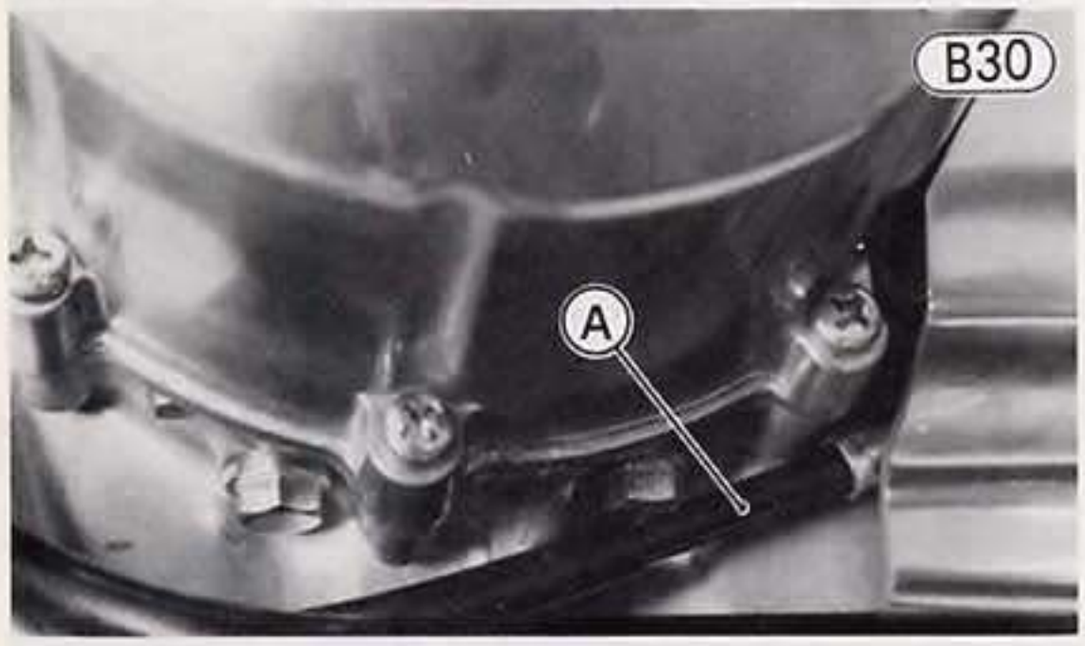
- Loosen the locknut, and turn in the adjusting screw until the screw turns without drag.
- Turn **out** the adjusting screw until it becomes hard to turn. This is the point where the clutch is just starting the release.
- Turn **in** the adjusting screw ¼ turn from that point, and tighten the locknut.



A. Locknut B. Adjusting Screw C. ¼ Turn

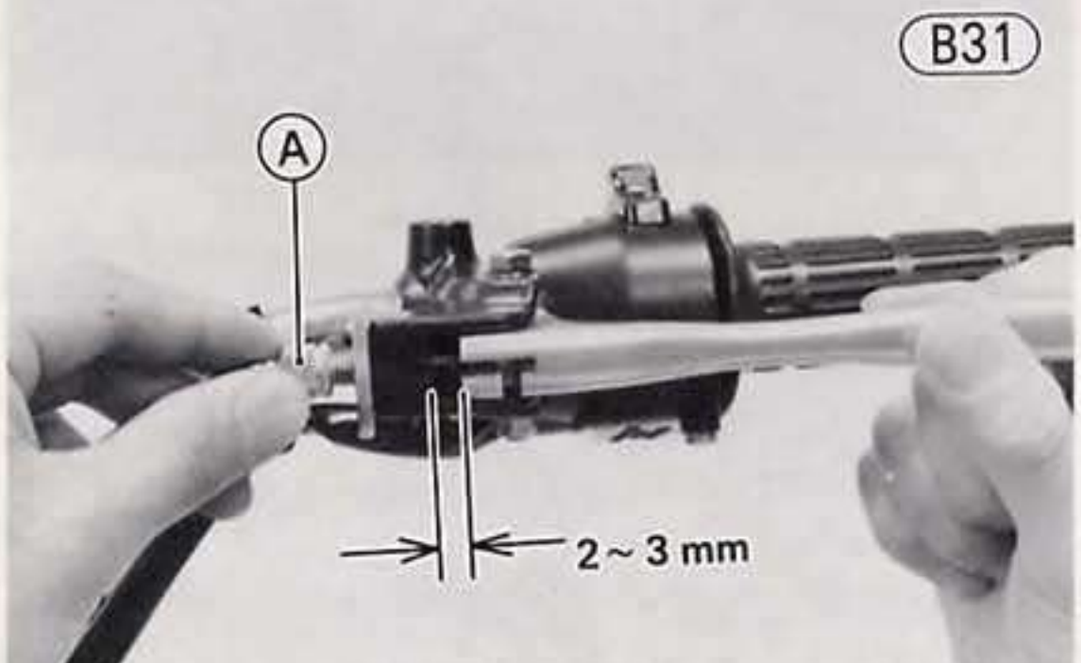
- Take up all the cable play with the adjusting nut at the center of the cable, and then tighten the locknut.

WARNING **Be sure the cable is fully seated in the engine sprocket cover hole, or it could slip into place later, creating enough cable play to prevent clutch disengagement.**



A. Clutch Cable

- Slide back the adjuster dust cover.
- Turn the adjuster at the clutch lever so that the clutch lever will have 2 ~ 3 mm of play and tighten the knurled locknut.



A. Adjuster

- Install the clutch release adjusting cover.

ENGINE OIL

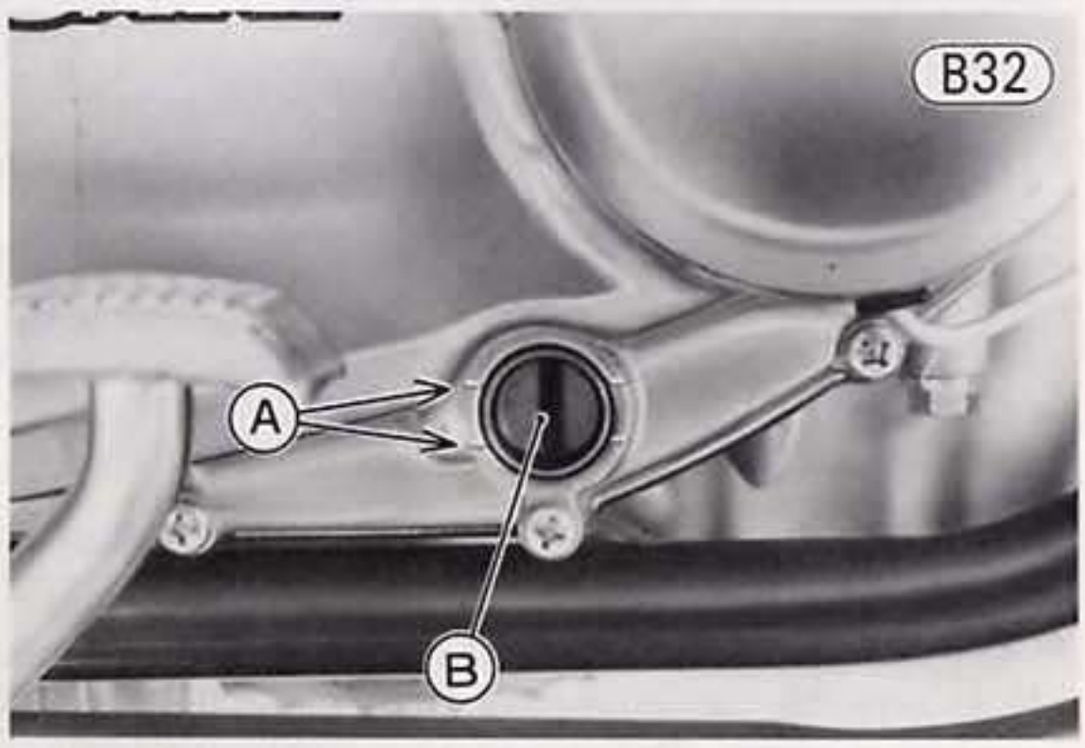
In order for the engine, transmission, and clutch to function properly; maintain the engine oil at the proper level, and change the oil in accordance with the Periodic Maintenance Chart (Pg. 10). Motorcycle operation with insufficient, deteriorated, or contaminated engine oil will cause accelerated wear and may result in engine or transmission seizure.

Oil Level Inspection

- Situate the motorcycle so that it is perpendicular to the ground.
- If the oil has just been changed, start the engine and run it for several minutes at idle speed. This fills the oil filter with oil. Stop the engine, then wait several minutes until the oil settles.

CAUTION **Run the engine at idle speed for several minutes. Racing the engine before the oil reaches every part can cause engine seizure.**

- If the motorcycle has just been used, wait several minutes for all the oil to drain down.
- Check the engine oil level through the oil level gauge in the lower right side of the engine. With the motorcycle held level or on the center stand, the oil level should come up between the lines next to the gauge.



A. Level Lines B. Oil Level Gauge

- If the oil level is too high, remove the excess oil, using a syringe or some other suitable device.
- If the amount of oil is insufficient, add the correct amount of oil through the oil filler opening. Use the same type and make of oil that is already in the engine.

CAUTION **If the engine oil get extremely low or if the oil pump or oil passages clog up or otherwise do not function properly, the red oil pressure warning light in the switch panel will light. If this light stays on when the engine speed is above 1,500 rpm, stop the engine immediately, and find the cause.**

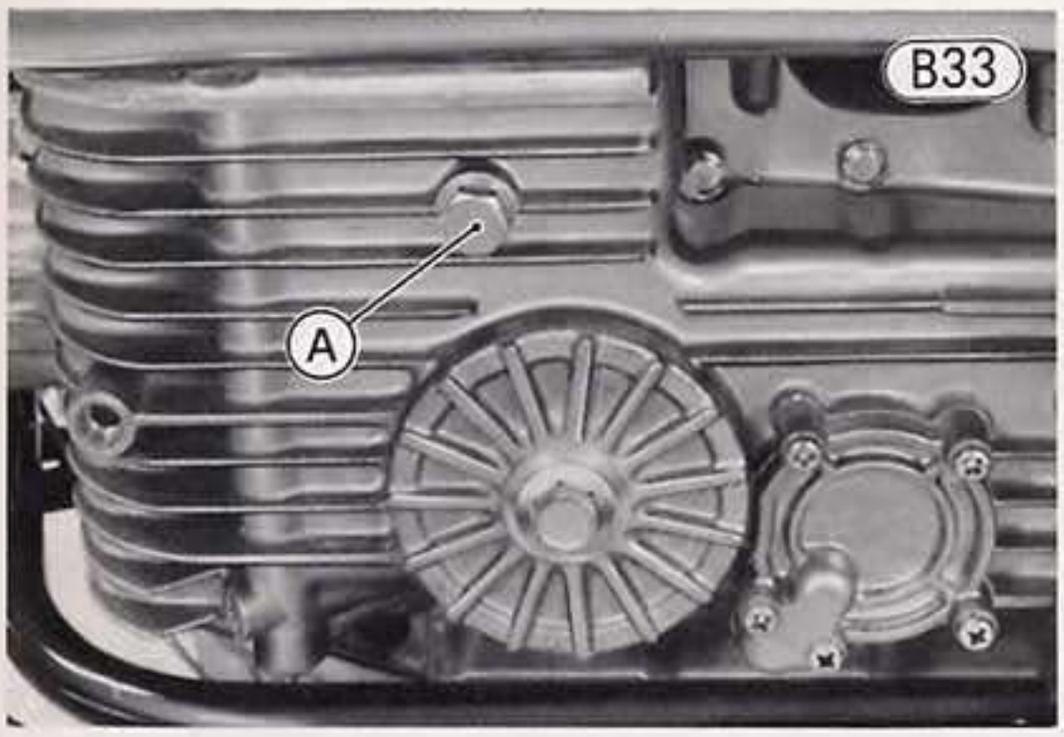
WARNING **If the engine runs without oil, it will be severely damaged. In addition, the engine may suddenly seize, locking the rear wheel and causing**

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an accident if the clutch lever is not pulled in fast enough.

Oil and Oil Filter Change

- Warm up the engine thoroughly, and then stop the engine.
- Situate the motorcycle so that it is perpendicular to the ground, place an oil pan beneath the engine, and remove the engine drain plug.



A. Engine Drain Plug

- If the oil filter is to be changed, replace the oil filter as explained on Pgs. 77~78.
- After the oil has completely drained out, install the drain plug and gasket. Replace the damaged gasket with a new one. Proper torque for the engine drain plug is 3.0 kg-m (22 ft-lbs).
- Fill the engine up to the upper level with SE class SAE 10W40, 10W50, 20W40, or 20W50 motor oil. It will take about 2.9 liters when the filter is changed. When the filter is not changed, a refill takes about 2.5 liters.

NOTE: After the engine has been run and then stopped for a few minutes, the oil level should be between the upper and lower marks.

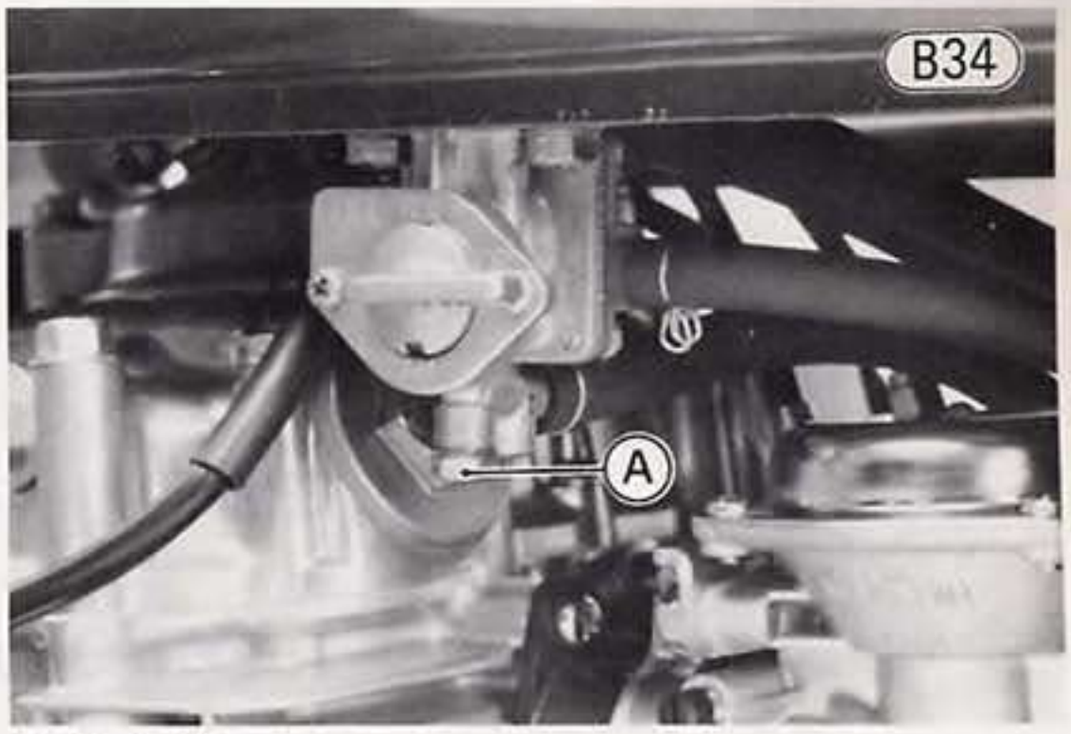
FUEL SYSTEM

Water anywhere in the fuel system can cause starting difficulty, poor running, and lack of power. Clean out the fuel system as follows:

WARNING

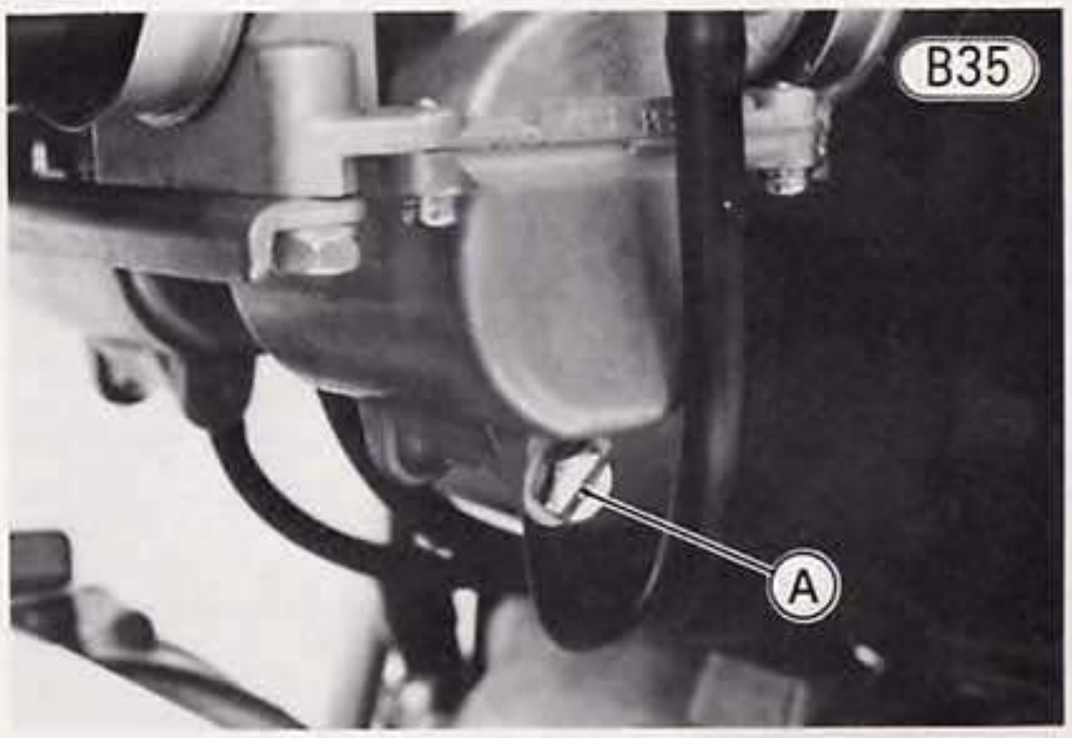
1. **Clean the fuel system in a well-ventilated area, and take ample care that there are no sparks or flame anywhere near the working area.**
2. **Never clean out the fuel system when the engine is still warm.**
3. **Wipe any fuel off the engine before starting it.**

- Remove the drain plug at the bottom of the fuel tap.
- Holding a container under the fuel tap, turn the tap to the "PRI" position to drain the tank until only gasoline comes out, and then turn the tap to the "ON" position.



A. Drain Plug

- Install the gasket and the drain plug on the tap.
- If there was water inside the fuel tank, there may also be some in the carburetor float bowls.
- Remove the drain plug from the bottom of each carburetor float bowl to drain the bowls.



A. Drain Plug

- Install the O rings and drain plugs on the float bowls.

Adjustment — Chassis

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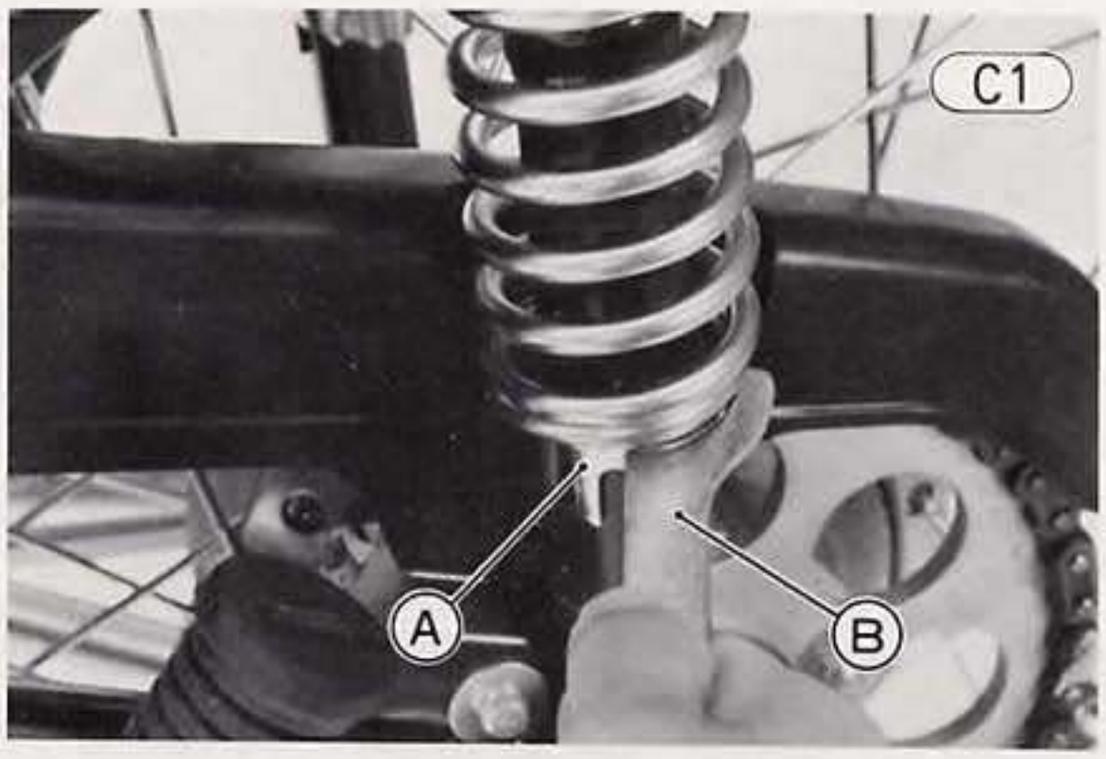
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REAR SHOCK ABSORBERS

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, riding on bad roads, or riding with a passenger. Shock absorbers adjusted either too soft or too hard adversely affect riding comfort and stability.

To adjust the rear shock absorbers:

- 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.



A. Adjusting Sleeve **B. Hook Spanner**

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

WARNING **If they are not adjusted to the same position, an unsafe riding condition may result.**

DRIVE CHAIN

Chain and sprocket wear causes the chain to stretch, which results in power loss, accelerated chain and sprocket wear, and increased noise. A chain that has been adjusted too loose may be thrown off the sprockets. A chain that has been adjusted too tight will wear excessively and possibly break.

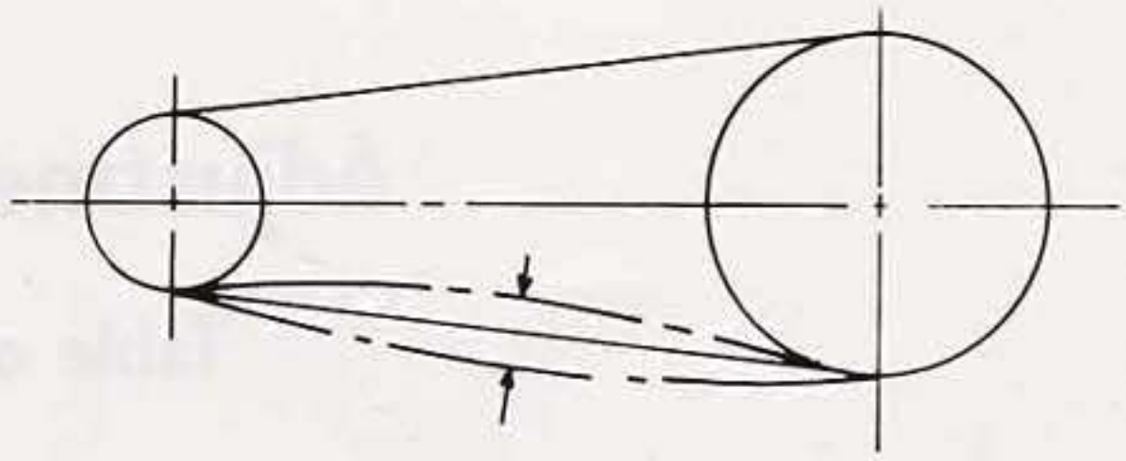
To check the drive chain slack:

- Check to see if the drive chain wear is past the service limit (Pg. 198). A chain worn past the service limit must be replaced with a new one.

WARNING **A chain worn past the service limit must be replaced. Such wear cannot be adequately compensated for by adjustment.**

- Set the motorcycle up on its center stand. In the case of KZ400-C, stand the motorcycle on its side stand.
- Rotate the rear wheel to find the position where the chain is tightest, and measure the vertical movement midway between the sprockets.

Chain Slack



- If the drive chain is too tight or too loose, adjust it so that the vertical movement will be within the standard value.

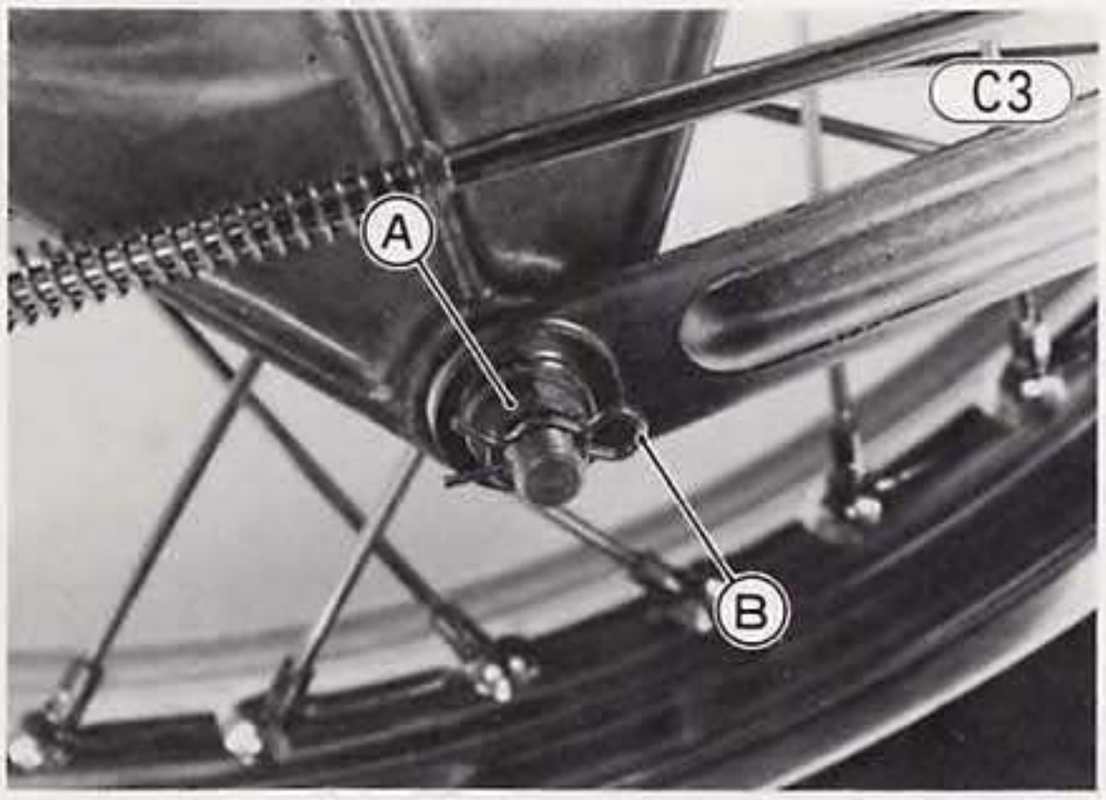
Table C1 Drive Chain Slack

	Vertical Movement	
Model	Standard (no adjustment required)	Too tight or too loose (adjustment required)
KZ400-B (on center stand)	25 ~ 30 mm	less than 25 mm more than 35 mm
KZ400-C (on side stand)	20 ~ 25 mm	less than 20 mm more than 30 mm

To adjust the drive chain:

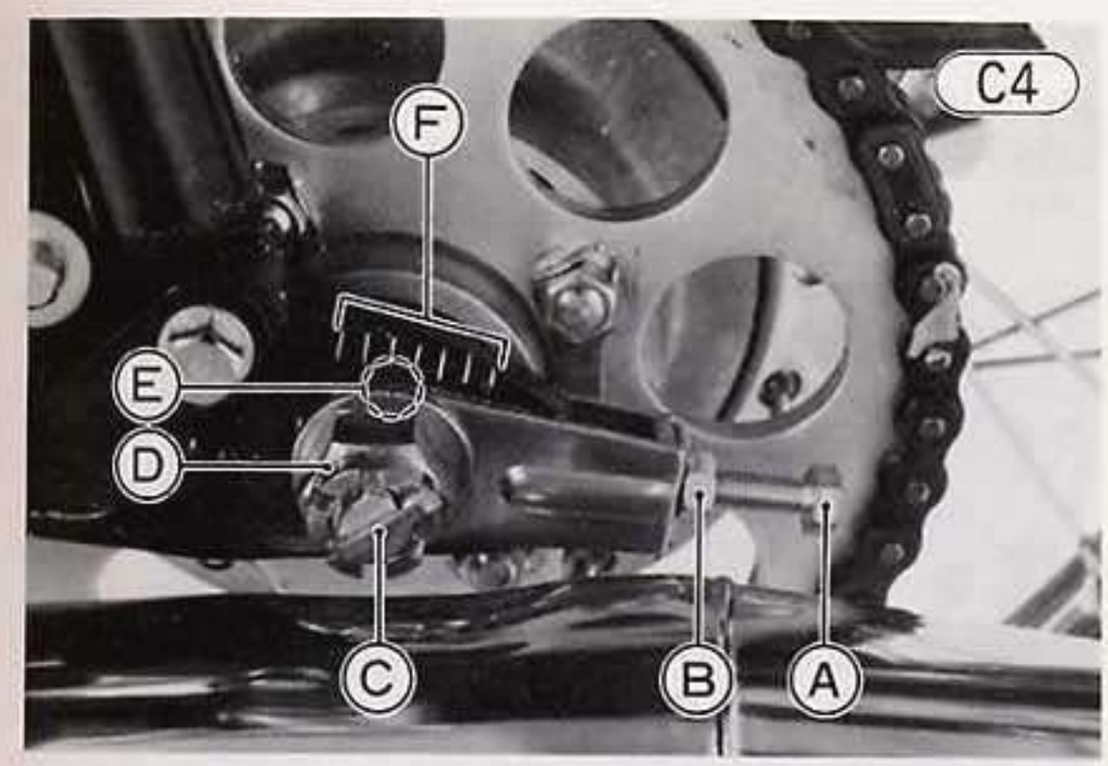
- Remove the safety clip, and loosen the nut at the rear end of the torque link.

CAUTION **If you don't loosen the torque link nut, it may lead to brake panel fracture when the chain adjusters are set.**



A. Torque Link Nut **B. Clip**

- Loosen the left and right chain adjusting bolt locknuts.
- Remove the axle cotter pin and loosen the axle nut.



A. Adjusting Bolt
B. Locknut
C. Cotter Pin
D. Axle Nut
E. Notch
F. Alignment Marks

- If the chain is too tight, back out the left and right chain adjusting bolts evenly, and kick the wheel forward until the chain is too loose.
- Turn the left and right chain adjusting 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 align with the same swing arm mark that the right chain adjuster notch aligns with.

NOTE: Wheel alignment can also be checked using the straightedge or string method.

WARNING **Misalignment of the wheel will result in abnormal wear, and may result in an unsafe riding condition.**

- Tighten both chain adjuster locknuts (Make sure the axle stays aligned).
- Center the brake panel assembly in the brake drum. This is done by tightening the axle lightly, spinning the wheel, and depressing the brake pedal forcefully. The partially tightened axle allows the brake panel assembly to center itself within the brake drum.

NOTE: This procedure can prevent a soft, or "spongy feeling" brake.

- Tighten the axle nut to 12.0 kg-m (87 ft-lbs) of torque.
- Rotate the wheel, measure the vertical movement again at the tightest position, and readjust if necessary.
- Insert a new cotter pin through the axle nut and axle, and spread its ends.
- Tighten the torque link rear nut to 3.0 kg-m (22 ft-lbs) of torque, and then insert the safety clip.
- Check the rear brake (Pg. 27).

BRAKES

Front Brake (on KZ400-B)

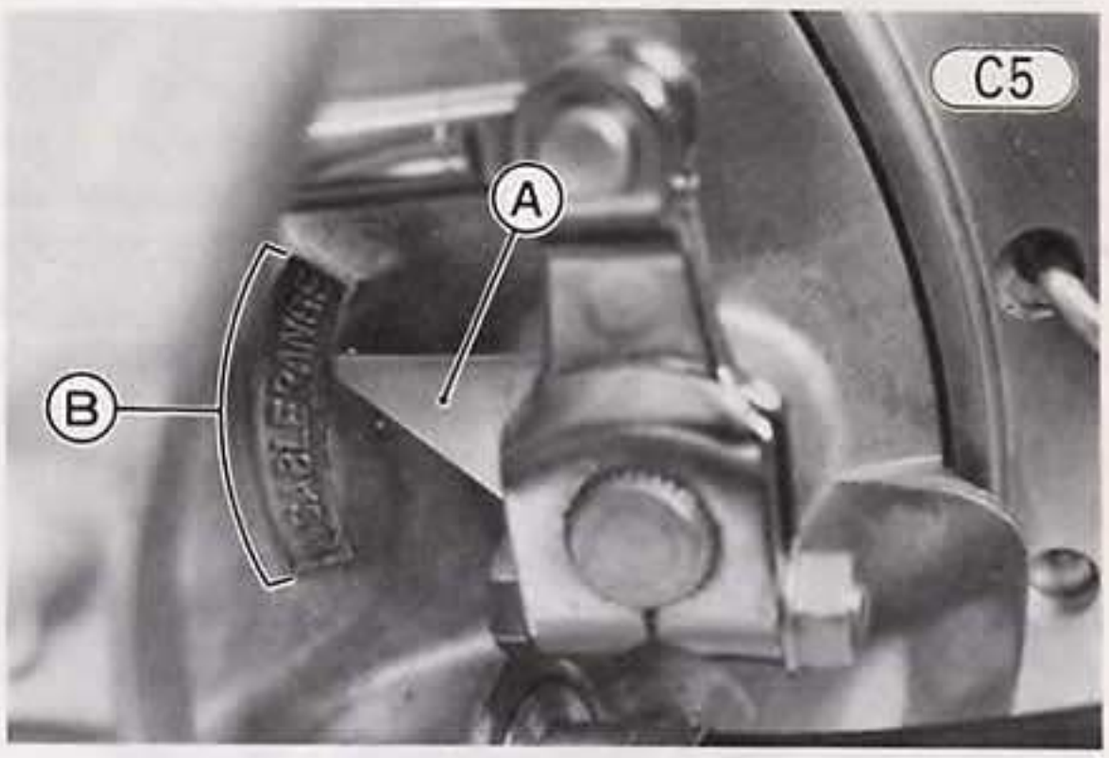
Disc and disc pad wear is automatically compensated for and has no effect on the brake lever action. So there are no parts that require adjustment on the front brake. However if the brake lever has a soft, or "spongy feeling", check the brake fluid level in the master cylinder and bleed the air from the brake line (Pg. 203).

Front Brake (on KZ400-C)

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

If brake drag is detected during brake adjustment, disassemble the brake (Pg. 111), and inspect for wear or damage (Pg. 206). Also, if the brake lever does not return to its rest position quickly upon release, inspect the brake for wear or damage. If the brake has a soft, or "spongy feeling", make sure the brake panel is properly synchronized.

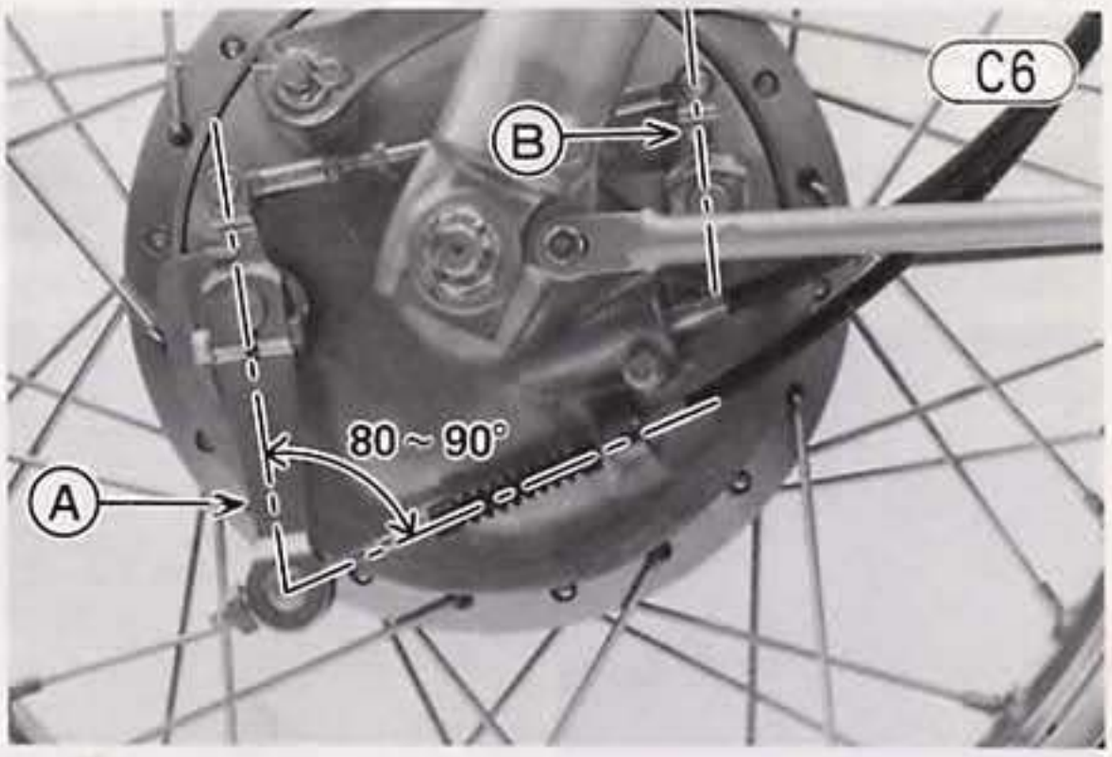
On the outside of the front brake panel there is a brake lining wear indicator. Whenever the indicator has gone past USABLE RANGE, the brake shoes must be immediately replaced and the other brake parts examined. Adjustment alone cannot compensate for the wear of a brake worn past USABLE RANGE.



A. Wear Indicator
B. USABLE RANGE

Cam Lever Angle

- When the brake is fully applied, the primary brake cam lever should come to an 80~90° 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.



A. Primary Brake Cam Lever
B. Secondary Brake Cam Lever

- If they do not, remove the cam levers and then remount them at new positions on the shafts to achieve the proper angle, or loosen the locknut and turn the connecting rod to make the two cam levers parallel.

WARNING **Since a cam lever angle greater than 90° reduces braking effectiveness, this adjustment should not be neglected. When remounting the**

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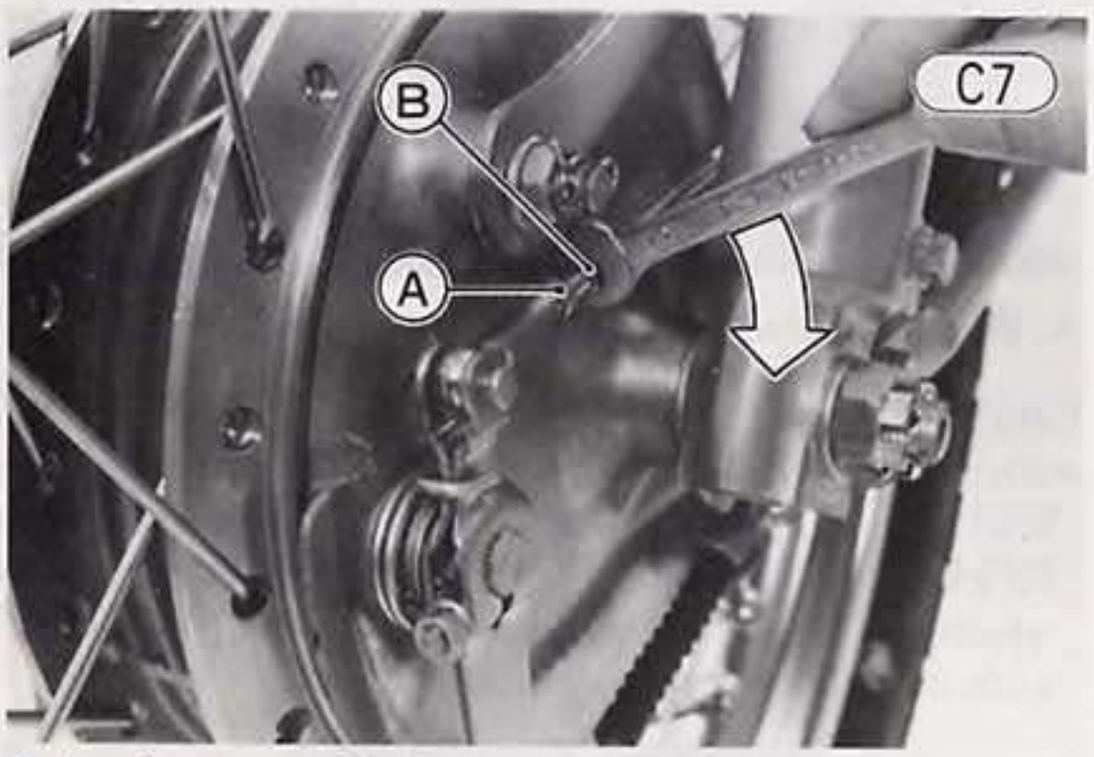
cam, be sure that the position of the indicator on the serrated shaft is not altered. See Pg. 112 for detailed information on the position of the wear indicator when the cam lever is not on the shaft. A change in cam lever angle is caused by wear of internal brake parts. Whenever the cam lever angle is adjusted, also check for drag and proper 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.

- Rotate the wheel to check for brake drag.
- Operate the brake lever a few times to see that it returns to its rest position immediately upon release.
- Adjust the front brake lever.

Brake Shoe Synchronization

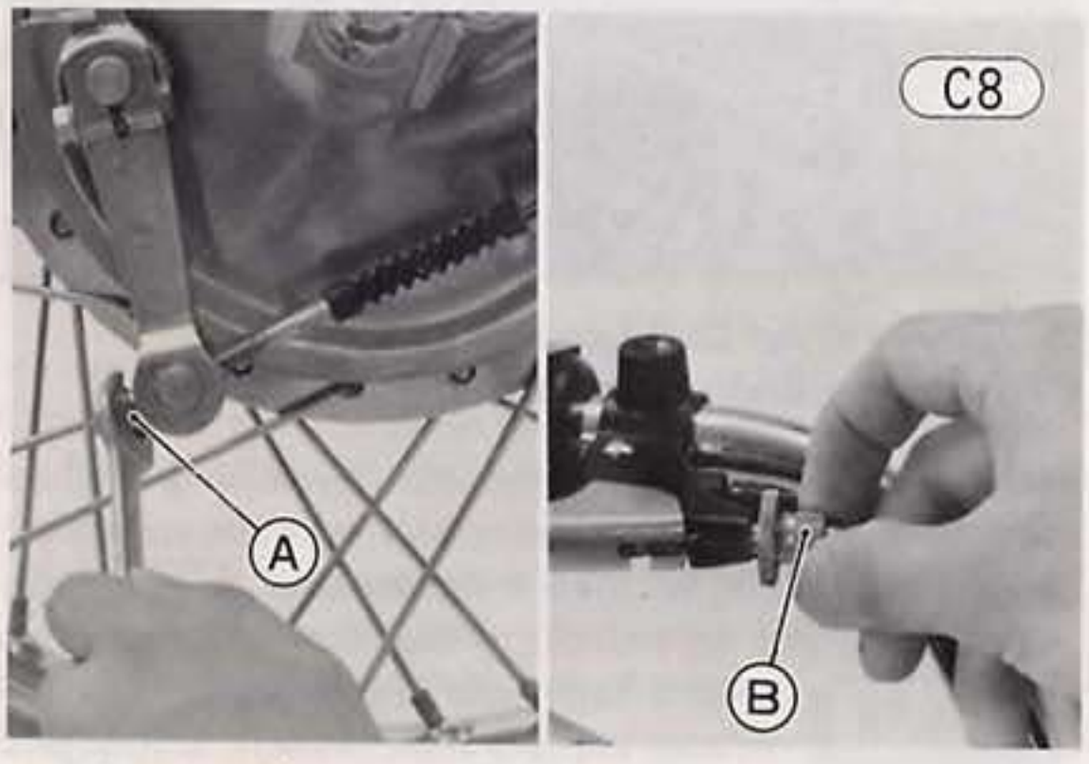
After the front wheel is removed, or after the brake was disassembled, synchronize the brake shoes.

- Raise the front wheel off the ground by some means.
- Loosen the locknut and turn the connecting rod one turn clockwise. 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.



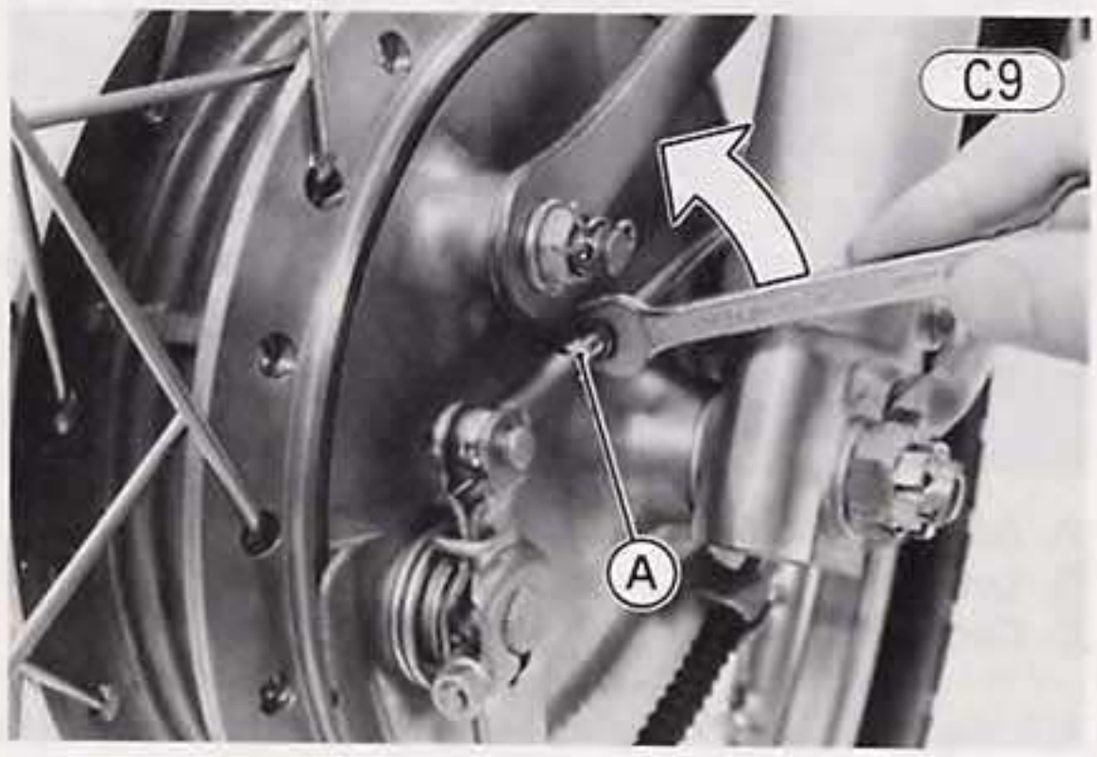
A. Locknut B. Connecting Rod

- While spinning the wheel lightly, turn in the adjusting nut and/or turn out the adjuster at the front brake lever until the primary shoe just starts touching the drum. When the shoe starts touching the drum, light dragging can be felt or heard.



A. Adjusting Nut B. Adjuster

- Spinning the wheel lightly, turn the connecting rod counterclockwise until the secondary brake shoe just starts dragging on the drum, and then tighten the locknut.

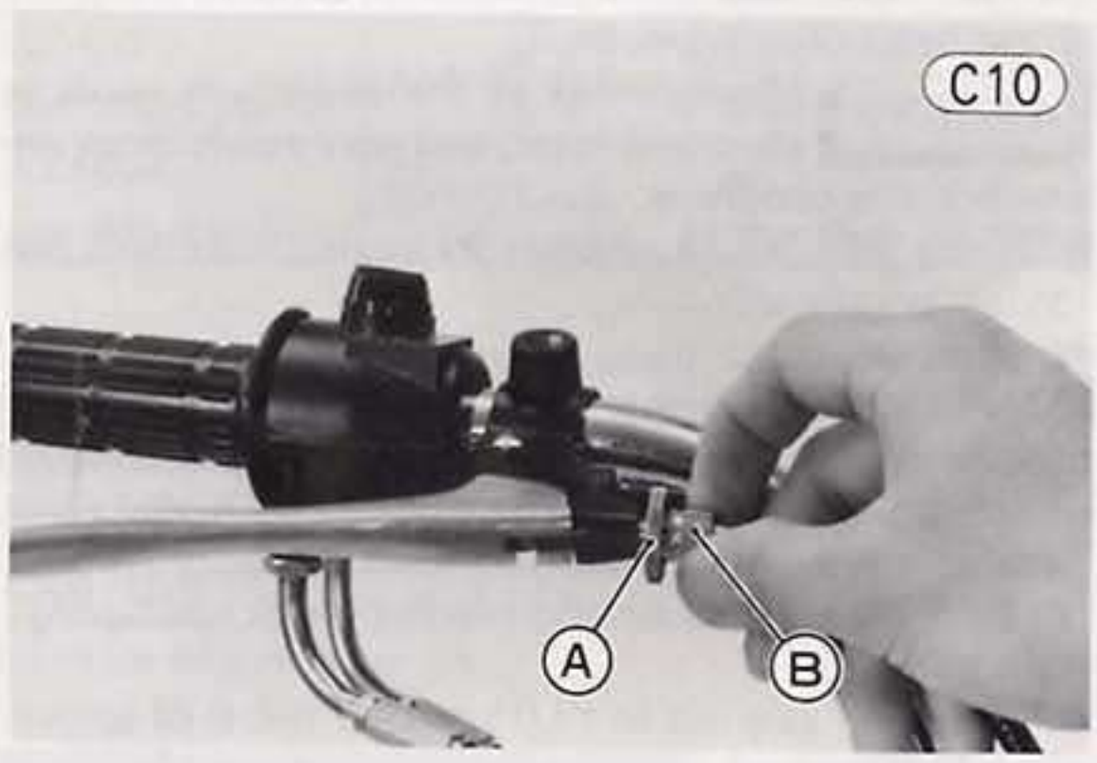


A. Locknut

- Adjust the front brake lever.

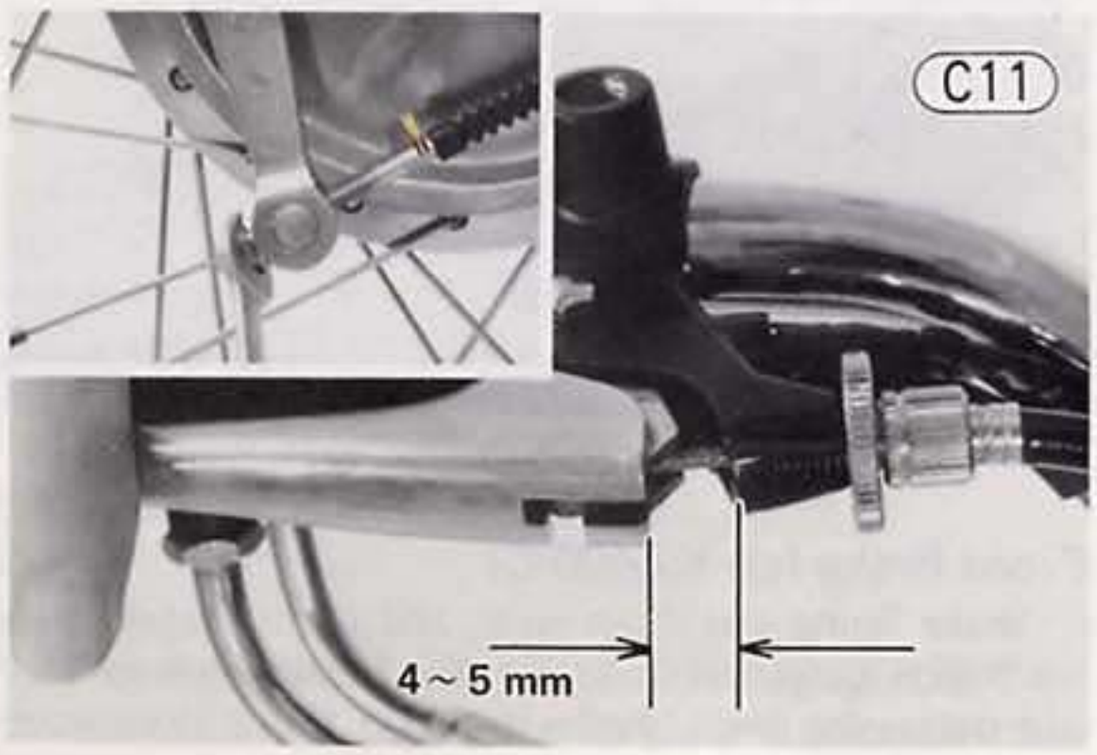
Front Brake Lever

- Loosen the knurled locknut at the front brake lever, turn the adjuster fully in, and tighten the locknut.



A. Knurled Locknut B. Adjuster

- Turn the adjusting nut on the lower end of the front brake cable so that the brake lever will have 4 ~ 5 mm of play as shown in the figure.



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•If sufficient adjustment cannot be made with the adjusting nut at the lower end of the brake cable, complete the adjustment with the adjuster at the brake lever, and then tighten the locknut.
•Check for brake drag.
•Operate the lever a few times to see that it returns to its rest position immediately upon release.
•For minor corrections, use the adjuster at the front brake lever.

Rear Brake

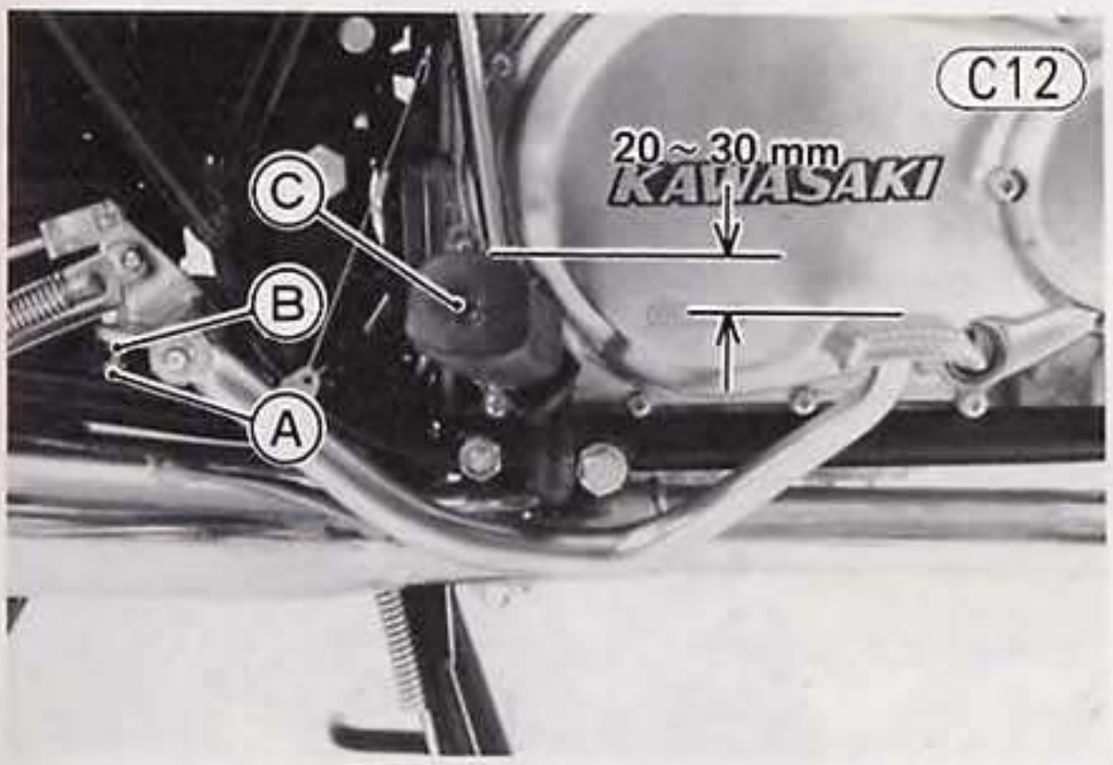
Brake lining and drum wear causes the rear brake to go out of adjustment, increasing pedal play and decreasing braking effectiveness. Rear brake adjustment to compensate for this actually consists of three successive adjustments: brake pedal position, cam lever angle, and brake pedal travel.

If brake drag is detected during brake adjustment, disassemble the brake (Pg. 120), and inspect for wear or damage (Pg. 206). Also, if the brake pedal does not return to its rest position quickly upon release, inspect the brake for wear or damage. If the brake has a soft, or "spongy feeling", make sure the brake panel is properly centered. See the second "NOTE" in drive chain adjustment procedure (Pg. 25).

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 top of the footpeg. If it is too high, turn out the adjusting nut at the end of the brake rod to give the brake pedal plenty of play. If it is too low, go to the next step.

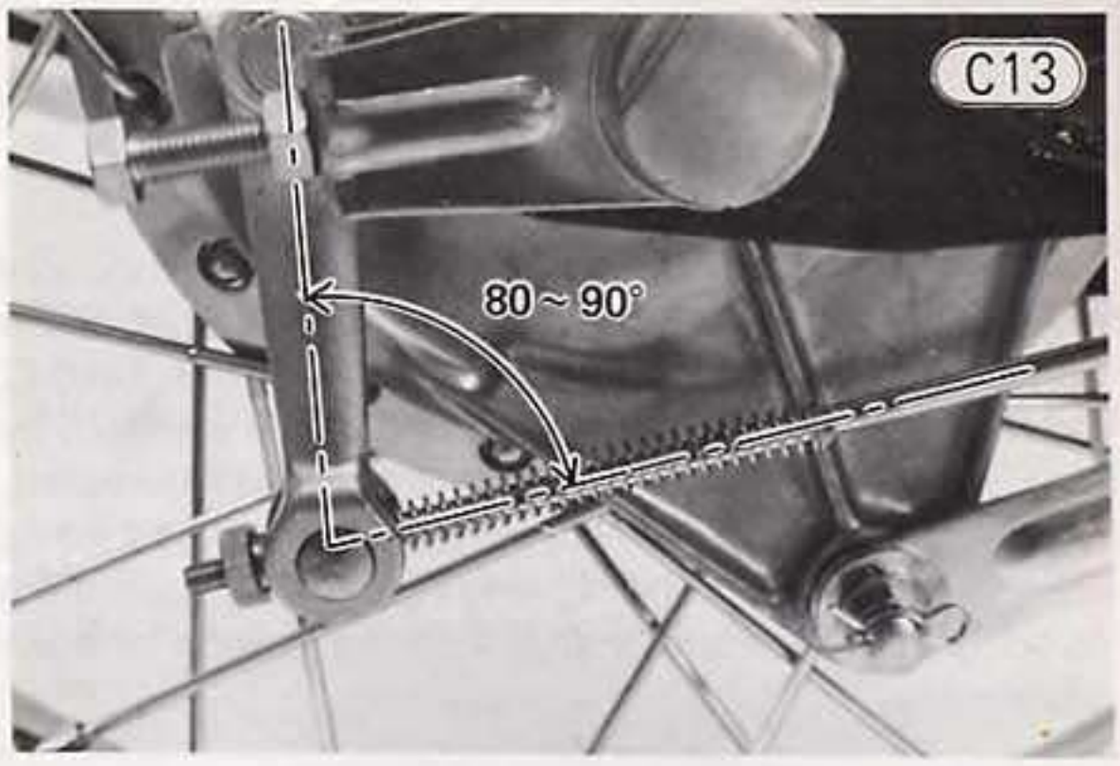


A. Adjusting Bolt B. Locknut C. Footpeg

•Loosen the brake pedal adjusting bolt locknut, turn the adjusting bolt to obtain the correct pedal position, and tighten the locknut.
•Check the brake pedal travel.
•Check the rear brake light switch operation.

Cam Lever Angle

•When the brake is fully applied, the brake cam lever should come to an 80~90° angle with the brake rod.



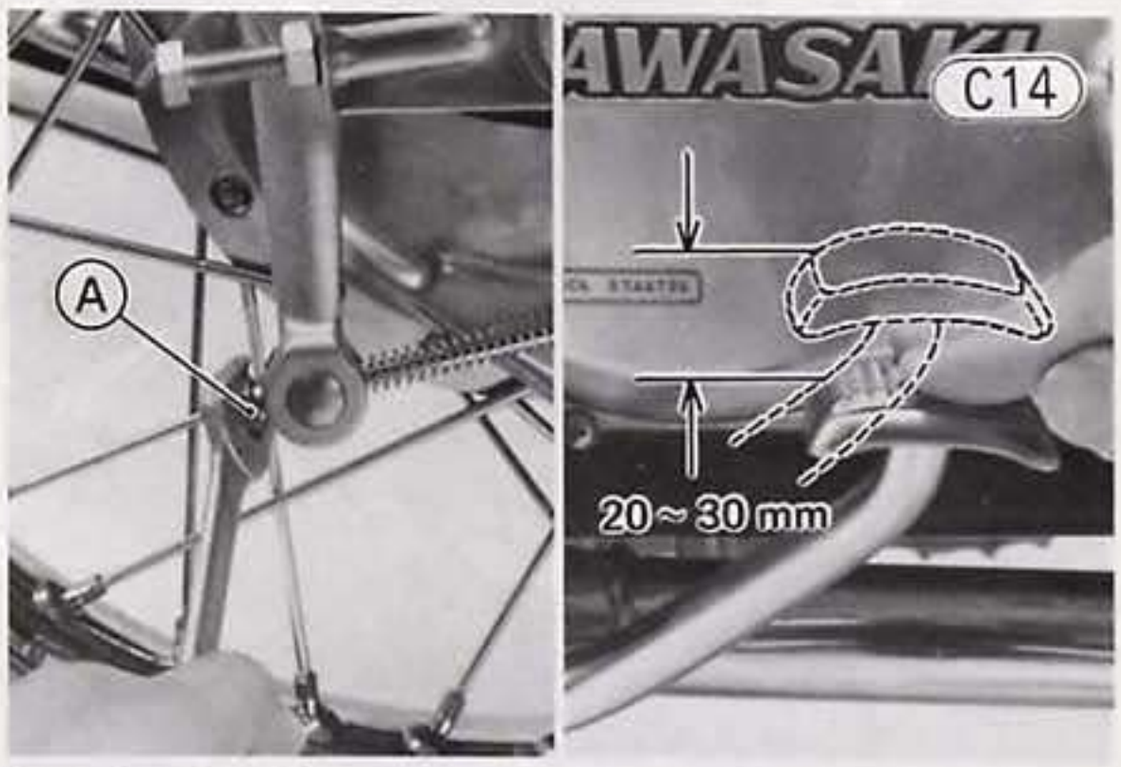
•If it does not, remove the cam lever, and then remount it at a new position on the shaft for the proper angle.

WARNING **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. See Pg. 120 for detailed information on the position of the wear indicator when the cam lever is not on the shaft. A 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.**

•Rotate the rear wheel to check for brake drag.
•Operate the pedal a few times to see that it returns to its rest position immediately upon release.
•Adjust the brake pedal travel.

Brake Pedal Travel

•Check to see 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.



A. Adjusting Nut

•If it does not, turn the adjusting nut on the end of the brake rod so that the brake pedal has the proper travel.

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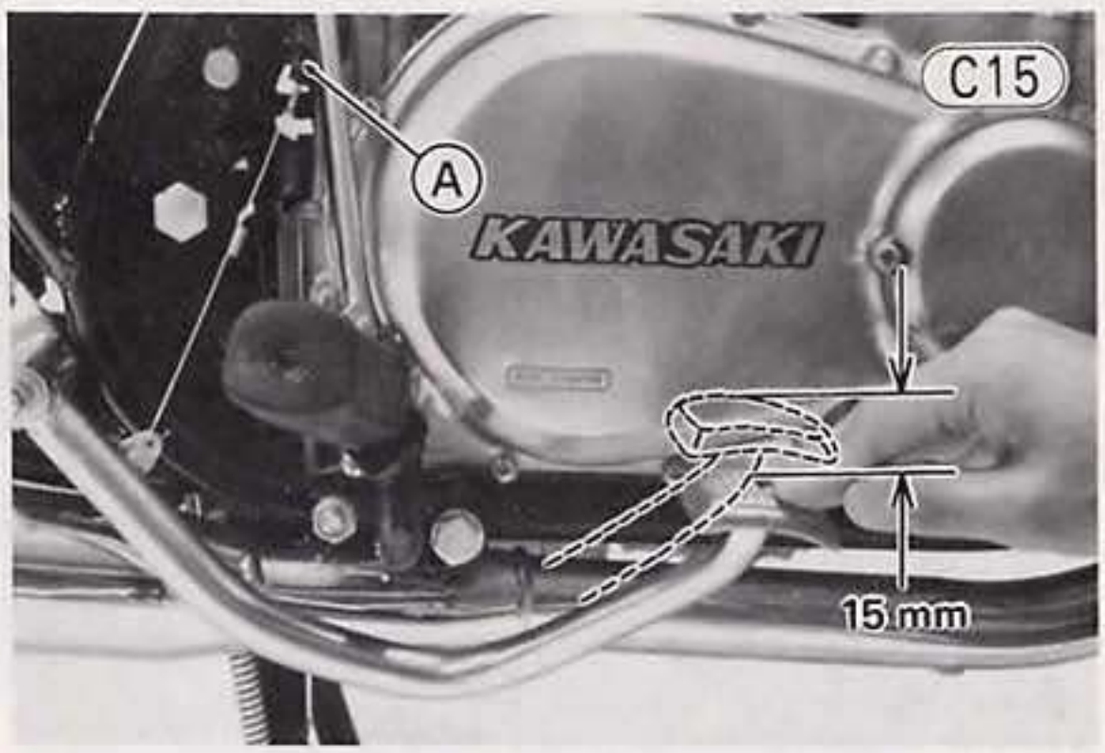
- Rotate the rear wheel to check for brake drag.
- Operate the pedal a few timse to see that it returns to its rest position immediately upon release.
- Check the rear brake light switch operation.

BRAKE LIGHT SWITCH

The front brake light switch of KZ400-B, mounted on the steering stem base, operates hydraulically and is non-adjustable. The front brake light switch of KZ400-C, mounted on the front brake lever holder, 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 tension or brake adjustment.

To check the brake light switch:

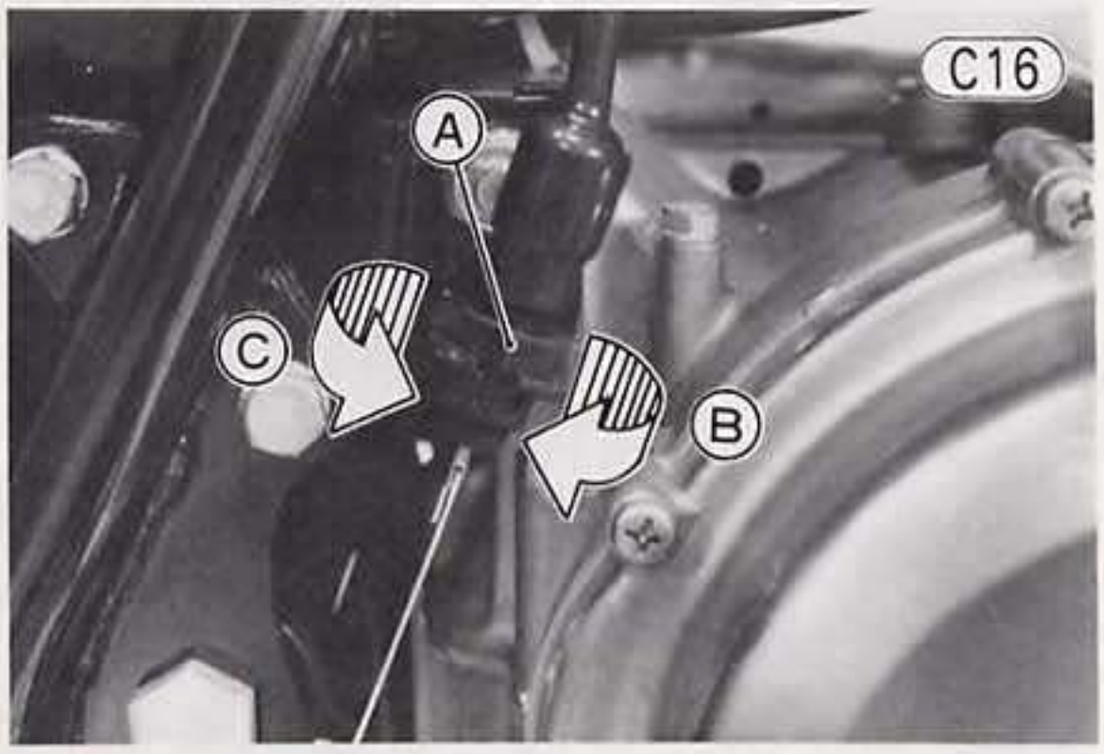
- With the ignition switch on, depress the brake pedal and note the brake pedal travel until the brake light goes on. The brake light should go on after 15 mm of pedal travel.



A. Brake Light Switch

To adjust the brake light switch:

- Turn the adjusting nut on the brake light switch body so that the brake light will go on after the proper amount of brake pedal travel. Raising the switch will make the light go on after less travel; lowering it will require more travel.



A. Adjusting Nut
B. Lights sooner
C. Lights later

CAUTION **To avoid damaging the electrical connections inside the switch, do not turn the switch body during adjustment.**

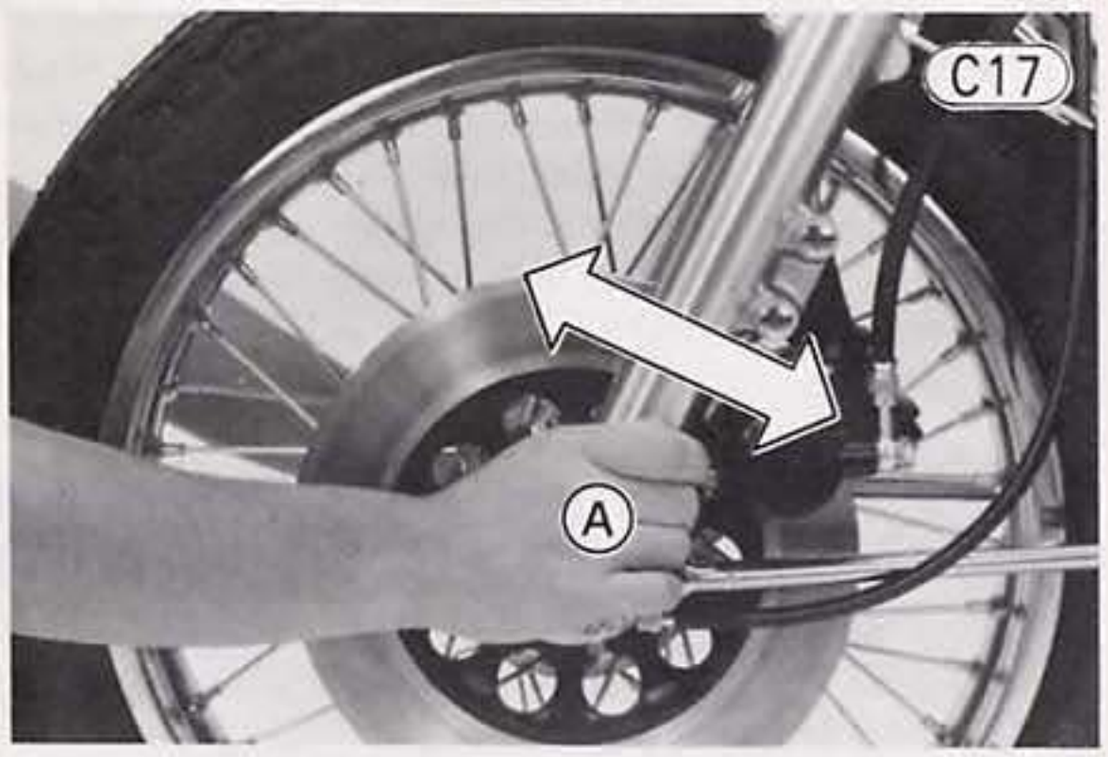
STEERING

For safety, the steering should always be kept adjusted so that the handlebar will turn freely but have no 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:

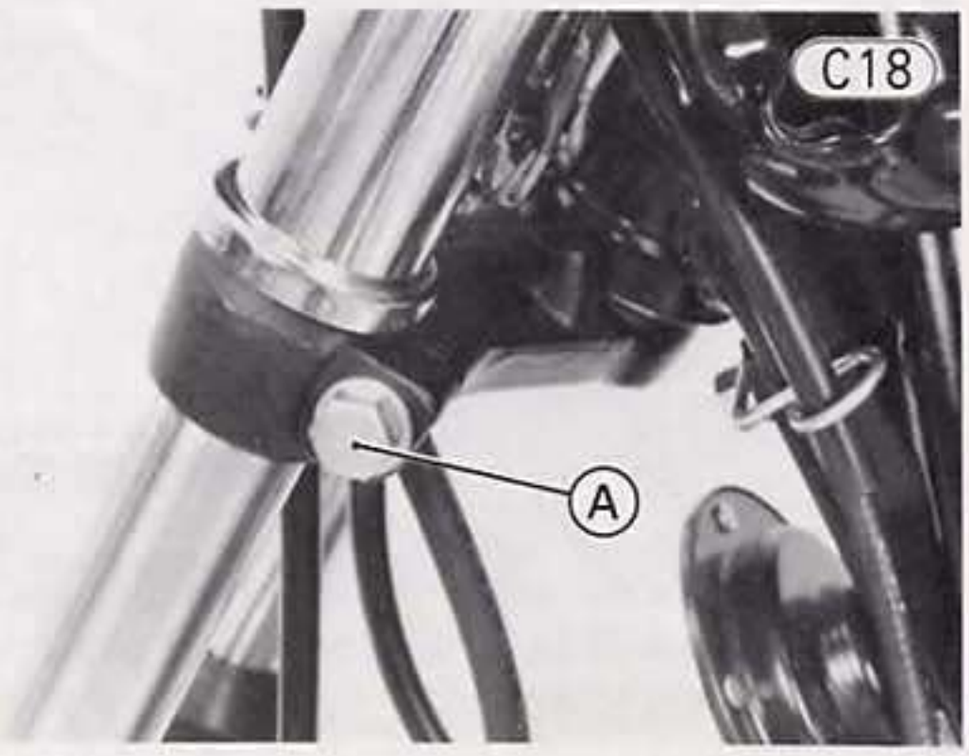
- Raise the front wheel off the ground.
- Push the handlebar lightly to either side; if it continues moving under its own momentum, the steering is not too tight.
- Squatting in front of the motorcycle, grasp the lower ends of the front fork at the axle, and push and pull the fork end back and forth; if play is felt, the steering is too loose.



A. Push and pull

To adjust the steering:

- Remove the fuel tank (Pg. 43) to avoid damaging the painted surface.
- Loosen the front fork lower clamp bolts (2) to free the fork tubes from the steering stem base during adjustment.

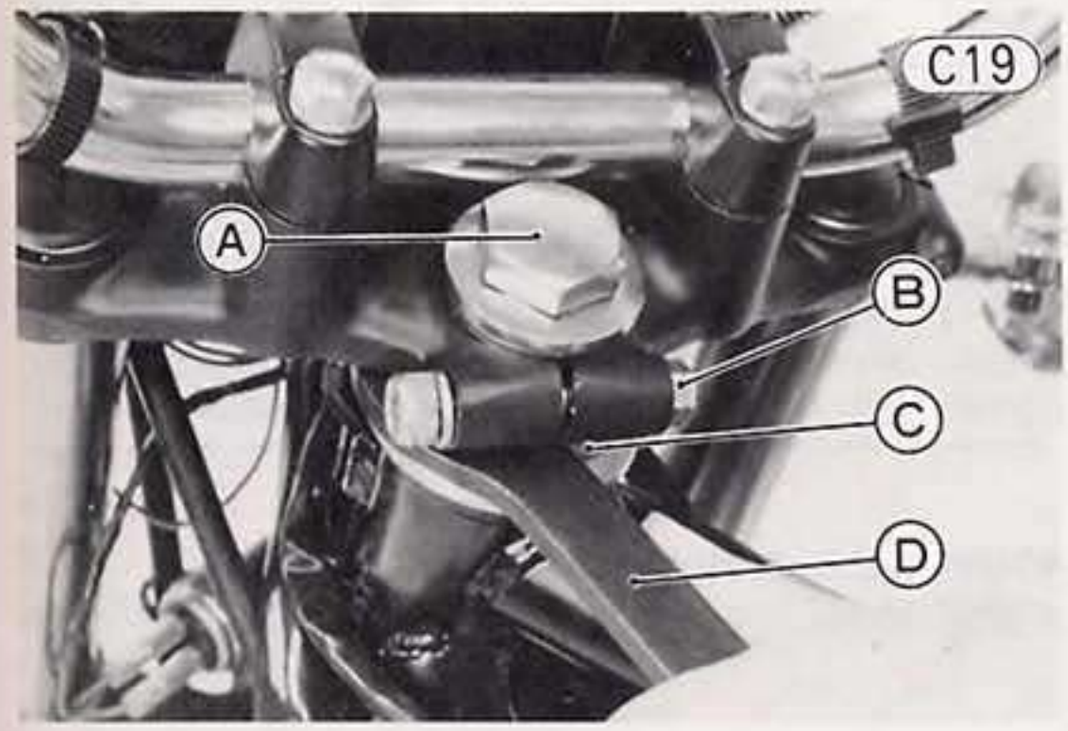


A. Lowr Clamp Bolt

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•Loosen the steering stem head bolt and head clamp bolt, and back out the steering stem locknut using the stem nut wrench (special tool) 1 or 2 turns until it turns without drag.

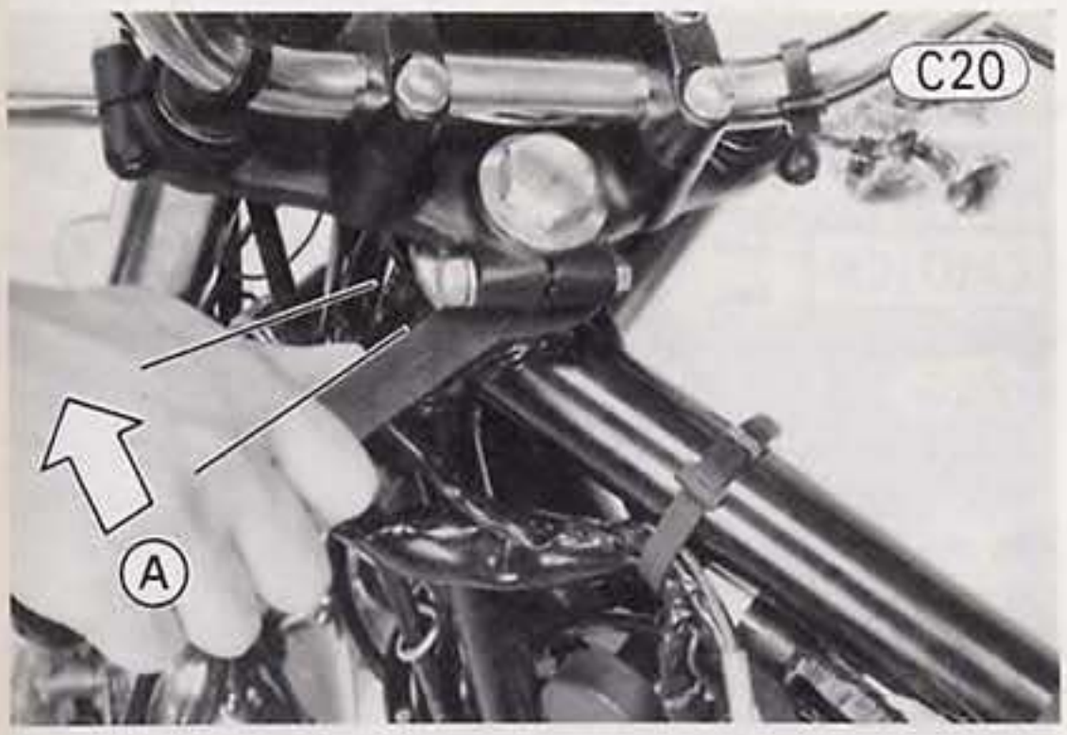
NOTE: Do not back out the steering stem locknut more than a couple of turns. If the locknut is backed off too far, the bearing balls in the steering stem may fall out of place. This will necessitate steering stem removal and installation.



A. Stem Head Bolt
B. Head Clamp Bolt
C. Stem Locknut
D. Stem Nut Wrench (57001-134 or 57001-1100)

•Tighten the stem locknut to 3.0 kg-m (22 ft-lbs) of torque.

NOTE: If a suitable torque wrench is not available, tighten the steering stem locknut lightly (until it just becomes hard to turn), and then continue for another 1/16 turn (about 20° travel) from that point.



A. 1/16 Turn (20°)

•Tighten the steering stem head bolt to 4.5 kg-m (33 ft-lbs) of torque.
•Tighten the steering stem head clamp bolt to 1.8 kg-m (13.0 ft-lbs) of torque.
•Tighten the front fork lower clamp bolts (2) to 3.0 kg-m (22 ft-lbs) of torque.
•Check the steering again. If the steering is too tight or too loose in spite of correct adjustment, inspect the steering stem parts according to the maintenance section (Pg. 208).
•Remount the fuel tank (Pg. 43).

WHEEL BALANCE

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

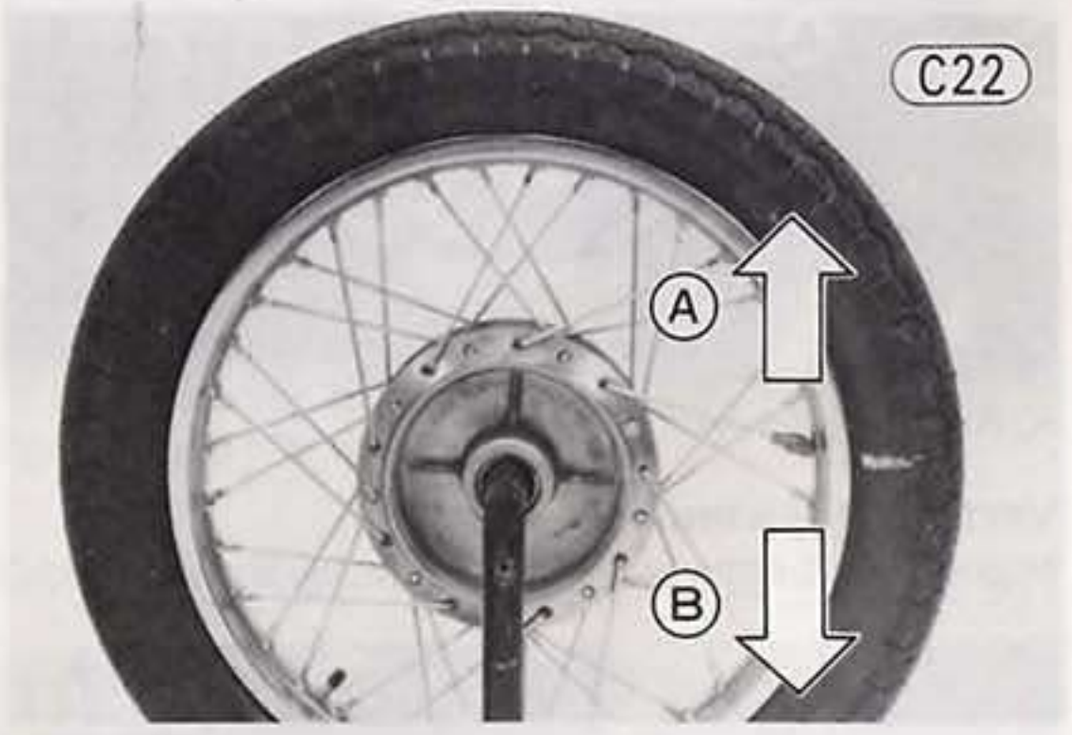
Check and balance the wheels when required, or when a tire is replaced with a new one.

•Remove the wheel (Pg. 107, 110, or 119).
•Check the all the spokes are tightened evenly and the rim runout is within the service limit (Pg. 196).
•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.



A. Balance Weight

•Rotate the wheel ¼ turn, and see whether or not the wheel stays in this position. If it does, the correct balance weight is being used.



A. Use heavier size **B. Use lighter size**

•If the wheel rotates and the weight goes up, replace the weight with the next heavier size. If the wheel rotates and the weight goes down, replace the weight with the next lighter size. Repeat these steps until the wheel remains at rest after being rotated ¼ turn.
•Rotate the wheel another ¼ turn and then another ¼ 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 (Pg. 107, 110, or 120).

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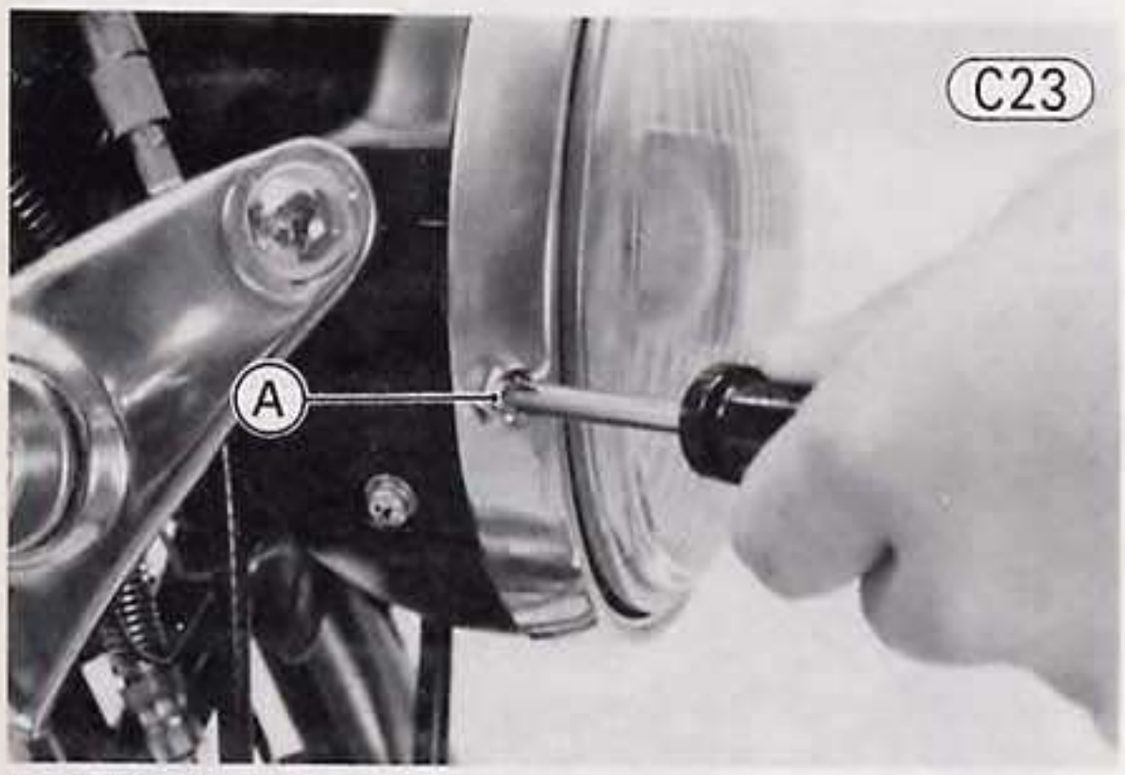
NOTES: 1. Balance weights are available from Kawasaki Dealers in 5, 10, 20, and 30 gram sizes. An imbalance of less than 10 grams will not usually affect running stability.
2. When removing a tire from a rim, mark the valve stem location on the tire so that it can be installed in the same position.
3. When installing a new tire, be sure to go through the balancing procedure.
4. If a new tire is installed, the yellow paint mark on the tire should be aligned with the valve stem for best balancing results.

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

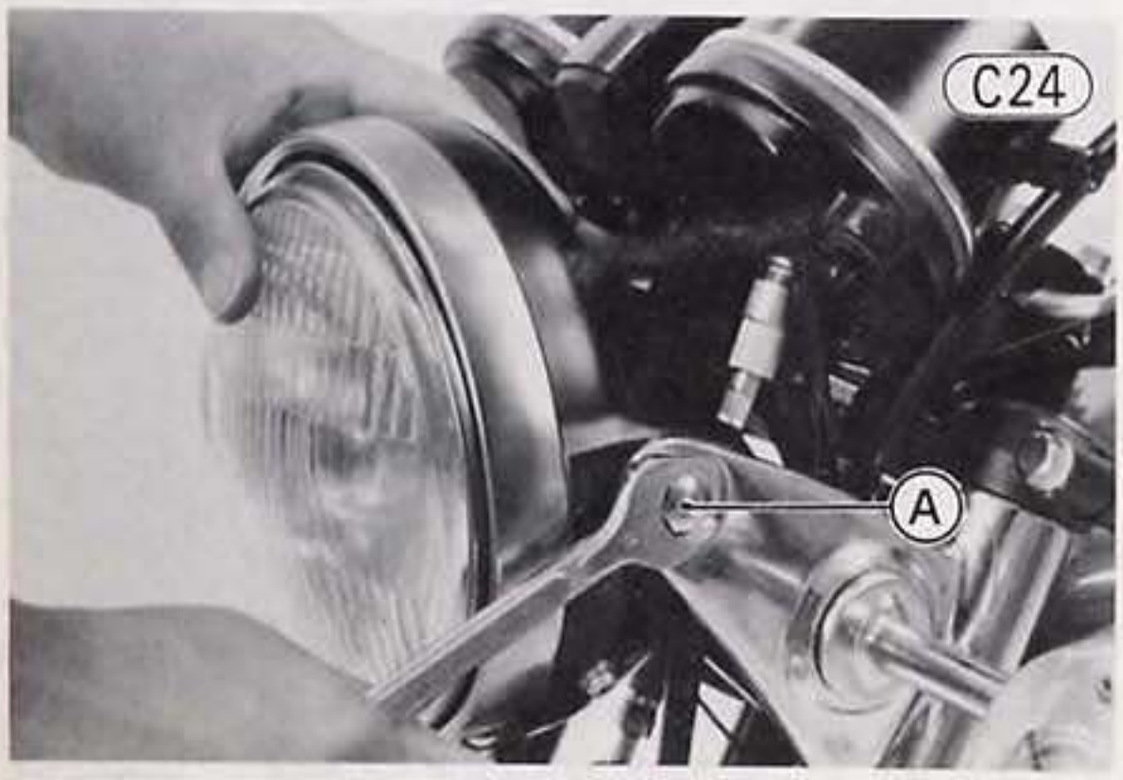
•Turn the small screw on the headlight rim in or out until the beam points straight ahead. Turning the adjusting screw clockwise makes the headlight beam point to the left.



A. Adjusting Screw

Vertical Adjustment

•Loosen the headlight housing mounting bolts.

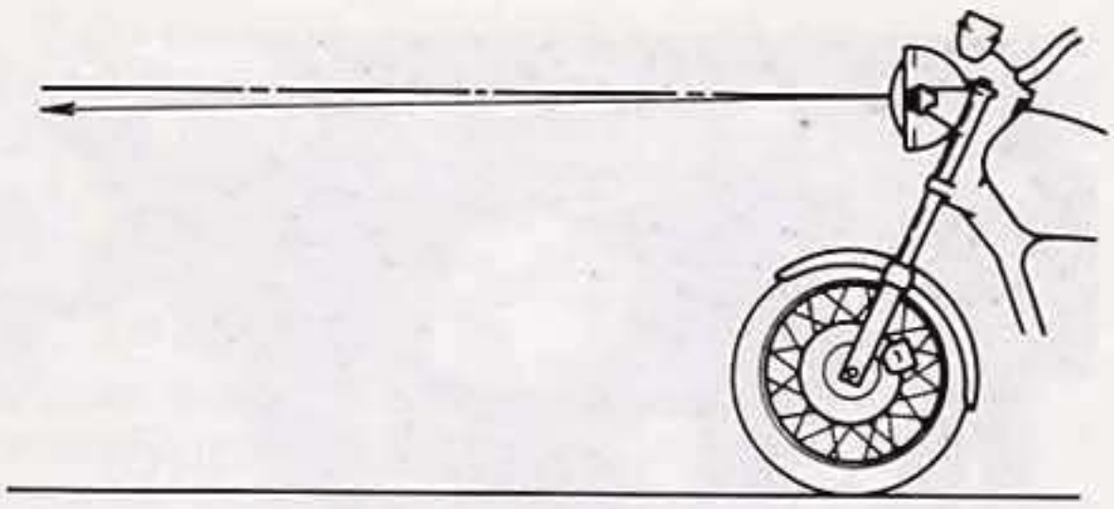


A. Mounting Bolt

•Move the headlight up or down by hand to where the vertical aim is correct.

NOTE: On high beam, the brightest point should be slightly below horizontal. Adjust the headlight to the proper angle according to local regulations.

Vertical Adjustment C25



•Tighten the headlight housing mounting bolts.

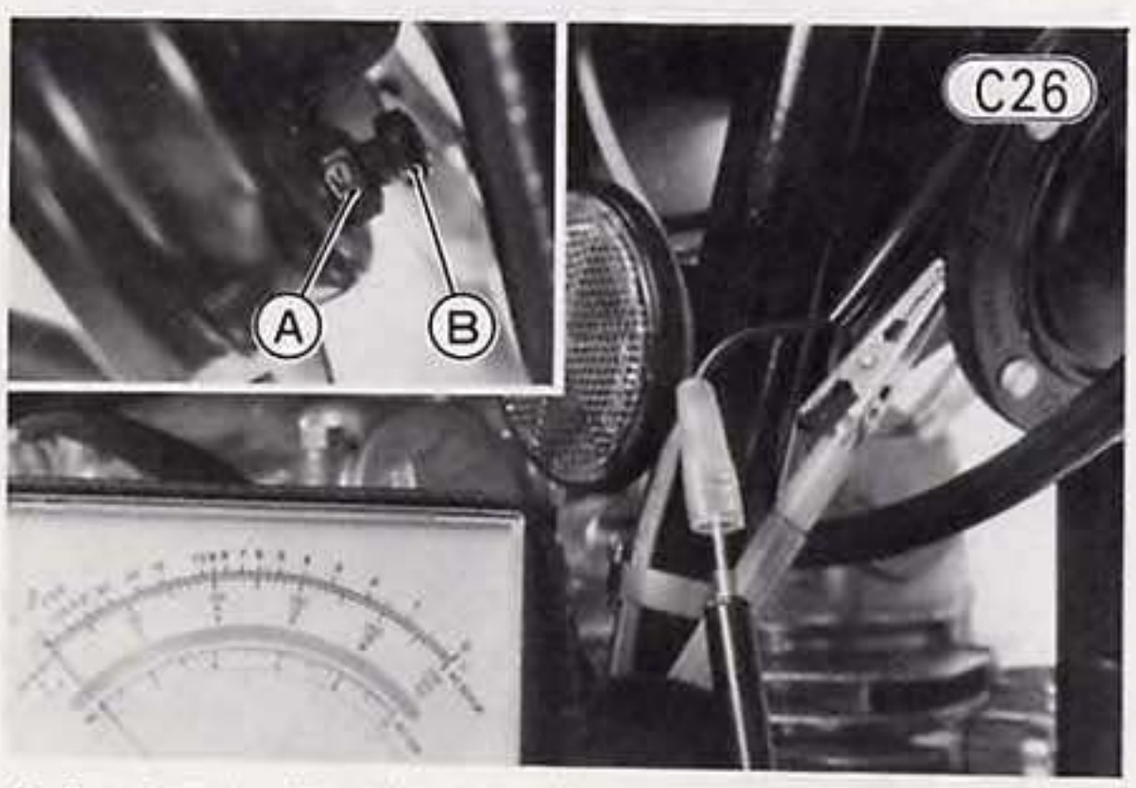
HORN

The horn contacts wear down after long use and may 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 cannot be disassembled.

WARNING **To avoid a serious burn, never touch the engine or exhaust pipes during horn adjustment.**

CAUTION **Do not turn the adjusting screw in too far, since doing so will increase horn current with the possibility of burning out the horn coil.**

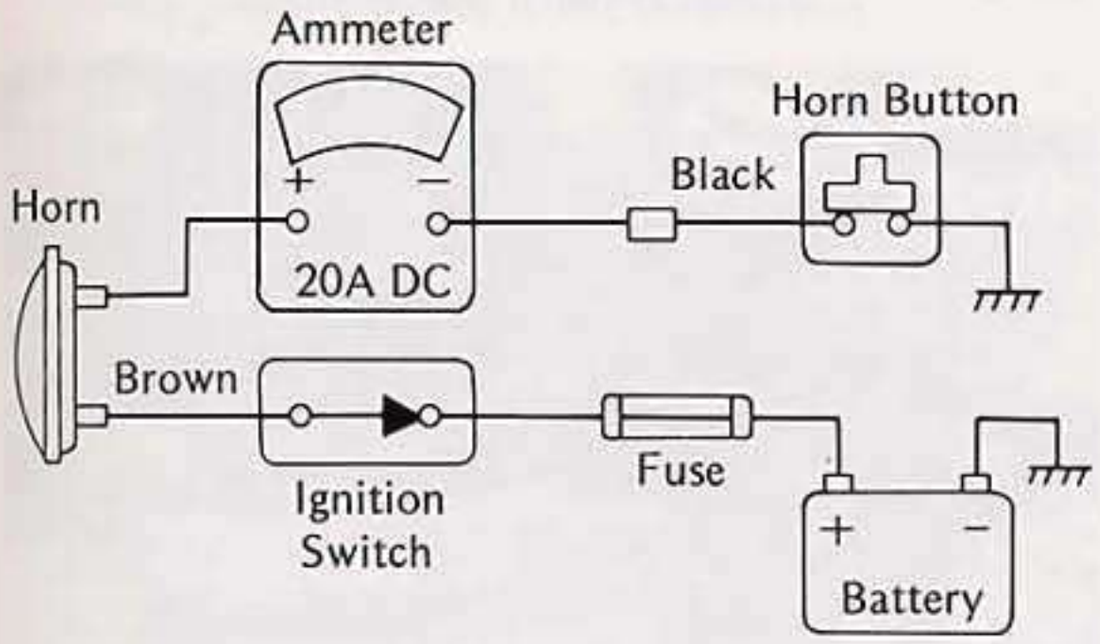
•Disconnect the black horn lead, and connect an ammeter in series to the horn circuit. The + ammeter lead goes to the horn terminal and the – ammeter lead to the black lead.



A. Locknut B. Adjusting Screw

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Horn Current Measurement C27



- Fully loosen the adjusting screw locknut.
- 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 2.0 ~ 3.0 amperes.
- Tighten the adjusting screw locknut.

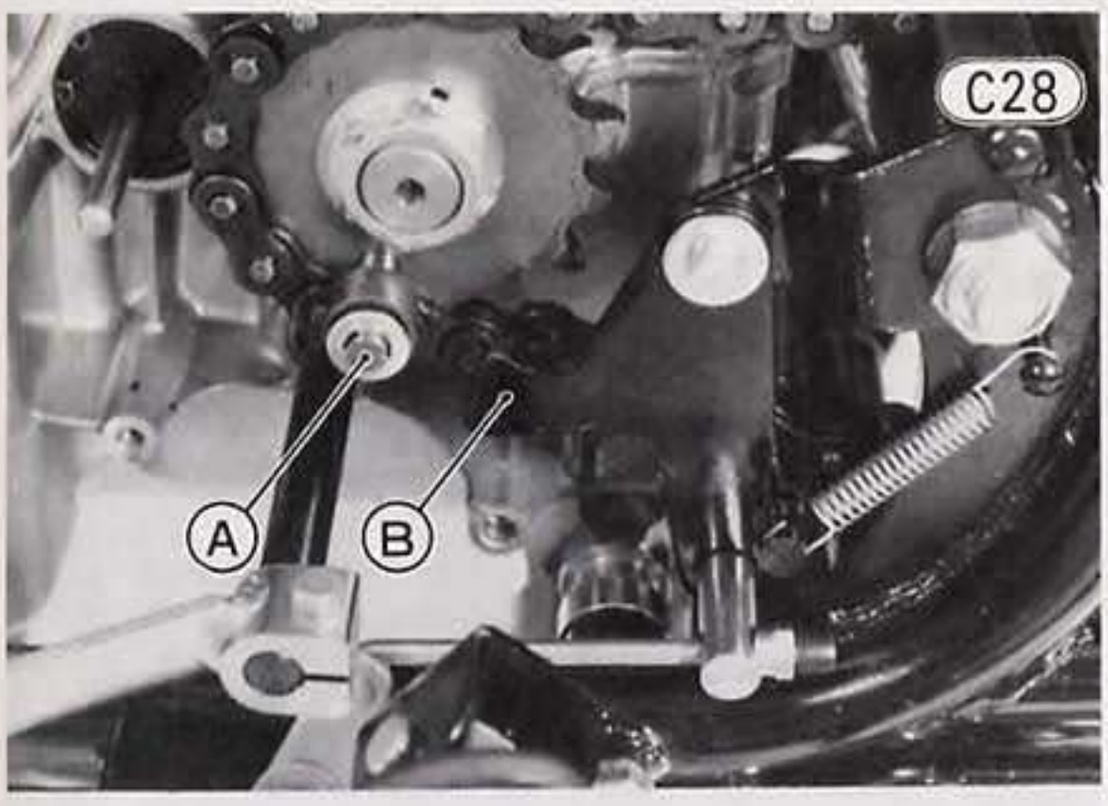
NOTE: The horn will not sound properly if it is mounted incorrectly or if any cable or other part is touching it.

AUTOMATIC SIDE STAND RETURN MECHANISM

Adjust the automatic side stand return mechanism whenever it does not work satisfactorily. If any damage to the mechanism is suspected or if it cannot be adjusted properly as explained below, consult the Maintenance Section (Pg. 214).

To check the mechanism:

- Swing down the side stand, and turn the rear wheel or walk the motorcycle. The side stand should return to its rest position when the rear wheel turns.
- Return the side stand to its rest position, and check that the pin on the engine sprocket does not hit the mechanism lever when the rear wheel rotates. The engine sprocket cover needs not be removed to check this tapping noise.



A. Pin B. Mechanism Lever

If any one of the above checks shows improper adjustment, or if there is a regular tapping noise from the mechanism when riding the motorcycle, adjust the mechanism.

To adjust the mechanism:

- Remove the rubber cap from the end of the rod.
- Turn the adjusting nut so that the proper adjustment is obtained. If the side stand does not return automatically, screw in the adjusting nut. If the pin hits the lever, screw out the adjusting nut.



A. Adjusting Nut

- Install the rubber cap on the end of the rod.
- Check the mechanism operation, and readjust if necessary.

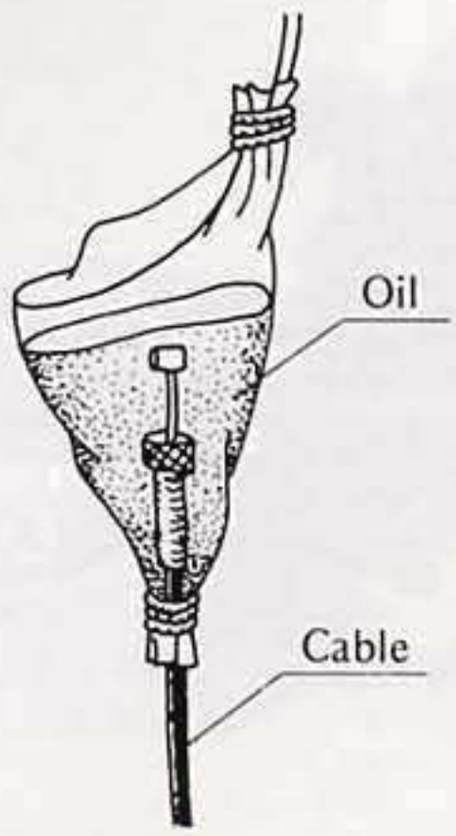
LUBRICATION

Lubricate exposed parts which are subject to rust, with either motor oil or regular grease whenever the vehicle has been operated under wet or rainy conditions, and especially after using a high-pressure spray washer. Before lubricating each part, clean off any rusty spots with rust remover and wipe off any grease, oil, dirt, or grime.

Clutch, Brake, and Throttle Cables

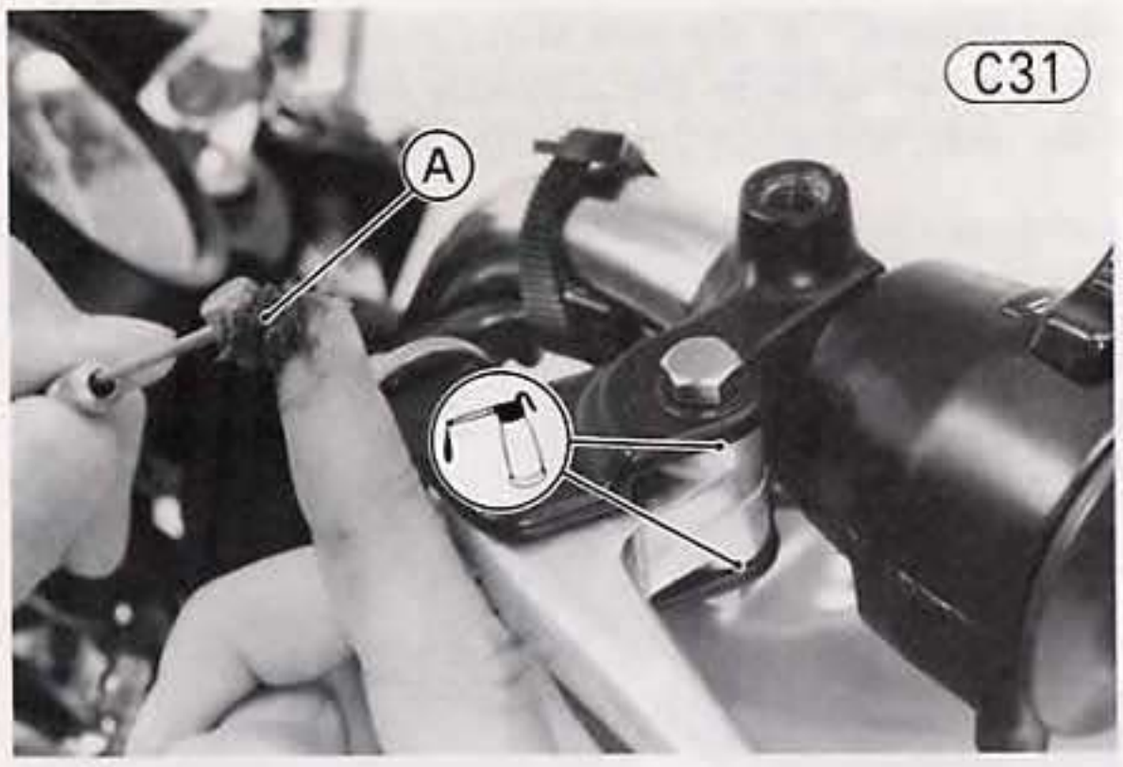
Lubricate the cables as shown in the figure. Refer to Pgs. 125 and 126 for cable removal.

Cable Lubrication C30

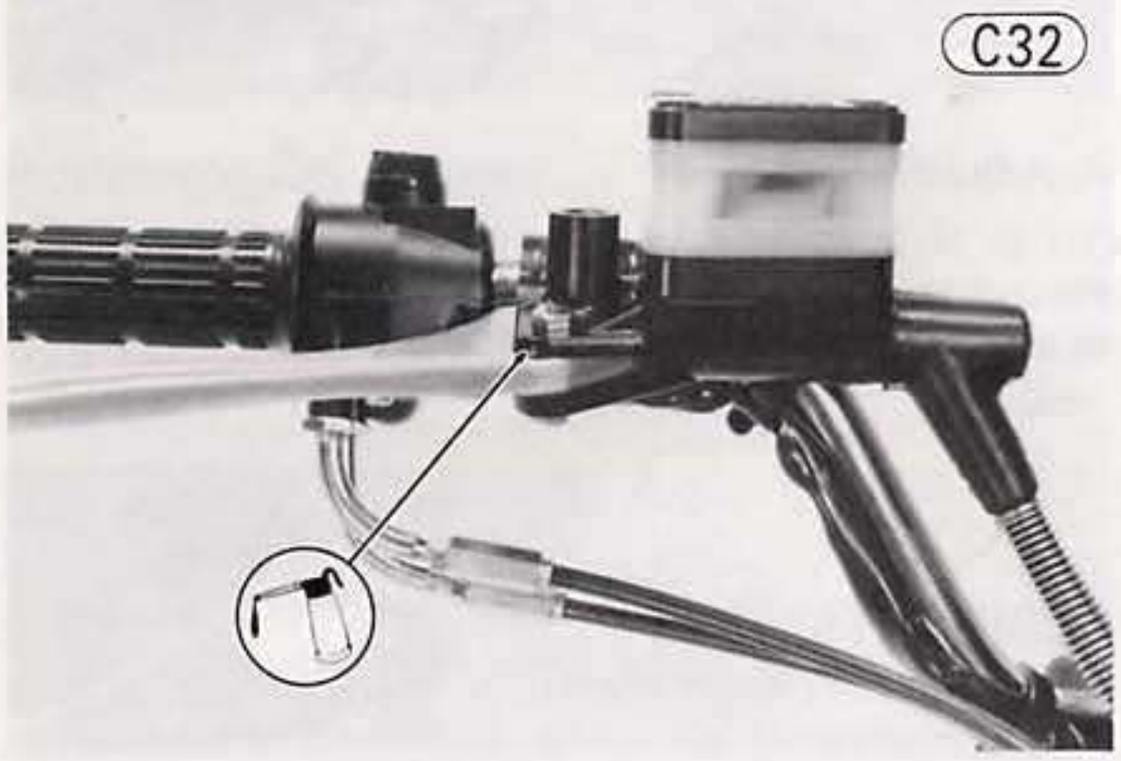


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Clutch and Brake Levers



A. Grease



Throttle Grip

Apply grease to the handlebar where the throttle grip turns.

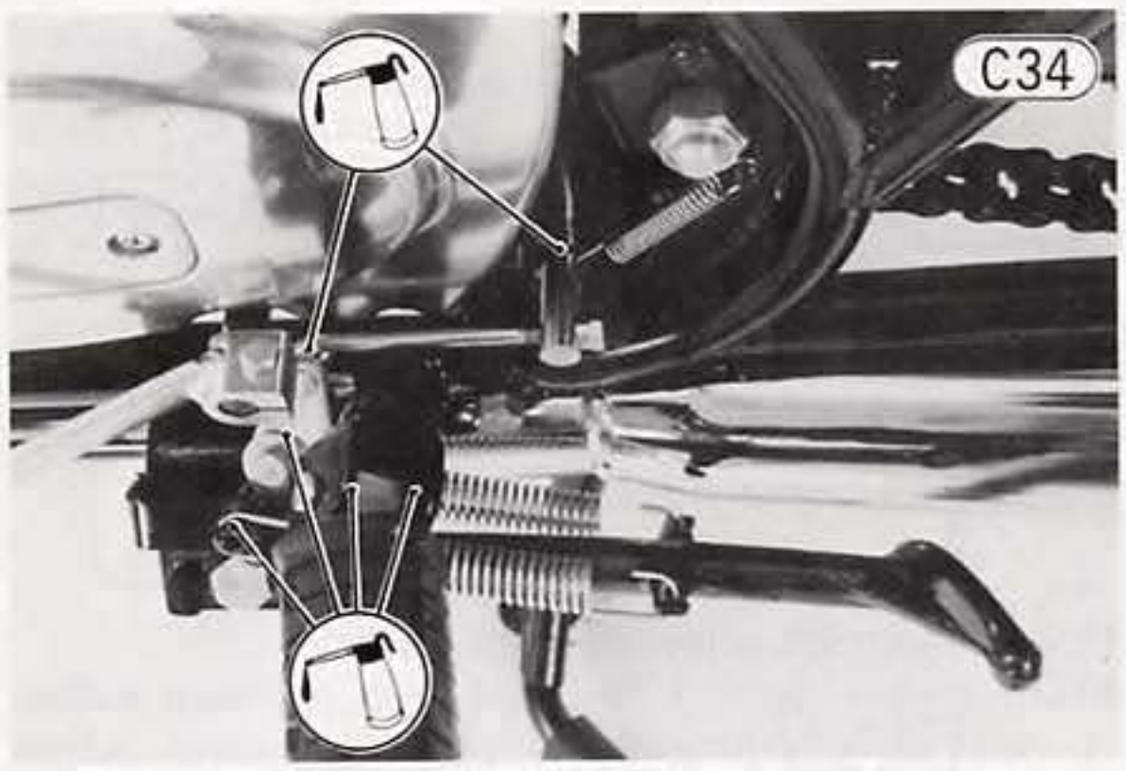
Apply a light coat of grease to the exposed portion of the throttle grip inner cables and their catches in the throttle grip.

Fit the throttle cables into the throttle grip. Refer to throttle cable installation (Pg. 127).

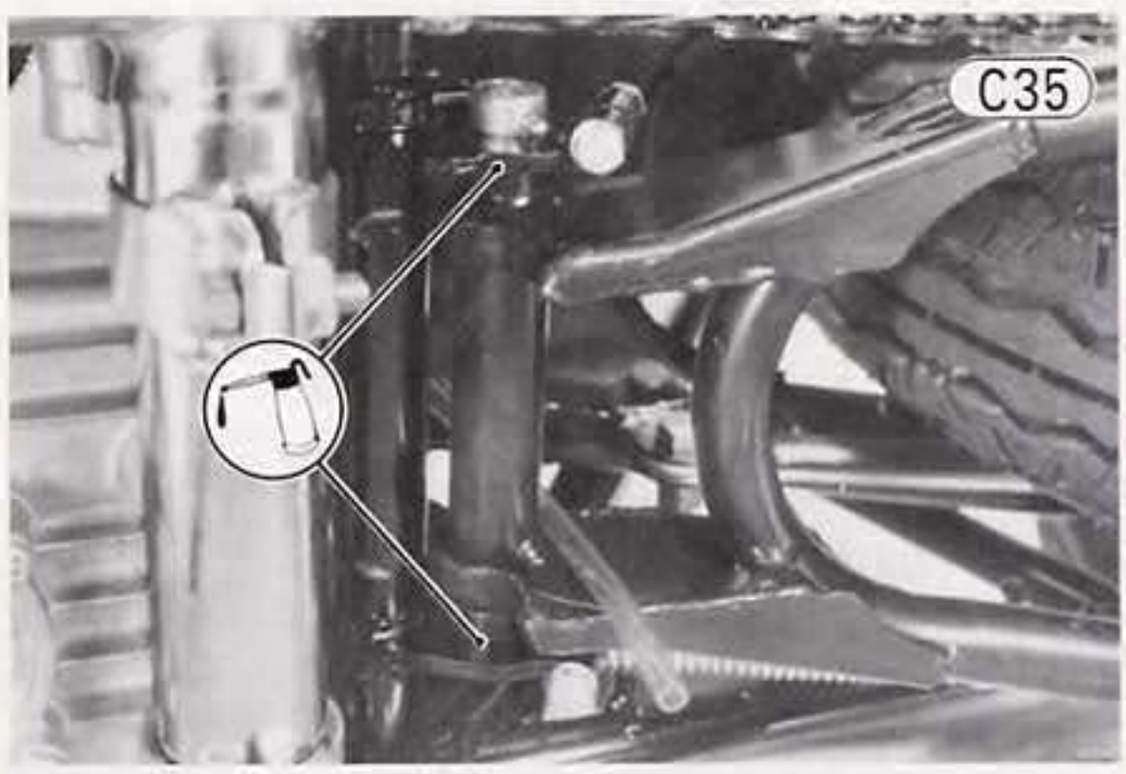


A. Grease

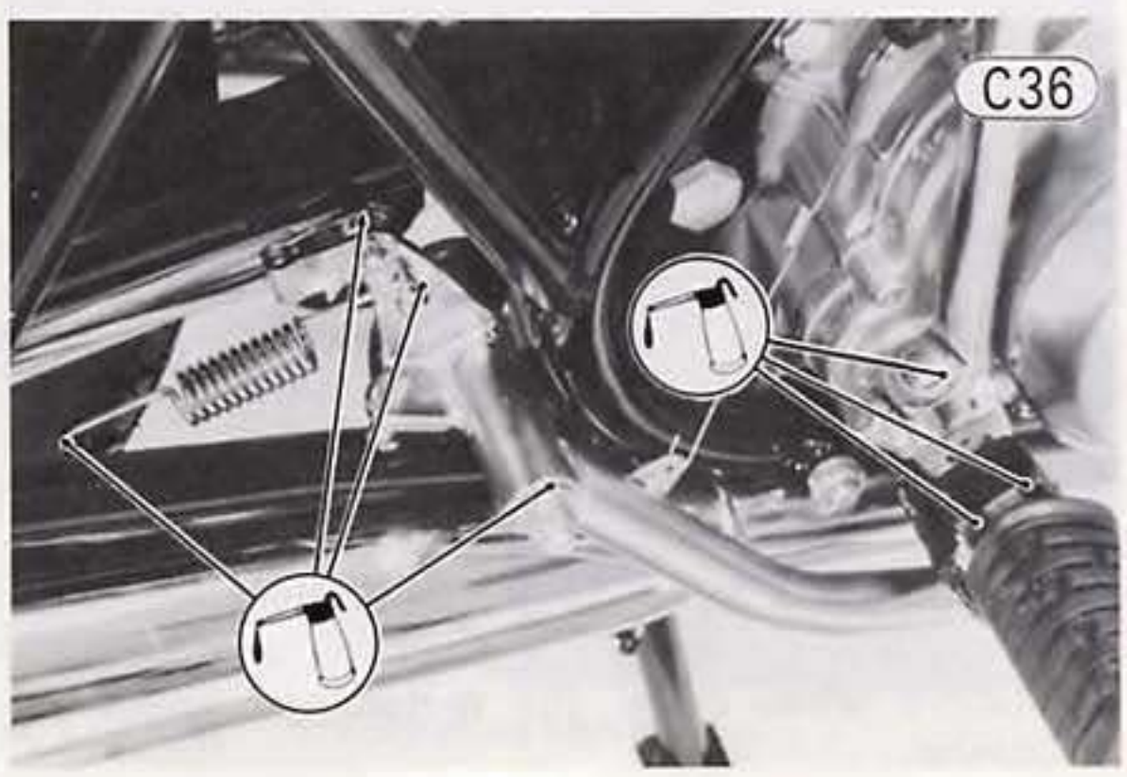
Left Footpeg, Side Stand, Stand Return Mechanism



Center Stand



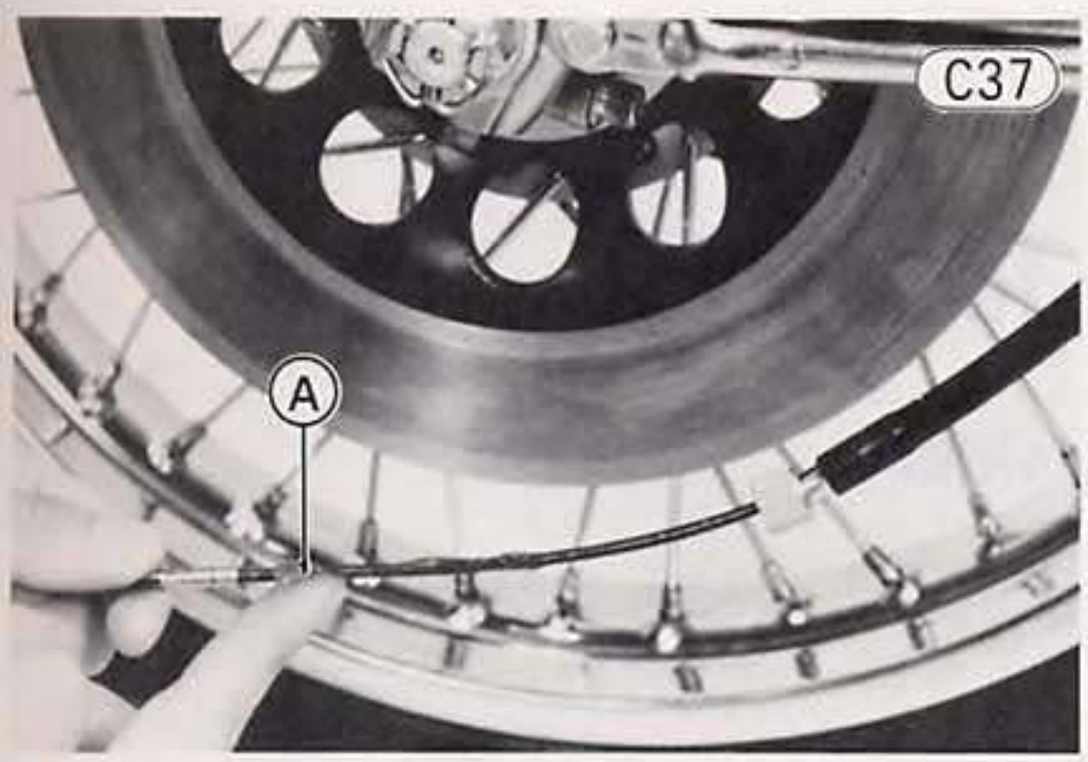
Kickstarter Pedal, Right Footpeg, Brake Pedal, and Brake Rod



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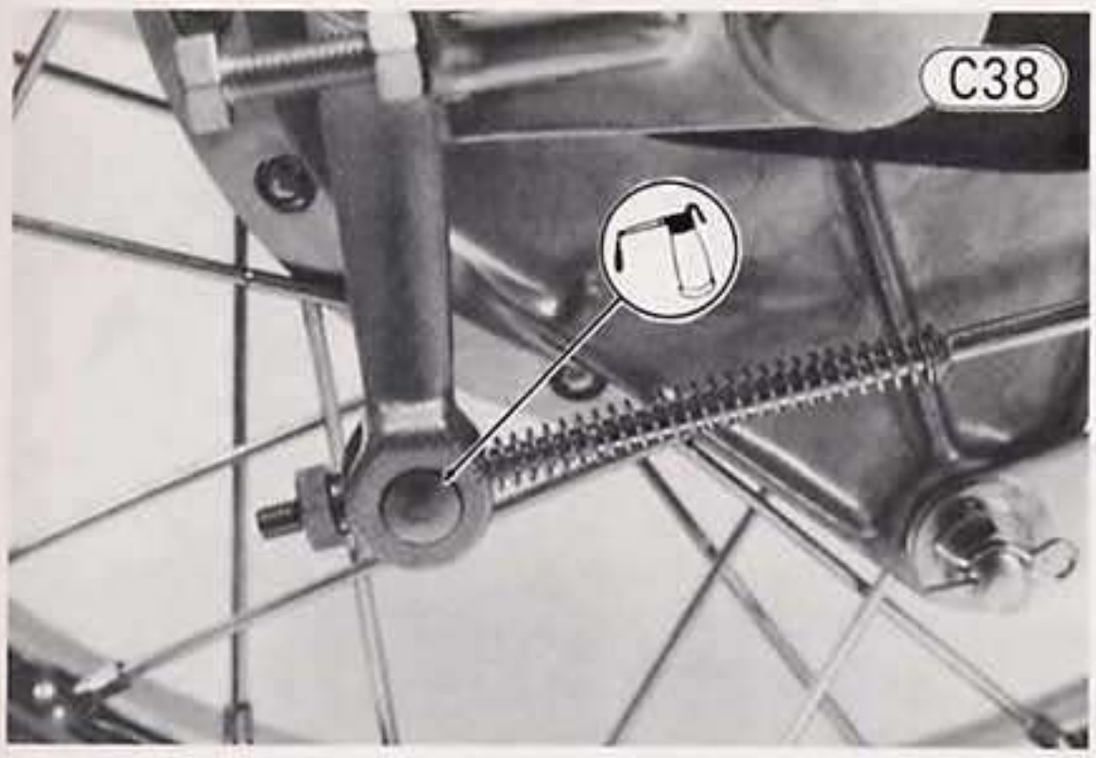
Speedometer and Tachometer Cables

Apply grease sparingly to the inner cables.

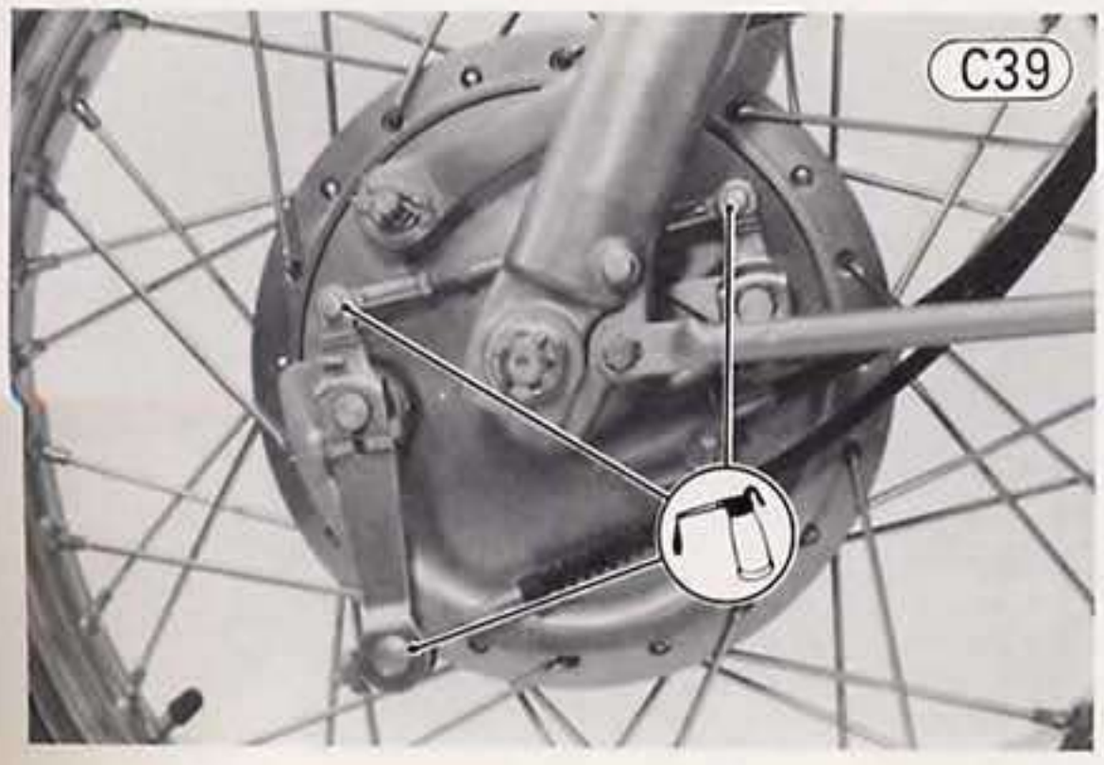


A. Grease

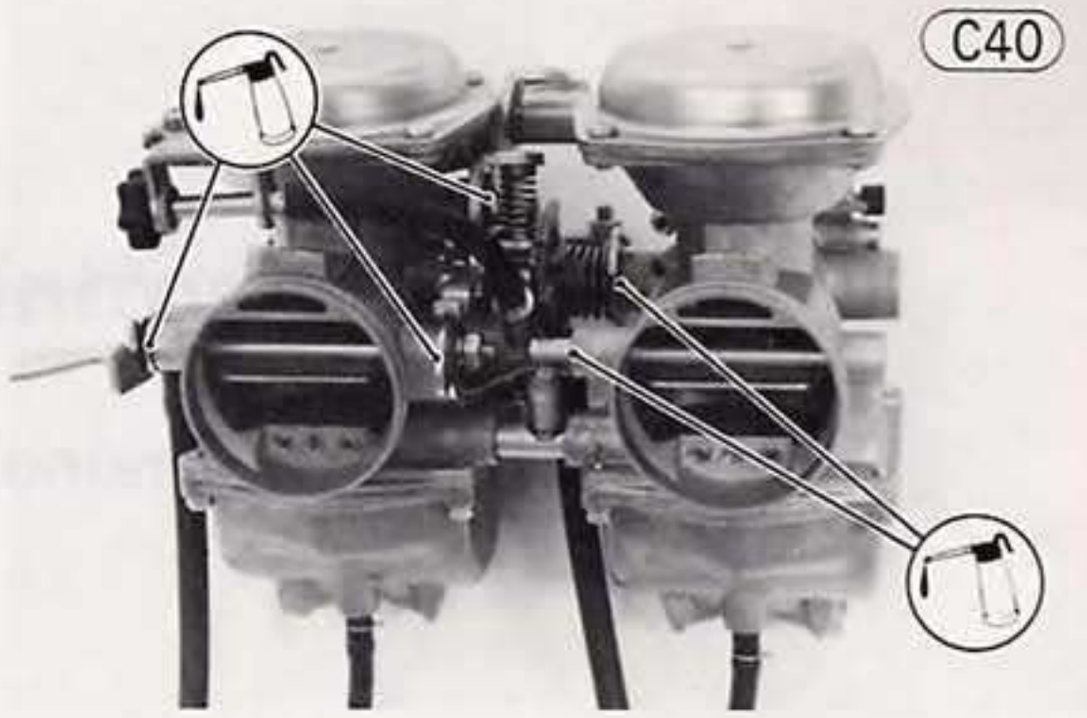
Brake Rod Joint



Brake Cam Lever Connecting Rod, Cable Joint



Carburetor Link Mechanism



Others

Lubricate the drive chain, wheel bearings, speedometer gear housing, swing arm pivot, and steering stem bearings as explained in the Maintenance Section.

NOTE: A few drops of oil are effective to keep bolts and nuts from rusting and sticking. This makes removal easier. Badly rusted nuts, bolt, etc. should be repalced with new ones.

Disassembly—Introduction

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TORQUE AND LOCKING AGENT 37

D

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INTRODUCTION TO DISASSEMBLY

Detail has not been spared in this chapter in order that the motorcycle can not only be taken apart but also back together properly as well. Photographs, diagrams, notes, cautions, warnings, and detailed descriptions have been included whenever 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) Edges
Watch for sharp edges, especially during major engine disassembly and assembly. Protect your hands with gloves or a piece of thick cloth when lifting the engine or turning it over.

(2) Dirt
Before removal and disassembly, clean the motorcycle. Any dirt entering the engine, carburetor or other parts will work as an abrasive and shorten the life of the motorcycle. For the same reason, before installing a new part, clean off any dust or metal fillings.

(3) Tightening Sequence
Where there is a tightening sequence indication in this Service Manual; the bolts, nuts, or screws must be tightened in the order and method indicated. When installing a part with several bolts, nuts, or screws; they should all be started in their holes and tightened to a snug fit. Then tighten them evenly, according to the tightening sequence, to the specified torque. This is to avoid distortion of the part and/or causing gas or oil leakage. Conversely when loosening the bolts, nuts, or screws; loosen all of them about a quarter of turn and then remove them.

(4) Torque
The torque values given in this Service 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.

(5) 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 wooden or plastic-faced mallet. 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.

(6) 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.

(7) Battery Ground
Before performing any disassembly operations on the motorcycle, remove the ground (–) lead from the battery to prevent the possibility of accidentally turning the engine over while partially disassembled.

(8) Engine Rotation
When turning the crankshaft by hand, always turn it in the direction of normal rotation; which is counterclockwise, viewed from the right side of the engine. This will ensure proper adjustments.

(9) 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 or grease (whichever is more suitable) should be applied to any rubbing 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.

(10) 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.

(11) Oil Seal, Grease Seal
Replace any oil or grease seals that were removed with new ones, as removal generally damage seals. A seal guide is required for certain oil or grease seals during installation to avoid damage to the seal lips. Before a shaft passes through a seal, apply a little oil, preferably high temperature grease on the lips to reduce rubber to metal friction.

(12) Gasket, O Ring
When in doubt as to the condition of a gasket or O ring, replace it with a new one. The mating surfaces around the gasket should be free of foreign matter and perfectly smooth to avoid oil or compression leaks.

(13) Liquid Gasket, Non-permanent Locking Agent
Follow manufacturer's directions for cleaning and preparing surfaces where these compounds will be used. Apply sparingly. Excessive amounts may block engine oil passages and cause serious damage. An example of a non-permanent locking agent commonly available in North America is Lock'n Seal (Blue).

(14) Ball Bearing, Oil Seal, Grease Seal Installation
When installing a ball bearing, the bearing race which is affected by friction should be pushed by a suitable driver. This prevents severe stress on the balls and races, and prevents races and balls from being dented. Press a ball bearing until it stops at the stop in the hole or on the shaft. Seals should be pressed into place using a suitable driver, which contacts evenly with the side of the seal until the face of the seal is even with the end of the hole.

(15) Circlip, Retaining Ring
Replace any circlips and retaining rings that were removed with new ones, as removal weakens and deforms them.

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When installing circlips and retaining rings, take care to compress or expand them only enough to install them and no more.

(16) **High Flash-point Solvent**
A high-flash point solvent is recommended to reduce fire danger. A commercial solvent commonly available in North America is Stoddard solvent (generic name). Always follow manufacturer and container directions regarding the use of any solvent.

(17) **Molybdenum Disulfide (MoS_2) Grease**
This manual makes reference to molybdenum disulfide grease in the assembly of certain engine and chassis parts. Always check manufacturer recommendations before using such special lubricants.

(18) **Electrical Leads**
All the electrical leads are either single-color or two-color and, with only a few exceptions, must be connected to leads of the same color. On any of the two-color leads there is a greater amount of one color and a lesser amount of a second color, so a two-color lead is identified by first the primary color and then the secondary color. For example, a yellow wire with thin red stripes is referred to as a "yellow/red" wire; it would be a "red/yellow" wire if the colors were reversed to make red the main color.

TORQUE AND LOCKING AGENT

Tighten all bolts and nuts to the proper torque using an accurate torque wrench. If insufficiently tightened, a bolt or nut may become damaged or fall off, possibly resulting in damage to the motorcycle and injury to the rider. A bolt or nut which is overtightened may become damaged, strip an internal thread, or break and then fall out. The following table lists the tightening torque for the major bolts and nuts, and the parts requiring use of a non-permanent locking agent.

Parts marked with an asterisk (*) must be retorqued according to the Periodic Maintenance Chart (Pg. 10). One at a time, loosen each bolt or nut ½ turn, then tighten it to the specified torque. Follow the sequence if specified. For engine fasteners, retorque them when the engine is cold (at room temperature).

Engine Part	Locking Agent (•) Required	Quantity	Metric (kg-m)	English (ft-lbs)	See Pg.
Balancer chain guide screws ϕ6 P1.0	•	3	–	–	100,101
Balancer weight bolts ϕ6 P1.0	•	2	1.5	11.0	102
Breather cover bolts ϕ8 P1.25	•	4	2.5	18.0	52
Camshaft cap bolts ϕ6 P1.0	–	6	1.2	104 in-lbs	54,159
Camshaft chain tensioner cap ϕ14 P1.5	–	1	1.5	11.0	14
Camshaft chain tensioner locknut ϕ14 P1.5	–	1	1.5	11.0	14
Camshaft oil receiver screws ϕ6 P1.0	•	2	–	–	53
Camshaft sprocket bolts ϕ6 P1.0	•	2	1.5	11.0	54
Carburetor holder screws ϕ6 P1.0	•	4	–	–	–
Clutch spring bolts ϕ6 P1.0	–	4	0.9	78 in-lbs	74,90
Connecting rod big end cap nuts ϕ7 P0.75	–	4	2.4	17.5	103,171
Crankcase bolts					
lower ϕ6 P1.0	–	11	1.0	87 in-lbs	87,172
ϕ8 P1.25	–	4	2.5	18.0	87,172
upper ϕ6 P1.0	–	5	1.0	87 in-lbs	87,172
Crankshaft main bearing cap bolts					
ϕ10 P1.5	–	4	4.0	29	87,100,172
ϕ8 P1.25	–	4	2.5	18.0	87,100,172
Crankshaft oil passage plugs ϕ6 P1.0	•	2	–	–	–
Cylinder head nuts ϕ10 P1.25	–	8	4.0	29	55
*Cylinder head cover bolts ϕ8 P1.25	–	8	2.5	18.0	52
ϕ6 P1.0	–	8	1.0	87 in-lbs	52

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Engine Part	Locking Agent (•), Liquid Gasket (★) Required	Quantity	Metric (kg-m)	English (ft-lbs)	See Pg.
Drive chain guard screws ϕ6 P1.0	•	4	—	—	63
Dynamo armature Allen bolts ϕ6 P1.0	•	3	1.0	87 in-lbs	64
Dynamo flywheel bolt ϕ10 P1.25	—	1	7.0	51	65,91
Engine drain plug ϕ12 P1.5	—	1	3.0	22	21,71,78,82
*Engine mounting bolts ϕ10 P1.25	—	4	4.0	29	84
Engine mounting front & rear ϕ8 P1.25	—	5	2.4	17.5	84
bracket bolts upper ϕ8 P1.25	—	3	1.8	13.0	52,84
Engine sprocket nut ϕ20 P1.5	—	1	8.0	58	64, 91
*Exhaust pipe holder nuts ϕ6 P1.0	—	4	—	—	50
Neutral switch ϕ10 P1.25	—	1	1.5	11.0	63
Oil filter mounting bolt ϕ20 P1.5	—	1	2.0	14.5	78,82
Oil passage plugs					
on lower crankcase PT 1/8	•, ★	1	1.0	87 in-lbs	—
PT 1/4	•, ★	2	3.0	22	—
on main bearing cap					
Allen screw ϕ6 x 1.0	★	1	—	—	—
hex head bolts ϕ6 x 1.0	★	2	1.0	87 in-lbs	—
Oil pipe fitting bolts ϕ10 P1.25	—	2	2.0	14.5	55,61,89
Oil pressure switch PT 1/8	—	1	1.5	11.0	61,89
Oil pressure relief valve ϕ12 P1.25	•	1	1.5	11.0	76
Primary chain guide screws ϕ6 P1.0	•	2	—	—	72
Ratchet gear arm stop bolts ϕ6 P1.0	•	2	—	—	98
Return spring pin ϕ8 P1.25	•	1	—	—	182
Rocker shafts ϕ16 P1.5	—	4	4.0	29	52
Shift drum positioning bolt ϕ16 P1.5	—	1	3.5	25	94
Shift shaft stop screws ϕ6 P1.0	•	2	—	—	77
Spark plugs ϕ14 P1.25	—	2	2.8	20	12
Starter motor chain guide screws ϕ5 P0.80	•	2	—	—	64
Starter motor clutch Allen bolts ϕ8 P1.25	•	3	3.5	25	66
Starter motor retaining bolts ϕ6 P1.0	•	2	1.0	87 in-lbs	67,89
Stud bolts					
cylinder ϕ10 P1.5	•	8	—	—	—
exhaust ϕ6 P1.0	•	4	—	—	—
Sump plate screws ϕ6 P1.0	•	4	—	—	87
Timing advancer bolt ϕ8 P1.25	—	1	2.5	18.0	70,91
Valve clearance adjusting screw locknuts ϕ6 P0.75	—	4	1.5	11.0 ft-lbs	14

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Chassis Part	Locking Agent (•), Liquid Gasket (★) Required	Quantity	Metric (kg-m)	English (ft-lbs)	See Pg.
*Brake cam lever bolt	–	1	–	–	–
*Brake pedal pivot nut	–	1	–	–	–
*Clutch lever holder bolt ϕ6 P1.0	–	1	–	–	–
*Disc brake parts	See Table G1 on Pg. 114.				
*Front axle clamp nuts ϕ8 P1.25	–	2	1.8	13.0	107,111
*Front axle nut					
(KZ400-B) ϕ16 P1.5	–	1	8.0	58	107
(KZ400-C) ϕ14 P1.5	–	1	8.0	58	111
Front brake light switch PT 1/8	•	1	2.8	20	133
*Front fender mounting bolts ϕ8 P1.25	–	2	–	–	–
*Front footpeg mounting bolts	–	2	–	–	–
Front fork bottom Allen bolts ϕ10 P1.0	•,★	2	1.8	13.0	142
*Front fork clamp bolts					
upper ϕ8 P1.25	–	2	1.8	13.0	138,140
lower ϕ10 P1.25	–	2	3.0	22	29,138,140
Handlebar clamp bolts ϕ8 P1.25	–	4	1.8	13.0	135
*Kick pedal bolt	–	1	–	–	–
*Rear axle nut ϕ16 P1.5	–	1	12.0	87	25
*Rear footpeg (muffler) mounting bolts	–	2	–	–	50
*Rear shock absorber mounting					
bolts ϕ10 P1.25	–	2	3.0	22	120,143
nuts ϕ10 P1.25	–	2	3.0	22	143
Rear sprocket nuts ϕ10 P1.25	–	4	4.0	29	122
*Shift pedal bolt ϕ6 P1.0	–	1	–	–	–
Spokes	–	76	0.30	26 in-lbs	124,196
*Steering stem head bolt ϕ16 P1.5	–	1	4.5	33	29,138
*Steering stem head clamp bolt ϕ8 P1.25	–	1	1.8	13.0	29,138
Steering stem locknut ϕ30 P1.0	–	1	3.0	22	29,138
*Swing arm pivot shaft nut ϕ14 P1.5	–	1	8.0	58	143
*Torque link nuts ϕ10 P1.25	–	2 (4)	3.0	22	25,111,145

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40 DISASSEMBLY–INTRODUCTION

The table below, relating tightening torque to thread diameter and pitch, lists the basic torque for the bolts and nuts used on Kawasaki Motorcycles. However, the actual torque that is necessary may vary among bolts and nuts with the same thread diameter and pitch. The bolts and nuts listed on Pg. 37 ~ 39 vary to a greater or lesser extent from what is given in this table. Refer to this table for only the bolts and nuts not included in the table on Pg. 37 ~ 39. All of the values are for use with dry solvent-cleaned threads.

Coarse threads

dia (mm)	pitch (mm)	kg-m	ft-lbs
5	0.80	0.35 ~ 0.50	2.5 ~ 3.5
6	1.00	0.6 ~ 0.9	4.5 ~ 6.5
8	1.25	1.6 ~ 2.2	11.5 ~ 16.0
10	1.50	3.1 ~ 4.2	22 ~ 30
12	1.75	5.4 ~ 7.5	39 ~ 54
14	2.00	8.3 ~ 11.5	60 ~ 83
16	2.00	13 ~ 18	94 ~ 130
18	2.50	18 ~ 25	130 ~ 181
20	2.50	26 ~ 35	188 ~ 253

Fine threads

dia (mm)	pitch (mm)	kg-m	ft-lbs
5	0.50	0.35 ~ 0.50	2.5 ~ 3.5
6	0.75	0.6 ~ 0.8	4.5 ~ 5.5
8	1.00	1.4 ~ 1.9	10.0 ~ 13.5
10	1.25	2.6 ~ 3.5	19.0 ~ 25
12	1.50	4.5 ~ 6.2	33 ~ 45
14	1.50	7.4 ~ 10.2	54 ~ 74
16	1.50	11.5 ~ 16	83 ~ 116
18	1.50	17 ~ 23	123 ~ 166
20	1.50	23 ~ 33	166 ~ 239

Disassembly – Engine Installed

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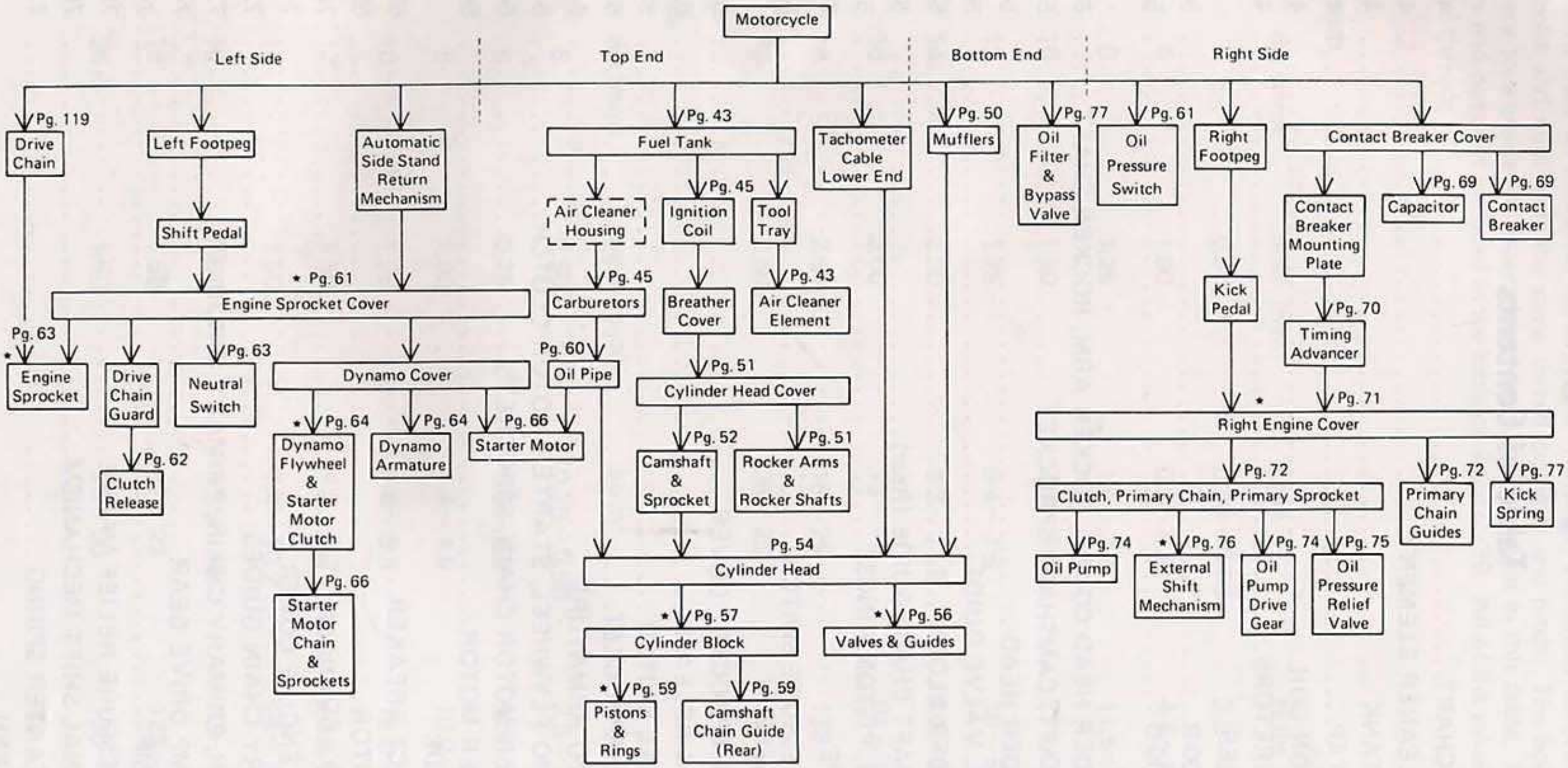
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FLOW CHART
Disassembly — Engine Installed

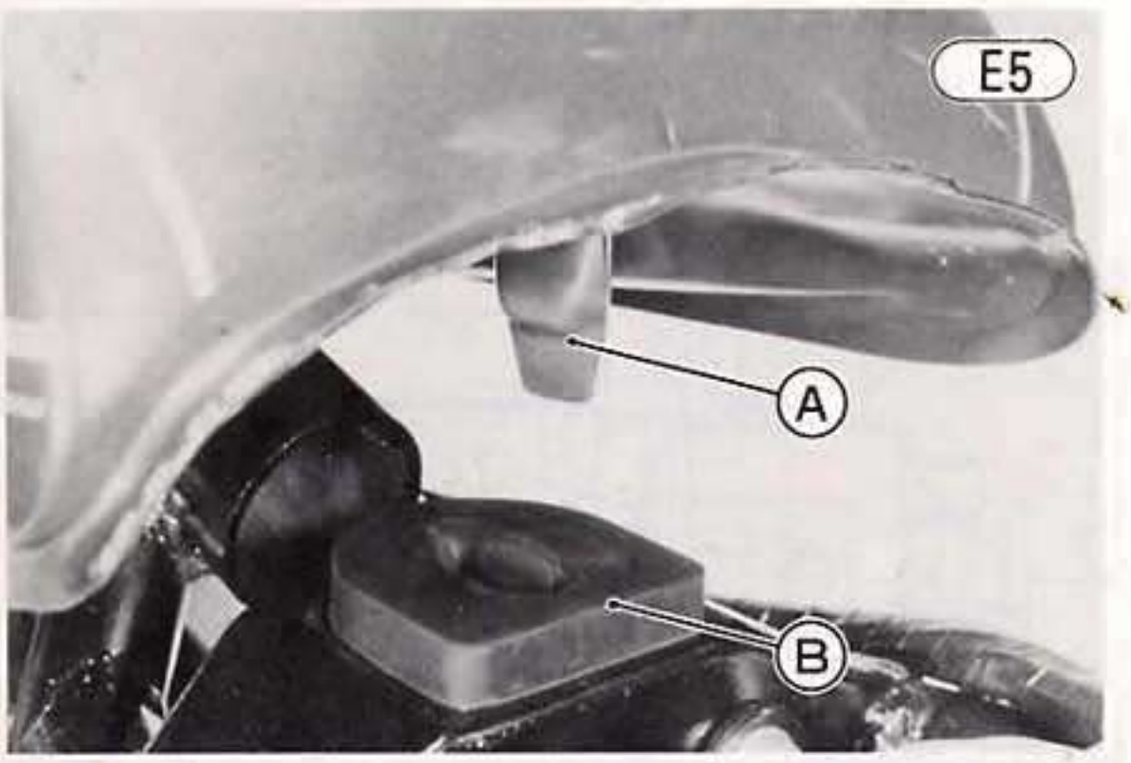
This chart is intended to be aids to proper removal. Select the component you wish to remove and follow the arrows to that point on the chart.



NOTES: 1. Before performing any disassembly operations, remove the ground (–) lead from the battery to prevent the possibility of accidentally turning the engine over.
2. Action with a mark (★) requires special tool(s) for removal, installation, disassembly, or assembly.
3. The part in the broken line is required to remove its mounting bolts, but not necessary its complete removal.

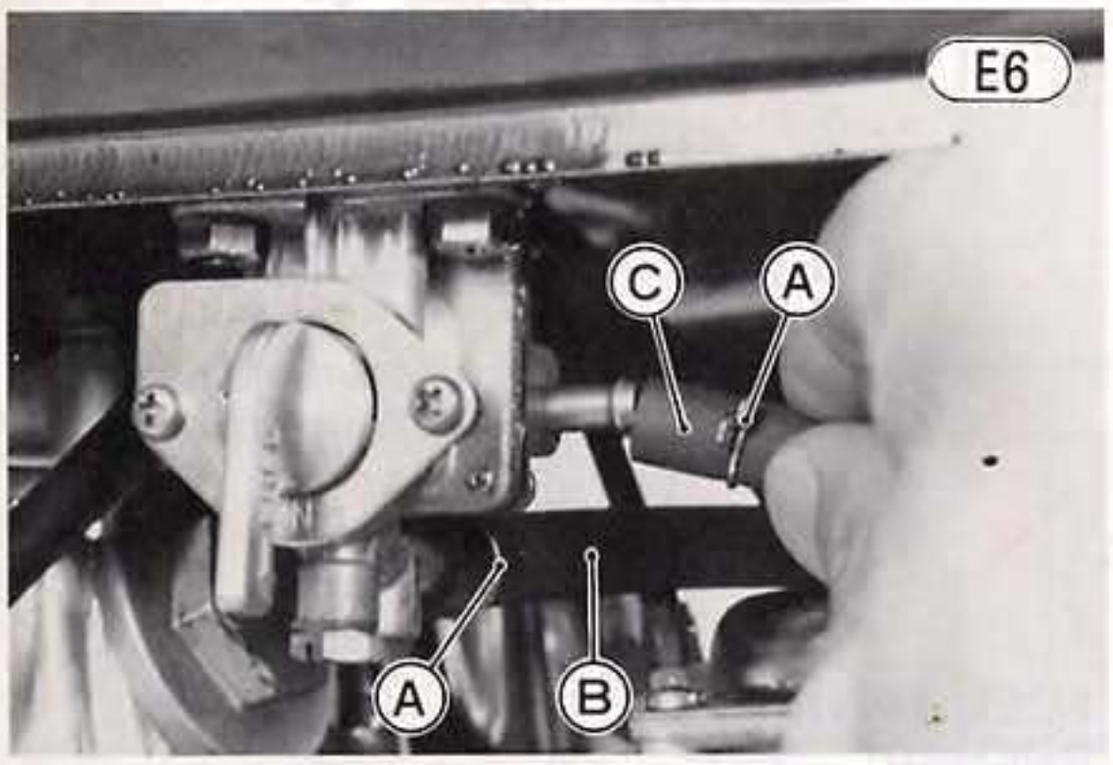
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A. Retaining Projection B. Retaining Rubber

- Fit the fuel hose and vacuum hose back onto the fuel tap, and slide the hose clamps back into place. The vacuum hose has a smaller diameter than the fuel hose.



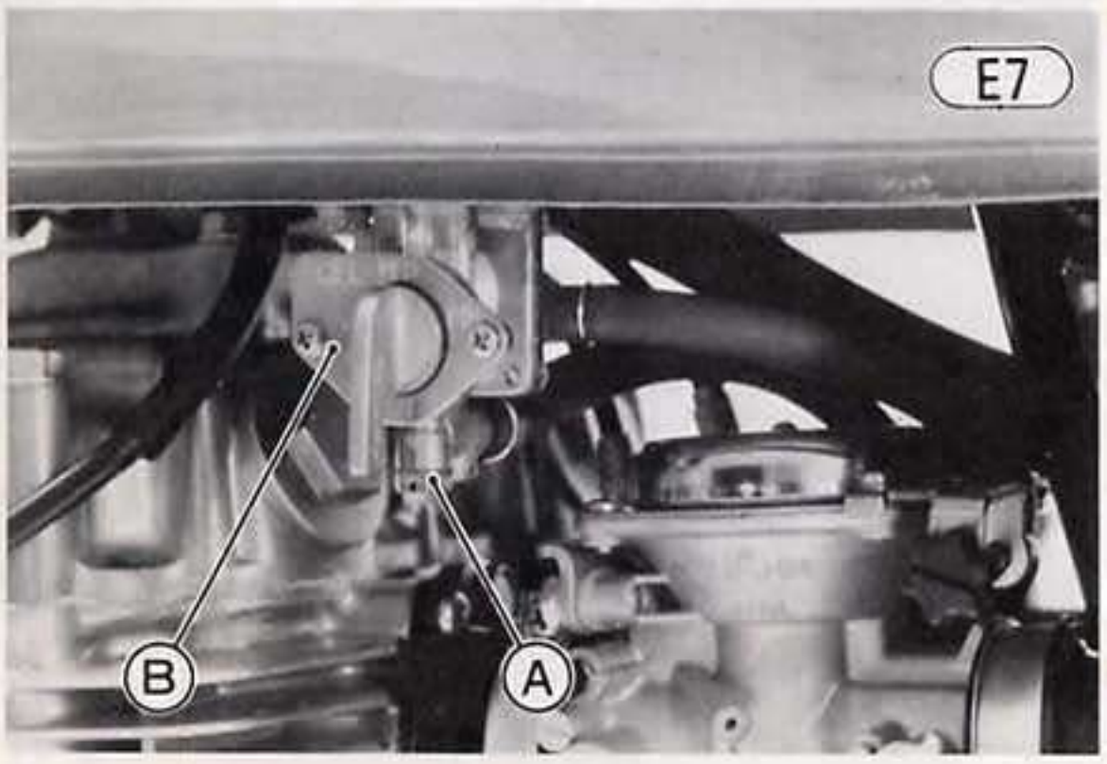
A. Clamp B. Fuel Hose C. Vacuum Hose

- Push the seat back down.

FUEL TAP

Removal:

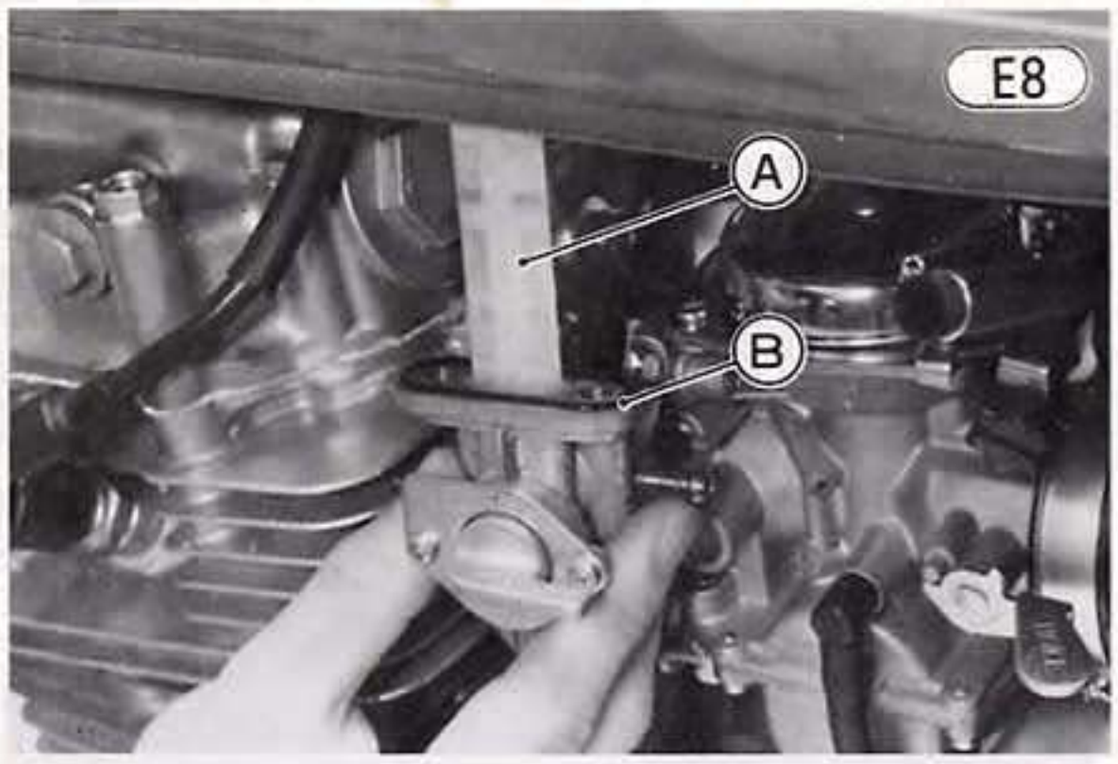
- Remove the drain plug and gasket at the bottom of the fuel tap.



A. Drain Plug B. Fuel Tap

- Holding a container under the fuel tap, turn the tap to the "PRI" position to drain the tank.

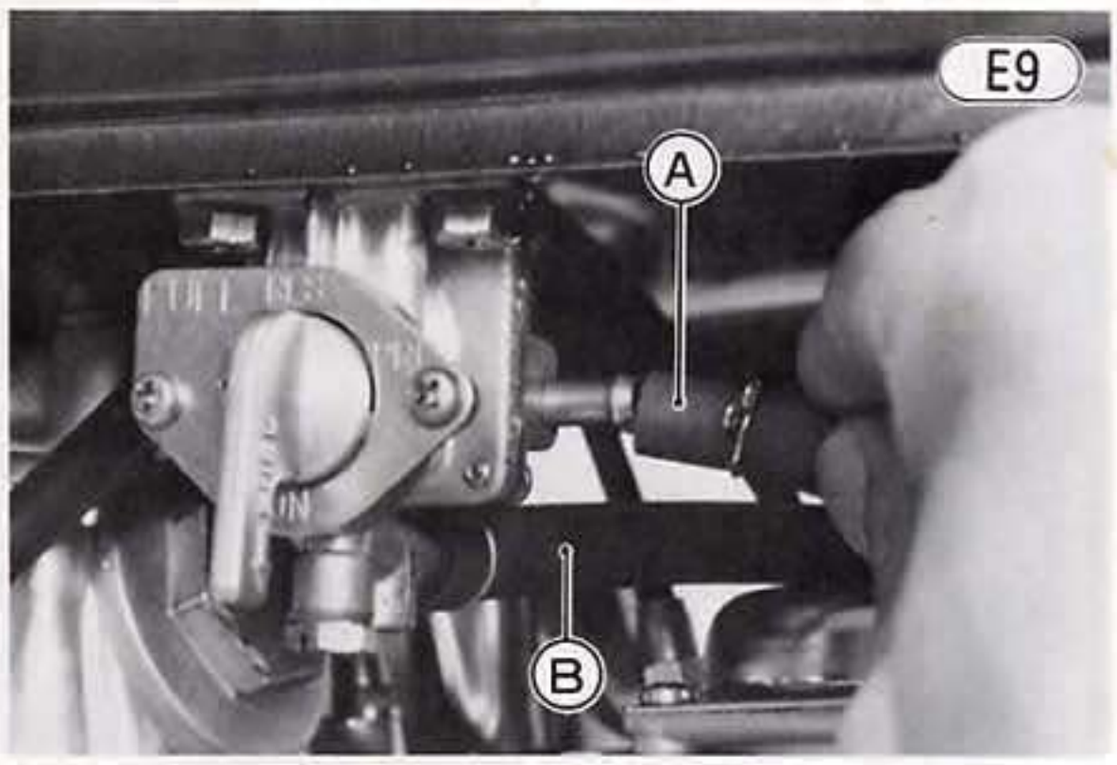
- Slide the hose clamps out of position, and pull the fuel and vacuum hoses off the tap.
- Remove the bolts and gaskets, and pull the fuel tap off the fuel tank. Be careful not to damage the filter.



A. Filter B. "O" Ring

Installation Notes:

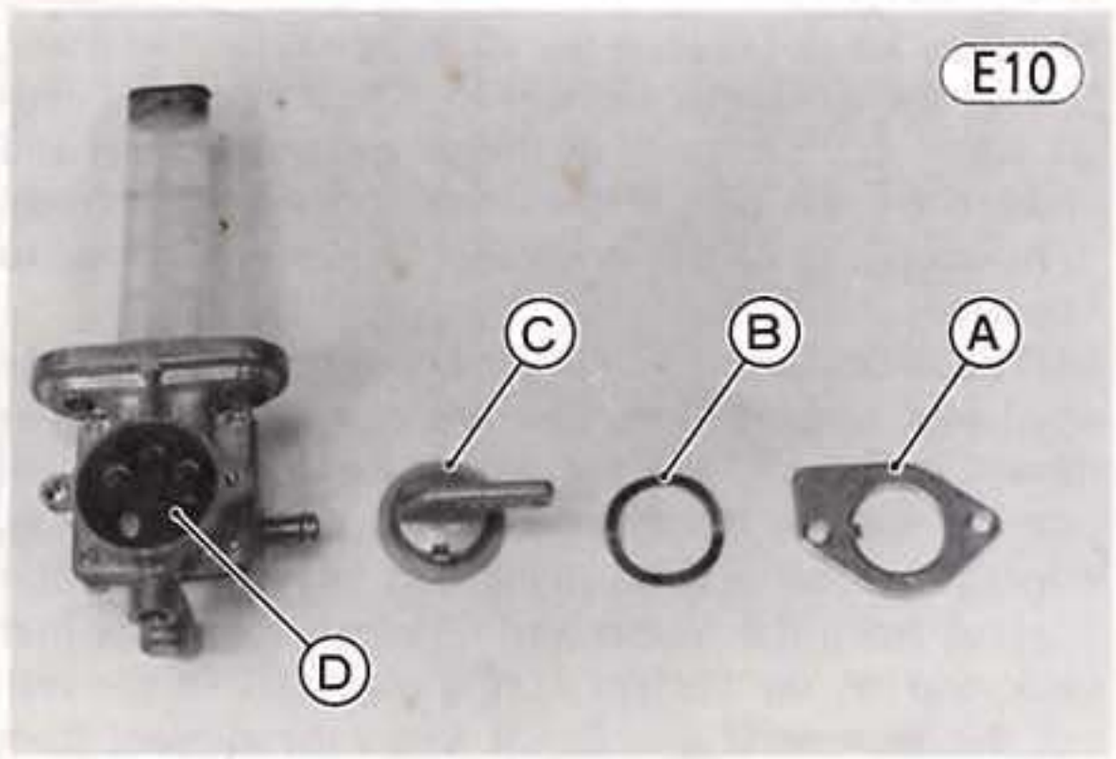
1. Check the O ring, and replace it with a new one if it is damaged or deteriorated.
2. After installing the fuel tap on the tank, make sure that the fuel stops when the engine stops.
3. The vacuum hose is the small diameter hose; the fuel hose is larger.



A. Vacuum Hose B. Fuel Hose

Disassembly:

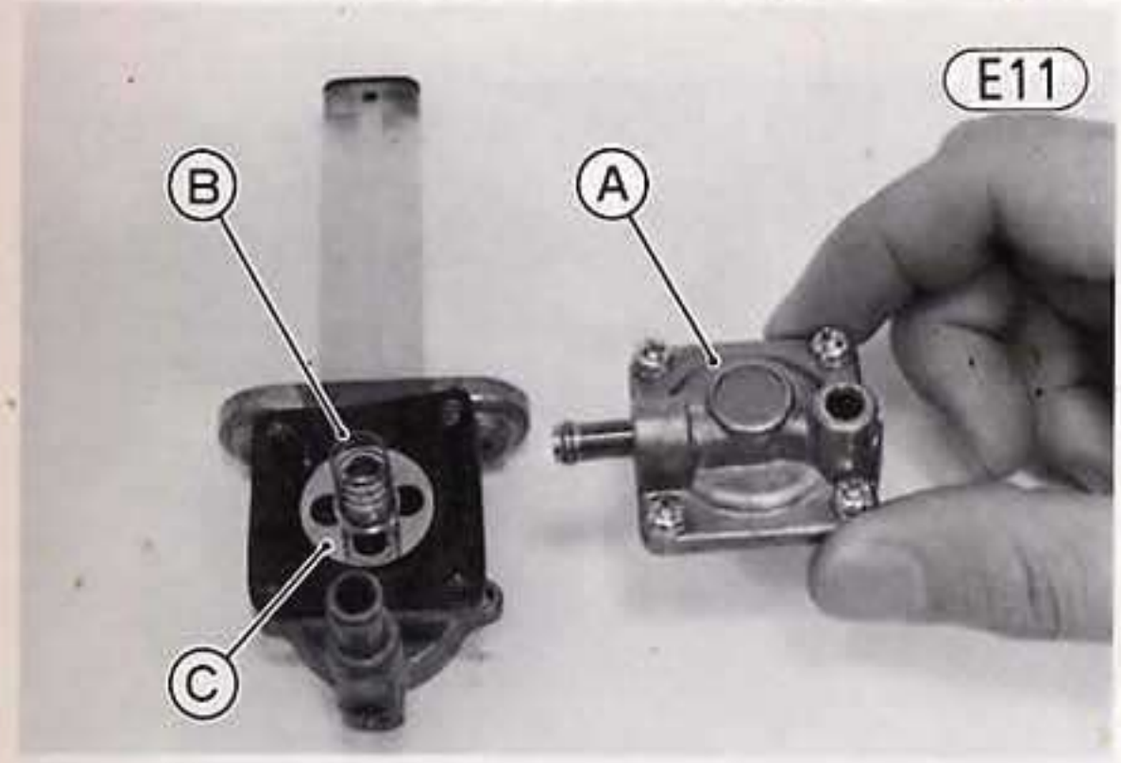
- Remove the screws (2), and remove the tap lever, wave washer, and holding plate.



A. Holding Plate C. Tap Lever
B. Wave Washer D. Valve Gasket

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•Take out the valve gasket.
•Remove the screws and lockwashers (4 ea), and remove the diaphragm cover and spring.



A. Diaphragm Cover
B. Spring
C. Diaphragm Assembly

•Remove the diaphragm assembly from the fuel tap.

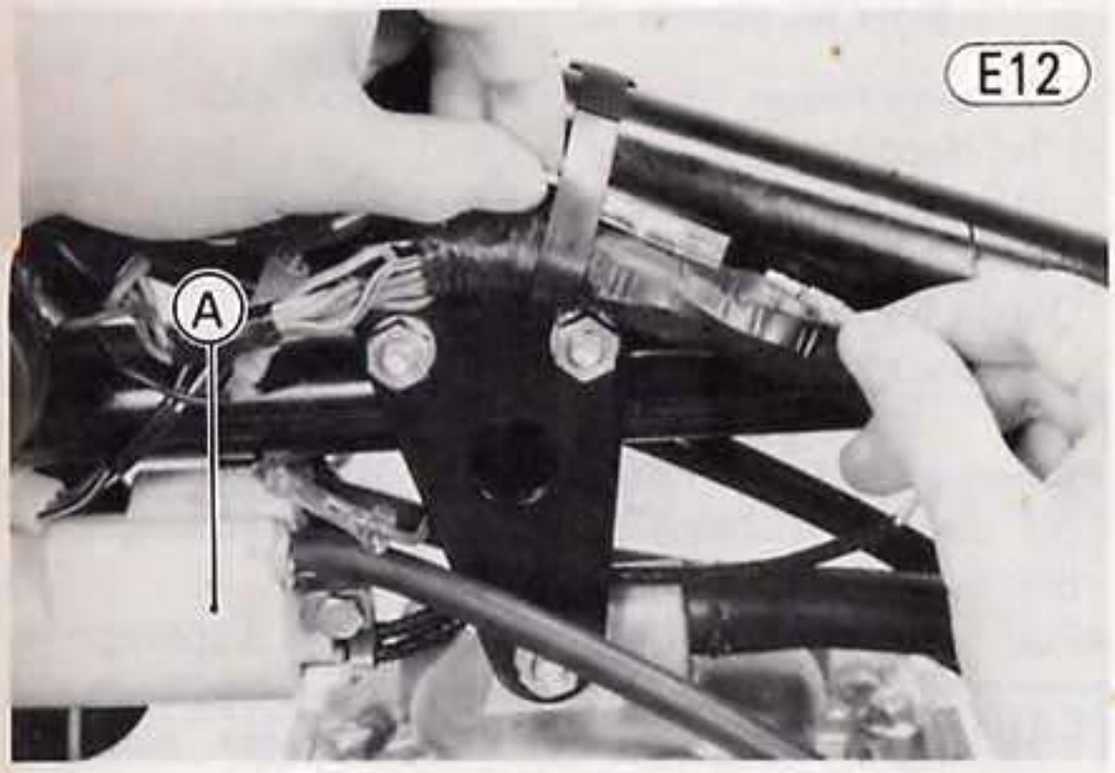
Assembly Notes:

1. Check and clean all the parts (Pg. 149). Replace damaged parts with new ones.
2. Install the diaphragm cover in the direction shown in Fig. E11, making sure that the spring is compressed at the center of the diaphragm between the diaphragm and the cover.

IGNITION COIL

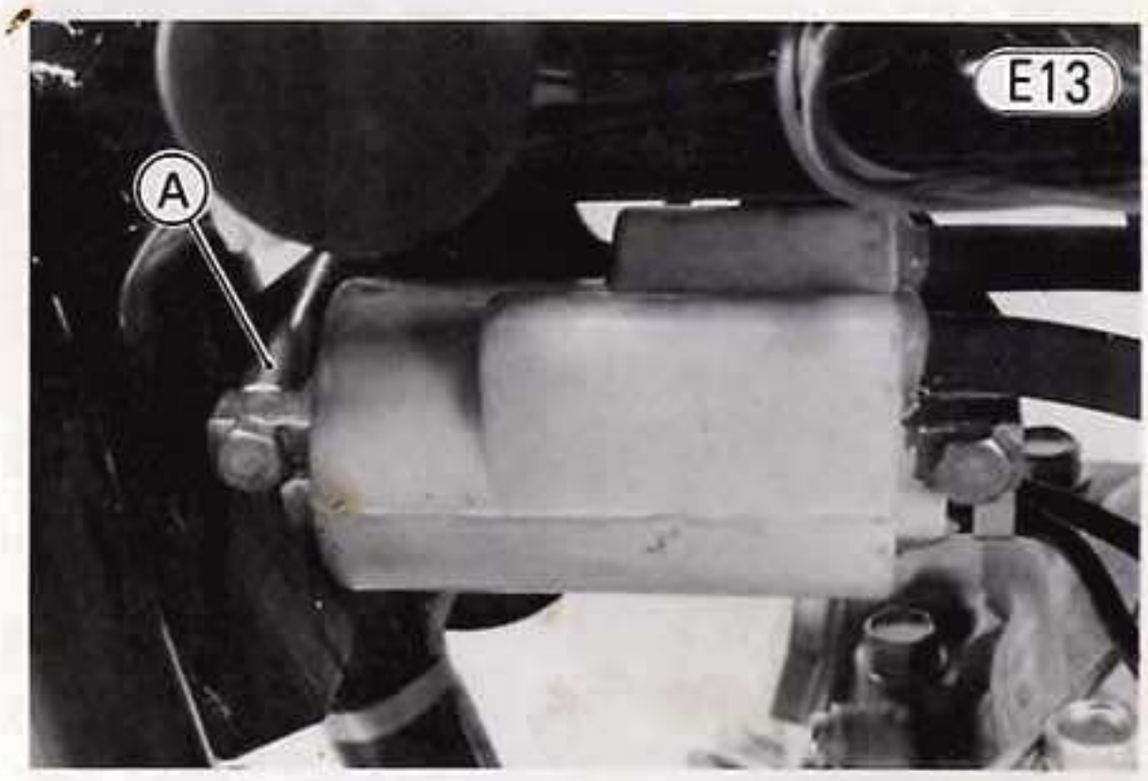
Removal:

•Remove the fuel tank (Pg. 43).
•Pull the spark plug leads off the spark plugs.
•Disconnect the blue and red/yellow leads of the ignition coil.



A. Ignition Coil

•Remove the bolts (2) that connect the ignition coil to the bracket, and remove the ignition coil. Each bolt has a collar between the ignition coil and the bracket.



A. Collar

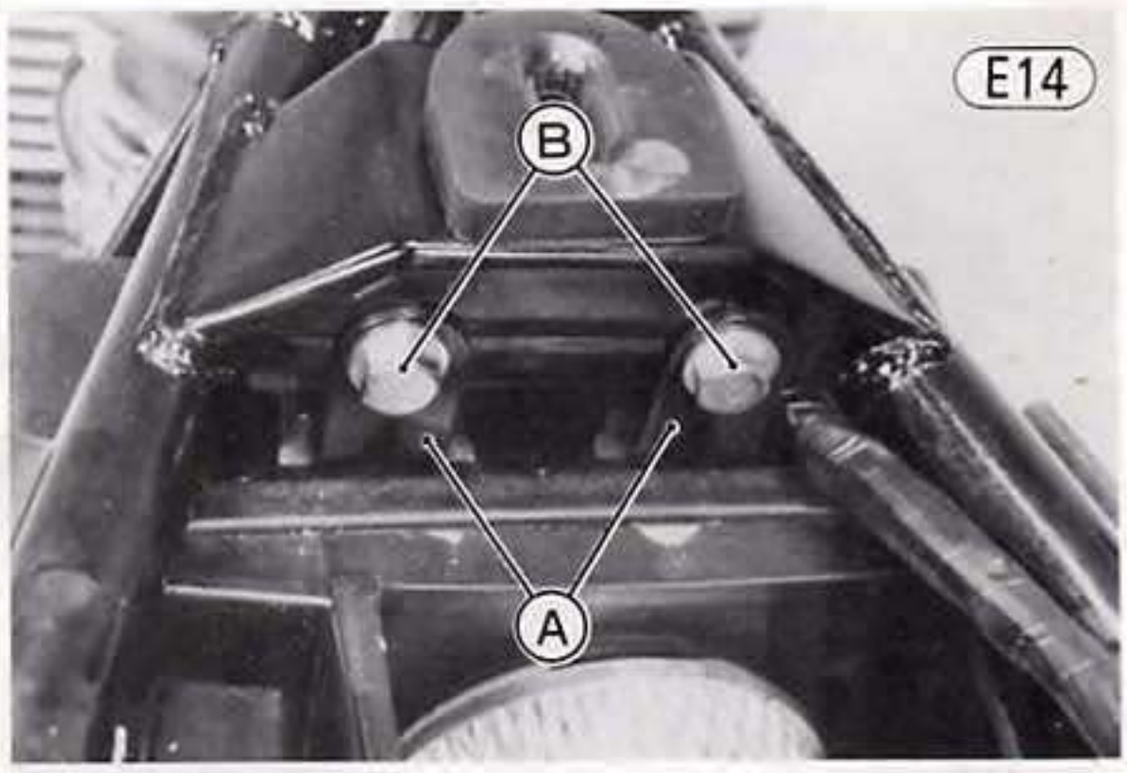
Installation Notes:

1. Use only the Kawasaki ignition coil bolts to mount the ignition coil. Bolts of a different composition may adversely affect ignition coil performance.
2. Run the right spark plug lead between the upper brackets.

CARBURETORS

Removal:

•Remove the fuel tank (Pg. 43).
•Take off the right and left side covers.
•Remove the tool kit, remove its tray retaining bolt (screw), lockwasher and flat washer, and then take off the tray.
•Remove the bolts and flat washers (2 ea), and take off the air cleaner housing mounting brackets (2).

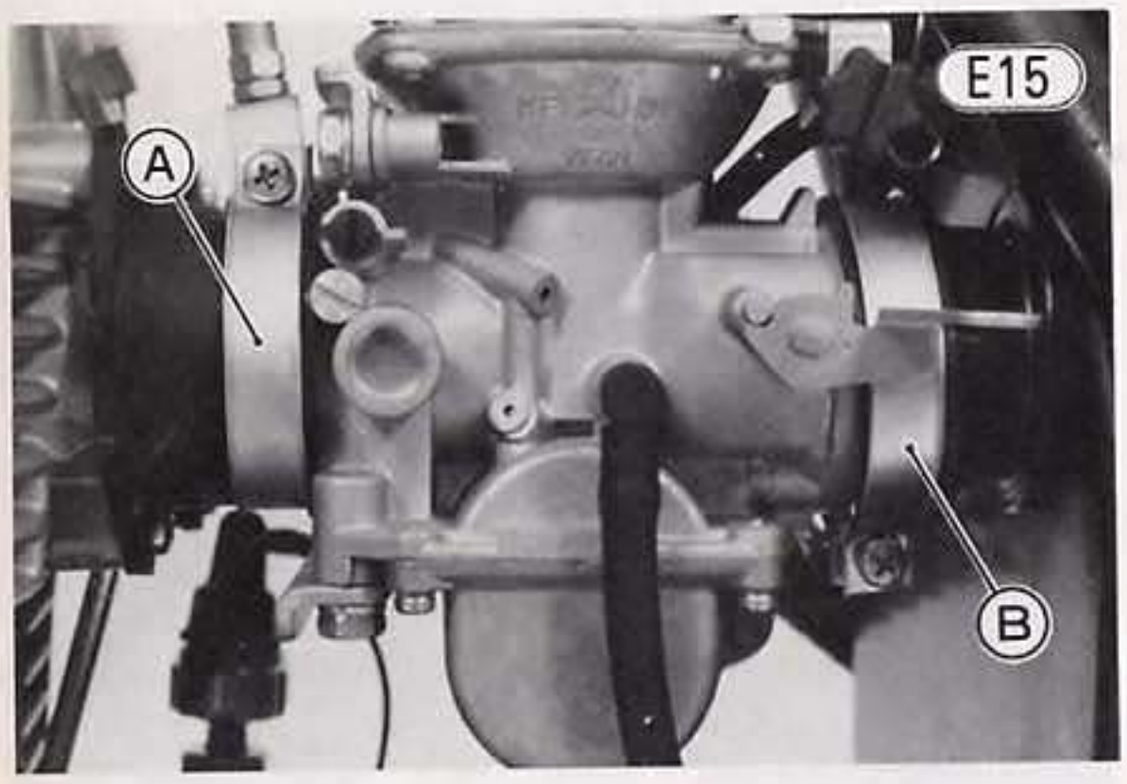


A. Air Cleaner Housing Mounting Brackets
B. Bolts

•Slide the clip out of place, and remove the breather hose from the pipe of the breather cover.

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●Loosen the carburetor holder clamp and the air cleaner duct clamp for each carburetor, and slip it out of place.



A. Carburetor Holder Clamp
B. Air Cleaner Duct Clamp

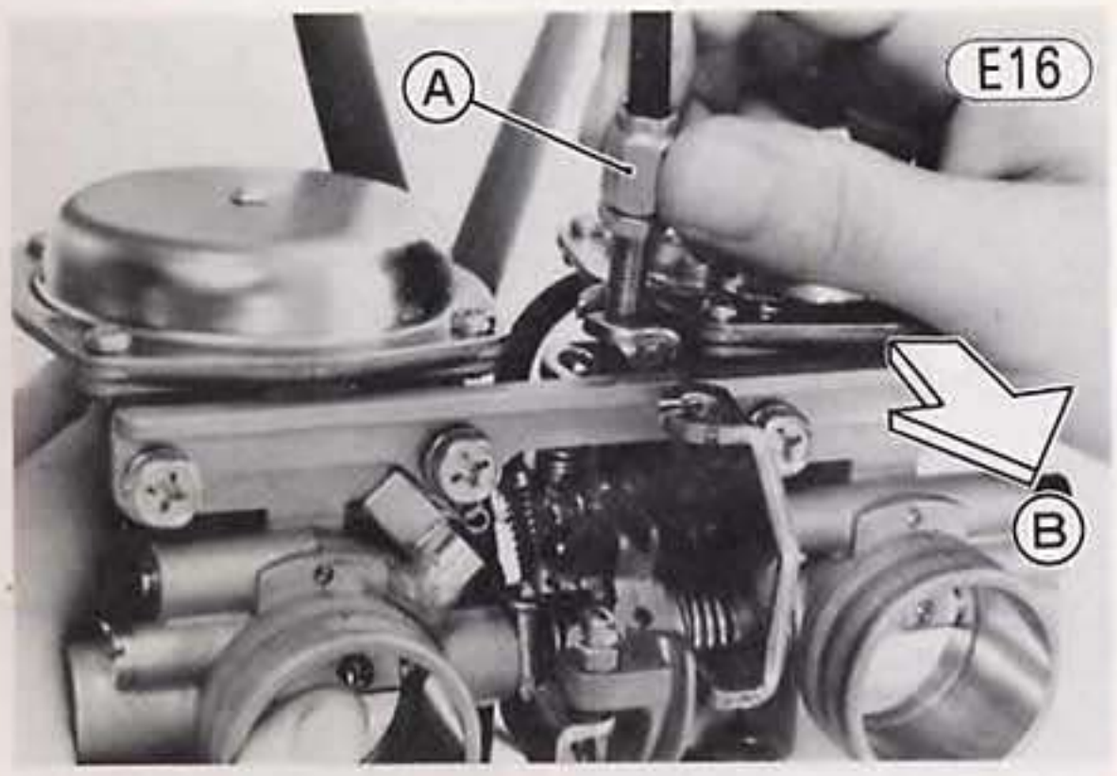
●Slip the carburetors up and out of them to the right side. Be sure not to damage the throttle cables.
●Turn in fully the locknuts and adjusting nuts at the upper end of the throttle cables so as to give the cables plenty of play.

CAUTION **Removing the throttle cables from the carburetors without enough cable play, may cause throttle cable damage.**

●Loosen the throttle cable adjuster locknuts (2), and screw down the decelerator cable adjuster fully into the cable bracket.
●Screw the accelerator cable adjuster 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.

Installation:

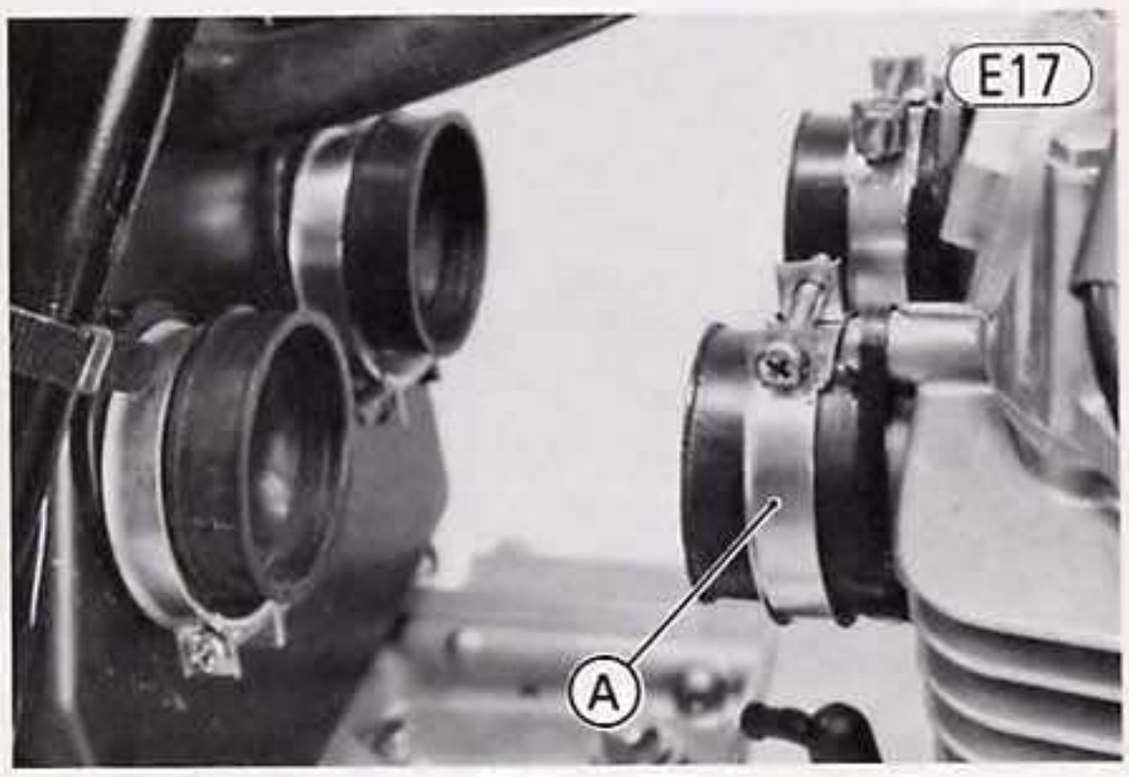
●Fit the tip of the decelerator throttle cable into the rear catch in the pulley, and install its adjuster into the cable bracket. Be sure that both throttle cables run between the frame top tube and the right side cradle tube without kinks or sharp bends, and that they do not twist around each other.



A. Decelerator Throttle Cable Adjuster **B. Front**

●Fit the tip of the other cable into the other catch, and install its adjuster onto the bracket. Turn the throttle grip at the same time, if necessary.

NOTE: If the carburetors were disassembled, perform Preliminary Adjustment (Pg. 17).
●Check that the carburetor holder clamps and air cleaner ducts are in place. The clamp screw of each carburetor holder clamp must be facing upward.



A. Carburetor Holder Clamp

●Slip the carburetors back into place reversing the removal procedure.
●Check that the ducts and holders are all properly fitted on the carburetors, tighten the clamps.
●Route the carburetor overflow tubes (4) to the right rear of the engine.
●Fit the breather hose onto the pipe of the breather cover, and slide back the clip.
●Install the air cleaner housing mounting brackets (2), flat washers (2), and lockwashers (2), and tighten the bolts (2).
●Install the tool kit tray, and tighten the bolt (screw) with the lockwasher and flat washer.
●Install the tool kit.
●Install the right and left side covers.
●Install the fuel tank (Pg. 43).
●Adjust the throttle cables (Pg. 15).
●Adjust the carburetors (Pg. 16).

Carburetor Body Disassembly (per carburetor):

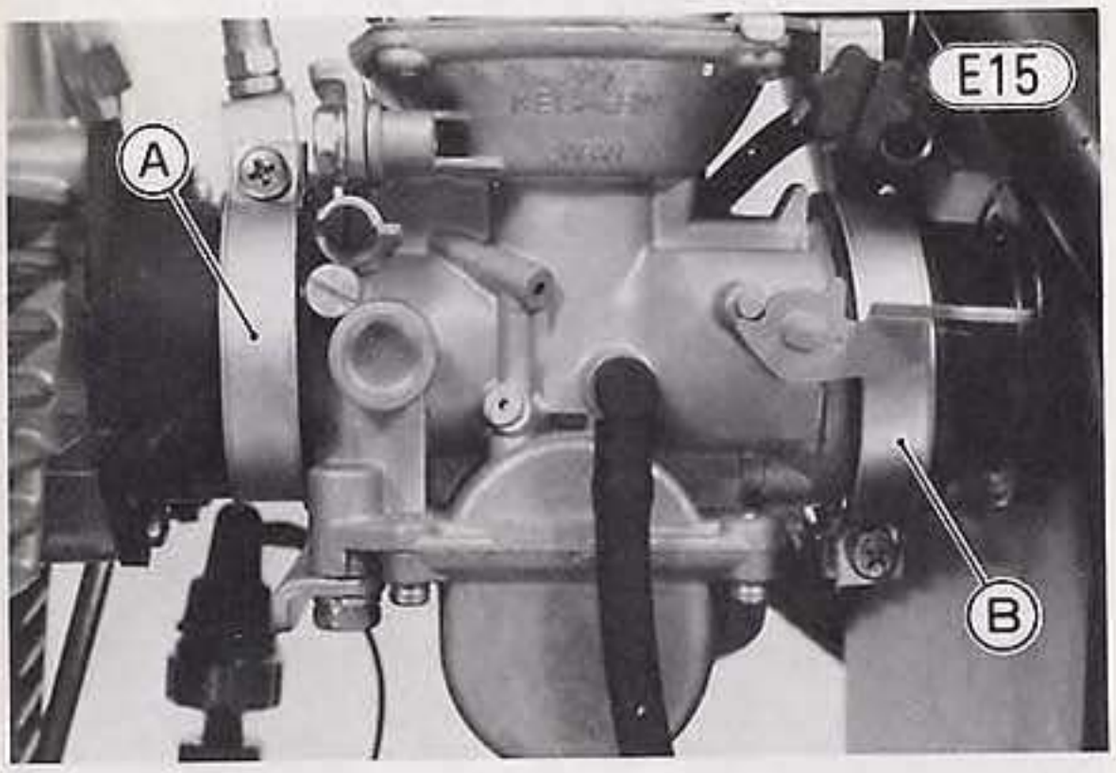
NOTE: The following procedure explains removal of the carburetor parts listed below, and these parts can be removed without separating the carburetors from the mounting plates.

Vacuum Piston	Needle Jet Holder
Jet Needle	Float
Pilot Screw	Float Valve Needle
Primary Main Jet	Needle Jet
Main Jet Bleed Pipe	Pilot Jet
Secondary Main Jet	

●Remove the upper chamber cover screws (4), and take off the upper chamber cover (39), idle adjusting screw bracket (6), and spring (17).
●Pull out the vacuum piston (45) with the diaphragm (44).

CAUTION **During carburetor disassembly, be careful not to damage the diaphragm. Never use a sharp edge to remove the diaphragm.**

●Loosen the carburetor holder clamp and the air cleaner duct clamp for each carburetor, and slip it out of place.



A. Carburetor Holder Clamp
B. Air Cleaner Duct Clamp

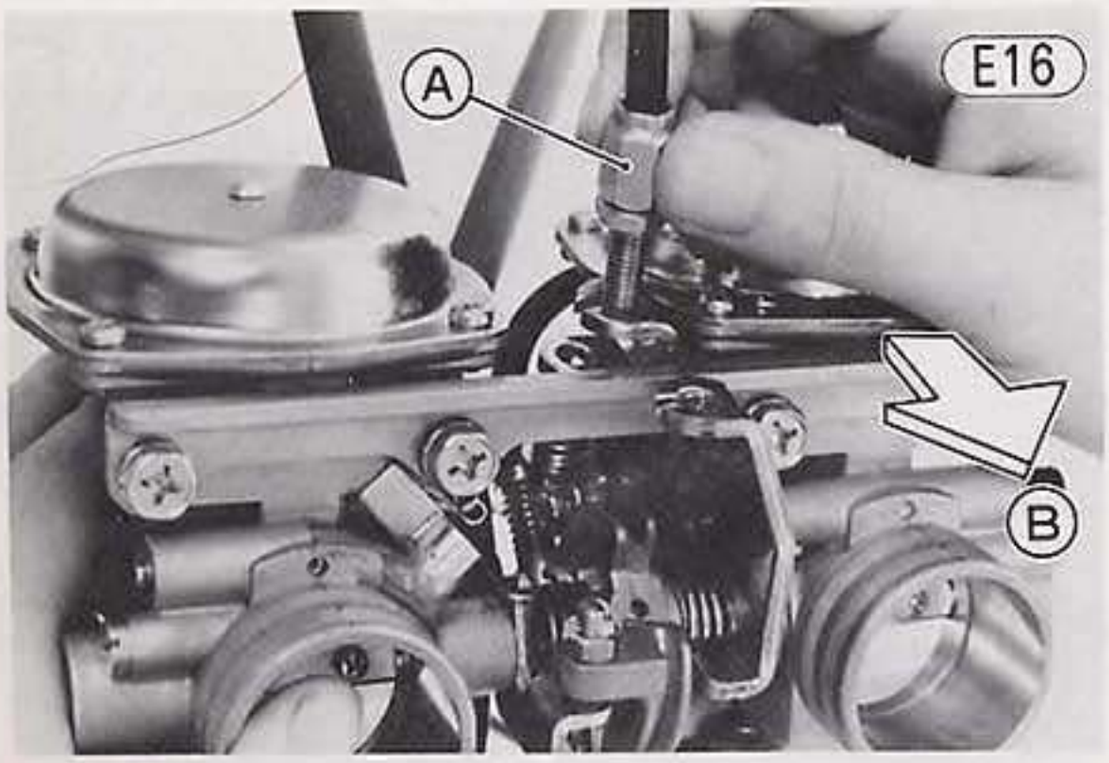
●Slip the carburetors up and out of them to the right side. Be sure not to damage the throttle cables.
●Turn in fully the locknuts and adjusting nuts at the upper end of the throttle cables so as to give the cables plenty of play.

CAUTION **Removing the throttle cables from the carburetors without enough cable play, may cause throttle cable damage.**

●Loosen the throttle cable adjuster locknuts (2), and screw down the decelerator cable adjuster fully into the cable bracket.
●Screw the accelerator cable adjuster 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.

Installation:

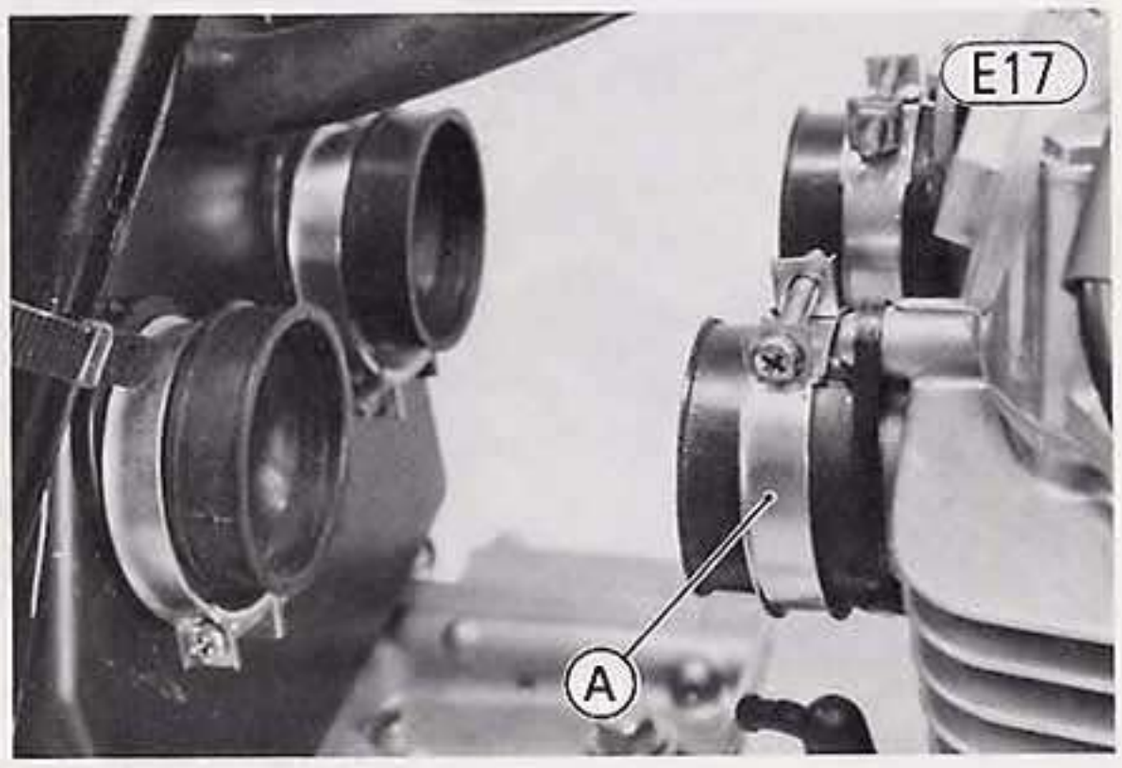
●Fit the tip of the decelerator throttle cable into the rear catch in the pulley, and install its adjuster into the cable bracket. Be sure that both throttle cables run between the frame top tube and the right side cradle tube without kinks or sharp bends, and that they do not twist around each other.



A. Decelerator Throttle Cable Adjuster **B. Front**

●Fit the tip of the other cable into the other catch, and install its adjuster onto the bracket. Turn the throttle grip at the same time, if necessary.

NOTE: If the carburetors were disassembled, perform Preliminary Adjustment (Pg. 17).
●Check that the carburetor holder clamps and air cleaner ducts are in place. The clamp screw of each carburetor holder clamp must be facing upward.



A. Carburetor Holder Clamp

●Slip the carburetors back into place reversing the removal procedure.
●Check that the ducts and holders are all properly fitted on the carburetors, tighten the clamps.
●Route the carburetor overflow tubes (4) to the right rear of the engine.
●Fit the breather hose onto the pipe of the breather cover, and slide back the clip.
●Install the air cleaner housing mounting brackets (2), flat washers (2), and lockwashers (2), and tighten the bolts (2).
●Install the tool kit tray, and tighten the bolt (screw) with the lockwasher and flat washer.
●Install the tool kit.
●Install the right and left side covers.
●Install the fuel tank (Pg. 43).
●Adjust the throttle cables (Pg. 15).
●Adjust the carburetors (Pg. 16).

Carburetor Body Disassembly (per carburetor):

NOTE: The following procedure explains removal of the carburetor parts listed below, and these parts can be removed without separating the carburetors from the mounting plates.

Vacuum Piston	Needle Jet Holder
Jet Needle	Float
Pilot Screw	Float Valve Needle
Primary Main Jet	Needle Jet
Main Jet Bleed Pipe	Pilot Jet
Secondary Main Jet	

●Remove the upper chamber cover screws (4), and take off the upper chamber cover ㊴, idle adjusting screw bracket ⑥, and spring ⑰.
●Pull out the vacuum piston ㊺ with the diaphragm ㊹.

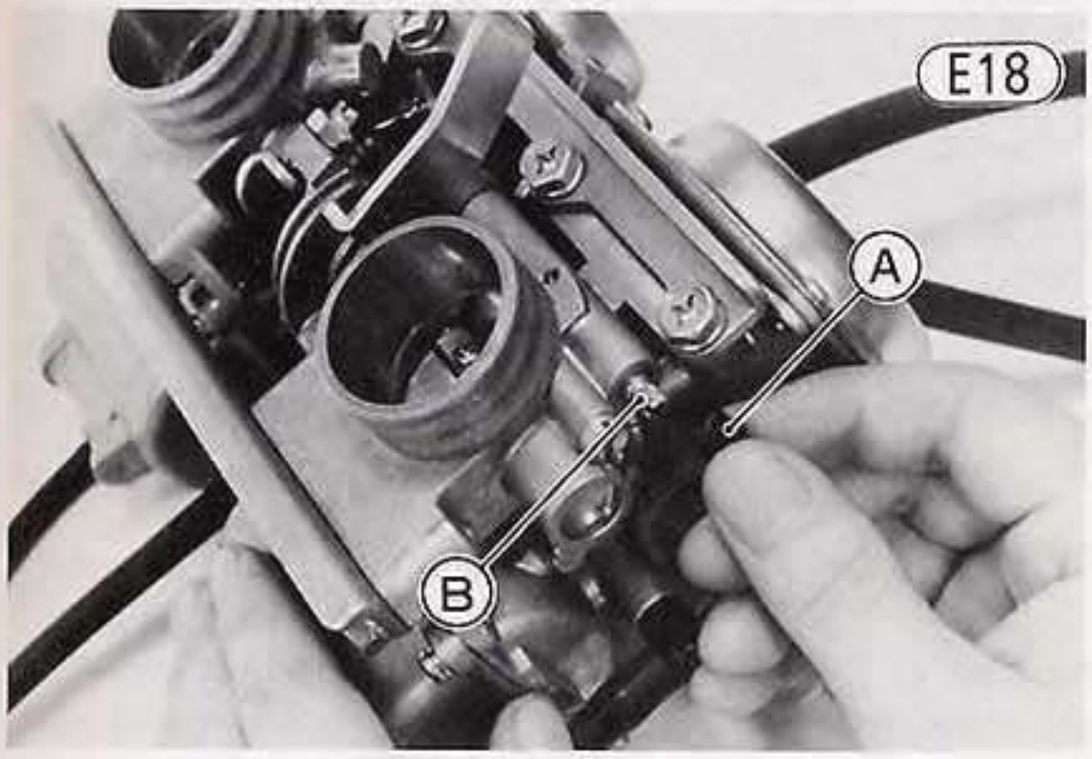
CAUTION **During carburetor disassembly, be careful not to damage the diaphragm. Never use a sharp edge to remove the diaphragm.**

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•Remove the circlip ㊶, jet needle holder ㊷, and jet needle ㊸.

Body Outside:

•Pull off the pilot screw limiter ㊹, and remove the pilot screw ㊸, spring ㊷, water ㊶, and O ring ㊿.

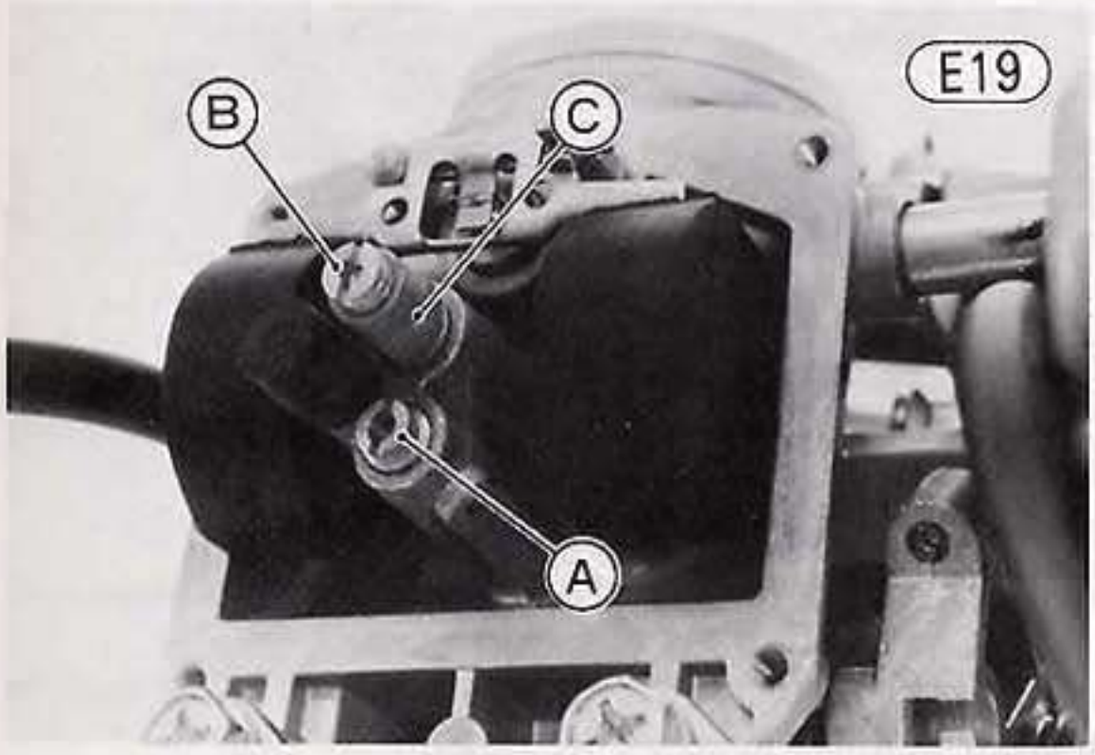


A. Pilot Screw Limiter B. Pilot Screw

Bottom End:

•Remove the screws ㊵ and lockwashers ㊾ (4 ea), and take off the float bowl ㊸ and O ring ㊷.

•Now, the primary main jet ㊿, main jet bleed pipe ㊾, secondary main jet ㊺, and needle jet holder ㊹ can be removed.



A. Primary Main Jet C. Needle Jet Holder
B. Secondary Main Jet

•To remove the float valve needle ㊻, first push out the float pin ㊶, remove the float ㊽, and pull out the float valve needle with its hanger clip ㊼.

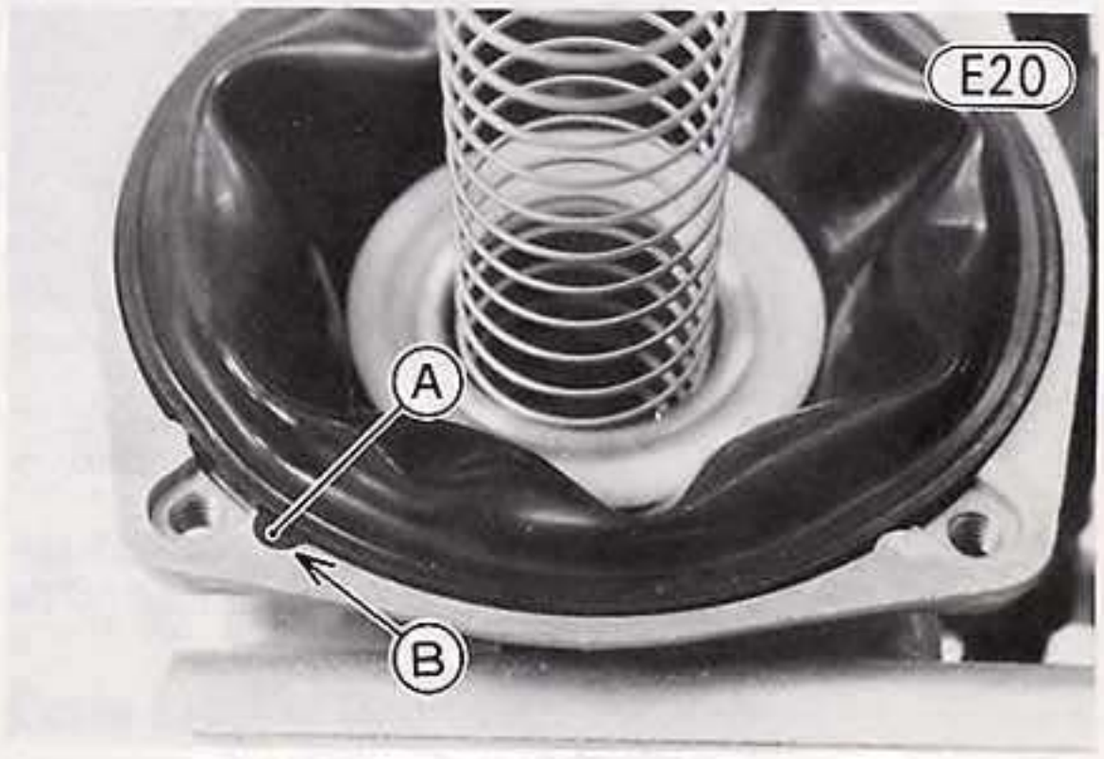
•To remove the needle jet ㊸, remove the vacuum piston (See Pg. 46) and needle jet holder.

•To remove the pilot jet ㊶, remove the rubber plug ㊷.

Assembly Notes:

1. Replace any O rings and rubber plugs if damaged or deteriorated.

2. Assemble the upper chamber as follows:
   ○Insert the spring into the vacuum piston.
   ○Fit the vacuum piston into the carburetor body, and check that the piston slides up and down without drag.
   ○Align the diaphragm tongue with the notch in the upper chamber cover mating surface, and fit the diaphragm sealing lip into its groove.

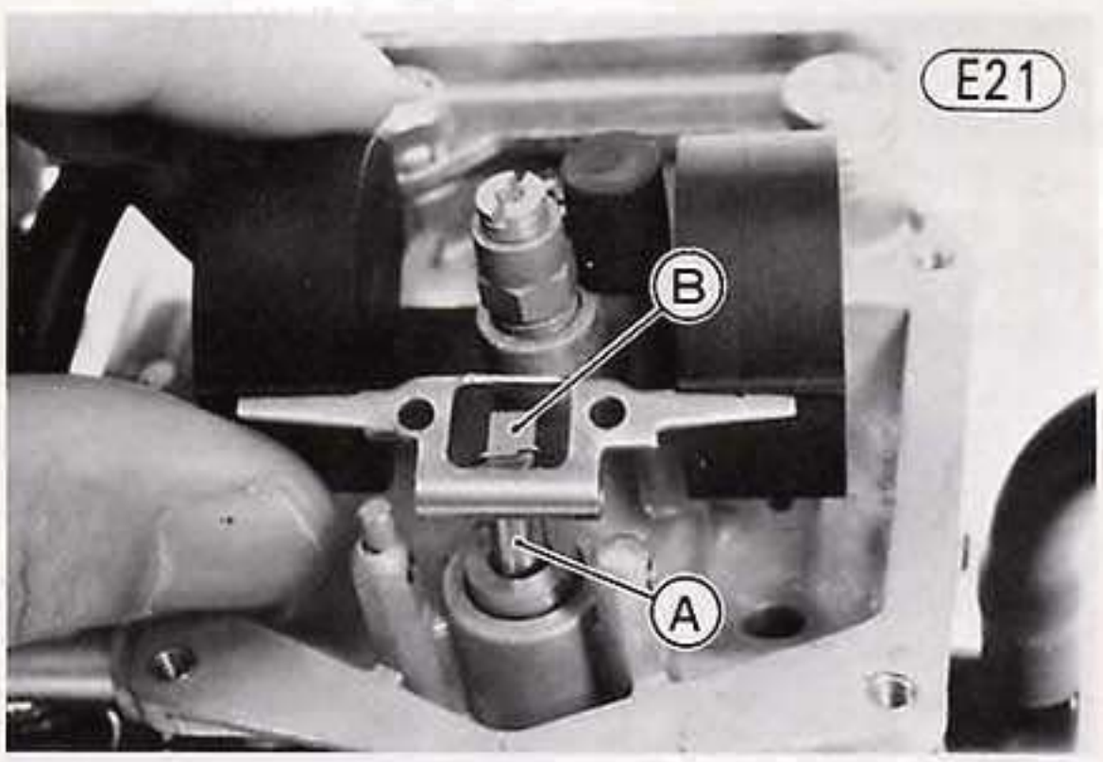


A. Tongue B. Notch

○With a finger, lift the vacuum piston just enough so that there is no crease on the diaphragm, and taking care not pinch the diaphragm lip, replace the upper chamber cover. While holding the cover to keep it from being lifted by the spring, tighten the three screws. Install the idle adjusting screw bracket with the screw and lockwasher.

CAUTION **If the diaphragm is pinched, not only does the diaphragm become damaged, but the vacuum piston will not slide down to the rest position (there is a 6 mm space normally left between the piston lower end and the carburetor venturi). This causes idling unstability and reduces engine performance.**

3. When assembling the float valve needle, hook its hanger clip to the tang on the float.



A. Valve Needle B. Tang

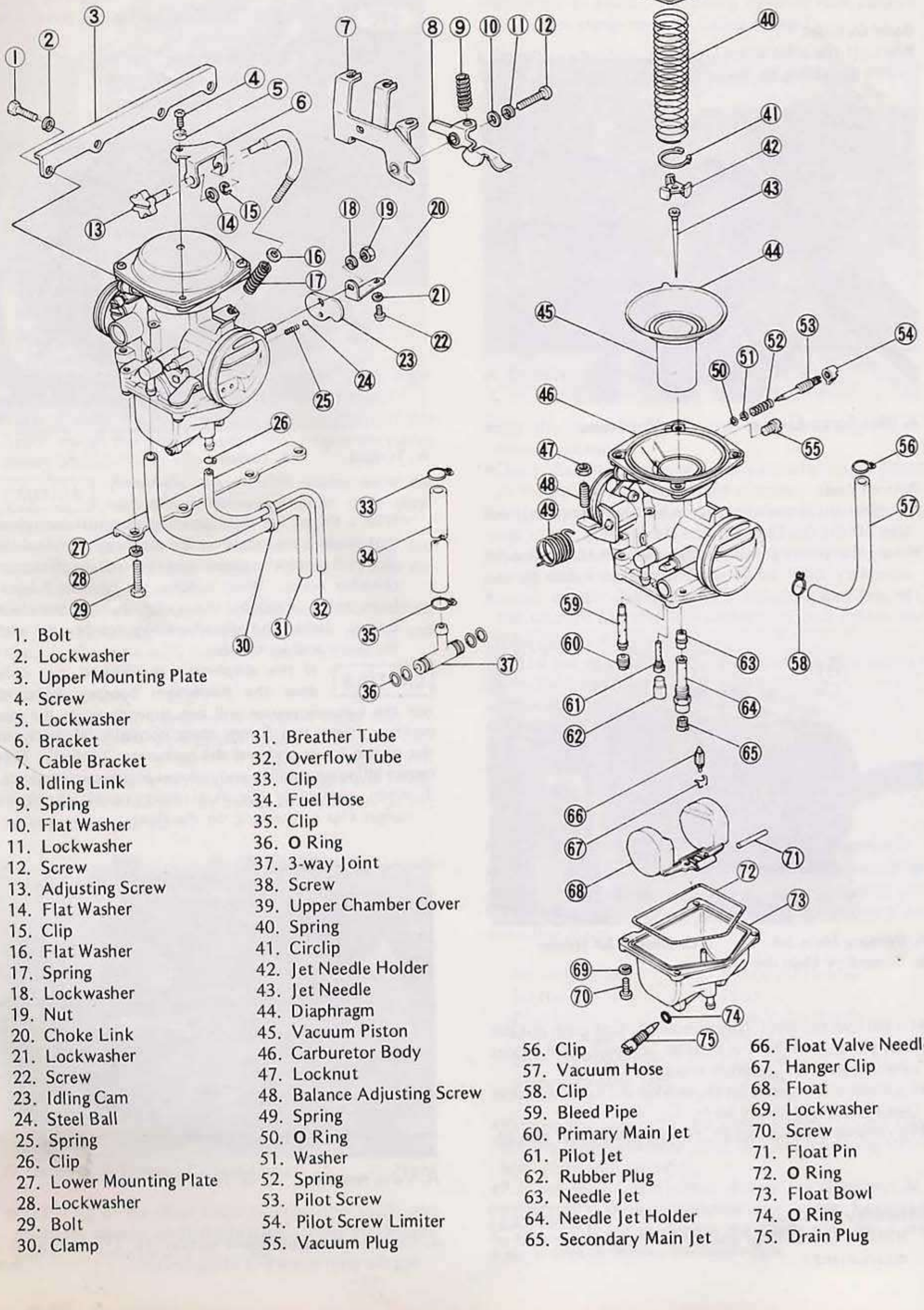
4. Refer to the adjustment section (Pg. 17), for installing the pilot screw and idling limiter.

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Carburetors

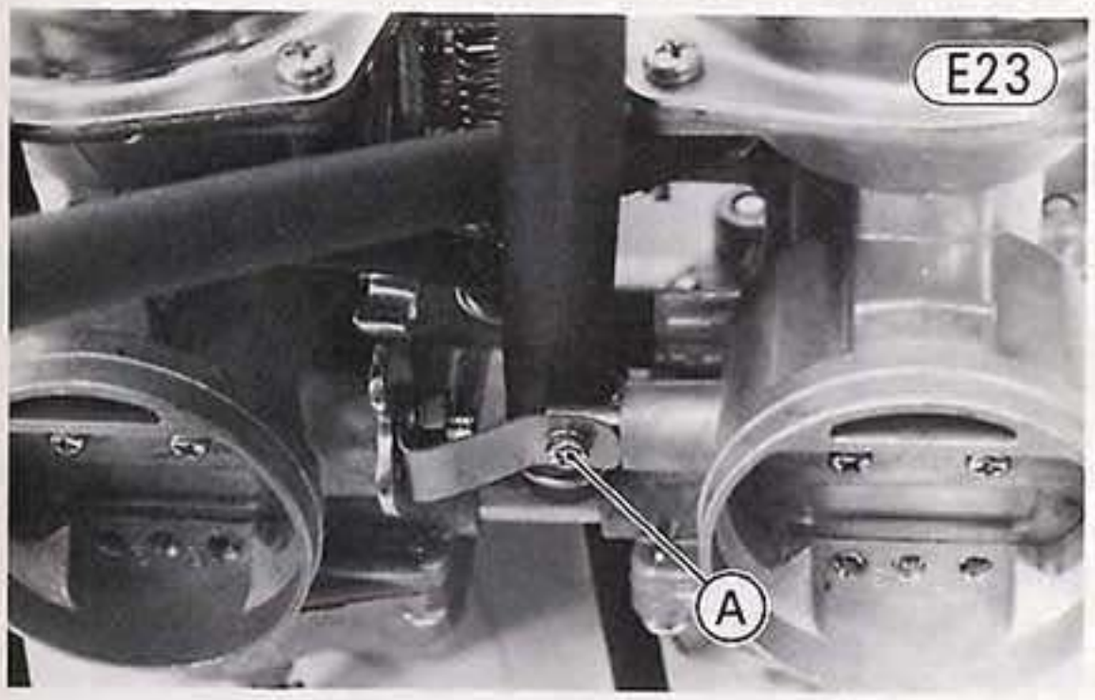


1. Bolt
2. Lockwasher
3. Upper Mounting Plate
4. Screw
5. Lockwasher
6. Bracket
7. Cable Bracket
8. Idling Link
9. Spring
10. Flat Washer
11. Lockwasher
12. Screw
13. Adjusting Screw
14. Flat Washer
15. Clip
16. Flat Washer
17. Spring
18. Lockwasher
19. Nut
20. Choke Link
21. Lockwasher
22. Screw
23. Idling Cam
24. Steel Ball
25. Spring
26. Clip
27. Lower Mounting Plate
28. Lockwasher
29. Bolt
30. Clamp
31. Breather Tube
32. Overflow Tube
33. Clip
34. Fuel Hose
35. Clip
36. O Ring
37. 3-way Joint
38. Screw
39. Upper Chamber Cover
40. Spring
41. Circlip
42. Jet Needle Holder
43. Jet Needle
44. Diaphragm
45. Vacuum Piston
46. Carburetor Body
47. Locknut
48. Balance Adjusting Screw
49. Spring
50. O Ring
51. Washer
52. Spring
53. Pilot Screw
54. Pilot Screw Limiter
55. Vacuum Plug
56. Clip
57. Vacuum Hose
58. Clip
59. Bleed Pipe
60. Primary Main Jet
61. Pilot Jet
62. Rubber Plug
63. Needle Jet
64. Needle Jet Holder
65. Secondary Main Jet
66. Float Valve Needle
67. Hanger Clip
68. Float
69. Lockwasher
70. Screw
71. Float Pin
72. O Ring
73. Float Bowl
74. O Ring
75. Drain Plug

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Separation of Carburetors:

●Remove the choke link screw ㉒ and lockwasher ㉑.

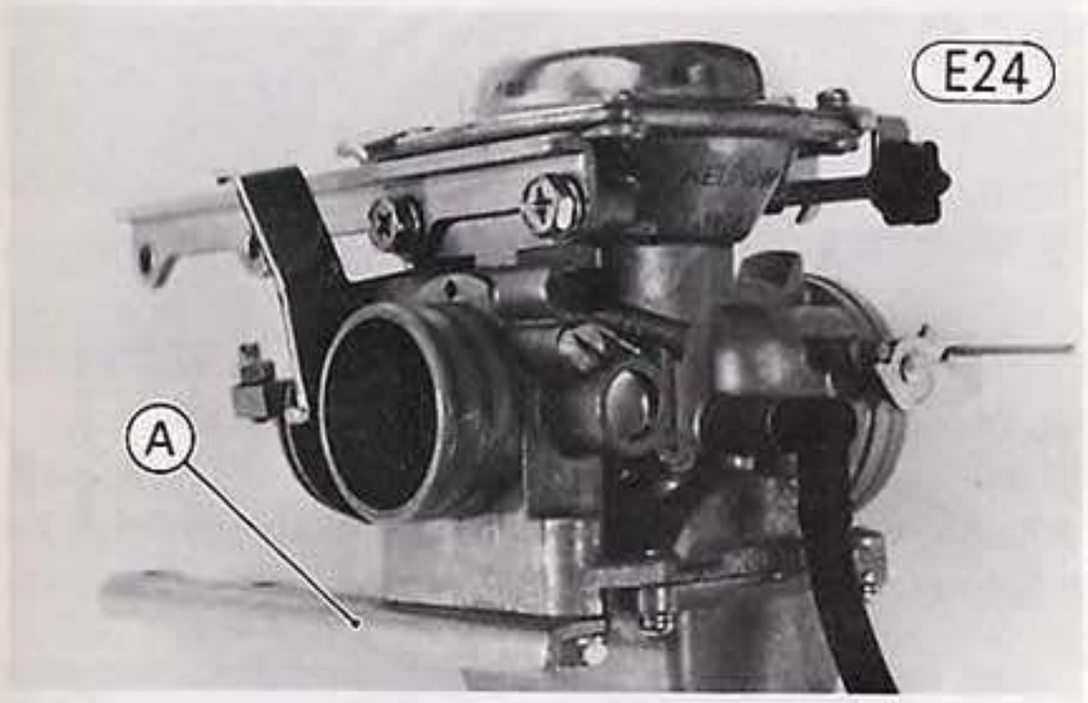


A. Choke Link Screw

●Remove the screws and lockwashers (4 ea) to take off the upper mounting plate ③.
●Remove the screws and lockwashers (4 ea) to take off the lower mounting plate ㉗ and separate the left and right carburetors. The linkage mechanism spring ㊾ and fuel hose 3-way joint ㊲ come off.

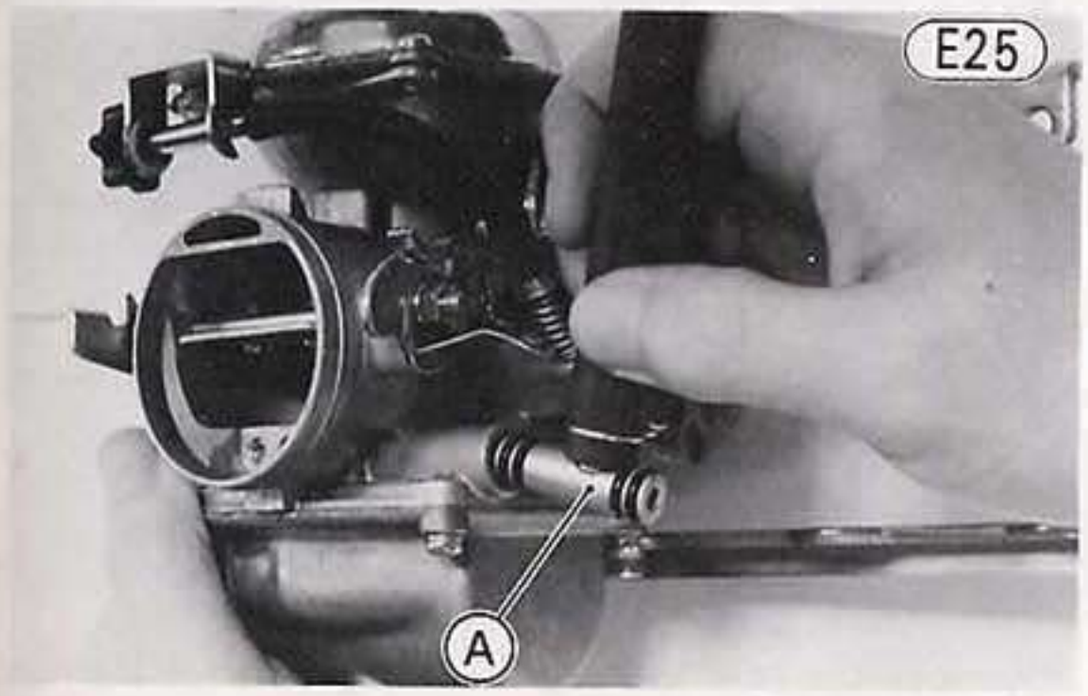
Assembly:

●Install the upper and lower mounting plates to one of the carburetors. The lower mounting plate must be installed as shown in the figure.



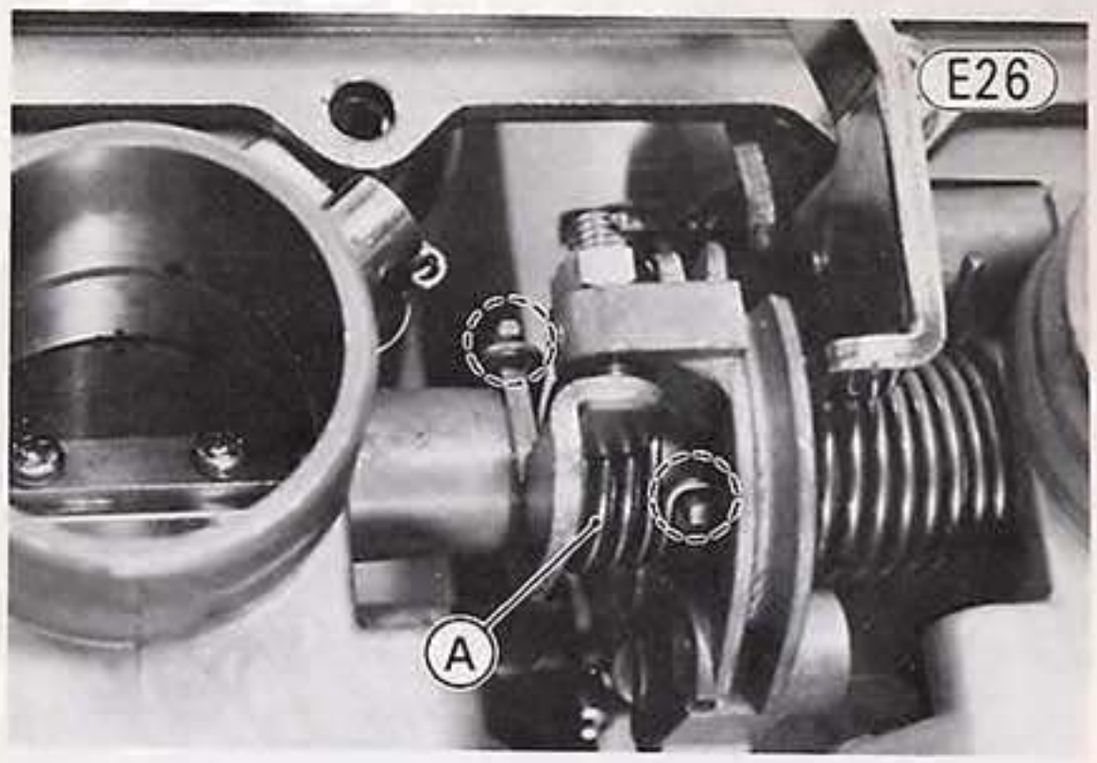
A. Lower Mounting Plate

●Check that the **O** rings (4) are in place, and install the long pipe of the fuel hose 3-way joint to the left carburetor.



A. Fuel Hose 3-way Joint

●Install the linkage mechanism spring as shown in the figure.

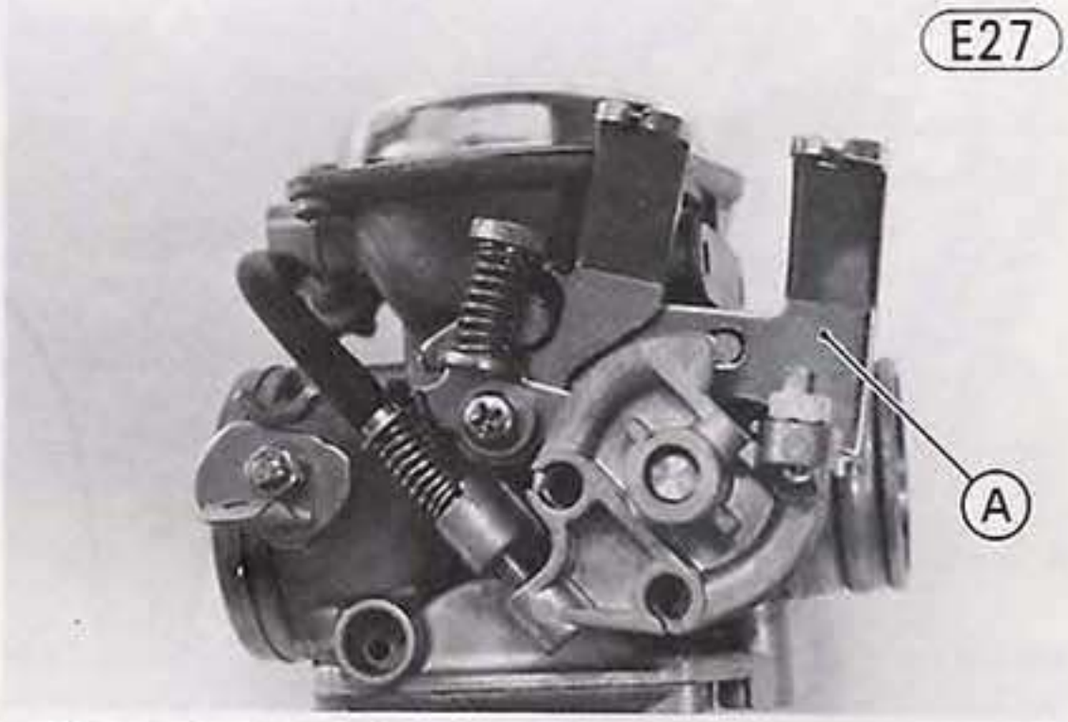


A. Spring

●Install the other carburetor on the mounting plate.
●Tighten the choke link screw and lockwasher.

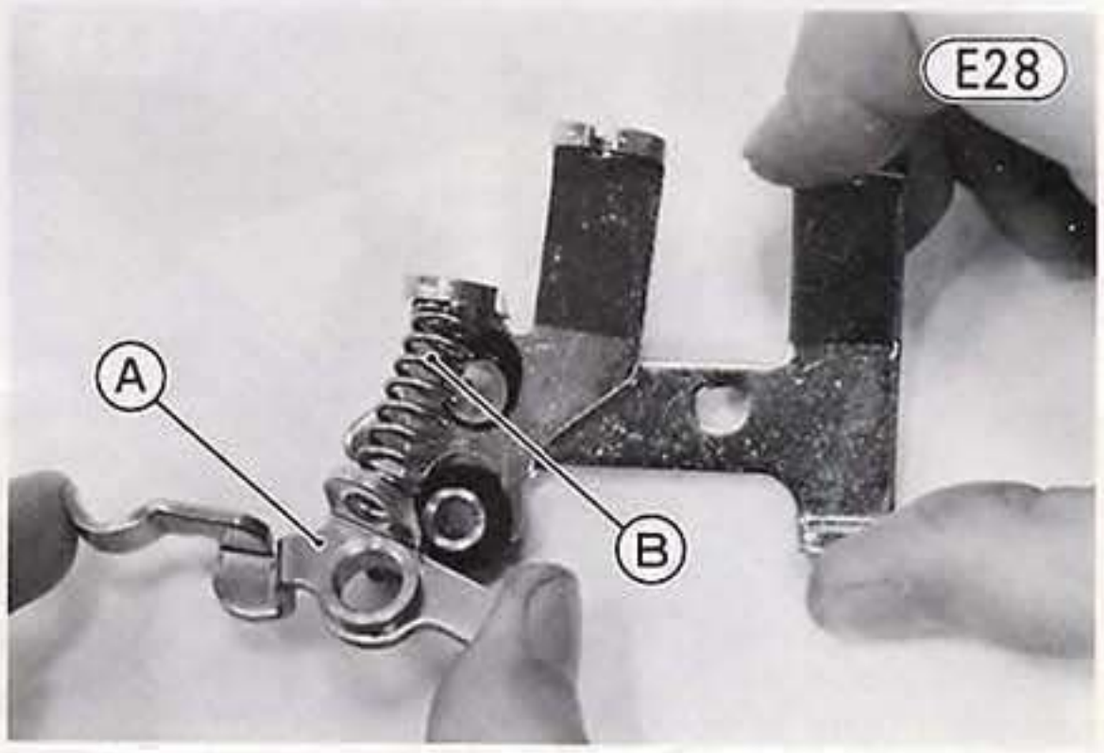
Cable Bracket Removal:

●Separate the carburetors (Pg. 49).
●Remove the fuel hose 3-way joint ㊲.
●Remove the throttle cable bracket screw ⑫, lockwasher ⑪, and flat washer ⑩, and take off the bracket assembly.



A. Throttle Cable Bracket Assembly

●Remove the idling link ⑧ and spring ⑨ from the bracket ⑦.



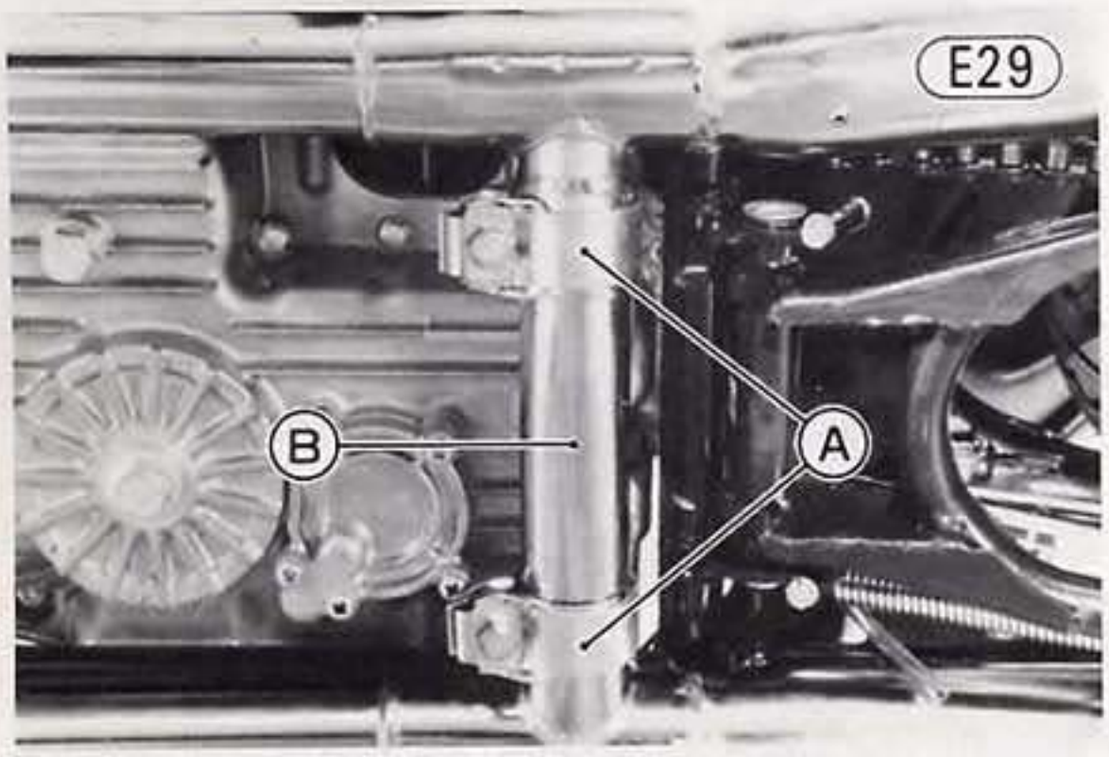
A. Idling Link **B. Spring**

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MUFFLER (on KZ400-B)

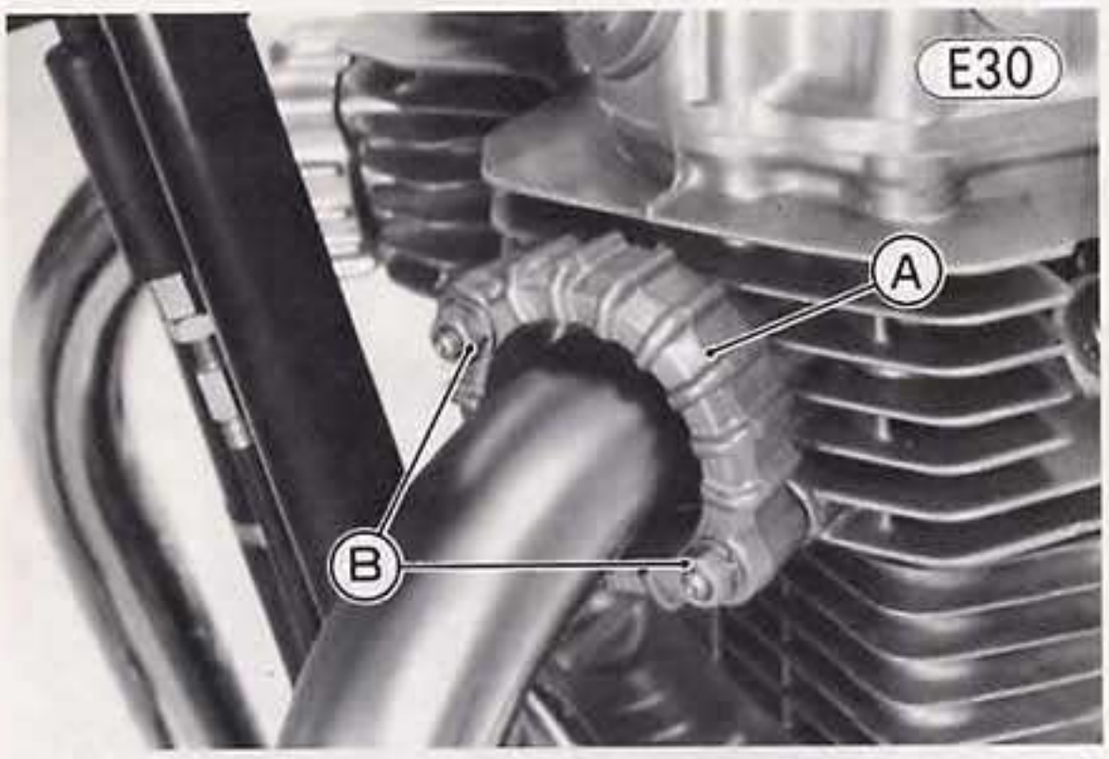
Removal (each muffler):

•Loosen the clamps that secure the mufflers to the muffler connecting pipe.



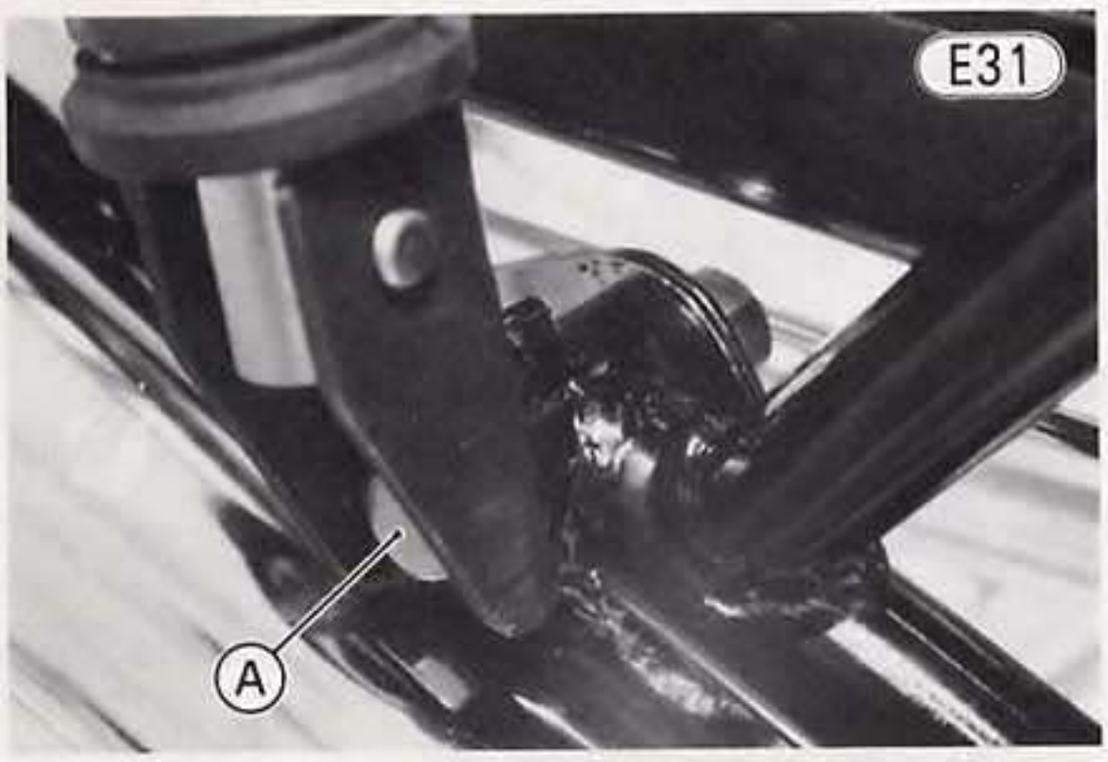
A. Clamps **B. Muffler Connecting Pipe**

•Remove the exhaust pipe holder nuts (2), and slide the holder off its cylinder head studs.



A. Exhaust Pipe Holder **B. Nuts**

•Remove the split keeper.
•Remove the rear footpeg mounting bolt to complete muffler removal. Also, remove the exhaust pipe holder and gasket. The rear footpeg mounting bolt has a footpeg, flat washer, lockwasher, and nut.



A. Rear Footpeg Mounting Bolt

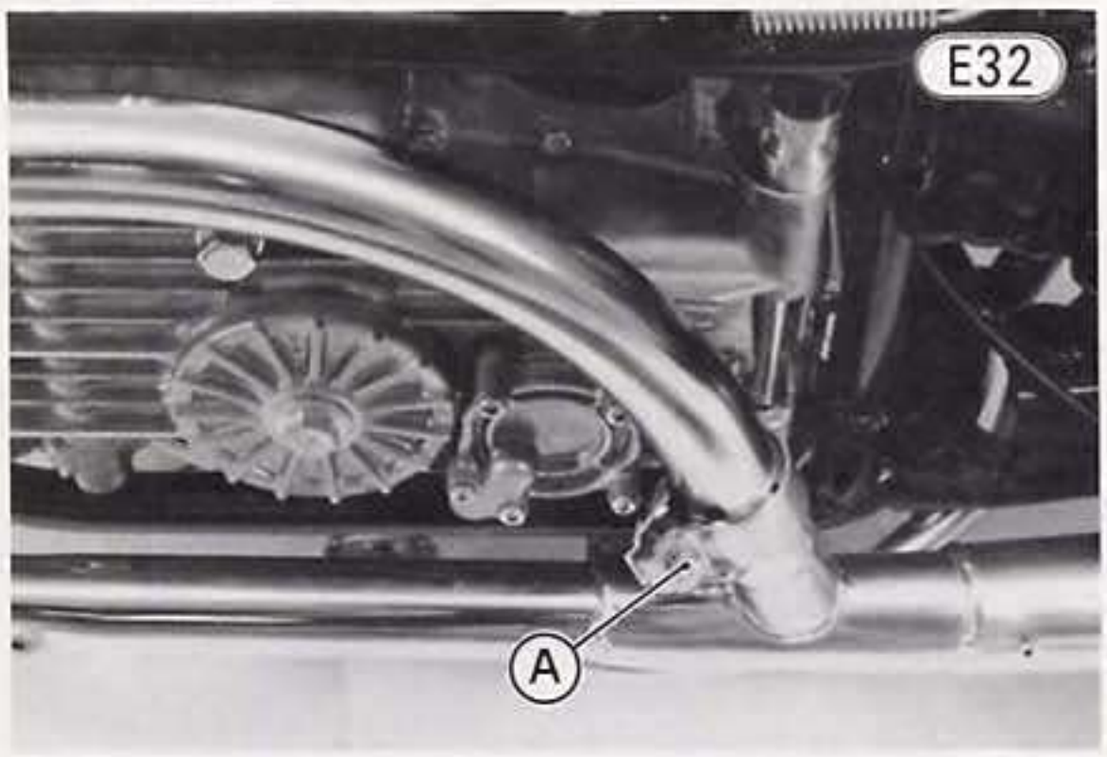
Installation (each muffler):

•Fit the connecting pipe to the muffler.
•Fit a gasket into the exhaust port, and place an exhaust pipe holder on the stud bolts.
•Fit the end of the exhaust pipe into the exhaust port, and attach the muffler to the frame with the rear footpeg mounting bolt finger tight.
•Connect both mufflers with the connecting pipe, and move the connecting pipe until it stops at the stop of the right muffler manifold. Tighten the clamp bolts loosely.
•Fit the split keeper back into place, holding it in place with the exhaust pipe holder, tighten the holder nuts evenly to avoid an exhaust leak, and then tighten the rear footpeg mounting bolt.
•Tighten the clamp bolts of the muffler connecting pipe.

MUFFLER (on KZ400-C)

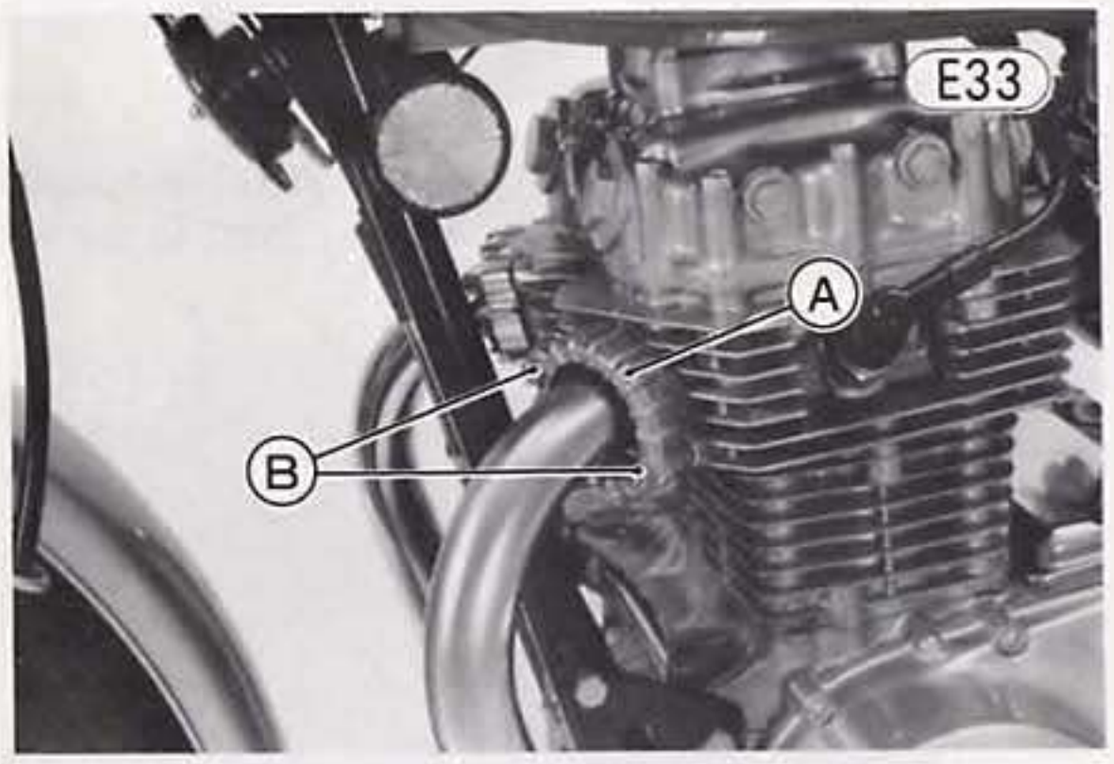
Removal:

•Loosen the exhaust pipe clamp bolt.



A. Clamp Bolt

•Remove the exhaust pipe holder nuts (4), and slide the holders (2) off the studs.

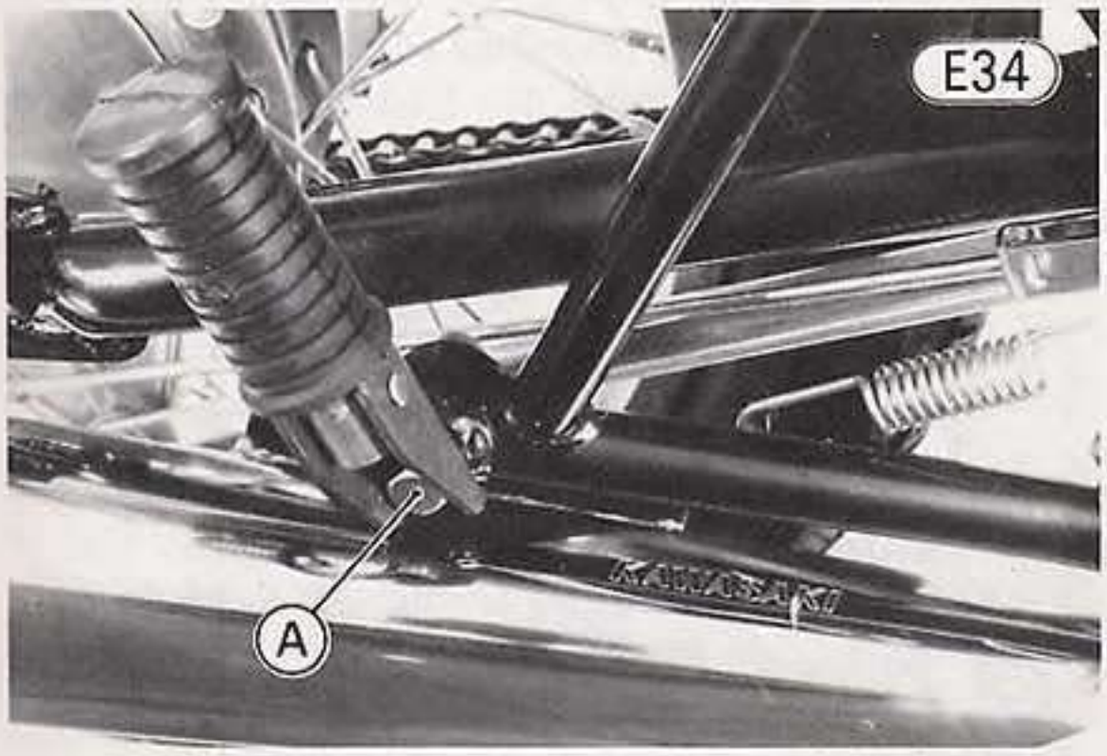


A. Exhaust Pipe Holder **B. Nuts**

•Remove the split keeper, and pull the left exhaust pipe off the muffler.
•Remove the rear footpeg mounting bolt for the right side to complete muffler removal. Also, remove the

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exhaust pipe holders (2) and gaskets (2). The rear footpeg mounting bolt has a rear footpeg, flat washer, lockwasher, and nut.



A. Rear Footpeg Mounting Bolt

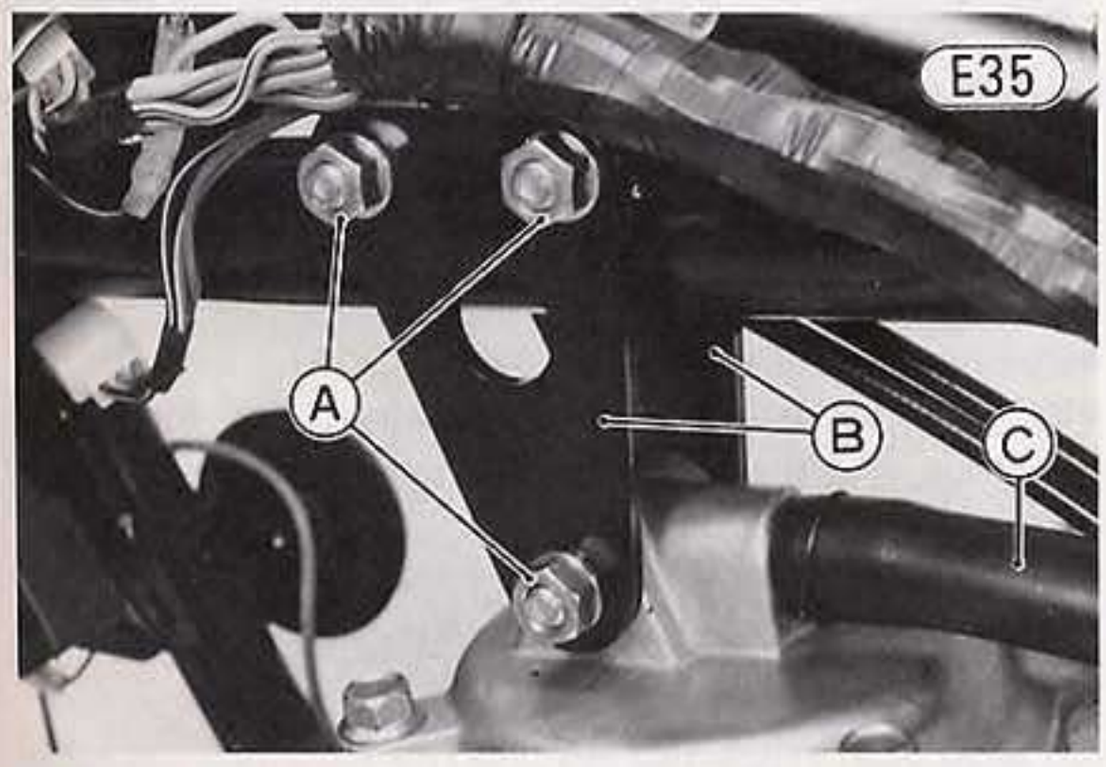
Installation:

- Attach the left exhaust pipe to the muffler with the exhaust pipe clamp bolt finger tight.
- Fit the gaskets into the exhaust ports, and place the exhaust pipe holders on the studs.
- Fit the ends of the exhaust pipes into the exhaust ports, and attach the muffler to the frame with the rear footpeg mounting bolt finger tight.
- Fit the split keeper back into place, holding them in place with the exhaust pipe holders, tighten the holder nuts (4) evenly to avoid an exhaust leak, and then tighten the rear footpeg mounting bolt.
- Tighten the exhaust pipe clamp bolt.

CYLINDER HEAD COVER, ROCKER ARM, ROCKER SHAFT

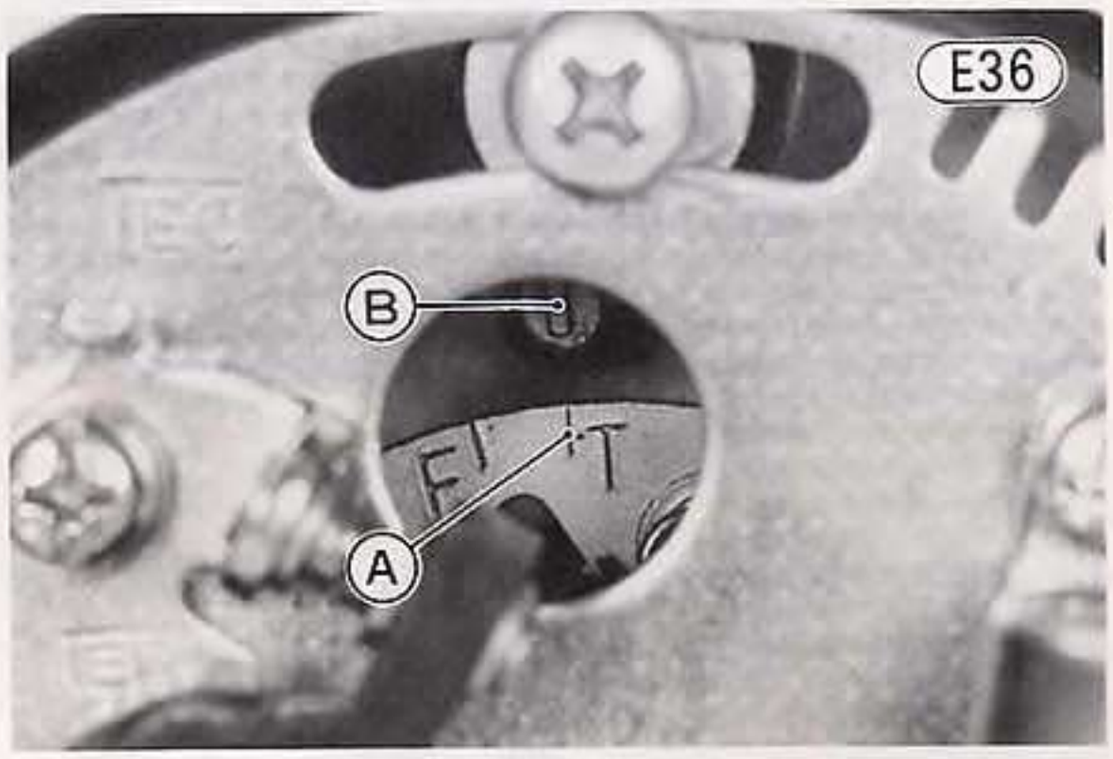
Removal:

- Remove the fuel tank (Pg. 43).
- Disconnect the blue and the red/yellow ignition coil leads.
- Remove the bolts (2), and take the ignition coil off the frame together with its mounting bracket.
- Remove the upper bracket bolts and nuts (3 ea), and take off the brackets.



A. Nuts B. Upper Brackets C. Breather Hose

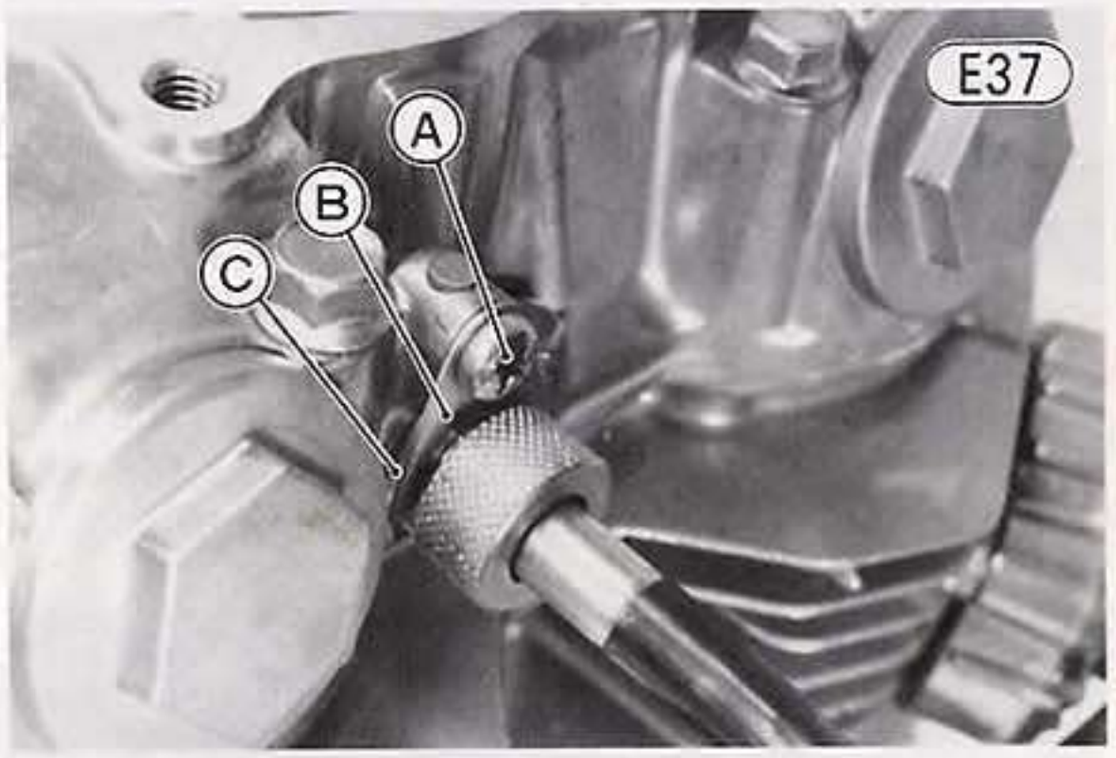
- Slide the clip out of place, and pull the breather hose off the breather cover.
- Remove the breather cover bolts (4), and take off the breather cover and O ring.
- Remove the contact breaker cover and gasket.
- Using a 17 mm wrench on the crankshaft, turn the crankshaft until the "T" mark on the timing advancer is aligned with the timing mark.



A. "T" Mark B. Timing Mark

- Remove the tachometer cable from the cylinder head cover. Remove the screw, and remove the tachometer pinion holder stop. Pull out the tachometer pinion holder and pinion.

CAUTION **Attempting to install the cylinder head cover with the tachometer pinion left in the cover may cause tachometer gear damage.**



A. Screw C. Tachometer Pinion Holder
B. Stop

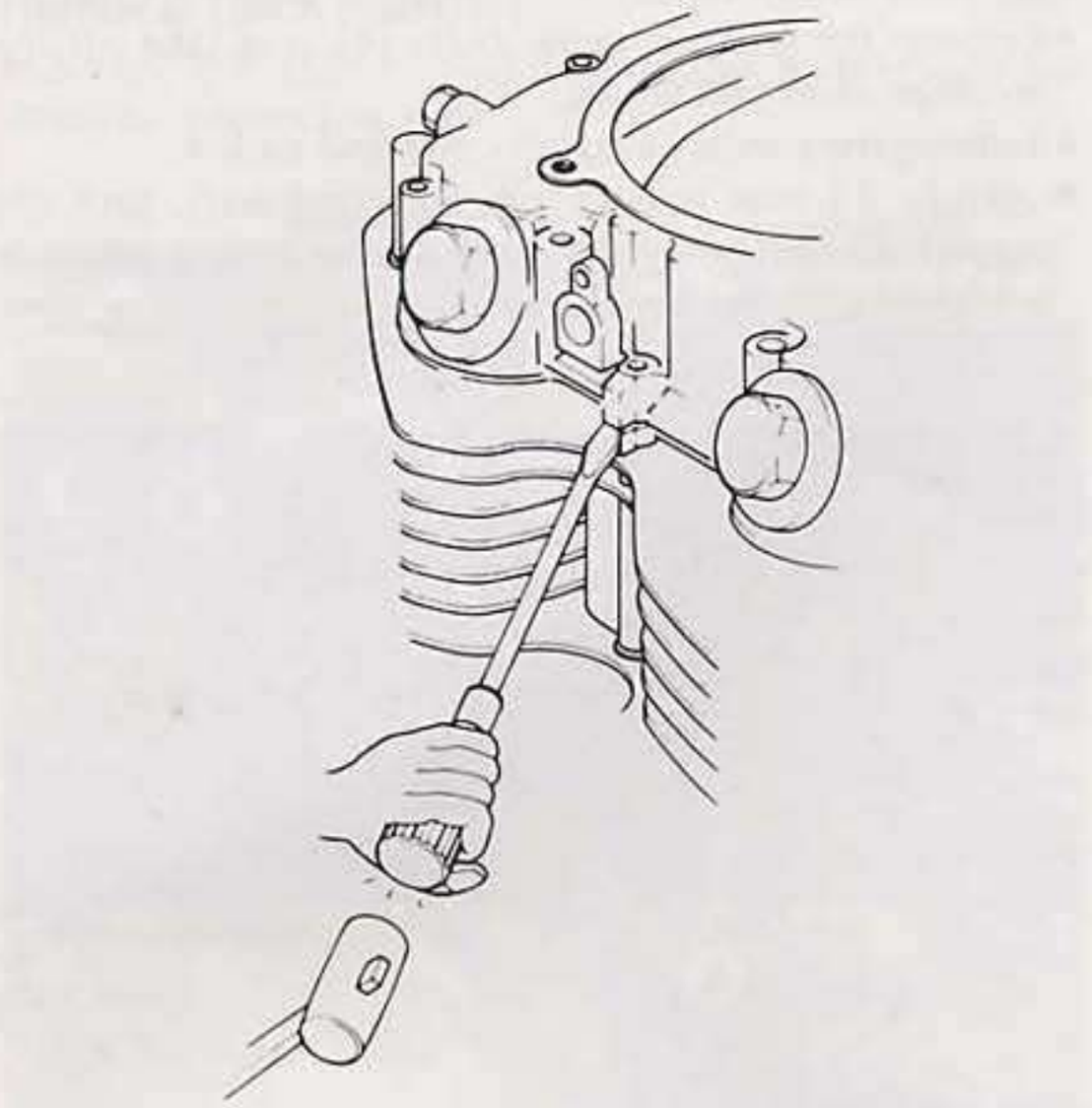
- Remove the cylinder head cover 8 mm bolts (8) and 6 mm bolts (8).
- With a wide screwdriver, pry at the gap in the front side of the cylinder head cover to free the cylinder head cover from the cylinder head.

CAUTION **Do not hammer on the screwdriver while it is in the pry point as engine damage could result.**

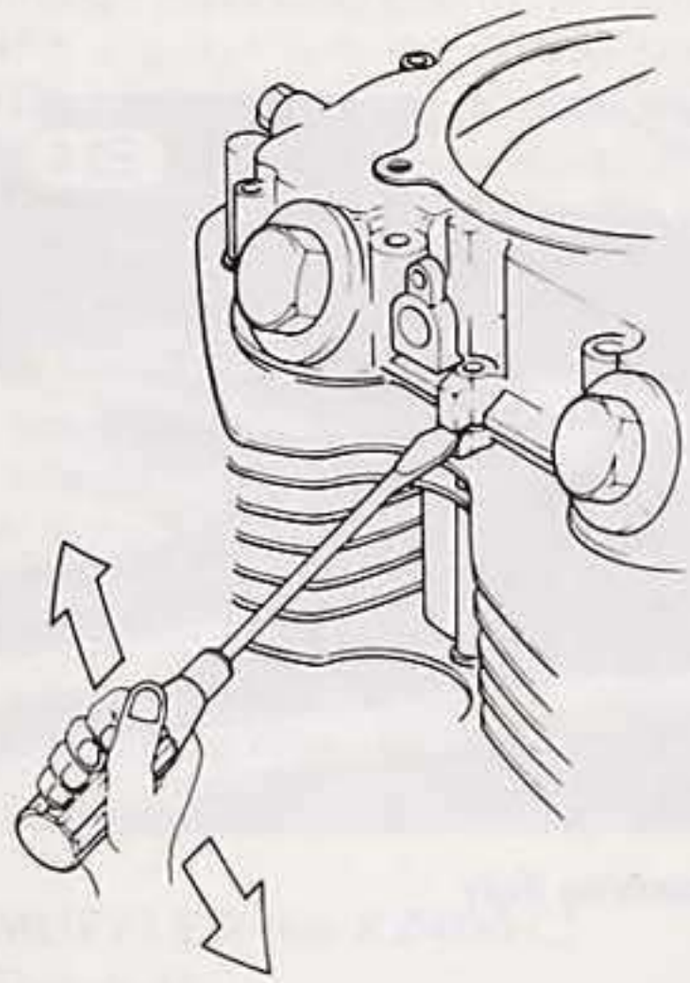
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Cylinder Head Cover Pry Point

E38

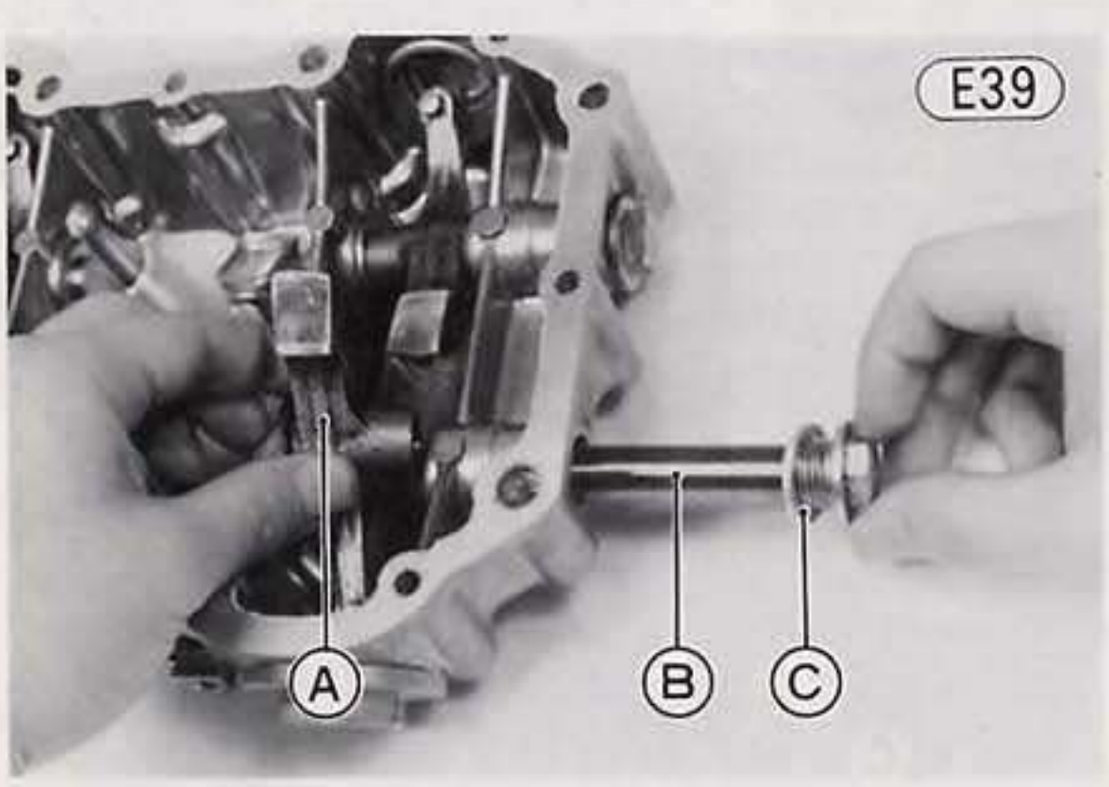


Bad



Good

- Remove the rocker shaft and washer, and take off the rocker arm.



A. Rocker Arm
B. Rocker Shaft
C. Washer

Installation:

- Apply a little engine oil to the rocker shaft, insert the shaft running it through the rocker arm, and tighten the rocker shaft to 4.0 kg-m (29 ft-lbs) of torque. Replace the washers with new ones.
- With a high flash-point solvent, clean off the mating surfaces of the cylinder head and cylinder head cover, and wipe dry.
- Check that the tachometer pinion is removed from the cylinder head cover, and cylinder head cover knock pins (2) are fitted.
- Check that the crankshaft is still at TDC (Fig. E36), and readjust if necessary.
- Apply a liquid gasket to the mating surface of the cylinder head cover, and fit the cylinder head cover to the cylinder head.
- Tighten the cylinder head cover 8 mm bolts (8) to 2.5 kg-m (18.0 ft-lbs) of torque, and tighten the 6 mm bolts (8) to 1.0 kg-m (87 in-lbs) of torque.
- Apply a small amount of high temperature grease to the tachometer pinion shaft, and then insert the pinion and pinion holder. Install the holder stop with a screw, and then connect the tachometer cable to the cylinder head cover.
- Install the breather cover with its O ring. Apply a non-permanent locking agent to the threads of the cover bolts (4), and tighten them to 2.5 kg-m (18.0 ft-lbs) of torque.
- Fit the breather hose onto the breather cover pipe, and slide the clip back into place.
- Install the upper brackets, and tighten the bracket bolts (3) to 1.8 kg-m (13.0 ft-lbs) of torque.
- Install the ignition coil and its bracket with the bolts, running the right spark plug lead between the upper brackets.
- Connect the ignition coil leads.
- Adjust the valve clearance (Pg. 14).

CAMSHAFT, CAMSHAFT SPROCKET

Removal:

- Remove the fuel tank (Pg. 43).
- Remove the ignition coil (Pg. 45).
- Remove the cylinder head cover (Pg. 51).
- Remove the chain tensioner cap and O ring, loosen the locknut, and then remove the chain tensioner assembly from the cylinder block.
- With a 17 mm wrench on the crankshaft to keep the shaft from turning, remove the camshaft sprocket bolts (2).
- Slide the sprocket off its position on the camshaft, and slip the chain off the sprocket.

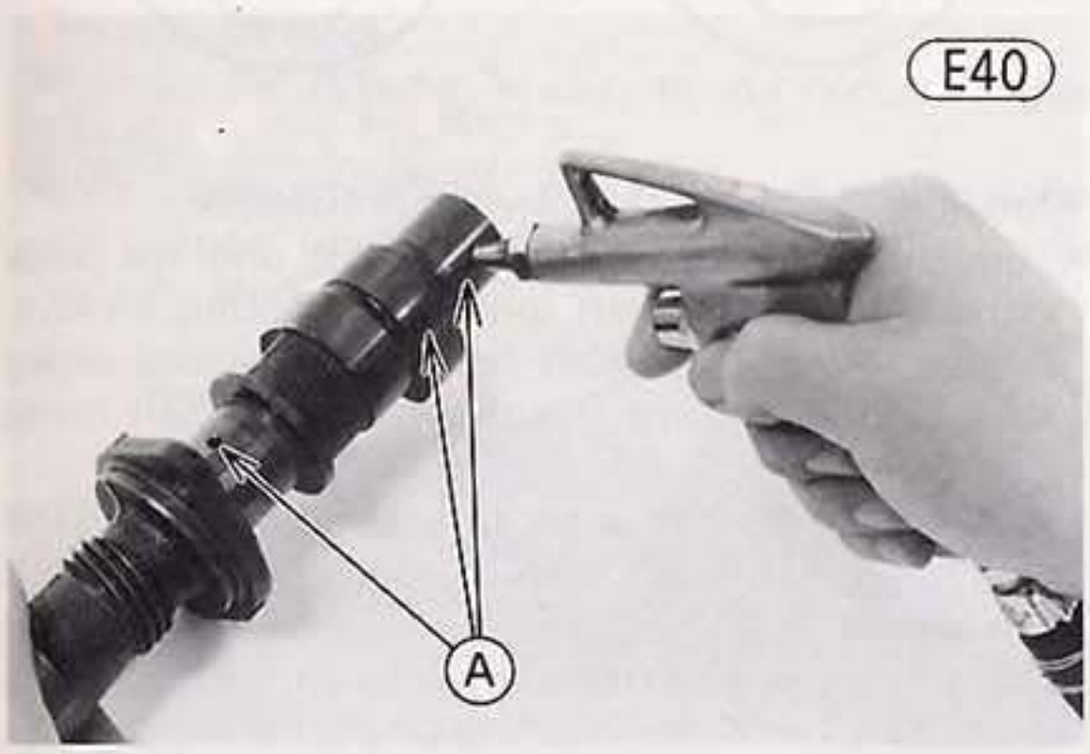
HTTP://WWW.K2400.COM

CAUTION **Always pull the camshaft chain taut while turning the crankshaft when the camshaft chain is loose. This avoids kinking the chain on the lower (crankshaft) sprocket. A kinked chain could damage both the chain and the sprocket.**

- Remove the camshaft cap bolts (6), and take off the camshaft caps.
- Remove the camshaft and camshaft sprocket. Use a screwdriver or wire to keep the chain from falling down into the cylinder block.

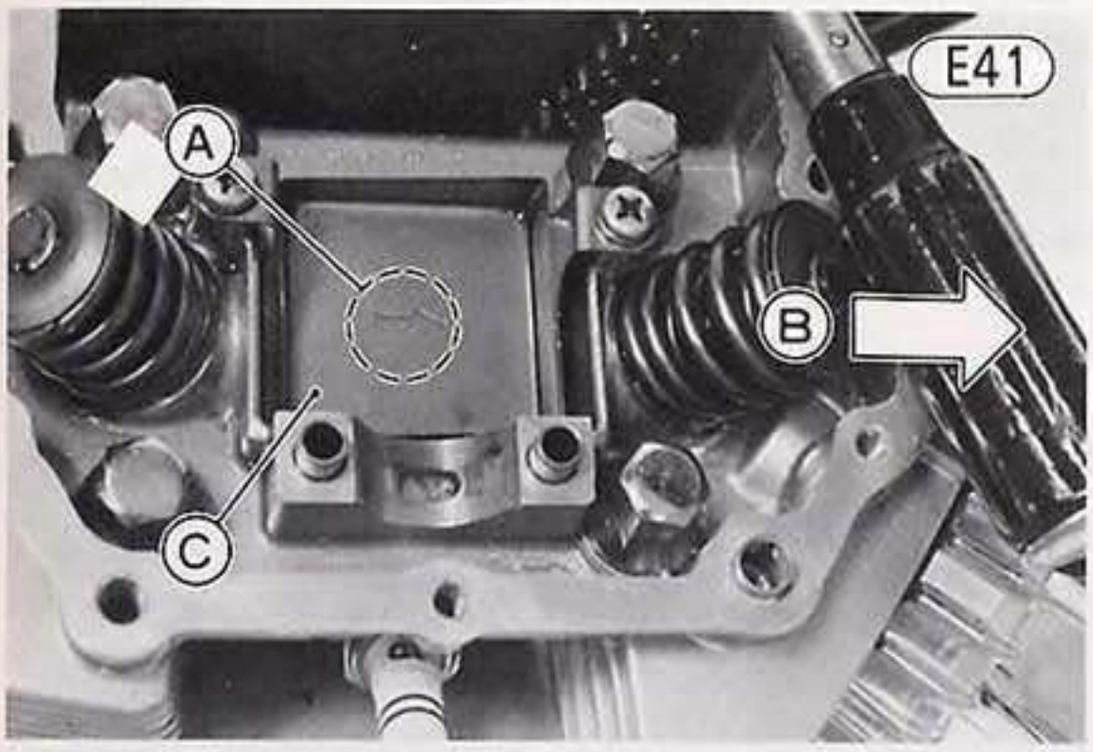
Installation:

- Using compressed air, blow out any particles which may obstruct the camshaft oil passages.



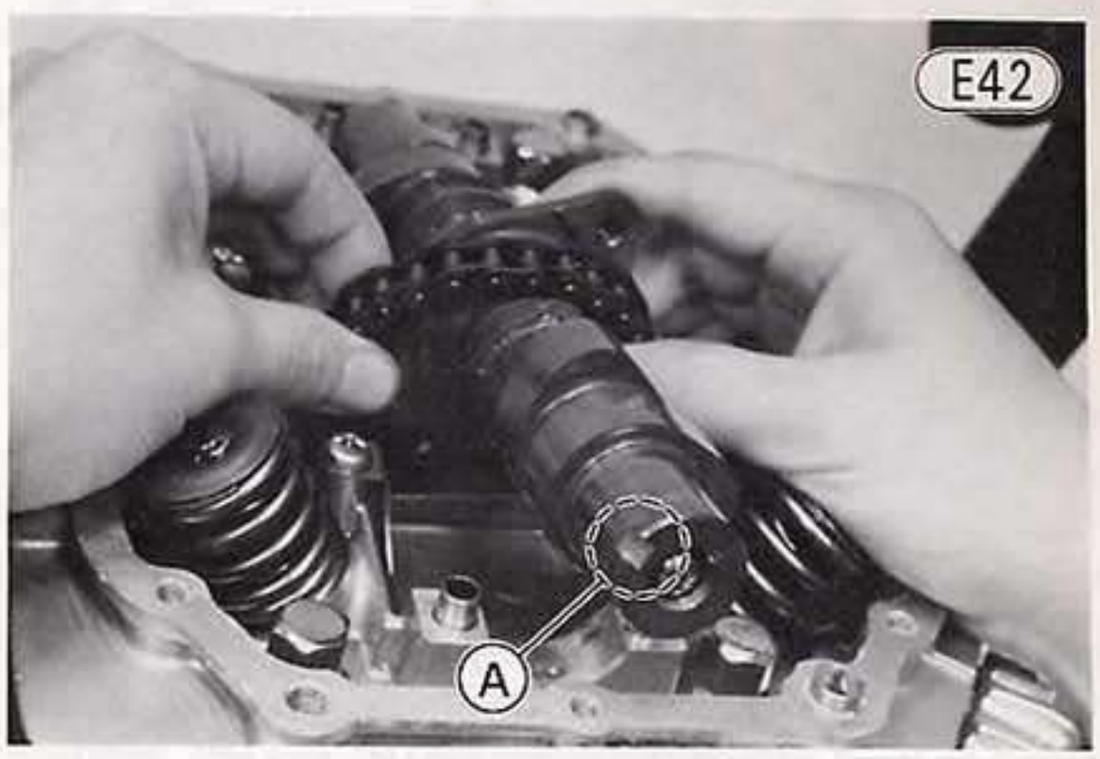
A. Oil Passages

- If the oil receiver is removed, install it so that the arrow on the sump points towards the front. Apply a non-permanent locking agent to the screws.



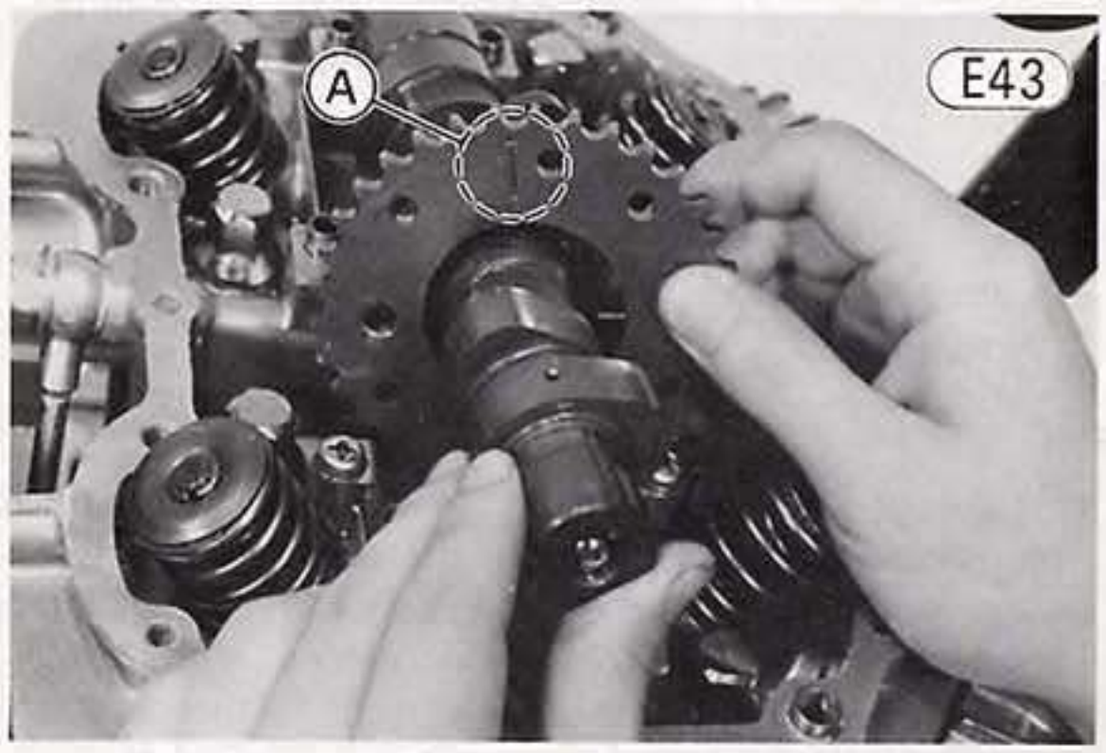
A. Arrow B. Front C. Oil Receiver

- Apply clean engine oil to the cam parts, camshaft caps, and cylinder head journals. When possible, apply a thin coat of a high temperature grease on the cam parts, camshaft caps, and cylinder head journals, if the camshaft, camshaft caps, and/or cylinder head are replaced with new ones.
- Run the camshaft through the camshaft chain from the right side of the engine, and remove the screwdriver or wire. The notched end of the camshaft must be on the right side of the engine.



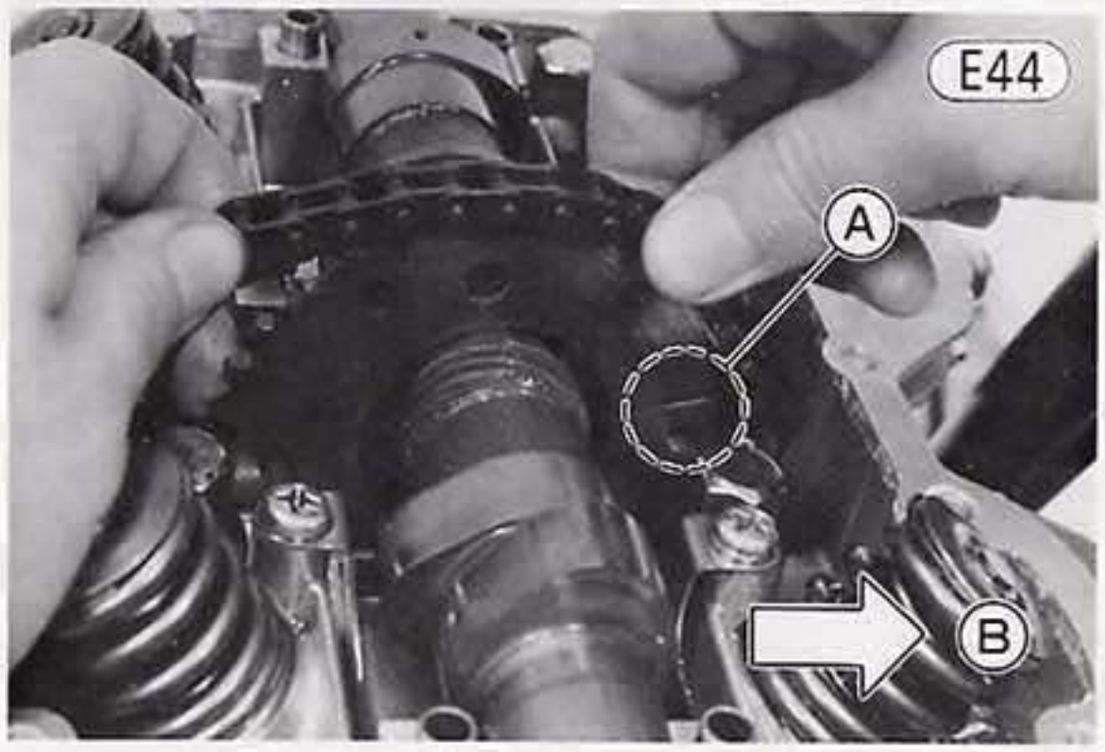
A. Notch

- Set the camshaft sprocket on the camshaft so that the side of the camshaft sprocket marked with an arrow faces the right side of the engine.



A. Arrow

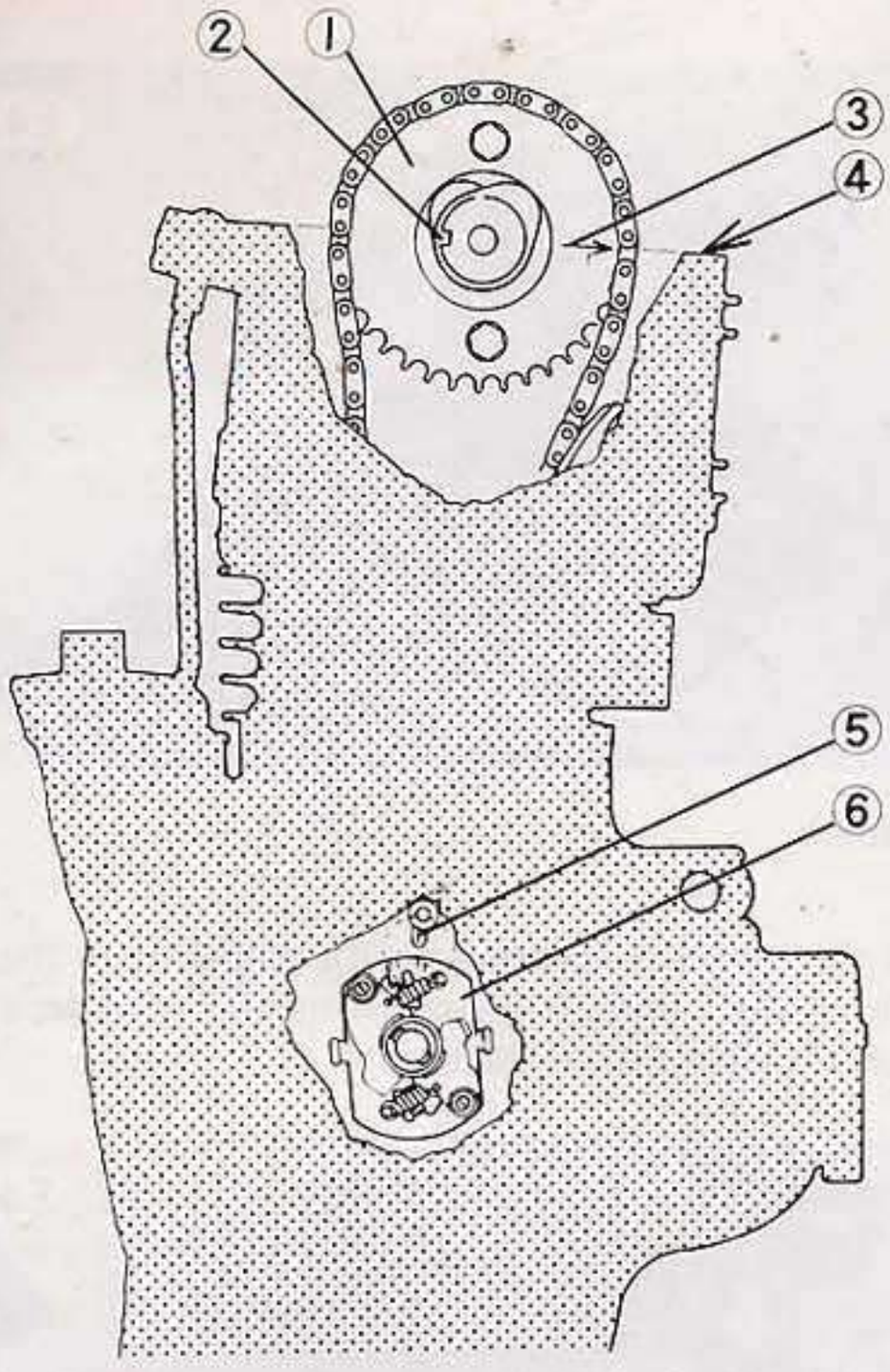
- Check to see that the crankshaft is still at TDC (Fig. E36), and readjust if necessary. Remember to pull the camshaft chain taut before rotating the crankshaft.
- Fit the camshaft chain onto the camshaft sprocket so that the arrow mark on the sprocket is pointing to the front aligned with the cylinder head surface.



A. Arrow B. Front

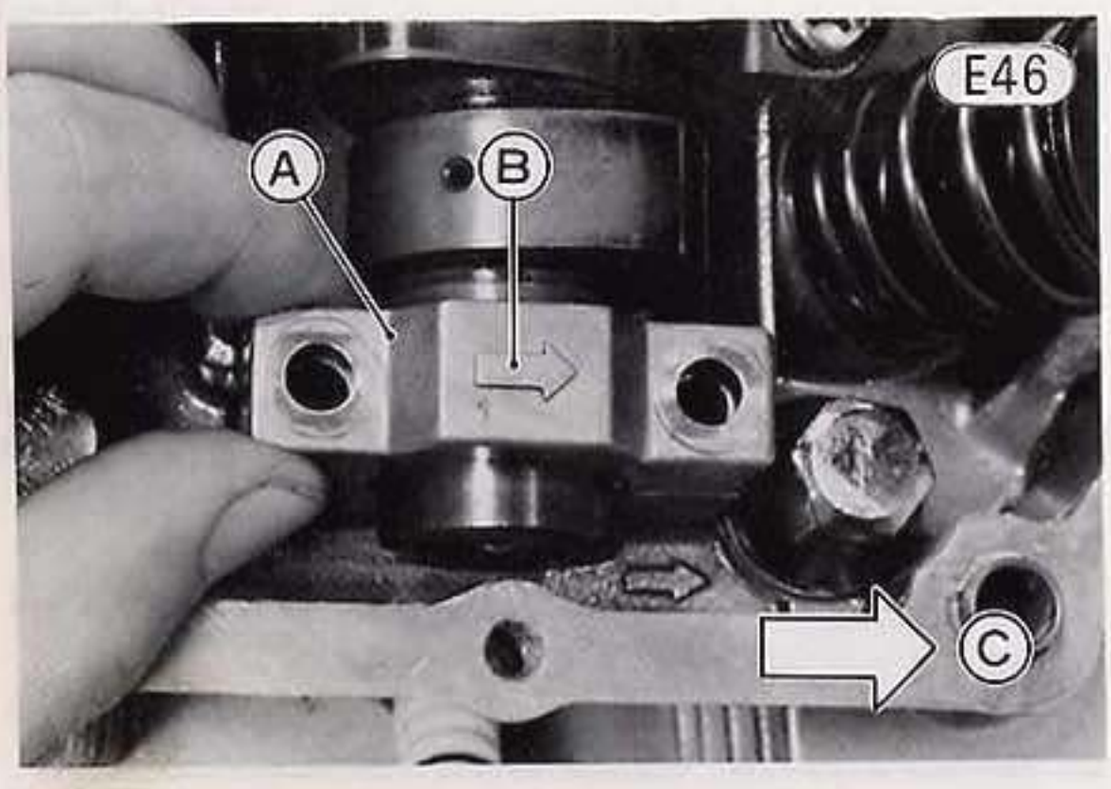
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Camshaft Chain Timing (E45)



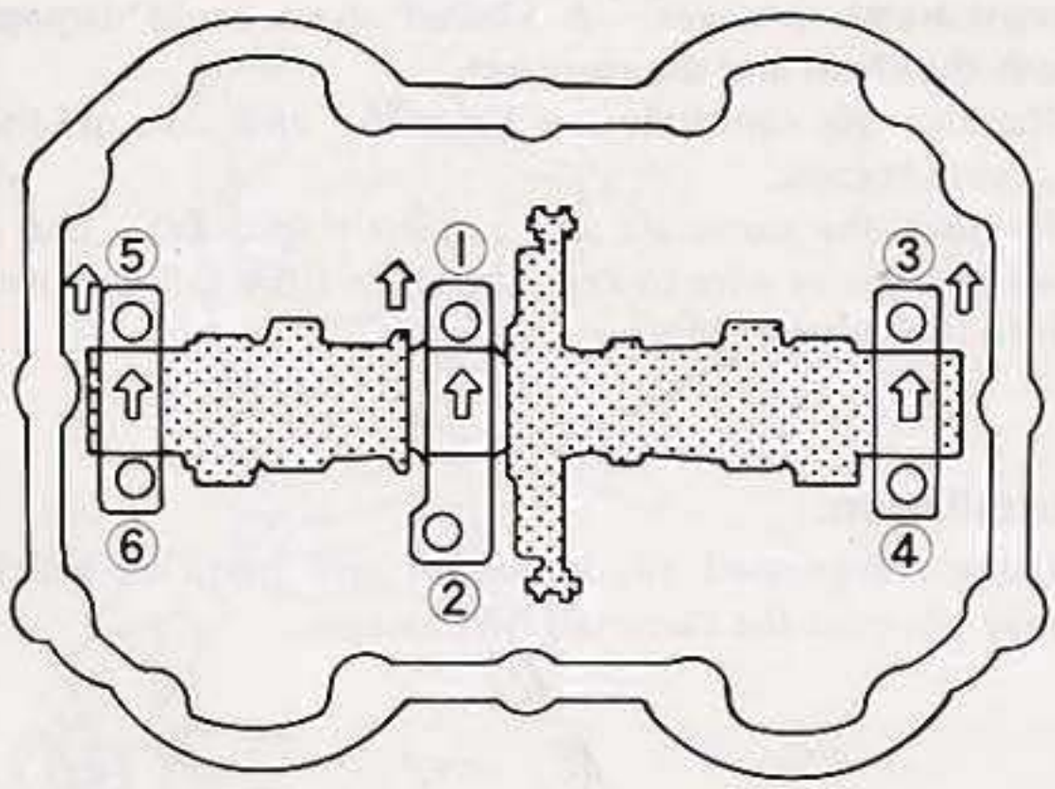
1. Camshaft Sprocket
2. Notch
3. Arrow
4. Cylinder Head Surface
5. Timing Mark
6. Timing Advancer

- Fit the sprocket up into place. Turn the camshaft until the notch on the right end of the camshaft faces rearward, while holding the sprocket steady to align the bolt holes.
- Apply a non-permanent locking agent to the camshaft sprocket bolts.
- Keep the crankshaft from turning by holding a wrench on the crankshaft. Tighten the sprocket bolts to 1.5 kg-m (11.0 ft-lbs) of torque.
- Check that the camshaft cap knock pins (6) are fitted.
- Install the camshaft caps (3), and tighten the camshaft cap bolts to 1.2 kg-m (104 in-lbs) of torque, following the tightening sequence as shown. The arrow on each cap points forward.



A. Camshaft Cap B. Arrow C. Front

Camshaft Cap Tightening Order (E47)



- Install the camshaft chain tensioner assembly.
- Turn the crankshaft counterclockwise until the arrow marked on the camshaft sprocket is pointing forward, and recheck the camshaft timing. If the two timing mark pairs are aligned (Fig. E45), the camshaft timing is correct.

CAUTION **Do not to try to turn the crankshaft and camshaft with a wrench on the camshaft sprocket.**

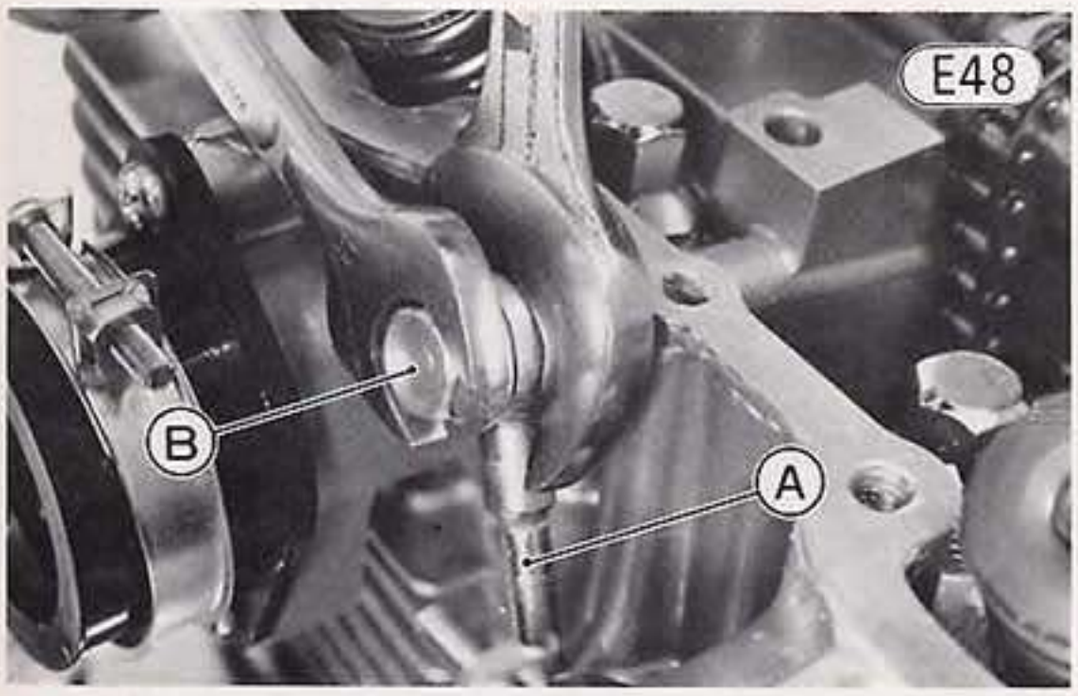
- Adjust the camshaft chain (Pg. 14), and install the camshaft chain tensioner cap and O ring.
- Install the cylinder head cover (Pg. 52).
- Install the ignition coil (Pg. 45).
- Adjust the valve clearance (Pg. 14).

CYLINDER HEAD

Removal:

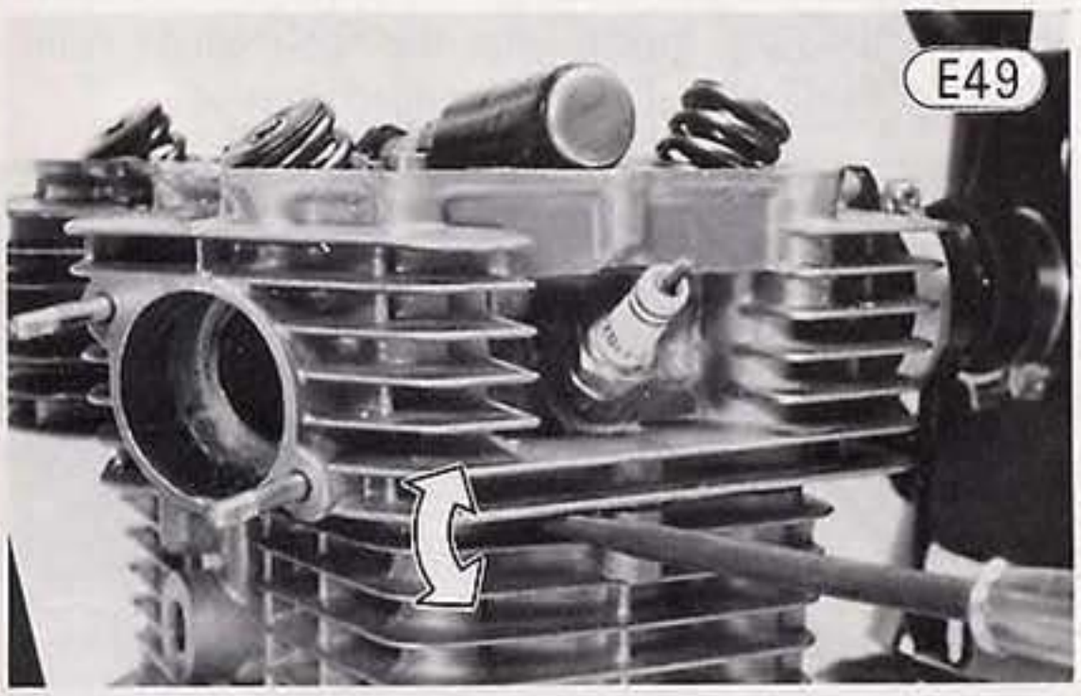
- Remove the fuel tank (Pg. 43).
- Remove the ignition coil (Pg. 45).
- Remove the carburetors as explained in the carburetor removal section (Pg. 45). The throttle cables need not be removed from the carburetors.
- Cover the carburetors with a clean cloth, and set them on the workbench to avoid damaging the throttle cables and carburetors.
- Remove the muffler (Pg. 50 for KZ400-B or Pg. 50 for KZ400-C).
- Remove the cylinder head cover (Pg. 51).
- Remove the camshaft and camshaft sprocket (Pg. 52).
- Using a wrench to hold the oil pipe upper end, remove the banjo bolt to disconnect the oil pipe upper end from the cylinder head. The banjo bolt has two washers.

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A. Oil Pipe B. Banjo Bolt

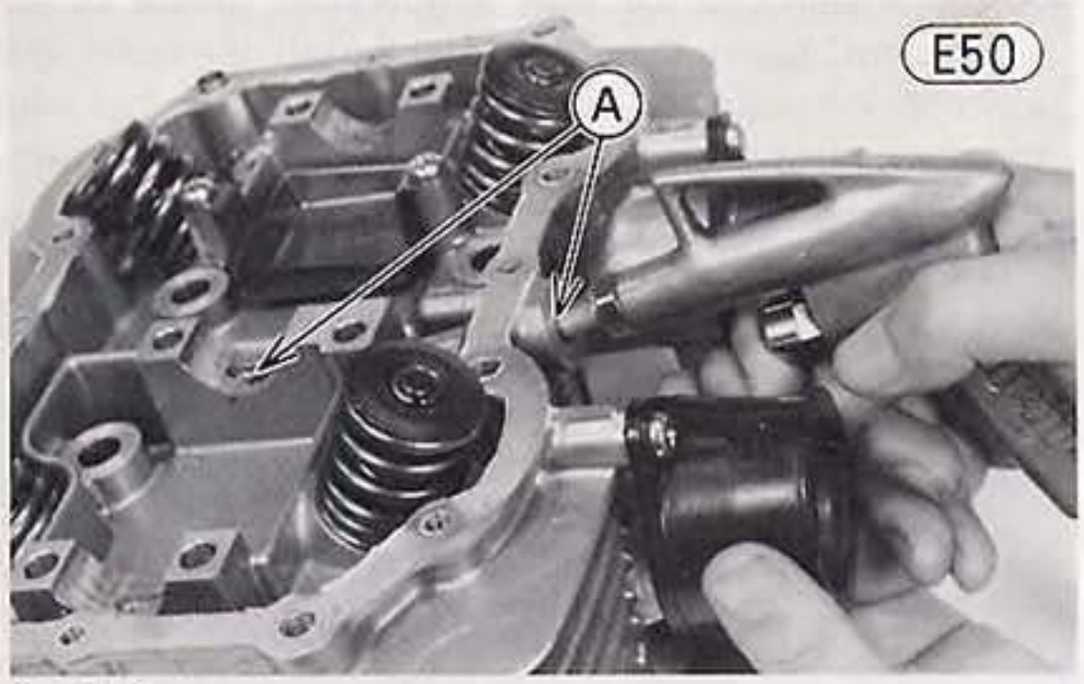
- Stuff a piece of clean cloth into the cylinder head hole for the camshaft chain, so that no parts will fall into the cylinder block.
- Remove the cylinder head nuts and copper washers (8 ea).
- With a large screwdriver, pry at the gap in each side of the cylinder head to free the cylinder head from the cylinder block.



- Being careful not to bend or otherwise damage the oil pipe, take off the cylinder head and gasket. Use a screwdriver or wire to keep the chain from falling down into the cylinder block.

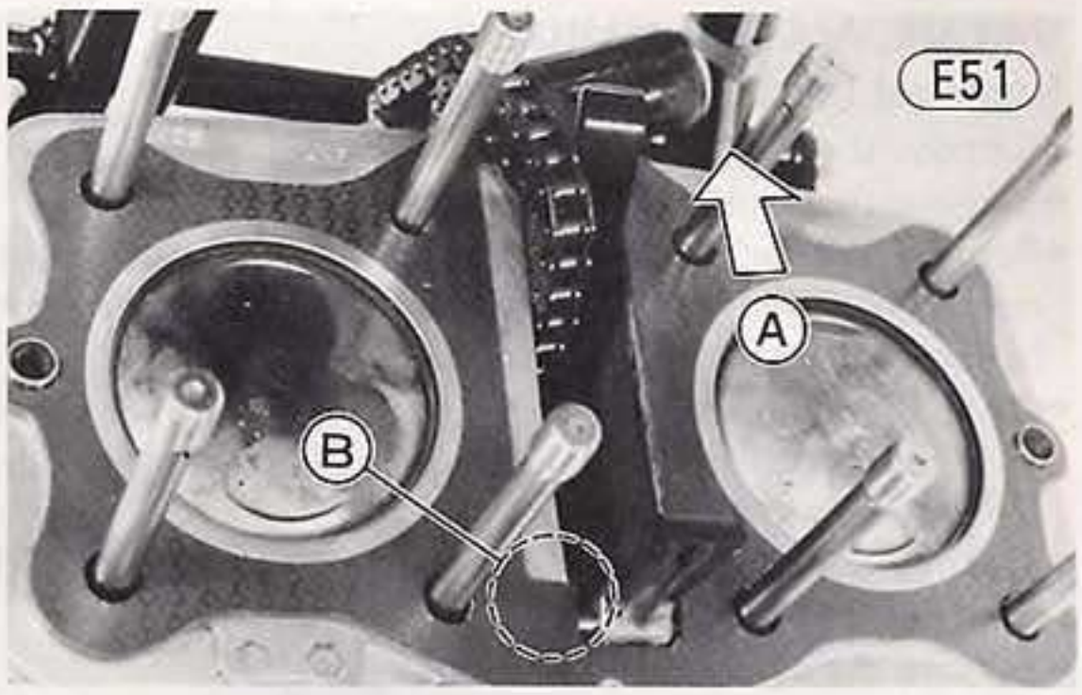
Installation:

- Using compressed air, blow out any particles which may obstruct the oil passages.



A. Oil Passages

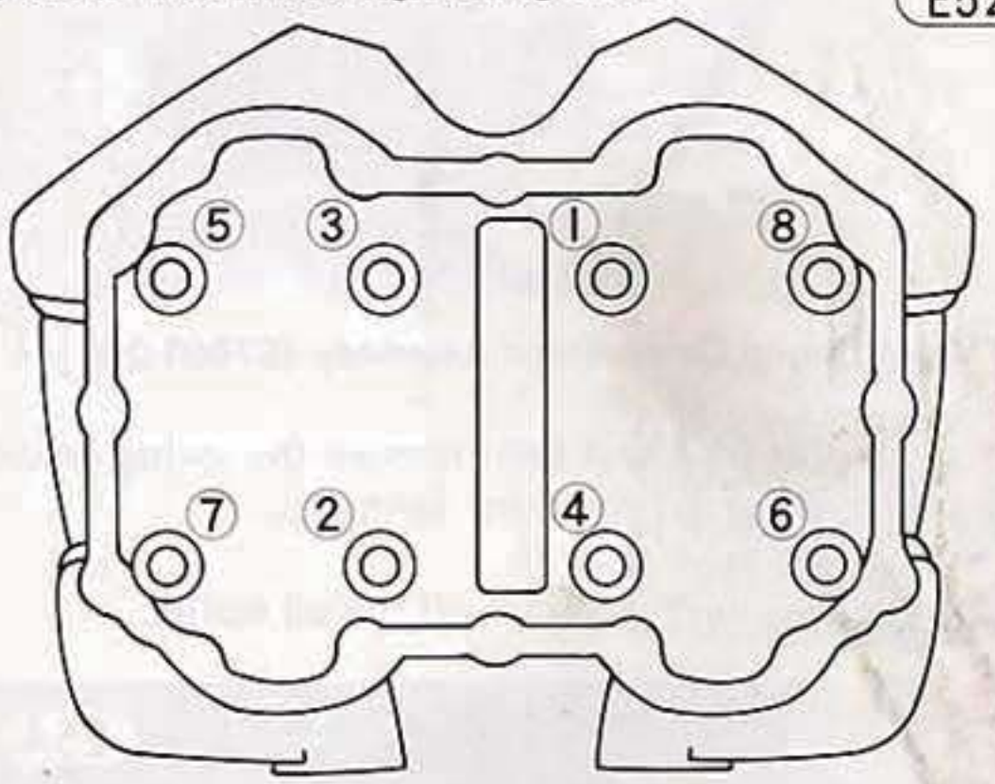
- Check to see that the knock pins (2) are in place.
- Install a new cylinder head gasket with the projected corner in its opening for the chain towards the rear left side.



A. Front B. Projection

- Being careful not to bend or otherwise damage the oil pipe, install the cylinder head. Lift up the camshaft chain, and use a screwdriver or wire to keep the chain from falling down into the cylinder block.
- Stuff a piece of clean cloth into the cylinder head hole for the camshaft chain, so that no parts will fall into the cylinder block.
- Tighten the cylinder head nuts (8) first to about 2.0 kg-m (14.5 ft-lbs) of torque and then to 4.0 kg-m (29 ft-lbs) of torque, following the tightening sequence numbers on the cylinder head. Each nut has a copper washer.

Cylinder Head Nuts Tightening Order



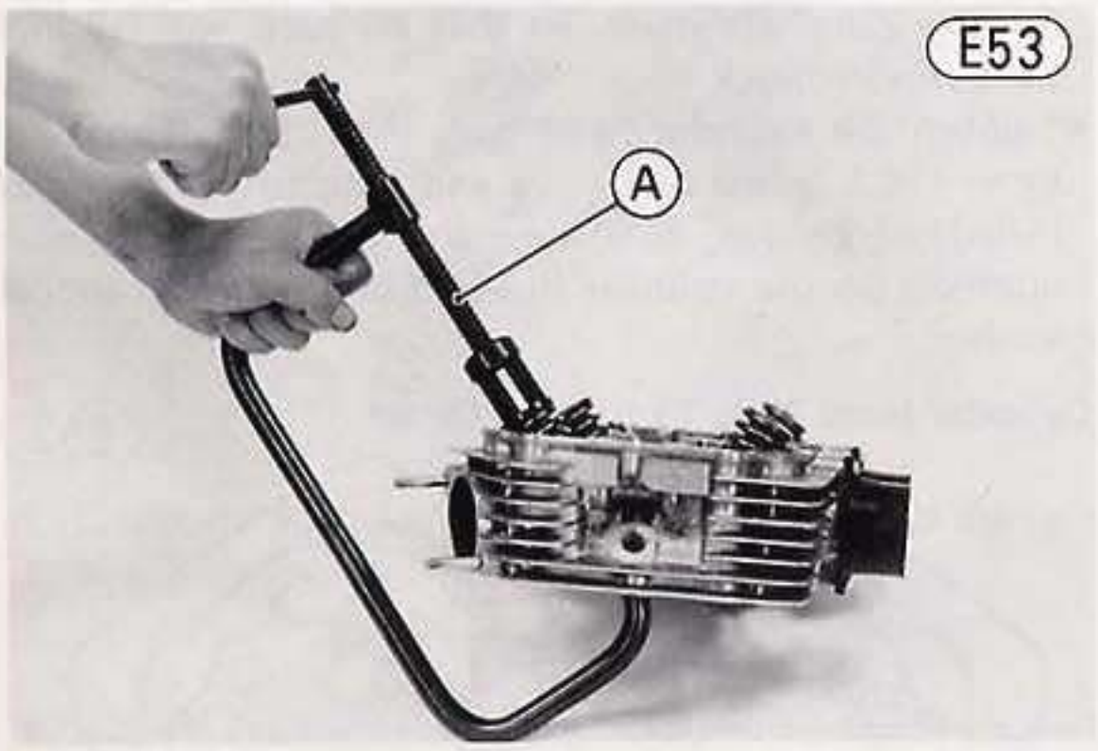
- Check that the oil pipe, and replace it if it is bent or otherwise damage (See Caution – Pg. 61).
- Using a wrench to hold the oil pipe upper end, tighten the banjo bolt to 2.0 kg-m (14.5 ft-lbs) of torque. The banjo bolt has two washers, one on each side of the fitting. Discard the old washers, and use new washers.
- Remove the cloth from the cylinder head.
- Install the camshaft and camshaft sprocket (Pg. 53).
- Install the cylinder head cover (Pg. 52).
- Install the ignition coil (Pg. 45).
- Install the carburetors (Pg. 46).
- Install the mufflers (Pg. 50 for KZ400-B or Pg. 51 for KZ400-C).
- Install the fuel tank (Pg. 43).
- Adjust the camshaft chain (Pg. 14).
- Adjust the valve clearance (Pg. 14).
- Check the throttle cables, and adjust if necessary (Pg. 15).
- Check the carburetors, and adjust if necessary (Pg. 16).

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VALVE, VALVE GUIDE

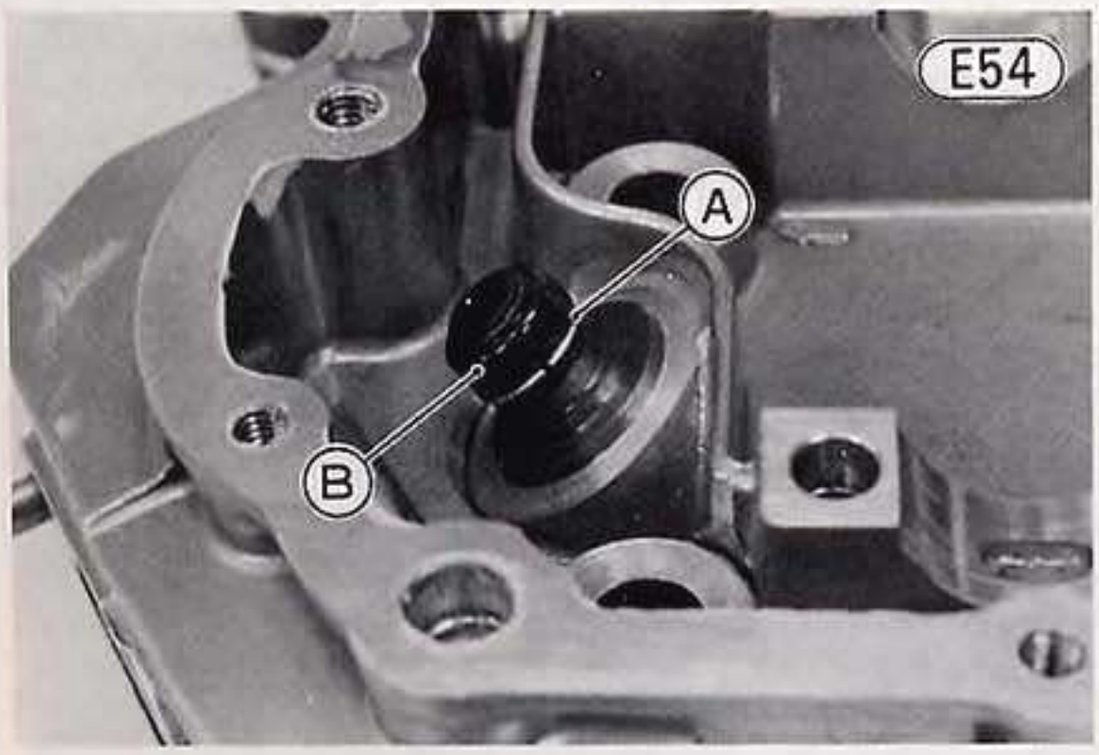
Removal (each valve and valve guide):

- Remove the fuel tank (Pg. 43).
- Remove the ignition coil (Pg. 45).
- Remove the carburetors as explained in the carburetor removal section (Pg. 45). The throttle cables need not be removed from the carburetors.
- Cover the carburetors with a clean cloth, and set them on the workbench to avoid damaging the throttle cables and carburetors.
- Remove the mufflers (Pg. 50 for KZ400-B or Pg. 50 for KZ400-C).
- Remove the cylinder head cover (Pg. 51).
- Remove the camshaft and camshaft sprocket (Pg. 52).
- Remove the cylinder head (Pg. 54).
- Remove the spark plugs (2) from the cylinder head.
- Using the valve spring compressor assembly (special tool) to press down the valve spring retainer ②, remove the split keeper ①.



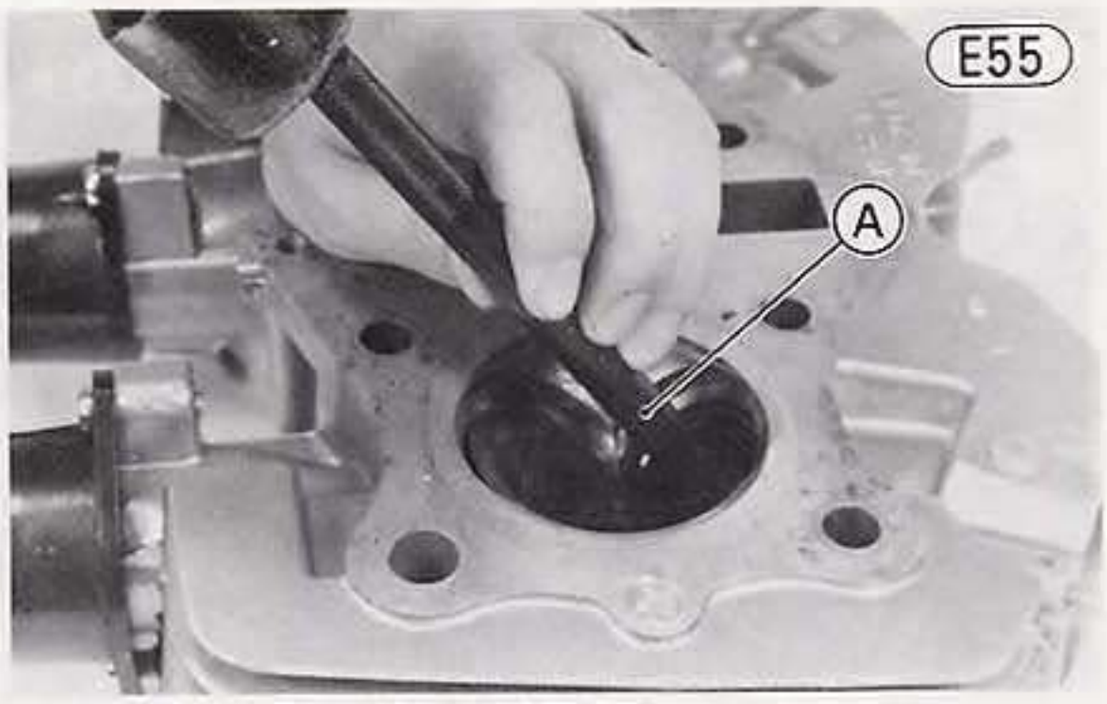
A. Valve Spring Compressor Assembly (57001-241)

- Remove the tool, and then remove the spring retainer ②, outer spring ③, and inner spring ⑤.
- Push out the valve ⑩ or ⑪.
- Remove the clip ⑦ and pull off the oil seal ⑧.



A. Clip **B. Oil Seal**

- Remove the inner spring seat ⑥ and outer spring seat ④.
- Heat the area around the guide to about 120 ~ 150°C (248 ~ 302°F), and hammer lightly on the valve guide arbor (special tool) to remove the guide from the top of the cylinder head.

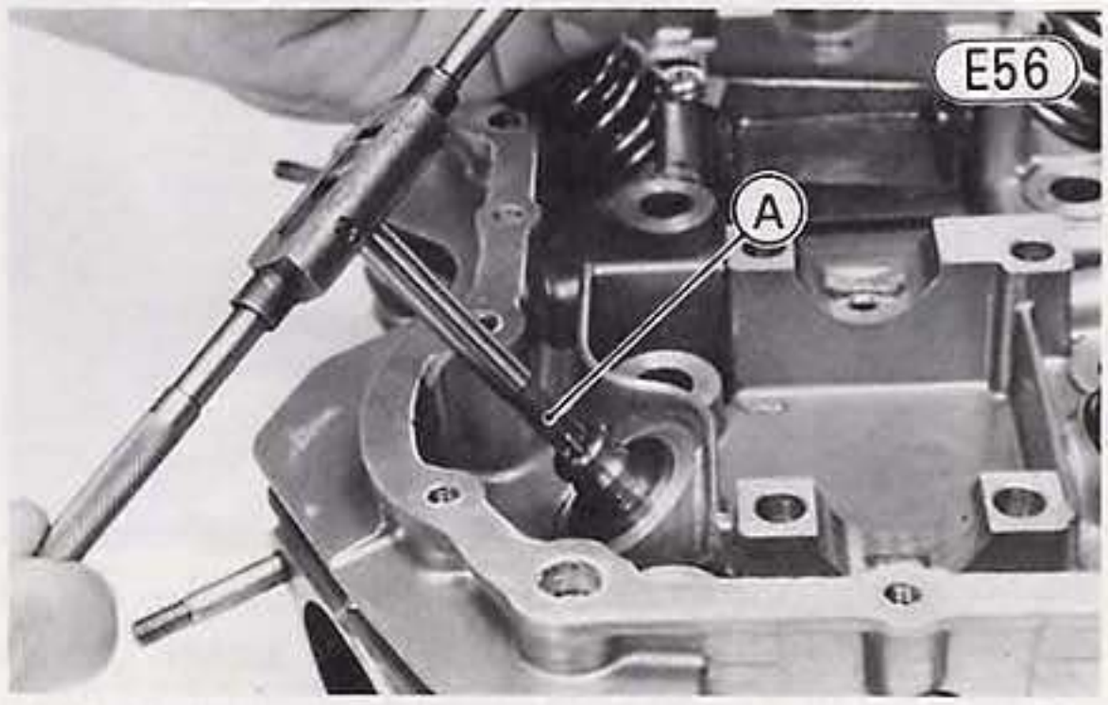


A. Valve Guide Arbor (57001-163)

Installation (each valve and valve guide):

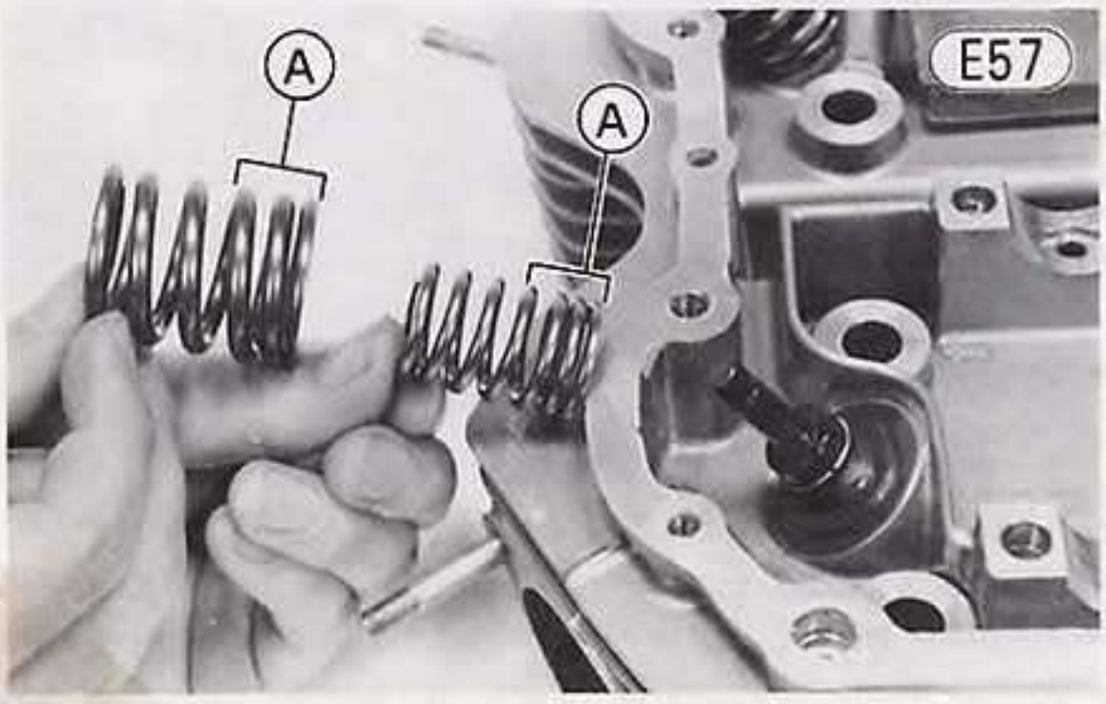
NOTE: If a new valve or valve guide is installed, check the valve/valve guide clearance (Pg. 163).

- Apply oil to the valve guide.
- Heat the area around the valve guide hole to about 120 ~ 150°C (248 ~ 302°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 reused.



A. Valve Guide Reamer (57001-162)

- Lap the valve to check that it is seating properly. If it is uneven, refer to the Maintenance Section (Pg. 163).
- Push a new oil seal into place, and replace its clip.
- Apply a thin coat of high temperature grease to the valve stem, insert the valve, and install the outer and inner spring seats and the outer and inner springs with the concentrated portion of each spring down as shown.

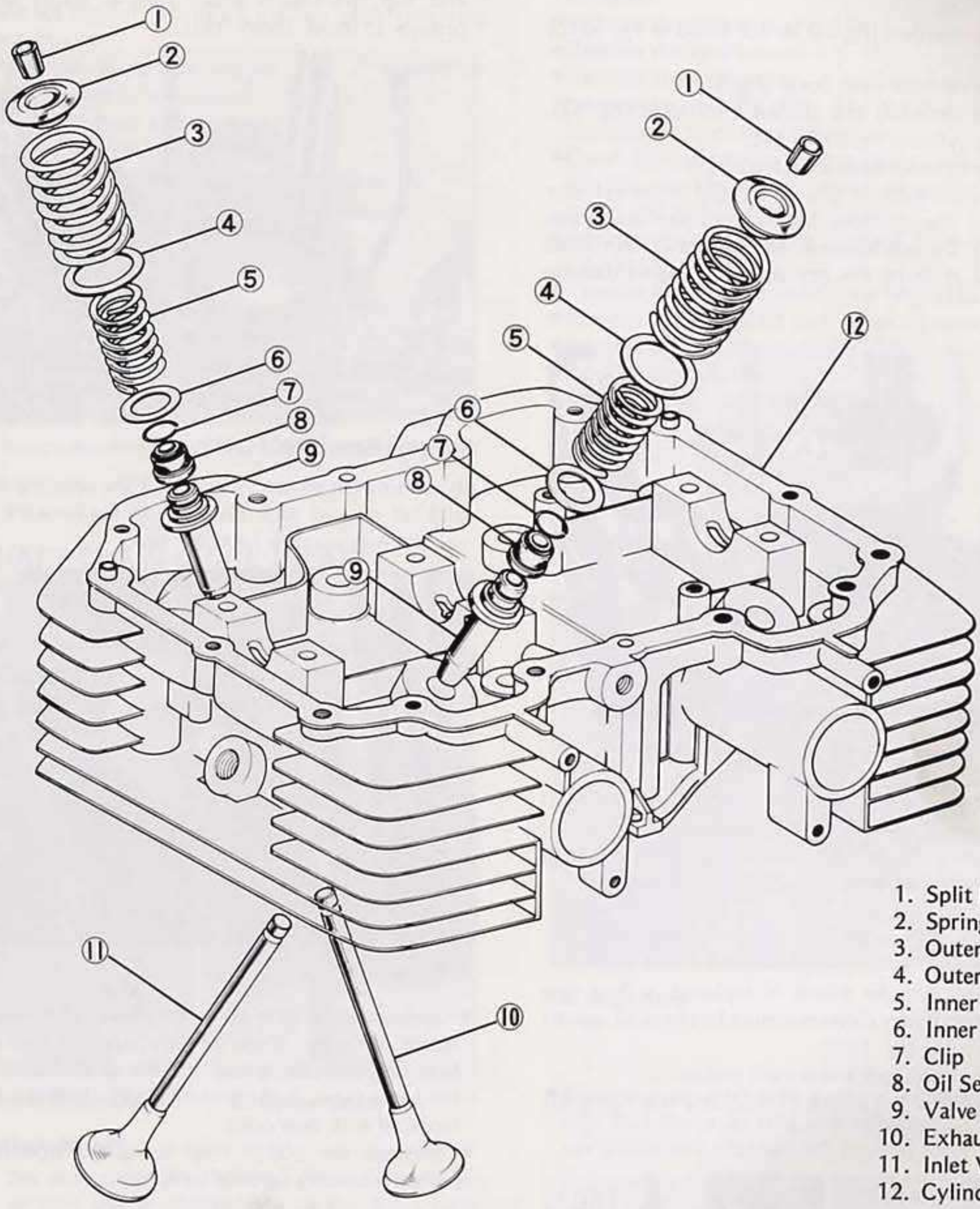


A. Concentrated Portion

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Valve and Valve Guide

E58



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

- Install the spring retainer, press it down with the valve spring compressor assembly (special tool), and put on the split keeper.
- After making sure that the split keeper, spring retainer, and valve stem are all properly fitted, remove the valve spring compressor assembly.
- Install the cylinder head (Pg. 55).
- Install the camshaft and camshaft sprocket (Pg. 53).
- Install the cylinder head cover (Pg. 52).
- Install the spark plugs (2), and tighten them to 2.8 kg-m (20 ft-lbs) of torque.
- Install the ignition coil (Pg. 45).
- Install the carburetors (Pg. 46).
- Install the fuel tank (Pg. 43).
- Install the mufflers (Pg. 50 or 51).
- Adjust the camshaft chain (Pg. 14).
- Check the throttle cables (Pg. 15), and adjust if necessary.
- Adjust the valve clearance (Pg. 14).
- Check the carburetors, and adjust if necessary (Pg. 16).

CYLINDER BLOCK

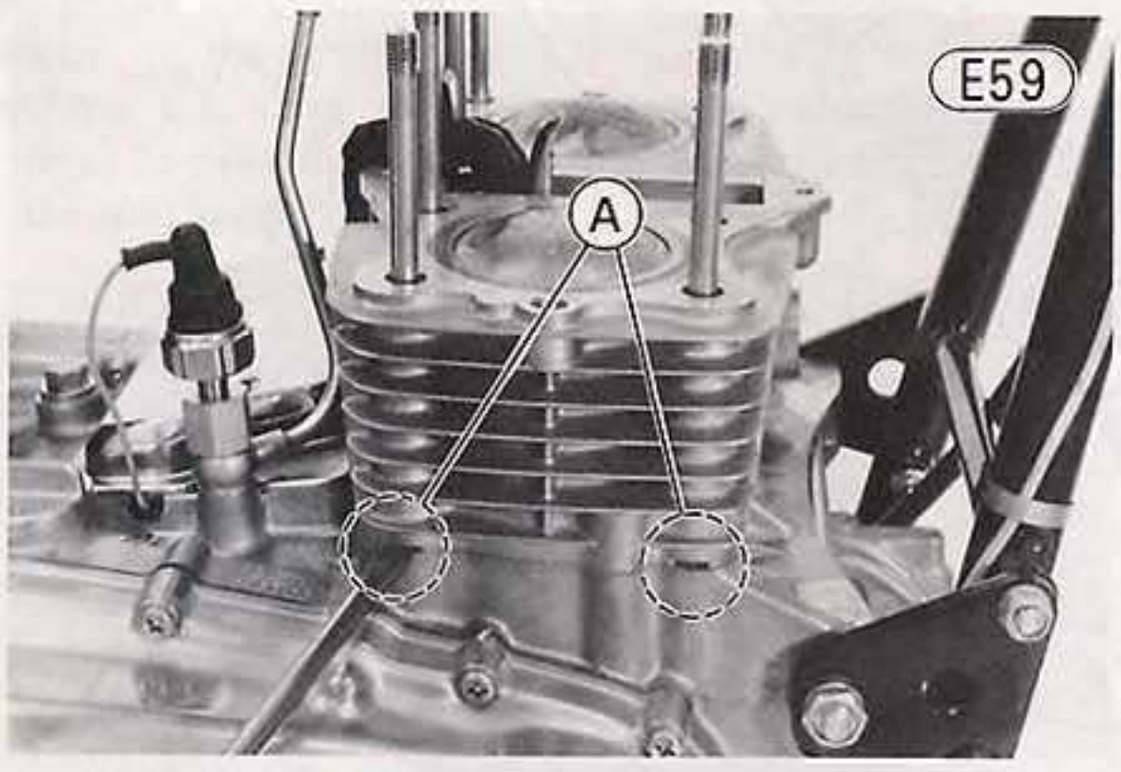
Removal:

- Remove the fuel tank (Pg. 43)
- Remove the ignition coil (Pg. 45).
- Remove the carburetors as explained in the carburetor removal section (Pg. 45). The throttle cables need not be removed from the carburetors.

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- Cover the carburetors with a clean cloth, and set them on the workbench to avoid damaging the throttle cables and carburetors.
- Remove the mufflers (Pg. 50 for KZ400-B or Pg. 50 for KZ400-C).
- Remove the cylinder head cover (Pg. 51).
- Remove the camshaft and camshaft sprocket (Pg. 52).
- Remove the cylinder head (Pg. 54).
- Remove the cylinder head knock pins (2).
- With a wide screwdriver, pry at the gap in the cylinder base to free the cylinder block from the crankcase.

CAUTION **Do not hammer on the screwdriver while it is in the pry point as engine damage could result.**



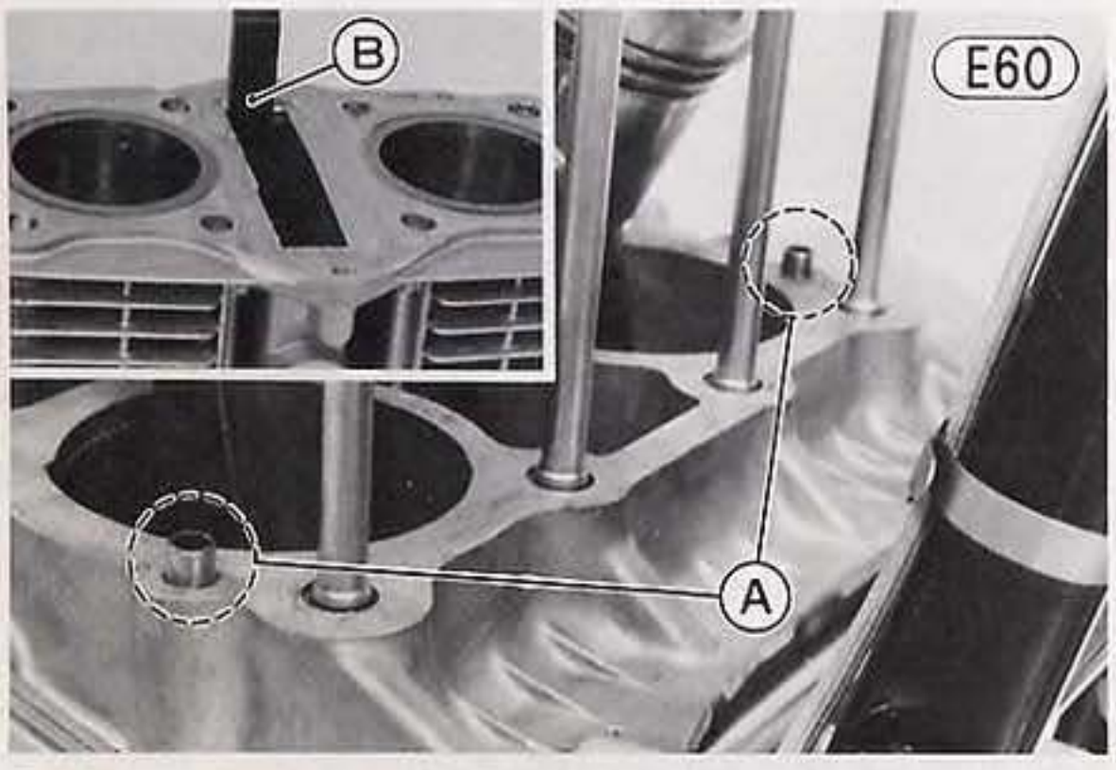
A. Pry Points

- Being careful not to bend or otherwise damage the oil pipe, remove the cylinder block and gasket.
- Wrap a clean cloth around the base of each piston so that no parts or dirt will fall into the crankcase.

Installation:

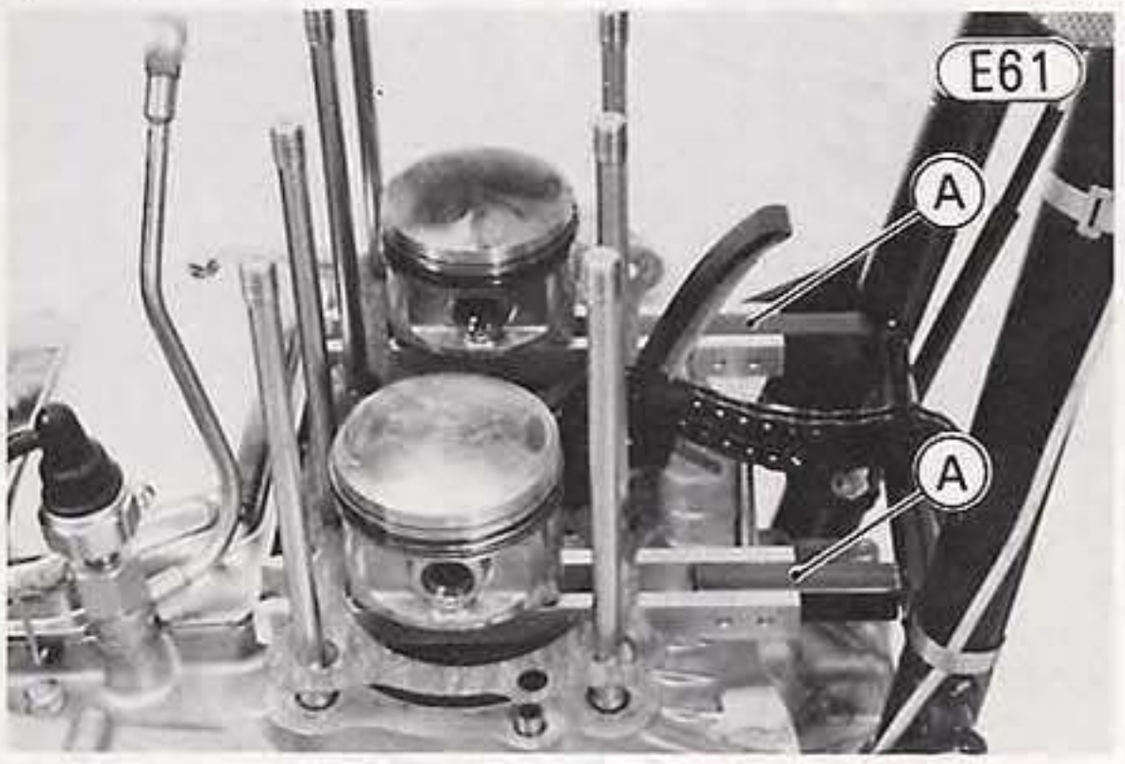
NOTE: If the cylinder block is replaced with a new one, piston to cylinder clearance must be checked against the specified value (Pg. 168).

- Remove the cloth from under each piston.
- Check to see that the knock pins (2) and rear camshaft chain guide are in place.



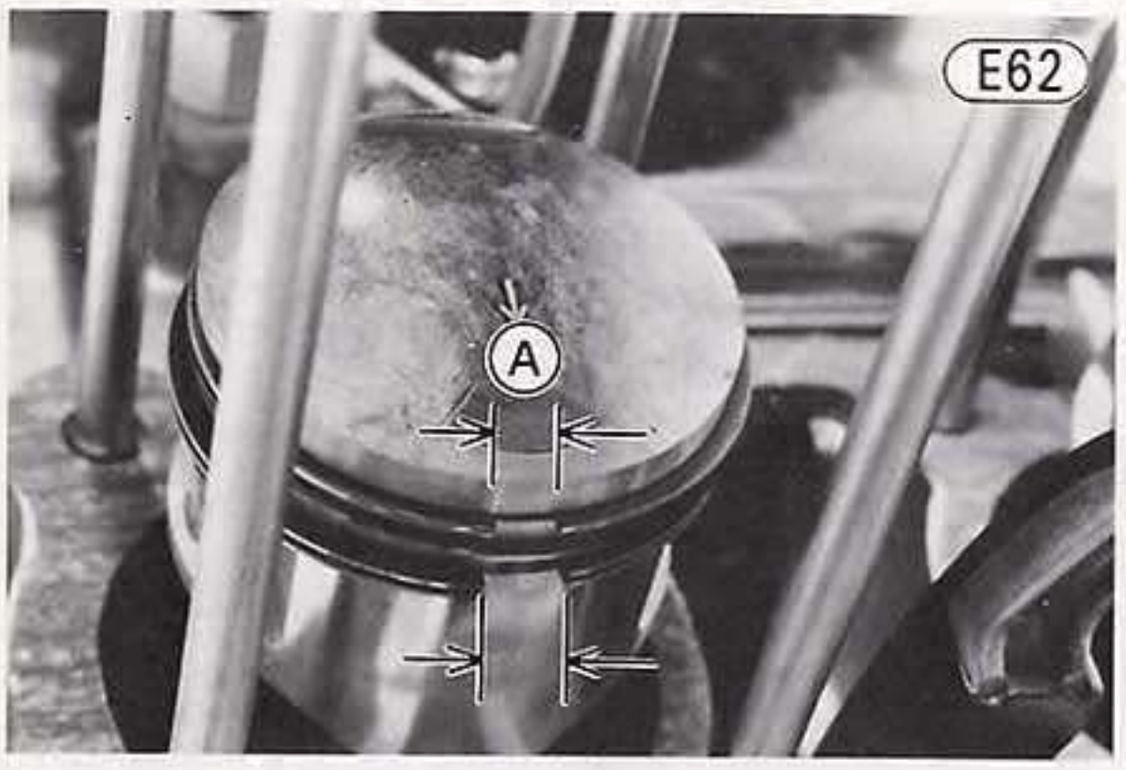
A. Knock Pins B. Rear Camshaft Chain Guide

- Install a new cylinder base gasket.
- Lifting up the camshaft chain so it doesn't get caught, turn the crankshaft so that the crankshaft is at TDC, and slip the piston bases (special tools) under the pistons to hold them level.



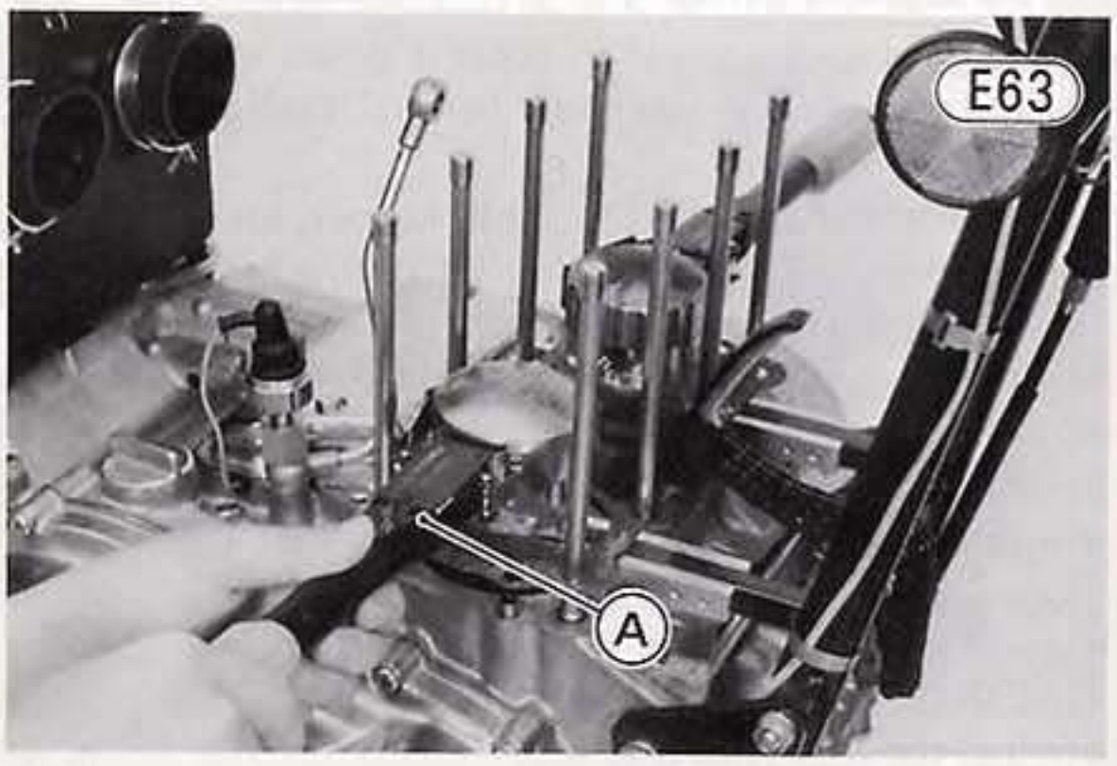
A. Piston Base (57001-341)

- Position each piston ring so that the opening in the top and oil ring of each piston is facing forward, and the second ring opening faces the rear.



A. Opening

- Apply a clean engine oil to the piston rings and cylinder inside surfaces. When possible, apply a thin coat of a high temperature grease on the pistons and cylinder inside surfaces, if the pistons and/or cylinder block are replaced with new ones.
- Compress the piston rings using a piston ring compressor assembly (special tool).



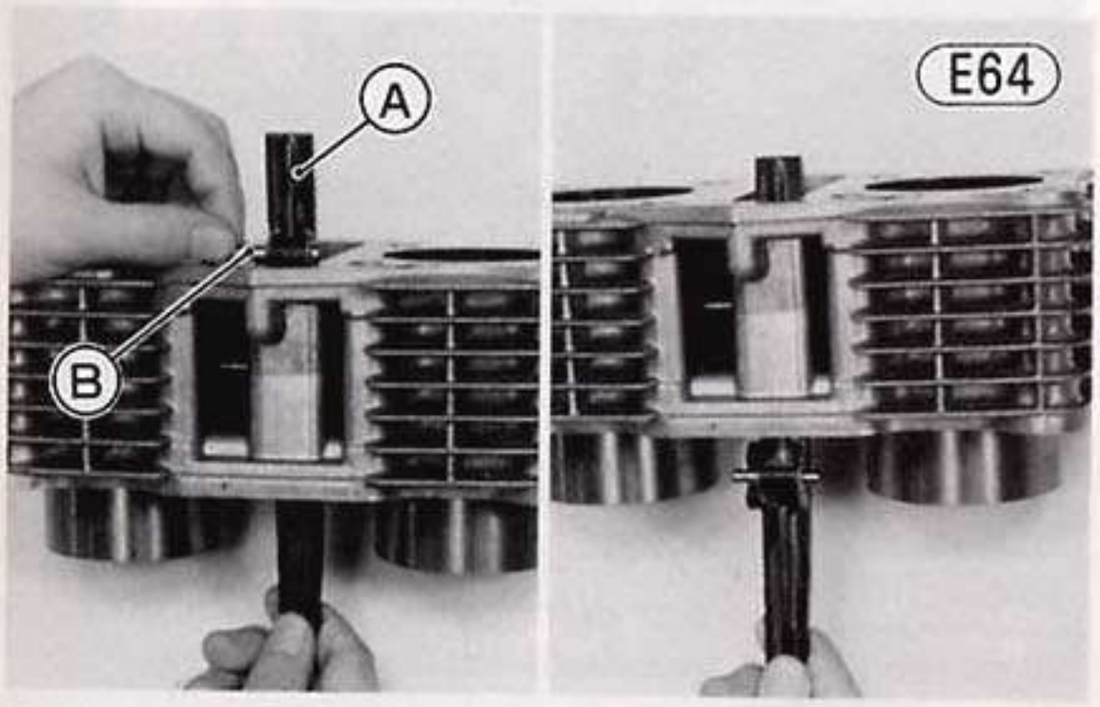
A. Piston Ring Compressor (57001-921)

- Being careful not to bend or otherwise damage the oil pipe, work the bottom of each cylinder past the rings, and set the cylinder block in place while removing the special tools.
- Check the oil pipe, and replace it if it is bent or otherwise damaged (See caution – Pg. 61).
- Fit the cylinder head knock pins (2).
- Install the cylinder head (Pg. 55).
- Install the camshaft and camshaft sprocket (Pg. 53).
- Install the cylinder head cover (Pg. 52).
- Install the ignition coil (Pg. 45).
- Install the carburetors (Pg. 46).
- Install the fuel tank (Pg. 43).
- Install the mufflers (Pg. 50 or 51).
- Adjust the camshaft chain (Pg. 14).
- Adjust the valve clearance (Pg. 14).
- Check the throttle cables (Pg. 15), and adjust if necessary.
- Check the carburetors, and adjust if necessary (Pg. 16).

CAMSHAFT CHAIN GUIDE (REAR)

Removal:

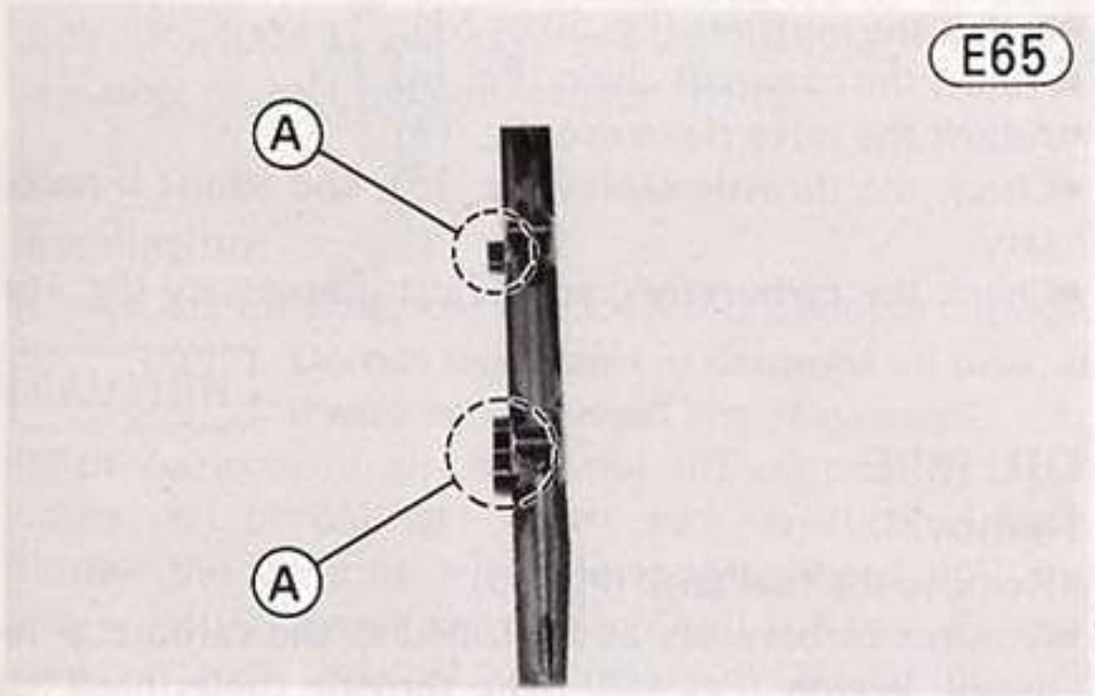
- Remove the cylinder block (Pg. 57).
- Pushing the rear camshft chain guide up, remove the upper guide pin, and remove the guide and lower guide pin.



A. Camshaft Chain Guide B. Upper Guide Pin

Installation Note:

- Install the rear camshaft chain guide in the cylinder block, so that the projecting side of the guide faces the left side of the engine.



A. Projection

PISTON, PISTON RINGS

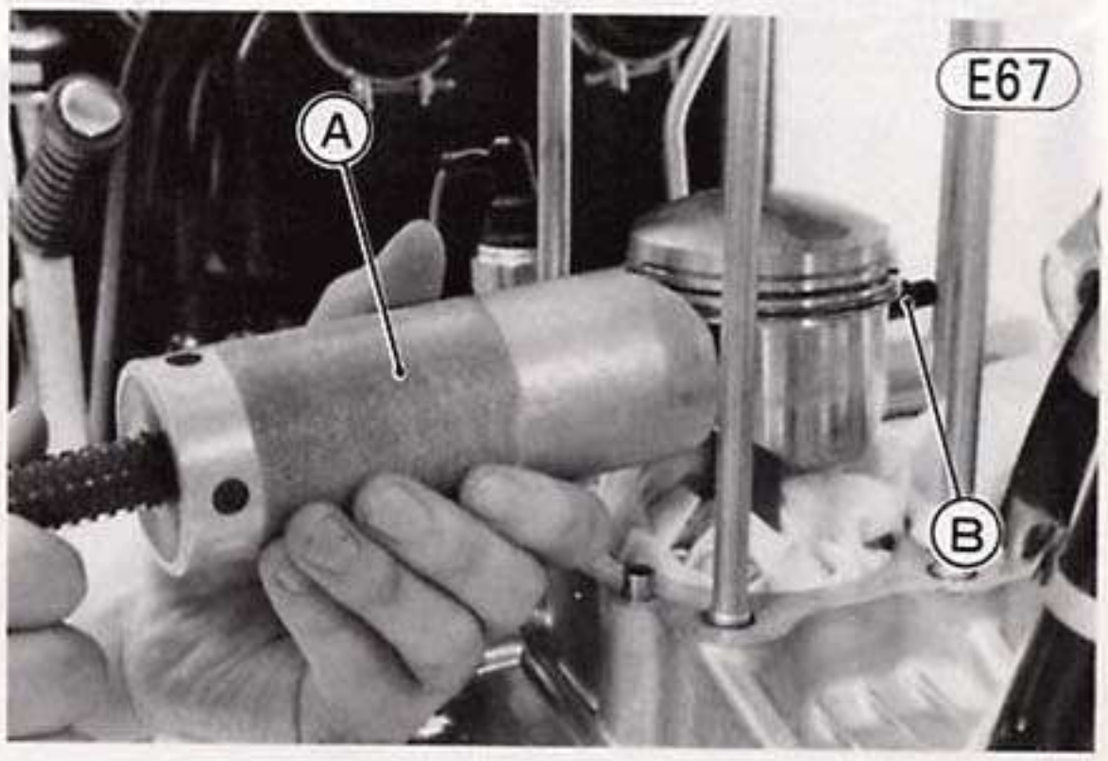
Removal:

- Remove the fuel tank (Pg. 43).
- Remove the ignition coil (Pg. 45).
- Remove the carburetors as explained in the carburetor removal section (Pg. 45). The throttle cables need not be removed from the carburetors.
- Cover the carburetors with a clean cloth, and set them on the workbench to avoid damaging the throttle cables and carburetors.
- Remove the mufflers (Pg. 50 for KZ400-B or Pg. 50 for KZ400-C).
- Remove the cylinder head cover (Pg. 51).
- Remove the camshaft and camshaft sprocket (Pg. 52).
- Remove the cylinder head (Pg. 54).
- Remove the cylinder block (Pg. 57).
- Wrap a clean cloth around the base of each piston to secure it in position for removal and so that no parts and dirt will fall into the crankcase.
- Remove the piston pin snap ring from the outside of each piston.



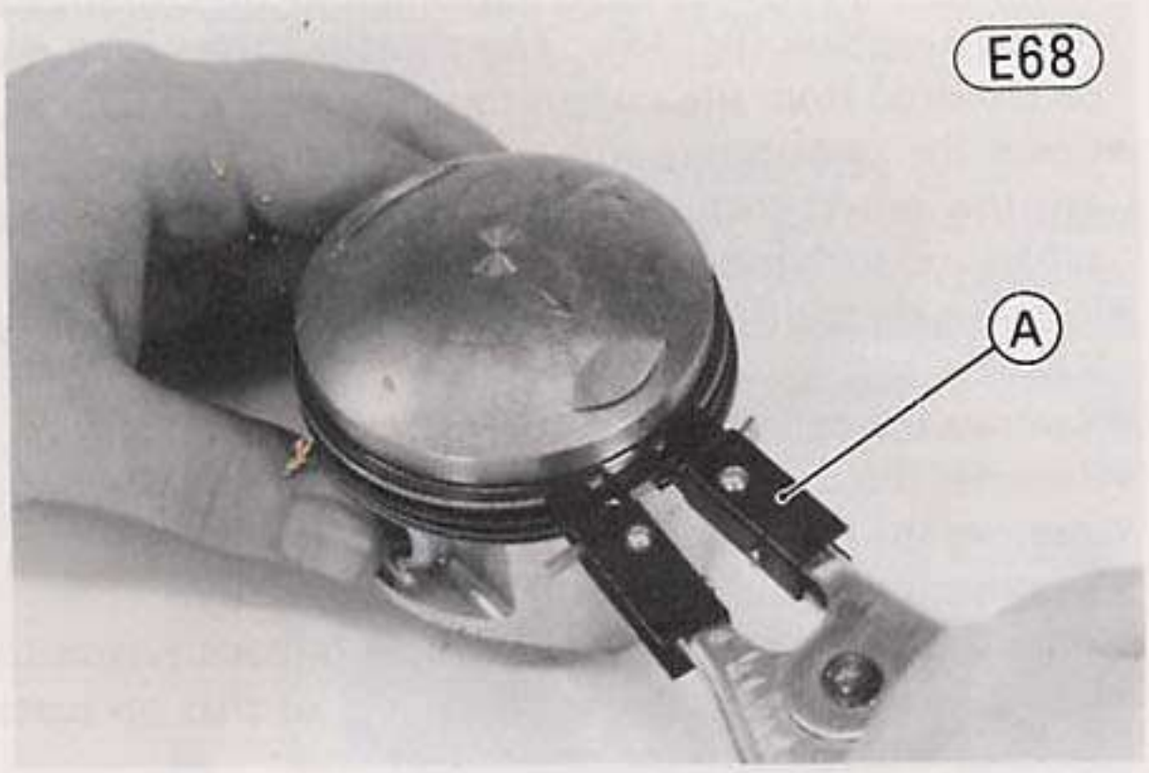
A. Snap Ring

- 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.



A. Piston Pin Puller (57001-910)
B. Adapter "B" (57001-913)

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



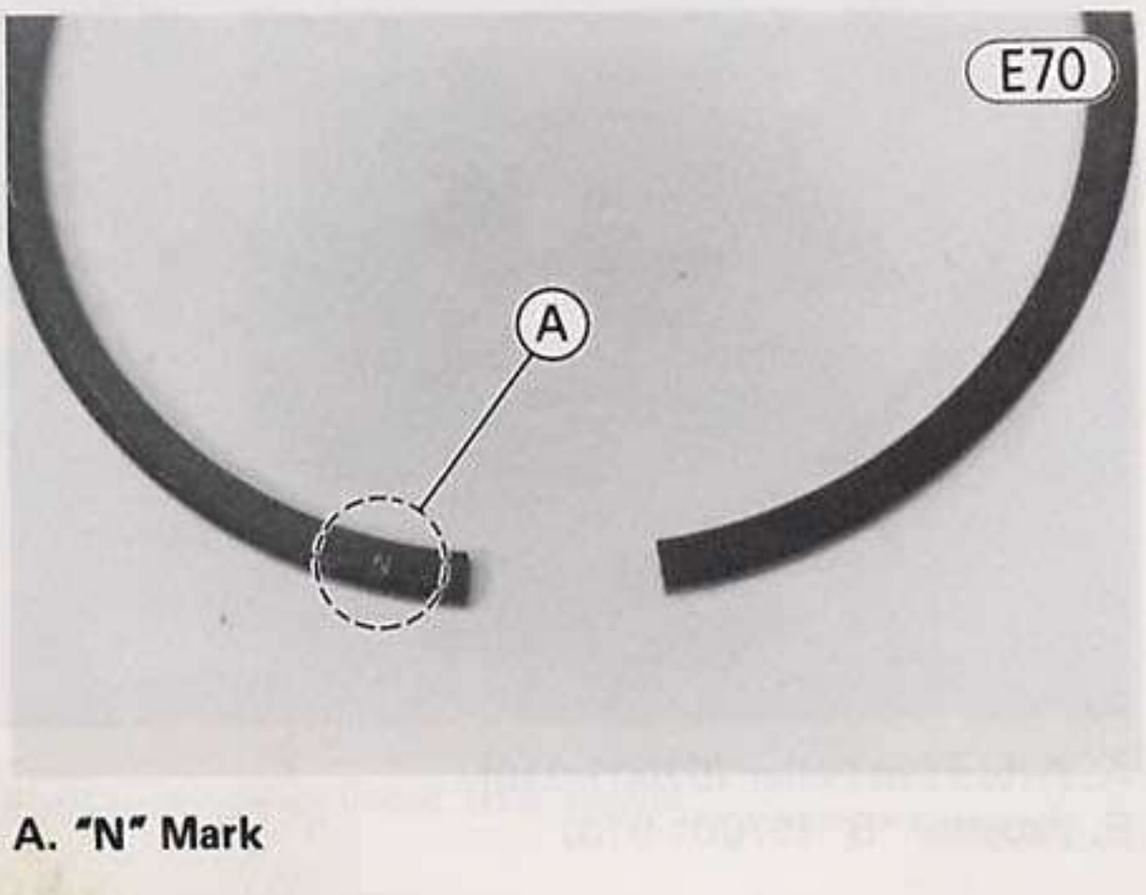
A. Piston Ring Pliers (57001-115)



Installation:

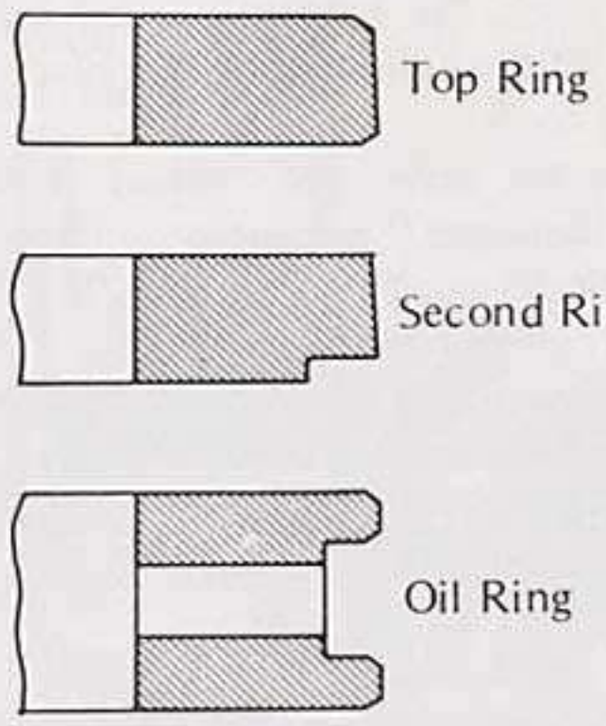
NOTE: If the piston is replaced with a new one, check that piston to cylinder clearance has the specified value (Pg. 168). Also, when a new piston or piston pin is installed, check that the piston to pin clearance has the specified value (Pg. 170).

●Install the piston rings so that the correct side (marked "N") faces up (Fig. E70). Do not mix up the top and second rings. The outer edges of the top ring are chamfered; the lower outer edge of the second ring is notched.

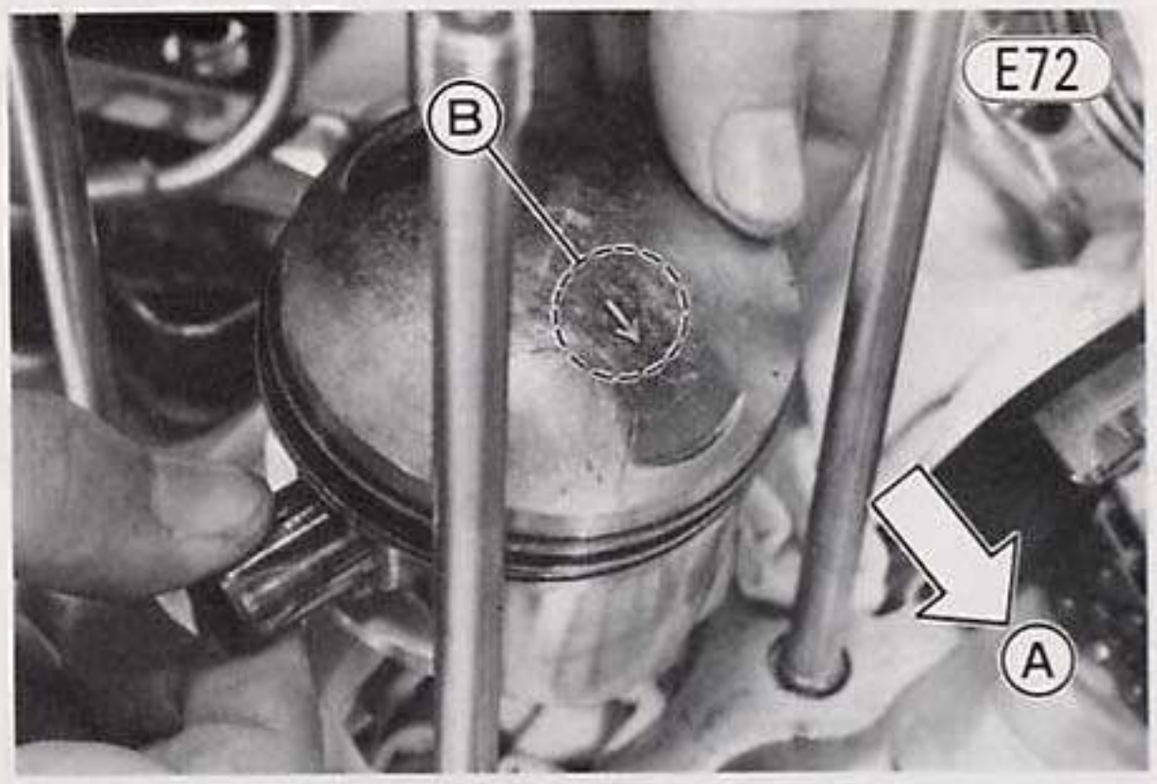


A. "N" Mark

Piston Rings E71



●Apply engine oil to the piston pins, and install the piston and piston pins. The arrow on the top of each piston must point towards the front.



A. Front **B. Arrow**

●Fit a new piston pin snap ring into the side of each piston, taking care to compress it only enough to install it and no more. Check that the other snap rings are in place.

CAUTION **Do not reuse snap rings, as removal weakens and deforms the snap ring. It could fall out and score the cylinder wall.**

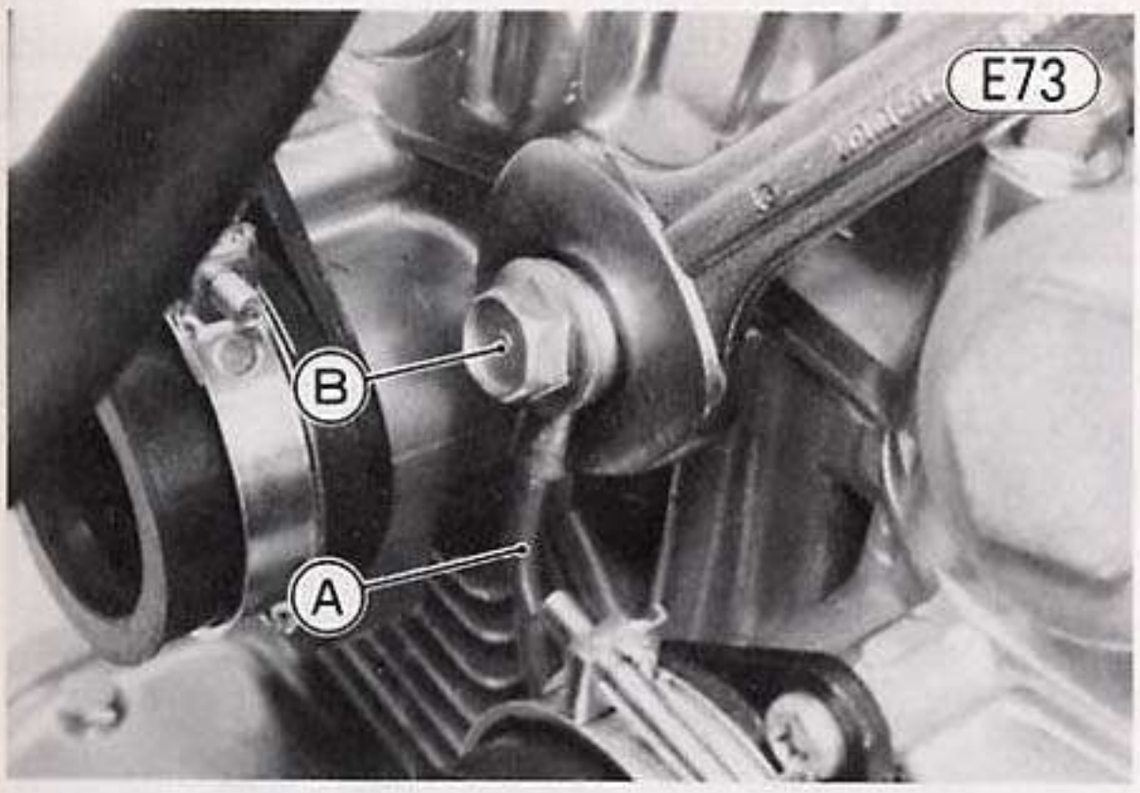
●Install the cylinder block (Pg. 59).
●Install the cylinder head (Pg. 55).
●Install the camshaft and camshaft sprocket (Pg. 53).
●Install the cylinder head cover (Pg. 52).
●Install the ignition coil (Pg. 45).
●Install the carburetors (Pg. 46).
●Install the fuel tank (Pg. 43).
●Install the mufflers (Pg. 50 or 51).
●Adjust the camshaft chain (Pg. 14).
●Adjust the valve clearance (Pg. 14).
●Check the throttle cables (Pg. 15), and adjust if necessary.
●Check the carburetors, and adjust if necessary (Pg. 16).

OIL PIPE

Removal:

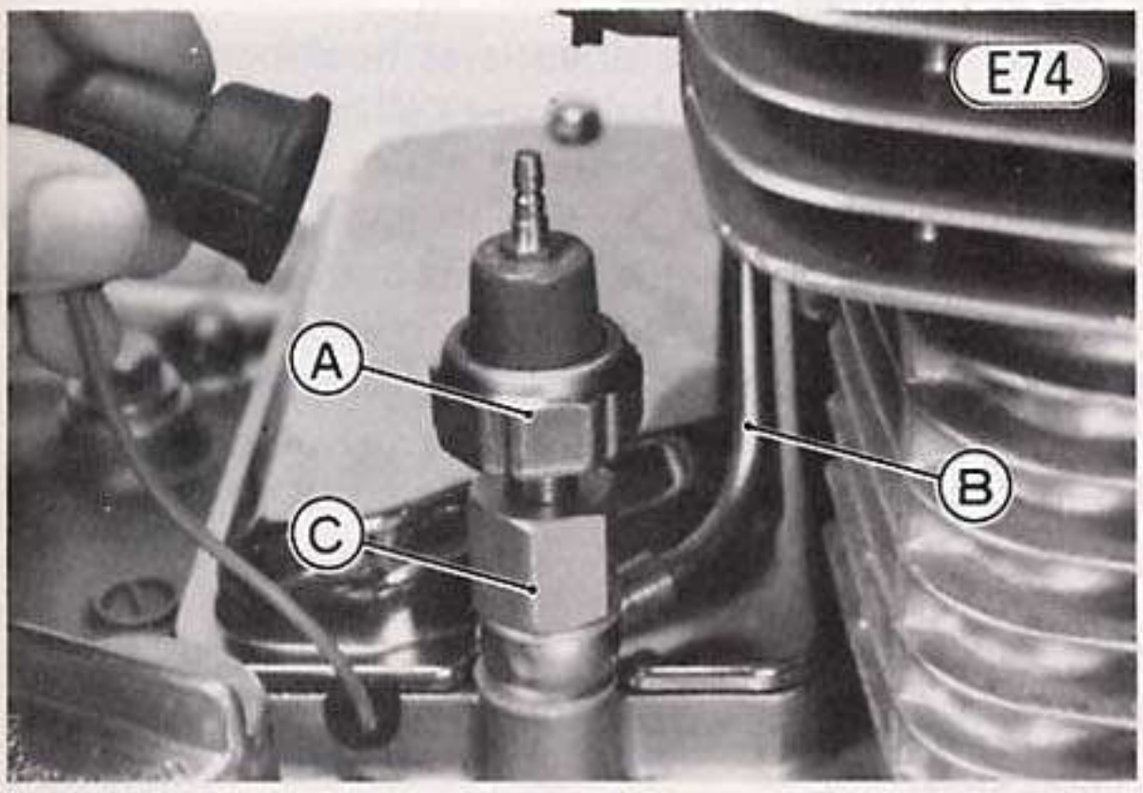
●Remove the fuel tank (Pg. 43).
●Remove carburetors as explained in the carburetor removal section (Pg. 45). The throttle cables need not be removed from the carburetors.

•Cover the carburetors with a clean cloth, and set them on the workbench to avoid damaging the throttle cables and carburetors.
•Using a wrench to hold the upper end of the oil pipe, remove the banjo bolt to disconnect the oil pipe upper end from the cylinder head. The banjo bolt has two washers.



A. Oil Pipe **B. Banjo Bolt**

•Disconnect the oil pressure switch lead from the switch, and remove the oil pressure switch (KZ400-B).



A. Oil Pressure Switch
B. Oil Pipe
C. Long-hex-head Bolt

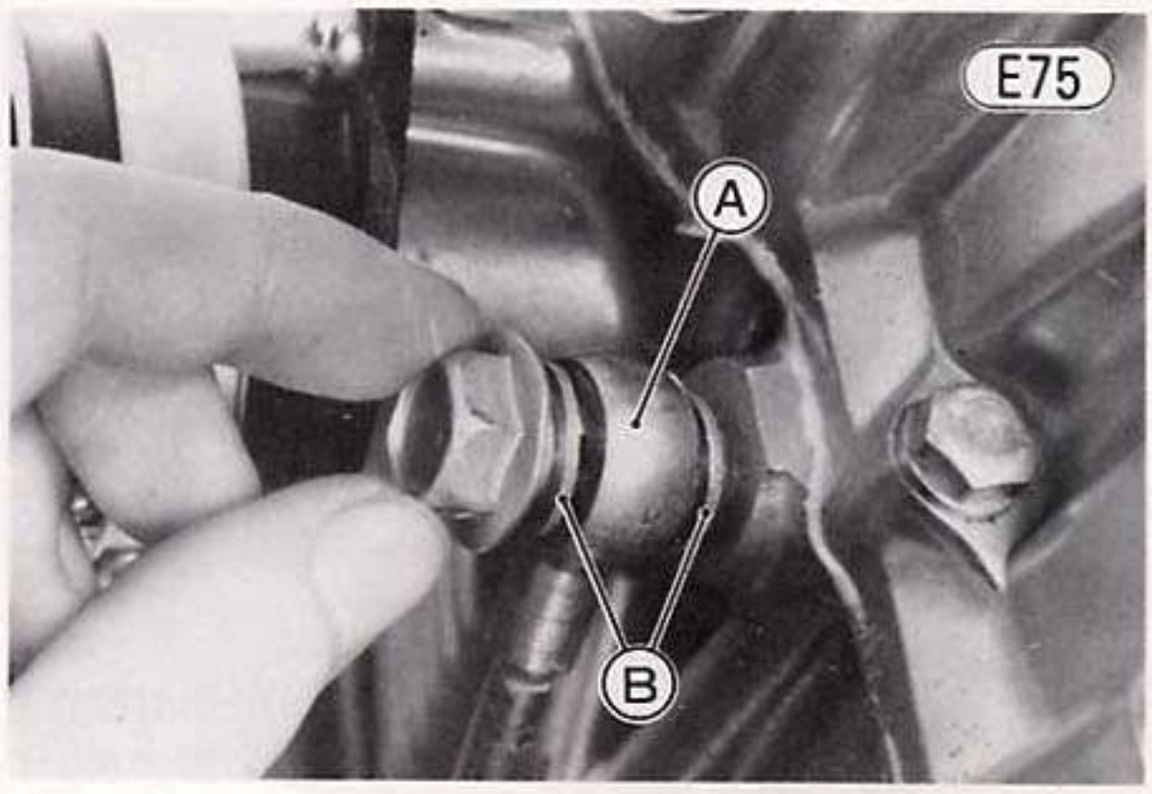
•Remove the long-hex-head bolt (KZ400-B) or banjo bolt (KZ400-C), and take off the oil pipe. There is a washer on each side of the pipe fitting.

Installation:

•Check the oil pipe, and replace it if it is bent or damage.

CAUTION **Do not use a bent or damaged oil pipe, as it may cause serious engine damage.**

•With compressed air, blow out the oil passage to remove dirt or particles which may obstruct oil flow.
•Install the oil pipe with the long-hex-head bolt and banjo bolt(s) finger tight. Each bolt has two washers, one on each side of the fitting. Discard the old washers, and use new washers.



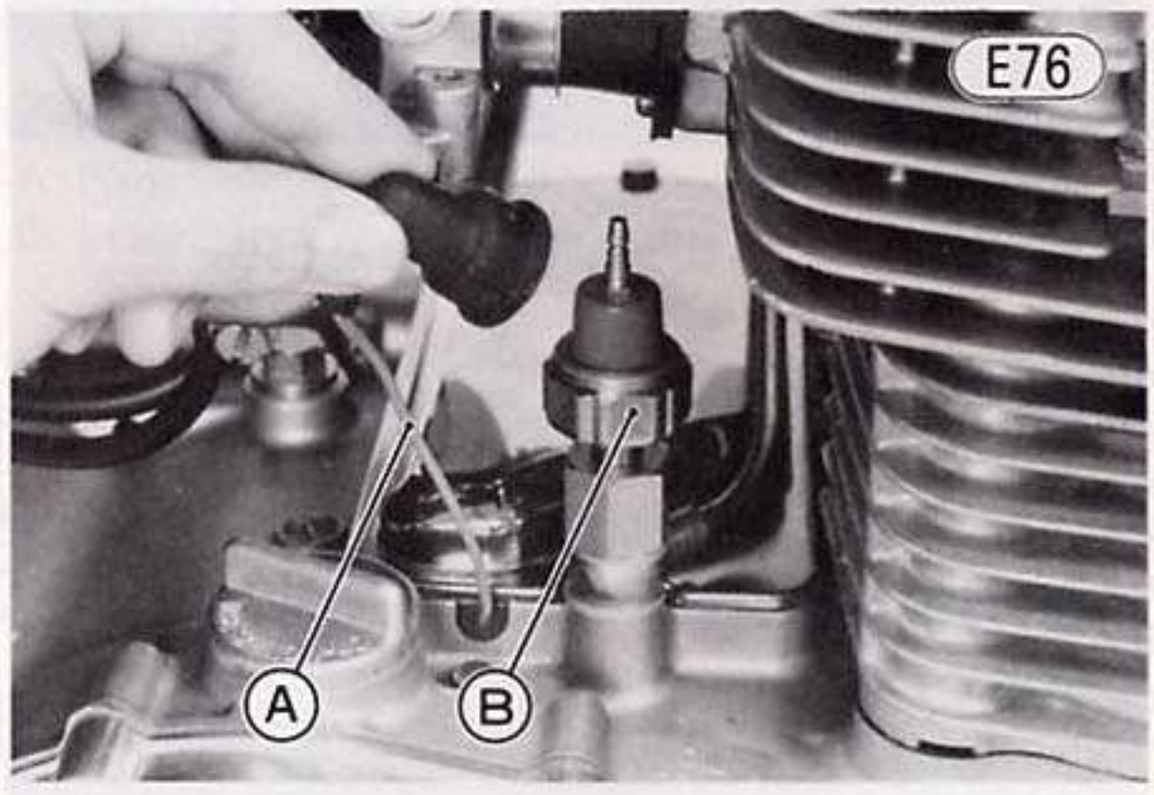
A. Fitting **B. New Washers**

•Using a wrench to hold the end of the oil pipe, tighten the long-hex-head and oil pipe banjo bolts to 2.0 kg-m (14.5 ft-lbs) of torque.
•Install the oil pressure switch tightening it to 1.5 kg-m (11.0 ft-lbs) of torque (KZ400-B).
•Connect the oil pressure switch lead to the switch (KZ400-B).
•Install the carburetors (Pg. 46).
•Install the fuel tank (Pg. 43).
•Check the throttle cables (Pg. 15), and adjust if necessary.

OIL PRESSURE SWITCH

Removal:

•Pull the oil pressure switch lead off the switch.



A. Switch Lead **B. Oil Pressure Switch**

•Remove the oil pressure switch.

Installation Note:

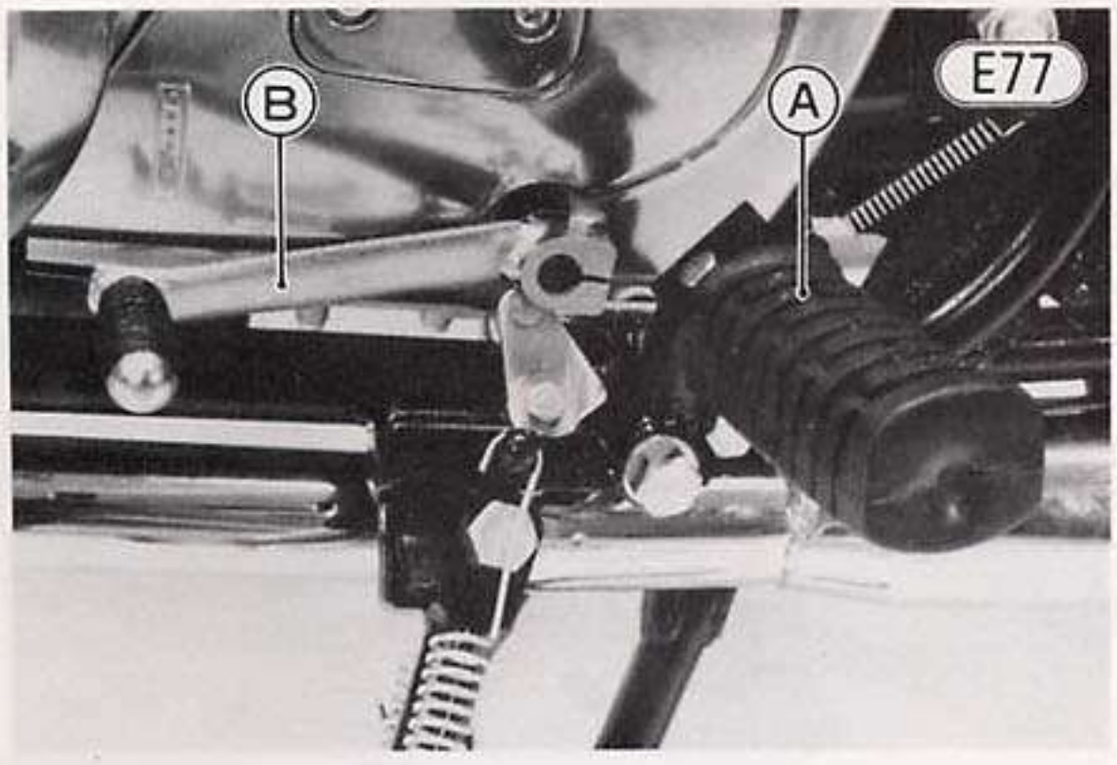
•Tighten the oil pressure switch to 1.5 kg-m (11.0 ft-lbs) of torque.

ENGINE SPROCKET COVER

Removal:

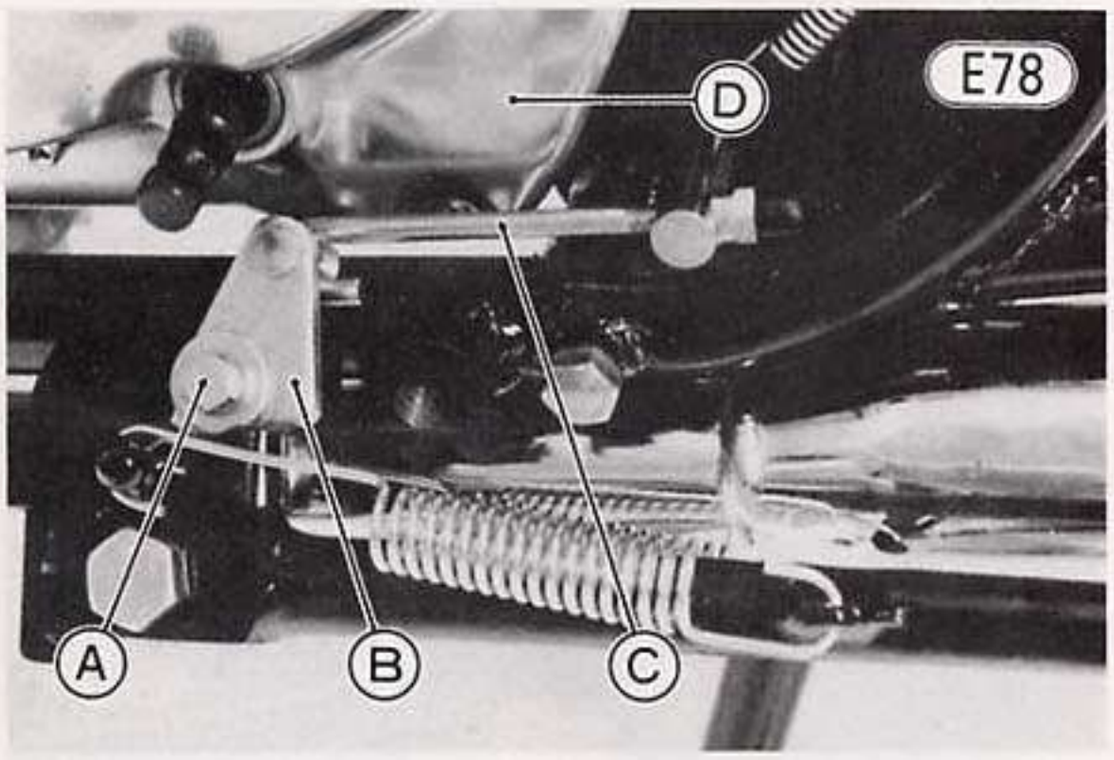
•Remove the left footpeg bolt, lockwasher, and left footpeg (Fig. E77).

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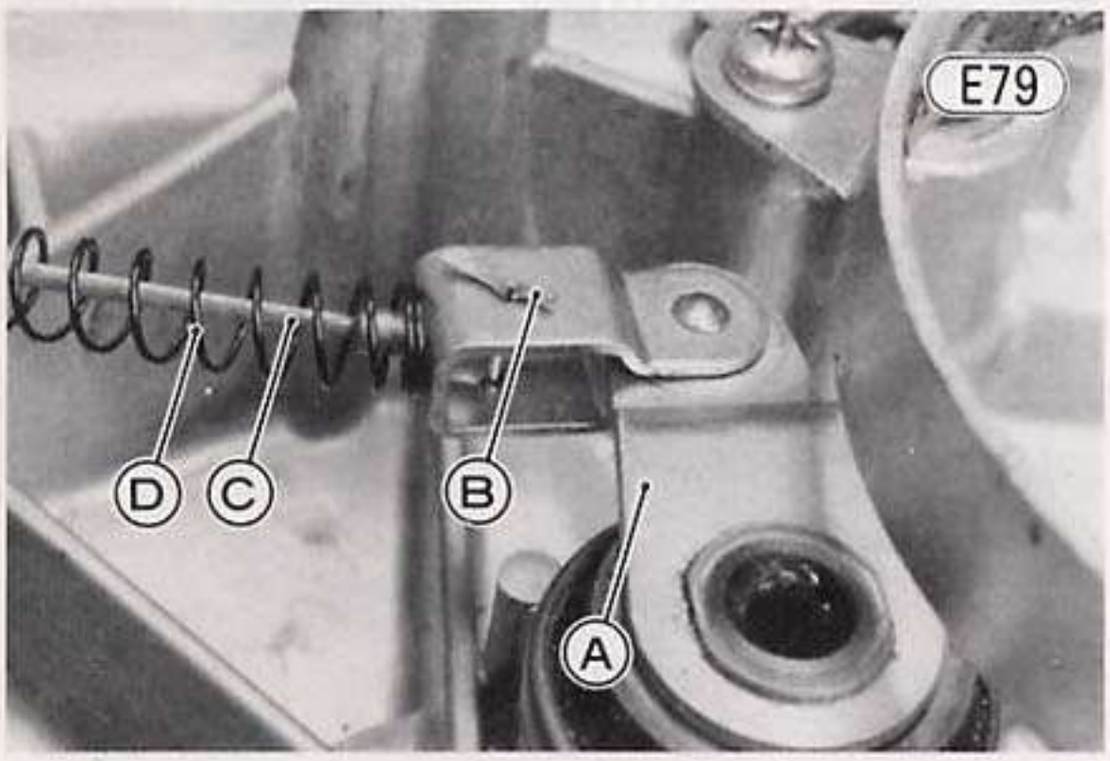
A. Footpeg B. Shift Pedal

- Remove the shift pedal bolt, and take off the shift pedal.
- Remove the pivot bolt of the side stand drive lever, and slide the rod towards the rear. There is a lock-washer, flat washer, and collar.



A. Pivot Bolt C. Rod
B. Lever D. Engine Sprocket Cover

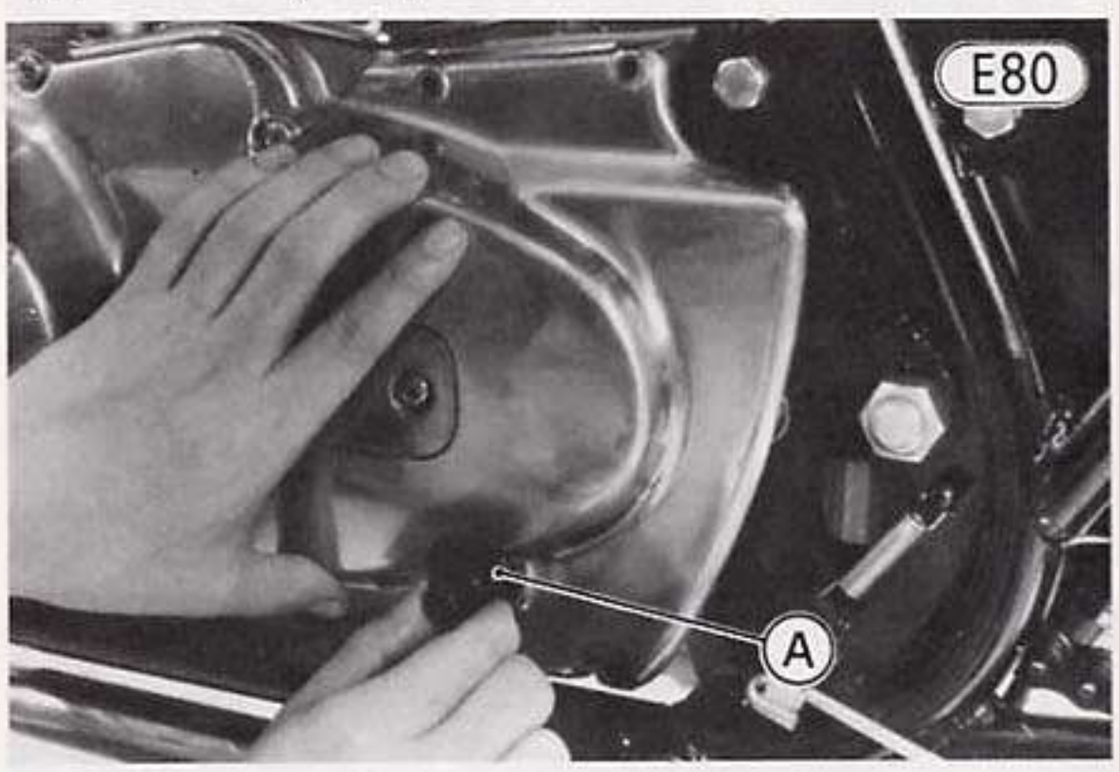
- Remove the engine sprocket cover screws (4), and pull the cover free from the crankcase.
- Remove the cotter pin from the clutch release lever, and free the clutch inner cable tip from the lever and engine sprocket cover.



A. Release Lever C. Inner Cable
B. Cotter Pin D. Spring

Installation:

- 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.
- Check that the engine sprocket cover knock pins (2) and clutch push rod are in place, and install the engine sprocket cover using the shift shaft oil seal guide (special tool) to protect the oil seal in the cover.



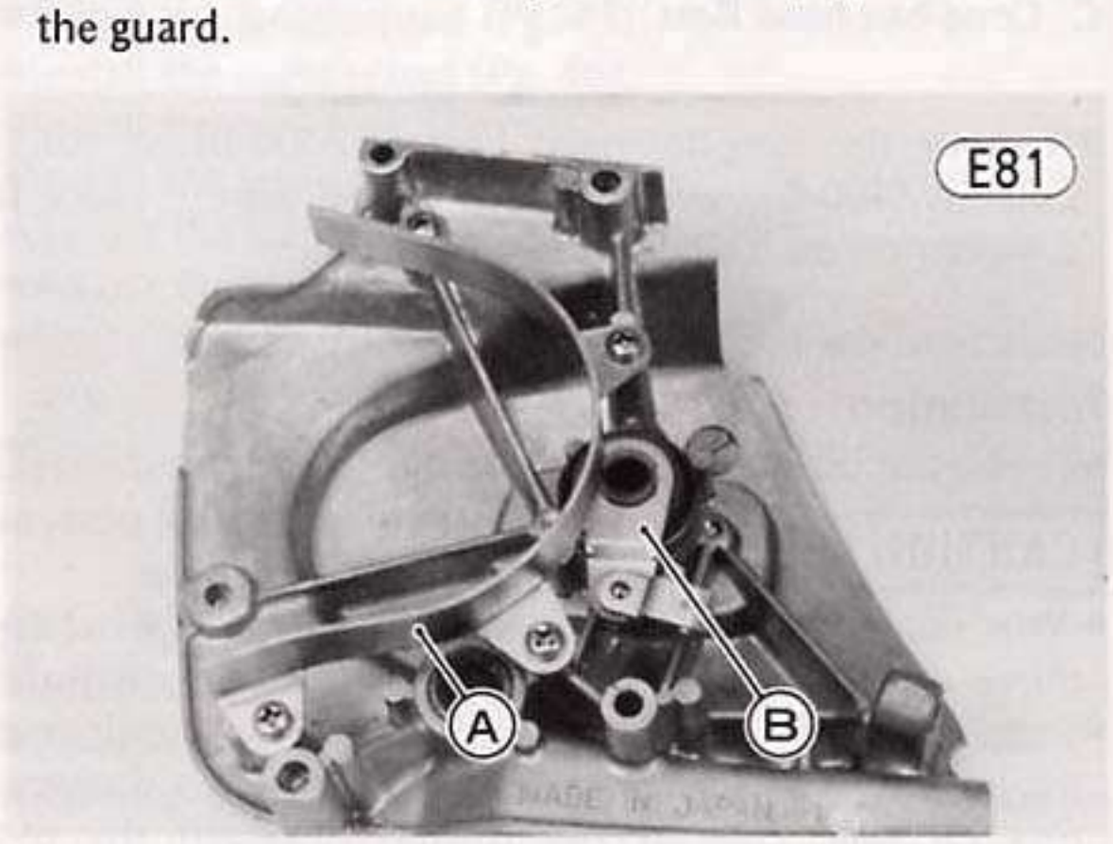
A. Shift Shaft Oil Seal Guide (57001-264)

- Tighten the engine sprocket cover screws (4).
- Install the left footpeg and lockwasher, and tighten the left footpeg bolt.
- Install the side stand drive lever hooking the rod on the lever. The pivot bolt has a collar, flat washer, and lockwasher.
- Mount the shift pedal so that its end matches the level of the left footpeg, and tighten its bolt.
- Check the clutch, and adjust if necessary (Pg. 19).
- Check the automatic side stand return mechanism, and adjust if necessary (Pg. 31).

CLUTCH RELEASE

Removal:

- Remove the engine sprocket cover (Pg. 61).
- Remove the drive chain guard screws (4), and take off the guard.



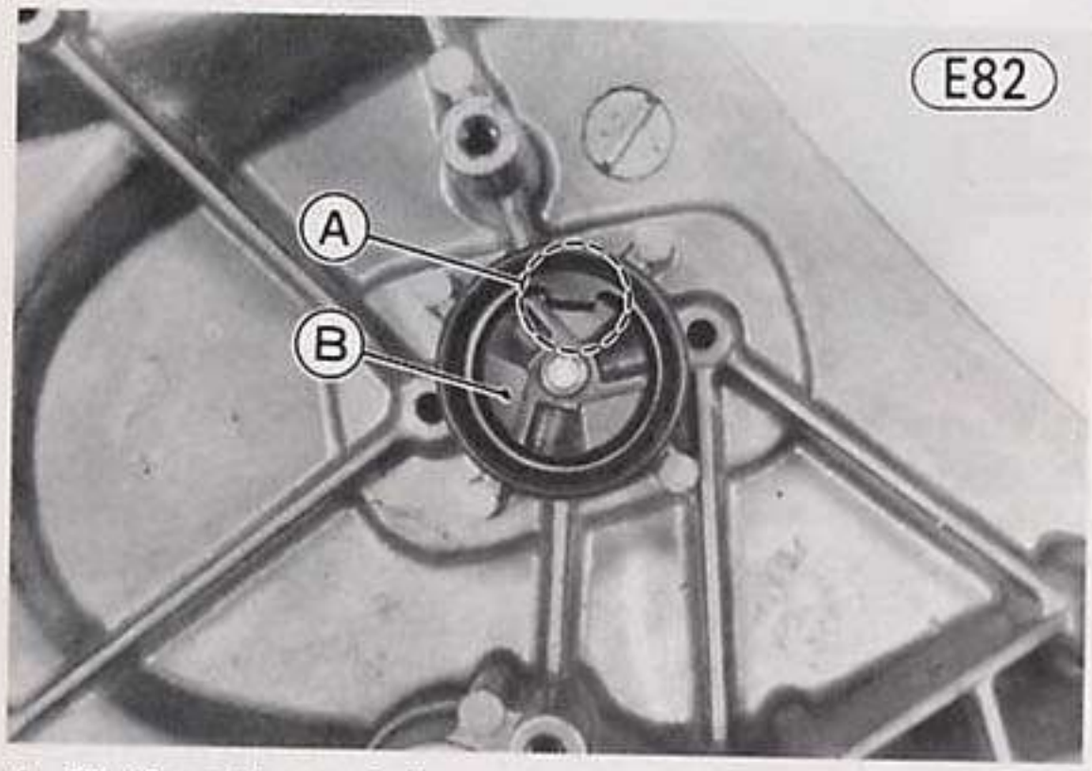
A. Drive Chain Guard B. Clutch Release Lever

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- Remove the clutch release lever and steel ball assembly.
- Remove the clutch adjusting cover screws (2), and take off the cover.
- Remove the clutch adjusting screw locknut, adjusting screw, and ball ramp plate.

Installation:

- Wash and clean the clutch release lever, steel ball assembly, and ball ramp plate with a high flash-point solvent. Dry and lubricate them with grease.
- Install the adjusting screw and ball ramp plate, aligning the ridge on the engine sprocket cover with the groove in the ball ramp plate.



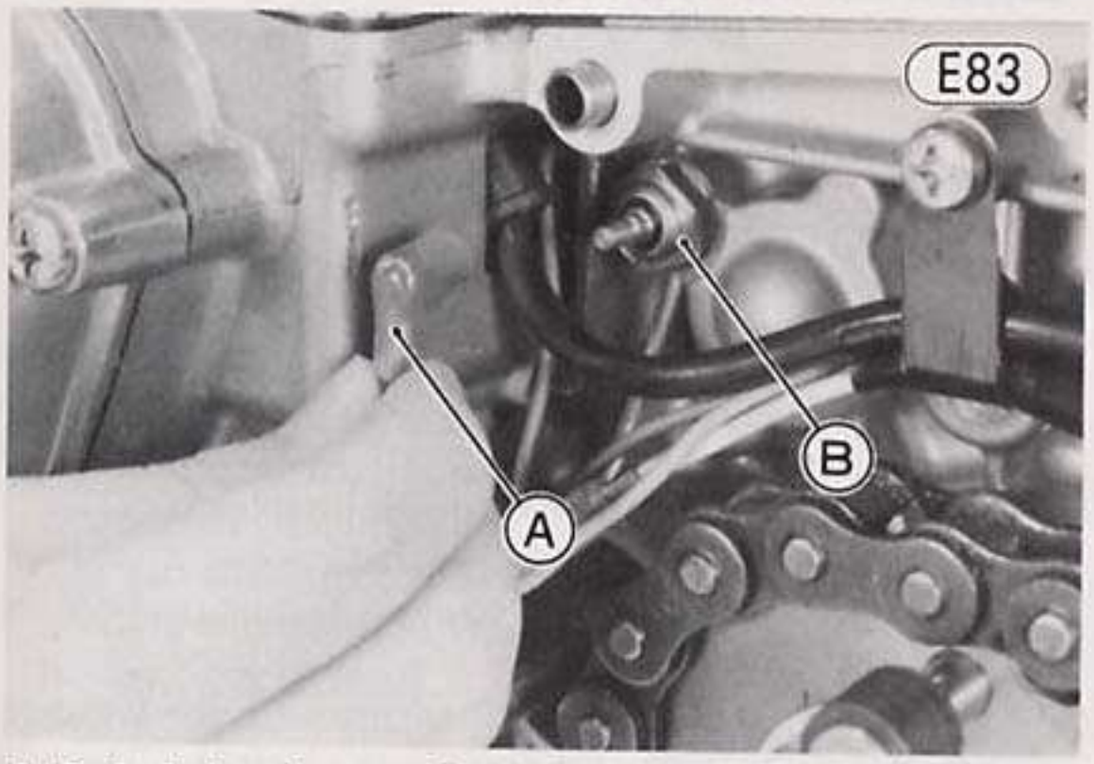
A. Fit the ridge and the groove. **B. Ramp Plate**

- Install the adjusting screw locknut with finger tight.
- Install the steel ball assembly.
- Apply a grease to the grease seal, and install the clutch release lever.
- Install the drive chain guard, and tighten its screws (4), applying a non-permanent locking agent to the screws.
- Install the engine sprocket cover (Pg. 62) and adjust the clutch (Pg. 19).
- Check the automatic side stand return mechanism and adjust if necessary (Pg. 31).

NEUTRAL SWITCH

Removal:

- Remove the engine sprocket cover as explained in engine sprocket cover removal (Pg. 61). The clutch cable need not be removed from the clutch release.
- Pull the neutral switch lead off the switch.



A. Switch Lead **B. Neutral Switch**

- Unscrew the neutral switch and gasket.

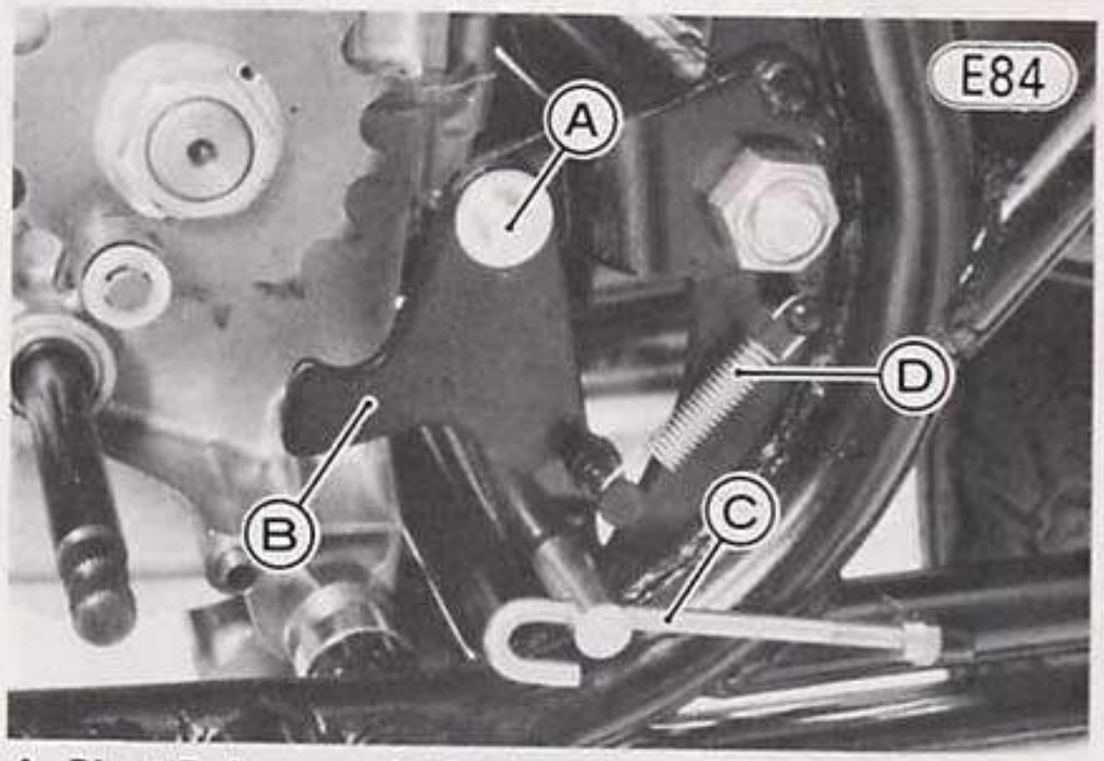
Installation:

- Install the neutral switch and gasket tightening it 1.5 kg-m (11.0 ft-lbs) of torque.
- Fit the lead back on the switch.
- Install the engine sprocket cover (Pg. 62).
- Adjust the clutch (Pg. 19).
- Check the automatic side stand return mechanism, and adjust if necessary (Pg. 31).

ENGINE SPROCKET

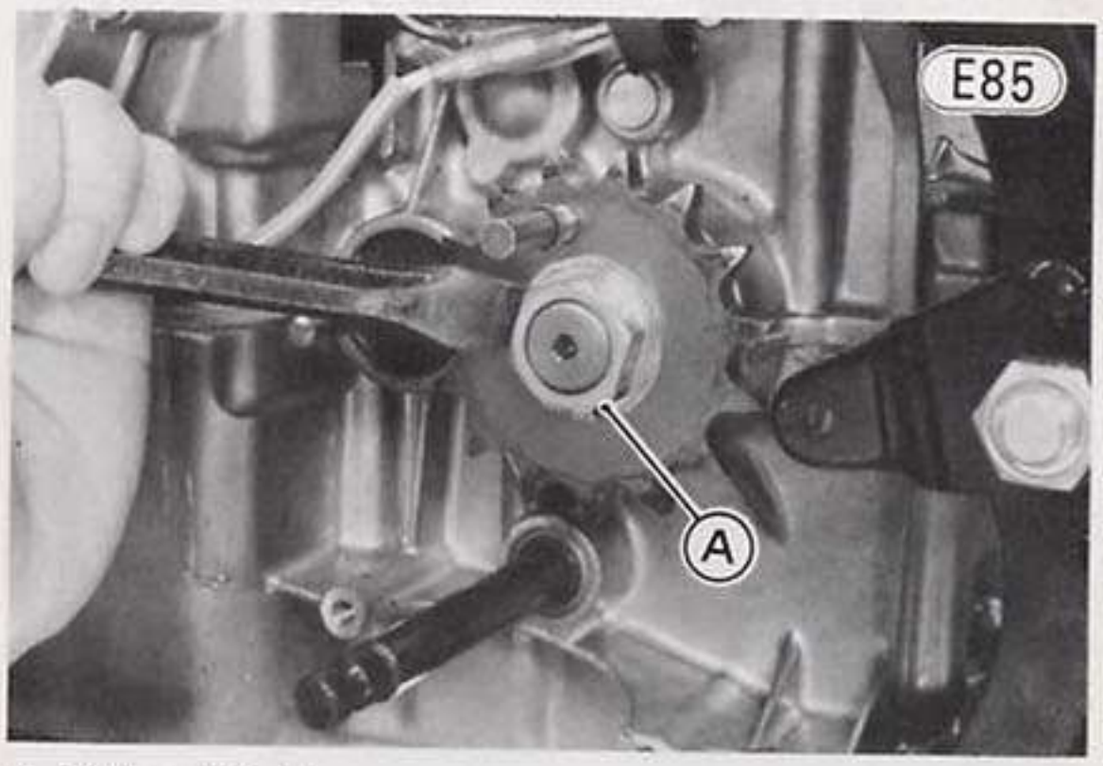
Removal:

- Remove the engine sprocket cover as explained in engine sprocket cover removal (Pg. 61). The clutch cable need not be removed from the clutch release lever.
- Remove the drive chain (Pg. 119).
- Remove the pivot bolt of the lever, and take off the lever, rod, and lever spring. The pivot bolt has a nut, collar, and flat washer.



A. Pivot Bolt **C. Rod**
B. Lever **D. Lever Spring**

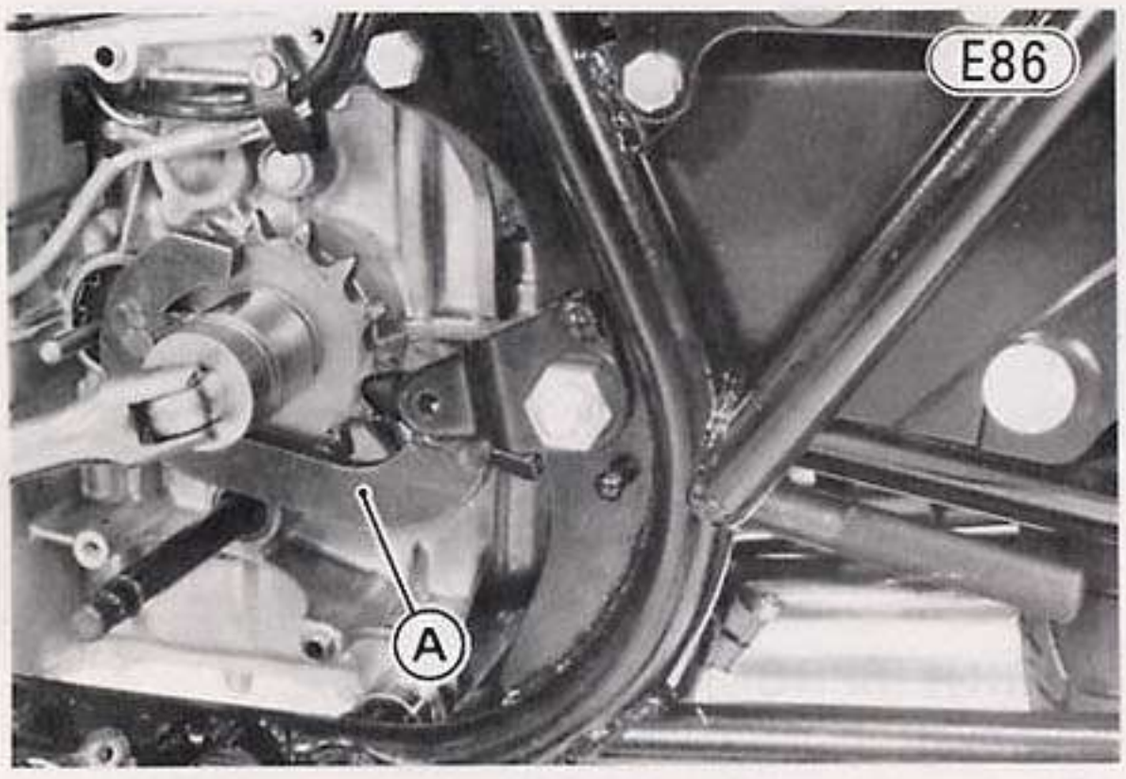
- Straighten the side of the splined washer that is bent over the side of the engine sprocket nut.



A. Splined Washer

- Hold the engine sprocket steady using the engine sprocket holder (special tool), and remove the nut, splined washer, and engine sprocket (Fig. E86).

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A. Engine Sprocket Holder (57001-307)

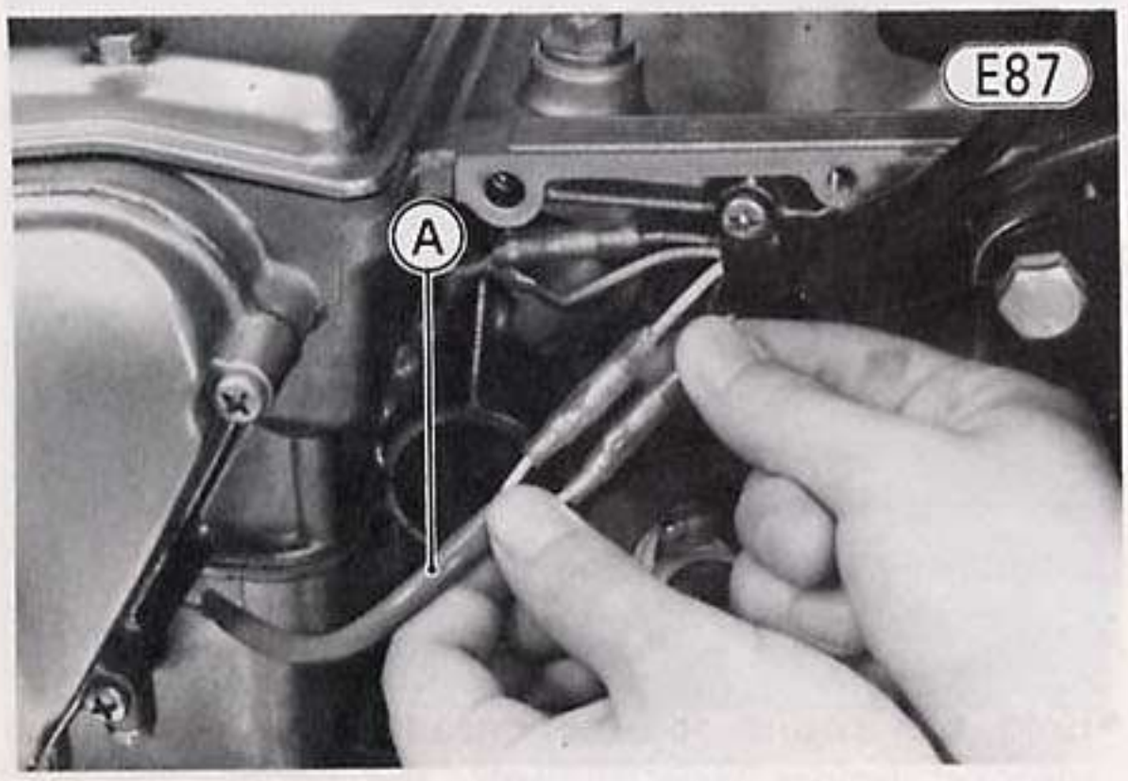
Installation:

- Mount the engine sprocket, and install the splined washer on the output shaft fitting their splines.
- Install the engine sprocket nut, and then tighten the nut to 8.0 kg-m (58 ft-lbs) of torque while using the engine sprocket holder to hold the sprocket steady.
- Bend one side of the splined washer over the side of the nut.
- Install the lever, rod, and lever spring as shown in Fig. E84. The pivot bolt has a flat washer, collar, and nut.
- Install the drive chain (Pg. 119).
- Install the engine sprocket cover (Pg. 62).
- Check the clutch (Pg. 19), and adjust if necessary.
- Check the drive chain (Pg. 24), and adjust if necessary.
- Check the automatic side stand return mechanism, and adjust if necessary (Pg. 31).

DYNAMO ARMATURE

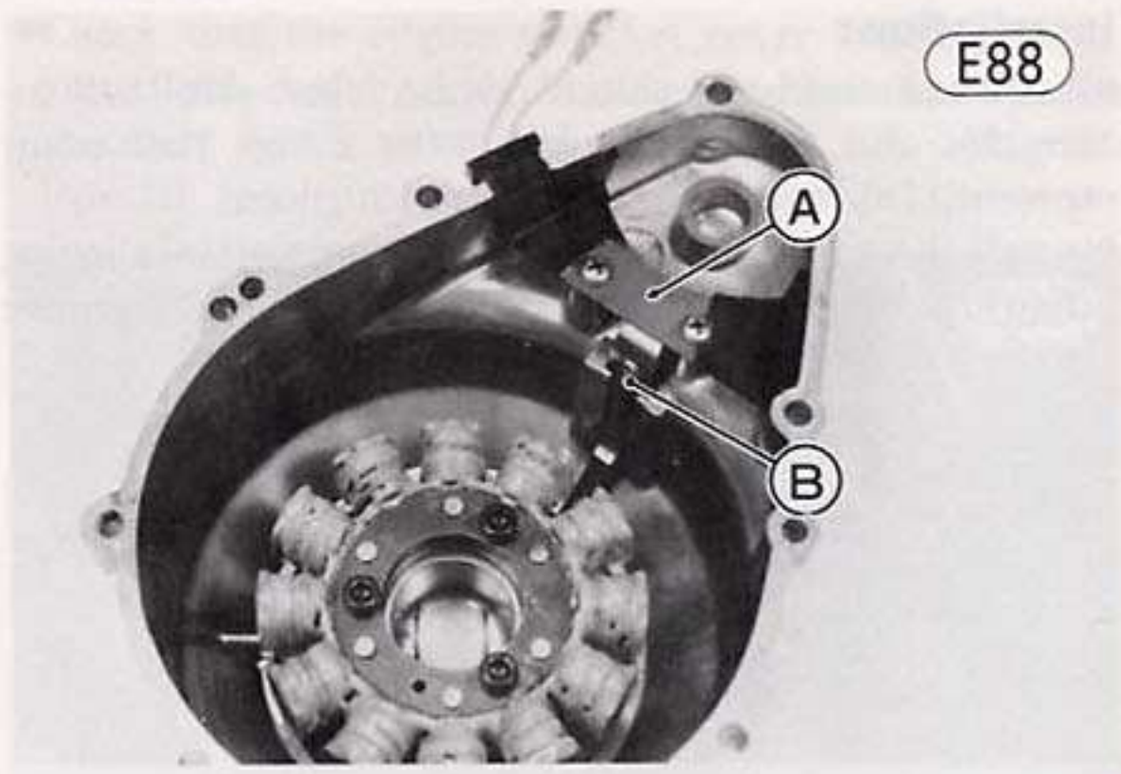
Removal:

- Remove the engine sprocket cover as explained in engine sprocket cover removal (Pg. 61). The clutch cable need not be removed from the clutch release.
- Disconnect the dynamo armature yellow leads (2).



A. Dynamo Armature Yellow Leads

- Place an oil pan beneath the dynamo cover.
- Remove the dynamo cover screws (9), and pull off the dynamo cover and gasket.
- Remove the starter motor chain guide screws (2), and take off the chain guide and lead holding plate.



A. Starter Motor Chain Guide
B. Lead Holding Plate

- Remove the armature Allen bolts (3) II , and pull the armature ① and the grommet ② out of the cover.

Installation:

- Install the grommet, and set the dynamo armature into place. Apply a non-permanent locking agent on each Allen bolt, and tighten the bolts to 1.0 kg-m (87 in-lbs) of torque.
- Install the lead holding plate and starter motor chain guide. Apply a non-permanent locking agent on each chain guide screw, and tighten the screws (2).
- Check that the knock pins (2) are in place, install the dynamo cover using a new gasket, and tighten its screws (9). Before installing the cover gasket, apply a liquid gasket to the portions on it where they contact the crankcase mating surface.
- Connect the dynamo armature yellow leads (2).
- Install the engine sprocket cover (Pg. 62).
- Check the clutch (Pg. 19), and adjust if necessary.
- Check the oil level (Pg. 20), and add more if necessary.
- Check the automatic side stand return mechanism, and adjust if necessary (Pg. 31).

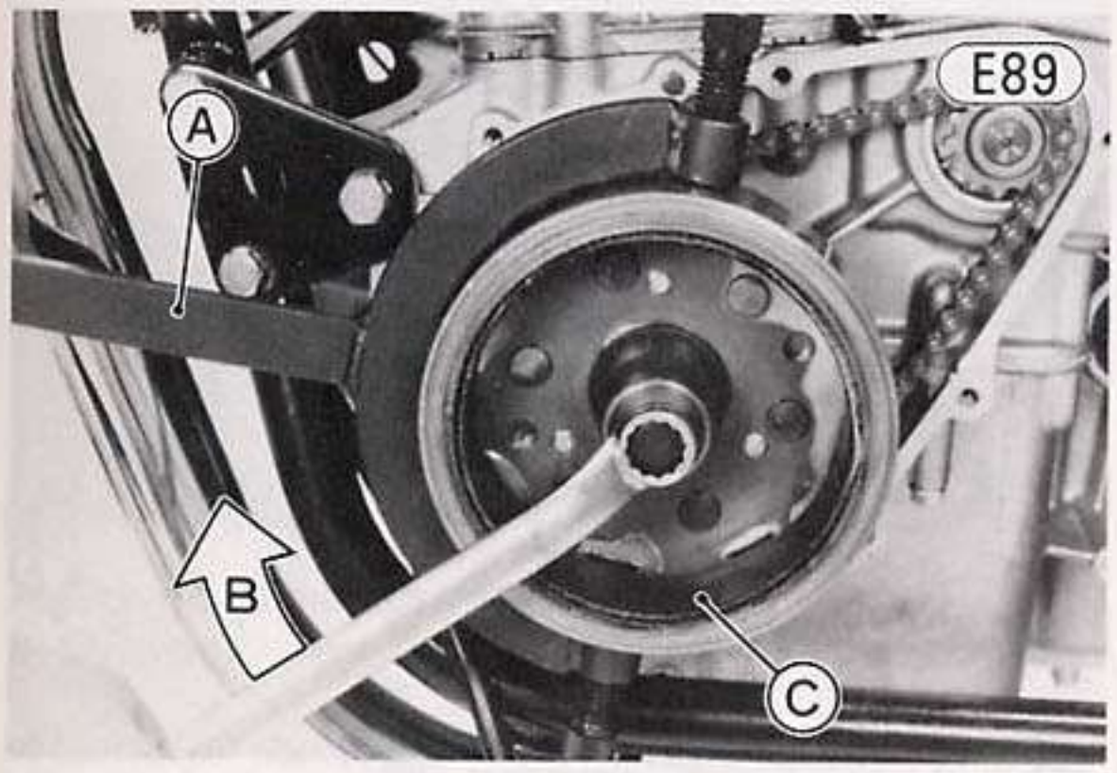
DYNAMO FLYWHEEL, STARTER MOTOR CLUTCH

Removal:

- Remove the engine sprocket cover as explained in engine sprocket cover removal (Pg. 61). The clutch cable need not be removed from the clutch release.
- Disconnect the dynamo armature yellow leads (2).
- Place an oil pan beneath the dynamo cover.
- Remove the dynamo cover screws (9), and pull off the dynamo cover and gasket.
- Hold the dynamo flywheel ③ steady with the flywheel holder (special tool), and remove the bolt 12 . The bolt

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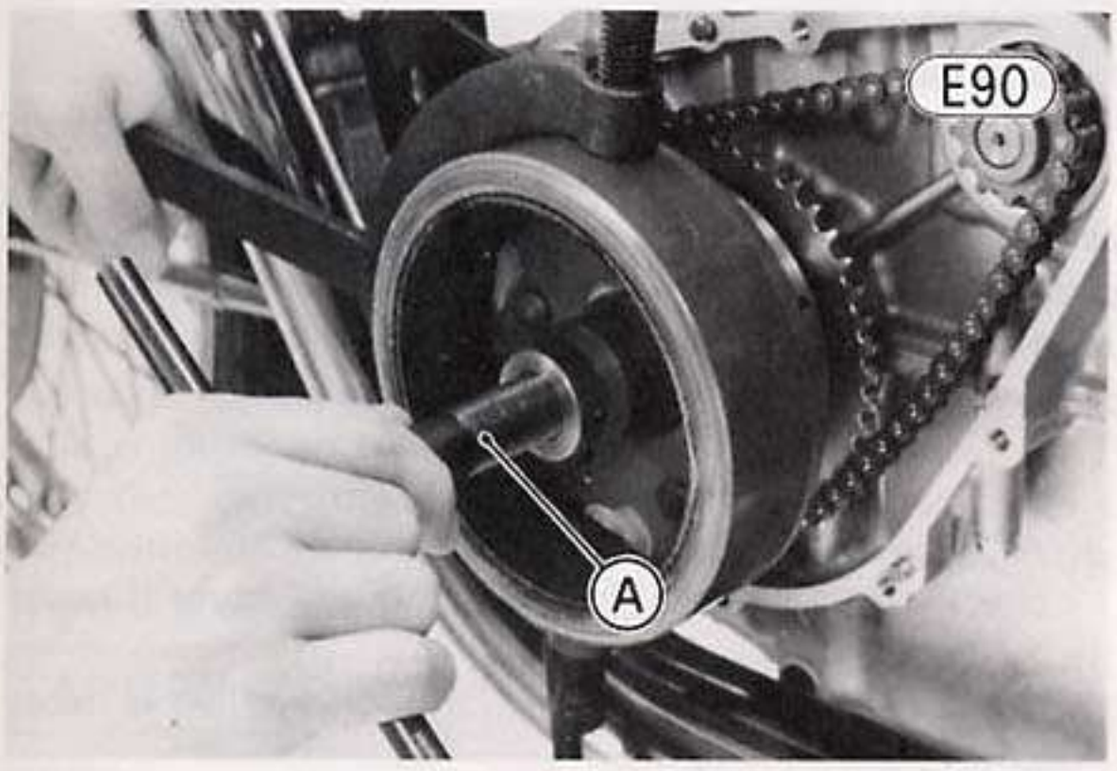
is a left hand thread and must be turned clockwise for removal.



A. Flywheel Holder (57001-308)
B. Turn clockwise
C. Dynamo Flywheel

- Using the special tool to hold the flywheel steady, remove the flywheel and starter motor clutch assembly (KZ400-B) with the dynamo rotor puller (special tool). There is a thrust washer ⑬ (KZ400-B) or collar (KZ400-C) at the rear of the flywheel.

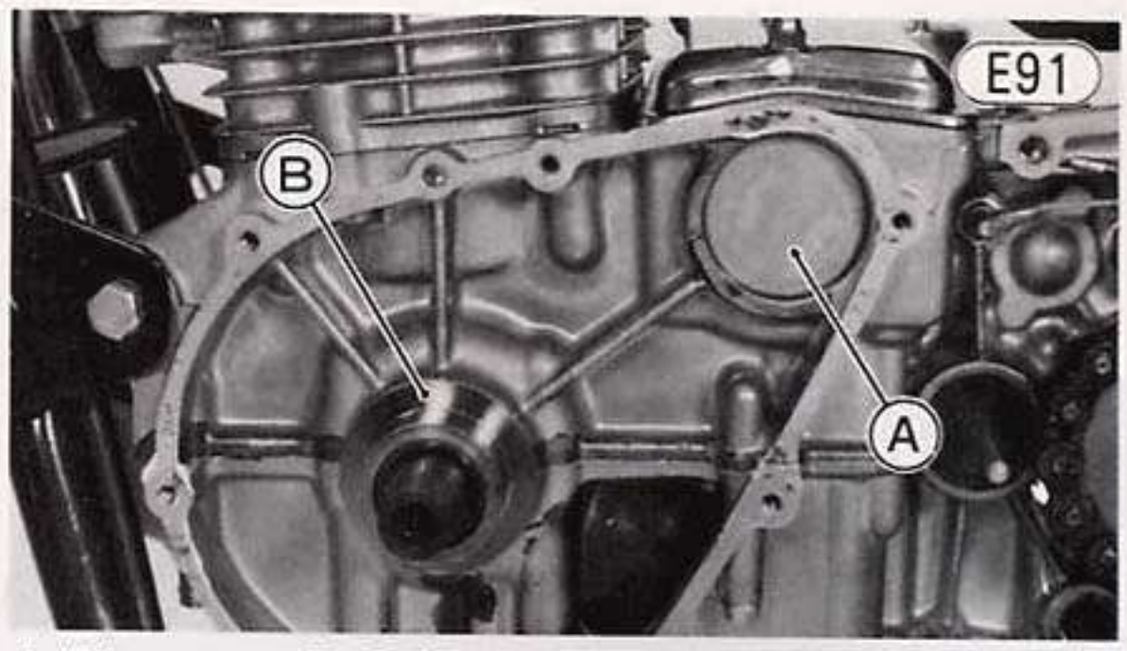
CAUTION **If the dynamo flywheel is difficult to remove and a hammer is used to tap the dynamo rotor puller, be careful not to strike the dynamo flywheel itself. Striking the dynamo flywheel can cause the magnets to lose their magnetism.**



A. Dynamo Rotor Puller (57001-254)

Installation:

- Using a high flash-point solvent, clean off any oil or dirt that may be on the crankshaft taper or flywheel hub.
- Check to see that the thrust washer (KZ400-B) or collar (KZ400-C) is at the rear of the flywheel, and place the flywheel and starter motor clutch assembly back on the crankshaft (KZ400-B).
- Tighten the bolt to 7.0 kg-m (51 ft-lbs) of torque while holding the dynamo flywheel steady with the flywheel holder (special tool).
- For KZ400-C, check that the plug and **O** ring are in place.

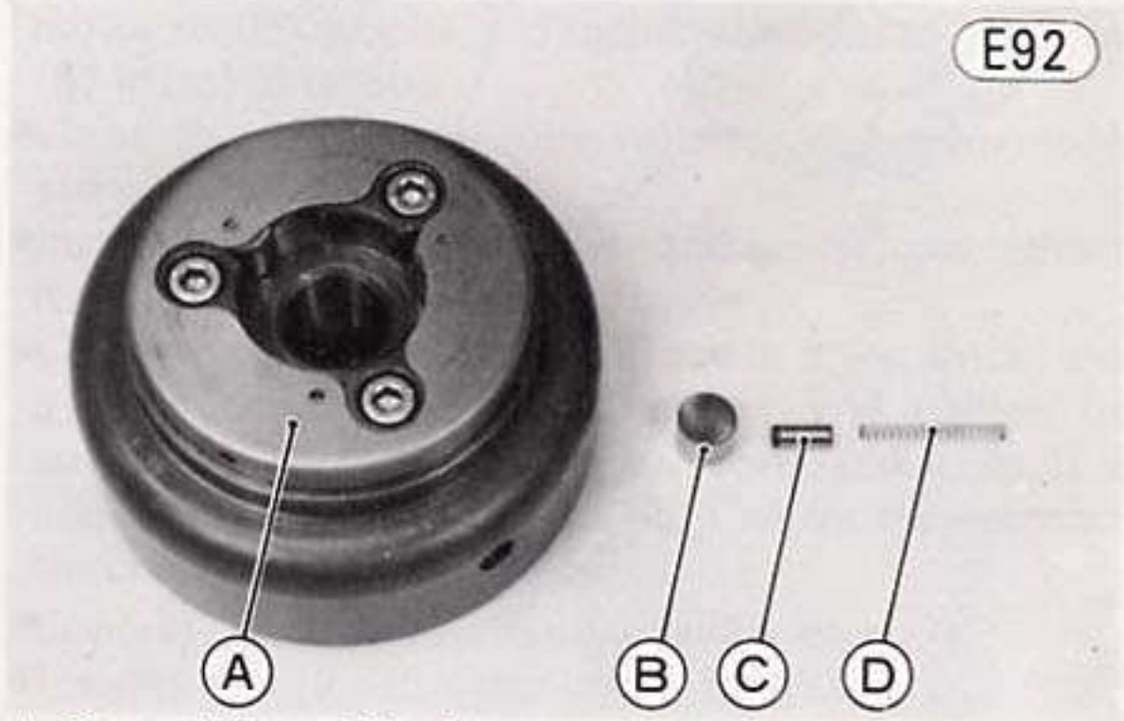


A. Plug **B. Collar**

- Check that the knock pins (2) are in place, install the dynamo cover using a new gasket, and tighten its screws (9). Before installing the cover gasket, apply a liquid gasket to the portions on it where they contact the crankcase mating surface.
- Connect the dynamo armature yellow leads (2).
- Install the engine sprocket cover (Pg. 62).
- Check the clutch (Pg. 19), and adjust if necessary.
- Check the oil level (Pg. 20), and add more if necessary.
- Check the automatic side stand return mechanism, and adjust if necessary (Pg. 31).

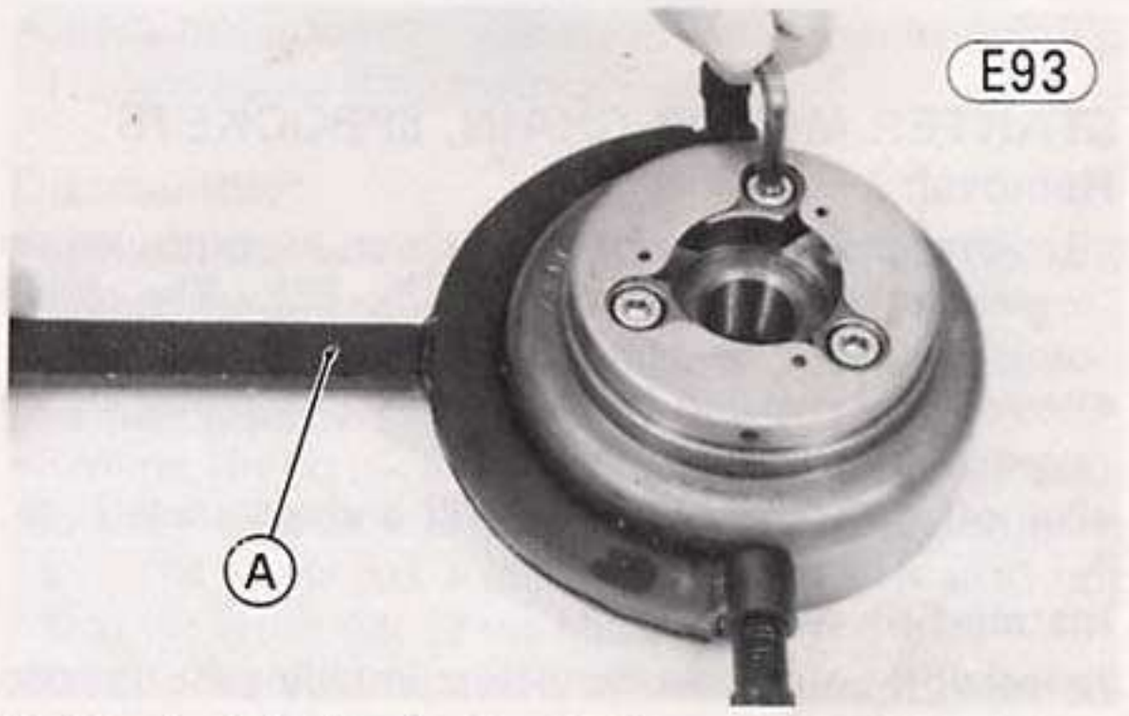
Disassembly:

- Remove the rollers ⑥, springs ④, and spring caps ⑤ (3 ea) from the starter motor clutch.



A. Starter Motor Clutch **C. Spring Cap**
B. Roller **D. Spring**

- Place the dynamo flywheel face down on the workbench. Holding the flywheel steady with the flywheel holder (special tool), remove the Allen bolts (3) to separate the flywheel and starter motor clutch.

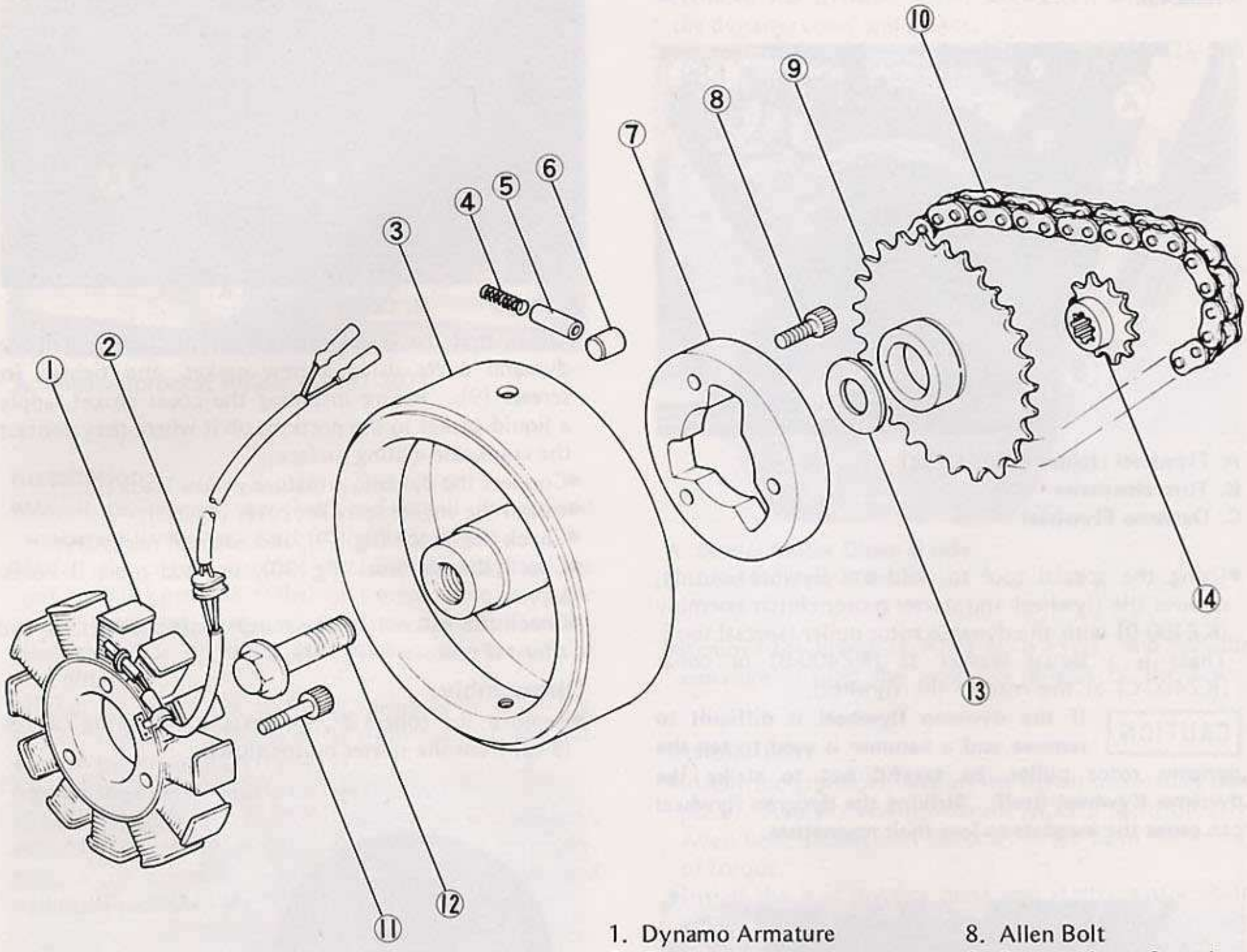


A. Flywheel Holder (57001-308)

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Dynamo, Starter Motor Clutch

E94



1. Dynamo Armature
2. Grommet
3. Dynamo Flywheel
4. Spring
5. Spring Cap
6. Roller
7. Starter Motor Clutch
8. Allen Bolt
9. Starter Motor Sprocket
10. Starter Chain
11. Allen Bolt
12. Flywheel Bolt
13. Washer
14. Starter Motor Sprocket

Assembly Note:

- Apply non-permanent locking agent to the starter motor clutch Allen bolts (3), and tighten the bolts to 3.5 kg-m (25 ft-lbs) of torque.

2. After installing the starter motor chain and sprockets, check the oil level (Pg. 20), and add more if necessary.
3. Check the automatic side stand, and adjust if necessary.

STARTER MOTOR CHAIN, SPROCKETS

Removal:

- Remove the engine sprocket cover as explained in engine sprocket cover removal (Pg. 61). The clutch cable need not be removed from the clutch release.
- Remove the dynamo flywheel and starter motor clutch assembly (Pg. 64).
- Pull off the starter motor chain ⑩ and sprockets ⑨, ⑭.

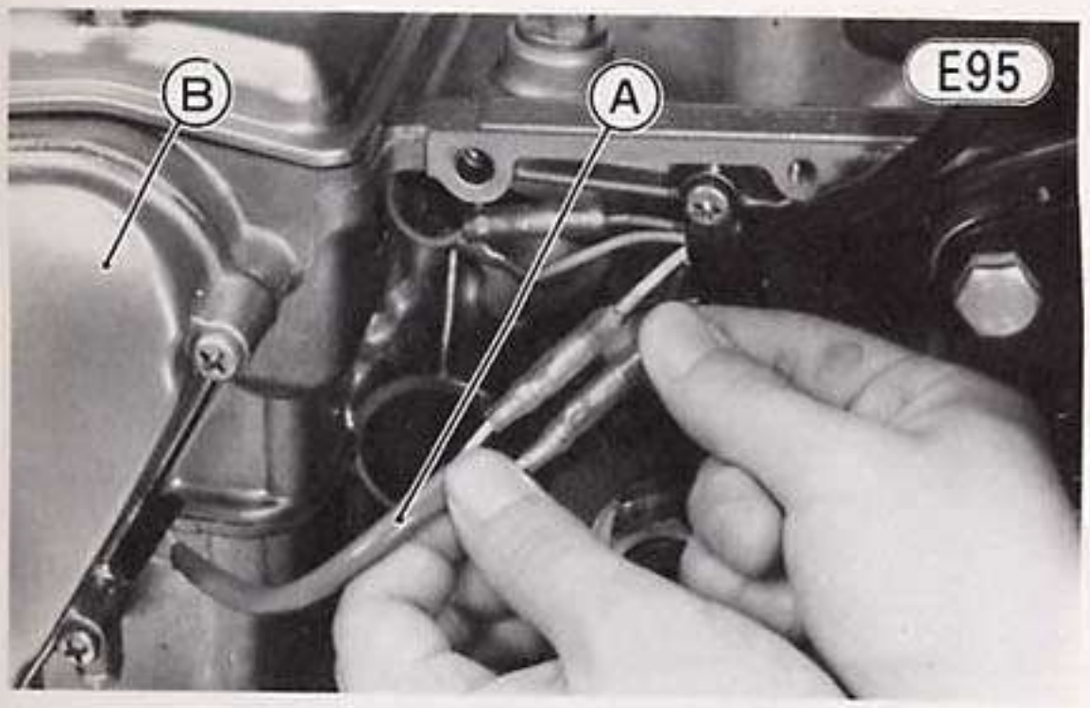
Installation Notes:

1. Install the thrust washer before installing the dynamo flywheel and starter motor clutch assembly.

STARTER MOTOR

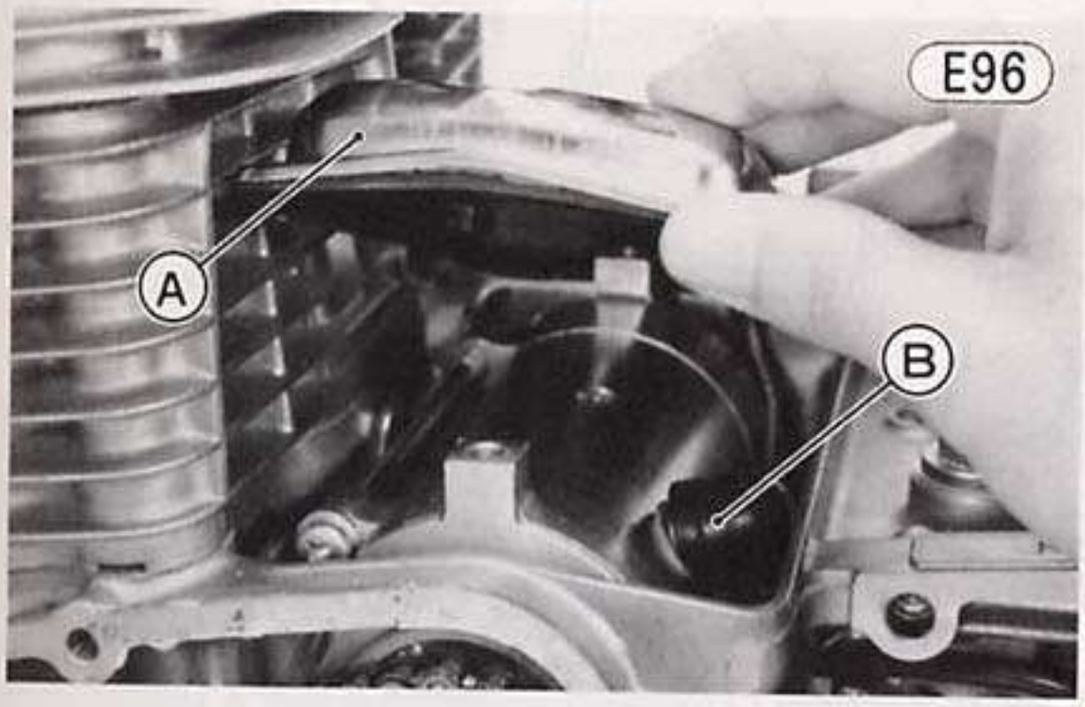
Removal:

- Remove the fuel tank (Pg. 43).
- Remove the carburetors (Pg. 45).
- Remove the oil pipe (Pg. 60).
- Remove the engine sprocket cover as explained in engine sprocket cover removal (Pg. 61). The clutch cable need not be removed from the clutch release lever.
- Disconnect the dynamo armature yellow leads (2).



A. Dynamo Armature Yellow Leads
B. Dynamo Cover

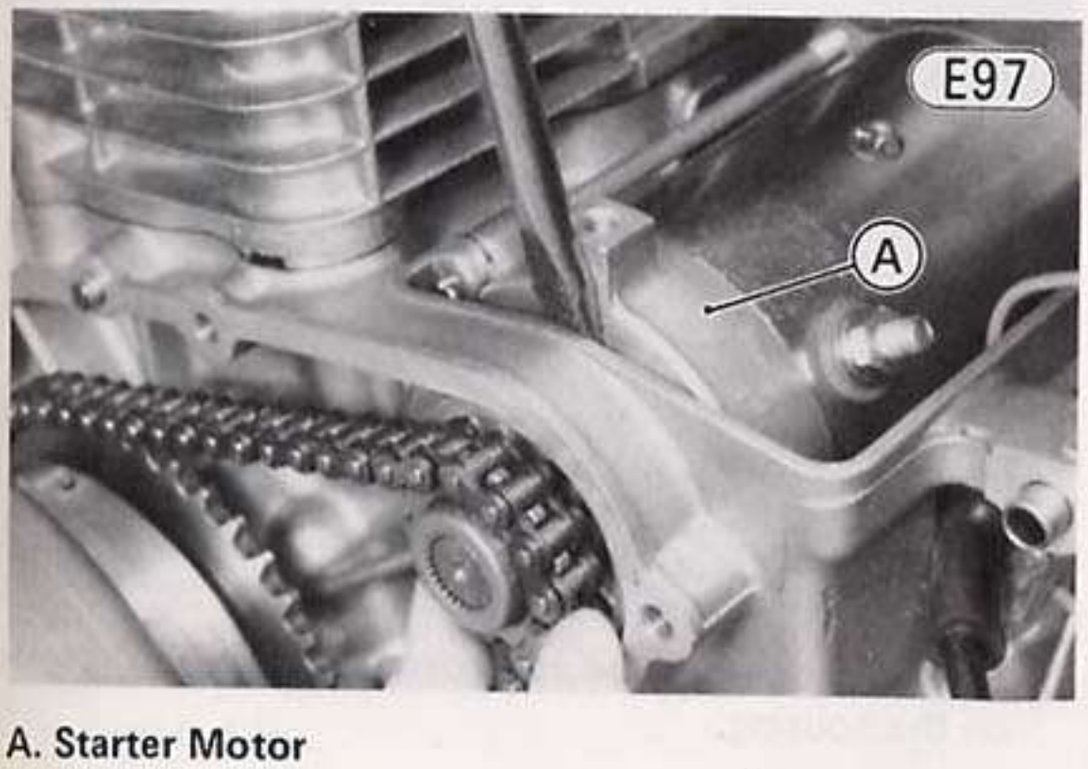
- Place an oil pan beneath the dynamo cover.
- Remove the dynamo cover screws (9), and pull off the dynamo cover and gasket.
- Remove the starter motor cover bolts and flat washers (2 ea), and take off the cover and gasket.



A. Starter Motor Cover B. Rubber Cap

- Slide off the rubber cap, remove the starter motor terminal nut and lockwasher, and free the lead from the motor.
- Using a T wrench with a pivoted socket, remove the starter motor retaining bolts (2).
- Pry the starter motor loose from the crankcase with a screwdriver, slide the starter motor off towards the right side of the engine, and then lift it upwards.

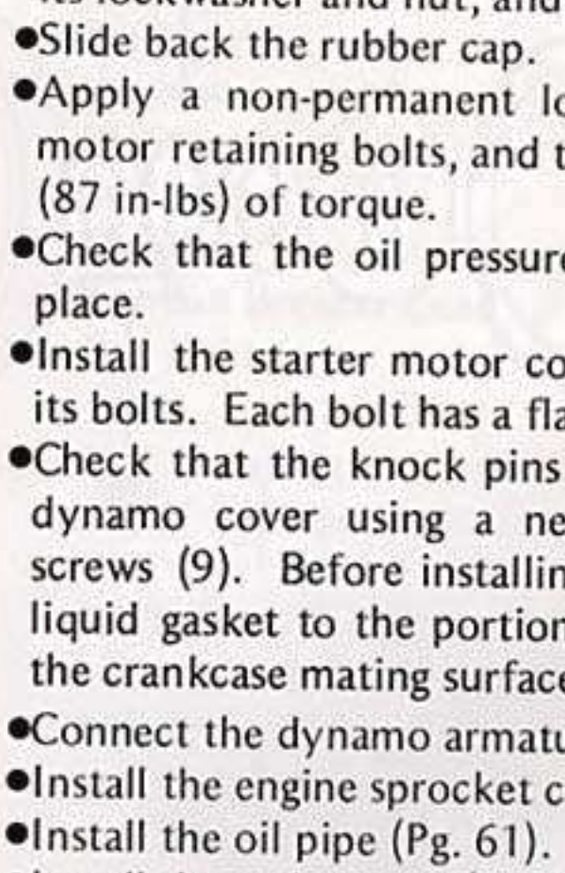
CAUTION **Do not tap on the starter motor shaft. Tapping on the shaft may damage the motor.**

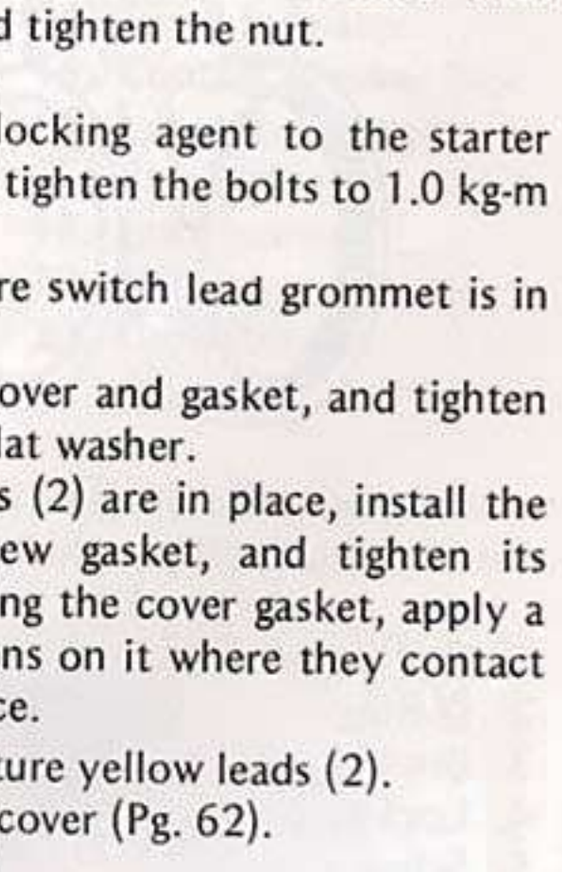


A. Starter Motor

Installation:

- Replace the O ring with a new one, if it is deteriorated or damaged, and apply a little oil to it.
- Clean the starter motor lugs and crankcase where the starter motor is grounded.





A. Starter Lugs B. Lug Mating Surfaces

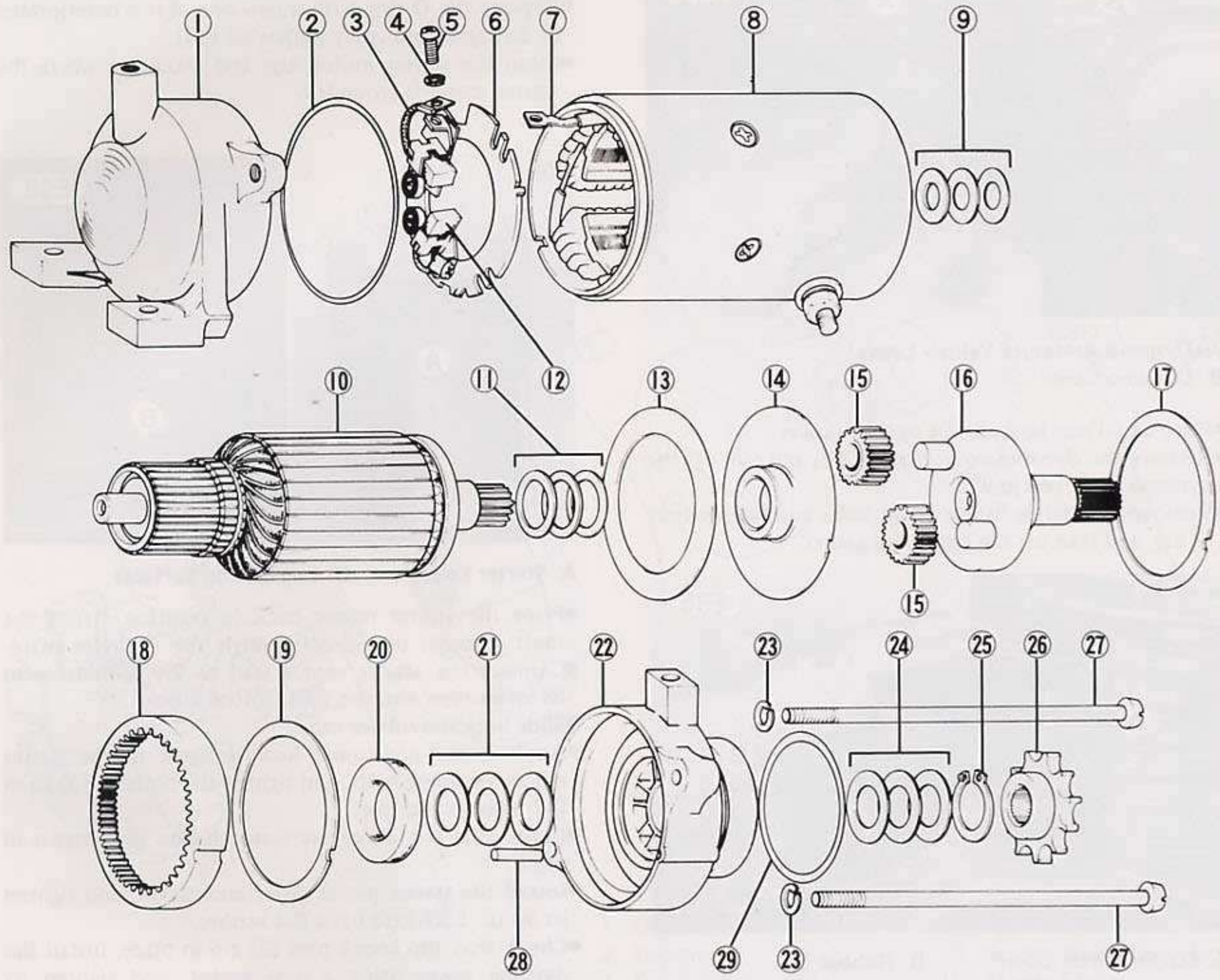
- Place the starter motor back in position, fitting the shaft through the sprocket with the chain in place.
- Connect the starter motor lead to the terminal with its lockwasher and nut, and tighten the nut.
- Slide back the rubber cap.
- Apply a non-permanent locking agent to the starter motor retaining bolts, and tighten the bolts to 1.0 kg-m (87 in-lbs) of torque.
- Check that the oil pressure switch lead grommet is in place.
- Install the starter motor cover and gasket, and tighten its bolts. Each bolt has a flat washer.
- Check that the knock pins (2) are in place, install the dynamo cover using a new gasket, and tighten its screws (9). Before installing the cover gasket, apply a liquid gasket to the portions on it where they contact the crankcase mating surface.
- Connect the dynamo armature yellow leads (2).
- Install the engine sprocket cover (Pg. 62).
- Install the oil pipe (Pg. 61).
- Install the carburetors (Pg. 46).
- Install the fuel tank (Pg. 43).
- Check the clutch (Pg. 19), and adjust if necessary.
- Check the throttle cables (Pg. 15), and adjust if necessary.
- Check the oil level (Pg. 20), and add more if necessary.
- Check the automatic side stand return mechanism (Pg. 31), and adjust if necessary.

Disassembly:

- Remove the screws ㉗ (2), lockwashers ㉓ (2), and remove the end covers ①, ㉒.
- Remove the gasket ⑰, end plate ⑭, gasket ⑬, thrust washers ⑪ and armature ⑩ from the shaft side.
- Remove the screw ⑤ which connects the brush lead ③ to the field coil lead ⑦, and remove the brush plate ⑥. The screw has a lockwasher. There is an O ring ② at the brush side of the housing.

NOTE: The yoke assembly ⑧ is not meant to be disassembled.

Starter Motor

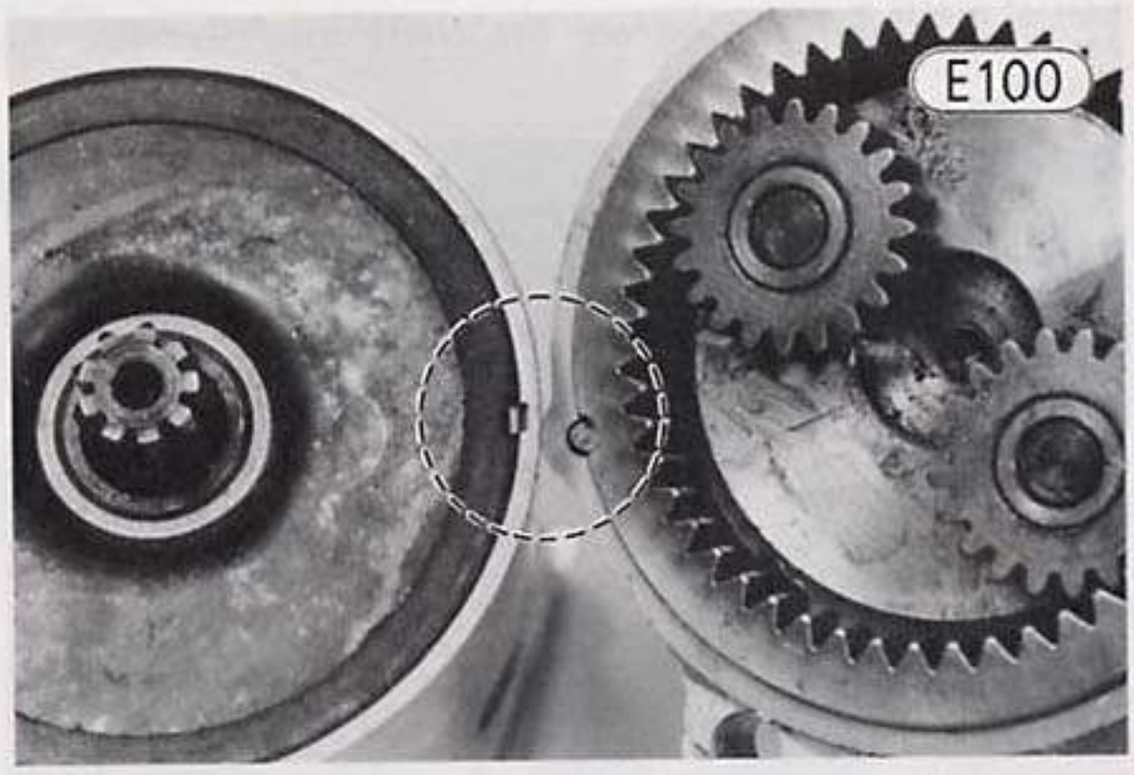


1. End Cover
2. O Ring
3. Brush Lead
4. Lockwasher
5. Screw
6. Brush Plate
7. Coil Lead
8. Yoke Assembly
9. Thrust Washers
10. Armature
11. Thrust Washers
12. Brush
13. Gasket
14. End Plate
15. Planet Pinion
16. Output Shaft
17. Gasket
18. Internal Gear
19. Gasket
20. Grease Seal
21. Thrust Washers
22. End Cover
23. Lockwasher
24. Thrust Washers
25. Circlip
26. Sprocket
27. Screw
28. Key
29. O Ring

●Remove the planet pinions ⑮, internal gear ⑱, gasket ⑲, and key ㉘.

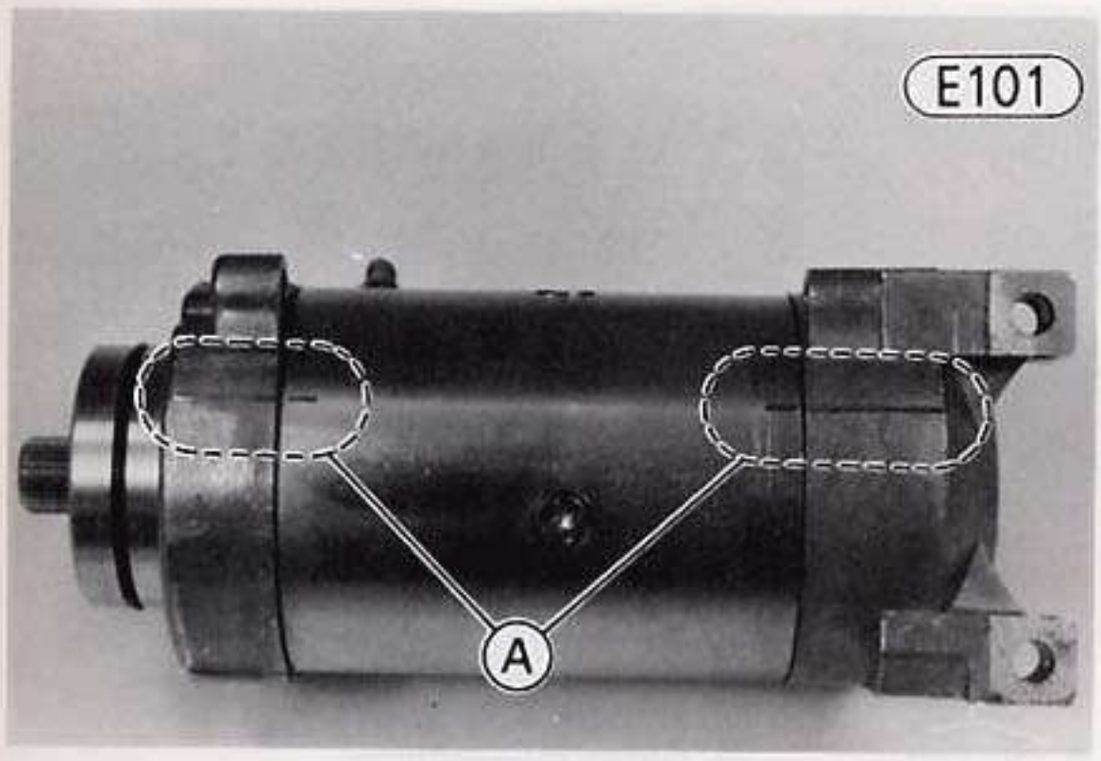
Assembly Notes:

1. Replace any O rings that are deteriorated or damaged with new ones.
2. Apply a high temperature grease to the planet pinions, internal gear, and planet pinion shafts on the output shaft.
3. Align the tongue on the housing with the notch on the end plate and the notch on the gasket ⑰, and align the notch in the internal gear ⑱ with the tongue on the housing. Align the key on the end cover ㉒ with the notch in the internal gear and the notch on the gasket ⑲.



4. Align the lines on the end covers ①, ㉒ with the lines on the housing.

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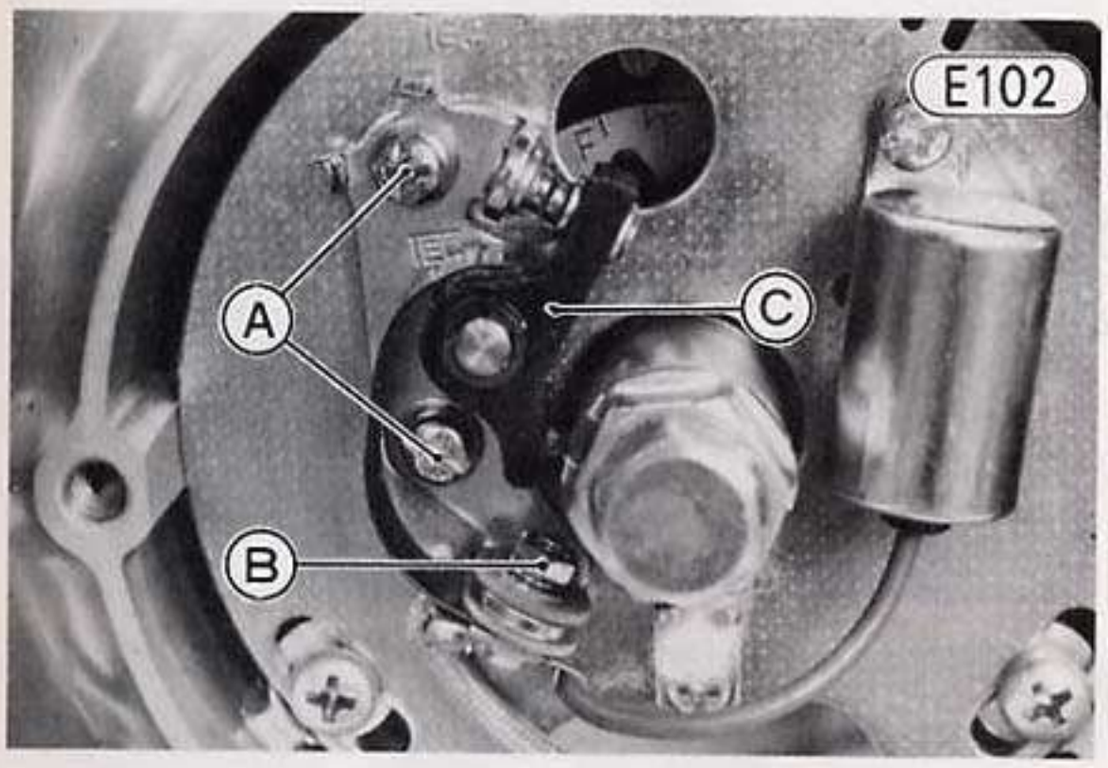


A. Align the lines

CONTACT BREAKER

Removal:

- Remove the contact breaker cover screws (2), and take off the cover and gasket.
- Remove the contact breaker base screws (2). Each screw has a flat washer and lockwasher.



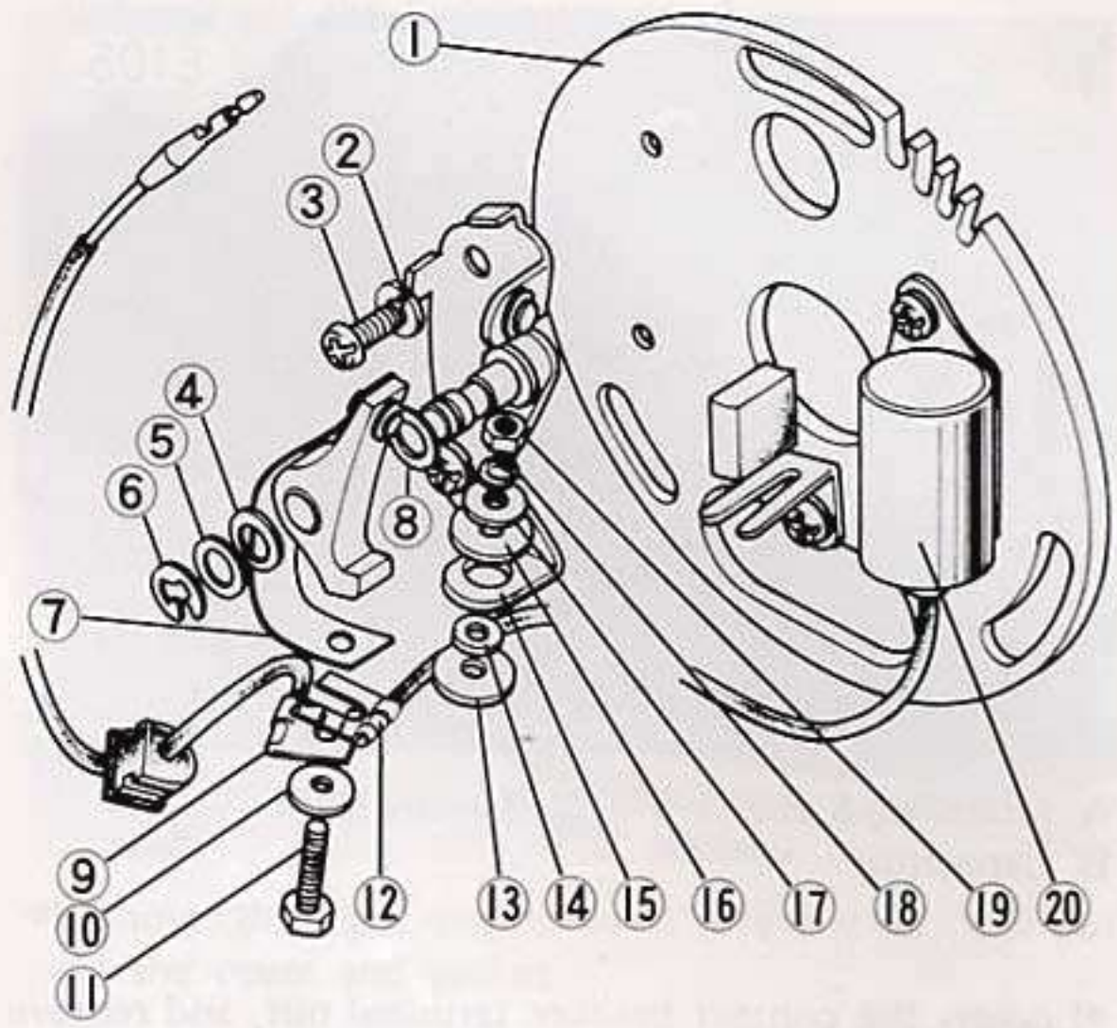
A. Base Screws
B. Terminal Nut
C. Contact Breaker

- Loosen the contact breaker terminal nut, and free the contact breaker from the engine by pulling off the contact breaker and capacitor leads at the same time.

Installation Notes:

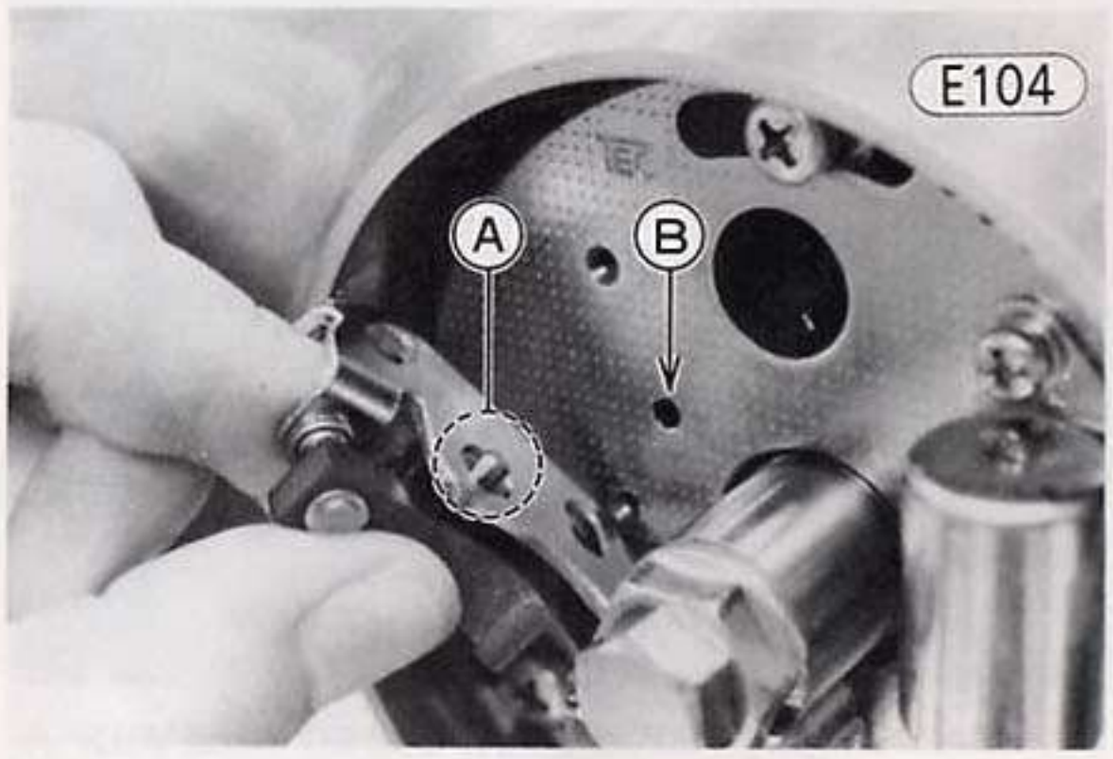
1. The sequence of installation on the contact breaker terminal bolt is: bolt ⑪, flat washer ⑩, contact breaker lead ⑨, capacitor lead ⑫, spring ⑦, large insulator ⑬, small insulator ⑭ (in contact breaker hole), large insulator ⑯, flat washer ⑰, lockwasher ⑱, and nut ⑲.

Contact Breaker Lead Installation



1. Contact Breaker Mounting Plate
2. Lockwasher
3. Screw
4. Washer
5. Washer
6. C Ring
7. Spring
8. Washer
9. Contact Breaker Lead
10. Flat Washer
11. Bolt
12. Capacitor Lead
13. Large Insulator
14. Small Insulator
15. Contact Breaker Base
16. Large Insulator
17. Flat Washer
18. Lockwasher
19. Nut
20. Capacitor

2. When installing the contact breaker, fit the contact breaker base pin into the hole on the starter plate.



A. Pin
B. Hole

3. After installation, adjust the ignition timing (Pg. 12).

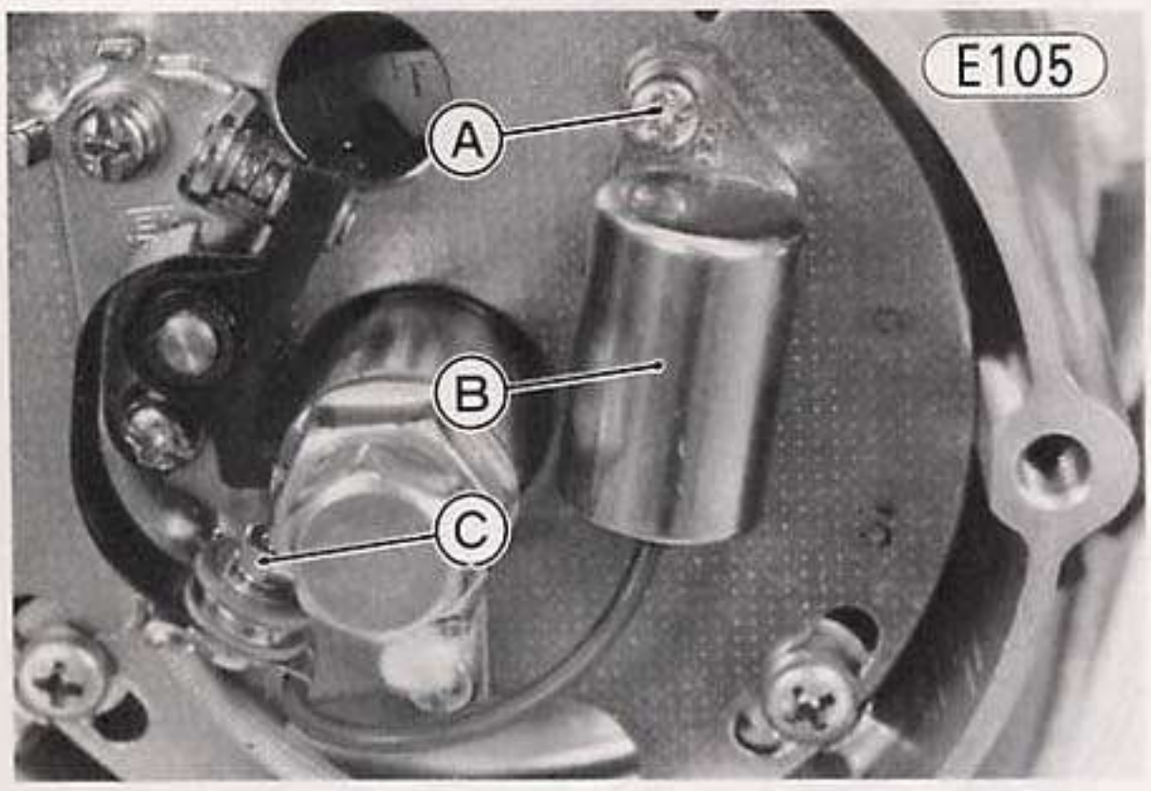
CAPACITOR

Removal:

- Remove the contact breaker cover screws (2), and take off the cover and gasket.

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•Remove the capacitor mounting screw and lockwasher.

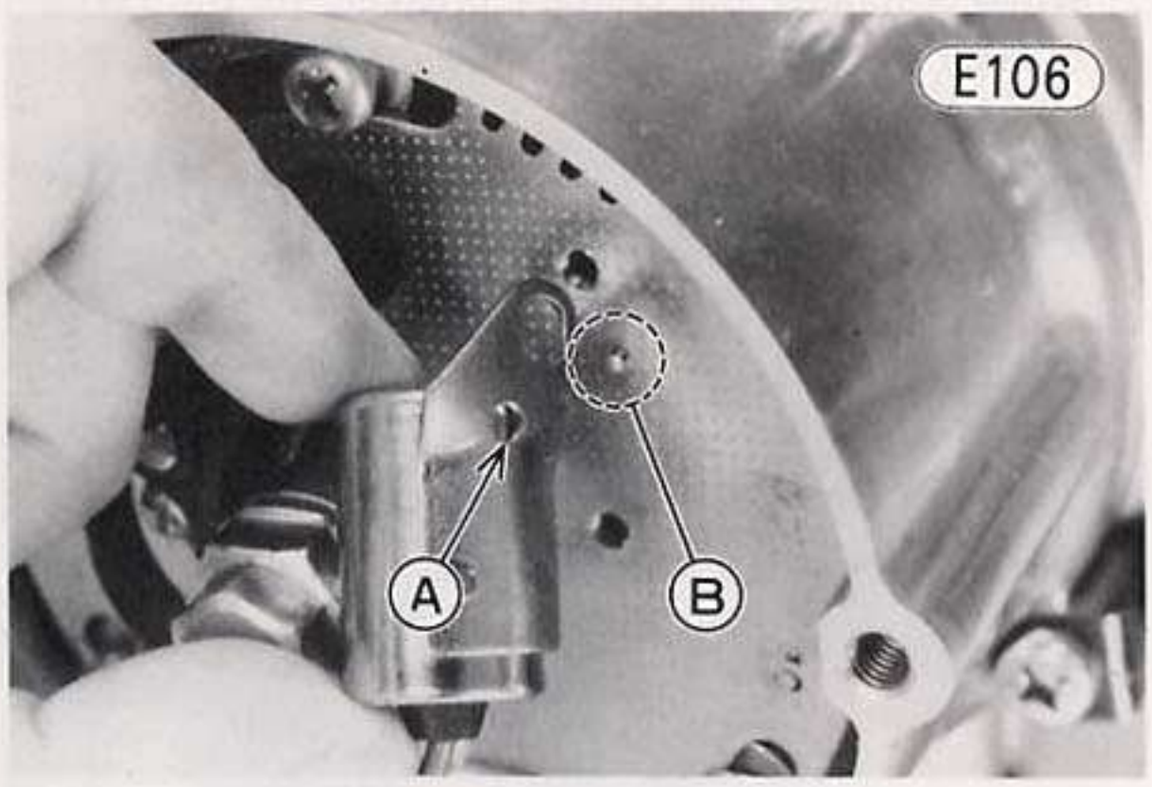


A. Mounting Screw C. Terminal Nut
B. Capacitor

•Loosen the contact breaker terminal nut, and remove the capacitor lead to complete capacitor removal.

Installation Notes:

1. The sequence of installation on the contact breaker bolt is: bolt, flat washer, contact breaker lead, capacitor lead, spring, large insulator, small insulator (in contact breaker hole), large insulator, flat washer, lockwasher, and nut (Fig. E103).
2. Match the capacitor mounting plate hole with the pin on the stator plate.

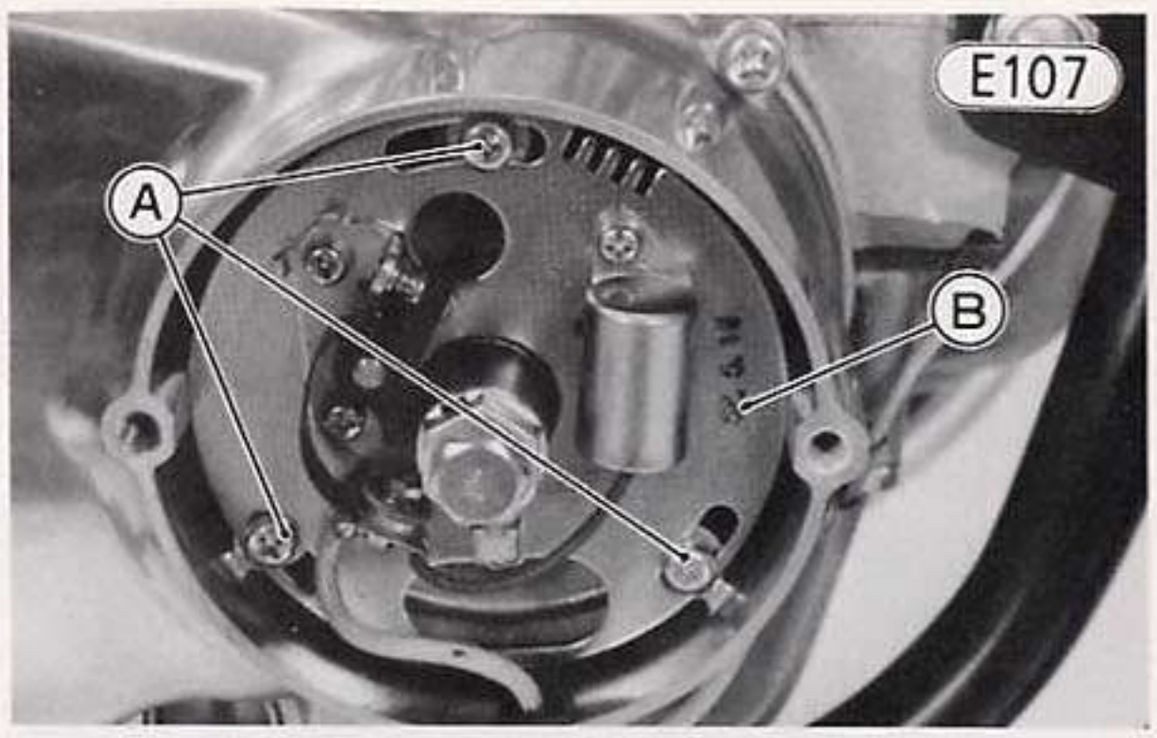


A. Hole B. Pin

TIMING ADVANCER

Removal:

•Remove the contact breaker cover screws (2), and take off the cover and gasket.
•Remove the mounting plate screws (3), and take off the mounting plate.

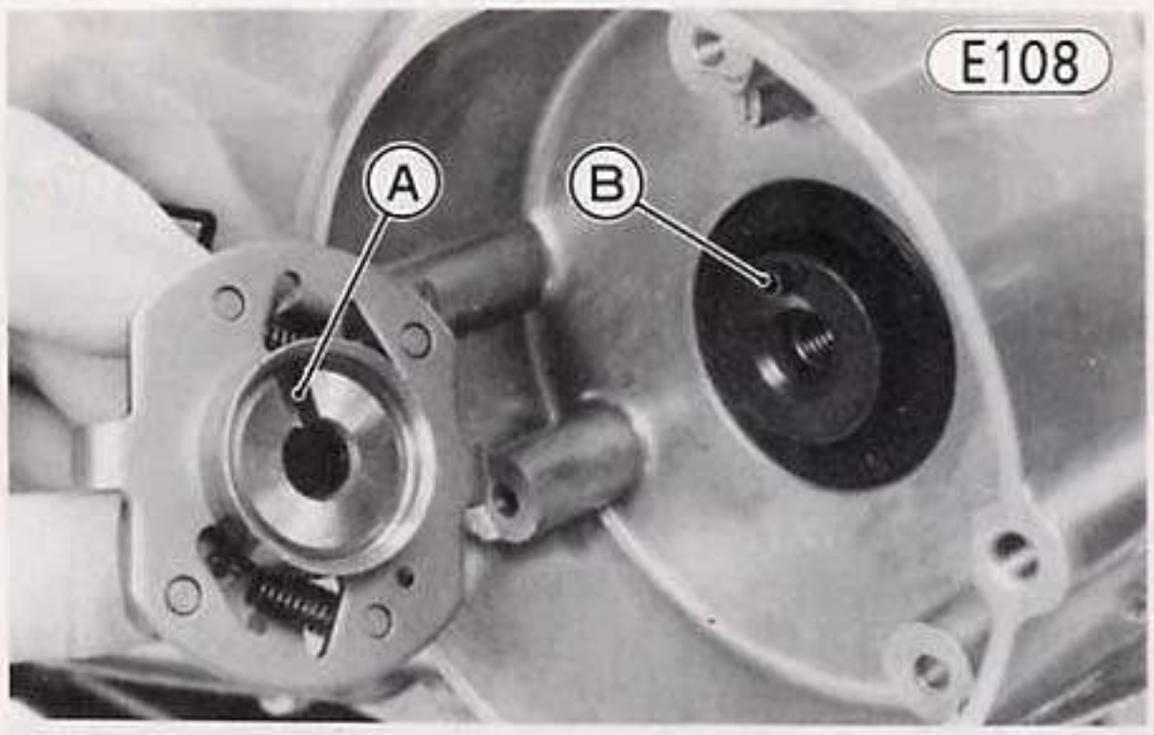


A. Screws B. Mounting Plate

•With a 17 mm wrench on the crankshaft rotation nut to keep the shaft from turning, remove the advancer mounting bolt, and take off the rotation nut and the timing advancer.

Installation Notes:

1. Fit the timing advancer onto the crankshaft, matching its notch with the pin in the end of the crankshaft, and install the crankshaft rotation nut and the advancer mounting bolt. The notches in the nut fit the projections on the timing advancer. Tighten the bolt to 2.5 kg-m (18.0 ft-lbs) of torque.

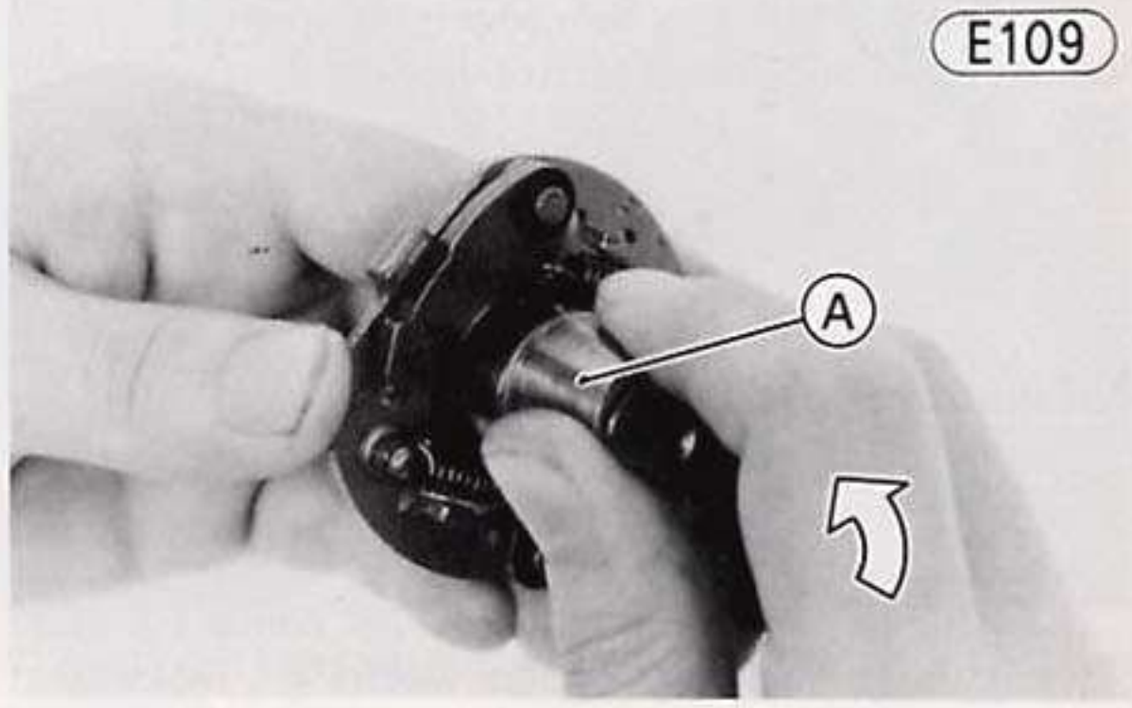


A. Notch B. Pin

2. After installing the timing advancer, adjust the ignition timing (Pg. 12).

Disassembly:

•Turn the cam counterclockwise and pull off the cam.



A. Cam

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- Remove the **C** rings (2), washers (4), and weights (2).
- Remove the washers (2) from the advancer body.

Assembly Notes:

1. Wipe the advancer clean, and fill the groove inside the cam with grease (Pg. 226).
2. When installing the cam, align the mark on the cam with the hole on the advancer body.

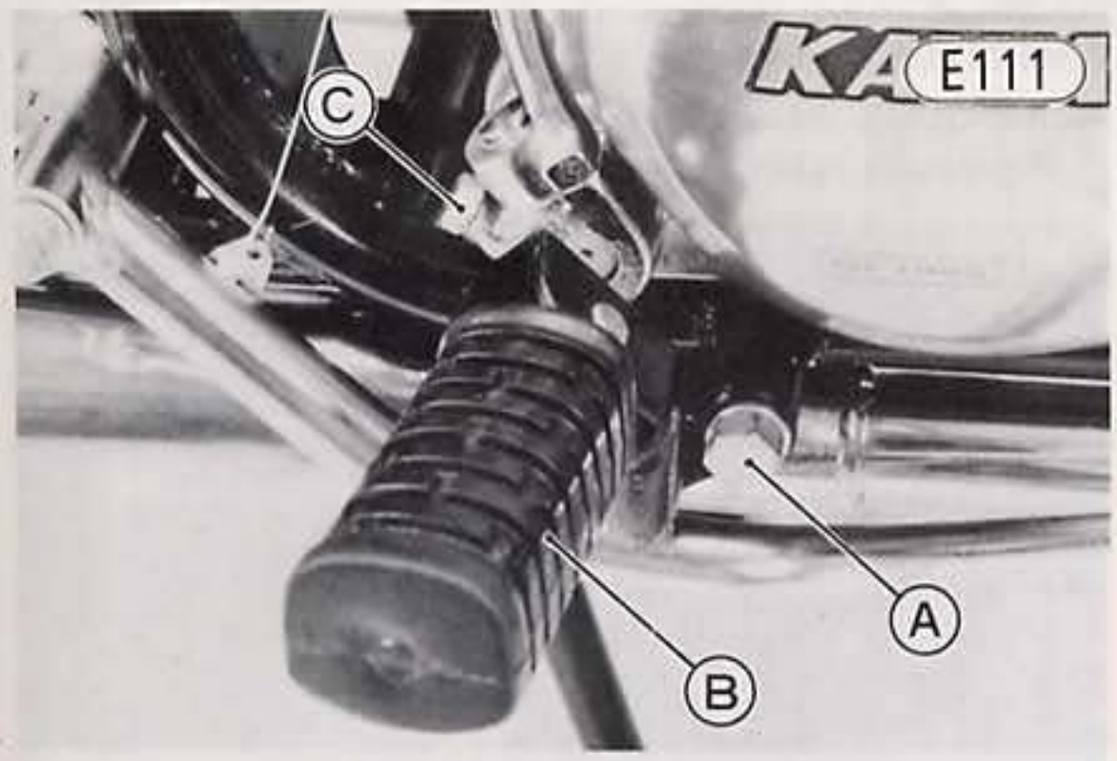


A. Mark **B. Hole**

RIGHT ENGINE COVER

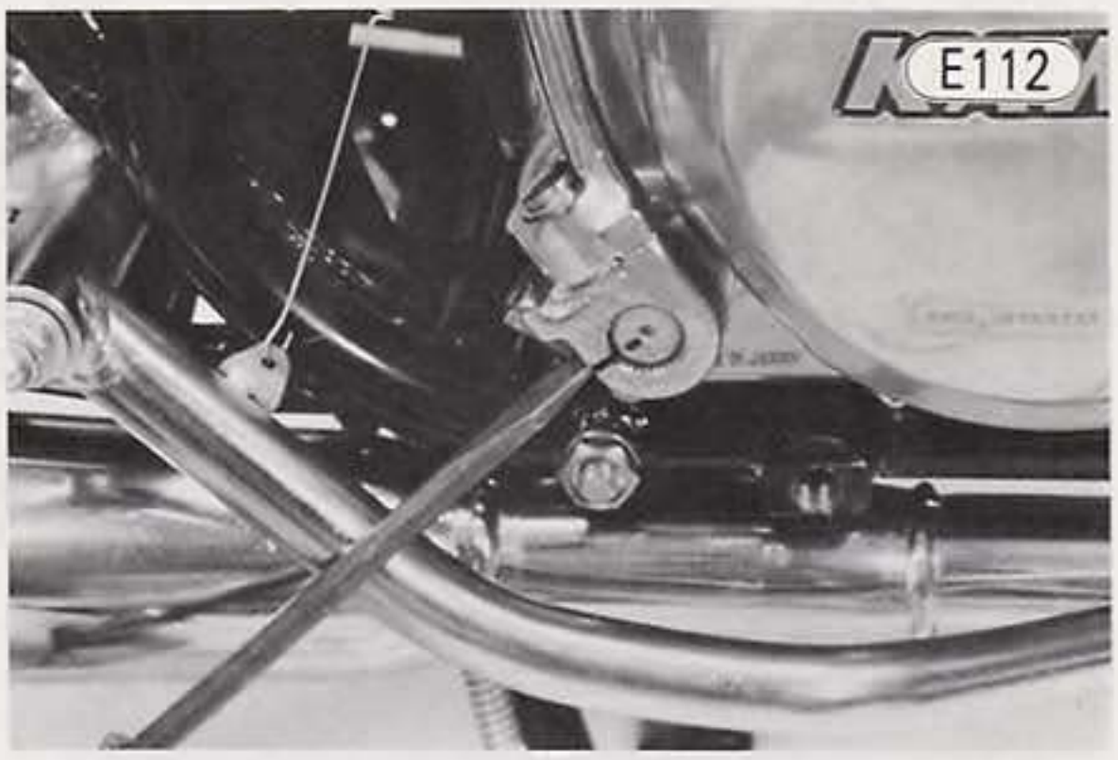
Removal:

- Place an oil pan beneath the engine, and remove the engine drain plug and washer to drain out the oil.
- After the oil has drained, install the engine drain plug and aluminum washer, and tighten the drain plug to 3.0 kg-m (22 ft-lbs) of torque. Replace the washer with a new one, if it is damaged.
- Remove the timing advancer (Pg. 70).
- Remove the right footpeg mounting bolt, and take off the lockwasher and right footpeg.



A. Footpeg Mounting Bolt **C. Pedal Bolt**
B. Right Footpeg

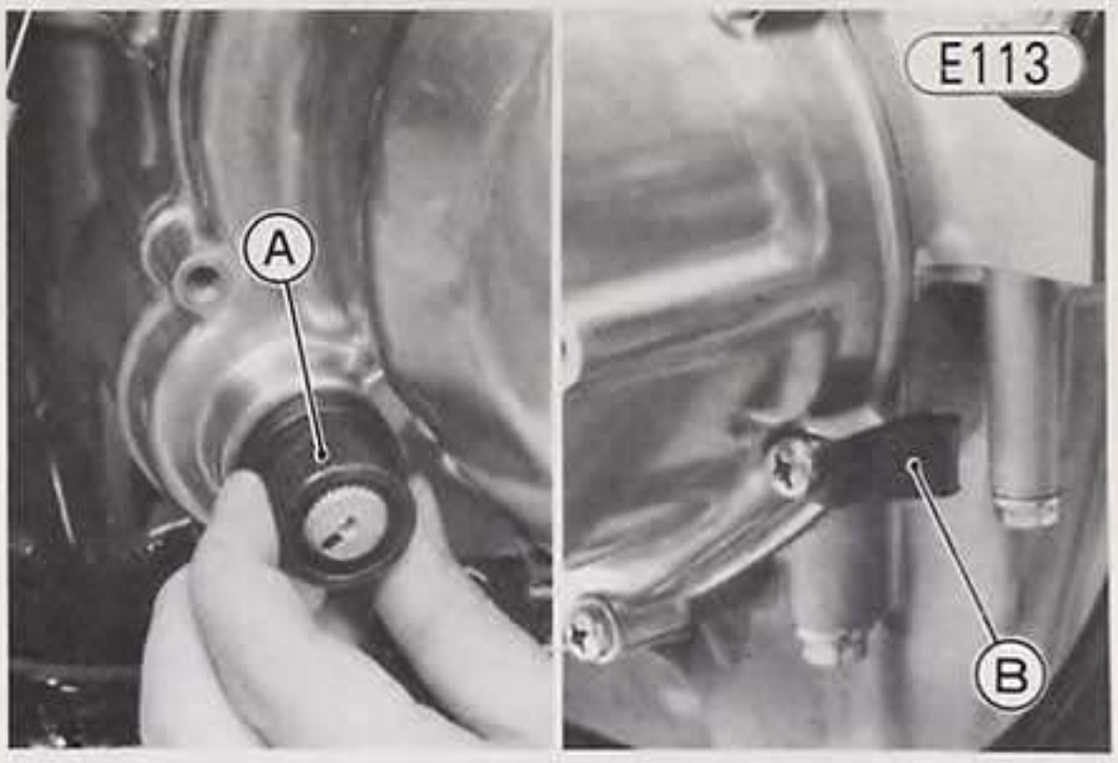
- Mark the position of the kickstarter pedal so that it can later be installed on the kick shaft in the same position.
- Take out the kickstarter pedal bolt. Slightly widen the gap in the kickstarter pedal with a screwdriver, and pull off the kickstarter pedal.



- Remove the right engine cover screws (12), and pull off the cover and gasket.

Installation:

- Check that the knock pins (2) are in place.
- Apply a liquid gasket to the portions on a new right engine cover gasket where they contact the crankcase mating surface, and fit it on the crankcase.
- Check that the spring in the right engine cover crankshaft oil seal has not slipped out of its proper position and apply clean engine oil to the oil seal lip. If the oil seal is damaged, replace it with a new one.
- Insert the kick shaft oil seal guide (special tool) in the right engine cover oil seal, and fit the right engine cover onto the crankcase. Tighten its screws (12). Be sure to include the contact breaker lead clamp on the front screw on the right engine cover.



A. Kick Shaft Oil Seal Guide (57001-265)
B. Lead Clamp

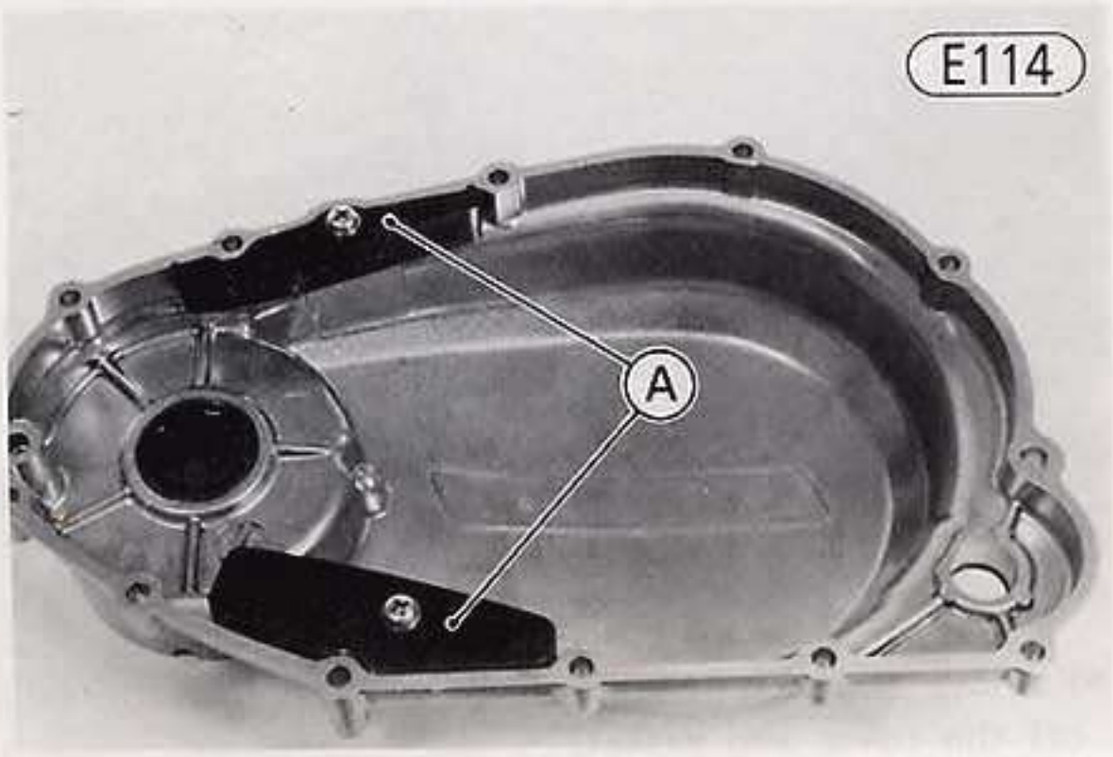
- Install the kickstarter pedal in its original position on the kick shaft, and tighten its bolt.
- Install the right footpeg and lockwasher, and tighten its bolt.
- Install the timing advancer (Pg. 70).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Adjust the ignition timing (Pg. 12).

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PRIMARY CHAIN GUIDES

Removal:

- Remove the right engine cover (Pg. 71).
- Remove the primary chain guide screws and flat washers (2 ea), and take off the guides (2).



A. Primary Chain Guides

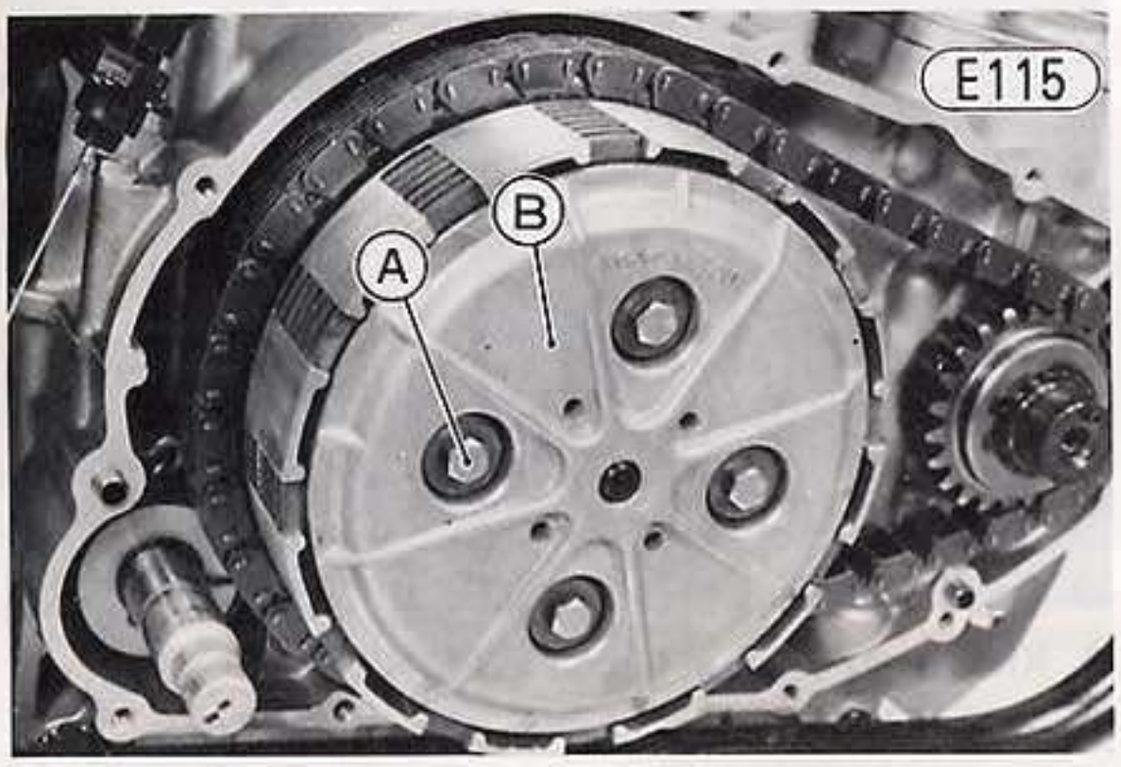
Installation Note:

- Apply a non-permanent locking agent to the guide screws, and tighten the screws.

CLUTCH, PRIMARY CHAIN, PRIMARY SPROCKET

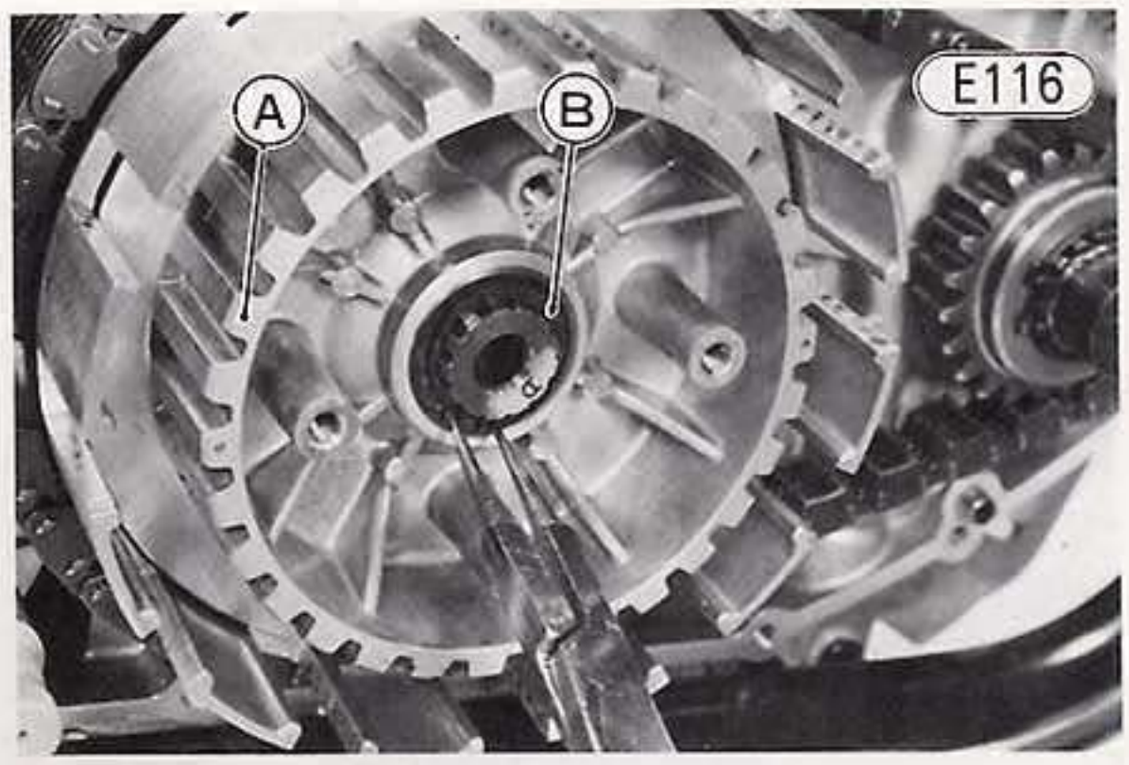
Removal:

- Remove the timing advancer (Pg. 70).
- Remove the right engine cover (Pg. 71).
- Remove the clutch spring bolts 18 and springs 17 (4 ea).



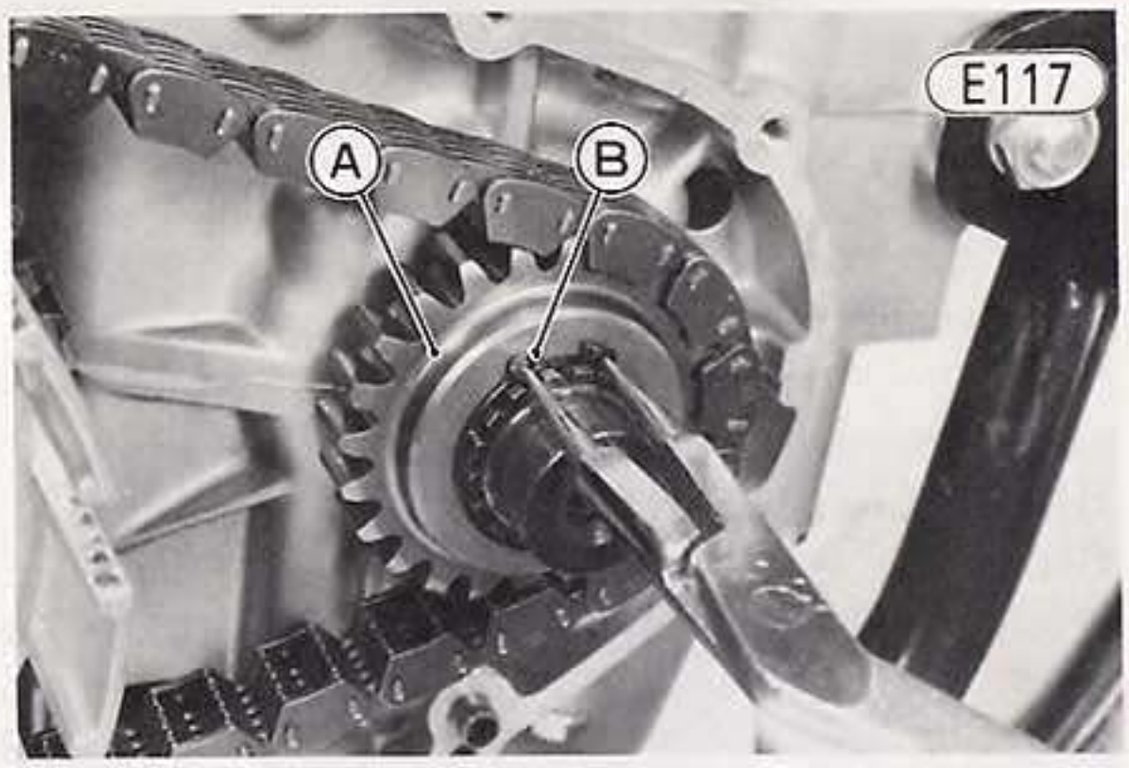
A. Clutch Spring Bolts B. Spring Plate

- Pull off the spring plate 16 and spring plate pusher 15, and tilt the motorcycle so that the steel ball 14 will fall out.
- Remove the friction plates ③ (6) and steel plates ④ (5).
- Remove the circlip ⑥ and shim(s) ⑤, and pull off the clutch hub ②. There is a thrust washer ① between the clutch hub and the clutch housing 13.



A. Clutch Hub B. Circlip

- Remove the primary sprocket circlip 11.

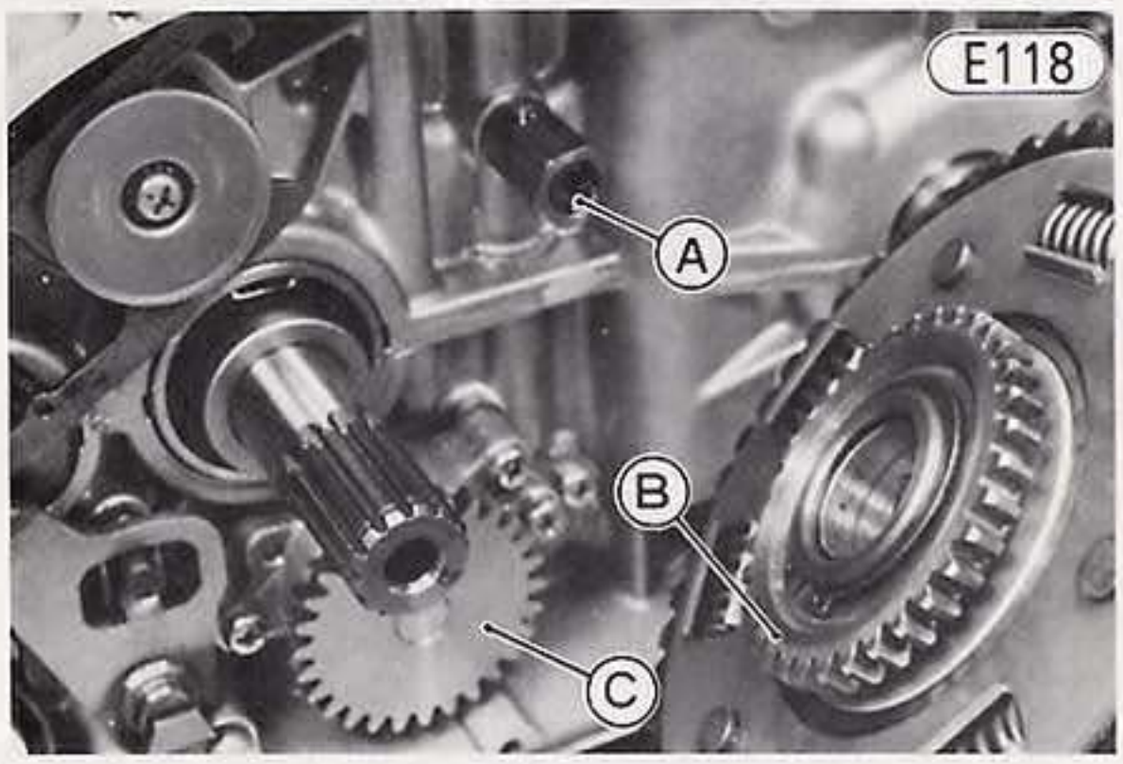


A. Primary Sprocket B. Circlip

- Pull off the clutch housing 13, primary chain 12, and primary sprocket 10 all together.

Installation:

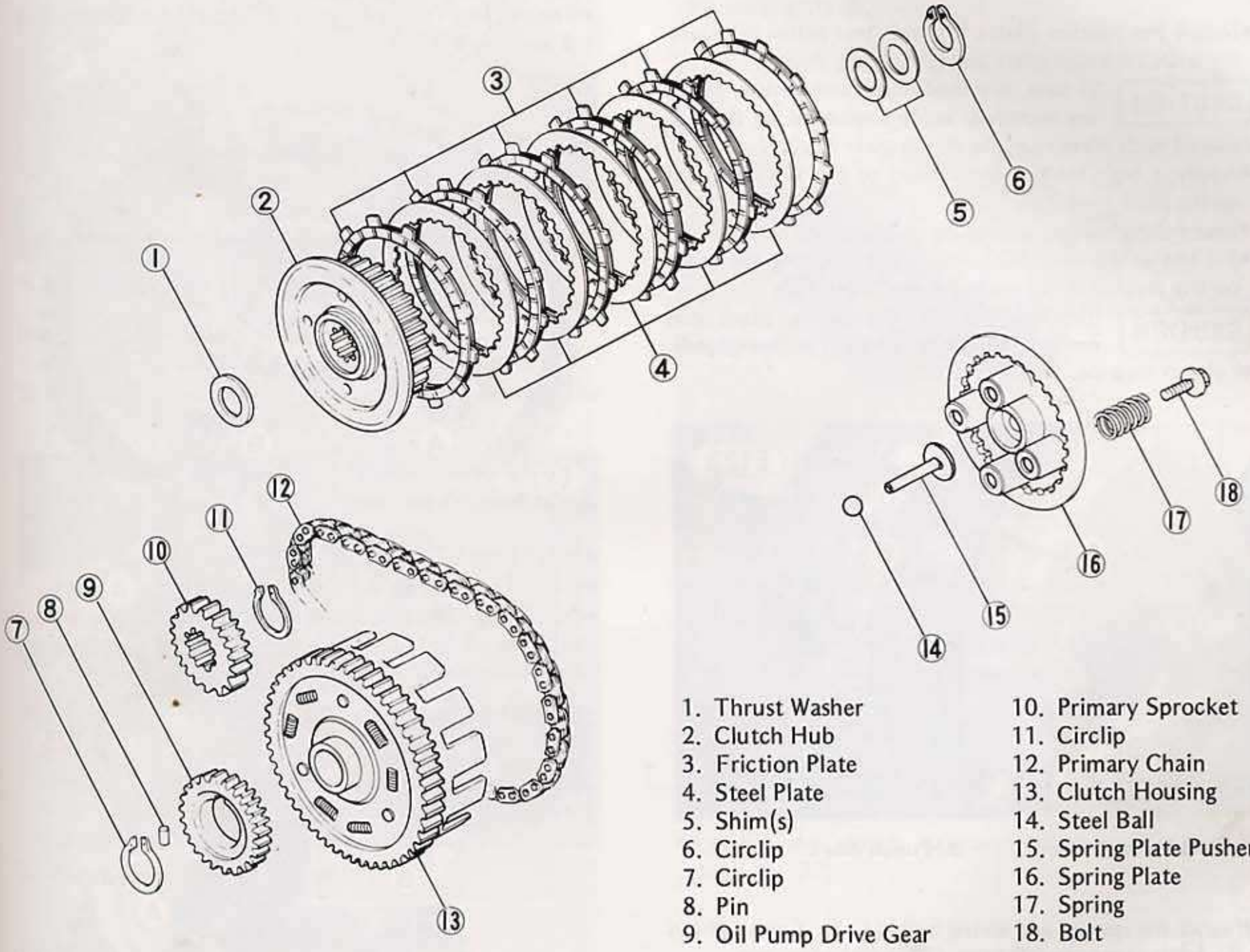
- Check that the oil pump drive gear is in place, and the oil pressure relief valve is in place.



A. Relief Valve C. Oil Pump Gear
B. Pump Drive Gear

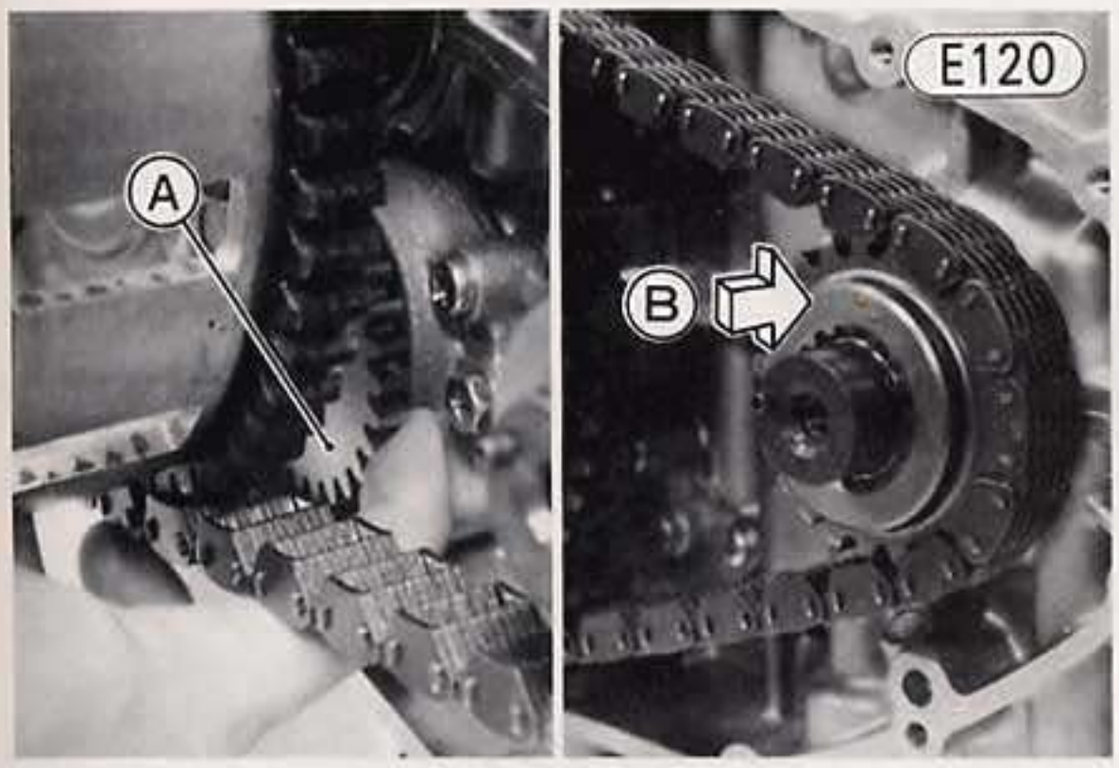
Clutch, Primary Chain, Primary Sprocket

E119



1. Thrust Washer
2. Clutch Hub
3. Friction Plate
4. Steel Plate
5. Shim(s)
6. Circlip
7. Circlip
8. Pin
9. Oil Pump Drive Gear
10. Primary Sprocket
11. Circlip
12. Primary Chain
13. Clutch Housing
14. Steel Ball
15. Spring Plate Pusher
16. Spring Plate
17. Spring
18. Bolt

•Assemble the clutch housing, primary sprocket, and primary chain, and install them while turning the oil pump gear by hand so that the oil pump gear will mesh with the oil pump drive gear. The protruding side of the primary sprocket must face out.



A. Oil Pump Gear **B. Protruding Side**

•Install the primary sprocket circlip.

•Install the thrust washer, clutch hub, shim(s), and circlip.

•Insert a thickness gauge between the circlip and the shim, and measure the side clearance of the clutch hub. If the clearance is excessive, replace the present shim(s) with new one(s) and/or add more shim(s), which will give the proper clearance (Table E1).

NOTE: Shims are available in 0.3 and 0.5 mm sizes.

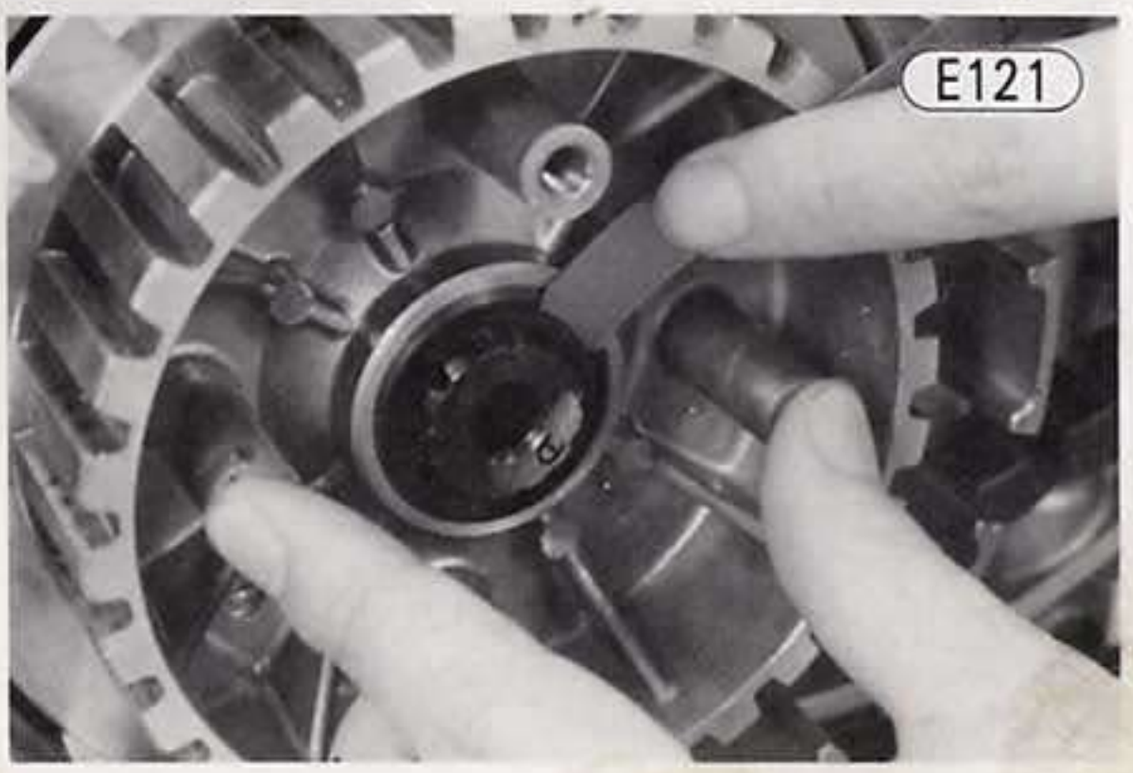


Table E1 Clutch Hub Side Clearance

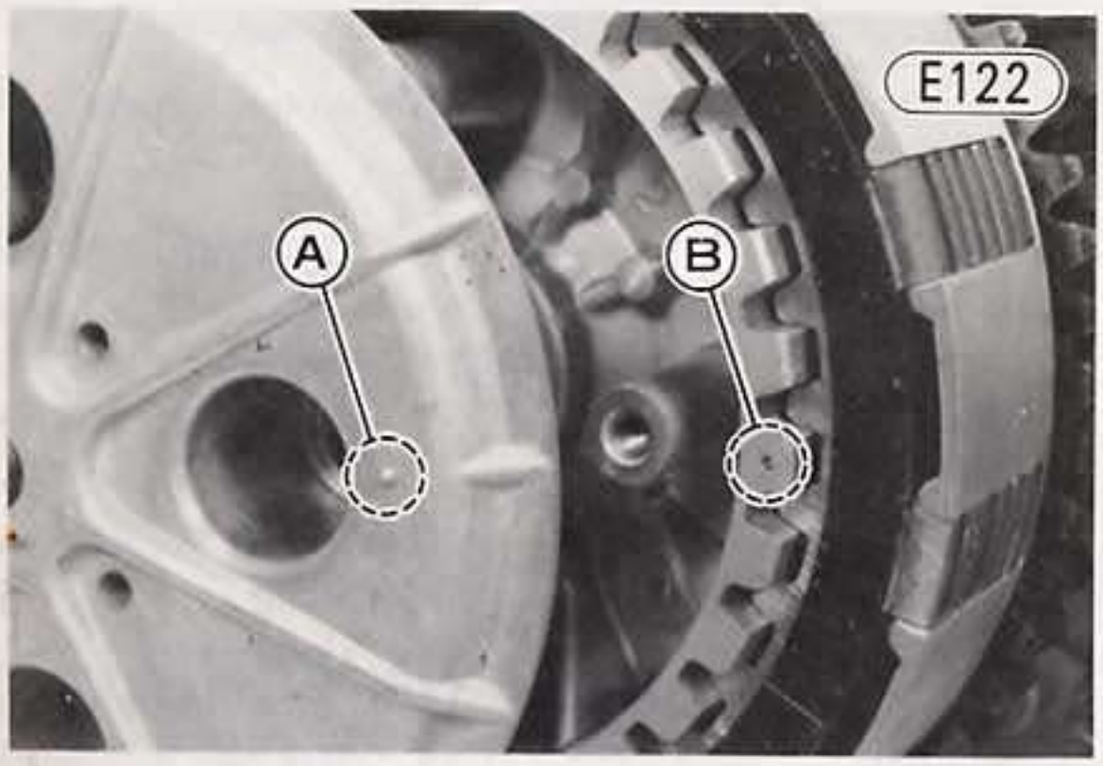
Standard
under 0.3 mm

- Install the friction plates (6) and steel plates (5), starting with a friction plate and alternating them.

CAUTION **If new, dry steel plates and friction plates are installed, apply engine oil on the surfaces of each plate to avoid clutch plate seizure.**

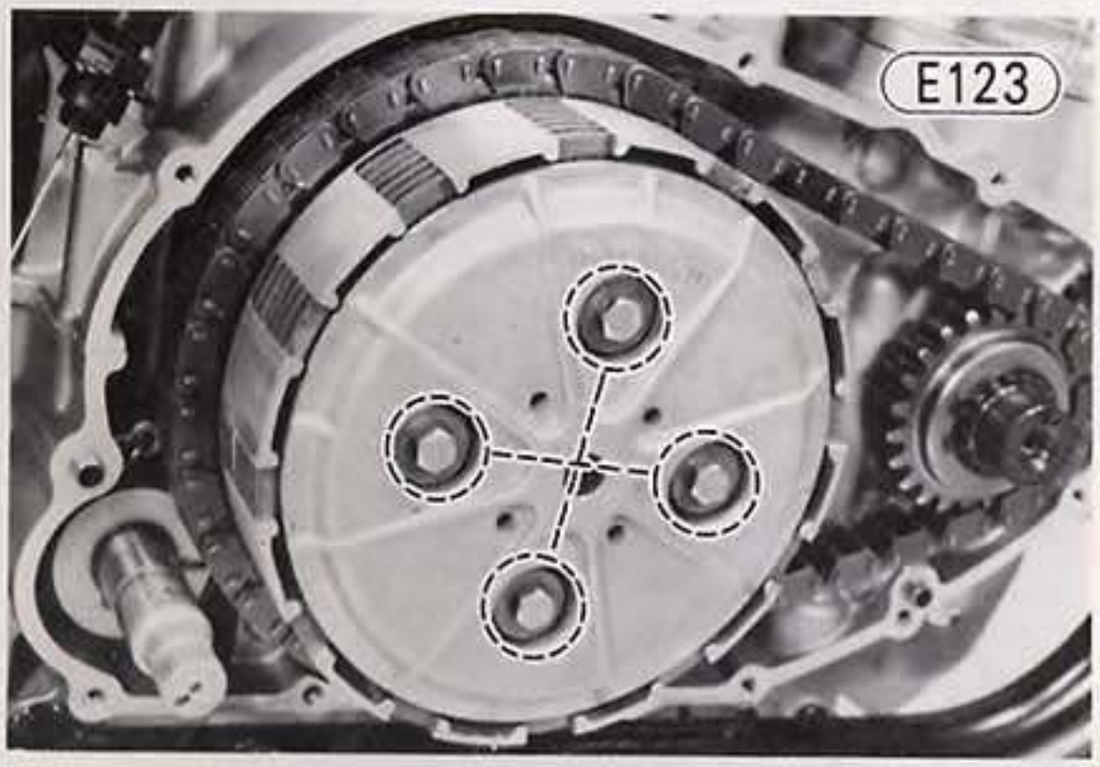
- Apply a high temperature grease to the steel ball and spring plate pusher surfaces.
- Insert the steel ball and spring plate pusher.
- Fit the spring plate back into place, aligning the mark on the plate with the mark on the clutch hub.

CAUTION **Misalignment of the spring plate can cause clutch drag (when it is disengaged), or clutch slipping.**



A. Raised Point Mark B. Punch Mark

- Install the springs and spring bolts (4 ea). Cross tighten the bolts evenly to 0.9 kg-m (78 in-lbs) of torque.

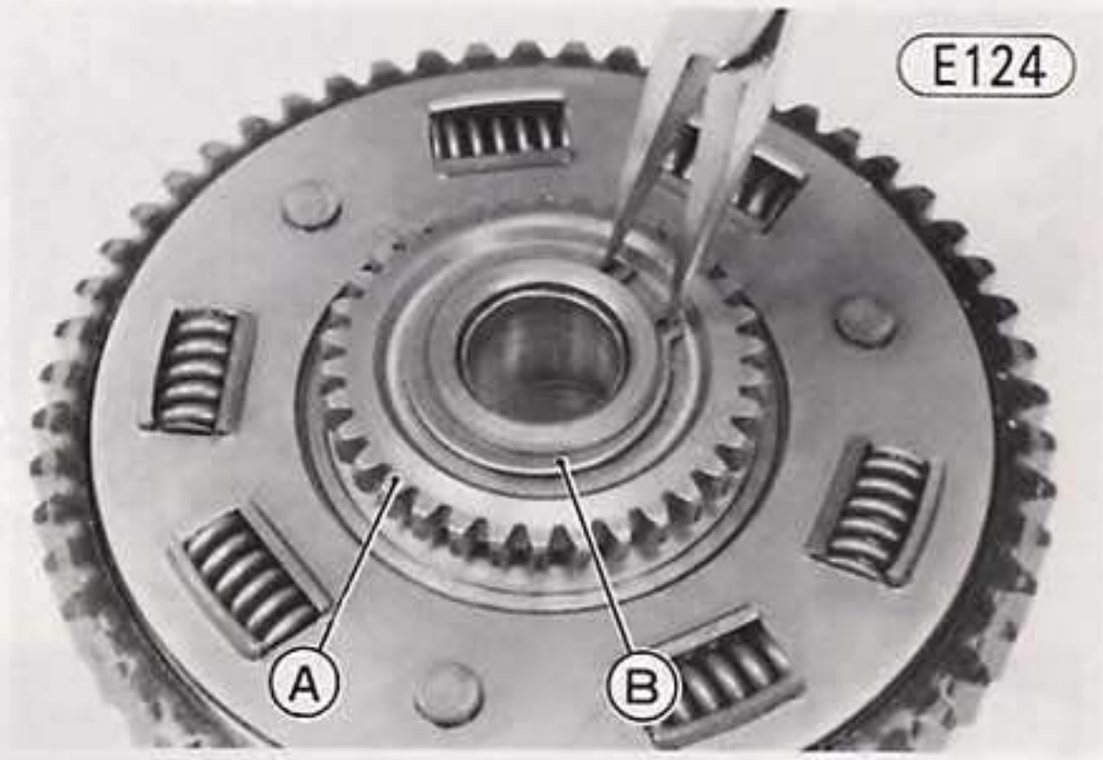


- Install the right engine cover (Pg. 71).
- Install the timing advancer (Pg. 70).
- Adjust the clutch (Pg. 19).
- Adjust the ignition timing (Pg. 12).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.

OIL PUMP DRIVE GEAR

Removal:

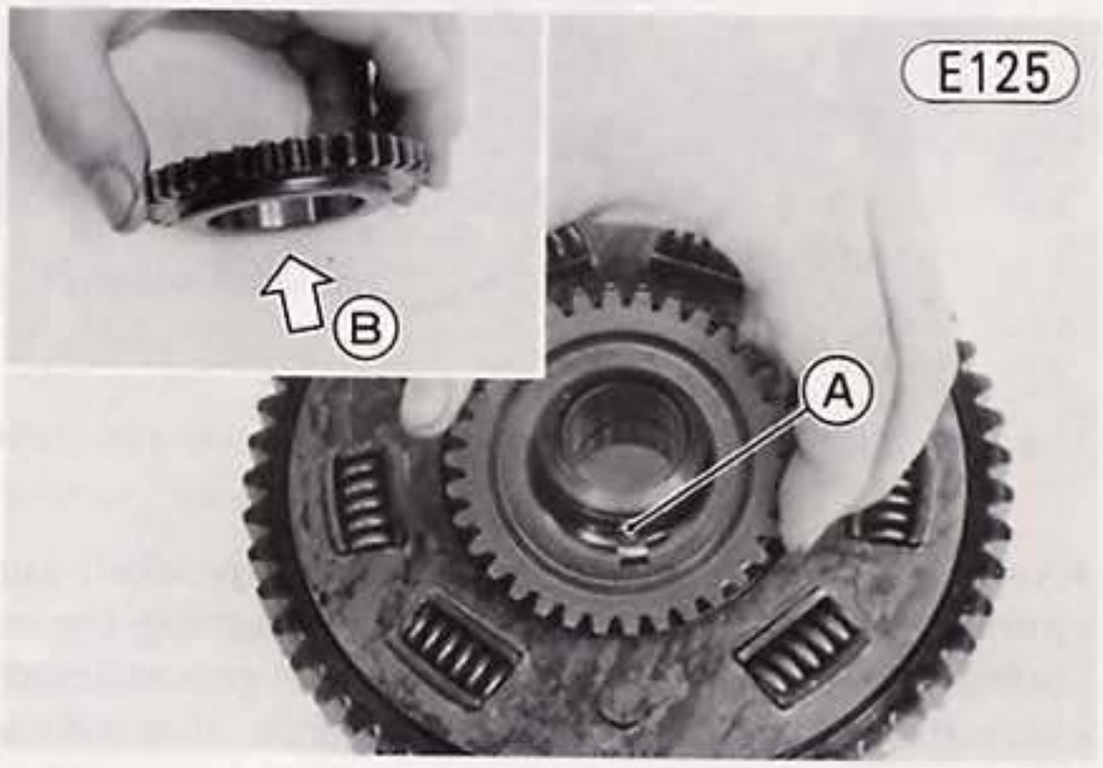
- Remove the timing advancer (Pg. 70).
- Remove the right engine cover (Pg. 71).
- Remove the clutch (Pg. 72).
- Remove the circlip 7 , pull off the oil pump drive gear 9 and pin 8 .



A. Oil Pump Drive Gear B. Circlip

Installation:

- Install the pin into the clutch housing.
- Install the oil pump drive gear, fitting the gear groove with the pin. The protruding side of the gear faces the clutch housing.



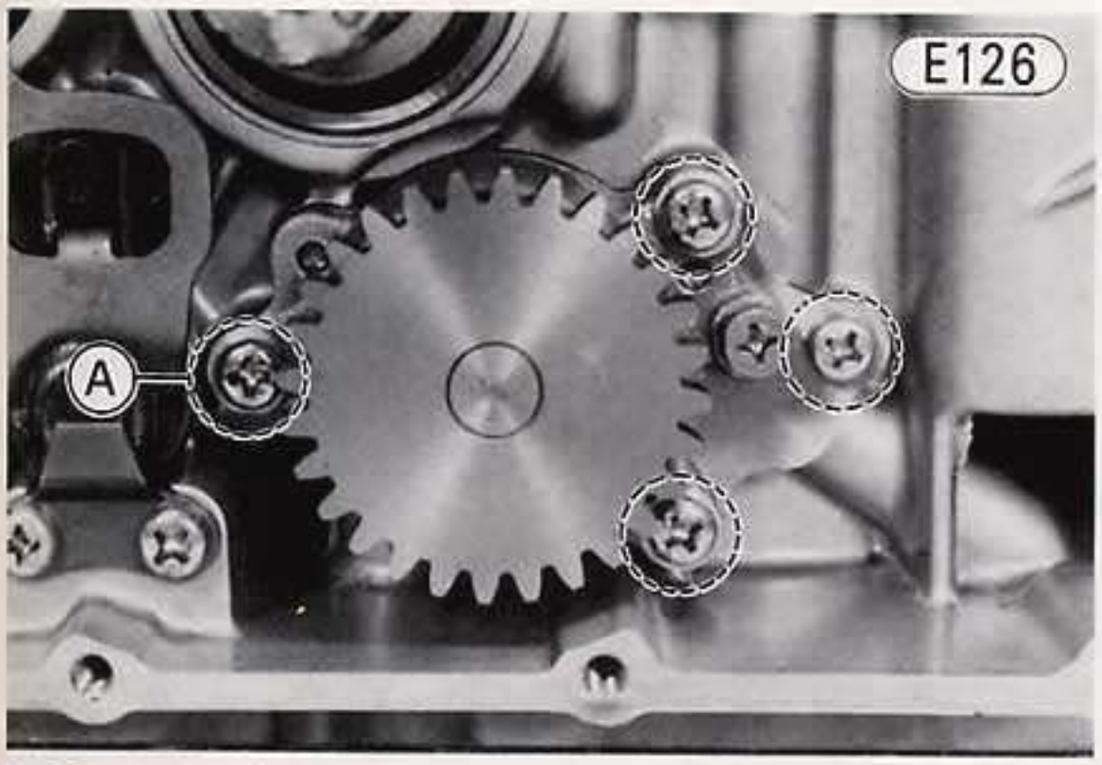
A. Pin B. Protruding Side

- Install the circlip.
- Install the clutch (Pg. 72).
- Install the right engine cover (Pg. 71).
- Install the timing advancer (Pg. 70).
- Adjust the clutch (Pg. 19).
- Adjust the ignition timing (Pg. 12).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.

OIL PUMP

Removal:

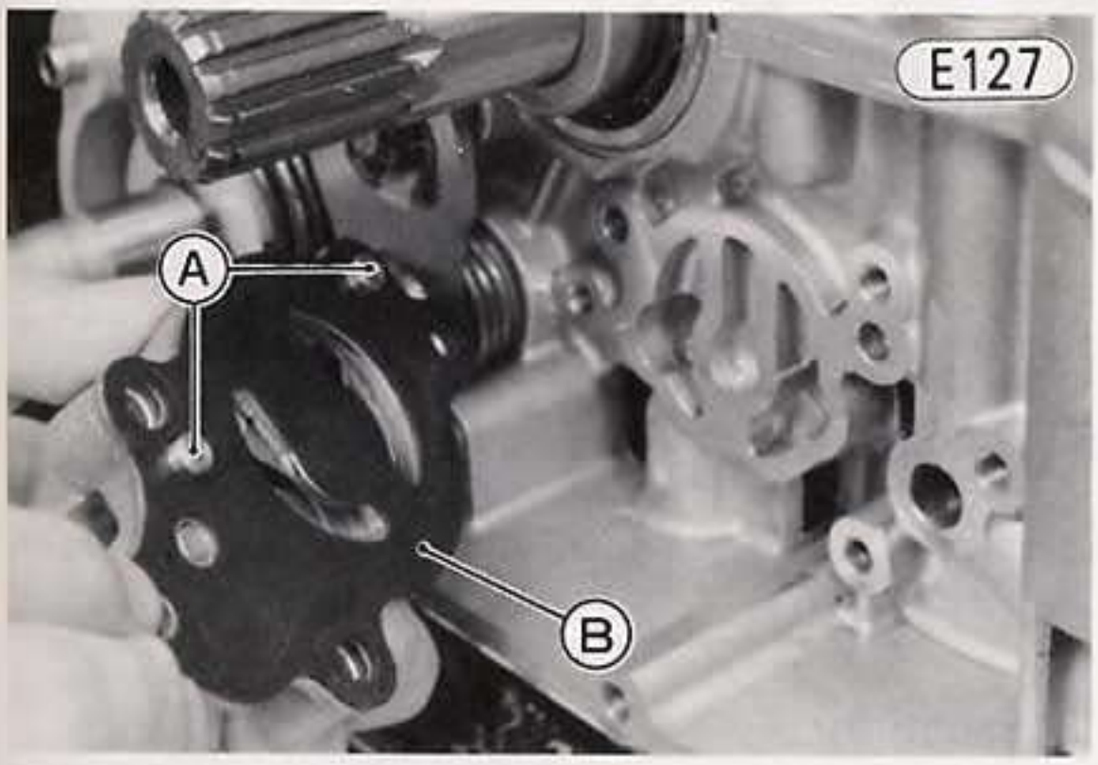
- Remove the clutch, primary sprocket, and primary chain (Pg. 72).
- Remove the oil pump mounting screws (4) 3 , and pull off the oil pump and gasket 1 .



A. Mounting Screws

Installation Notes:

1. Fill the oil pump with oil for initial lubrication.
2. Before installing the oil pump, check to see that the knock pins (2) are in place.

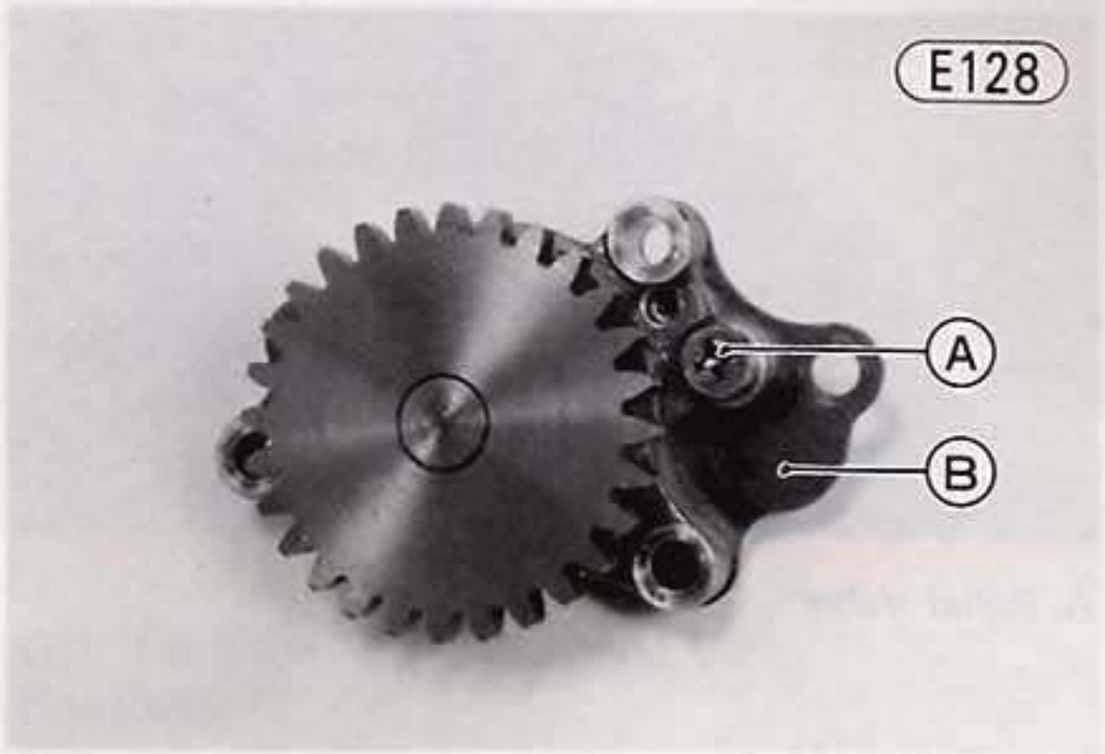


A. Knock Pins B. Gasket

3. Replace the oil pump gasket with a new one.

Disassembly:

●Remove the bolt ⑦ and lockwasher ⑧, and take off the cover plate ②.



A. Bolt B. Cover Plate

●Remove the outer rotor ④.

Assembly Notes:

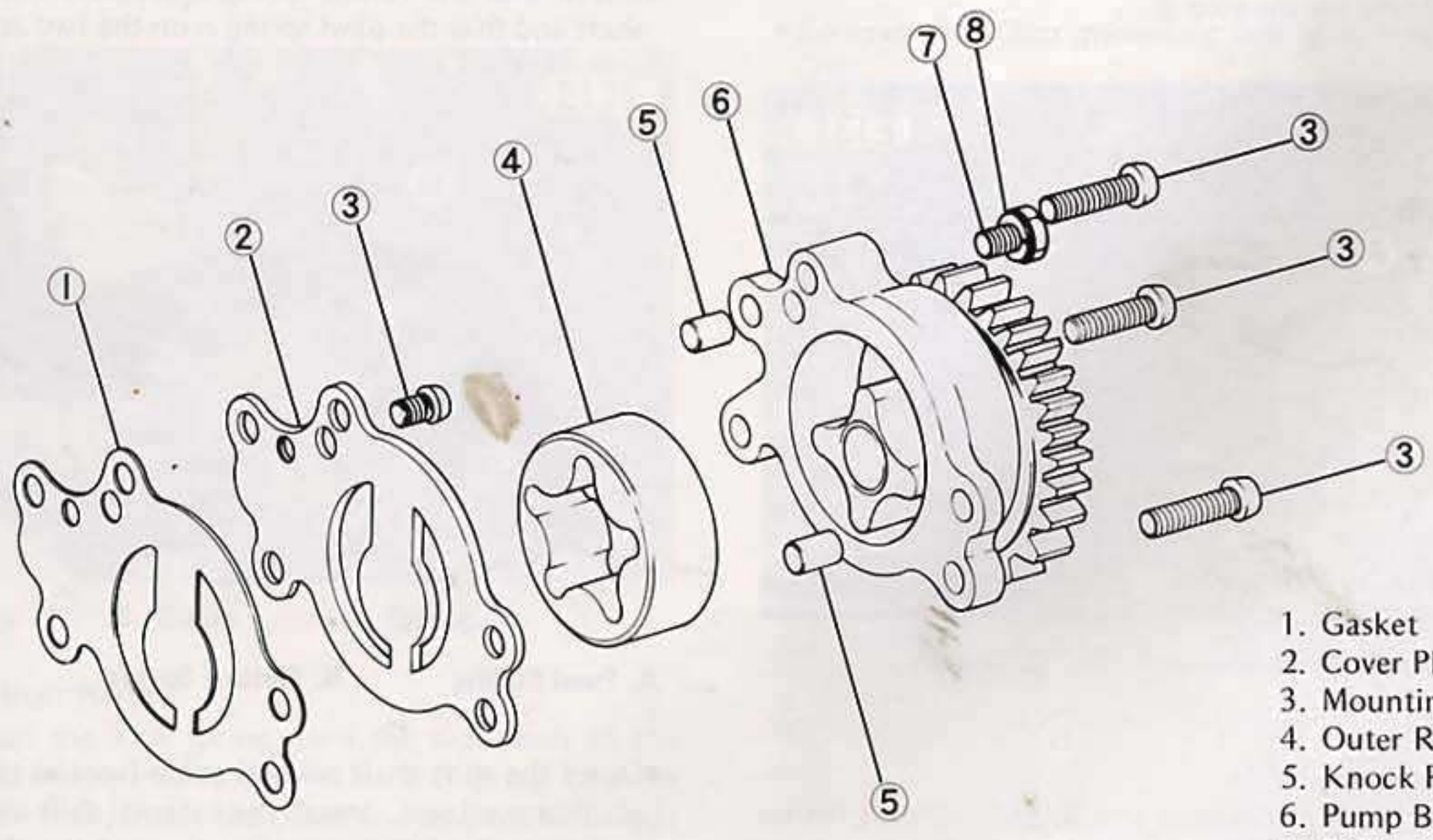
1. Check to see that the knock pins ⑤ are in place.
2. After completing the oil pump assembly, check that the rotor shaft and rotors turn smoothly.

OIL PRESSURE RELIEF VALVE

Removal:

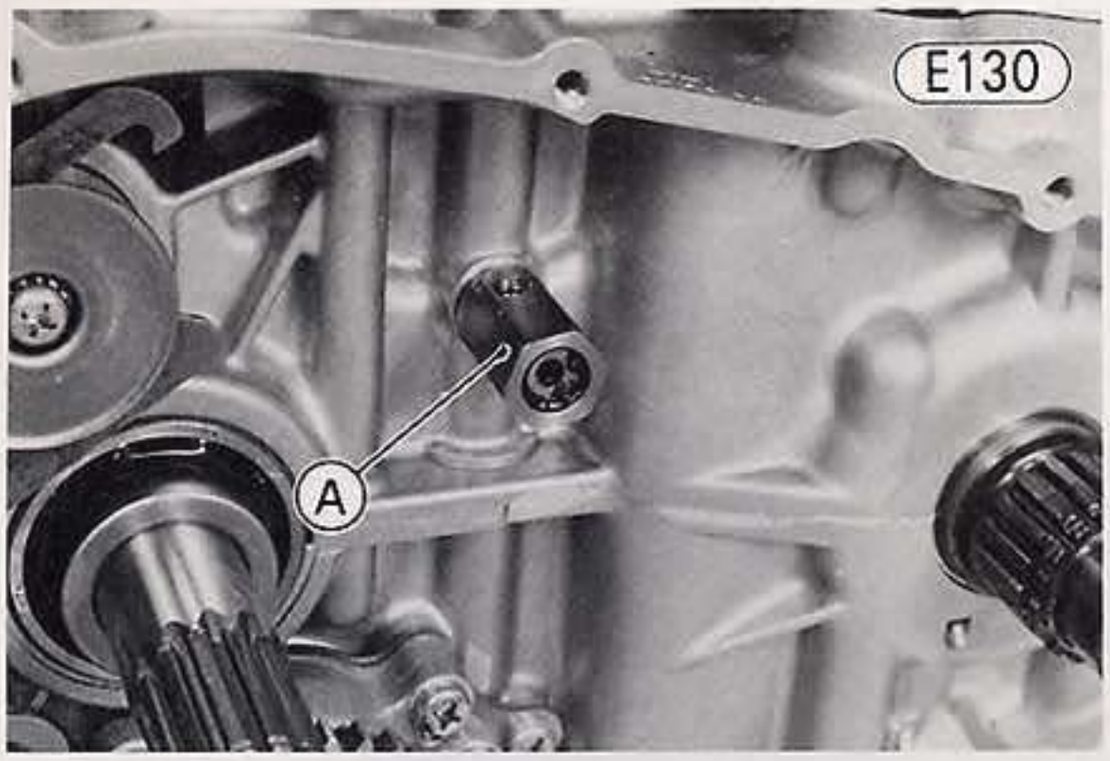
●Remove the clutch, primary sprocket, and primary chain (Pg. 72).

Oil Pump



1. Gasket
2. Cover Plate
3. Mounting Screw
4. Outer Rotor
5. Knock Pin
6. Pump Body
7. Bolt
8. Lockwasher

●Remove the oil pressure relief valve.



A. Relief Valve

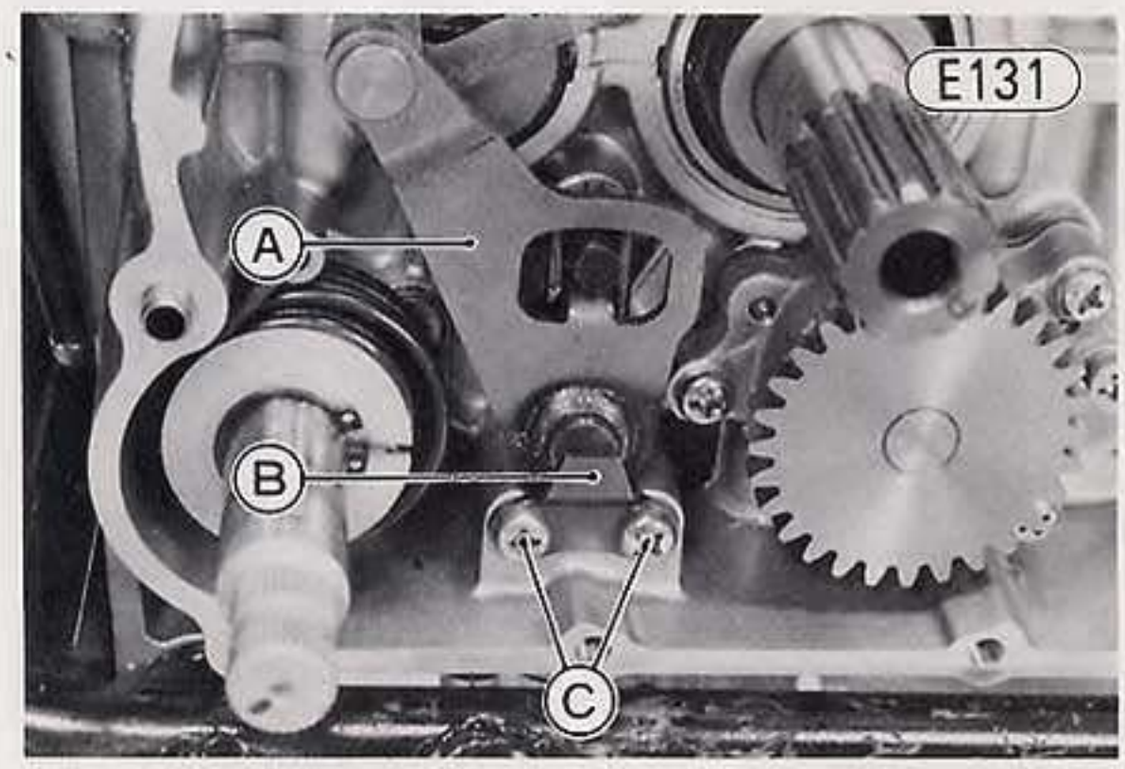
Installation Note:

●Apply a non-permanent locking agent to the valve threads, and tighten it to 1.5 kg-m (11.0 ft-lbs) of torque.

EXTERNAL SHIFT MECHANISM

Removal:

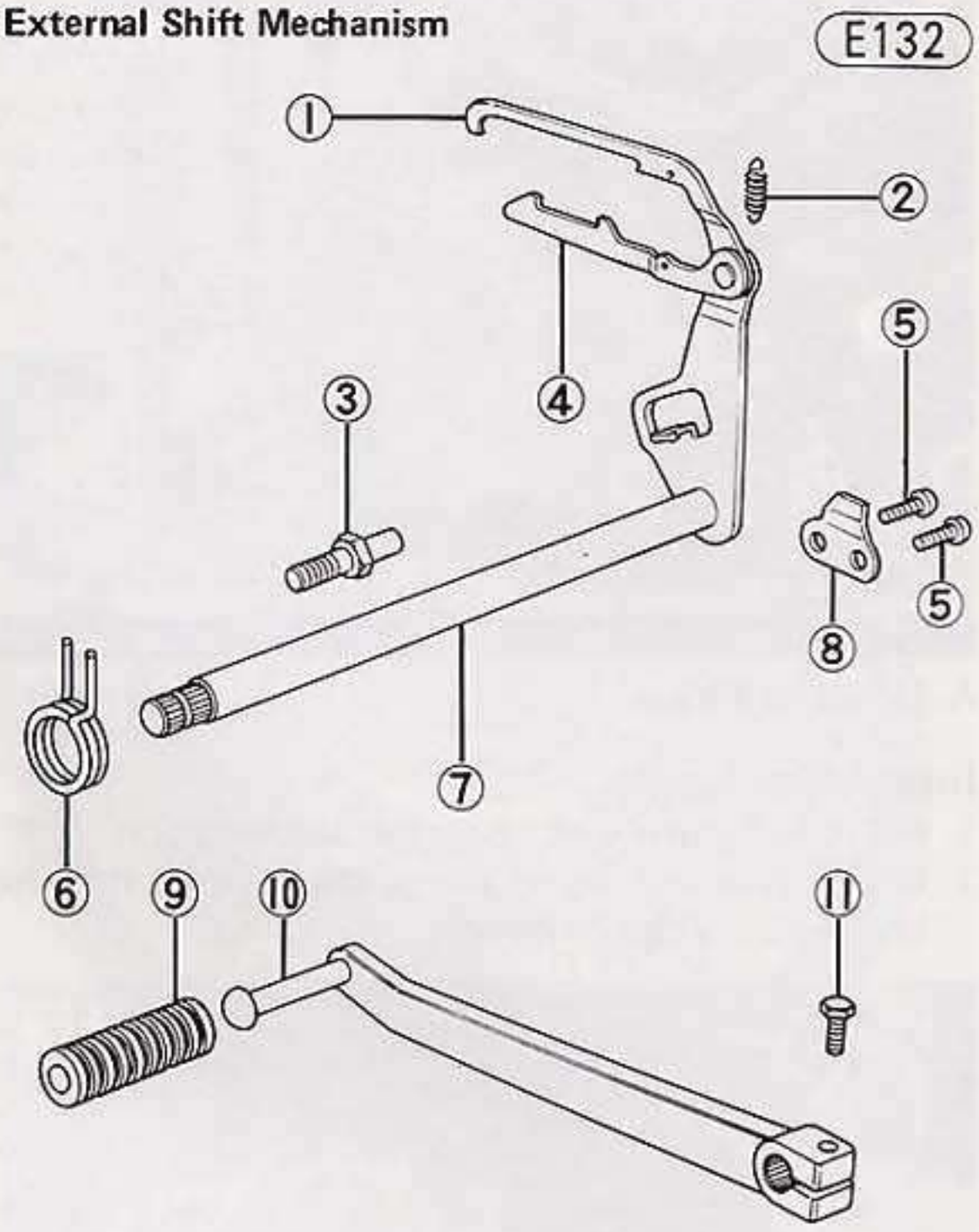
●Remove the engine sprocket cover (Pg. 61) as explained in engine sprocket cover removal. The clutch cable does not require removal from the clutch release.
●Remove the timing advancer (Pg. 70).
●Remove the right engine cover (Pg. 71).
●Remove the clutch, primary sprocket, and primary chain (Pg. 72).
●Remove the external shift mechanism stop screws ⑤ (2), and take off the stop ⑧.



A. External Shift Mechanism
B. Stop
C. Screws

●Move the shift mechanism arm ④ and overshift limiter ① out of their positions on the end of the shift drum and pull out the shift shaft ⑦.

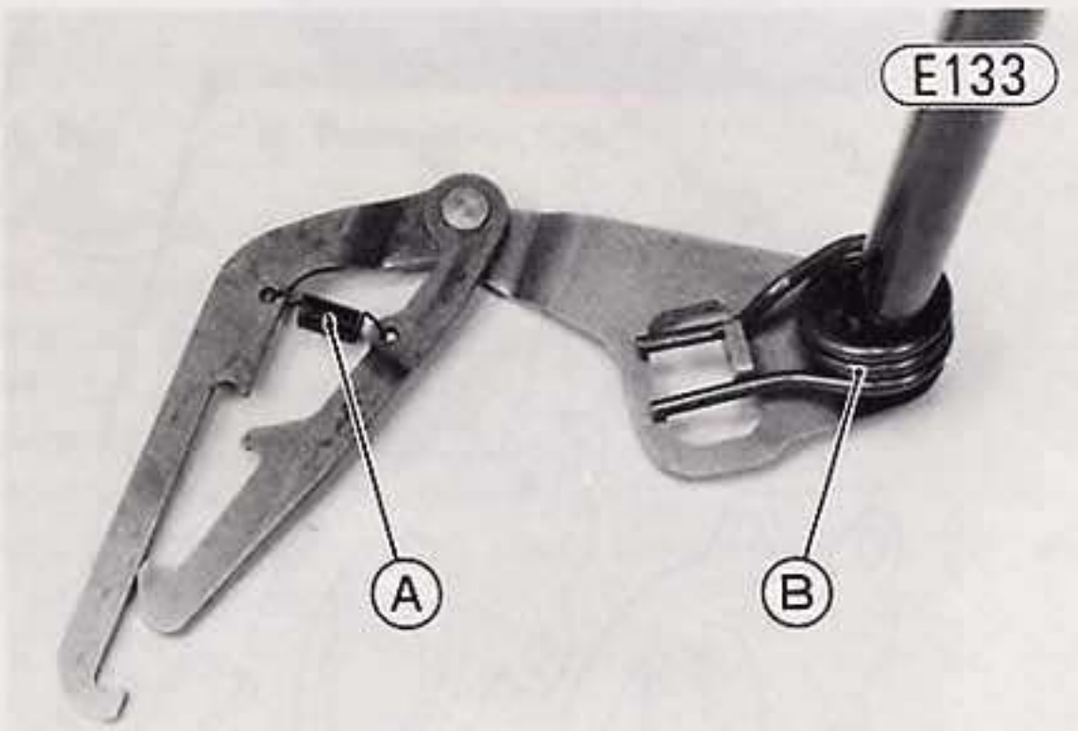
External Shift Mechanism



1. Overshift Limiter
2. Pawl Spring
3. Return Spring Pin
4. Shift Mechanism Arm
5. Screw
6. Return Spring
7. Shift Shaft
8. Shift Mechanism Stop
9. Pedal Rubber
10. Shift Pedal
11. Bolt

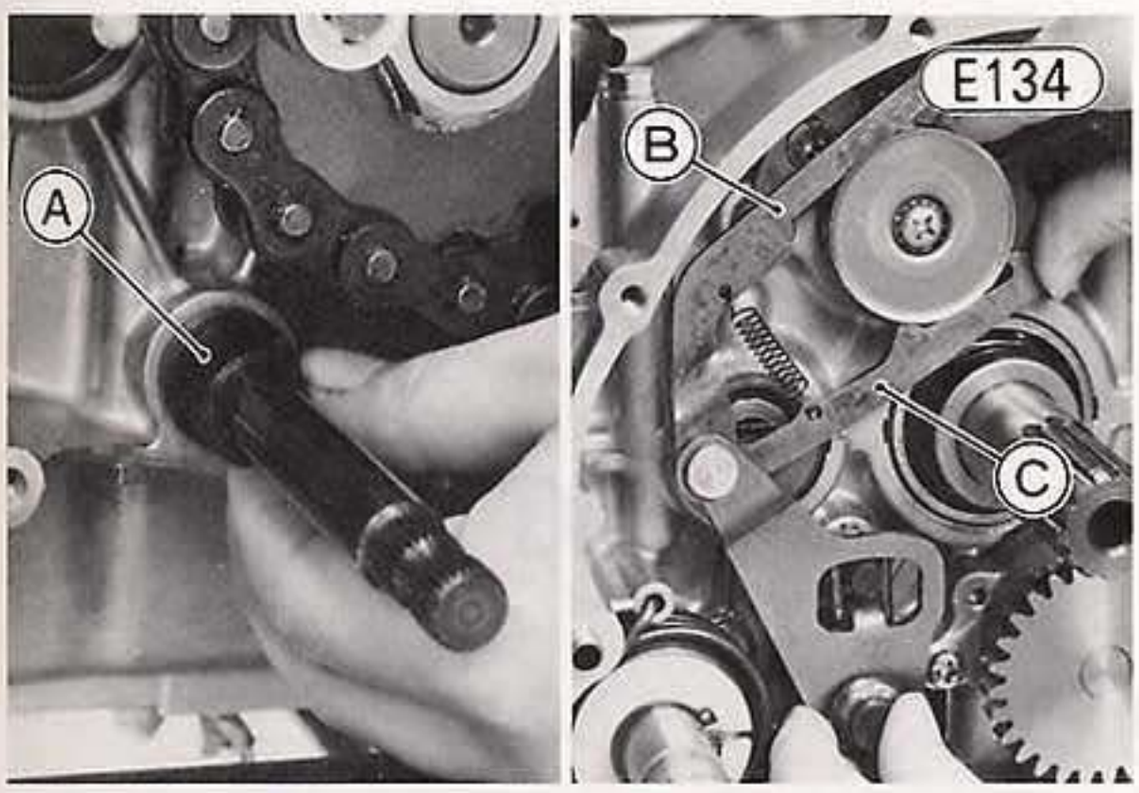
Installation:

●Check that the external shift mechanism return spring pin is not loose. If it is loose, remove it, apply a non-permanent locking agent to the threads, and tighten it.
●Check that the return spring is properly fitted on the shaft and that the pawl spring is on the two arms.



A. Pawl Spring
B. Return Spring

●Insert the shift shaft oil seal guide (special tool) in the crankcase oil seal. Install the external shift mechanism, and place the shift mechanism arm and overshift limiter on the shift drum pins.



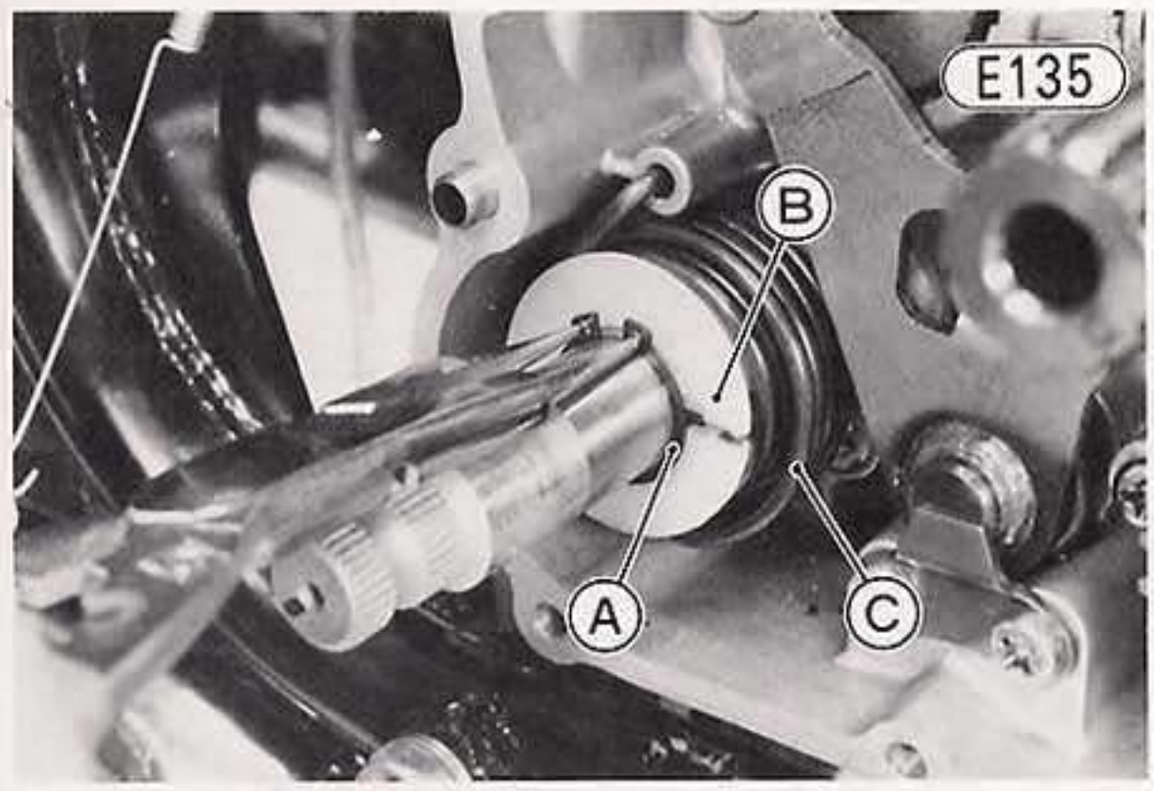
A. Shift Shaft•Oil Seal Guide (57001-264)
B. Overshift Limiter
C. Shift Mechanism Arm

- Install the external shift mechanism stop, and tighten its screws, applying a non-permanent locking agent to the screws.
- Install the clutch, primary sprocket, and primary chain (Pg. 72).
- Install the right engine cover (Pg. 71).
- Install the timing advancer (Pg. 70).
- Install the engine sprocket cover (Pg. 62).
- Adjust the clutch (Pg. 72).
- Adjust the ignition timing (Pg. 12).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Check the automatic side stand return mechanism, and adjust if necessary (Pg. 31).

KICKSTARTER SPRING

Removal:

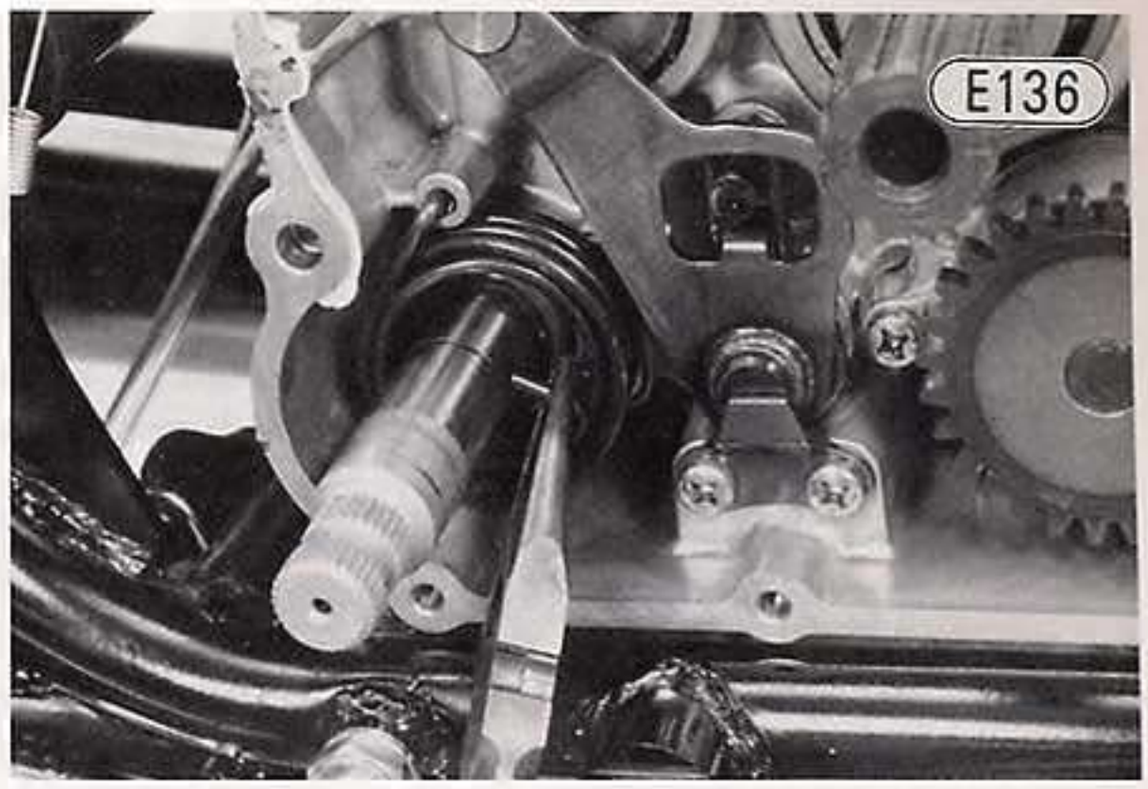
- Remove the right engine cover (Pg. 71).
- Remove the circlip, and pull off the spring guide and spring.



A. Circlip B. Guide C. Spring

Installation Note:

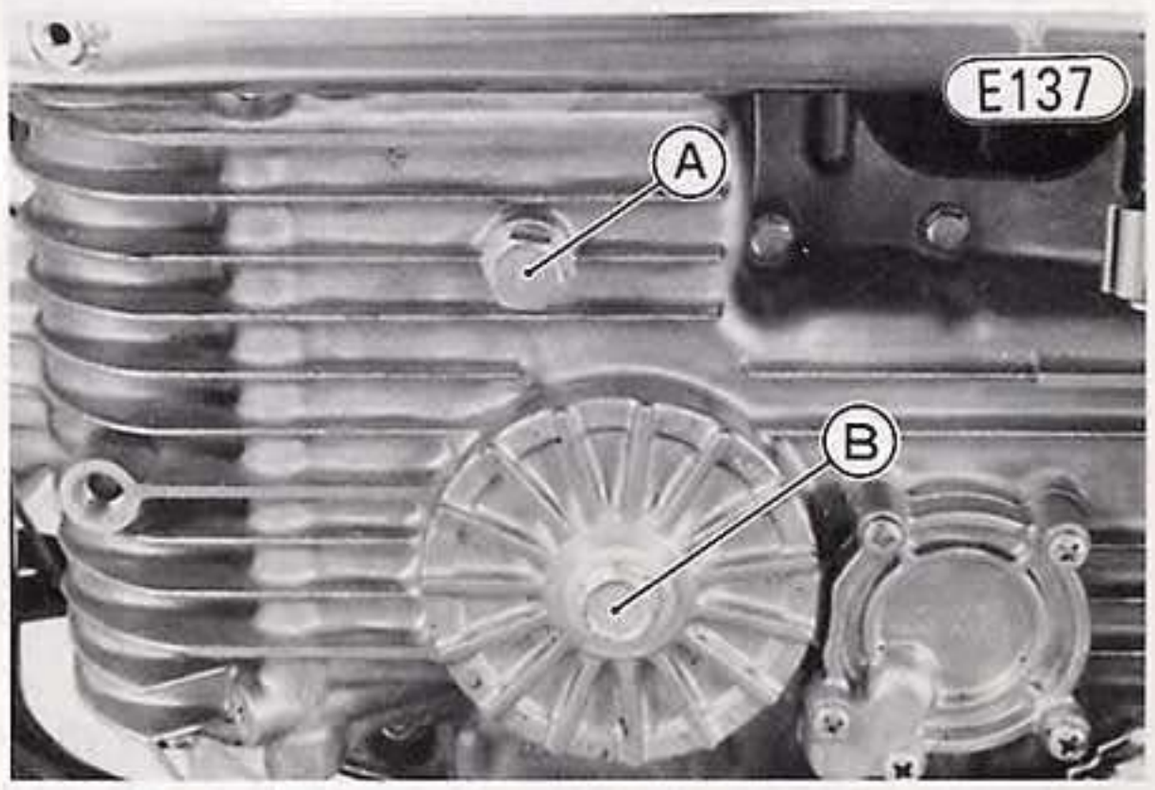
- To install the kick spring, turn the kick shaft all the way clockwise, insert one end of the spring into the crankcase hole, insert the other end into the kick shaft using needle nose pliers, and, which holding the spring in place if necessary, insert the kick spring guide.



OIL FILTER, BYPASS VALVE

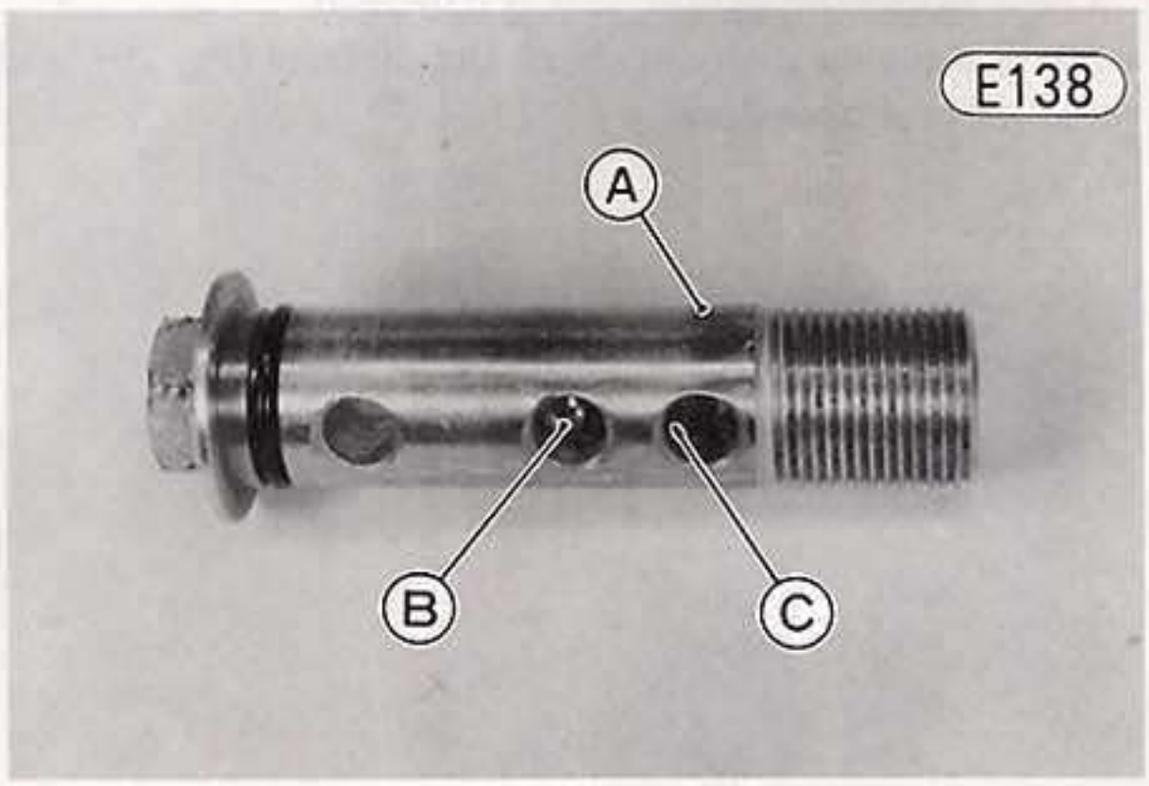
Removal:

- Place an oil pan beneath the engine, and remove the engine drain plug.



A. Engine Drain Plug B. Oil Filter Mounting Bolt

- Remove the filter mounting bolt and drop out the filter.
- Pull the filter off the mounting bolt. There is a spring seat and spring between the oil filter and the filter cover.
- To remove the bypass valve, drive the pin and drop out the spring and steel ball.

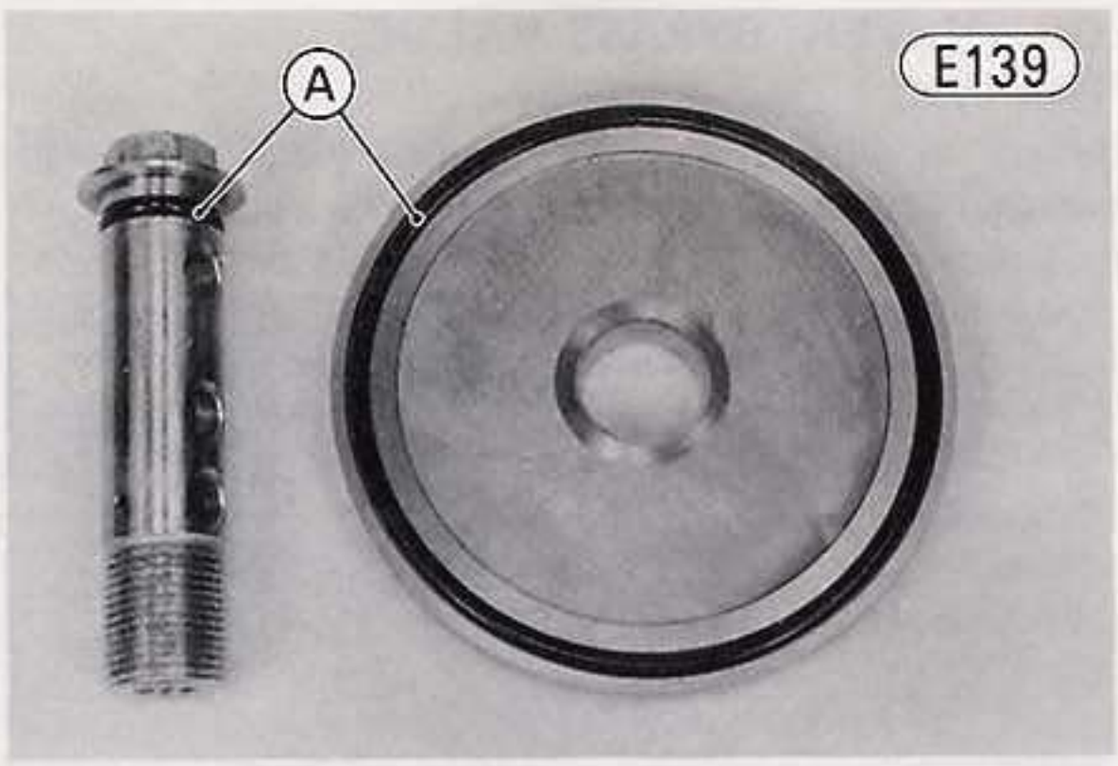


A. Pin B. Steel Ball C. Spring

Installation:

- Fit the steel ball and spring into the mounting bolt, and drive in the pin while pressing the spring.
- Check that the O rings on the filter mounting bolt and filter cover are all properly in place. Replace the O ring with a new one if deteriorated or damaged.

CAUTION **Using damaged or deteriorated O rings instead of replacing them with new ones will cause oil leaks and eventually result in little or no oil left in the engine. This will cause serious engine damage. The oil in the oil filter housing is pressurized by the engine oil pump, so these O rings must be inspected with special care. Look for discoloration (indicating the rubber has deteriorated), hardening (the sides which face the mating surfaces are flattened), scoring, or other damage.**



A. "O" Rings

- Apply a little engine oil to the O ring on the filter mounting bolt, fit the filter cover on the bolt, and install the spring and spring seat in this sequence.
- Apply a little engine oil on the oil filter grommets, and turn the filter mounting bolt to work the new filter into place while holding the filter steady. Be careful that the filter grommets do not slip out of place.
- Install the oil filter, tightening its bolt to 2.0 kg-m (14.5 ft-lbs) of torque.
- Install the engine drain plug and aluminum gasket, and tighten the plug to 3.0 kg-m (22 ft-lbs) of torque. Use a new aluminum gasket, if it is damaged.
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.

Disassembly—Engine Removed

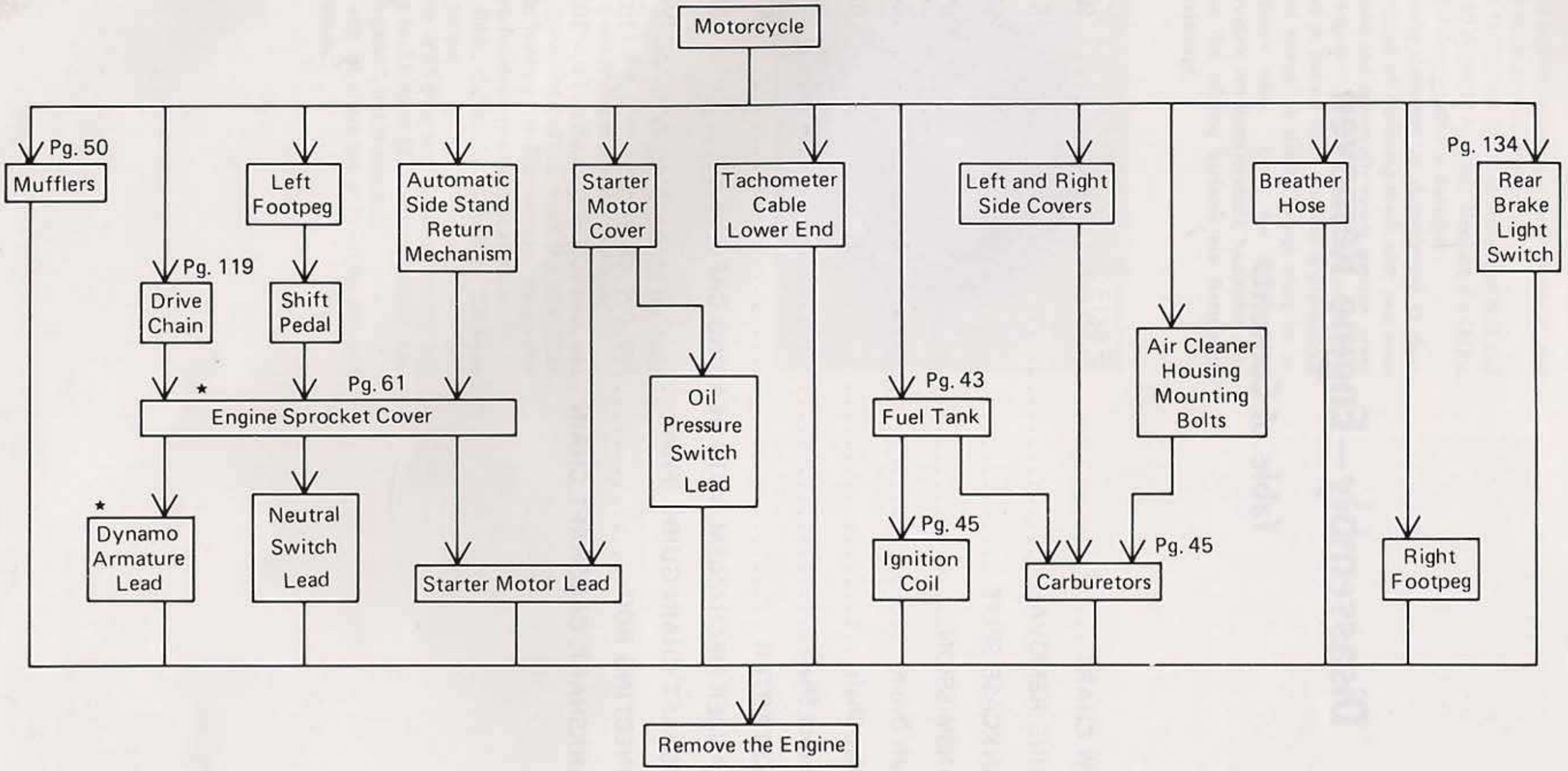
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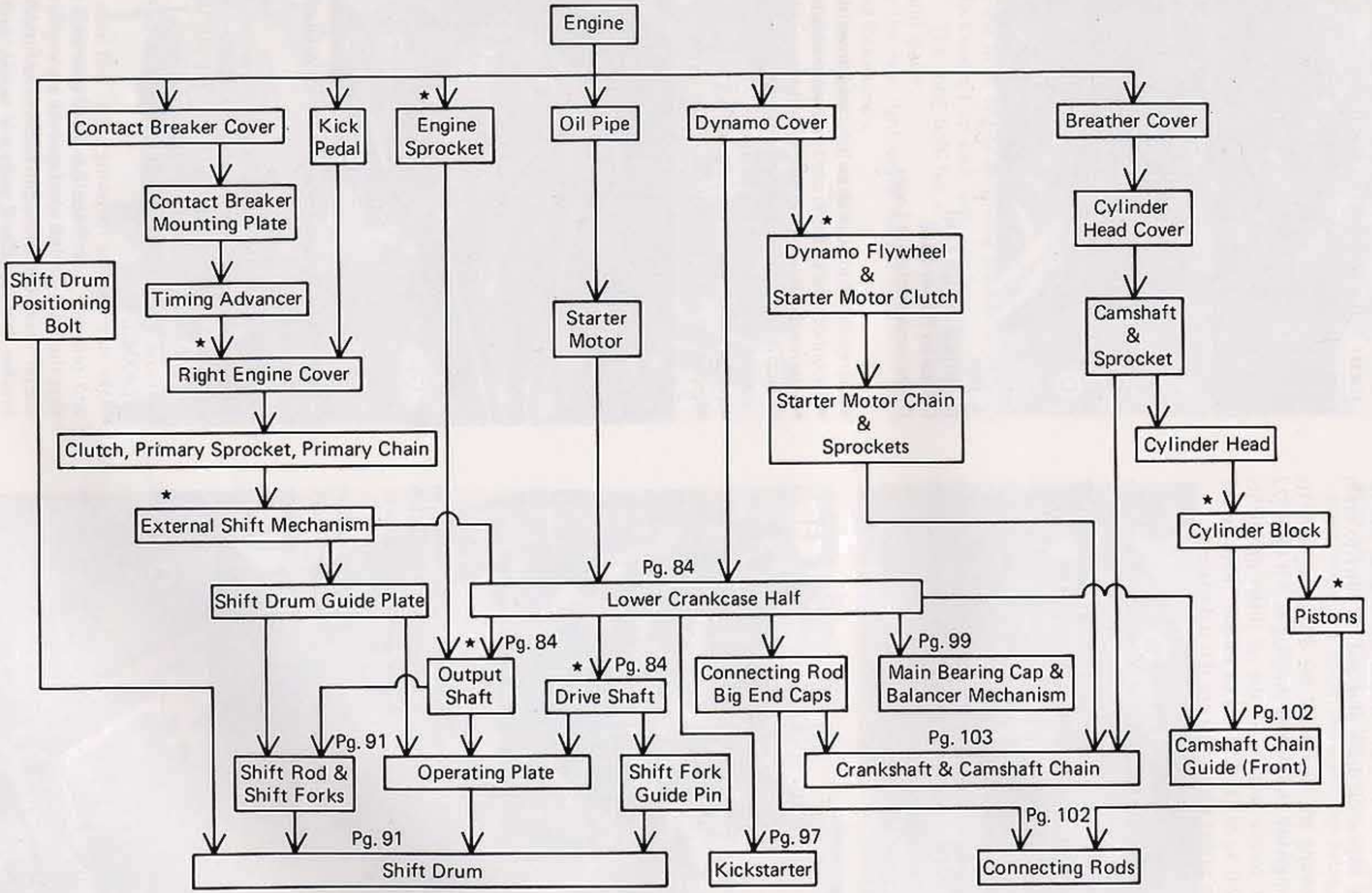
FLOW CHART
Engine Removal

The following charts are intended to be aids to proper removal. Select the component you wish to remove and follow the arrows to that point on the chart.



NOTE: Action with a mark (★) requires special tool(s) for removal, installation, disassembly, or assembly.

FROW CHART
Disassembly — Engine Removed



NOTES: 1. Action that has been already done in the engine removal procedure is omitted. Action that is not necessarily required for engine disassembly off the motorcycle is also omitted.
2. Action with a mark (★) requires special tool(s) for removal, installation, disassembly, or assembly.

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ENGINE REMOVAL

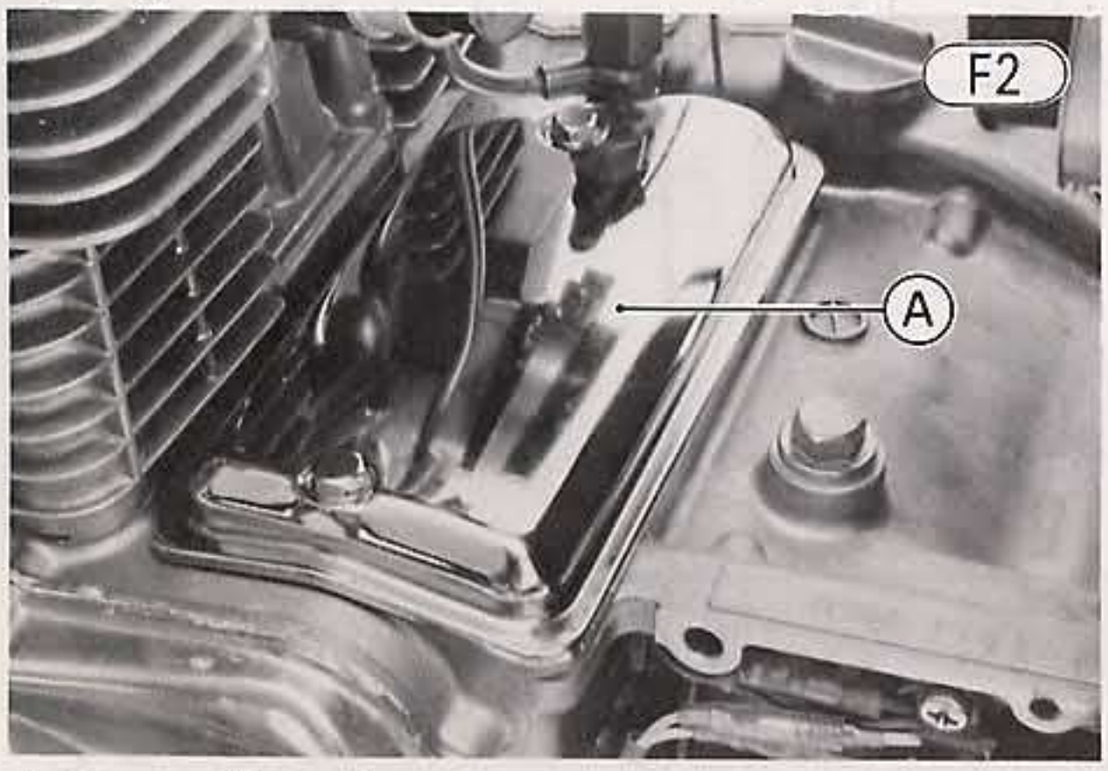
Removal:

- Situate the motorcycle so that it is perpendicular to the ground, place an oil pan beneath the engine, and remove the engine oil drain plug and oil filter to drain out the oil.
- After draining the oil, install the drain plug with its aluminum gasket and tighten the plug to 3.0 kg-m (22 ft-lbs) of torque and install the oil filter, tighten its bolt to 2.0 kg-m (14.5 ft-lbs) of torque. Replace the aluminum gasket with a new one if it is damaged.
- Remove the fuel tank (Pg. 43).
- Take off the right and left side covers.
- Pull the spark plug leads off the plugs, and disconnect the ignition coil leads.
- Remove the bolts (2), and take the ignition coil off the frame together with its mounting bracket.
- Remove the carburetors (Pg. 45) as explained in carburetors removal. The throttle cables do not require removal from the carburetors.
- Cover the carburetors with a clean cloth to keep dirt out of the carburetors, and set them on the workbench to avoid damaging the throttle cables and carburetors.
- Disconnect the tachometer cable lower end with pliers (KZ400-B).



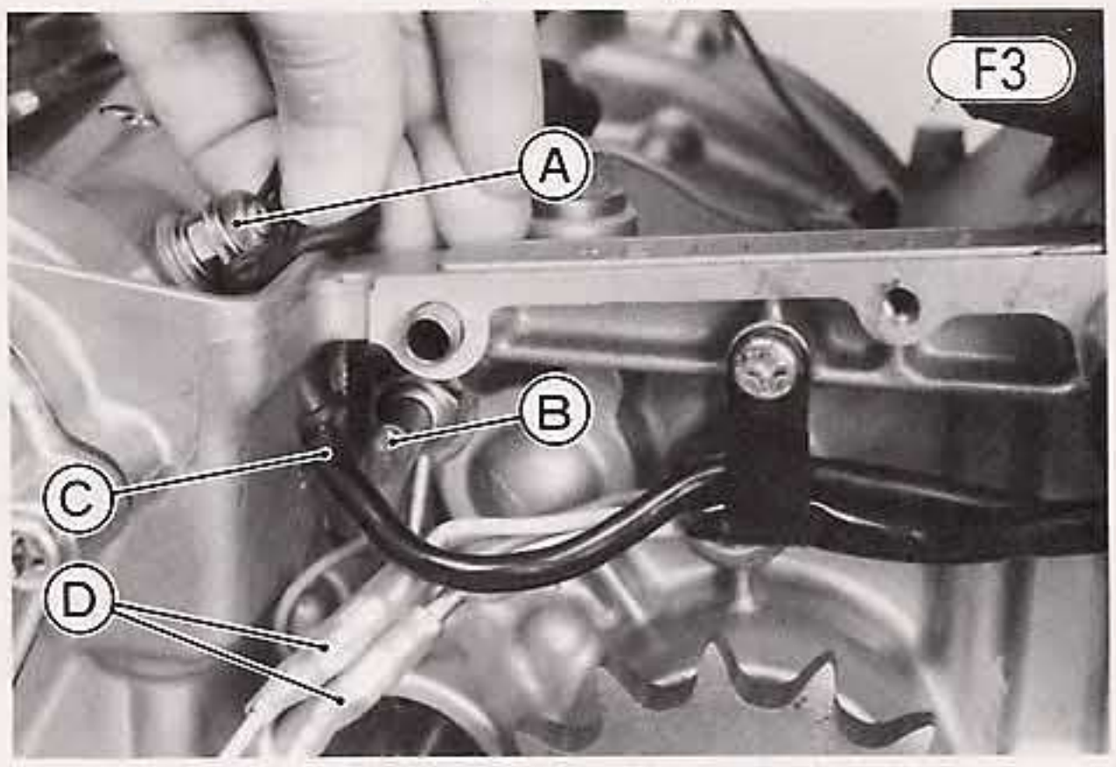
A. Tachometer Cable

- Remove the engine sprocket cover as explained in engine sprocket cover removal (Pg. 61). The clutch cable does not require removal from the clutch release.
- Remove the drive chain (Pg. 119).
- Remove the starter motor cover bolts and flat washers (2 ea), and take off the cover and gasket (KZ400-B).



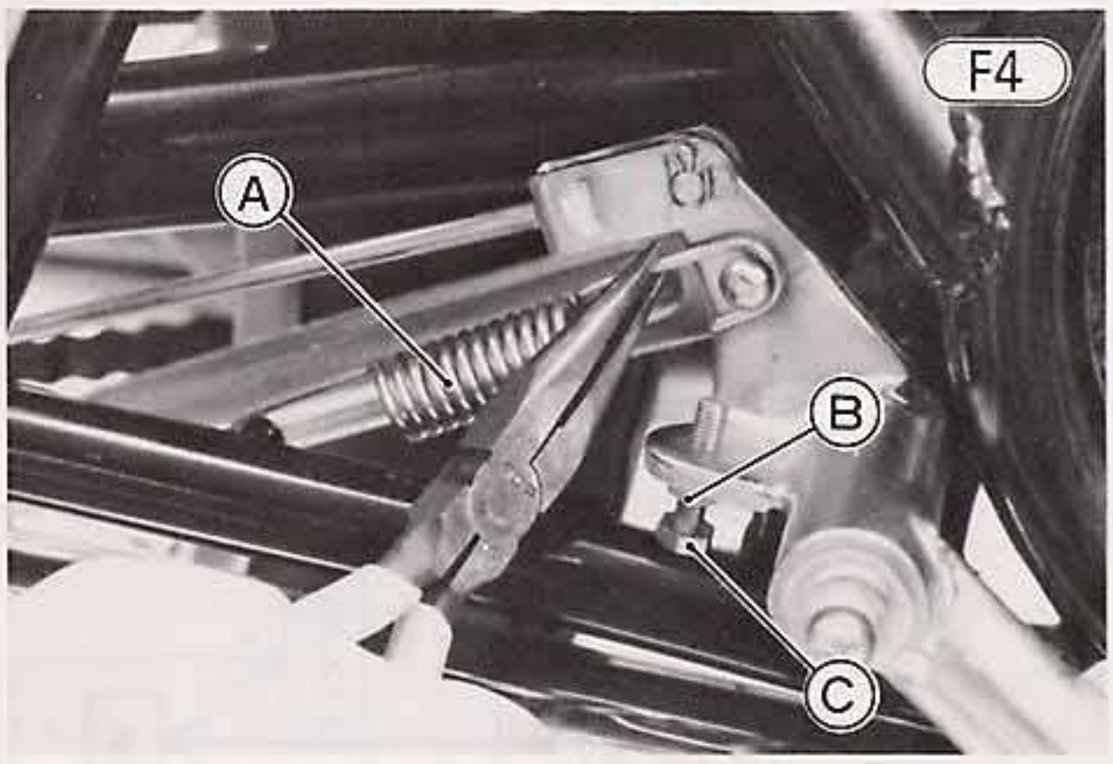
A. Starter Motor Cover

- Disconnect the oil pressure switch lead from the switch (KZ400-B).
- Slide the rubber cap out of place, remove the nut and lockwasher, and free the starter motor lead from the starter motor terminal (KZ400-B).



A. Nut
B. Neutral Switch Lead
C. Starter Motor Lead
D. Dynamo Armature Leads

- Disconnect the neutral switch lead from the switch.
- Disconnect the dynamo armature yellow leads (2).
- Remove the lead clamp screw, and take off the clamp.
- Remove the right footpeg mounting bolt and lockwasher, and take off the footpeg.
- Remove rear brake light switch (Pg. 134).
- Remove the rear brake pedal return spring.



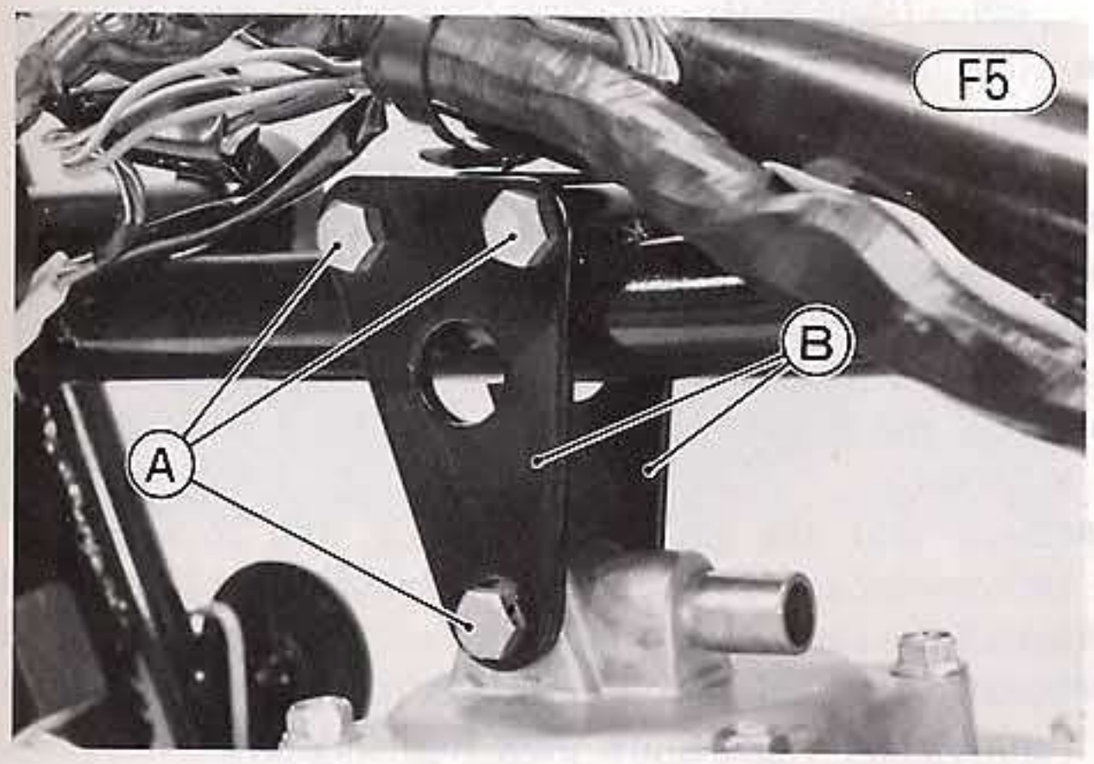
A. Brake Pedal Return Spring
B. Locknut
C. Adjusting Bolt

- Back the rear brake adjusting nut off to the end of the brake rod to give the pedal play. Loosen the brake pedal adjusting bolt locknut, and back out the adjusting bolt until the pedal is held down out of the way.
- Remove the mufflers (Pg. 50 for KZ400-B or Pg. 50 for KZ400-C).
- Make sure that the following cables and leads are free, and properly positioned on the engine and frame so that they will not get damaged during engine removal: starter lead, clutch cable, tachometer cable, contact breaker lead, dynamo armature wiring, and throttle cables (with carburetors).
- Jack or lever the engine up slightly to take the weight off the engine mounting bolts.

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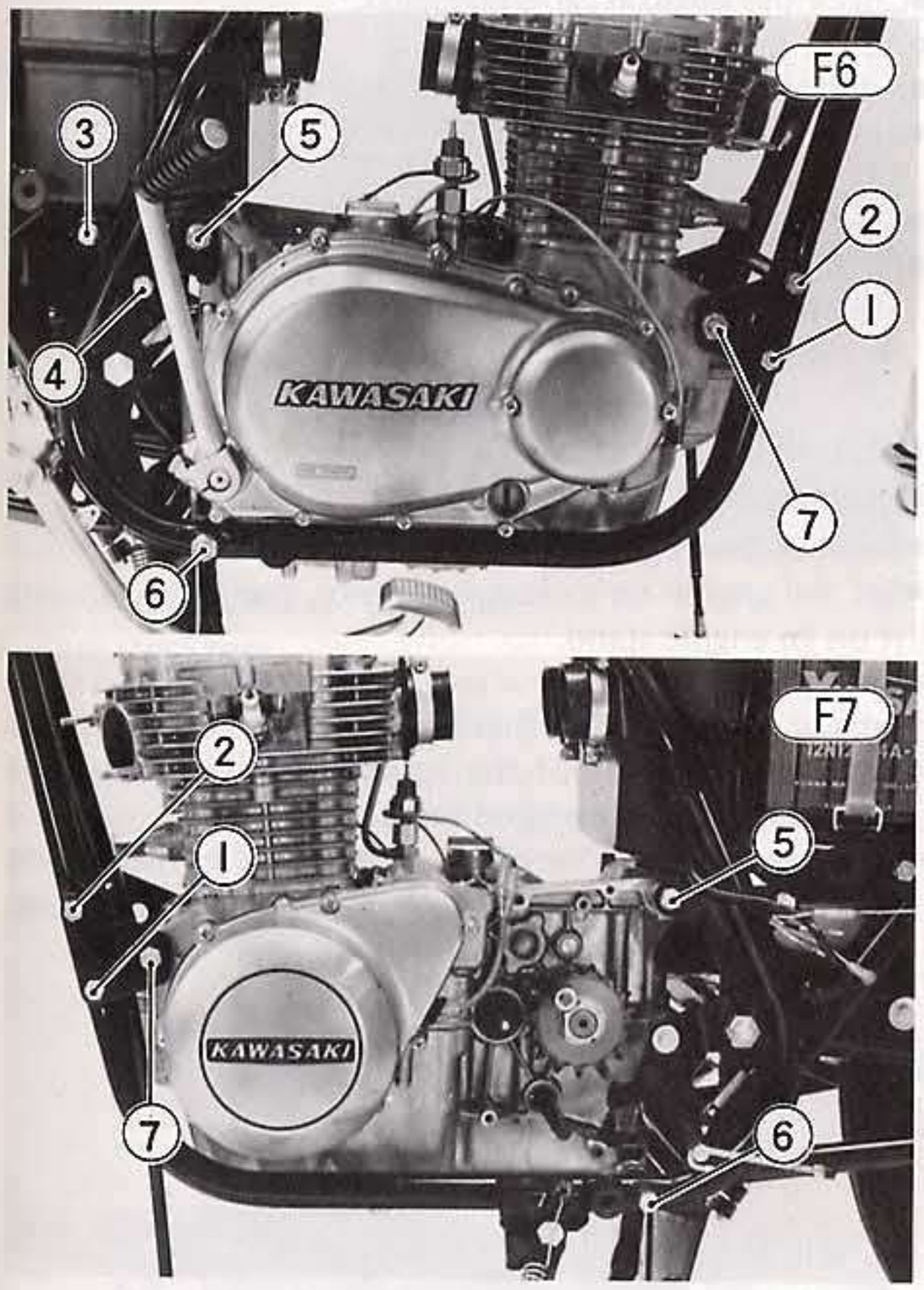
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•Remove the upper engine mounting bracket bolts (3), and take off the brackets. Each bolt has a lockwasher and nut.



A. Bolts B. Brackets

•Remove the front engine mounting bracket short bolts ① and lockwashers on each side, and remove the long bolt ② . The long bolt has a self-locking nut, lockwasher and spacer.
•Remove the rear right upper mounting bracket bolts ③, ④ and lockwashers.
•Remove the self-locking nuts and lockwashers (4 ea) off the engine mounting bolts ⑤, ⑥, ⑦.



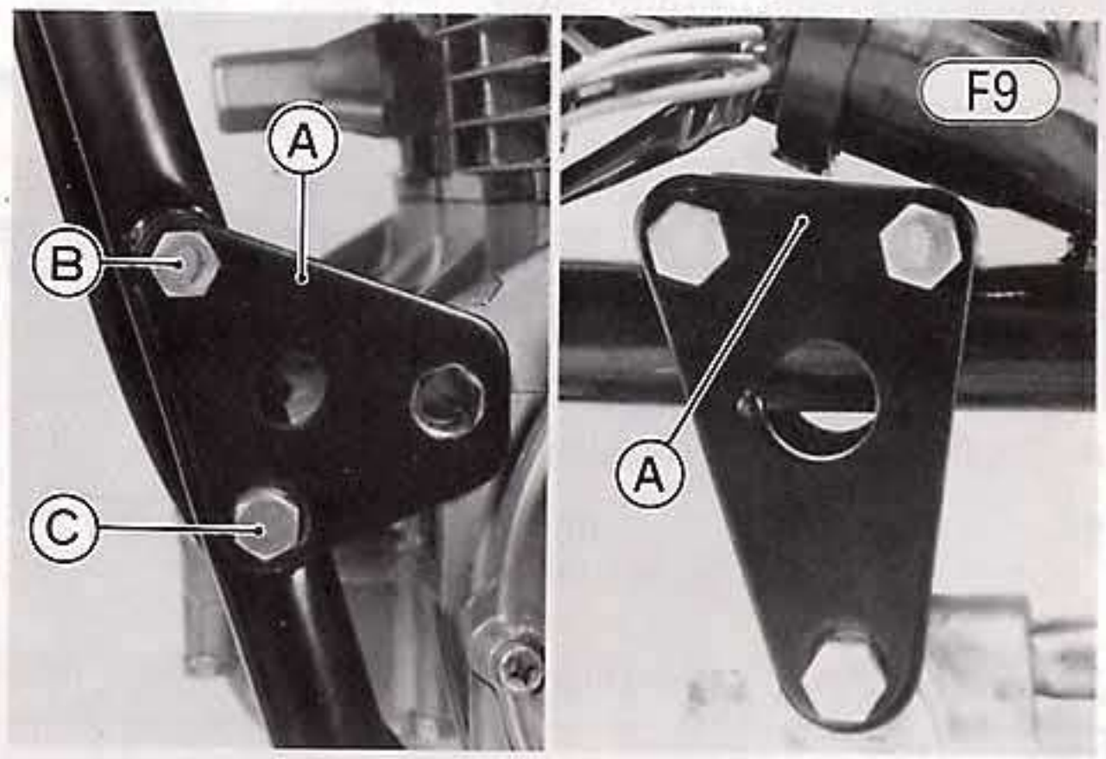
1. Front Mounting Bracket Short Bolt
2. Front Mounting Bracket Long Bolt
3. Rear Right Upper Mounting Bracket Bolt
4. Rear Right Upper Mounting Bracket Bolt
5. Rear Upper Mounting Bolt
6. Rear Lower Mounting Bolt
7. Front Mounting Bolt

•Pull off the engine mounting bolts ⑤, ⑥, ⑦. Be careful not to damage the threads upon removal. The rear upper mounting bolt has a spacer and bracket, and the rear lower mounting bolt has a spacer.
•Lift up on the front of the engine until its breather cover stops just under the frame top tube, move it to the right so that the bottom of the engine clears the frame, and pull the engine out of the frame, top first and rear last.

A. Breather Cover

Installation:

•Place the engine in the frame in the reverse of its removal.
•Loosely mount the engine mounting brackets as shown. See Table F1 for bolt identification. Each bracket bolt has a lockwasher. The front mounting bracket long bolt has a spacer, lockwasher, and self-locking nut.

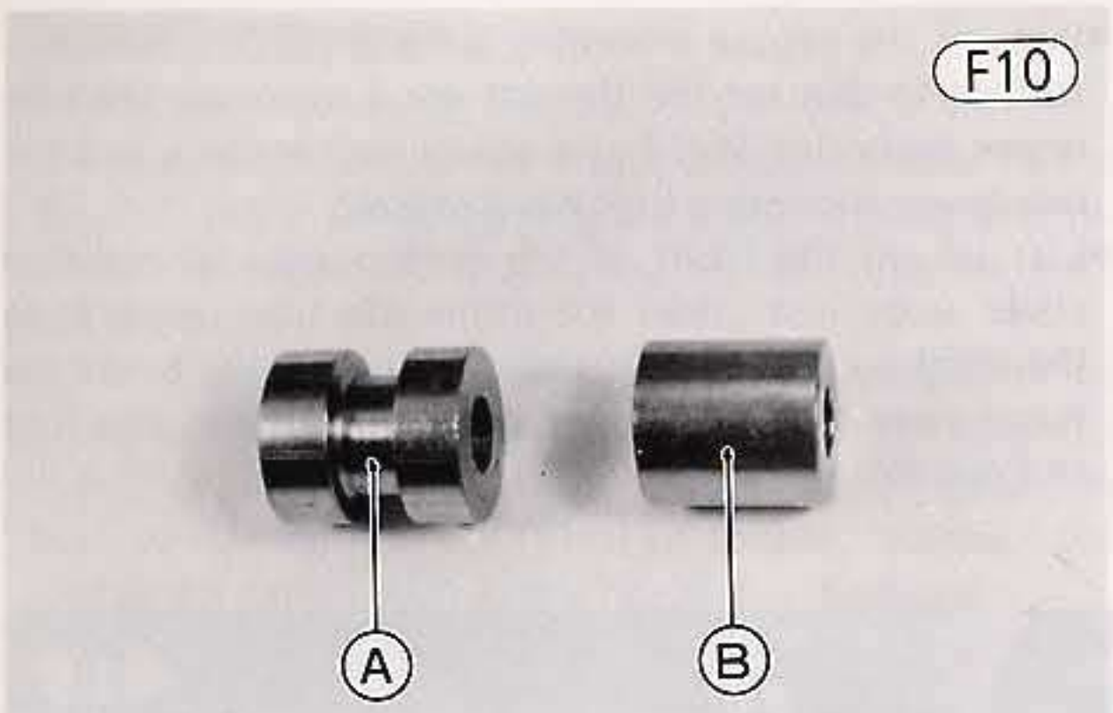


A. Mounting Bracket C. Short Bolt
B. Long Bolt

•Lifting the engine as necessary so that the engine mounting bolt threads do not get damaged, insert the engine mounting bolts to the left side of the engine, and install the lockwashers and self-locking nuts finger tight. Each rear upper and lower mounting bolt has a spacer. The spacer for the lower mounting bolt has a groove (Fig. F10).

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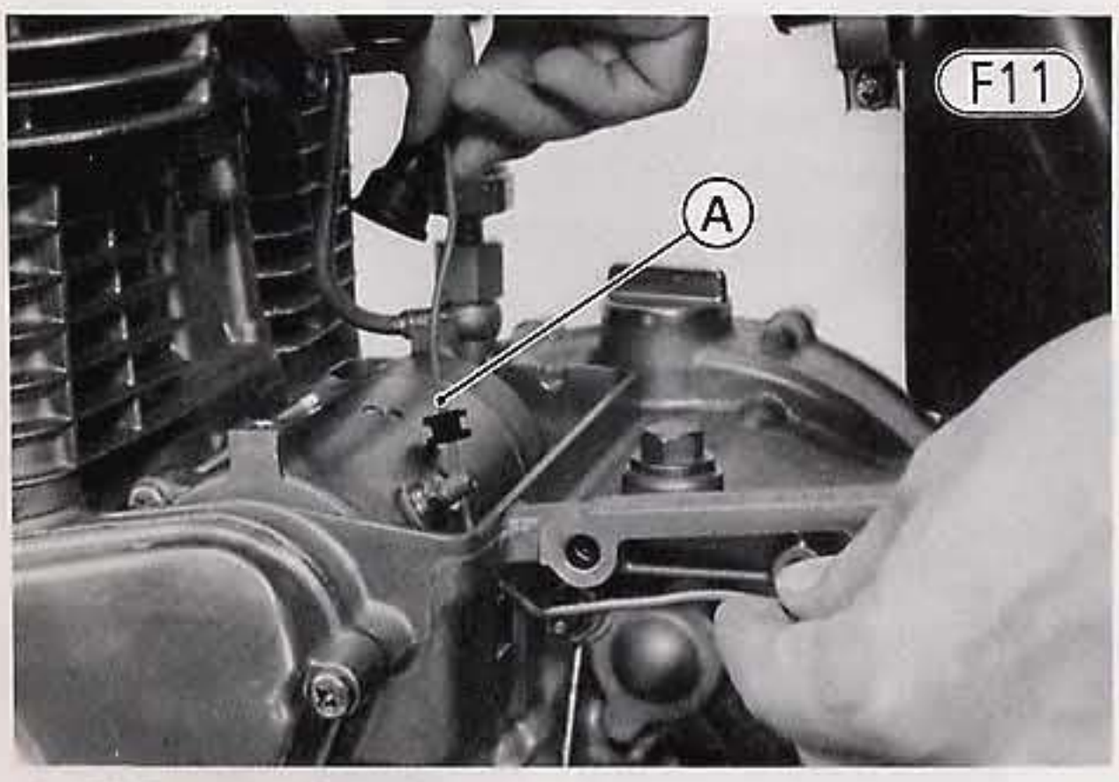


A. Lower Spacer **B. Upper Spacer**

- After engine mounting bolt insertion, first tighten the bracket mounting bolts, and then the engine mounting bolts to the torque specified in Table F1.

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.

- Turn in the rear brake pedal adjusting bolt, and install the rear brake pedal return spring.
- Install the rear brake light switch (Pg. 134).
- Install the right footpeg and lockwasher, and tighten the footpeg bolt.
- Run the oil pressure switch lead through the crankcase hole, and connect the lead to the oil pressure switch (KZ400-B).



A. Oil Pressure Switch Lead

- Run the wiring harness and the starter motor lead in front of the upper mounting bolt spacer.
- Run the starter motor lead through the crankcase hole, fit the lead to the starter motor terminal, and tighten the nut with the lockwasher. Slide the rubber cap back in place (KZ400-B).
- Install the starter motor cover with the gasket, and tighten the cover bolts (2) (KZ400-B). Each bolt has a flat washer.
- Connect the neutral switch lead to the switch.
- Connect the dynamo armature yellow leads (2).
- Install the drive chain (Pg. 119).
- Install the engine sprocket cover (Pg. 62).
- Install the muffler (Pg. 50 for KZ400-B or Pg. 51 for KZ400-C).
- Check that the gasket is in place, and connect the tachometer cable lower end to the cylinder head cover.
- Install the carburetors (Pg. 46).
- Install the ignition coil and its bracket with the bolts, running the right spark plug lead between the upper brackets.
- Connect the ignition coil leads.
- Connect the spark plug lead on each spark plug.
- Install the fuel tank (Pg. 43).
- Install the left and right side covers.
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Check the drive chain (Pg. 24).
- Check the clutch (Pg. 19).
- Check the throttle cables (Pg. 15).
- Adjust the rear brake (Pg. 27).
- Adjust the rear brake light switch (Pg. 28).
- Check the automatic side stand return mechanism (Pg. 31), and adjust if necessary.
- Check the carburetors (Pg. 16).
- If the crankshaft or front camshaft chain guide was removed, adjust the camshaft chain (Pg. 14) and valve clearance (Pg. 14).

CRANKCASE SPLIT

Disassembly:

- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Remove the engine sprocket using the following 3 steps only if the output shaft assembly is to be disassembled.

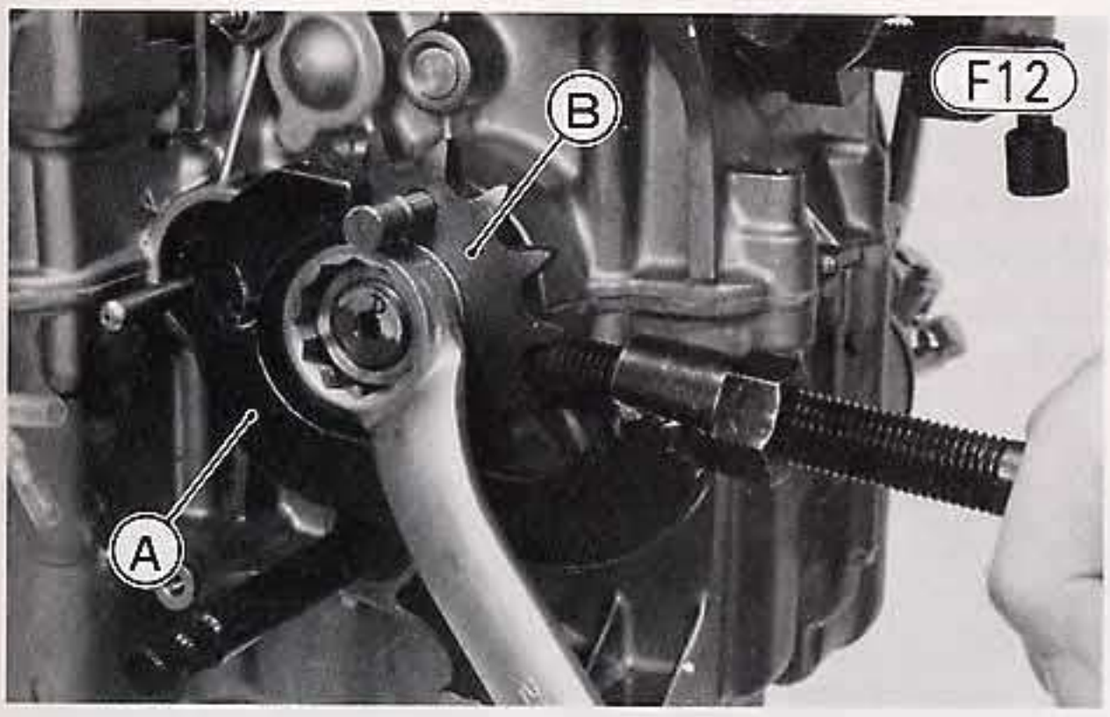
○Straighten the side of the splined washer that is bent over the side of the engine sprocket nut.

○Hold the engine sprocket steady using the engine sprocket holder (special tool), and remove the engine sprocket nut and splined washer.

Table F1 Engine Bolt Tightening Torque

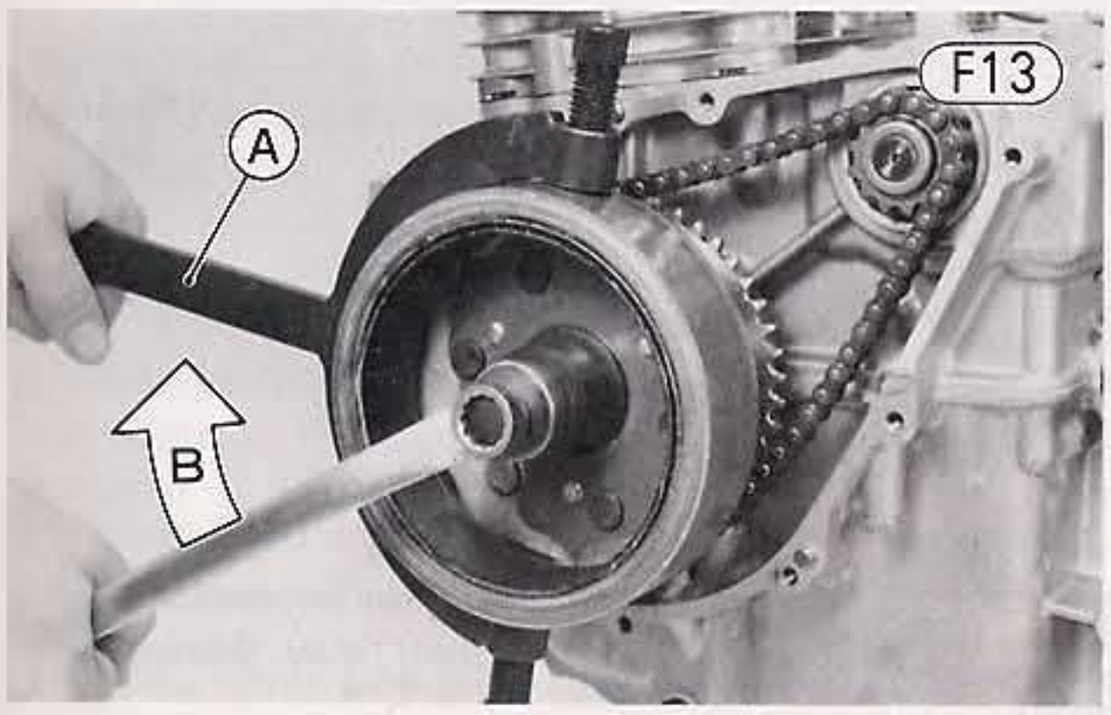
Bolt		Length	Torque
Front Bracket Bolts	Lower ① (2)	60 mm	2.4 kg-m (17.5 ft-lbs)
	Upper ②	253 mm	
Rear Right Upper Bracket Bolts	Rear ③	40 mm	
	Front ④	25 mm	
Upper Bracket Bolts (3)		55 mm	1.8 kg-m (13.0 ft-lbs)
Engine Mounting Bolts	Rear Upper ⑤	220 mm	4.0 kg-m (29 ft-lbs)
	Rear Lower ⑥	292 mm	
	Front ⑦ (2)	50 mm	

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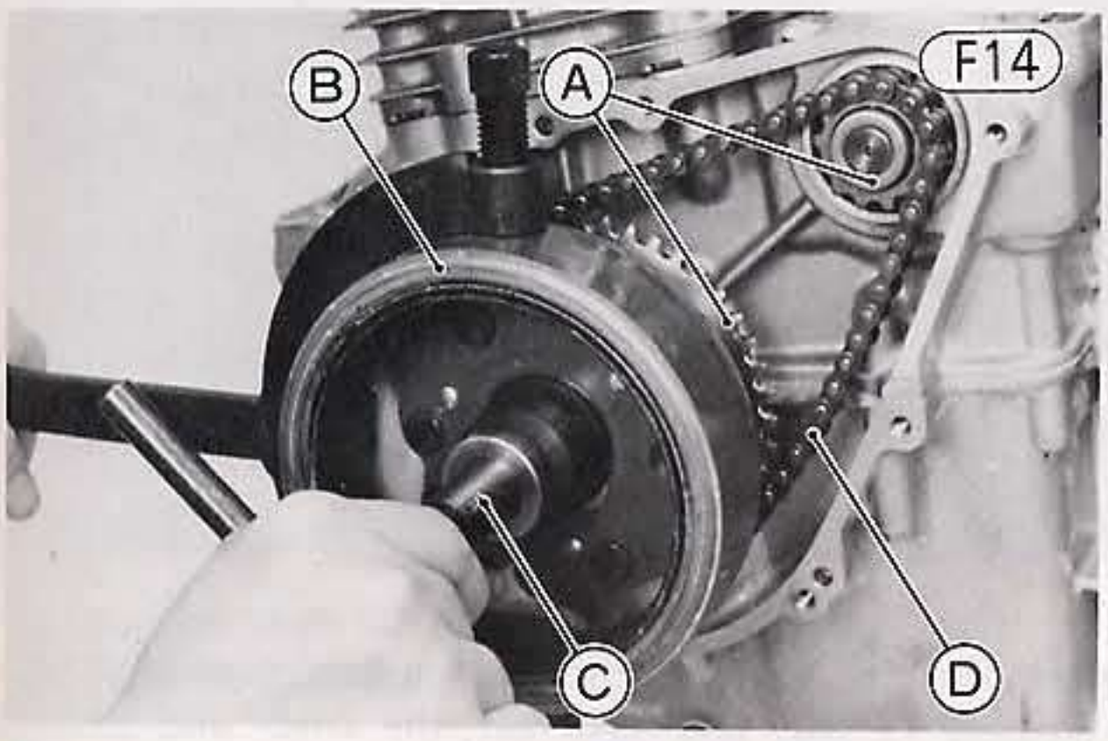
A. Engine Sprocket Holder (57001-307)
B. Engine Sprocket

○Pull off the engine sprocket and output shaft collar, and take off the O ring.
●Remove the dynamo cover screws (9), and pull off the dynamo cover, gasket, and knock pins (2).
●Remove the dynamo flywheel using the following 4 steps only if the crankshaft is to be removed.
○Hold the dynamo flywheel steady with the flywheel holder (special tool), and remove the left hand thread bolt. The bolt must be turned clockwise for removal.



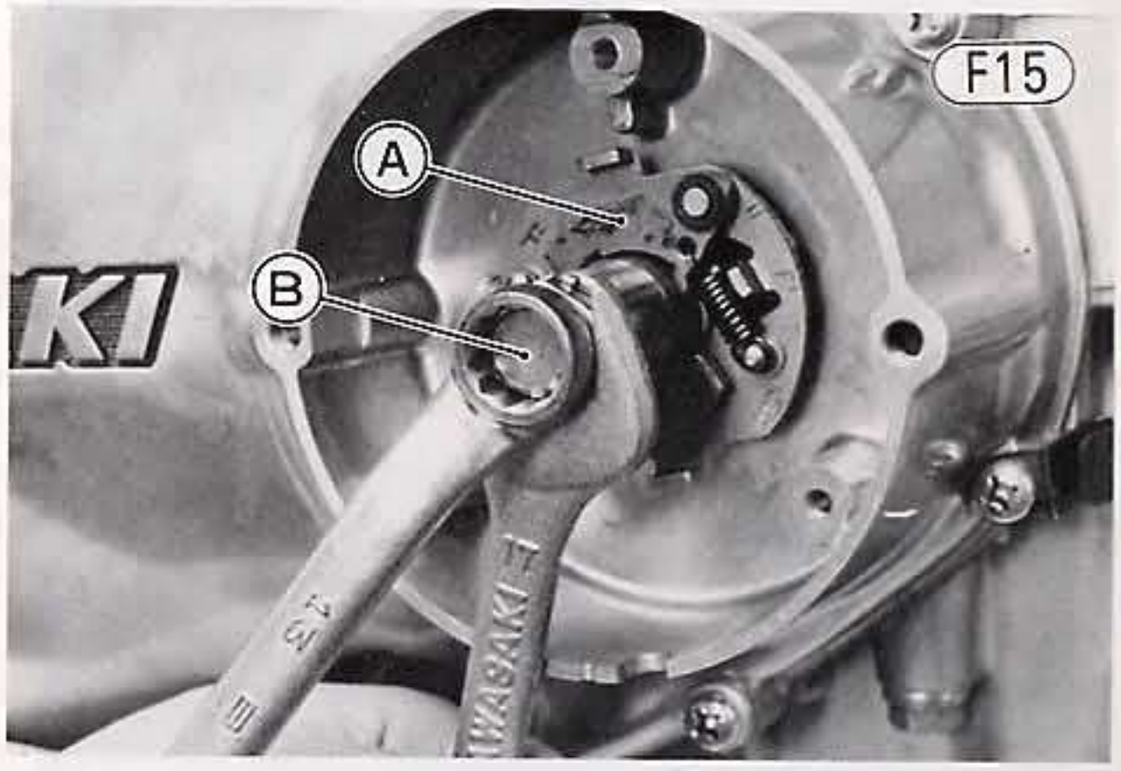
A. Flywheel Holder (57001-308)
B. Turn clockwise

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



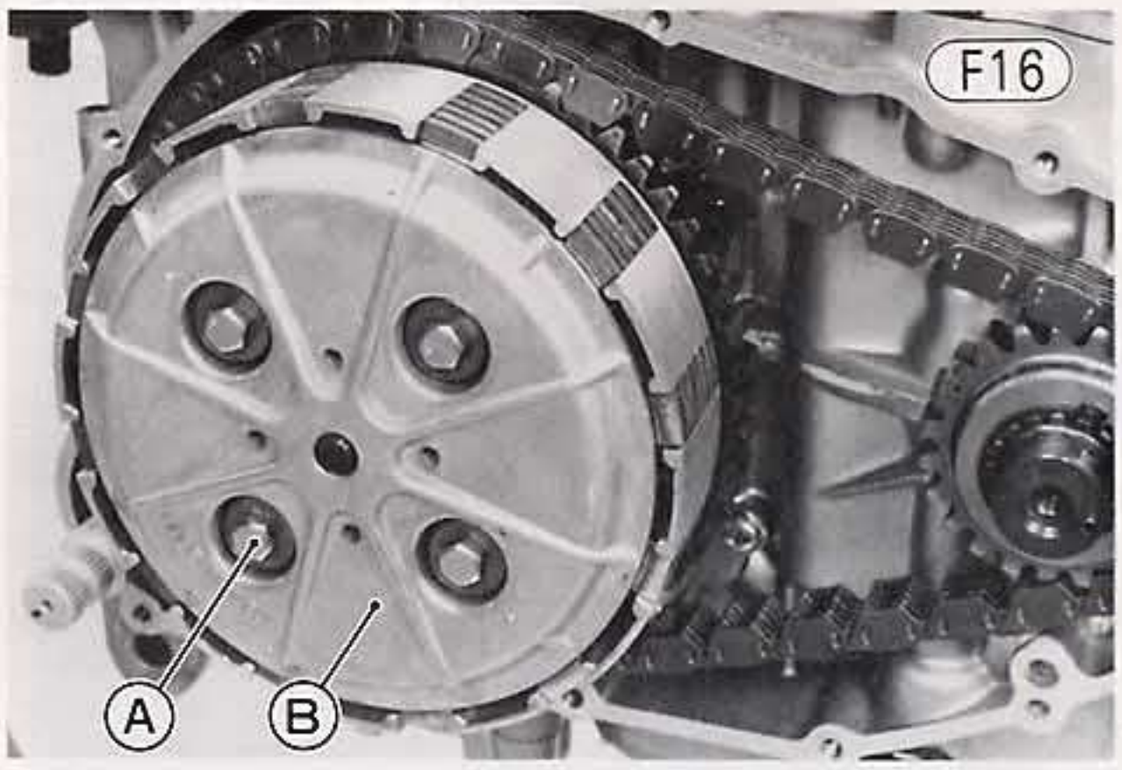
A. Sprockets
B. Flywheel
C. Rotor Puller (57001-254)
D. Starter Motor Chain

○Pull off the starter motor sprockets and chain (KZ400-B).
○Pull the collar off of the crankshaft (KZ400-C).
●Remove the contact breaker cover screws (2), and take off the cover and gasket.
●Take out the contact breaker mounting plate screws (3), and remove the plate.
●With a 17 mm wrench on the crankshaft rotation nut to keep the shaft from turning, remove the timing advancer mounting bolt, crankshaft rotation nut, and timing advancer.



A. Timing Advancer
B. Mounting Bolt

●Mark the position of the kickstarter pedal so that it can later be installed on the kick shaft in the same position.
●Take out the kickstarter pedal bolt, widen the gap in the kickstarter pedal slightly with a screwdriver, and then pull off the kickstarter pedal.
●Remove the right engine cover screws (12), and take off the cover, gasket, and knock pins (2).
●Remove the clutch spring bolts and springs (4 ea).

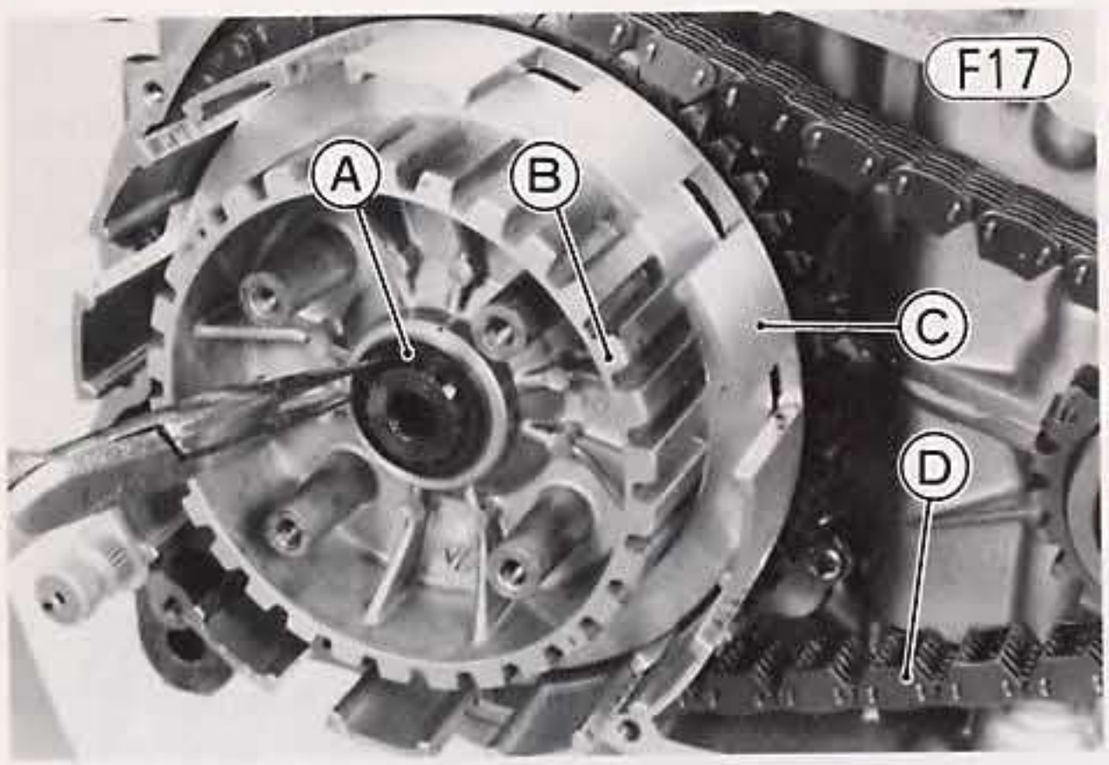


A. Clutch Spring Bolts
B. Spring Plate

●Pull off the spring plate and spring plate pusher.
●Push in on the push rod to remove the steel ball, and pull out the push rod.
●Remove the friction plates (6) and steel plates (5).

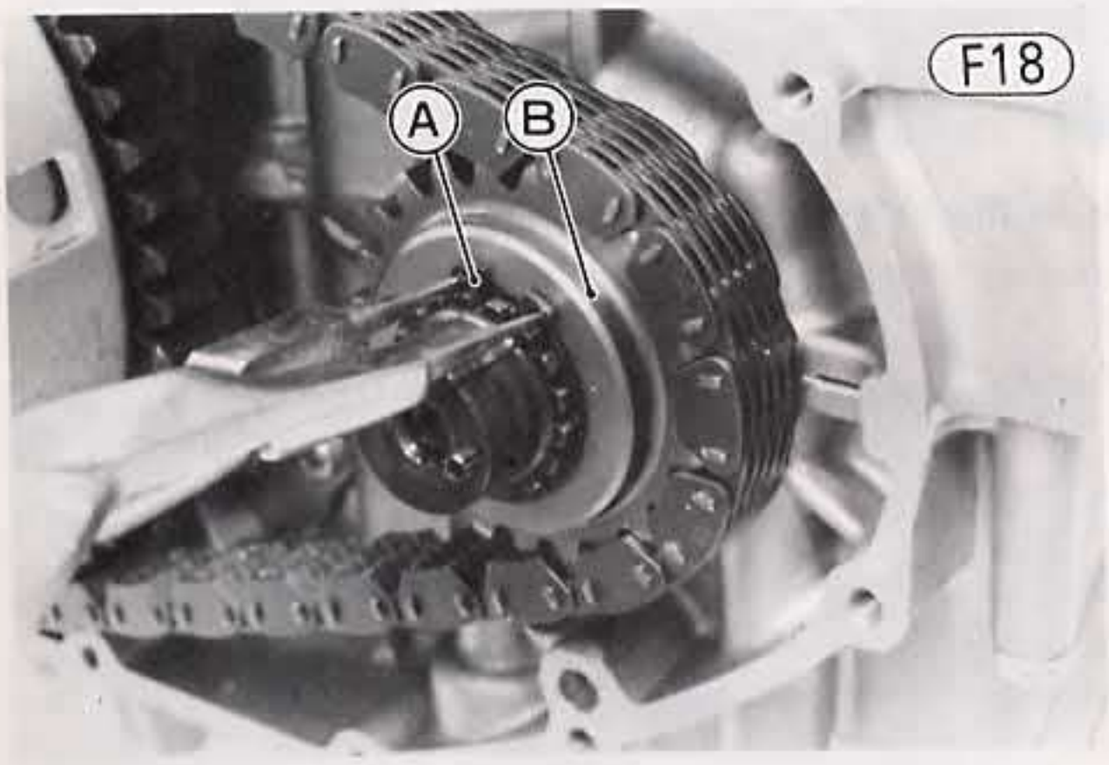
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- Remove the circlip and shim(s), and pull off the clutch hub and thrust washer.



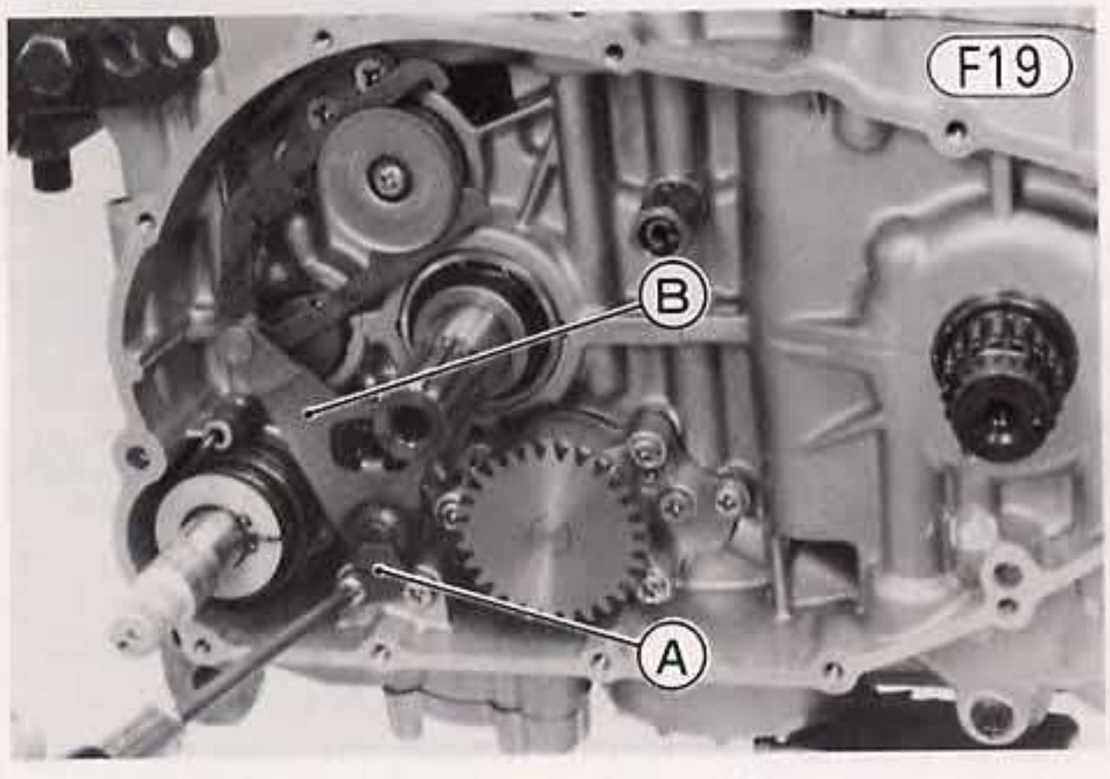
A. Circlip **C. Clutch Housing**
B. Clutch Hub **D. Primary Chain**

- Remove the primary sprocket circlip.



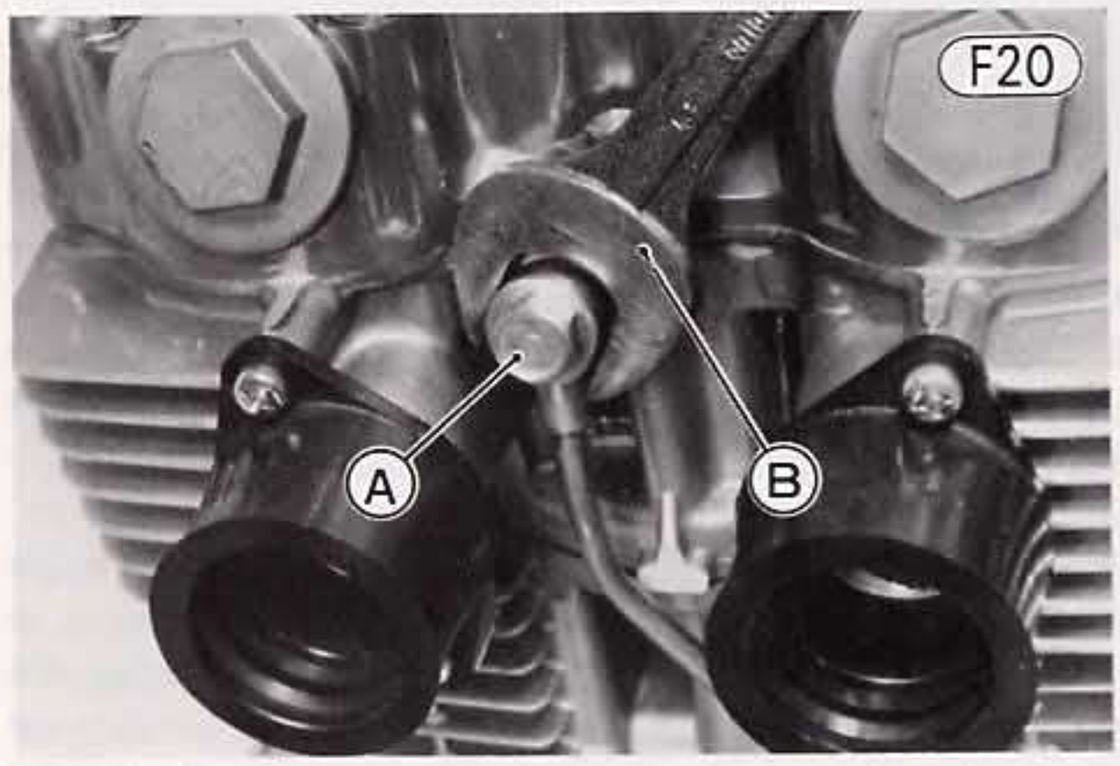
A. Circlip **B. Primary Sprocket**

- Pull off the clutch housing, primary sprocket, and primary chain together.
- Remove the external shift mechanism stop screws (2), and take off the stop.



A. Shift Mechanism Stop
B. External Shift Mechanism

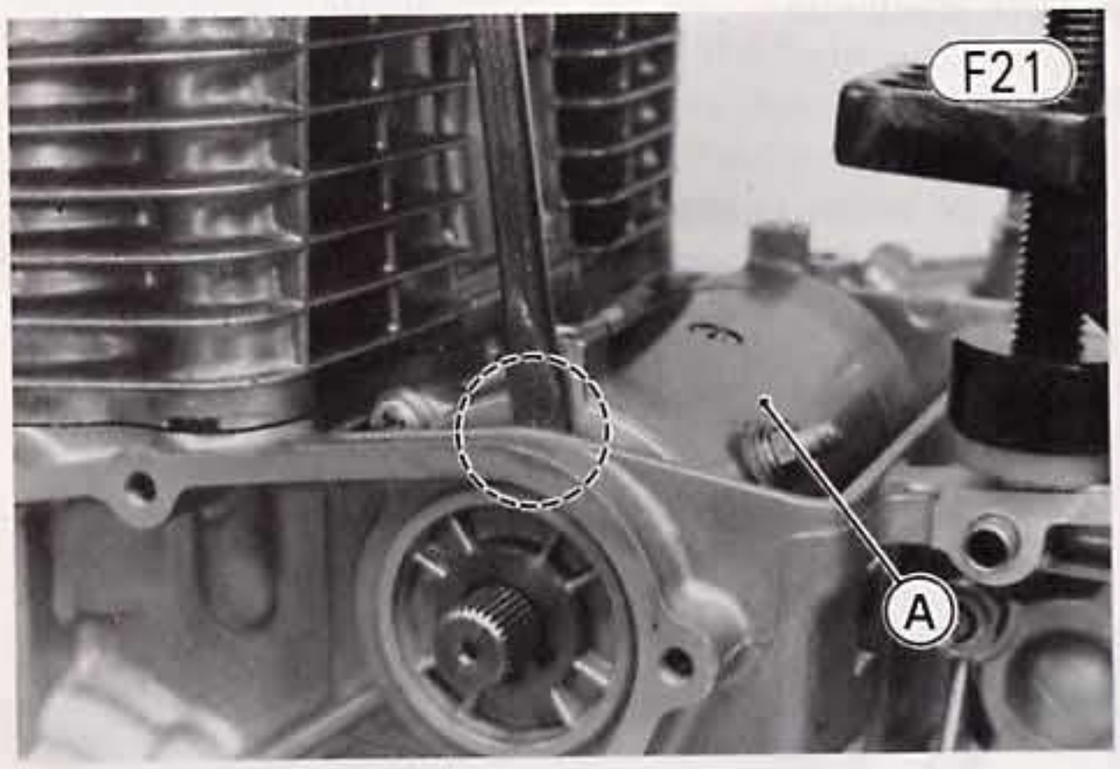
- Move the external shift mechanism arm and overshift limiter out of their positions on the end of the shift drum, and pull out the external shift mechanism.
- Using a wrench to hold the upper end of the oil pipe, remove the banjo bolt to disconnect the oil pipe upper end from the cylinder head. The banjo bolt has two washers.



A. Banjo Bolt **B. Wrench**

- Remove the oil pressure switch from the long-hex-head bolt, and unscrew the long-hex-head bolt (KZ400-B) or banjo bolt (KZ400-C), and take off oil pipe. There is a washer on each side of the fitting.
- Remove the starter motor retaining bolts (2) (KZ400-B).
- Pry the starter motor loose from the crankcase with a screwdriver, slide the starter motor off towards the right side of the engine, and then lift it upwards (KZ400-B).

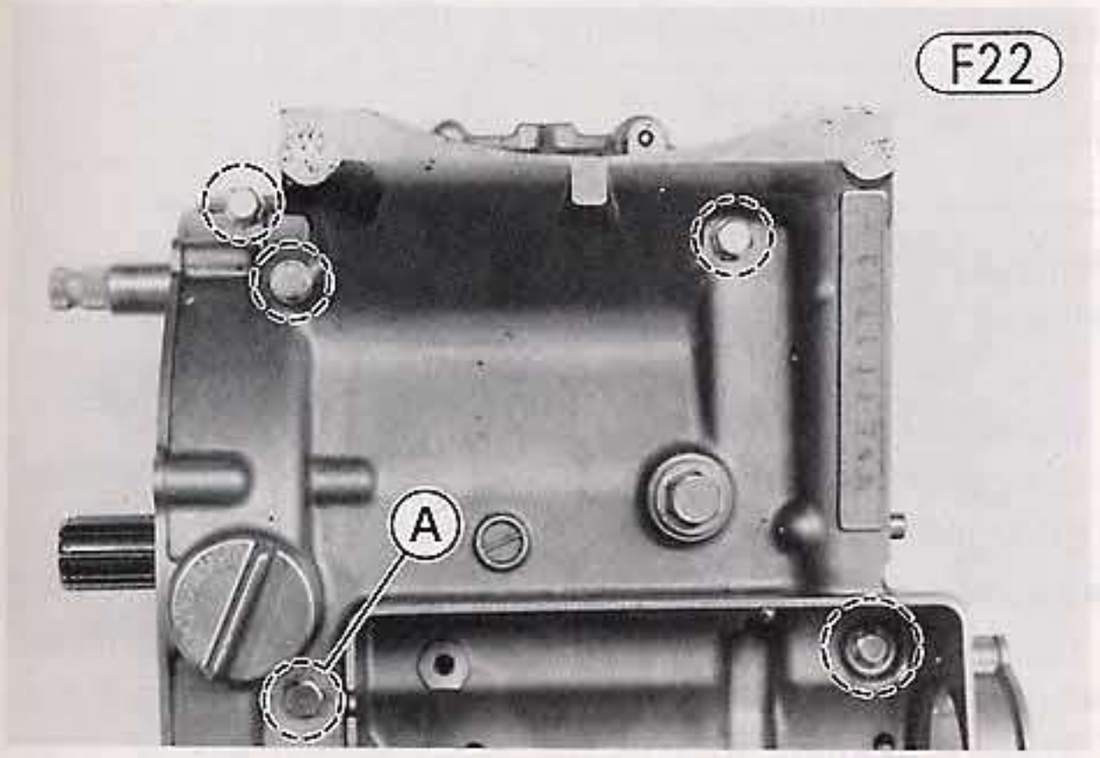
CAUTION **Do not tap on the starter motor shaft. Tapping on the shaft may damage the motor.**



A. Starter Motor

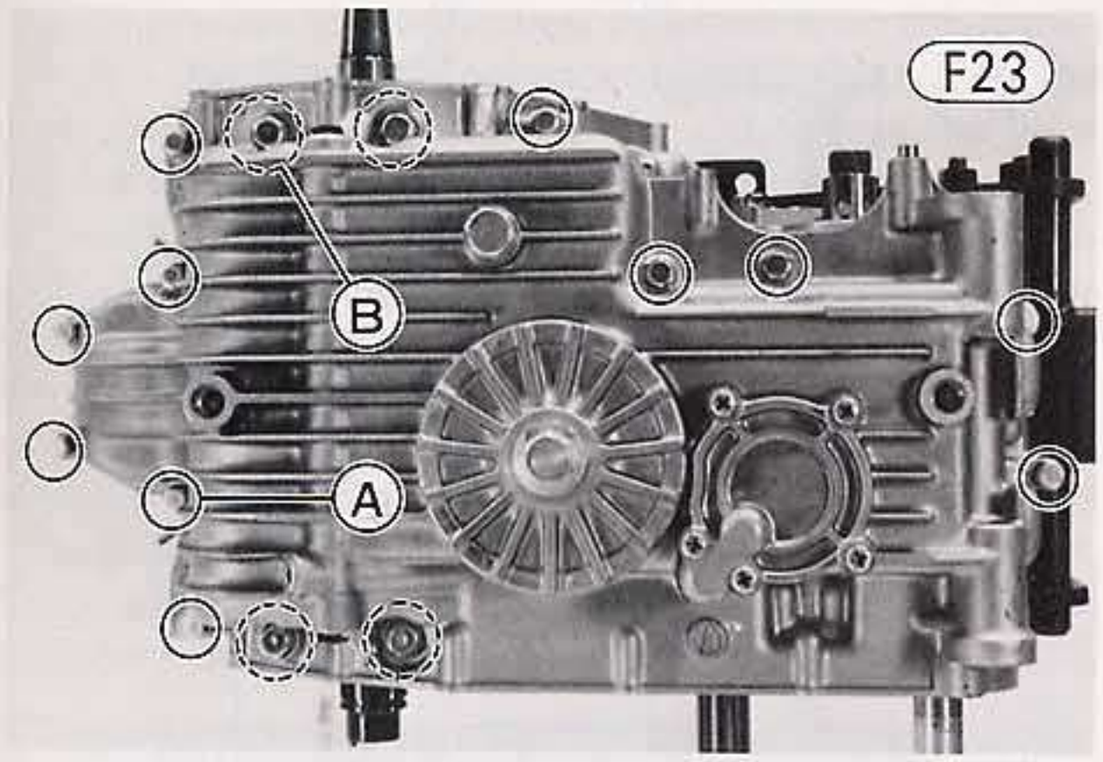
- Remove the starter motor cover cap nuts and flat washers (2 ea), and take off the cover and gasket (KZ400-C).
- Remove the upper crankcase half bolts (5).

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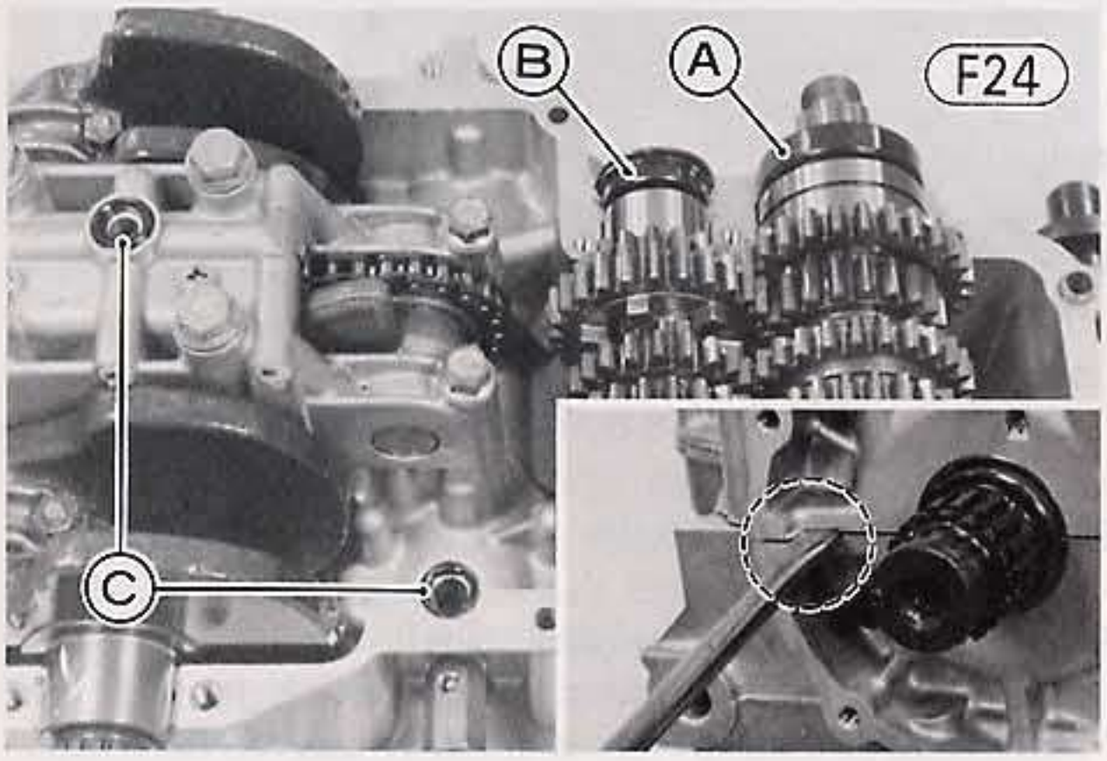
A. Upper Crankcase Half Bolts

- Turn the engine upside down.
- Remove the 6 mm lower crankcase half bolts (11) and the 8 mm bolts (4).



A. 6 mm Bolts **B. 8 mm Bolts**

- Pry the three points to split the two crankcase halves apart, and lift off the lower crankcase half.
- Remove the circlip, oil seals (2), and oil passage **O** rings (2).



A. Output Shaft Oil Seal **C. "O" Ring**
B. Push Rod Oil Seal

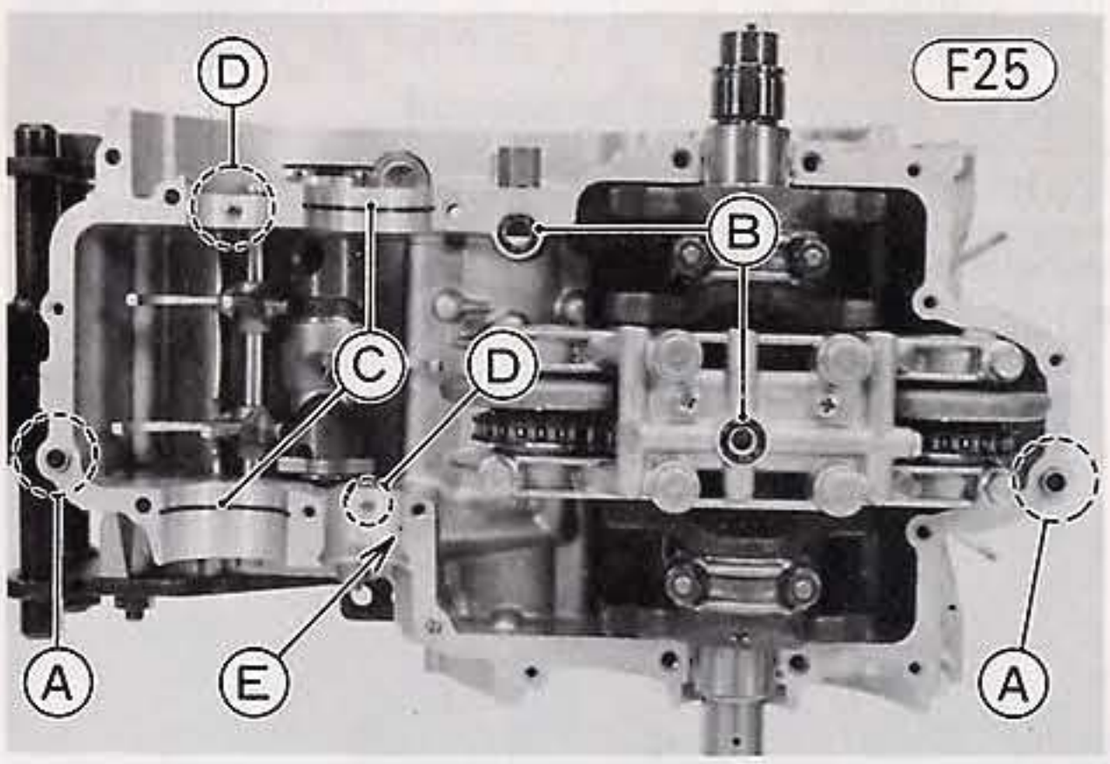
- Remove the drive shaft and output shaft assembly.

Assembly:

NOTE: The upper crankcase half, the lower crankcase half, and the crankshaft main bearing cap are machined at the factory in the assembled state, so the crankcase halves and main bearing cap must be replaced together as a set.

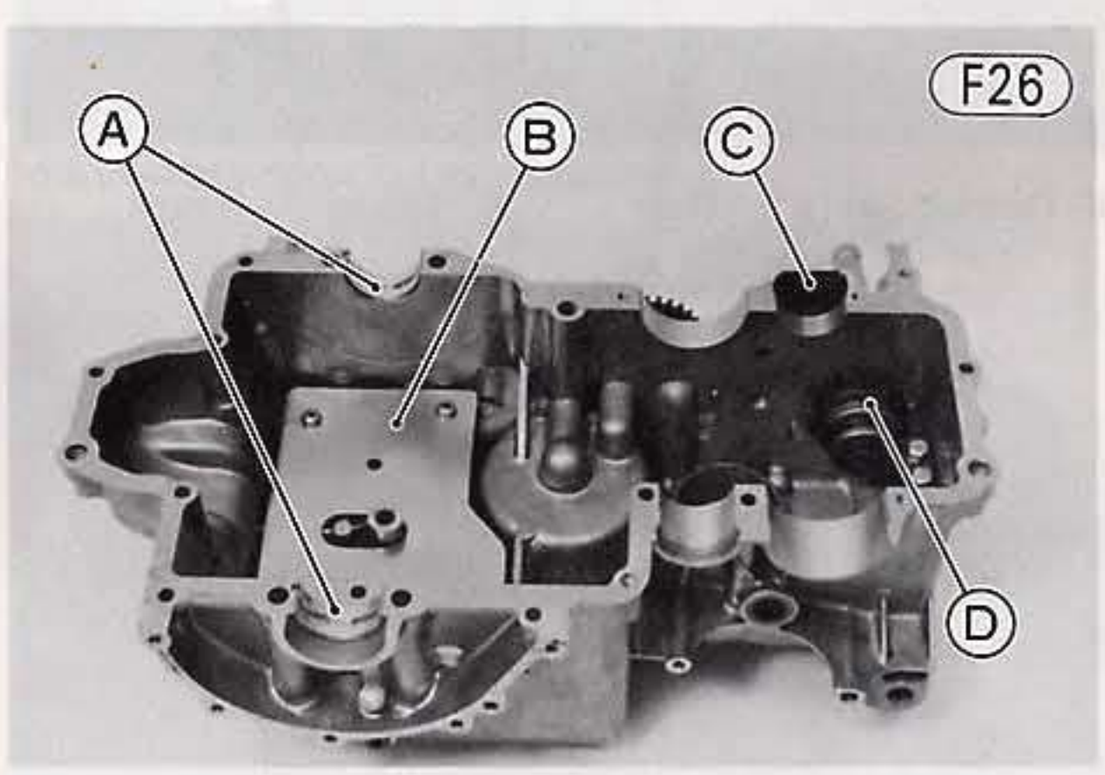
- With a high flash-point solvent, clean off the mating surfaces of the crankcases halves and wipe dry.
- Check to see that the following parts are in place on both the upper crankcase half and the lower crankcase half, and blow the oil passages clean with compressed air. Check that the drive and output shaft set pins (2) protrude 1.7 ~ 2.5 mm from their bearing housings. The flat side of each oil passage **O** ring must face to the upper crankcase half or main bearing cap.

Upper crankcase half:
Knock pins (2); oil passage **O** rings (2) (use a new one if deteriorated or damaged); oil passage nozzle; drive shaft and output shaft set rings (2); and drive shaft and output shaft set pins (2).



A. Knock Pin **C. Set Rings** **E. Nozzle**
B. "O" Rings **D. Set Pin**

Lower crankcase half:
Crankshaft bearing inserts (2); output shaft oil receiver; kick shaft assembly; and sump plate.
NOTE: When installing the sump plate, apply a non-permanent locking agent to the sump plate screws.

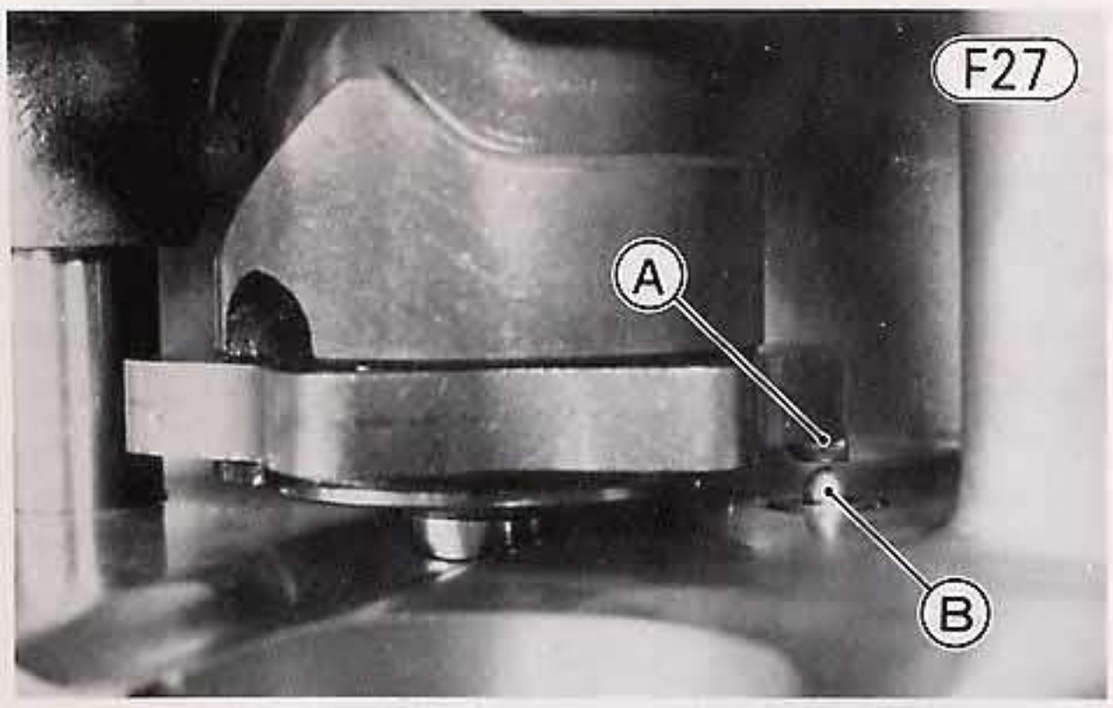


A. Bearing Inserts **C. Oil Receiver**
B. Sump Plate **D. Kick Shaft Assembly**

- Check that the crankshaft main bearing cap is tightened to the correct amount of torque (Pg. 37).

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•To set the shift drum in neutral position, turn the shift drum so that the projection on the operating plate contacts with the neutral switch pin (Fig. F27).

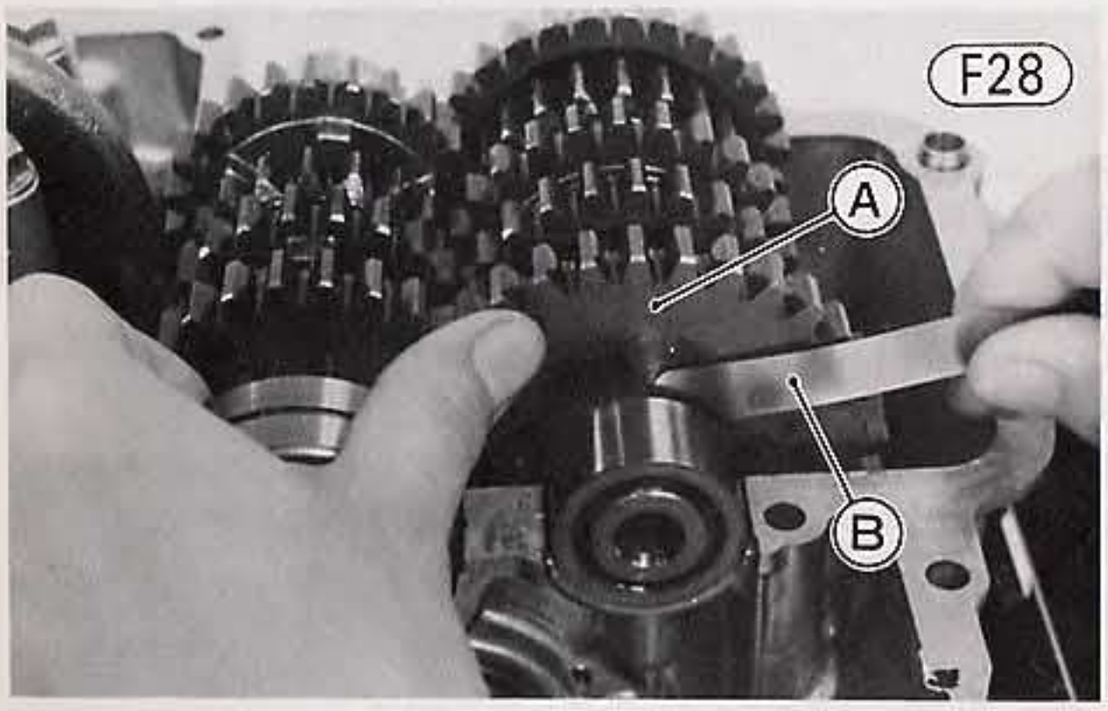


A. Projection **B. Neutral Switch Pin**

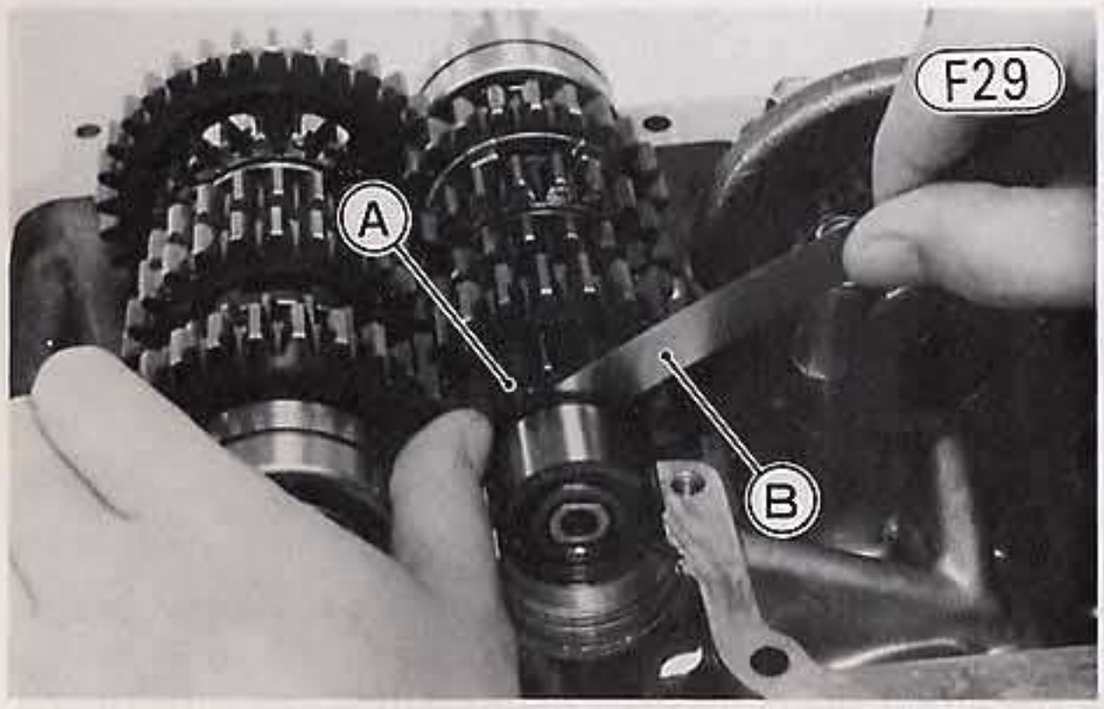
•Fit the output and drive shaft assemblies on the upper crankcase half. When installing output and drive shafts, the crankcase set pins must go into the holes in the needle bearing outer races, and the set rings must fit into the grooves in each ball bearing.

CAUTION **Make sure the crankcase set pins are properly aligned to avoid damage to the crankcases upon installation.**

•Check that the side clearance of the output shaft 1st gear and side clearance of the drive shaft 2nd gear are within the standard value. If the clearance exceeds the standard value, add the washer (0.5 mm thickness). Side clearance for the output shaft 1st gear of KZ400-C need not be adjusted.



A. Output Shaft 1st Gear **B. Thickness Gauge**



A. Drive Shaft 2nd Gear **B. Thickness Gauge**

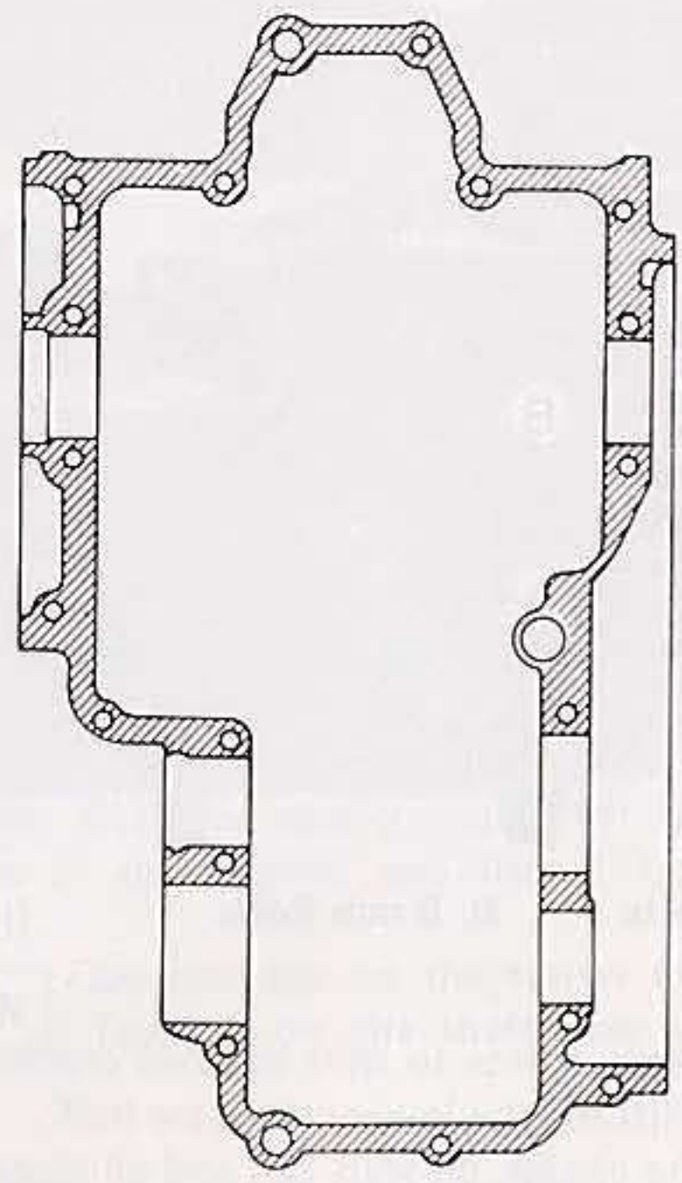
Table F2 Side Clearance

Standard
under 0.5 mm

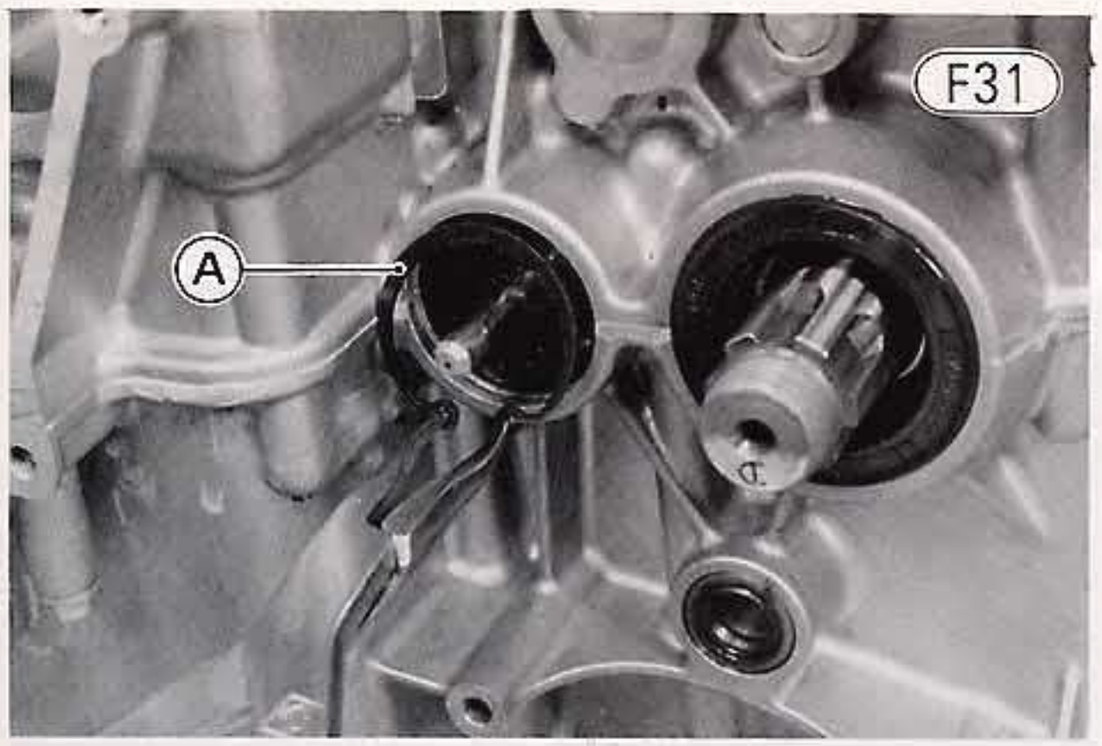
•Install the oil seal next to the output shaft ball bearing.
•Install the clutch push rod oil seal next to the drive shaft needle bearing, and insert the push rod through the oil seal and into the drive shaft, applying a high temperature grease to the push rod. The ridge on the oil seal must fit in its crankcase groove.
•Apply a little engine oil to the transmission gears, ball bearings, crankshaft bearing inserts, and shift forks.
•Apply a liquid gasket to the mating surface of the lower crankcase half in the areas shown in Fig. F30.

CAUTION **If liquid gasket adheres to any areas not indicated, the engine oil passages may be obstructed, causing engine seizure.**

Liquid Gasket Applied Area F30



•Fit the lower crankcase half on the upper crankcase half. Be careful that the oil seals do not slip out of place.
•Install and lightly tighten the lower crankcase half 8 mm bolts (4) and 6 mm bolts (11).
•Tighten the 8 mm bolts first about 1.5 kg-m (11.0 ft-lbs) of torque, following the tightening sequence numbers on the lower crankcase half, and then tighten them to 2.5 kg-m (18.0 ft-lbs) of torque in the same sequence.
•Tighten the 6 mm bolts to 1.0 kg-m (87 in-lbs) of torque.
•Check to see that the drive shaft and output shaft turn freely, and, spinning the output shaft, shift the transmission through all gears to make certain there is no binding and that all gears shift properly.
•Turn the engine upside down.
•Tighten the upper crankcase half bolts (5) to 1.0 kg-m (87 in-lbs) of torque.
•Install the circlip next to the push rod oil seal.

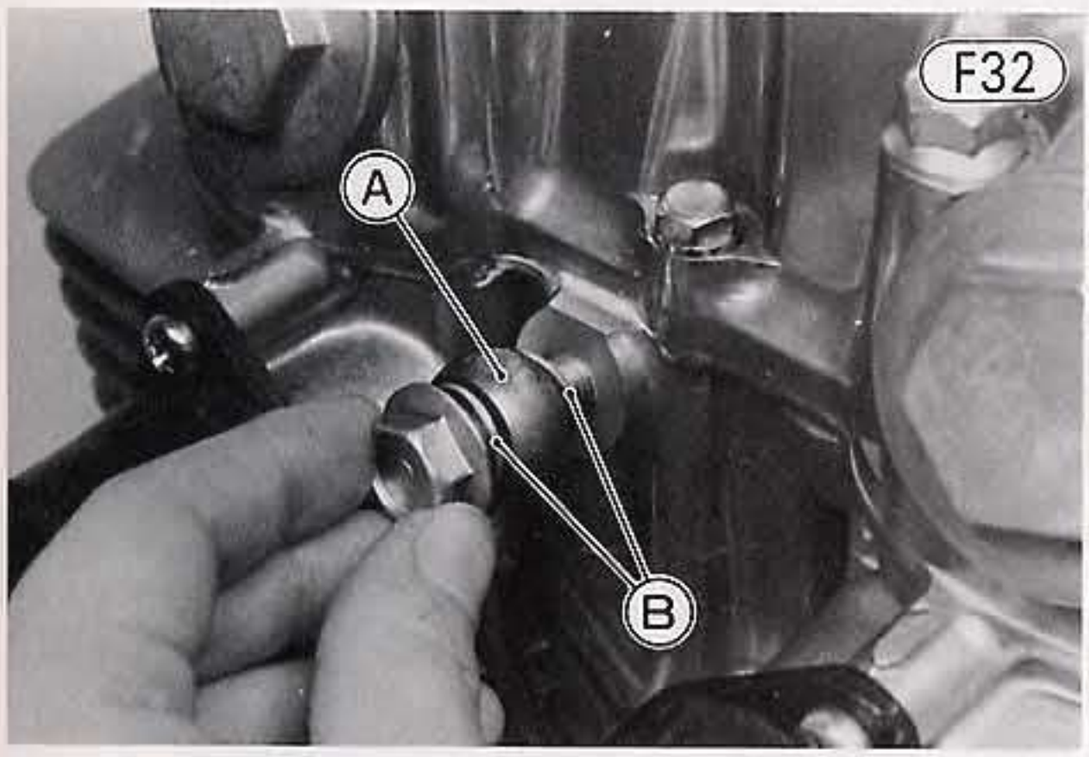


A. Circlip

- Install the starter motor cover and gasket, and tighten the cover cap nuts with the flat washers (2 ea) (KZ400-C).
- Clean the starter motor lugs and crankcase where the starter motor is ground (KZ400-B).
- Apply a little oil to the **O** ring and install the starter motor, fitting the shaft through the sprocket with the chain is place if the dynamo flywheel is on the crankshaft. Apply a non-permanent locking agent to the starter motor retaining bolts (2), and tighten the bolts to 1.0 kg-m (87 in-lbs) of torque (KZ400-B).
- Check the oil pipe, and replace it if it is bent or damage.

CAUTION **Do not use a bent or damaged oil pipe, as it may cause serious engine damage.**

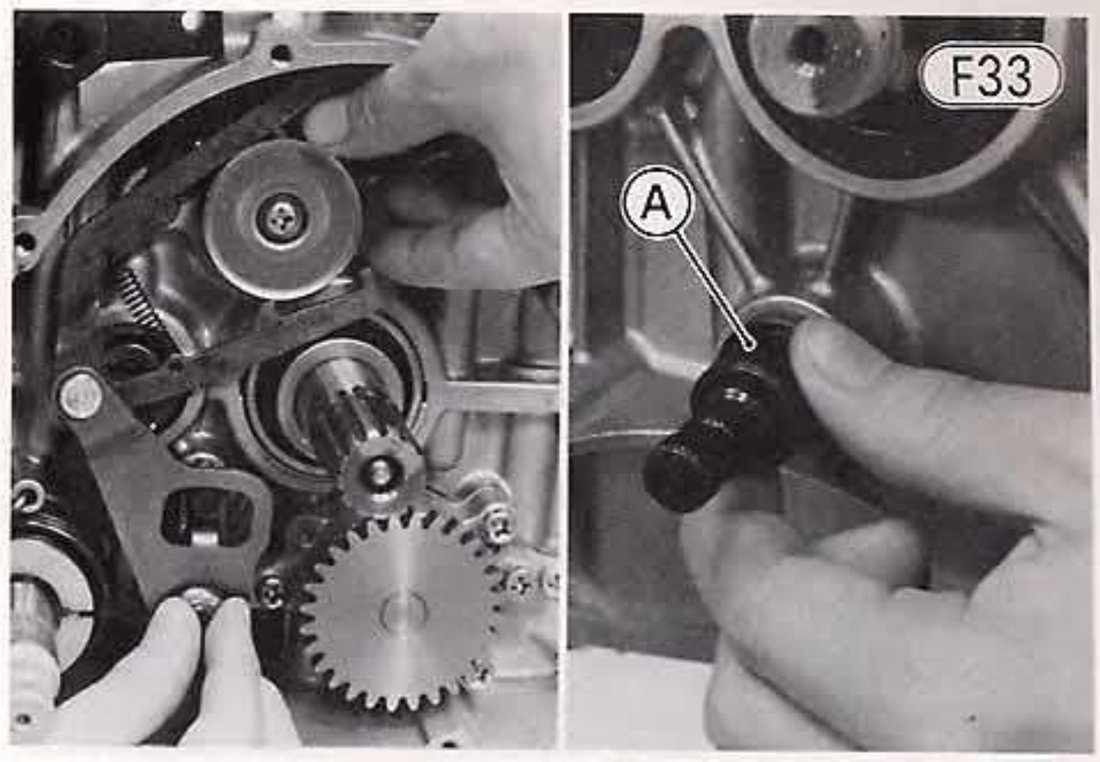
- With compressed air, blow out the oil passage to remove dirt or particles which may obstruct oil flow.
- Install the oil pipe with the long-hex-head bolt and banjo bolt(s) finger tight. Each bolt has two wahsers, one on each side of the fitting. Discard the old washers, and use new washers.



A. Fitting **B. New Washers**

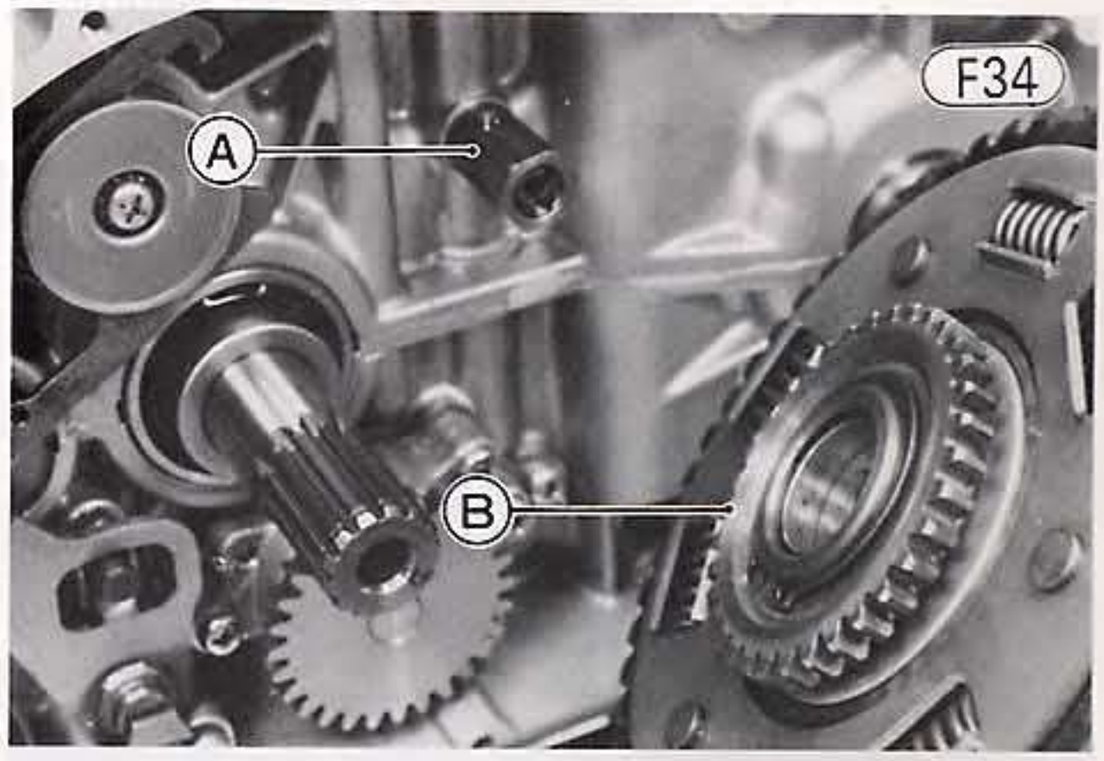
- Using a wrench to hold the end of the oil pipe, tighten the long-hex-head and oil pipe banjo bolts to 2.0 kg-m (14.5 ft-lbs) of torque.
- Install the oil pressure switch tightening it to 1.5 kg-m (11.0 ft-lbs) of torque (KZ400-B).
- Check that the external shift mechanism return spring pin is not loose. If it is loose, remove it, apply non-permanent locking agent to the threads, and tighten the pin.
- Check that the return spring is properly fitted on the shaft (Fig. E133 on Pg. 76) and that the pawl spring is on the two arms.

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



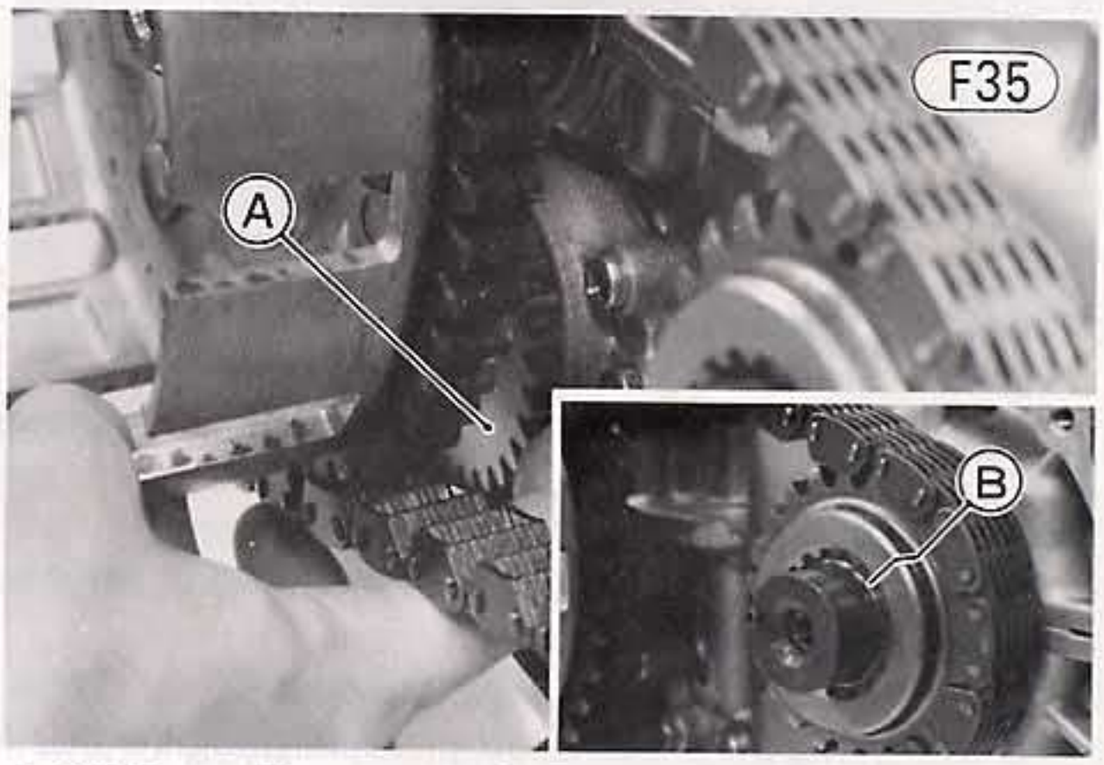
A. Shift Shaft Oil Seal Guide (57001-264)

- Install the external shift mechanism stop. Apply a non-permanent locking agent to the stop screws (2), and tighten the screws.
- Check that the oil pump drive gear is installed, and the oil pressure relief valve is installed.



A. Oil Pressure Relief Valve
B. Oil Pump Drive Gear

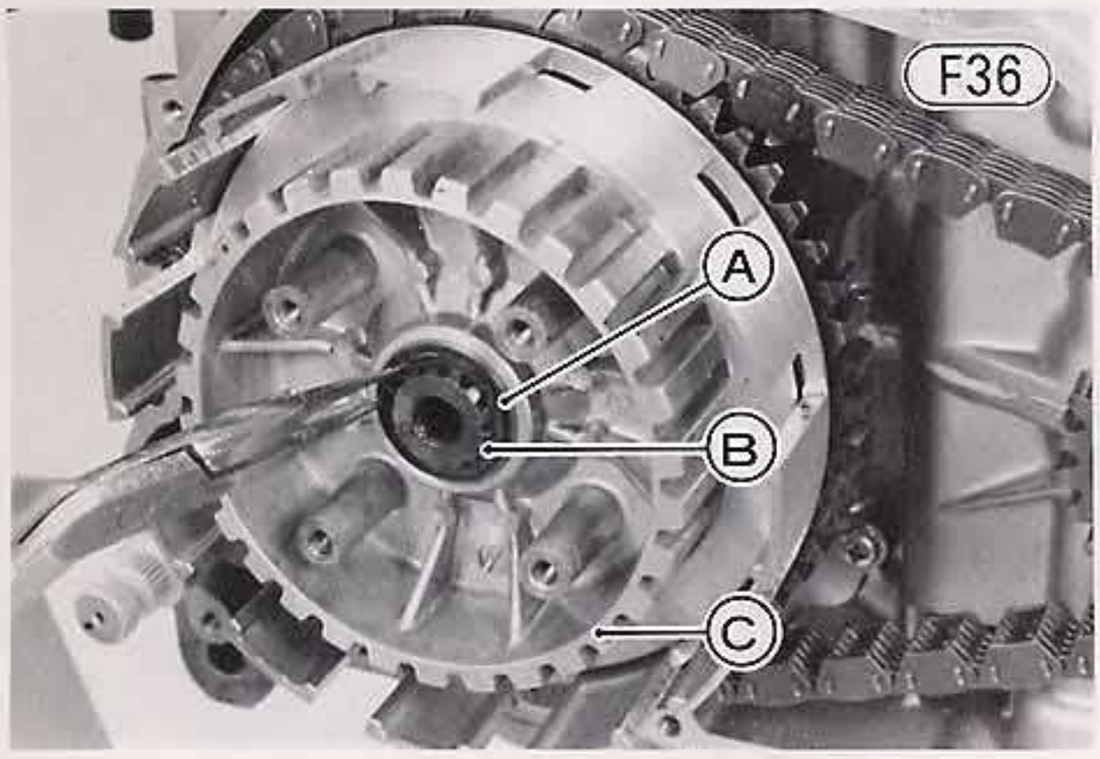
- Assemble the clutch housing, primary sprocket, and primary chain, and install them while turning the oil pump gear by hand so that the oil pump gear will mesh with the oil pump drive gear. The protruding side of the primary sprocket must face out.



A. Oil Pump Gear **B. Protruding Side**

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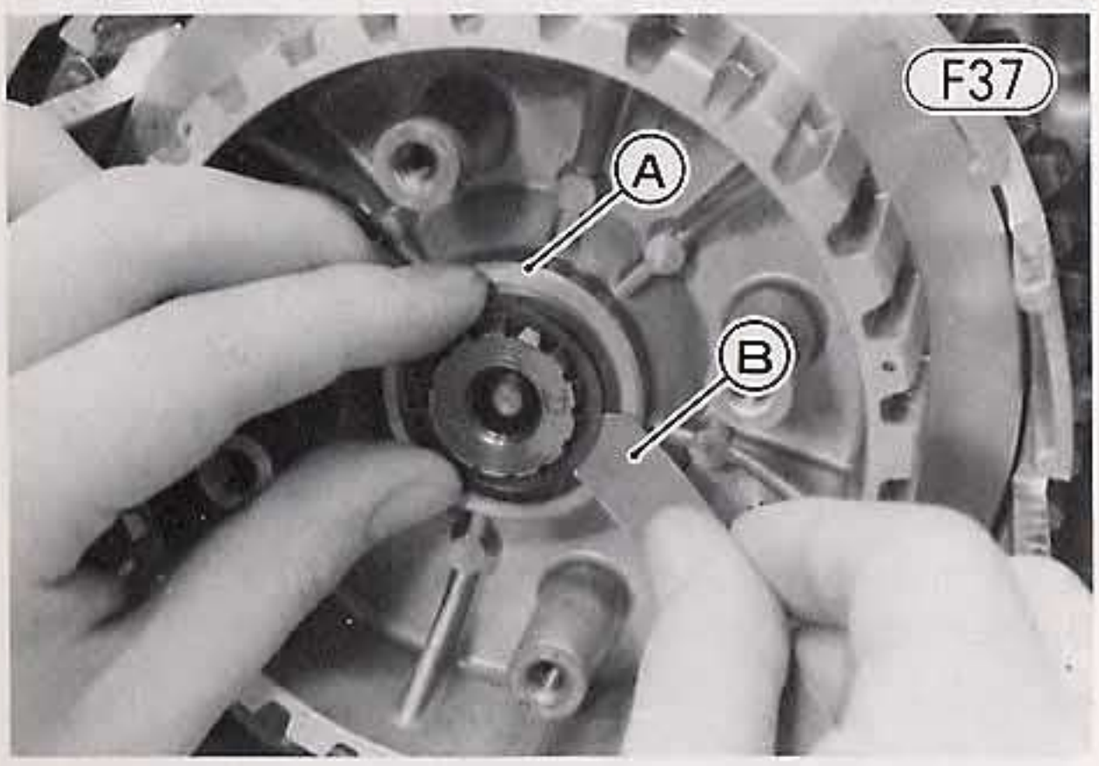
- Install the primary sprocket circlip.
- Install the thrust washer, clutch hub, shim(s), and circlip.



A. Shim(s) B. Circlip C. Clutch Hub

- Insert a thickness gauge between the circlip and the shim, and measure the side clearance of the clutch hub. If the clearance is incorrect, replace the present shim(s) with new one(s) and/or add more shim(s) to give the proper clearance.

NOTE: Shims are available in 0.3 and 0.5 mm sizes.



A. Clutch Hub B. Thickness Gauge

Table F3 Clutch Hub Side Clearance

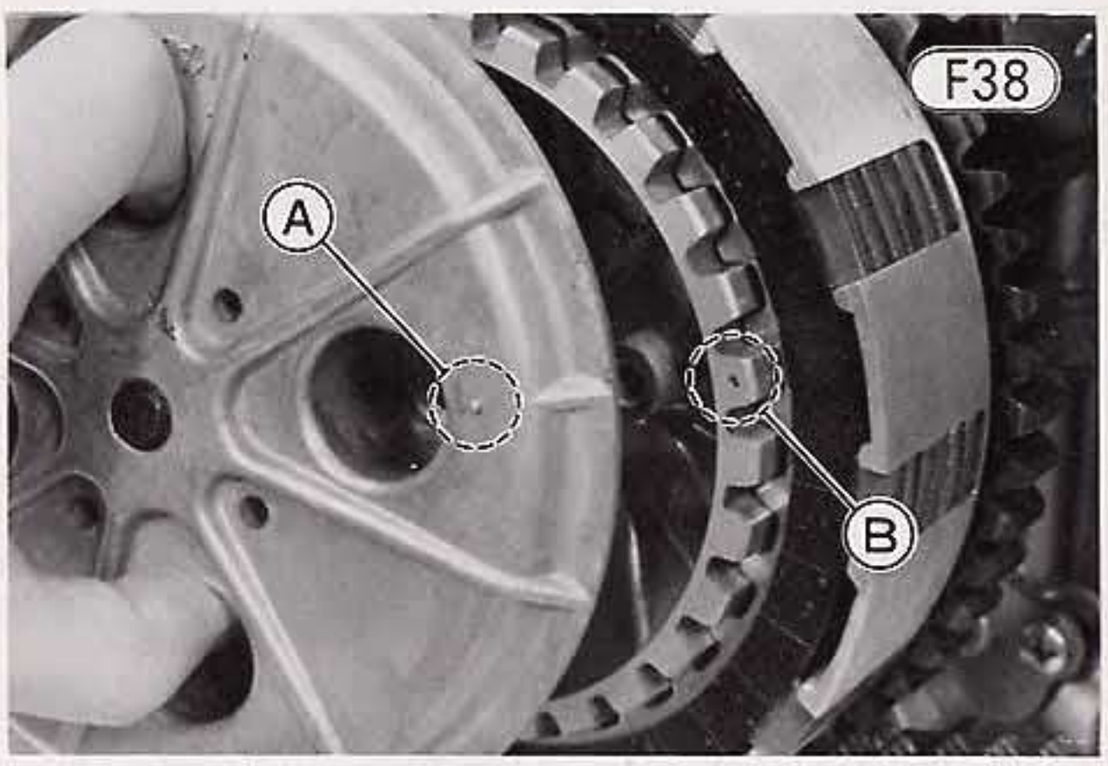
Standard
under 0.3 mm

- Install the friction plates (6) and steel plates (5), starting with a friction plate and alternating them.

CAUTION **If new dry steel plates and friction plates are installed, apply engine oil on the surfaces of each plate to avoid clutch plate seizure.**

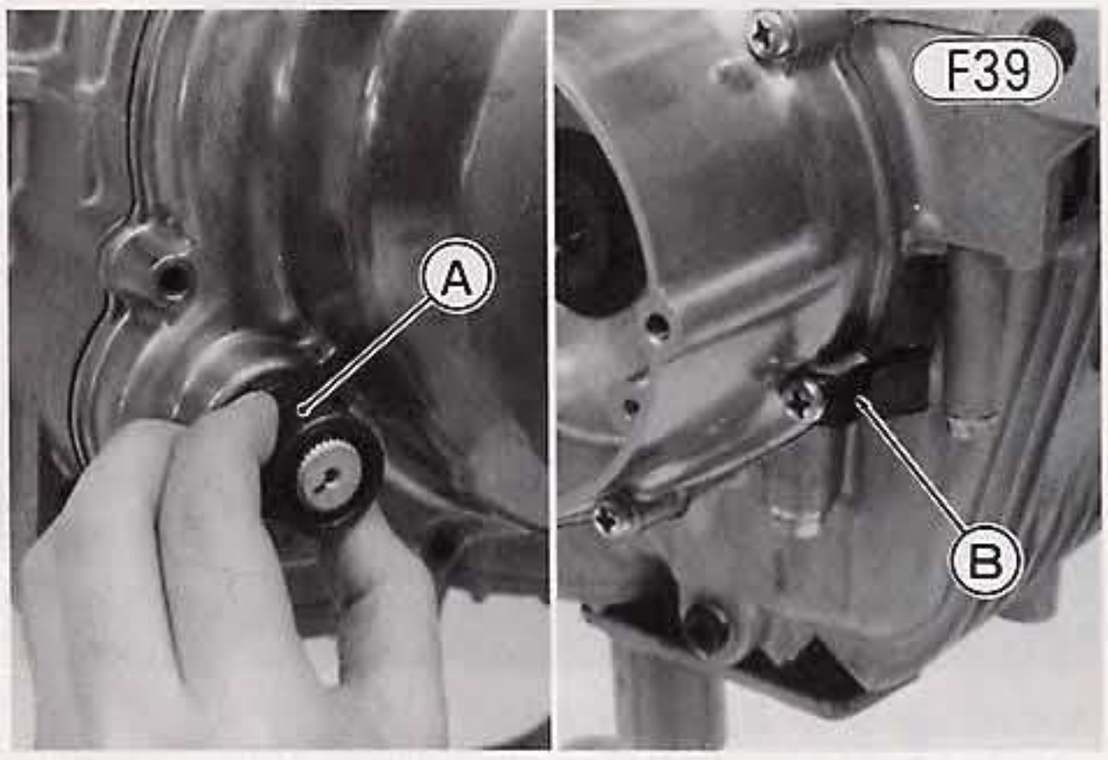
- Apply a high temperature grease to the steel ball and spring plate pusher surfaces.
- Insert the steel ball and spring plate pusher.
- Fit the spring plate back into place, aligning the marks on the plate with the marks on the clutch hub.

CAUTION **Misalignment of the spring plate can cause clutch drag (when it is disengaged), or clutch slipping.**



A. Raised Mark B. Punch Mark

- Install the springs and spring bolts (4 ea). Cross tighten the bolts evenly to 0.9 kg-m (78 in-lbs) of torque.
- Install the knock pins (2), apply a liquid gasket to the portions on a new right engine cover gasket where they contact the crankcase mating surface, and then fit it on the crankcase.
- Check that the spring in the right engine cover crankshaft oil seal has not slipped out of its proper position and apply a high temperature grease to the oil seal lip. If the oil seal is damaged, replace it with a new one.
- Insert the kick shaft oil seal guide (special tool) in the right engine cover oil seal, and fit the cover onto the crankcase. Tighten its screws (12). Be sure to include the contact breaker lead clamp with the right engine cover front screw.



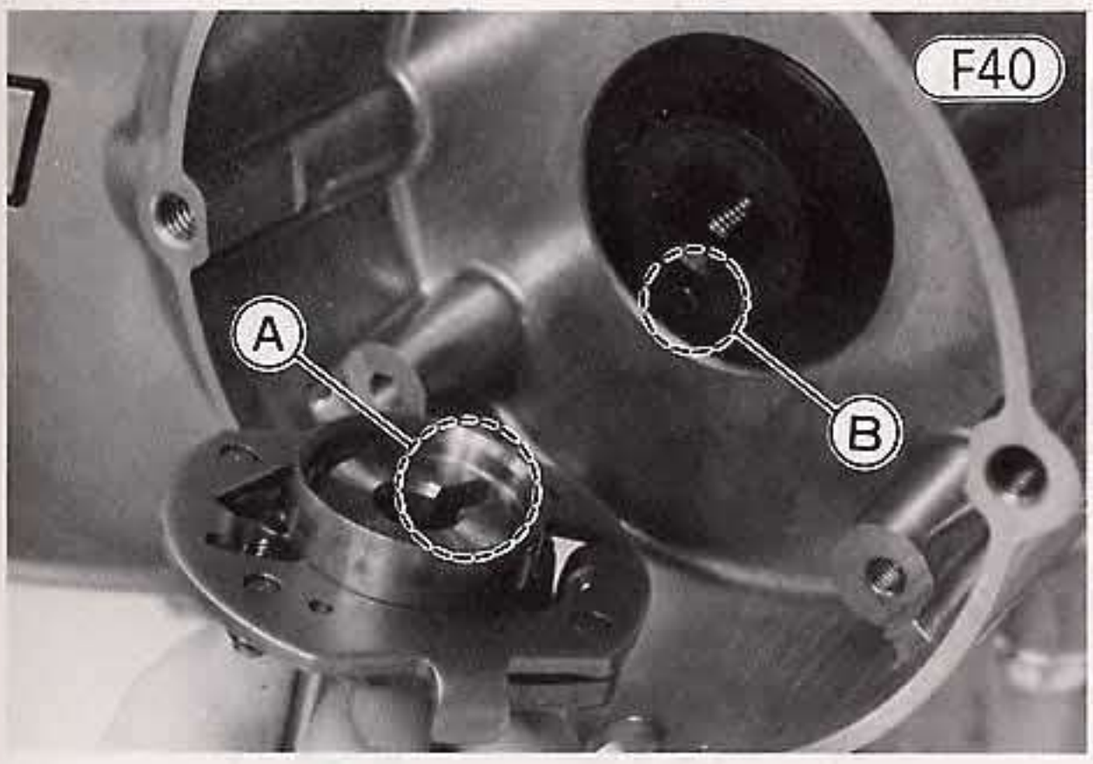
A. Kick Shaft Oil Seal Guide (57001-265)
B. Lead Clamp

- Install the kickstarter pedal in its original position on the kick shaft, and tighten the bolt.
- Fit the timing advancer onto the crankshaft matching its notch with the pin in the end of the crankshaft. Install the crankshaft rotation nut and the advancer mounting bolt. The notches in the nut fit the projection on the timing advancer. Using a 17 mm wrench on the crankshaft rotation nut to keep the shaft from

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turning, tighten the bolt to 2.5 kg-m (18.0 ft-lbs) of torque.

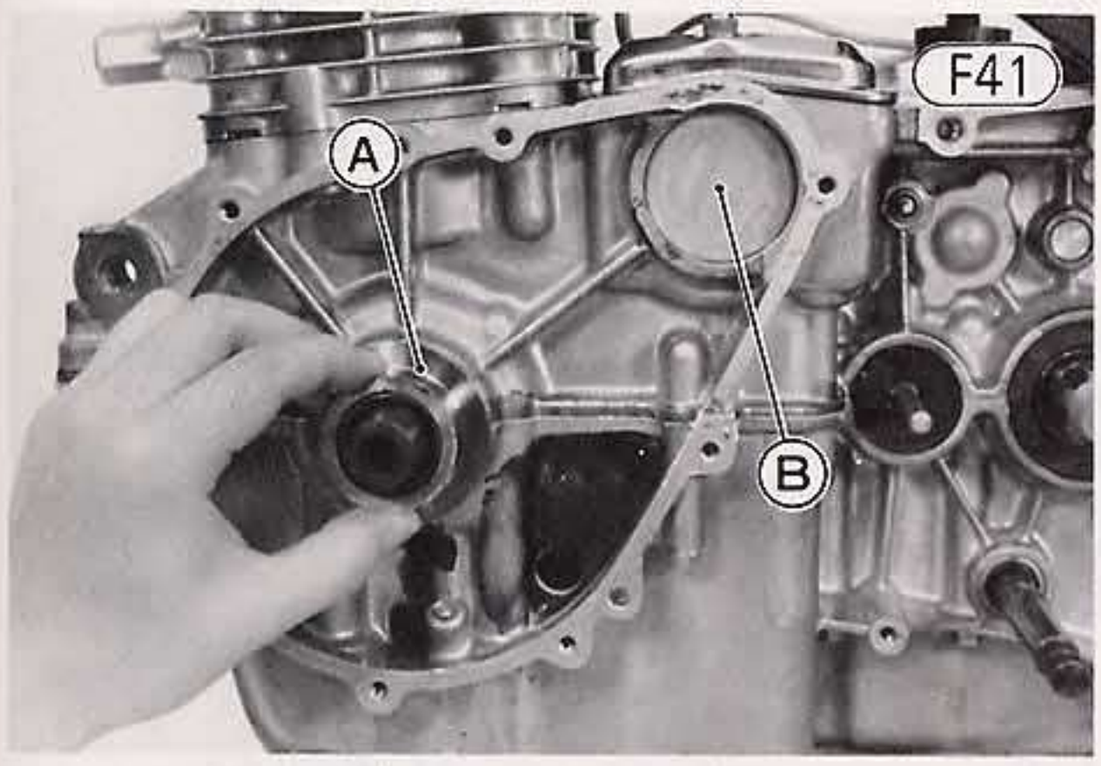


A. Notch B. Pin

- Mount the contact breaker mounting plate, and tighten its screws (3) loosely. Fit the contact breaker lead with the clamp at the right engine cover front screw.

NOTE: These screws will be tightened securely during ignition timing adjustment.

- Install the contact breaker cover and gasket, and tighten its screws (2).
- Assemble the starter motor chain and sprockets, and install them (KZ400-B).
- Install the collar on the crankshaft (KZ400-C)



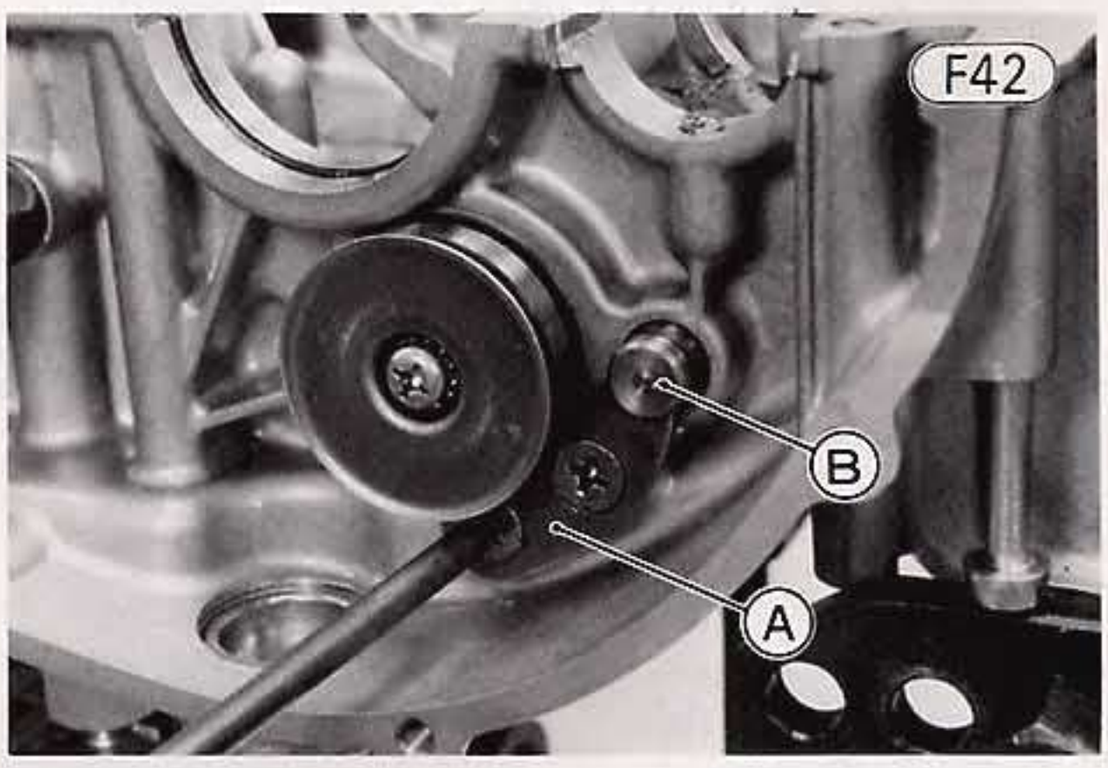
A. Collar B. Plug

- Using a high flash-point solvent, clean off any oil or dirt that may be on the crankshaft taper or flywheel hub.
- Check to see that the thrust washer (KZ400-B) is at the rear of the flywheel, and place the flywheel and starter motor clutch assembly back onto the crankshaft.
- Tighten the dynamo flywheel bolt to 7.0 kg-m (51 ft-lbs) of torque while holding the flywheel steady with the flywheel holder (special tool).
- Check that the plug and O ring are fitted as shown in Fig. F41 (KZ400-C).
- Install the knock pins (2), fit the dynamo cover with a new gasket, and tighten its screws (9). Before installing the cover gasket apply a liquid gasket to the portions on it where they contact the crankcase mating surface.
- Replace the output shaft O ring with a new one if it is damaged, and install it next to the ball bearing inner race.
- Install the output shaft collar, engine sprocket, and splined washer.
- Install the engine sprocket nut, and tighten the nut to 8.0 kg-m (58 ft-lbs) of torque while using the engine sprocket holder to keep the sprocket steady.
- Bend one side of the splined washer over the side of the nut.
- Install the engine (Pg. 83).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Carry out the adjustment procedures listed at the end of the engine installation section (Pg. 84).

TRANSMISSION

Removal:

- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Split the crankcase (Pg. 84).
- Remove the shift drum positioning bolt 20, aluminum washer 21, spring 22, and pin 23.
- Remove the screws (2) 39, and take off the shift drum guide plate 38.

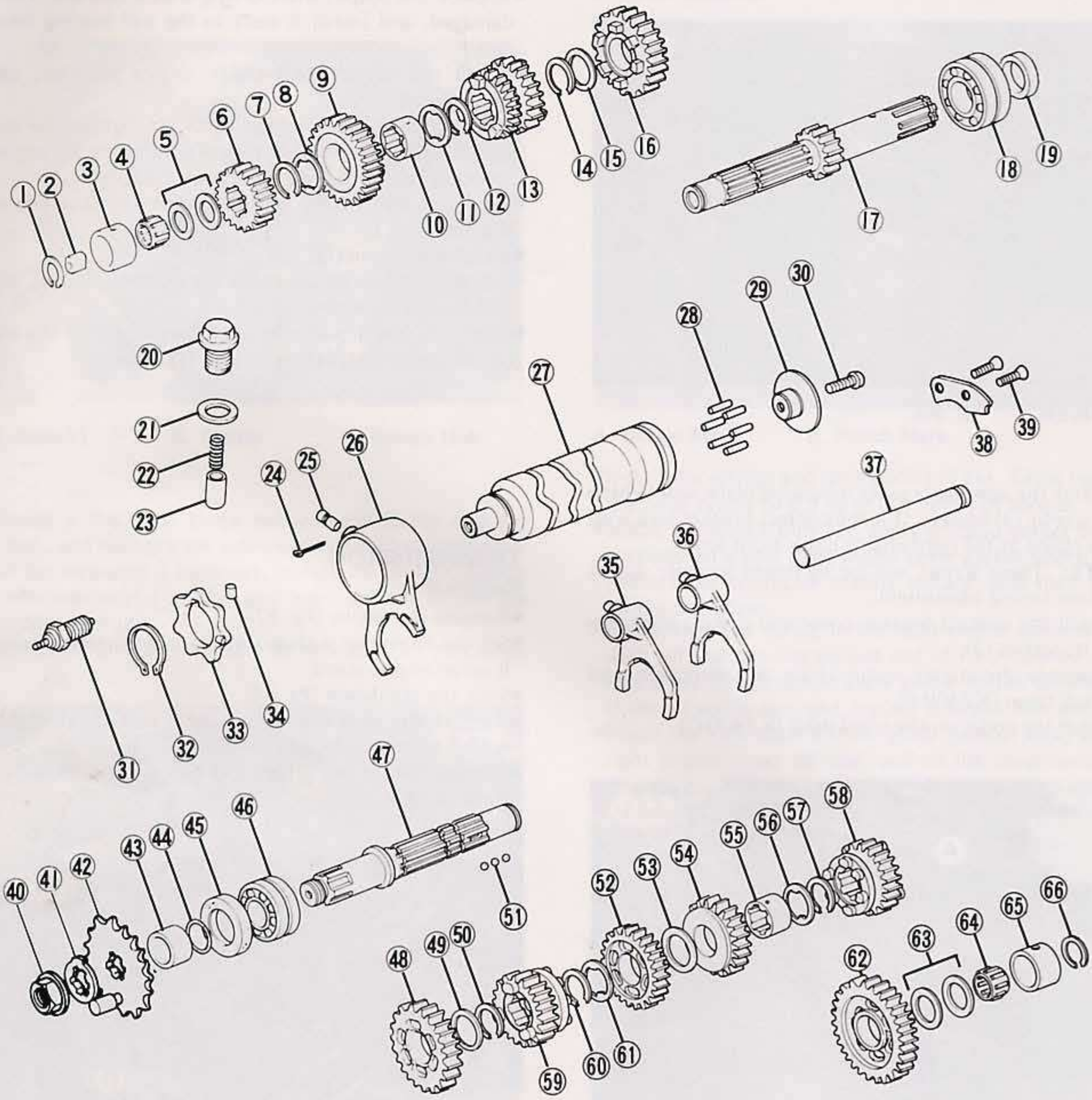


A. Guide Plate B. Shift Rod

- Pull out the shift rod 37, and remove the two shift forks 35, 36.
- Remove the operating plate circlip 32 and operating plate 33.
- Drop out the operating plate pin 34.
- Remove the 3rd/4th (KZ400-C: 3rd) gear shift fork cotter pin 24, and pull out the shift fork guide pin 25.
- Pull the shift drum 27 out of the crankcase and the 3rd/4th (KZ400-C: 3rd) gear shift fork 26 will come out.

Shift Drum, Drive Shaft, Output Shaft (KZ400-B)

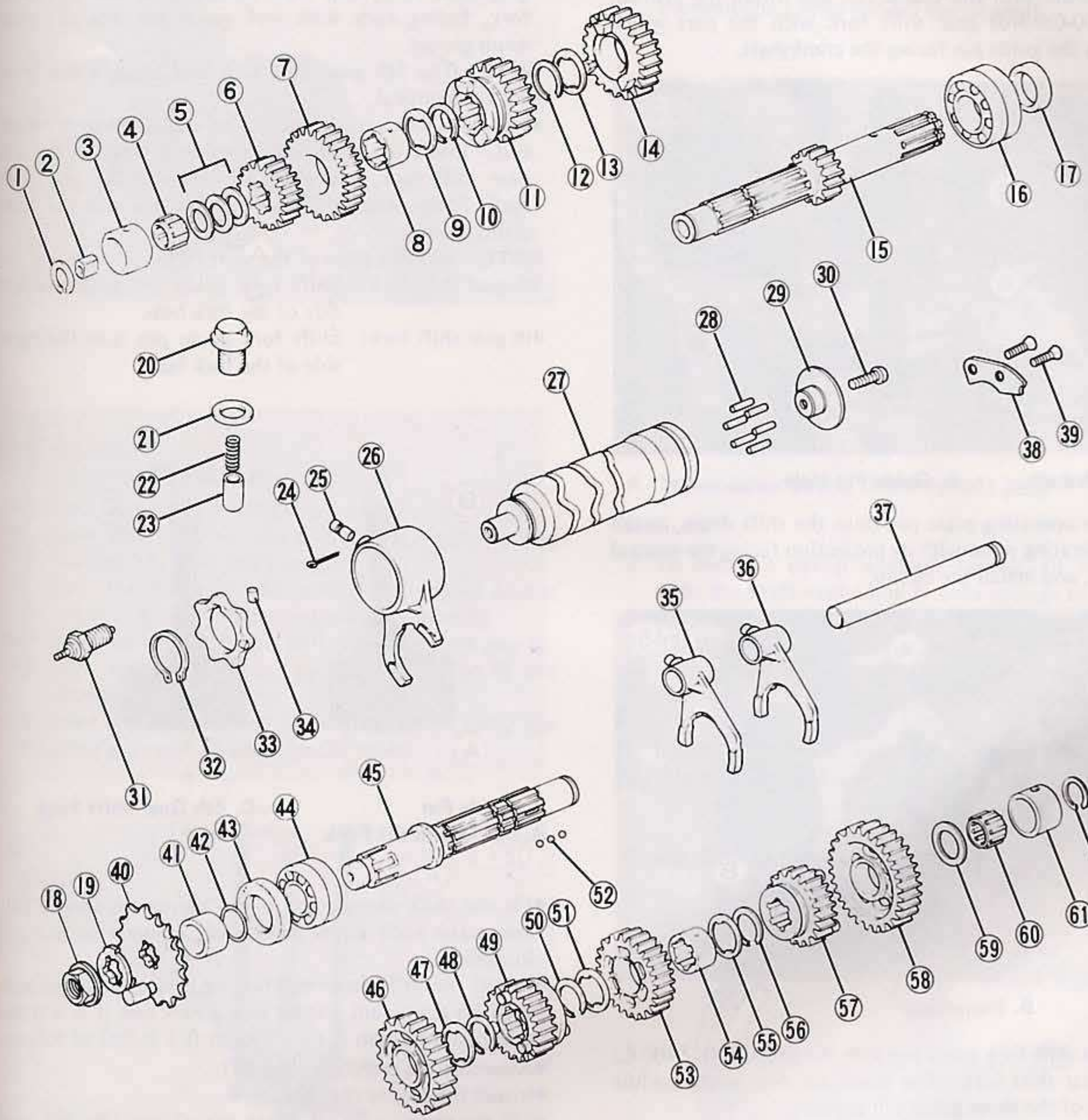
F43



1. Circlip
2. Bushing
3. Bearing Outer Race
4. Needle Bearing
5. Washer(s)
6. 2nd Gear (D)
7. Circlip
8. Splined Washer
9. 6th Gear (D)
10. Bushing
11. Splined Washer
12. Circlip
13. 3rd/4th Gear (D)
14. Circlip
15. Washer
16. 5th Gear (D)
17. Drive Shaft
18. Ball Bearing
19. Collar
20. Positioning Bolt
21. Aluminum Washer
22. Spring
23. Pin
24. Cotter Pin
25. Shift Fork Guide Pin
26. 3rd/4th Gear Shift Fork
27. Shift Drum
28. Shift Drum Pin
29. Shift Drum Pin Plate
30. Screw
31. Neutral Switch
32. Circlip
33. Operating Plate
34. Pin
35. Shift Fork (6th)
36. Shift Fork (5th)
37. Shift Rod
38. Shift Drum Guide Plate
39. Screw
40. Nut
*41. Splined Washer
42. Engine Sprocket
43. Collar
44. **O** Ring
45. Oil Seal
46. Ball Bearing
47. Output Shaft
48. 2nd Gear (O)
49. Washer
50. Circlip
51. Steel Balls
52. 3rd Gear (O)
53. Washer
54. 4th Gear (O)
55. Bushing
56. Splined Washer
57. Circlip
58. 5th Gear (O)
59. 6th Gear (O)
60. Circlip
61. Splined Washer
62. 1st Gear (O)
63. Washer(s)
64. Needle Bearing
65. Bearing Outer Race
66. Circlip

Shift Drum, Drive Shaft, Output Shaft (KZ400-C)

F44

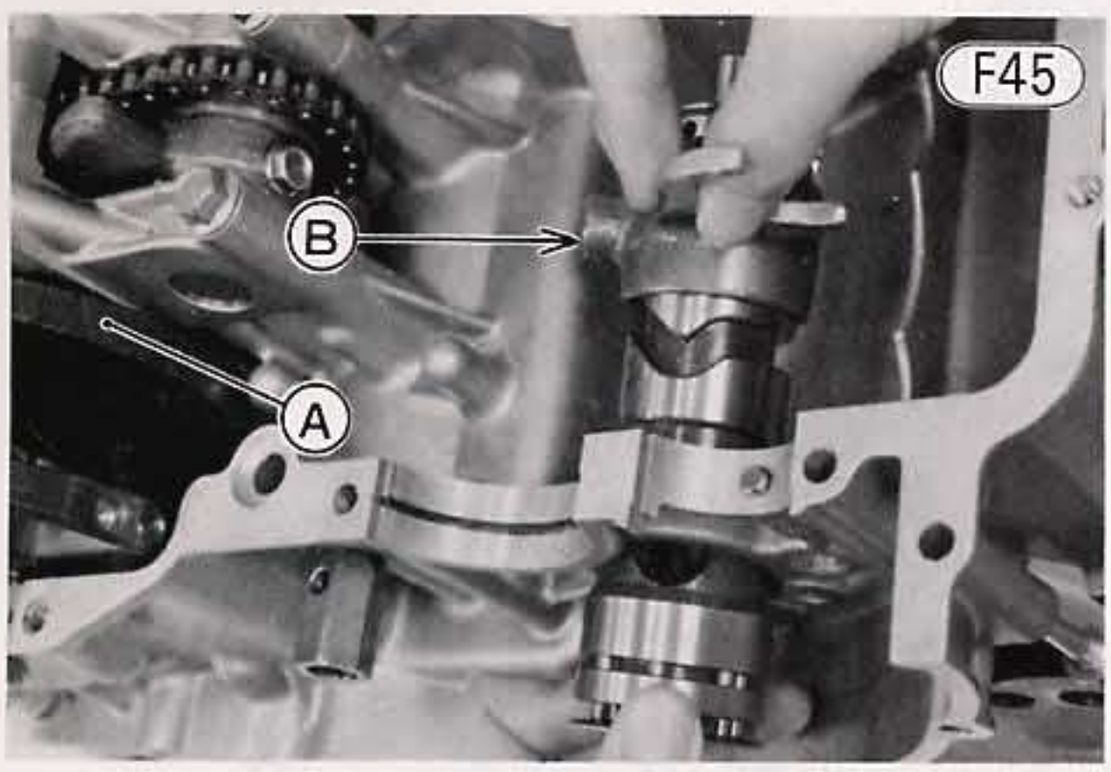


1. Circlip
2. Bushing
3. Bearing Outer Race
4. Needle Bearing
5. Washer(s)
6. 2nd Gear (D)
7. 5th Gear (D)
8. Bushing
9. Splined Washer
10. Circlip
11. 3rd Gear (D)
12. Circlip
13. Splined Washer
14. 4th Gear (D)
15. Drive Shaft
16. Ball Bearing
17. Collar
18. Nut
*19. Splined Washer
20. Positioning Bolt
21. Aluminum Washer
22. Spring
23. Pin
24. Cotter Pin
25. Shift Fork Guide Pin
26. 3rd Gear Shift Fork
27. Shift Drum
28. Shift Drum Pin
29. Shift Drum Pin Plate
30. Screw
31. Neutral Switch
32. Circlip
33. Operating Plate
34. Pin
35. 5th Gear Shift Fork
36. 4th Gear Shift Fork
37. Shift Rod
38. Shift Drum Guide Plate
39. Screw
40. Engine Sprocket
41. Collar
42. O Ring
43. Oil Seal
44. Ball Bearing
45. Output Shaft
46. 2nd Gear (O)
47. Splined Washer
48. Circlip
49. 5th Gear (O)
50. Circlip
51. Splined Washer
52. Steel Ball
53. 3rd Gear (O)
54. Bushing
55. Splined Washer
56. Circlip
57. 5th Gear (O)
58. 1st Gear (O)
59. Washer
60. Needle Bearing
61. Bearing Outer Race
62. Circlip

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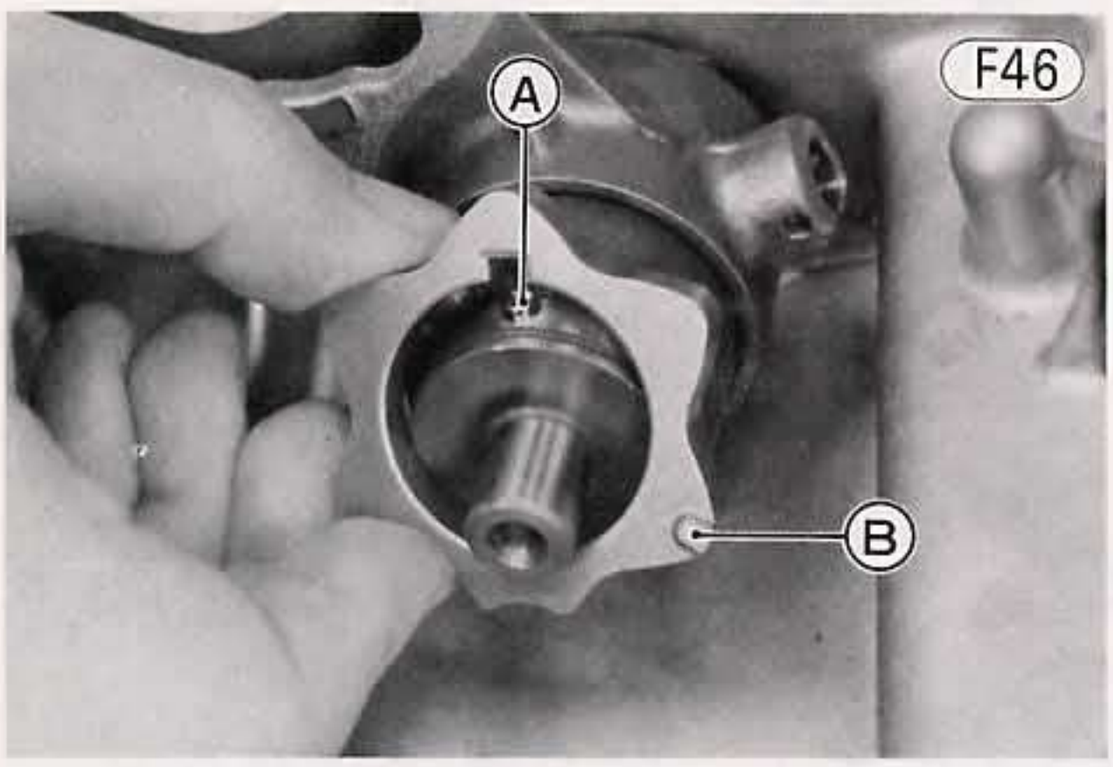
Installation:

- Apply a little engine oil to the shift drum. Insert the shift drum into the crankcase, and install the 3rd/4th (KZ400-C: 3rd) gear shift fork with the part which houses the guide pin facing the crankshaft.



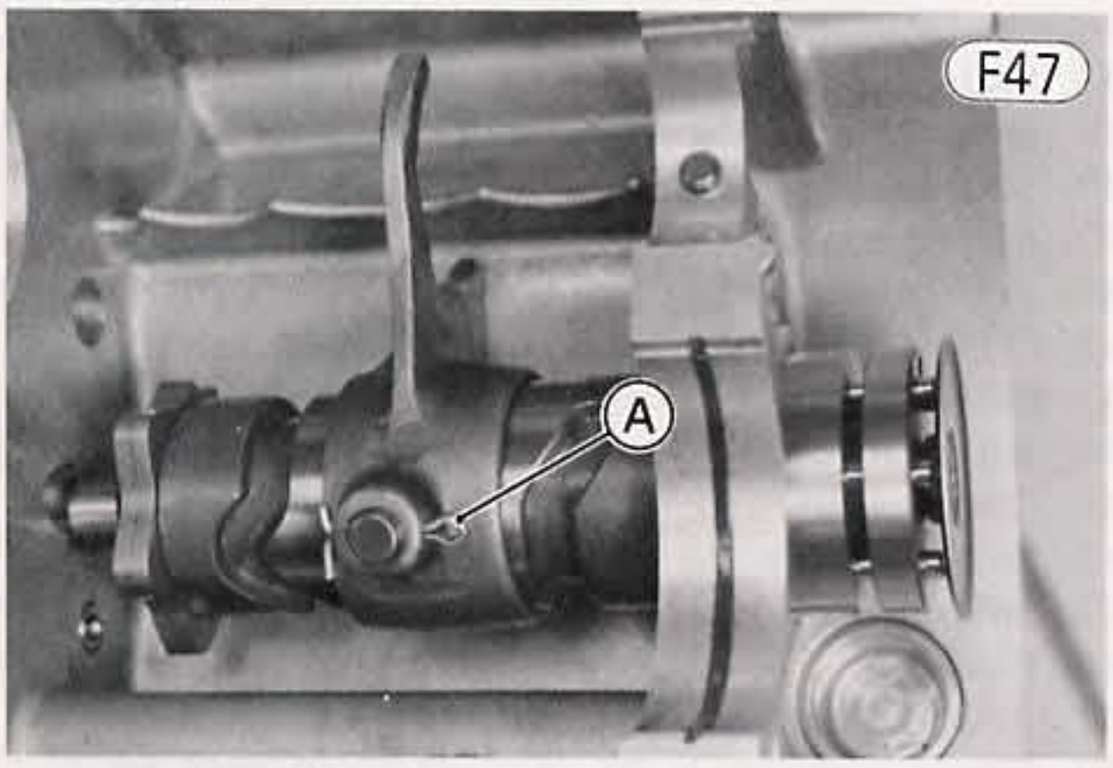
A. Crankshaft **B. Guide Pin Hole**

- Fit the operating plate pin onto the shift drum, install the operating plate with its projection facing the neutral switch, and install the circlip.



A. Pin **B. Projection**

- Put the shift fork guide pin into the 3rd/4th (KZ400-C: 3rd) gear shift fork. The guide pin rides in the middle groove of the three guide pin grooves.
- Insert a new cotter pin through the shift fork and guide pin, and spread its ends.



A. Cotter Pin

- For KZ400-B, apply a little clean engine oil to the shift rod. Insert the shift rod, running it through the 5th gear shift fork, and then through the 6th gear shift fork, fitting each shift fork guide pin into the shift drum groove.

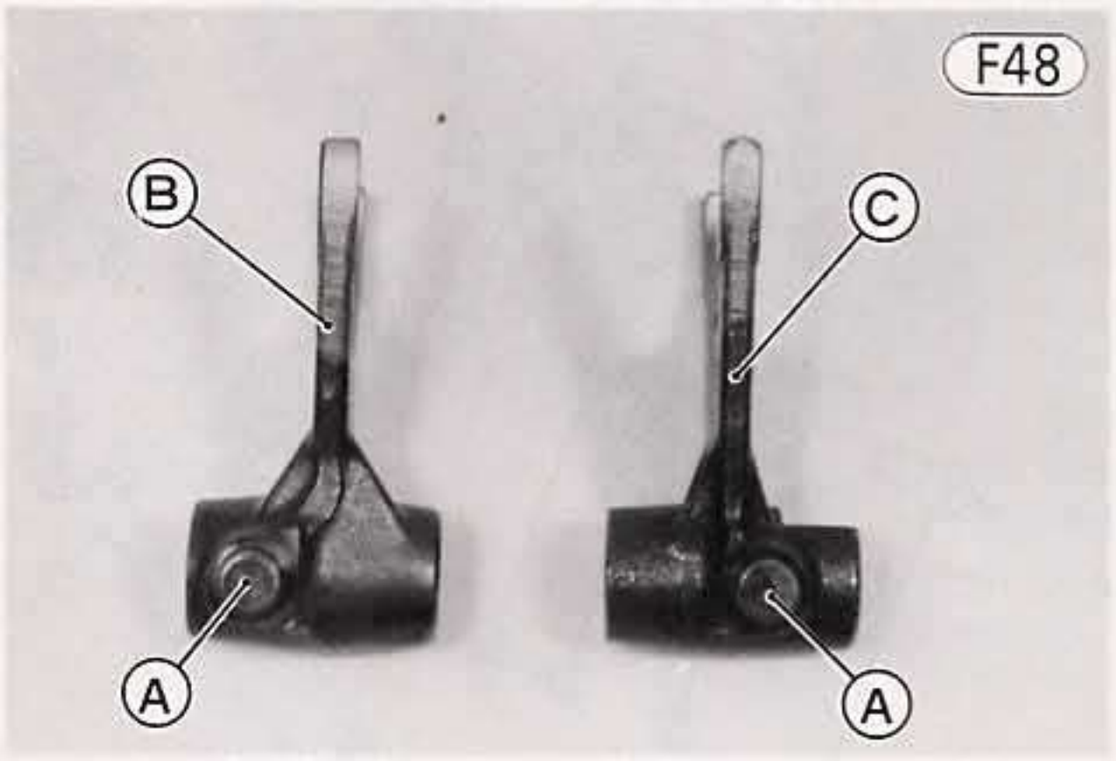
NOTE: The 5th gear shift fork and the 6th gear shift fork are identical.

- For KZ400-C, apply a little clean engine oil to the shift rod. Insert the shift rod, running it through the 4th gear shift fork, and then through the 5th gear shift fork, fitting each shift fork guide pin into the shift drum groove.

NOTE: Identification of the shift forks.

5th gear shift fork: Shift fork guide pin is in the left side of the fork hub.

4th gear shift fork: Shift fork guide pin is in the right side of the fork hub.



A. Guide Pin **C. 4th Gear Shift Fork**
B. 5th Gear Shift Fork

- Fit the shift drum guide plate, tighten its screws (2), and stake each screw head with a punch to prevent loosening.
- Install the shift drum positioning pin, spring, and bolt with an aluminum washer (use a new one if it is damaged), and tighten it to 3.5 kg-m (25 ft-lbs) of torque.
- Assemble the crankcase (Pg. 87).
- Install the engine (Pg. 83).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Carry out the adjustment procedures listed at the end of the engine installation section (Pg. 84).

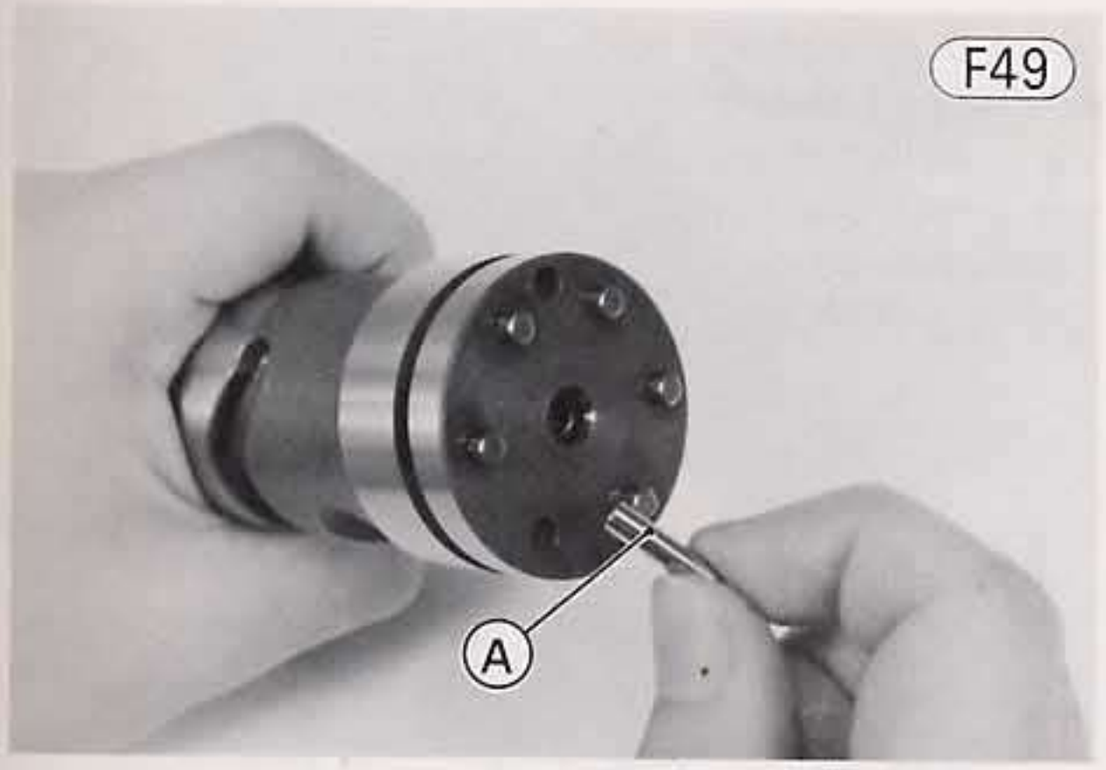
Shift Drum
Disassembly:

- Remove the screw ㉚ and the shift drum pin plate ㉙.
- Pull out the pins ㉘ (6).

Assembly Note:

- Install the shift drum needle bearings from the right side of the crankcase using a suitable driver. Press them into place until the bearing right end is even with the end of the hole.

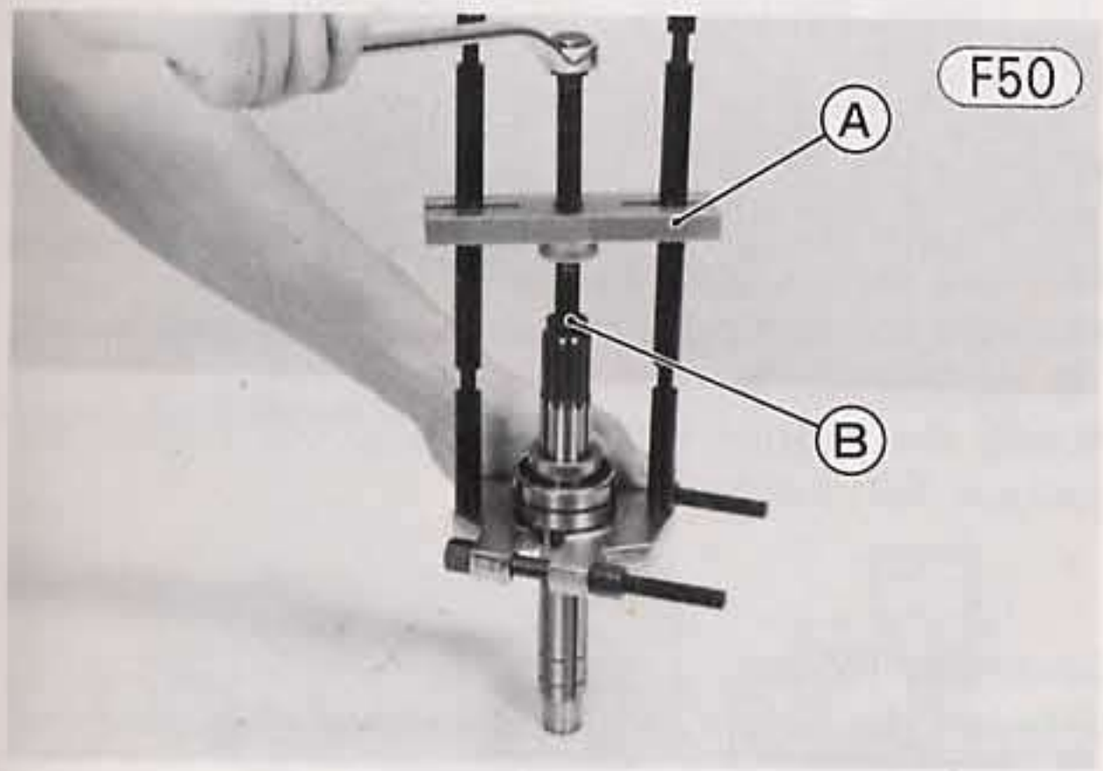
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A. Pins

Drive Shaft
Disassembly (KZ400-B):

- Remove the needle bearing outer race ③.
- Remove the circlip ①, and pull off the needle bearing ④, washer(s) ⑤, and 2nd gear ⑥.
- Remove the circlip ⑦, and pull off the splined washer ⑧, 6th gear ⑨, bushing ⑩, and splined washer ⑪.
- Remove the circlip ⑫, and pull off the 3rd/4th gear ⑬.
- Remove the circlip ⑭, and pull off the washer ⑮ and 5th gear ⑯.
- Remove the ball bearing ⑱ and collar ⑲ using the bearing puller and adapter (special tools).



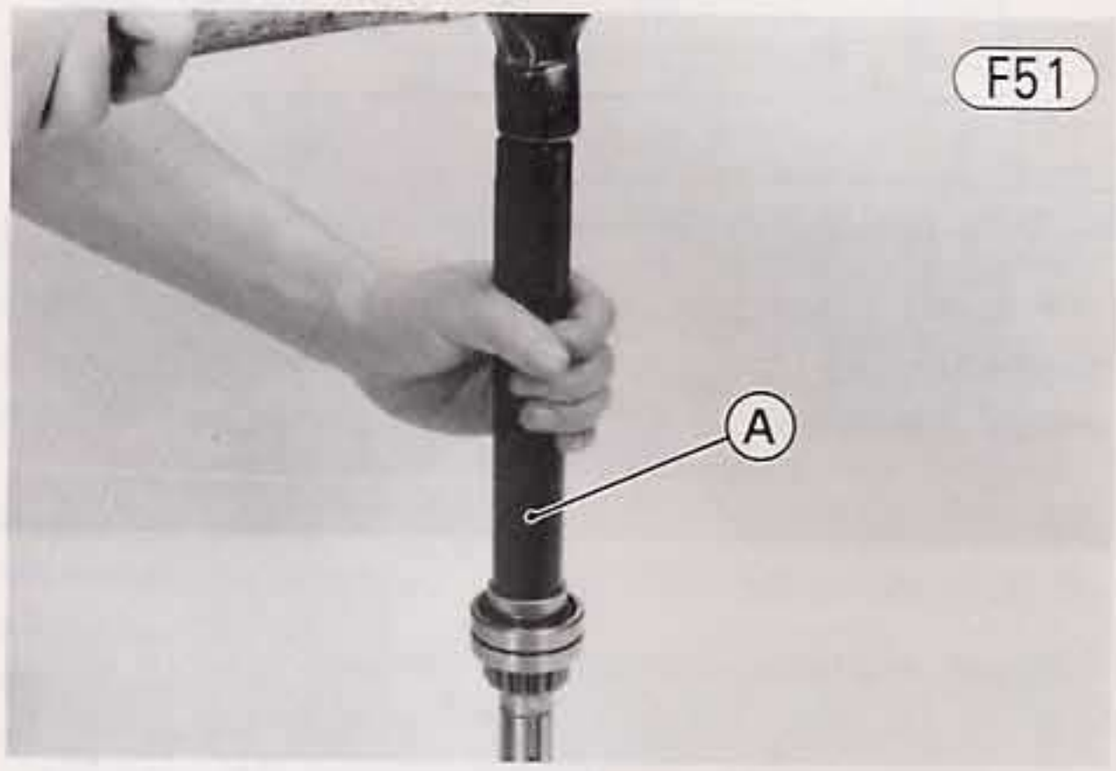
A. Bearing Puller (57001-135)
B. Adapter (57001-317)

Disassembly (KZ400-C):

- Remove the needle bearing outer race ③
- Remove the circlip ①, and pull off the needle bearing ④, washer(s) ⑤, 2nd gear ⑥, 5th gear ⑦, bushing ⑧, and splined washer ⑨.
- Remove the circlip ⑩, and pull off the 3rd gear ⑪.
- Remove the circlip ⑫, and pull off the splined washer ⑬ and 4th gear ⑭.
- Remove the ball bearing ⑯ and collar ⑰ using the bearing puller and adapter (special tools).

Assembly Notes:

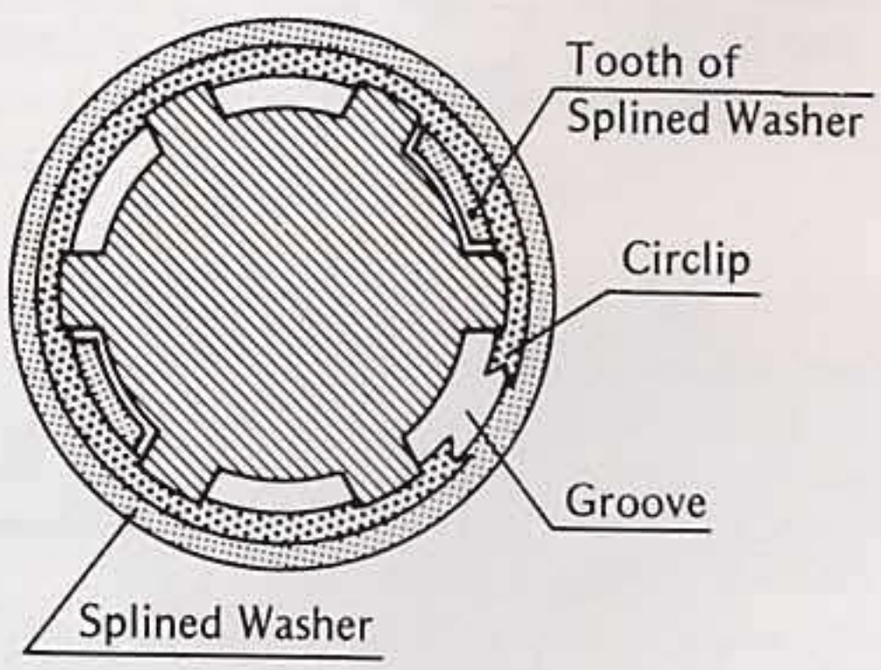
1. Install the drive shaft ball bearing and collar using the transmission circlip driver (special tool).



A. Transmission Circlip Driver (57001-380)

2. To install a circlip without damage, fit the circlip onto the shaft expanding it onto enough to install it, and use a suitable gear to push the circlip into place.
3. Replace any circlips that were removed with new ones. Install the circlip so that the opening coincides with one of the splined grooves in the output shaft (Fig. F52).
4. Install the splined washer so that its teeth do not coincide with the circlip opening (Fig. F52).

Circlip, Splined Washer Installation

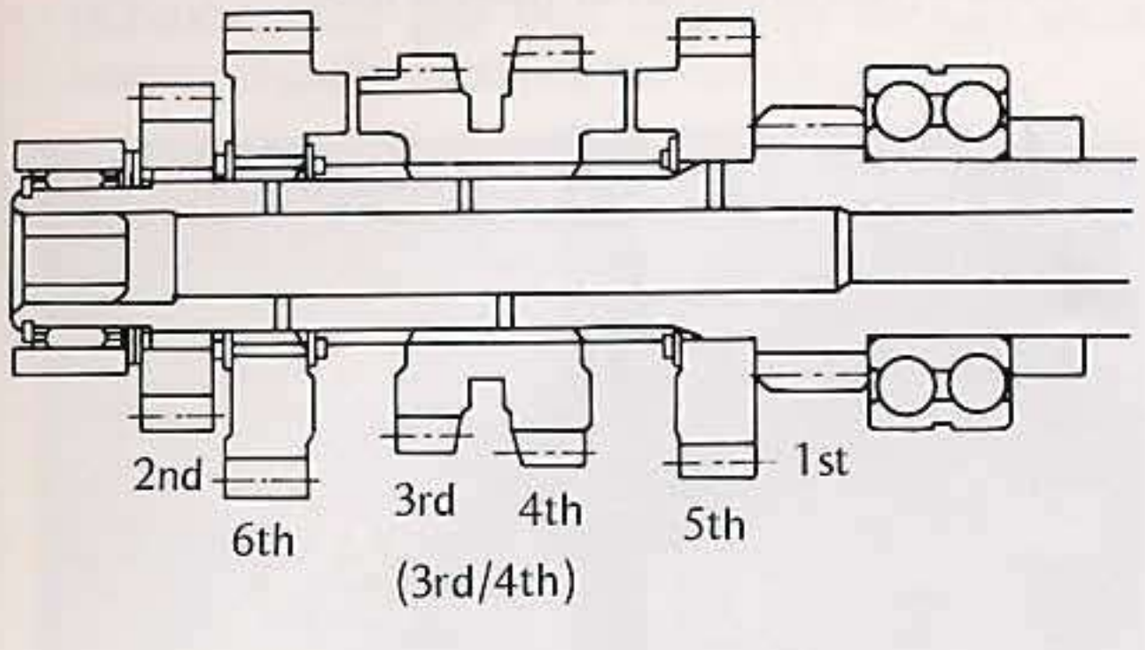


5. When assembling 3rd/4th gear and the 6th gear bushing (KZ400C: 3rd gear and the 5th gear bushing) to the drive shaft, align the oil holes with the holes in the shaft.
6. The drive shaft gears can be recognized by size, the gear with smallest diameter being 1st gear, and the largest one being top gear. Be sure that all parts are put back in the correct sequence, facing the proper direction, and all circlips and washers are properly in place. See Fig. F53 for KZ400-B or Fig. F54 for KZ400-C.

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Drive Shaft Gears (KZ400-B)

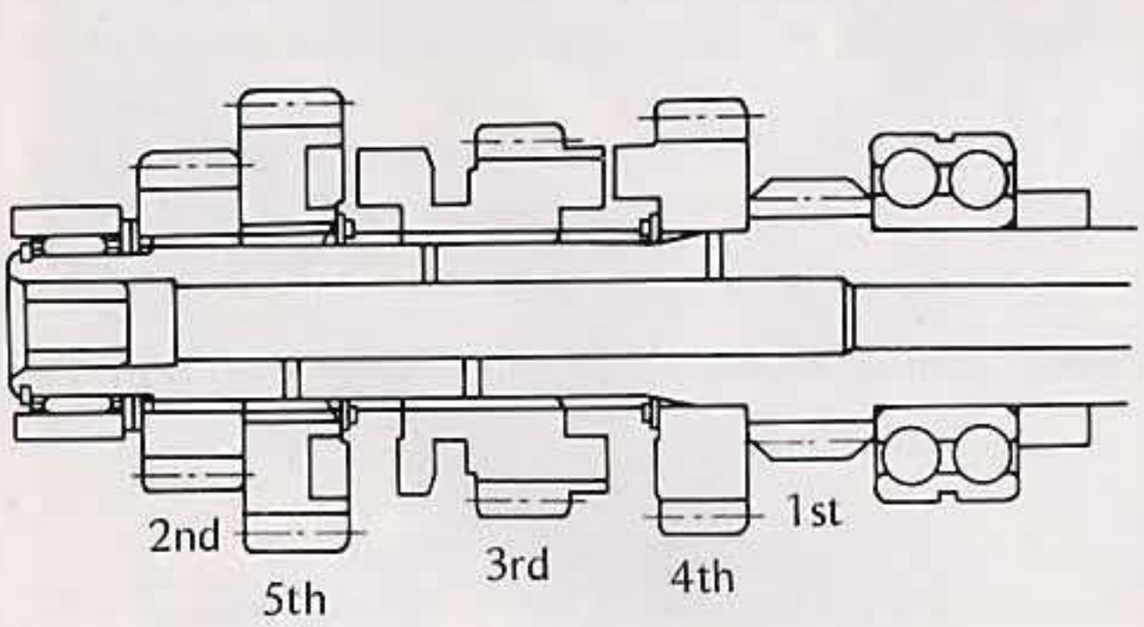
F53



Proper sequence starting with 1st gear (part of drive shaft) is: 1st gear, 5th gear (face the flat side of the gear to the right), washer, circlip, 3rd/4th gear (face 4th gear side to the right), circlip, splined washer, bushing (face the chamfered side to the right), 6th gear (face the dogs to the right), splined washer, circlip, 2nd gear, washer(s), needle bearing, circlip, and needle bearing outer race.

Drive Shaft Gears (KZ400-C)

F54

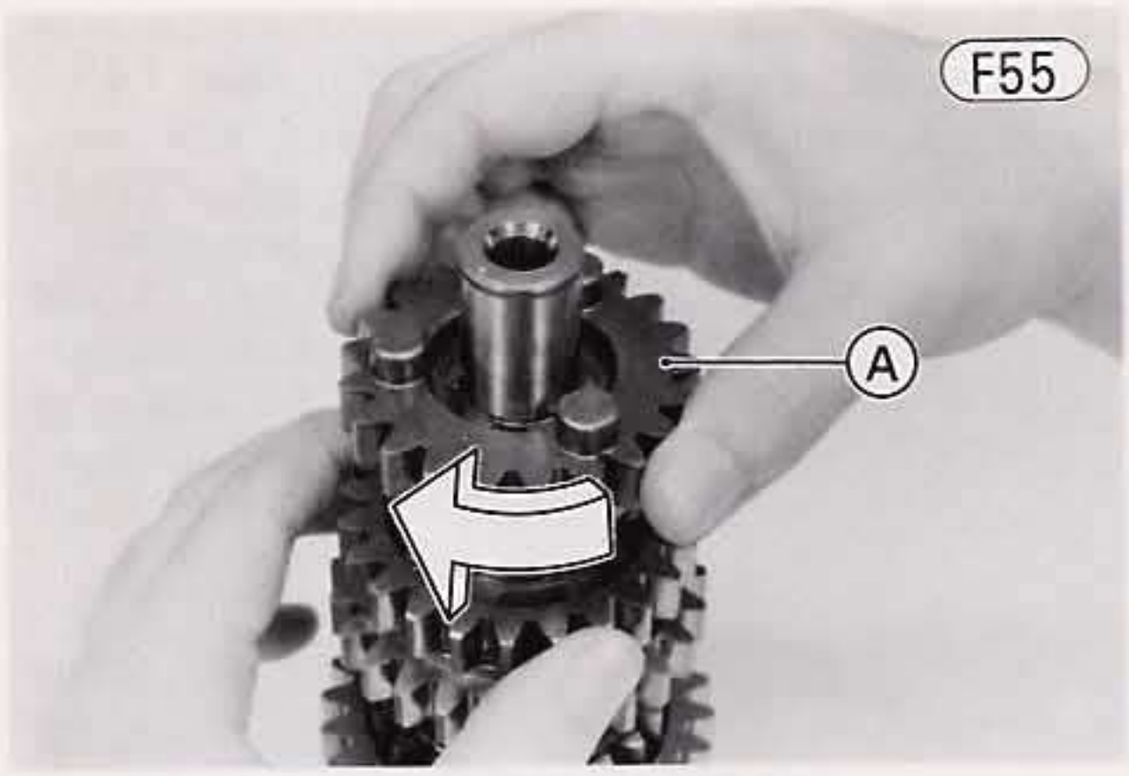


Proper sequence starting with 1st gear (part of the drive shaft) is: 1st gear, 4th gear (face the dogs to the left), splined washer, circlip, 3rd gear (face the fork groove side to the left), circlip, splined washer, bushing (face the chamfered side to the right), 5th gear (face the side with the dog recesses to the right), 2nd gear (face the chamfered side to the right), washer(s), needle bearing, circlip, and needle bearing outer race.

Output Shaft
Disassembly (KZ400-B):

- Pull off the needle bearing outer race ⑥⑤.
- Remove the circlip ⑥⑥, and pull off the needle bearing ⑥④, washer(s) ⑥③, and 1st gear ⑥②.
- 5th gear ⑤⑧ has three steel balls ⑤① (3) assembled into it for neutral positioning. To remove this gear with the balls, quickly spin the shaft in a vertical position while holding 3rd gear ⑤② or 4th gear, and pull off 5th gear upwards.

F55



A. 5th Gear

- Remove the circlip ⑤⑦, and pull off the splined washer ⑤⑥, 4th gear ⑤④, washer ⑤③, 3rd gear ⑤②, bushing ⑤⑤, and splined washer ⑥①.
- Remove the circlip ⑥⑩, and pull off the 6th gear ⑤⑨.
- Remove the circlip ⑤⓪, and pull off the washer ④⓪, and 2nd gear ④⑧.
- Using the bearing puller (special tool), remove the output shaft ball bearing ④⑥.

Disassembly (KZ400-C):

- Remove the needle bearing outer race ⑥①.
- Remove the circlip ⑥②, and pull off the needle bearing ⑥⓪, washer ⑤⑨, and 1st gear ⑤⑧.
- 4th gear ⑤⑦ has the steel balls ⑤② (3) assembled into it for neutral positioning. To remove this gear with the balls, quickly spin the shaft in a vertical position while holding 3rd gear ⑤③, and pull off 4th gear upwards.
- Remove the circlip ⑤⑥, and pull off the splined washer ⑤⑤, 3rd gear ⑤③, bushing ⑤④, and splined washer ⑤①.
- Remove the circlip ⑤⓪, and pull off 5th gear ④⑨.
- Remove the circlip ④⑧, and pull off the splined washer ④⑦ and 2nd gear ④⑥.
- Using the bearing puller (special tool), remove the output shaft ball bearing ④④.

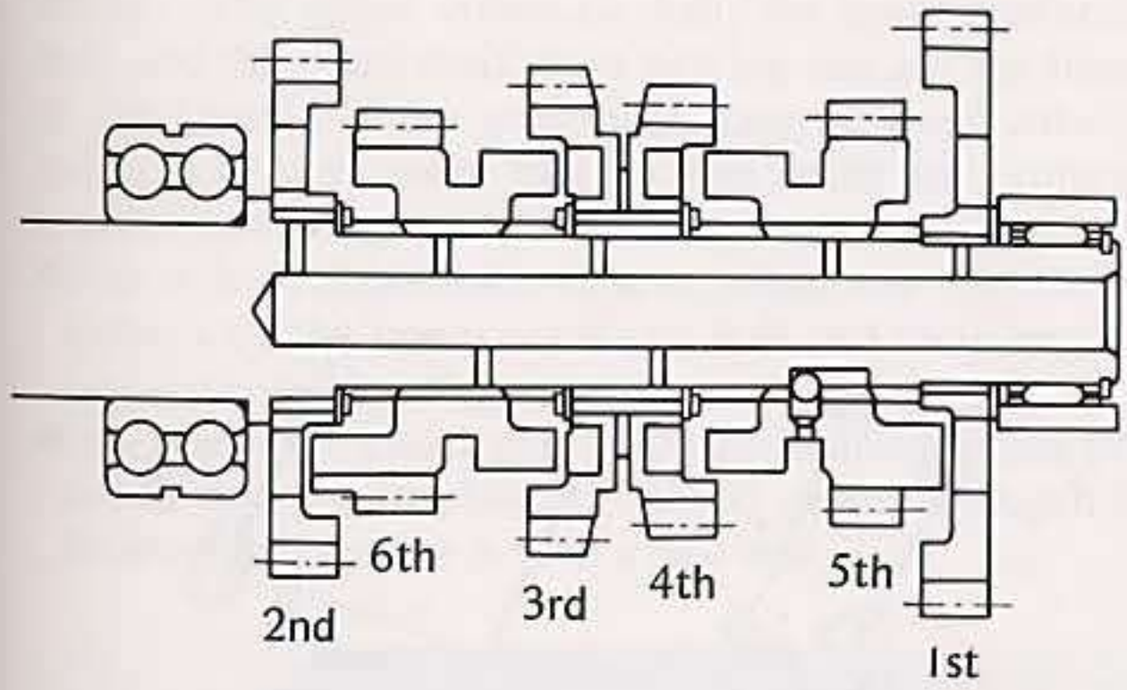
Assembly Notes:

1. Install the output shaft ball bearing using the transmission circlip driver (special tool).
2. To install a circlip without damage, fit the circlip onto the shaft expanding it only enough to install it, and use a suitable gear to push the circlip into place.
3. Replace any circlips that were removed with new ones. Install the circlip so that the opening coincides with one of the splined grooves in the driver shaft (Fig. F52).
4. Install the splined washer so that its teeth do not coincide with the circlip opening (Fig. F52).
5. Do not use grease on the three balls during assembly; these balls must be able to move freely.
6. When assembling 6th gear and the 3rd-4th gear bushing (KZ400-C: 5th gear and the 3rd gear bushing) to the output shaft, align the oil holes with the holes in the shaft.

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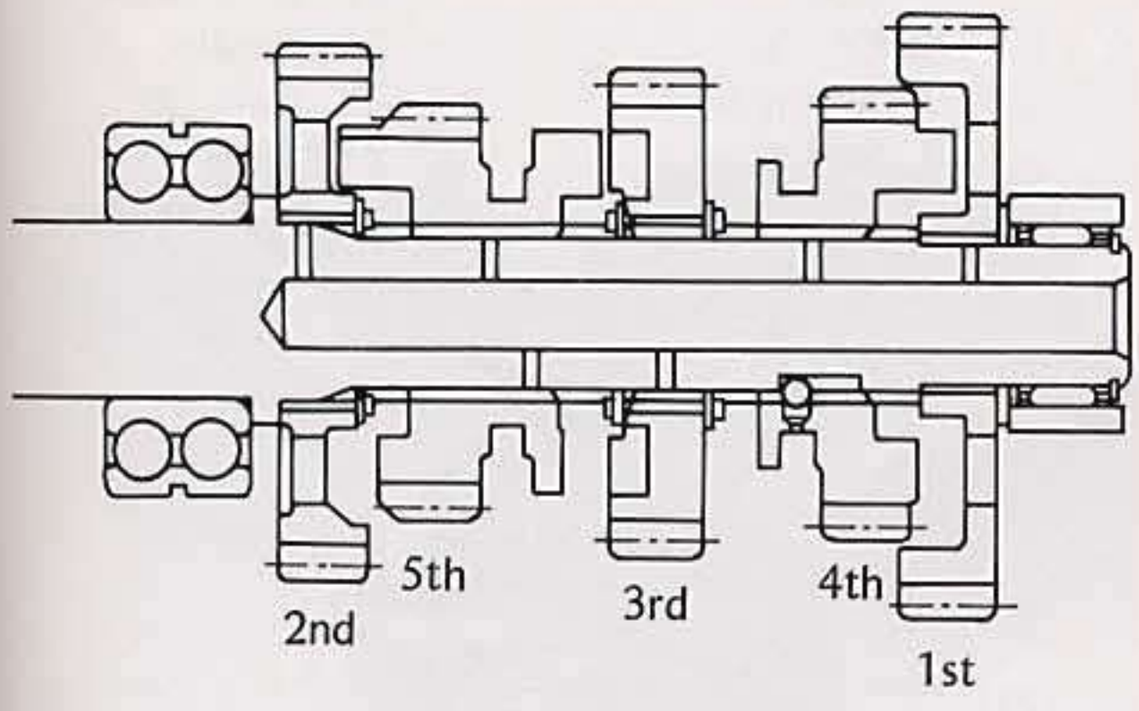
7. The output shaft gear sizes are opposite from those of the drive shaft gears, the largest being 1st gear and the smallest being top gear. Be sure that all parts are put back in the correct sequence, and facing the proper direction, and that all circlips and washers are properly in place. See Fig. F56 for KZ400-B or Fig. F57 for KZ400-C.

Output Shaft Gears (KZ400-B) F56



Proper sequence starting with 2nd gear is: 2nd gear (face the flat side of the gear to the left), washer, circlip, 6th gear (face the fork groove side to the right), circlip, splined washer, bushing (face the chamfered side to the left), 3rd gear (face the side with the dog recesses to the left), washer, 4th gear (face the side with the dog recesses to the right), splined washer, circlip, 5th gear (face the fork groove side to the left) and steel balls (3), 1st gear (face the flat side of the gear to the right), washer(s), needle bearing, circlip, and needle bearing outer race.

Output Shaft Gears (KZ400-C) F57



Proper sequence starting with 2nd gear is: 2nd gear (face the flat side of the gear to the left), splined washer, circlip, 5th gear (face the fork groove side to the right), circlip, splined washer, bushing (face the chamfered side to the left), 3rd gear (face the flat side of the gear to the right), splined washer, circlip, 4th gear (face the dogs to the right) and steel balls (3), 1st gear (face the flat side of the gear to the right), washer, needle bearing, circlip, needle bearing outer race.

KICKSTARTER

Removal:

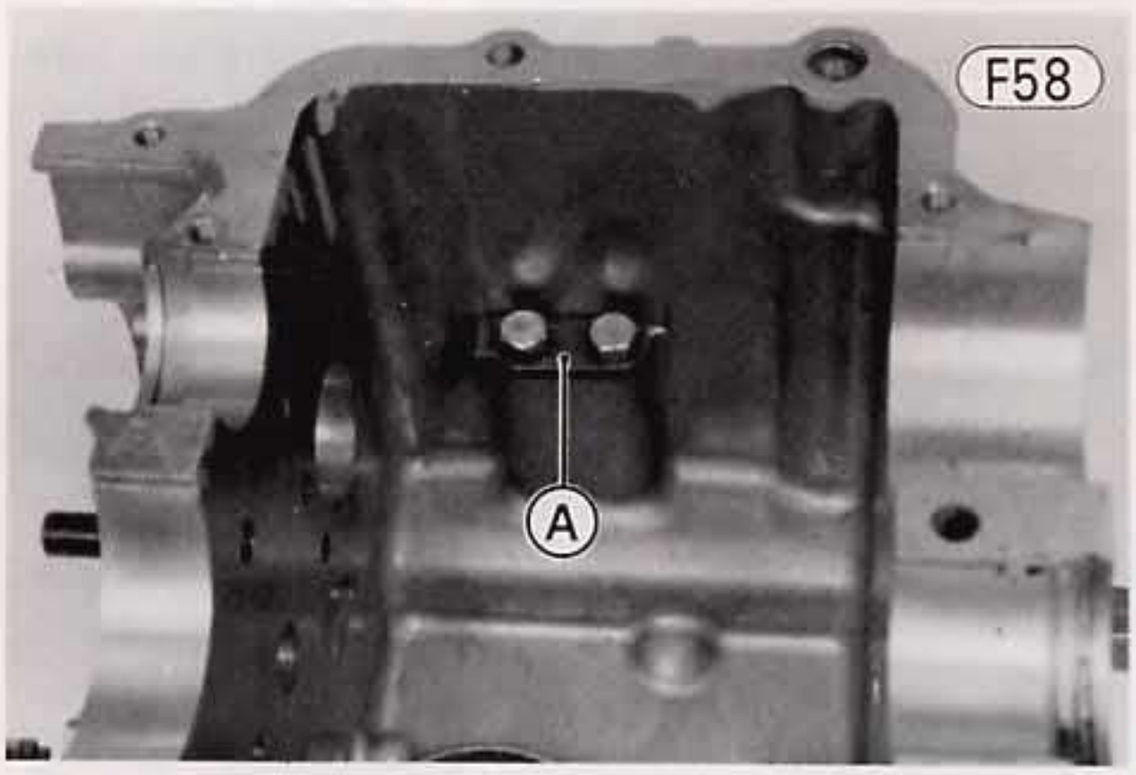
- Remove the engine (Pg. 82).
- Set the engine or a clean surface or, preferably, mount it on an engine stand.
- Split the crankcase (Pg. 84).
- Remove the circlip ㉒, and pull off the spring guide ⑱.
- Remove the kick spring ⑰.
- Remove the circlip ⑯ from the kick shaft bushing ⑮.
- Remove the kick shaft bushing stop screws ⑳ (2) and stop ⑲, and pull off the bushing.
- Remove the kick shaft assembly from the lower crankcase half.

Installation Notes:

1. Install the kick shaft bushing on the kick shaft, applying a high temperature grease to the inside surface of the bushing.
2. After tightening the kick shaft stop screws (2), stake each screw head with a punch to prevent loosening.
3. To install the kick spring, turn the kick shaft all the way clockwise, insert one end of the spring into the crankcase hole, insert the other end into the kick shaft using needle nose pliers, and, while holding the spring in place if necessary, insert the kick spring guide.

Disassembly:

- Remove the ratchet gear arm stop bolts ㉓, and remove the stop ㉔.



F58

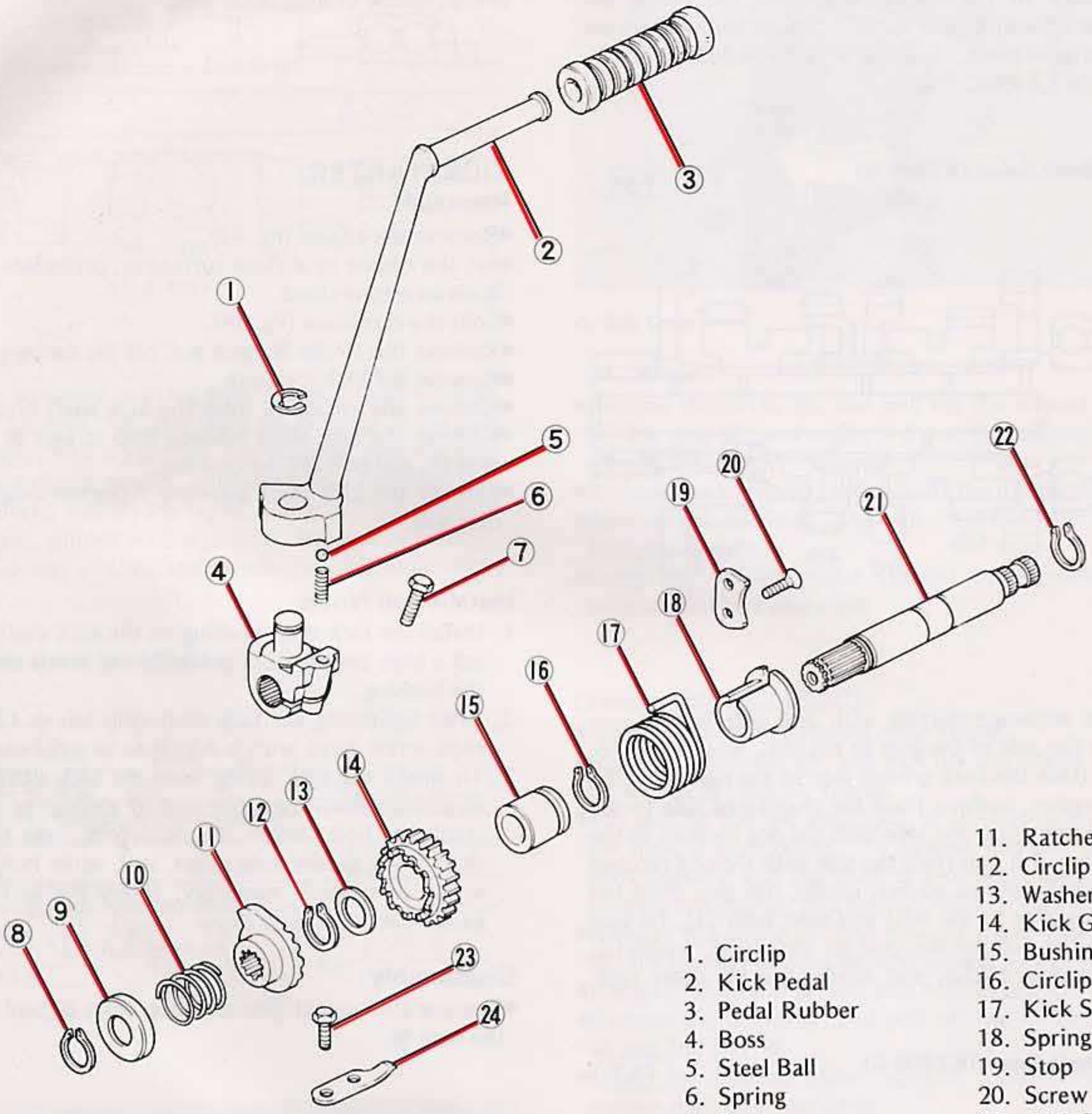
A. Ratchet Gear Arm Stop

- Remove the circlip ⑧ on the kick shaft end, and take off the spring seat ⑨, spring ⑩, and ratchet gear ⑪.
- Remove the circlip ⑫, and pull off the washer ⑬ and kick gear ⑭.

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Kickstarter

F59



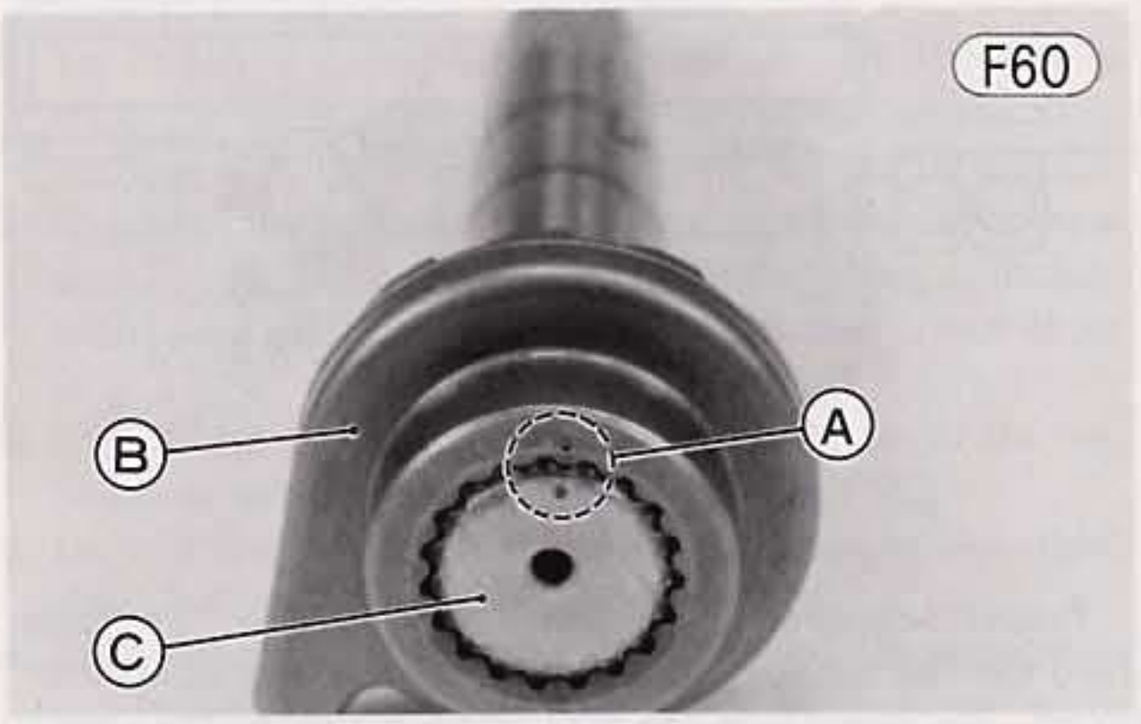
1. Circlip
2. Kick Pedal
3. Pedal Rubber
4. Boss
5. Steel Ball
6. Spring
7. Bolt
8. Circlip
9. Spring Seat
10. Spring
11. Ratchet Gear
12. Circlip
13. Washer
14. Kick Gear
15. Bushing
16. Circlip
17. Kick Spring
18. Spring Guide
19. Stop
20. Screw
21. Kick Shaft
22. Circlip
23. Bolt
24. Stop

Assembly Notes:

1. Fit the ratchet gear arm stop as shown in Fig. F58. Apply a non-permanent locking agent to the ratchet gear arm stop bolts (2), and tighten them.
2. Apply a little engine oil to the inside of the kick gear and ratchet gear, and apply a high temperature grease to the inside of the bushing before installation.
3. When installing the ratchet gear, align the ratchet gear punch mark with the punch mark on the kick shaft.

⚠ **CAUTION** **Misalignment of the ratchet gear changes the kick spring preload. If the kick spring preload is too light, partial mesh of the kick gear and the ratchet gear could cause kick mechanism noise. If the kick spring preload is too heavy, the kick spring could weaken or break.**

F60



A. Align the marks
B. Ratchet Gear
C. Kick Shaft

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BALANCER MECHANISM, MAIN BEARING CAP

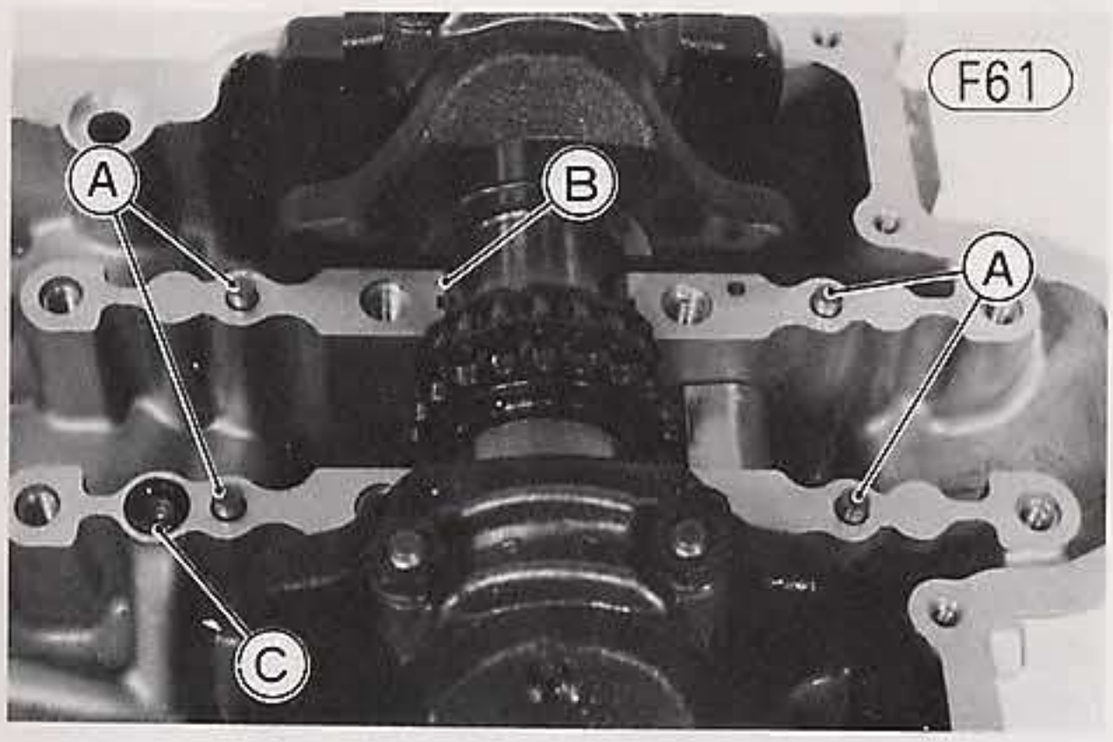
Removal:

- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Split the crankcase (Pg. 84).
- Remove the main bearing cap 10 mm bolts (4) and 8 mm bolts (4), and take off the main bearing cap and balancer mechanism.

Installation:

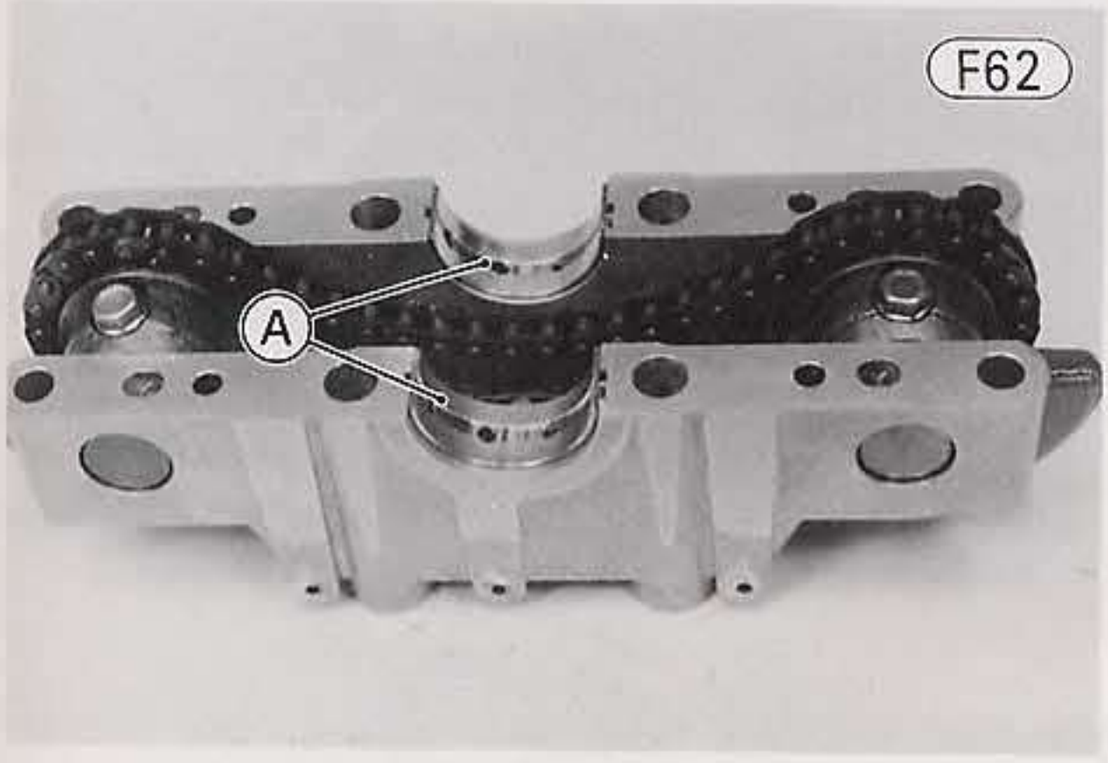
NOTE: The upper crankcase half, the lower crankcase half, and the crankshaft main bearing cap are machined at the factory in the assembled state, so the crankcase halves and the main bearing cap must be replaced together as a set.

- With a high flash-point solvent, clean off the mating surfaces of the upper crankcase half and main bearing cap, and wipe dry.
- Check that the knock pins (4), main bearing inserts (2), and O ring are in place. If the O ring is damaged or deteriorated, replace it with a new one.



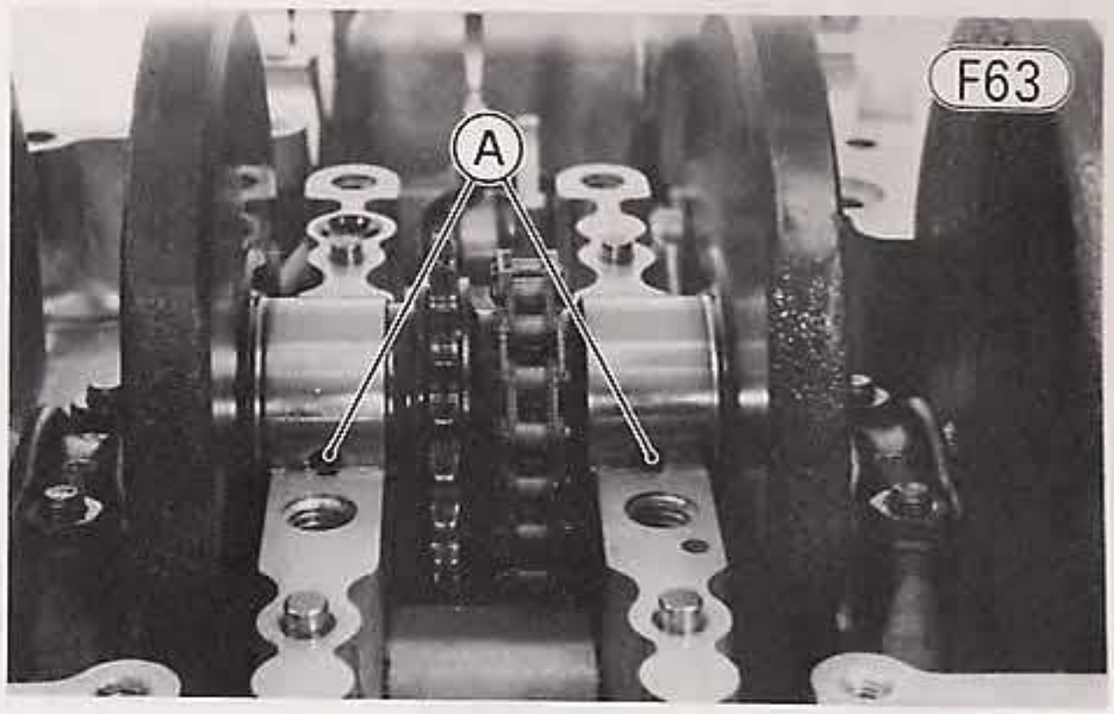
A. Knock Pins
B. Bearing Inserts
C. "O" Ring

- Check that the main bearing inserts (2) are in place.



A. Bearing Inserts

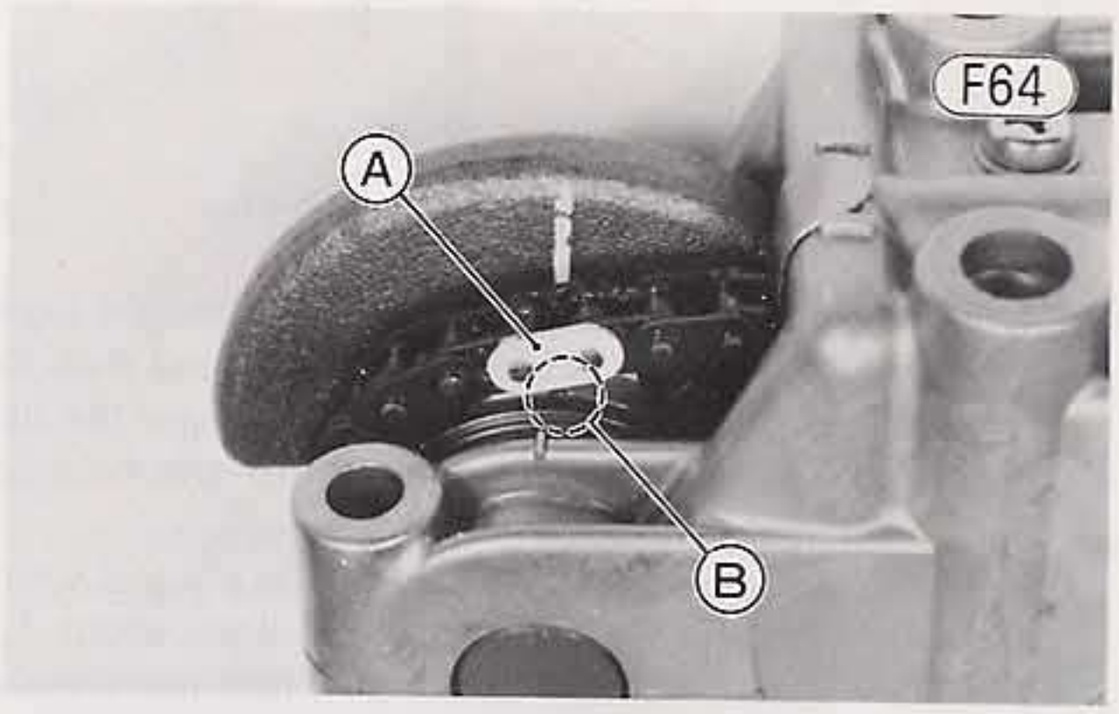
- Temporarily install the timing advancer, and, with a 17 mm wrench, turn the crankshaft so that the crankshaft oil holes are even with the upper crankcase half surface, with flywheels positioned up.



A. Oil Holes

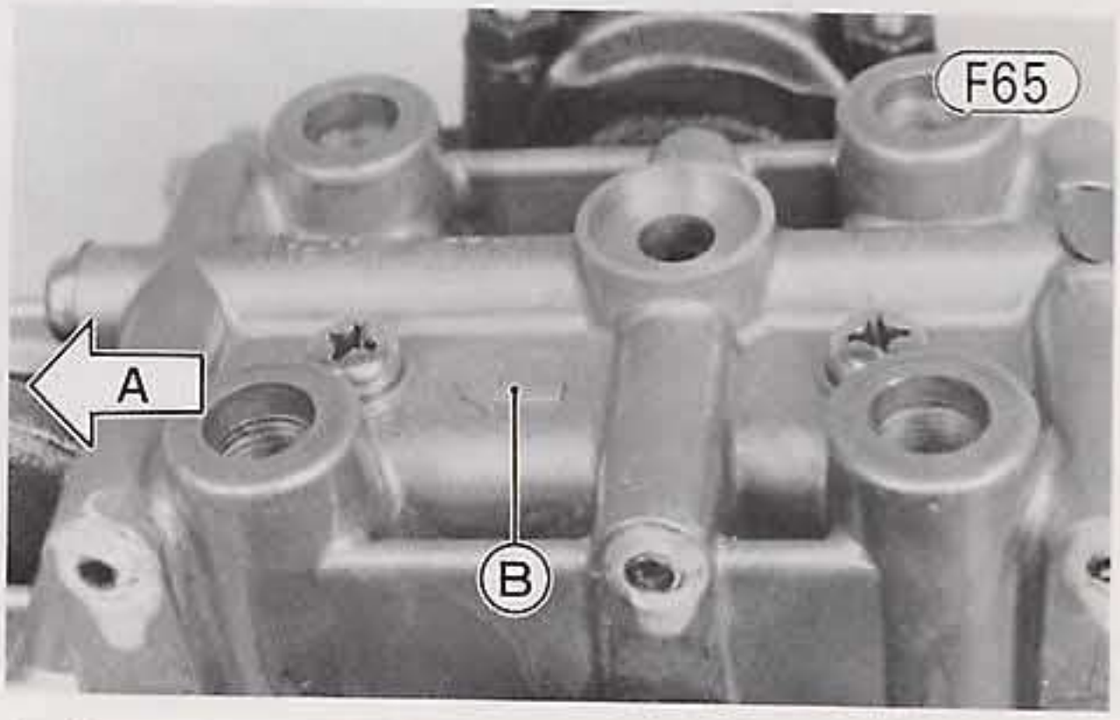
- Check to see that the balancer chain and balancer sprockets are properly fitted. For the front sprocket, the plated link must fit on the sprocket tooth with the punch mark. For the rear sprocket, the 4th plated link counted from the front must fit on the sprocket tooth with the punch mark.

NOTE: There are four plated links, and, with the chain in the position mentioned above, the 2nd and 3rd plated links counted from the front will be located on the main bearing cap mating surface side (Fig. F66).



A. Plated Link
B. Punch Mark

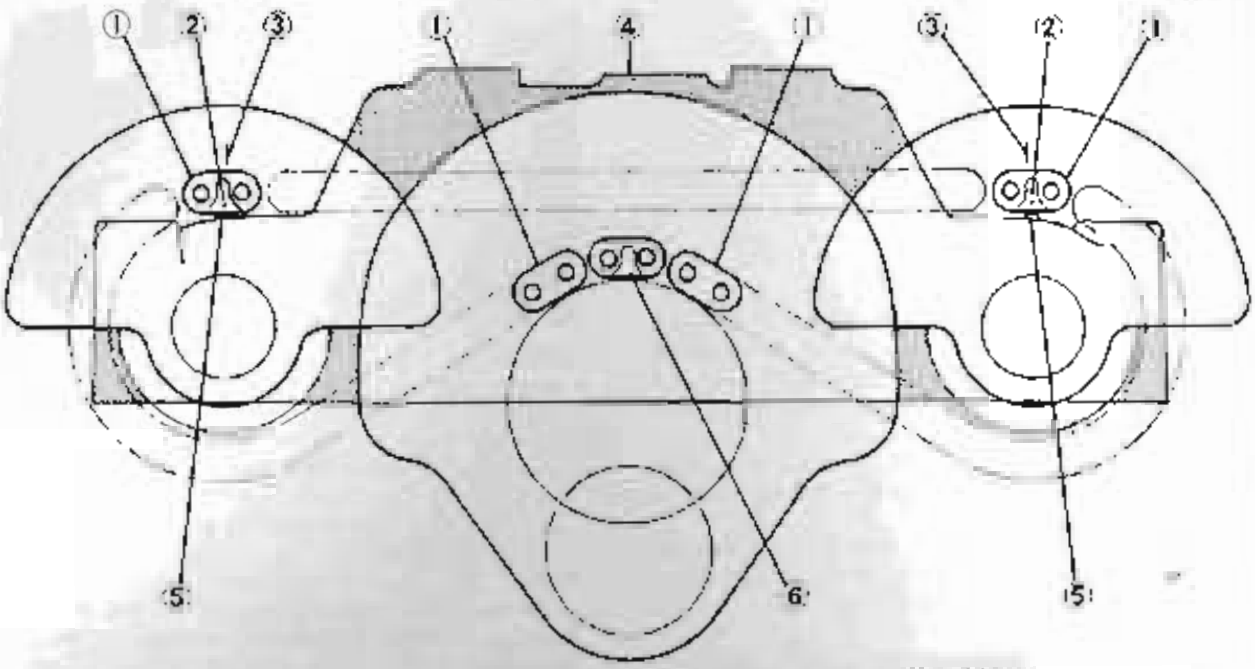
- Fit the main bearing cap on the upper crankcase half with the arrow on the main bearing cap pointing forward, engaging the middle link between the 2nd plated link and the 3rd plated link with the top tooth of the sprocket on the crankshaft.



A. Front
B. Arrow

Balancer Chain Timing

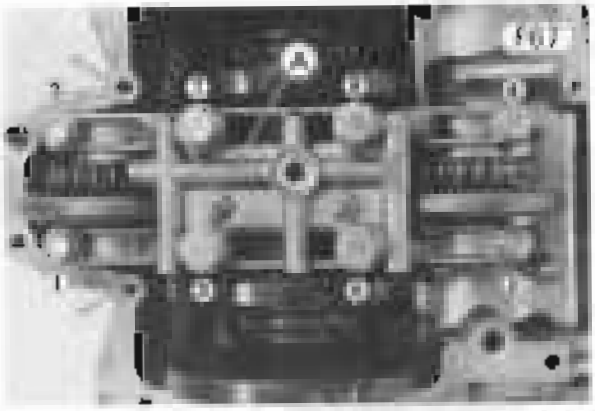
F66



1. Plated Link
2. Balancer Sprocket Punch Mark
3. Balancer Weight Line Mark
4. Main Bearing Cap
5. Main Bearing Cap Mark
6. Crankshaft Sprocket Top Tooth

•Check that the line mark on each balancer weight aligns with the mark on the main bearing cap, and that the sprocket tooth with the punch mark engages the balancer chain plated link. If not, lift off the balancer mechanism, and correct the timing.

•Install the main bearing cap 10 mm bolts (4) and 8 mm bolts (4), and first tighten the 8 mm bolts about 1.5 kg·m (11 ft·lbs) of torque and the 10 mm bolts about 3.5 kg·m (18 ft·lbs) of torque, following the tightening sequence numbers on the main bearing cap, and then tighten the 8 mm bolts to 2.5 kg·m (18 ft·lbs) of torque and the 10 mm bolts to 4.0 kg·m (29 ft·lbs) of torque in the same sequence.



A. Main Bearing Cap

•Install the O ring onto the top of the main bearing cap.

•Assemble the crankcase (Pg. 87).

•Install the engine (Pg. 83).

•Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.

•Carry out the adjustment procedures listed at the end of the engine installation section (Pg. 84).

Disassembly:

•Remove the main bearing inserts (2) 6.

•Remove the balancer weight bolts (2) 7.

•Pull out the balancer weight shafts (2) 3, and take off the washers 1, weights 6 and sprockets 2 (2 ea).

•Tapping lightly with a mallet, separate the sprocket 1 and balancer weight 6. The springs 4 and pins 5 (4 ea) may be removed.

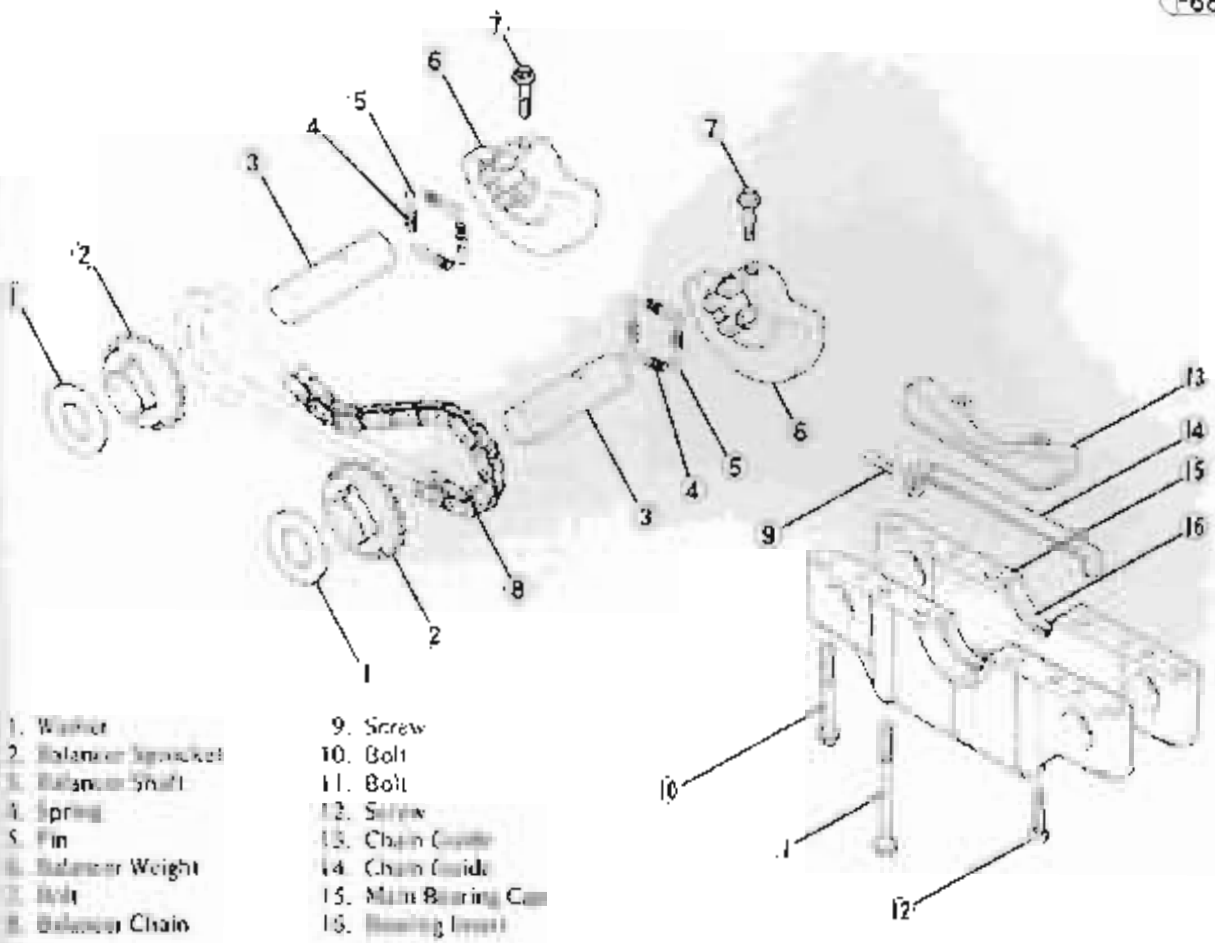
•Remove the balancer chain guide screws (2) 12, and take off the guide 11 and balancer chain 8.

•Remove the balancer chain guide screw 9, and take off the guide 14.

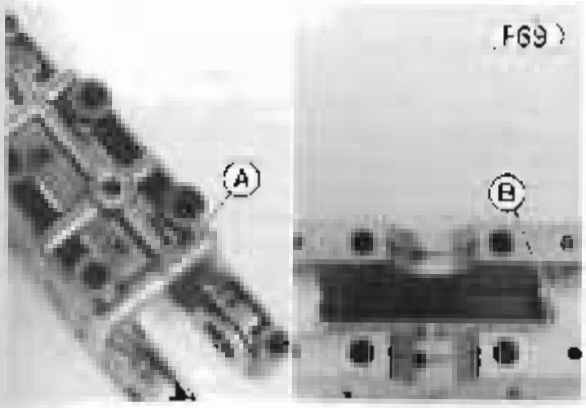
Assembly:

•Fit the balancer chain guide, and tighten its screw applying a nonpermanent locking agent to its threads. After tightening the guide screw, bend the other end of the guide over the side of the main bearing cap.

Balancer Mechanism



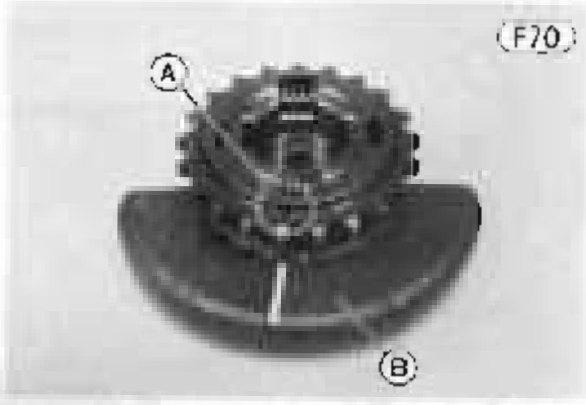
1. Washer
2. Balancer Sprocket
3. Balancer Shaft
4. Spring
5. Pin
6. Balancer Weight
7. Bolt
8. Balancer Chain
9. Screw
10. Bolt
11. Bolt
12. Screw
13. Chain Guide
14. Chain Guide
15. Main Bearing Cap
16. Bearing Insert



A. Chain Guide End
B. Apply a non-permanent locking agent

•Install the balancer chain guide with the chain and tighten its screws (B) applying a non-permanent locking agent on the screws. The balancer chain plated links must face the engine dynamo side.

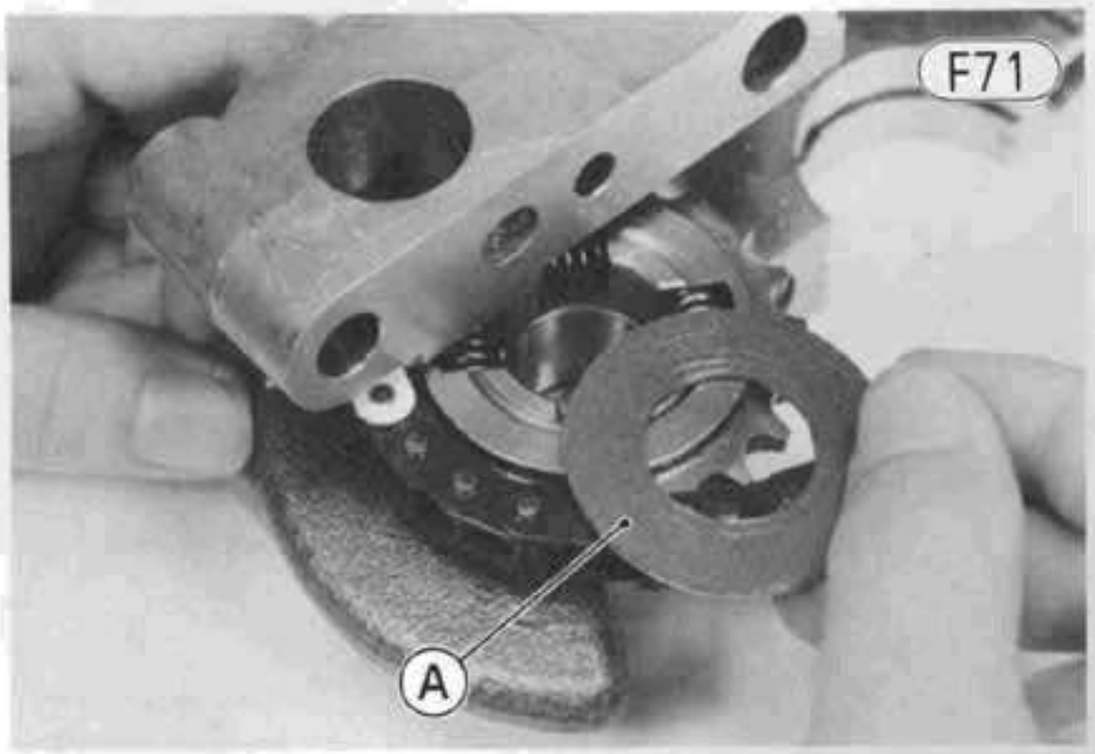
•With the springs and pins (B and A) in place in the inner circumference of the balancer weight, install the sprocket. The punch mark on the sprocket must face out (opposite side from the balancer weight), with the sprocket positioned as shown.



A. Punch Mark B. Balancer Weight

•Move each spring to the furthest point outward in its space so that the springs will not hinder inserting the balancer shaft through the weight.

•Install the balancer weight and sprocket assemblies through the balancer chain, and fit the washer on each balancer sprocket side (Fig. F 71).



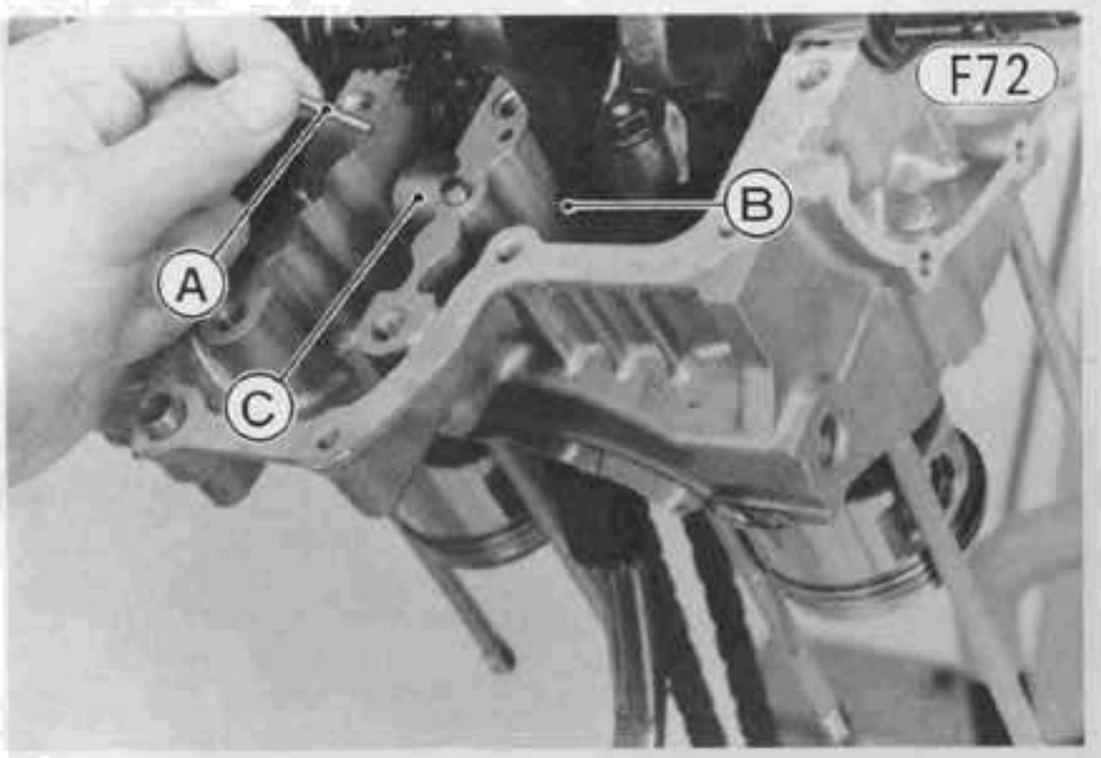
A. Washer

- Apply oil to each shaft and insert them, keeping the chain on the sprockets. Match the hole in the shaft with the hole in the balancer weight. Be sure that the washers are in place between each sprocket and the main bearing cap.
- Apply a non-permanent locking agent to the balancer weight bolts (2), and tighten them to 1.5 kg-m (11.0 ft-lbs) of torque.
- Install the main bearing inserts (2).

CAMSHAFT CHAIN GUIDE (FRONT)

Removal:

- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Remove the cylinder head cover (Pg. 51).
- Remove the camshaft and camshaft sprocket (Pg. 52).
- Remove the cylinder head (Pg. 54).
- Remove the cylinder block (Pg. 57).
- Split the crankcase (Pg. 84).
- Remove the balancer mechanism (Pg. 99).
- Remove the retaining pin, and take out the front camshaft chain guide pivot pin and guide.



A. Retaining Pin
B. Pivot Pin
C. Chain Guide

Installation:

- Install the front camshaft chain guide, insert the guide pivot pin, and install the retaining pin.
- Install the balancer mechanism (Pg. 99).
- Assemble the crankcase (Pg. 87).
- Install the cylinder block (Pg. 58).
- Install the cylinder head (Pg. 55).
- Install the camshaft and camshaft sprocket (Pg. 53).
- Install the cylinder head cover (Pg. 51).
- Install the engine (Pg. 83).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Carry out the adjustment procedures listed at the end of the engine installation section (Pg. 84).

CONNECTING ROD

Removal:

- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Remove the cylinder head cover (Pg. 51).
- Remove the camshaft and camshaft sprocket (Pg. 52).
- Remove the cylinder head (Pg. 54).
- Remove the cylinder block (Pg. 57).
- Remove the pistons (Pg. 59).
- Split the crankcase (Pg. 84).
- Remove the nuts (4) and pull off the connecting rod big end caps.

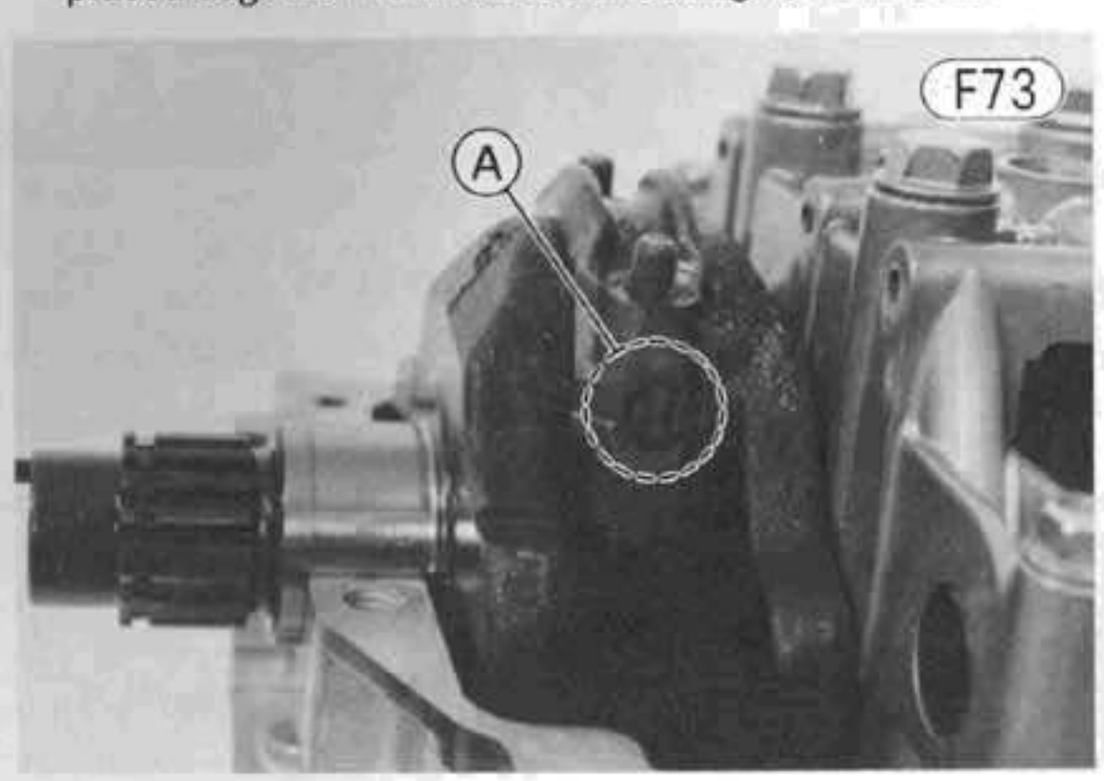
CAUTION **Do not allow the big end cap bolts to bump against the crankshaft journals to prevent damage.**

- Remove the connecting rod bearing insert halves from the connecting rod big ends and the big end caps.

NOTE: It is recommended that the connecting rod big end cap bolts not be removed. This is to keep the alignment of the connecting rods and the big end caps.

Installation Notes:

1. Apply engine oil to the connecting rod bearing inserts.
2. When installing new connecting rods, use connecting rods having the same weight mark. This weight mark, indicated using a capital letter, is stamped on the connecting rod big end.
3. The connecting rod big end cap is machined with the connecting rod as a set, so fit them together so that the weight marks align. The big end cap must be replaced together with the connecting rod as a set.

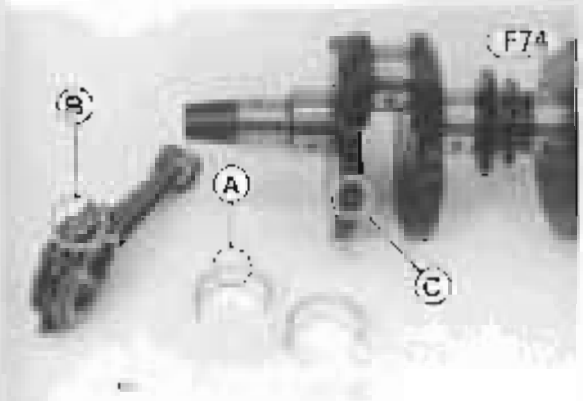


A. Weight Mark (Alphabet)

4. If a new crankshaft and/or connecting rod is used, select the proper bearing insert in accordance with the combination of the connecting rod and the crankshaft marks (Fig. F74). If the connecting rod only is replaced with a new one, first measure the diameter of the connecting rod journal, mark its flywheel in accordance with the diameter (Pg. 171), and then select the proper bearing insert in accordance with Table F4.

Table F4 Bearing Insert Selection

Crankshaft Marking \ Con Rod Marking	○	No mark
○	Black PN 13034-051	Brown PN 13034-052
No mark	Green PN 13034-050	Black PN 13034-051



A. Color Mark
B. Connecting Rod Mark (Circle)
C. Crankshaft Mark (Circle)

5. Hand tighten both nuts first, and then tighten each nut to 2.4 kg-m (17.5 ft-lbs) of torque.

CRANKSHAFT, CAMSHAFT CHAIN

Removal:

- Remove the engine (Pg. 82).
- Set the engine on a clean surface or, preferably, mount it on an engine stand.
- Remove the cylinder head cover (Pg. 51).
- Remove the camshaft and camshaft sprocket (Pg. 52).
- Split the crankcase (Pg. 84).
- Remove the balancer mechanism (Pg. 90).
- Remove the nuts (4) and pull off the connecting rod big end caps.

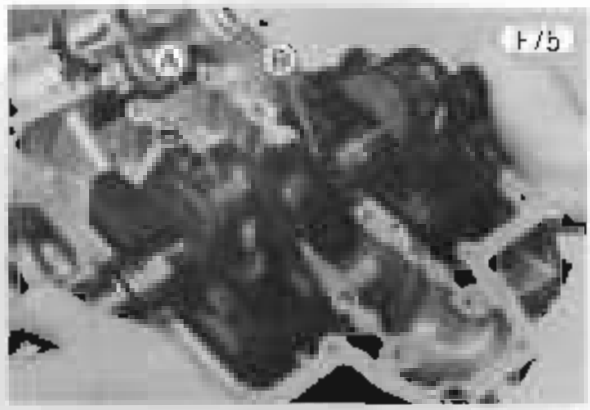
CAUTION **To prevent damage to the crankshaft journals, do not allow the big end cap bolts to bump against them.**

- Lift off the crankshaft with the camshaft chain.
- Slip the camshaft chain off the crankshaft.

Installation:

NOTE: If a new crankshaft and/or connecting rod is used, select the proper bearing insert in accordance with the combination of connecting rod and crankshaft marks (Fig. F74, Table F4).

- Blow the oil passages clean with compressed air.
- Apply engine oil to the crankshaft bearing inserts.
- Fit the camshaft chain back onto the sprocket and set the crankshaft back in its place on the upper crankcase half.



A. Crankshaft B. Camshaft Chain

- Fit the connecting rod big end cap on the connecting rods the weight marks align (Fig. F73).

NOTE: The connecting rod big end cap is machined with the connecting rod as a set, so fit them together so that the weight marks align. The big end cap must be replaced together with the connecting rod as a set.

- Hand tighten both nuts first, and then tighten each nut to 2.4 kg-m (17.5 ft-lbs) of torque.
- Install the balancer mechanism (Pg. 90).
- Assemble the crankcase (Pg. 87).
- Install the camshaft and camshaft sprocket (Pg. 53).
- Install the cylinder head cover (Pg. 52).
- Install the engine (Pg. 83).
- Fill the engine with oil, check the oil level (Pg. 20), and add more if necessary.
- Carry out the adjustment procedures listed at the end of the engine installation section (Pg. 84).

Disassembly – Chassis

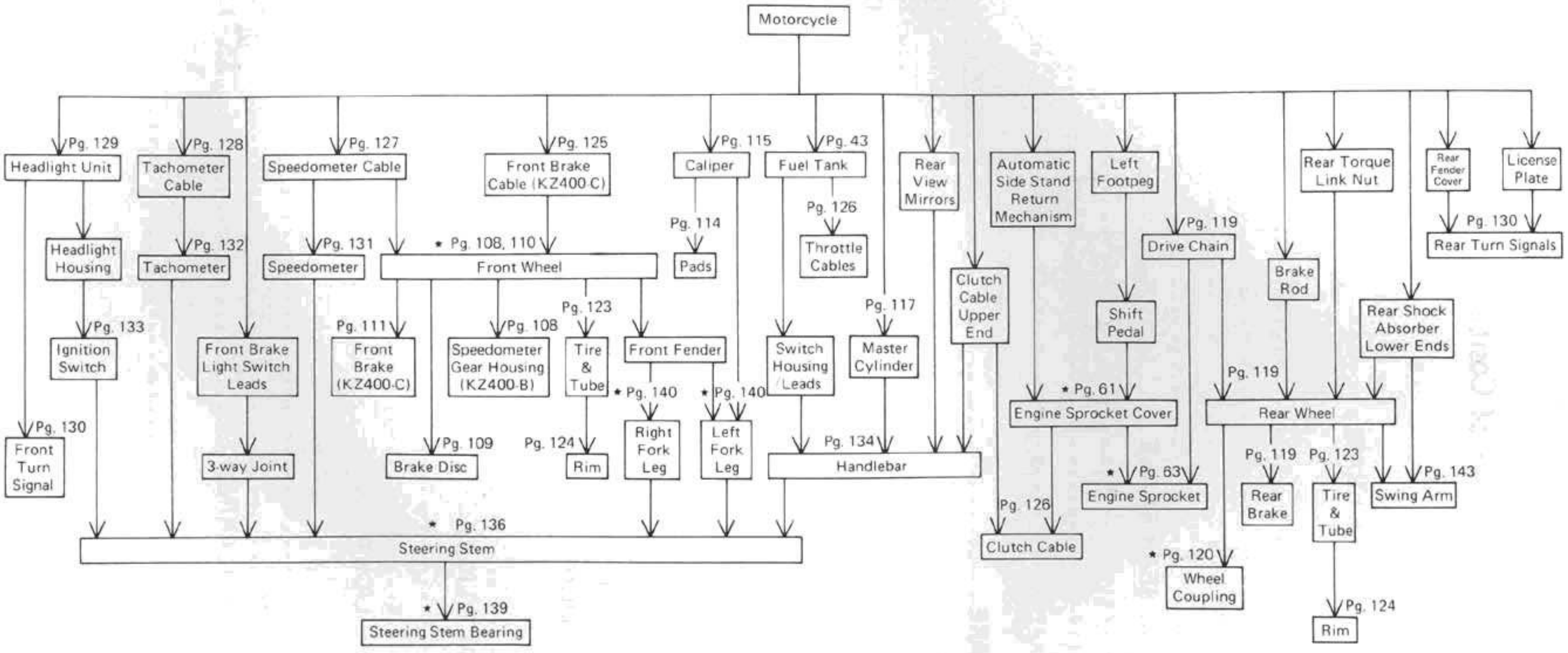
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FLOW CHART
Disassembly – Chassis

This chart is intended to be aids to proper removal. Select the component you wish to remove and follow the arrows to that point on the chart.

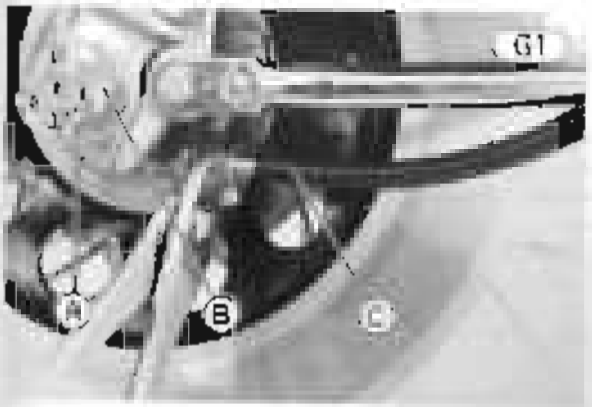


NOTE: Action with a mark (★) requires special tool(s) for removal, installation, disassembly, or assembly.

FRONT WHEEL (on KZ400-B)

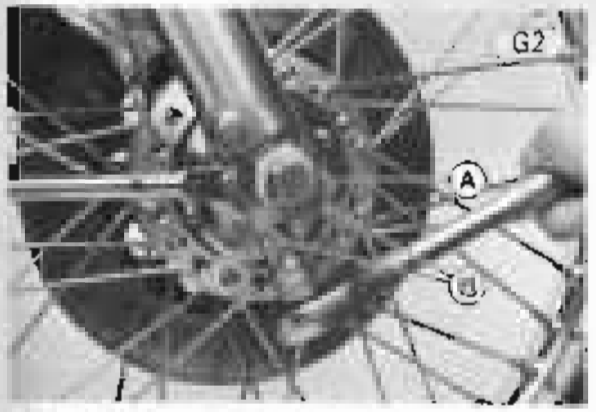
Removal:

•Disconnect the lower end of the speedometer cable with pliers.



A. Cotter Pin
B. Axle Nut
C. Speedometer Cable

•Remove the front axle cotter pin, nut and washer.
•Loosen the front axle clamp nuts (2), but do not remove them.



A. Axle Clamp
B. Clamp Nuts

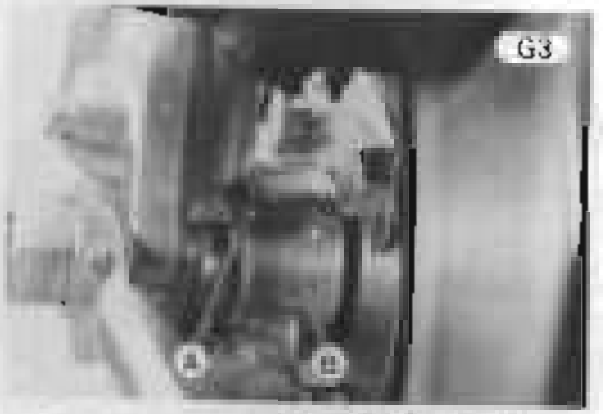
•Use a jack under the engine or other suitable means to lift the front of the motorcycle.
•Remove the axle clamp nuts (2), lockwashers (2), and clamp.
•Holding the wheel to facilitate axle removal, pull out the axle, and then remove the wheel from the motorcycle.

CAUTION **Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc.**

•Insert a wood wedge (7 ~ 8 mm thick) between the disc brake pads. This prevents the pads from being moved out of their proper position, should the brake lever be squeezed accidentally.

Installation:

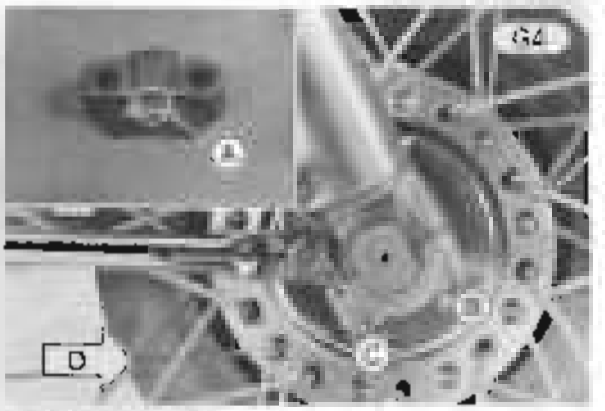
•Remove the wedge from between the disc brake pads.
•Check that the speedometer gear housing is properly fitted on the front hub (See the speedometer gear housing assembly notes on Pg. 109), and check that the collar is on the right side of the hub.
•Hold the front wheel in its place between the front fork tubes, and insert the axle from the right.
•Mount the front axle clamp, and install the lockwashers and nuts finger tight. The arrow at the bottom of the clamp must point to the front as shown in Fig. G4.
•Install the washer and front axle nut finger tight.
•Turn the speedometer gear housing counterclockwise until it stops. Be sure that the small projection on the gear housing does not catch on the lower part of the left tube.



A. Projection
B. Speedometer Gear Housing

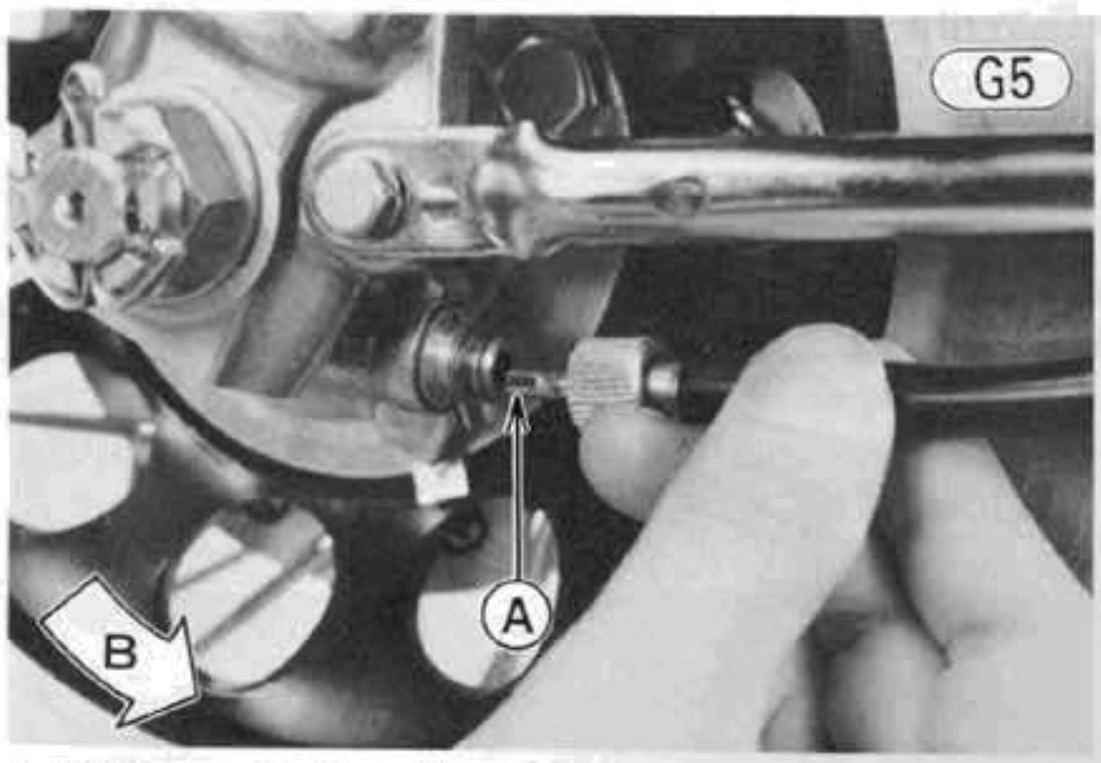
•Holding the axle with an open end wrench so that it does not turn, tighten the axle nut to 8.0 kg-m (58 ft-lbs) of torque.
•Insert a new cotter pin through the axle nut and axle, and spread its ends.
•Tighten first the front axle clamp nut and then the rear nut to 1.8 kg-m (13.0 ft-lbs) of torque. There will be a gap at the rear of the clamp after tightening.

WARNING **If the clamp is installed incorrectly or improperly tightened, the clamp or the studs could fail, resulting in loss of control.**



A. Arrow
B. No Gap
C. Even Gap
D. Front

•Insert the speedometer inner cable into the housing while turning the wheel so that the slot in the end of the cable will seat in the tongue of the speedometer pinion. Tighten the cable nut with pliers (Fig. G5).
•Check the front brake.



A. Slot B. Turn the wheel

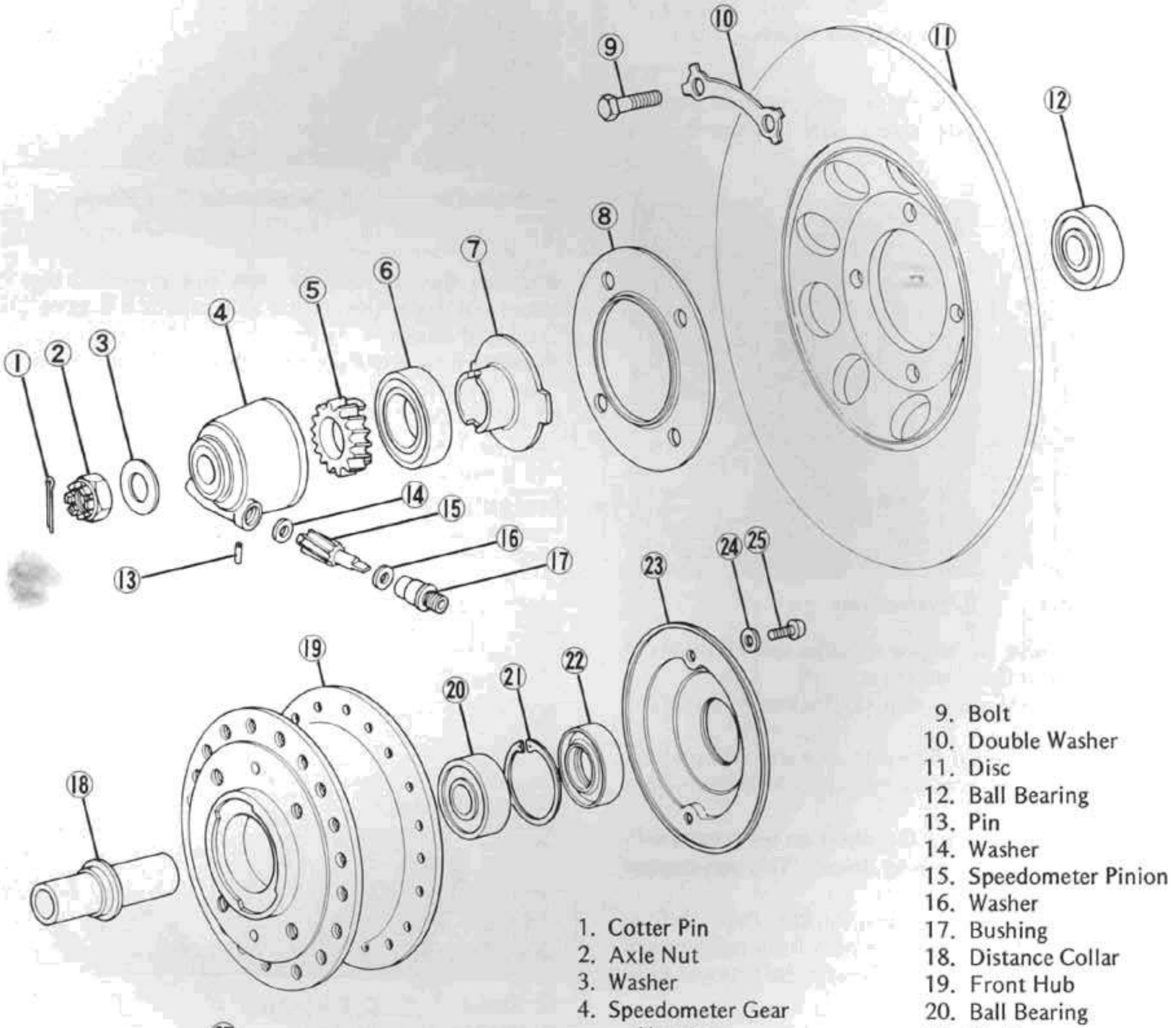
WARNING **Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brakes will not function on the first application of the lever if this is not done.**

Speedometer Gear Housing Disassembly:

- Pull the speedometer gear housing ④ off the front hub ⑲.
- Pull out the grease seal ⑥ using a hook.
- Pull out the speedometer gear ⑤.
- If the speedometer cable bushing ⑰ or speedometer pinion ⑮ needs to be removed, first drill the housing through the pin ⑬ using a 1 mm drill bit. Drill the housing from the gear side using a 2 mm drill bit.

Front Hub (KZ400-B)

G6



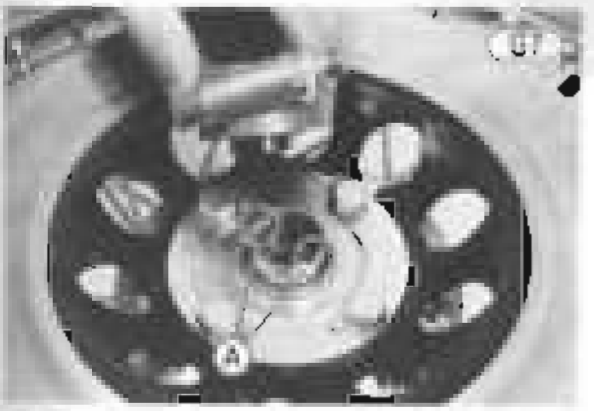
1. Cotter Pin
2. Axle Nut
3. Washer
4. Speedometer Gear Housing
5. Speedometer Gear
6. Grease Seal
7. Speedometer Gear Drive
8. Speedometer Gear Drive Holding Plate and Spacer
9. Bolt
10. Double Washer
11. Disc
12. Ball Bearing
13. Pin
14. Washer
15. Speedometer Pinion
16. Washer
17. Bushing
18. Distance Collar
19. Front Hub
20. Ball Bearing
21. Circlip
22. Ball Bearing
23. Cap
24. Washer
25. Screw
26. Collar
27. Front Axle

Using a suitable tool, tap out the pin, and then pull out the speedometer cable housing and pinion.

NOTE: It is recommended that the assembly be replaced rather than attempting to repair the components.

Speedometer Gear Housing Assembly Notes:

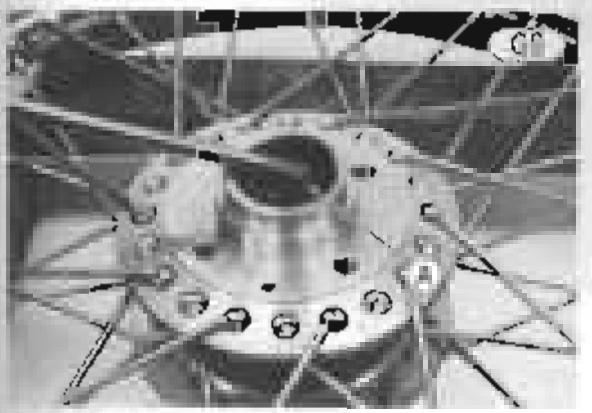
1. Replace the grease seal with a new one. Apply a little grease to the seal. Install it using a press or a suitable driver so that the face of the seal is level with the surface of the housing.
2. After inserting a new pin, punch the housing hole to secure the pin in place.
3. Replace the speedometer gear.
4. Install the speedometer gear housing so that it fits in the speedometer gear drive notches. When properly fitted, the clearance between the speedometer gear housing and the gear drive holding plate is a little less than 1 mm.



A. Notches

Front Hub Disassembly (including disc removal):

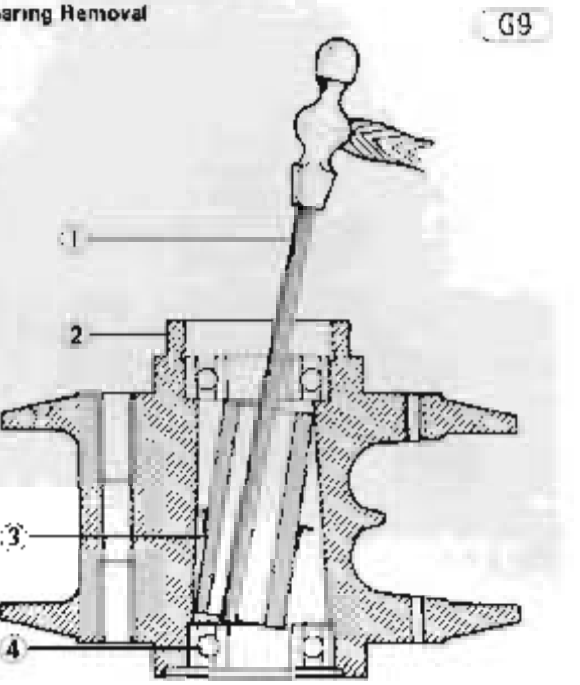
- Pull the speedometer gear housing 4 and collar 26 off the front hub.
- Remove the screws 11 (2) and washers 10 (2), and take the cap 12 off the right side of the hub.
- Straighten the tabs of the disc double washers 10 (2) that are bent over the disc bolts 9 (4). Remove the bolts, double washers, speedometer gear drive holding plate and spacer 6, speedometer gear drive 7, and disc 8.
- Using a hook, pull out the grease seal 22 and remove the circlip 21.



A. Grease Seal

- Insert a metal rod into the hub from the right side, and remove the bearing 23 on the left side by tapping evenly around the bearing inner race. The distance collar 25 will come out with the bearing.

Bearing Removal

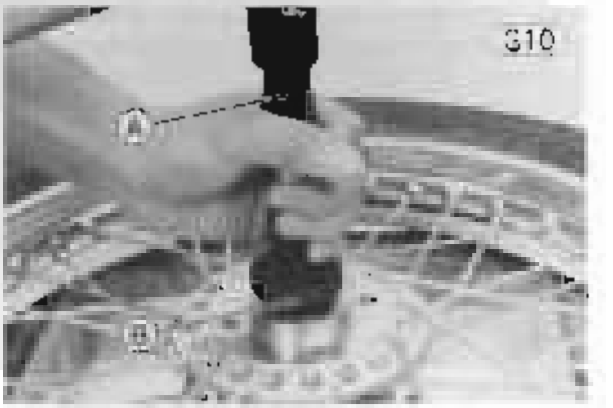


1. Metal Rod
2. Front Hub
3. Distance Collar
4. Ball Bearing

- Insert the metal rod into the hub from the left side, and remove the other bearing 23 by tapping evenly around the bearing inner race.

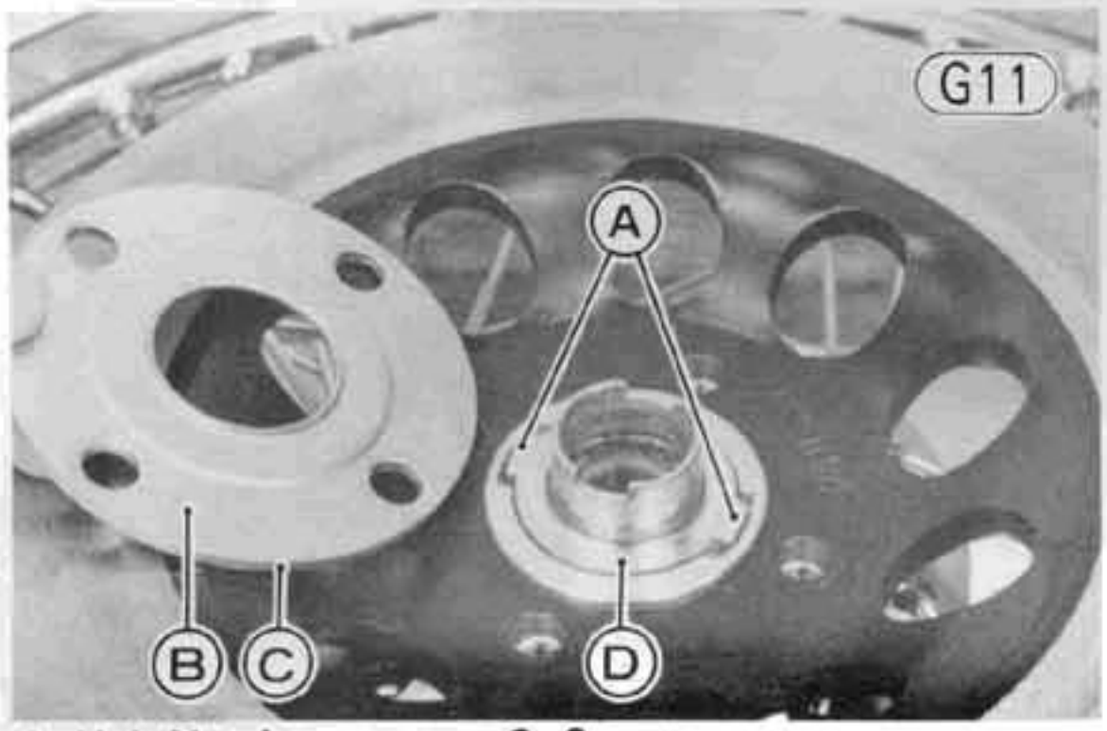
Front Hub Assembly:

- Inspect the bearings and replace if necessary (Pg. 196).
- Lubricate the ball bearings (Pg. 197).
- Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.
- Install the left side ball bearing using the wheel bearing driver and the bearing driver holder (special tools). Press the bearing until it stops at the bottom of the hole.



A. Bearing Driver Holder (57001-139)
B. Bearing Driver (57001-140)

- Put the distance collar into the hub.
- Install the right side ball bearing using the same special tools, and install the circlip.
- Install a new grease seal using a bearing driver (special tool: PN 57001-296) and bearing driver holder. Press the seal so that the face of the seal is level with the surface of the front hub.
- Install the cap using the screws (2) and flat washers (2).
- Place the disc on the hub, and install the speedometer gear drive fitting it in the hub notches.
- Install the spacer and speedometer gear drive holding plate in place. The speedometer gear drive holding plate must be installed with the protruding side facing out.



A. Hub Notches
B. Holding Plate
C. Spacer
D. Speedometer Gear Drive

- Install new double washers (2) and disc mounting bolts (4). Tighten the disc mounting bolts (4) to 4.0 kg-m (29 ft-lbs) of torque, and then bend the washer tabs back over the bolts.
- After installing the disc, check the disc runout (Pg. 205).
- Install the speedometer gear housing so that it fits in the speedometer gear drive notches (Fig. G7).
- Install the collar on the right side of the hub.
- Completely clean off any grease that has gotton on either side of the disc with a high flash-point solvent. Do not use one which will leave an oily residue.

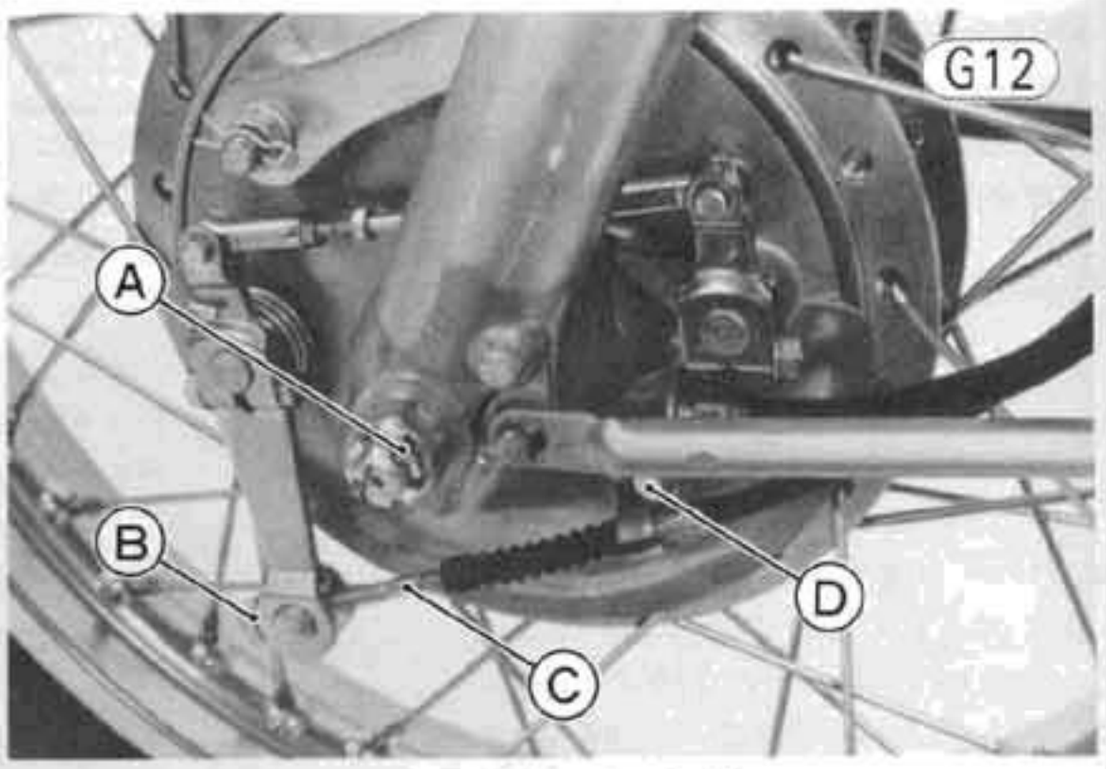
FRONT WHEEL (on KZ400-C)

WARNING **Brake linings contain asbestos fiber. Inhalation of asbestos may cause serious scarring of the lungs and may promote other internal injury and illness, including cancer. Observe the following precautions when handling brake linings:**

1. **Never blow brake lining dust with compressed air.**
2. **If any components are to be cleaned, wash with detergent, then immediately discard the cleaning solution and wash your hands.**
3. **Do not grind any brake lining material unless a ventilation hood is available and properly used.**

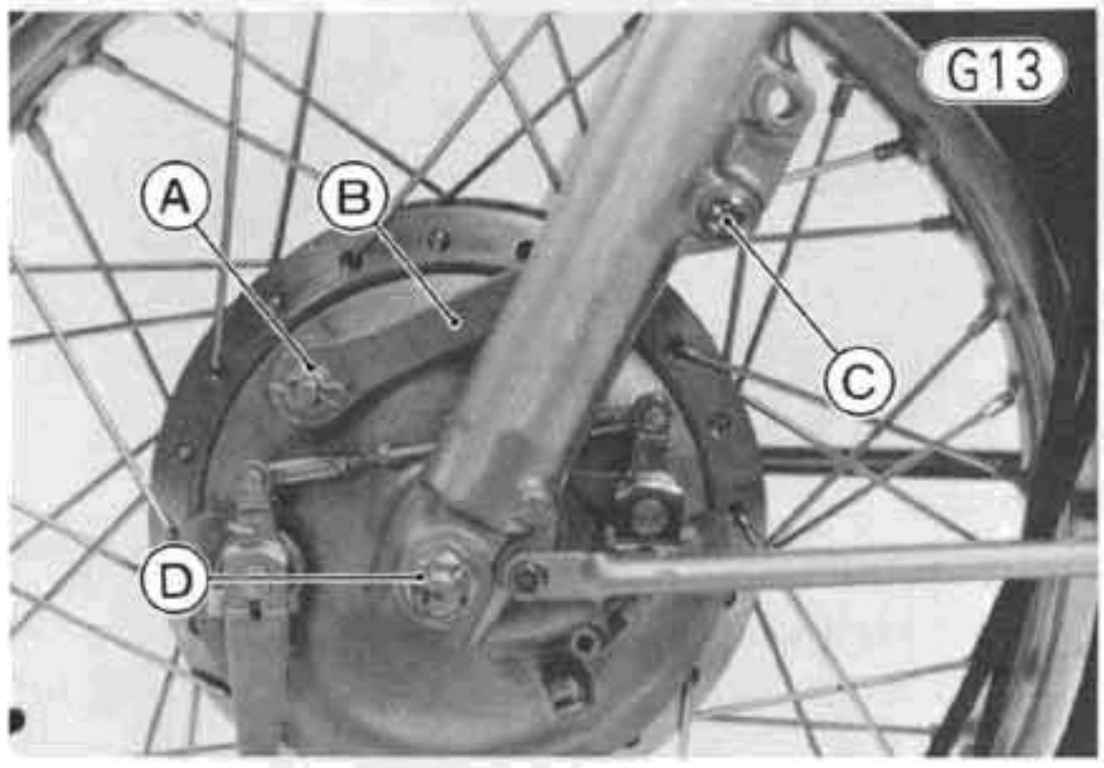
Removal:

- Jack or prop up the engine so that the front wheel is off the ground.
- Slide the cable dust cover out of its position on the outer cable end.
- Screw off the adjusting nut, and free the brake cable from the brake panel. Also remove the brake cable joint.



A. Cotter Pin
B. Adjusting Nut
C. Brake Cable
D. Cable Retaining Bolt

- Remove the speedometer cable retaining bolt and washer and pull the lower end of the speedometer cable off the brake panel.
- Take out the torque link clips (2), remove the nuts (2), bolt, lockwashers (2), and flat washer, and remove the torque link.



A. Nut
B. Torque Link
C. Bolt
D. Axle Nut

- Remove the front axle cotter pin, nut, and washer.
- Remove the front axle clamp nuts (2), lockwashers (2), and clamp.
- Holding the wheel to facilitate axle removal, pull out the axle, and then remove the wheel from the motorcycle.

Installation:

- Hold the front wheel in place between the front fork tubes, and insert the axle from the right.
- Mount the front axle clamp, and install the lockwashers and nuts finger tight. The arrow at the bottom of the clamp must point to the front as shown in Fig. G15.
- Install the washer and front axle nut finger tight.
- Hook the lower end of the torque link on the brake panel.
- Hook the upper end of the torque link on the bolt that goes through the lower hole in the fork tube. Install the torque link with the welded-washer side of the link facing the fork tube.



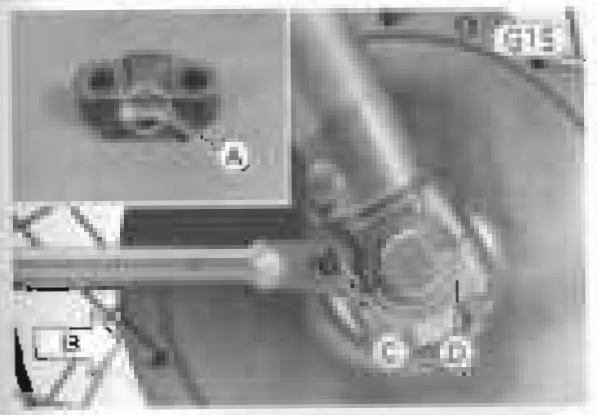
A. Welded Washer

- Install the flat washer, lockwasher, and nut on the bolt, and install the lockwasher and nut on the stud on the brake panel. Finger tighten the nuts.
- Center the brake panel assembly in the brake drum. This is done by tightening the axle lightly, spinning the wheel, and pulling the brake lever forcefully. The partially tightened axle allows the brake panel assembly to center itself within the brake drum.

NOTE: This procedure can prevent a soft or "spongy feeling" brake.

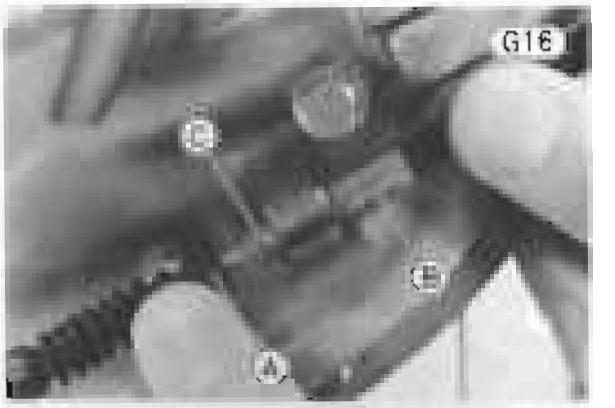
- Holding the axle with an open end wrench so that it does not turn, tighten the axle nut to 8.0 kg-m (58 ft-lbs) of torque.
- Tighten first the front axle clamp nut and then the rear nut to 1.8 kg-m (13.0 ft-lbs) of torque. There will be a gap at the rear of the clamp after tightening.

WARNING **If the clamps are installed incorrectly or improperly tightened, the clamps or the studs could fail, resulting in loss of control.**



A. Arrow
B. Front
C. Even Gap
D. No Gap

- Tighten the torque link nuts to 3.0 kg-m (22 ft-lbs) of torque, and insert the torque link clips.
- Insert the speedometer inner cable into the front brake panel while turning the wheel so that the inner cable end will seat in the speedometer pinion gear.
- Install the speedometer cable retaining bolt and washer.
- Attach the brake cable, brake cable joint, and adjusting nut back onto the front brake panel. Install a new cotter pin in the end of the threaded brake cable extension.
- Slide the cable dust cover back into the groove on the brake outer cable and to secure the brake outer cable in the cable mount.



A. Dust Cover
B. Brake Outer Cable
C. Groove

- Adjust the front brake (Pg. 25).

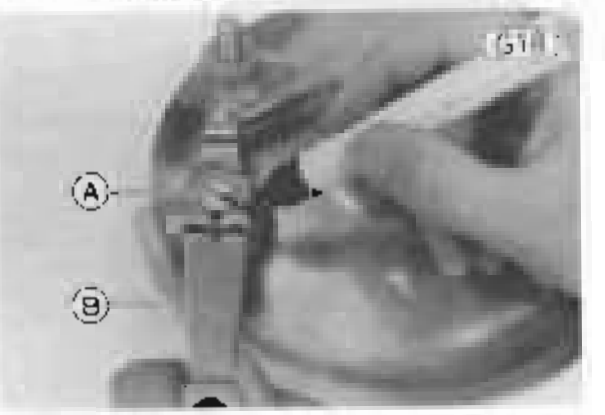
Front Brake Disassembly:

- Remove the brake panel (1) from the front hub.
- Using a clean cloth around the linings to prevent grease or oil from getting on them, remove the brake shoes (4) by pulling them off the brake cam shafts.



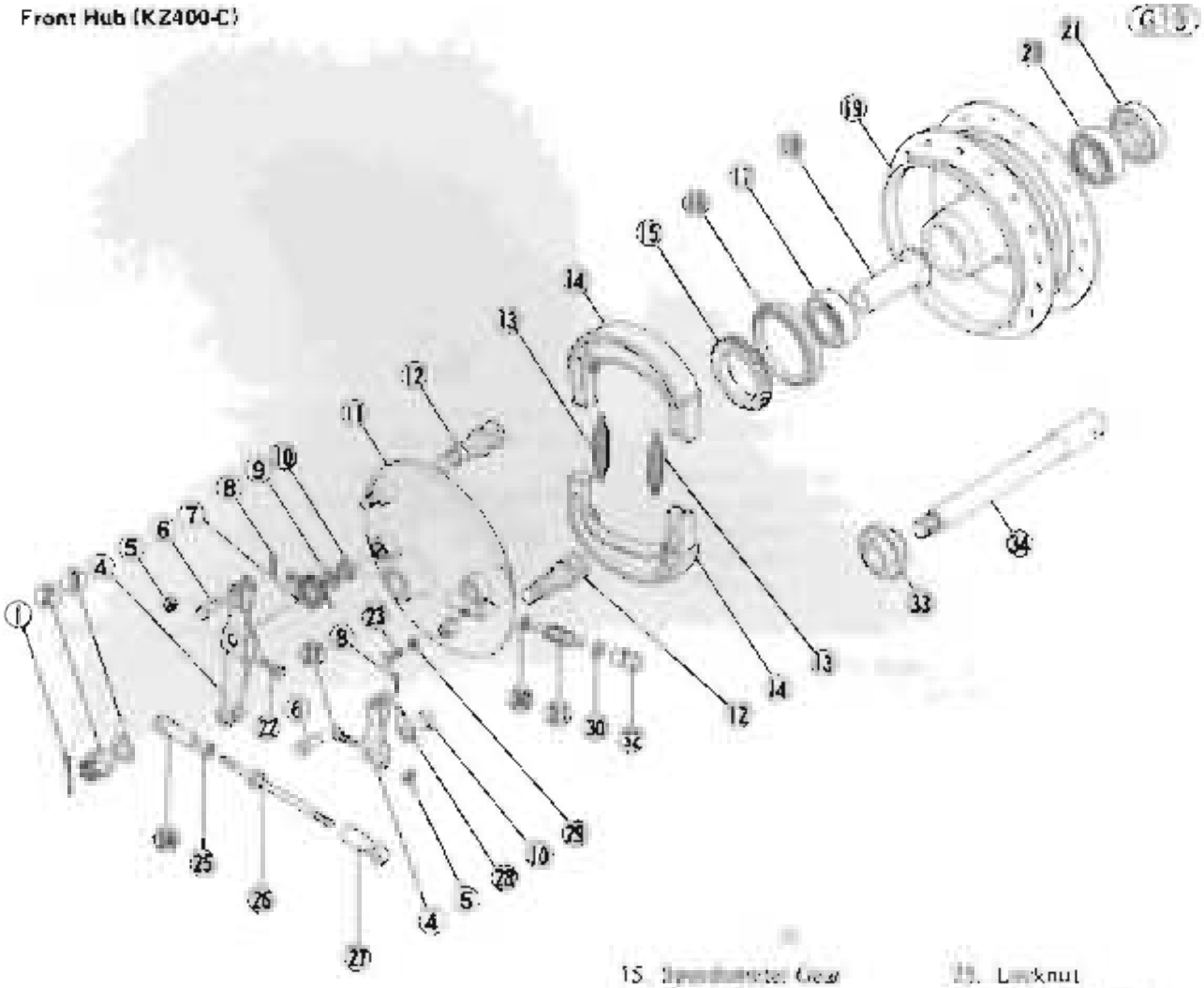
A. Brake Shoes

- Remove the brake springs (3) (2) to separate the two brake shoes.
- Mark the position of each cam lever on the camshaft so that they can later be installed at the same angle.



A. Cam Shaft
B. Cam Lever

Front Hub (KZ400-C)

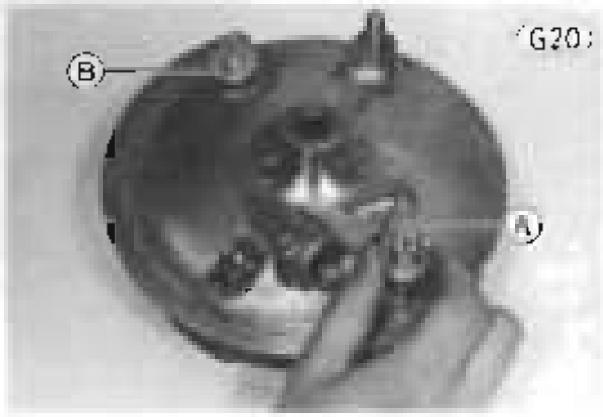


1. Cotter Pin
2. Axle Nut
3. Washer
4. Cam Lever
5. Nut
6. Pin
7. Return Spring
8. Cotter Pin
9. Washer
10. Dust Seal
11. Brake Panel
12. Camshaft
13. Shoe Spring
14. Brake Shoe
15. Speedometer Gear
16. Grease Seal
17. Ball Bearing
18. Distance Collar
19. Front Hub
20. Ball Bearing
21. Grease Seal
22. Bolt
23. Bolt
24. Joint
25. Locknut
26. Connecting Rod
27. Joint
28. Indicator
29. Washer
30. Washer
31. Speedometer Pinion
32. Bushing
33. Cap
34. Front Axle

- Remove the nuts 5 and bolts 22, and pull the cam levers off the camshafts.
- Remove the return spring 7, brake lining wear indicator 28, washer 9, and dust seals 10.
- Remove the camshafts 12.

Front Brake Assembly:

- Lubricate the brake parts [Pg. 20].
- Install the brake springs connecting the brake shoes.
- Wrapping a clean cloth around the linings to prevent grease or oil from getting on them, put the shoes back onto the brake panel.
- Fit the dust seals on the camshafts.
- Replace the washer and the brake lining wear indicator. The indicator should point just to the right of the "L" in RANGE.



A. Wear Indicator B. Washer

•Install the cam levers with the return spring part of the way onto the camshafts, fit the return spring end into its hole in the panel, and put the cam levers the rest of the way into position on the camshafts. Tighten the bolts.



A. Return Spring B. Hole

Speedometer Pinion Removal:

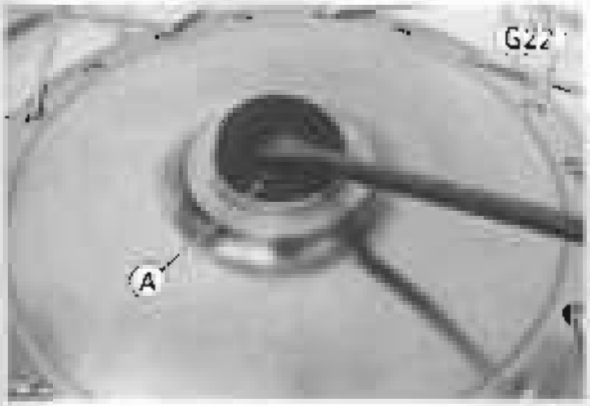
•Unscrew the speedometer pinion bushing ② from the brake panel, and draw out the pinion ① and washers ③.

Speedometer Pinion Installation:

•Grease the speedometer pinion, install the pinion and its washers, and screw in the speedometer pinion bushing securely.

Front Hub Disassembly:

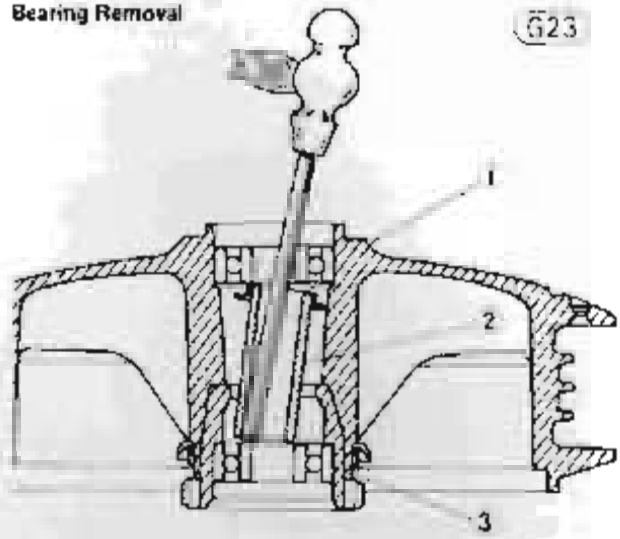
•Pull the brake panel ① and cap ③ off the front hub.
•Pull off the grease seal ② on the cap side using a hook.



A. Grease Seal

•Insert a metal rod into the hub from the cap side, and remove the bearing ① by tapping evenly around its inner race. The distance collar ② will come out with the bearing.

Bearing Removal



1. Front Hub 2. Distance Collar 3. Ball Bearing

•Insert a metal rod into the hub from the panel side, and remove the bearing ① on the cap side by tapping evenly around its inner race.
•To remove the grease seal ② on the panel side, pull off the speedometer gear ③ using a gear puller, and pull off the grease seal using a hook.

Front Hub Assembly:

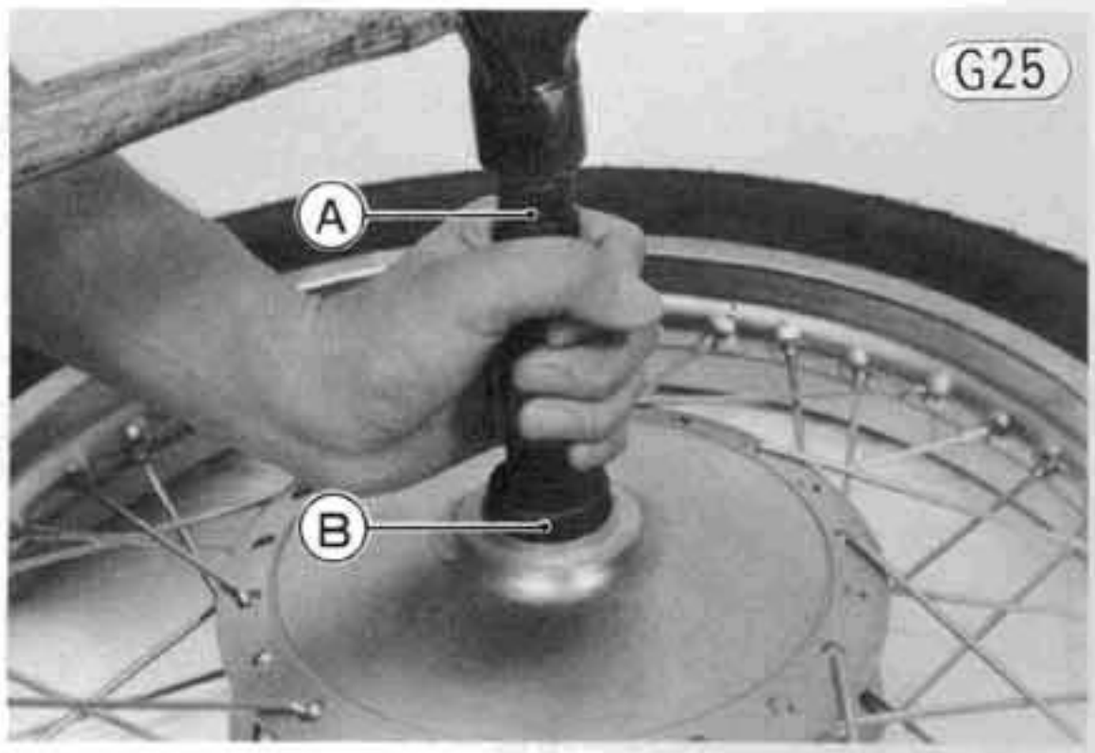
•Using a suitable tool, install the wheel side grease seal and the speedometer gear. Press them in until they stop at the shoulders on the hub.
•After installing the speedometer gear, punch two points on the drum to lock the gear in place.



A. Speedometer Gear B. Punch two points

•Inspect the bearings and replace them if necessary (Pg. 196).
•Lubricate the ball bearings (Pg. 197).
•Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.
•Install the cap side ball bearing using the wheel bearing driver and the bearing driver holder (special tools).

Press the bearing in until it stops at the bottom of the hole.



A. Bearing Driver Holder (57001-139)
B. Bearing Driver (57001-288)

- Install a new grease seal on the cap side using the bearing driver (special tool: PN 57001-296) and bearing driver holder. Press the seal so that the face of the seal is level with the surface of the front hub.
- Put the distance collar into the hub.
- Install the brake panel side bearing facing the shield outward. Press the bearing in until it stops at the bottom of the hole using the same special tools used for the other bearing installation.

FRONT DISC BRAKE

NOTE: Observe the "Warning" on Pg. 110.

Removal, installation, disassembly, and assembly of the front disc brake is divided as follows:

Pad Removal
Pad Installation
Caliper Removal
Caliper Installation Notes
Caliper Disassembly
Caliper Assembly
Master Cylinder Removal
Master Cylinder Installation Notes
Master Cylinder Disassembly
Master Cylinder Assembly Notes
Brake Hose Replacement

NOTE: Disc removal and disc installation are covered in front hub disassembly and front hub assembly sections (Pgs. 109~110).

Before working on the disc brake, take caution of the following:

CAUTION

1. **Except for the disc pads and disc; use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, motor oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely, and will eventually deterioarte the rubber used in the disc brake.**
2. **When handling the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high flash-point solvent. Replace the pads with new ones if they cannot be cleaned satisfactorily.**
3. **Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely wiped up immediately.**
4. **If any of the brake line fittings or the bleed valve is opened at any time, AIR MUST BE BLED FROM THE BRAKE SYSTEM (Pg. 203).**
5. **When installing or assembling the disc brake, tighten the disc brake fittings to the values given in Table G1. Improper torque may cause the brake to malfunction.**

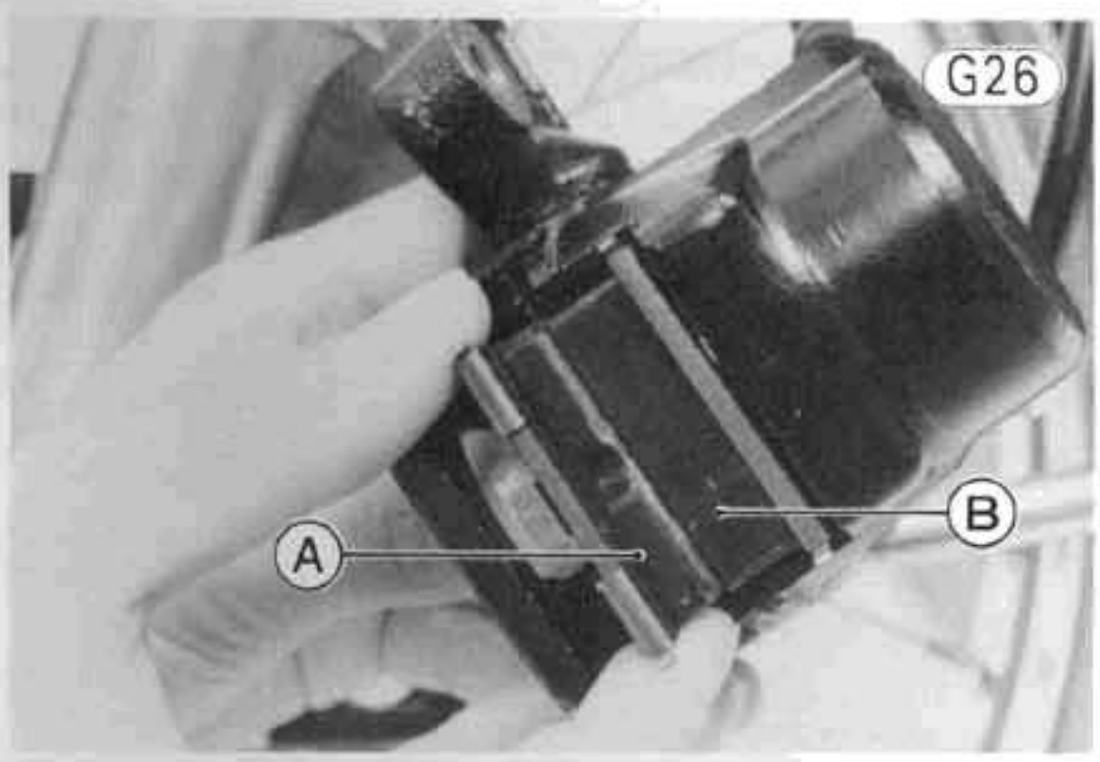
Table G1 Disc Brake Torque

Bleed valve	0.80 kg-m	69 in-lbs
Brake lever pivot	0.60 kg-m	52 in-lbs
*Caliper mounting bolts	4.0 kg-m	29 ft-lbs
Disc mounting bolts	4.0 kg-m	29 ft-lbs
Fitting (banjo) bolts	3.0 kg-m	22 ft-lbs
Front brake light switch	2.8 kg-m	20 ft-lbs
*Master cylinder clamp	0.80 kg-m	69 in-lbs
3-way joint	0.80 kg-m	69 in-lbs

* : Retorque these parts regularly (Pg. 10).

Pad Removal:

- Remove the caliper mounting bolts (2), each with a flat washer and lockwasher.
- Push pad B toward the piston, and take pad B out of the caliper opening.



A. Pad B B. Pad A

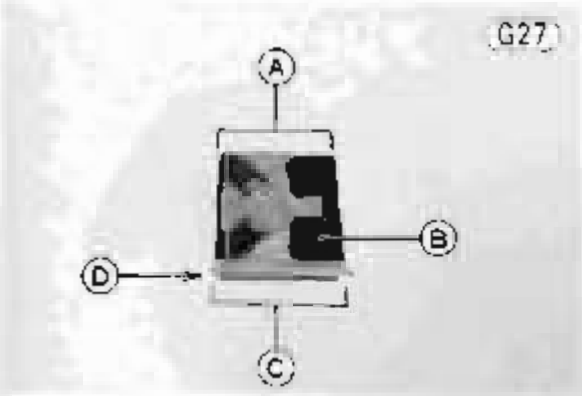
- Slide pad A toward pad B, and remove pad A.
- Separate each pad and shim by sliding the shim to the side. The anti-rattle spring between the shim and the pad will drop off.

Pad Installation:

- Remove the bleed valve cap on the caliper, attach a clear plastic hose to the bleed valve, and run the other end of the hose into a container.

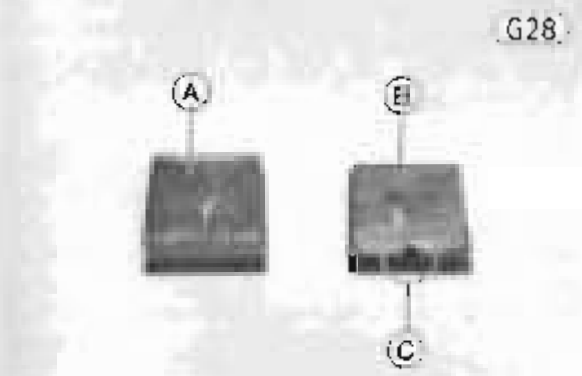
•Open (loosen) the valve slightly, push the piston in by hand as far as it will go, and then close (tighten) the valve. Wipe up any spilled fluid, and recap the bleed valve.

•Install the anti-rattle spring and shim for pad A on pad A. Put the spring in place on the longer base side when sliding the shim on the pad, and fit the shim long side on the pad long side.



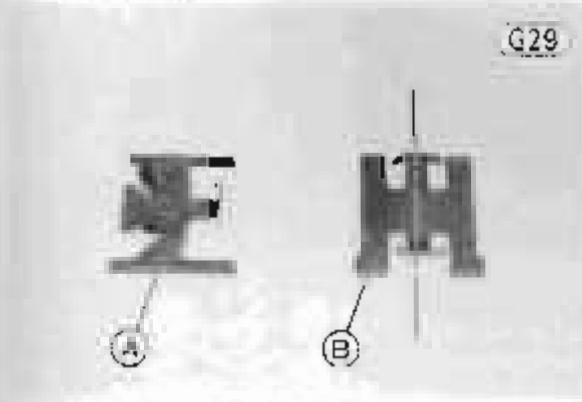
A. Shorter Base
B. Pad A
C. Longer Base
D. Anti-rattle Spring

NOTES: 1. The thickest one is pad A, and pad B has a notch that indicates the usable range.



A. Pad A B. Pad B C. Notch

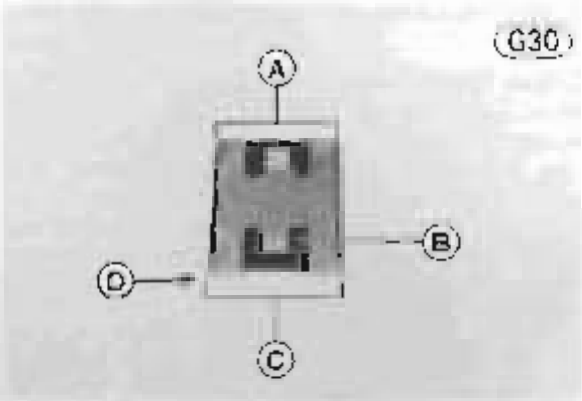
2. The shim for pad A is unsymmetrical with respect to the vertical axis.



A. Pad A Shim B. Pad B Shim

•Install pad A on the piston side in the caliper.

•Install the anti-rattle spring and shim for pad B on pad B. Put the spring in place on the longer base side when sliding the shim on the pad, and fit the shim long side on the pad long side.



A. Shorter Base
B. Pad B
C. Longer Base
D. Anti-rattle Spring

•Install pad B in the caliper.

•Install the caliper, tightening the caliper mounting bolts to the specified torque. Each mounting bolt has a flat washer and lockwasher.

•Since brake fluid was spilled when the bleed valve was opened, check the fluid level in the master cylinder and bleed the air from the brake system (Pg. 203).

•Check the front brake.

WARNING **Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.**

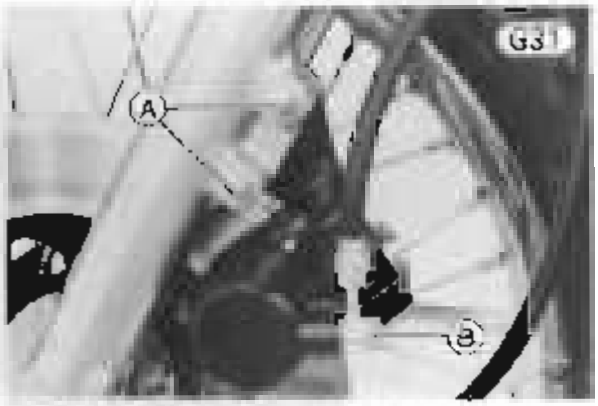
Caliper Removal:

NOTE: If the caliper is to be disassembled after caliper removal and compressed air is not available, remove the piston using the following two steps before disconnecting the brake hose fitting from the caliper.

Remove the pad (Pg. 114).

Pump the piston out with the brake lever.

•Remove the banjo bolt at the caliper, and temporarily secure the end of the brake hose to some high place to prevent fluid flow movement. There is a flat washer on each side of the hose fitting.



A. Caliper Mounting Bolts B. Banjo Bolt

•Remove the caliper mounting bolts (2), each with a flat washer and lockwasher, and take off the caliper.

Caliper Installation Notes:

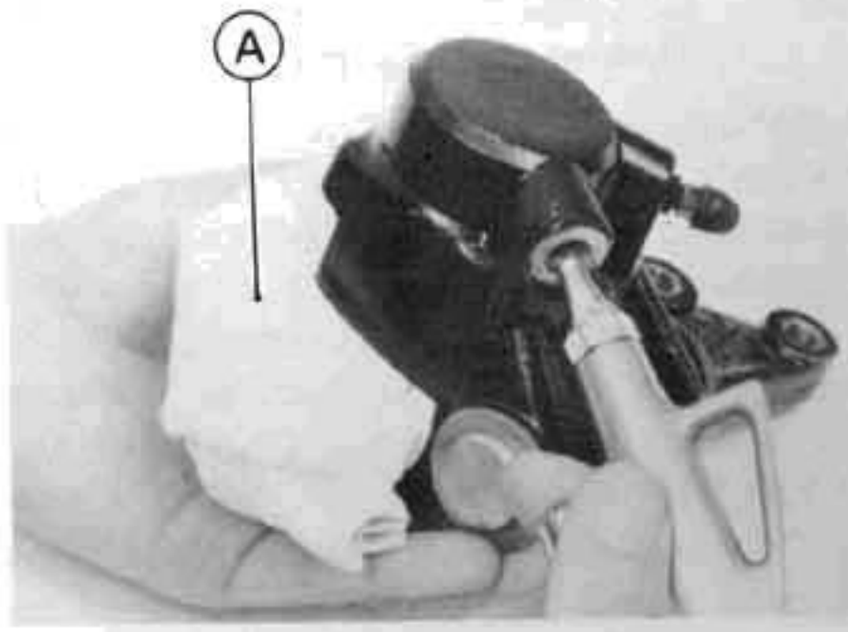
1. Use a new flat washer on each side of the brake hose fitting.
2. Check the fluid level in the master cylinder, and bleed the brake line (Pg. 203).

Caliper Disassembly:

- Remove the pads (Pg. 114).
- Cover the caliper opening with a clean, heavy cloth, and remove the piston ⑪ by lightly applying compressed air to where the brake line fits into the caliper.

WARNING **To avoid serious injury, never place your fingers or palm inside the caliper opening. If you apply compressed air into the caliper, the piston may crush your hand or fingers.**

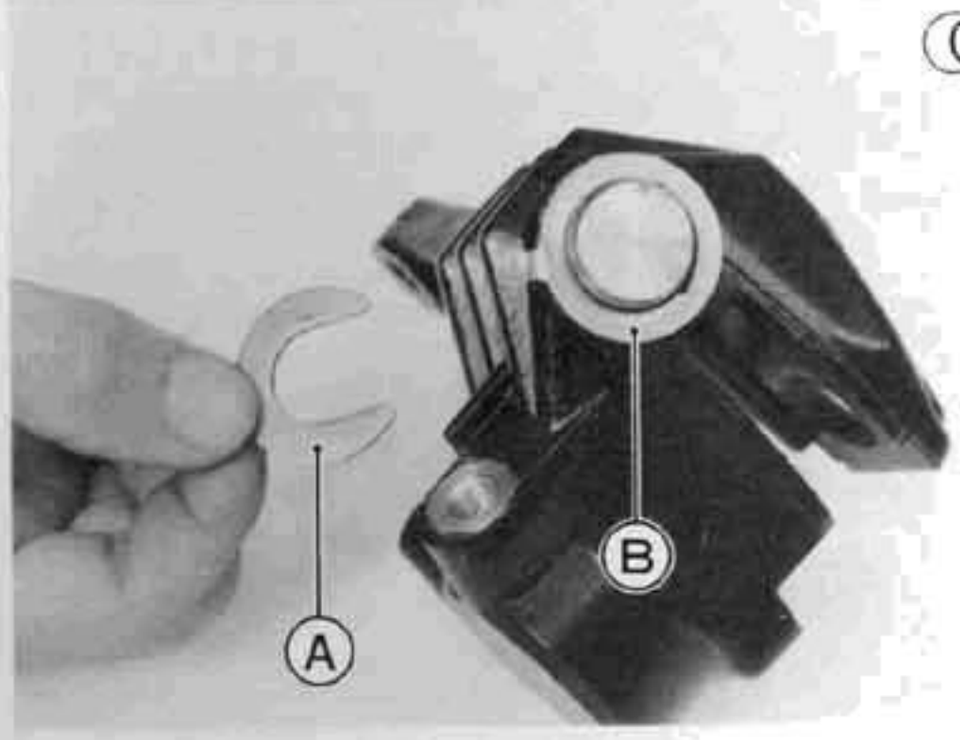
G32



A. Clean, Heavy Cloth
Caliper

- Taking care not to damage the cylinder surface, remove the dust seal ⑩ and fluid seal ⑨ with a hook.
- Screw off the bleed valve ⑥ and cap ⑤.
- Straighten the tab of the lockwasher ⑰ that is bent over the stop ⑱.
- Pull or push out the stop and remove the lockwasher.

G33



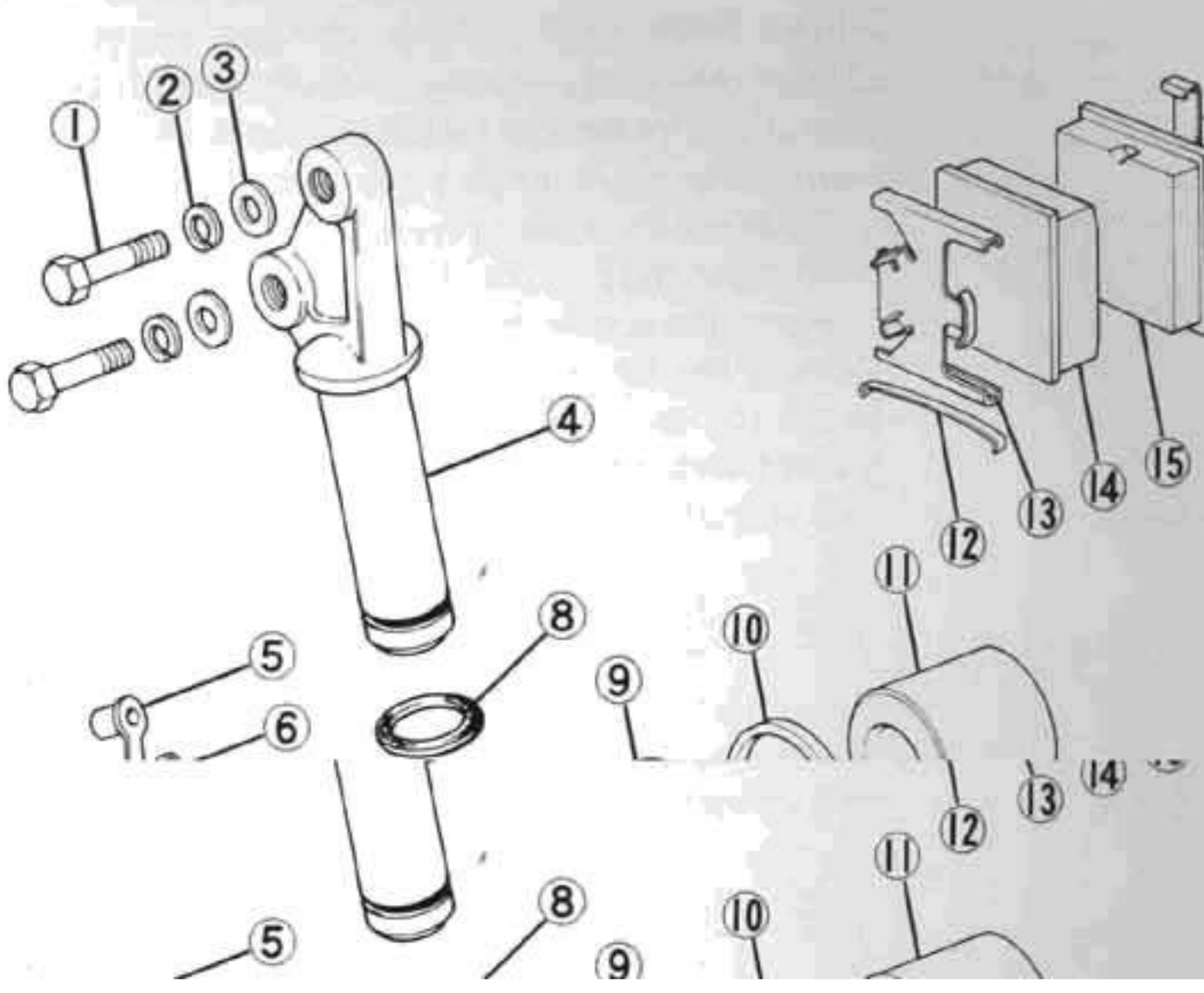
A. Stop **B. Lockwasher**

- Pull the caliper holder ④ out of the caliper ⑦.
- Remove the friction seals ⑧ from the caliper.

Caliper Assembly:

- Clean the caliper parts with brake fluid or alcohol (See CAUTION–Pg. 114).

G34

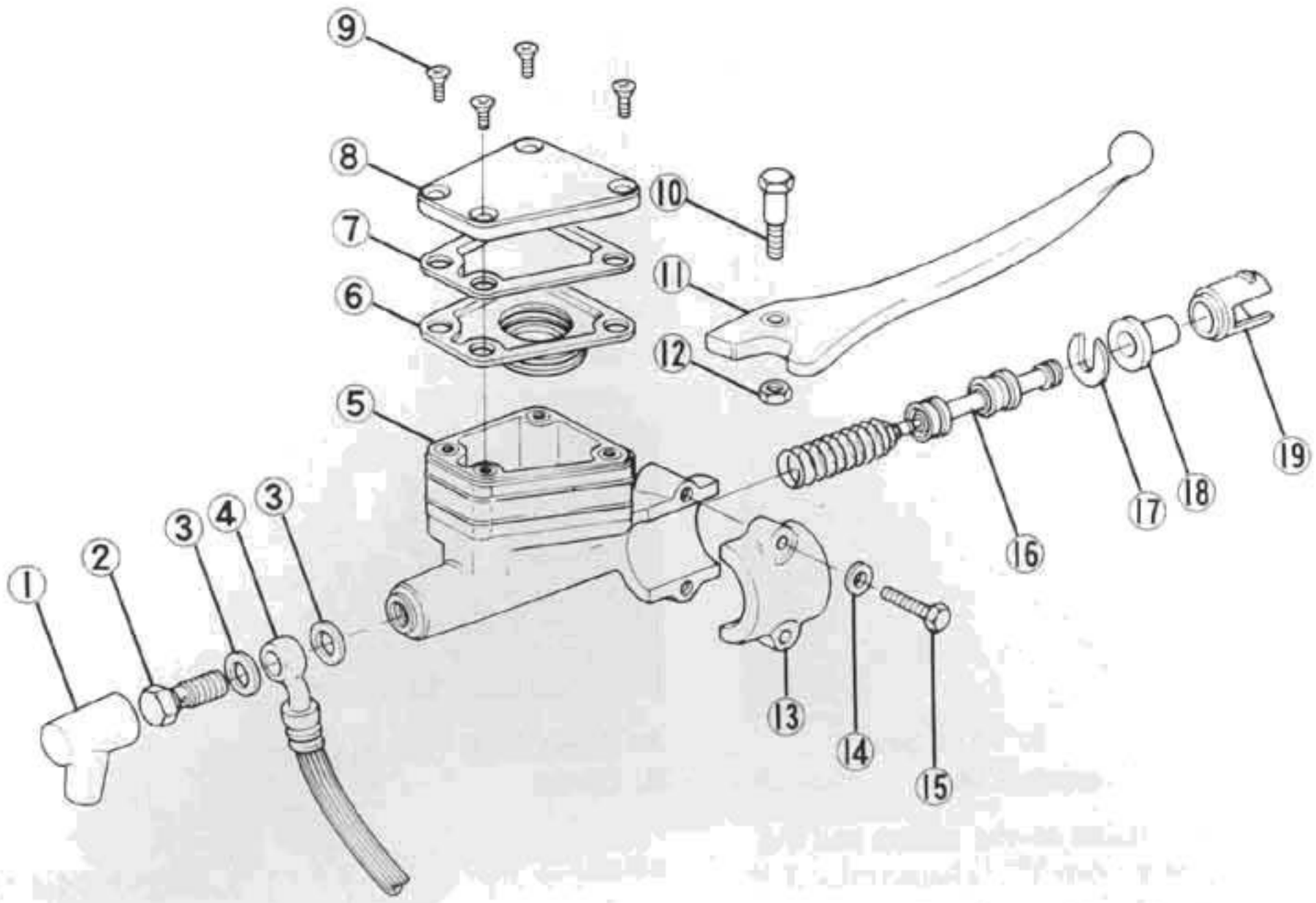


1. Caliper Mounting Bolt
2. Lockwasher
3. Flat Washer
4. Caliper Holder
5. Bleed Valve Cap

1. Caliper Mounting Bolt
2. Lockwasher
3. Flat Washer
4. Caliper Holder

Master Cylinder

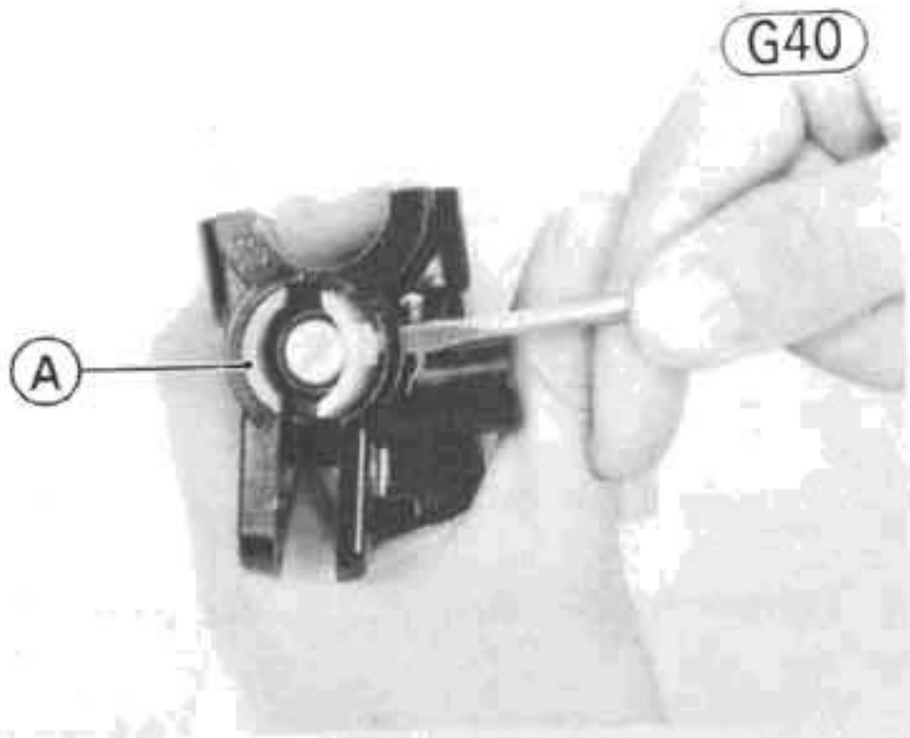
G39



1. Dust Cover
2. Banjo Bolt
3. Washer
4. Brake Hose
5. Master Cylinder Body
6. Diaphragm
7. Plate
8. Cap
9. Screw
10. Pivot Bolt
11. Brake Lever
12. Locknut
13. Clamp
14. Washer
15. Bolt
16. Piston and Spring Unit
17. Piston Stop
18. Dust Seal
19. Liner

●Using a thin-bladed screwdriver or some other suitable tool, press in the liner tabs which catch in the holes in the master cylinder, and then remove the liner ⑲.

G40



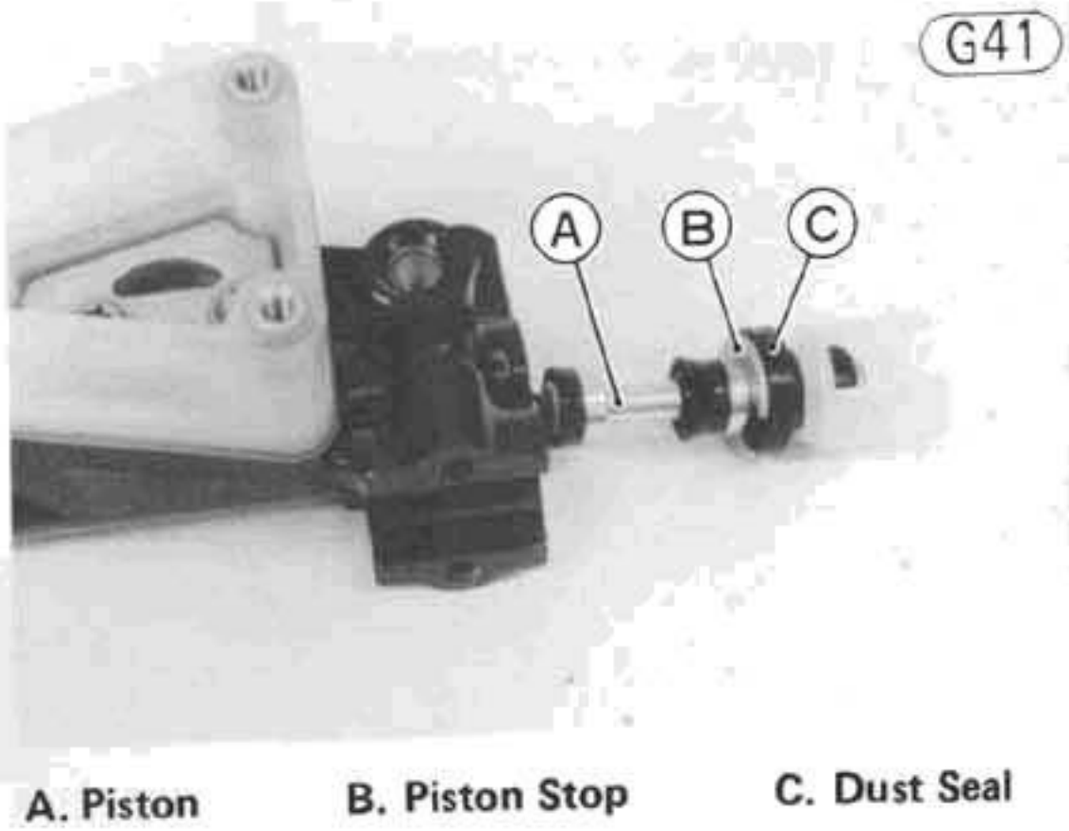
A. Liner

●Pull out the piston and spring unit ⑯.

Master Cylinder Assembly Notes:

1. Before assembly, clean all parts including the master cylinder with brake fluid or alcohol (See CAUTION –Pg. 114). Apply brake fluid to the parts removed and to the inner wall of the cylinder.
2. Be sure that the piston stop ⑰ is between the piston and dust seal ⑱.

G41

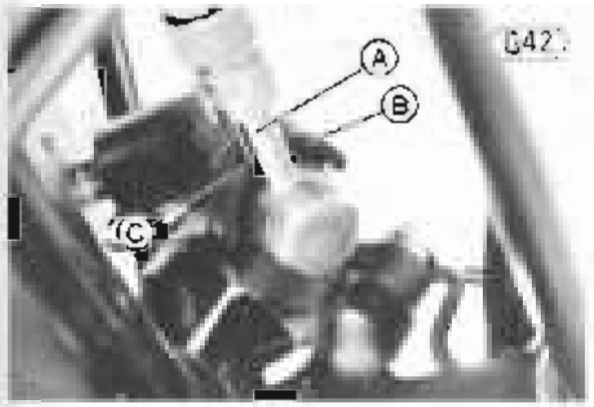


A. Piston B. Piston Stop C. Dust Seal

Brake Hose Replacement:

●Pump the brake fluid out of the line as explained in the Maintenance Section – *Changing the brake fluid* (Pg. 202).
●Remove the banjo bolts at the 3-way joint and at the caliper or master cylinder (depending on the hose), and remove the brake hose. There is a flat washer on each side of the hose fitting.

•Connect the new brake hose to the 3-way joint and the caliper or master cylinder, putting a new seat washer on each side of the brake hose fittings.
•Be sure that the metal pipe is properly fitted into the U-shaped notch in the 3-way joint and tighten the banjo bolts to the specified torque.



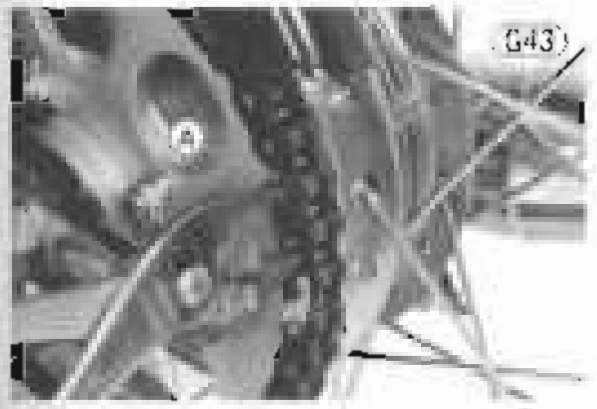
A. Metal Pipe B. 3-way Joint C. Notch

•Fill the reservoir with fresh brake fluid, and bleed the brake line (Pg. 203).

DRIVE CHAIN

Removal:

•Check to see that the transmission is in neutral.
•Remove the engine sprocket cover as explained in engine sprocket cover removal (Pg. 61). The clutch cable does not require removal from the clutch release.
•Remove the clip from the drive chain master link using pliers, and remove the master link.



A. Clip

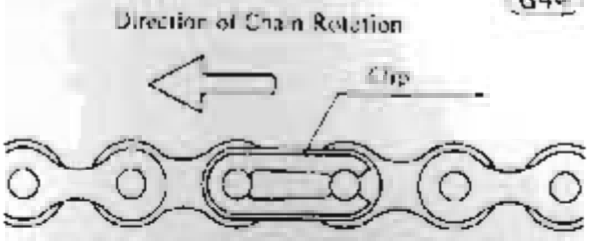
•Free the drive chain from the sprockets, being careful that the chain does not get dirty from contact with the ground.

Installation:

•Fit the drive chain back onto the sprockets with the ends at the rear sprocket.
•Install the master link.
•Install the master link clip with pliers. The direction of the master link clip must be as shown.

WARNING Incorrect installation of the master link clip can allow it to catch on an adjacent part. If the clip dislodges, the chain could come apart, and this could result in rear wheel lockup and loss of control.

Master Link Clip Installation



•Install the engine sprocket cover (Pg. 62).
•Adjust the automatic side stand return mechanism (Pg. 81).
•Adjust the drive chain (Pg. 24).

REAR WHEEL, REAR BRAKE

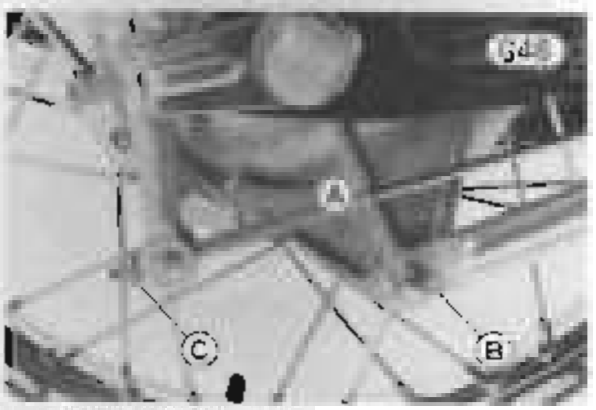
Removal:

•Raise the rear wheel off the ground.
•Remove the drive chain from the rear sprocket as explained in drive chain removal (Pg. 119). The engine sprocket cover does not require removal.
•Take out the cotter pin, and remove the axle nut.



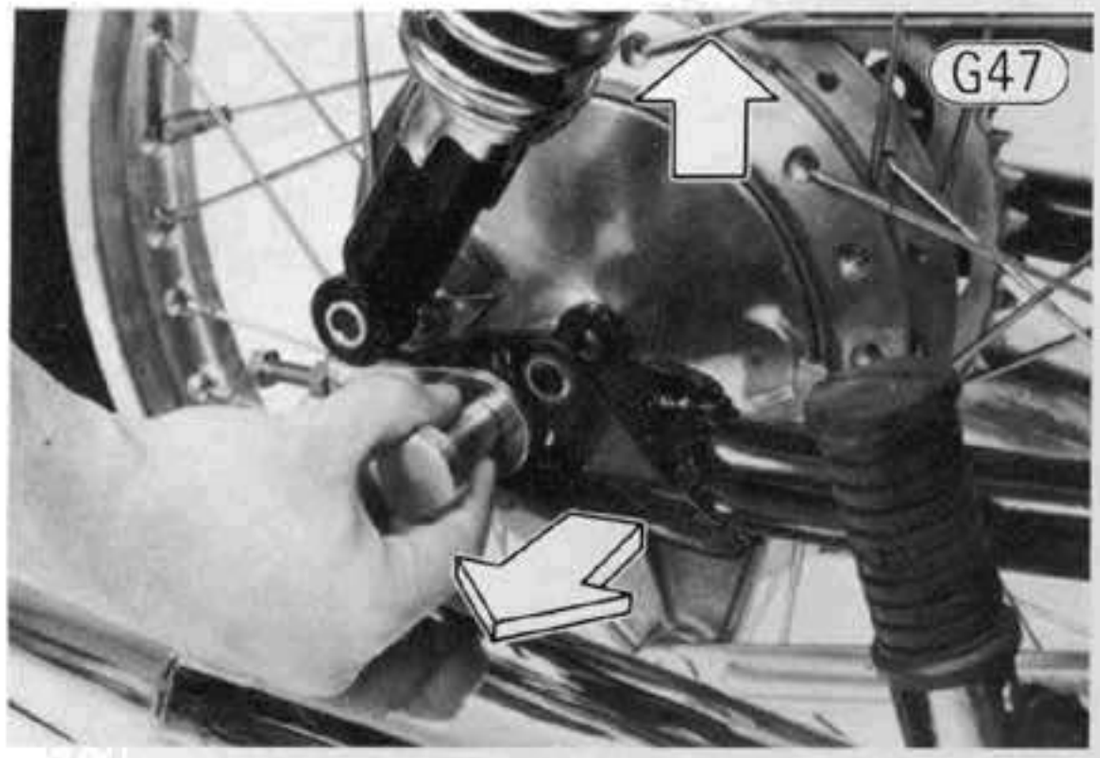
A. Cotter Pin B. Axle Nut

•Remove the clip nut, lockwasher, and bolt at the rear end of the torque link.



A. Torque Link Nut B. Clip C. Adjusting Nut

- Remove the adjusting nut from the end of the brake rod, and free the rod from the cam lever.
- Remove the spring from the brake rod and remove the brake rod joint from the brake cam lever.
- Remove the mounting bolts and lockwashers of the rear shock absorbers, lifting up on the rear wheel as necessary to avoid damaging the bolt threads.
- Slide the bottoms of the shock absorbers out of their brackets, raise the rear wheel enough to pull out the axle, and remove the axle. The chain adjusters and spacer will drop out.



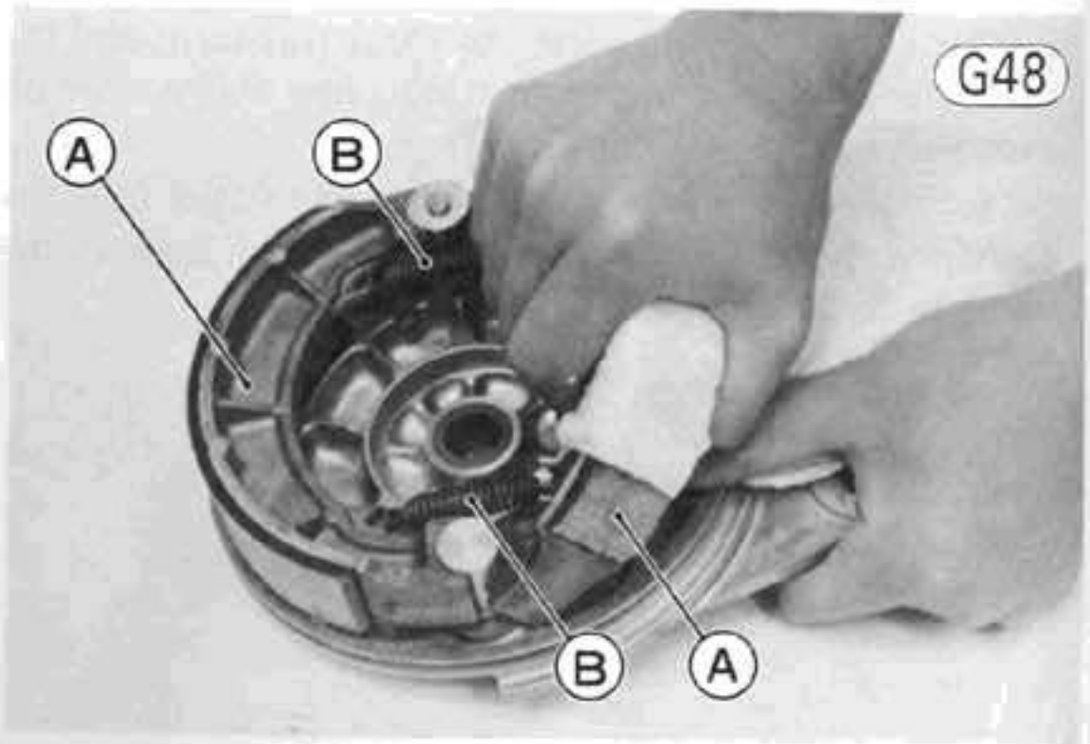
Installation:

- Apply a little grease to the inside surface of the hole in the coupling where the rear hub fits.
- Check to see that the wheel coupling, coupling collar, coupling sleeve, rubber damper, and brake panel are in place.
- Slip the rear wheel into the end of the swing arm.
- Install the chain adjuster on each side of the swing arm. The chain adjusters should be installed with the notch mark side facing out.
- Slide the axle through from right to left. Do not forget to put the spacer in place between the brake panel and the right chain adjuster.
- Attach the rear axle nut loosely.
- Install the rear shock absorber lower mounting bolts and lockwashers, and tighten them to 3.0 kg-m (22 ft-lbs) of torque.
- Fit the drive chain onto the rear sprocket and install the drive chain master link and clip. The direction of the master link clip should be as shown in Fig. G44.
- Fit the brake rod joint to the cam lever.
- Install the spring on the end of the brake rod, fit the rod through the joint, and screw on the adjusting nut.
- Insert the torque link bolt into the brake panel, and install the torque link, lockwasher, and nut finger tight.
- Adjust the drive chain (Pg. 24).
- Adjust the rear brake (Pg. 27).
- Check the rear brake light switch and adjust if necessary (Pg. 28).

Rear Brake Disassembly:

NOTE: Refer to the Warning (Pg.110) for general brake information.

- Remove the brake panel ⑱ from the wheel.
- Using a clean cloth around the linings to prevent grease or oil from getting on them, remove the brake shoes ⑮, by pulling up on the center of the linings.

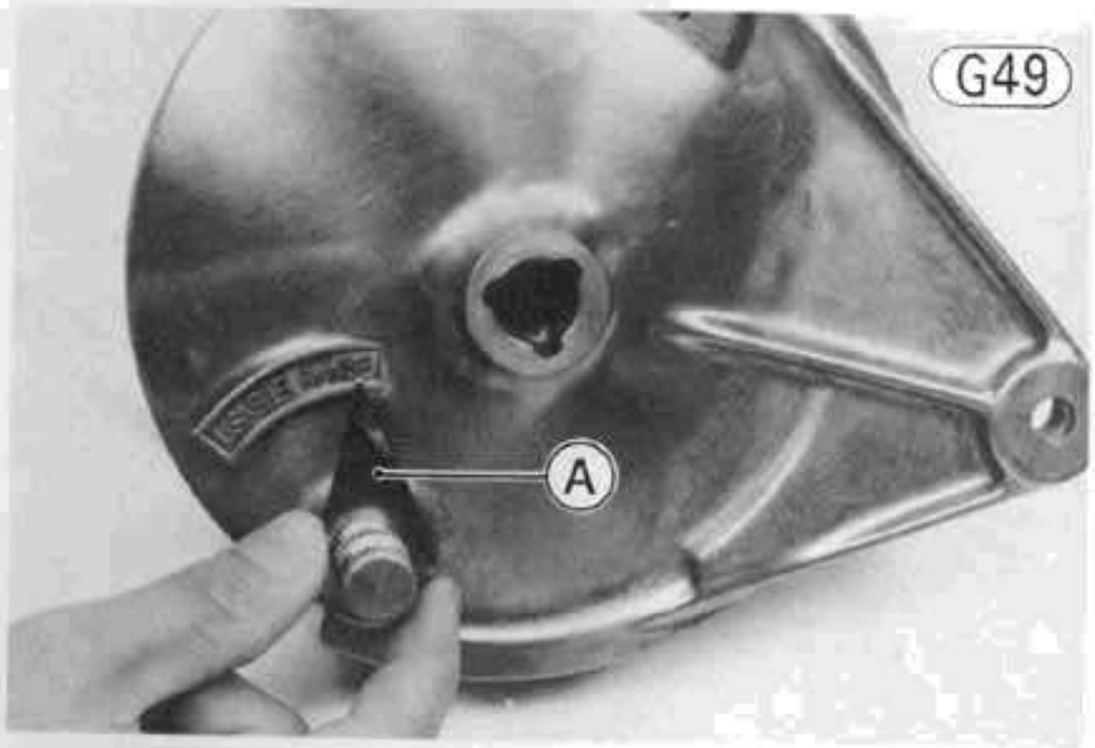


A. Brake Shoe **B. Spring**

- Remove the springs ⑯ (2) to separate the two brake shoes.
- Mark the position of the cam lever ㉘ so that it can be installed later in the same position.
- Unbolt and remove the cam lever, brake lining wear indicator ⑳, dust seal ⑲, and camshaft ㉖.

Rear Brake Assembly:

- Lubricate the brake parts (Pg. 207).
- Put the camshaft back into the panel.
- Fit the springs onto the brake shoes, and wrapping a clean cloth around the linings to prevent grease or oil from getting on them, install the shoes on the brake panel.
- Fit the dust seal and the indicator on the serration so that it points to the extreme right of the USABLE RANGE.



A. Indicator

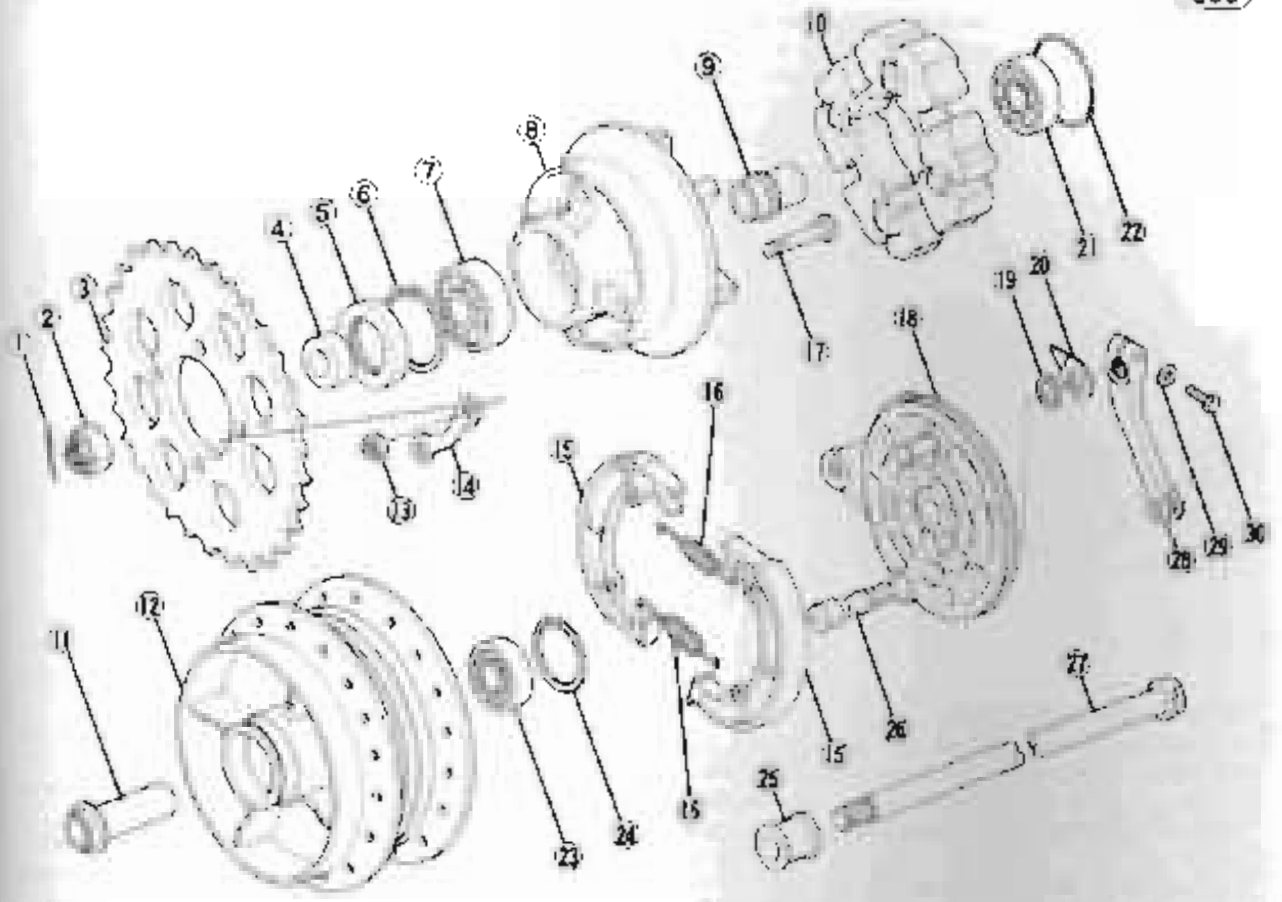
- Install the cam lever in its original position on the camshaft, and tighten its bolt.

Wheel Coupling Disassembly:

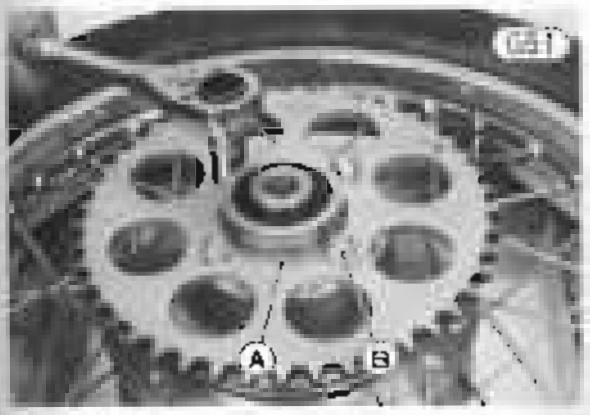
- Straighten the bent portions of the double washers ⑭ (2).
- Remove the rear sprocket nuts ⑬ (4) and double washers to separate the rear sprocket ③ and wheel coupling ⑧.

Rear Hub

G50



1. Cotter Pin
2. Axle Nut
3. Rear Sprocket
4. Collar
5. Grease Seal
6. Circlip
7. Ball Bearing
8. Coupling
9. Sleeve
10. Rubber Damper
11. Distance Collar
12. Rear Hub
13. Nut
14. Double Washer
15. Brake Shoe
16. Spring
17. Sprocket Mounting Bolt
18. Brake Panel
19. Dust Seal
20. Indicator
21. Ball Bearing
22. O Ring
23. Ball Bearing
24. Circlip
25. Spacer
26. Brake Camshaft
27. Rear Axle
28. Cam Lever
29. Washer
30. Bolt



A. Double Washer B. Sprocket Nut

•Remove the coupling and rubber damper ⑩ from the wheel.

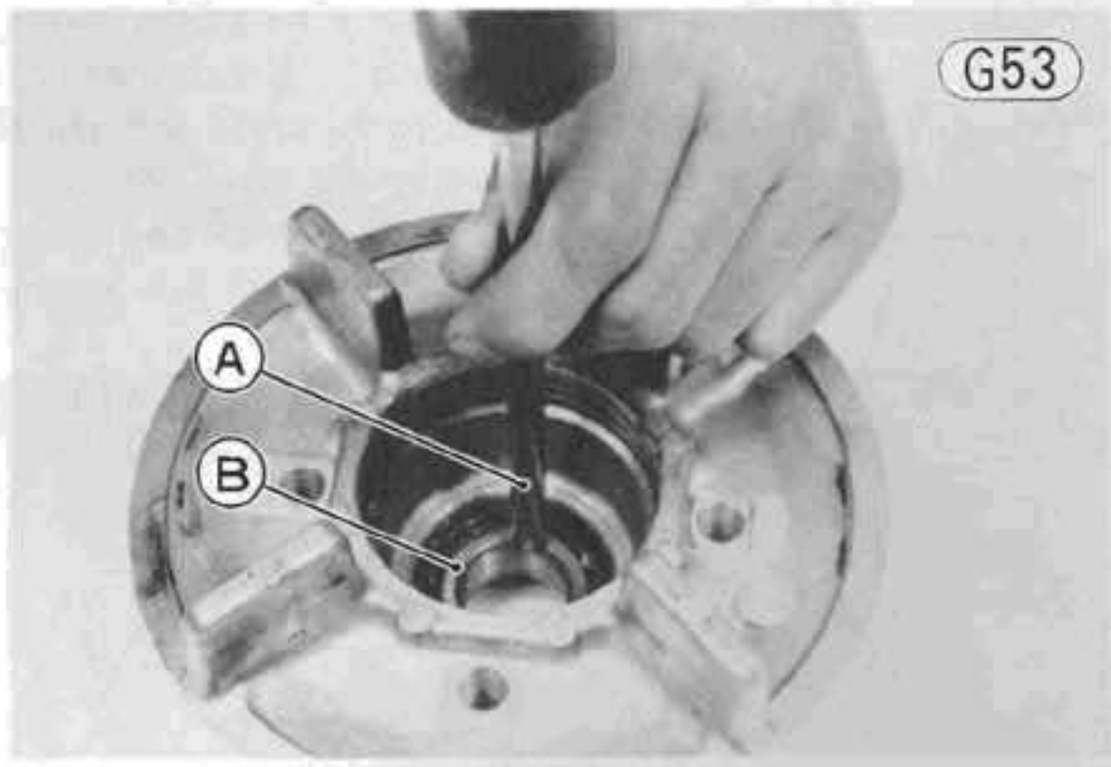
•Pull out the coupling collar ⑧ from the left, and the coupling sleeve ⑨ from the right.

•Using a hook, pull off the grease seal ⑤.



A. Grease Seal

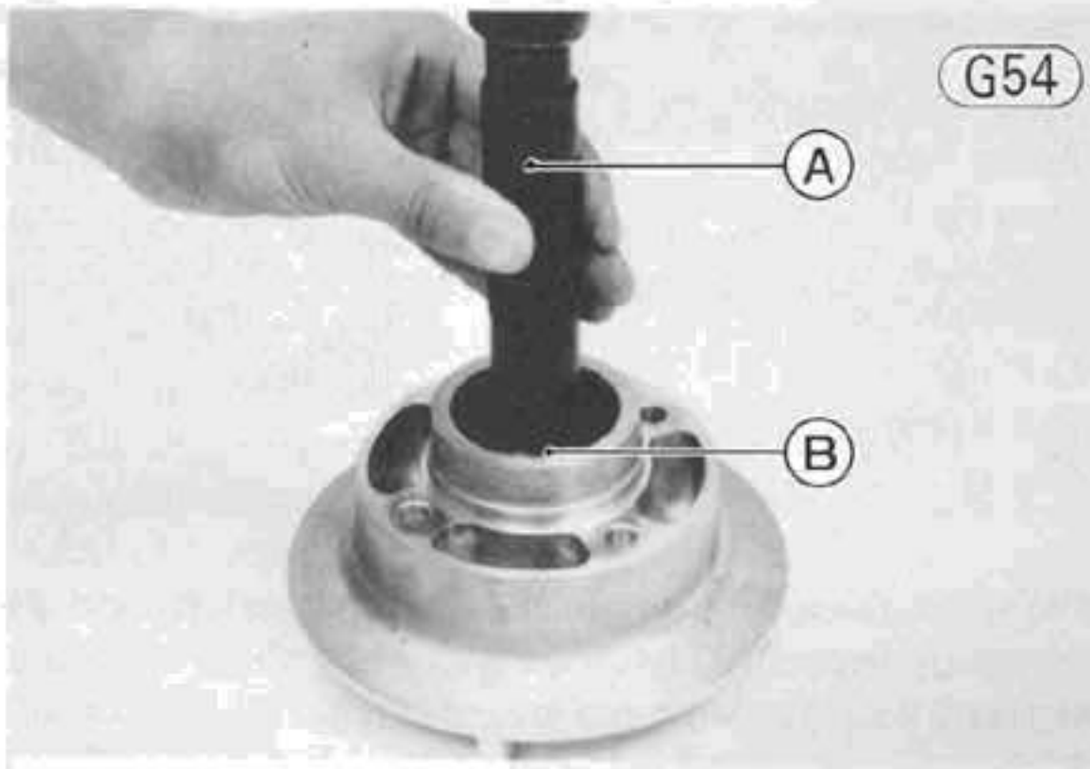
- Remove the circlip ⑥.
- Remove the bearing ⑦ by tapping from the wheel side evenly around the bearing inner race.



A. Rod **B. Bearing Inner Race**

Wheel Coupling Assembly:

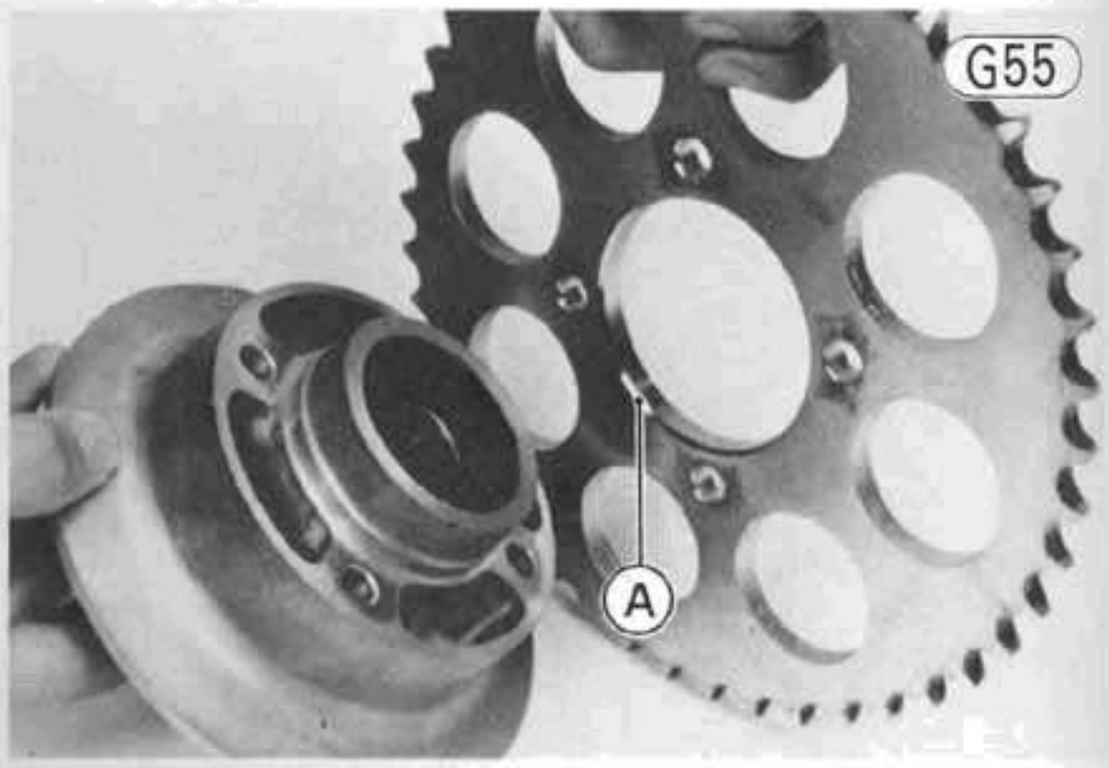
- Inspect the bearing, and replace if necessary (Pg. 196).
- Lubricate it (Pg. 197), and install it using the bearing driver and the bearing driver holder (special tools). Drive the bearing in until it stops at the bottom of the hole.



A. Bearing Driver Holder (57001-139)
B. Bearing Driver (57001-289)

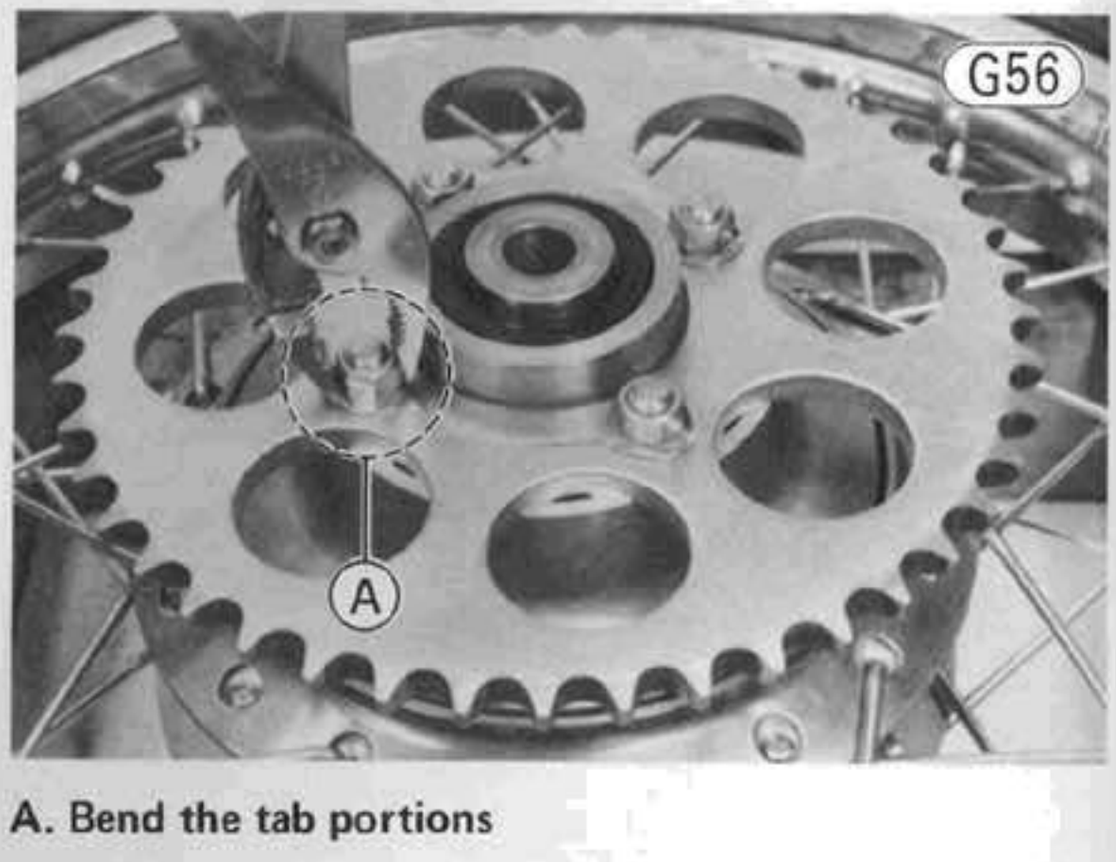
- Install the circlip.
- Replace the grease seal with a new one using the bearing driver (special tool: PN 57001-296) and bearing driver holder. Drive in the seal until the face of the seal is level with the end of the grease seal hole.
- Install the rear sprocket, new double washers (2), and nuts (4), and install the nuts finger tight.

WARNING **The rear sprocket must be installed with the chamfered hole side facing toward the coupling. If not, the sprocket will not seat on the coupling evenly, causing the drive chain to be thrown off by excessive sprocket runout during operation. This can result in rear wheel lockup and loss of control.**



A. Chamfer

- Inspect the O ring ㉒ on the rear hub, replace it with a new one if it has deteriorated, and apply a little grease to the O ring.
- Install the coupling sleeve on the right side and the coupling collar on the left side of the coupling.
- Install the rubber damper and wheel coupling on the rear hub, and then tighten the sprocket nuts to 4.0 kg-m (29 ft-lbs) of torque.
- Bend the tab portions of the double washers over the nuts.

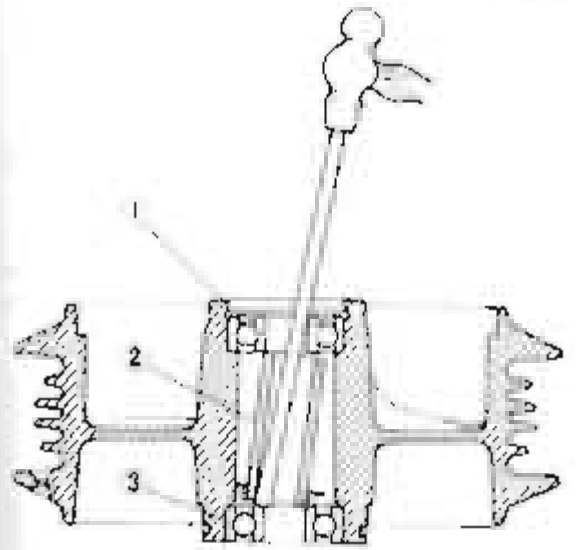


A. Bend the tab portions

Rear Hub Disassembly:

- Remove the wheel coupling ⑧, rear brake panel ⑱, and rubber damper ⑩ from the wheel.
- Remove the circlip ㉔.
- Insert a metal rod into the hub from the brake panel side, and remove the left side bearing ㉑ by tapping evenly around the bearing inner race. The distance collar ⑪ will come out with the bearing.

Bearing Removal



1. Rear Hub
2. Distance Collar
3. Ball Bearing

•Insert the metal rod into the hub from the other side, and tap out the remaining bearing.

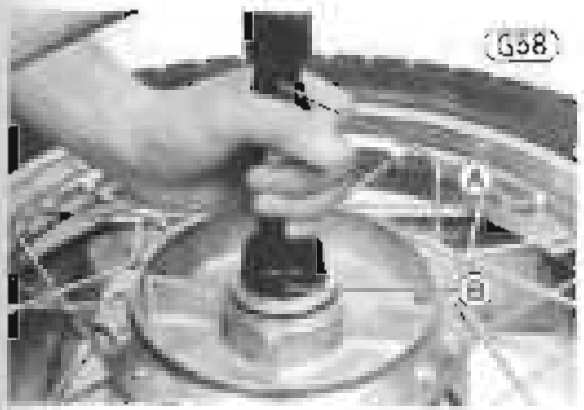
Rear Hub Assembly:

•Inspect the bearings and replace them if necessary (Pg. [illegible]).

•Lubricate the ball bearings (Pg. 197).

•Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.

•Install the retaining side ball bearing using the wheel bearing driver and the bearing driver holder (special tools). Press the bearing in until it stops at the bottom of the hole.



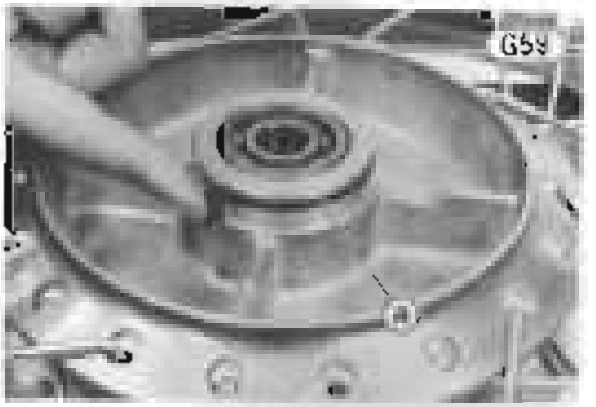
A. Bearing Driver Holder (57001-139)
B. Bearing Driver (57001-290)

•Put the distance collar into the hub.

•Install the brake panel side bearing facing the sealed surface. Press the bearing in until it stops at the bottom of the hole using the same special tools used for the other bearing installation.

•Install the circlip.

•Inspect the O ring 2 on the rear hub and replace it if necessary. Apply a little grease to the O ring before fitting the coupling on the rear hub.



A. "O" Ring

TIRE, TUBE

Removal:

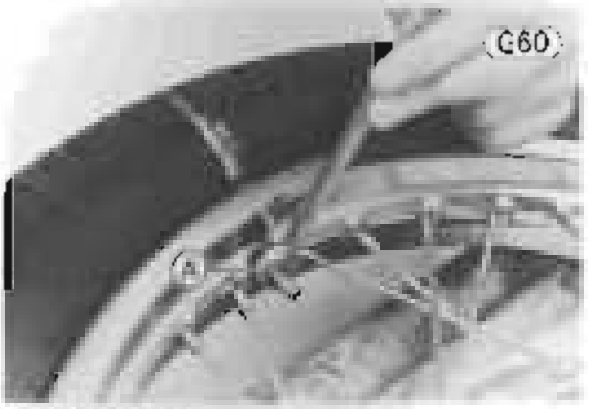
•Remove the wheel from the motorcycle (Pg. 107, 110, or 119).

CAUTION **Do not lay the wheel on the ground with the disc facing down. This could damage or warp the disc.**

•Mark the valve stem position on the tire with chalk so that the tire may be reinstalled in the same position to maintain wheel balance.

•Take out the valve core to let out the air.

•Remove the valve stem nut.



A. Valve Stem Nut

•Use a rubber mallet to break the tire beads away from both sides of the rim.

•Step on the side of the tire opposite the valve stem, and start prying the tire off the rim near the valve stem with tire irons. Take care not to insert the tire irons so deeply that the tube gets damaged (Fig. G61).



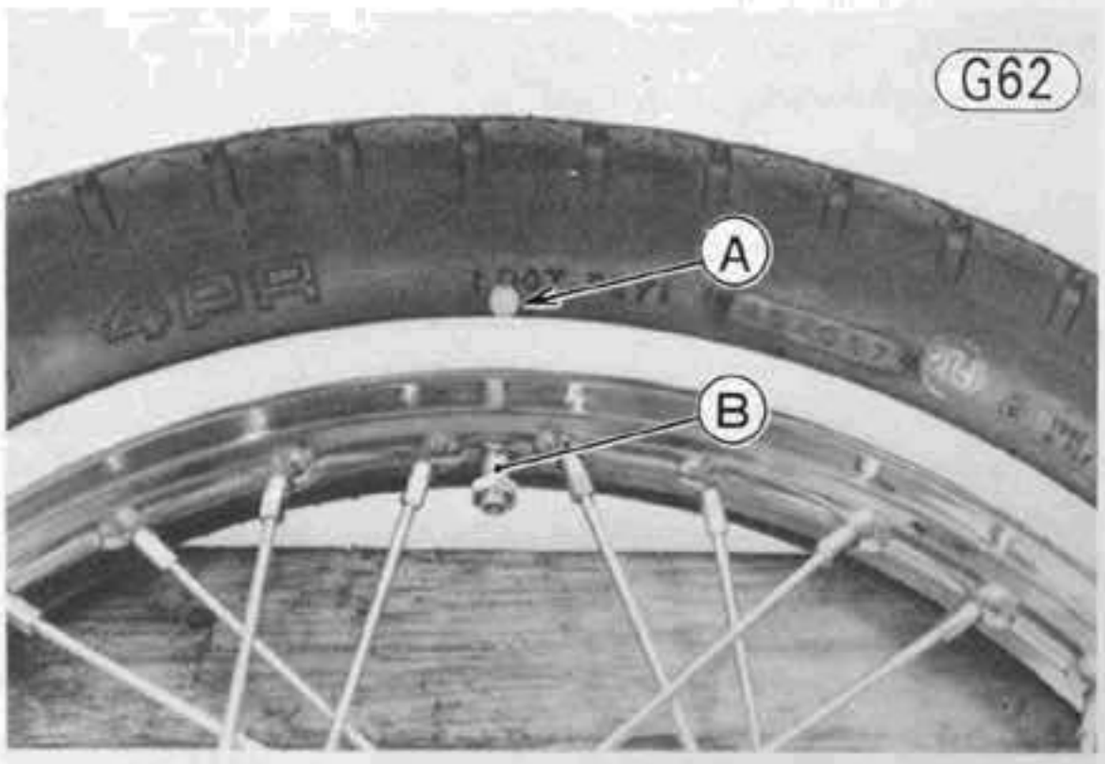
A. Tire Irons

- Remove the tube when one side of the tire is pried off.
- Pry the tire off the rim.

Installation:

- Put just enough air in the tube to keep it from getting caught between the tire and rim. Too much air makes fitting difficult, and too little will make the tube more liable to be pinched by the irons. Dust the tube and the inside of the tire with talcum powder, and insert the tube into the tire, even if the tire was completely removed from the rim. Insert the valve stem into the rim, and screw the nut on loosely.
- Lubricate the tire beads and rim flanges with a soap and water solution or liquid soap to help seat the tire beads in the rim while inflating the tire.
- If the tire was completely removed, pry one side of the tire back onto the rim.

NOTE: If a new tire is installed, the yellow paint mark on the tire should be aligned with the valve stem for best balancing results.



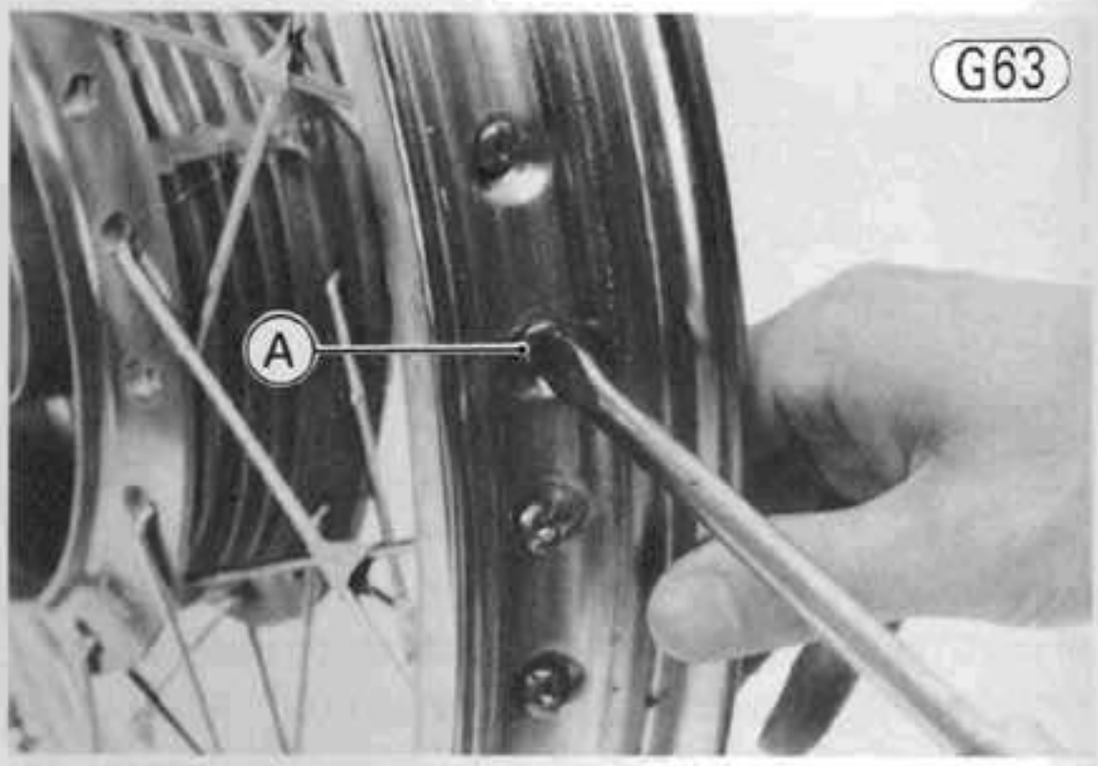
A. Yellow Paint Mark **B. Valve Stem**

- Pry the other side of the tire onto the rim, starting at the side opposite the valve. Take care not to insert the tire irons so deeply that the tube gets damaged.
- Check that the tube is not pinched between the tire and rim, and then inflate to the specified pressure (Pg. 195).
- Tighten the valve stem nut, and put on the valve cap.
- Balance the wheel (Pg. 29).
- Mount the wheel on the motorcycle (Pg. 107, 110, or 120).
- Adjust the drive chain (Pg. 24), and rear brake (Pg. 27), if the rear wheel was removed.
- Adjust the front brake (Pg. 25) (KZ400-C).

RIM

Removal:

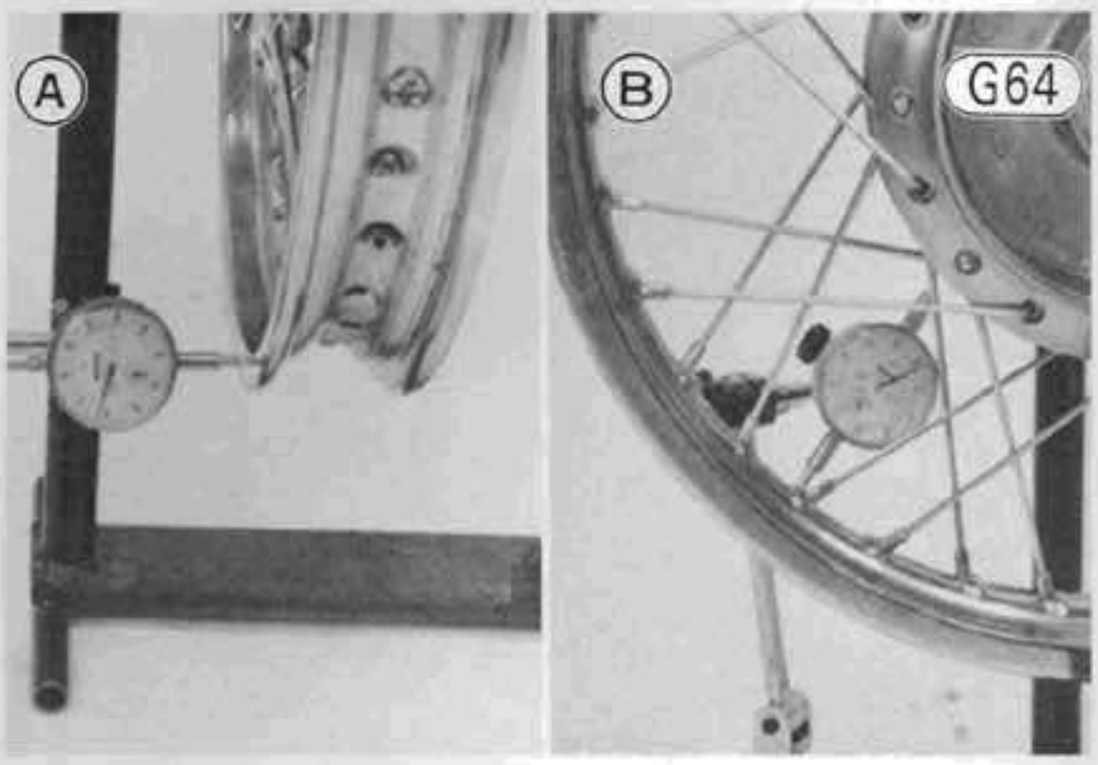
- Remove the wheel from the motorcycle (Pg. 107, 110, or 119).
- Remove the rubber band.
- Take the tire and tube off the rim.
- Tape or wire all the spoke intersections so that the spokes don't get mixed up, and unscrew the nipples from all the spokes with a screwdriver.



A. Nipple

Installation:

- Fit all the spokes through the holes, and screw all the nipples onto the spokes tightening them partially.
- Suspend the wheel by the axle, and set up a dial gauge to measure rim runout. Fix the axle in place if necessary to prevent horizontal movement.



A. Axial Runout Measurement
B. Radial Runout Measurement

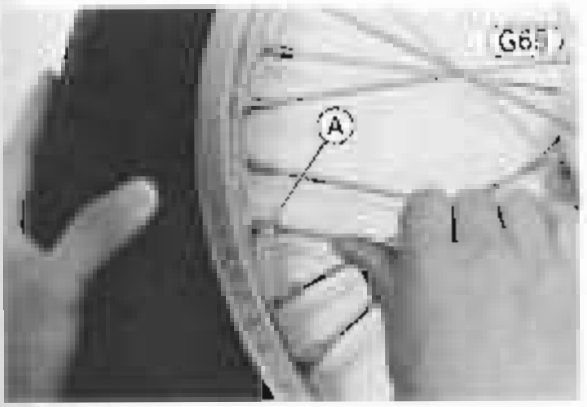
- Tighten the spokes evenly so that the radial (out from the axle) runout is less than 0.8 mm and the axial (side to side) runout is less than 0.5 mm.
- Make sure that the spokes are tightened evenly. Standard torque is 0.3 kg-m (26 in-lbs).
- Mount the tube and tire (Pg. 124).
- Balance the wheel (Pg. 29).

•Mount the wheel on the motorcycle [Pg. 107, 110, or 120].
•Adjust the drive chain [Pg. 24] and rear brake [Pg. 27], if the rear wheel was removed.
•Adjust the front brake [Pg. 25] [KZ400-C].

SPOKE

Breakage Replacement:

•Remove the tire in case of spoke replacement of the front wheel [Pg. 100].
•Reduce the tire air pressure by a small amount.
•Insert the new spoke through the hub, and bend it to meet the nipple.



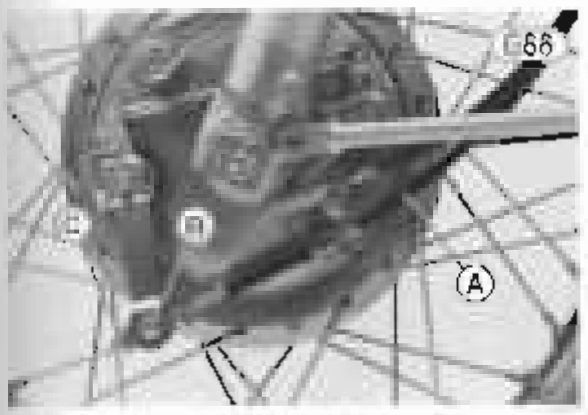
A. Nipple

•Tighten with a spoke wrench. Standard torque is 0.3 kg-m (26 in-lbs).
•Inflate the tire to standard pressure [Pg. 195].
•Install the disc [Pg. 120].

FRONT BRAKE CABLE

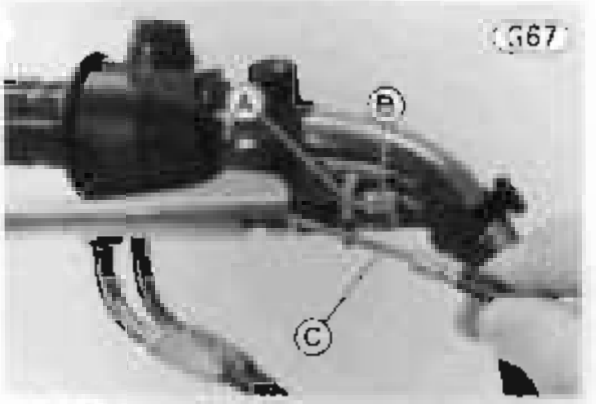
Removal:

•Slide the cable dust cover out of its position on the outer cable end.
•Screw off the adjusting nut, and free the brake cable from the brake panel. Also remove the brake cable joint.



A. Brake Cable
B. Cable Joint
C. Adjusting Nut

•Loosen the knurled locknut on the front brake lever, and line up the slots on the brake lever, knurled locknut, and adjuster, and free the front brake cable from the brake lever.



A. Knurled Locknut
B. Adjuster
C. Brake Cable

•Slide the cable out of the guides and free the cable from the motorcycle.

Installation:

•Before installing the brake cable, lubricate it [Pg. 31].
•Run the cable through the guides on the steering stem base and front fender. Route the cable with a minimum of bending so that the inner cable will slide smoothly.
•Connect the upper end of the cable back into the brake lever and through the slots on the brake lever, knurled locknut, and adjuster.
•Attach the brake cable, brake cable joint, and adjusting nut back onto the front brake panel. Use a new cotter pin at the end of the threaded brake cable extension.
•Slide the cable dust cover back into the groove on the brake outer cable end to secure the brake outer cable in the cable mount.



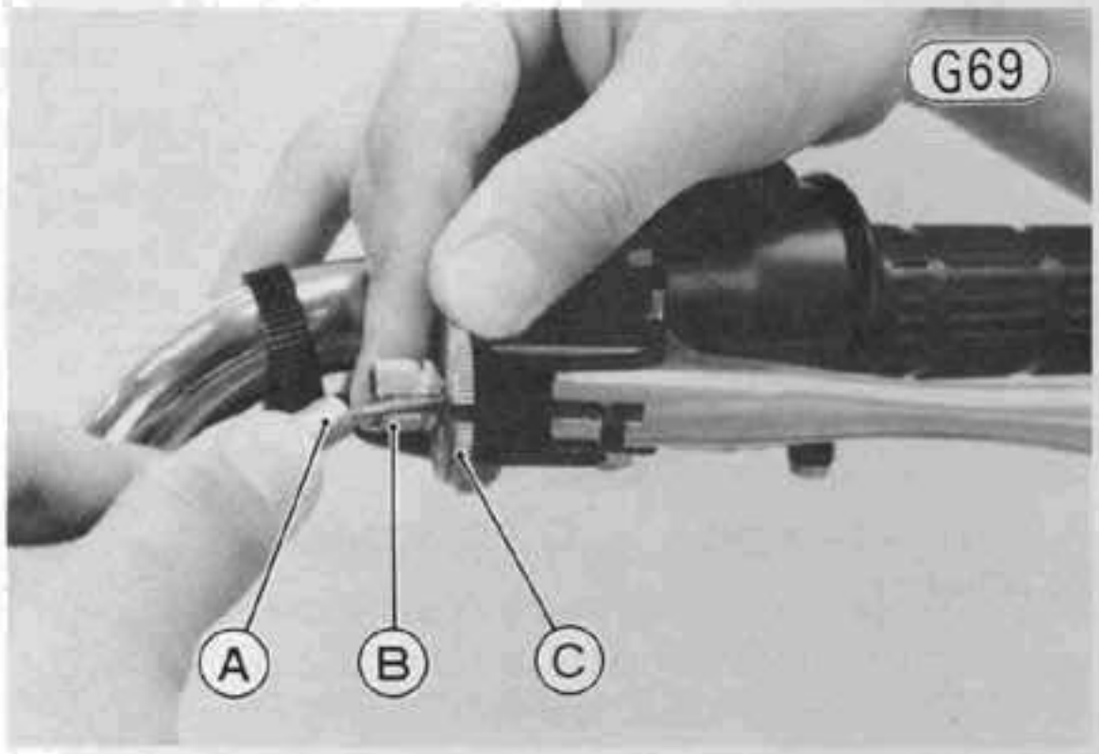
A. Cable Dust Cover
B. Groove
C. Outer Cable

•Adjust the front brake [Pg. 25].

CLUTCH CABLE

Removal:

- Remove the engine sprocket cover (Pg. 61).
- Remove the clutch cable clamp that holds the clutch cable to the frame down tube.
- Loosen the knurled locknut on the clutch lever holder, and screw in the adjuster.
- Line up the slots in the clutch lever, locknut, and adjuster and then free the cable from the lever.

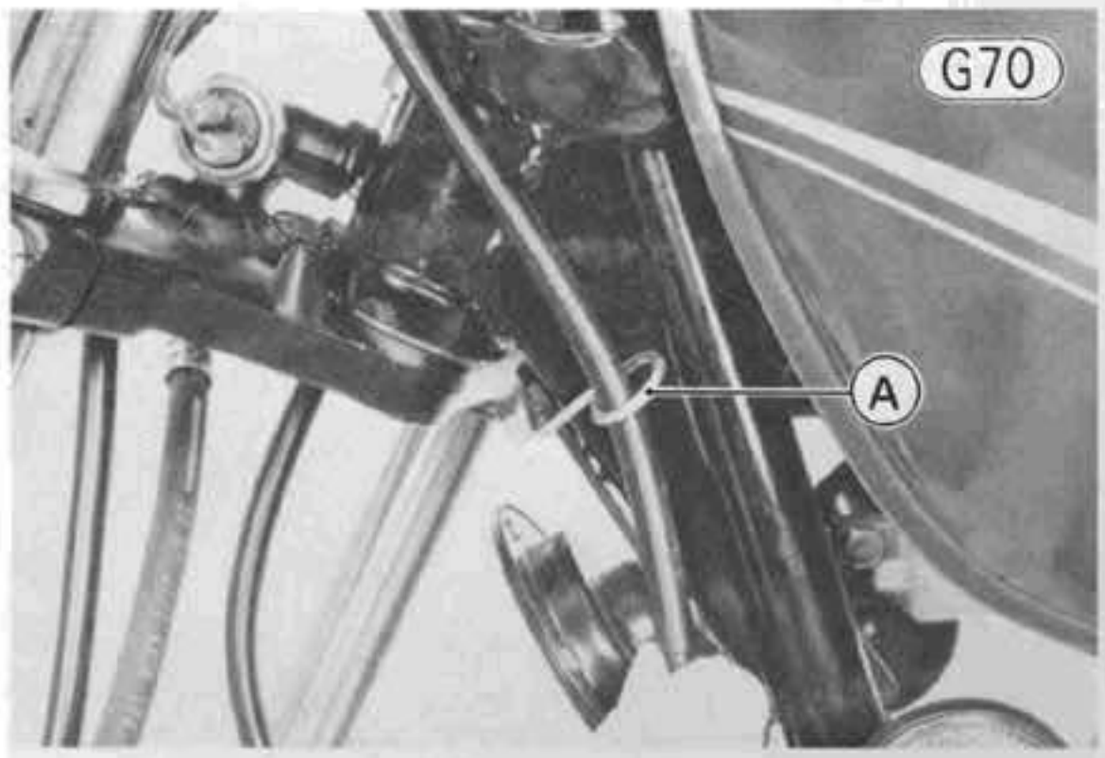


A. Outer Cable **C. Knurled Locknut**
B. Adjuster

- Pull the cable free of the motorcycle.

Installation:

- Before installing the clutch cable, lubricate it (Pg. 31).
- Run the upper end of the cable through the straps and the cable guide on the left side of the head pipe, and to the clutch lever.



A. Clutch Cable Guide

- Fit the tip of the cable back into the clutch lever.
- Run the lower end of the clutch cable between the left down tube and the lower part of the engine.
- Install the engine sprocket cover (Pg. 62).
- Adjust the clutch (Pg. 19).
- Adjust the automatic side stand return mechanism (Pg. 31).

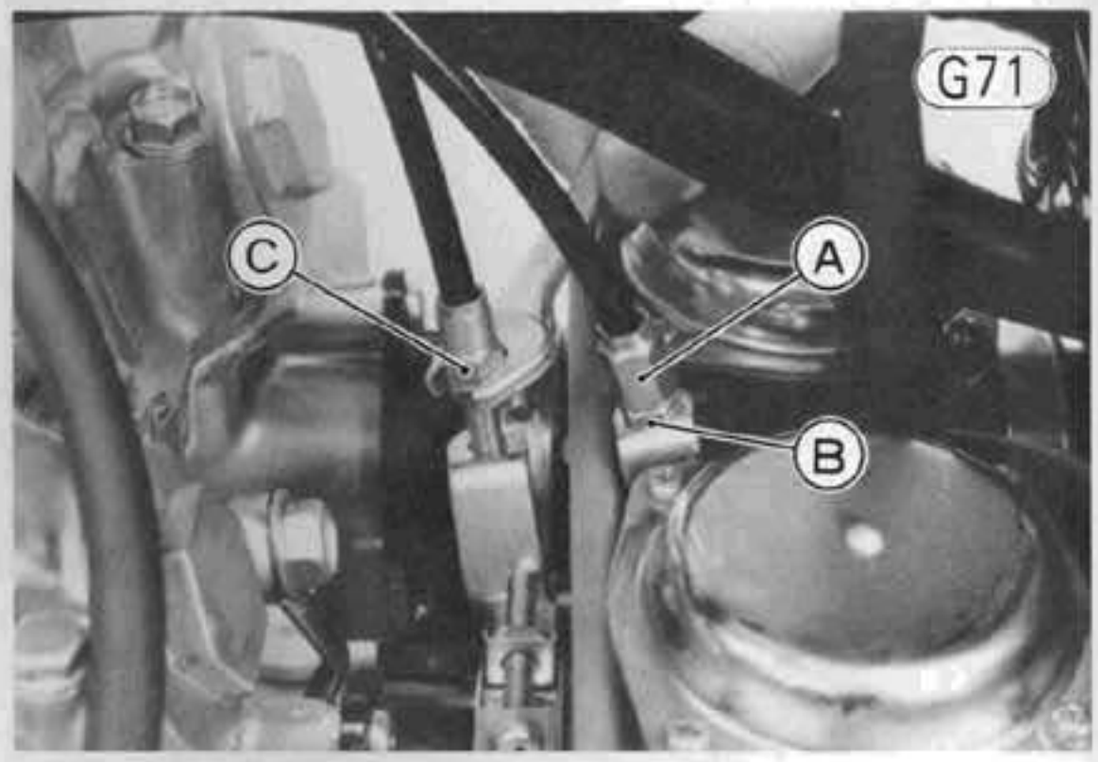
THROTTLE CABLES

Removal:

- Remove the fuel tank (Pg. 43).
- Remove the strap that hold the throttle cables and wiring harness to the frame.
- Screw in the locknuts and adjusting nuts at the upper end of the throttle cables all the way, to give the cables plenty of play.

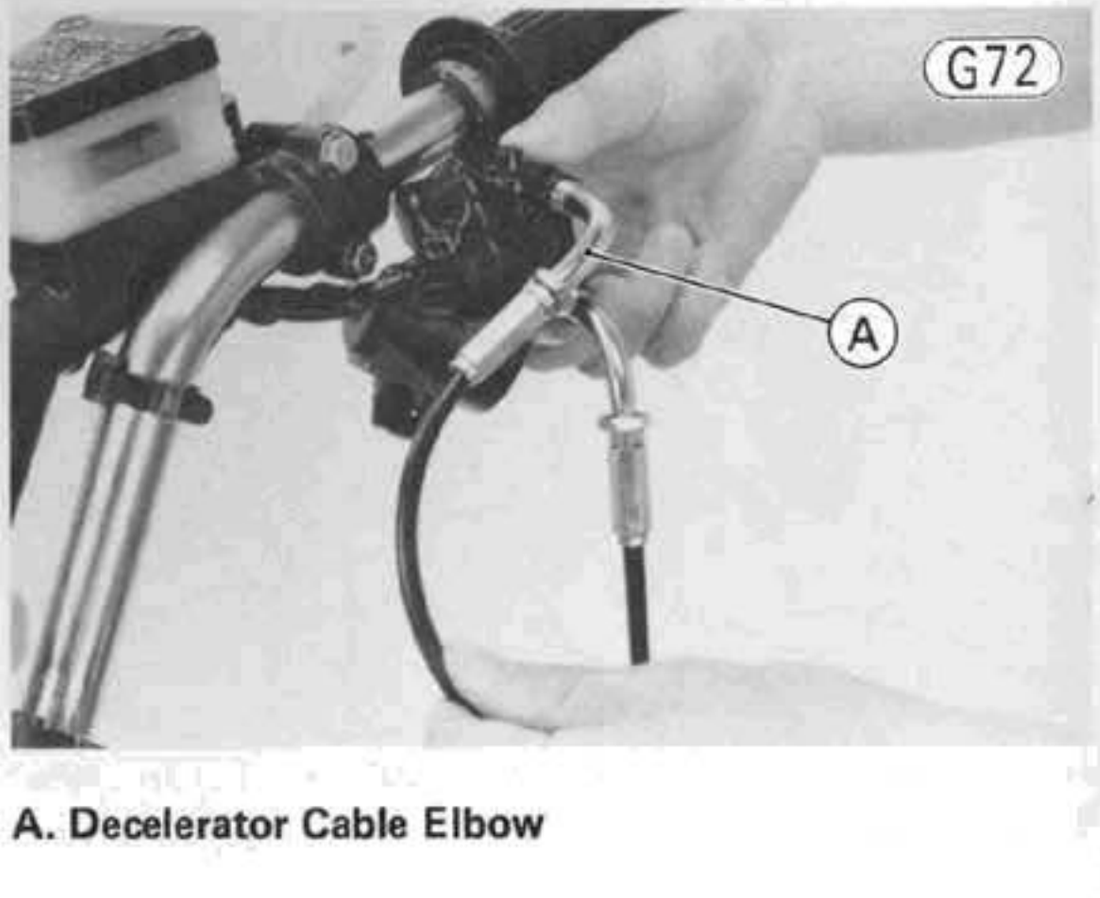
CAUTION **Removing the throttle cables from the carburetors without enough cable play, may cause throttle cable damage.**

- Loosen the throttle cable adjuster locknuts (2), and screw down the decelerator cable adjuster fully into the cable bracket.
- Screw the accelerator cable adjuster 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.



A. Decelerator Cable Adjuster
B. Locknut
C. Accelerator Cable Adjuster

- Loosen both cable elbow nuts, and pull the cables out between the right front fork leg and the head pipe.
- Remove the right switch housing screws (2), and open the housing.
- Slip both throttle cable tips from their catches in the throttle grip.
- Unscrew the decelerator throttle cable elbow, and pull the cable out of the right switch housing. Then do the same with the accelerator throttle cable elbow to free the throttle cables from the motorcycle.



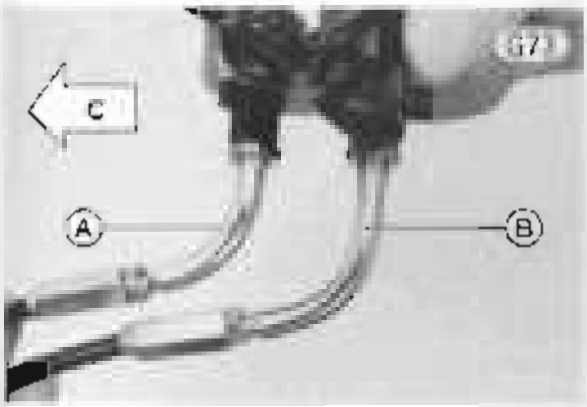
A. Decelerator Cable Elbow

Installation:

•Before installing the throttle cables, lubricate them (Fig. 31).

•Screw the accelerator throttle cable elbow (shorter than the decelerator throttle cable elbow) into the front hole in the right switch housing. Screw it in almost all the way, and then lightly tighten the elbow nut.

•Screw in the decelerator cable elbow almost all the way, and then lightly tighten the elbow nut.



A. Accelerator Cable Elbow C. Front
B. Decelerator Cable Elbow

•Run both cables between the right front fork leg and the head pipe, and to the carburetors. The cables should be naturally routed, neither one twisted about the other.

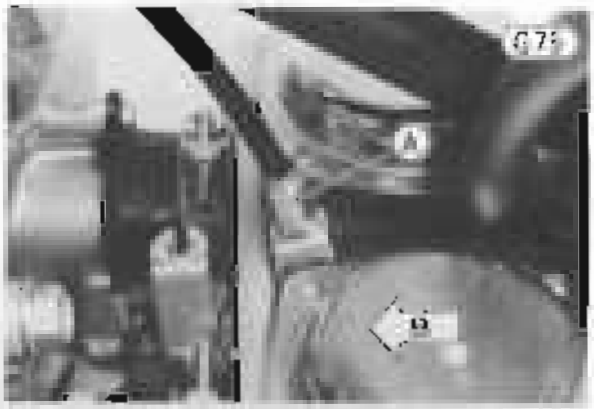
•Turn the throttle grip so that the cable catches are facing up, fit the accelerator throttle cable tip into the front catch and the other cable tip into the rear catch.

•Put together the right switch housing, and tighten its screws. The upper half of the housing has a small projection which fits into a small hole in the handlebar. The front switch housing screw is longer than the rear screw.



A. Projection B. Hole

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



A. Decelerator Throttle Cable B. Front

•Fit the tip of the other cable into the other catch, and fit its adjuster onto the bracket while turning the throttle grip at the same time, if necessary.

•Center each adjuster in its place in the bracket, and then tighten the locknuts.

•Turn each elbow in the direction of its cable, and tighten its elbow nut to secure the elbow in the proper position.

•Tighten the strap that holds the throttle cables and wiring harness to the frame.

•Install the fuel tank (Pg. 43).

•Adjust the throttle cables (Pg. 15).

SPEEDOMETER CABLE

Removal:

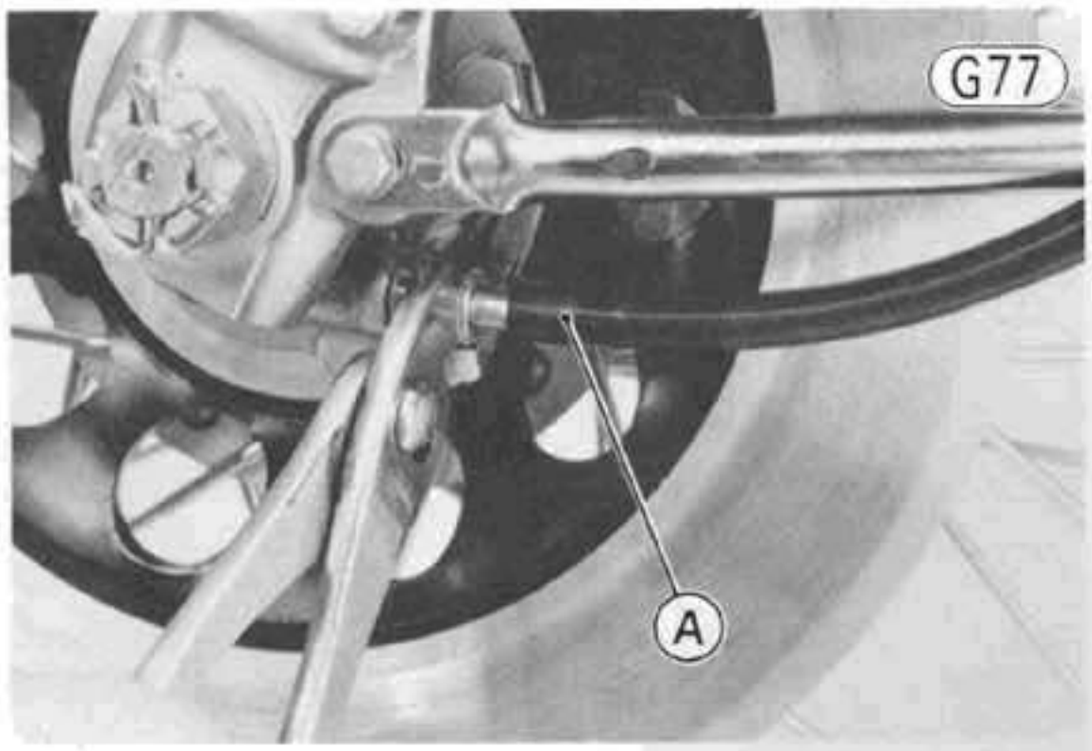
•Disconnect the upper end of the speedometer cable with pliers.



A. Speedometer Cable B. Unscrew with pliers

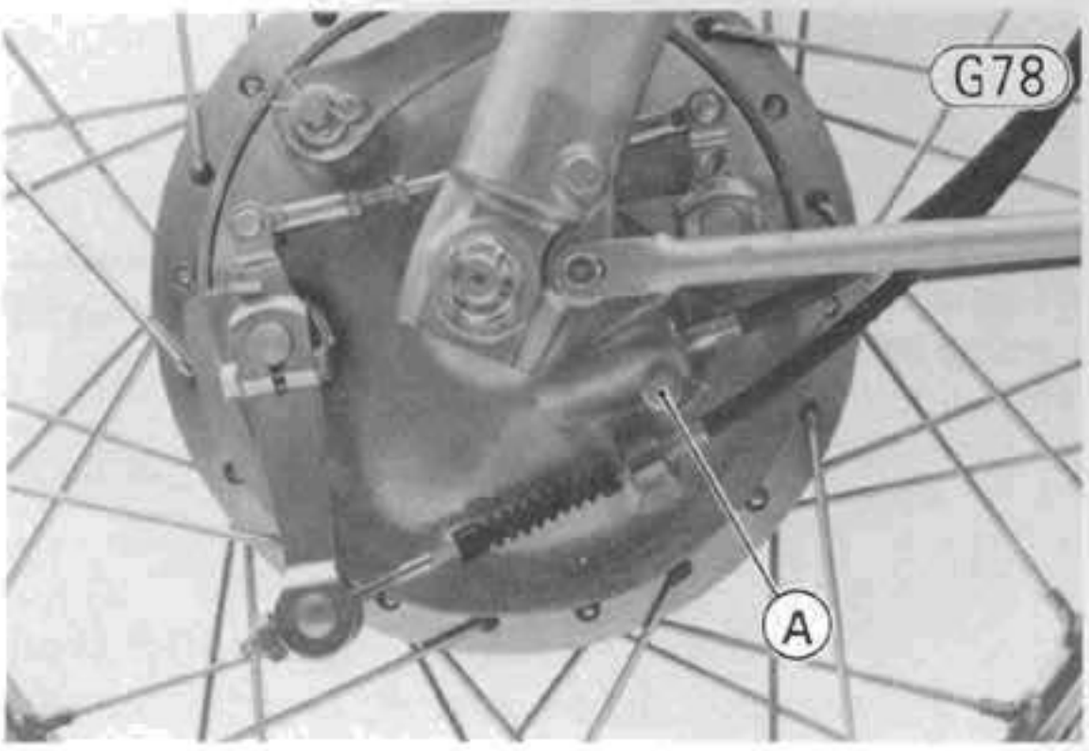
•Disconnect the lower end of the speedometer cable and follows.

KZ400-B Disconnect the lower end of the speedometer cable with pliers (Fig. G77).



A. Speedometer Cable

KZ400-C: Remove the speedometer cable bolt and washer and pull the lower end of the speedometer cable off the brake panel.



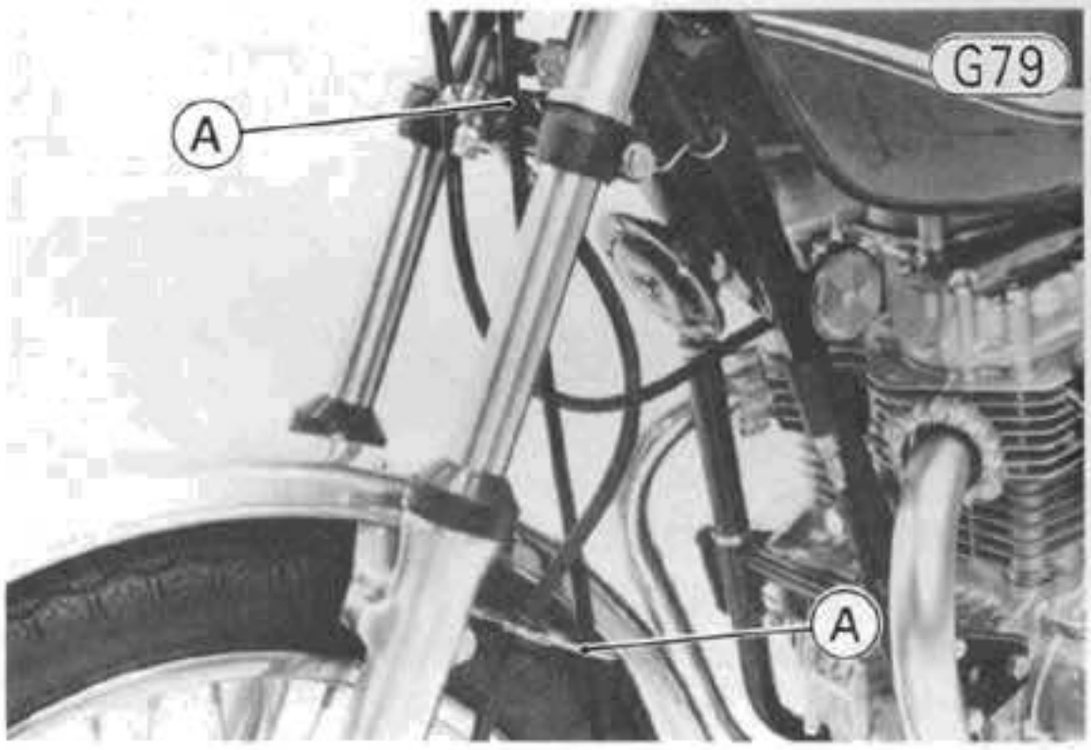
A. Speedometer Cable Bolt

●Pull the cable free.

Installation:

●Before installing the speedometer cable, lubricate it (Pg. 33).

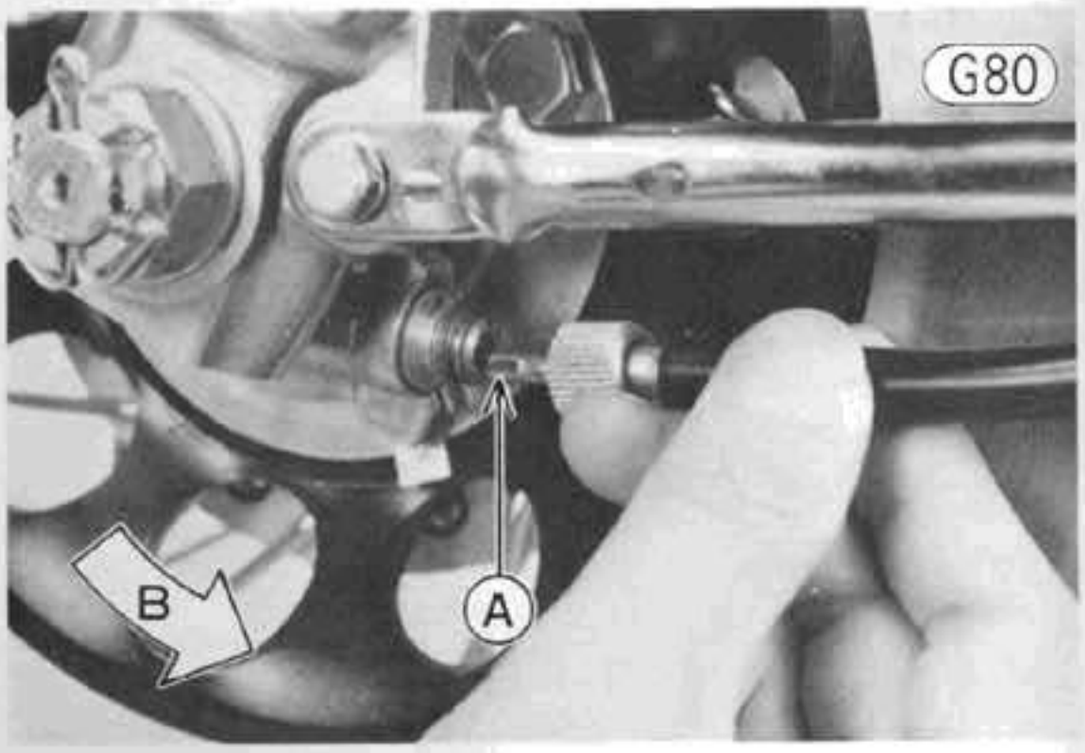
●Run the speedometer cable through its guides at the stem base and the front fender left side, and secure the upper end of the cable to the speedometer with pliers.



A. Cable Guide

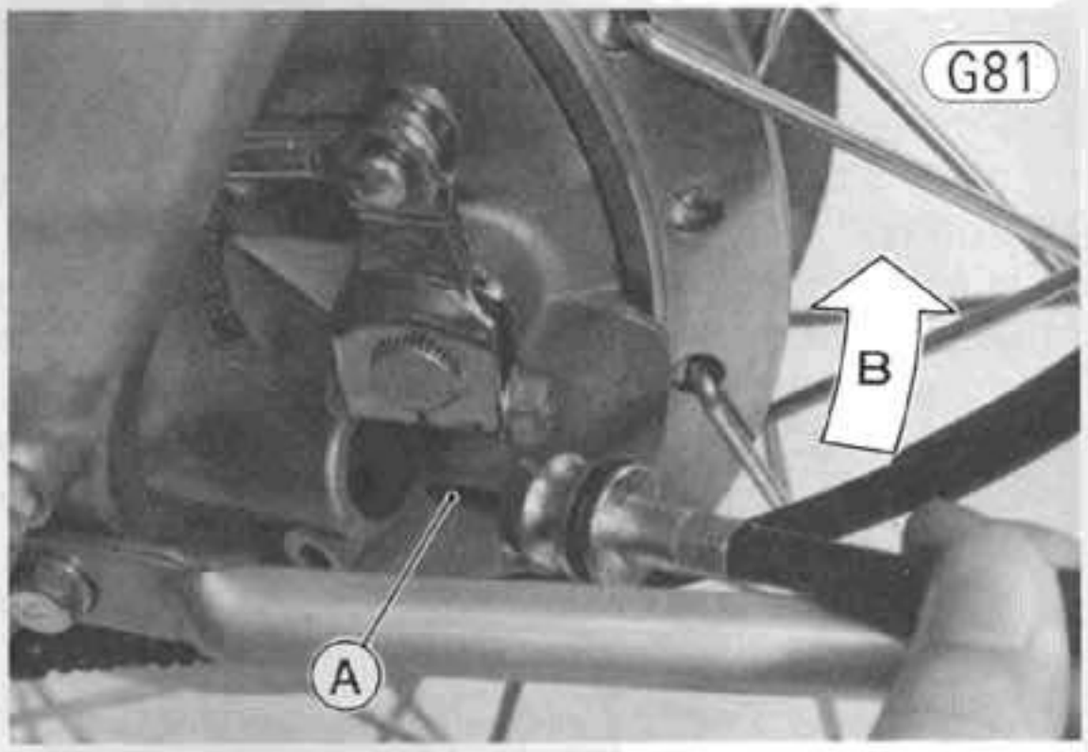
●Install the lower end of the speedometer cable as follows.

KZ400-B: Insert the speedometer inner cable into the speedometer gear housing while turning the wheel so that the slot in the end of the cable will seat in the tongue of the speedometer pinion. Tighten the cable nut with pliers.



A. Slot **B. Turn the wheel**

KZ400-C: Insert the speedometer inner cable into the front brake panel while turning the wheel so that the inner cable end will seat in the speedometer pinion gear. Install the speedometer cable bolt and washer.



A. Inner Cable **B. Turn the wheel**

TACHOMETER CABLE

Removal:

●Disconnect the upper and lower ends of the tachometer cable with pliers.

●Free the cable from the motorcycle.

Installation:

●Before installing the tachometer cable, lubricate it (Pg. 33).

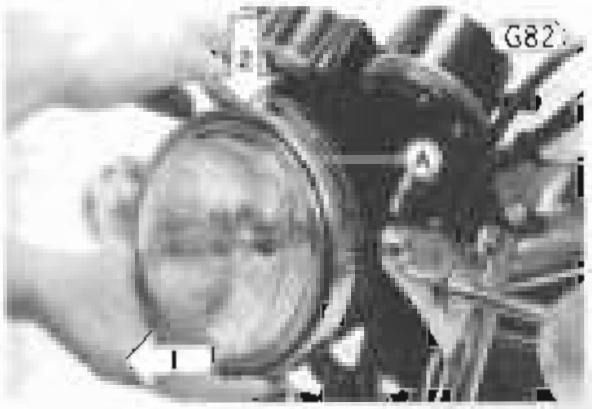
●Run the tachometer cable through its guide at the stem base fit the inner cable into the tachometer, and tighten the cable nut with pliers.

●Fit the bottom end of the cable into its place in the cylinder head. Turn it if necessary so that it fits all the way into place, and tighten its nut with pliers. There is a gasket between the outer cable and the tachometer pinion holder.

HEADLIGHT UNIT

Removal:

- Take out the retaining screws (3), lockwashers (4), and collars (5) (2 sets).
- Pull the bottom of the headlight unit (1) out of its housing (3), and then push down on the top of the headlight rim (2) to free the unit from the housing.



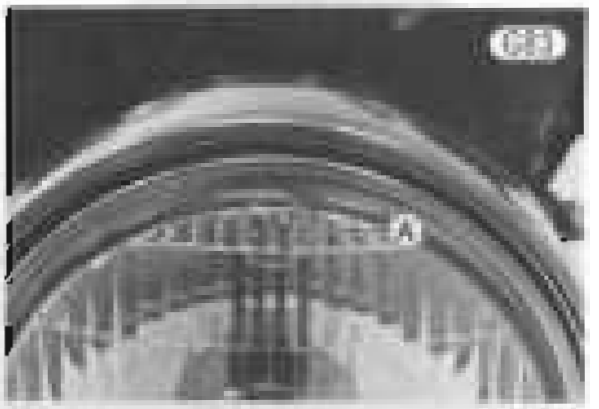
A. Headlight Rim

- Disconnect the city light from the rear of the unit (European model).
- Disconnect the headlight socket (1) from the rear of the unit. For sealed beam units, the bulb can now be removed.

- Remove the pivot screws (3), nuts (9), and rubber dampers (8) (2 sets).
- Remove the beam horizontal adjusting screw (4), and separate the sealed beam unit from the rim (2). A nut (10), spring seat (6), and spring (5) come off with the adjusting screw.

Installation Notes:

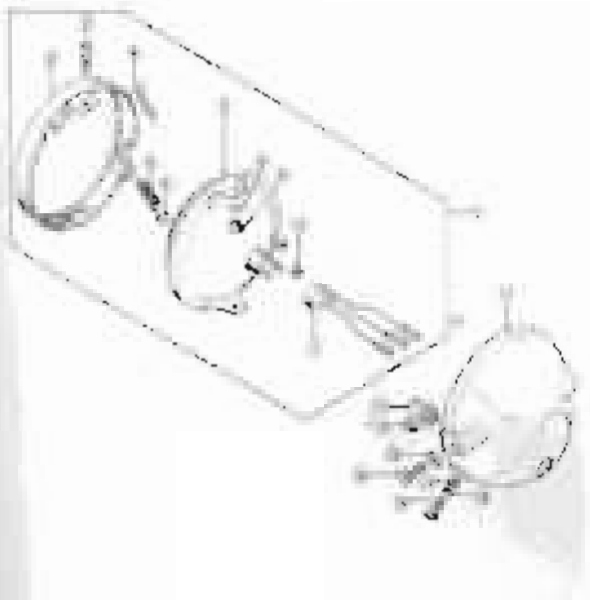
1. The spring seat on the adjusting screw goes between the spring and the bracket.
2. The top of the sealed beam unit is marked "TOP".



A. Top Mark

3. Carry out the headlight adjustment after installation (Pg. 30).

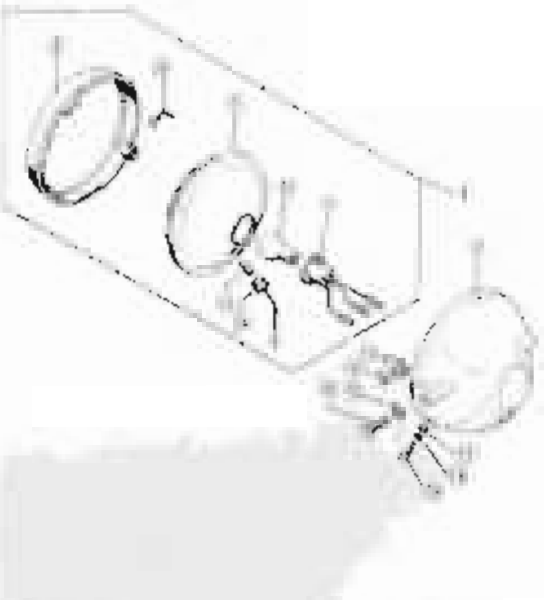
Headlight Unit
(US model)



1. Headlight Unit
2. Rim
3. Pivot Screws
4. Adjusting Screw
5. Spring
6. Spring Seat
7. Sealed Beam Unit
8. Damper
9. Nuts
10. Nut
11. Socket
12. Headlight Housing
13. Nuts
14. Collar

G84

(European model)

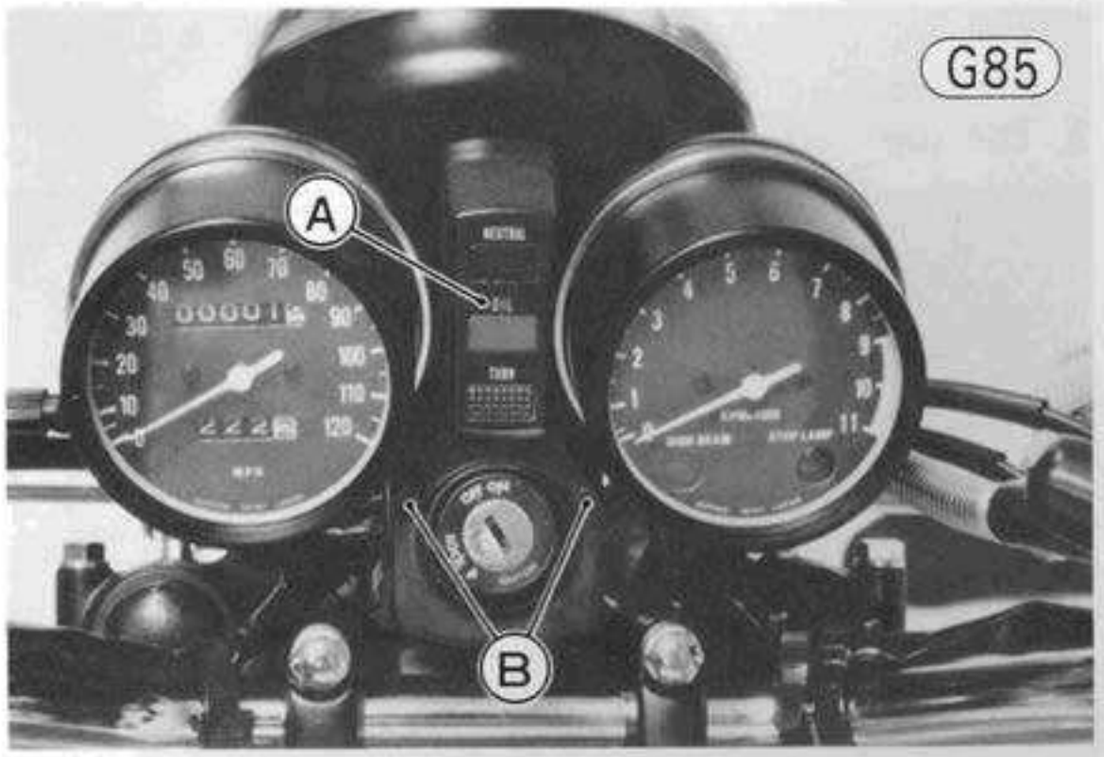


15. Washer
16. Housing Mounting Bolts
17. Collar
18. Lockwasher
19. Retaining Screws
20. Spring
21. Reflector
22. Headlight Bulb
23. City Light Bulb
24. Socket

INDICATOR LIGHTS
(Neutral, Oil, High Beam, Turn)

Removal:

- Remove the instrument unit mounting nuts, and lift up the unit slightly (KZ400-C). There are a lockwasher, flat washer, rubber dampers (2) on each studs.
- Remove the screws (2) and take off the upper cover.



A. Upper Cover **B. Screws**

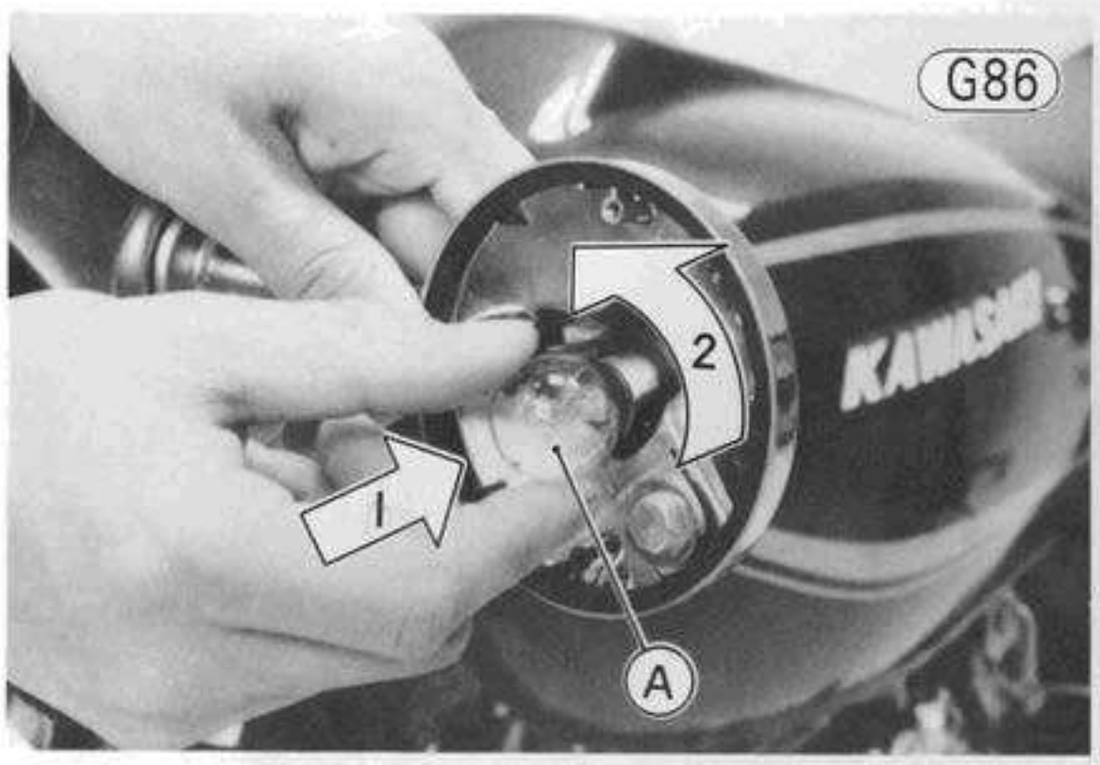
- To remove the indicator lights (3), first press the bulb inwards, then holding the bulb in this position, twist it to the left and pull it out.

Installation Note:

- Use 12V 3.4W bulbs for indicator light replacement.

TURN SIGNAL LIGHT
Bulb Replacement:

- Remove the lens mounting screws, and take off the lens.
- Press the bulb inwards, and holding the bulb in this position, twist it to the left and pull it out.

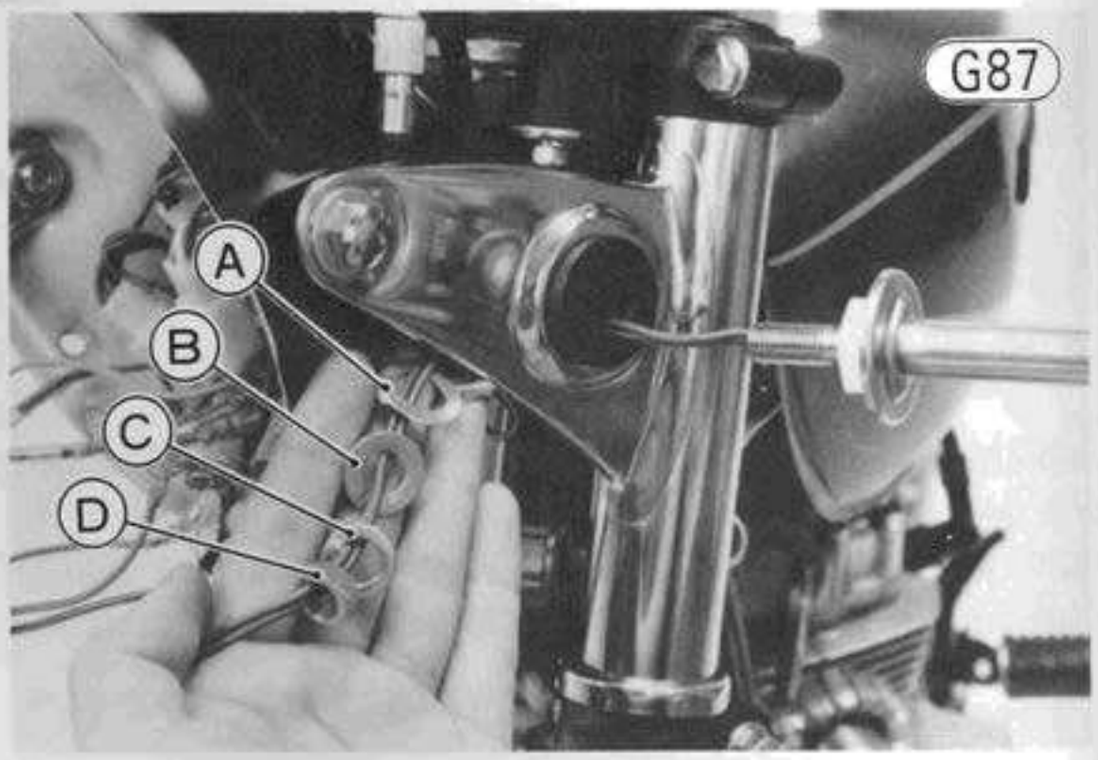


A. Bulb

- Install a new 12 volt bulb of the correct wattage (see the wiring diagram).
- Fit the rubber gasket in place, and install the lens. Be careful not to overtighten the mounting screws.

TURN SIGNAL ASSEMBLY
Removal (front, either side):

- Open the headlight housing, and free the headlight unit from the motorcycle (Pg. 129).
- Disconnect the turn signal/running position light leads in the headlight housing.
- Remove the mounting nut, lockwasher, flat washer, and black/yellow ground lead terminal, and pull the front turn signal from the front fork cover stay.



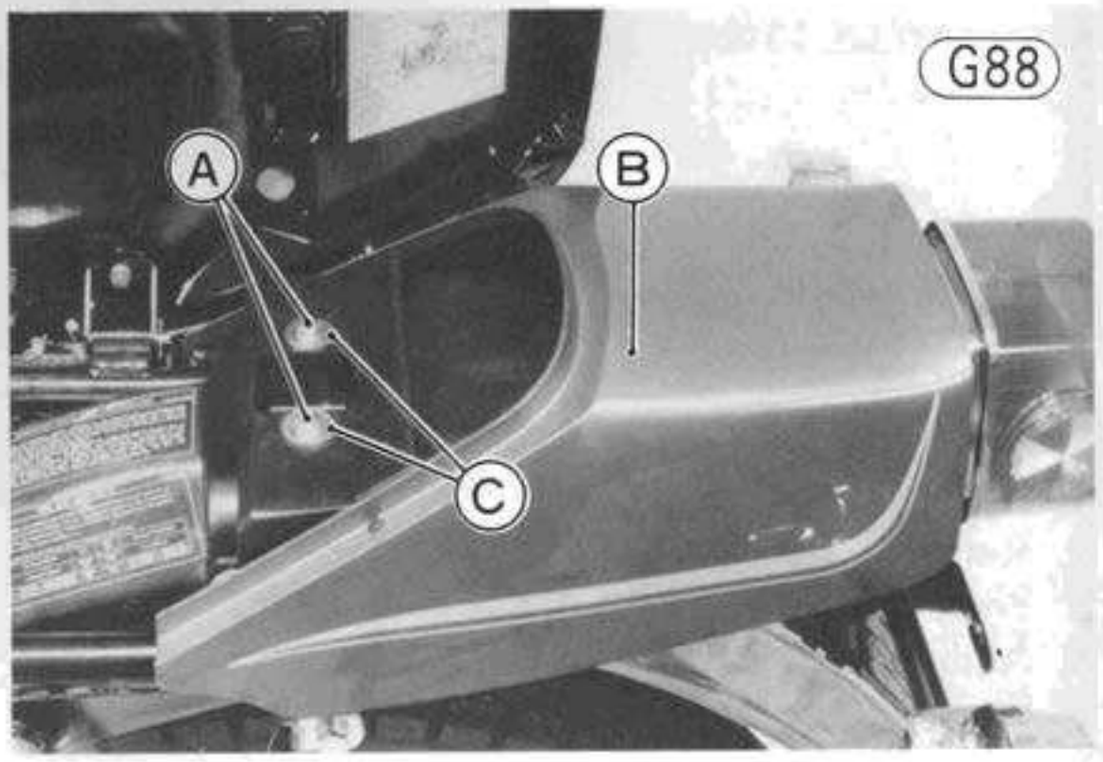
A. Ground Lead Terminal **C. Lockwasher**
B. Flat Washer **D. Nut**

Installation Notes (front, either side):

1. If the front turn signal dampers have been removed, install them as shown in Fig. G89.
2. Adjust the headlight (Pg. 30).

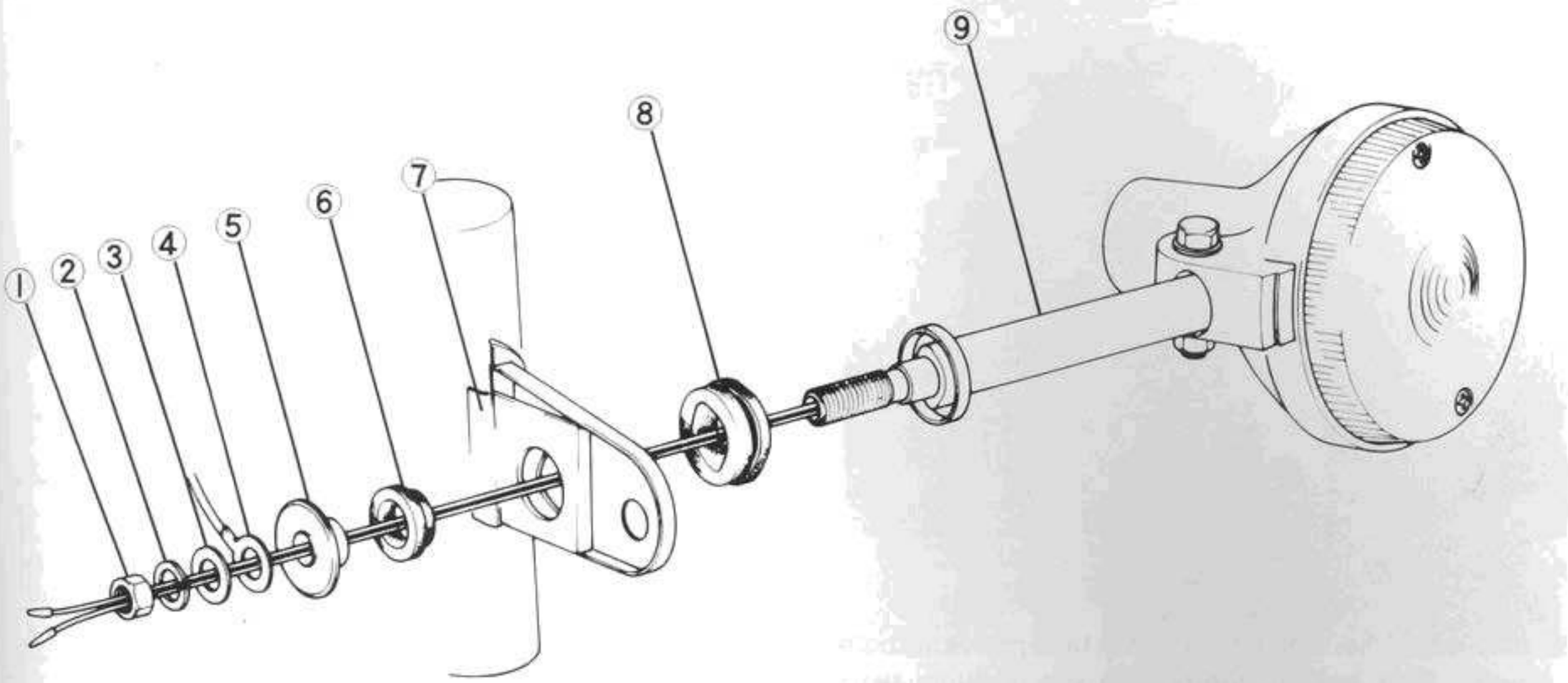
Removal (rear, either side):

- Unlock the seat and swing it open.
- Remove the license plate.
- Remove the bolts, lockwashers, and flat washers (2 ea), and remove the rear fender cover toward the front.



A. Bolts **B. Rear Fender Cover** **C. Flat Washers**

Front Turn Signal Installation

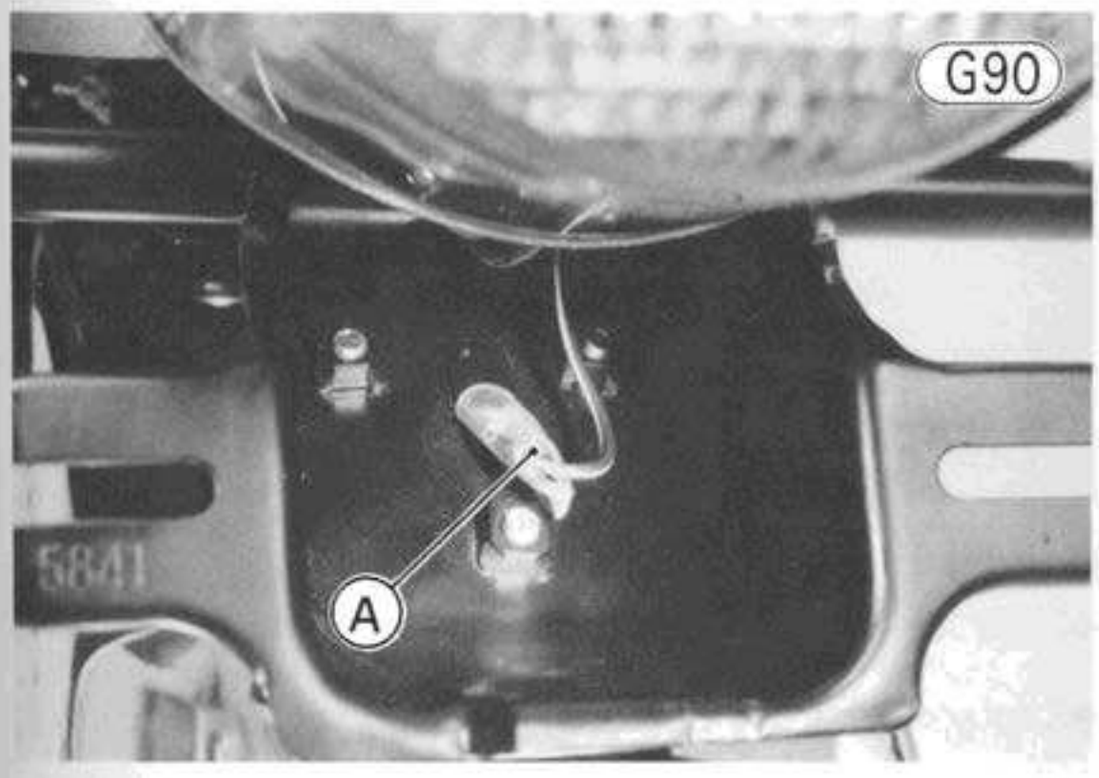


1. Mounting Nut
2. Lockwasher
3. Flat Washer
4. Ground Lead
5. Collar
6. Rubber Damper
7. Fork Cover
8. Rubber Damper
9. Turn Signal

- Disconnect the gray turn signal lead.
- Remove the mounting bolt, nut, lockwasher, and flat washers (2), and pull the rear turn signal assembly off the stay.

Installation Notes (rear, either side):

1. Check that the black/yellow lead is grounded in the license plate bracket.



A. Ground Lead

2. Connect the turn signal leads according to Table G2.

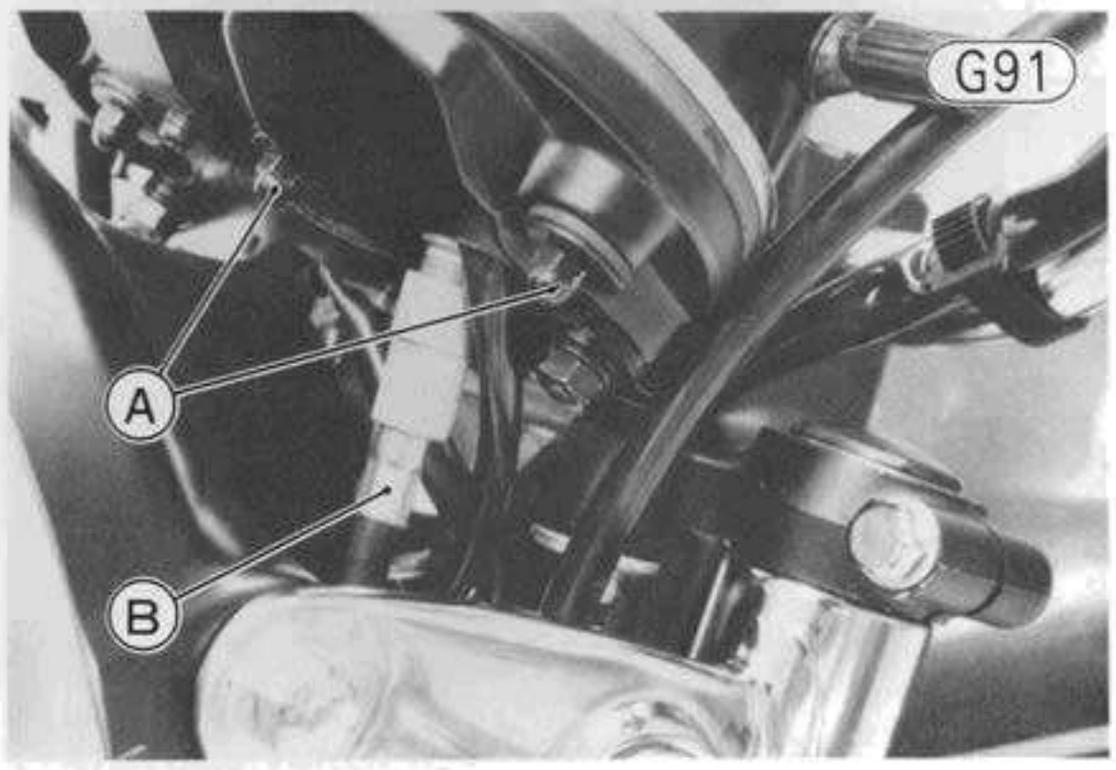
Table G2 Turn Signal Lead Color

	Turn Signal Lead		Main Wiring Harness Lead
Right	Gray	↔	Gray
	Black/Yellow	↔	Black/Yellow
Left	Gray	↔	Green
	Black/Yellow	↔	Black/Yellow

SPEEDOMETER, METER LIGHT

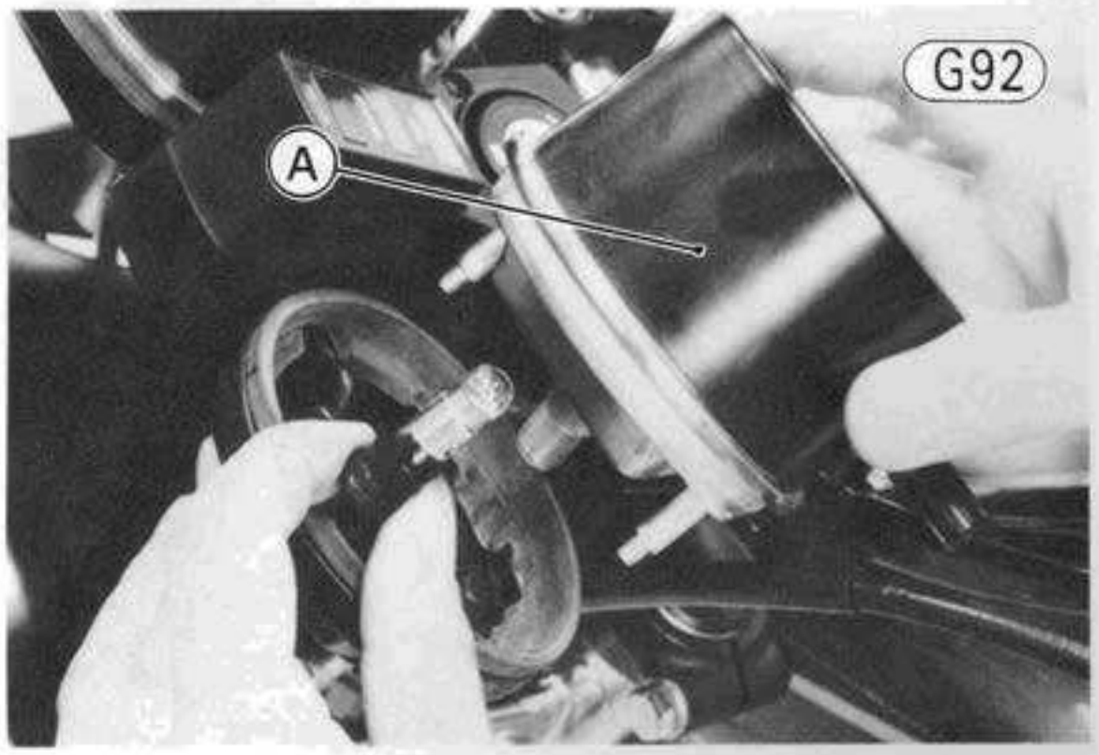
Removal:

- Disconnect the upper end of the speedometer cable with pliers.



A. Cap Nuts **B. Cable**

- Remove the cap nuts, flat washers, dampers (2 ea) from the bottom of the meter holder.
- Pull up the speedometer, pull the meter light out of the speedometer base, and remove the speedometer.



A. Speedometer

- To remove the meter light bulb, first press the bulb inward, then holding the bulb in this position, twist it to the left and pull it out.

CAUTION **Place the meter so that the correct side of the meter is up. If a meter is left upside down or sideways for any length of time it will malfunction.**

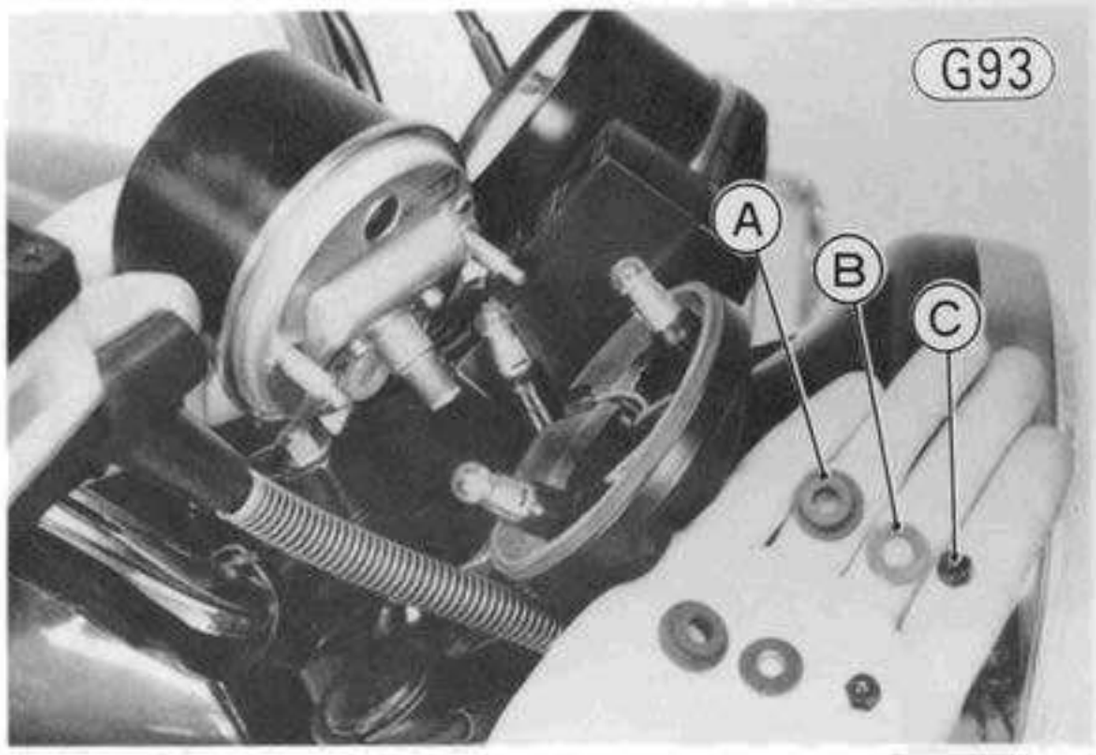
Installation Note:

- Use 12V 3.4W bulb for meter light replacement.

TACHOMETER, METER LIGHT, INDICATOR LIGHTS (Stop, High Beam)

Removal:

- Disconnect the upper end of tachometer cable with pliers.
- Remove the cap nuts, flat washers, dampers (2 ea) from the bottom of the meter holder.
- Pull up the tachometer, and pull the meter light and indicator lights (2) out of the tachometer base, and remove the tachometer.



A. Rubber Damper
B. Flat Washer
C. Cap Nut

- To remove the meter and indicator bulbs, first press the bulb inwards then holding the bulb in this position, twist it to the left and pull it out.

CAUTION **Place the meter so that the correct side of the meter is up. If a meter is left upside down or sideways for any length of time it will malfunction.**

Installation Notes:

1. Use 12V 3.4W bulb for meter light replacement.
2. Use the bulbs shown in Table G3 for indicator light replacement. Also, refer to the table for light location by lead color.

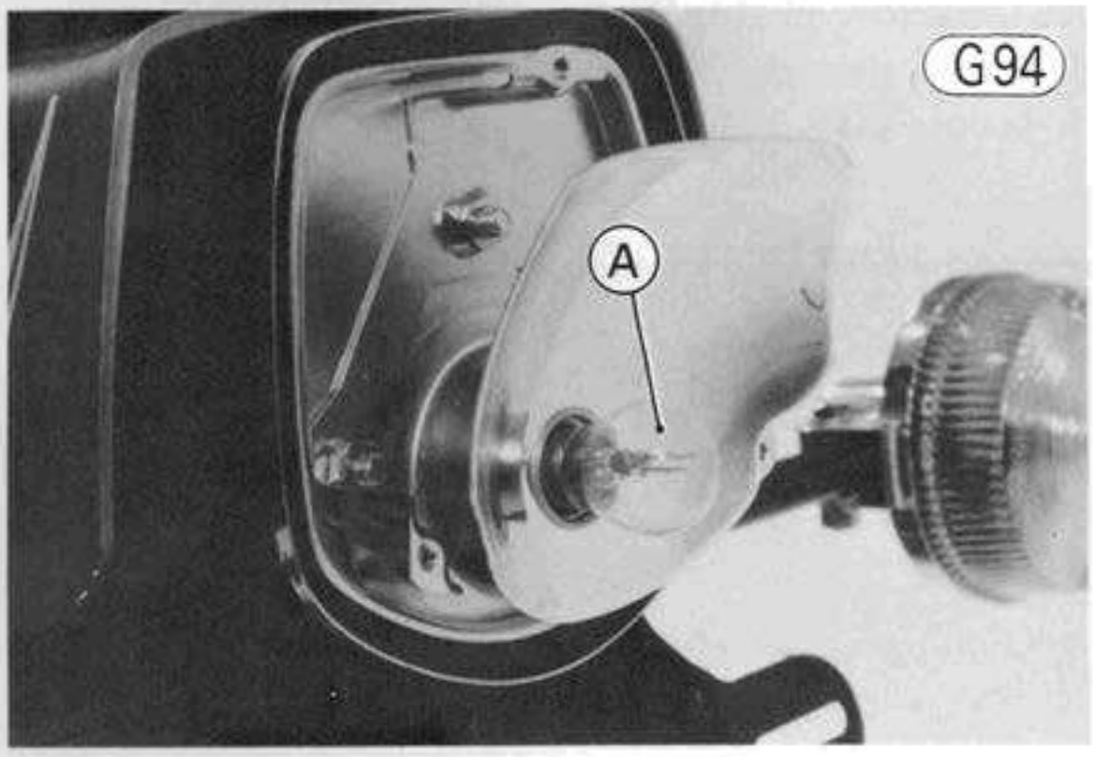
Table G3 Indicator Lights

Bulb Wattage	Indicator Light	Lead Color
12V 3.4W	High Beam	Red/Black, Black/Yellow
	Stop Lamp	Green/White, Brown

TAIL/BRAKE LIGHT

Bulb Replacement:

- Remove the lens mounting screws, and take off the lens.
- Press the bulb inwards, and holding the bulb in this position, twist it to the left and pull it out.



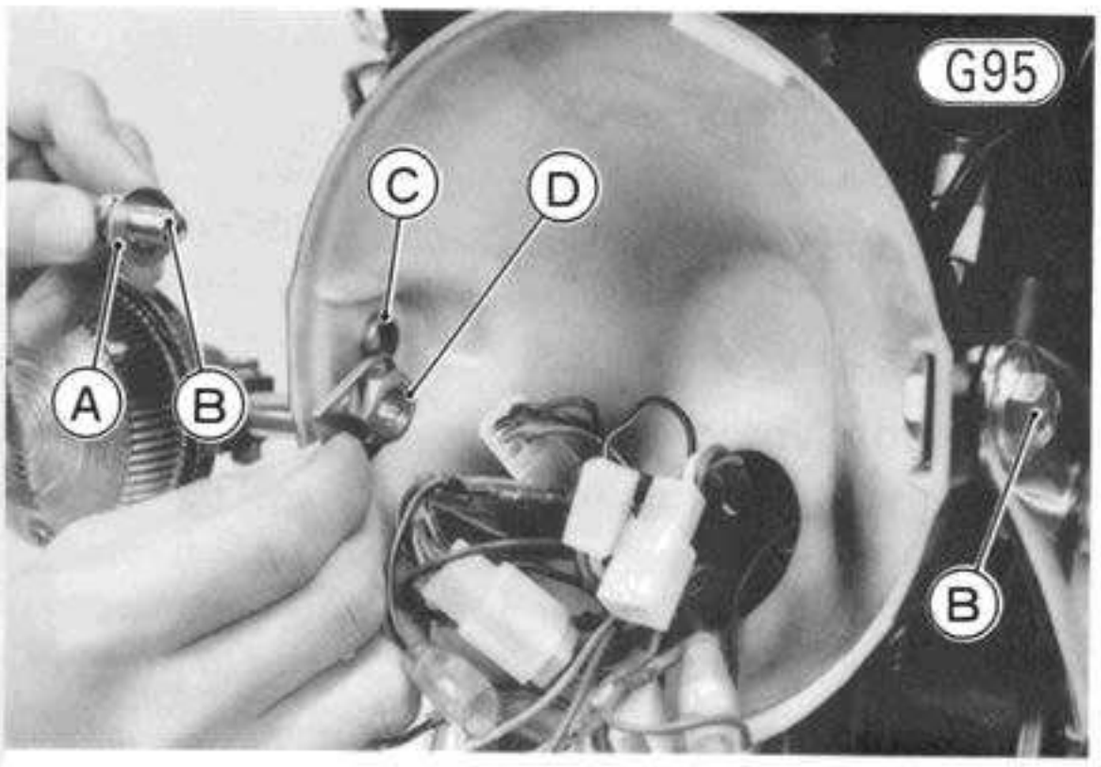
A. Bulb

- Replace a burned-out bulb with a new 12 volt bulb of the correct wattage (see the wiring diagram).
- Fit the rubber gasket in place, if removed, and install the lens. Be careful not to overtighten the mounting screws.

IGNITION SWITCH

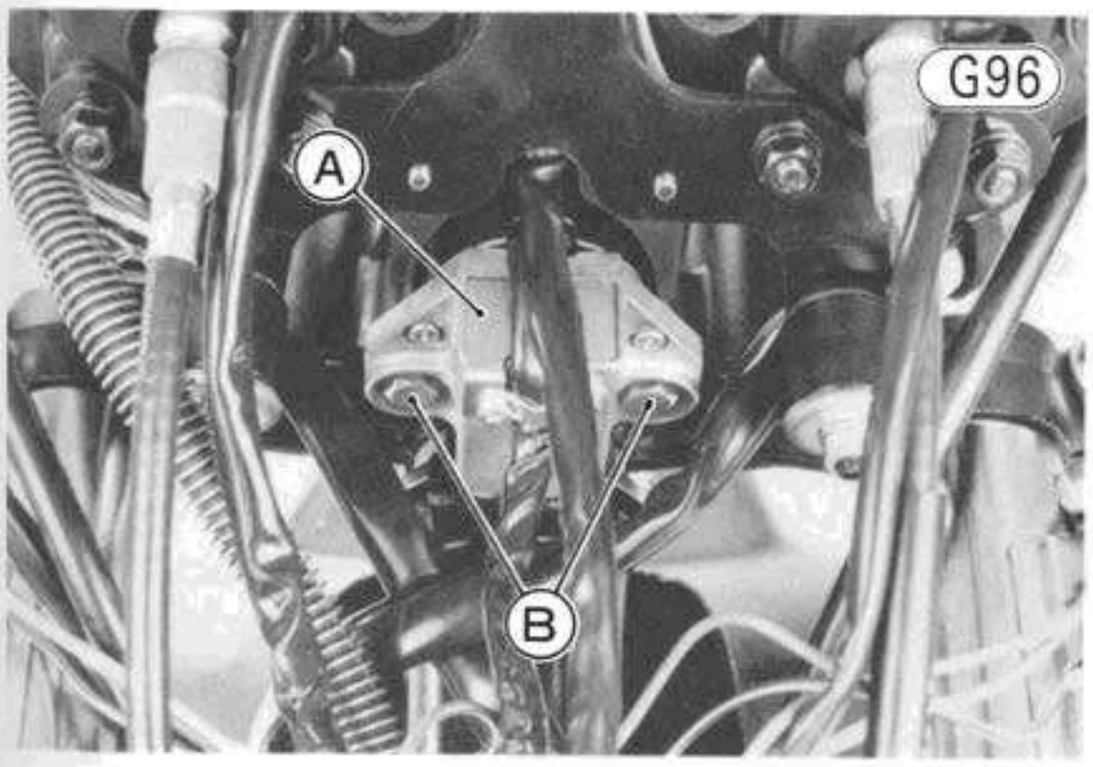
Removal:

- Open the headlight housing, and free the headlight unit from the motorcycle (Pg. 129).
- Disconnect the ignition switch wiring harness socket from the plug (4-pin) it connects to in the headlight housing and push the socket out of the housing.
- Remove the headlight housing mounting bolts (2). Each bolt has a nut, collar, and washer.



A. Flat Washer **C. Collar**
B. Mounting Bolt **D. Nut**

- Move the headlight housing down slightly.
- Remove the bolts (2) from the bottom of the steering lock assembly, and remove the steering lock assembly and ignition switch. Each bolt has a lockwasher, flat washer, collar and two rubber dampers.



A. Ignition Switch **B. Mounting Bolts**

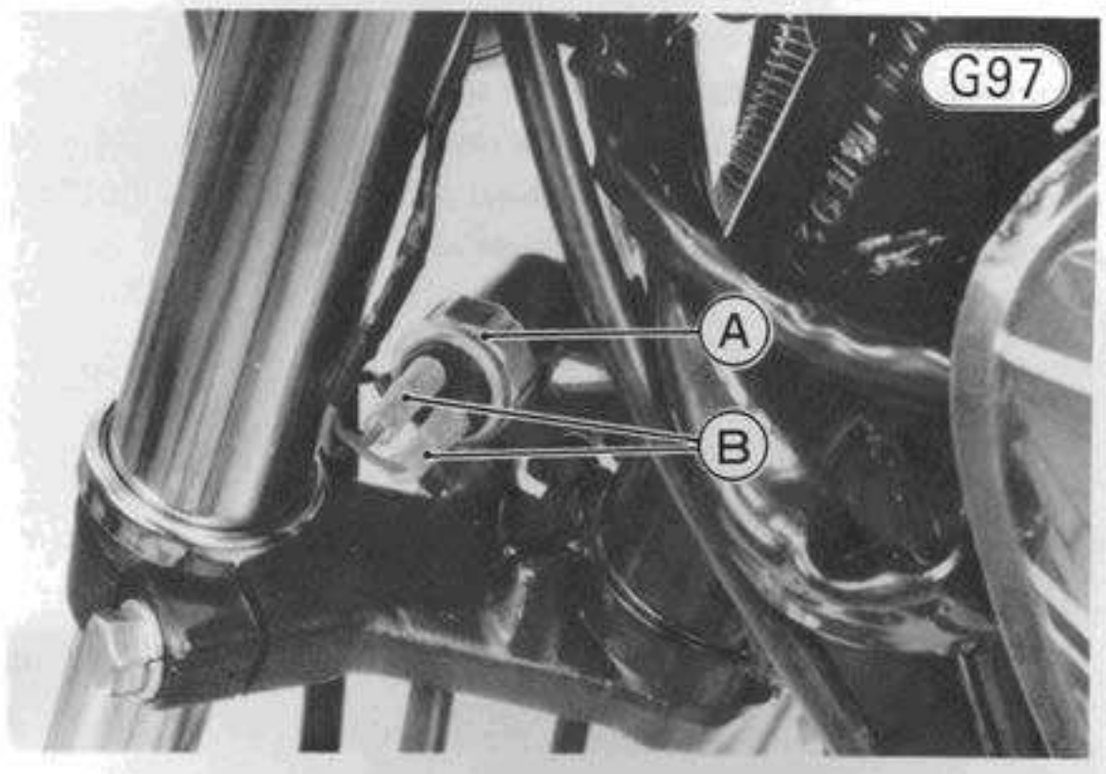
Installation:

- Fit the ignition switch and steering lock assembly in place, and tighten the bolts (2). The sequence is bolt, lockwasher, flat washer, rubber damper, steering lock assembly, rubber damper and collar.
- Connect the ignition switch wiring harness socket to its plug in the headlight housing.
- Mount the headlight housing in place tightening its mounting bolts. The sequence is mounting bolt, flat washer, fork cover, housing collar, and nut.
- Install the headlight unit (Pg. 129).
- Adjust the headlight (Pg. 30).

FRONT BRAKE LIGHT SWITCH (on KZ400-B)

Removal:

- Pump the brake fluid out of the line as explained in the Maintenance Section – *Changing the brake fluid* (Pg. 202).
- Disconnect the front brake light switch leads from the switch.



A. Brake Light Switch **B. Switch Leads**

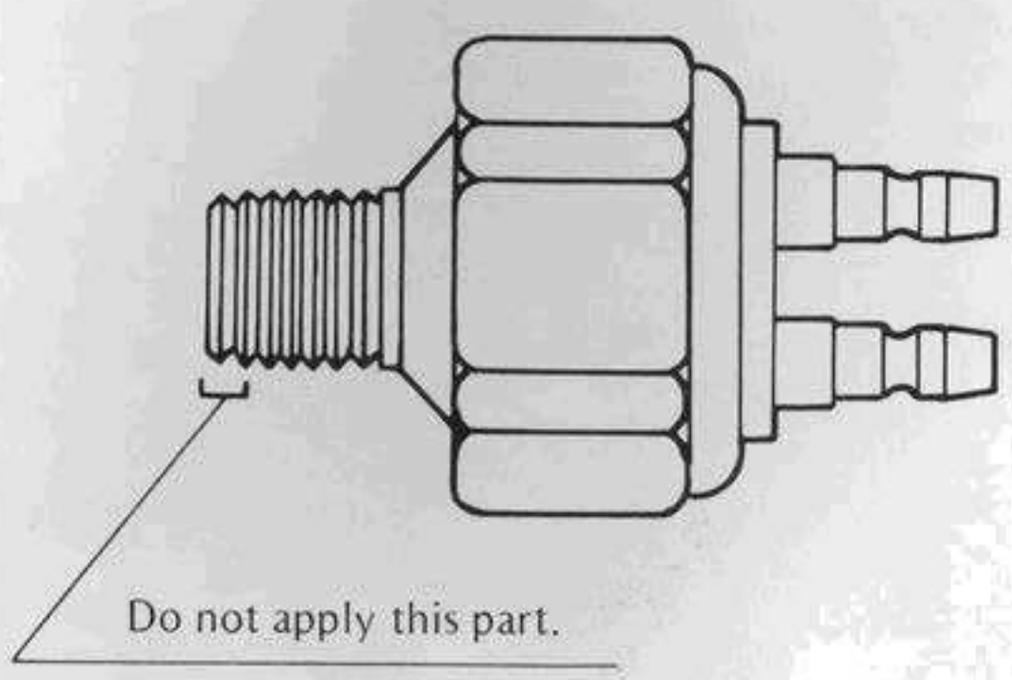
- Unscrew the front brake light switch from the 3-way joint.

CAUTION **If brake fluid spills when the switch is removed, painted or chromed surfaces may be damaged. Wipe up any spilled fluid immediately.**

Installation Notes:

1. Apply a small amount of a non-permanent locking agent to the switch threads before mounting the switch. So that no locking agent will get mixed in with the brake fluid, do not apply any on the lower one-fourth of the threads.

Brake Light Switch Installation G98

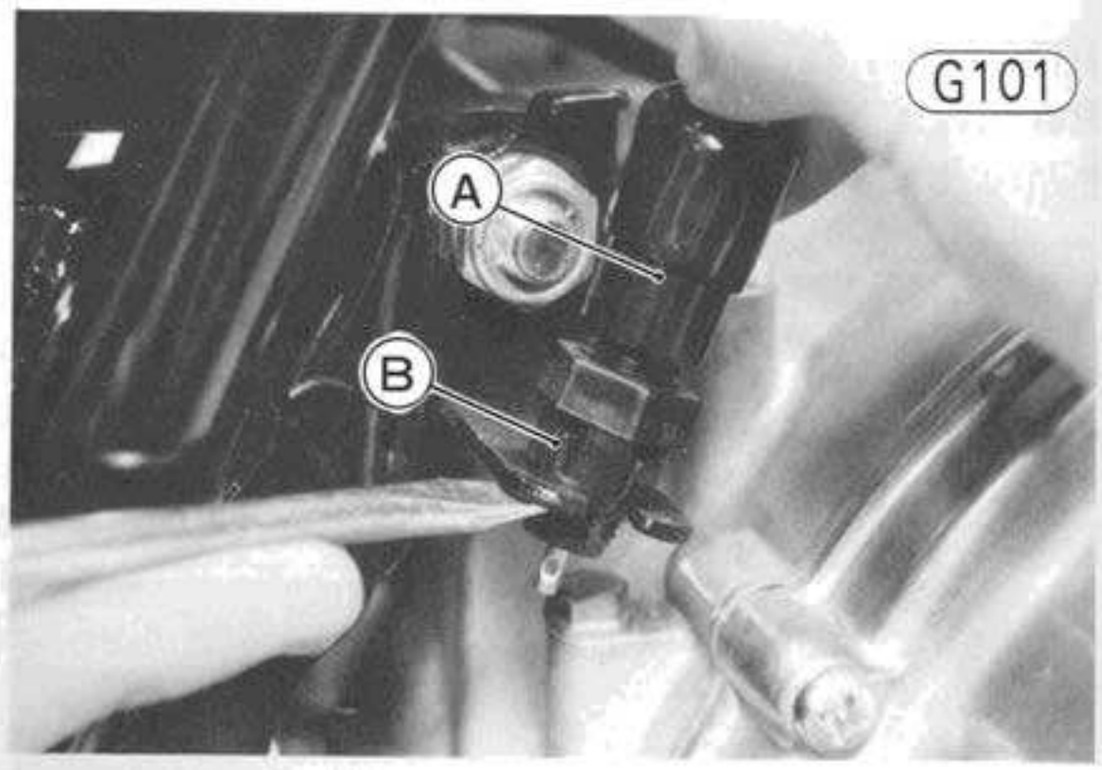


2. Tighten the front brake light switch to 2.8 kg-m (20 ft-lbs) of torque.
3. After the switch has been installed, bleed the front brake lines (Pg. 203).

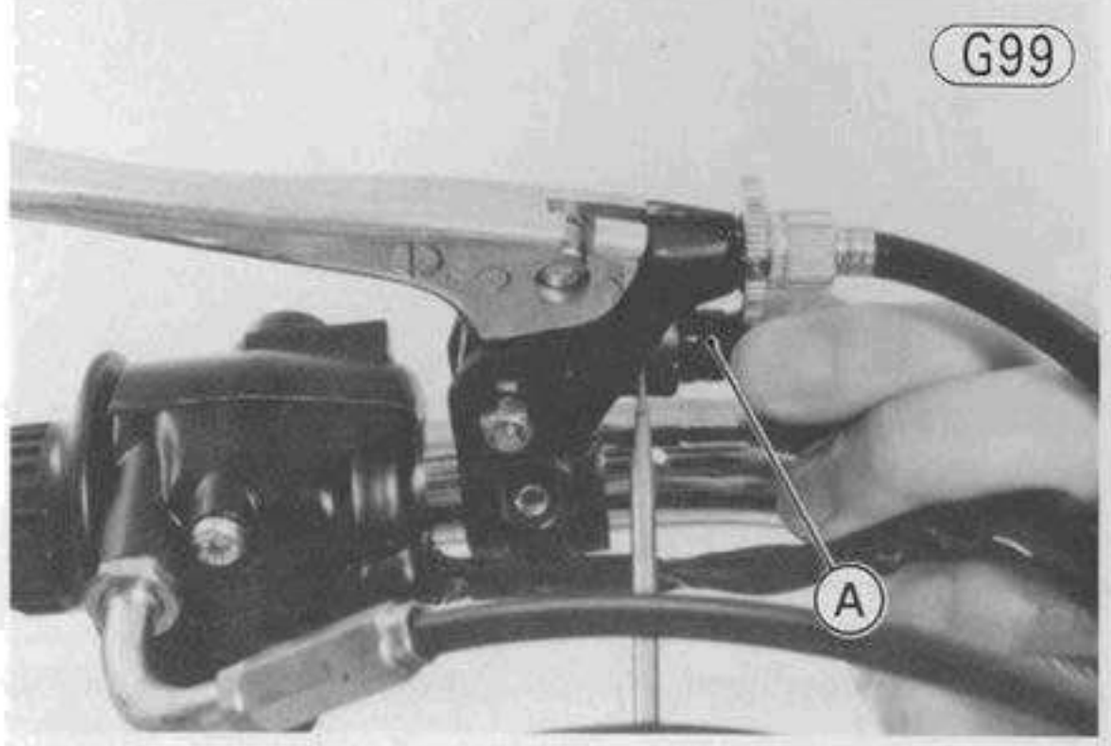
FRONT BRAKE LIGHT SWITCH (on KZ400-C)

Removal:

- Open the headlight housing, and free the headlight unit from the motorcycle (Pg. 129).
- Disconnect the brown and the blue/red front brake switch lead connections in the headlight housing, and pull these leads out of the housing.
- Remove the straps (2) on the right side of the handlebar, and free the front brake switch leads.
- Using a thin-bladed screwdriver or some other suitable tool, press in the front brake switch tab which catches in the hole in the underside of the brake lever holder, and then remove the switch.



A. Brake Light Switch **B. Tab**



A. Brake Light Switch

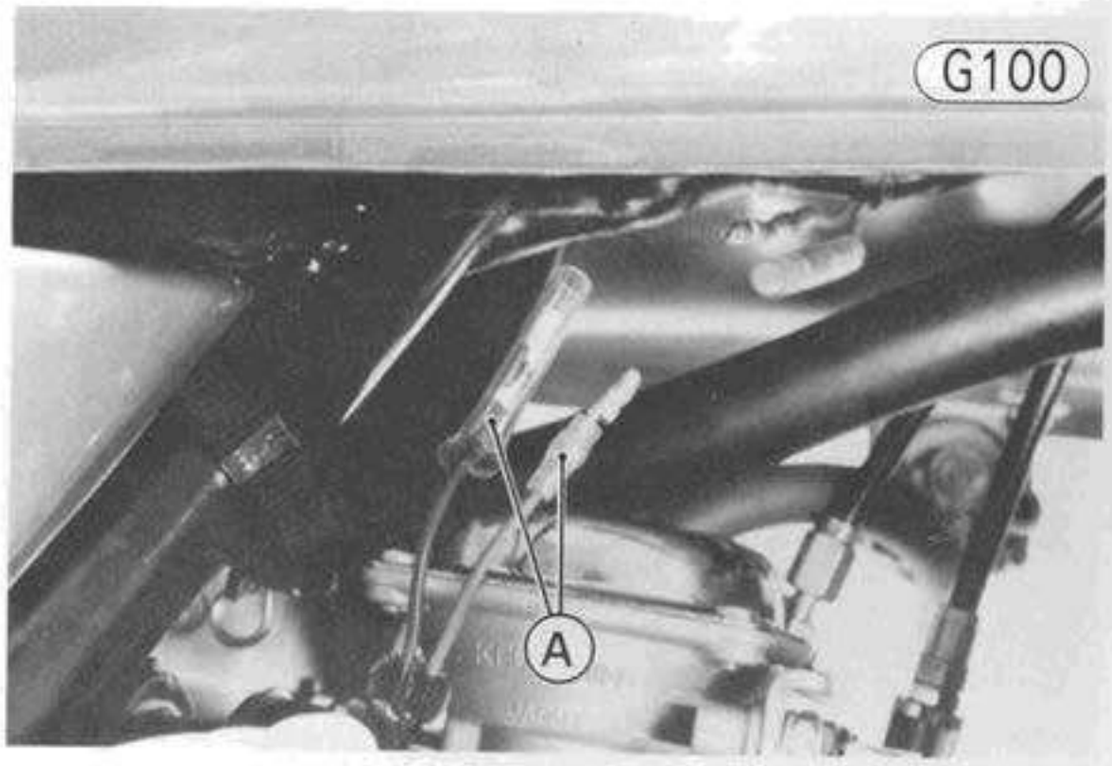
Installation Note:

- Adjust the switch after installation (Pg. 28).

REAR BRAKE LIGHT SWITCH

Removal:

- Remove the rear brake light switch spring.
- Unfasten the strap which holds the switch leads on the frame.
- Disconnect the blue and brown leads from the rear brake light switch under the fuel tank.



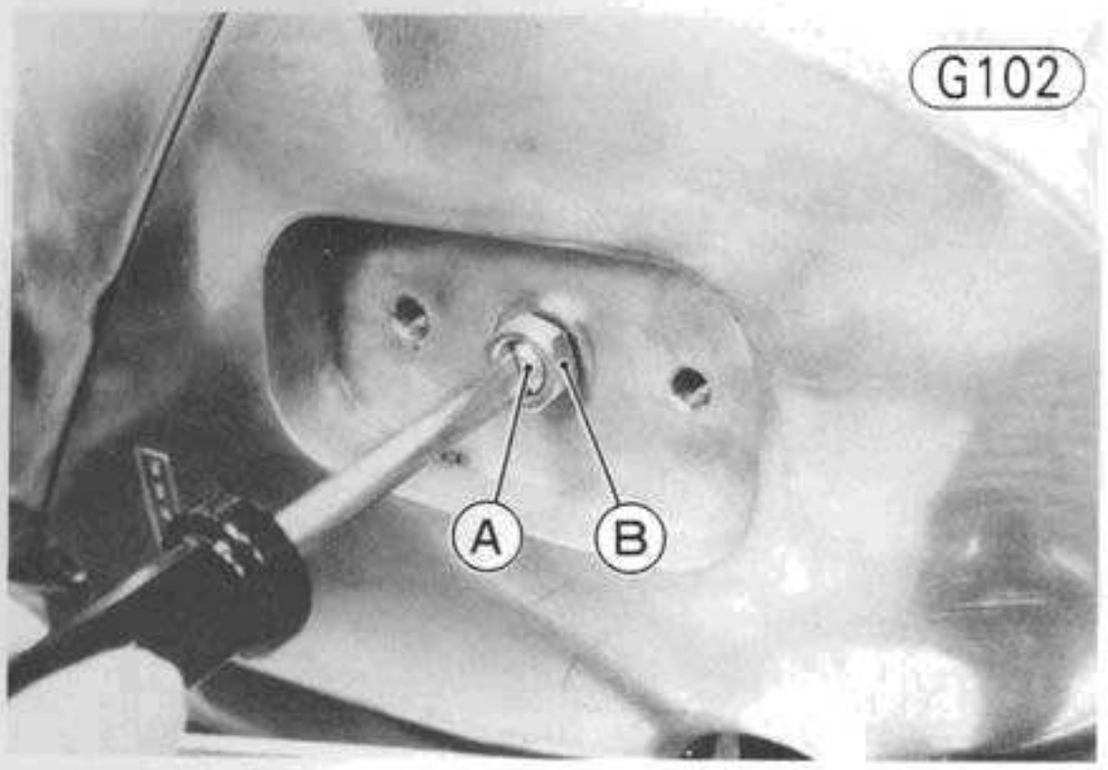
A. Switch Leads

- Press in the rear brake light switch tabs which catch in the bracket hole, and remove the rear brake light switch.

HANDLEBAR

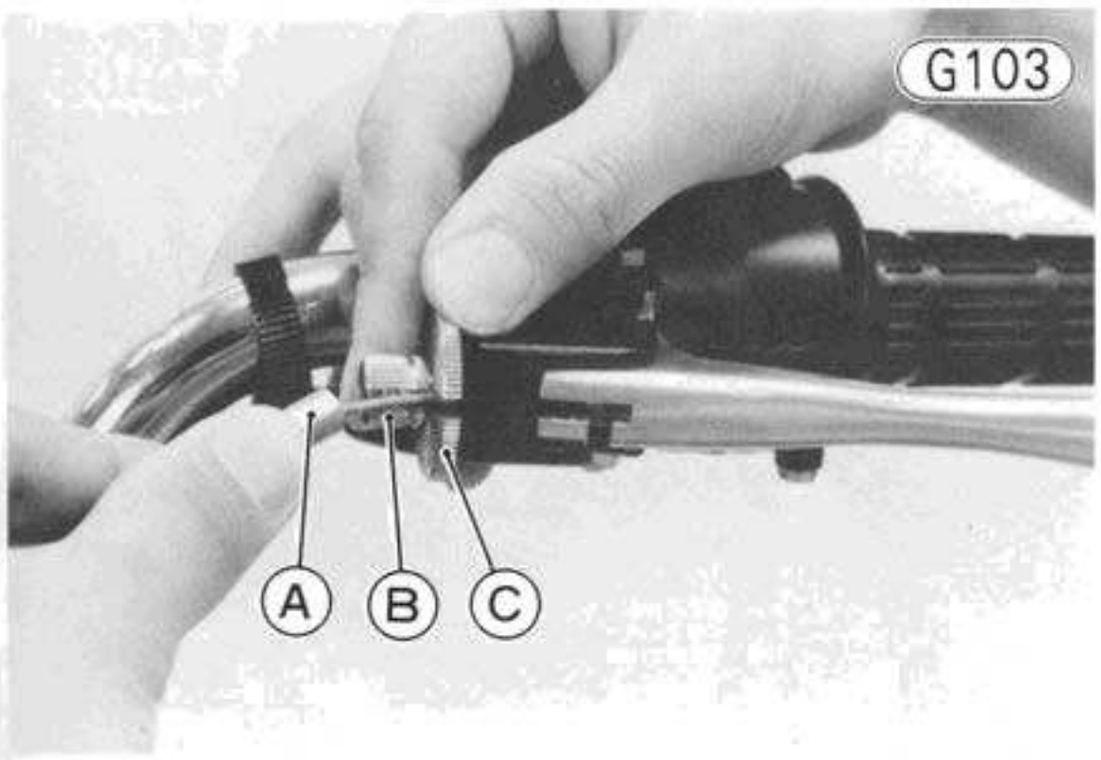
Removal:

- Take off the rear view mirrors.
- Remove the fuel tank (Pg. 43) or cover it with a thick cloth to avoid damaging the painted surface.
- Loosen the locknut, and turn in fully the adjuster at the center of the clutch cable to give the cable plenty of play.
- Remove the clutch adjusting cover.
- Loosen the locknut, and turn in the clutch adjusitng screw a couple of turns to give the clutch cable plenty of play.



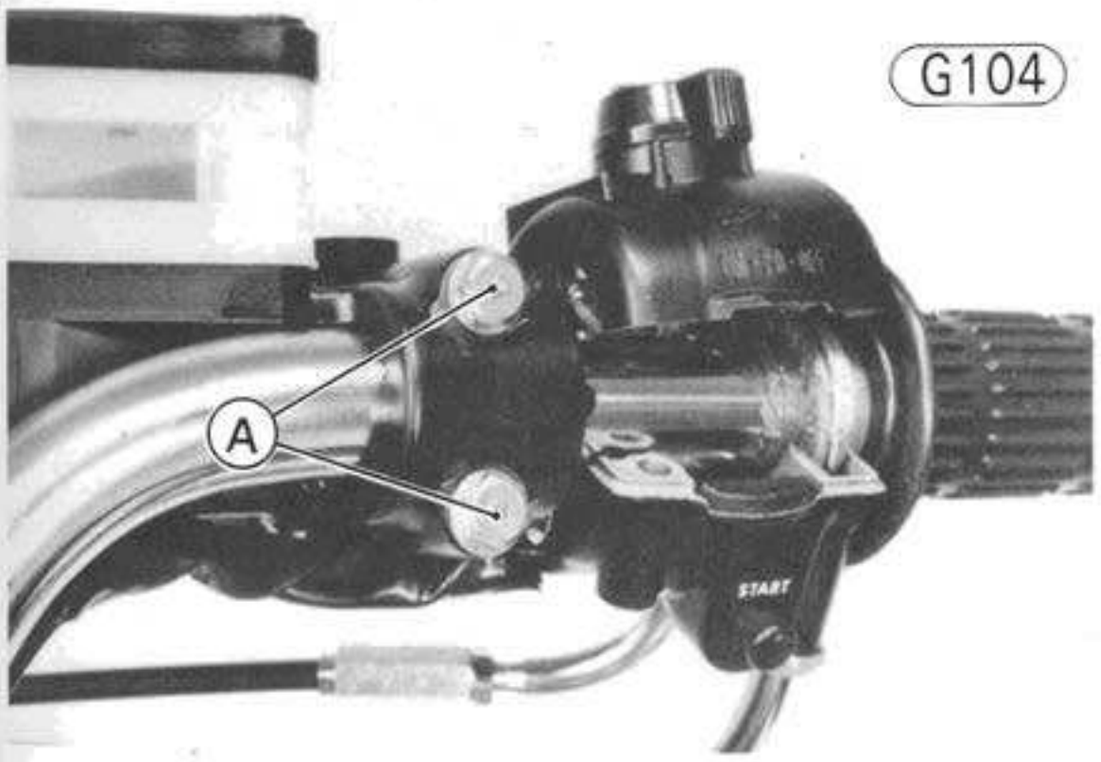
A. Adjusting Screw **B. Locknut**

- Loosen the knurled locknut on the clutch lever, and turn in the adjuster and line up the slots in the clutch lever, locknut, and adjuster. Free the inner cable from the lever.



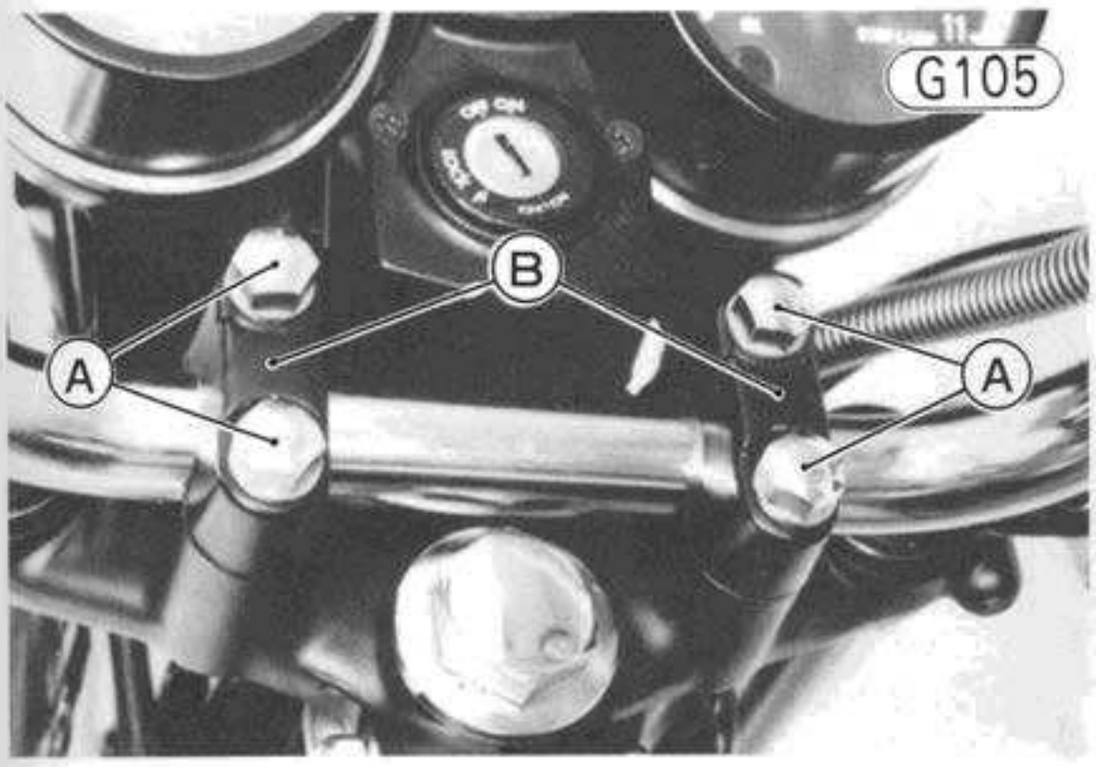
A. Clutch Cable **C. Knurled Locknut**
B. Adjuster

- Remove the straps which hold the left switch wiring harness and right switch wiring harness to the handlebar.
- Take out the left switch housing screws (2), and remove the housing from the handlebar. If necessary, loosen the clutch lever holder bolt, and slide the clutch lever to the right.
- Remove the right switch housing screws (2), and open up the housing.
- Loosen the master cylinder clamp bolts (2) (KZ400-B).



A. Clamp Bolts

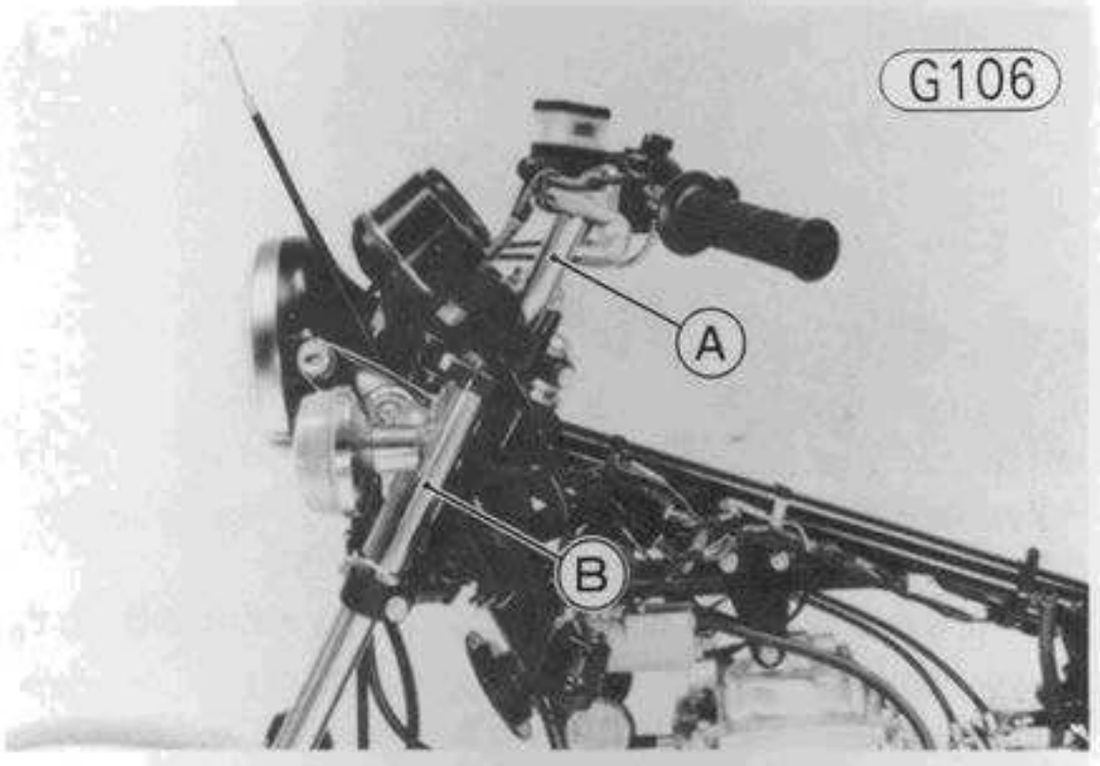
- Loosen the front brake lever holder bolt (KZ400-C).
- Remove the handlebar clamp bolts and lockwashers (4 ea), remove the clamps (2), and slide the handlebar from the throttle grip, right switch housing, and master cylinder or front brake lever holder.



- To remove the clutch lever, loosen the clutch lever holder bolt, cut off the left handlegrip, which is bonded to the handlebar, and slide off the clutch lever.

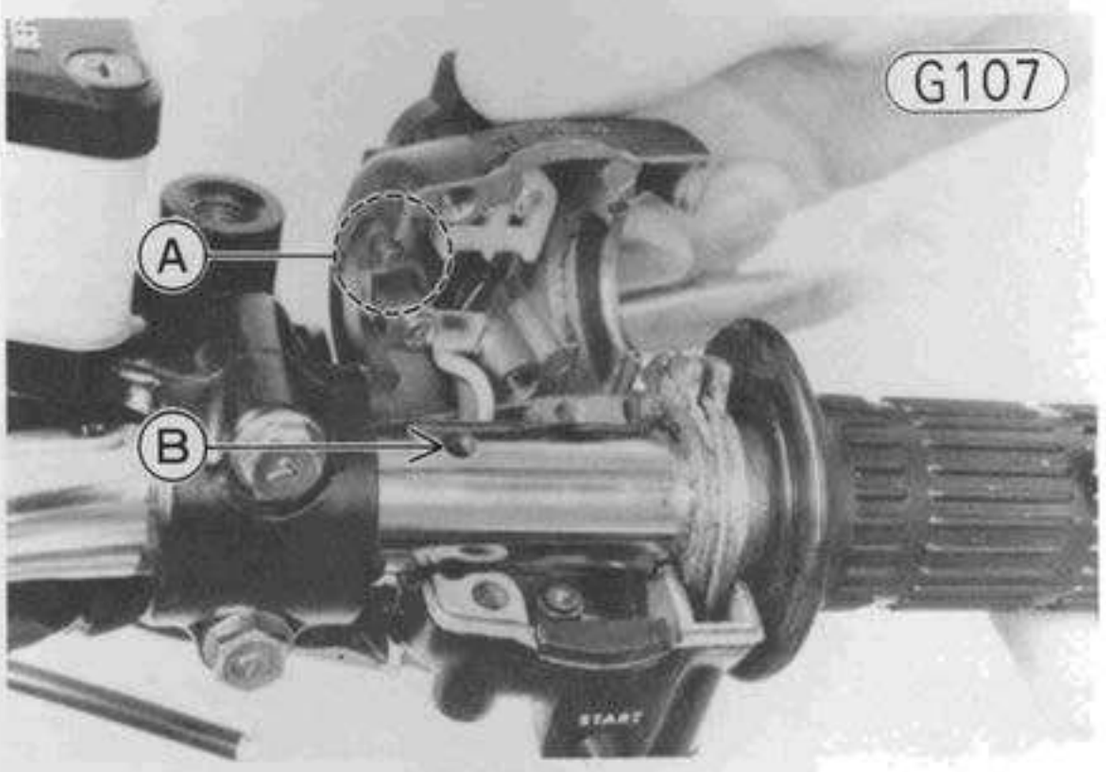
Installation:

- If the clutch lever and left handlegrip were removed; slide the clutch lever back on, hand tighten its bolt, and bond a new left handlegrip to the handlebar.
- Slide the right side of the handlebar through the master cylinder or front brake lever holder, and the right switch housing, and into the throttle grip assembly.
- Mount the handlebar, and install the handlebar clamps, lockwashers, and clamp bolts so that the angle of the handlebar matches the angle of the front fork as shown, and tighten the clamp bolts evenly to 1.8 kg-m (13.0 ft-lbs) of torque.



A. Handlebar **B. Front Fork**

- Install the left switch housing, and tighten its screws (2).
- Put together the right switch housing, and tighten its screws. The upper half of the housing has a small projection which fits into a small hole in the handlebar. The front switch housing screw is longer than the rear screw.



A. Projection **B. Hole**

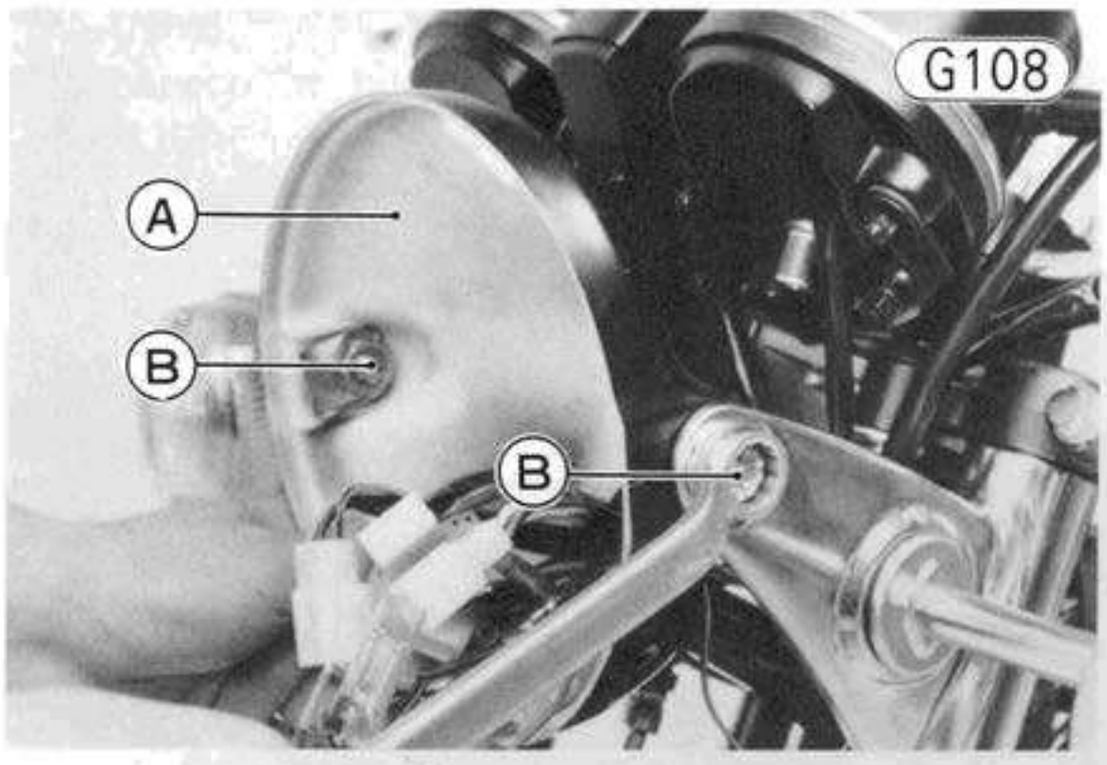
- With the brake lever mounted at the proper angle, tighten first the upper and then the lower master cylinder clamp bolt to 0.80 kg-m (69 in-lbs) of torque (KZ400-B).

- With the brake lever mounted at the proper angle, tighten the brake lever bolt (KZ400-C).
- With the clutch lever mounted at the proper angle, tighten the clutch lever holder bolt.
- Strap the left switch housing wiring harness, the right switch housing wiring harness, and the front brake light switch leads back onto the handlebar.
- Fit the tip of the clutch cable back into the clutch lever.
- Install the fuel tank (Pg. 43).
- Check the front brake (Pg. 25).
- Check the throttle cable (Pg. 15).
- Adjust the clutch (Pg. 19).
- Install the rear view mirrors.
- Adjust the rear view mirrors.

STEERING STEM

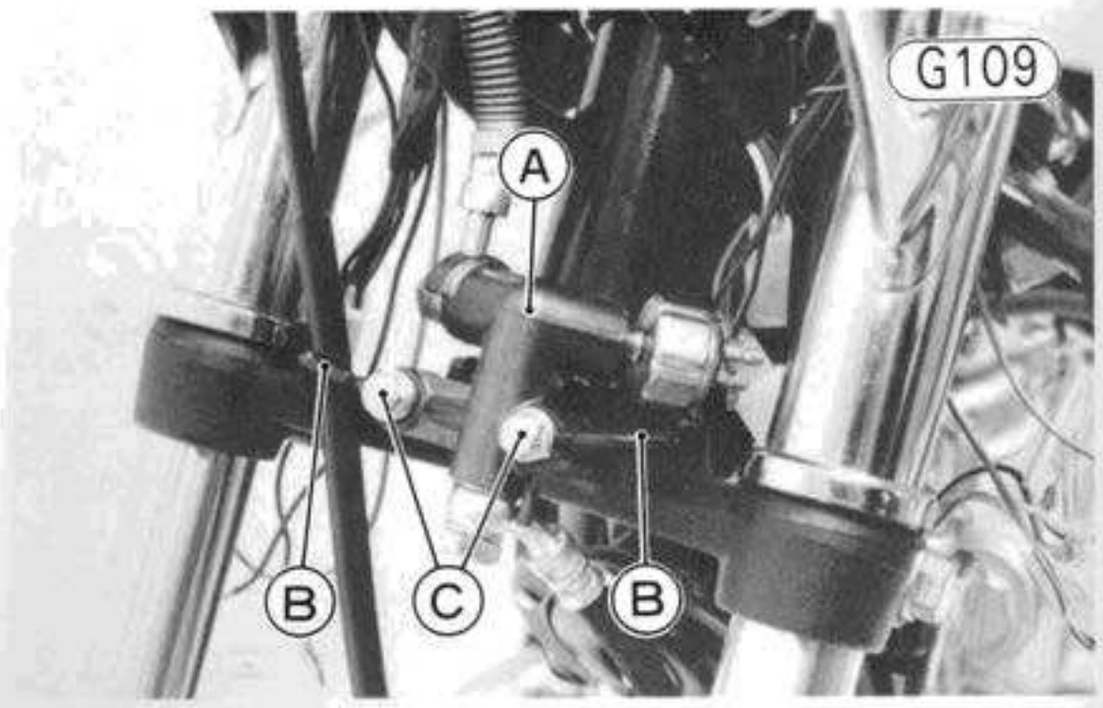
Removal:

- Remove the fuel tank (Pg. 43).
- Remove the speedometer cable (Pg. 127).
- Remove the front brake cable (Pg. 125).
- Remove the front wheel (Pg. 107 for KZ400-B or Pg. 110 for KZ400-C).
- Remove the headlight unit (Pg. 129).
- Disconnect all the leads and plugs in the headlight housing.
- Disconnect the front brake light switch leads from the switch (KZ400-B).
- Remove the headlight housing mounting bolts (2) and remove the headlight housing. Each bolt has a flat washer, collar, and nut.



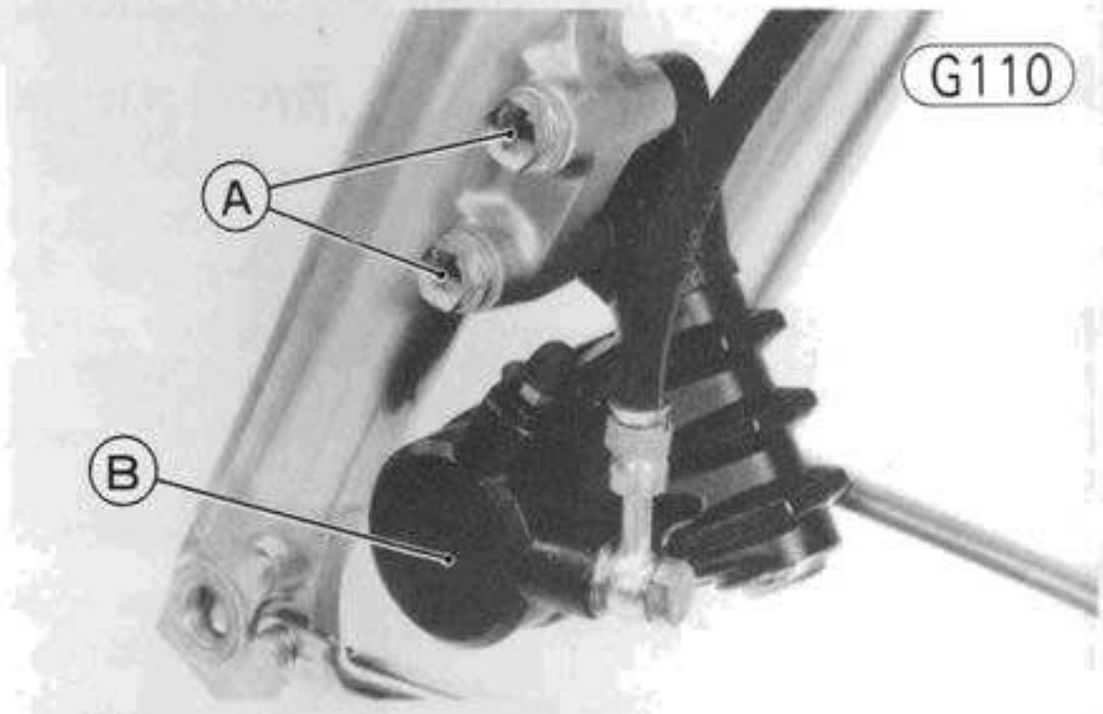
A. Headlight Housing **B. Mounting Bolts**

- Remove the clamp bolts (2), and take off the master cylinder. There is a flat washer for each master cylinder clamp bolt.
- On the KZ400-B, remove the 3-way joint mounting bolts, lockwashers, and flat washers (2 ea) with the two cable guides.



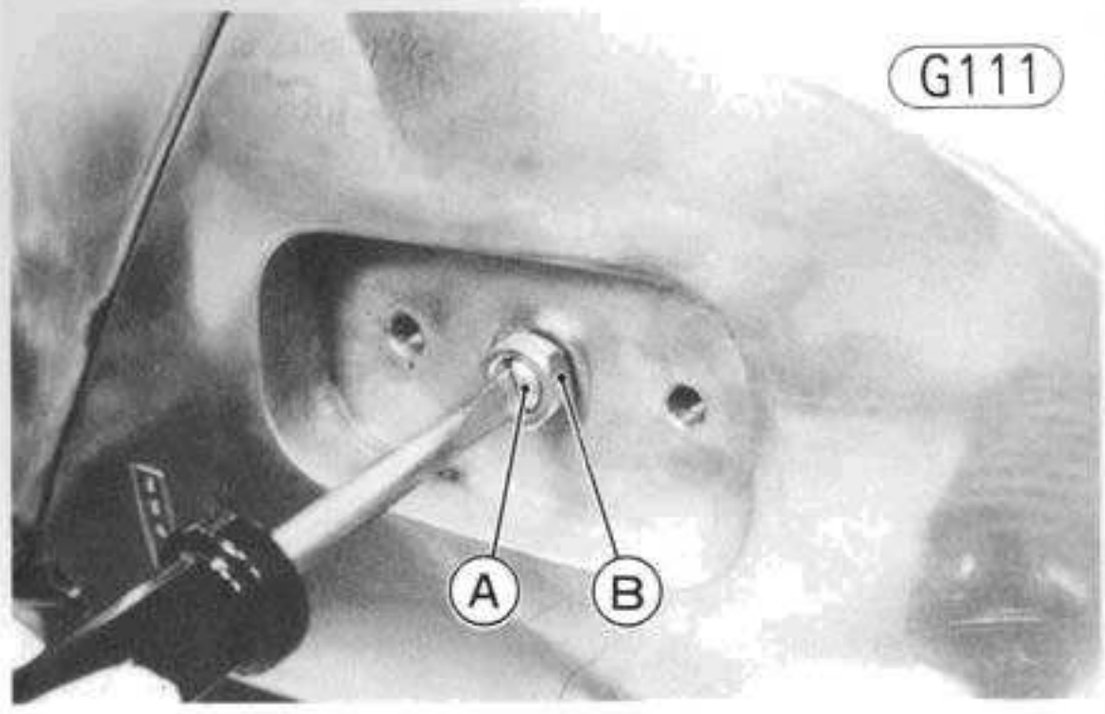
A. 3-way Joint **C. Mounting Bolts**
B. Cable Guide

- On the KZ400-C, remove the cable guide mounting bolts (2) at the stem base, and remove the cable guide (2). Each bolt has a lockwasher and flat washer.
- Disconnect the tachometer cable at the tachometer with pliers.
- Remove the caliper mounting bolts, lockwashers, and flat washers (2 ea), and remove the caliper together with the master cylinder, upper brake hose, 3-way joint, and lower brake hose.



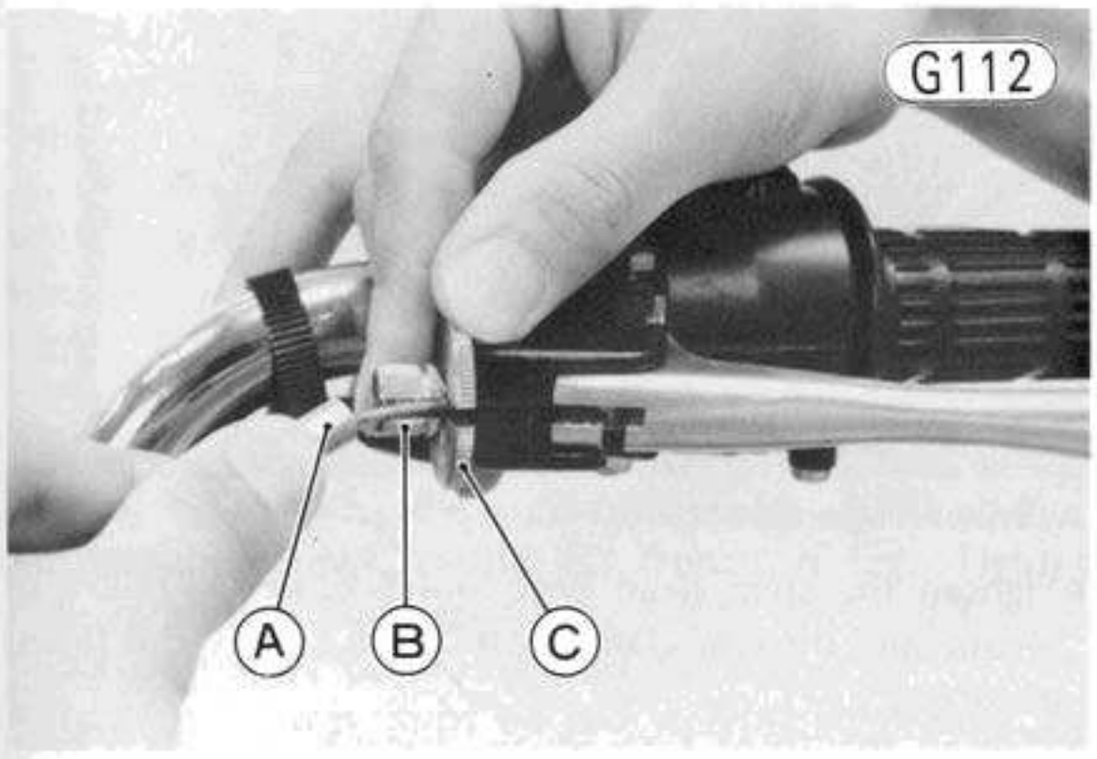
A. Mounting Bolts **B. Caliper**

- Loosen the locknut, and turn in fully the adjuster at the center of the clutch cable to give the cable plenty of play.
- Remove the clutch adjusting cover.
- Loosen the locknut, and turn in the clutch adjusting screw a couple of turns to give the clutch cable plenty of play.



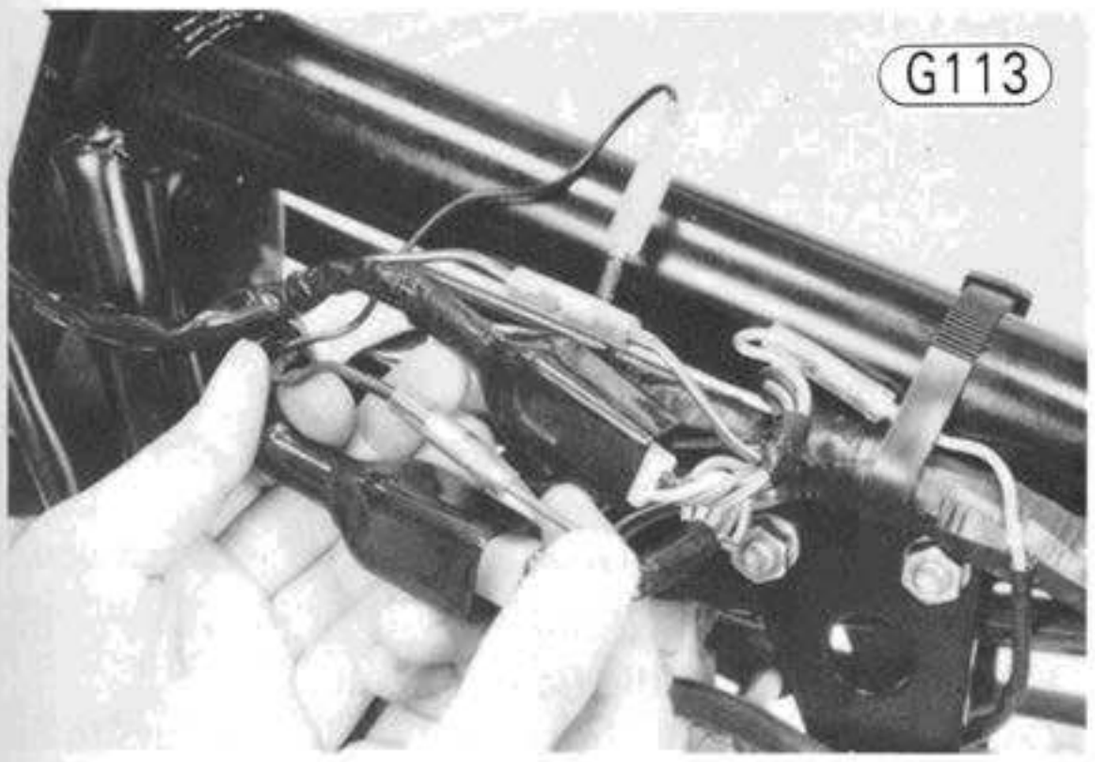
A. Adjusting Screw **B. Locknut**

•Loosen the knurled locknut on the clutch lever holder, and screw in the adjuster, lining up the slots in the clutch lever, knurled locknut, and adjuster. Free the inner cable from the lever.

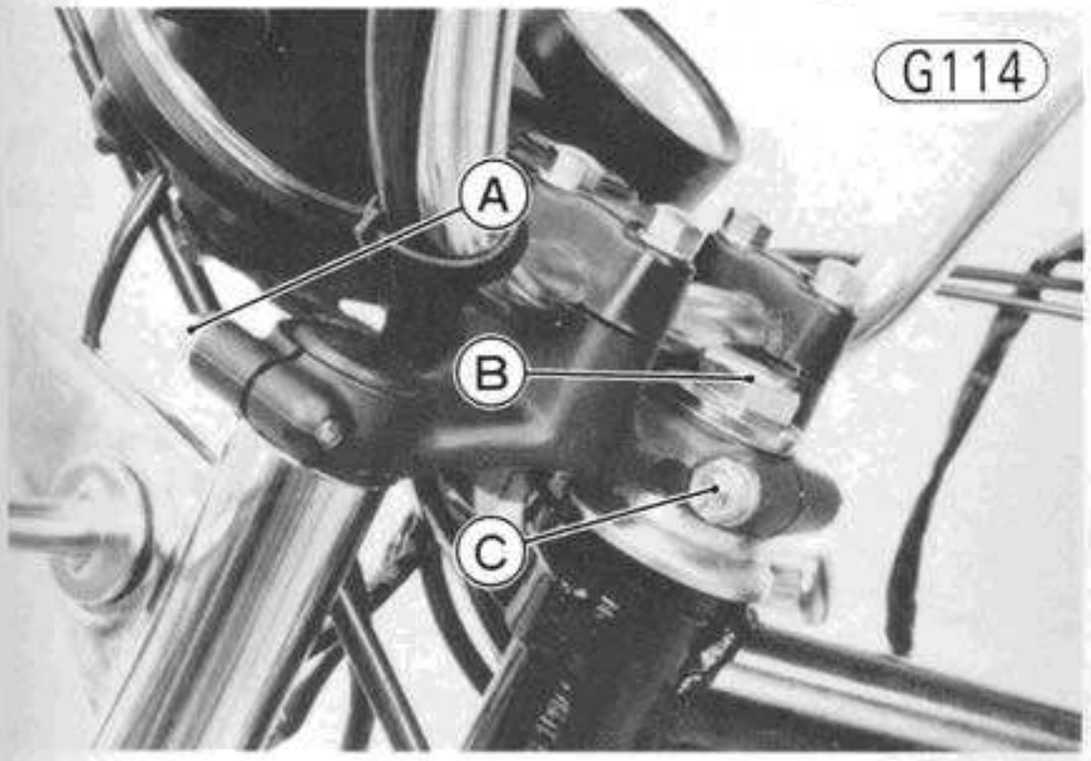


A. Clutch Cable **C. Knurled Locknut**
B. Adjuster

•Remove the straps which hold the right switch wiring harness to the handlebar.
•Remove the strap which secures the wiring harness to the frame top tube.
•Disconnect all the leads and plugs from the left and right switch housings under the frame top tube.



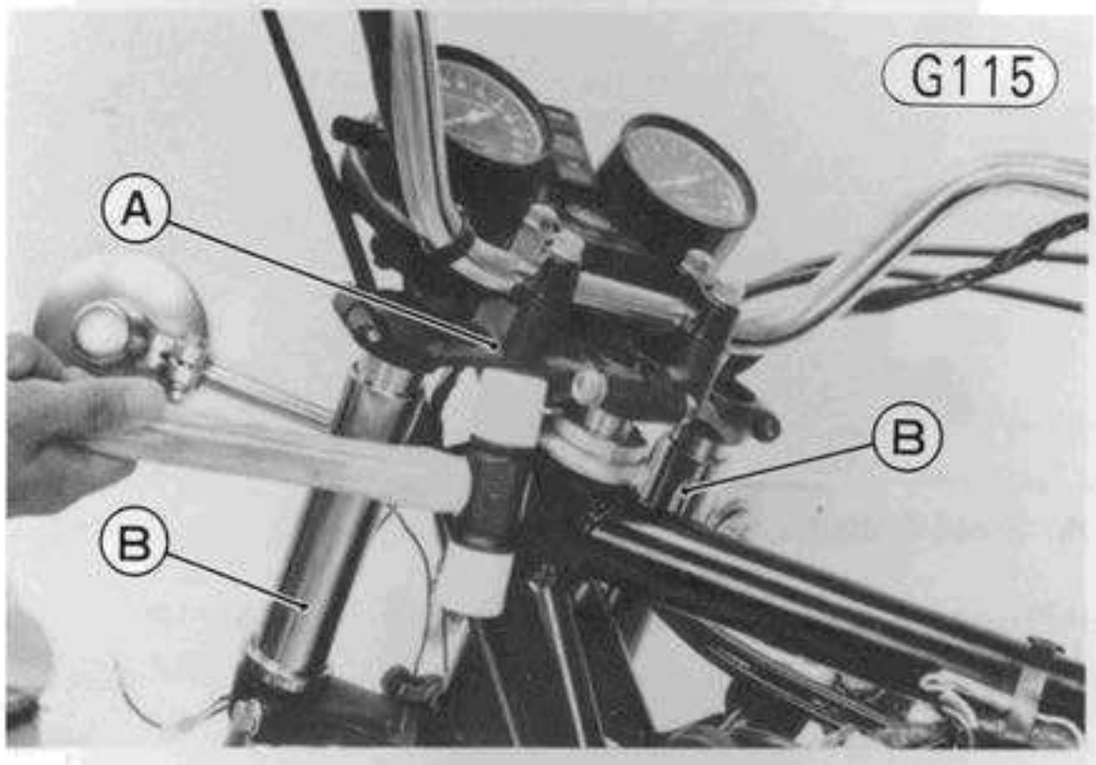
•Pull the right switch wiring harness out through the space between the stem head and the instrument unit.
•Remove the right switch housing screws (2), and open the housing.
•Loosen the front fork upper clamp bolts (2).



A. Fork Upper Clamp Bolt **C. Head Clamp Bolt**
B. Stem Head Bolt

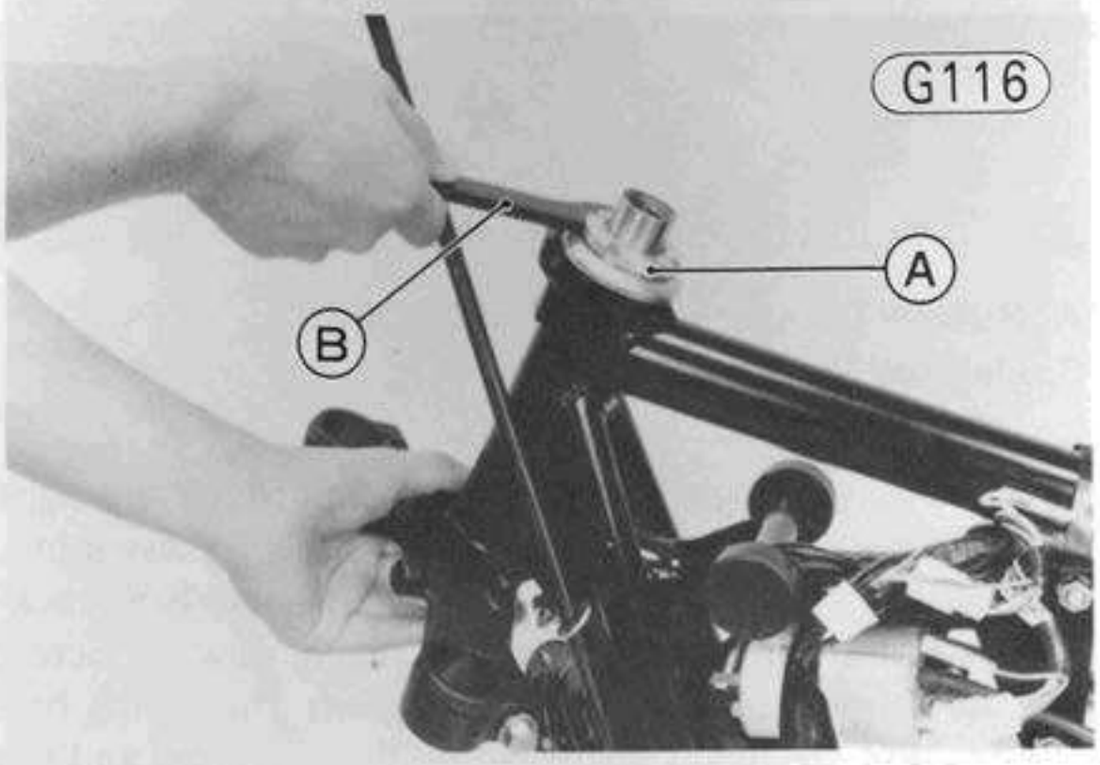
•Loosen the stem head clamp bolt, and then remove the stem head bolt, lockwasher, and flat washer.
•Tap lightly on the bottom of the stem head with a mallet, and then remove the steering stem head together with the handlebar, meter(s), and ignition switch. Slide the handlebar from the throttle grip and the right switch housing.

CAUTION **Place the stem head so that the correct side of the meter(s) is up. If a meter is left upside down or sideways for any length of time, it will malfunction.**



A. Stem Head **B. Fork Cover**

•Remove the fork covers with the turn signals. Each fork cover has a stem base cover, damper ring, and rubber damper at the bottom.
•Remove the fender bolts and lockwashers (6 ea), and take off the fender.
•Loosen the lower clamp bolts, and pull out each fork leg with a twisting motion.
•Push up on the stem base, and remove the steering stem locknut with the stem nut wrench (special tool); then remove the steering stem and stem base (single unit). As the stem is removed, some of the steel balls will drop out of the lower outer race. Remove the rest. There are 19 steel balls in the lower outer race.

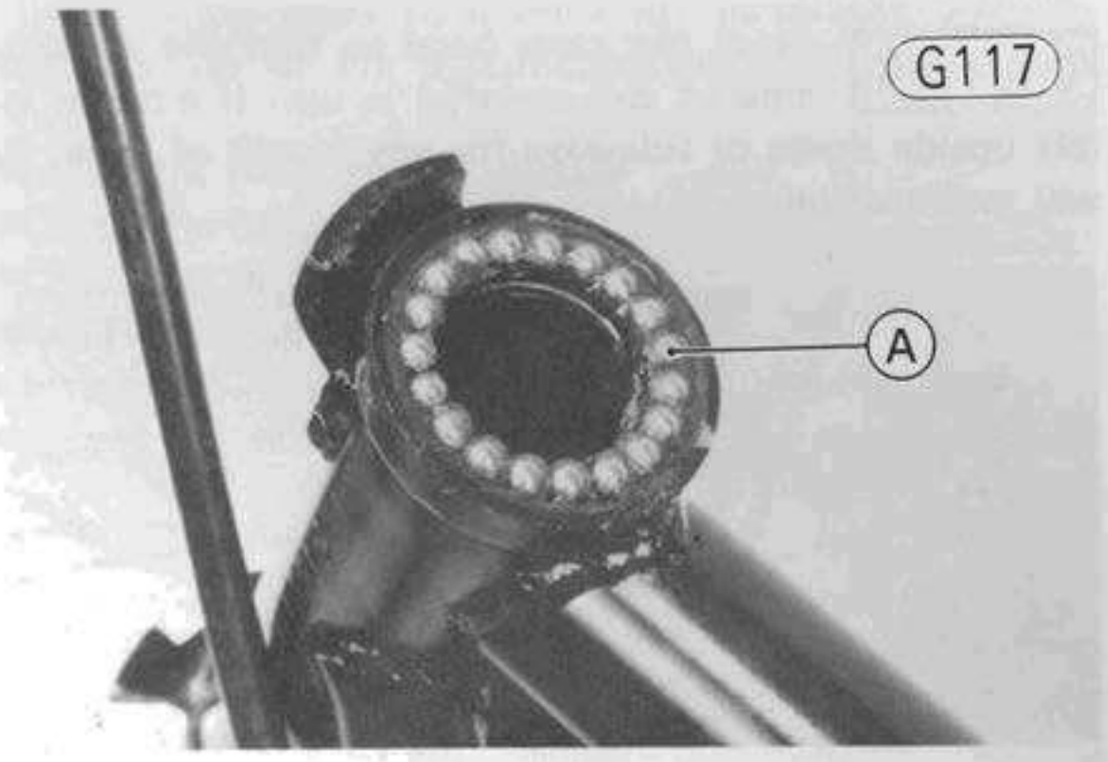


A. Stem Locknut
B. Stem Nut Wrench (57001-134 or 1100)

•Remove the steering stem cap, the upper inner race, and the upper steel balls (19).

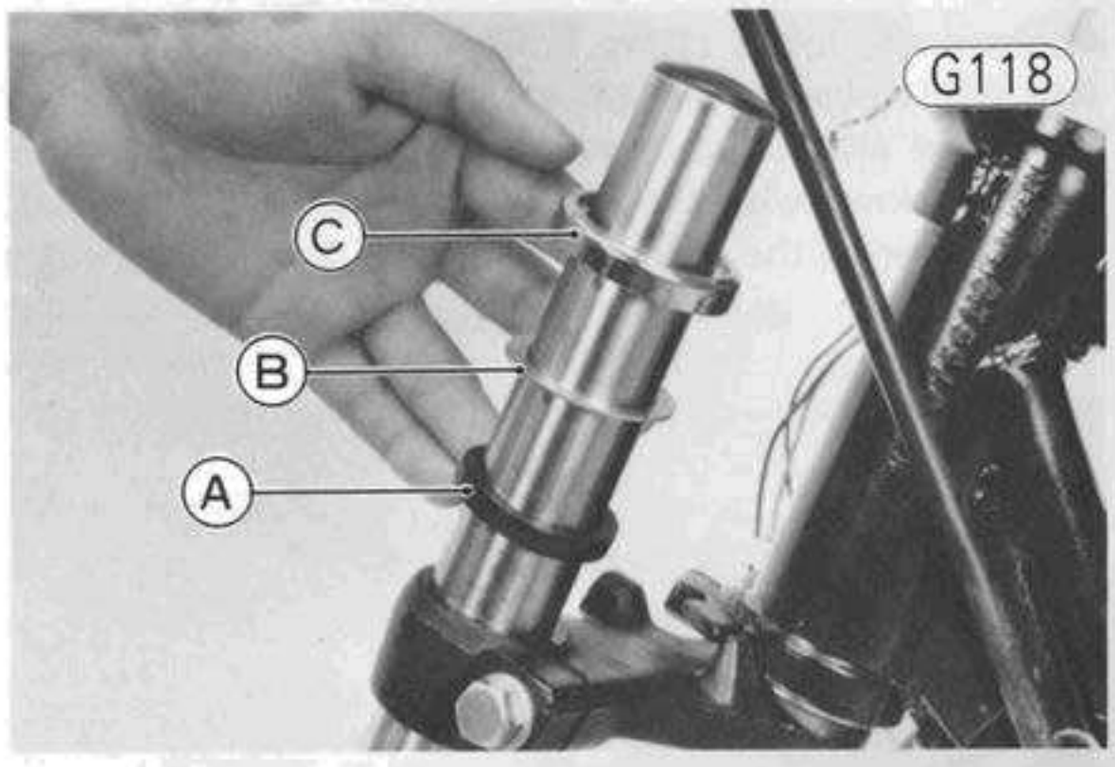
Installation:

- Apply grease to the upper and lower outer races in the head pipe so that the steel balls will stick in place during stem insertion. Install the upper steel balls (19) and lower steel balls (19). All upper and lower steel balls are one size.



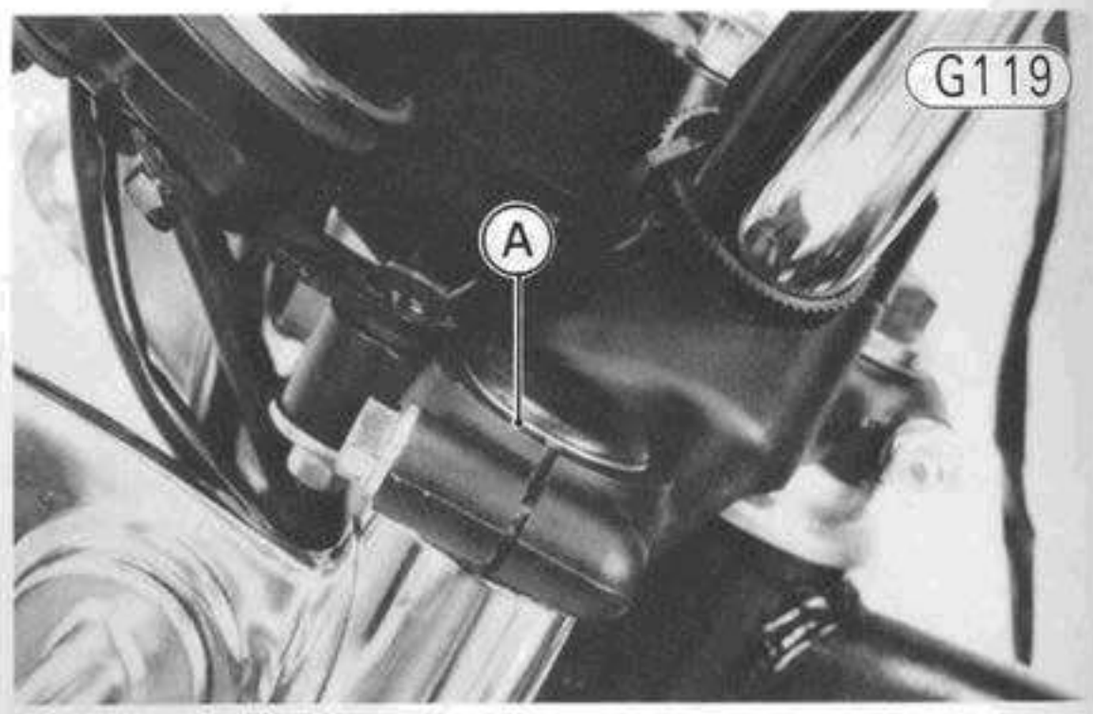
A. Steel Balls

- Put on the upper inner race and steering stem cap. Insert the steering stem into the head pipe, and tighten the steering stem locknut to 3.0 kg-m (22 ft-lbs) of torque.
- Run the inner tube of each front fork leg up through its clamp in the stem base. Temporarily tighten the lower clamp bolt on each side to hold each fork leg in place with its inner tube protruding about 150 mm above the steering stem base.
- Install the rubber damper, damper ring, base cover, and fork cover, on each tube in this order.



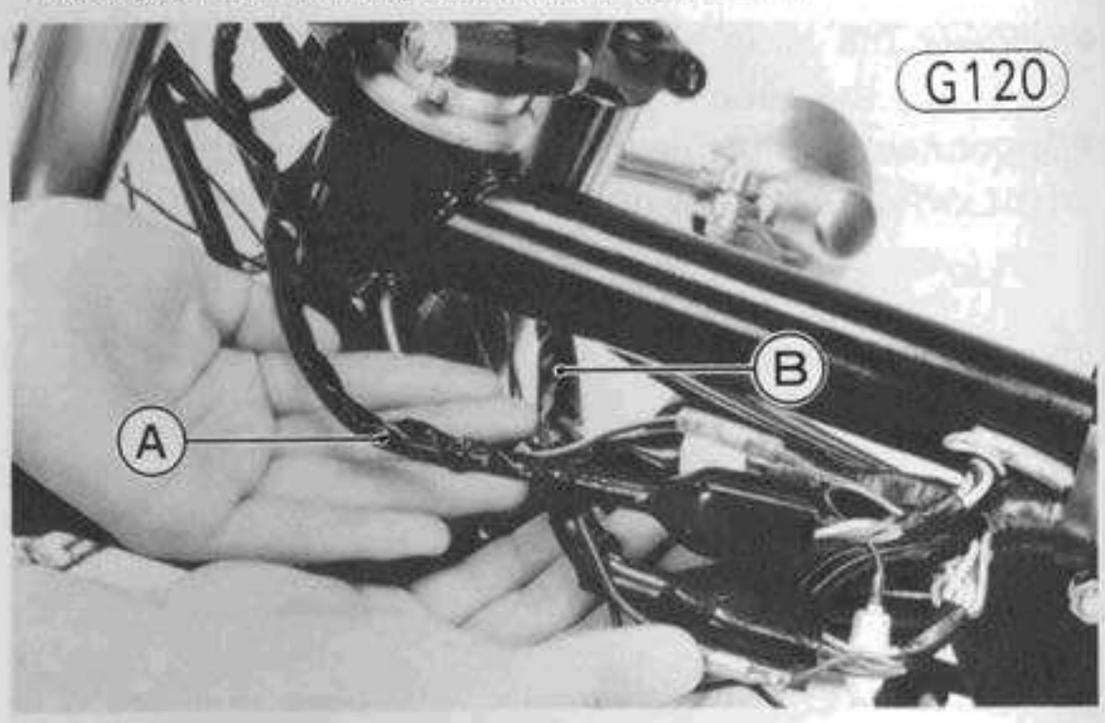
A. Rubber Damper
B. Damper Ring
C. Base Cover

- Slide the right side of the handlebar through the right switch housing, and into the throttle grip assembly.
- Install the stem head assembly and the stem head lockwasher and flat washer (flat side facing down). Screw in the stem head bolt loosely. Be sure the wiring harnesses and all cables go between the stem head and the front fork legs.
- For each fork leg, loosen the lower clamp, and align the upper end of the front fork inner tube with the upper surface of the stem head. Tighten the upper clamp bolt to 1.8 kg-m (13.0 ft-lbs) of torque.



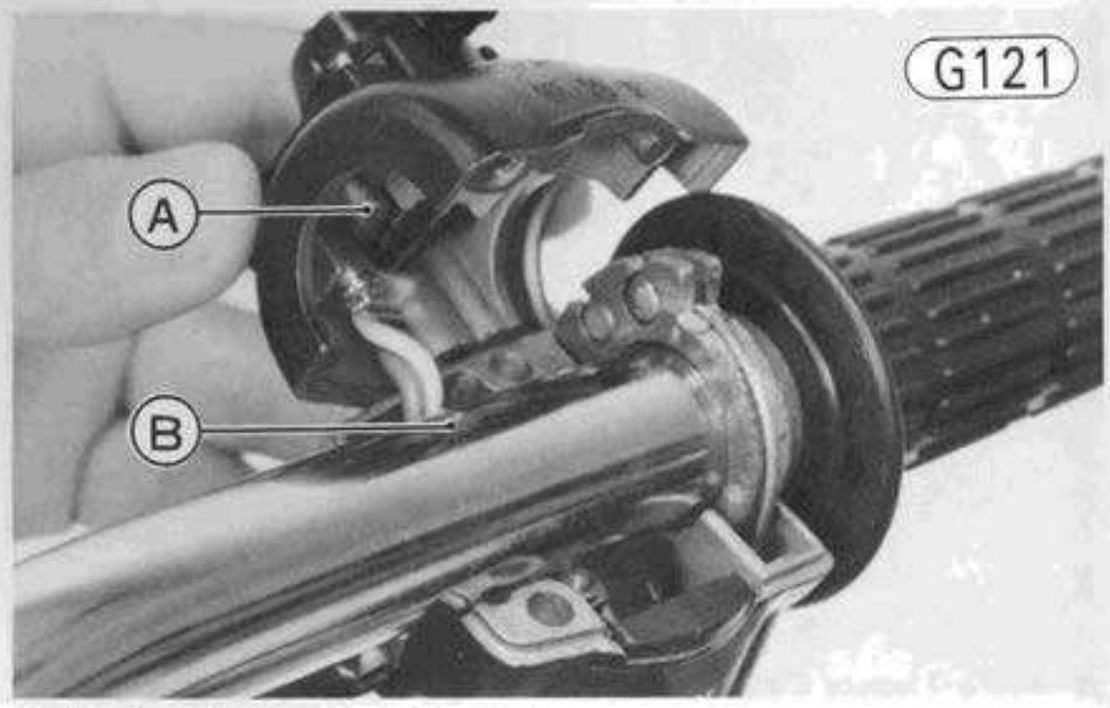
A. Inner Tube Upper End

- Tighten the stem head bolt to 4.5 kg-m (33 ft-lbs) of torque and the rear clamp bolt to 1.8 kg-m (13.0 ft-lbs) of torque.
- Tighten the front fork lower clamp bolts to 3.0 kg-m (22 ft-lbs) of torque.
- Run the right switch wiring harness between the stem head and the instrument unit, going to the left of the head pipe and along the frame top tube.



A. Right Switch Wiring Harness
B. Left Switch Wiring Harness

- Run the left switch wiring harness to the right of the head pipe and along the frame top tube.
- Connect the right and left switch leads and plugs to the same color leads of the main wiring harness.
- Strap the wiring harnesses back onto the frame top tube.
- Put together the right switch housing, and tighten its screws. The upper half of the housing has a small projection which fits into a hole in the handlebar. The front switch housing screw is longer than the rear screw.



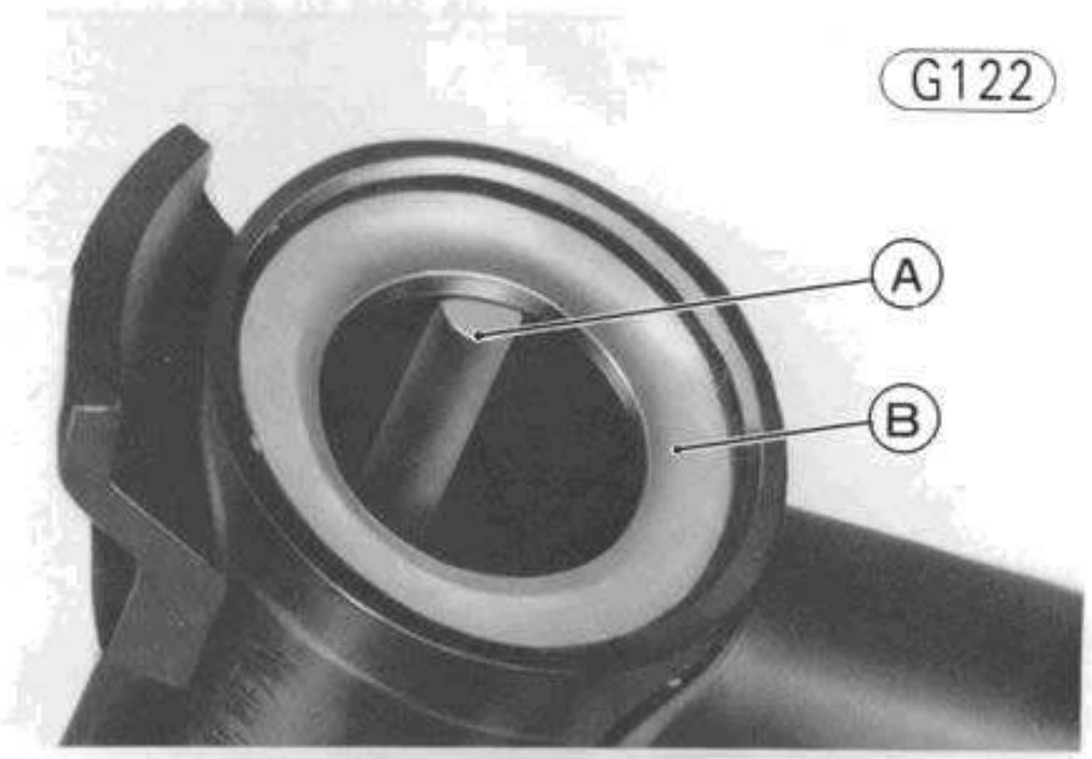
A. Projection **B. Hole**

- Position the left switch housing in place, and tighten its screws. The front screw is longer than the rear screw.
- Run the front brake light switch lead between the stem head and the instrument unit (KZ400-C).
- Strap both the right switch housing wiring harness and the left switch housing wiring harness back onto the handlebar.
- Fit the tip of the clutch cable back into the clutch lever.
- Install the master cylinder on the handlebar with the small projection on the clamp facing the throttle grip (Fig. G38 on Pg. 117). Tighten first the upper clamp bolt and then the lower bolt, both to 0.80 kg-m (69 in-lbs) of torque. Each clamp bolt has a flat washer.
- Install the caliper on the left front fork leg. Tighten the mounting bolts to 4.0 kg-m (29 ft-lbs) of torque. Each bolt has a lockwasher and flat washer.
- Install the 3-way joint on the steering stem base. Be sure to include a cable guide, flat washer, and lockwasher with each bolt. Tighten the bolts to 0.80 kg-m (69 in-lbs) of torque.
- On the KZ400-C, install the cable guides on the steering stem base. Each bolt has a lockwasher and flat washer.
- Run the tachometer cable through its guide at the 3-way joint, fit the inner cable into the tachometer, and tighten the cable nut with pliers.
- Connect the front brake light switch leads to the switch. The leads may connect to either terminal (KZ400-B).
- Run the plugs, sockets, and wiring into the headlight housing, and mount the headlight housing, tightening its mounting bolts. The sequence is mounting bolt, flat washer, fork cover, collar, and nut.
- Connect the plugs, sockets, and leads in the headlight housing. Connect the same color leads to the same color leads.
- Install the headlight unit (Pg. 129).
- Install the front fender, tighten its bolts (6). Each bolt has a lockwasher.
- Secure the lower brake hose in its guide. Be sure the rubber grommet is in place.
- Install the front wheel (Pg. 107 for KZ400-B or Pg. 110 for KZ400-C).
- Install the speedometer cable (Pg. 128).
- Install the front brake cable (Pg. 125).
- Check the steering and adjust it, if necessary (Pg. 28).
- Install the fuel tank (Pg. 43).
- On the KZ400-B, check the front brake and bleed the system, if necessary (Pg. 203).
- On the KZ400-C, adjust the front brake (Pg. 25).
- Adjust the clutch (Pg. 19).
- Check the throttle cables and adjust, if necessary (Pg. 30).
- Adjust the rear view mirrors.

STEERING STEM BEARING

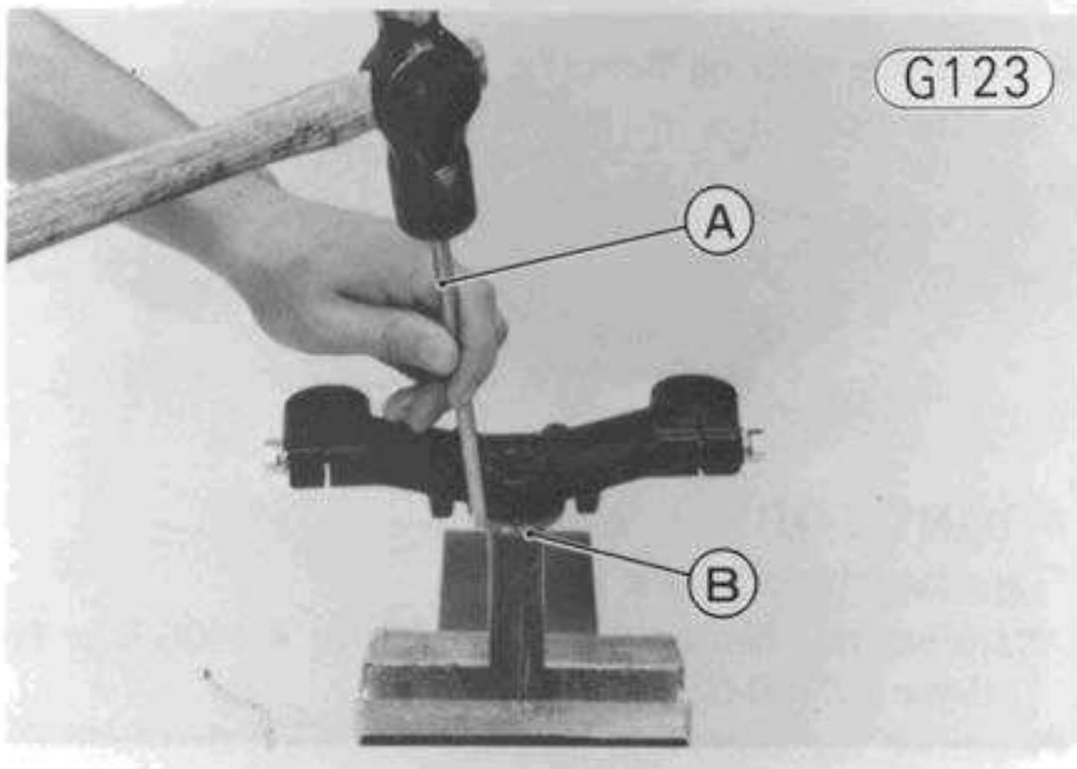
Removal:

- Remove the steering stem (Pg. 136).
- To remove the outer races pressed into the head pipe, insert a bar into the head pipe, and hammer evenly around the circumference of the opposite race to drive it out.



A. Bar **B. Outer Race**

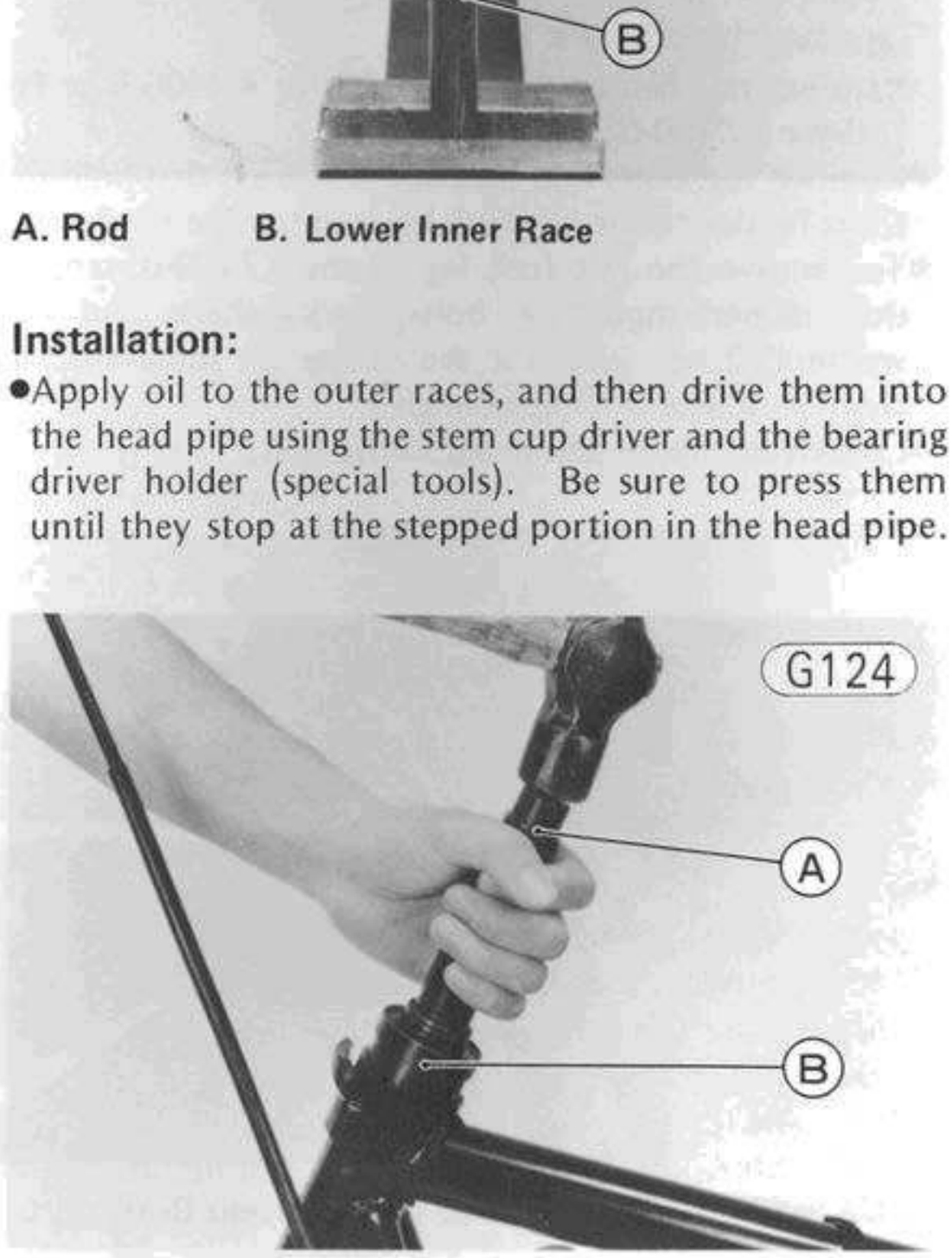
- To remove the lower inner race, which is pressed onto the steering stem, grip the stem in a vice, and use a metal rod and hammer as shown in the figure.



A. Rod **B. Lower Inner Race**

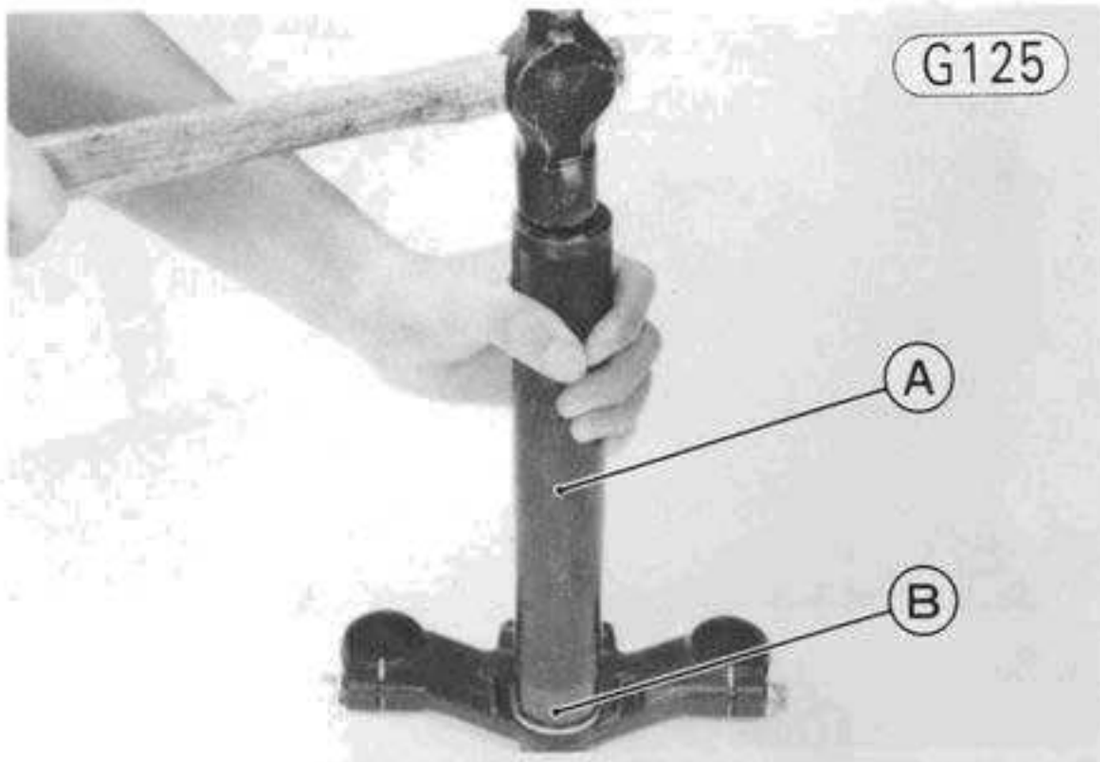
Installation:

- Apply oil to the outer races, and then drive them into the head pipe using the stem cup driver and the bearing driver holder (special tools). Be sure to press them until they stop at the stepped portion in the head pipe.



A. Bearing Driver Holder (57001-139)
B. Stem Cup Driver (57001-138)

●Apply oil to the lower inner race, and then drive it onto the steering stem using the stem bearing driver and adapter (special tools). Be sure to press it until it stops at the stem base.



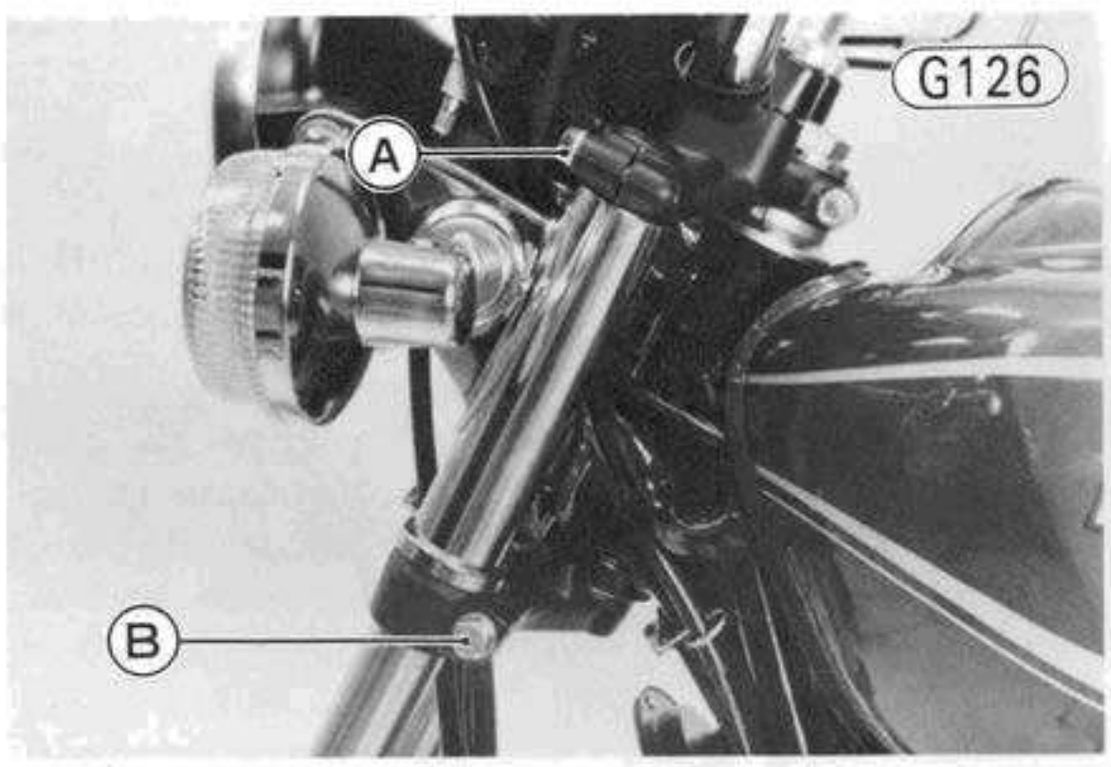
A. Stem Bearing Driver (57001-137)
B. Adapter (57001-294)

●Install the steering stem (Pg. 138).

FRONT FORK

Removal (each fork leg):

●Remove the front wheel (Pg. 107 for KZ400-B or Pg. 110 for KZ400-C).
●Remove the bolts and lockwashers (6 ea) that hold the front fender to the left fork leg, and remove the fender.
●To remove the left fork leg on the KZ400-B, remove the caliper mounting bolts, lockwashers, and flat washers (2 ea); and rest the caliper on some kind of stand so that it does not dangle.
●Loosen the upper and lower clamp bolt.

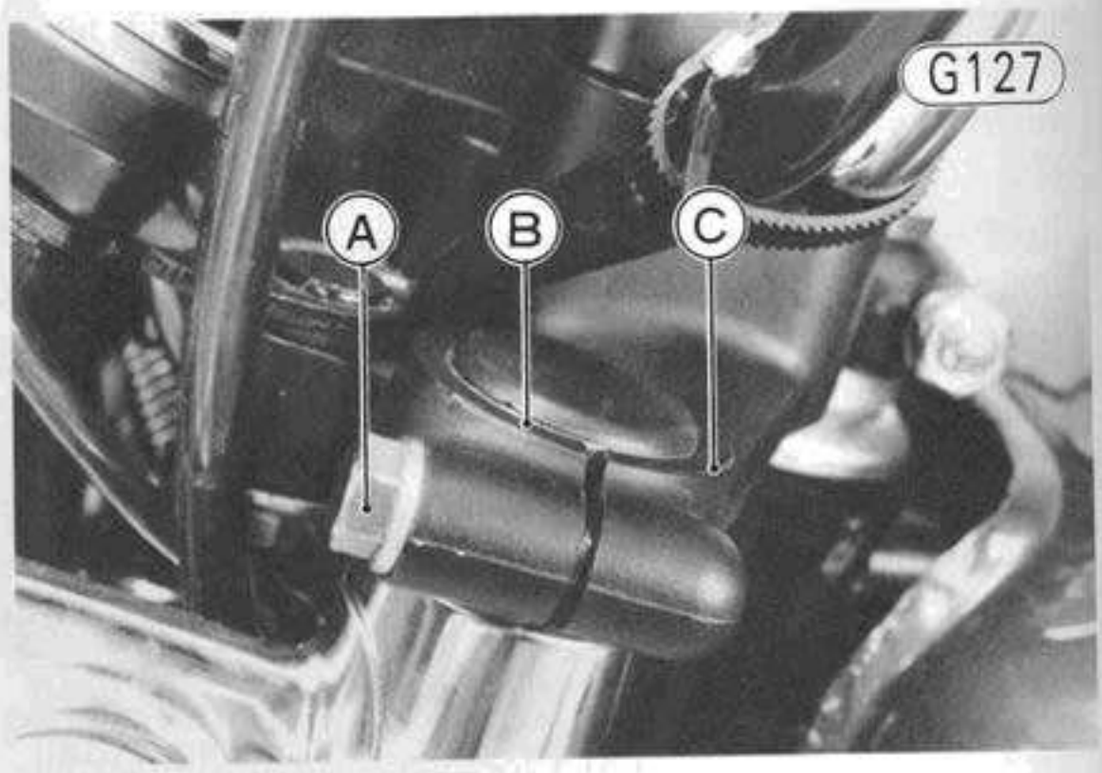


A. Upper Clamp Bolt **B. Lower Clamp Bolt**

●With a twisting motion, work the fork leg down and out.

Installation (each fork leg):

●Slide the fork leg up through the lower and upper clamps until the upper end of the front fork inner tube is even with the upper surface of the stem head. Tighten the upper clamp bolt to 1.8 kg-m (13.0 ft-lbs) of torque and the lower clamp bolt to 3.0 kg-m (22 ft-lbs). ft-lbs).

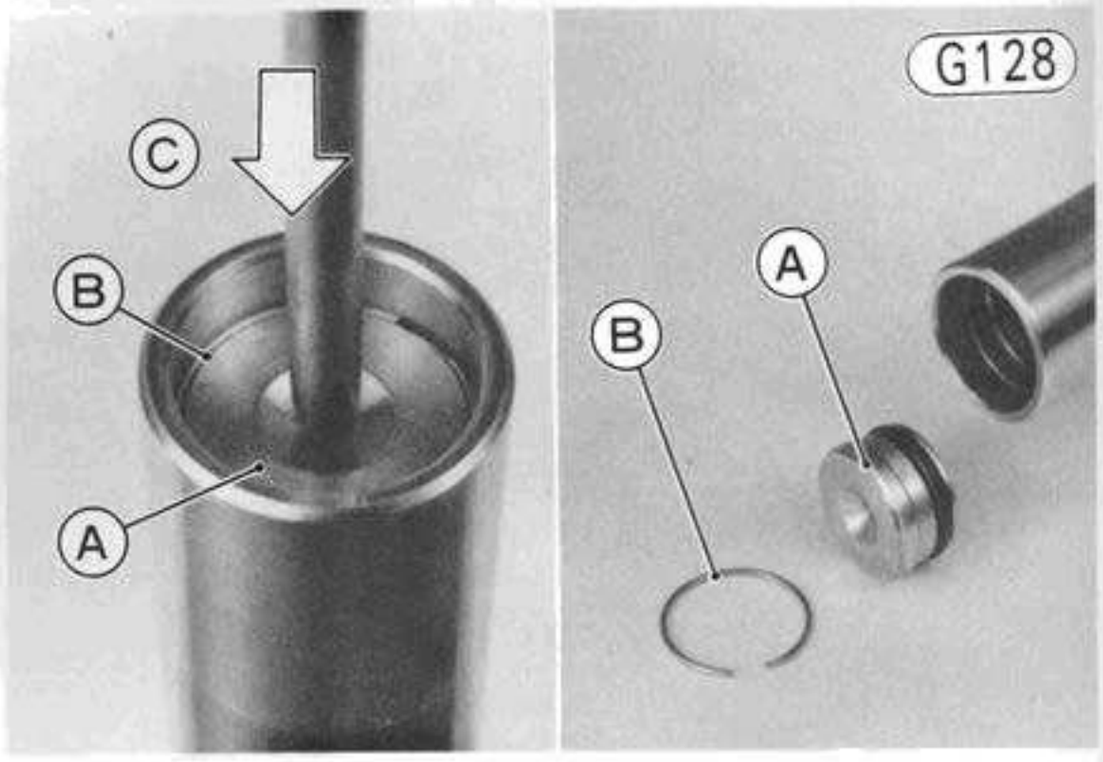


A. Upper Clamp Bolt **C. Stem Head**
B. Inner Tube End

●Install the front fender between the front fork legs. Tighten the bolts (6) with lockwashers.
●Install the caliper, tightening the caliper mounting bolts to 4.0 kg-m (29 ft-lbs) of torque. Each mounting bolt has a flat washer and lockwasher.
●Secure the lower brake hose in its guide. Be sure the rubber grommet is in place.
●Install the front wheel (Pg. 107 for KZ400-B or Pg. 110 for KZ400-C.

Disassembly:

●Remove the cap ⑭ from the inner tube.
●Press the top plug ⑯ to remove the top plug retaining ring ⑮, and then remove the top plug and spring ㉖

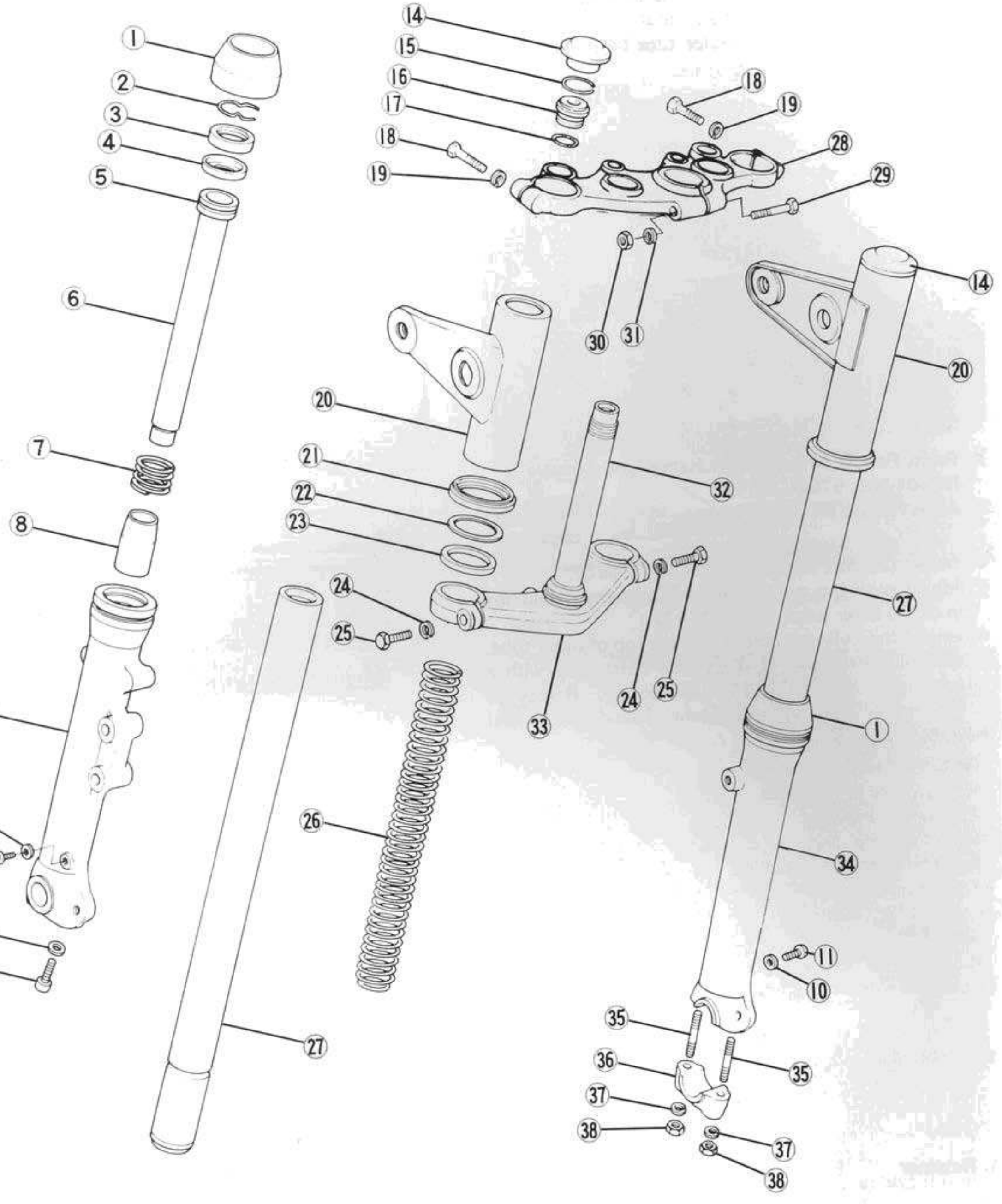


A. Top Plug **C. Press down**
B. Retaining Ring

●Pour the oil into a suitable container, pumping as necessary to empty out all the oil.

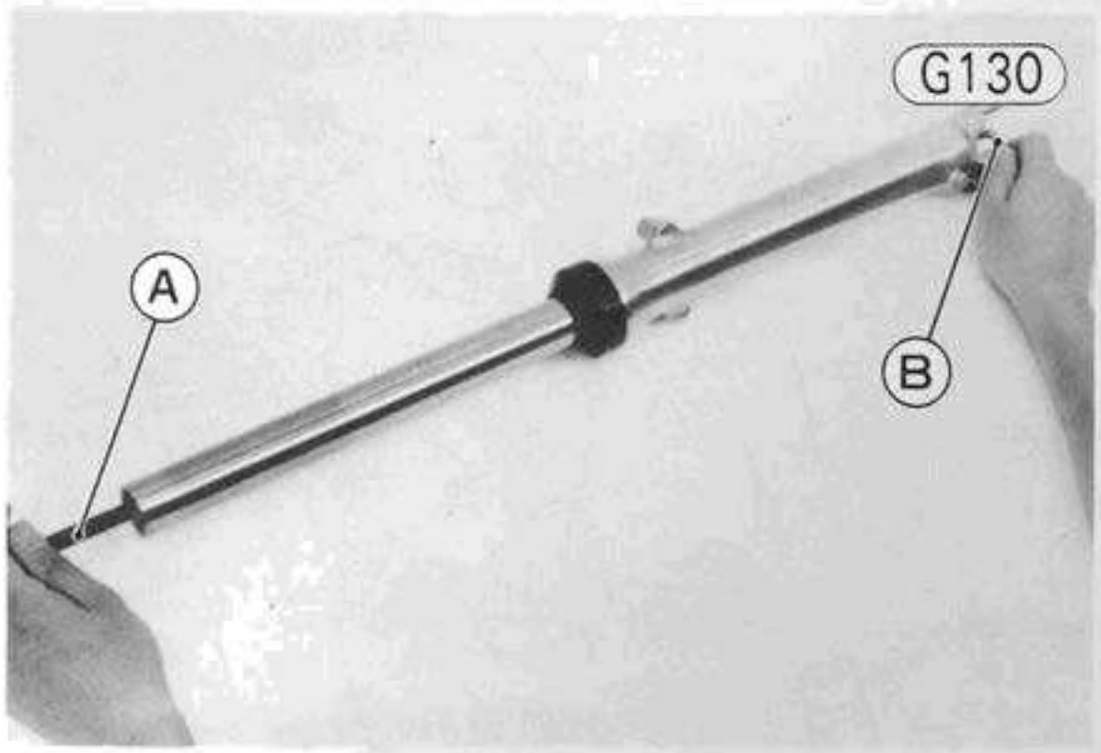
G129

Front Fork



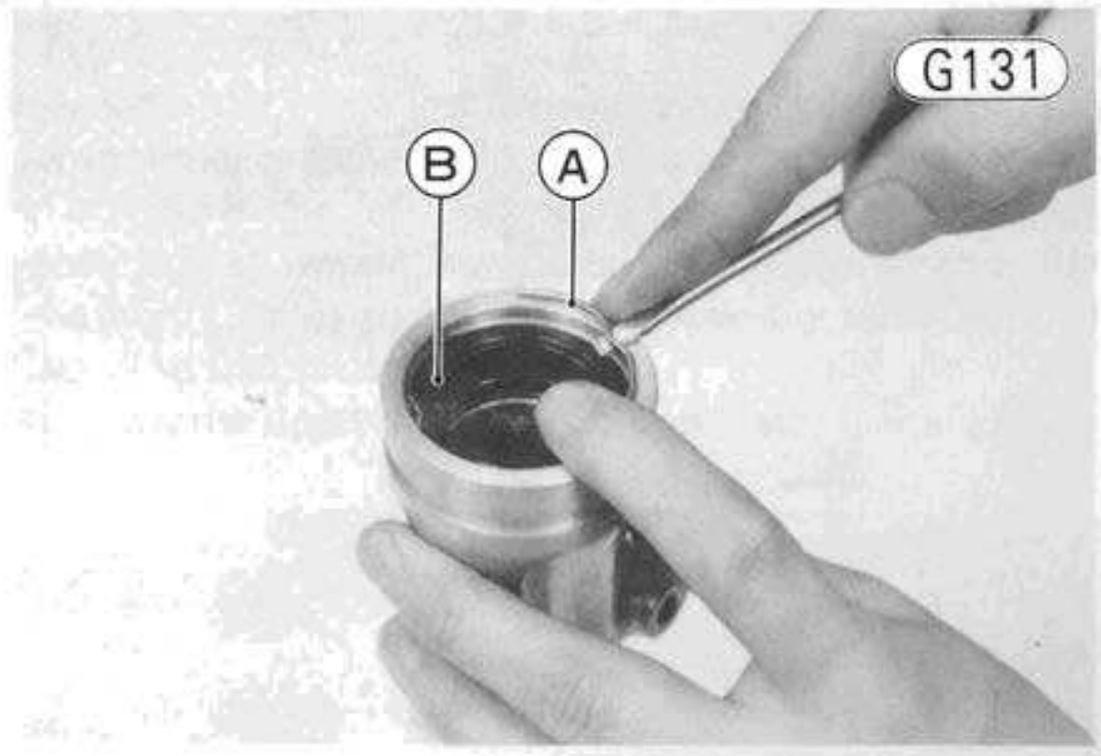
1. Dust Seal
2. Retainer
3. Oil Seal
4. Spacer
5. Piston Ring
6. Piston and Cylinder Unit
7. Spring
8. Cylinder Base
9. Outer Tube
10. Gasket
11. Drain Screw
12. Gasket
13. Allen Bolt
14. Cap
15. Retaining Ring
16. Top Plug
17. O Ring
18. Bolt
19. Lockwasher
20. Fork Cover
21. Stem Base Cover
22. Damper Ring
23. Rubber Damper
24. Lockwasher
25. Bolt
26. Spring
27. Inner Tube
28. Stem Head
29. Bolt
30. Nut
31. Lockwasher
32. Steering Stem
33. Stem Base
34. Outer Tube
35. Stud
36. Axle Clamp
37. Lockwasher
38. Nut

●Stop the cylinder ⑥ from turning by using the front fork cylinder holder handle and holder adapter (special tools). Unscrew the Allen bolt ⑬ and gasket ⑫ from the bottom of the outer tube ⑨ or ㉞, and then separate the inner tube from the outer tube by pulling it out.



A. Front Fork Cylinder Holder Handle and Adapter (57001-183, 57001-1011)
B. Allen Wrench

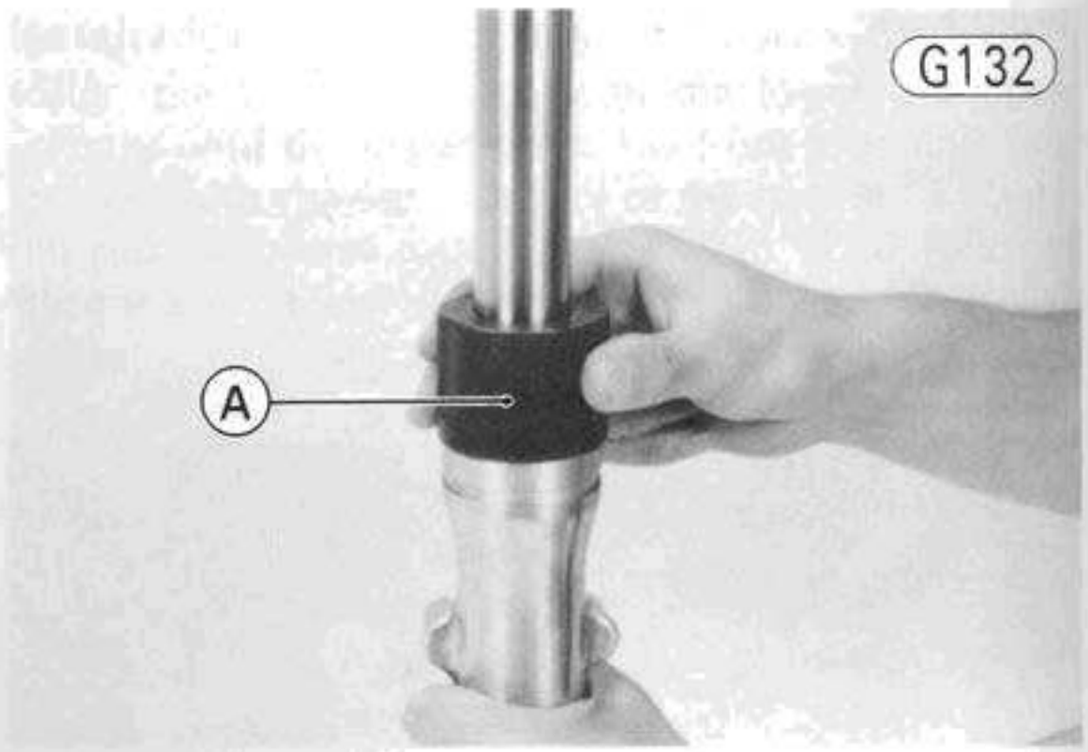
●Remove the dust seal ① off the outer tube ⑨.
●Slide or push the cylinder ⑥ and its spring ⑦ out the top of the inner tube.
●Remove the cylinder base ⑧ out the top of outer tube.
●Remove the retainer ② from the outer tube with a sharp hook, and pull out the oil seal ③. It may be necessary to heat the outer tube around the oil seal before pulling it out.



A. Retainer **B. Oil Seal**

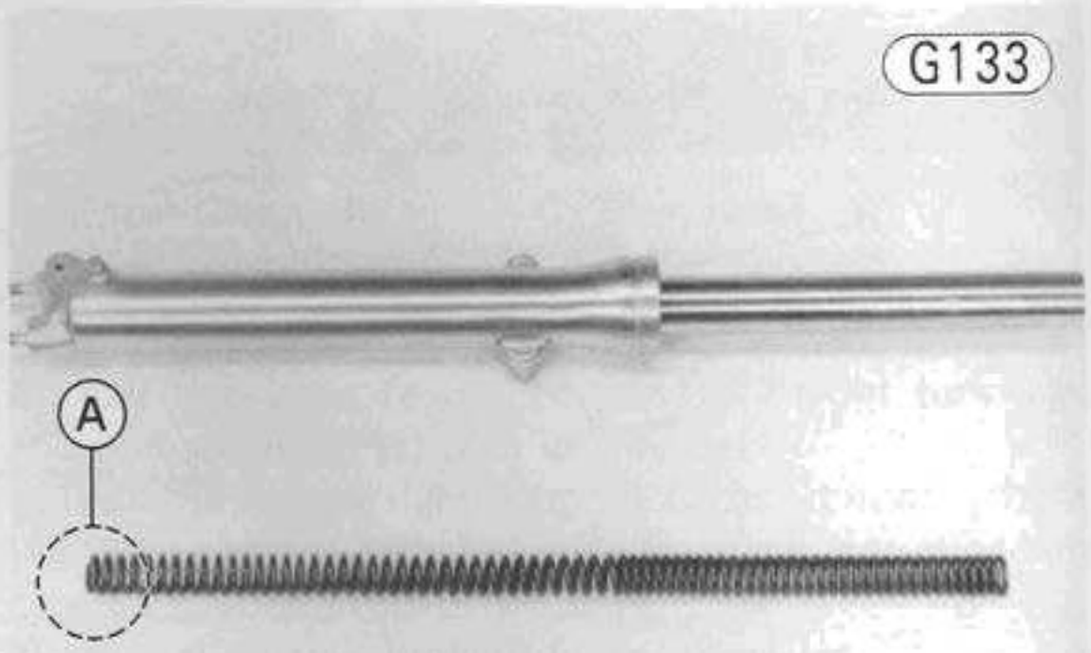
Assembly Notes:

1. Apply liquid gasket to both sides of the gasket ⑫, apply a non-permanent locking agent to the Allen bolt, and tighten it using the front fork cylinder holder handle and holder adapter (special tools) to stop the cylinder from turning. The torque for the Allen bolt is 1.8 kg-m (13.0 ft-lbs).
2. Replace the oil seal with a new one, apply oil to the outside, and install it with the front fork oil seal driver (special tool).



A. Front Fork Oil Seal Driver (57001-191)

3. Install the spring ㉖ with the smaller diameter end facing down.



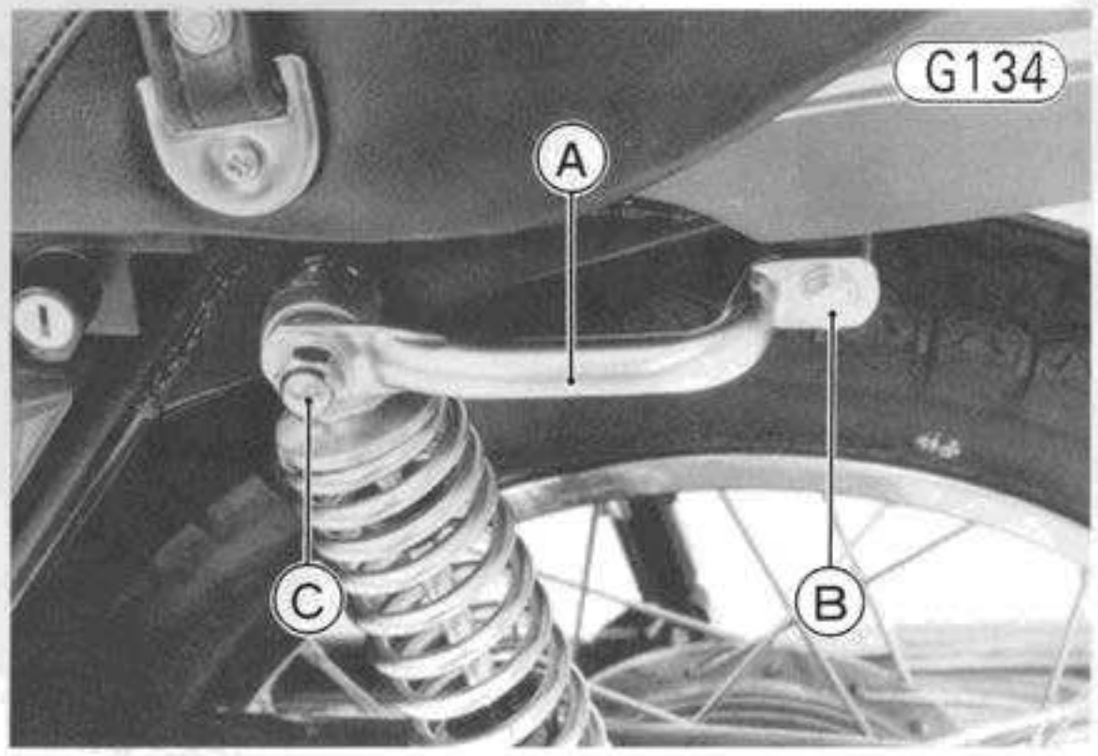
A. Smaller Diameter End

4. Refill with 145~155 cc of fresh SAE 5W20 oil.

REAR SHOCK ABSORBER (on KZ400-B)

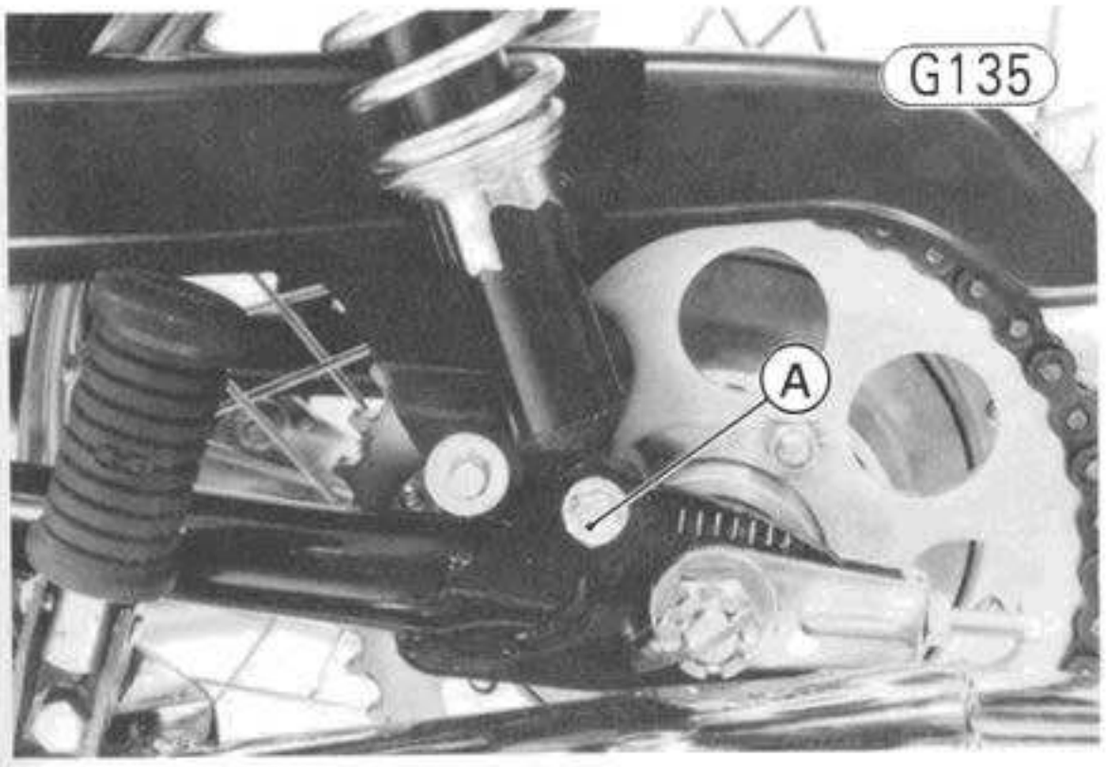
Removal (each side):

●Set the motorcycle up on its center stand.
●To remove the left shock absorber, remove the grab rail mounting bolt, lockwasher, and flat washer.



A. Grab Rail **C. Cap Nut**
B. Mounting Bolt

- Remove the cap nut, lockwasher, and flat washer. To remove the left shock absorber, also remove the grab rail and flat washer.
- Lift up on the rear wheel as necessary to avoid damaging the shock absrober bolt threads, and remove the shock absorber bolt and lockwasher.



A. Shock Absorber Bolt

- Pull off the rear shock absorber.

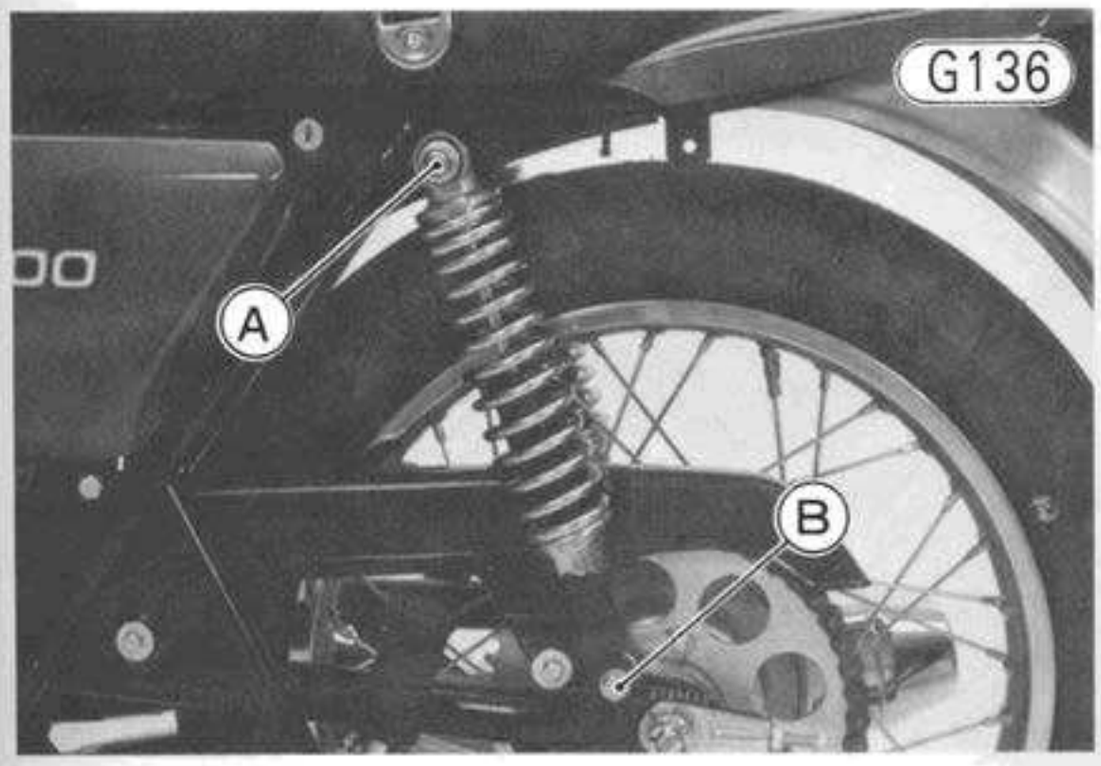
Installation Notes:

1. Place the thin flat washer on each side of the grab rail.
2. Tighten the shock absorber bolt and nut to 3.0 kg-m (22 ft-lbs) of torque.

REAR SHOCK ABSORBER (on KZ400-C)

Removal (each side):

- Remove the cap nut, lockwasher, and flat washer.



A. Cap Nut **B. Rear Shock Absorber Bolt**

- Lift up the rear of the frame as necessary to avoid damaging the shock absorber bolt threads, and remove the shock absorber bolt and lockwasher.
- Slide the bottom of the shock absorber out of its bracket, and pull it off.

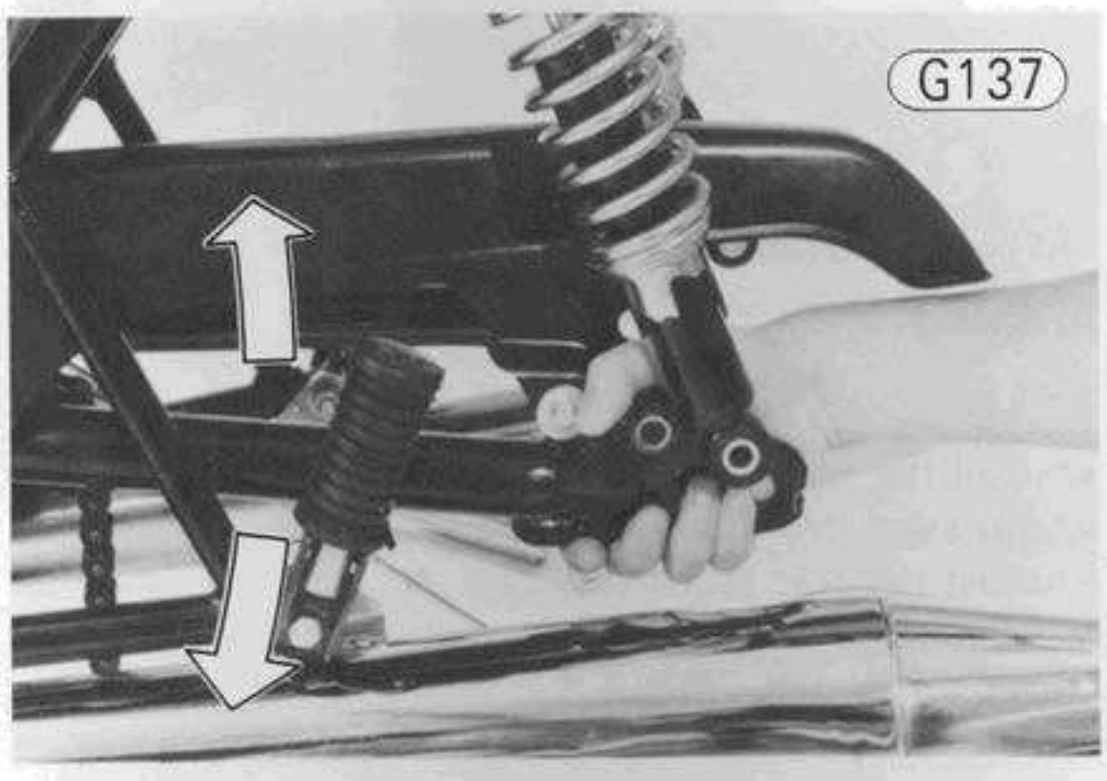
Installation Note:

- Tighten the shock absorber bolt and nut to 3.0 kg-m (22 ft-lbs) of torque.

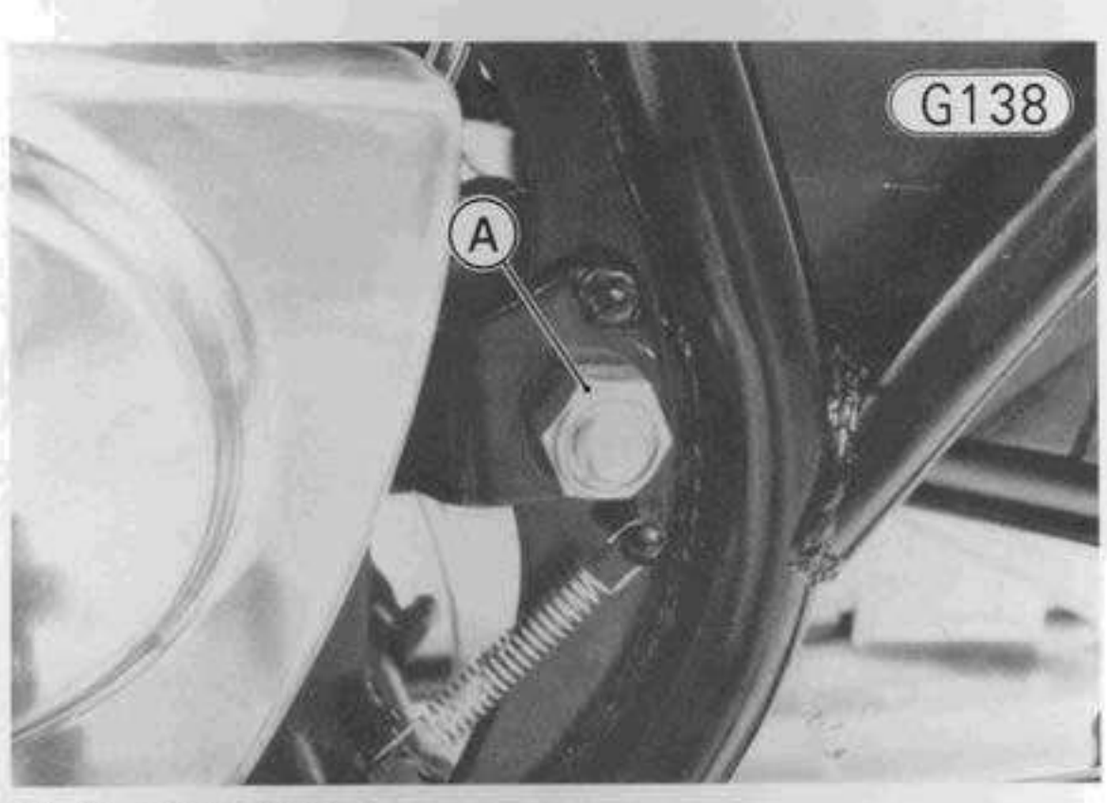
SWING ARM

Removal:

- Remove the rear wheel (Pg. 119).
- Move the swing arm up and down to check for abnormal friction.



- Remove the pivot shaft nut, and pull out the pivot shaft.



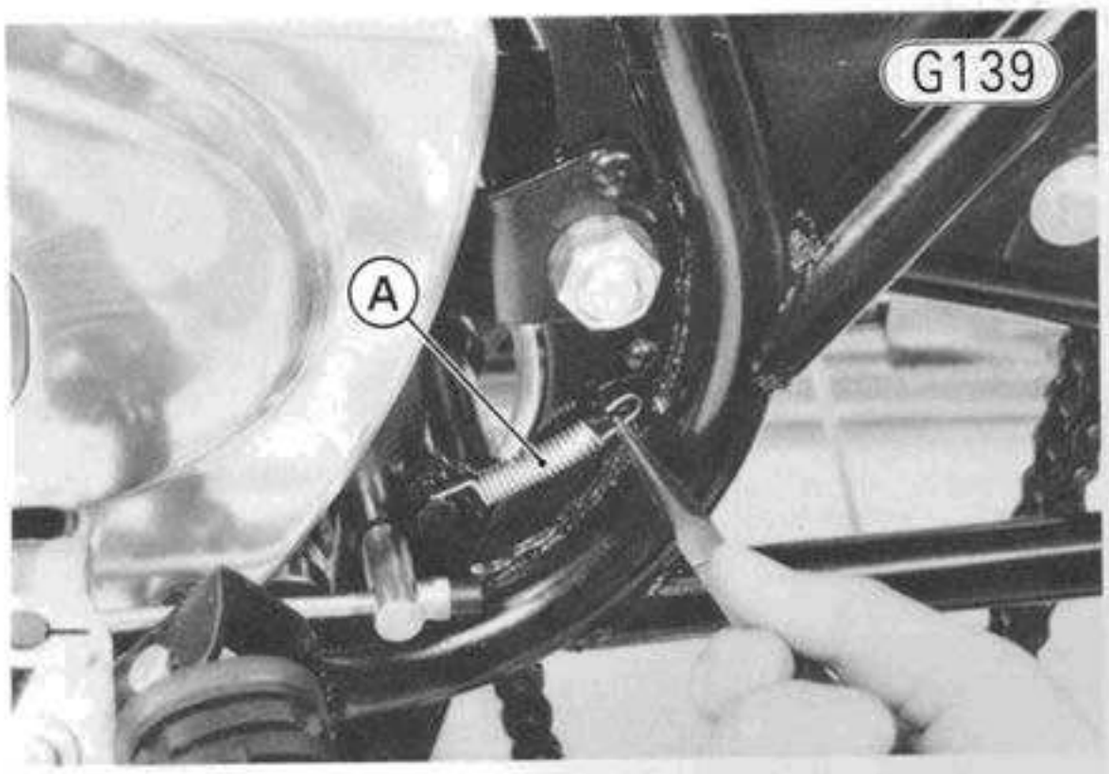
A. Pivot Shaft Nut

- Pull back the swing arm. A cap on each side of the pivot will also drop off.

Installation:

- Lubricate the swing arm pivot (Pg. 214).
- Apply grease to the cap inner surfaces and install the cap on each side of the pivot of the swing arm.
- Install the rear shock absorber lower mounting bolts finger tight. Each bolt has a lockwasher. This is to help hold the swing arm in place when installing the pivot shaft.
- Position the pivot of the swing arm into its place in the frame, and slide in the pivot shaft from right to left. A screwdriver inserted into the left side of the pivot will keep the left cap in place.
- Install the side stand return mechanism and pivot shaft nut, and tighten the nut to 8.0 kg-m (58 ft-lbs) of torque.

●Hook the return mechanism spring on the pins.



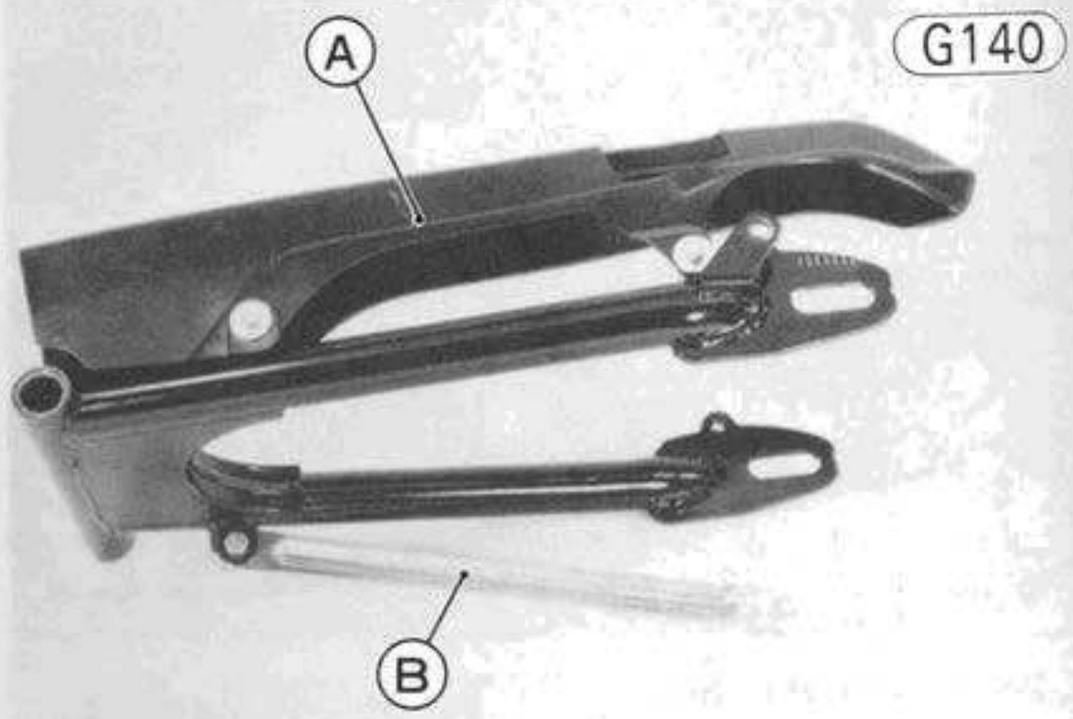
A. Spring

●Install the rear wheel (Pg. 120).
●Adjust the drive chain (Pg. 24).
●Adjust the rear brake (Pg. 27).
●Check and adjust the automatic side stand return mechanism (Pg. 31).

Disassembly:

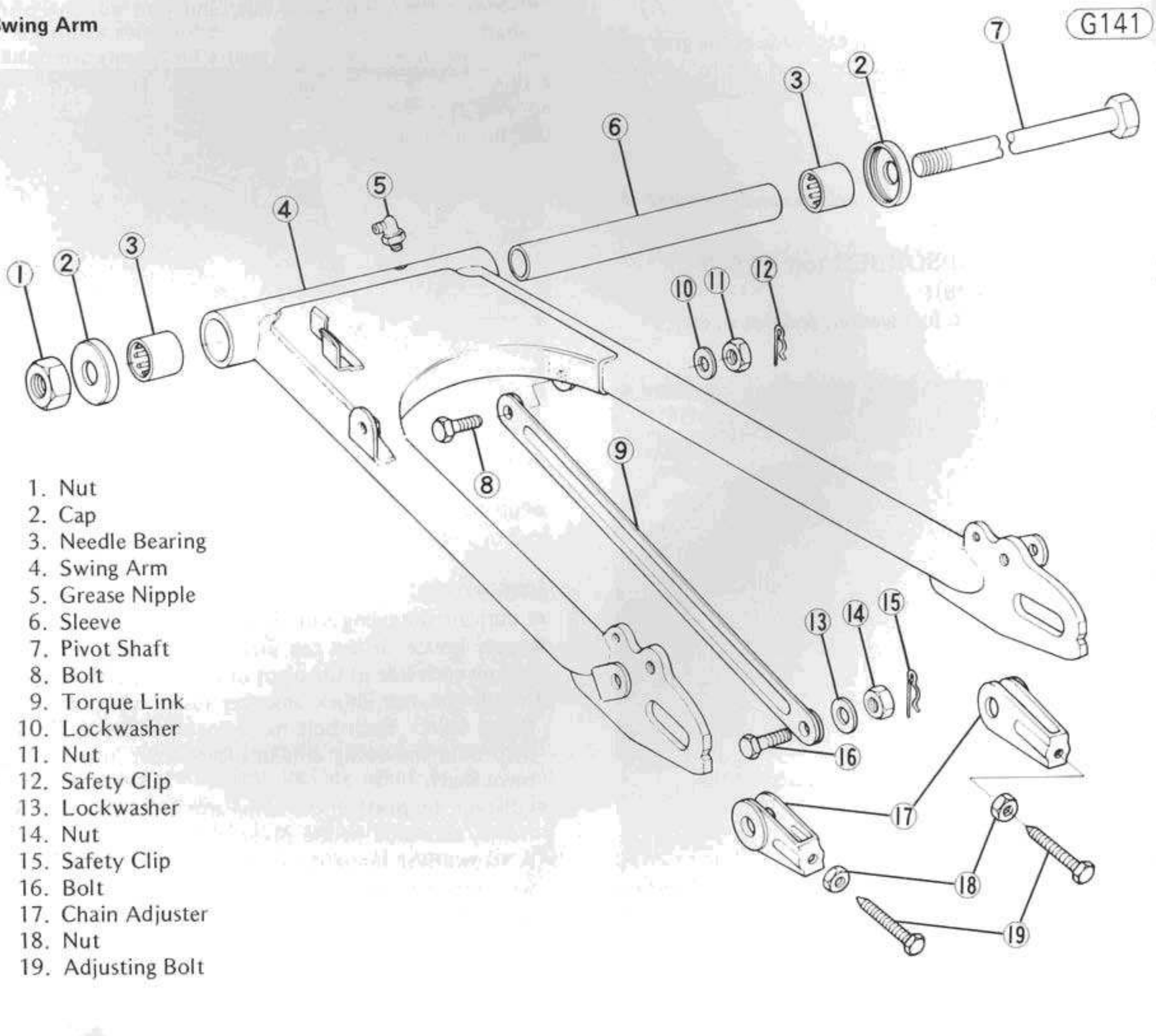
NOTE: As the swing arm needle bearings will be damaged upon removal, be sure to have new ones on hand prior to disassembly.

●Remove the caps ②, and pull out the swing arm sleeve ⑥.
●Remove the screws (2), and take off the chain guard. Each screw has a lockwasher and flat washer.



A. Chain Guard **B. Torque Link**

Swing Arm



1. Nut
2. Cap
3. Needle Bearing
4. Swing Arm
5. Grease Nipple
6. Sleeve
7. Pivot Shaft
8. Bolt
9. Torque Link
10. Lockwasher
11. Nut
12. Safety Clip
13. Lockwasher
14. Nut
15. Safety Clip
16. Bolt
17. Chain Adjuster
18. Nut
19. Adjusting Bolt

- Remove the clip ⑫ from the torque link bolt ⑧. Take out the nut ⑪ and bolt, and then remove the torque link ⑨ from the swing arm ④.
- Insert a bar into one side, hammering on it lightly to knock out the needle bearing ③ on the opposite side.
- Use the bar again to knock out the other bearing.

Assembly Notes:

1. Inspect the swing arm sleeve (Pg. 213), and replace it with a new one if it has worn past the service limit or is damaged. Also, replace both needle bearings whenever the sleeve is replaced.
2. Replace the needle bearings with new ones if either one has been damaged or removed. Apply oil to the outside surface of the bearings before installing them with a press.
3. Install the torque link and then tighten the torque link nut to 3.0 kg-m (22 ft-lbs) of torque. Insert the safety clip through the bolt.
4. Adjust the drive chain (Pg. 24) after installing the swing arm.

Maintenance – Engine

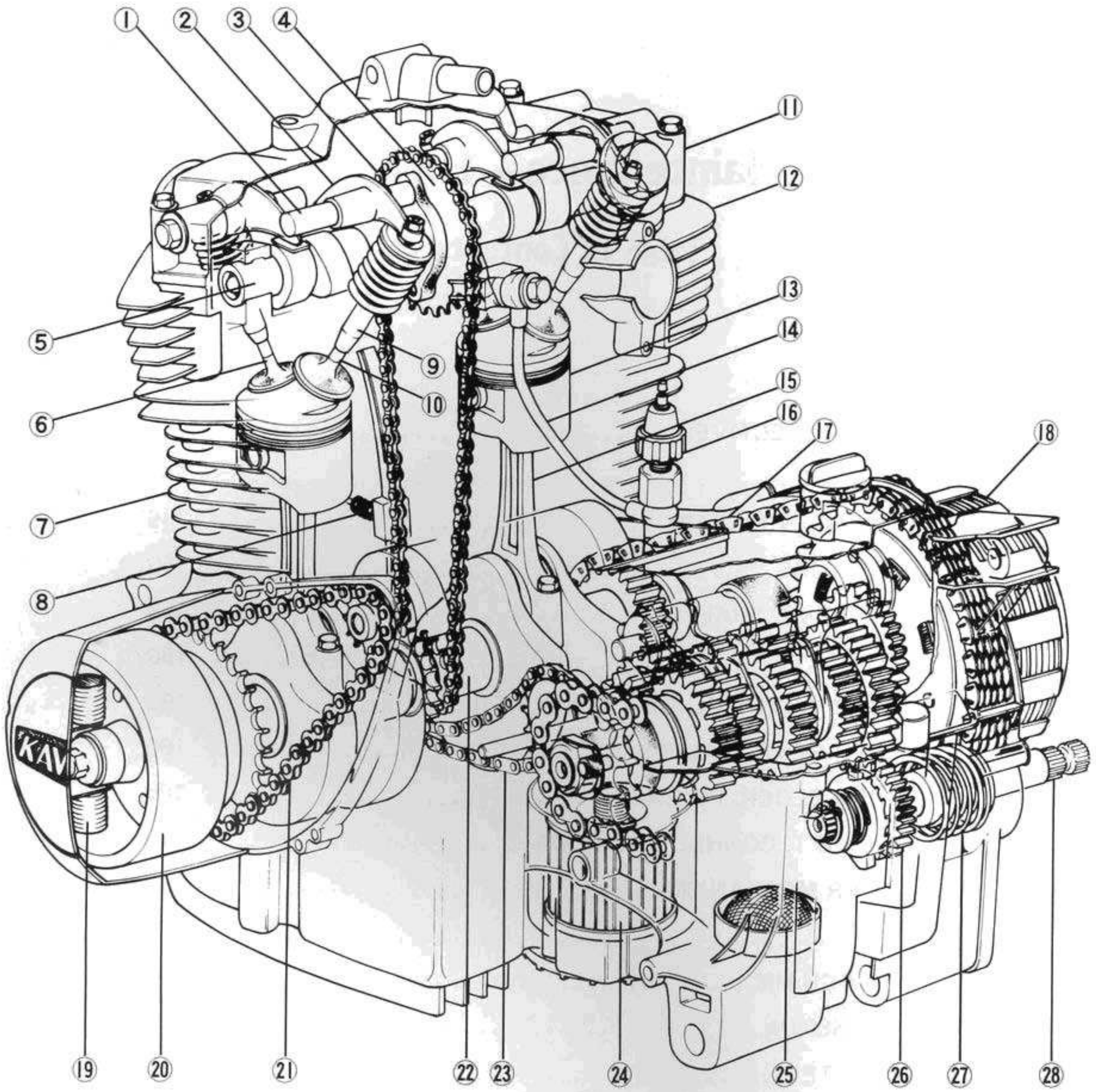
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H

ENGINE PERSPECTIVE

H1



1. Rocker Arm Shaft
2. Rocker Arm
3. Camshaft Chain
4. Camshaft Sprocket
5. Camshaft
6. Inlet Valve
7. Cylinder Block
8. Chain Tensioner
9. Valve Guide
10. Exhaust Valve
11. Cylinder Head Cover
12. Cylinder Head
13. Piston
14. Oil Pipe
15. Connecting Rod
16. Oil Pressure Switch
17. Primary Chain
18. Clutch
19. Dynamo Armature
20. Dynamo Flywheel
21. Starter Motor Chain
22. Crankshaft
23. Balancer Chain
24. Oil Filter
25. Oil Screen
26. Kick Gear
27. Kick Spring
28. Kick Shaft

AIR CLEANER

A properly maintained air cleaner ensures that only clean, filtered air is supplied through the carburetor to the engine. If the air is supplied directly without filtering, dirt and dust from the air will clog carburetor passages causing the engine to run poorly. The dust that enters the engine will also act like grinding compound, wearing down the cylinders, pistons, and rings. If the air cleaner element is damaged, the result will be the same as if no element were used.

An air cleaner element clogged with dirt chokes the air supply to the engine, resulting in an overly rich fuel/air mixture and inefficient combustion. This in turn causes overheating from carbon build-up, and reduced engine power.

Cleaning and replacement

The air cleaner element must be cleaned periodically (Pg. 10). In extremely dry, dusty areas, the element will need to be cleaned more often. After riding through rain or on muddy roads, the element should be cleaned immediately.

Remove the air cleaner element (Pg. 43). Clean it in a bath of a high flash-point solvent, and then dry it from the inside using compressed air. Since this is a dry-type element, do not use kerosene or any fluid which would leave the element oily.

WARNING **Clean the element in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low flash-point solvents to clean the element.**

If the sponge gasket on the side of the element come loose, stick them back on with an adhesive sealant. If the sponge or the element is damaged or holed, replace the element.

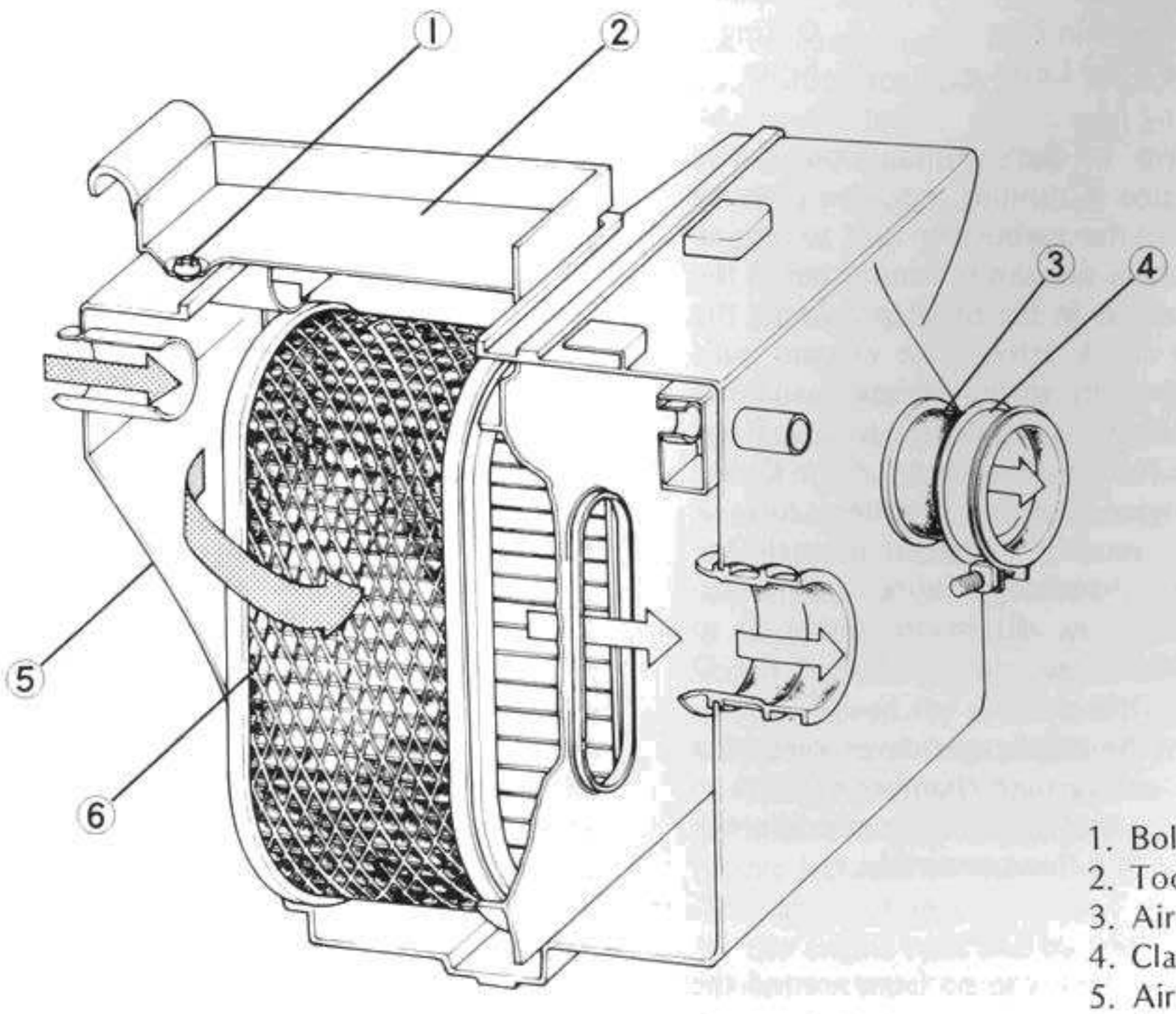
Since repeated cleaning opens the pores of the element, replace it with a new one in accordance with the Periodic Maintenance Chart (Pg. 10). Also, if there is a break in the element material or any other damage to the element, replace the element with a new one.

FUEL TANK, FUEL TAP

The fuel tank capacity is 14 liters, 1 liter of which forms the reserve supply. A cap is attached to the top of the tank, and a fuel tap to the bottom. An air vent is provided in the cap to prevent an air lock, which would hinder fuel flow to the carburetors.

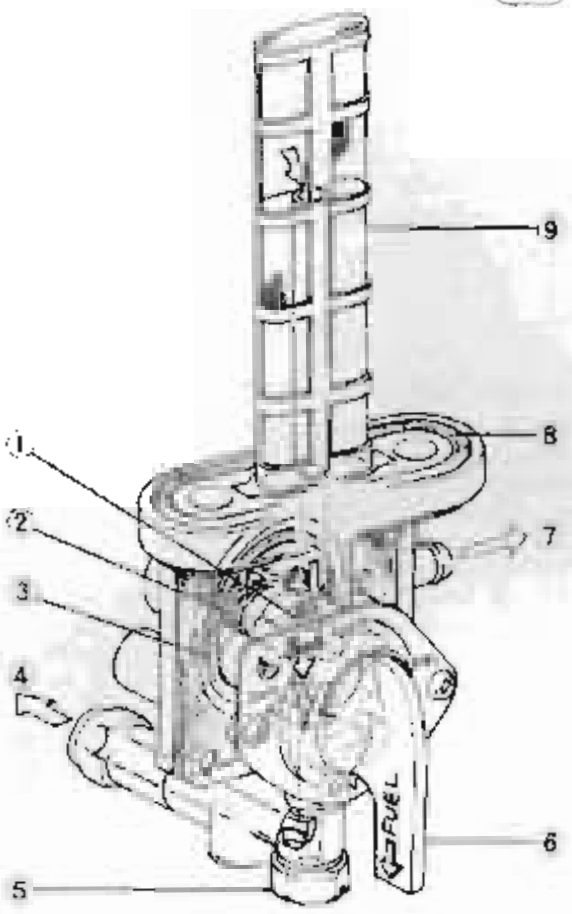
Fuel tap construction is shown in Fig. H3. The fuel tap is an automatic type which shuts off the fuel supply when the engine is stopped in the **ON** or **RES** position. The fuel tap has three positions: **ON**, **RES** (reserve), and **PRI** (prime). With the tap in the "On" position, fuel flows through the tap by way of the main pipe until only the reserve supply is left in the tank; with the tap in the "Reserve" position, fuel flows through the tap from the bottom of the tank. The "Pri" position bypasses the automatic control and is useful for priming the engine after running out of gas, or for completely draining the tank. The fuel tap contains a filter to filter out dirt.

Air Cleaner H2



1. Bolt
2. Tool Tray
3. Air Cleaner Duct
4. Clamp
5. Air Cleaner Housing
6. Air Cleaner Element

Fuel Tap



1. O Ring
2. Spring
3. Diaphragm
4. Fuel
5. Drain Plug
6. Tap Lever
7. Vacuum
8. O Ring
9. Filter

The automatic valve in the fuel tap operates as follows: When the engine is running, negative pressure (vacuum) is created at the carburetor due to engine intake. This engine intake vacuum is connected to the diaphragm vacuum chamber in the fuel tap through the vacuum hose and the check valve. The vacuum pulls the diaphragm 3 against its spring pressure, and the O ring 1 on the diaphragm assembly is pulled out of its seat, permitting fuel to flow between the O ring and seat. When the engine stops and vacuum is lost, air enters the diaphragm vacuum chamber through the vacuum hose, bringing chamber pressure back up to atmospheric and allowing the diaphragm spring 2 to push the diaphragm back into place and hold the O ring against the seat.

The check valve in the diaphragm cover keeps the pressure in the diaphragm vacuum chamber negative in spite of the pulsation of the intake vacuum while the engine is running so that fuel flows steadily.

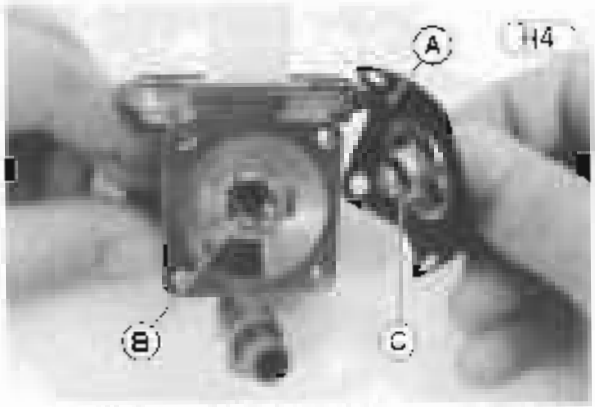
Inspection and cleaning

If fuel leaks from the tank cap or from around the fuel tap, the cap gasket or tap O ring may be damaged. Visually inspect these parts, and replace them if necessary.

Examine the air vent in the tank cap to see if it is obstructed. Use compressed air to clear an obstructed vent.

Any water in the fuel tank and the carburetors can be drained through the drain plugs [Fig. 31]. If water can not be drained completely by removing the drain plugs, remove the fuel tap [Fig. 44], and flush out the tank with a high flash-point solvent. For thorough cleaning of the carburetors, remove and disassemble the carburetors [Fig. 48].

If there is any doubt about the condition of the fuel tap, remove and disassemble the fuel tap [Fig. 44], and inspect the parts. Especially examine the diaphragm assembly. Make sure the O ring and its seat are clean and undamaged. If the O ring is prevented from sealing properly or if it is damaged, fuel flow will not stop when the engine is stopped, and may overflow from the carburetors. Visually inspect the diaphragm. If there is any tear or other damage, the diaphragm assembly should be replaced.



A. Diaphragm B. "O" Ring Seat C. "O" Ring

Clean the air and fuel passages by lightly applying compressed air to the passage openings.

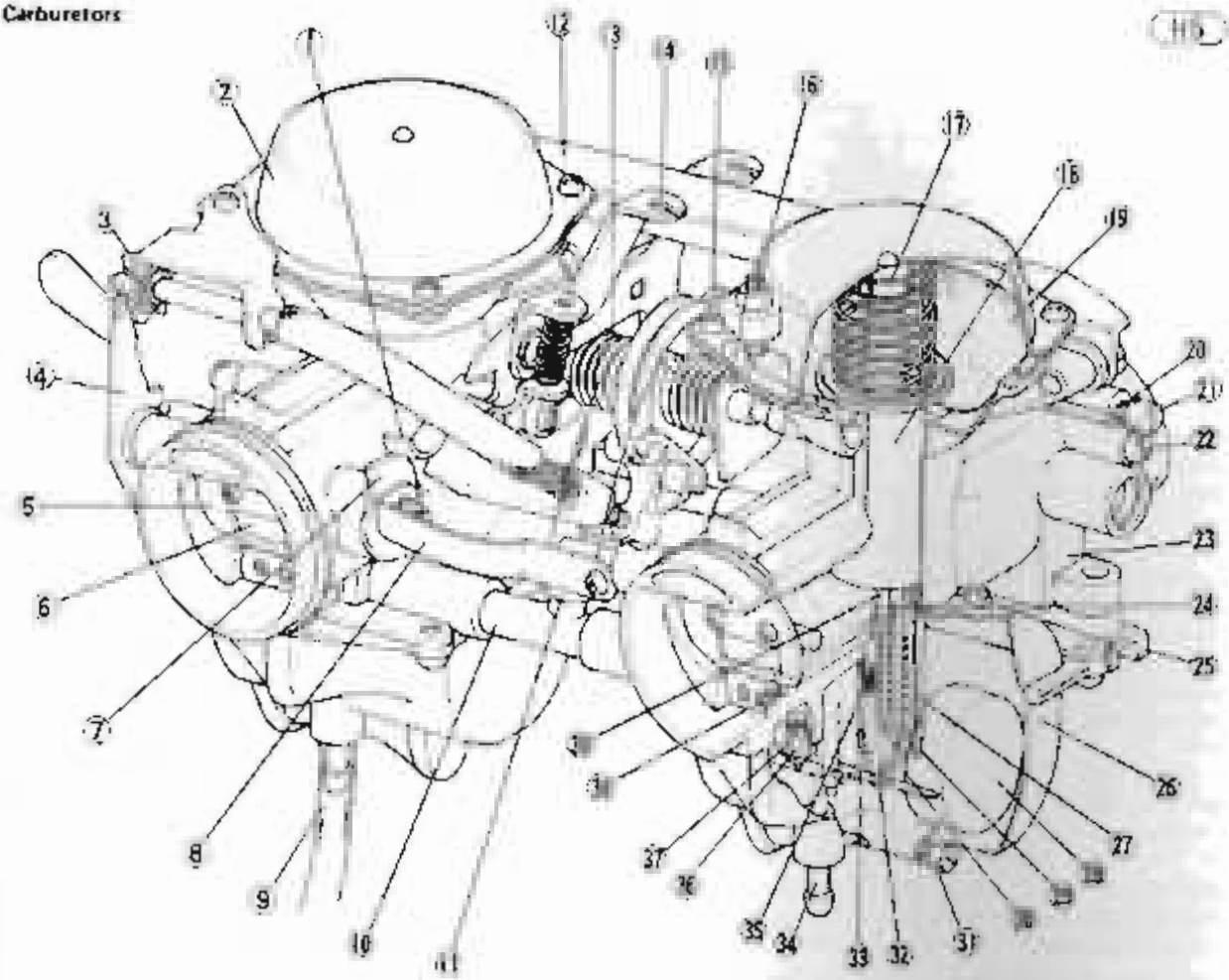
CAUTION **Do not use wire for cleaning as this could damage the check valve, O ring seat, and diaphragm mating surfaces.**

CARBURETORS

The carburetors perform the function of mixing the fuel and air in the proportions necessary for good engine performance at varying speeds and loads. In order for them to function satisfactorily, they must be kept well adjusted and maintained. The throttle cable adjustment [Fig. 13] and the pilot screw, idling, and synchronizing adjustments [Fig. 18] are covered in the Adjustment Section. This discussion here concerns the fundamentals of carburetor operation, special adjustments, and the checking and replacement of carburetor parts.

A linkage mechanism turns each carburetor butterfly valve the same amount in response to throttle grip movement so that the carburetors operate in tandem. As the throttle grip is turned counterclockwise, the throttle accelerator cable turns the carburetor pulley,

Carburetors



1. Idling Link
2. Upper Chamber Cover
3. Idle Adjusting Screw
4. Choke Lever
5. Choke Valve
6. Relief Valve
7. Idling Cam
8. Choke Link Plate
9. Overflow Tube
10. Throttle Joint
11. Fuel Hose
12. Upper Mounting Plate
13. Return Spring
14. Cable Bracket
15. Pulley
16. Balance Adjusting Screw
17. Spring
18. Vacuum Piston
19. Diaphragm
20. Pilot Screw
21. Pilot Screw Limiter
22. Vacuum Plug
23. Carburetor Body
24. Needle Jet
25. Lower Mounting Plate
26. Float Bowl
27. Bleed Pipe
28. Float
29. Primary Main Jet
30. Needle Jet Holder
31. Drain Plug
32. Secondary Main Jet
33. Plug
34. Overflow Pipe
35. Pilot Jet
36. Float Valve Needle
37. Float Valve Seat
38. Air Jet
39. Jet Needle

which through the linkage mechanism opens the butterfly valves. As the throttle grip is turned clockwise or is released, the return spring, together with the throttle accelerator cable, closes the butterfly valves.

One of the basic principles in carburetor operation is that the pressure exerted by a moving body of air is less than atmospheric pressure. As the engine draws air in through the carburetor bore, the air pressure in the carburetor bore is less than the air pressure in the float chamber, which is at atmospheric pressure. This difference in air pressure forces the fuel up through the passage into the carburetor bore where it is then atomized by the air, which is flowing at high speed to the engine.

Another important principle is the Venturi Principle, which states that when an air passage narrows, moving air flows faster, exerting even less pressure. For example, at low speeds (0 ~ ¼ throttle) the vacuum piston is at its lowest position, forming what is called the "primary venturi". Since the engine intake requires less air at lower engine speeds, there would not be enough air flow speed for sufficient fuel to be forced up through the jets unless the passage (carburetor bore) above the jets is constricted. The low position of the vacuum piston constricts this passage so that there will be sufficient air flow speed for pressure difference to force the necessary amount of fuel up through the jet.

The amount of fuel passing through a jet depends both on the size of the jet (variable in the case of the needle jet) and on the speed of the air flow over the jet. The speed of this air flow is in turn determined both by the engine rpm and by the dimensions of the passage (varied with the vacuum piston) just above the jet. The size of the jet openings, the various dimensions of the

Table H1 Carburetor Specifications

Type	Jet Needle	Main Jet		Air Jet			Pilot Jet	Pilot Screw	Float Level	
		Primary	Secondary	Pilot	Primary Main	Secondary Main			Gauge	Service
VB32	003303	70	90	115	150	60	35	1¼ to 1½ turns out	12~14 mm	13~15 mm

air passages, and the engine rpm are correlated through carburetor design so that, when properly adjusted, the carburetor meters (measures) the fuel and air in the correct proportions at different throttle openings.

The carburetor specifications (Table H1) have been chosen for best all around performance, and ordinarily will not require any change. However, sometimes an alteration may be desirable for improved performance under special conditions, and when proper mixture is not obtained after the carburetor has been properly adjusted and all parts cleaned and found to be functioning properly. For example, the quantity of air entering the carburetor bore is less at high altitude due to the lower atmospheric pressure. To obtain the proper carburetor fuel/air mixture, it may be necessary to exchange the main jets on each carburetor for one a size smaller. In particularly cold weather, the increased density of the air may necessitate a size large main jets for each carburetor.

Since the carburetor regulates and mixes fuel and air going to the engine, there are two general types of carburetor trouble: too rich a mixture (too much fuel); or too lean a mixture (too little fuel). Such trouble can be caused by dirt, wear, maladjustment, or improper fuel level in the float chamber. A dirty or damaged air cleaner can also alter the fuel-to-air ratio.

Table H2 Mixture Trouble Symptoms

Mixture too rich	Mixture too lean
Engine is sluggish	Engine overheats
Smoky exhaust	Runs better with choke lever pulled up
Runs worse when warm	Spark plug burned white
Spark plug fouled black	Running is unstable
Runs better without air cleaner	Loss of power

The following explanation of the functioning and maintenance of the carburetors covers the four main systems for fuel regulation and supply.

Table H3 Carburetor Systems

System	Function
Starter System	Supplies the necessary rich mixture for starting a cold engine.
Pilot System	Supplies fuel at idling and low speeds.
Main System	Supplies fuel at medium and high speeds.
Float System	Maintains the fuel at a constant level in the float chamber.

CAUTION

1. Remove the diaphragm and float before cleaning the carburetor with compressed air, or they will be damaged.

2. Remove as many rubber or plastic parts from the carburetors (Table H4) as possible before cleaning the carburetors with a cleaning solution. This will prevent damage or deterioration of the parts.

3. The carburetor body has plastic parts (Table H4) that cannot be removed. DO NOT use a strong carburetor cleaning solution which could attack these parts; instead, use a mild cleaning solution safe for plastic parts.

4. Do not use wire for cleaning as this could damage the jets.

Table H4 Carburetor Rubber Parts and Plastic Parts

Parts	Quantity	Removable
Breather Tubes	2	Yes
Cable Bracket Washers	4	Yes
Diaphragms	2	Yes
Float Bowl O Rings	2	Yes
Fuel Hose	1	Yes
Idle Adjusting Screw	1	Yes
Idle Limiter	2	Yes
Jet Needle Holder	2	Yes
Overflow Tubes	2	Yes
Pilot Jet Rubber Plugs	2	Yes
Pilot Screw O Rings	2	Yes
3 way Joint O Rings	4	Yes
Vacuum Hose	1	Yes
Vacuum Pistons	2	Yes

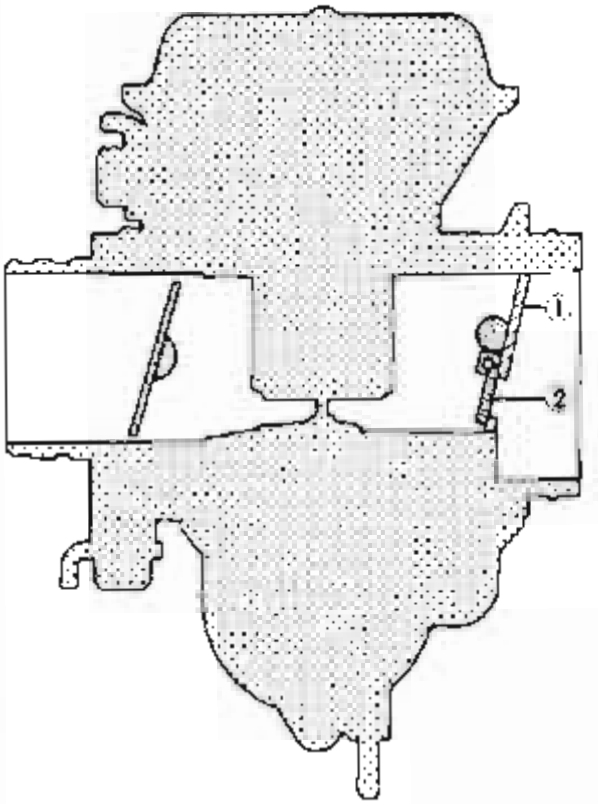
Starter System

Fig. H6 shows the starter system, which includes the choke lever, choke valve 1, relief valve 2, idling cam, and idling link.

The starter system provides the exceptionally rich fuel/air ratio that is necessary to enable easy starting when the engine is cold. When starting the engine, the choke valves close down the carburetor bores by pulling up the choke lever. Since the choke valves close down the carburetor bores, a high intake vacuum (suction or low pressure) is developed at the engine side of the carburetor bores. The relief valves on the choke valves are opened by a high intake vacuum, and air is drawn into the carburetor bores. As the engine is cranked over, fuel is drawn in from the float chamber through the main jets and pilot jet. This fuel is then drawn into the carburetor, mixed with the air drawn in through the relief valve, and drawn into the engine.

The engine must be run at a faster than normal idle speed to prevent the engine from stalling until it reaches operating temperature. To accomplish this, the fast idling cam varies the idling fast when the choke lever is pulled up, and the throttle valve is held open an amount sufficient to prevent stalling.

Starter System (H6)



1. Choke Valve 2. Relief Valve

In order for the starter system to work properly, the choke lever must be pushed up fully so that the choke valve will be kept closed and sufficient vacuum can be built up in the engine of the carburetor bore. Clogged pilot jet, main jet, pilot air jet, needle jet holder and main jet bleed pipe will cause insufficient atomization, thus impairing starter efficiency. Fuel mixture trouble results if choke mechanism, pilot and main system is defective. A damaged relief valve will cause insufficient vacuum, thus impairing starter system efficiency. Fuel mixture trouble results if the choke valve does not open fully after the choke lever is returned.

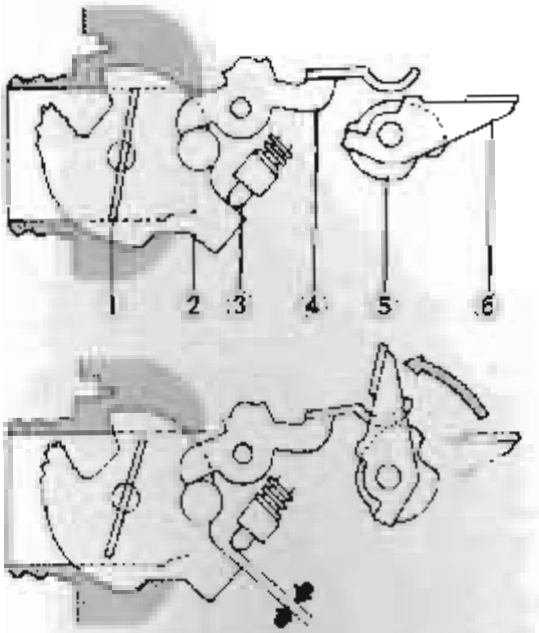
Cleaning and inspection (See cautions on Pg. 152)

Disassemble the carburetor, and wash the main jets, pilot jet, needle jet holder, main jet bleed pipe, air jets, and air passage with a high flash-point solvent, blowing them clean with compressed air. If necessary, use a bath of automotive type carburetor cleaner.

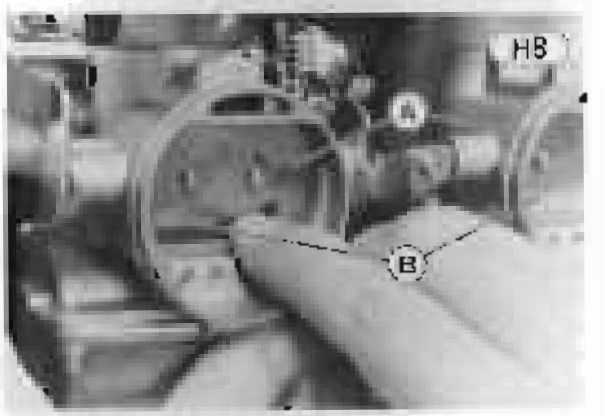
Pull up and push down the choke lever to check that the choke valves move smoothly. The choke valves must close the carburetor bores completely when the lever is pulled up, and must open fully when the lever is pushed down. If necessary, adjust the choke linkage (Pg. 17). To check that the relief valve spring is working properly, push on the relief valve itself. The relief valve must move smoothly, and must close by spring tension.

If the choke valve or the relief valve does not work properly, replace the carburetor body.

Fast Idle Mechanism (H7)



1. Butterfly Valve
2. Pulley
3. Idle Adjusting Screw
4. Idling Link
5. Idling Cam
6. Choke Lever

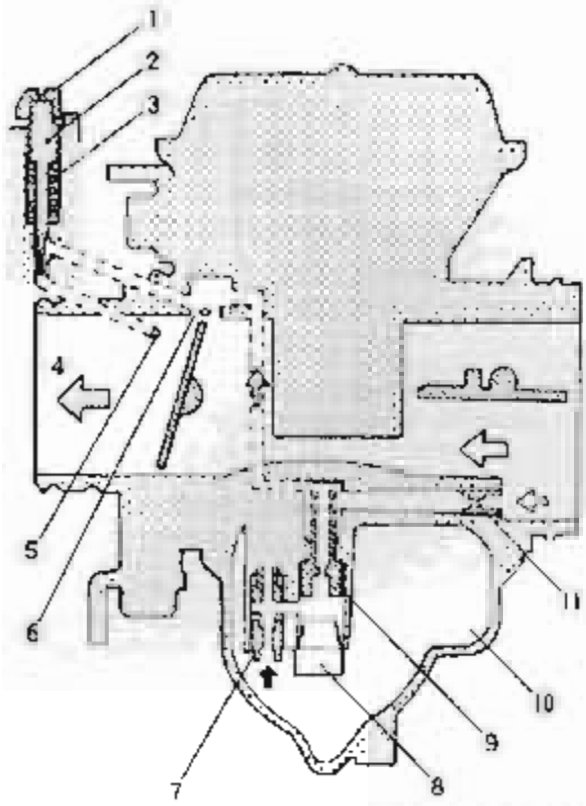


A. Choke Valves B. Relief Valves

Pilot System

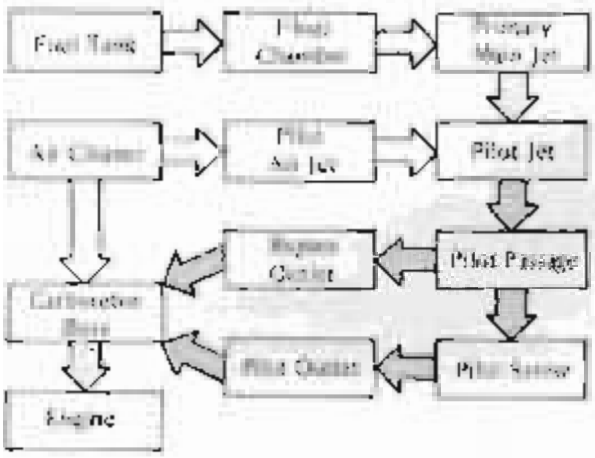
Fig. H9 shows the pilot system, which includes the pilot air jet 11, pilot jet 9, primary main jet 7, bypass outlet 6, pilot outlet 5, pilot screw 2, and pilot screw limiter 1.

Pilot System H9



1. Pilot Screw Limiter
2. Pilot Screw
3. Spring
4. Carburetor Bore
5. Pilot Outlet
6. Bypass Outlet
7. Primary Main Jet
8. Plug
9. Pilot Jet
10. Float Chamber
11. Pilot Air Jet

Pilot System Fuel and Air Supply H10

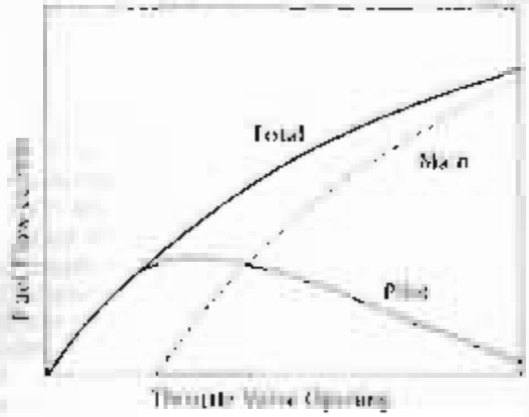


The pilot system determines the operation of the carburetor from 0 to ¼ throttle opening. At idle throttle openings, almost no fuel is drawn through the main system due to insufficient air flow. Instead, the fuel is drawn through the main and pilot jets as a result of the low pressure (vacuum) brought about by the demand for air by the engine and the limited but relatively fast flow of air past the pilot outlet. The almost closed position of the butterfly valve restricts the carburetor bore air flow, preventing it from relieving the low pressure created by the engine around the pilot outlet. With the Venturi effect (the narrower the air passage, the faster the flow of air) at the engine side of the butterfly valve further reduces the low pressure.

The supply of the fuel and air in the pilot system is shown in Fig. H10. At idling and slightly above, the fuel passes through the main jet, and is then metered at the pilot jet, where the fuel mixes with air metered by the pilot air jet. Then, the fuel passes through the pilot passage, where the pilot screw affects the flow, through the pilot outlet into the carburetor bore, and to the engine. As the butterfly valve turns a little more, the butterfly valve position extends the low pressure area to the pilot bypass, allowing fuel to bypass part of the pilot passage to go directly to the carburetor bore such that the supply of fuel increases efficiently with engine speed.

Fig. H11 shows throttle opening versus fuel flow for the main and pilot systems. If trouble occurs in the pilot system, not only will starting and low speed running affected, but the transition from pilot to main system is not smooth as the throttle is opened, causing a drop in engine efficiency. Pilot system trouble might be to maladjustment, a dirty or loose pilot jet, or pilot air jet; or clogging of the main jet, pilot passage, pilot outlet, or pilot bypass.

Fuel Flow Characteristics H11



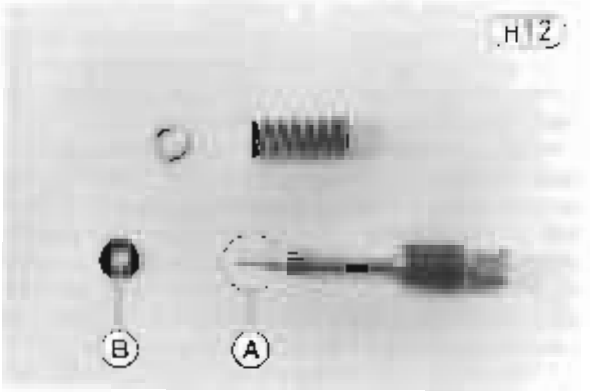
Cleaning and replacement

(See cautions on Pg. 152)

Disassemble the carburetor, and wash the primary main jet, pilot jet, pilot air jet, and air passage with a high flash-point solvent, blowing them clean with compressed air. If necessary, use a bath of automotive type carburetor cleaner.

Remove the pilot screw, and check that the tapered portion is not worn or otherwise damaged. If it is, replace the screw. If the screw O ring is damaged, replace the O ring.

H12

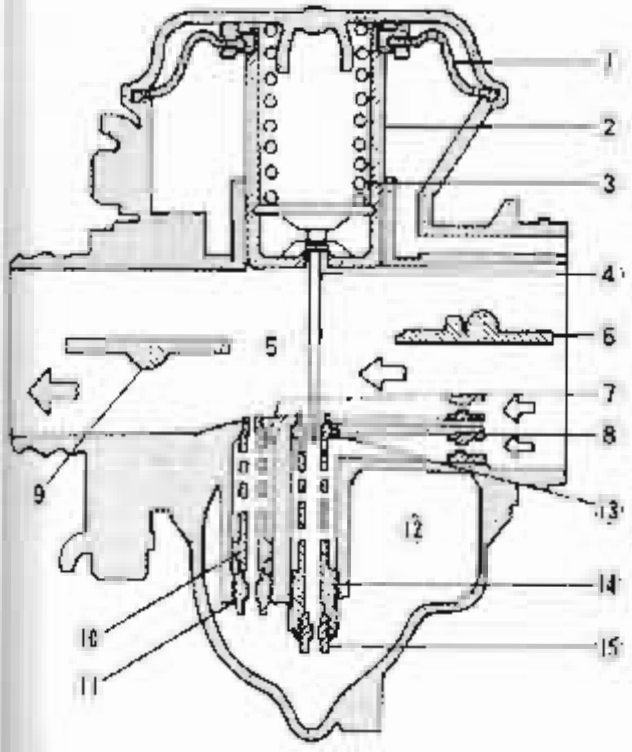


A. Tapered Portion B. "O" Ring

Main System

Fig. H13 shows the main system, which consists of the main jets 11, 15, main jet bleed pipe 10, needle jet holder M, jet needle 4, needle jet 14, vacuum piston 2, spring 3, and main air jet 7, 8.

Main System H13



1. Diaphragm
2. Vacuum Piston
3. Spring
4. Jet Needle
5. Carburetor Bore
6. Choke Valve
7. Primary Main Air Jet
8. Secondary Main Air Jet
9. Butterfly Valve
10. Bleed Pipe
11. Primary Main Jet
12. Float Chamber
13. Needle Jet
14. Needle Jet Holder
15. Secondary Main Jet

Main System Fuel and Air Supply H14

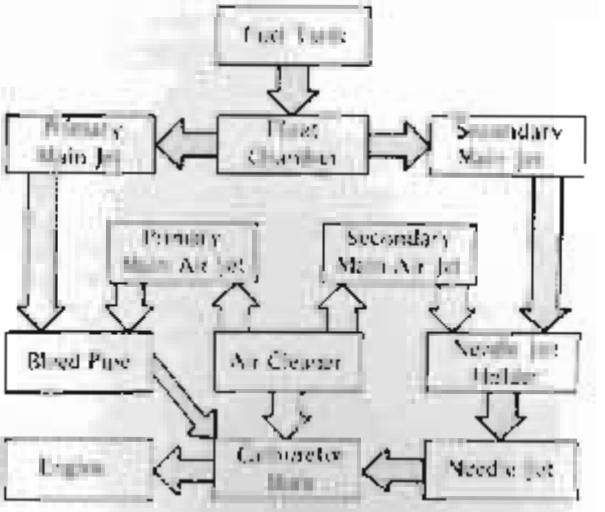


Fig. H14 shows the supply of fuel and air in the main system. From about ⅛ ~ ¼ throttle opening, the air flow past the main jet bleed pipe is sufficient to cause fuel to be drawn through the main system, and from about ¼ throttle opening, the air flow past the needle jet outlet is sufficient too. The fuel passes through the primary main jet and then part of it goes through the pilot jet as in the pilot system while the rest of it passes straight up through the main jet bleed pipe at about ⅛ ~ ¼ throttle opening, and from about ¼ throttle opening the fuel passes through the secondary main jet and then it goes straight up through the space in the needle jet not blocked by the jet needle and into the carburetor bore, where it is atomized by the air flow to the engine.

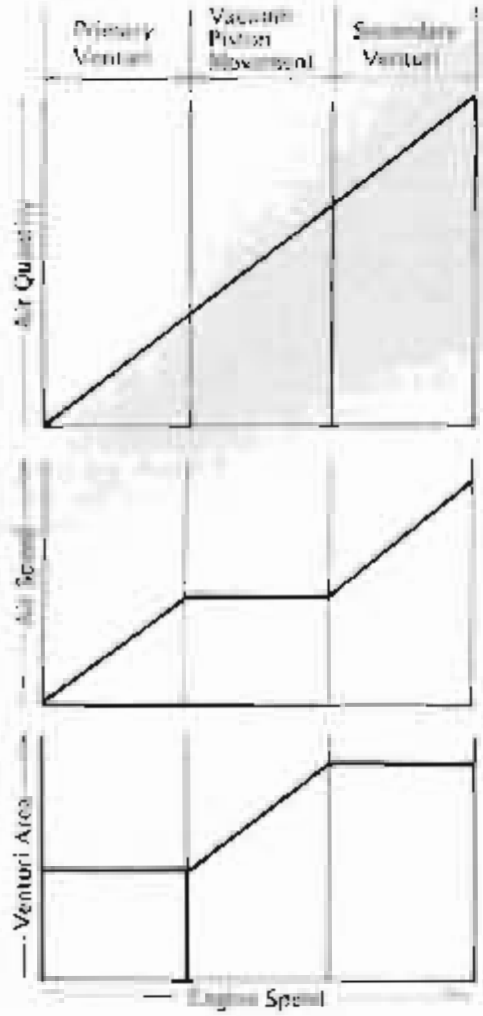
The needle jet holder and main jet bleed pipe have holes to admit the air metered by the main air jets. This air mixes with the fuel in the needle jet holder and main jet bleed pipe to prepare the fuel for better atomization in the carburetor bore.

The lower part of the jet needle is tapered and extends down into the needle jet and needle jet holder. It is fixed to the vacuum piston and thus rises up in the needle jet and needle jet holder as the vacuum piston rises. From the time the vacuum piston starts rising, from about ⅛ throttle, until it reaches most of the way up in the carburetor bore, the fuel is metered primarily by the primary main jet and secondarily by the jet needle taper. As the jet needle rises, the needle jet clearance increases, thereby increasing the amount of fuel that can pass up through the jet.

The vacuum piston is attached to the diaphragm and rises only between ⅛ and ¼ throttle. Through the holes in the bottom of the piston, the air pressure in the chamber above the diaphragm is reduced by engine intake vacuum. The air vent maintains atmospheric pressure in the chamber under the diaphragm. As engine speed increases, air pressure in the upper chamber decreases. The difference between this pressure and atmospheric pressure in the lower chamber becomes

greater. The force of the spring and the weight of the piston are overcome, and the piston rises to an extent corresponding to this pressure difference. The diaphragm is made of rubber and absorbs the vibration caused by engine intake pulsing to prevent the vacuum piston from wearing.

Venturi Principle H15



As shown in Fig. H15 the quantity of air drawn in by the engine intake is in direct proportion to engine rpm, and the speed of the air flow is constant while the vacuum piston rises from ¼ to ¾ throttle. Were the size of the air passage above the needle jet to change simultaneously with throttle movement rather than with engine intake (demand), the speed of the air flow in the air passage might even drop during a rapid increase in throttle due to the Venturi effect, causing a slight stall in acceleration. However, the vacuum piston-butterfly valve arrangement controls both the air and fuel supply at sudden throttle for smooth and immediate engine response.

At ¾ throttle the vacuum piston reaches its highest position, forming the "secondary venturi" to permit maximum engine output. At near full throttle openings, the cross-sectional area of the needle to jet clearance becomes greater than the cross-sectional area of the main jet. At these openings, the fuel drawn up into the carburetor bore is limited by the size of the main jet rather than the needle to jet clearance.

Trouble in the main system is usually indicated by poor running or lack of power at high speeds. Dirty or clogged main jets will cause the mixture to become too lean. An overly rich mixture could be caused by clogging of the main air jets, its air passage, or the air holes in the main jet blood pipe and needle jet holder; by needle jet or needle wear (increasing clearance); by loose main air jets, or by a loose needle jet.

Cleaning and adjustment (See cautions Pg. 152)

Disassemble the carburetor and wash the main jets, main jet blood pipe, needle jet holder, needle jet, jet needle, main air jets, and air passage with a high flash point solvent, blowing them clean with compressed air. If necessary, use a bath of automotive type carburetor cleaner.

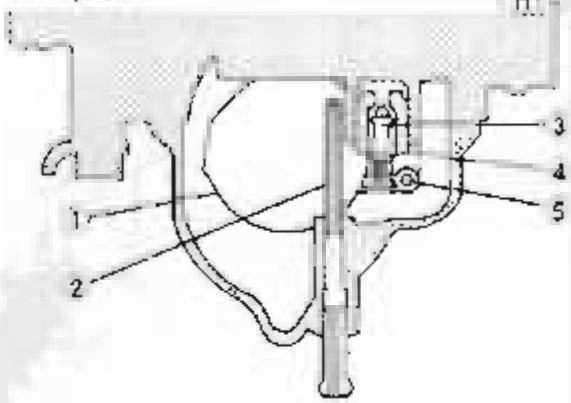
Visually inspect the diaphragm. If there is any tear or other damage, the diaphragm should be replaced. A worn needle jet or jet needle should be replaced.

If the engine still exhibits symptoms of overly rich or lean carburetion after all maintenance and adjustments are correctly performed, the secondary main jet can be replaced with a smaller or larger one. A smaller numbered jet gives a leaner mixture and a larger numbered jet a richer mixture.

Float System

Fig. H16 shows the float system, which consists of the float 1, float valve needle 3, float valve seat 4, float pin 5, and overflow pipe 2.

Float System H16



1. Float
2. Overflow Pipe
3. Valve Needle
4. Valve Seat
5. Float Pin

The float system serves to keep a more or less fixed level of fuel in the carburetor float chamber at all times so that the fuel mixture to the engine will be stable. If the fuel level in the float chamber is set too low, it will be more difficult for fuel to be drawn up into the carburetor bore, resulting in too lean a mixture. If the level is set too high, the fuel can be drawn up too easily, resulting too in rich a mixture.

The fuel level is defined as the vertical distance from the center of the carburetor bore to the surface of the fuel in the float chamber. The fuel level is maintained at a constant value by the action of the float valve, which opens and closes according to the fuel level. As fuel flows through the float valve into the chamber, the fuel level rises. The float, rising with the fuel level, pushes up on the valve needle. When the fuel reaches a certain level, the valve needle is pushed completely into the valve seat, which closes the valve so that no more fuel may enter the chamber. As the fuel is drawn up out of the float chamber, the fuel level drops, lowering the float. The needle no longer blocks the float valve, and fuel once again flows through the float valve into the chamber.

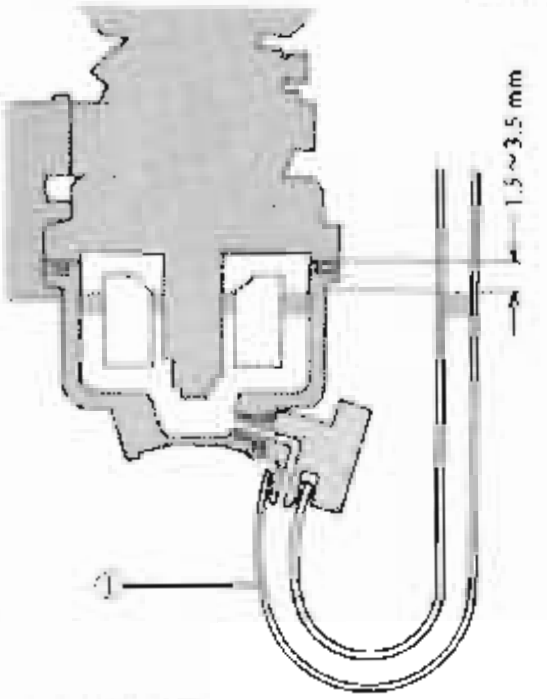
NOTE: It is impractical to measure the actual design fuel level. Service fuel level is defined as the vertical distance from the bottom edge of the carburetor body to the surface of the fuel in the float chamber. Measuring the service fuel level is an indirect method of inspecting for correct design fuel level.

Service fuel level measurement and adjustment

Secure the motorcycle in a true vertical position. Turn the fuel tap to the "ON" or "RES" position, and remove the drain plug from the bottom of the float bowl. Install the fuel level gauge (special tool). Hold the plastic tube against the side of the carburetor so that the "0" line is even with the bottom edge of the carburetor body. Turn the fuel tap to the "PRI" position. Read the service fuel level in the plastic tube.

NOTE: Measure the service fuel level keeping the carburetor fully perpendicular to the ground.

Service Fuel Level Measurement (H17)



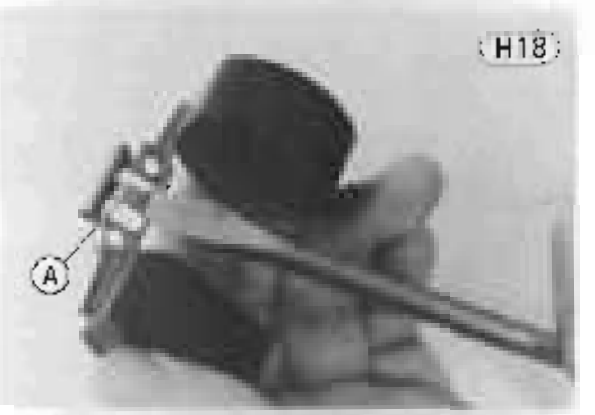
1. Fuel Level Gauge (57001-208)

Table H5 Service Fuel Level

Standard
1.5—3.5 mm below from the bottom edge of the carburetor body to the fuel level

If the fuel level is incorrect, remove the carburetor and then remove the float bowl and float. Bend the tang on the float a very slight amount to change the fuel level. Bending it up toward the valve closes the valve sooner and lowers the fuel level; bending it down raises the level.

After adjustment, measure the service fuel level again, and readjust if necessary.



A. Tang

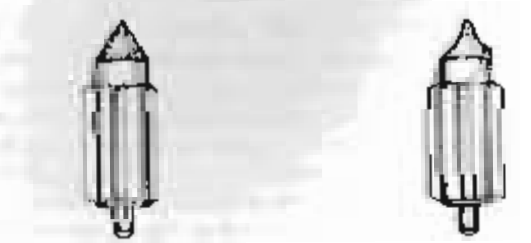
Cleaning and replacement (See cautions Pg. 152)

If dirt gets between the needle and seat, the float valve will not close and fuel will overflow. Overflow can also result if the needle and seat become worn. If the needle sticks closed, no fuel will flow into the carburetor.

Remove the carburetor, and take off the float bowl and float. Wash the bowl and float parts in a high flash-point solvent. Use carburetor cleaner if necessary on the float bowl and metal parts. Blow out the fuel overflow pipe with compressed air.

Examine the float, and replace it if it is damaged. If the needle is worn as shown in the diagram, replace it. If the seat is worn, the entire carburetor must be replaced.

Valve Needle (H19)



Good Bad

ROCKER ARMS, SHAFTS

There are four rocker arms and shafts in the cylinder head cover. The two arms and shafts to the front control the two exhaust valves, while the two to the rear control the two inlet valves. The rocker arms are made of a special steel alloy for durability, and each arm surface which makes contact with the cam and the valve stem has been heat-treated to achieve superior surface hardness. An oil hole in each rocker arm enables oil to lubricate between the arm and shaft.

Excessive clearance between a rocker arm and shaft results in engine noise.

Rocker arm/shaft wear

Visually inspect where the cam and valve stem wear on each arm. If there is any damage or uneven wear, replace the arm.

Measure the inside diameter of each arm with a cylinder gauge. If it exceeds the service limit, replace the arm.

Measure the diameter of each shaft where the arm fits. If the diameter is less than the service limit, replace the shaft.

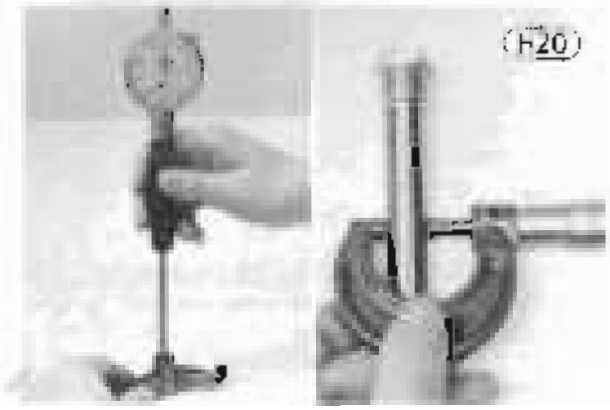


Table H6 Rocker Arm Inside Diameter

Standard	Service Limit
13.000 ~ 13.018 mm	13.05 mm

Table H7 Rocker Shaft Diameter

Standard	Service Limit
12.966 ~ 12.984 mm	12.94 mm

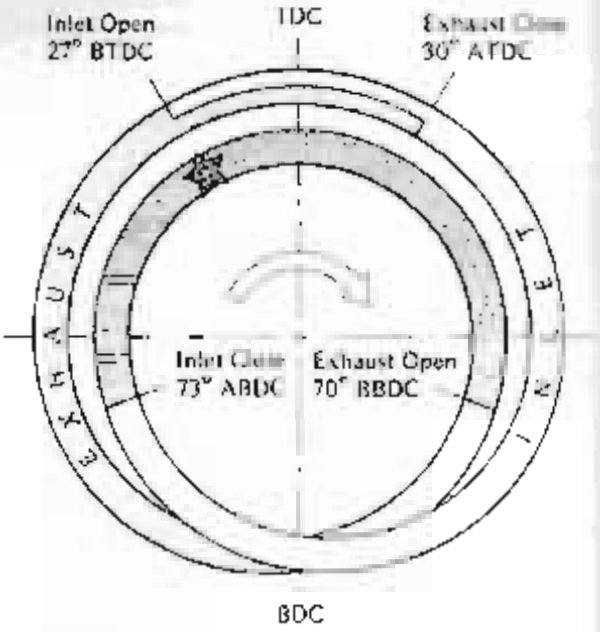
CAMSHAFT

The engine has an overhead camshaft (OHC) at the top of the cylinder head. The camshaft has four cams, two for the two inlet valves and two for the two exhaust valves. There is a sprocket at the center of the crankshaft and at the center of the camshaft. A chain placed over these sprockets enables the crankshaft to turn the camshaft so that the valves will be opened and closed at the proper times during each rotation of the engine.

The sprocket has a mark so that valve timing (the time that each valve is opened) can be reset correctly any time the camshafts are removed for inspection or repairs (See Pg. 34).

However, since the time, amount, and duration that each valve is opened (valve timing) changes with cam wear and journal wear, the camshaft should be inspected periodically and whenever timing trouble is suspected. If the valves do not open at the right times or if they do not open the correct amount or for the proper duration, there will be a decrease in combustion efficiency, causing a loss of engine power and leading to serious engine trouble.

Valve Timing (H21)



Cam wear

Remove the camshaft, and measure the height of each cam with a micrometer. If the cams are worn down past the service limit, replace the camshaft.

Cam Height Measurement (H22)

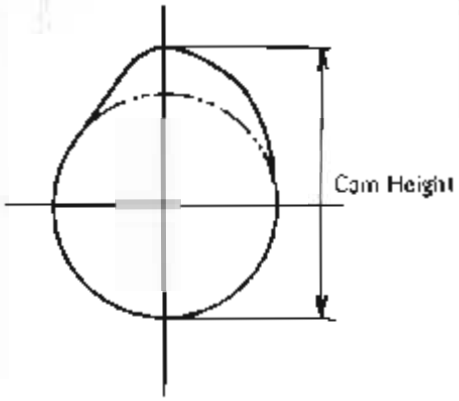


Table H8 Cam Height

Standard	Service Limit
38.339 ~ 38.479 mm	38.25 mm

Journal, bearing wear

The journal wear is measured using plastigauge (press gauge), which is inserted into the clearance to be measured. The plastigauge indicates the clearance by the amount it is compressed and widened when the parts are assembled.

Remove the cylinder head cover and camshaft caps, and wipe each journal and camshaft cap surface clean of oil. Cut strips of plastigauge to journal width. Place a strip on each journal parallel to the camshaft and so that the plastigauge will be compressed between the journal and camshaft cap.

Now, tighten the camshaft cap bolts in the correct sequence to the specified torque (Fig. 17).

Next, remove the camshaft cap again, and measure the plastigauge width to determine the clearance between each journal and the camshaft cap.

If any clearance exceeds the service limit, measure the diameter of the camshaft journal. If camshaft replacement does not bring the journal clearance within the service limit, replace the cylinder head and camshaft cam.



A. Plastigauge

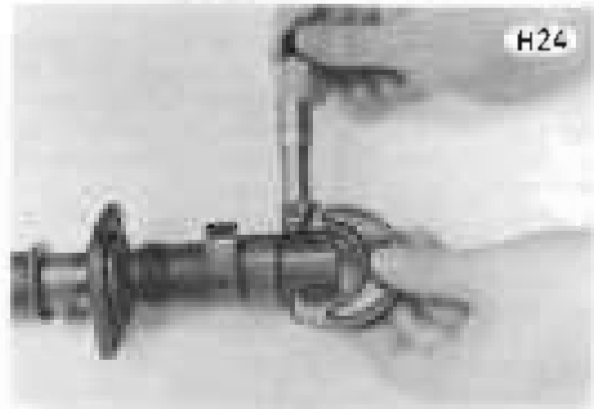
Table H9 Camshaft Journal/Camshaft Cap Clearance

Standard	Service Limit
0.130 ~ 0.240 mm	0.25 mm

Measure the diameter of each camshaft journal with a micrometer. If the diameter of any journal is less than the service limit, replace the camshaft.

Table H10 Camshaft Journal Diameter

Standard	Service Limit
24.950 ~ 24.970 mm	24.93 mm



Camshaft runout

Remove the camshaft and take the sprocket off the shaft.

Set the shaft on V blocks at the outside journals as shown in the figure. Measure runout with a dial gauge at the sprocket mounting location, and replace the shaft if the runout exceeds the service limit.

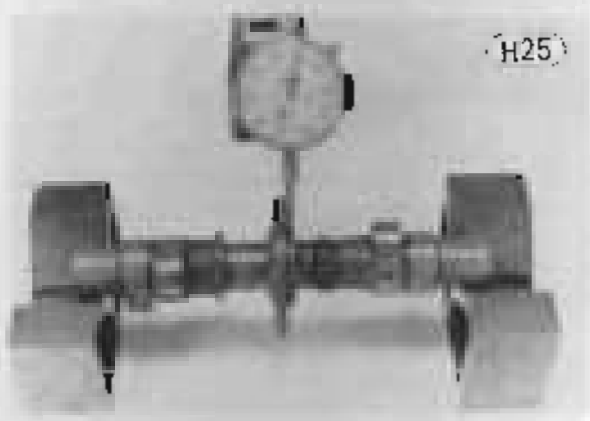


Table H11 Camshaft Runout

Standard	Service Limit
under 0.01 mm	0.1 mm

CAMSHAFT CHAIN, GUIDES, TENSIONER

The camshaft chain, which is driven by the crankshaft sprocket, drives the camshaft at one-half crankshaft speed. For maximum durability, it is an endless-type chain with no master link.

Camshaft chain, sprocket, and chain guide wear cause noise, accelerate wear, and could possibly lead to serious damage to the engine. If the chain tension can no longer be adjusted by the chain tensioner, either the camshaft chain or the chain guides must be replaced.

Camshaft chain wear

Remove the camshaft chain. Hold the chain taut with a force of about 5 kg in some manner such as the one shown in Fig. H26, and measure a 20-link length. Since the chain may wear unevenly, take measurements at several places. If any measurement exceeds the service limit, replace the chain.

Camshaft Chain Length Measurement H25

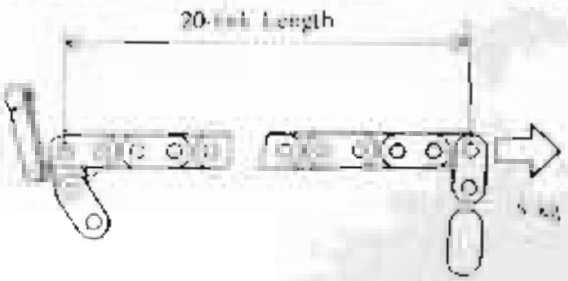


Table H12 Camshaft Chain 20-link Length

Standard	Service Limit
160.0 ~ 160.3 mm	162.5 mm

Chain guide wear

Remove the chain guides, and inspect them visually. Replace a guide if the rubber or any other portion is damaged.

Measure the depth of the grooves where the chain links run. Replace a guide if the wear exceeds the service limit.

Chain Guide Rubber Wear H27

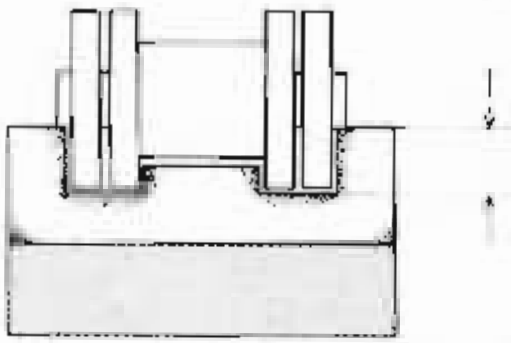


Table H13 Camshaft Chain Guide Wear

	Service Limit
Front	1.5 mm
Rear	2.5 mm

Chain tensioner inspection

Remove the camshaft chain tensioner. Visually inspect the push rod, and check that it moves smoothly in the guide, with the spring removed. If there is any damage or abnormal operation, replace the tensioner with a new one.

Measure the spring free length. Replace the spring if the free length exceeds the service limit.

H28

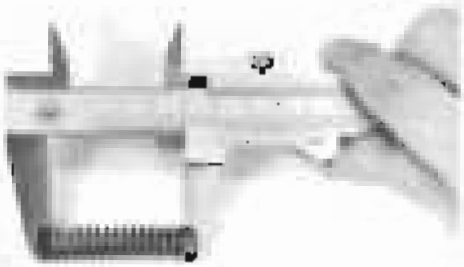


Table H14 Chain Tensioner Spring Free Length

Standard	Service Limit
about 44.2 mm	42 mm

CYLINDER HEAD, VALVES

The valves are mounted in the head; they are pushed open by the rocker arms and cams, and closed by the valve springs.

Valve guides and valve seats are pressed into the cylinder head. The valve seat, which is cut to the angles shown in Fig. H42, prevents compression leakage by fitting snugly against the valve. It also prevents the valve from overheating by allowing efficient heat transfer.

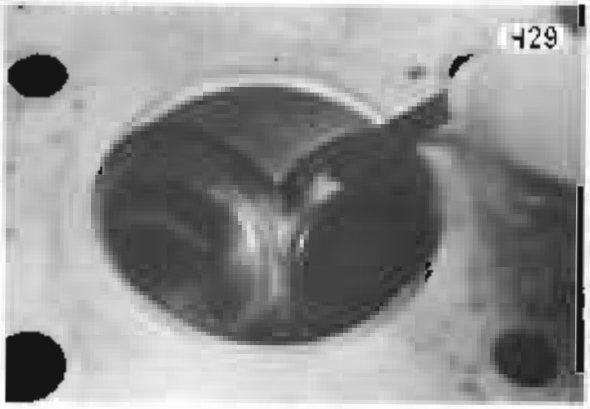
Cylinder Head

The cylinder head is made of aluminum alloy, used for its high heat conductivity, and is finned on the outside to aid dissipation of the heat generated in the combustion chambers. Carbon built up inside the combustion chambers interferes with heat dissipation and increases the compression ratio, which may result in preignition, detonation, and overheating. Trouble can also arise from improper head mounting or mounting torque, which may cause compression leakage.

Cleaning and inspection

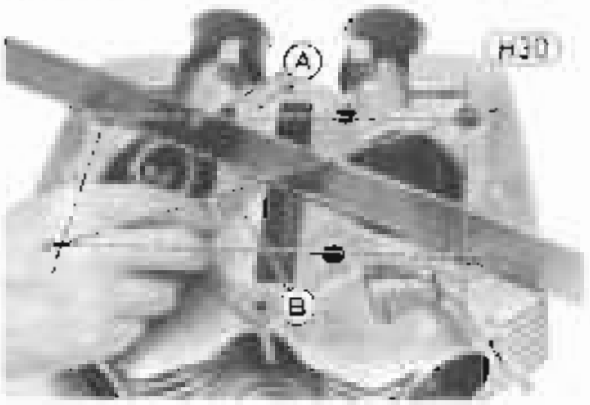
Remove the cylinder head (Fig. S41) and valves (Fig.). Scrape out any carbon, and wash the head with a high flashpoint solvent.

H29



Cylinder head warp

Lay a straightedge across the lower surface of the head at several different points, and measure warp by inserting a thickness gauge between the straightedge and the head. If warp exceeds the service limit, repair the mating surface. Replace the cylinder head if the mating surface is badly damaged.



A. Straightedge B. Thickness Gauge

Table H15 Cylinder Head Warp

Service Limit
0.05 mm

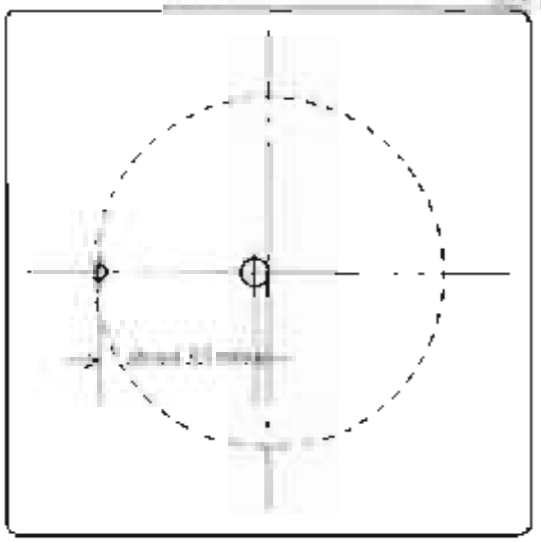
Combustion chamber volume measurement

The combustion chamber volume should be measured any time that compression measurement results in compression pressures well below or above the standard.

NOTES:

1. Another person will be needed to help expel air bubbles out of the combustion chamber.
2. Prepare a piece of transparent plastic plate which has a flat surface and two holes about 20 mm apart in its center portion. One hole should be about 6 mm in diameter, the other about 3 mm in diameter. The plate must be oil resistant, about 120 mm square, and at least 3 mm thick.

Plastic Measuring Plate



3. Obtain a burette or syringe which is calibrated at cc or smaller graduations. Fill it with thin oil.

Prior to the combustion chamber volume measurement, clean off any carbon in the combustion chamber, and remove any gasket flakes on the cylinder head mating surface. The standard spark plug should be installed in the chamber to be measured.

NOTE: The valves must seat well to prevent the oil from leaking out.

Apply a thin coat of grease to the cylinder head mating surface and place the plastic plate over the cylinder head combustion chamber, fitting its small hole near the edge of the combustion chamber.



Place the cylinder head on a level surface. Through the large hole, fill the combustion chamber with light oil such as 2-stroke oil until the chamber is completely but not overly filled. Tilt the cylinder head slightly so that air bubbles come out through the small hole. The oil should just rise to the bottom edge of the holes in the plate.

The amount of oil used to fill the chamber is the combustion chamber volume.

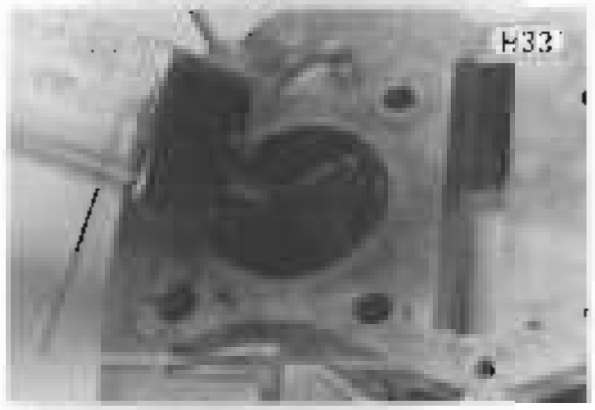


Table H16 Combustion Chamber Volume

Standard
36.5 – 37.0 cc

If the combustion chamber volume is too small, it is possible that the cylinder head was modified for higher compression. Make sure that all carbon deposits have been cleaned out of the chamber.

If the combustion chamber volume is too large, it is possible that the valves and valve seats have been resurfaced so much that the volume is increased. Make sure that the spark plug is the standard type and that it is fully tightened.

Valve, Valve Guide, Valve Seat

Valve face deformation or wear, stem bending or wear, and valve guide wear can cause poor valve seating. Poor seating can also be caused by the valve seat itself, if there is heat damage or carbon build-up. The result of poor valve seating is compression leakage and a loss of engine power.

In addition, valve and valve seat wear causes deeper valve seating and a decrease in valve clearance. Insufficient clearance upsets valve timing and may eventually prevent the valve from seating fully. So that wear never progresses this far, adjust the valve clearance in accordance with the Periodic Maintenance Chart (Pg. 30).

Valve Inspection

Visually inspect the valve face, and replace the valve if it shows deformation or uneven wear.

Measure the thickness of the valve head using vernier calipers, and replace the valve if the thickness is under the service limit.

Valve Shapes H34



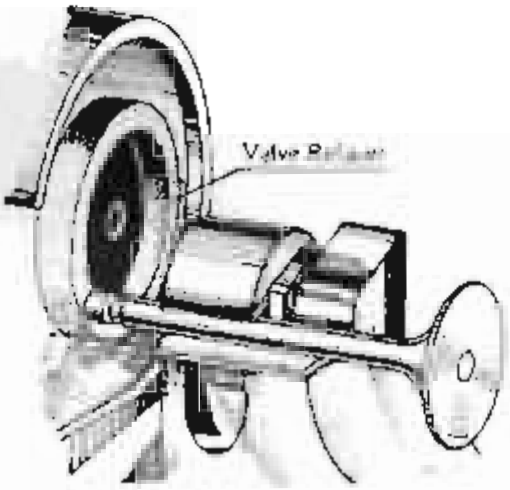
Table H17 Valve Head Thickness

Standard	Service Limit
1.0 mm	0.5 mm

If the seating surface of the valve or the end of the valve stem is damaged or badly worn, repair the valve with a valve refacer. The angle of the seating surface is 45° (Fig. H35).

CAUTION **If the valve stem is ground down, be sure to leave at least 4.3 mm of stem and above the wide groove portion.**

Valve Stem Grinding H35



Position the valve in V blocks at each end of the straight portion of the stem, and set dial gauge against the center of the stem. See the example shown in Fig. H36.

Turning the valve, read the variation in the dial gauge. Replace the valve if it is bent more than the service limit.

Valve Stem Bend H36

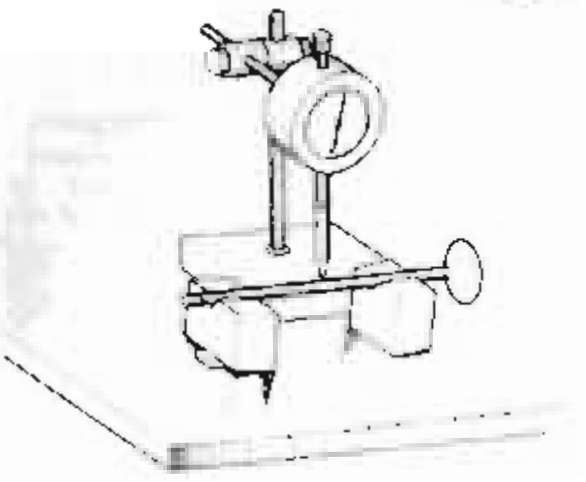


Table H18 Valve Stem Bend

Standard	Service Limit
under 0.01 mm	0.05 mm

Measure the diameter of the valve stem with a micrometer. Since the stem wears unevenly, take measurements at four places up and down the stem, keeping the micrometer at right angles to the stem.

Replace the valve if the stem is worn to less than the service limit.

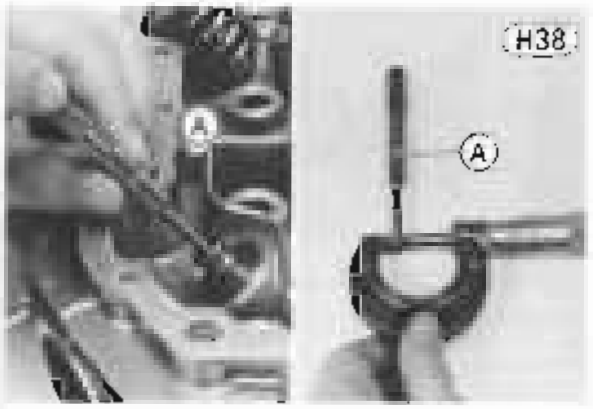


Table H19 Valve Stem Diameter

	Standard	Service Limit
Intake	6.965 ~ 6.980 mm	6.90 mm
Exhaust	6.950 ~ 6.970 mm	6.90 mm

Valve guide inspection

Remove the valve, and measure the inside diameter of the valve guide using a small bore gauge and micrometer. Since the guide wears unevenly, measure the diameter at four places up and down the guide. If any measurement exceeds the service limit, replace the guide.



A. Bore Guage

Table H20 Valve Guide Inside Diameter

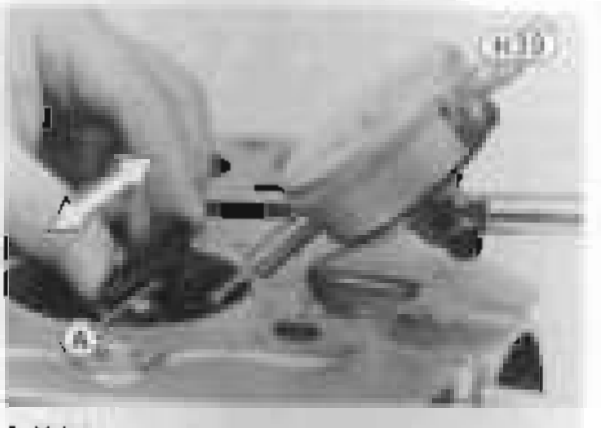
Standard	Service Limit
7.000 ~ 7.015 mm	7.08 mm

If a small bore gauge is not available, inspect the valve guide wear by measuring the valve to valve guide clearance with the wobble method, as indicated below.

Insert a new valve into the guide and set a dial gauge against the stem perpendicular to it as close as possible to the cylinder head mating surface. Move the stem back and forth to measure valve/valve guide clearance. Repeat the measurement in a direction at a right angle to the first.

If the reading exceeds the service limit, replace the guide.

NOTE: The reading is not actual valve/valve guide clearance because the measuring point is above the guide.



A. Valve

Table H21 Valve/Valve Guide Clearance (Wobble Method)

	Standard	Service Limit
Intake	0.053 ~ 0.139 mm	0.26 mm
Exhaust	0.073 ~ 0.159 mm	0.25 mm

Valve seat repair

The valve must seat in the valve seat evenly around the circumference over the specified area. If the seat is too wide, the seating pressure per unit of area is reduced, which may result in compression leakage and carbon accumulation on the seating surface. If the seating area is too narrow, heat transfer from the valve is reduced and the valve will overheat and warp. Uneven seating or seat damage will cause compression leakage.

Valve Seating Width

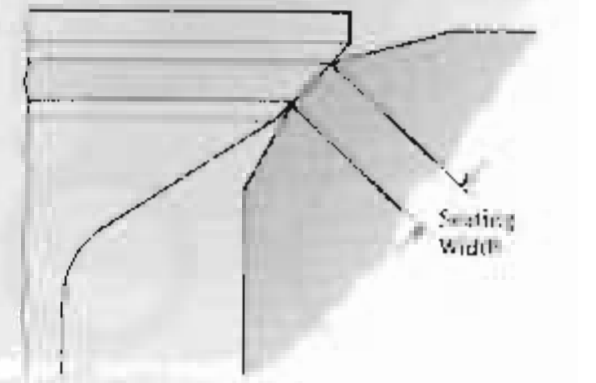
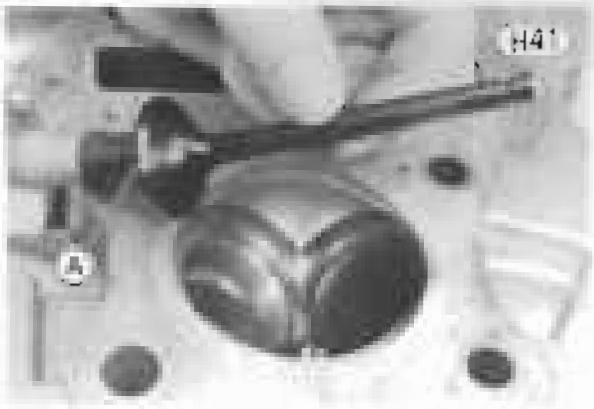


Table H22 Valve Seating Width

Standard
0.5 ~ 1.0 mm

To determine whether or not the valve seat requires repair, first remove the valve, apply machinist's dye to the valve seat, and then use a lapper to tap the valve lightly into place. Remove the valve, and note where the dye adheres to the valve seating surface. The valve seating surface should be in the middle of the valve face (Fig. H40). The distribution of the dye on the seating surface gives an indication of seat condition (Fig. H45). **NOTE:** The valve and valve guide must be in good condition before this check will give an accurate indication of valve seat condition.



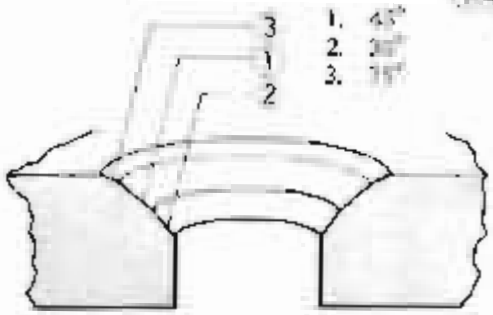
A. Valve Seating Surface

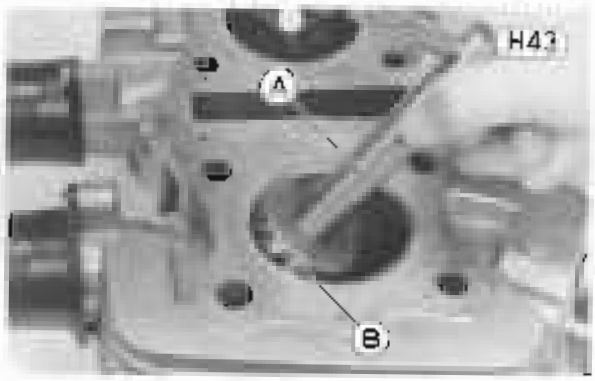
A valve seat which requires repair is cut with a set of valve seat cutters (special tools). Four cutters are required for complete repair: one 30°, one 45°, and two 75° cutters, one for the inlet and the other for the exhaust.

First, cut the seating surface of the valve seat with the 45° cutter. Cut only the amount necessary to make a good surface; overcutting will reduce the valve clearance, possibly making it no longer adjustable.

Next, use the 30° cutter to cut the surface inside the seating surface, and then use the 75° cutter to cut the outermost surface. Cut these two surfaces so that the seating surface will have a specified width.

Cutting Angle of Valve Seat

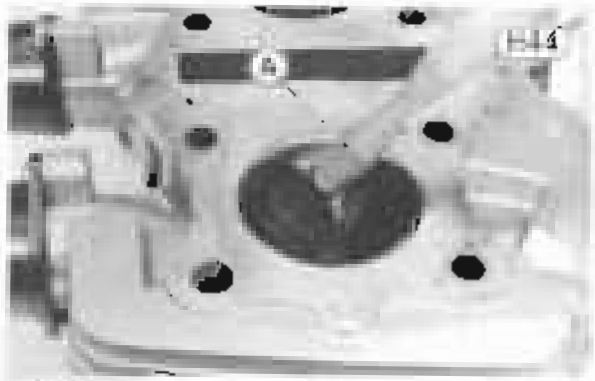




A. Valve Seat Cutter Holder (57001-106)
B. Valve Seat Cutter (57001-101, 102, 360, 361)

After cutting, lap the valve to properly match the valve and valve seat surfaces. Start with coarse lapping compound, and finish with fine compound.

Apply compound to the valve seat, and lap the valve lightly into place while rotating it. Repeat this until a smooth, matched surface is obtained.



A. Lapper

Valve/Valve Seat Contact Area



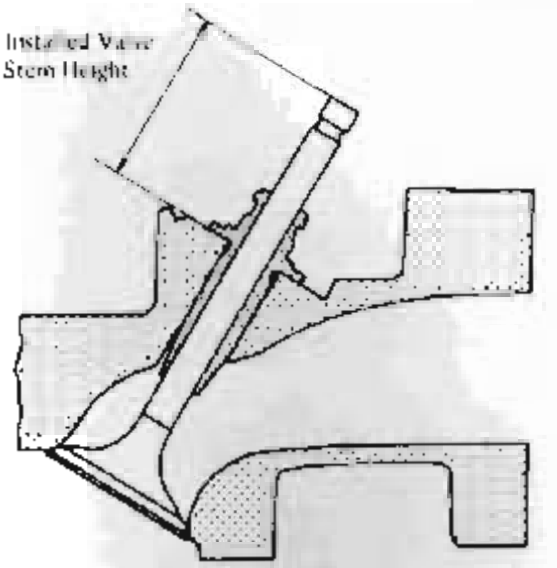
When lapping is completed, be sure to mark each valve so it will be properly matched to its corresponding valve seat during assembly.

The valve clearance adjusting screw, located in the rocker arm, is used to adjust the valve clearance. There is, however, a limit to the amount of adjustment possible turning the adjusting screw. Resurfacing of the valve face and valve seat inevitably drops the valve deeper into the valve seat, allowing the valve stem end to come closer to the adjusting screw. Consequently, the adjusting screw must be turned out to compensate for the reduced valve clearance. If the valve seat, face, and/or stem end are resurfaced, measure the installed valve height from the cylinder head upper surface which the valve guide contacts, with to the end of the valve stem with a vernier caliper before assembling the cylinder head. Refer to Table H23 for the recommended repair.

Over a period of long use and repeated resurfacing, the valve may drop so far into the valve seat that even the adjusting screw cannot give adequate clearance. In this case, it is possible to grind the end of the valve stem to reduce the valve installed height and so gain the needed clearance. [See Caution in Pg. 162].

If the valve drops so far into the valve seat that the installed height becomes quite large, either by a resurfacing error or heavy wear, it may be necessary to replace the valve and remeasure the installed height. If that is not successful, it will be necessary to replace the cylinder head. Replacement valve seats are not available.

Valve Stem Height H46



Valve Springs

When the valve is not being pushed open by the rocker arm, the valve springs press the valve against the seat to prevent compression leakage. An inner spring is used with each outer spring to prevent spring surge,

Table H23 Valve Installed Height

MEASUREMENT	PROBABLE CAUSE	RECOMMENDATION
Less than 36.76 mm	Valve stem previously ground	1. Be sure to leave at least 4.3 mm of stem end above the groove. See Pg. 162. 2. Move valve to deeper cut seat. Remeasure. 3. Grind valve face to drop it farther into seat. Remeasure. 4. Replace valve. Remeasure.
36.77 ~ 37.84 mm	Normal acceptable	
37.85 ~ 38.04 mm	Wear or valve face and seat grounding have dropped valve too far into seat.	1. Move valve to shallower cut seat. Remeasure. 2. Grind 0.2 mm maximum off valve stem. See CAUTION, Pg. 162. Remeasure.
More than 38.05 mm	Valve face or seat worn out or ground excessively.	1. Replace valve. Remeasure. 2. Replace cylinder head. Remeasure.

which may cause valve float at high rpm. If the springs weaken or break, compression leakage and valve noise will result, dropping engine power.

Spring tension

Remove the springs, and set them one at a time, on a spring tension testing device. Compress the spring, and read the tension at the test length. If the spring tension at the specified length is weaker than the service limit, replace the spring.

Valve Spring Tension Measurement (H47)

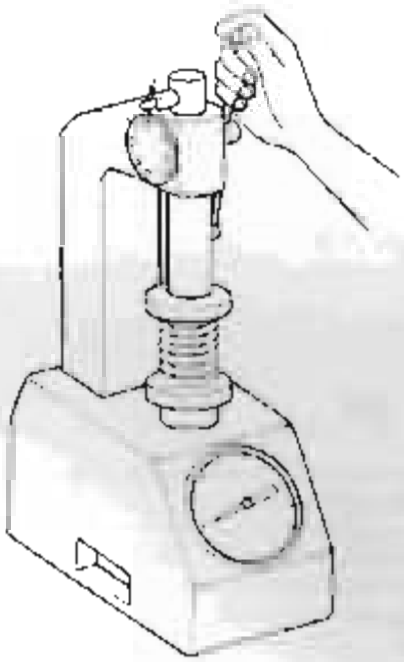


Table H24 Valve Spring Tension

	Length	Standard	Service Limit
Inner	32.2 mm	28.3 ~ 31.3 kg	27.3 kg
Outer	25.7 mm	53.2 ~ 58.8 kg	51.4 kg

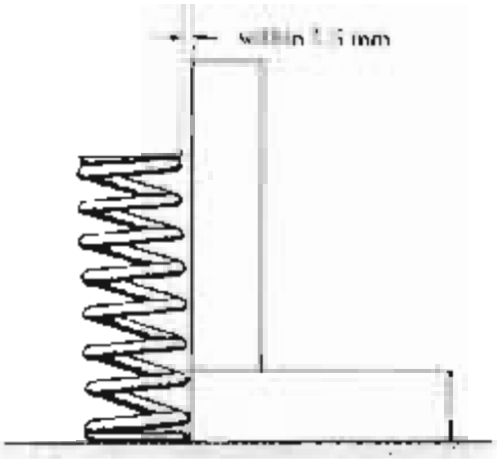
Squareness

Measure the squareness of each spring by standing each end on a surface plate and setting a square against it. Replace any spring for which the distance between the top of the spring and the square is greater than the service limit.

Table H25 Valve Spring Squareness

Standard	Service Limit
under 1.0 mm	1.5 mm

Valve Spring Squareness (H48)



Oil Seals

The oil seal around each valve stem prevents oil from leaking down into the combustion chamber. If an oil seal is damaged or deteriorated, oil consumption will increase, and carbon may build up in the combustion chambers. This may be indicated by white exhaust smoke.

If an oil seal appears damaged or deteriorated or if there is any doubt as to its condition, replace it with a new one.

CYLINDER BLOCK, PISTONS

The cylinder block is subjected to extremely high temperatures. Since excessive heat can seriously distort the shape of a cylinder or cause piston seizure, the cylinder block is made of aluminum alloy for good heat conduction and the outside is formed to increase the heat-radiating surface for better cooling efficiency. To minimize distortion from heat and to maximize durability, a wear resistant iron sleeve is cold-pressed into each cylinder.

Each piston is made from an aluminum alloy, which expands and distorts slightly from heat during engine operation. So that the piston will become cylindrical after heat expansion, it is designed such that, when cold, it is tapered in towards the head and is elliptical rather than perfectly round. The piston diameter is made so that there is enough clearance between the piston and cylinder to allow for expansion.

Three rings are fitted into grooves near the top of each piston to straight compression leakage into the crankcase and to stop oil from getting up into the combustion chambers. The top two rings are compression rings, and the bottom ring is an oil ring.

The full floating type of piston pin is used to connect each piston to its connecting rod. The middle part of

the piston pin passes through the small end of the connecting rod, and a snap ring is fitted at each end of the piston pin in a groove to prevent the pin from coming out. Since the pin is the full floating type, a small amount of clearance exists between the piston pin and the piston when the engine is at normal operating temperatures.

Proper inspection and maintenance of the cylinder block and the pistons include checking the compression, removing carbon from the piston heads, piston ring grooves, and cylinder head exhaust ports, and checking for wear and proper clearance during top end overhaul. A worn cylinder, worn piston, or worn or stuck piston rings may cause a loss of compression from gas blowby past the rings. Blowby may result in difficult starting, power loss, excessive fuel consumption, contaminated engine oil, and possibly engine destruction. Oil leakage into the combustion chambers causes carbon to build up on top of the pistons, which may result in preignition, overheating, and detonation. A worn piston pin causes piston slap, which may cause accelerated piston and cylinder wear. It is evidenced by a knocking sound in the engine.

Engine problems may be caused not only by carbon deposits and wear or damage to the engine itself, but also by poor quality fuel or oil, improper oil, improper fuel/air mixture, improper supply of oil, or incorrect ignition timing. Whenever knocking, pinging, piston slap, or other abnormal engine noise is heard, the cause should be determined as soon as possible. Neglect of proper maintenance will result in reduced engine power and may lead to accelerated wear, overheating, detonation, piston seizure, and engine destruction.

Compression measurement

A compression test is useful in determining the condition of the engine. Low compression may be due to cylinder wear, worn piston ring grooves; worn, broken, or sticking piston rings; poor valve seating; cylinder head leaks; or damage to the engine such as piston seizure. Too high compression may be due to carbon build-up on the piston heads and cylinder head. Difference in compression between the cylinders may cause poor running.

Before measuring compression, check that the cylinder head is tightened down to the specified torque (Pg. 37) and that the battery is fully charged. Pg. 218 for KZ400-B), and thoroughly warm up the engine so that engine oil between the pistons and cylinder walls will help seal compression as it does during normal running. While the engine is running, check that there is no gas leakage from around the cylinder head gasket and from the spark plugs.

Stop the engine, remove the spark plugs, and attach the compression gauge (special tool) firmly into one spark plug hole. For KZ400-B, using the starter motor, and for KZ400-C, using the kickstarter several times, turn the engine over with the throttle fully open until the compression gauge stops rising; the compression is the highest reading obtainable. Repeat the measurement for the other cylinder.



A. Compression Gauge (57001-123)

Table H24 Cylinder Compression[1]

Standard	Service Limit
11 kg/cm² (156 psi)	7.7 kg/cm² (109 psi) and less than 1 kg/cm² (14 psi) difference between the cylinder

[1] Engine hot, spark plugs removed, throttle fully opened, cranking the engine with the starter motor (with the kickstarter for KZ400-C).

If cylinder compression is higher than the standard value, check the following.

1. Carbon build-up on the piston head and cylinder head – clean off any carbon on the piston head and cylinder head.
2. Cylinder head gasket, cylinder base gasket – use only the proper gasket for the cylinder head. The use of a gasket of incorrect thickness will change the compression.
3. Valve stem oil seals and piston rings – rapid carbon accumulation in the combustion chambers may be caused by damaged valve stem oil seals and/or damaged piston oil rings. This may be indicated by white exhaust smoke.
4. Cylinder head volume (Pg. 161).

If cylinder compression is lower than the service limit, check the following.

1. Gas leakage around the cylinder head – replace the damaged gasket and check the cylinder head warp (Pg. 161).
2. Condition of the valve seating (Pg. 163).
3. Valve clearance (Pg. 14).
4. Piston/cylinder clearance, piston seizure
5. Piston ring, piston ring groove

Cylinder, piston wear

Since there is a difference in cylinder wear in different directions, take a side-to-side and a front-to-back measurement at each of the 3 locations (total of 6 measurements) shown in Fig. H50. If any of the cylinder inside diameter measurements exceeds the service limit,

the cylinder will have to be bored to oversize and then honed. However, if the amount of boring necessary would make the inside diameter greater than 64.99 mm, the cylinder block must be replaced.

Cylinder Inside Diameter Measurement H50

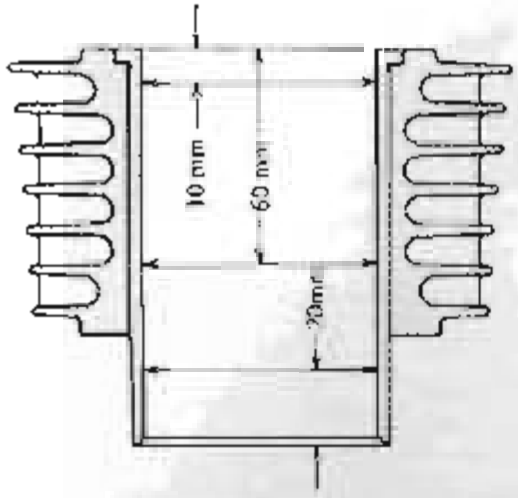


Table H27 Cylinder Inside Diameter

Standard	Service Limit
64.000 ~ 64.012 mm, and less than 0.01 mm difference between any two measurements	64.10 mm, or more than 0.05 mm difference between any two measurements

Measure the outside diameter of each piston 5 mm up from the bottom of the piston at a right angle to the direction of the piston pin. If the measurement is under the service limit, replace the piston.

NOTE: Abnormal wear such as a marked diagonal pattern across the piston skirt may mean a bent connecting rod or crankshaft.

Piston Diameter Measurement H51

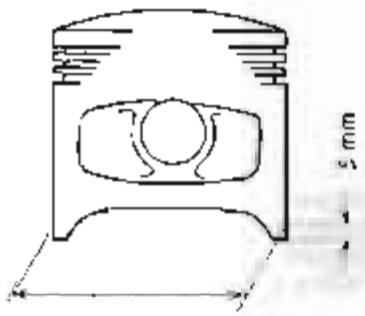


Table H28 Piston Diameter

Standard	Service Limit
63.948 ~ 63.965 mm	63.80 mm

Table H27 applies only to a cylinder that has not been bored to oversize, and Table H28 applies only to the standard size piston. In the case of a rebored cylinder and oversize piston, the service limit for the cylinder is the diameter that the cylinder was bored to plus 0.1 mm and the service limit for the piston is the oversize piston original diameter minus 0.13 mm. If the exact figure for the reamed diameter is unknown, it can be roughly determined by measuring the diameter at the base of the cylinder.

NOTE: Whenever a piston or cylinder block has been replaced with a new one, the motorcycle must be broken in the same as with a new machine.

Piston/cylinder clearance

The piston-to-cylinder clearance is measured whenever a piston or the cylinder block is replaced with a new one, or whenever a cylinder is rebored and an oversize piston installed. The standard piston-to-cylinder clearance must be adhered to whenever the cylinder block is replaced or a cylinder rebored. If only a piston is replaced, the clearance may exceed the standard slightly. But it must not be less than the minimum, in order to avoid piston seizure.

The most accurate way to find the piston clearance is by making separate piston and cylinder diameter measurements and then computing the difference between the two values. Measure the piston diameter as just described, and measure the cylinder diameter at the very bottom of the cylinder.

Table H29 Piston/Cylinder Clearance

Standard
0.037 ~ 0.054 mm

Boring, honing

When boring and honing a cylinder, note the following.

1. Before boring a cylinder, first measure the exact diameter of the oversize piston, and then, in accordance with the standard clearance given in Table H29, determine the diameter of the cylinder.
2. Cylinder inside diameter must not vary more than 0.01 mm at any point.
3. There are two sizes of oversize pistons available: 0.5 mm and 1.0 mm. Oversize pistons require oversize rings.
4. Be wary of measurements taken immediately after boring since the heat affects cylinder diameter.

Piston/cylinder seizure

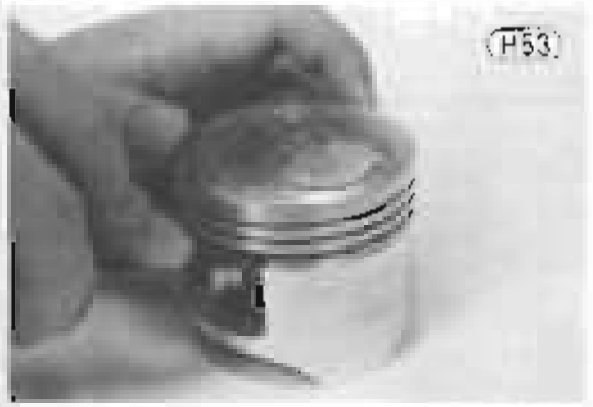
Remove the cylinder block and pistons to check for damage. If there is only slight damage, the piston may be smoothed with #400 emery cloth, and any aluminum deposits removed from the cylinder with either #400 emery cloth or light honing. However, in most cases, the cylinder will have to be bored to oversize and honed, and an oversize piston installed.

Piston Cleaning

Built-up carbon on the piston head reduces the cooling capability of the piston and raises compression, leading to overheating which could possibly even melt the top of the piston. To decarbonize the piston head, remove the piston (Pg. 59), scrape off the carbon, and then lightly polish the piston with fine emery cloth.



Carbon accumulated in the piston ring grooves can cause the rings to stick. Remove the rings, and clean out any carbon deposits using an end of a broken piston ring or some other suitable tool.



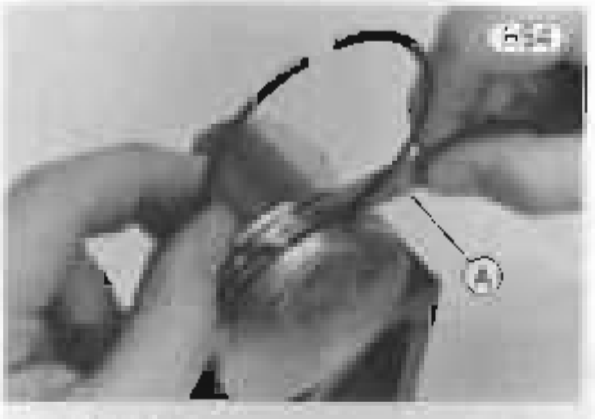
CAUTION

1. When removing carbon, take ample care not to scratch the side of the piston, or the piston ring grooves.
2. Never clean the piston heads with the engine assembled. If the carbon is scraped from the piston heads with the cylinder left in place, carbon particles will unavoidably drop between the pistons and cylinder walls onto the rings and eventually find their way into the crank chamber. Carbon particles, which are very abrasive, drastically shorten the life of the rings, pistons, cylinders, crankshaft bearings, and oil seals.

Piston ring, piston ring groove wear

Visually inspect the piston rings and the piston ring grooves. If the rings are worn unevenly or damaged, they must be replaced. If the piston ring grooves are worn unevenly or damaged, the piston must be replaced and fitted with new rings.

With the piston rings in their grooves, make several measurements with a thickness gauge to determine piston ring/groove clearance. If the clearance exceeds the service limit, measure the thickness of the piston rings and the width of the ring grooves. If the ring has worn down to less than the service limit, replace the ring; if the groove width exceeds the service limit, replace the piston.



A. Thickness Gauge

Table H30 Piston Ring/Groove Clearance

	Standard	Service Limit
Top	0.040 ~ 0.080 mm	0.15 mm
2nd	0.010 ~ 0.045 mm	0.14 mm
Oil	0.020 ~ 0.055 mm	0.15 mm

Table H31 Piston Ring Thickness

	Standard	Service Limit
Top Ring	1.170 ~ 1.190 mm	1.10 mm
2nd Ring	1.475 ~ 1.490 mm	1.40 mm
Oil Ring	2.475 ~ 2.490 mm	2.40 mm

Table H32 Piston Ring Groove Width

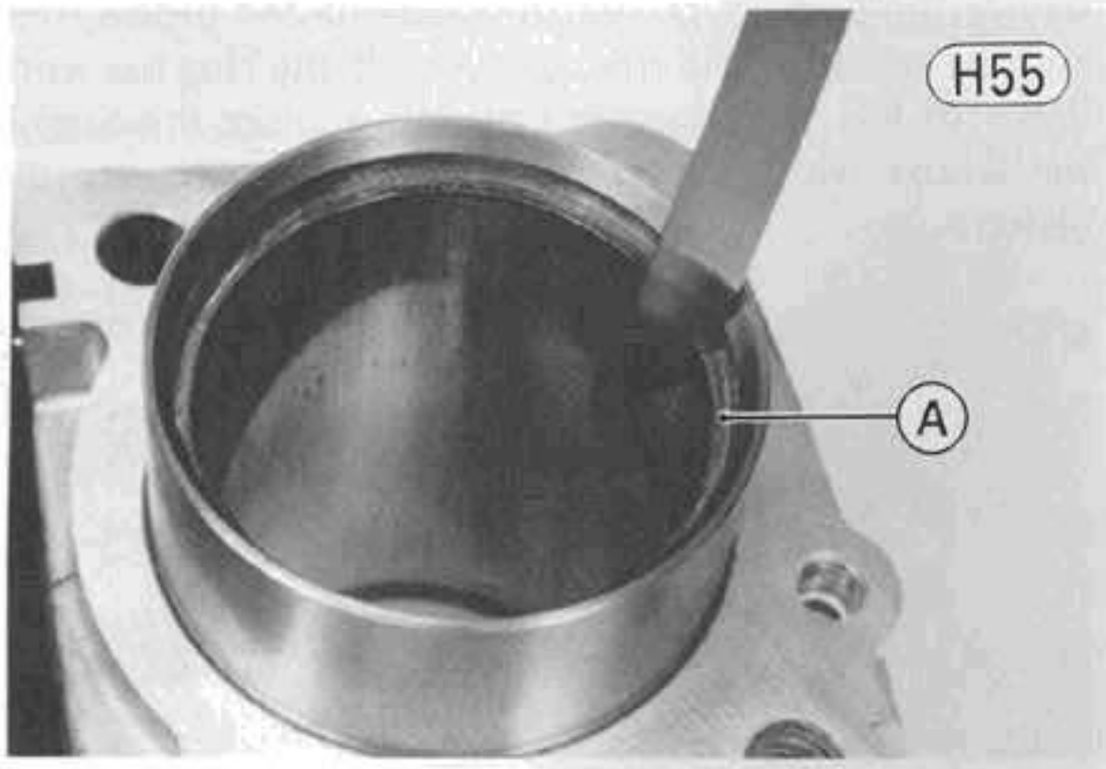
	Standard	Service Limit
Top Ring	1.23 ~ 1.25 mm	1.33 mm
2nd Ring	1.50 ~ 1.52 mm	1.60 mm
Oil Ring	2.51 ~ 2.53 mm	2.61 mm

When new rings are being fitted into a used piston, check for uneven groove wear by inspecting the ring seating. The rings should fit perfectly parallel to the groove surfaces. If not, the piston must be replaced.

Piston ring end gap

Place the piston ring inside the cylinder, using the piston to locate the ring squarely in place. Set it close to the bottom of the cylinder, where cylinder wear is low. Measure the gap between the ends of the ring

with a thickness gauge. If the gap is wider than the service limit, the ring is overworn and must be replaced.



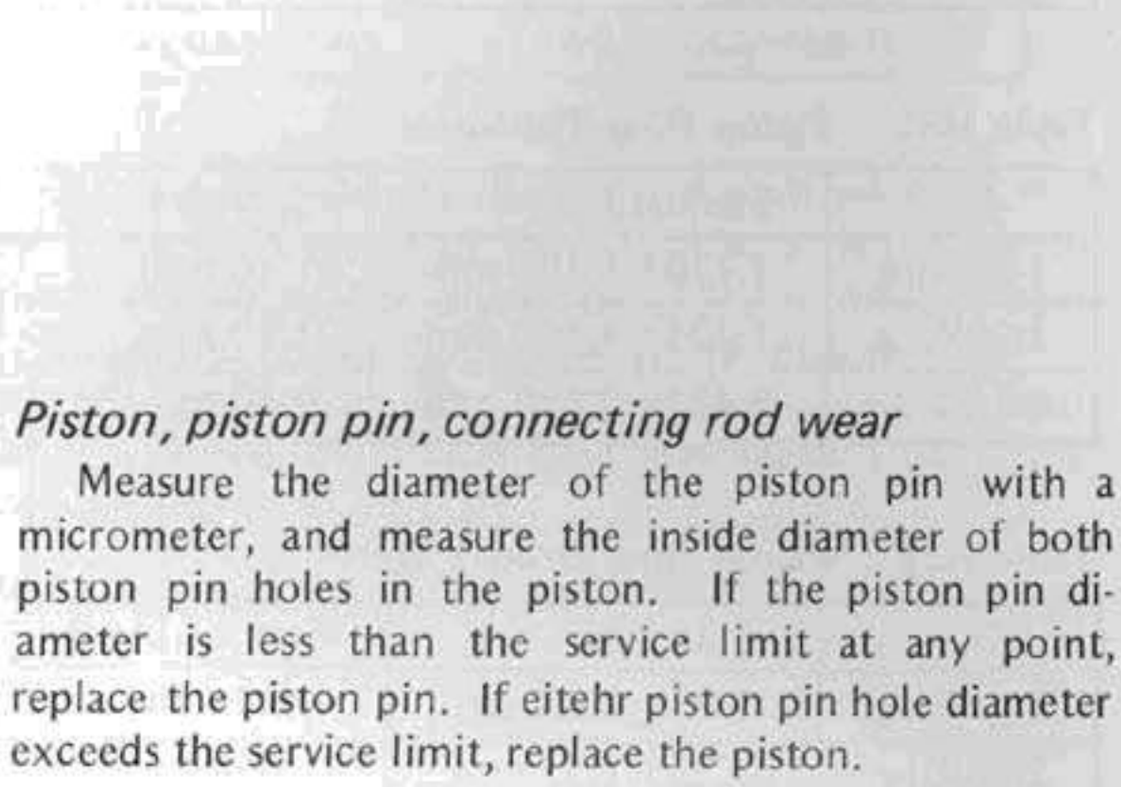
A. Piston Ring

Table H33 Ring End Gap

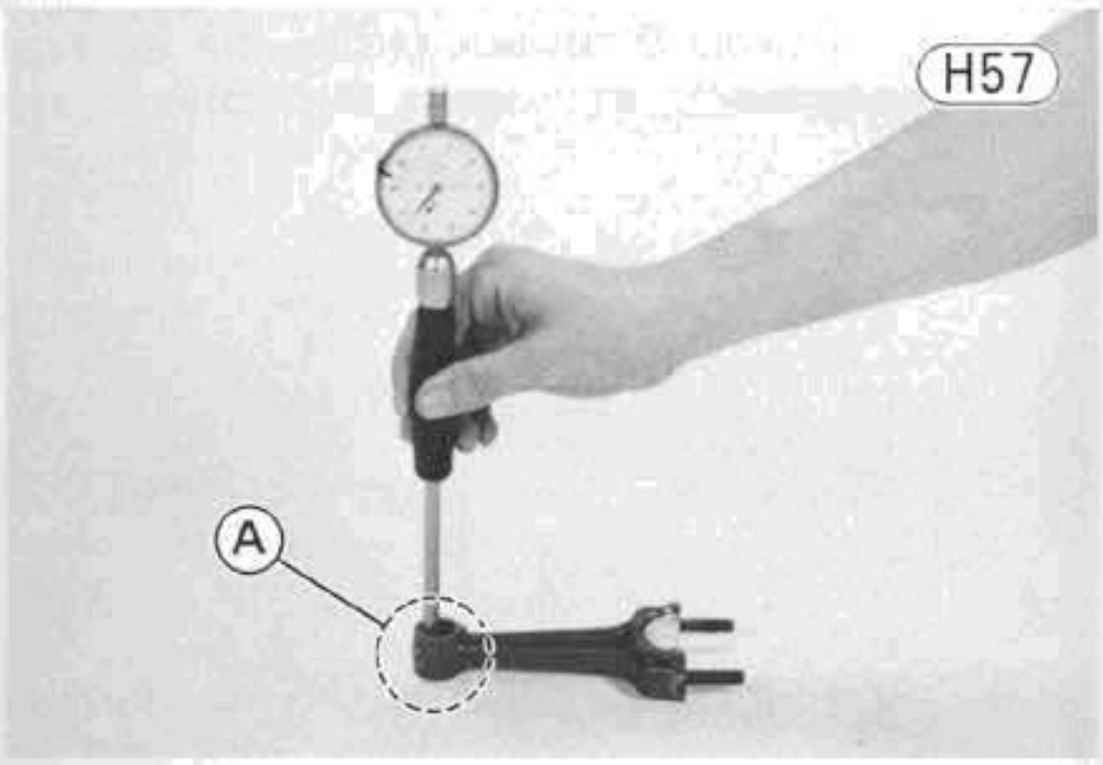
Standard	Service Limit
0.20~0.40 mm	0.7 mm

Piston, piston pin, connecting rod wear

Measure the diameter of the piston pin with a micrometer, and measure the inside diameter of both piston pin holes in the piston. If the piston pin diameter is less than the service limit at any point, replace the piston pin. If eitehr piston pin hole diameter exceeds the service limit, replace the piston.



Measure the inside diameter of the connecting rod small end. If the diameter exceeds the service limit, replace the connecting rod.



A. Connecting Rod Small End

Table H35 Piston Pin, Piston Pin Hole, Small End Diameter

	Standard	Service Limit
Piston Pin	14.994~14.998 mm	14.96 mm
Pin Hole	15.004~15.009 mm	15.08 mm
Small End	15.003~15.014 mm	15.05 mm

NOTE: When a new piston or pin is used, also check that piston-to-pin clearance is 0.006~0.015 mm, and that pin to small end clearance is within 0.005~0.020 mm.

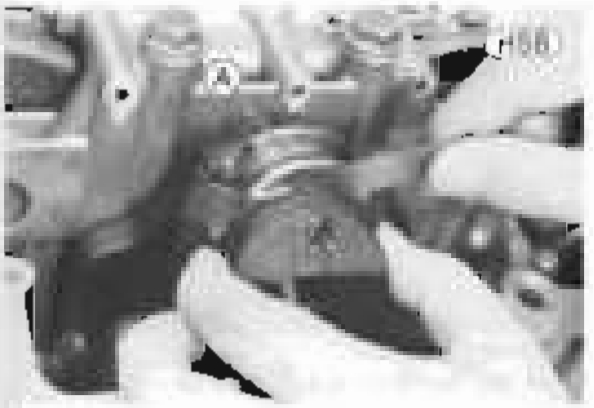
CRANKSHAFT, CONNECTING RODS

The crankshaft changes the reciprocating motion of the pistons into rotating motion, which is transmitted to the rear wheel when the clutch is engaged. The connecting rods connect the pistons to the crankshaft. Crankshaft or connecting rod trouble, such as worn crankshaft journals or a bent connecting rod, will multiply the stress caused by the intermittent force on the pistons. This results in not only rapid crankshaft bearing wear, but also noise, power loss, vibration, and shortened engine life. A defective crankshaft or connecting rod should always be detected at an early stage and then replaced immediately.

The following explanation concerns the most common crankshaft and connecting rod problems, giving the procedure for detecting damage and measuring wear and runout.

Connecting rod side clearance

Measure the side clearance of the connecting rod with a thickness gauge as shown. Replace the crankshaft and the connecting rod if the clearance exceeds the service limit.



A. Big End

Table H36 Connecting Rod Big End Side Clearance

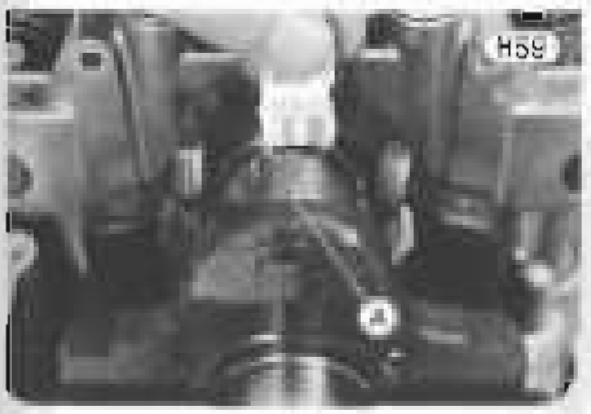
Standard	Service Limit
0.15 ~ 0.25 mm	0.5 mm

Connecting rod bearing insert/journal wear

Bearing insert wear is measured using a plastigage (press gauge), which is inserted into the clearance to be measured. The plastigage indicates the clearance by the amount it is compressed and widened when the parts are assembled.

Split the crankcase and remove the connecting rod big end caps. Cut strips of plastigauge to bearing insert width. Place a strip on the connecting rod big end journal for each connecting rod parallel to the crankshaft so that plastigauge will be compressed between the bearing insert and the connecting rod journal. Install the connecting rod big end cap, tightening the nuts to the specified torque (Pg. 37).

Remove the connecting rod big end cap, and measure the plastigauge width to determine the bearing insert/journal wear.



A. Plastigauge

Table H37 Connecting Rod Bearing Insert/Journal Clearance

Standard	Service Limit
0.040 ~ 0.069 mm	0.1 mm

If the clearance exceeds the service limit, replace the bearing inserts as follows:

1. With a micrometer, measure the diameter of the crankshaft journals on which the connecting rods fit. Mark each flywheel in accordance with the journal diameter (Table H38).

If the measurement is less than the service limit, replace the crankshaft.

If the measurement is less than the standard value, but is not under the service limit, use bearing inserts painted green.

NOTE: Any mark already on the flywheel should not be referred to during servicing.



Table H38 Connecting Rod Journal Diameter

Marking	Standard	Service Limit
No mark	34.984 ~ 34.994 mm	34.97 mm
○	34.995 ~ 35.000 mm	

2. Put the connecting rod big end caps on the rods and tighten the nuts to the specified torque (Pg. 37). Measure the inside diameter, and mark each connecting rod big end in accordance with the inside diameter (Table H39).

NOTE: The mark already on the big end should almost coincide with the measurement.

Table H39 Connecting Rod Big End Diameter

Marking	Standard
No mark	38.000 ~ 38.008 mm
○	38.009 ~ 38.016 mm

3. Select the proper bearing insert in accordance with the combination of the connecting rod and crankshaft coding.

Table H40 Bearing Insert Selection

Crank-shaft Marking \ Con-Rod Marking	○	No mark
○	Black PN 13034-051	Brown PN 13034-052
No mark	Green PN 13034-050	Black PN 13034-051

Table H41 Bearing Insert Thickness

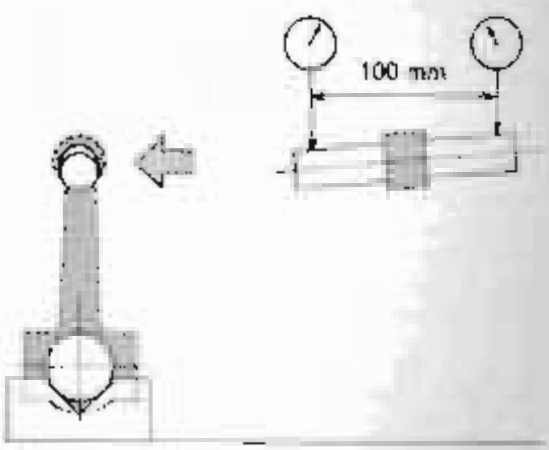
Color	Thickness
Green	1.485 ~ 1.490 mm
Black	1.480 ~ 1.485 mm
Brown	1.475 ~ 1.480 mm

Connecting rod bend, twist

Remove the connecting rod big end bearing inserts and install the connecting rod big end cap. Select an arbor of the same diameter as the connecting rod big end and of optional length, and insert it through the big end of the connecting rod. Select an arbor of the same diameter as the piston pin and of optional length, and insert it through the small end of the connecting rod.

On a surface plate, set the big-end arbor on V blocks so that the connecting rod is perpendicular to the surface plate. Using a height gauge or dial gauge, measure the difference in the height of the small-end arbor above the surface plate over a 100 mm length to determine the amount the connecting rod is bent. If the measurement exceeds the service limit, replace the connecting rod.

Connecting Rod Bend Measurement (H61)



Swing the connecting rod 90° to one side and support it parallel to the surface plate as shown in Fig. H62. Measure the difference in the height of the small end arbor above the surface plate over a 100 mm length to determine the amount the connecting rod is twisted.

If the measurement exceeds the service limit replace the connecting rod.

Connecting Rod Twist Measurement (H62)

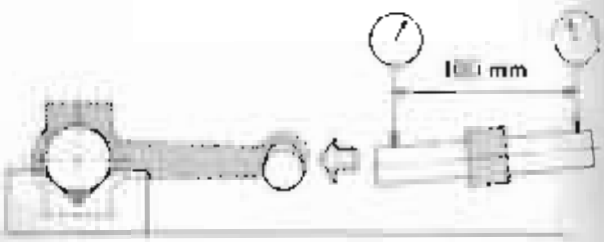


Table H42 Connecting Rod Bend, Twist/100 mm

	Standard	Service Limit
Bend	under 0.10 mm	0.2 mm
Twist	under 0.15 mm	0.2 mm

Crankshaft runout

Set the crankshaft in a flywheel alignment jig or on V blocks, and place a dial gauge against each crankshaft journal. Turn the crankshaft slowly. The maximum difference in gauge readings is the crankshaft runout. If the runout exceeds the service limit, replace the crankshaft.

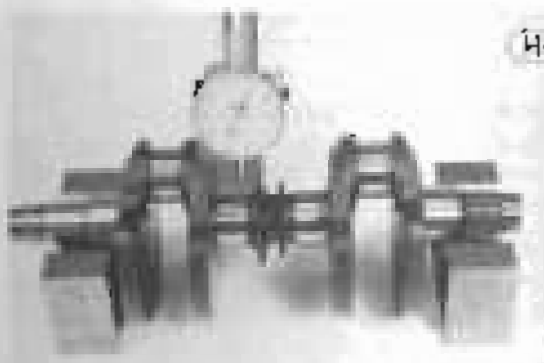


Table H43 Crankshaft Runout

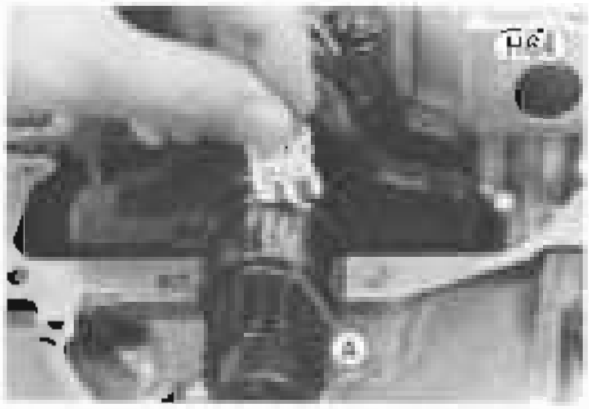
Standard	Service Limit
under 0.02 mm	0.05 mm

Crankshaft bearing insert/journal wear

Split the crankcase, remove the main bearing cap, and clean off the mating surfaces of the crankcase halves and main bearing cap. Cut strips of plastigage to bearing insert width. Place a strip on each journal parallel to the crankshaft so the plastigage will be compressed between the bearing insert and the crankshaft journal. Install the main bearing cap without turning the crankshaft, tighten the bolts in the correct sequence to the specified amount of torque (Pg. 37) install the lower crankcase half without turning the crankshaft, and tighten the bolts in the correct sequence to the specified amount of torque (Pg. 37).

Remove the lower crankcase half and main bearing cap (making sure that the crankshaft does not turn at any time), and measure the plastigage width to determine the bearing insert/journal wear. If any clearance

exceeds the service limit, replace all bearing inserts (S), and check the crankshaft journals.



A. Plastigauge

Table H44 Crankshaft Bearing Insert/Journal Clearance

Standard	Service Limit
0.031 ~ 0.075 mm	0.11 mm

Measure the journals which wear on these bearing inserts. If the micrometer reading is less than the service limit, replace the crankshaft.

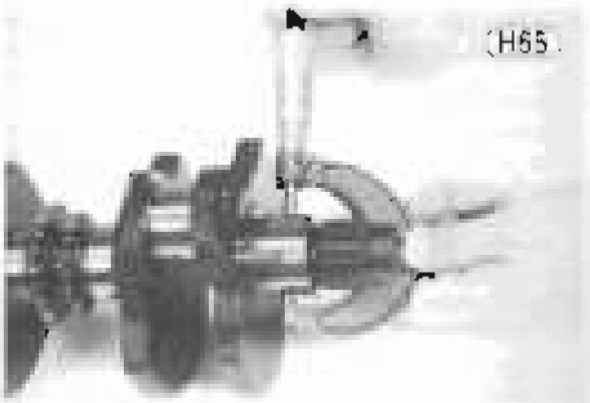


Table H45 Crankshaft Journal Diameter

Standard	Service Limit
35.984 ~ 36.000 mm	35.96 mm

Crankshaft side clearance

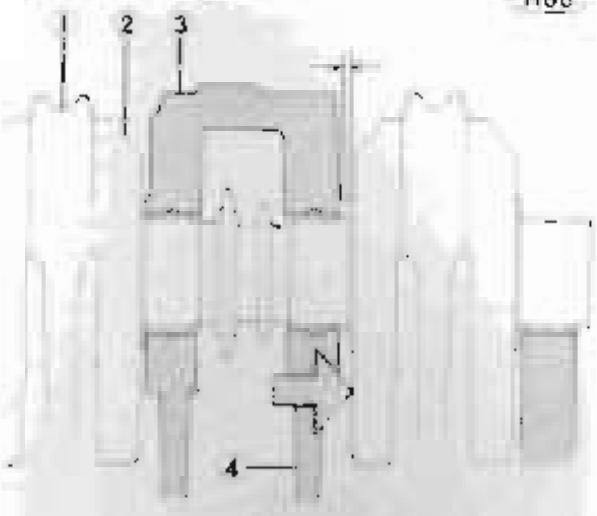
Measure the crankshaft side clearance with a thickness gauge as shown. Replace the crankcase halves as a set, if the clearance exceeds the service limit.

Table H46 Crankshaft Side Clearance

Standard	Service Limit
0.20 ~ 0.35 mm	0.45 mm

NOTE: The upper crankcase half, lower crankcase half, and main bearing cap are machined at the factory in the assembled state, so they must be replaced as a set.

Crankshaft Side Clearance H66



1. Connecting Rod
2. Crankshaft
3. Main Bearing Cap
4. Crankcase

Oil passage cleaning

There are oil passages running between the crankshaft journals. Use compressed air to remove any foreign particles or residue that may have accumulated in these passages.

BALANCER MECHANISM

The balancer mechanism basically consists of two weights which are chain-driven by the crankshaft. The following explanation covers how this mechanism reduces vibration.

The vibration of a 4-stroke, 2-cylinder engine is generally greater with larger engine displacement. This up-and-down vibration is natural due to the mechanics of a reciprocating engine, but the proper addition of counterweights on the crankshaft can reduce this vibration. However, troublesome revolving vibration remains unless some additional measure is taken.

Fig. H67 shows the internal engine forces when the centrifugal force of the counterweights is one half the inertial force of the pistons. The arrows show the amount and direction of these forces.

As the crankshaft rotates clockwise, A ~ E in Fig. H67, one half of the inertial force of the pistons is negated by the vertical component of the centrifugal force of the counterweights. However, the horizontal component of the centrifugal force of the counterweights (brought about by having counterweights) is not negated by anything. The thick arrows indicate the resulting unbalanced force, which is the main cause of engine revolving vibration.

The balancer mechanism includes two balancing weights having one half the centrifugal force of the counterweights. A balancing weight is installed at an equal distance on each side of the crankshaft and chain driven in the opposite direction of crankshaft rotation.

Vibration Reduction with Crankshaft (H67)

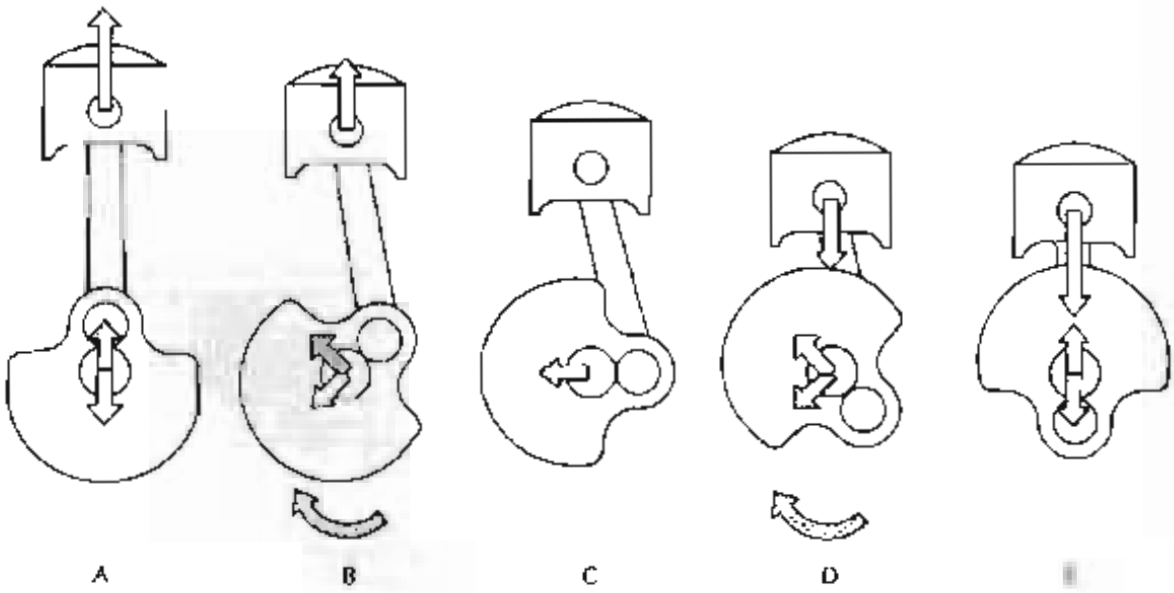
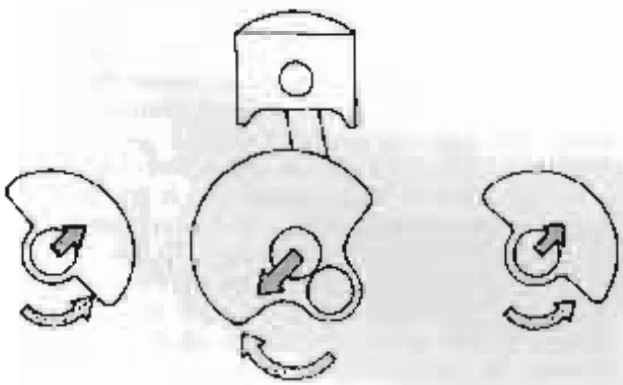


Fig. H68 shows how this mechanism works at one crankshaft position (D). The centrifugal force of the balancer weights exerts a pull on the engine to the upper right as the arrows in the figure show. At the same time the crankshaft counterweights are exerting a pull on the engine to the lower left. The centrifugal force of the two balancer weights equals the unbalanced force of the crankshaft counterweights, but the forces cancel each other since the directions of these forces are opposite. With the forces cancelled, engine vibration is greatly reduced. At other crankshaft positions, these two forces are also equal and opposing such that they cancel each other, keeping the system always in balance.

Balancer Mechanism (H68)



The balancer weights, turning at the same rpm as the crankshaft, are chain driven by a sprocket on the crankshaft. The balancer chain is an endless type for maximum durability and wears very slowly due to its ample lubrication. The chain drives the weights through a sprocket on each balancer shaft. Each sprocket has four springs wedged between the sprocket and the weights to protect the sprocket and chain from the shock of power impulses. In the center of each spring is a pin, which prevents damage to the spring from excessive compression.

If balancer mechanism trouble develops, such as excessive shaft or chain wear, not only are the bearings and crankcase parts affected but the resulting power loss and engine vibration may adversely affect performance and overall engine life.

Balancer shaft, main bearing cap wear

Measure the diameter of each balancer shaft where it rests on the main bearing cap. If the balancer shaft diameter is less than the service limit at any point, replace the shaft with a new one.

Measure the inside diameter of each balancer shaft hole in the main bearing cap. If any balancer shaft hole diameter exceeds the service limit, replace the main bearing cap and crankcase halves as a set.

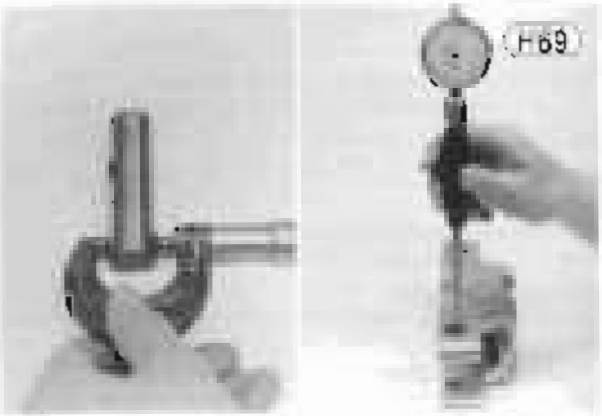


Table H47 Balancer Shaft, Hole Diameter

	Standard	Service Limit
Balancer Shaft	19.967 – 19.980 mm	19.93 mm
Hole	20.000 – 20.030 mm	20.08 mm

Spring free length

Measure the free length of each spring with vernier calipers. Replace any spring which is shorter than the service limit.

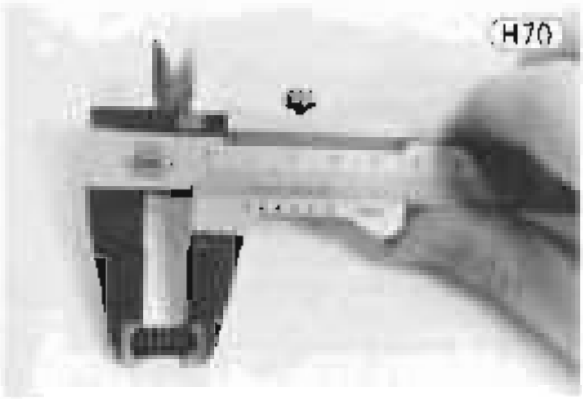


Table H48 Balancer Spring Free Length

Standard	Service Limit
9.8 ~ 10.4 mm	9.3 mm

Chain wear

Remove the chain, hold it taut with a force of about 5 kg in some manner such as the one shown in Fig. H26, and measure a 20-link length. Since the chain may wear unevenly, take measurements at several places. If any measurement exceeds the service limit, replace the chain.

Table H49 Balancer Chain 20-link Length

Standard	Service Limit
160.6 ~ 160.8 mm	162.4 mm

When replacing a chain with a new one, inspect all the sprockets. If either of the balancer mechanism sprockets is damaged or overly worn, replace it with a new one. If the crankshaft sprocket is damaged or overly worn, replace the crankshaft with a new one.

NOTE: If the crankshaft is replaced, select the right bearing insert in accordance with the combination of the connecting rod and the crankshaft marks (Fig. 103).

Chain guide wear

Visually inspect the rubber part of each chain guide. If it is worn down or damaged, replace the guide.

Measure the depth of the grooves where the chain links run (Fig. H27). If wear exceeds the service limit, replace the guide.

Table H50 Balancer Chain Guide Wear

	Service Limit
Upper	1 mm
Lower	1.5 mm

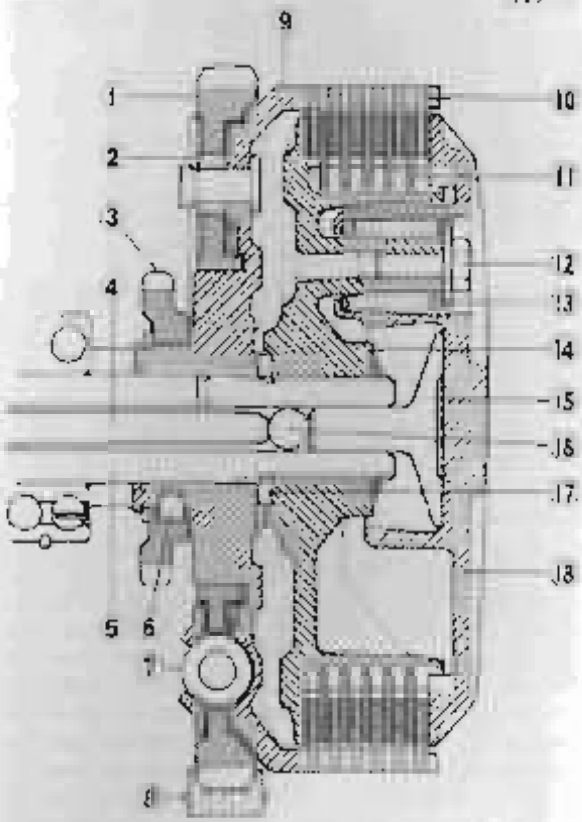
CLUTCH

Fig. H71 shows the construction of the clutch, which is a wet, multi-plate type with 6 friction plates 10 and 5 steel plates 11. The friction plates are made of cork, used for its high coefficient of friction, bonded on a steel core, which provides durability and warp resistance. The clutch housing 9 has a reduction sprocket on one side and contains springs 7 to absorb shock from the drive train.

The clutch release mechanism is shown in Fig. H72. When the clutch release lever 6 turns, the lever rides on the steel balls 4, and pushes the push rod 9 toward the clutch. The clutch adjusting screw 2, assembled to the steel ball raise plate 3, is installed in the engine sprocket cover.

Clutch

H71



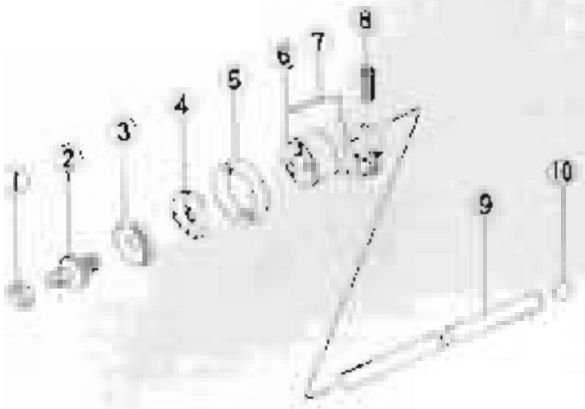
1. Clutch Housing Sprocket
2. Collar
3. Oil Pump Drive Gear
4. Push Rod
5. Drive Shaft
6. Knock Pin
7. Shock Damper Spring
8. Primary Chain
9. Clutch Housing
10. Friction Plate
11. Steel Plate
12. Bolt
13. Spring
14. Clutch Hub
15. Spring Plate Pusher
16. Steel Ball
17. Washer
18. Spring Plate

The friction plates are keyed to the clutch housing by tangs on the outer circumference of each plate. Since the clutch housing is chain driven directly from the crankshaft, these plates are always turning any time the

engine is running. The steel plates have a toothed inner circumference and mesh with the splines in the clutch hub. The hub is mounted on the drive shaft, so that the drive shaft and steel plates always turn together.

One end of each clutch spring forces against its bolts, which is threaded into the clutch hub. The other end forces against the spring plate. When the clutch is left engaged, the springs force the spring plate, friction plates, steel plates, and clutch hub tightly together so that the friction plates will drive the steel plates and transmit power to the transmission drive shaft.

Clutch Release Mechanism (H72)



1. Locknut
2. Adjusting Screw
3. Ball Ramp Plate
4. Ball Assembly
5. Grease Seal
6. Release Lever
7. Cotter Pin
8. Spring
9. Push Rod
10. Steel Ball

When the clutch lever is pulled to release (disengage) the clutch, the clutch cable turns the clutch release lever, pushing the clutch push rod towards the clutch. The clutch push rod pushes the steel ball (4), which pushes the clutch spring plate (3) through the spring plate washer (5). Since the spring plate moves the same distance that the push rod moves and the clutch hub remains stationary, the spring pressure is taken off the clutch plates. Because the plates are no longer pressed together, the power transmission from the crankshaft to the transmission drive shaft is interrupted. However, as the clutch lever is released, the clutch springs return the spring plate and once again force the spring plate, plate assembly, and clutch hub tightly together.

A clutch that does not properly disengage will cause shifting difficulty and possible transmission damage. On the other hand, a slipping clutch will reduce power transmission efficiency and may overheat and burn out. A clutch that does not properly disengage may be caused by:

1. Excessive clutch lever play
2. Clutch plates that are warped or too rough
3. Uneven clutch spring tension
4. Deteriorated engine oil
5. Engine oil viscosity too high
6. Engine oil level too high
7. The clutch housing frozen on the drive shaft
8. A defective clutch release mechanism
9. An unevenly worn clutch hub or housing
10. Missing parts

A slipping clutch may be caused by:

1. No clutch lever play
2. Worn friction plates
3. Weak clutch springs
4. The clutch cable not sliding smoothly
5. A defective clutch release mechanism
6. An unevenly worn clutch hub or housing

Clutch noise may be caused by:

1. Excessively worn primary chain and sprockets
2. Damaged sprocket teeth
3. Too much clearance between the friction plate tangs and the clutch housing
4. Weak or damaged damper spring(s)

Spring tension

Remove the clutch springs, and set them, one at a time, on a spring tension testing device (Fig. H47). Compress the spring, and read the tension at the test length. If the spring tension at the specified length is weaker than the service limit, replace the spring.

Table H51 Clutch Spring Tension

Length	Standard	Service Limit
23.5 mm	23.5 ~ 26.5 kg	21.8 kg

Friction plate wear, damage

Visually inspect the friction plates to see whether or not they show any signs of seizure, overheating, or uneven wear. Measure the thickness of the plates with vernier calipers.

If any plates show signs of damage, or if they have worn past the service limit, replace them with new ones.

Friction Plate Measurement (H73)

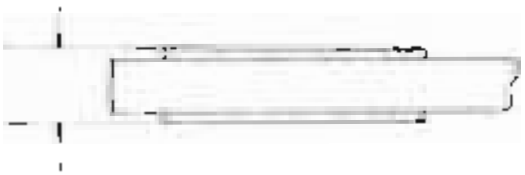


Table H52 Friction Plate Thickness

Standard	Service Limit
2.9 ~ 3.1 mm	2.7 mm

Clutch plate warp

Place each clutch plate on a surface plate, and measure the gap between each clutch plate and the surface plate. This gap is the amount of clutch plate warp. Replace any plates warped over the service limit.

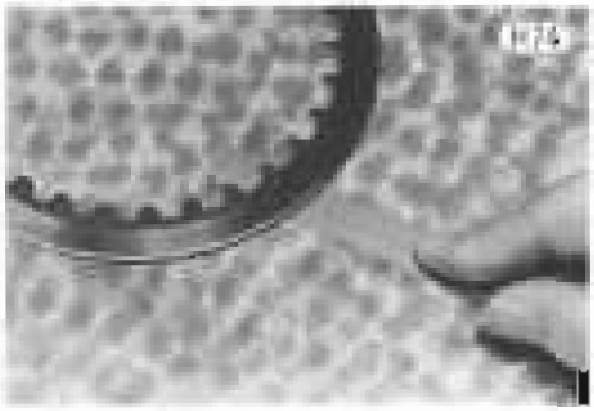


Table H53 Clutch Plate Warp

Standard	Service Limit
under 0.2 mm	0.4 mm

Friction plate/clutch housing clearance

Measure the clearance between the tangs on the friction plates and the fingers of the clutch housing. If this clearance is excessive, the clutch will be noisy.

If the clearance exceeds the service limit, replace the friction plates. Also, replace the clutch housing if it is unevenly or badly worn where the friction plates wear against it.

Friction Plate/Clutch Housing Clearance H75

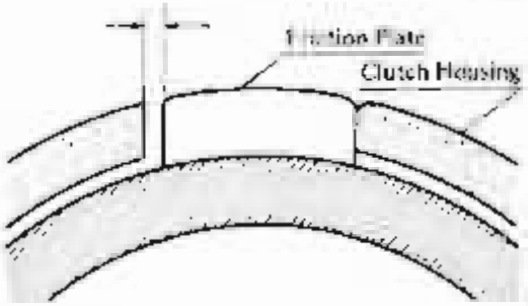


Table H54 Friction Plate/Clutch Housing Clearance

Standard	Service Limit
0.05~0.40 mm	0.70 mm

Inspect the fingers of the housing where the tangs of the friction plates hit them. If they are badly worn or if there are grooves cut where the tangs hit, replace the clutch housing.

Clutch housing sprocket damage

Inspect the teeth on the clutch sprocket. Any light damage can be corrected with an oilstone, but the clutch housing must be replaced if the teeth are badly damaged. Damaged teeth on the clutch housing sprocket indicate that the primary chain, by which it is driven, may also be damaged. At the same time that the clutch housing sprocket is repaired or replaced, the primary chain should be inspected, and then replaced if necessary.



A. Oilstone

Clutch housing/drive shaft wear

Measure the inside diameter of the clutch housing with the cylinder gauge. Replace the clutch housing if the diameter exceeds the service limit. Measure the diameter of the drive shaft at the clutch housing with the micrometer. Replace the drive shaft if the diameter is less than the service limit.

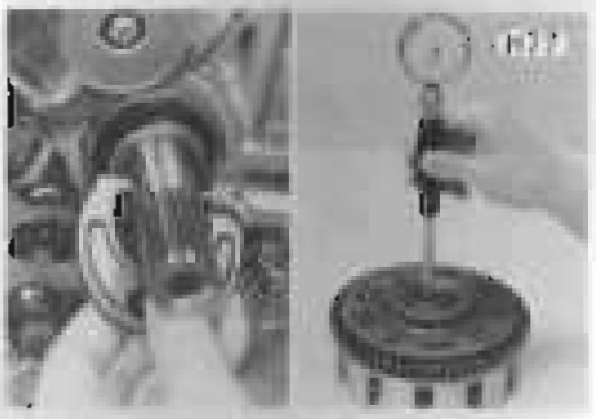


Table H55 Clutch Housing, Drive Shaft Diameter

	Standard	Service Limit
Housing I.D.	25.000~25.021 mm	25.05 mm
Shaft O.D.	24.959~24.980 mm	24.94 mm

Clutch hub damage

Inspect where the teeth on the steel plates wear against the splines of the clutch hub. If there are notches worn into the splines, replace the clutch hub.

Clutch release mechanism wear

Visually inspect the clutch release lever, balls, and ball ramp for damage or excessive wear. If there is any damage or excessive wear, replace the clutch release lever, balls, and ball ramp as a set.

Lubrication

Lubricate the clutch release lever, balls, and ball ramp with grease.

PRIMARY CHAIN

The power transmission from the crankshaft to the drive shaft is chain-drive, utilizing a Hy-Vo (high velocity) chain. The Hy-Vo chain is a rocker-joint type with a pin and rocker construction. Some of the special features of the Hy-Vo chain are its capacity to transmit much power at high speed, its resistance to heat seizure due to a construction which employs rolling, rather than sliding friction, quiet operation even at high rpm, and low power loss.

Wear

A primary chain which has worn so that it is 1.6% or more longer than when new is no longer safe for use and should be replaced. To inspect the chain wear by measuring the chain slack, remove the right engine cover (Fig. 71). Measure the chain slack, and replace the chain if it has worn past the service limit. The replacement chain must be a Tsubakimoto Hy-Vo 338P-L/DR, 74 link chain.

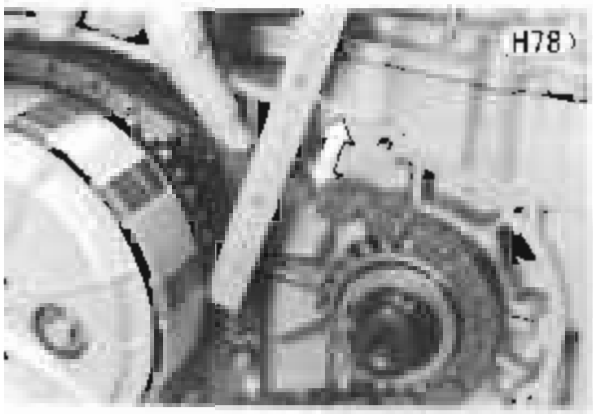
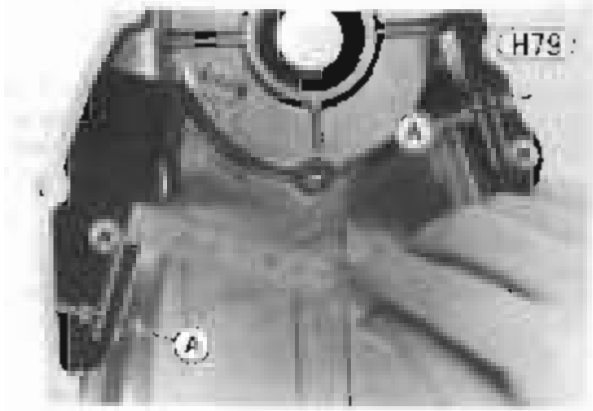


Table H56 Primary Chain Play

Service Limit
30 mm

When a new chain is installed, check the chain guides, and replace them with new ones if necessary.



A. Thickness

Table H57 Primary Chain Guide Thickness

	Standard	Service Limit
Upper	4.5 mm	3 mm
Lower	6.0 mm	2 mm

TRANSMISSION

For KZ400-B, the transmission is a 6-speed, constant mesh, return shift type. Its cross section is shown in Fig. H84, and the external shift mechanism is shown in Fig. H86. For simplicity, the drive shaft gears in the following explanation are referred to as "D" (e.g., D1= drive shaft 1st gear) and the output shaft gear as "O".

Gears D3/4, O5, and O6 are all splined to, and thus rotate with their shafts. During gear changes, these gears are moved sideways on their shafts by the three shift forks, one for each of them. Gears D5, D6, O1, O2, O3, and O4 rotate free of shaft rotation, but cannot move sideways. Gears D1 and D2 rotate with the shaft and are unable to move sideways.

For KZ400-C, the transmission is a 5-speed, constant mesh, return shift type. Its cross section is shown in Fig. H85.

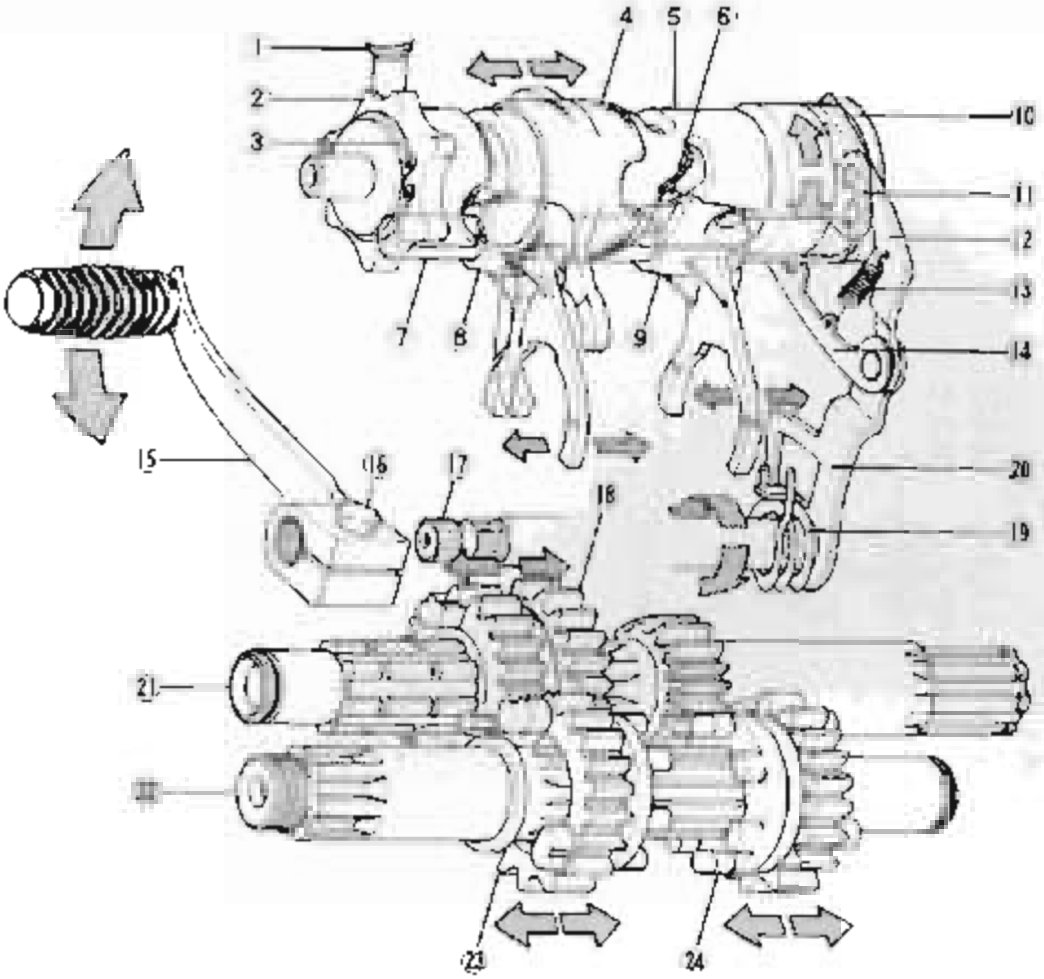
Gears D3, D4, and O5 are all splined to, and thus rotate with their shafts. During gear changes, these gears are moved sideways on their shafts by the three shift forks, one for each of them. Gears D4, D5, O1, O2, and O3 rotate free of shaft rotation, but cannot move sideways. Gears D1 and D2 rotate with the shaft and are unable to move sideways.

Shift Mechanism

When the shift pedal is raised or lowered, the shift shaft turns, a pawl on the external shift mechanism arm operates on one of the shift drum pins, and the shift drum turns. At the same time, the overshift limiter on the shift lever engages another pin as shown in Fig. H81. As the shift drum turns, the shift fork guide pins (Fig. H81) each riding in a groove in the shift drum, change the position of one or another of the shift forks according to the winding of the grooves. The shift fork ears then determine the position of gears D3/4, O5, and/or D6 (for KZ400-C, D3, O4, and/or O5). Refer to Fig. H83 for the gear position and drive path for neutral and each of the 6 gears. A pawl spring is fitted on the external shift mechanism to keep the shift arm and overshift limiter pressed against the shift drum pin to ensure proper pawl and pin contact. When the shift pedal is released after shifting, the return spring returns the shift lever and shift pedal to their original positions. So that the transmission will remain where it was shifted, the shift drum positioning pin spring pushes the shift drum positioning pin into one of seven notches on the shift drum operating plate. Six of these notches are equally spaced and correspond to the 6 gears. The other notch is halfway between the notches for 1st and 2nd gears, and corresponds to the half-stroke shift pedal movement from 1st or 2nd gear required to shift into neutral.

Shift Mechanism

H80



1. Shift Drum Positioning Bolt
2. Operating Plate
3. Circlip
4. Shift Fork (D1/4)
5. Shift Drum
6. Shift Fork Guide Pin
7. Shift Rod
8. Shift Fork (O6)
9. Shift Fork (O5)
10. Shift Drum Pin Plate
11. Shift Drum Guide Plate
12. Overshift Limiter
13. Pawl Spring
14. Shift Mechanism Arm
15. Shift Pedal
16. Bolt
17. Shift Shaft
18. Gear (O3/4)
19. Return Spring
20. Shift Lever
21. Drive Shaft
22. Output Shaft
23. Gear (O6)
24. Gear (O5)

The return spring pin on the side of the crankcase passes through a cutout on the shift mechanism lever. This pin engages between the two ends of the shift mechanism return spring. At the end of a full upshift or downshift stroke, the return spring pin makes contact with the cutout on the shift lever to limit the shift lever's range of movement.

Overshift Limiter

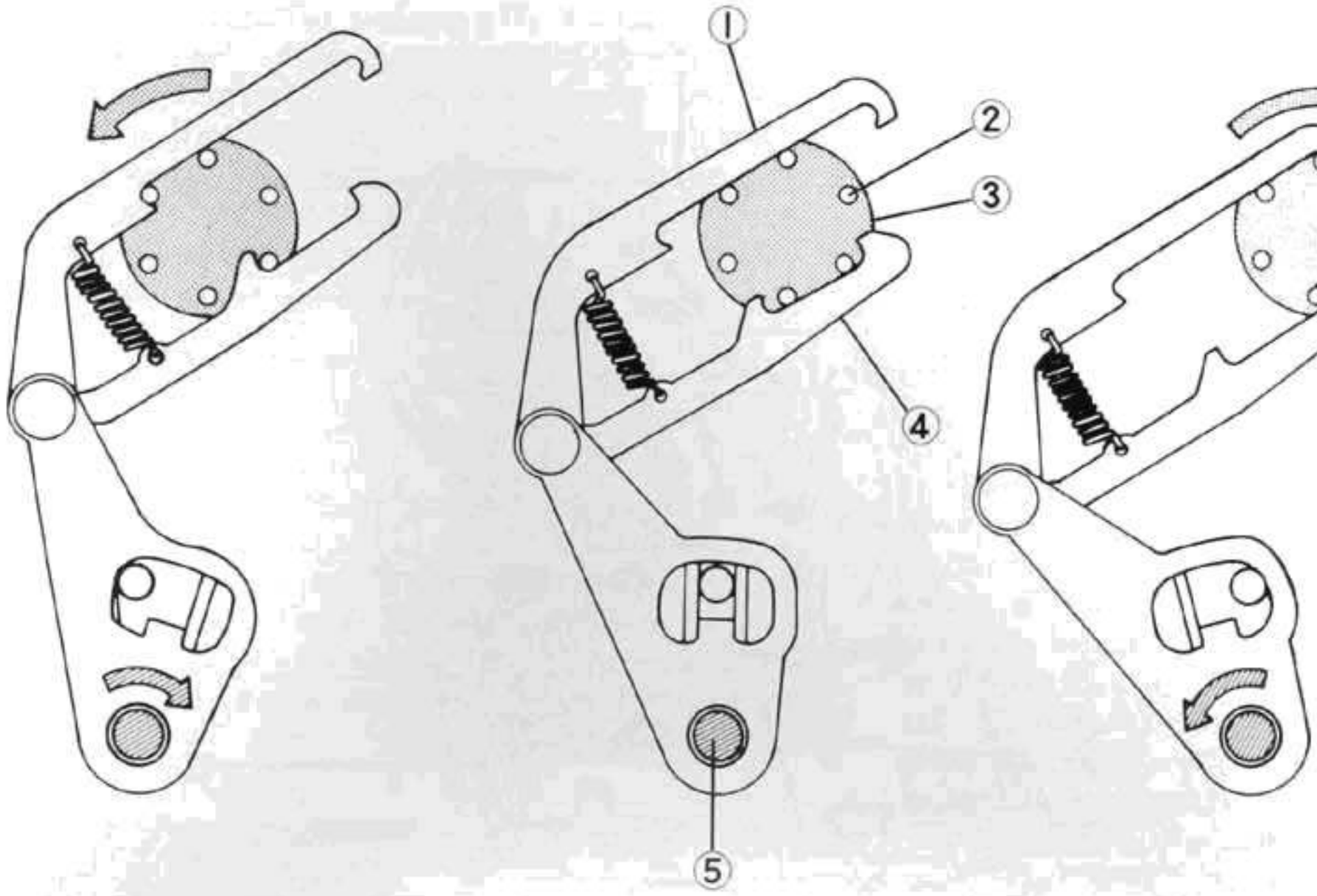
Each time that the shift pedal is operated, the overshift limiter interlocks with the shift drum pins to prevent overshifting. On a full upshift or downshift stroke, the limiter "hooks" catch the shift drum pins to keep the inertia of the heavy shift drum from allowing it to rotate beyond the intended gear position, particularly on a fast shift.

Neutral Locator

Inside gear O5 (for KZ400-C, O4) three steel balls are located 120° apart and serve to facilitate neutral location when shifting from first gear. When the shift cycle is stopped and the output shaft is not turning, one or two of these balls falls down into its respective groove in the output shaft. When the shift pedal is operated to shift from first toward second gear, O5 starts moving, but halfway toward its second gear position, the steel ball(s) hits the end of the groove(s) in the output shaft, stopping gear O5 from moving, stopping the shift drum from turning, and leaving the transmission gears in the neutral position.

Shift Mechanism Arm and Overshift Limiter Operation

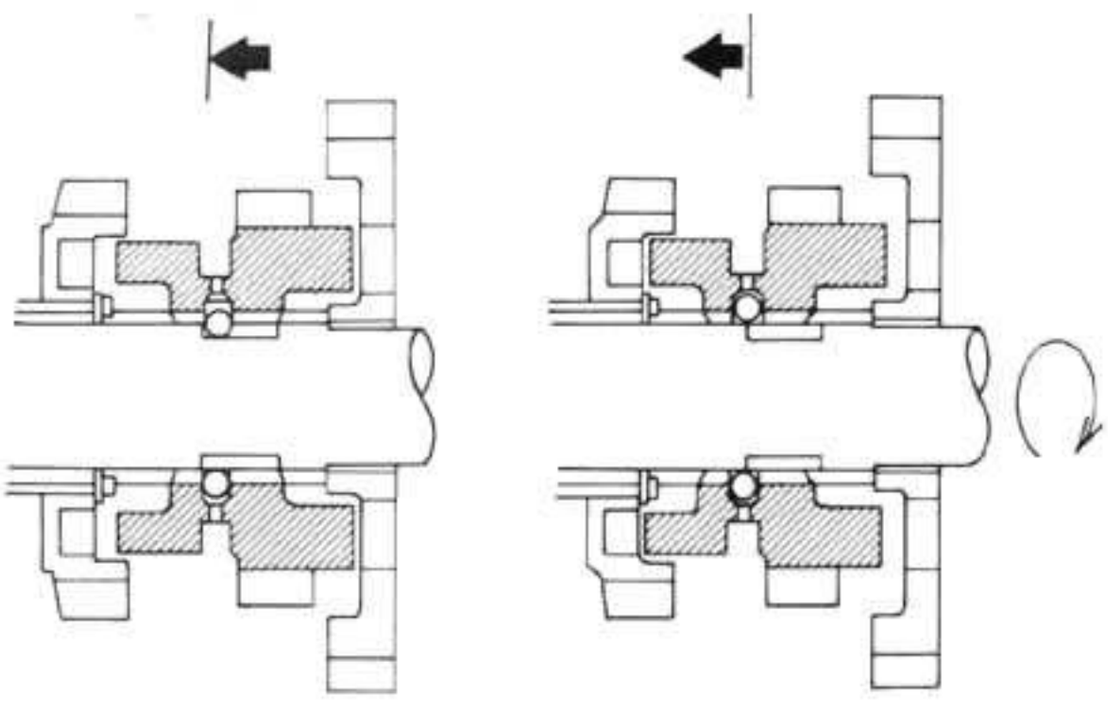
H81



1. Overshift Limiter
2. Shift Drum Pin
3. Shift Drum
4. Shift Mechanism Arm
5. Shift Shaft

Neutral Locator

H82



Transmission or external shift mechanism damage, causing the transmission to misshift, overshift, and/or jump out of gear, brings about more damage to the transmission and also overrev damage to the engine itself. An improperly functioning transmission or external shift mechanism may be caused by the following:

1. Loose return spring pin, and/or broken or weakened return spring
2. Broken or weakened shift drum positioning pin spring
3. Broken or weakened shift pawl spring
4. Damaged shift mechanism arm and/or overshift limiter
5. Loose shift drum stop
6. Bent or worn shift fork(s)
7. Worn shift fork grooves on gears D3/4, O5, and/or O6 (for KZ400-C, D3, O4, and/or O5)
8. Worn shift fork guide pin(s)
9. Worn shift drum groove(s)
10. Binding of shift drum positioning pin in the positioning bolt
11. Worn or damaged gear dogs, gear dog holes, and/or gear dog recesses
12. Improperly functioning clutch or clutch release
13. Improper assembly or missing parts

Transmission noise results from worn or damaged shafts, bearings, gear hubs or teeth, etc.

External shift mechanism inspection

Inspect the shift pawls, overshift limiter, and return spring. Replace any broken or otherwise damaged parts.

Measure the free length of the pawl spring. If it is longer than the service limit, replace it with a new one.

Measure the free length of the shift drum positioning pin spring. If it is shorter than the service limit, replace it with a new one.

H83

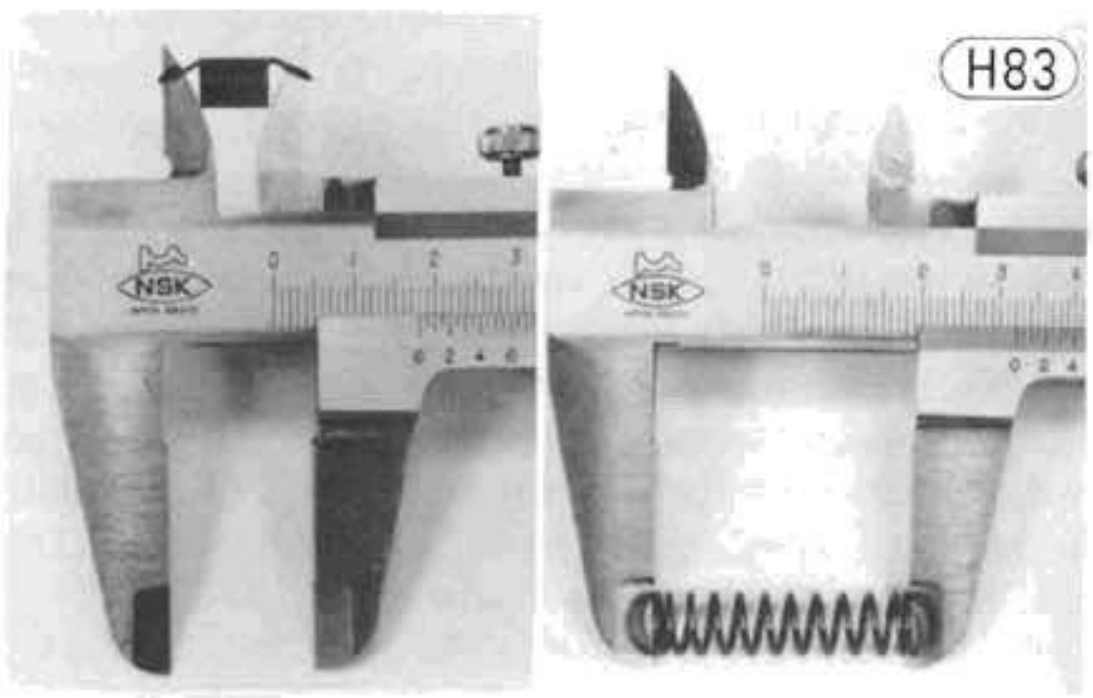
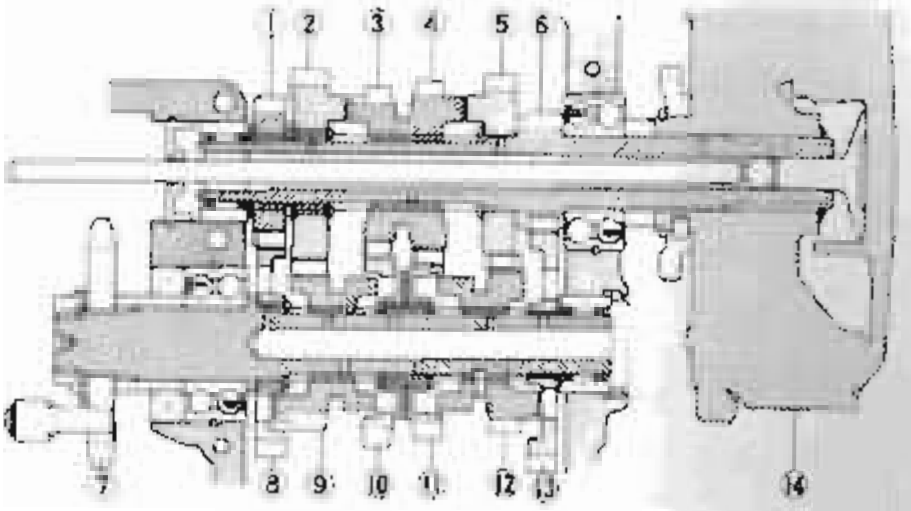


Table H58 Pawl Spring, Positioning Pin Spring Free Length

	Standard	Service Limit
Shift Pawl	18.0 mm	19 mm
Positioning	32.3 mm	31 mm

Transmission (KZ400-B)

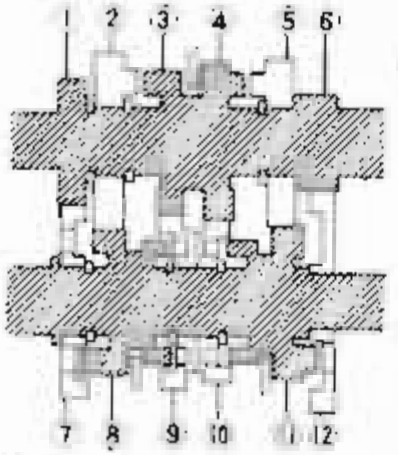
H84



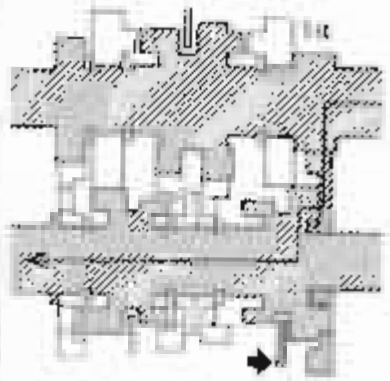
1. Drive 2nd Gear
2. Drive 6th Gear
3. Drive 3rd Gear
4. Drive 4th Gear
5. Drive 5th Gear
6. Drive 1st Gear
7. Engine Sprocket
8. Output 2nd Gear
9. Output 6th Gear
10. Output 3rd Gear
11. Output 4th Gear
12. Output 5th Gear
13. Output 1st Gear
14. Clutch

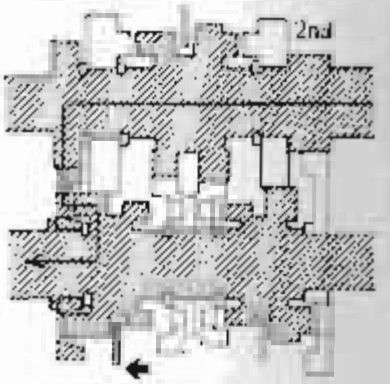
Gear Position (KZ400-B)

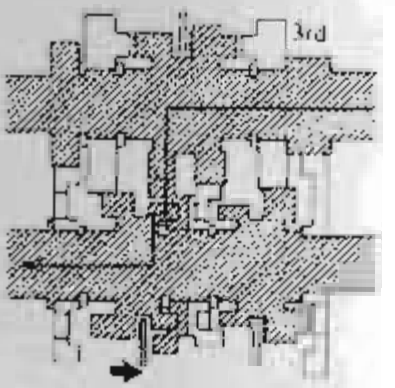
H85



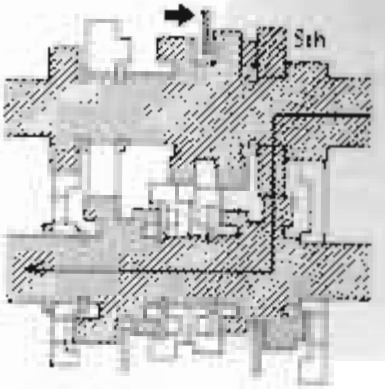
1. Drive 2nd Gear
2. Drive 6th Gear
3. Drive 3rd Gear
4. Drive 4th Gear
5. Drive 5th Gear
6. Drive 1st Gear
7. Output 2nd Gear
8. Output 6th Gear
9. Output 3rd Gear
10. Output 4th Gear
11. Output 5th Gear
12. Output 1st Gear

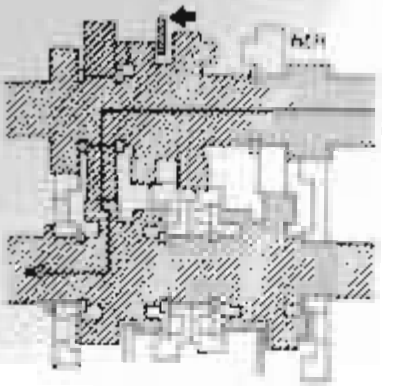






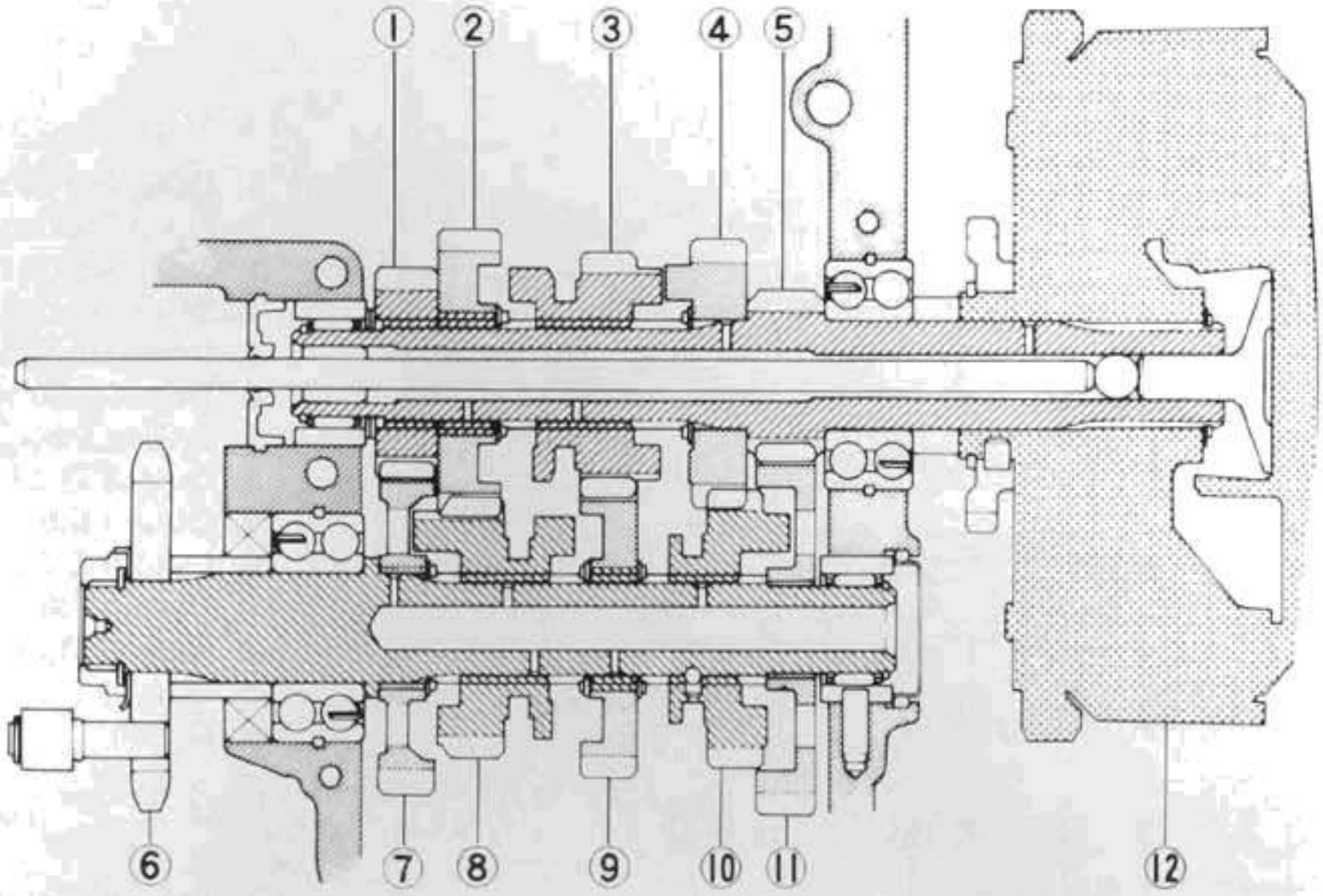






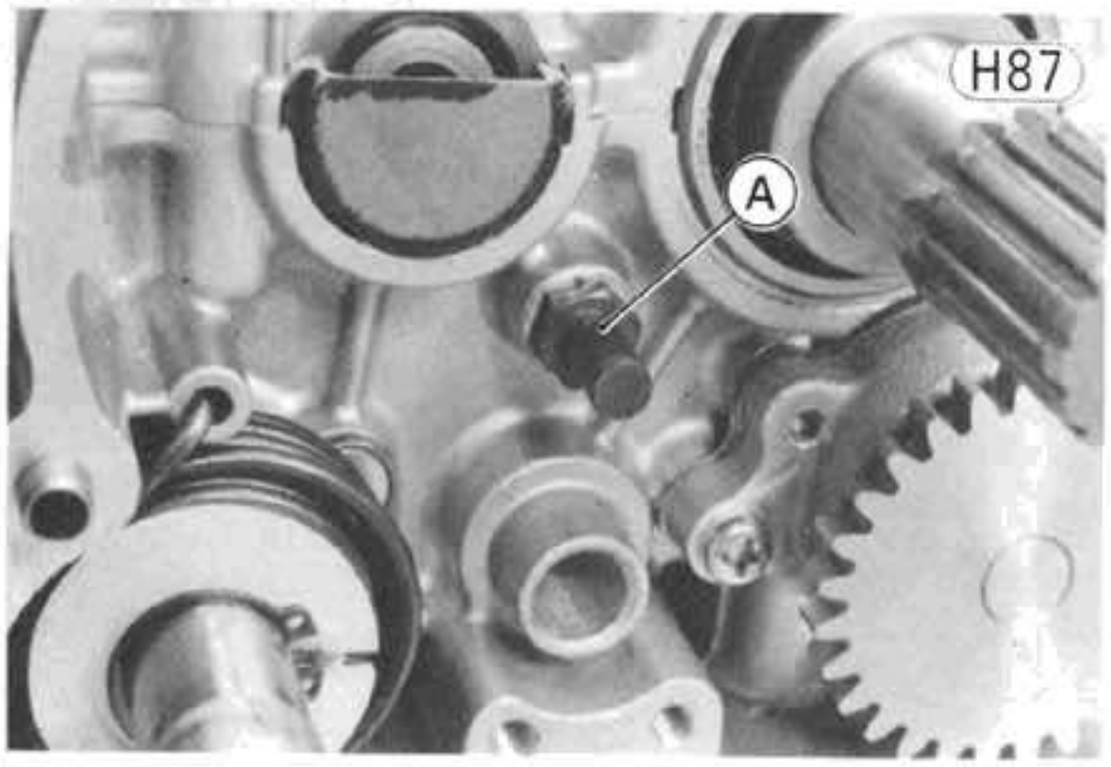
Transmission (KZ400-C)

H86

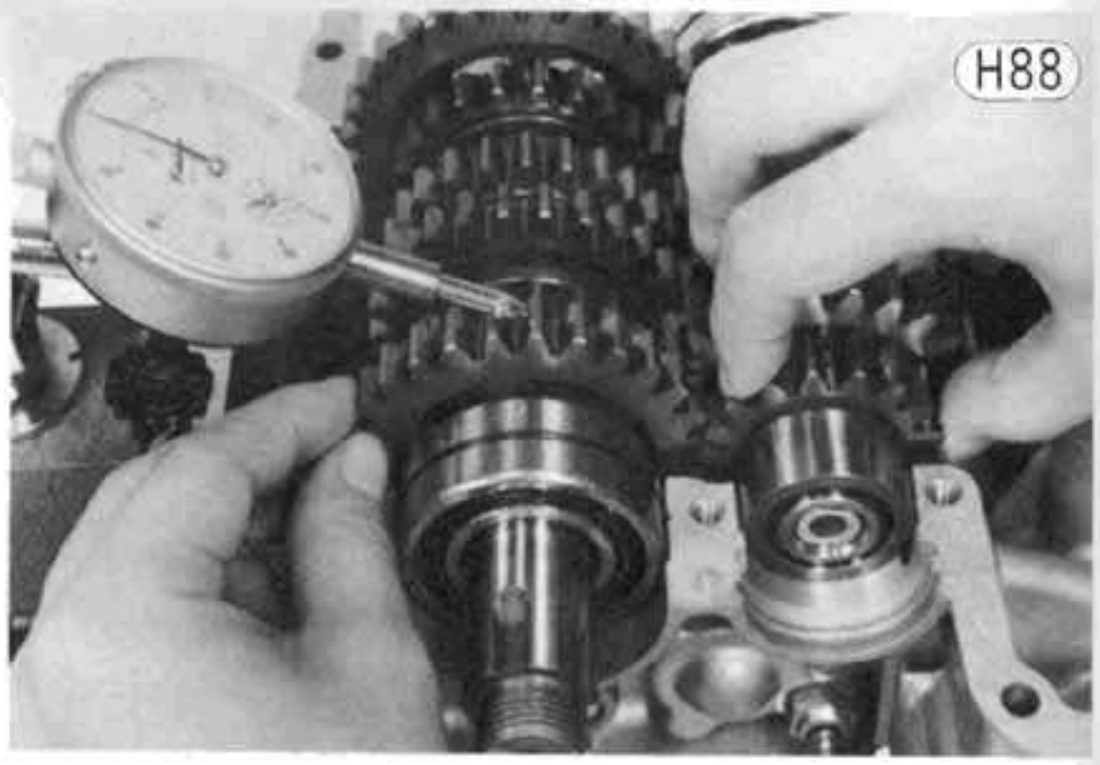


1. Drive 2nd Gear
2. Drive 5th Gear
3. Drive 3rd Gear
4. Drive 4th Gear
5. Drive 1st Gear
6. Engine Sprocket
7. Output 2nd Gear
8. Output 5th Gear
9. Output 3rd Gear
10. Output 4th Gear
11. Output 1st Gear
12. Clutch

Check to see if the return spring pin is loose. If it is, remove it and apply a non-permanent locking agent to the threads. Then tighten it.



A. Return Spring Pin



Shift fork bending

Visually inspect the shift forks, and replace any fork that is bent. A bent fork could cause difficulty in shifting or allow the transmission to jump out of gear when under power.

Gear backlash

Split the crankcase. Leaving the drive shaft and output shaft assembly in place, measure the backlash between gears O1 and D1, O2 and D2, O3 and D3, O4 and D4, O5 and D5, O6 and D6. To measure the backlash, set a dial gauge against the teeth on one gear, and move the gear back and forth while holding the other gear steady. The difference between the highest and the lowest gauge reading is the amount of backlash. Replace both gears if the amount of backlash exceeds the service limit.

Table H59 Gear Backlash

Standard	Service Limit
0.06 ~ 0.23 mm	0.3 mm

Shift fork/gear groove wear

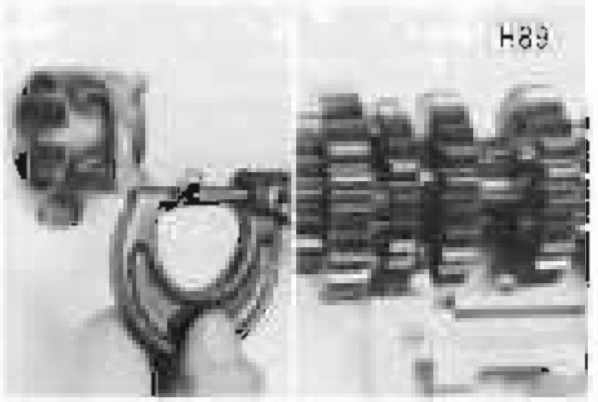
Measure the thickness of the ears of each shift fork, and measure the width of the shift fork grooves on gears D3/4, O5, and O6 (for KZ400-C, D3, O4, and O5). If the thickness of a shift fork ear is under the service limit, the shift fork must be replaced. If a gear shift fork groove is worn over the service limit, the gear must be replaced.

Table H60 Shift Fork Thickness

Standard	Service Limit
4.9 ~ 5.0 mm	4.7 mm

Table H61 Gear Shift Fork Groove Width

Standard	Service Limit
5.05 ~ 5.15 mm	5.25 mm



Shift fork guide pin/shift drum groove wear

Measure the diameter of each shift fork guide pin, and measure the width of each shift drum groove. Replace any replaceable guide pin that has worn past the service limit and any shift fork on which the non-replaceable guide pin has worn past the service limit. If a shift drum groove is worn past the service limit, replace the shift drum.

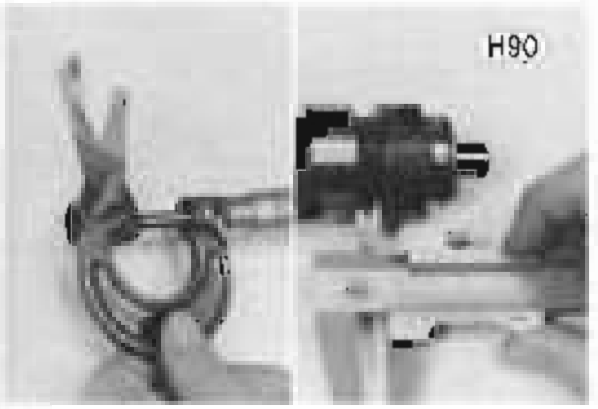


Table H62 Shift Fork Guide Pin Diameter

	Standard	Service Limit
on Shift Drum	7.95~8.000 mm	7.93 mm
on Shift Rod	7.9~8.0 mm	7.85 mm

Table H63 Shift Drum Groove Width

Standard	Service Limit
8.05~8.20 mm	8.25 mm

Gear dog, gear dog hole, gear dog recess damage

Visually inspect the gear dogs, gear dog holes, and gear dog recesses. Replace any gears that have damaged, or unevenly or excessively worn dogs, dog holes, or dog recesses.

Gear/shaft wear

Measure the diameter of each shaft and bush with a micrometer, and measure the inside diameter of each gear listed below. Find the difference between the two readings to figure clearance, and replace any gear with clearance exceeding the service limit.

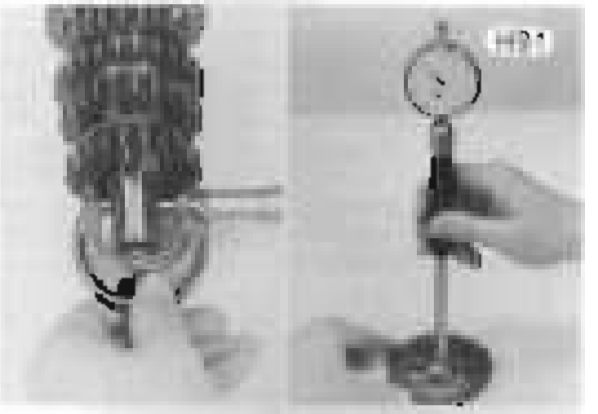


Table H64 Gear/Shaft, Gear/Bush Clearance

Gear	Standard	Service Limit
O1	0.027~0.061 mm	0.16 mm
O2, O3, D5, O4 and D6 of KZ400-B, D4 of KZ400-C	0.020~0.062 mm	0.16 mm

Shaft/needle bearing outer race wear

Measure the diameter of the drive and output shafts where it passes through the needle bearing. Replace the shaft if the diameter is less than the service limit. Measure the inside diameter of the needle bearing outer race with a cylinder gauge. Replace the needle bearing outer race if the diameter exceeds the service limit. When replacing the shaft and/or needle bearing outer race, replace the needle bearing also.

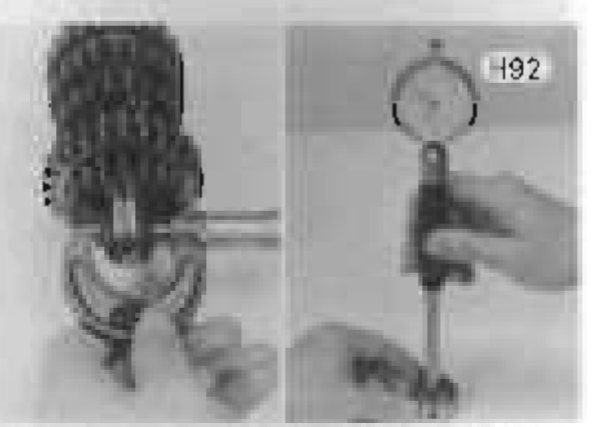


Table H65 Shaft, Needle Bearing Outer Race Wear

	Standard	Service Limit
Shaft	19.980~19.993 mm	19.96 mm
Outer Race	25.007~25.020 mm	25.04 mm

Ball bearing, needle bearing wear, damage

Check the ball bearing and needle bearing (Pg. 189). If there is any doubt as to the condition of either bearing, replace it.

KICKSTARTER

Kickstarter construction is shown in Fig. H94. The kick gear is connected to the primary sprocket on the crankshaft through the output shaft 1st gear, drive shaft 1st gear, clutch housing sprocket, and primary chain.

The kick gear ⑥, constructed with a ratchet on one side, is always meshed with the output shaft 1st gear and turns freely anytime the output shaft is turning. The ratchet gear ⑤, mounted on the splined portion of the kick shaft ⑨, always turns with the kick shaft and can be moved sidewise on the shaft. A spring ④ presses on the ratchet gear in the direction of the kick gear, but, when the kick pedal ⑩ is not being operated, an arm on the ratchet gear is caught on the stop ⑪, which prevents the ratchet gear from meshing with the ratchet on the kick gear.

When the kick pedal is operated, the ratchet gear arm is free from the stop and the ratchet gear then meshes with the kick gear ratchet rotating the kick gear. The gear train of the kickstarter system then cranks the engine. As the engine starts, the primary sprocket through the gear train turns the kick gear. But, since the kick gear rotates in the direction of arrow "A" as shown in Fig. H94, the kick gear ratchet doesn't catch on the ratchet gear.

When the kick pedal is released, the kick shaft is turned by the return spring returning the kick pedal to its original position. At the same time the ratchet gear arm rides up on the stop, breaking away from the kick gear. The kick gear now turns freely.

If the kick pedal return spring weakens or breaks, the kick pedal will not return completely or at all, and the kick gear and ratchet gear will stay partially meshed, making noise while the engine is running. Kick mechanism noise may also result when the kick gear, collar, or kick shaft becomes worn.

If the ratchet gear or the ratchet on the kick gear is worn or damaged, the kick gear will slip, and it will not be possible to kickstart the engine.

Kickstarter

Kick gear, shaft wear

Measure the inside diameter of the kick gear, and replace the gear if the diameter is over the service limit. Visually inspect the ratchet portion of the kick gear. If there is any kind of damage, replace the kick gear.

Measure the kick shaft diameter at the kick gear, and replace it if it is under the service limit.

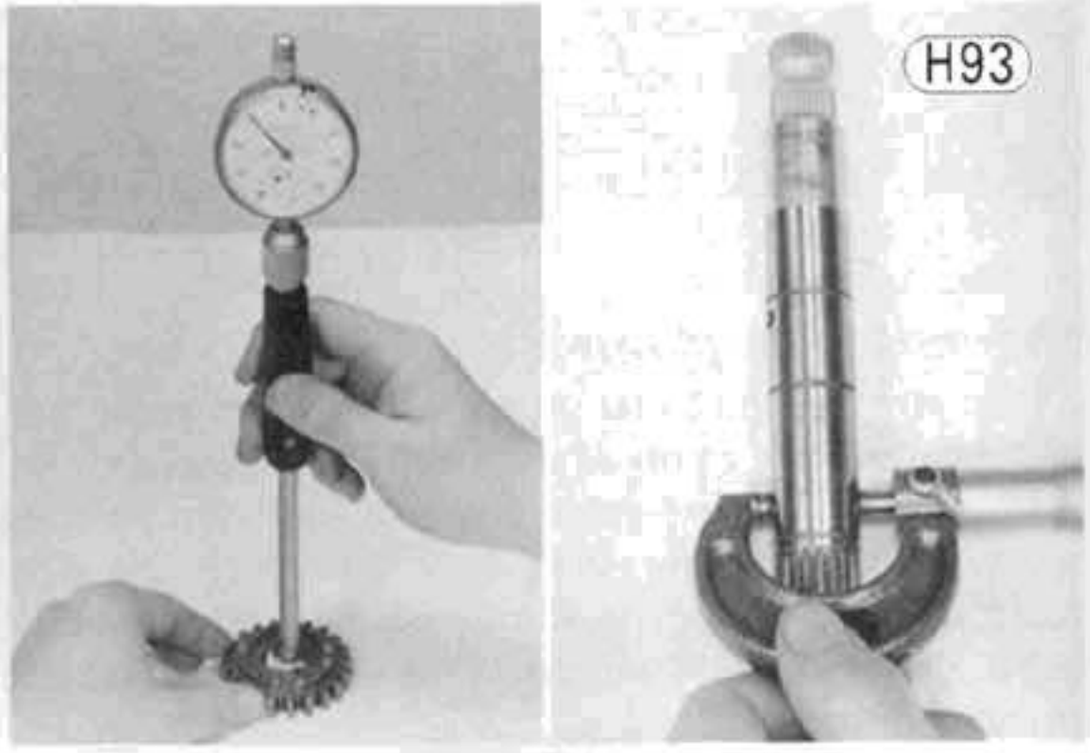
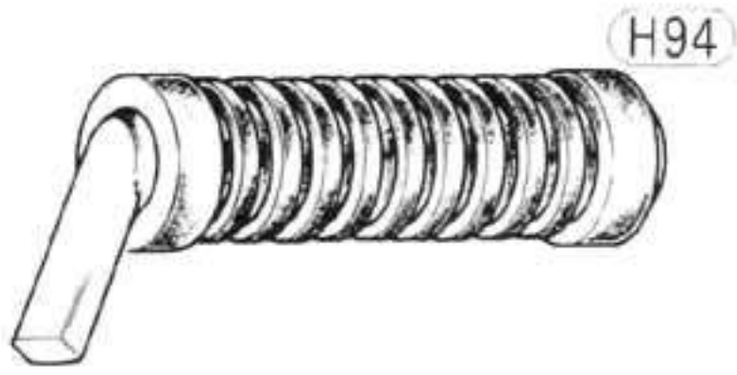


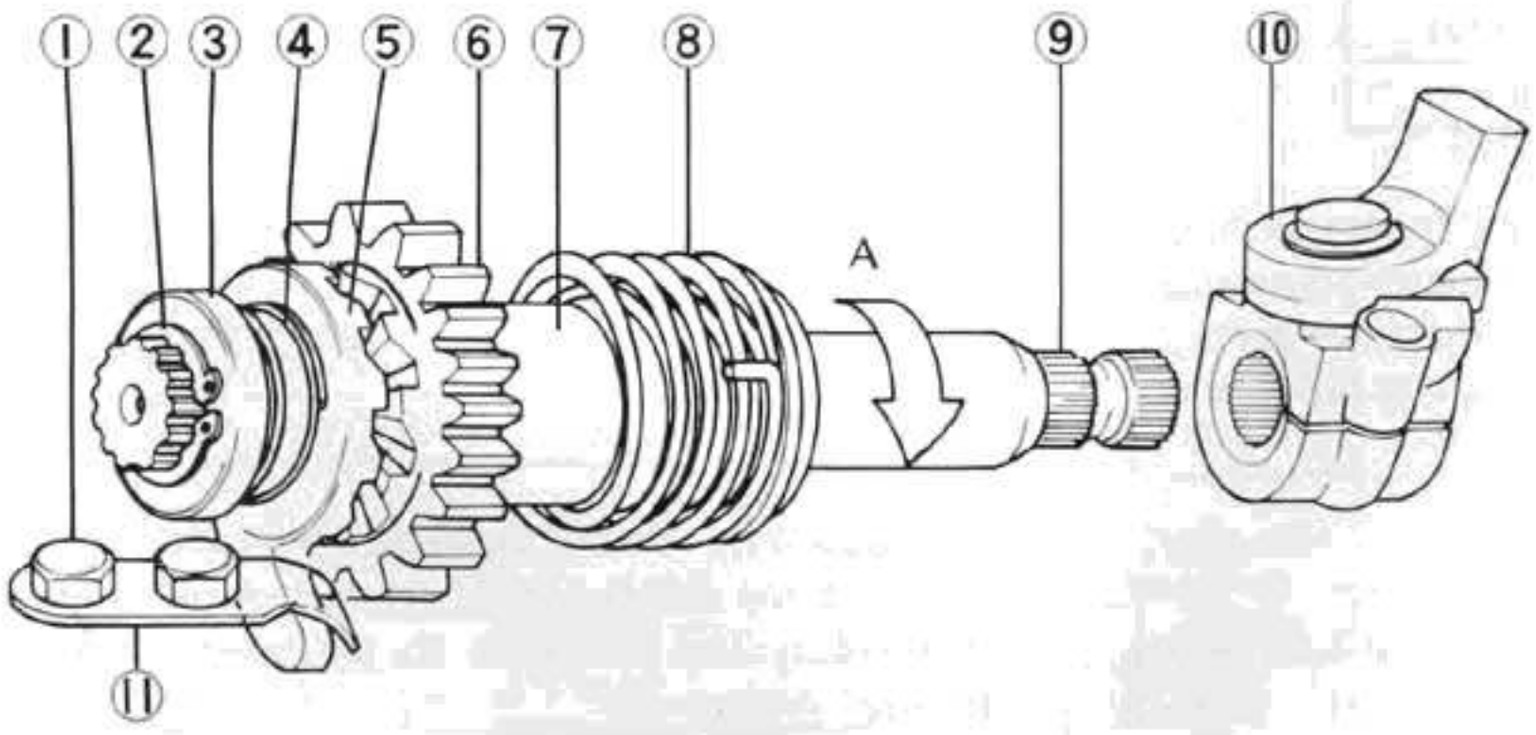
Table H66 Kick Gear Inside Diameter

Standard	Service Limit
20.000 ~ 20.021 mm	20.07 mm

Table H67 Kick Shaft Diameter at Kick Gear

Standard	Service Limit
19.960 ~ 19.979 mm	19.93 mm





1. Bolt
2. Circlip
3. Spring Seat
4. Spring
5. Ratchet Gear
6. Kick Gear
7. Bushing
8. Kick Spring
9. Kick Shaft
10. Kick Pedal
11. Ratchet Gear Arm Stop

ENGINE LUBRICATION

The engine lubrication system includes the oil screen, engine oil pump, oil filter, oil bypass valve, oil pressure relief valve, and oil passages. An oil breather keeps crankcase pressure variations to a minimum and reduces emissions by recirculating blowby gas. The discussion here concerns how these parts work together and how the oil reaches the various parts of the engine. Details on the relief valve, engine oil pump, oil screen, oil filter, and oil breather are given in the sections (Pgs. 187~189) following engine lubrication.

Since the engine lubrication system is a wet sump type, there is always supply of oil in the crankcase at the bottom of the engine. The oil is drawn through the wire screen into the oil pump as the pump rotors turn. The pump is driven by a gear attached to the rear of the clutch housing. The screen removes any metal particles and other foreign matter which could damage the oil pump. From the pump the oil passes through the oil filter element for filtration. If the element is badly clogged, slowing the flow of oil through it, oil bypasses the element through a bypass valve in the oil filter mounting bolt. After passing through the filter, the oil branches into four lubrication routes.

One of these routes is to the crankshaft main bearings, then to the connecting rod journals and to the starter clutch sprocket. The cylinder walls, pistons, and piston pins are lubricated by splash from the spinning crankshaft. The oil then drops and collects at the bottom of the crankcase to be used again.

The second route for filtered oil is to the balancer mechanism shafts. After lubricating the shafts, the oil drops and collects at the bottom of the crankcase.

The third route for filtered oil is through the oil pipe, up to the top of the cylinder head. The oil lubricates the camshaft journals, camshaft cams, and valve parts. After lubricating each camshaft journal and each cam surface, the oil drops through the camshaft chain opening back to the bottom of the crankcase.

The oil pump also feeds filtered oil to the transmission. It exits from the oil passage at the needle bearing of the drive shaft. Finally the oil drops down into the bottom of the crankcase after lubricating the bearings and transmission gears.

Both the oil pressure switch (KZ400-B) and the oil pressure relief valve are important for maintaining a constant oil pressure. The oil pressure switch, mounted on the upper part of the crankcase, checks on the oil pressure in the main oil passage and lights the oil pressure warning light if the pressure falls below a safe level. If the oil pressure is insufficient, the oil pump is worn or malfunctioning or there is an insufficient oil supply to the pump. On the other hand, if the oil pressure becomes excessive, such as when the engine is first started (especially in cold weather), the relief valve reduces the oil pressure. The relief valve opens whenever a pressure of 5.2 kg/cm^2 (74 psi) is exerted on the valve spring.

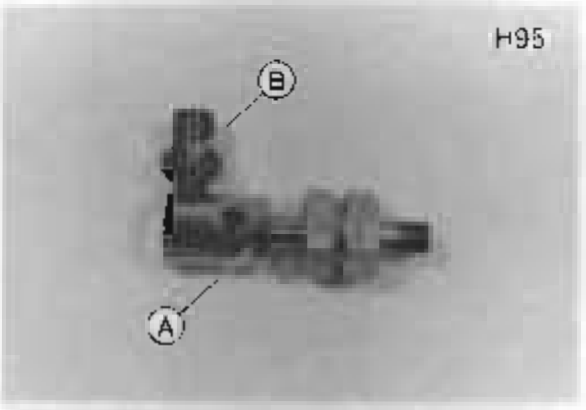
Oil pressure measurement

To inspect the relief valve operation, check the oil pressure with the engine cold (about room temperature).

NOTE: If the engine is warmed up already, begin by measuring the oil pressure at the normal operating temperature.

The engine must be stopped. Remove the oil pressure switch from the right side of the crankcase and connect the oil pressure gauge and adapter (special tools) in its place to measure oil pressure. Use a part of the adapter to connect the long-hex-head bolt and the gauge.

NOTE: If oil pressure of KZ400-C engine is to be measured, remove the fitting banjo bolt from the crankcase and install the long-hex-head bolt which is used to mount the oil pressure indicator switch on KZ400-B.



A. Adapter (57001-400) **B. Use this part**



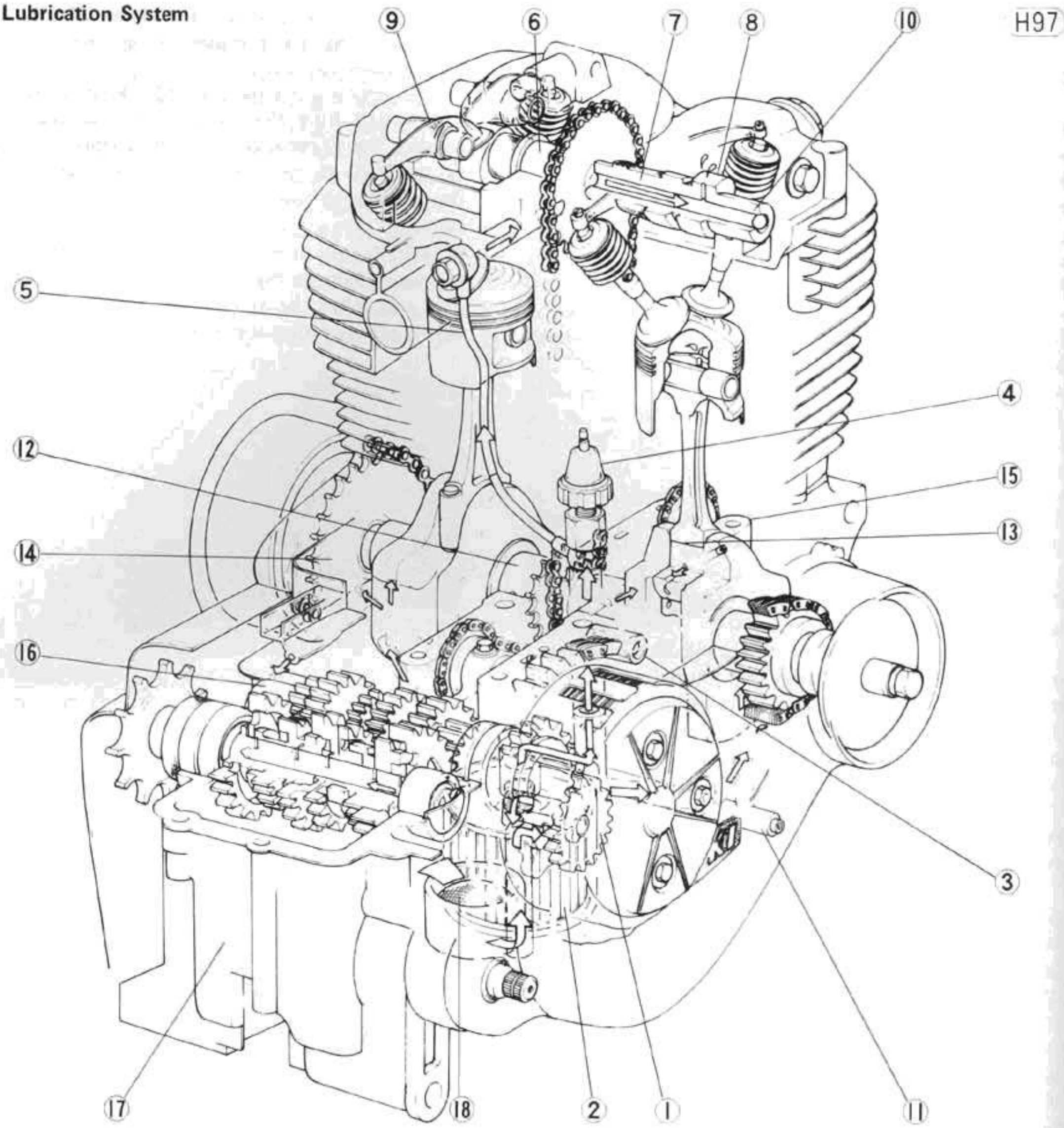
A. Oil Pressure Gauge (57001-164)
B. Part of Adapter
C. Long-hex-head bolt

Start the engine, and note the oil pressure while running the engine at various speeds. A normal relief valve keeps the maximum oil pressure between the values in Table H68. If the oil pressure exceeds 6.0 kg/cm^2 (85 psi) by very much, the relief valve is stuck at its closed position. If the oil pressure is much lower than 4.4 kg/cm^2 (63 psi) at more than 4,000 rpm, the relief valve may be stuck open, or there may be other damage in the lubrication system.

Table H68 Relief Valve Opening Pressure

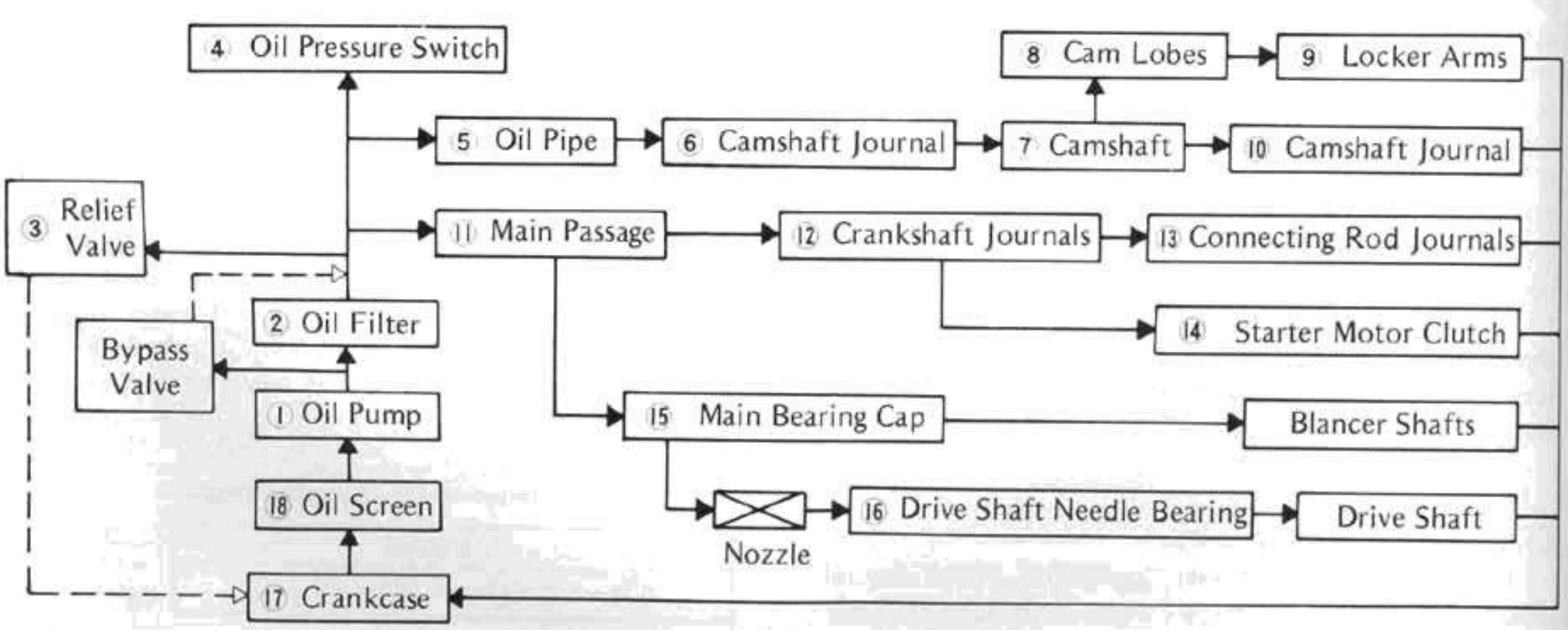
Standard
4.4 ~ 6.0 kg/cm^2 (63 ~ 85 psi)

Engine Lubrication System



Engine Oil Flow Chart

H98



Warm up the engine, and measure the oil pressure at the normal operating temperature.

Run the engine at the specified speed (Table H69) and read the oil pressure gauge.

Table H69 Oil Pressure

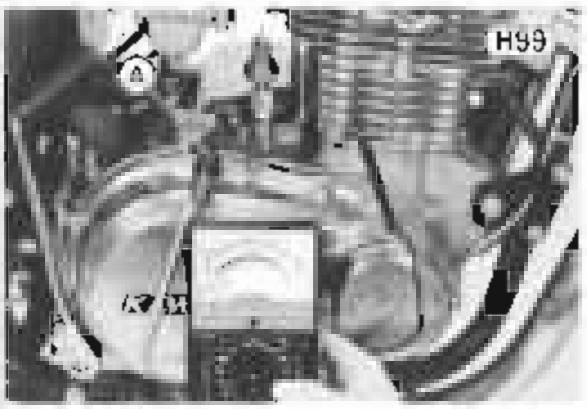
Oil Pressure at 3,000 rpm, 90°C (194°F)	
More than 2.0 kg/cm² (28 psi)	

If the oil pressure is significantly below the standard pressure when the oil temperature is at or below 90°C (194°F), inspect the engine oil pump and relief valve. If the pump and relief valve are not at fault, inspect the rest of the lubrication system.

Oil pressure switch inspection

The switch should turn on the warning light whenever the ignition switch is on with the engine not running.

If the light does not go on, disconnect the switch lead. Connect the positive lead of a 20V DC range voltmeter to the switch lead and ground the voltmeter negative lead to the engine. Turn the ignition switch to the "ON" position, and read the voltmeter. If the voltmeter does not indicate battery voltage, the trouble is either in the wiring or a burned-out indicator bulb.



A. Switch Lead

If the voltmeter does indicate battery voltage, then the oil pressure switch may be defective. Use an ohmmeter to check for continuity between the switch terminal and the switch body. With the switch lead disconnected, and the engine stopped, any reading other than zero ohms indicates that the switch is at fault.

The switch should turn off the warning light whenever the engine is running faster than the specified speed. If the light stays on, stop the engine immediately, disconnect the lead from the switch, and connect the ohmmeter between the switch terminal and the engine (chassis ground). The meter should read zero ohms when the engine is off and infinity when the engine is running above the specified speed (Table H70). If the meter reads zero ohms when the engine is running at the specified speed, stop the engine and measure the oil pressure (Pg. H69). If the oil pressure is more than the specified value with the engine running at the specified speed, the oil pressure switch is defective, and must be replaced.

Table H70 Oil Pressure Switch Inspection

Meter	Engine Speed	Oil Pressure Switch
× 1 Ω	Stopped	ON (ohmmeter reads zero ohms)
	More than idle rpm	OFF (Ohmmeter reads infinity)

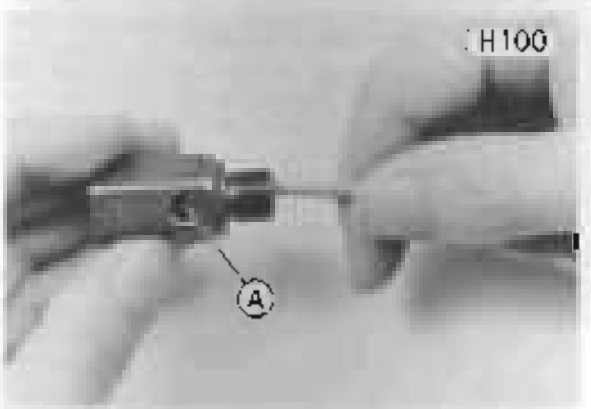
NOTE: Oil pressure is low when engine speed is low, so the oil pressure warning light may flicker or it comes on at idle. However, this does not indicate trouble if the light goes out when engine speed is increased.

Relief Valve

Relief valve inspection

Check to see if the steel ball inside the valve slides smoothly when pushing it in with a wooden or other soft rod, and see if it comes back to its seat by valve spring pressure.

NOTE: Inspect the valve in its assembled state. Disassembly and assembly may change the valve performance.



A. Steel Ball

If any rough spots are found during the above inspection, wash the valve clean with a high flash point solvent and blow out any foreign particles that may be in the valve with compressed air.

If cleaning does not solve the problem, replace the relief valve as an assembly. The relief valve is precision made with no allowance for replacement of individual parts.

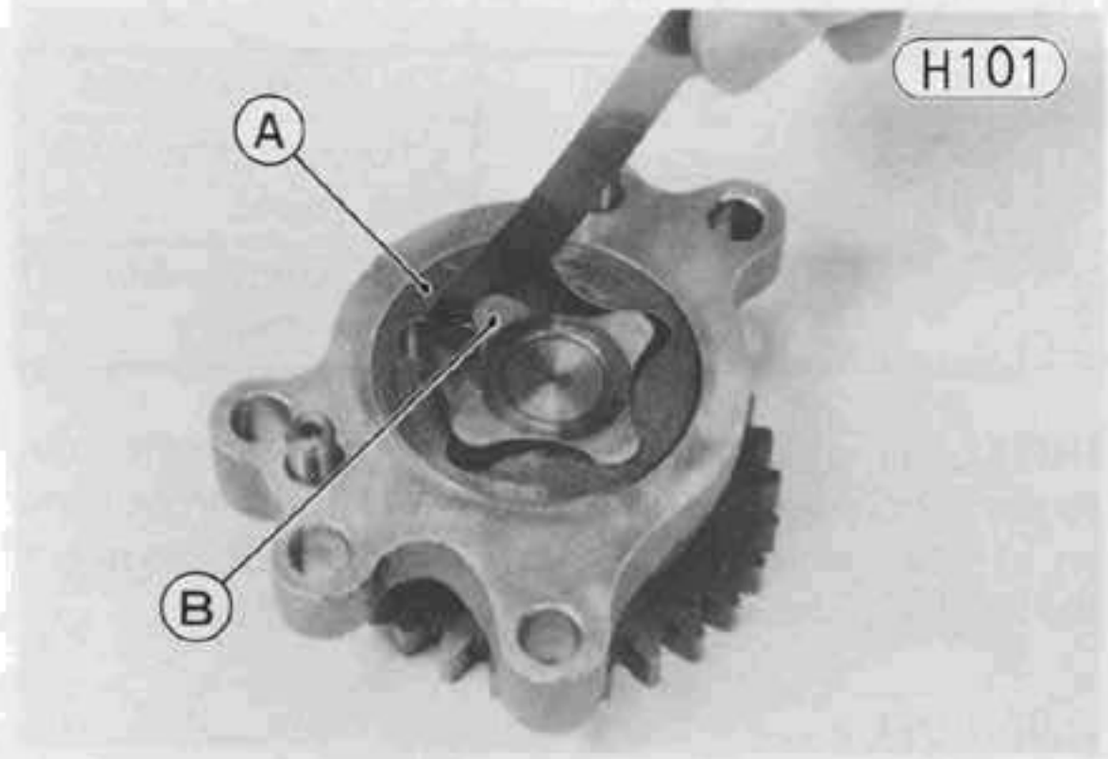
Engine Oil Pump

The oil pump installed in the right side of the crankcase, is a simple trochoid type with an outer and an inner rotor. The gear on the pump is driven in direct proportion to engine rpm by a gear attached to the rear of the clutch housing.

If the oil pump becomes worn, it may no longer be able to supply oil to lubricate the engine adequately.

Outer rotor/inner rotor clearance

Measure the clearance between the outer rotor and inner rotor with a thickness gauge. If the clearance exceeds the service limit, replace the oil pump assembly.



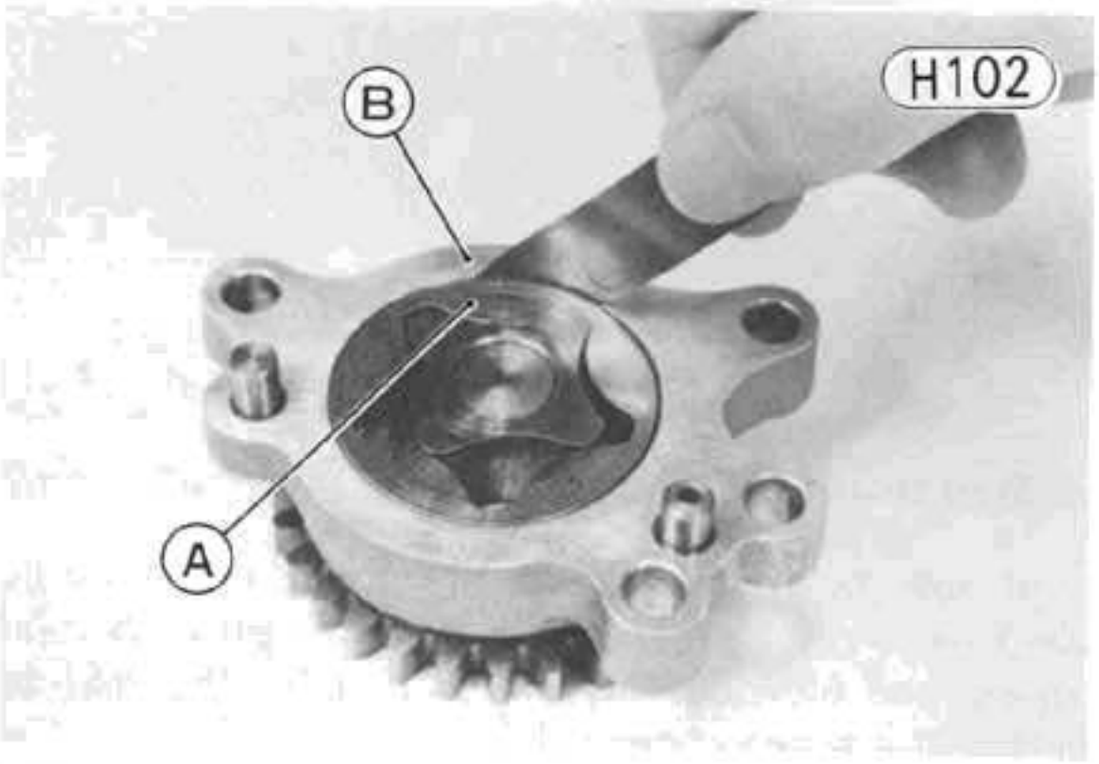
A. Outer Rotor **B. Inner Rotor**

Table H71 Outer Rotor/Inner Rotor Clearance

Standard	Service Limit
under 0.15 mm	0.21 mm

Outer rotor/pump body clearance

Measure the clearance between the outer rotor and the pump body with a thickness gauge. If the clearance exceeds the service limit, replace the oil pump assembly.



A. Outer Rotor **B. Pump Body**

Table H72 Outer Rotor/Pump Body Clearance

Standard	Service Limit
0.10~0.18 mm	0.25 mm

Rotor side clearance

Lay a straightedge on the oil pump body, and measure the clearance between the straightedge and the rotors with a thickness gauge. If the clearance exceeds the service limit, replace the oil pump assembly.

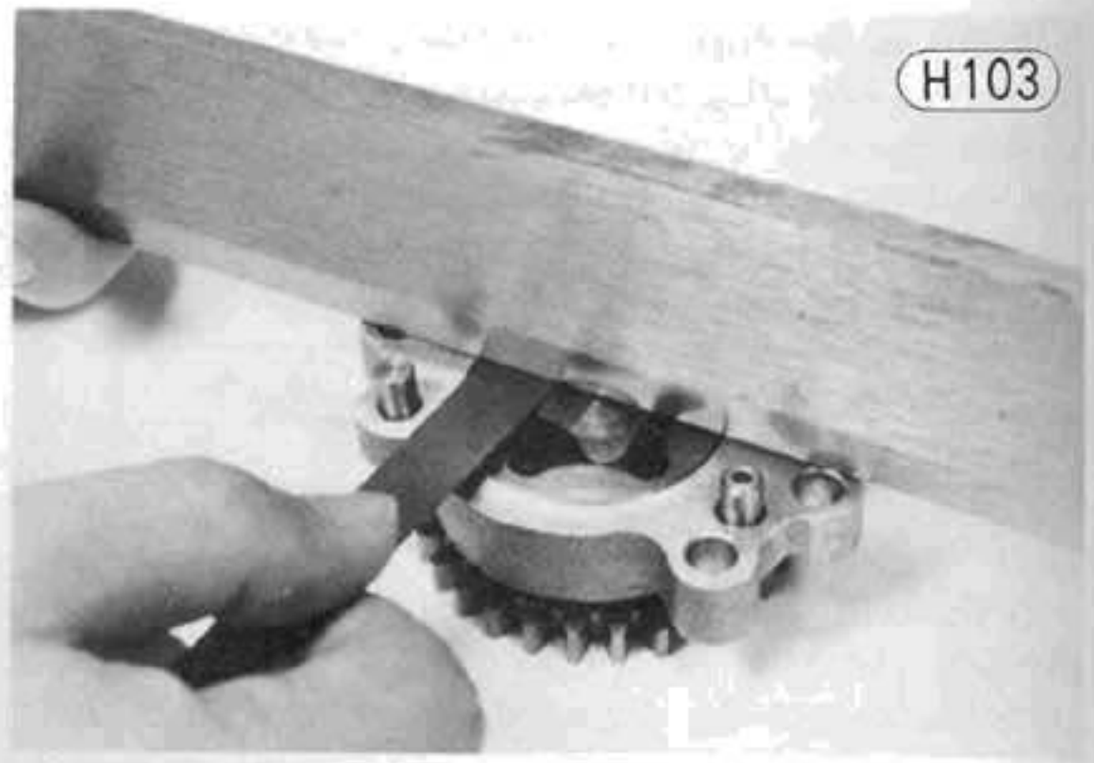


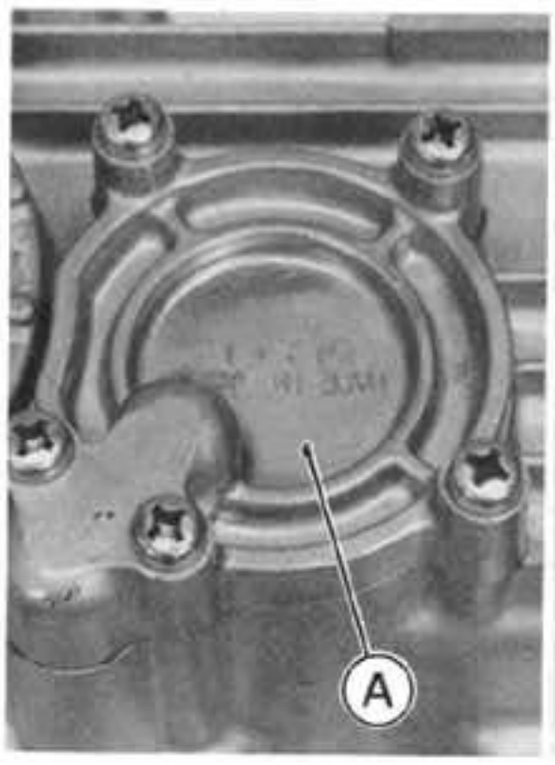
Table H73 Rotor Side Clearance

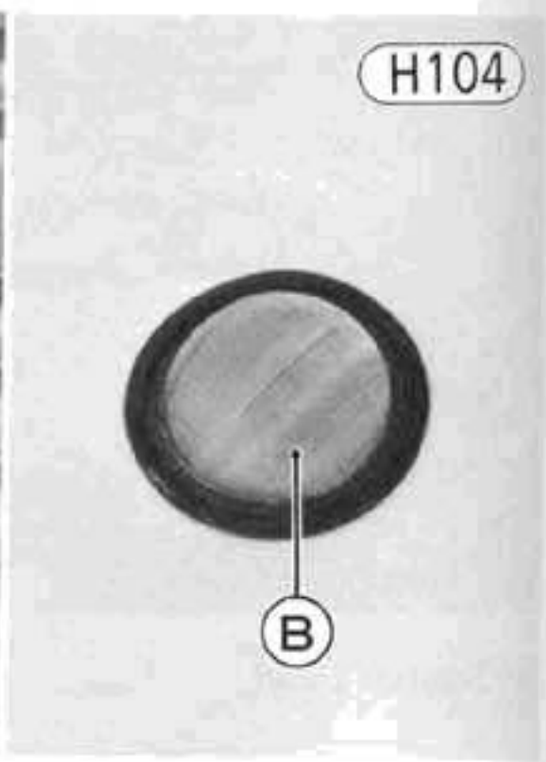
Standard	Service Limit
0.04~0.10 mm	0.15 mm

Oil Screen

The oil screen, installed in the lower part of the crankcase, removes any metal particles and other foreign matter which could damage the oil pump.

When the crankcase is split, remove the oil screen, and clean any metal particles and other dirt out of the screen. If the oil screen is damaged, replace it with a new one.





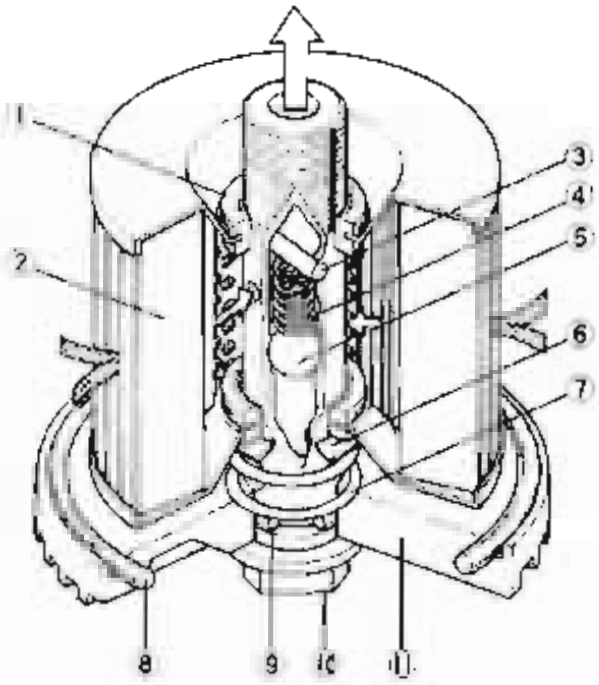
A. Oil Screen Cover **B. Oil Screen**

Oil Filter

The oil filter, located in the lower part of the crankcase, removes impurities from the oil.

As the filter element becomes dirt and clogged, its filtering efficiency is impaired. If it becomes so clogged that it seriously impedes oil flow, a pressure-activated bypass valve in the oil filter mounting bolt opens so that sufficient oil will still reach the parts of the engine needing lubrication. When the filter becomes clogged such that the oil pressure difference between the inlet and outlet for the filter reaches a certain pressure, the oil on the inlet side pushing on the valve spring opens the valve, allowing oil to flow to the oil passage, bypassing the filter.

Oil Filter (H105)



1. Grommet
2. Oil Filter Element
3. Pin
4. Bypass Valve Spring
5. Bypass Valve Steel Ball
6. Washer
7. Spring
8. O-ring
9. O-ring
10. Mounting Bolt
11. Oil Filter Cover

Never neglect the oil filter, or else metal particles or other foreign matter in the oil could reach the crankshaft and transmission, accelerating wear and shortening engine life.

Replace the filter element in accordance with the Periodic Maintenance Chart (Pg. 30) since it becomes clogged with metal filings from the engine and transmission especially during break-in. After break-in, replace the element at every other oil change. When the filter is removed for element replacement, wash the rest of the filter parts in a high flash-point solvent and check the condition of the O-rings. If they are worn or deteriorated, replace them to avoid oil leakage.

Oil Breather

The oil breather is located on the top of the cylinder head cover. The underside of the breather opens to the crankcase, while the upper part connects through the breather hose to the air cleaner. Its function is to minimize crankcase pressure variations caused by crankshaft and piston movement and to recycle blowby gas.

Gas blowby is the combustion chamber gas escaping past the rings into the crankcase. A small amount is unavoidable, but gas blowby increases as cylinder wall and piston ring wear progresses. If not efficiently removed, blowby gas will seriously contaminate the engine oil.

Recycling blowby gas means more efficient combustion, but the oil mist resulting from transmission gear movement must first be removed. The mixture of blowby gas and oil mist passes through a maze in the breather, which separates most of the oil from the gas. The oil which is separated from the gas returns to the bottom of the crankcase. The gas is drawn through the breather hose into the air cleaner housing, and is drawn through the carburetors into the engine.

If the breather hose or the parts inside the breather become clogged, pressure may build up in the crankcase and cause oil leaks.

BALL, NEEDLE BEARINGS

Ball bearing wear, damage

Since the ball bearings are made to extremely close tolerances, the wear must be judged by feel rather than by measurement.

Clean each bearing in a high flash-point solvent, dry it (do not spin it while it is dry), and oil it. Spin it by hand to check its condition. If it is noisy, does not spin smoothly, or has any rough spots, replace it.

Needle bearing wear, damage

The rollers in the needle bearings wear so little that the wear is difficult to measure. Instead, inspect the bearings for abrasion, color change, or other damage. If there is any doubt as to the condition of either bearing, replace it.

OIL SEALS

The crankshaft oil seal in the right engine cover forms a seal between the crank chamber and the contact breaker point cavity. If this seal is damaged, oil will leak into the contact breaker point cavity, and foul the contact breaker points. Any damaged, hardened, or otherwise defective oil seal will allow oil to leak.

Oil seal damage

Inspect the oil seals, and replace any if the lips are misshapen, discolored (indicating the rubber has deteriorated), hardened, or otherwise damaged. Since an oil seal is nearly always damaged on removal, any removed oil seals must be replaced. When pressing in an oil seal which is marked, press it in with the mark facing out. Press the seal in so that the face of the seal is level with the surface of its hole.

MUFFLERS

The mufflers reduce exhaust noise and conduct the exhaust gases back away from the rider while keeping power loss to a minimum. If much carbon is built up inside the mufflers, exhaust efficiency is reduced, which lowers the engine power output.

If there is any exhaust leakage where the mufflers connect to the cylinder head, or if the gaskets appear damaged, replace the gaskets. If either muffler is badly damaged, dented, cracked or rusted, replace it with a new one.

Maintenance—Chassis

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J

WHEELS

Wheel construction is shown in Figs. J1 ~ J3. The following sections, Pgs. 192 ~ 197 cover the tires, rims, spokes, axles, wheel bearings, and grease seals. For the brakes, see Pgs. 200 ~ 208.

Tires

The tires are designed to provide good traction and power transmission during acceleration and braking even on bad surfaces. To do this, they must be inflated to the correct pressure and not overloaded. The maximum recommended load, in addition to vehicle weight, is 155 kg.

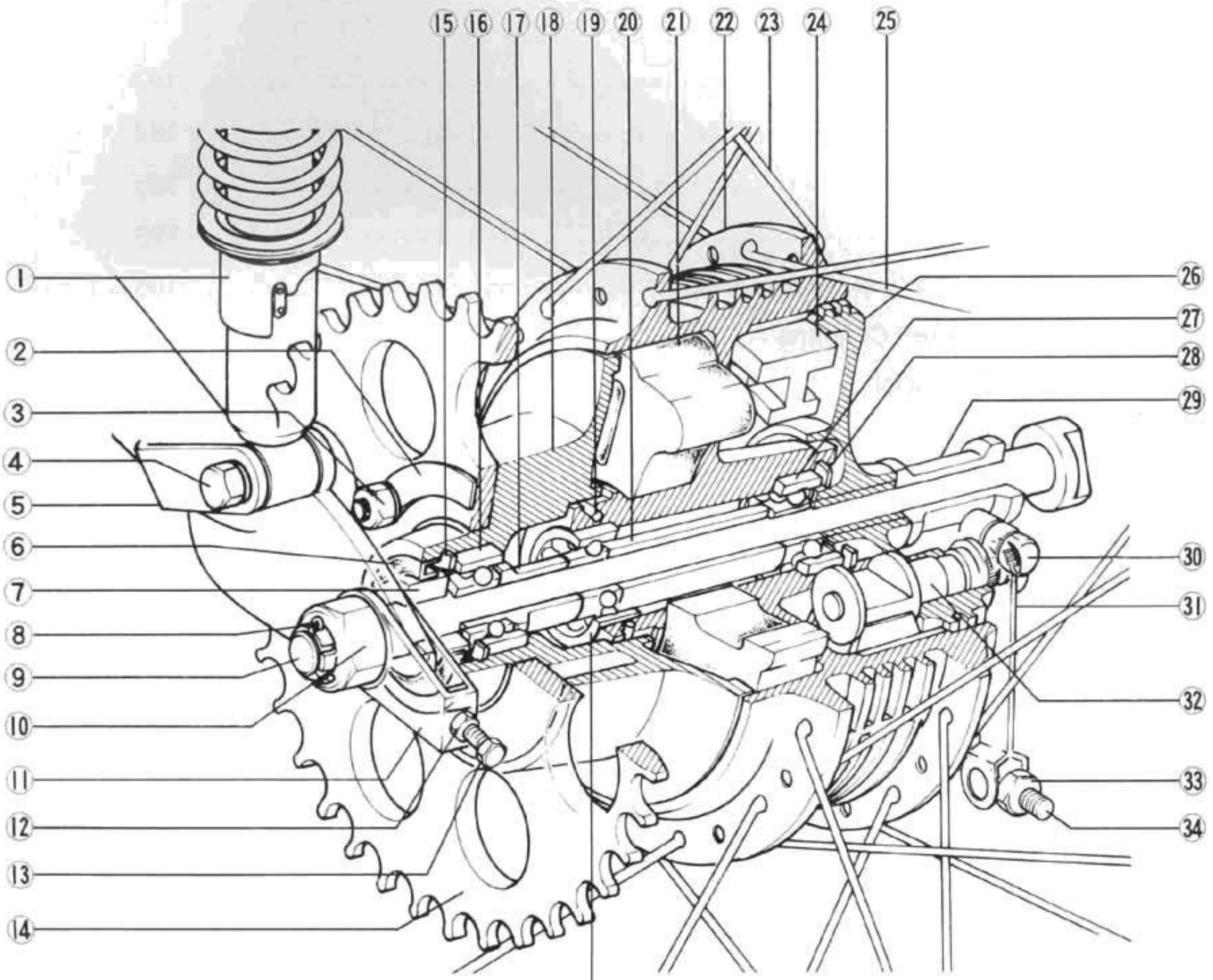
If the tires are inflated to too high a pressure, the ride is rough, the center portion of the tread wears quickly, and the tires are easily damaged.

If inflation pressure is too low, the shoulder portions wear quickly, the cord suffers damage, fuel consumption is high and handling is poor. In addition, heat builds up at high speeds, and tire life is greatly shortened.

To ensure safe handling and stability, use only the recommended standard tires for replacement, inflating them to the standard pressure. A certain variation from the standard pressure may be desired depending on road surface conditions (rain, ice, rough surface, etc.).

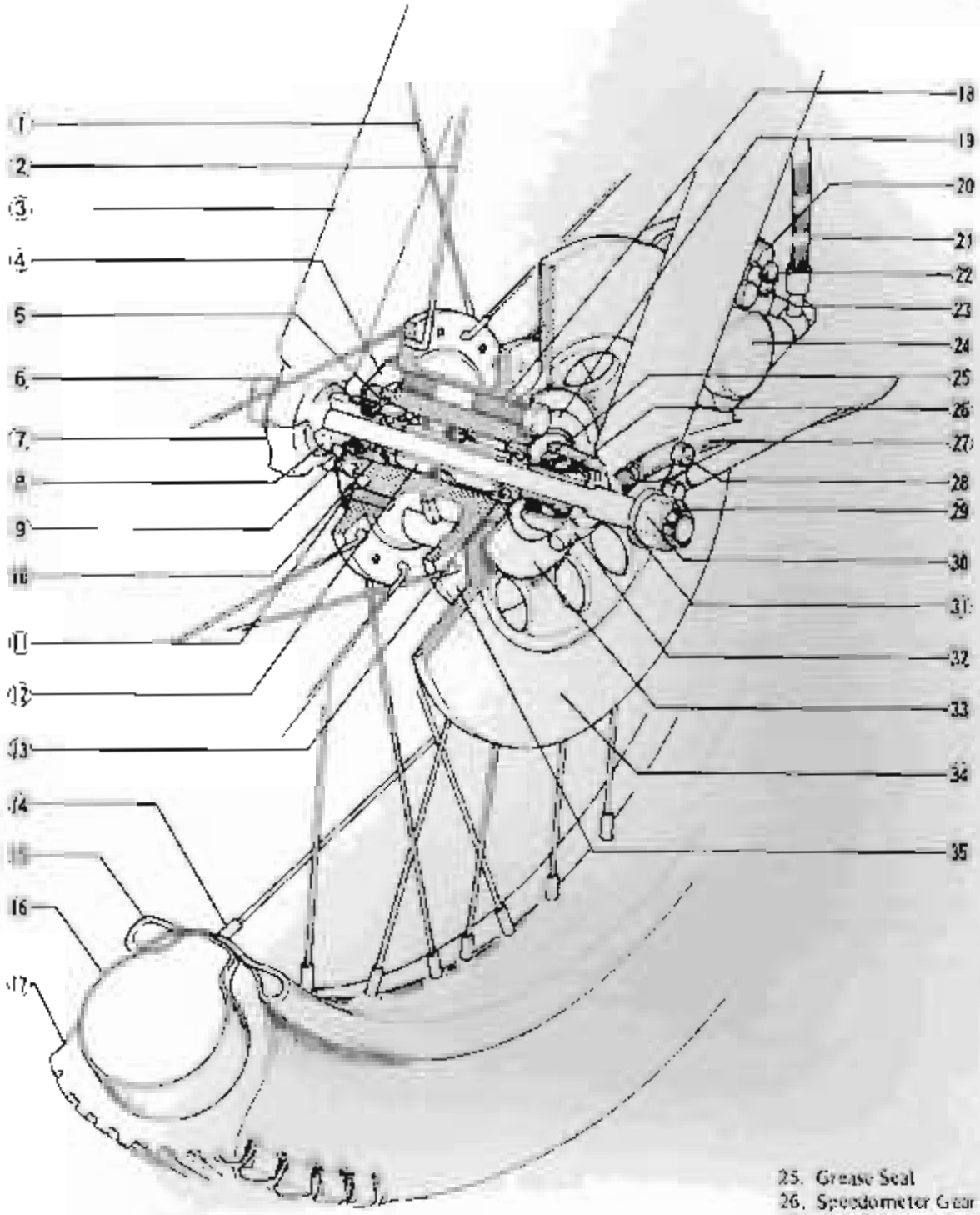
Rear Wheel

J1



1. Rear Shock Absorber
2. Double Washer
3. Rear Sprocket Mounting Nut
4. Mounting Bolt
5. Swing Arm
6. Grease Seal
7. Coupling Collar
8. Cotter Pin
9. Rear Axle
10. Rear Axle Nut
11. Drive Chain Adjuster
12. Locknut
13. Chain Adjusting Bolt
14. Rear Sprocket
15. Circlip
16. Ball Bearing
17. Coupling Sleeve
18. Wheel Coupling
19. O Ring
20. Distance Collar
21. Rubber Damper
22. Rear Hub
23. Outer Spoke
24. Brake Shoe
25. Inner Spoke
26. Brake Panel
27. Ball Bearing
28. Circlip
29. Spacer
30. Cam Lever Bolt
31. Cam Lever
32. Camshaft
33. Adjusting Nut
34. Brake Rod
35. Ball Bearing

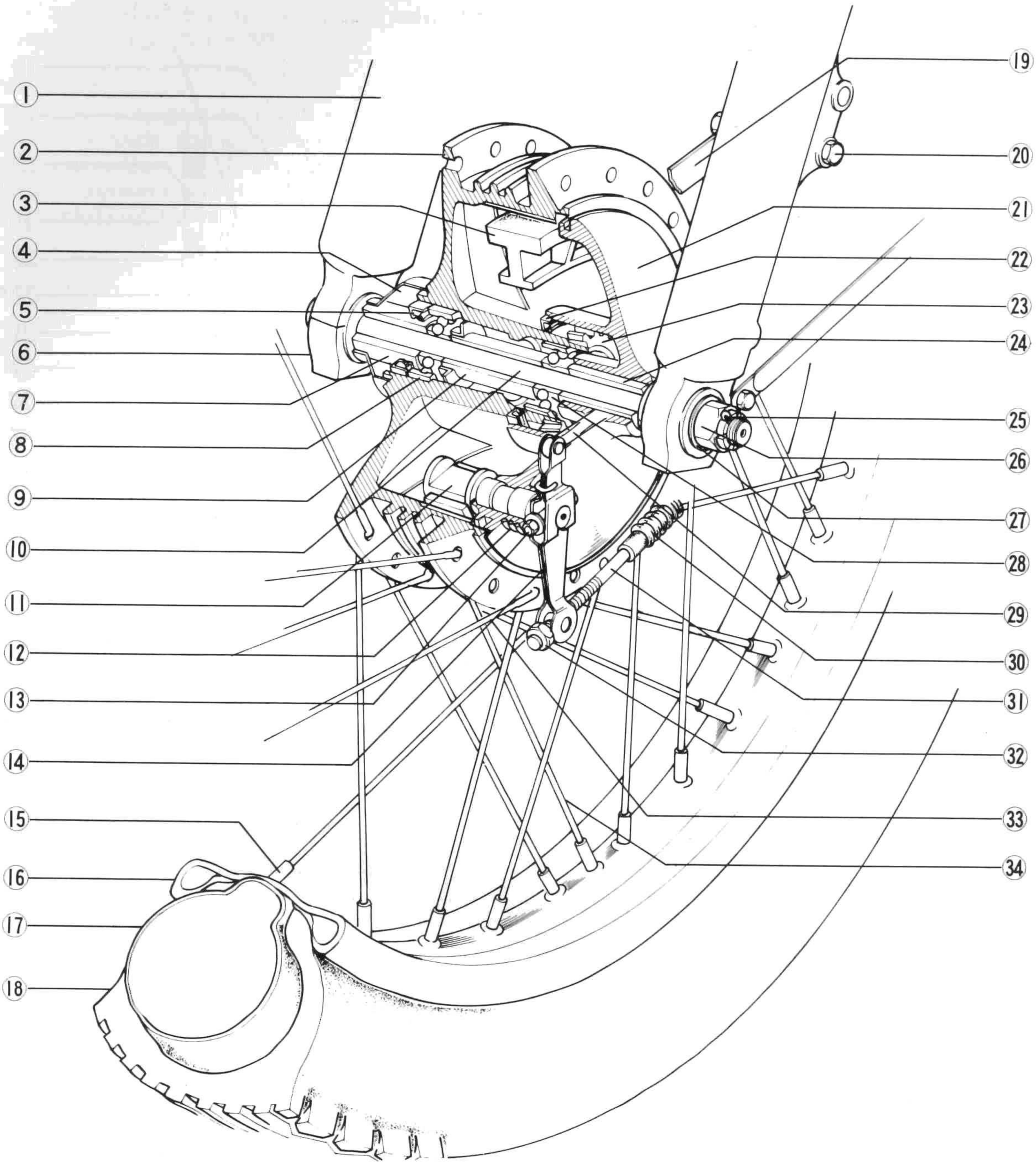
Front Wheel (KZ400-B)



1. Outer Spoke
2. Inner Spoke
3. Front Fork Leg
4. Cap
5. Circlip
6. Front Axle
7. Front Axle Clamp
8. Collar
9. Grease Seal
10. Ball Bearing
11. Screw
12. Distance Collar
13. Ball Bearing
14. Spoke Nipple
15. Rim
16. Tube
17. Tire
18. Disc Mounting Bolt
19. Double Washer
20. Caliper Mounting Bolt
21. Brake Hose
22. Bleed Valve Cap
23. Bleed Valve
24. Caliper
25. Grease Seal
26. Speedometer Gear
27. Speedometer Cable
28. Front Fork Drain Bolt
29. Cotter Pin
30. Front Axle Nut
31. Washer
32. Speedometer Gear Housing
33. Speedometer Gear Drive Herding Plate
34. Disc
35. Front Hub

Front Wheel (KZ400-C)

J3



1. Front Fork Leg
2. Front Hub
3. Brake Shoe
4. Cap
5. Grease Seal
6. Front Axle Clamp
7. Collar
8. Ball Bearing
9. Distance Collar
10. Front Axle
11. Brake Camshaft
12. Return Spring
13. Cam Lever Bolt
14. Cam Lever
15. Spoke Nipple
16. Rim
17. Tube
18. Tire
19. Torque Link
20. Torque Link Bolt
21. Brake Panel
22. Grease Seal
23. Speedometer Gear
24. Collar
25. Cotter Pin
26. Front Axle Nut
27. Washer
28. Ball Bearing
29. Connecting Rod
30. Dust Cover
31. Brake Cable
32. Adjusting Nut
33. Outer Spoke
34. Inner Spoke

Table J1 Tires, Air Pressure (measured when cold)

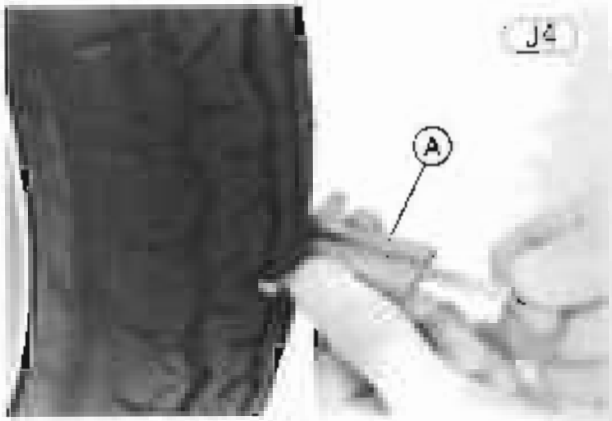
	Air Pressure		Size	Make, Type
Front	1.75 kg/cm² (25 psi)		3.00S-18 4PR	Yokohama Y-988A
Rear	Up to 97.5 kg (215 lb) load	2.0 kg/cm² (28 psi)	3.50S-18 4PR	Yokohama Y-987A
	97.5 – 215 kg (215 – 440 lb) load	2.5 kg/cm² (36 psi)		

Tire wear, damage

Tires must not be used if they are getting bald, or if they are cut or otherwise damaged. As the tire tread wears down, the tire becomes more susceptible to puncture and failure. 90% of tire failures occur during the last 10% of tire life.

Visually inspect the tire for cracks and cuts, replacing the tire in case of bad damage. Remove any imbedded stones or other foreign particles from the tread. Swelling or high spots indicate internal damage, requiring tire replacement unless the damage to the fabric is very minor.

Measure the depth of the tread with a depth gauge, and replace the tire if the tread depth is less than the service limit.



A. Depth Gauge

Table J2 Tire Tread Depth

Tire	Standard	Service Limit	
		Under 110 kph	Over 110 kph
Front	1.6 mm	1 mm	1 mm
Rear	6.6 mm	2 mm	3 mm

Rims, Spokes

The rim of each wheel is made of steel and is connected to the hub by the spokes. A rim band around the outside center of the rim keeps the tube from coming into direct contact with the spoke nipples.

The spokes are connected to the hub at tangents and in different directions so that different spokes bear the brunt of the load under different conditions. With the spokes doing specialized work, the strength of the spokes can be used more effectively.

When the motorcycle is at rest (Fig. J5A), the spokes above the axle are stretched and tense, while the spokes below the axle are slightly loose and do not provide support. During acceleration (B), the spokes running to the hub in the direction of rotation are stretched, while during deceleration or braking (C), the spokes running to the hub opposite to the direction of rotation are the ones that are stretched. In both cases (B) and (C), the spokes (that are not stretched (omitted from the diagram) are slightly loose and do not provide support. A damping of road shock is achieved by flexing of the spokes since they are arranged in this cross pattern instead of running straight from the hub to the rim.

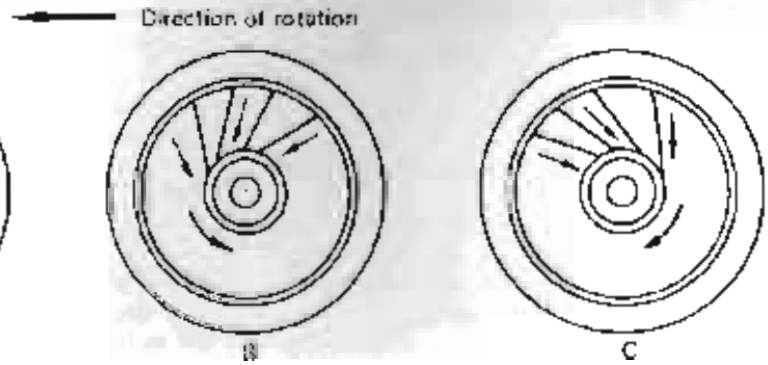
Since the spokes must withstand this repeated stress, it is important to take sufficient care that the spokes are not allowed to loosen and that they are tightened evenly. Loose or unevenly tightened spokes cause the rim to warp, increase the possibility of spoke breakage, and hasten nipple and spoke metal fatigue.

NOTE: The rim size shown in Table J3 is the outer width and diameter, both in inches. The spoke size is diameter number by length in millimeters. The two numbers for diameter size mean that each spoke has two diameters. To make the spoke more resistant to breakage the diameter is greater near the hub.

Table J3 Rim, Spoke Size

		Spoke		Rim
		Inner	Outer	
Front	KZ400-B	#8 x #9 x 174.5 x 102°	#8 x #9 x 174.0 x 85°	1.60 x 18
	KZ400-C	#8 x 147.5 x 102°	#8 x 147.0 x 85°	
Rear		#8 x #9 x 155.5 x 102°	#8 x #9 x 154.5 x 84°	1.85 x 18

Spoke Force



Spoke breakage

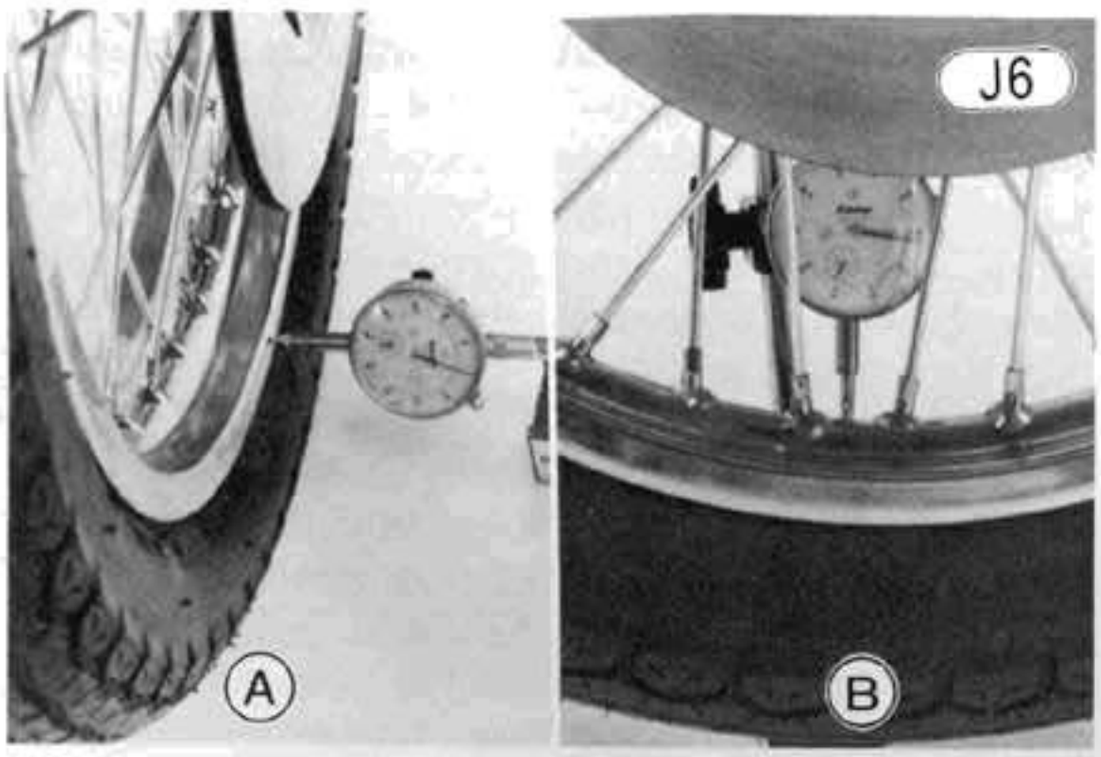
If any spoke breaks, it should be replaced immediately. A missing spoke places an additional load on the other spokes, which will eventually cause other spokes to break.

Periodically check that all the spokes are tightened evenly since they stretch a certain amount during use. Standard spoke tightening torque is 0.30 kg-m (26 in-lbs). Over- or under-tightening may cause breakage.

Rim runout

Set a dial gauge against the side of the rim, and rotate the wheel to measure axial runout. The difference between the highest and lowest dial readings is the amount of runout.

Set the dial gauge against the inner circumference of the rim, and rotate the wheel to measure radial runout. The difference between the highest and lowest dial readings is the amount of runout.



A. Axial Runout Measurement
B. Radial Runout Measurement

Table J4 Rim Runout

	Standard	Service Limit
Axial	under 0.8 mm	2 mm
Radial	under 1.0 mm	2 mm

A certain amount of rim warp (runout) can be corrected by recentering the rim. Loosen some spokes and tighten others to change the position of different parts of the rim. If the rim is badly bent, however, it should be replaced.

Axle

A bent axle causes vibration, poor handling, and instability.

To measure axle runout, remove the axle, place it in V blocks that are 100 mm apart, and set a dial gauge to the axle at a point halfway between the blocks. Turn the axle to measure the runout. The amount of runout is the amount of dial variation.

If runout exceeds the service limit, straighten the axle or replace it. If the axle cannot be straightened to within tolerance, or if runout exceeds the repair limit, replace the axle.

Axle Runout J7

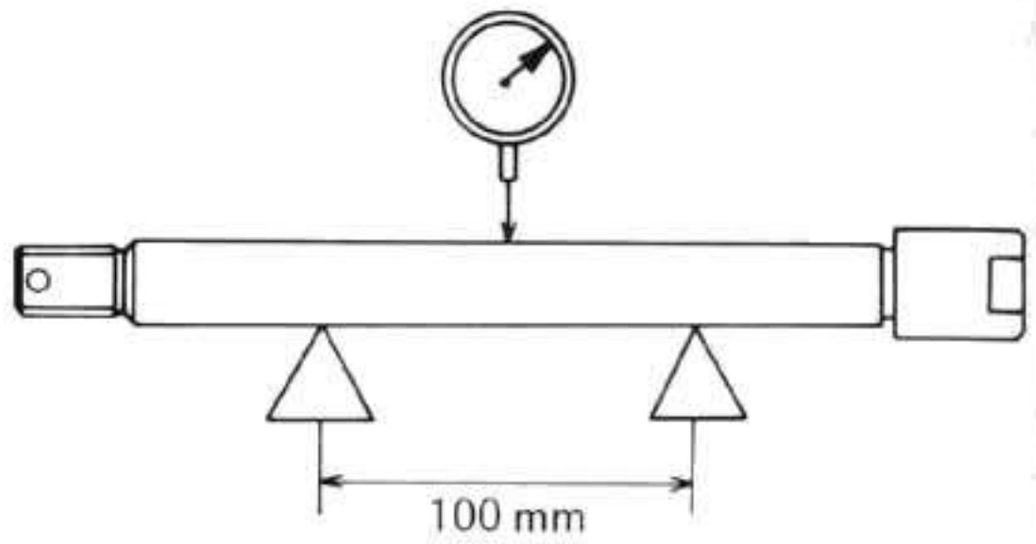


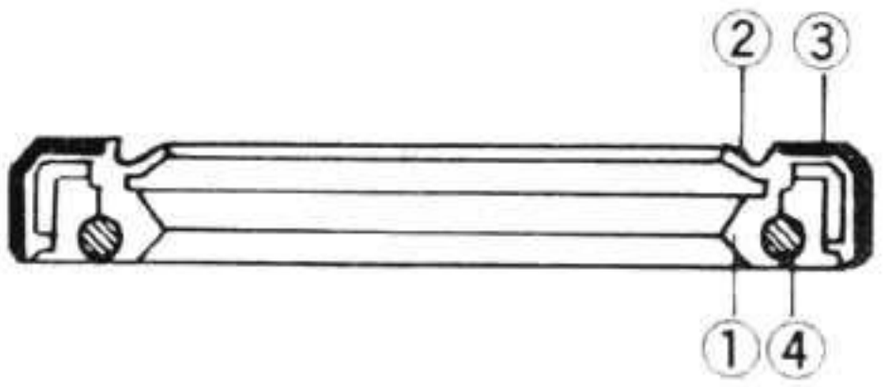
Table J5 Axle Runout/100 mm

		Standard	Service Limit	Repair Limit
Front	KZ400-B	under 0.05 mm	0.2 mm	0.7 mm
	KZ400-C	under 0.1 mm		
Rear		under 0.05 mm	0.2 mm	0.7 mm

Wheel Bearings, Grease Seals

A grease seal is fitted in the speedometer gear housing, in the right side of the front hub, and in the rear wheel coupling. Each grease seal is a rubber ring equipped with a steel band on its outer circumference. The grease seal inner lip is held against the axle collar by a wire spring band. Since the grease seal not only seals in the wheel bearing grease but also keeps dirt and moisture from entering the hub, the use of a damaged grease seal will cause the wheel bearing to wear quickly.

Grease Seal J8



1. Primary Lip
2. Secondary Lip
3. Metal Band
4. Wire Spring Band

A wheel bearing is fitted in both sides of each hub. Since worn wheel bearings will cause play in the wheel (resulting in vibration and instability), they should be cleaned, inspected, and greased periodically.

Inspection and lubrication

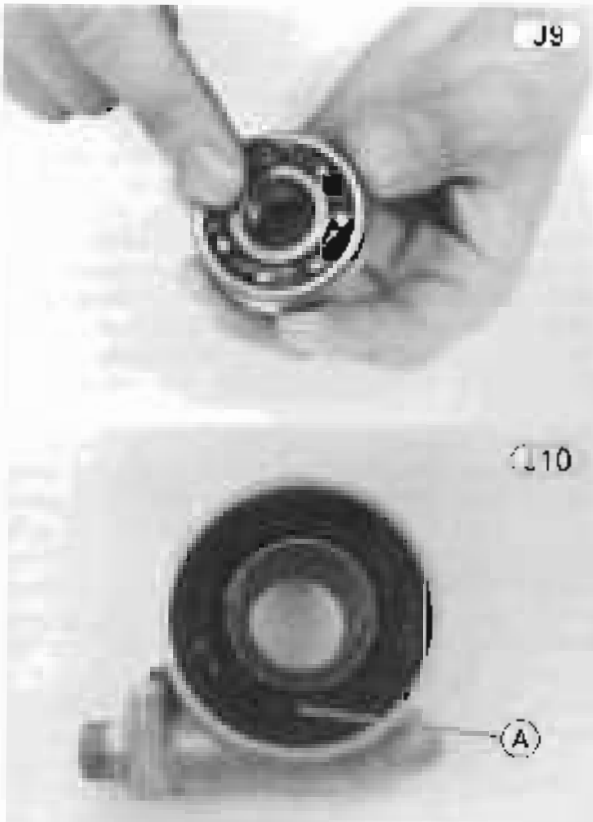
If the grease seals are examined without removing the seals themselves, look for discoloration (indicating

Table J6 Grease Seals, Wheel Bearings

	Front Wheel (KZ400-B)		Front Wheel (KZ400-C)		Rear Wheel		
	Hub Left	Hub Right	Hub Left	Hub Right	Coupling	Hub Left	Hub Right
Bearing	#6203	#6203	#6302Z	#6302	#6208	#6303	#6303NS
Grease Seal	PJ30-4208	PJ25-4206	WTC3568T	WTC2428	PJN35-4207	—	—

the rubber has deteriorated), hardening, damage to the internal ribbing, or other damage. If the seal or internal ribbing has hardened, the clearance between the seal and the axle sleeve will not be taken up, which will allow dirt and moisture to enter and reach the bearing. If in doubt as to its condition and whenever the seal is removed for greasing the bearing, the seal should be replaced. The seals are generally damaged upon removal.

Since the wheel bearings are made to extremely close tolerances, the clearance cannot normally be measured. Wash the bearing with a high flash point solvent, dry it **(do not spin it while it is dry)**, and oil it. Spin it by hand to check its condition. If it is noisy, does not spin smoothly, or has any rough spots, it must be replaced. If the same bearing is to be used again, re-wash it with a high flash-point solvent, dry it, and pack it with good quality bearing grease before installation. Turn the bearing by hand a few times to make sure the grease is distributed uniformly inside the bearing, and wipe the old grease out of the hub before bearing installation. Clean and grease the wheel bearings and the front hub gear housing [speedometer gear] in accordance with the Periodic Maintenance Chart (Pg. 10).



A. Speedometer Pinion



A. Speedometer Gear

Rear Wheel Coupling

The rear wheel coupling connects the rear sprocket to the wheel. A rubber shock damper in the coupling absorbs some of the shock resulting from sudden changes in torque due to acceleration or braking.

Damper inspection

Remove the rear wheel coupling (Pg. 120), and inspect the rubber damper.

Replace the damper if it appears damaged or deteriorated.

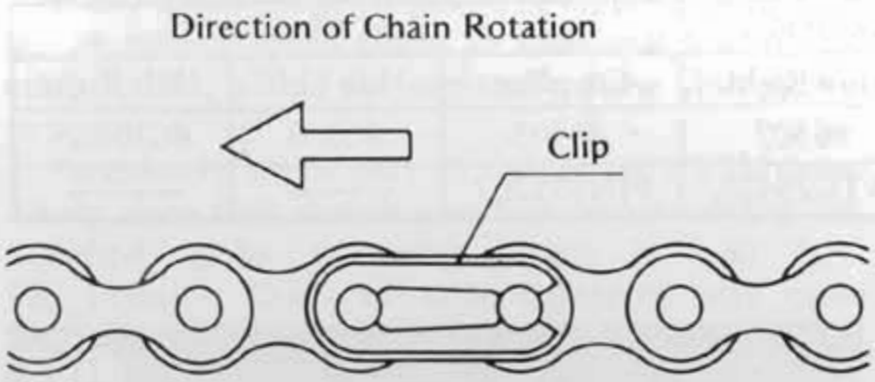


A. Rubber Damper

DRIVE CHAIN

The drive chain is used to transmit the engine power to the rear wheel, and is provided with a master link to facilitate removal and replacement. To minimize any chance of the master link decoupling, the master link is fitted with the closed end of the "O" pointed in the direction of chain rotation.

Master Link Clip Installation



When chain replacement is necessary, use only the standard chain for replacement, since only this chain has been especially designed for this drive system.

Table J7 Drive Chain

Make	Type	Link
Enuma	EK530SH-G	100-link

Chain construction is shown in Fig. J15. Most chain wear occurs between the pins and bushings, and between the bushings and rollers, rather than on the outside of the rollers. This wear causes the chain to lengthen. If the chain is left unadjusted, the lengthening will lead to noise, excessive wear, breakage, and disengagement from the sprockets. If the chain is allowed to wear too much, the distance from roller to roller is so much greater than the distance between each tooth of the sprocket that the wear to the chain and the sprocket rapidly accelerates.

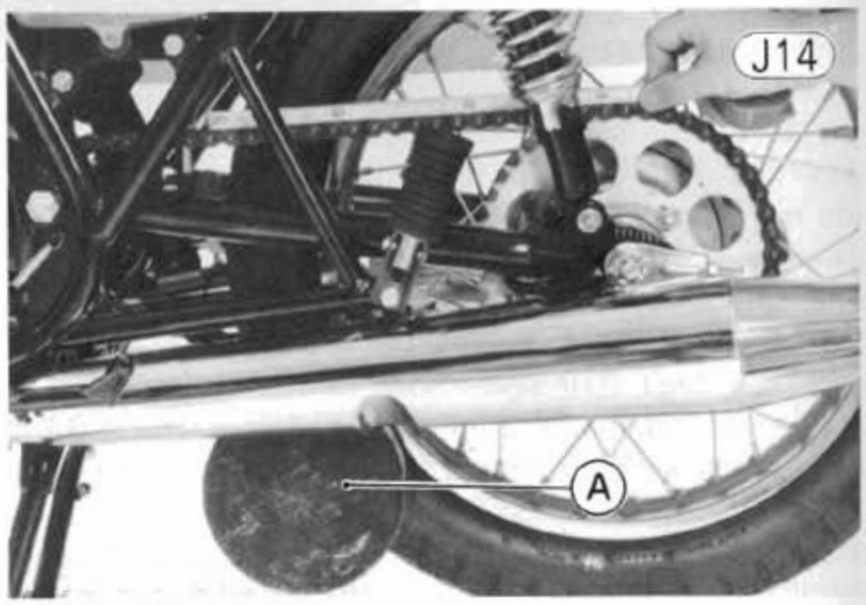
The rate of wear can be greatly reduced, however, by frequent and adequate lubrication, especially between the side plates of the links so that oil can reach the pins and bushings inside the rollers.

Wear

When the chain has worn so much that is more than 2% longer than when new, it is no longer safe for use and should be replaced. Whenever the chain is replaced, inspect both the engine and rear sprockets, and replace them if necessary. Overworn sprockets will cause a new chain to wear quickly. See page 199 ("sprockets" section).

Since it is impractical to measure the entire length of the chain, determine the degree of wear by measuring a 20-link length of the chain. Stretch the chain taut either by using the chain adjuster, or by hanging a 10 kg weight on the chain. Measure the legnth of 20 links on a straight part of the chain from the center of the 1st pin to the center of the 21st pin. Since the chain may wear unevenly, take measurements at several places. If any measurement exceeds the service limit, replace the chain.

NOTE: The drive system was designed for use with the standard chain. For maximum strength and safety, the standard chain must be used for replacement.



A. Weight

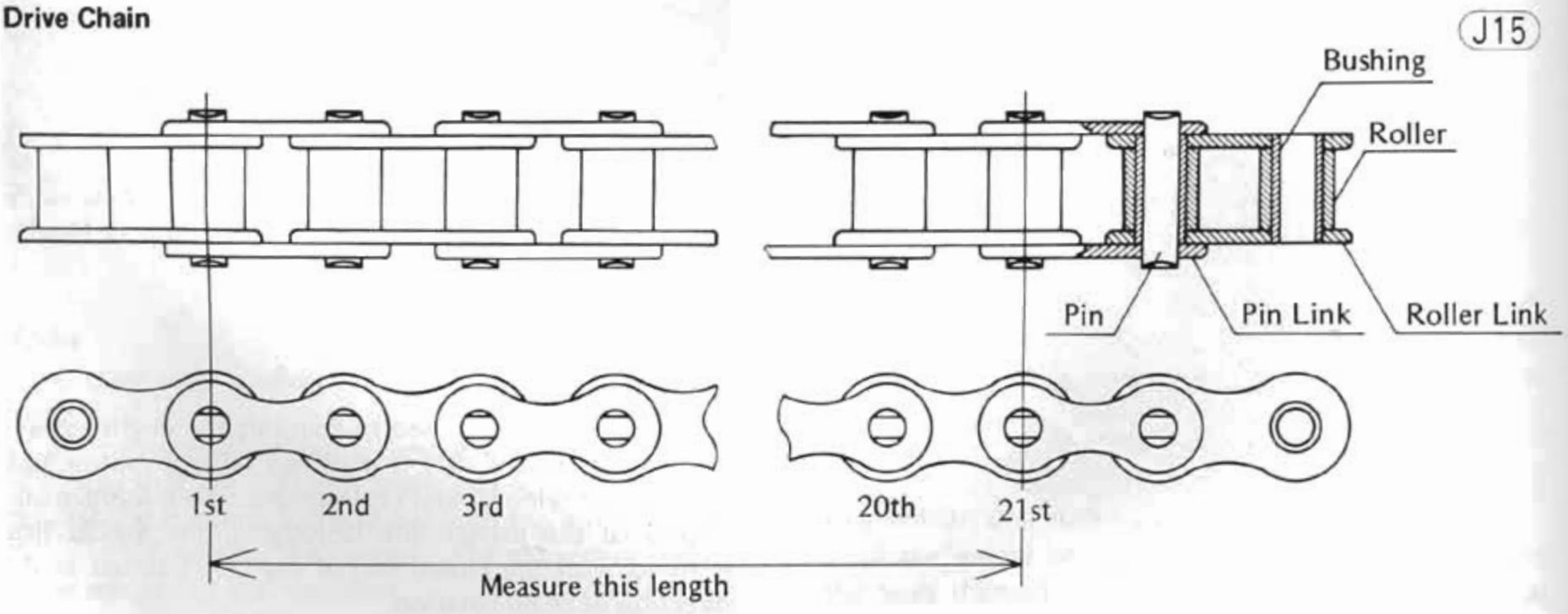
Table J8 Drive Chain 20-link Length

Standard	Service Limit
317.5~318.1 mm	323 mm

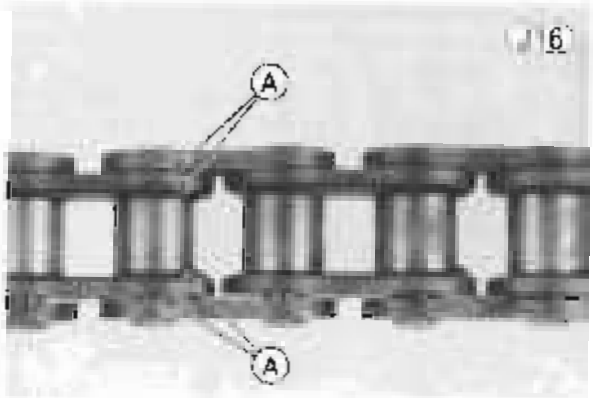
Lubrication

In order for the chain to function safely and wear slowly, it should be properly lubricated in accordance with the Periodic Maintenance Chart (Pg. 10). Lubrication is also becessary after riding through rain or on wet roads, or any time that the chain appears dry. Anytime that the motorcycle has been washed, the chain should be immediately lubricated to avoid rust.

Drive Chain



The chain should be lubricated with a lubricant which will both prevent the exterior from rusting and also absorb shock and reduce friction in the interior of the chain. An effective, good quality lubricant specially formulated for chains is best for regular chain lubrication. If a special lubricant is not available, a heavy oil such as SAE 90 is preferred to a lighter oil because it will stay on the chain longer and provide better lubrication. Apply the oil to the sides of the rollers and between the side plates of the links so that oil will penetrate to the pins and bushings where most wear takes place. Wipe off any excess oil.



A. Oil

Dirt will cling to the oil and act as an abrasive, accelerating chain wear. Whenever the chain becomes particularly dirty, it must be cleaned in kerosene and then soaked in a heavy oil. Shake the chain while it is in the oil so that oil will penetrate to the inside of the rollers.

SPROCKETS

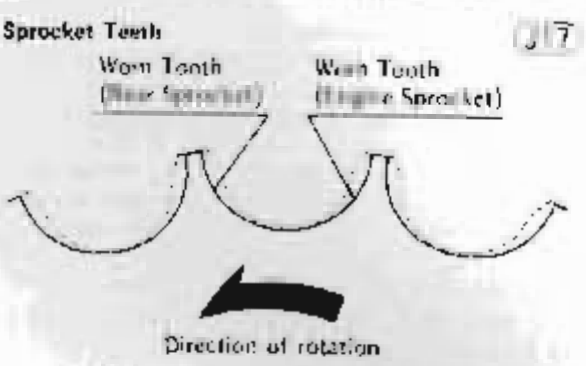
There are two sprockets for the drive chain. A forward sprocket, or engine sprocket, is mounted on the end of the output shaft and is used to drive the chain. A rear sprocket is connected to the rear wheel hub through the rear wheel coupling and is driven by the chain to turn the rear wheel.

Sprockets that have become excessively worn cause chain noise and greatly accelerate chain and sprocket wear. The sprockets should be checked for wear any time that the chain is replaced. A warped rear sprocket destroys chain alignment and may cause the chain to break or jump off the sprockets when traveling at high speed. The sprockets should be checked for wear and the rear sprocket for warp any time the chain is replaced.

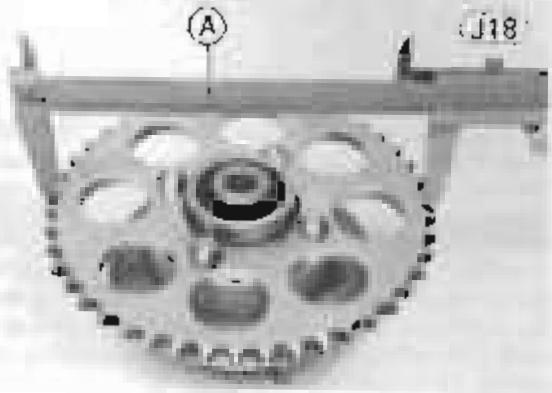
Sprocket wear

Visually inspect the sprocket teeth. If they are worn as illustrated, replace the sprocket.

Measure the diameter of the sprocket at the base of the teeth. If the sprocket is worn down to less than the service limit, replace the sprocket.



NOTE: If a sprocket requires replacement, the chain is probably worn also. Upon replacing a sprocket, inspect the chain.



A. Vernier Calipers

Table J8 Sprocket Diameter

	Standard	Service Limit
Engine	[illegible] mm	[illegible] mm
Rear	216.8~217.35 mm	216.5 mm

Rear sprocket warp

Elevate the rear wheel so that it will turn freely, and set a dial gauge against the rear sprocket near the teeth as shown in Fig. J19. Rotate the rear wheel. The difference between the highest and lowest dial gauge readings is the amount of runout (warp).

If the runout exceeds the service limit, replace the rear sprocket.



A. Dial Gauge

Table J10 Rear Sprocket Warp

Standard	Service Limit
under 0.5 mm	0.6 mm

DISC BRAKE

A hydraulic disc brake is used on the front wheel of the KZ400-B for superior braking performance and high reliability. The major components of the disc brake are the brake lever, master cylinder, brake line, caliper assembly, and disc. The brake lever is pulled to move a piston in the master cylinder and pressurize the brake fluid. Fluid pressure is transmitted through the brake line to operate the caliper. The caliper grips the disc attached to the wheel, slowing wheel rotation. Fluid pressure operates the brake light switch. The switch turns on the brake light.

The brake fluid is an extra heavy duty type with a high boiling point to withstand the heat produced by friction of the caliper pads on the disc. Since the boiling point and thus the performance of the fluid would be reduced by contamination with water vapor or dirt from the air, the reservoir is sealed with a rubber diaphragm under the cap. This diaphragm also prevents fluid evaporation and spillage should the motorcycle fall over. The fluid is further protected by rubber seals in the caliper assembly and at the master cylinder brake line fitting.

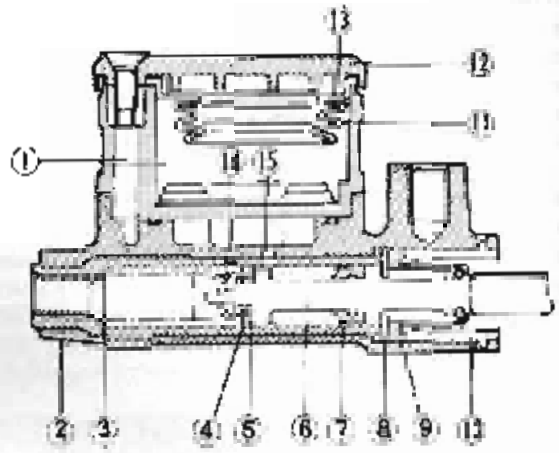
The master cylinder assembly includes the reservoir (1), piston (6), primary and secondary cups (4), (7), non-return valve (5), and spring (3). The reservoir has two holes at the bottom: a relatively large supply port (15) to supply fluid to the lines and a small relief port (14) to admit excess fluid from the line. The primary and secondary cups stop the fluid from leaking back around the piston while the piston is moving forward to pressurize the line. The non-return valve is in the head of the piston; it stops backward fluid flow when the brake is applied. When the brake lever is released, the valve allows flow around the cup to fill the vacuum in front of the piston so that the piston can return easily.

The fluid seal in the caliper and the cup at the head of the master cylinder piston are made of special heat resistant rubber for best performance and to prevent deterioration. For this reason, only standard parts should be used.

The caliper assembly includes pad A (9), pad B (11), and the piston (5), which is inside the caliper cylinder. Through the caliper runs the caliper holder (1) to mount the assembly to the left fork leg. When the piston forces pad A against the disc, the caliper swings on the shaft portion of the caliper holder such that pad B is also forced against the disc.

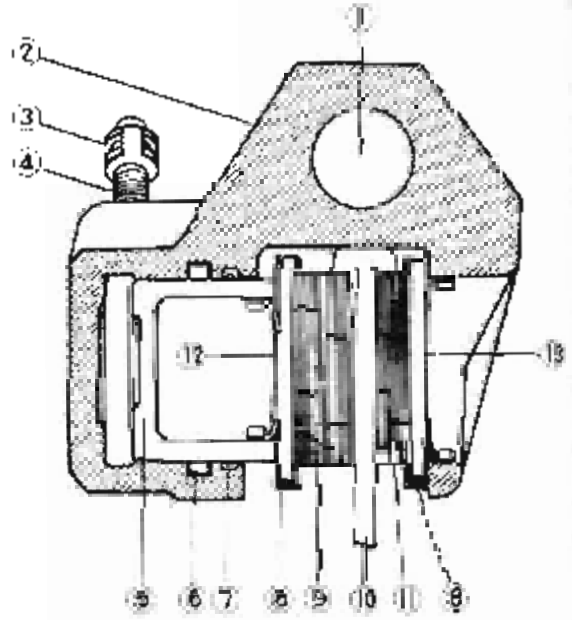
Unlike a drum type brake, the components of the disc brake which perform the actual braking action, i.e., the disc and pads, are open to direct contact with the air flow past the motorcycle. This provides for excellent dissipation of the heat from brake friction, and minimizes the possibility of brake fade common to drum brakes.

Master Cylinder (J20)



1. Reservoir
2. Master Cylinder Body
3. Spring
4. Primary Cup
5. Non-return Valve
6. Piston
7. Secondary Cup
8. Piston Stop
9. Dust Seal
10. Liner
11. Diaphragm
12. Cap
13. Plate
14. Relief Port
15. Supply Port

Caliper (J21)



1. Caliper Holder
2. Caliper Body
3. Cap
4. Bleed Valve
5. Piston
6. Fluid Seal
7. Dust Seal
8. Anti-rattle spring
9. Pad A
10. Disc
11. Pad B
12. Shim
13. Shim

Automatic Wear Adjustment

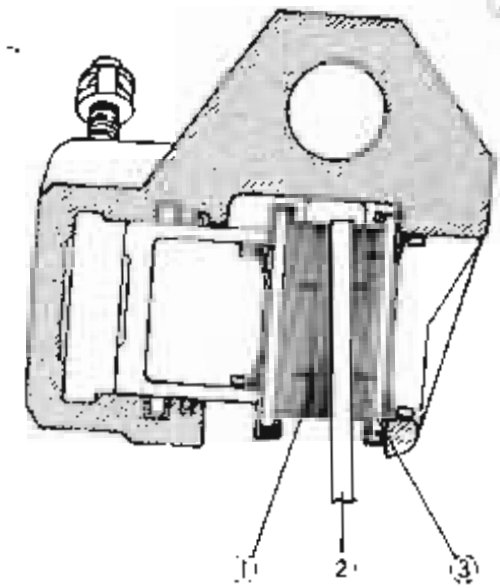
When fluid pressure develops in the cylinder, the piston is pushed exerting pressure against the brake pad, which in turn presses against the brake disc. The pressurized fluid is prevented from leaking by a fluid seal

fitted into the cylinder wall. The seal is pressed against the piston, and instead of sliding when the piston moves, the seal is only distorted, allowing no fluid leakage at all. When the brake lever is released and fluid pressure lowers, the elasticity of the seal returns the piston to its original position. After the brakes are used for a while and the pads wear slightly, the rubber seal will no longer be able to absorb the additional amount that the piston travels. Instead, when piston travel forces the seal past its limit, the seal slips on the piston. The seal then returns the piston to a new rest position that is closer to the disc.

A small amount of fluid from the reservoir supplements the fluid in the brake line to compensate for the difference in piston position. Consequently, the length of the brake lever stroke remains unchanged, and the brake never needs adjustment.

The caliper turns on the holder gradually as pad wear progresses. So the pads do not wear evenly.

Pad Wear (when worn) J22



1. Pad A
2. Disc
3. Pad B

Braking Stroke

When the brake lever is pulled, the piston 7 in the master cylinder is pushed and moves forward against the force of the return spring 4. At this time, the primary cup 6 at the head of the piston closes the small relief port 8, which connects the pressure chamber 3 and the reservoir 10. Until this port is fully closed, the brake fluid does not start being pressurized, in spite of the forward movement of the piston.

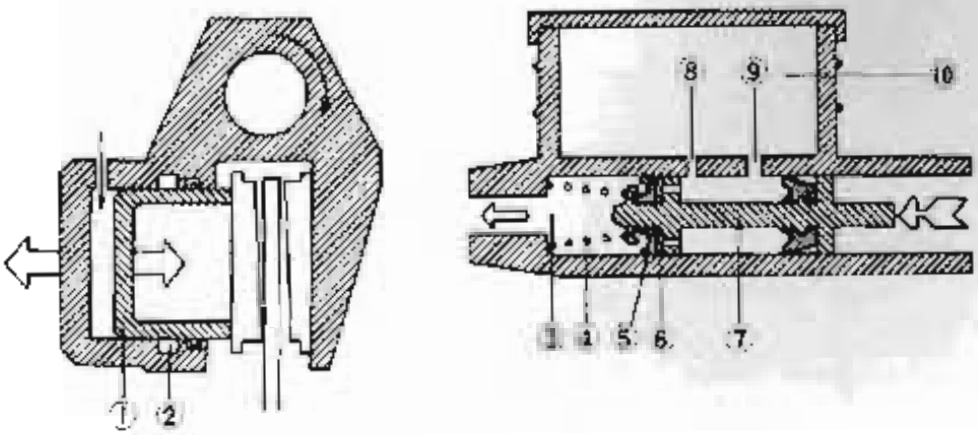
The pressure stroke starts as soon as the relief port is closed. The piston compresses the brake fluid, which is being used as the pressure medium, forcing it out into the brake line. The pressure is transmitted through the line to the cylinder portion of the caliper assembly, where it forces the piston 1 towards the disc. The piston presses pad A against the disc, but since the disc is immovable, further pressure cannot move the pad any farther. Instead, the entire caliper assembly moves in the opposite direction such that pad B is also forced against the disc. In this manner, the disc is gripped between the two pads, and the resulting friction slows wheel rotation.

Braking Release Stroke

When the brake lever is released, the piston in the master cylinder is quickly returned toward its rest position by the spring 4, and brake fluid pressure drops in the line and in the caliper cylinder. The elasticity of the fluid seal 2 in the cylinder then returns the piston. This leaves no pressure against either pad A or B so that slight friction against the disc pushes them both slightly away from the disc.

As the master cylinder piston moves back further, the brake fluid in the line rushes to fill the low pressure area in front of the primary cup at the piston head. At this time, fluid from the reservoir flows through the large supply port 9 into the space between the primary and secondary cups, through the non-return valve 6, and passes around the edges of the primary cup to fill the vacuum. When the piston has returned to its rest

Braking Stroke J23



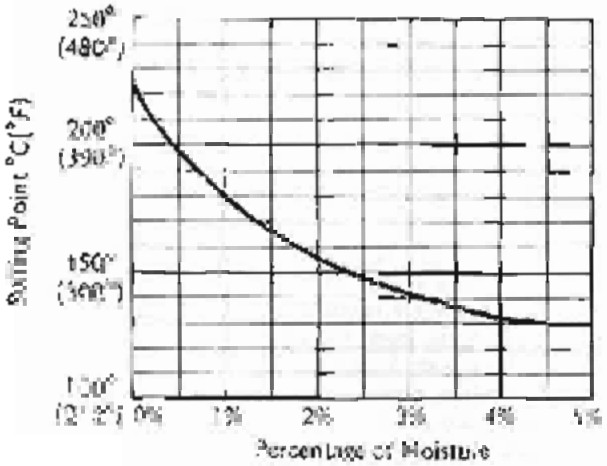
1. Piston
2. Fluid Seal
3. Pressure Chamber
4. Spring
5. Primary Cup
6. Non-return Valve
7. Piston
8. Relief Port
9. Supply Port
10. Reservoir

position against the stop, the small relief port is uncovered. As the brake fluid returns from the line, excess fluid passes through the relief port into the reservoir until the brake line pressure returns to zero.

Brake Fluid

When the brake is applied, heat is generated by the friction between the disc and the brake pads. While much of this heat is immediately dissipated, some of it is transmitted to the brake fluid and may raise fluid temperature to as high as 150°C (300°F) during brake operation. This temperature could boil the brake fluid and cause a vapor lock in the lines unless fluid with a high boiling point is used and has been kept from being contaminated with dirt, moisture, or a different type of fluid. Poor quality or contaminated fluid can also deteriorate the rubber parts of the brake mechanism, although a special rubber is used to make them resistant to brake fluids.

Brake Fluid Boiling Point J24

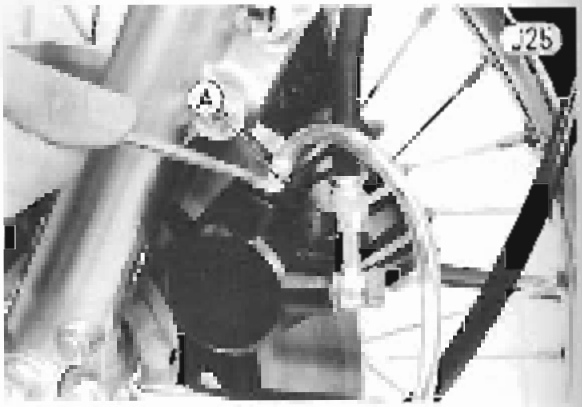


The graph of Fig. J24 shows how brake fluid contamination with moisture lowers the fluid boiling point. Although not shown in the graph, the boiling point also lowers as the fluid gets old, is contaminated with dirt, or if two different types of brake fluid are mixed.

Changing the brake fluid

The brake fluid should be changed in accordance with the Periodic Maintenance Chart (Fig. 10) and whenever it becomes contaminated with dirt or water.

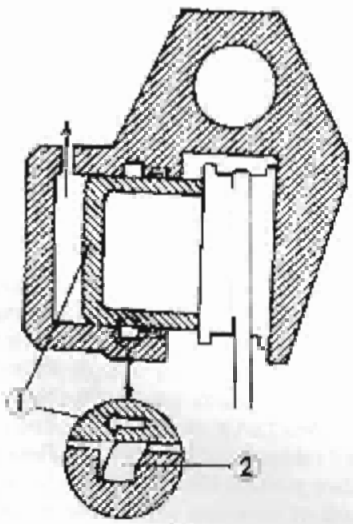
- Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
- Open the bleed valve (counterclockwise to open), and pump the brake lever until all the fluid is drained from the line.

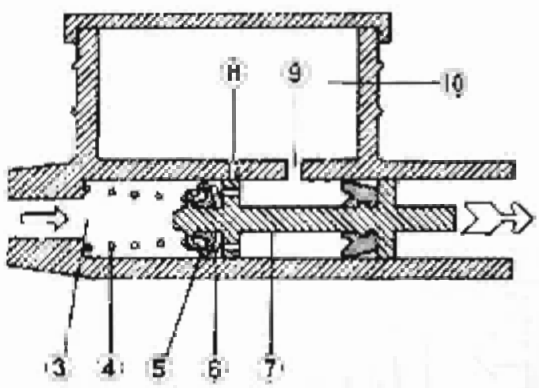


A. Bleed Valve

- Close the bleed valve, and fill the reservoir with fresh brake fluid.
- Open the bleed valve, apply the brake by the brake lever, close the valve with the brake held applied, and then quickly release the lever. Repeat this operation until the brake line is filled and fluid starts

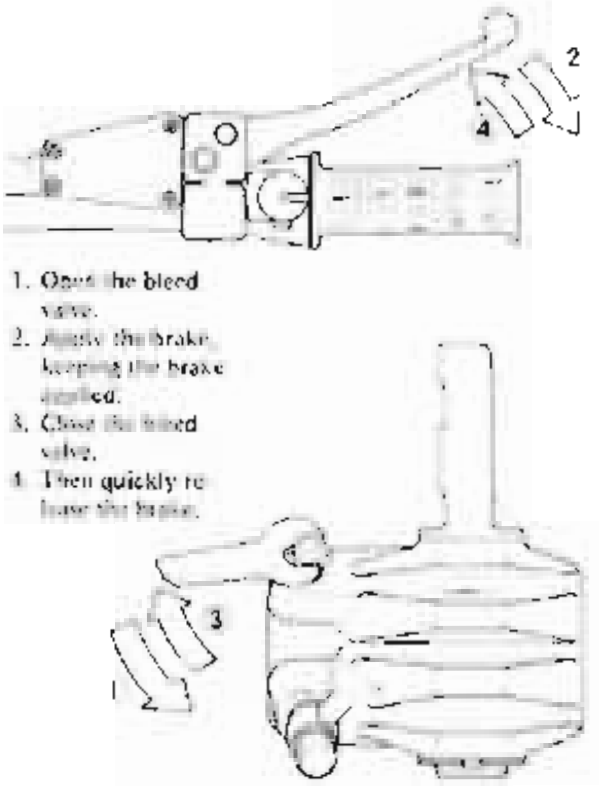
Braking Release Stroke J26





1. Piston
2. Fluid Seal
3. Pressure Chamber
4. Spring
5. Primary Cup
6. Non return Valve
7. Piston
8. Relief Port
9. Supply Port
10. Reservoir

Filling Up the Brake Line J27



1. Open the bleed valve.
2. Apply the brake, keeping the brake applied.
3. Close the bleed valve.
4. Then quickly release the brake.

coming out of the plastic hose. Replenish the fluid in the reservoir as often as necessary to keep it from running completely out.

- Bleed the air from the lines.

Bleeding the brake

The brake hose has very low compression coefficient so that almost all the movement of the brake lever is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake lines, brake lever movement will be partially used in compressing the air. This will make the lever feel spongy, and there will be a loss in braking power.

Bleed the air from the brake whenever brake lever action feels soft or spongy, after the brake fluid is changed, or whenever a brake line fitting has been loosened for any reason.

- Remove the reservoir cap, and check that there is plenty of fluid in the reservoir. The fluid level must be checked several times during the bleeding operation and replenished as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.
- With the reservoir cap off, slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir. This bleeds the air from the master cylinder end of the line.

WARNING

When working with the disc brake, observe the precautions listed below.

1. Never reuse old brake fluid.
2. Do not use fluid from a container that has been left unsealed or that has been open for a long time.
3. Do not mix two types of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate. Recommended fluids are given in the table.

NOTE: The type of fluid originally used in the disc brake is not available in most areas, but it should be necessary to add only little fluid before the first brake fluid change. After changing the fluid, use only the same type thereafter.

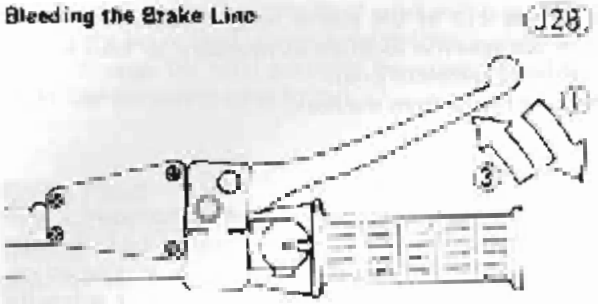
Table J11 Recommended Disc Brake Fluid

Atlas Extra Heavy Duty
Shell Super Heavy Duty
Texaco Super Heavy Duty
Wagner Lockheed Heavy Duty
Castrol Girling Green
Castrol GTX Mfl
Castrol Disc Brake Fluid

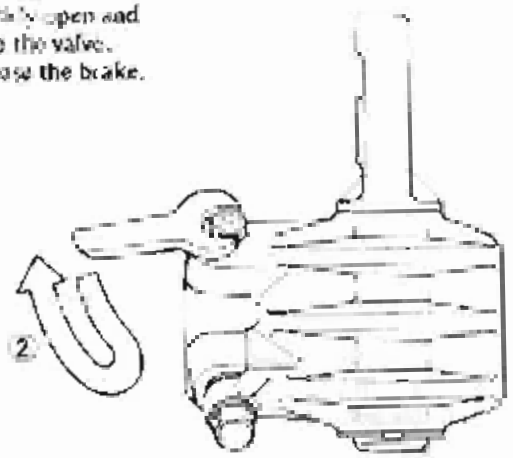
The correct fluid will come in a can labeled D.O.T.3. Do not use fluid that does not have this marking.

4. Don't leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.
5. Don't change the fluid in the rain or when a strong wind is blowing.
6. Except for the disc pads and discs, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, motor oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely and will eventually reach and break down the rubber used in the disc brake.
7. When handling the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high flash-point solvent. Do not use one which will leave an oily residue. Replace the pads with new ones if they cannot be cleaned satisfactorily.
8. Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely wiped up immediately.
9. If any of the brake line fittings or the bleed valve is opened at any time, the **AIR MUST BE BLED FROM THE BRAKE.**
10. When installing or assembling the disc brake, tighten the disc brake fittings to the values given in Table 0.1 on Pg. 1-4. Improper torque may cause the brake to malfunction.

Bleeding the Brake Line

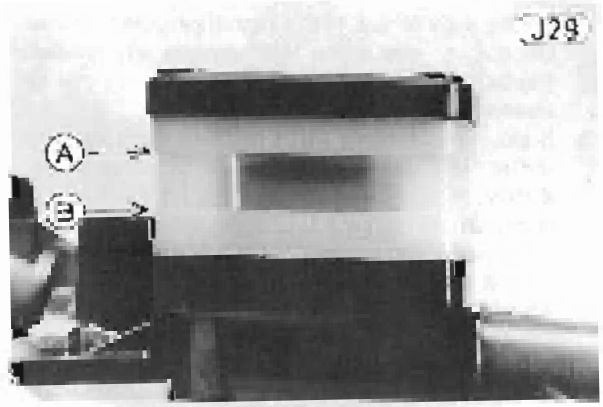


1. Hold the brake applied.
2. Quickly open and close the valve.
3. Release the brake.



•Install the reservoir cap, and connect a clear plastic hose to the bleed valve at the caliper, running the other end of the hose into a container. Pump the brake lever a few times until it becomes hard. Then, holding the lever squeezed, quickly open (turn counterclockwise) and close the bleed valve. Then release the lever. Repeat this operation until no more air can be seen coming out into the plastic hose. Check the fluid level in the reservoir every so often, replenishing it as necessary.

•When air bleeding is finished, install the rubber cap on the bleed valve, and check that the brake fluid is filled to the upper level line marked in the reservoir (handlebar turned so that the reservoir is level).



A. Upper Level B. Lower Level

Master cylinder parts wear

When master cylinder parts are worn or damaged, proper brake fluid pressure cannot be obtained in the line, and the brake will not hold.

If the small relief port becomes plugged, especially with a swollen or damaged primary cup, the brake will drag on the disc.

•Check that there are no scratches, rust or pitting on the inside of the master cylinder, and that it is not worn past the service limit.

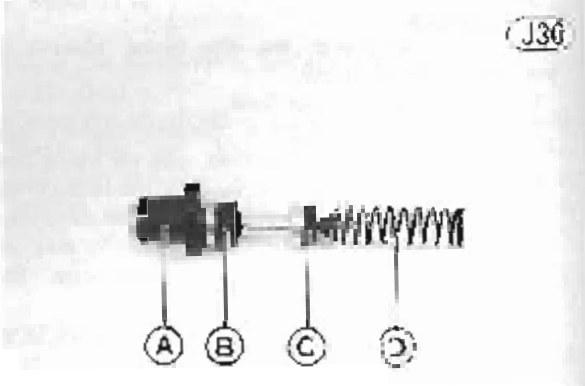
•Check the piston for these same faults.

NOTE: The cups and spring are part of the piston assembly. Replace the piston assembly if any one of the cups or the spring requires replacement.

Table J12 Master Cylinder Parts

	Standard	Service Limit
Cylinder Inside Dia.	14.000~14.063 mm	14.08 mm
Piston Outside Dia.	13.957~13.984 mm	13.90 mm
Primary Cup Dia.	14.2~14.6 mm	14.1 mm
Secondary Cup Dia.	14.5~14.15 mm	14.5 mm
Spring Free Length	42.8~45.8 mm	42.2 mm

•Inspect the primary and secondary cups. If a cup is worn, damaged, softened (rotted), or swollen, replace it. When inserting the cup into the cylinder, see that it is slightly larger than the cylinder (standard values given in the table). If fluid leakage is noted at the brake lever, the cups should be replaced.



A. Dust Seal C. Primary Cup
B. Secondary Cup D. Spring

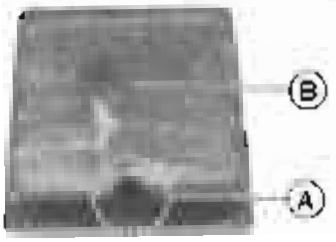
•Check that the spring is not damaged, or not shorter than the service limit. Replace the spring if it is damaged, or shorter than the service limit.

•Replace the dust seal if it is damaged.

Caliper parts wear

Inspect the pads for wear. If either pad is worn down through the bottom of the notch, replace both pads as a set. If any grease or oil spills on the pads, wash it off with trichloroethylene or a high flash point solvent. Do not use one which will leave an oily residue. If the oil cannot be thoroughly cleaned off, replace the pads.

J31

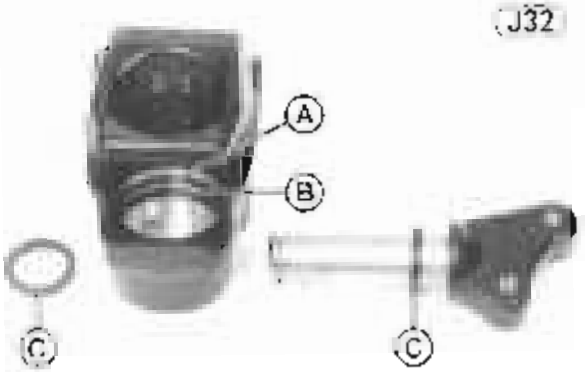


A. Notch B. Pad B

The fluid seal around the piston maintains the proper pad/disc clearance. If this seal is not satisfactory, pad wear will increase, and constant pad drag on the disc will raise brake and brake fluid temperature.

Replace the fluid seal under any of the following conditions: (a) fluid leakage around the pad; (b) brakes overheat; (c) the seal is stuck to the piston. If the fluid seal is replaced, replace the dust seal as well. Check the friction seals on the caliper holder, and replace any that are cracked, worn, swollen or otherwise damaged. Also, replace all seals every other time the pads are changed.

J32



A. Dust Seal C. Friction Seal
B. Fluid Seal

Measure the cylinder inside diameter and piston outside diameter.

Replace the cylinder and piston if they are worn out of tolerance, badly scored, or rusty.

Table J13 Caliper Parts

	Standard	Service Limit
Cylinder Inside Diameter	41.30 ~ 41.35 mm	41.6 mm
Piston Outside Diameter	41.13 ~ 41.22 mm	40.9 mm

Brake line damage

The high pressure inside the brake line can cause fluid to leak or the line to burst if the line is not properly maintained.

Bend and twist the rubber hose while examining it. Replace it if any cracks or bulges are noticed.

Disc wear, warp

Besides wearing down, the disc may warp. A warped disc will cause the brake pads to drag on the disc and wear down both the pads and disc quickly. Dragging will also cause overheating and poor braking efficiency. Poor braking can also be caused by oil on the disc. Oil on the disc must be cleaned off with trichloroethylene or a high flash point solvent. Do not use one which will leave an oily residue.

Jack up the motorcycle so that the front wheel is off the ground, and turn the handlebar fully to one side. Set up a dial gauge against the front disc as illustrated and measure disc runout. If runout exceeds the service limit, replace the disc.

J33



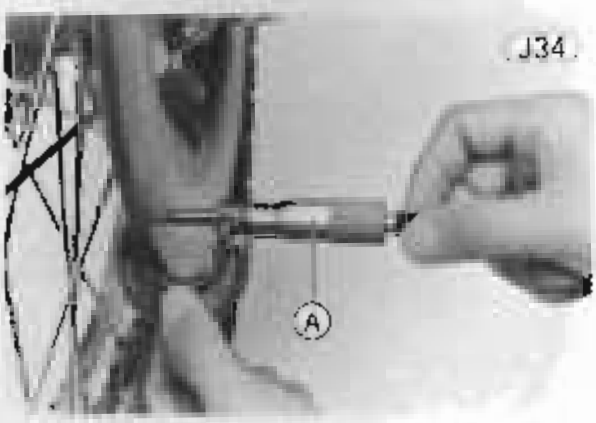
A. Dial Gauge

Table J14 Disc Runout

Standard	Service Limit
under 0.15 mm	0.3 mm

Measure the thickness of the disc at the point where it has worn the most. Replace the disc if it has worn past the service limit.

J34



A. Micrometer

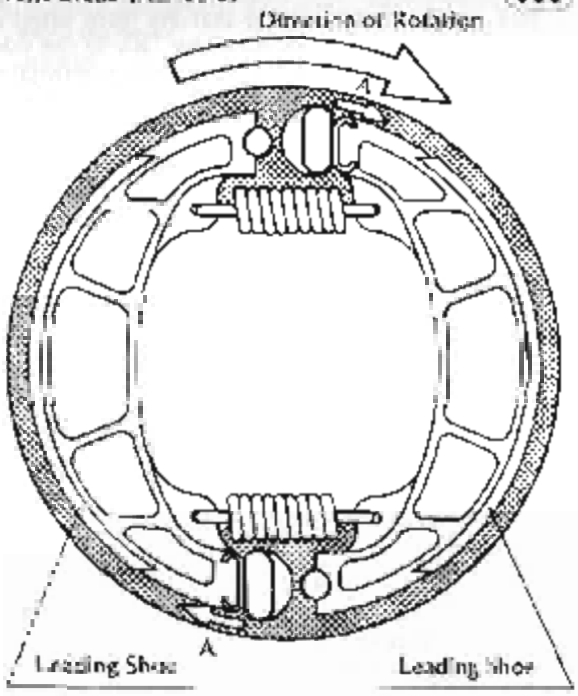
Table J15 Disc Thickness

Standard	Service Limit
6.9 ~ 7.1 mm	6 mm

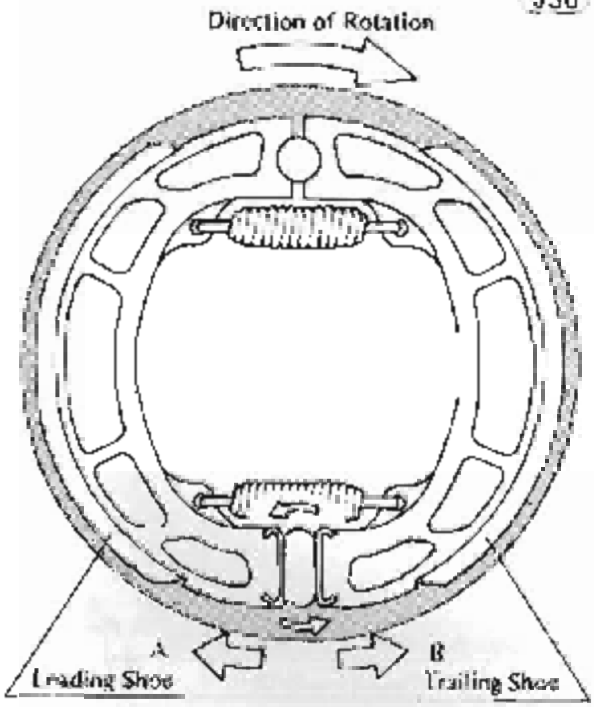
DRUM BRAKE

The front wheel of KZ400-C is equipped with a two-leading shoe type of drum brake and the rear wheel is equipped with a leading trailing type of drum brake. "Two-leading shoe" means that both brake shoes lead, that is, expand against the drum in the direction of drum rotation. "Leading trailing" means that one of the two brake shoes leads, expanding against the drum in the direction of drum rotation, and the other shoe trails, expanding in the direction opposite drum rotation.

Front Brake (KZ400-C) J35



Rear Brake J36



The force applied by the rider upon braking is transmitted to the interior of the brake by a camshaft. The force applied at the brake pedal or brake lever is transmitted by a rod or a cable to the cam lever which then turns the camshaft. When the camshaft rotates, the large portion of the cam is forced between the two brake shoes. Since the shoes are only held together away from the drum by springs, the cam, overcoming spring tension, pushes the shoes outward against the drum. The leading shoe rotates in direction "A", and the trailing shoe in direction "B" as shown in the diagrams.

The friction between the linings and the drum, which decelerates the motorcycle, gradually wears down the brake shoe linings. On the outside of the brake panel is a brake lining wear indicator, which, as the brake is applied, moves in direct proportion to the distance that the brake shoe linings move to reach the brake drum. As the linings wear down, the lining surface has further to travel before reaching the drum. The indicator accordingly travels farther until it finally points just to the rib of the "UP" in USABLE when the lining wear has reached the service limit.

Due to wear of the brake drum, shoe linings, and cam, periodic brake adjustment is required. However, if the brake parts become overworn, adjustment will not be sufficient to ensure safe brake operation. Not only can overworn parts crack (drum) and otherwise suffer damage as they lose their braking effectiveness, but, if the cam wears to the point where it turns nearly horizontal when the brake is fully applied, the brake may lock in the applied position, or brake pedal return may be very sluggish. All brake parts should be checked for wear in accordance with the Periodic Maintenance Chart (Pg. 10).

Brake drum wear

Measure the inside diameter of the brake drum with calipers to determine wear. Since uneven drum wear will decrease braking effectiveness, take measurements at a minimum of two places. If the drum is worn unevenly or if it is scored, turn the drum down on a brake drum lathe or replace the hub with a new one. (Do not turn it down to the service limit, and do not turn it down if any diameter measurement exceeds the service limit). If any diameter measurement exceeds the service limit, replace the hub with a new one.

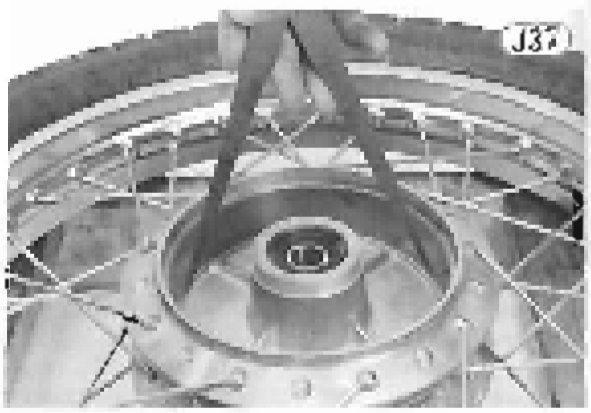
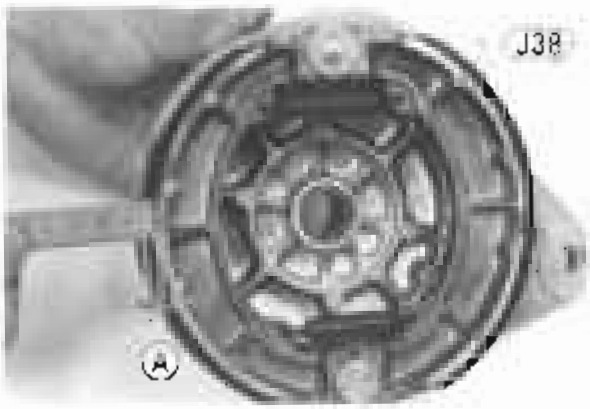


Table J16 Brake Drum Inside Diameter

	Standard	Service Limit
Front	180.000~180.110 mm	180.75 mm
Rear	160.000~160.160 mm	160.75 mm

Brake shoe lining wear

Check the thickness of the brake linings, and replace both shoes as a set if the thickness at any point is less than the service limit. If the thickness of the brake linings is sufficient, check the linings for uneven wear, and file or sand down any high spots. With a wire brush, remove any foreign particles imbedded in the lining surface. Wash off any oil or grease with a high flash-point solvent. Use one and one which will leave no oily residue. In case the linings are damaged or the surface cannot be restored by sanding and cleaning, the shoes must be replaced.



A. Lining Thickness

Table J17 Brake Lining Thickness

	Standard	Service Limit
Front Wheel	4.8~5.6 mm	2.5 mm
Rear Wheel	4.0~4.8 mm	2 mm

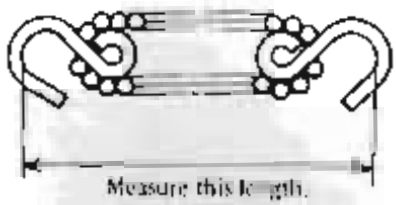
Brake shoe spring tension

If the brake springs have stretched, they will not pull the shoes back away from the drum after the brake pedal or lever is released, and the shoes will drag on the drum. Remove the springs, and check their free length with vernier calipers. If either is stretched beyond the service limit, replace both springs.

Table J18 Brake Spring Free Length

	Standard	Service Limit
Front Wheel	46.7~47.5 mm	46.5 mm
Rear Wheel	47.5~48.5 mm	50 mm

Brake Spring Free Length J39

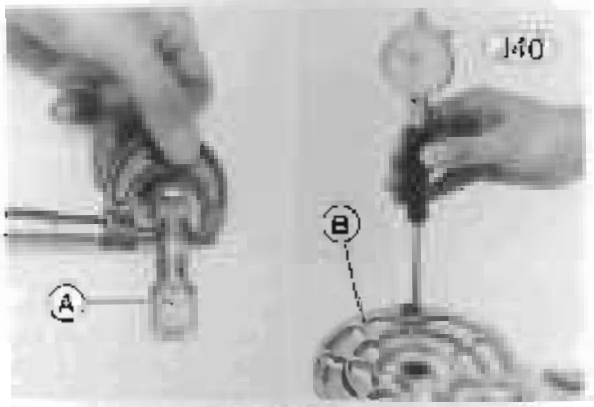


Camshaft, shaft hole wear

Excessive shaft to hole clearance will increase camshaft play and reduce braking efficiency.

Measure the shaft diameter with a micrometer, and replace it if it is worn down to less than the service limit.

Measure the inside diameter of the camshaft hole, and replace the brake panel if the hole is worn past the service limit.



A. Camshaft B. Brake Panel

Table J19 Brake Camshaft Diameter

	Standard	Service Limit
Front Wheel	14.957~14.984 mm	14.89 mm
Rear Wheel	16.957~16.984 mm	16.89 mm

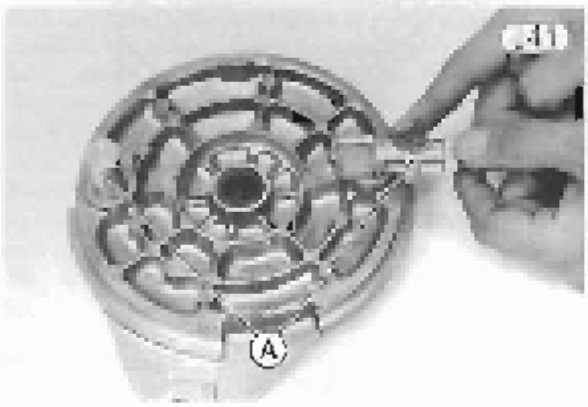
Table J20 Camshaft Hole Diameter

	Standard	Service Limit
Front Wheel	15.000~15.027 mm	15.10 mm
Rear Wheel	17.000~17.027 mm	17.10 mm

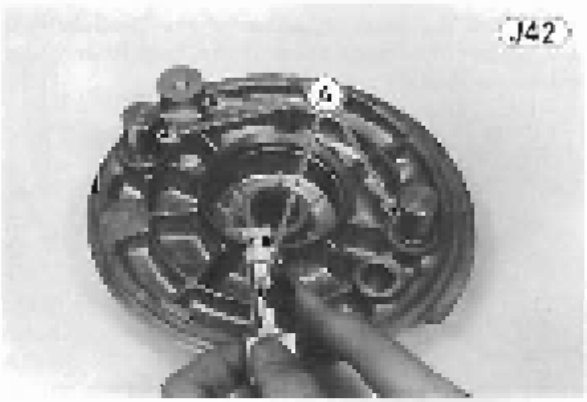
Lubrication

Every time that the brake is disassembled, and in accordance with the Periodic Maintenance Chart (Fig. 10), wipe out the old grease, and regrease the brake pivot points. Apply grease to the brake lever anchor pin, spring ends, and cam surface of the camshaft, and

fill the conduit groove with grease. Do not get any grease on the brake shoe linings, and wipe off any excess grease so that it will not get on the linings or drum after brake assembly.



A. Grease



A. Grease

STEERING STEM

The steering stem supports the handlebar and front fork legs, and turns inside the frame head pipe. Ball bearings in the upper and lower ends of the head pipe enable the steering stem to turn smoothly and easily.

The steering stem itself does not wear, but it may become bent. If it becomes bent, the steering will be stiff, and the bearings may become damaged.

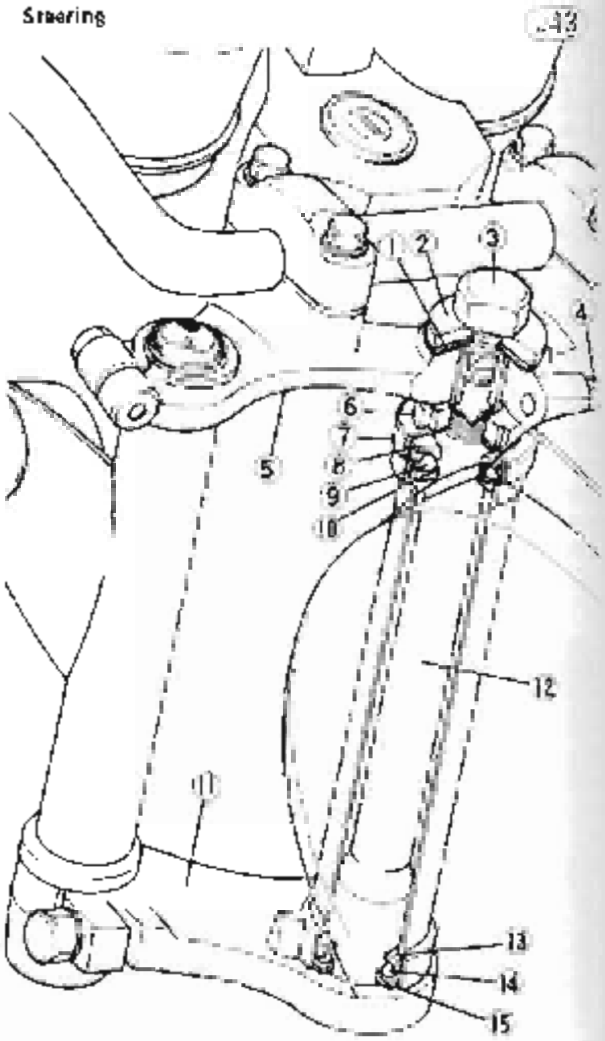
The steering stem will require periodic adjustment as it loosens due to bearing wear. Overtightening during adjustment, however, will make the steering stiff and cause accelerated bearing wear. Lack of proper lubrication will do the same.

Overtightening or a heavy shock to the steering stem may dent the bearing race surfaces. Damaged bearing races will cause the handlebar to jerk or catch when turned.

Table J21 Bearing Ball Specifications

	Size	Quantity
Upper & Lower	1/4"	19 each

Steering



1. Wave Washer
2. Flat Washer
3. Stem Head Bolt
4. Stem Head Clamp Bolt
5. Stem Head
6. Stem Locknut
7. Cap
8. Upper Inner Race
9. Steel Ball
10. Upper Outer Race
11. Stem Base
12. Steering Stem
13. Lower Outer Race
14. Steel Ball
15. Lower Inner Race

Steering stem warp

Examine the steering stem, and replace it if it is bent.

Bearing wear, damage

Wipe the bearings clean of grease and dirt, and examine the races and balls. If the balls or races are worn, or if either race is dented, replace both races and all the balls for that bearing as a set.

Bearing lubrication

In accordance with the Periodic Maintenance Chart (Pg. 10), and whenever the steering stem is disassembled, the steering stem bearings should be relubricated.

Wipe all the old grease off the races and balls, washing them in a high flash-point solvent if necessary. Replace the bearing parts if they show wear or damage. Apply grease liberally to the upper and lower races, and stick the bearing balls in place with grease.



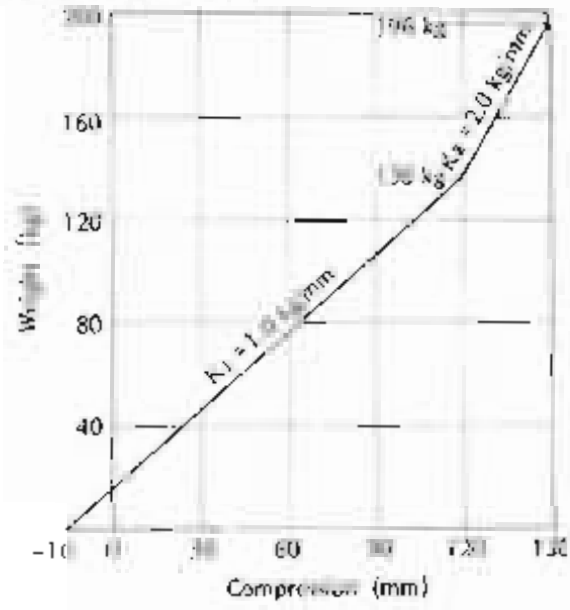
A, Bearing Balls

FRONT FORK

Front fork construction is shown in Fig. J46. It consists of two fork legs connected to the frame head pipe by the stem base and stem head bracket. It accomplishes shock absorption through spring action, air compression in the inner tube, and resistance to the flow of the oil forced into the cylinder by tube movement.

J45

Front Fork Spring Force



Each fork leg is a telescopic tube including an inner tube 5, outer tube 12, piston and cylinder unit 6, collar 11, and cylinder base 13. The inner tube fits into the outer tube, entering its position in the outer tube as the tube arrangement absorbs shocks. The cylinder is fixed to the bottom of the outer tube and the piston (equipped with a piston ring 4) is secured to the top of the cylinder. The collar (coupled with a non-return valve 10), fixed in the lower end of the inner tube, forms the upper part of the lower chamber 15 and, together with the piston 6, helps seal the upper chamber 14. The collar and cylinder base configuration function to form an oil lock at the end of the compression stroke to prevent the inner tube from striking the bottom. Small orifices in the upper part of the cylinder cause an oil lock at the end of the extension stroke to prevent the inner tube from striking the top.

Oil is prevented from leaking out by the oil seal 2, which is fitted at the upper end of the outer tube. A dust seal 1 on the outside of the tube keeps dirt and water from entering and damaging the oil seal and tube surface.

Compression Stroke

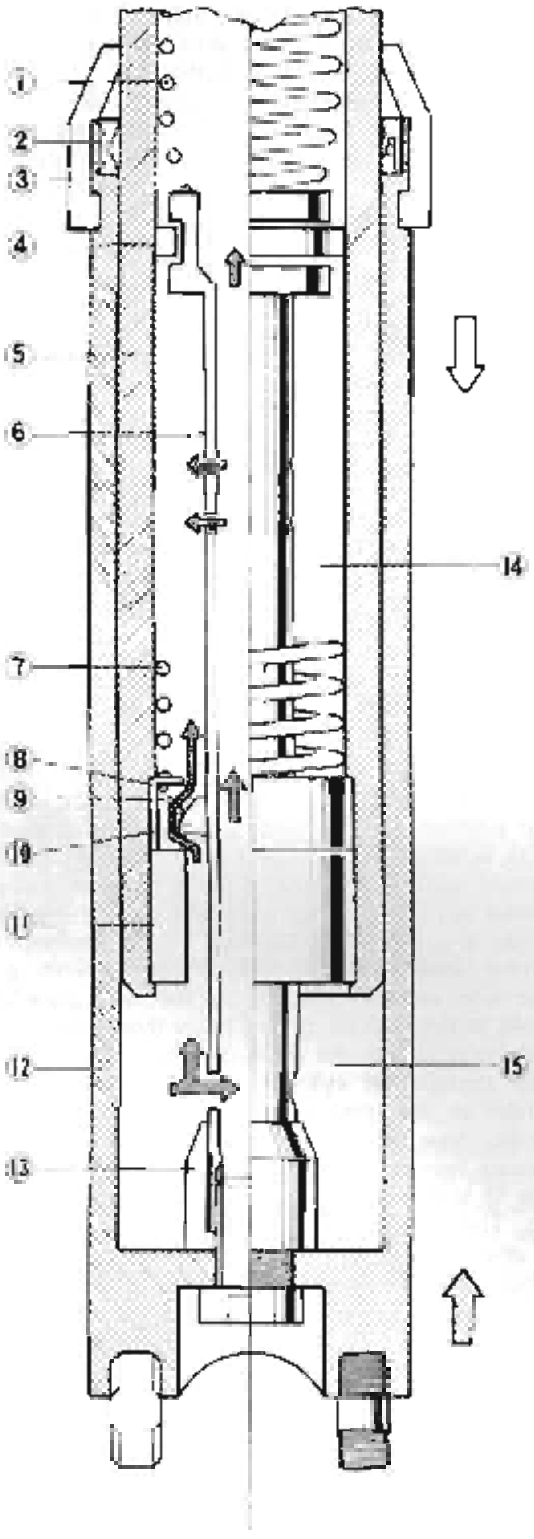
Whenever a load is placed on the front fork and whenever the front wheel receives a shock, the inner tube 5 moves down inside the outer tube 12, or the outer tube moves up, compressing both the spring 1 and the air in the inner tube. At the same time, low pressure (suction) is created in an enlarging chamber (upper chamber 14) formed between the inner tube and the cylinder 6 and oil is drawn in from a diminishing chamber (lower chamber 15) formed between the outer tube and the cylinder. As the lower chamber shrinks in size with oil passing freely through the non-return valve 10 into the upper chamber, oil also passes freely through the cylinder lower orifices into the cylinder as the inner tube approaches the cylinder base 13. Near the end of the compression stroke, the clearance between the tapered-out cylinder base and the collar 11 at the lower end of the inner tube approaches zero. The resulting resistance to the flow of oil through this small space slows the movement, finally forming an oil lock to finish the compression stroke.

Extension Stroke

Following the compression stroke is the extension stroke, in which the compressed spring exerts an push the inner tube back out of the outer tube. As the tubes move apart, the upper chamber grows smaller, forcing the oil through the way it came through the non-return valve. These small holes restrict the oil flow into the inner tube damping fork extension. Near the end of the extension stroke both the cylinder spring and the arrangement of the cylinder upper orifices provide further resistance to extension. As the collar rises, reducing orifices are eliminated and an oil lock forms, finishing the extension stroke.

Compression Stroke

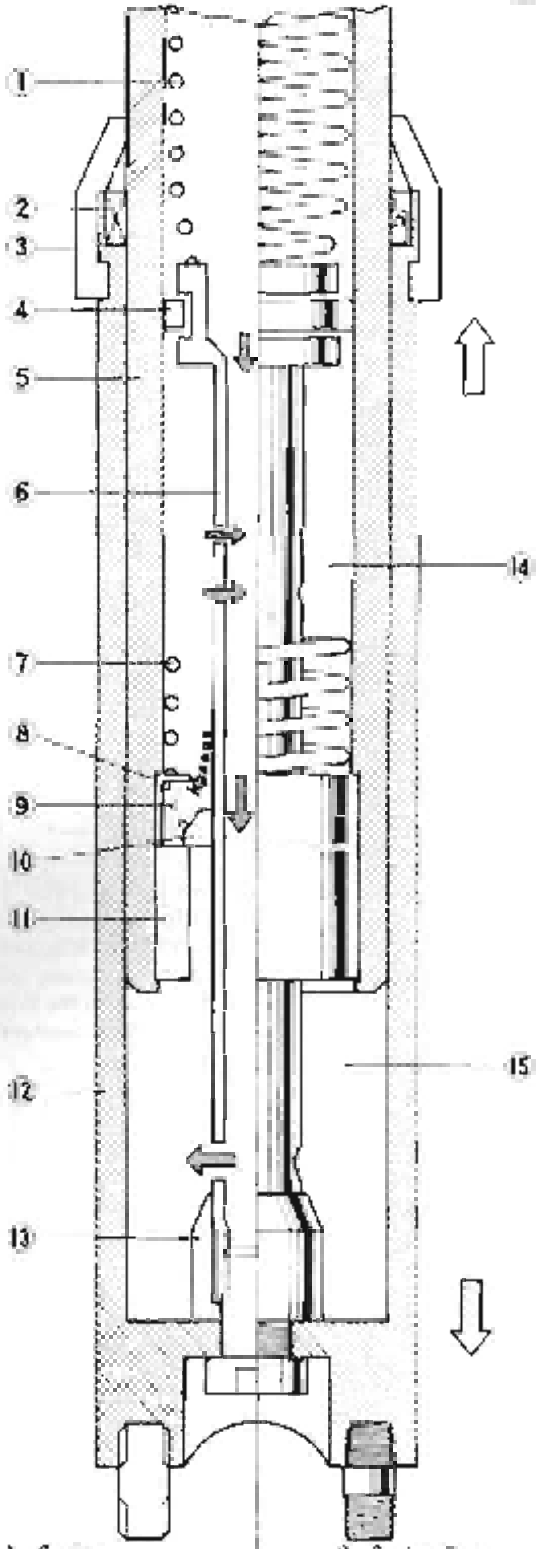
J46



1. Spring
2. Oil Seal
3. Dust Seal
4. Piston Ring
5. Inner Tube
6. Cylinder and Piston Unit
7. Spring
8. Spring Seat
9. Spring
10. Non-return Valve
11. Collar
12. Outer Tube
13. Cylinder Base
14. Upper Chamber
15. Lower Chamber

Extension Stroke

J47



1. Spring
2. Oil Seal
3. Dust Seal
4. Piston Ring
5. Inner Tube
6. Cylinder and Piston Unit
7. Spring
8. Spring Seat
9. Spring
10. Non-return Valve
11. Collar
12. Outer Tube
13. Cylinder Base
14. Upper Chamber
15. Lower Chamber

Fork Oil

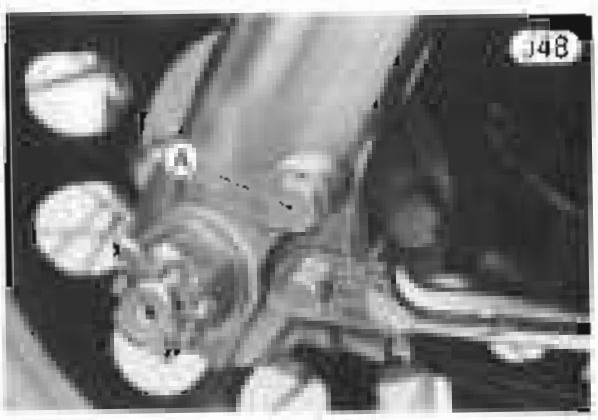
Either too much or too little oil in the fork legs will adversely affect shock damping. Too much oil or too heavy an oil makes the action too stiff; too little oil or too light an oil makes the action soft, decreases damping potential, and may cause noise during fork movement.

Contaminated or deteriorated oil will also affect shock damping and, in addition, will accelerate internal wear. The fork oil should be changed periodically (Pg. 10) or sooner if the oil appears dirty.

Fork oil change

To drain the old oil, remove the drain bolt from the lower end of the outer tube. With the front wheel on the ground and the front brake fully applied push down on the handlebar a few times to pump out the oil. Install the drain bolt and gasket, remove the top plug from the inner tube, and pour in the type and amount of oil specified in Table J22. Check the oil level, and install the top plug. If the oil is below the specified level, add oil and recheck the oil level.

NOTE: After the front fork oil is changed, but before checking the oil level, pump the forks several times to expel the air from the upper and lower chambers.



A. Drain Bolt

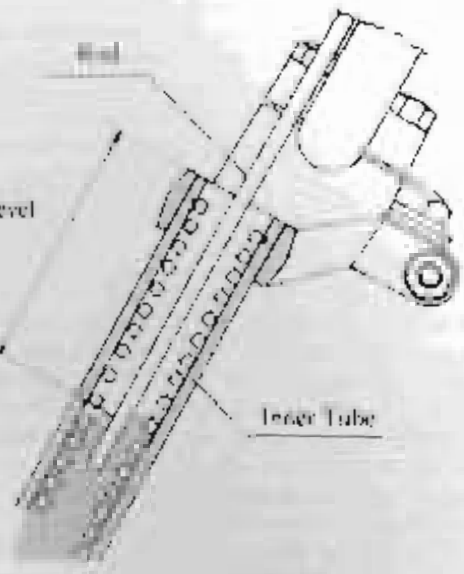
Table J22 Fork Oil

Type	Filling fork's oil capacity		Oil level
	When changing oil	After disassembly and completely dry	
SAE 5W 20	about 125 cc	145~155 cc	117 mm from top of inner tube

Oil level

To check the fork oil level, first place a jack or stand under the engine so that the front wheel is raised off the ground. Remove the top plug from the inner tube, insert a rod down into the tube, and measure the distance from the top of the inner tube to the oil level. If the oil is below the correct level, add enough oil to bring it up to the proper level, taking care not to overfill.

Fork Oil Level J49



Spring

Spring tension

Since the spring becomes shorter as it weakens, check its free length to determine its condition. If the spring of either fork leg is shorter than the service limit, it must be replaced. If the length of a replacement spring and that of the remaining spring vary greatly, the remaining spring should also be replaced in order to keep the fork legs balanced for motorcycle stability.

J50



A. Free Length

Table J23 Fork Spring Free Length

Standard	Service Limit
484.5 mm	475 mm

Inner Tube

A bent, dented, scored, or otherwise damaged inner tube will damage the oil seal, causing oil leakage. A badly bent inner tube may cause poor handling.

Inner tube damage

Visually inspect the inner tube, and repair any damage. If the damage is not repairable, replace the

inner tube. Since damage to the inner tube damages the oil seal, replace the oil seal whenever the inner tube is repaired or replaced. Temporarily assemble the inner and outer tubes, and pump them back and forth manually to check for smooth operation.

CAUTION **If the inner tube is bent or badly creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.**

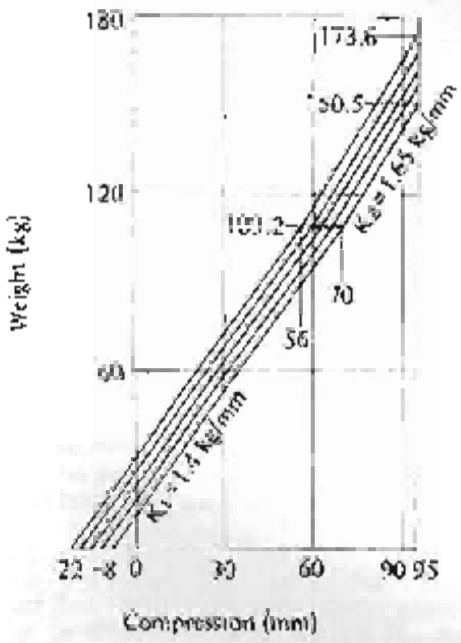
REAR SHOCK ABSORBERS

The rear shock absorbers serve to dampen shock transmitted to the frame and rider from the rear wheel. For this purpose, they are connected between the frame and the rear end of the swing arm. Shock absorption is performed by the spring and by the resistance to the flow of oil inside each unit. Shock absorption is further aided by the use of rubber bushings in both the upper and lower shock absorber mountings.

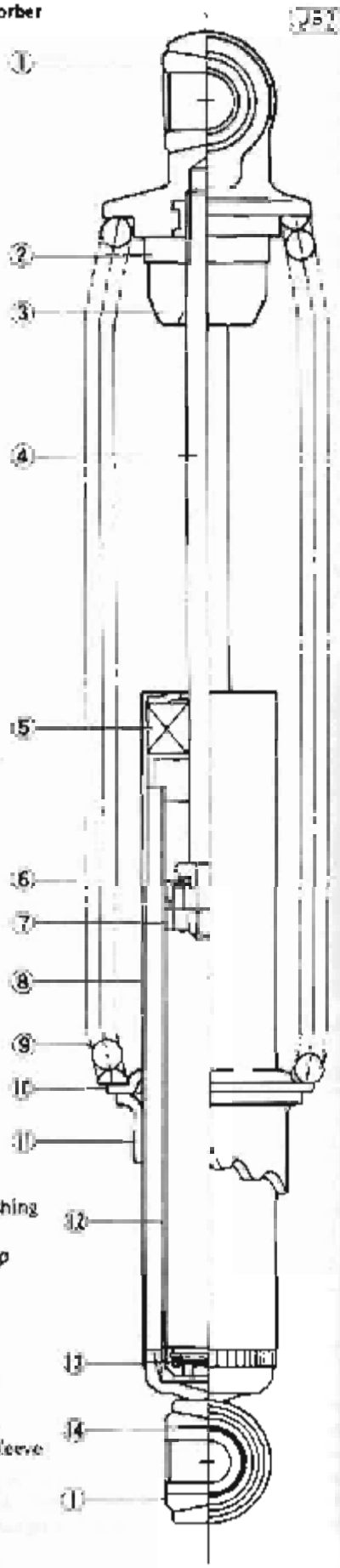
Since the rear shock absorbers are sealed units which cannot be disassembled, only external checks of operation are necessary. With the shocks removed, compress each one and see that the compression stroke is smooth and that there is damping in addition to spring resistance to compression. When the unit is released, the spring should not suddenly snap out to full length. It should extend smoothly with notable damping. When the shock absorber is operated, there should be no oil leakage. If either shock absorber does not perform all of these operations satisfactorily, or if one unit feels weaker than the other, replace both shock absorbers as a set. If only one unit is replaced and the two are not balanced, motorcycle instability at high speeds may result.

Shock absorber spring force for the 5 different settings is shown in the graph.

Rear Shock Absorber Spring Force (US model) (351)



Rear Shock Absorber (351)



Bushings

Check the rubber bushings, and replace any that are worn, cracked, hardened, or otherwise damaged.

SWING ARM

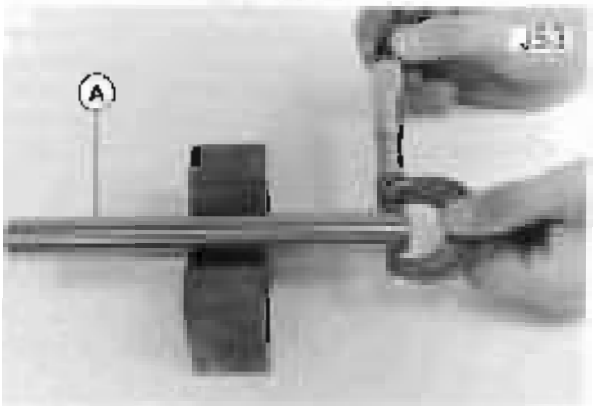
The swing arm is designed to work with the shock absorbers to damp the shock to the frame from the rear wheel. The rear of the swing arm is connected to the frame by the rear shock absorbers, while the front end pivots on a shaft connected to the frame. When the rear wheel receives a shock, the swing arm, pivoting on its shaft, allows the wheel to move up and down in relation to the frame within the limits of the shock absorbers.

This motorcycle has needle bearings at the swing arm pivot. If bearing wear has progressed such that the swing arm has become loose, the motorcycle will be unstable. To minimize wear, the swing arm should be kept properly lubricated.

A bent pivot shaft or twisted swing arm will also cause instability by throwing the rear wheel out of alignment.

Swing arm bearing wear

Measure the outside diameter of the swing arm sleeve at both ends with a micrometer. Replace the swing arm sleeve if the diameter is less than the service limit or if it shows visible damage.



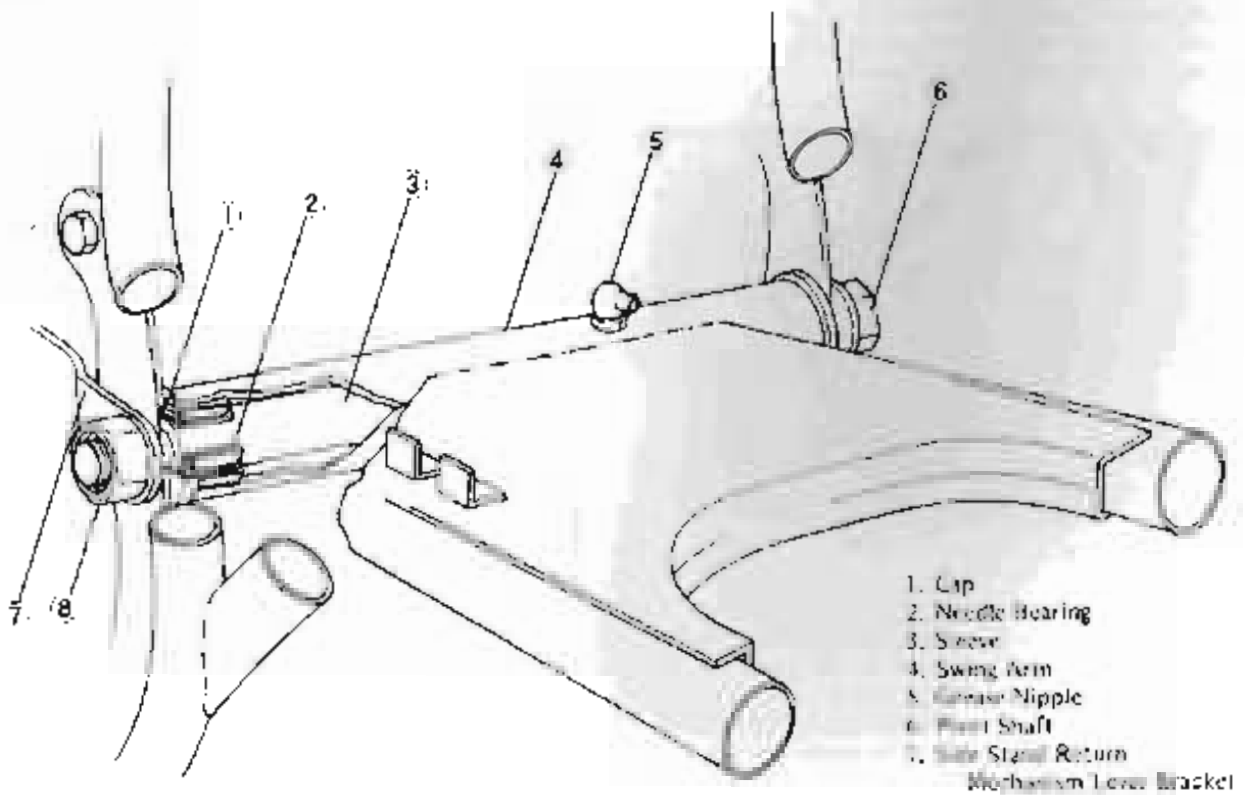
A. Swing Arm Sleeve

Table J24 Swing Arm Sleeve Diameter

Standard	Service Limit
21.987 ~ 22.000 mm	21.96 mm

The rollers in the needle bearings wear so little that the wear is difficult to measure. Instead, inspect the needle bearings for abrasions, color change, or other damage. If there is any doubt as to the condition of either needle bearing, replace both needle bearings. Whenever the swing arm sleeve is replaced, also replace the needle bearings.

Swing Arm



1. Cap
2. Needle Bearing
3. Sleeve
4. Swing Arm
5. Grease Nipple
6. Pivot Shaft
7. Side Stand Return Mechanism Lever Bracket
8. Pivot Shaft Nut

Pivot shaft

To measure the pivot shaft runout, set the pivot shaft on V blocks at the ends of the shaft, and set a dial gauge to the shaft halfway between the blocks. Turn the shaft to measure the runout. The amount of runout is the amount of dial variation. If the shaft runout exceeds the service limit, straighten it. If it cannot be straightened, or if the runout exceeds the repair limit, replace the shaft.

Pivot Shaft Runout J55

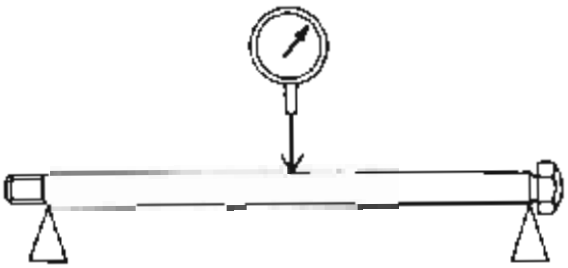
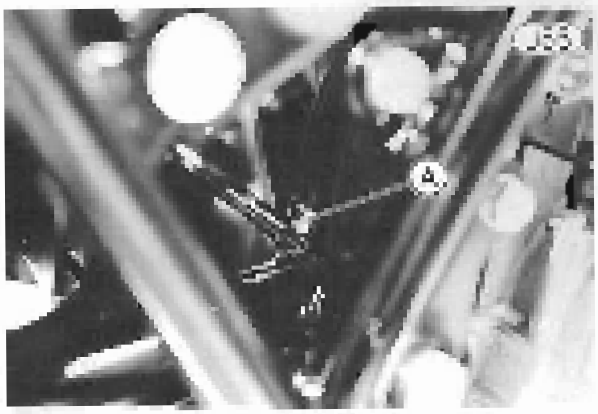


Table J25 Pivot Shaft Runout

Standard	Service Limit	Repair Limit
under 0.10 mm	0.14 mm	0.7 mm

Swing arm lubrication

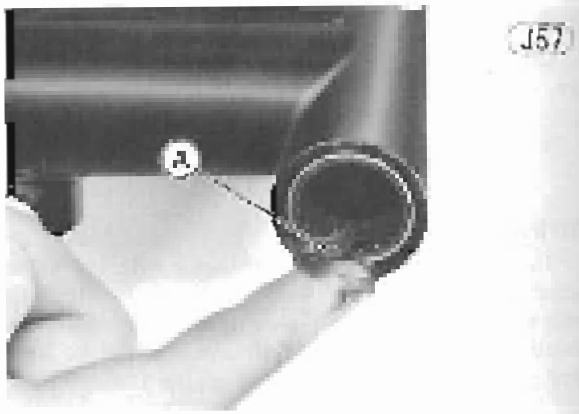
There is a grease fitting on the swing arm for lubrication. Grease the swing arm with regular cup grease in accordance with the frequency given in the Periodic Maintenance Chart (Pg. 19). Force the grease into the grease nipple until it comes out at both sides of the swing arm, and wipe off any excess.



A. Grease Nipple

If the grease does not come out, first check that the fitting is not clogged with dirt or old grease. If the fitting is clear but still will not take grease, remove the swing arm (Pg. 143), pull out the sleeve, clean out the old grease, and apply grease to the needle bearings.

In addition, when installing the swing arm, clean and lubricate the needle bearings.



A. Grease

AUTOMATIC SIDE STAND RETURN MECHANISM

The automatic side stand return mechanism returns the side stand to its rest position, should the rider move off with the side stand down. This mechanism is actuated by movement of the pin on the engine sprocket.

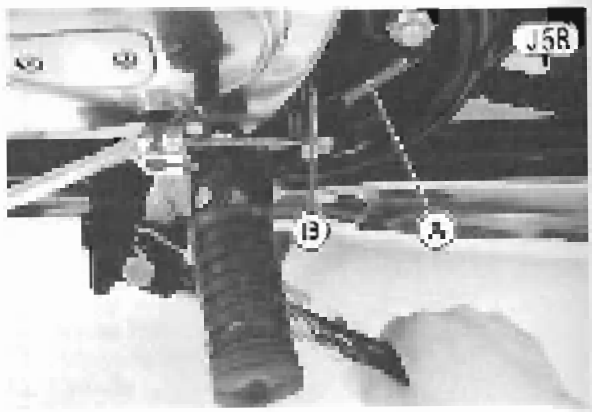
When the side stand is up, the spring tension holds the lever away from the pin so that the lever does not interfere the sprocket motion. If the engine sprocket rotates with the side stand down, the pin on the engine sprocket pushes the lever, and swings up the side stand through the rod and the drive lever.

Inspect and lubricate the mechanism whenever the engine sprocket cover is removed and whenever there is any doubt that the mechanism is not functioning properly.

Inspection

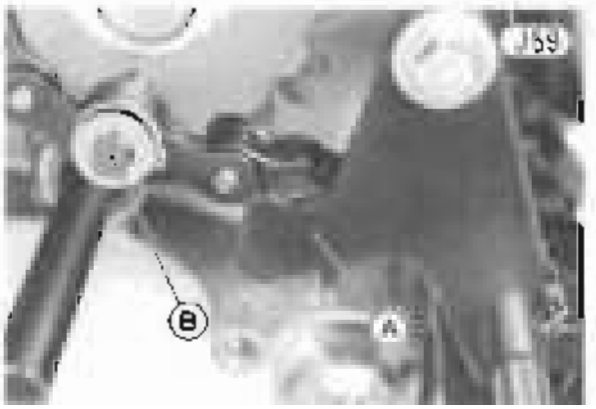
Check the lever return spring for cracks and any other damage. Replace the spring if it is damaged.

Situate the motorcycle so that it is perpendicular to the ground. Moving the side stand up and down by hand, check that the side stand return mechanism moves smoothly without binding, and check that the lever returns to the rearmost position by spring tension. If there are any rough spots in the lever action, find the cause and correct it.



A. Spring **B. Lever**

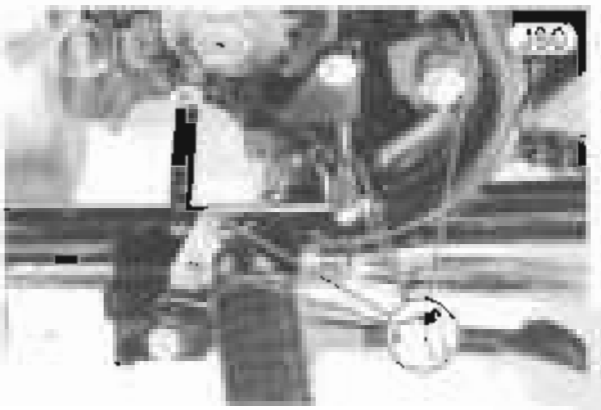
If the side stand cannot be adjusted by the procedure in the Adjustment Section, remove the engine sprocket cover (Fig. 61) and inspect the lever and the pin on the engine sprocket. Replace any parts that have damaged.



A. Lever B. Pin

Lubrication

Lubricate the automatic return mechanism with motor oil. Before lubricating the mechanism, clean off any rusty spots with rust remover and wipe off oil or dirt and any dirt or grime.





Maintenance – Electrical

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BATTERY

The battery supplies the current to the starter motor and serves as a back-up source of power to operate the electrical equipment whenever the engine is turning over too slowly for the dynamo to supply sufficient power.

With proper care, the battery can be expected to last several years, but it may be completely ruined long before that if it is mistreated. Following a few simple rules will greatly extend the life of the battery.

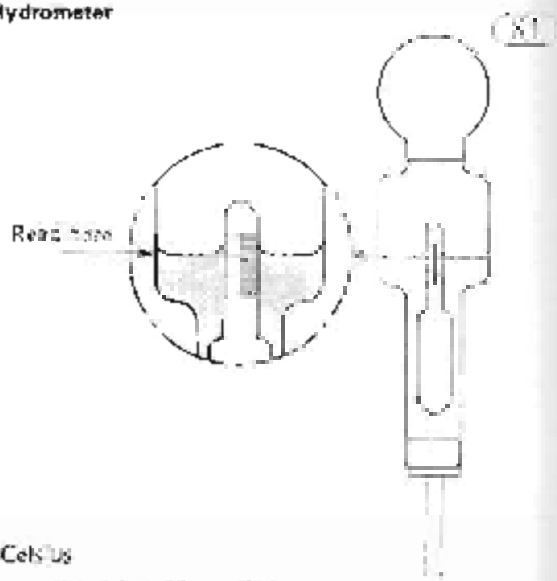
1. When the level of the electrolyte in the battery is low, add only distilled water to each cell, until the level is at the upper level line marked on the outside of the battery. Ordinary tap water is not a substitute for distilled water and will shorten the life of the battery.
2. Never add sulphuric acid solution to the battery. This will make the electrolyte solution too strong and will ruin the battery within a very short time.
3. Avoid quick-charging the battery. A quick-charge will damage the battery plates.
4. Never let a good battery stand for more than 30 days without giving it a supplemental charge, and never let a discharged battery stand without charging it. If a battery stands for any length of time, it slowly self-discharges. Once it is discharged, the plates sulphate (turn white), and the battery will no longer take a charge.
5. Keep the battery well-charged during cold weather so that the electrolyte does not freeze and crack open the battery. The more discharged the battery becomes, the more easily it freezes.
6. Always keep the battery vent hose free of obstruction, and make sure it does not get pinched, crimped, or melted shut by contact with the hot muffler. If battery gases cannot escape through this hose, they will explode the battery.
7. DON'T INSTALL THE BATTERY BACKWARDS. The negative side is grounded.

Electrolyte

The electrolyte is dilute sulphuric acid. In the US model, the standard specific gravity of the electrolyte used in warm climates in a fully charged battery is 1.260 at 20°C (68°F). On particularly cold regions a solution with a standard specific gravity of 1.280 is used. In the other than US model, the standard specific gravity of the electrolyte used in a fully charged battery is 1.280 at 20°C (68°F). The water in this solution changes to a gaseous mixture due to chemical action in the battery and escapes, which concentrates the acid in a charged battery. Consequently, when the level of the electrolyte becomes low, only distilled water should be added. If sulphuric acid is added, the solution will become too strong for proper chemical action and will damage the plates. Metal from the damaged plates collects in the bottom of the battery. This sediment will eventually cause an internal short circuit.

The specific gravity of the electrolyte is measured with a hydrometer and is the most accurate indication of the condition of the battery. When using the hydrometer, read the electrolyte level at the bottom of the meniscus (curved surface of the fluid). See Fig. K1. Fig. K2 shows the relationship between the specific gravity of the solution at 20°C (68°F) and the percentage of battery charge. Since specific gravity varies with temperature, and since the temperature of the solution being checked likely to be other than 20°C (68°F), the formula given below should be used to compute the corrected specific gravity for any temperature. When the temperature goes up, the specific gravity goes down, and vice versa.

Hydrometer (K1)



°Celsius

$$S_{20} = S_t + [0.0007 (t - 20)]$$

°Fahrenheit

$$S_{68} = S_t + [0.0004 (t - 68)]$$

S_t = specific gravity at the present temperature

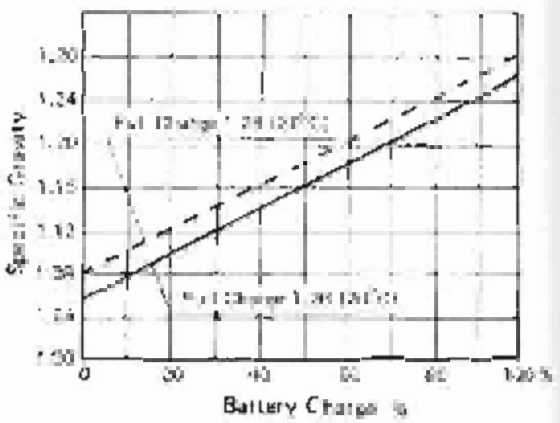
S_{20} = specific gravity at 20°C

S_{68} = specific gravity at 68°F

t = present temperature of solution

Generally speaking, a battery should be charged if a specific gravity reading shows it to be discharged to 50% or less of full charge.

Specific Gravity/Battery Charge Relationship (K2)



Initial charge

New batteries for Kawasaki motorcycles are dry charged and can be used directly after adding the electrolyte. However, the effect of the dry charge deteriorates somewhat during storage, especially if any air has entered the battery when assembling. Therefore, it is best to give the battery an initial charge before using it in order to ensure long battery life.

WARNING **Because the battery gives off an explosive gas mixture of hydrogen and oxygen, keep any sparks or open flame away from the battery during charging.**

- In the US model, pour a 1.260 (specific gravity at 20°C or 68°F) sulphuric acid solution into each cell of the battery up to the upper level line.
- In the other than US model, pour a 1.280 specific gravity at 20°C or 68°F) sulphuric acid solution into each cell of the battery up to the upper level line.
- Let the battery stand for 30 minutes, adding more acid if the level drops during this time.

NOTES: 1. If the temperature of the solution is over 30°C (86°F), cool the solution before putting it into the battery.

2. After putting the acid into the battery, start charging the battery within 12 hours.

- Keeping the caps off the cells, connect the battery to a charger, set the charging rate at 1/10 the battery capacity, and charge it for 10 hours. For example, if the battery is rated at 12AH, the charging rate would be 1.2 ampere. If a constant voltage charger is used, the voltage must be adjusted periodically to keep the current at a constant value.

CAUTION **If the temperature of the electrolyte rises above 45°C (115°F) during charging, reduce the charging rate to bring down the temperature, and increase the charging time proportionately.**

- After charging, check the electrolyte level in each cell. If the level has dropped, add distilled water to bring it back up to the upper level line.
- Check the results of charging by measuring the specific gravity of each cell and by measuring battery voltage. Battery voltage of a 12 volt battery directly after the completion of charging should be 15 to 16 volts.

Ordinary charge

WARNING **Because the battery gives off an explosive gas mixture of hydrogen and oxygen, keep any sparks or open flame away from the battery during charging.**

- Clean off the battery using a solution of baking soda and water. Make especially sure that the terminals are clean.
- If the electrolyte level is low in any cell, fill to over the lower level line but not up to the upper level line since the level rises during charging. Figure the charging rate to be between 1/10 and 3/10 of battery capacity. For example, the maximum charging rate for a 12 AH battery would be 3/10 x 12 which equals 3.6 amperes.

CAUTION **Charging the battery at a rate higher than specified above could ruin the battery. Charging at a higher rate causes excess heat, which can warp the plates and cause internal shorting. Higher than normal charging rates also cause the plates to shed active material. Deposits will accumulate, and can cause internal shorting.**

- Measure the specific gravity of the electrolyte and use the graph, Fig. K2, to determine the percentage of discharge. Multiply the capacity of the battery by the percentage of discharge to find the amount of discharge in ampere-hours. Use this figure in the formula below to calculate charging time.

$$\text{Charging hours} = \frac{\text{Amount of discharge (AH)}}{\text{charging current (A)}} \times 1.2 \sim 1.5$$

- Remove the caps from all the cells, and begin charging the battery at the rate just calculated. If a constant voltage charger is used, the voltage will have to be adjusted periodically to maintain charging current at a constant value.

CAUTION **If the temperature of the electrolyte rises above 45°C (115°F) during charging, reduce the charging rate to bring down the temperature, and increase charging time proportionately.**

- After charging, check the electrolyte level in each cell. If the level has dropped, add distilled water to bring it back up to the upper level line.
- Check charging results by measuring the specific gravity of each cell and by measuring battery voltage. Battery voltage of a 12 volt battery directly after the completion of charging should be 15 to 16 volts and the specific gravity of the electrolyte should be more than 1.220. If the voltage is lower than this, the battery is not completely charged or can no longer take a full charge. If the specific gravity of any one cell is lower than 1.220, there may be damage in the cell.

Test charging

When the battery is suspected of being defective, first inspect the points noted in the table below. The battery can be restored by charging it with the ordinary

Table K1 Battery Troubleshooting Guide

	Good Battery	Suspect Battery	Action
Plates	(+) chocolate color (−) gray	white (sulfated) plates broken or corroded	Replace
Sediment	none or small amount	sediment up to plates, causing short	Replace
Voltage	above 12 volts	below 12 volts	Test charge
Electrolyte Level	above plates	below top of plates	Fill and test charge
Specific Gravity	above 1.220 in all cells; the two cells more than 0.020 different	below 1.220, or difference of more than 0.020 between two cells	Test charge

charge. If it will take a charge so that the voltage and specific gravity come up to normal, it may be considered good except in the following case.

★ If the voltage suddenly jumps to over 13 volts just after the start of charging, the plates are probably sulphated. A good battery will rise to 12 volts immediately and then gradually go up to 12.5 - 13 volts in about 30 to 60 minutes after charging is started.

★ If one cell produces no gas bubbles, or has a very low specific gravity, it is probably shorted.

★ If there does not appear to be enough sediment to short the plates, but one cell has a low specific gravity after the battery is fully charged, the trouble may be just that there is insufficient acid in that cell. In this instance only, sulphuric acid solution may be added to correct the specific gravity.

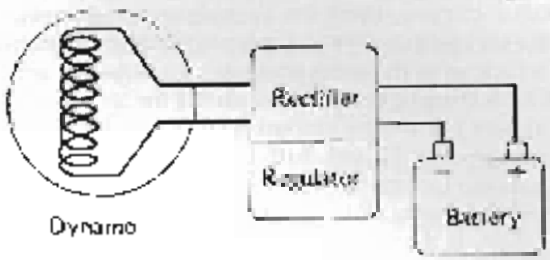
★ If a fully charged battery not in use loses its charge after 2 to 7 days, or if the specific gravity drops markedly, the battery is defective. The self-discharge rate of a good battery is only about 1% per day.

CHARGING SYSTEM

The charging system consists of a dynamo (an alternator) and regulator/rectifier.

The dynamo generates the current required by the electrical circuits. The generated current is a single phase alternating current (AC), which is changed to direct current (DC) and controlled by a solid state regulator/rectifier unit to supply an even voltage to the circuit components.

Charging System (K3)



There are a number of important precautions that are musts when servicing the charging system. Cautions that are applied to the individual sections are mentioned in each section. Failure to observe these rules can result in serious system damage. Learn and observe all the rules in each section.

When there are any problem indications in the charging system, give the system a quick initial inspection or check before starting a series of time consuming tests, or worse yet, removing parts for repair or replacement. Such a check will often turn up the source of the trouble.

Make sure all connections in the circuit are clean and tight. Examine wires for signs of burning, fraying, etc. Poor wires and bad connections will affect electrical system operation. Check the dynamo and regulator/rectifier for evidence of physical damage.

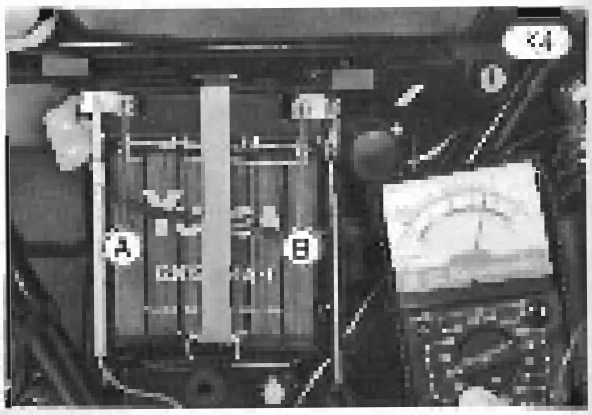
A worn out or badly sulphated battery will produce numerous problems that cannot be corrected until the battery is replaced. **ALWAYS CHECK BATTERY CONDITION BEFORE CONDEMNING OTHER PARTS OF THE SYSTEM. A FULLY CHARGED BATTERY IS A MUST FOR CONDUCTING ACCURATE SYSTEMS TESTS.**

Charging system malfunctions can be traced to either the battery, dynamo, regulator/rectifier, or the wiring. Trouble may involve one unit or in some cases, all units. Never replace a defective unit without determining what **CAUSED** the failure. If the failure was brought on by some other unit or units, they too must be repaired or replaced, or the new replacement will soon fail.

Initial inspection

Before making this test, check the condition of the battery (Pg. 218). If the battery voltage is less than 12 volts, charge the battery. Before starting the charging voltage test warm up the engine to obtain actual charging operating conditions.

- Remove the left side cover.
- Set the multimeter to the 20V DC range, and connect the meter + lead to the battery + terminal and the meter – lead to the battery – terminal.



A. Battery (+) Terminal **B. Battery (–) Terminal**

- Start the engine, and run the engine at the rpm in Table K2. Note the voltage reading.

Table K2 Charging Voltage

Meter	Connections	Reading @6,000 rpm
20V DC	Meter (+) to Battery (+) Meter (–) to Battery (–)	About 14.5V

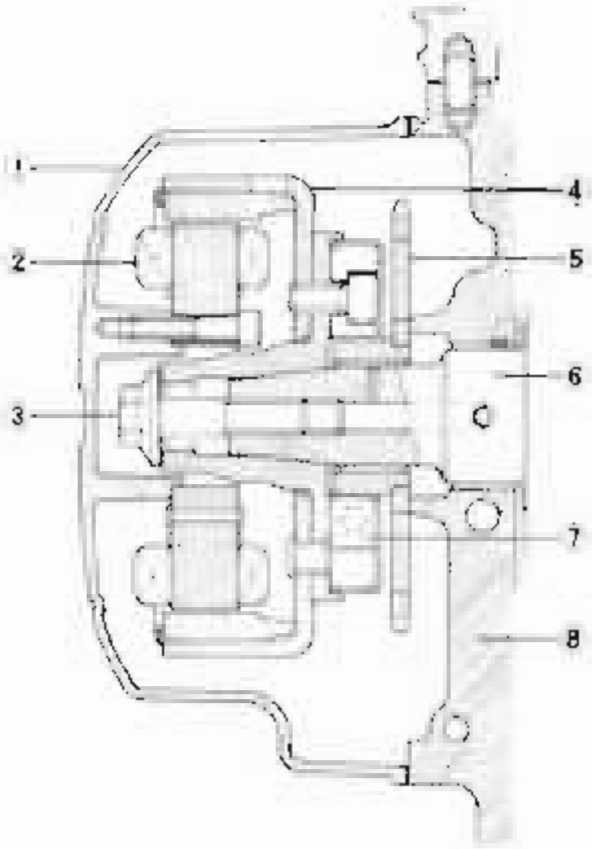
- If the reading is more than 16V, the regulator/rectifier is defective, and should be replaced with a new one. If the reading is less than 14V, check the dynamo output (Pg. 222) and regulator/rectifier (Pg. 221) to determine which part is defective.

Dynamo

The dynamo, fundamentally a single phase A.C. generator, can be divided up into a moving part called the flywheel ①, which is taper fitted to one end of the crankshaft ②, and a stationary part called the armature ③, which is located inside the flywheel and fixed to the

leads of the dynamo cover (). The flywheel has 6 permanent magnets evenly spaced in its circumference to generate an alternating current with 6 cycles per flywheel revolution.

Dynamo Construction



1. Dynamo Cover
2. Dynamo Armature
3. Flywheel Bolt
4. Dynamo Flywheel
5. Starter Clutch Sprocket
6. Crankshaft
7. Starter Clutch
8. Crankcase

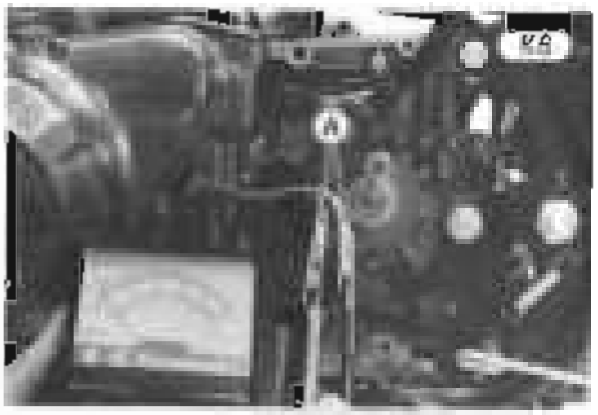
Dynamo failure

If the battery, regulator/rectifier, leads, and connections are all good, but there is still low voltage or insufficient charging current, the dynamo may be defective. There are three types of dynamo failures: short, open (wire burned out), or loss of flywheel magnetism. A short or open in the armature coil will result in either a low output, or no output at all. A loss in flywheel magnetism, which may be caused by dropping or hitting the flywheel, loosing it near an electromagnetic field, or just by aging, will result in low output.

Dynamo output test

Before starting dynamo output test, warm up the engine to obtain actual dynamo operating condition.

- Remove the engine sprocket cover (Pg. 61), and disconnect the yellow leads from the dynamo. Set the multimeter to the 250V AC scale, and connect the meter leads to the yellow leads.



A. Yellow Leads

- Start the engine, run it at the rpm given in Table K3, and note the voltage reading. A much lower reading than that given in the table indicates that the dynamo is defective.

Table K3 Dynamo Output

Meter	Reading at 5,000 rpm
250V AC	about 75V

Armature resistance check

- Disconnect the meter leads from the dynamo leads.
- Set the multimeter to the x 1Ω range, and measure for continuity between the yellow leads. If there is more resistance than shown in Table K4, or no meter reading, the armature has an open and must be replaced.



A. Yellow Leads

Table K4 Armature Resistance

Meter	Reading
x 1 Ω	0.26 ~ 0.38 Ω

- Using the highest resistance range of the multimeter, measure the resistance between each of the yellow leads and chassis ground. Any meter reading less than infinity (∞) indicates a short, necessitating armature replacement.

If the armature windings have normal resistance, but the voltage check showed the dynamo to be defective, then the flywheel magnets have probably weakened, and the flywheel must be replaced.

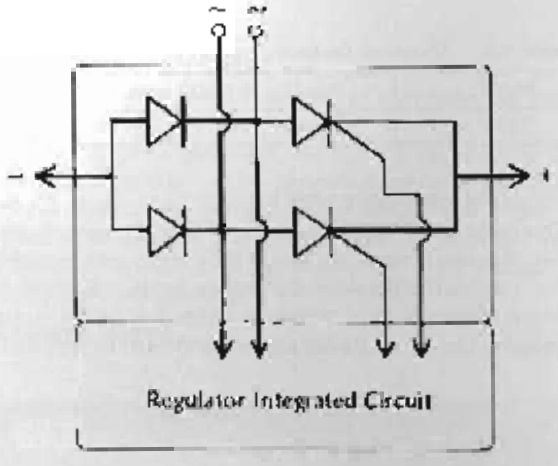
Regulator/Rectifier

This motorcycle has a regulator and rectifier as a unit. The regulator/rectifier functions cannot be checked separately because it is a solid-state type, and must be replaced as a unit should it become defective.

CAUTION **When inspecting the regulator/rectifier, observe the following to avoid damage to the regulator/rectifier.**

1. **Do not disconnect the regulator/rectifier with the ignition switch on. This may damage the regulator/rectifier.**
2. **Do not disconnect the battery leads while the engine is running. This may damage the regulator/rectifier.**

Regulator/Rectifier (K8)

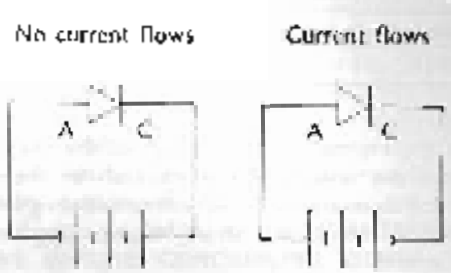


The rectifier is used to change the alternating current (AC) from the dynamo to direct current (DC) for the battery charging, ignition, lighting, and other circuits. It contains two silicon diodes and thyristors. The diodes and thyristors are connected in a bridge circuit arrangement for efficient, full wave rectification.

1. Diode

The current of electrons flows only from the – to the + side of the diode. However, a defective diode will conduct in both directions (a short) or not conduct at all (an open). If any of the diodes is shorted or open, the voltage from the rectifier will be below normal, and the battery may not be charged adequately.

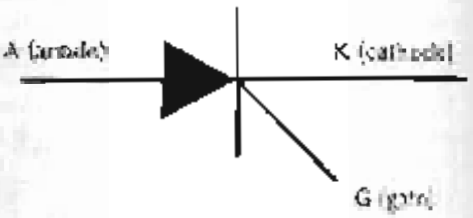
Diode Current Flow (K9)



2. Thyristor

The current of electrons will flow from the cathode to the anode but will not flow in the reverse direction. The thyristor differs from a diode in two respects: (a) even though a voltage of the correct polarity (negative to cathode) may be applied, the thyristor will not conduct until a signal is received at the gate input lead; (b) once started, it will not stop conducting (even if the gate lead signal voltage stops) until the anode to cathode voltage is removed or reversed.

Thyristor (K10)

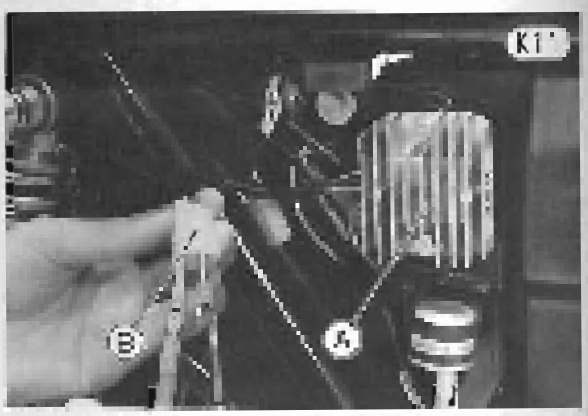


The solid-state regulator limits dynamo output voltage to a maximum of 14.0 – 15.0 volts. Since it contains no contacts or other moving parts, it does not wear out and never needs to be adjusted. According to the dynamo output, the regulator circuit sends signals to the rectifier thyristors to keep the output voltage at specified value.

Inspection

Before testing the regulator/rectifier out of circuit, check the charging voltage (Pg. 220) and the dynamo output (Pg. 221).

- Remove the right side cover.
- With the ignition switch turned off, disconnect the regulator/rectifier 3-pin connector.
- Using an ohmmeter, check the resistance between the black lead and each yellow lead as shown in Table K3. The resistance should be as shown in the table. If any two leads are low or high in both directions, the regulator/rectifier is defective and must be replaced.



A. Regulator/Rectifier B. 3-pin Connector

Table K5 Regulator/Rectifier Resistance

Meter	Connections	Reading
x 1 Ω	Meter (+) — Yellow Lead Meter (–) — Black Lead	less than 20Ω
x 1 kΩ	Meter (+) — Black Lead Meter (–) — Yellow Lead	more than 200 kΩ

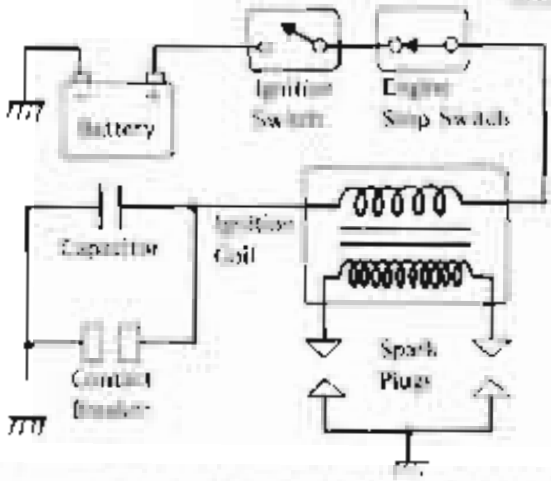
NOTE: If the regulator/rectifier check is good with the above procedure but still does not appear to be operating correctly in the circuit, check it by trial replacement with a good unit.

IGNITION SYSTEM

The working electrical part of the ignition system consists of the battery, contact breaker points, capacitor, ignition coil, and spark plugs. A timing advancer is attached to advance the ignition timing as engine rpm rises.

Ignition Circuit

K12



A wiring diagram of the ignition system is shown in Fig. K12, and works as follows. The battery supplies the current for the primary circuit, which includes the contact breaker points, capacitor, and the primary winding of the ignition coil. When the points suddenly open with the ignition switch turned on, a surge of electricity is produced in the secondary circuit, which includes the ignition coil secondary winding and the spark plugs. For this system to function properly, all ignition parts must be in good order, the ignition timing correctly set, the ignition and engine stop switches not shorted, and all wiring in good condition (no shorts or breaks, and no loose or corroded connections).

Ordinarily in a 4-stroke engine, a spark jumps across the spark plug electrodes only every other time that the piston for that spark plug rises (once every 720° of crankshaft rotation). This is because between each compression stroke, in which a fuel/air mixture ready for combustion is in the cylinder, there is an exhaust stroke, in which the piston rises only to push out the burned gases. However, even if a spark does jump across the electrodes during the exhaust stroke, there is no effect since there is no compression and no fuel to burn. Therefore, to eliminate any need for a distributor (thus simplifying the system and making it more reliable), the system is constructed so that both spark plugs fire every time both pistons rise (once every 360° of crankshaft rotation) although one piston is on the compression stroke and the other on the exhaust stroke.

Because the two spark plugs are connected in series, the current through one spark plug also must go through the other. Consequently, if a spark will not jump across the electrodes of one spark plug (due to dirty electrodes, faulty plug lead, etc.), no spark will jump across the electrodes of the other plug as well.

Ignition Coil

With the ignition switch on and the points closed, current flows in the primary circuit, including the ignition coil primary winding where the magnetic field (which accompanies electron flow) is concentrated (due to the winding). When the points open, this circuit is broken stopping the electron flow and collapsing the magnetic field. As this field collapses, magnetic flux cuts through the secondary winding, inducing voltage in the winding. The induced voltage, depending on the number of turns in the secondary winding and the speed of the drop in the primary winding current, is much greater than the voltage in the primary winding. It is this high voltage that causes a spark to jump across the spark plug electrodes. A greater ratio of secondary winding turns over primary winding turns and a sharper drop of primary winding current increase the secondary winding voltage that is produced. For this reason, a certain ratio of turns in the ignition coil has been chosen and a certain current drop sharpness (determined by capacitor and breaker point performance) has been designed into the ignition system so that a spark of sufficient but not excessive strength will be produced.

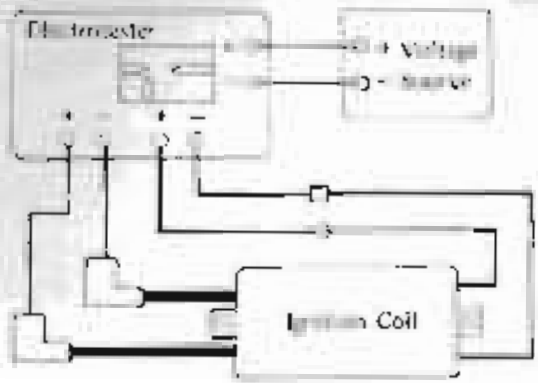
Ignition coil inspection

The most accurate test for determining the condition of the ignition coil is made by measuring arcing distance with the Kawasaki Electrotester. Since a tester other than the Kawasaki Electrotester may produce a different arcing distance, the Kawasaki Electrotester is recommended for reliable results.

- Remove the ignition coil (Pg. 45).
- Connect the ignition coil to the Kawasaki Electrotester as shown in the figure.

Ignition Coil Test

K13



•Turn on the tester switches.

WARNING **Do not touch the coil or leads to avoid extremely high voltage shocks.**

•Gradually rotate the arcing distance adjusting knob from left to right (small distance to large distance) carefully watching the arcing (Fig. K14).

Arcing Distance Measurement (K14)



•Stop moving the knob at the point where the arcing begins to fluctuate, and note the knob position in mm. The reading should show the value in Table K6.

Table K6 Arcing Distance*

Standard
5 mm or more

* Measure with the Kawasaki Electrotester.

If the distance reading is less than the value shown in the table, the ignition coil or spark plug caps are defective. To determine which part is defective, measure the arcing distance again with the spark plug caps removed from the ignition coil. If the arcing distance is subnormal as before, the trouble is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug caps.

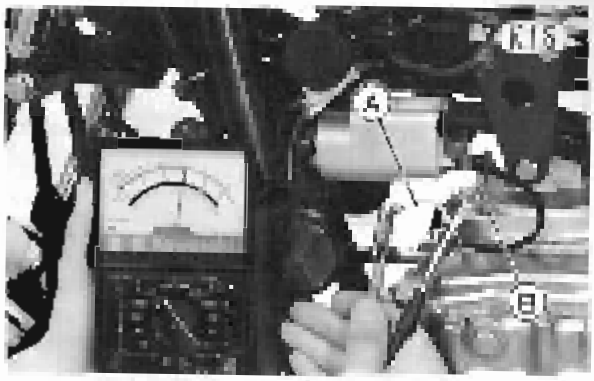
If an Electrotester is not available, the coil can be checked for a broken or badly shorted winding with an ohmmeter. However, an ohmmeter cannot detect layer shorts and shorts resulting from insulation breakdown under high voltage.

To measure the primary winding resistance:

•Remove the fuel tank (Fig. 42).

•Disconnect the yellow/red ignition coil lead, and disconnect the blue ignition coil lead.

•Set the ohmmeter to the x 1Ω range, and connect one ohmmeter lead to the yellow/red lead and the other to the blue lead from the ignition coil.



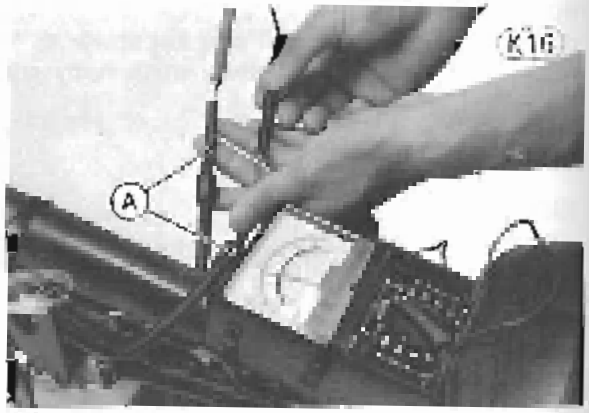
A. Yellow/Red Lead **B. Blue Lead**

To measure the secondary winding resistance:

•Pull the spark plug caps off the spark plugs.

•Unscrew the spark plug caps from the spark plug leads.

•Set the ohmmeter to the x 1kΩ range, and connect one ohmmeter lead to one of the spark plug leads and the other ohmmeter lead to the remaining spark plug lead.



A. Spark Plug Leads

Table K7 Ignition Coil Resistance

	Meter	Reading
Primary Winding	x 1 Ω	3.2 ~ 4.8 Ω
Secondary Winding	x 1 kΩ	10.4 ~ 15.6 kΩ

If the coil does not produce an adequate spark, or if either the primary or secondary winding does not have the correct resistance, replace the ignition coil.

With the highest ohmmeter range, check for continuity between the yellow/red lead and the coil core and between each plug lead and the coil core. If there is any reading, the coil is shorted and must be replaced. Also, replace the ignition coil if the spark plug lead shows visible damage.

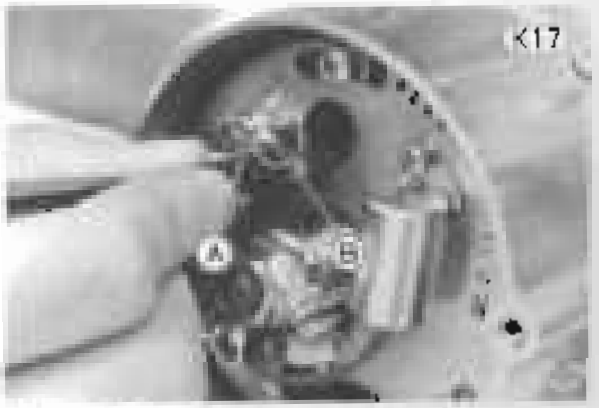
Contact Breaker

The contact breaker consists of one fixed and one movable contact point. The movable point is pivoted, and the heel on one end is held against the cam surface on the timing advancer by a single leaf spring. As the crankshaft rotates, the heel rides on the cam surface, and, as the crankshaft reaches the position where ignition takes place, the high spot on the cam surface pushes out on the heel, which opens the points. As the heel wears down, the point gap narrows, affecting ignition timing. Consequently, the ignition timing and point gap must be periodically adjusted to compensate for heel wear.

Contact breaker inspection

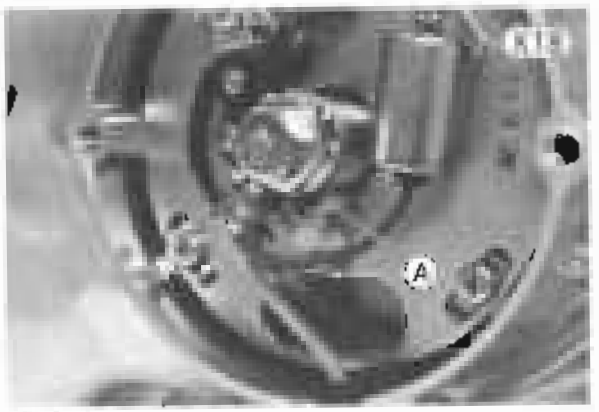
When the points become dirty, pitted, or burned, or if the spring weakens, the points will not make the contact necessary to produce a good spark, resulting in unstable idling, misfiring, or the engine not running at all. Inspect the contact breaker in accordance with the Periodic Maintenance Chart (Fig. 1), and repair or replace if necessary.

Clean the points with clean paper or cloth using an oil free solvent. A business card soaked in trichloroethylene can be used to remove traces of oil. To repair light damage, use fine emery cloth or an oilstone. If the points are badly worn down or damaged, or if the spring is weak, replace the contact breaker.



A. Fine Emery Cloth B. Points

Whenever the contact breaker is inspected or replaced, apply a small amount of point cam grease to the felt to lubricate the cam. This will minimize wear of the contact breaker heel. Be careful not to apply so much grease that it can drop off or be thrown onto the points, which will cause the points to foul and burn.



A. Felt

Capacitor

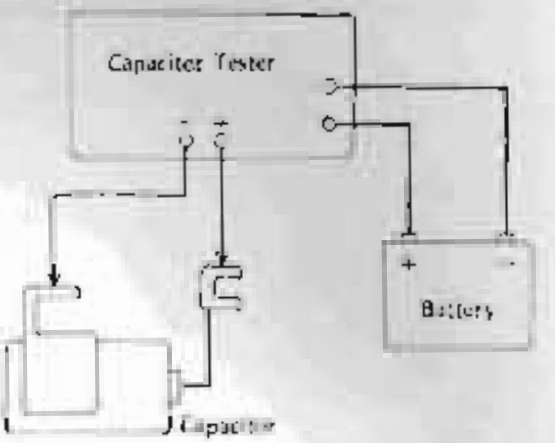
A capacitor is connected in parallel across the contact breaker points and serves to prevent current from arcing across the points as they open. Arcing across the points would reduce the sharpness of the voltage drop in the primary winding, thus weakening the spark plug spark, and also damaging the surface of the points. When the points are first opening, the capacitor absorbs a certain amount of current, giving the points time to open far enough apart to where current will not arc across. However, if the capacitor shorts, the current will simply flow through the capacitor whenever the points open. When the capacitor is otherwise defective, the current will not be prevented from arcing across the points at the time of ignition, resulting in poor spark plug performance and burned and pitted points.

Capacitor inspection

The capacitor can usually be considered to be defective if a long spark is seen arcing across the points as they open or if the points are burned or pitted for no apparent reason. Replace the capacitor any time it appears defective and whenever the contact breaker is replaced.

NOTE: For checking with a capacitor tester, capacitor specifications are: 0.24 ± 0.02 µfd, 1,000W VDC.

Capacitor Test (K19)

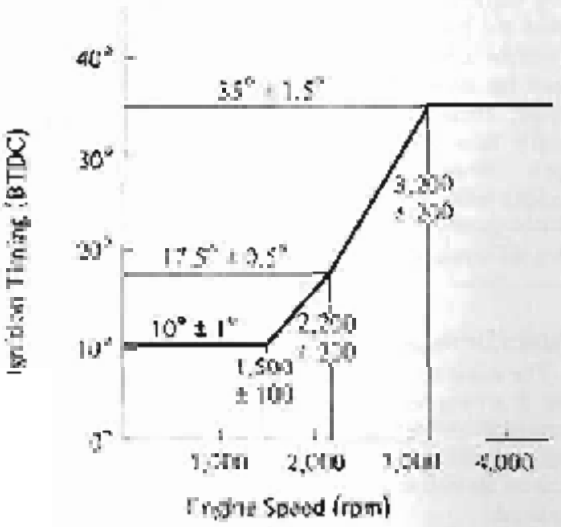


Timing Advancer

The timing advancer is a device that advances the ignition timing (makes the spark plugs fire sooner) as engine rpm rises. It consists of two weights and two springs connected to the timing cam that opens the contact breaker points. The more the engine speed rises, the further the weights are thrown out against spring tension, turning the cam in the direction of crankshaft rotation and causing the points to open sooner.

If the mechanism is damaged, has a weak or broken spring(s), or does not move smoothly, the ignition timing will not advance smoothly or it may stick in one position. This will result in incorrect timing at certain engine speeds, causing poor engine performance. Failure to advance at all will cause poor high speed performance, and excessive advance will cause knocking and poor low speed performance.

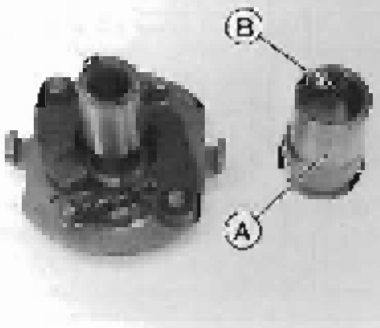
Ignition Timing/Engine Speed Relationship (K20)



Inspection and lubrication

Remove the timing advancer (Pg. 70), and check that the mechanism moves smoothly by hand and that no parts are visually worn or damaged. Periodically wipe the advancer clean, apply oil to it, and fill the groove inside the cam sleeve or sleeve shaft with grease.

(K21)



A. Cam Body B. Grease

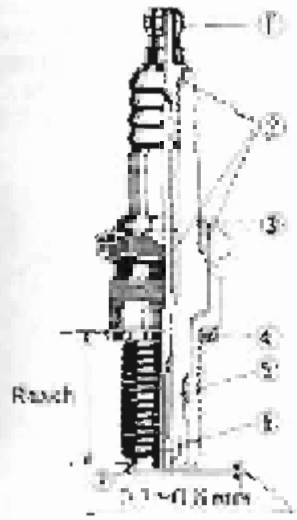
Install the advancer (Pg. 70), adjust the timing (Pgs. 12 ~ 14), and check it with a stroboscopic light for both low and high speed operation. If the timing differs from that which is shown in the graph (Fig. K20), replace the timing advancer with a new one.

Spark Plugs

The spark plugs ignite the fuel/air mixture in the combustion chamber. To do this effectively and at the proper time, the correct spark plugs must be used, and the spark plugs must be kept clean and adjusted.

Tests have shown the plugs shown in Table K3 set to a 0.7~0.8 mm gap to be the best plug for general use. But since spark plug requirements change with ignition and carburetion adjustments and with riding conditions, this plug may have to be replaced with one in the next higher or lower heat range. Whether or not a spark plug of a different heat range should be used is generally determined by removing and inspecting the plug.

Spark Plug (K22)



When a plug of the correct heat range is being used, the electrodes will stay hot enough to keep all the carbon burned off, but cool enough to keep from damaging the engine and the plug itself. This temperature is about 400 ~ 800°C. (750 ~ 1,450°F.) and can be judged by seeing the condition and color of the ceramic insulator around the center electrode. If the ceramic is clean and of a light brown color, the plug is operating at the right temperature.

A spark plug for higher operating temperatures is used for racing and other high speed applications. Such a plug is designed for better cooling efficiency so that it will not overheat and thus is often called a "colder" plug. If a spark plug with too high a heat range is used — that is, a "cold" plug that doesn't get hot enough — the plug will stay too cool to burn off the carbon, and the carbon will collect on the electrodes and the ceramic insulator. This carbon deposit conducts electricity, and can short the center electrode to ground by either coating the ceramic insulator or bridging across the gap. Such a short will prevent an effective spark. Carbon buildup on the plug can also cause other troubles. It can heat up red hot and cause preignition and knocking, which may eventually burn a hole in the top of the piston.

Inspection and replacement

Remove each plug and inspect the ceramic insulator. Whether or not the right temperature plug is being used can be ascertained by seeing the condition of the ceramic insulator around the electrode. A light brown color indicates the correct plug is being used. If the ceramic is white, the plug is operating at too high a temperature and it should be replaced with the next cooler type.

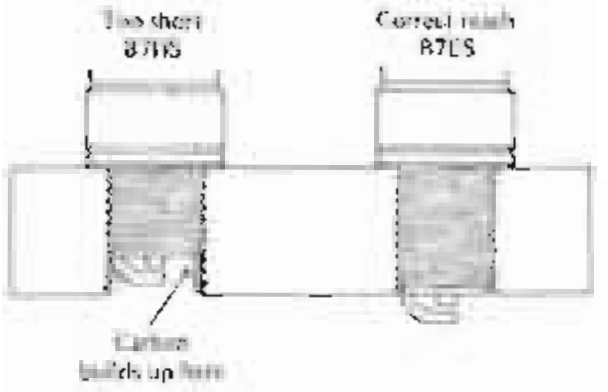
The heat range of the spark plug functions like a thermostat for the engine. Using the wrong type of spark plug can make the engine run too hot (possibly causing engine damage) or too cold (with poor performance, fouling, and stalling). The standard plug has been selected to match the normal usage of the motorcycle in combined street and highway riding. Unusual riding conditions may require a different spark plug heat range.

CAUTION **If the spark plugs are replaced with a type other than those mentioned below, make certain the replacement plugs have the same thread pitch and reach (length of threaded portion) as the standard plugs.**

Table K8 Spark Plug Specifications

Required Plug Threads	Type
14 mm Diameter 19.0 mm Reach	NGK B7ES ND W22ES-U

Spark Plug Reach K23



If the plug reach is too short, carbon will build up on the plug hole threads in the cylinder head, causing overheating and making it very difficult to insert the correct spark plug later.

If the reach is too long, carbon will build up on the exposed spark plug threads causing overheating, preignition, and possibly burning a hole in the piston top. In addition, it may be impossible to remove the plug without damaging the cylinder head.

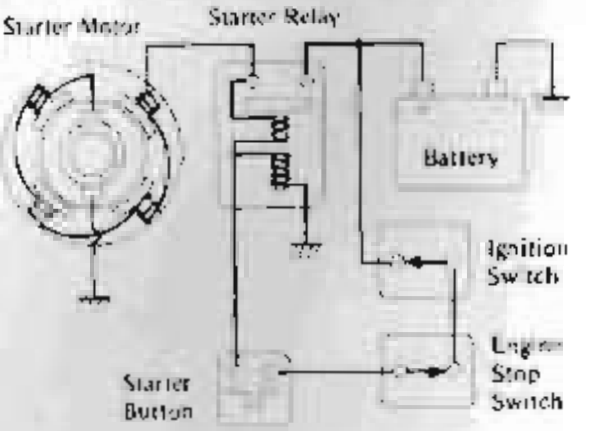
ELECTRIC STARTER SYSTEM (KZ400-B)

Starter Motor Circuit

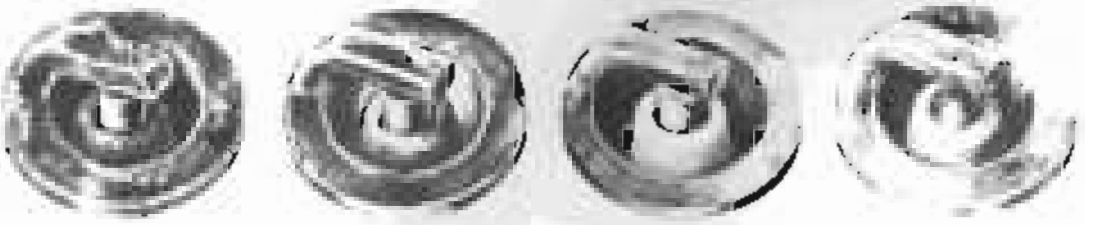
The starter motor circuit includes the starter button (switch), starter relay, battery, and starter motor. When the ignition switch is on and the starter button is pushed, a small amount of current flows through the switch and the relay coil. This current magnetizes the relay core, which then pulls the armature to it, closing the relay contacts. The closed contacts complete a circuit for the starter motor, and the motor turns. The reason for using a relay instead of using the switch to turn on the starter motor directly is that the starter motor requires much current — enough that relatively thick wire is necessary to carry the current to the starter motor. Because it is not practical to put a heavy switch on the handlebar and have large wires running to it, the starter switch is made to carry just the light relay coil current, and heavy contacts inside the relay carry the starter motor current.

CAUTION **Because of the large amount of current, never keep the starter button pushed any time that the starter motor will not turn over, or the current may burn out the starter motor windings.**

Starter Motor Circuit K24

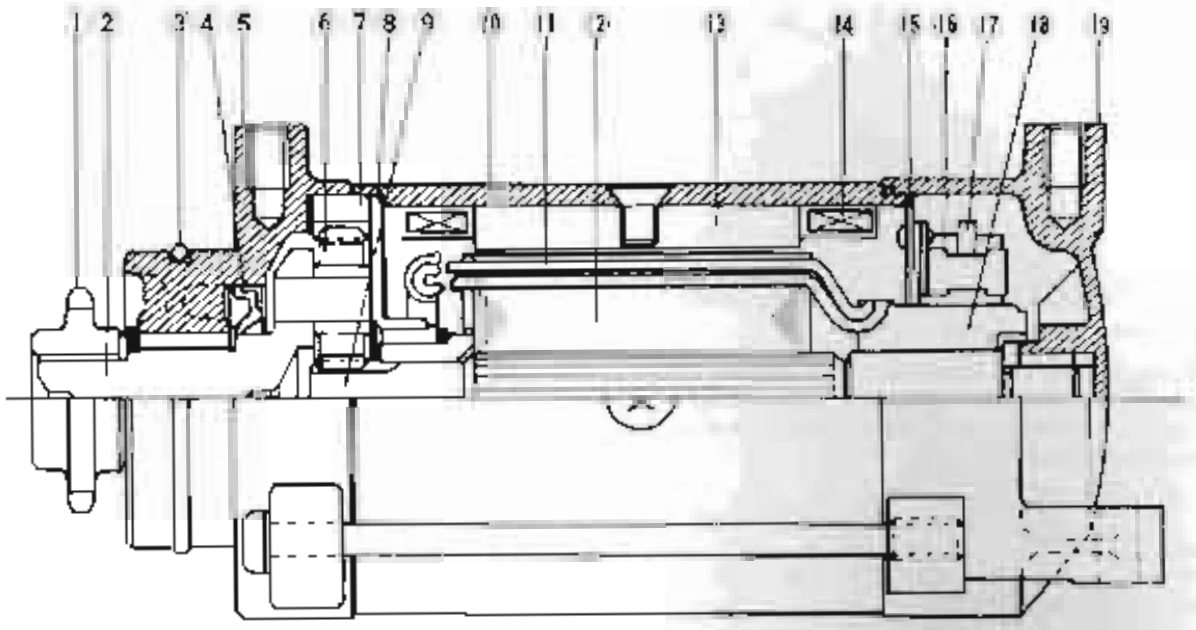


Spark Plug Condition K25



Starter Motor Construction

K29

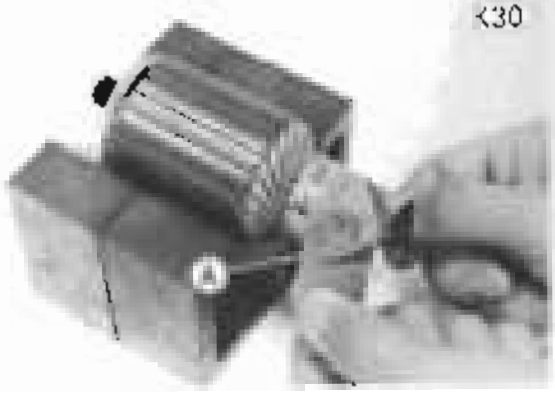


1. Starter Motor Sprocket
2. Output Shaft
3. O Ring
4. Grease Seal
5. End Cover
6. Planet Pinion
7. Internal Gear
8. End Plate
9. Sun Gear
10. Yoke Assembly
11. Armature Winding
12. Armature
13. Core
14. Field Coil
15. Brush Plate
16. Carbon Brush
17. Spring
18. Commutator
19. End Cover

...ments. In addition, particles from brush wear accumulating between commutator segments may cause partial shorts.

●Correct the commutator surface if necessary with fine emery cloth, and clean out the grooves as illustrated. Determine as accurately as possible the depth of the grooves between commutator segments. Replace the armature with a new one if the groove depth is less than the service limit.

K30



A. Emery Cloth

Commutator

K31

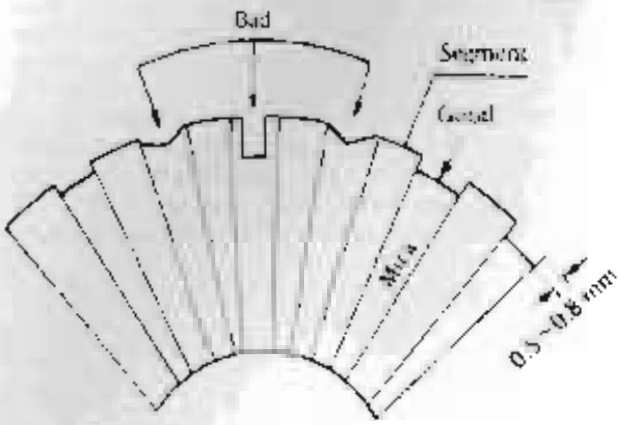
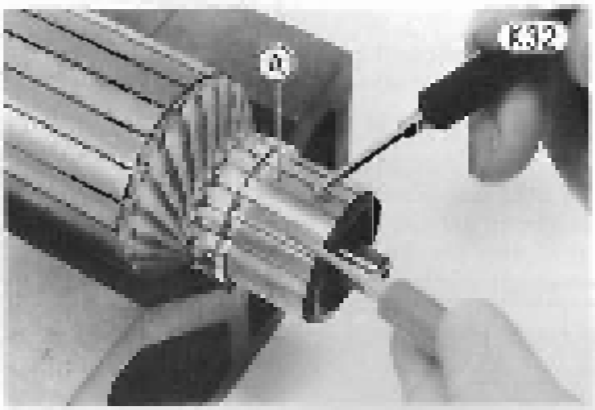


Table K10 Commutator Groove Depth

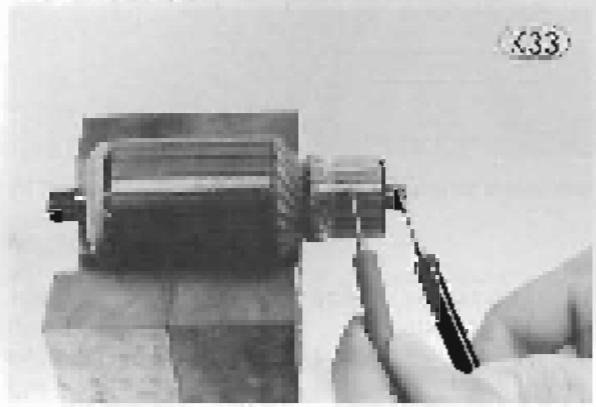
Standard	Service Limit
0.5 ~ 0.8 mm	0.2 mm

●Using the x 1 Ω ohmmeter range, measure the resistance between any two commutator segments. If there is a high resistance or no reading between any two segments, a winding is open and the armature must be replaced (Fig. K32).



A. Commutator Segments

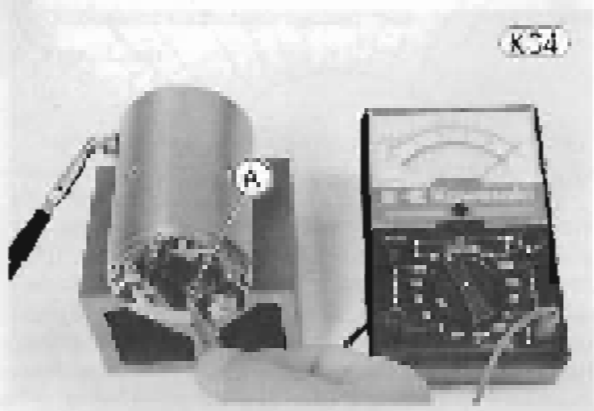
•Using the highest ohmmeter range, measure the resistance between the commutator and the shaft. If there is any reading at all, the armature has a short and must be replaced.



NOTE: Even if the foregoing checks show the armature to be good, it may be defective in some manner not readily detectable with an ohmmeter. If all other starter motor and starter motor circuit components check good, but the starter motor still does not turn over or only turns over weakly, replace the armature with a new one.

Field coils

•Using the x 1 Ω ohmmeter range, measure the resistance between the + side carbon brush and the starter motor terminal. If there is not close to zero ohms, the field coils have an open and the yoke assembly must be replaced.



A. (+) Side Carbon Brush

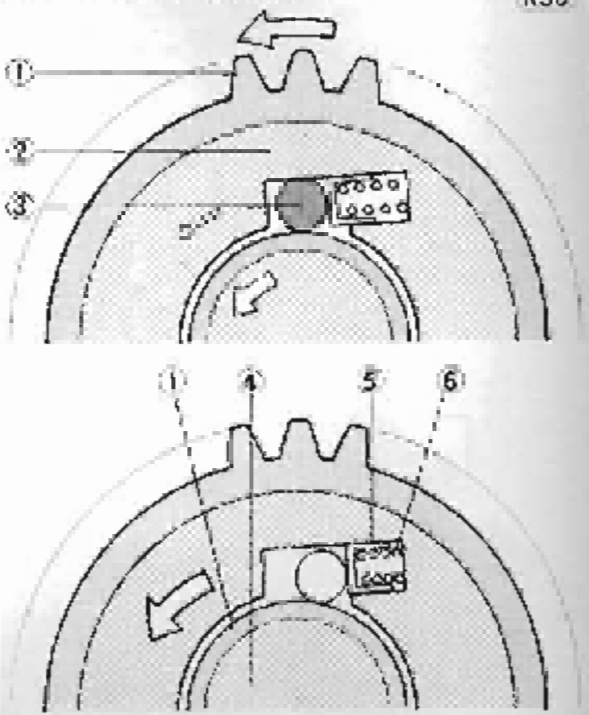
•Using the highest ohmmeter range, measure the resistance between the + side carbon brush and the yoke (housing). If there is any meter reading, the coils are shorted to ground and the yoke assembly must be replaced.



Starter Motor Clutch, Chain

Fig. K36 shows starter motor clutch operation. The clutch body ② is fixed to the countershaft ④ through the dynamo flywheel. When the starter clutch sprocket ① rotates in the direction of the arrow, each of the three rollers ③, pushed by its spring ⑤, is wedged into the narrower space between the clutch body and the starter clutch sprocket hub (the portion jutting out from the sprocket), thereby locking the clutch body and starter clutch sprocket together. With these two locked, starter motor rotation is transmitted to the crankshaft through the starter chain, starter clutch sprocket, rollers, clutch body, and flywheel.

Starter Motor Clutch Operation K36



1. Clutch Sprocket
2. Clutch Body
3. Roller
4. Crankshaft
5. Spring Cap
6. Spring

When the engine starts, friction with the starter clutch sprocket (and at higher speeds, inertia) moves the rollers back against the tension of their springs so that they no longer serve as wedges locking the clutch body and starter clutch sprocket together. In this manner, the engine rotates freely without forcing the starter motor to turn with it.

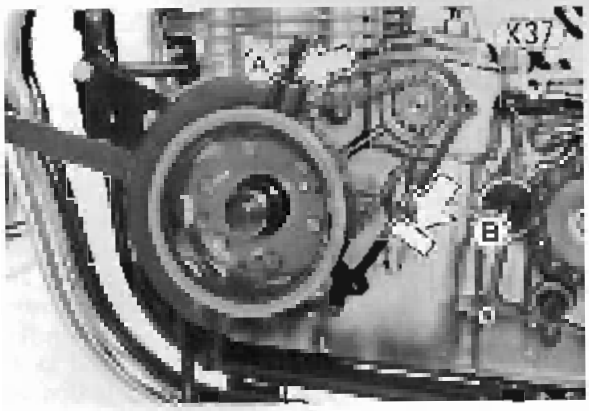
If the rollers or the starter clutch sprocket hub become damaged or worn, the rollers may lock in place so that the starter motor will not disengage when the engine starts. On the other hand, roller or sprocket hub damage could prevent the clutch from engaging properly, causing the starter motor to run freely without transmitting rotation.

Clutch inspection

- Turn off the ignition switch and disconnect the battery negative lead from the battery.
- Remove the dynamo cover.

NOTE: Some engine oil will be spilled by dynamo cover removal. After installing the cover check the engine oil level and add engine oil as necessary (Pg. 20).

- Turn the dynamo flywheel using the flywheel holder (special tool), and check the starter motor clutch operation. When turning the flywheel clockwise, the starter clutch sprocket should not turn with the flywheel, but, when turning the flywheel counterclockwise, the sprocket should turn. If the clutch does not operate as it should or if it makes noise, disassemble the starter motor clutch (Pg. 65), examine each part visually, and replace any worn or damaged parts.



A. Turns B. Stops

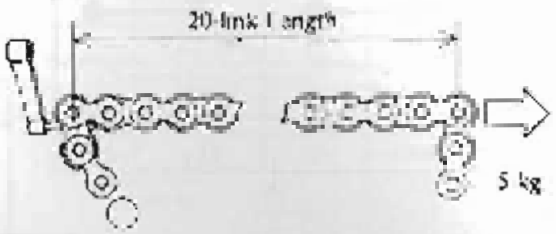
Starter chain inspection

- Remove the starter chain (Pg. 66), hold the chain taut with a force of about 5 kg in some manner such as the one shown in Fig. K38, and measure a 20-link length. Since the chain may wear unevenly, take measurements at several places. If any measurement exceeds the service limit, replace the chain.

Table K11 Starter Chain 20-link Length

Standard	Service Limit
155.7 — 155.9 mm	158.0 mm

Starter Chain Measurement K38



IGNITION SWITCH

The ignition switch has four positions: Off, On, Lock, and Park. In the "Off" position all circuits are turned off and the key can be removed from the switch. In the "On" position the motorcycle can be started and all electrical equipment can be used. The key cannot be removed from the switch when it is in the "On" position. In the "Lock" position all circuits are cut off and the steering is locked. The key can be removed from the switch when it is in the "Lock" position. In the "Park" position the tail light is on, but all other circuits are off and the key can be removed from the switch. This provides added visibility when the motorcycle is parked.

Testing the switch

Table K12 shows the internal connections of the ignition switch for each switch position. To check the switch, remove the headlight unit (Pg. 129), and disconnect the socket (4-pin) from the ignition switch in the headlight housing. Use an ohmmeter to verify that all the connections listed in the table are making contact (zero ohms between those wires) and that no other wires are connected. If there are any opens or shorts in the switch, replace it with a new one.



A. Ignition Switch 4-pin Socket

Table K12 Ignition Switch Connections

Color	White	Brown	Red/Black	Red
ON	●	●	●	●
OFF				
LOCK				
PARK	●			●
Lead	BAT	IG	TL_1	TL_2

NEUTRAL SWITCH

A neutral indicator light is provided so that the rider can readily determine whether or not the transmission is in neutral. The neutral switch, installed in the left crankcase half, consists of a spring loaded pin which contacts a projection on the shift drum operating plate when the transmission is in neutral. This completes the neutral indicator light circuit, which turns on the neutral indicator light.

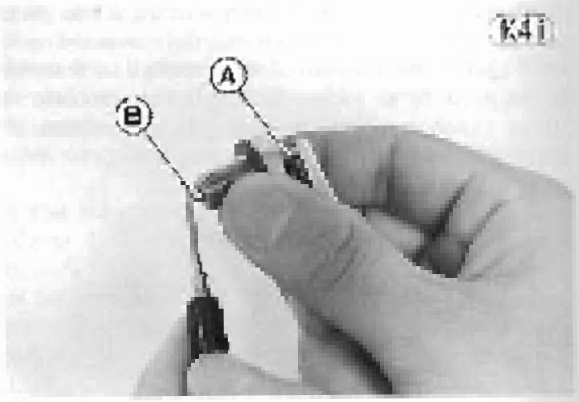
Switch inspection

- Turn on the ignition switch. Watching the indicator light, shift the transmission into neutral and then shift the transmission into other positions. If the neutral indicator light goes on in neutral position and the light does not go on in other positions, the neutral switch is good.
- If the neutral indicator light does not go on in the neutral position or if it does go on in other positions, remove the engine sprocket cover, (Pg. 61), and disconnect the neutral switch light green lead.
- To check for the voltage, first turn the meter to 20V DC, connect the + meter lead to the switch lead, and connect the – meter lead to chassis ground.
- Turn the ignition switch on, and see if the meter reads battery voltage. If the meter does not indicate battery voltage, the trouble is either defective wiring or a burned out indicator bulb. If the voltmeter reads battery voltage, then the neutral switch may be defective.



A. Switch Lead

- To check the neutral switch, first remove the switch (Pg. 63), turn the meter to the x 1Ω range, and measure the resistance between the switch terminal and the spring loaded pin. If the resistance is not close to zero ohms, the switch is defective, and must be replaced.



A. Switch Terminal B. Spring Loaded Pin

- If the resistance is close to zero ohms, measure the resistance between the switch terminal or spring loaded pin and the switch body. If there is any meter reading, the neutral switch is defective and must be replaced.

LIGHTING SYSTEM

Headlight Circuit

Fig. K42 and Fig. K43 are US, Canadian and European model wiring diagrams of the headlight circuit.

In the US and Canadian model, there is no headlight switch, and when the ignition switch is turned on, the headlight circuit is completed.

In the European model, the center "●" position of the headlight switch turns on the small city light, tail light, and meter lights for driving in the city after dark. When the switch is turned to the "OFF" position, the headlight illuminates and the city light stays on. With the dimmer switch, high and low beam can be selected only when the headlight switch is in the "ON" position.

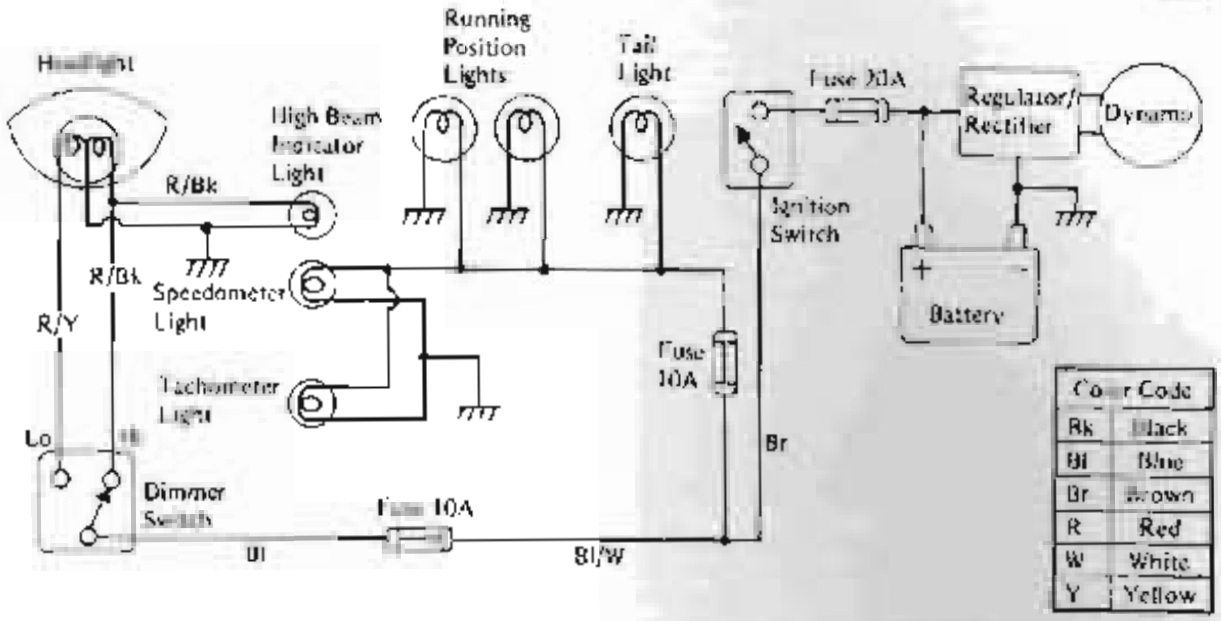
In the European model, there is also a passing and horn button. This button is spring loaded and when the button is pushed in pass, the high beam light (but not the tail light) comes on as a passing signal to the driver of the vehicle ahead. The passing button will light the high beam light regardless of the headlight switch position, and the button will spring back and turn the light off as soon as it is released.

Headlight trouble

If the headlight does not light, check to see if the bulb has burned out or has been blown. If the bulb on the US or Canadian model has burned out, the sealed beam unit must be replaced. A blown fuse should be replaced. On the European model the headlight or the city light can be replaced separately, as the headlight is of semi-sealed construction. If the bulb and fuses are good, check the dimmer switch and the headlight switch. Tables K13, K14, and K15 show the connections in the

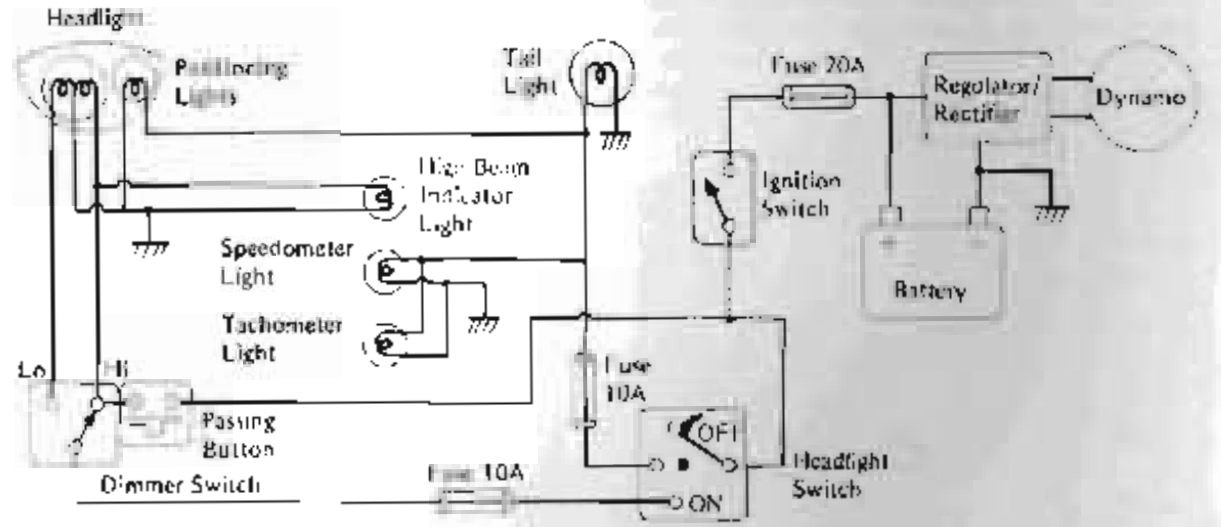
Headlight Circuit (US, Canadian Model)

K42



Headlight Circuit (European model)

K43



dimmer switch for both high and low beam, and the connections in the headlight switch.

To check the dimmer switch and horn/passing switch:

- Remove the fuel tank (Pg. 43), and disconnect the plug (6-pin) and blue lead, and black lead to the left switch housing under the frame top tube.
- Use an ohmmeter to see that only the connections shown in the table have continuity (zero ohms). If the switch has an open or a short, it can be disassembled for repair. The contact surfaces may be cleaned, but no internal parts are available for replacement. If any parts are not repairable, the switch must be replaced as a unit. If the procedure above does not remedy the problem, check the ignition switch and the wiring.



K44

A. Left Switch Housing Plug and Lead

Table K13 Dimmer Switch Connections

Color	Red/Black	Blue	Red/Yellow
HI	●		●
LO		●	●



Table K14 Horn/Passing Switch Connections (European model)

Color	Black	Yellow	R/Bl	Brown
OFF				
ON	●		●	
Switch	Horn		Passing	



To check the headlight switch (European model):

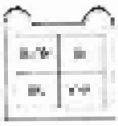
- Remove the fuel tank (Pg. 43), and disconnect the plug (4-pin) and blue/white lead to the right switch housing under the frame top tube.
- Use an ohmmeter to see that only the connections shown in the table have continuity (zero ohms). If the switch has an open or a short, it cannot be assembled for repair. The contact surfaces may be cleaned, but no internal parts are available for replacement. If any parts are not repairable, the switch must be replaced as a unit. If the procedure above does not remedy the problem, check the ignition switch and the wiring.



A. Right Switch Housing Plug and Lead

Table K15 Headlight Switch Connections (European model)

Color	Brown	Brown/White	Blue/White
OFF			
•	●	●	
ON	●	●	●



If the headlight lights but does not light brightly, the trouble may be that the headlight is of improper wattage or the battery or the dynamo is not applying sufficient current. However, the trouble may also be caused by a short or a component drawing too much current in some other part of the electrical system.

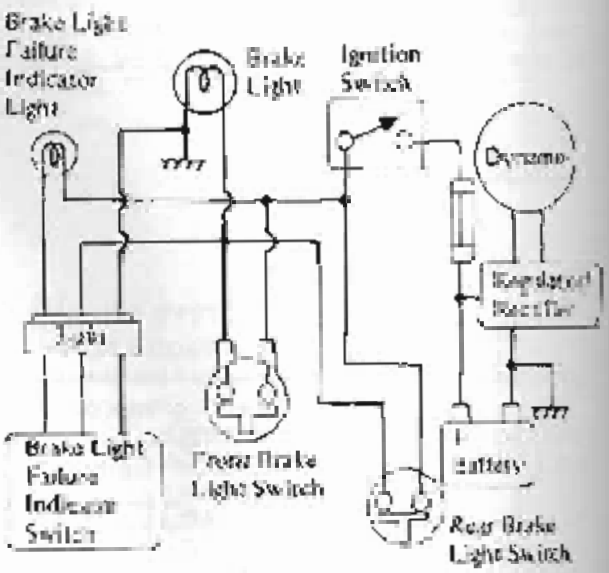
Tail light trouble

If the tail light does not go on when the circuit is closed, the filament is probably burned out. However, if the bulb is good, check the fuses, wiring, ignition switch, headlight switch, and battery.

Brake Light Circuit

The brake light circuit is shown in Fig. K46. When the ignition switch is turned on, the brake light goes on whenever the circuit is closed by either the front or rear brake light switch. The same bulb is used for both the brake and tail lights as explained in the preceding section.

Brake Light Circuit K46



The front brake light switch of KZ400-B is a pressure switch installed in the brake fluid line, and is operated by fluid pressure when the brake lever is pulled. The front brake light switch of KZ400-C, mounted on the front brake lever holder, is actuated when pressed by the front brake lever. The front brake light switch never requires adjustment, and so is not designed to be adjusted. It cannot be disassembled for repair and must be replaced when defective.

The rear brake light switch is a plunger type switch actuated by a spring attached to the rear brake pedal. It can be adjusted by changing its position higher or lower in the mounting bracket (See Pg. 28).

The brake light failure indicator switch is in the brake light circuit of KZ400-B as a warning device to indicate whether or not the brake light is functioning properly during vehicle operation. Brake light failure may be given in a manner not both or some other failure in the brake light circuit.

Brake light circuit inspection involves the front brake light switch, rear brake light switch, brake light, brake light failure indicator switch, brake light failure indicator light, and wiring.

Front brake light switch inspection

KZ400-B:

- Disconnect the front brake light switch leads from the switch.
- Set an ohmmeter to the x 1Ω range, connect the meter to the switch terminals, and determine whether or not there is continuity whenever the front brake lever is squeezed.



A. Front Brake Light Switch

- If there is no continuity, replace the switch with a new one (Pg. 133).

KZ400-C:

- Remove the headlight unit (Pg. 129).
- Disconnect the front brake light switch leads (brown, blue).
- Set an ohmmeter to the x 1Ω range, connect the meter to the switch leads, and determine whether or not there is continuity whenever the front brake lever is squeezed.



A. Brake Light Switch Leads

- If there is no continuity, replace the switch with a new one (Pg. 134).

Rear brake light switch inspection

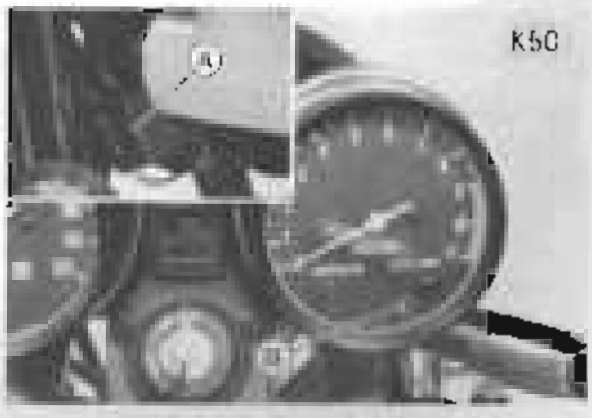
- Disconnect the rear brake light switch leads (brown, blue) under the fuel tank.
- Inspect in the same way that the front brake light switch was inspected. If there is no continuity whenever the rear brake pedal is depressed, replace the switch (Pg. 134).



A. Brake Light Switch Leads

Brake light failure indicator switch inspection

Turn on the ignition switch. Watching the indicator light, apply and then release either brake. Next, with the tail/brake light bulb removed, do the same thing. If the indicator lights as shown in Table K16, the brake light failure indicator switch and brake light circuit are functioning properly.



A. Brake Light Failure Indicator Switch
B. Indicator

Table K16 Brake Light Failure Indicator Switch Test

		Brake Lever or Pedal	
		Applied	Released
Tail/Brake Light Bulb	In place	Goes on	Goes off
	Out of place	Goes on	Flashes

If the brake light failure indicator does not function properly, find out whether the brake light wiring is defective or the failure indicator switch is defective.

The easiest way to test the failure indicator switch is to install and check the suspect switch on a motorcycle with a known good brake light circuit. When this method is impossible, check the circuit as follows (The battery must be charged).

(1)Brake light wiring inspection:

- Check brake light operation and replace any defective parts. The brake light must go on only when the brakes are applied.
- Remove the fuel tank (Pg. 43), and disconnect the indicator switch 3-pin plug.
- Set an ohmmeter to the x 1Ω range and a voltmeter to the 20V DC range. Check the wiring as shown in Table K17.

CAUTION **To prevent a meter burning, turn off the ignition switch while using an ohmmeter.**



A. 3-pin Socket

Table K17 Brake Light Wiring Inspection

Meter	Connections†	Brake	Standard
Voltmeter 20V DC	Meter (+) ← → Blue	Apply	Battery Voltage
		Release	0V
	Meter (+) ← → Green/White	—	Battery Voltage
Ohmmeter x 1Ω	Meter (+) ← → Black/Yellow	—	0Ω

†1. Negative (−) meter lead connected to the ground.
2. Positive (+) meter lead at 3-pin socket with indicator switch disconnected.

If the meter does not read according to this table, there may be an open or short. In case the voltage of the green/white lead shows 0 volts, the indicator bulb may be burned out.

(2)Brake light failure indicator switch inspection:

- Make sure that the brake light operates properly, and that the brake light wiring is not damaged.
- Connect the indicator switch 3-pin plug.
- Measure the voltage at the 3-pin socket as shown in Table K18.



A. 3-pin Socket

Table K18 Indicator Switch Inspection

Meter	Connections†	Brake	Standard
20V DC	Meter (+) ← → Blue	Apply	Battery Voltage
		Release	0V
	Meter (+) ← → Green/White	Apply	about 0V
		Release	Battery Voltage

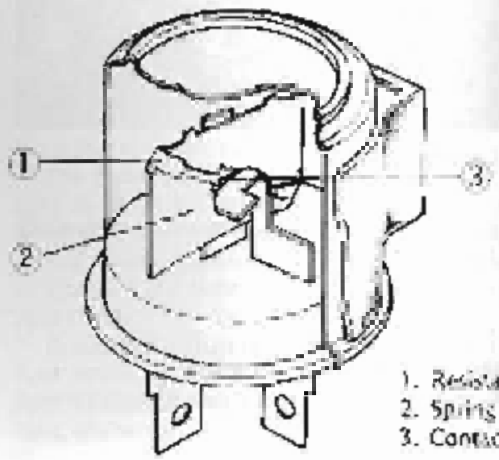
†1. Negative (−) meter lead connected to the ground.
2. Positive (+) meter lead at 3-pin socket with indicator switch connected.

If any one of the meter readings shows an improper value, the brake light failure indicator switch is defective.

Turn Signal Circuit

A wiring diagram of the turn signal circuit is shown in Fig. K54. When the ignition switch is on and the turn signal switch is turned to "R" or "L", a ground is provided for the circuit so current can flow. Current to the right or left turn signals flows through the closed contacts and through the resistance wire inside the turn signal relay, and the turn signals go on. The resistance wire quickly heats up, expands, and allows a spring to pull the contacts open. When the contacts have opened, the circuit is broken, the turn signals go off, and the resistance wire cools and contracts, closing the contacts so that the cycle can begin again. The indicator light for the turn signals indicates that they are working properly.

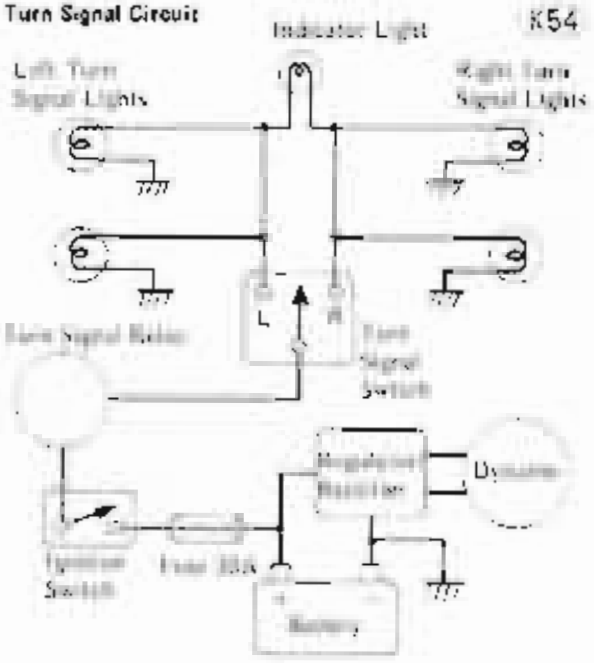
Turn Signal Relay K53



1. Resistance Wire
2. Spring
3. Contacts

Since the turn signal relay is designed to operate correctly only when two turn signals (one front and one rear) and the turn signal indicator light are properly connected in the circuit, trouble may result from a burned out bulb, a bulb of incorrect wattage, loose wiring, as well as from a defect in the relay itself. In general, if the trouble with the circuit is common to both right and left turn signals, it is probably caused by a defective turn signal relay, although it may be due to a bad switch, wiring, or battery. If the trouble is with only one side – either right or left – then the relay is not at fault since the same relay is used for both sides.

Turn Signal Circuit K54



Turn signal trouble

(1) Neither right nor left turn signals come on at all:

- Check that battery voltage is normal.
- Disconnect the relay leads and use an ohmmeter to check that there is continuity (close to zero ohms) between the relay terminals. If there is no ohmmeter reading, or if there is normal ohms resistance, replace the relay with a new one.



A. Turn Signal Relay

- If the relay checks good, turn the meter to 20V DC range, connect the + meter lead to the brown lead that was disconnected from the relay, and connect the – meter lead to the orange lead.
- With the ignition switch on, first switch the turn signal switch to the "R" and then to the "L" position. The meter should register battery voltage at either position. If it does not, the fuse, ignition switch, or wiring is at fault. If battery voltage is read on the meter but the turn signals still will not work when the relay is reconnected, then recheck all wiring connections.



A. Relay Leads

(2) Both right or both left turn signals come on and stay on or flash too slowly:

- Check that battery voltage is not low.
- Check that all wiring connections are good.
- Check that the turn signal bulbs and indicator bulb are of the correct wattage.
- If all of the above check good, replace the relay.

(3) A single light on one side comes on and stays on:

- Either the light bulb that does not come on is burned out, of the incorrect wattage, or the wiring is broken or improperly connected.

(4) Neither light on one side comes on:

- Unless both lights for that side are burned out, the problem is with the turn signal switch.

(5) Flashing rate is too fast:

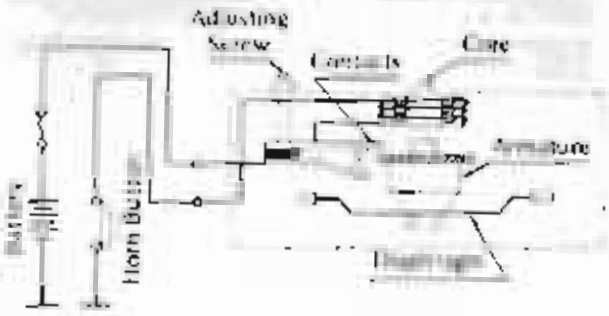
- If this occurs on both the right and left sides, check that the battery is not being overcharged (indicating a defective regulator/rectifier). If the dynamo and the battery voltage are normal, replace the turn signal relay.
- If this occurs on only one side, one or both of the turn signal bulbs are of too high a wattage.

HORN

The horn circuit and construction are shown in Fig. K57. When the horn button is pressed with the ignition switch on, the horn is grounded to complete the horn circuit. Current then flows through the horn contacts and horn coil, magnetizing the iron core. The

magnetized iron core pulls on the armature and diaphragm assembly, the movement of which pushes open the contacts, interrupting the current flow. Since the core now loses its magnetism, the armature and diaphragm assembly springs back to its original position, closing the contacts. This cycle repeats until the horn button is released. Since each cycle takes only a fraction of a second, the diaphragm moves fast enough to produce sound.

Horn Construction (K57)



The contacts wear down after long use, requiring adjustment from time to time (Pg. 40). If the horn itself is determined to be at fault and adjustment fails to correct the trouble, the contacts or some other component in the horn is defective. The horn cannot be disassembled and must be replaced if defective.

Horn trouble

- Check that battery voltage is normal.
- Disconnect the leads to the horn, and connect a multimeter set to the × 1Ω range to the horn terminals to check for continuity (close to zero ohms). If the reading is several ohms or if there is no reading at all, replace the horn.
- If the reading is very close to zero, set the multimeter to the 20V DC range, and connect the meter to the leads that were disconnected from the horn. The + meter lead goes to the brown lead, and the – meter lead goes to the black lead.
- With the ignition switch on, press the horn button. The meter should register battery voltage. If it does not, the fuse, ignition switch, horn button, or wiring is at fault. Also check that the black/yellow lead is grounded to the handlebar holder stem.



A. Horn Leads

- If the meter does show battery voltage, indicating that the horn trouble lies within the horn itself, and adjustment fails to correct the trouble, replace the horn.

NOTE: Do not loosen the armature mounting screw; doing so would alter the armature position such that the horn would probably have to be replaced.

SPEEDOMETER, TACHOMETER

The speedometer and tachometer are sealed units which cannot be disassembled. If either fails to work satisfactorily, it must be replaced as a complete unit.

The speedometer and tachometer lights and the indicator lights are independent and can be removed for replacement if necessary.

There is damping oil around the meter needle shaft which damps needle flutter and makes the needle move smoothly. If the meters are left upside down or sideways for any length of time, the damping oil will spill out of the reservoir, and the meters will malfunction.

Troubleshooting—Guide

Engine Doesn't Start, Starting Difficulty

Starter motor not rotating
- Starter motor defective
- Battery voltage low
- Relay not contacting or operating
- Starter button not contacting
- Wiring open or shorted
- Ignition switch defective
- Engine stop switch defective
- Engine stop switch off
- Fuse blown

Starter motor rotating but engine doesn't turn over
- Starter motor clutch defective

Engine won't turn over
- Valve seizure
- Cylinder, piston seizure
- Crankshaft seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Camshaft seizure
- Kickstarter return spring broken
- Kick gear not engaging

No fuel flow
- No fuel in tank
- Sticking of the valve in the automatic fuel tap
- Fuel tap vacuum hose clogged
- Tank cap air vent obstructed
- Fuel tap clogged
- Fuel line clogged
- Float valve clogged

Engine flooded
- Fuel level too high
- Float valve worn or stuck open
- Starting technique faulty

(When flooded, kick with the throttle fully open to allow more air to reach the engine.)

No spark; spark weak
- Battery voltage low
- Ignition switch not on
- Engine stop switch turned off
- Spark plug dirty, defective, or misadjusted
- Spark plug cap or high tension wiring defective
- Spark plug cap not in good contact
- Incorrect spark plug range
- Contact breaker points dirty or damaged
- Contact breaker point gap misadjusted
- Capacitor defective
- Ignition coil defective
- Ignition or engine stop switch shorted
- Wiring shorted or open

Compression low
- Spark plugs loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston rings bad (worn, weak, broken, or sticking)
- Piston ring/land clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)

Poor Running at Low Speed

Spark weak
- Battery voltage low
- Spark plug dirty, defective, or misadjusted
- Spark plug cap or high tension wiring defective
- Spark plug cap shorted or not in good contact
- Incorrect spark plug heat range
- Contact breaker points dirty or damaged
- Contact breaker point gap misadjusted
- Capacitor defective
- Ignition coil defective

Fuel/air mixture incorrect
- Air screw(s) misadjusted
- Slow jet, or air passage clogged
- Slow jet bleed holes clogged
- Main jet clogged
- Pilot passage clogged
- Air cleaner clogged, poorly sealed or missing
- Choke valve closed
- Fuel level too high or too low
- Fuel tank air vent obstructed
- Carburetor holder loose
- Air cleaner duct loose

Compression low
- Spark plugs loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston rings bad (worn, weak, broken or sticking)
- Piston ring/land clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)

Other
- Ignition timing misadjusted
- Timing not advancing (spring broken or stretched)
- Carburetors not synchronizing
- Vacuum piston doesn't slide smoothly
- Damaged vacuum piston diaphragm
- Engine oil viscosity too high
- Brake dragging

Poor Running or No Power at High Speed

Firing incorrect
- Spark plug dirty, defective, or misadjusted
- Spark plug cap or high tension wiring defective
- Spark plug cap shorted or not in good contact
- Incorrect spark plug heat range
- Contact breaker points dirty or damaged
- Contact breaker point gap misadjusted
- Capacitor defective

Ignition coil defective
Ignition timing maladjusted and/or timing not advancing
Contact breaker spring weak
Fuel/air mixture incorrect
Choke valves closed
Main jet clogged or wrong size
Jet needle or needle jet worn
Air jets clogged
Fuel level too high or too low
Bleed holes of main jet bleed pipe or needle jet holder clogged
Air cleaner clogged, poorly sealed, or missing
Air cleaner duct poorly sealed
Water or foreign matter in fuel
Carburetor holder loose
Air cleaner duct bent
Fuel tank air vent obstructed
Fuel tap clogged
Fuel line clogged
Compression low
Spark plug loose
Cylinder head not sufficiently tightened down
No valve clearance
Cylinder, piston worn
Piston rings bad (worn, weak, broken, or stuck)
Piston ring/ring slot clearance excessive
Cylinder head gasket damaged
Cylinder head warped
Valve spring broken or weak
Valve not seating properly (valve bent, worn or carbon accumulation on the seating surface)
Knocking
Ignition timing maladjusted
Carbon built up in combustion chamber
Fuel poor quality or incorrect
Incorrect spark plug heat range
Miscellaneous
Throttle valve won't fully open
Vacuum pistons don't slide smoothly
Damaged vacuum piston diaphragm
Ignition timing maladjusted
Timing not advancing
Brakes dragging
Clutch slipping
Overheating
Engine oil level too high
Engine oil viscosity too high

Overheating

Firing incorrect
Spark plug dirty, damaged, or maladjusted
Incorrect spark plug heat range
Ignition timing maladjusted
Fuel/air mixture incorrect
Main jet clogged or wrong size
Fuel level too low
Carburetor holder loose
Air cleaner poorly sealed, or missing
Air cleaner duct poorly sealed
Air cleaner clogged
Compression high
Carbon built up in combustion chambers
Engine load faulty
Clutch slipping
Engine oil level too high
Engine oil viscosity too high
Brakes dragging
Lubrication inadequate
Engine oil level too low
Engine oil poor quality or incorrect

Clutch Operation Faulty

Clutch slipping
No clutch lever play
Friction plates worn or warped
Steel plates worn or warped
Clutch springs broken or weak
Clutch release maladjusted
Clutch cable maladjusted
Clutch inner cable catching
Clutch release mechanism defective
Clutch hub or housing unevenly worn
Clutch not disengaging properly
Clutch lever play excessive
Clutch plates warped or too rough
Clutch spring tension uneven
Engine oil deteriorated
Engine oil viscosity too high
Engine oil level too high
Clutch housing frozen on drive shaft
Clutch release mechanism defective

Gear Shifting Faulty

Doesn't go into gear; shift pedal doesn't return
Clutch not disengaging
Shift fork(s) bent or seized
Gear(s) stuck on the shaft
Shift drum positioning pin binding
Shift return spring weak or broken
Shift mechanism arm spring broken
Shift mechanism arm broken
Jumps out of gear
Shift fork(s) worn
Gear groove(s) worn
Gear dogs, dog holes, and/or dog recesses worn
Shift drum groove(s) worn
Shift drum positioning pin spring weak or broken
Shift fork pin(s) worn
Drive shaft, output shaft, and/or gear splines worn
Overshifts
Shift drum positioning pin spring weak or broken
Overshift limiter hook broken

Abnormal Engine Noise

Knocking
Ignition timing maladjusted
Carbon built up in combustion chamber

Fuel poor quality or incorrect
Incorrect spark plug heat range
Overheating
Piston slap
Cylinder/piston clearance excessive
Cylinder, piston worn
Connecting rod bent
Piston pin, piston hole worn
Valve noise
Valve clearance incorrect
Valve spring broken or weak
Camshaft bearing worn
Rocker arm or rocker shafts worn
Other noise
Connecting rod small end clearance excessive
Connecting rod big end clearance excessive
Piston ring(s) worn, broken, or stuck
Piston seizure damage
Cylinder head gasket leaking
Exhaust pipe leaking at cylinder head connection
Crankshaft runout excessive
Engine mounts loose
Crankshaft bearing worn
Primary chain, chain guides worn
Starter motor chain, chain guides worn
Balancer chain, chain guides worn
Balancer mechanism springs weak or broken
Camshaft, chain tensioner defective
Camshaft, chain, sprocket, guides worn
Camshaft chain requires adjustment
Loose magneto flywheel

Abnormal Drive Train Noise

Clutch noise
Weak or damaged shock damper springs
Clutch housing/friction plate clearance excessive
Transmission noise
Bearings worn
Transmission gears worn or chipped
Metal chips jammed in gear teeth
Engine oil insufficient or too thin
Kick ratchet gear not properly disengaging from kick gear
Drive chain noise
Drive chain adjusted improperly
Chain worn
Rear and/or engine sprocket(s) worn
Chain lubrication insufficient
Rear wheel misaligned

Abnormal Frame Noise

Front fork noise
Oil insufficient or too thin
Spring weak or broken
Rear shock absorber noise
Shock absorber defective
Disc brake noise
Pads installed incorrectly
Pad surface glazed
Disc warped
Caliper seal defective
Cylinder damaged
Drum brake noise
Brake linings overworn or worn unevenly
Drum worn unevenly or scored
Brake springs weak or broken
Foreign matter in hub
Brake not properly adjusted
Other noise
Brackets, nuts, bolts, etc. not properly mounted or tightened

Exhaust Smokes Excessively

White smoke
Piston oil ring worn
Cylinder worn
Valve oil seal damaged
Valve guide worn
Engine oil level too high
Black smoke
Air cleaner clogged
Main jet too large or fallen off
Choke valves closed
Fuel level too high
Brown smoke
Main jet too small
Fuel level too low
Air cleaner duct loose
Air cleaner poorly sealed or missing

Handling and/or Stability Unsatisfactory

Handlebar hard to turn
Steering stem locknut too tight
Bearing balls damaged
Race(s) dented or worn
Steering stem lubrication inadequate
Steering stem bent
Tire air pressure too low
Handlebar shakes or excessively vibrates
Tire(s) worn
Swing arm needle bearing worn
Rim(s) warped, or not balanced
Front, rear axle runout excessive
Spokes loose
Wheel bearing(s) worn
Handlebar clamps loose
Steering stem head bolt and/or clamp bolt loose
Handlebar pulls to one side
Frame bent
Wheel misalignment
Swing arm bent or twisted
Steering stem bent
Front fork bent
Right/left front fork oil level uneven
Right/left rear shock absorbers unbalanced
Shock absorption unsatisfactory
Too hard:
Front fork oil excessive

Front fork oil viscosity too high
Tire air pressure too high
Rear shock absorber maladjusted
Front fork worn
Tire soft
Front fork oil insufficient and/or leaking
Front fork oil viscosity too low
Front fork, rear shock absorber spring(s) weak
Rear shock absorber oil leaking

Brakes Don't Hold

Disc brake

Air in the brake line
Pad or disc worn
Brake fluid leak
Disc warped
Contaminated pads
Brake fluid deteriorated
Primary or secondary cup defective
Master cylinder scratched inside

Drum brake

Brake not properly adjusted
Linings oil-worn or worn unevenly
Drum worn unevenly or scored
Cam, camshaft, shaft hole worn
Oil, grease on lining and drum
Dirt, water between lining and drum
Overheated

Battery Discharged

Battery faulty (e.g., plates sulphated, shorted through sedimentation, electrolyte level too low)
Battery leads making poor contact
Load excessive (e.g., built-in accessories)
Regulator/rectifier defective
Ignition switch defective
Dynamo defective
Wiring faulty

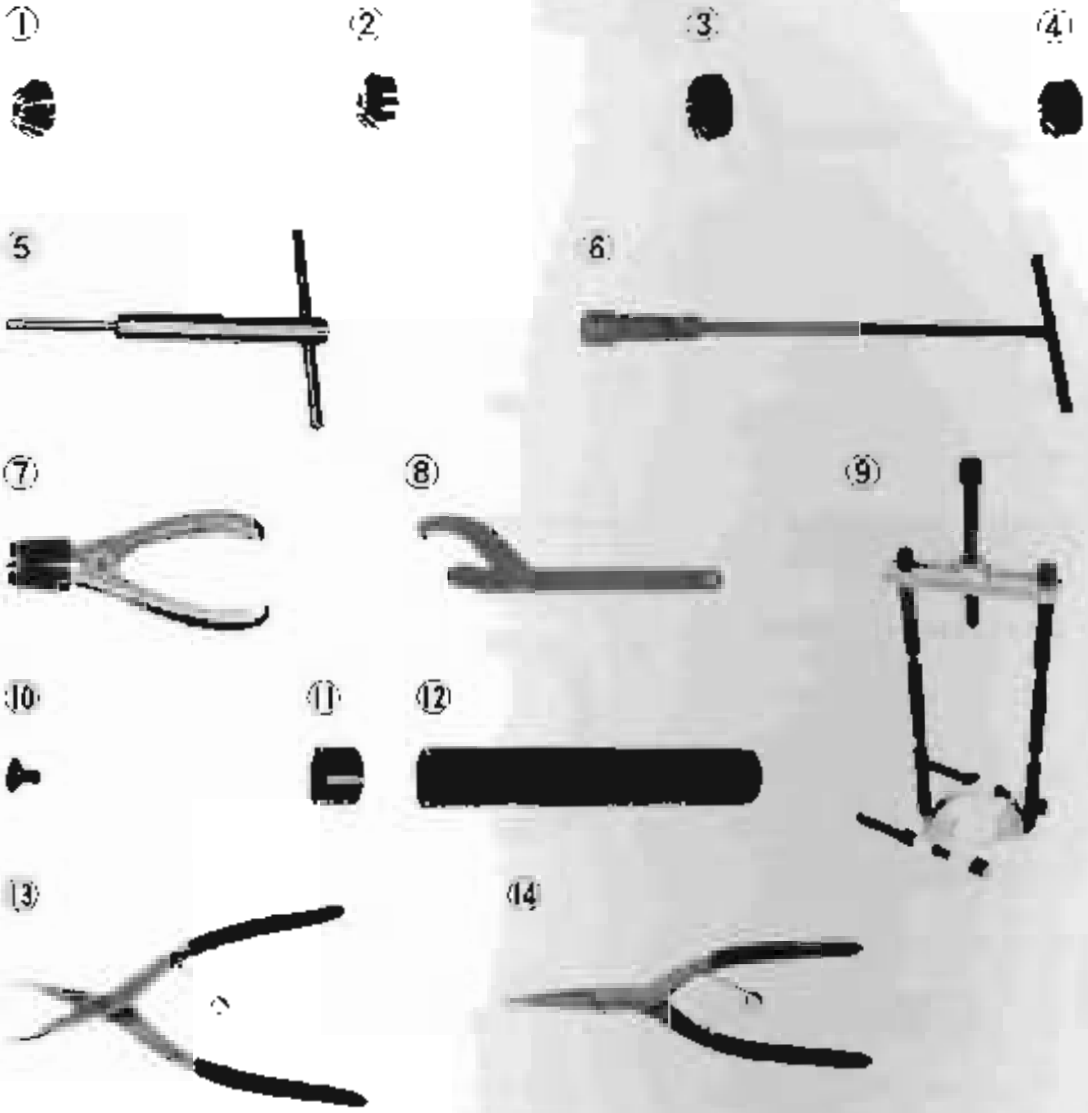
Battery Overcharged

Regulator/rectifier defective
Battery defective

NOTE: This is not an exhaustive list, giving every possible cause for each problem listed. It is meant simply as a rough guide to aid the troubleshooting for some of the more common difficulties. Electrical troubleshooting is not covered here due to its complexity. For electrical problems, refer to the appropriate heading in the Maintenance Section.

Appendix

SPECIAL TOOLS



REF NO.	PART NO.	DESCRIPTION
1	57001-101	VALVE SEAT CUTTER 30°
2	57001-102	VALVE SEAT CUTTER 45°
3	57001-360	VALVE SEAT CUTTER 75° (INLET)
4	57001-361	VALVE SEAT CUTTER 75° (EXHAUST)
5	57001-106	VALVE SEAT CUTTER HOLDER
6	57001-110	SPARK PLUG WRENCH
7	57001-115	PISTON RING PLIERS
8	57001-134	STEM NUT WRENCH
9	57001-135	BEARING PULLER
	(or P/NO. 57001-158)	
10	57001-317	BEARING PULLER ADAPTER
11	57001-294	STEM BEARING DRIVER ADAPTER
12	57001-137	STEM BEARING DRIVER
13	57001-143	INSIDE CIRCLIP PLIERS
14	57001-144	OUTSIDE CIRCLIP PLIERS

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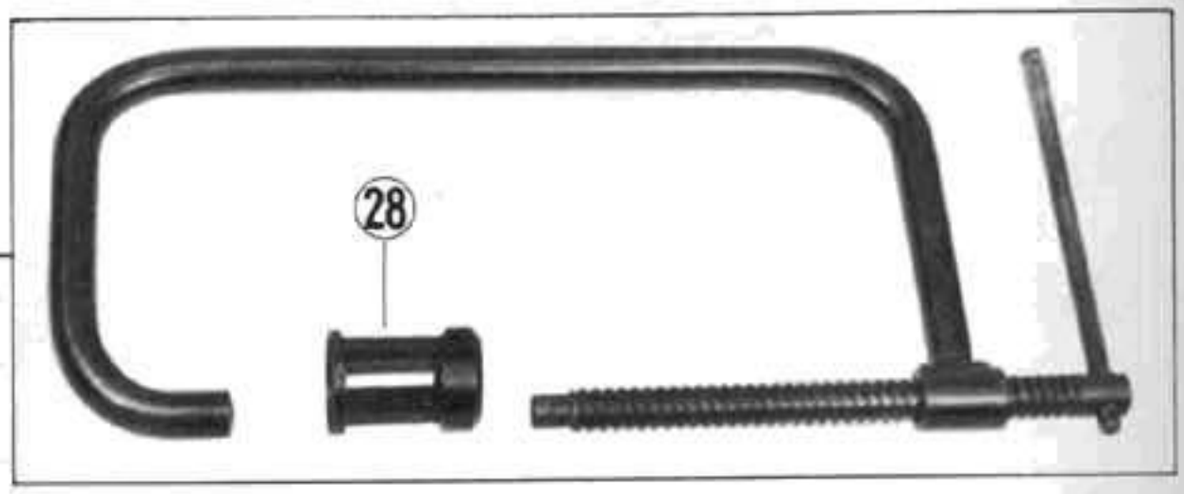










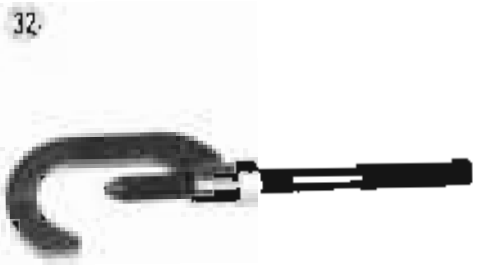


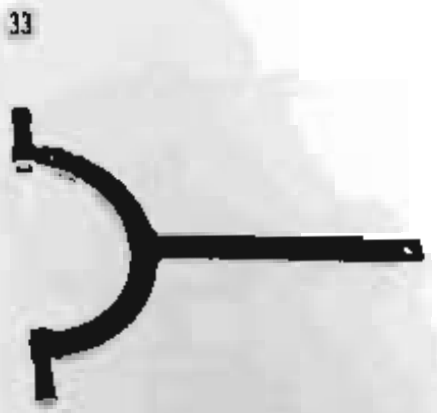


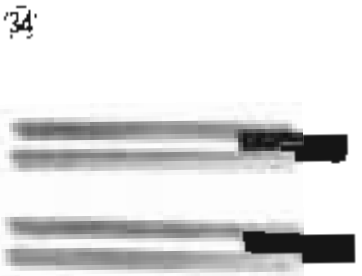


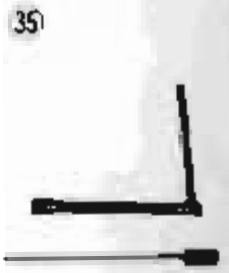


REF NO.	PART NO.	DESCRIPTION
15	57001-138	STEM CUP DRIVER
16	57001-139	BEARING DRIVER HOLDER
17	57001-140	BEARING DRIVER
18	57001-191	FRONT FORK OIL SEAL DRIVER
19	57001-288	BEARING DRIVER "A"
20	57001-289	BEARING DRIVER "B"
21	57001-290	BEARING DRIVER "C"
22	57001-296	BEARING DRIVER
	(or P/NO. 57001-298)	
23	57001-162	VALVE GUIDE REAMER
24	57001-163	VALVE GUIDE ARBOR
25	57001-1011	FRONT FORK CYLINDER HOLDER ADAPTER
26	57001-183	FRONT FORK CYLINDER HOLDER HANDLE
27	57001-241	VALVE SPRING COMPRESSOR ASSEMBLY
28	57001-242	VALVE SPRING COMPRESSOR ADAPTER
29	57001-254	ROTOR PULLER
30	57001-264	SHIFT SHAFT OIL SEAL GUIDE
31	57001-265	KICK SHAFT OIL SEAL GUIDE

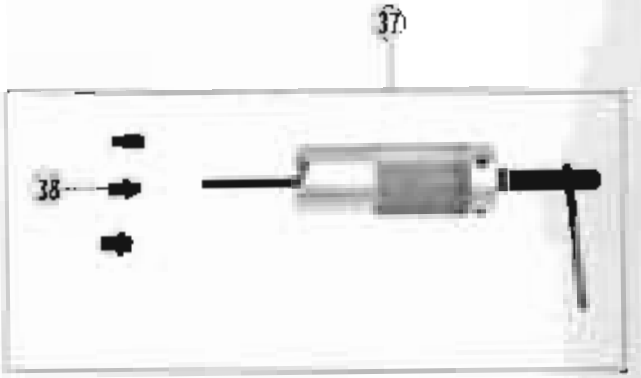


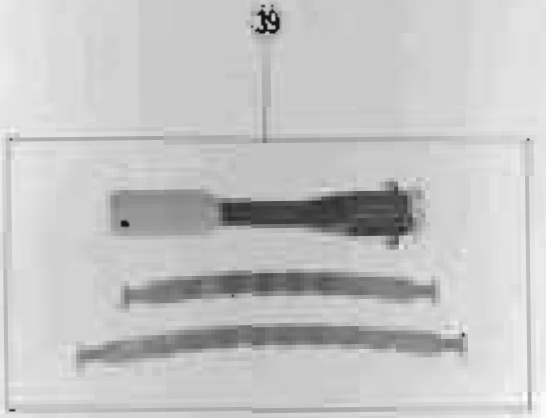










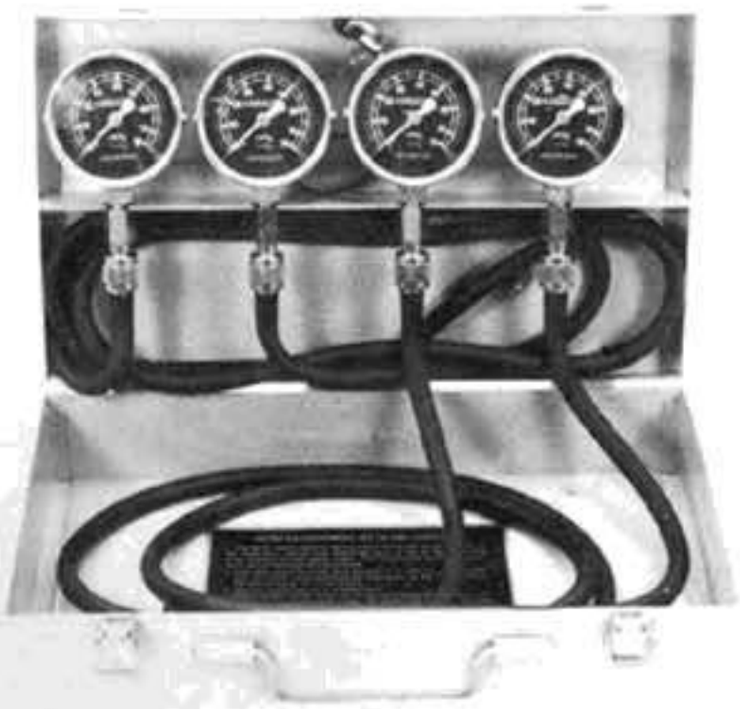


REF NO.	PART NO.	DESCRIPTION
32	57001-307	ENGINE SPROCKET HOLDER
33	57001-308	FLYWHEEL HOLDER
34	57001-341	PISTON BASE
	(or P/NO. 57001-340)	
35	57001-351	BALANCE ADJUSTER
36	57001-380	TRANSMISSION CIRCLIP DRIVER
37	57001-910	PISTON PIN PULLER ASSEMBLY
38	57001-913	PISTON PIN PULLER ADAPTER "B"
39	57001-1094	PISTON RING COMPRESSOR ASSEMBLY

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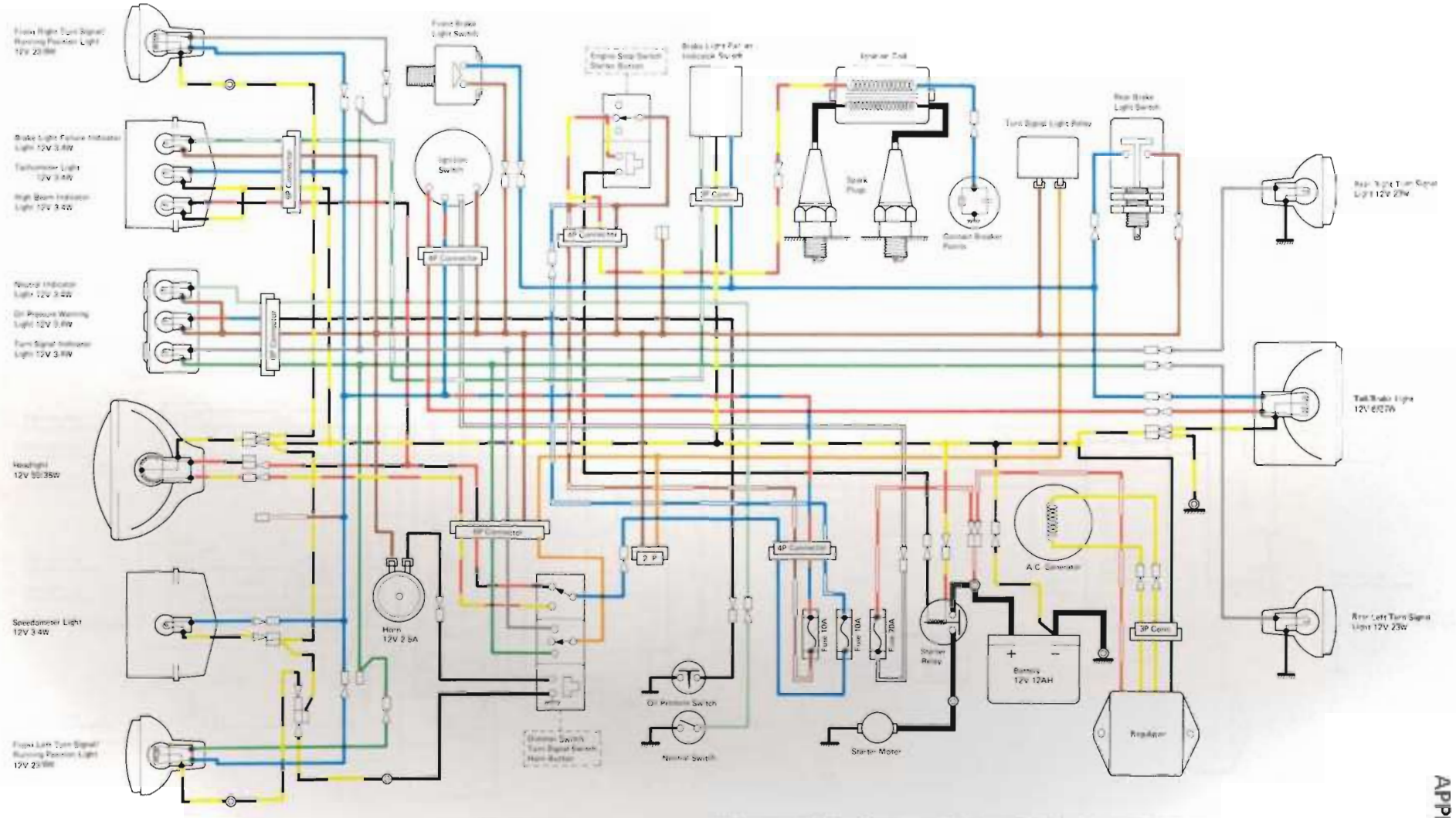


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REF. NO.	PART NO.	DESCRIPTION
40	57001-123	COMPRESSION GAUGE ASSEMBLY
41	57001-127	VACUUM GAUGE SET
42	57001-226	VACUUM GAUGE
43	57001-401	VACUUM GAUGE ADAPTER
44	57001-164	OIL PRESSURE GAUGE ASSEMBLY
45	57001-400	OIL PRESSURE GAUGE ADAPTER
46	57001-208	FUEL LEVEL GAUGE
	(See Pg. 252 for 1979 and later models.)	
47	57001-980	ELECTRO TESTER
48	57001-983	HAND TESTER
49	57001-1013	THICKNESS GAUGE

KZ400-B1 Wiring Diagram
(US, Canadian model)



Left Handlebar Switch Connections

	Horn Button		Dimmer Switch			Turn Signal Switch		
	Black	Wh		R/Bk	Blue	R/Y	Green	Orange	Gray
OFF									
ON	●		HI	●			L	●	
			LO		●		R		●

Ignition Switch Connections

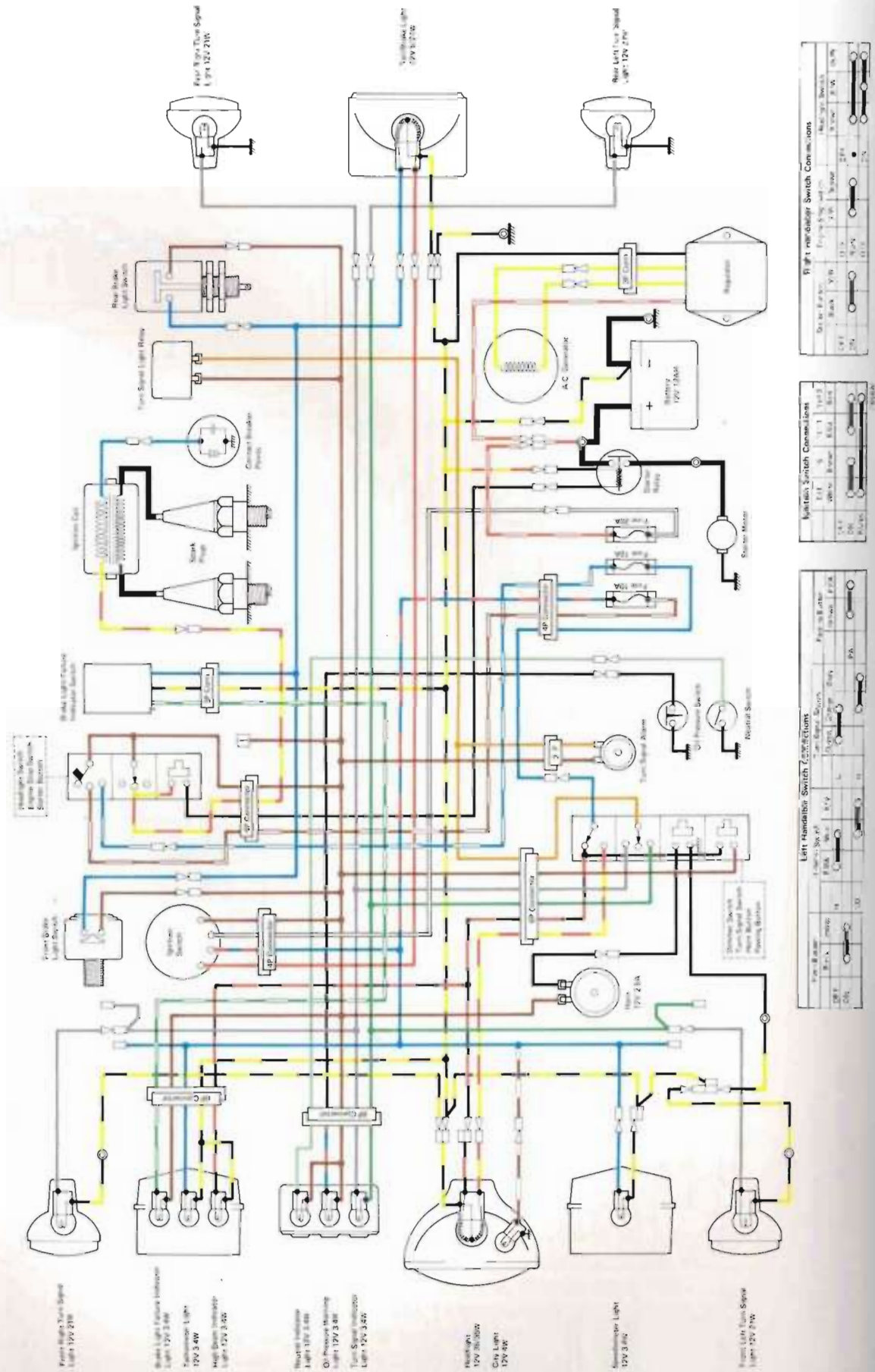
	Batt	Ig	Tail 1	Tail 2
	White	Brown	R/Bl	Red
OFF				
ON		●	●	
PARK	●	●	●	

(1049C)

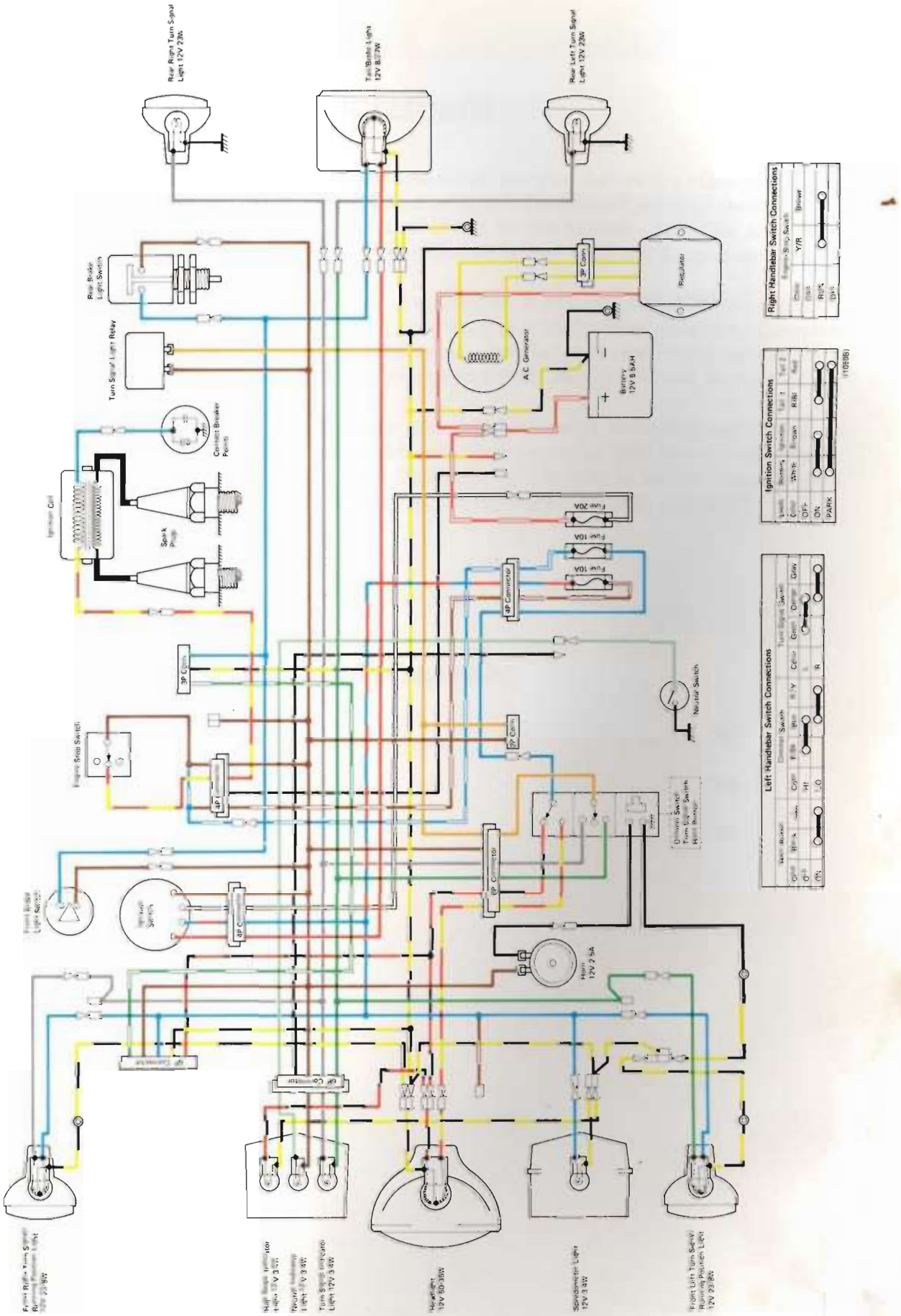
Right Handlebar Switch Connections

	Starter Button		Engine Stop Switch	
	Black	R/Bl	R/Bl	Brown
OFF				
ON	●	●		●
			OFF	

KZ400-B1 Wiring Diagram (European model)



KZ400-C1 Wiring Diagram



Supplement

This supplement is designed to be used in conjunction with the front part of this manual (up to Pg. 249). The maintenance and repair procedures described in this Supplement are only those that are unique to later year units since the first publication of this Service Manual. Complete and proper servicing of the later year units therefore requires mechanics to read both this Supplement and the text in front of the Supplement.

This Supplement is divided into few sections. Each section is annually added to the preceding section, and explains procedures per one year unit that are unique to the latest year unit. Complete and proper servicing of the later year units therefore requires mechanics to read (1) the section corresponding to the year unit they work at, (2) the previous section(s), and (3) the text in front of this Supplement.

NOTE: The maintenance and repair procedures for the variation models (KZ400-G and KZ400-H) are first included in the "Supplement for 1979 Model" and "Supplement for 1981 Model" respectively. Unless otherwise noted, procedures for the 1979 KZ400-G1 are the same as for the standard 1979 KZ400-B2, and procedures for the 1981 KZ1000-H3 are the same as for the 1981 KZ400-B4.

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SUPPLEMENT FOR 1980 MODEL 269

SUPPLEMENT FOR 1981 MODEL 283

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Supplement for 1979 Model

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Model Identification

KZ400-G



KZ400-B



SPECIFICATIONS (KZ400-G)

Dimensions		
Overall length		2,045 mm Ⓔ 2,070 mm
Overall width		810 mm Ⓔ 775 mm
Overall height		1,130 mm Ⓔ 1,070 mm
Wheelbase		1,365 mm
Road clearance		135 mm
Dry weight		167 kg
Fuel tank capacity		14 ℓ
Performance		
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		64.0 x 62.0 mm
Displacement		398 cc
Compression ratio		9.5
Maximum horsepower		36 HP @8,500 rpm
Maximum torque		3.3 kg-m @7,000 rpm
Valve timing		
Inlet	Open	27° BTDC
	Close	73° ABDC
	Duration	280°
Exhaust	Open	70° BBDC
	Close	30° ATDC
	Duration	280°
Carburetors		Keihin VB32 x 2
Lubrication system		Forced lubrication (wet sump)
Engine oil		SE class SAE 10W40, 10W50, 20W40, or 20W50
Engine oil capacity		2.9 ℓ
Starting system		Electric and kick
Ignition system		Battery and coil
Ignition timing		From 10° BTDC @1,100 rpm to 35° BTDC @3,200 rpm
Spark plugs		NGK B7ES or ND W22ES-U
Transmission		
Type		6-speed, constant mesh, return shift
Clutch		Wet, multi disc
Gear ratio:	1st	2.54 (33/13)
	2nd	1.75 (28/16)
	3rd	1.32 (25/19)
	4th	1.10 (23/21)
	5th	0.96 (22/23)
	6th	0.88 (21/24)

Primary reduction ratio		2.43 (56/23)
Final reduction ratio		3.00 (45/15)
Overall drive ratio		6.39 (Top gear)

Electrical Equipment

Alternator		Nippon Denso 5-037000-373
Regulator/Rectifier		Shindengen SH221-12
Ignition coil		Nippon Denso 029700-3881
Battery		Yuasa 12N 12A-4A-1 (12V 12AH)
Starter		Mitsuba SM-223
Headlight type		Semi-sealed
Headlight		12V 50/40W (F) 36/36W (E) 35/35W
City light		12V 3.4W (E) 4W
Tail/Brake light		12V 8/27W (E) 5/21W
Meter lights		12V 3.4W
Indicator lights		12V 3.4W
Turn signal lights		12V 23W (E) 21W
Horn		12V 2.5A

Frame

Type		Tubular, double-cradle
Steering angle		41° to either side
Castor		27°
Trail		100 mm
Tire size	Front	3.00S-18 4PR
	Rear	3.50S-18 4PR
Suspension	Front	Telescopic fork
	Rear	Swing arm
Suspension stroke	Front	150 mm
	Rear	95 mm
Front fork oil capacity (each fork)		145~155 cc
Front fork oil type		SAE 5W20

Brakes

Type	Front	Disc brake
	Rear	Internal expansion, leading-trailing
Effective disc diameter		230 mm
Brake drum inside diameter and width		160 x 30 mm

(E) : European model (F) : French model

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

PERIODIC MAINTENANCE CHART

The maintenance and adjustments for KZ400-G must be done in accordance with this chart to keep the motorcycle in good running condition. The initial maintenance is vitally important and must not be neglected.

OPERATION \ FREQUENCY	Whichever comes first — Every	ODOMETER READING* 800 km	5,000 km	10,000 km	15,000 km	20,000 km	25,000 km	30,000 km	See Page
Battery electrolyte level — check †	month	•	•	•	•	•	•	•	218
Brake adjustment — check †		•	•	•	•	•	•	•	25
Brake wear — check †			•	•	•	•	•	•	265
Brake fluid level — check †	month	•	•	•	•	•	•	•	265
Brake fluid — change	year			•		•		•	202
Clutch — adjust		•	•	•	•	•	•	•	19
Carburetors — adjust		•	•	•	•	•	•	•	16
Throttle cables — adjust		•	•	•	•	•	•	•	15
Steering play — check †		•	•	•	•	•	•	•	28
Drive chain wear — check †			•	•	•	•	•	•	198
Front fork — inspect/clean		•	•	•	•	•	•	•	211
Rear shock absorbers — inspect		•	•	•	•	•	•	•	212
Nuts, bolts, fasteners — check and torque		•		•		•		•	258
Spark plugs — clean and gap †		•	•	•	•	•	•	•	12
Camshaft chain — adjust		•	•	•	•	•	•	•	14
Points, timing — check †		•	•	•	•	•	•	•	12
Valve clearance — check †		•	•	•	•	•	•	•	14
Air cleaner element — clean			•		•		•		149
Air cleaner element — replace	5 cleanings			•		•		•	149
Fuel system — clean		•	•	•	•	•	•	•	257
Tire tread wear — check †			•	•	•	•	•	•	195
Engine oil — change	year	•	•	•	•	•	•	•	20
Oil filter — replace		•		•		•		•	20,188
General lubrication — perform			•	•	•	•	•	•	257
Front fork oil — change				•		•		•	211
Timing advancer — lubricate				•		•		•	226
Swing arm — lubricate				•		•		•	214
Wheel bearings — grease	2 years					•			198
Speedometer gear housing — grease	2 years					•			197
Brake cam shaft — grease	2 years					•			207
Steering stem bearings — grease	2 years					•			208
Drive chain — lubricate	Every 300 km								198
Drive chain — adjust	Every 800 km								24

* For higher odometer readings, repeat at the frequency interval established here.
† Replace, add or adjust if necessary.

Adjustment

WHEEL BALANCE (For Cast Wheel)

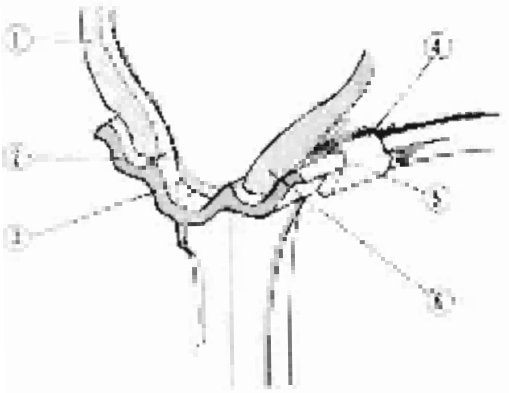
Refer to Pgs. 29~31, noting the following:

1. To install the balance weights on the rim of cast wheels:

•First reduce the tire pressure, pry the tire bead from the rim, and then insert the blade part of the balance weight between the rim and the tire bead until the stepped portions of the rim and the weight is hooked over the rim.

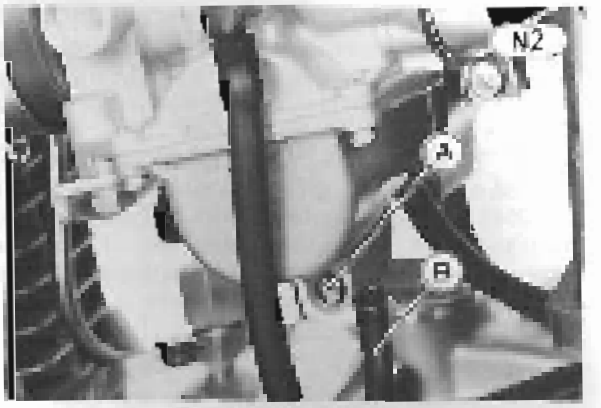
•Inflate the tire to standard pressure (Pg. 193).

Balance Weight Installation (N1)



1. Tire
2. Rim
3. Tube
4. Blade
5. Weight
6. Tire Bead

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



A. Drain Plug B. Overflow Tube

•Check the O rings, and replace them with new ones if they are damaged.

LUBRICATION (KZ400-G)

In addition to the points listed on Pgs. 34~38, check and lubricate regularly the following area.

Front Brake Lever

Apply a light coat of grease to the surface that the push rod of the front brake light switch pushing against.



FUEL SYSTEM

Refer to Pg. 77, noting the following:

•Loosen the drain plug at the bottom of each carburetor float bowl to drain the fuel through the overflow tube.

Disassembly

TORQUE AND LOCKING AGENT (KZ400-G)

Tighten the engine parts of KZ400-G to the specified amount of torque listed on Pgs. 3-37~38. But tighten the chassis parts of KZ400-G to the specified torque listed in Table N1.

NOTE: Parts marked with an asterisk (*) must be re-torqued according to the Periodic Maintenance Chart (Pg. 256). One at a time, loosen each bolt or nut 1/4 turn, then tighten it to the specified torque. Follow the sequence if specified. For engine fasteners, retorque them when the engine is cold (at room temperature).

CYLINDER BLOCK, PISTON, PISTON RINGS

Removal and Installation:

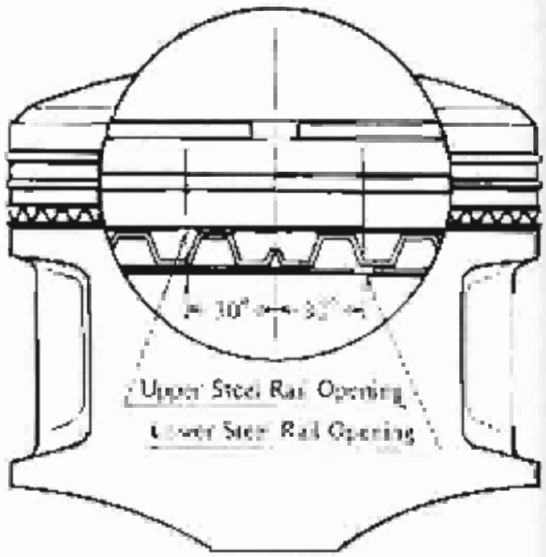
The piston rings are changed. When installing them on the piston, and installing the cylinder block, refer to Pgs. 5-7~5-9 noting the following:

1. The oil rings are of three-piece construction using two steel rails and one expander.

•To install the oil ring, first install the expander so that the expander ends butt together, and then install the upper and lower steel rails. There is no "up" or "down" to the rails: they can be installed either way.

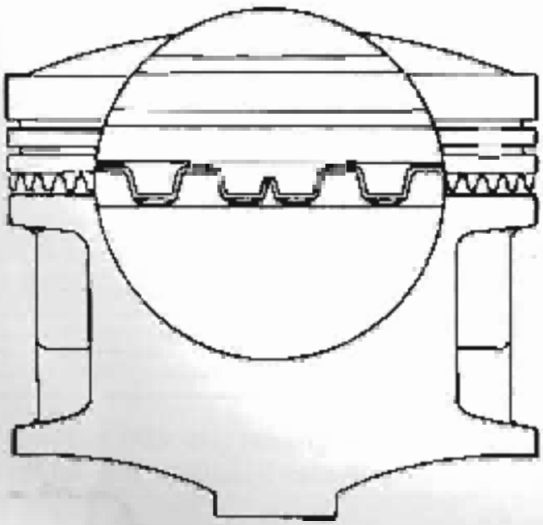
•The openings of the oil ring steel rails must be positioned so that one is about 30° on one side of the opening of the expander, and the other about 30° on the other side of the expander opening.

Piston Rings (N5)



2. Install the second and top rings so that the "N" mark faces up. Do not mix up the top and second rings. Both the inner and outer edges of the top ring are chamfered. The second rings are of taper face, and the edges of the second ring are not chamfered.

Oil Ring Installation (N4)



Top and Second Rings (N6)

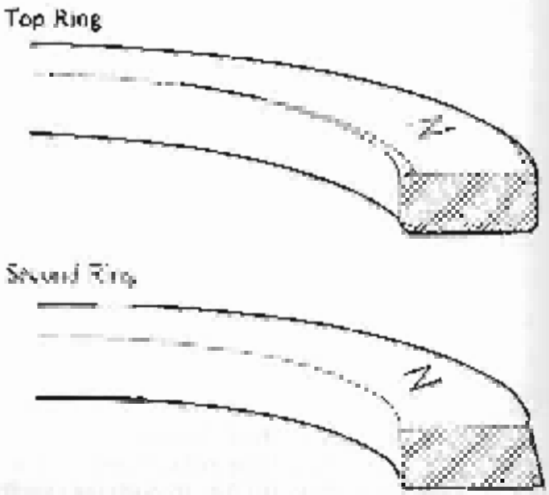


Table N1 Tightening Torque (KZ400-G)

Chassis Part	Locking Agent (•), Liquid Gasket (*) Required	Quantity	Metric (kg-m)	English (ft-lbs)	See Pg.
*Brake cam lever bolt	–	1	–	–	–
*Brake pedal pivot nut	–	1	–	–	–
*Clutch lever holder bolt ϕ6 P1.0	–	1	–	–	–
*Disc brake parts	See Table N2 on Pg. 260.				
*Front axle nut ϕ16 P1.5	–	1	8.0	58	107
*Front fender mounting bolts ϕ8 P1.25	–	4	–	–	–
*Front footpeg mounting bolts	–	2	–	–	–
Front fork bottom Allen bolts ϕ10 P1.0	•,*	2	1.8	13.0	142
*Front fork clamp bolts					
upper ϕ8 P1.25	–	2	1.8	13.0	138,140
lower ϕ10 P1.25	–	2	3.0	22	29,138,140
Handlebar clamp bolts ϕ8 P1.25	–	4	1.8	13.0	135
*Kick pedal bolt	–	1	–	–	–
Pad mounting screw	•	1	–	–	260
*Rear axle nut ϕ16 P1.5	–	1	12.0	87	25
*Rear footpeg (muffler) mounting bolts	–	2	–	–	50
*Rear shock absorber mounting					
bolts ϕ10 P1.25	–	2	3.0	22	120,143,144
nuts ϕ10 P1.25	–	2	3.0	22	143
Rear sprocket nuts ϕ10 P1.25	–	4	4.0	29	122
*Shift pedal bolt ϕ6 P1.0	–	1	–	–	–
*Steering stem head bolt ϕ16 P1.5	–	1	4.5	33	29,138
*Steering stem head clamp bolt ϕ8 P1.25	–	1	1.8	13.0	29,138
Steering stem locknut ϕ30 P1.0	–	1	3.0	22	29,138
*Swing arm pivot shaft nut ϕ14 P1.5	–	1	8.0	58	143
*Torque link nuts ϕ10 P1.25	–	2	3.0	22	25,111,145

FRONT DISC BRAKE (KZ400-G)

Observe carefully the caution on Pg. 114 and the torque table below before working on the disc brakes.

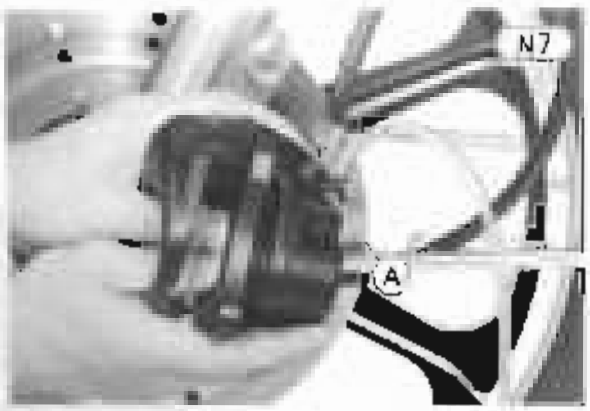
Table N2 Disc Brake Torque

Bleed valve	0.85 kg-m	74 in-lbs
Brake lever pivot bolt	0.10 kg-m	29 in-lbs
Brake lever pivot bolt locknut	0.60 kg-m	52 in-lbs
Caliper holder shaft nuts	2.3 kg-m	19.0 ft-lbs
*Caliper mounting bolts	4.0 kg-m	29 ft-lbs
Disc mounting bolts	3.3 kg-m	24 ft-lbs
Union bolt(s)	3.0 kg-m	22 ft-lbs
*Master cylinder clamp bolts	0.80 kg-m	70 in-lbs

* : Retorque these parts regularly (Pg. 116).

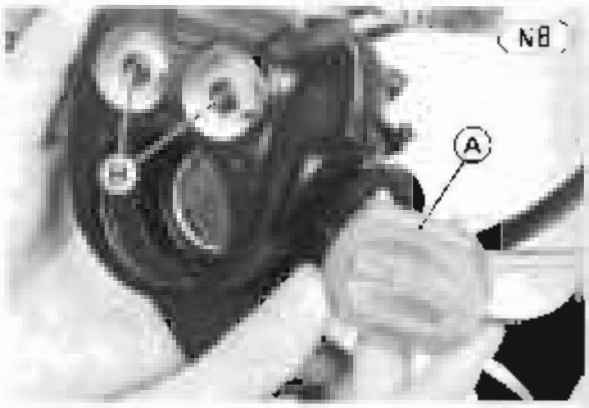
Pad Replacement:

- Remove the caliper mounting bolts (2).
- Lift the caliper off the disc, take out the mounting screw for pad B, and remove the pad. A lockwasher and metal plate also come off (Fig. N11).
- After pad B is removed, slide the caliper holder to the piston side and remove pad A.
- Remove the bleed valve cap on the caliper, attach a clear plastic hose to the bleed valve, and run the other end of the hose into a container.
- Open (loosen) the valve slightly, push the piston in by hand as far as it will go, and then close (tighten) the valve. Wipe up any spilled fluid, and recap the bleed valve.



A. Bleed Valve

- Install pad A in the caliper holder so that the pad lining is toward the disc and stepped portion of the lining is toward the caliper holder shafts.



A. Stepped Portion B. Caliper Holder Shafts

- Fit pad B, aligning the tongue on the pad with the groove in the caliper. Install the metal plate, lockwasher, and mounting screw, using a non-permanent locking agent on the screw.



A. Apply a non-permanent locking agent.
B. Fit the tongue in the groove.

- Mount the brake caliper and tighten the mounting bolts to 3.0 kg-m (22 ft-lbs) of torque.
- Since brake fluid was spilled when the bleed valve was opened, check the fluid level in the master cylinder and bleed the air from the brake system (Pg. 116).
- Check the front brake.

WARNING Do not ride the motorcycle until the pads are seated against the disc. Pump the brake lever several times until a full, firm lever "feel" is obtained. The brakes will not function on the first application of the lever if this is not done.

Caliper Removal and Installation:

Refer to Pgs. 113–116 using the following.

1. If the caliper is to be disassembled, loosen the caliper holder shaft nuts (2) before removal.
2. Tighten the caliper holder shaft nuts (2) to 2.3 kg-m (19.0 ft-lbs) of torque.

Caliper Disassembly:

- Take out the mounting screw 7 for pad B 14, and remove the pad. A lockwasher 6 and metal plate 15 also come off.
- Remove pad A 11.
- Remove the caliper holder shaft nuts 5 (2), and pull out the caliper holder shafts 1 (2) and the spacers 4 (2), taking care not to damage the dust covers 12 (4). Remove the caliper holder 2.

CAUTION **To avoid damage to the dust covers and O rings, unscrew each shaft in turn a little at a time.**

- Remove the dust seal 8 around the piston 9.
- Cover the caliper opening with a clear, heavy cloth, and remove the piston by lightly applying compressed air to where the brake line fits into the caliper.

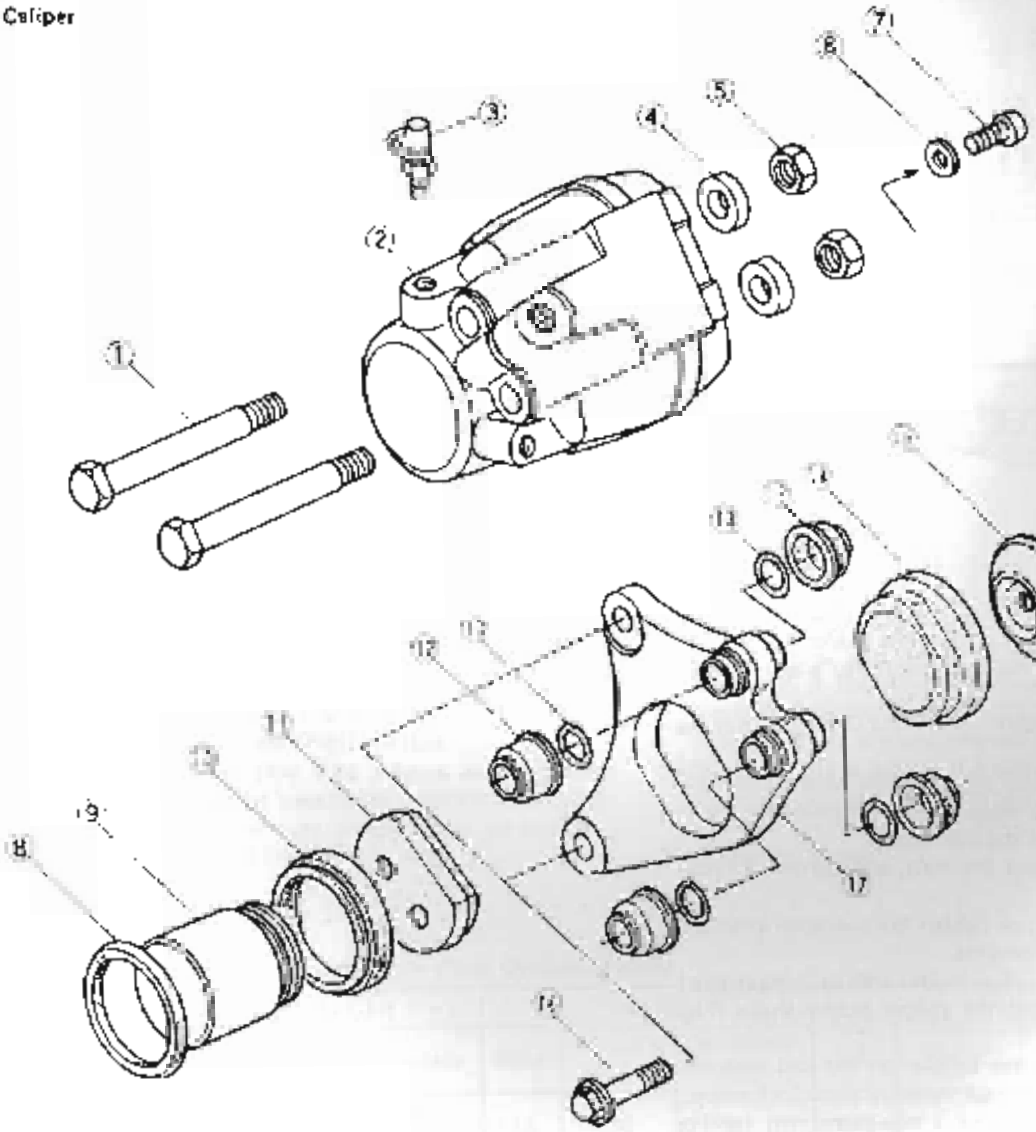
WARNING **To avoid serious injury, never place your fingers or palm inside the caliper opening. If you apply compressed air into the caliper, the piston may crush your hand or fingers.**

NOTE: If compressed air is not available, reconnect the brake line and pump the piston out with the brake lever.



Caliper

(N11)



1. Holder Shaft
2. Caliper
3. Bleed Valve
4. Spacer
5. Nut
6. Lockwasher
7. Screw
8. Fluid Seal
9. Piston
10. Dust Seal
11. Pad A
12. Dust Cover
13. O Ring
14. Pad B
15. Metal Plate
16. Mounting Bolt
17. Caliper Holder

•Taking care not to damage the cylinder surface, remove the fluid seal ⑧ with a hook.

Caliper Assembly:

•Clean the caliper parts with brake fluid or alcohol (See CAUTION — Pg. 114).

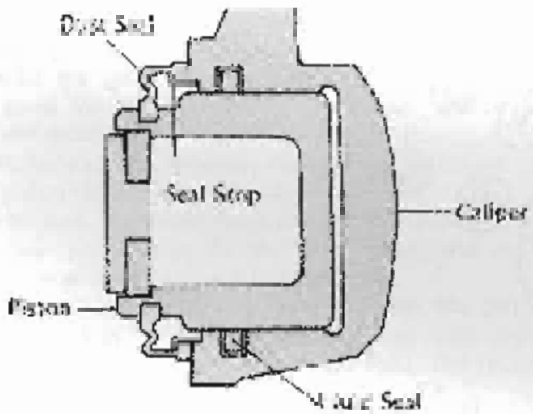
•Fit a new fluid seal in place inside the cylinder.

NOTE: It is recommended that the fluid seal, which is removed, is replaced with a new one.

•Apply brake fluid to the outside of the piston and the fluid seal, and push the piston into the cylinder by hand. Take care that neither the cylinder nor the piston skirt get scratched.

•Install the dust seal around the dust seal stop. Check that the dust seal is properly fitted into the groove in the piston and on the dust seal stop.

Caliper Dust Seal (N17)



•Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the caliper holder shafts and the holder holes. (PBC grease is a special high temperature, water resistant grease).

NOTE: Replace the dust covers and O rings if they are damaged.

•With the caliper holder properly positioned, insert the caliper holder shafts while carefully turning the shafts to prevent damage to the dust covers.

•Install the spacers and the nuts, and tighten the nuts loosely.

NOTE: Do not forget to tighten the nuts after installing the caliper on the motorcycle.

•Install pad A in the caliper holder with its lining stepped portion facing toward the caliper holder shafts (Fig. 78).

•Fit pad B, aligning the tongue on the pad with the groove in the caliper. Install the metal plate, lockwasher, and mounting screw using a non-permanent locking agent on the screw (Fig. 79).

Maintenance

CYLINDER BLOCK, PISTONS

The piston rings are changed. Refer to Pgs. 166~170 for other service data not specifically mentioned here.

Table N3 Piston Ring/Groove Clearance

	Standard	Service Limit
Top	0.05~0.09 mm	0.19 mm
Second	0.01~0.05 mm	0.15 mm

Table N4 Piston Ring Thickness

	Standard	Service Limit
Top Ring	1.16~1.18 mm	1.10 mm
Second Ring	1.47~1.49 mm	1.40 mm

CARBURETORS

Refer to Pgs. 150~157, noting the following.

1. Table N5 shows the carburetor specifications of West German model.
2. Measure the service fuel level as following.

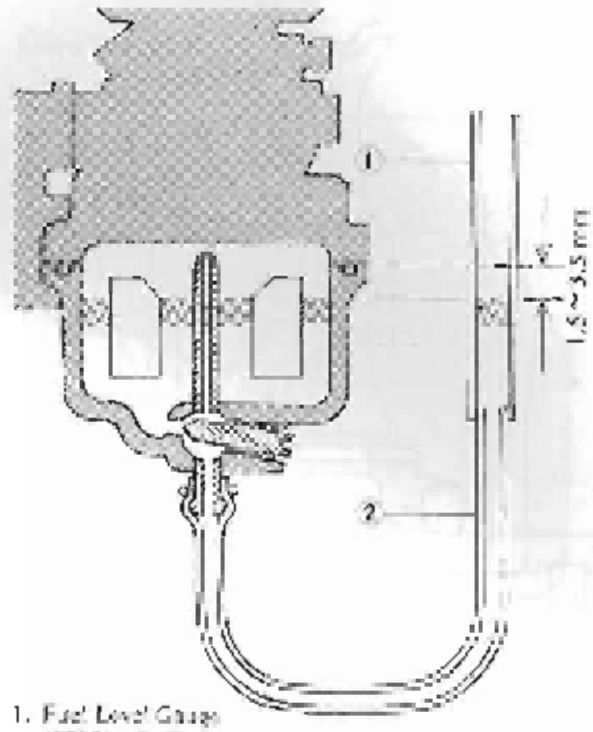
WARNING **Check the fuel level in a well-ventilated area, and take ample care that there are no sparks or flame anywhere near the working area.**

- Secure the motorcycle in a true vertical position.
- Turn the fuel to the "ON" or "RES" position, and attach the fuel level gauge (special tool) to the open end of the overflow tube.
- Hold the tube gauge against the side of the carburetor so that the "0" line is even with the bottom edge of the carburetor body at the center portion.

NOTE: Don't move the tube gauge, because if the tube gauge is moved up and down, the fuel in the overflow tube flows back into the float chamber and raises the fuel level, resulting in incorrect reading.

- Turn the fuel up to the "PRI" position.
- Unscrew the drain plug 1 to 2 turns, and wait until no air bubbles can be seen rising up in the tube gauge. (Air in the overflow tube comes out as air bubbles.)
- Read the service fuel level in the gauge.

Service Fuel Level Measurement (N13)



1. Fuel Level Gauge (57001-1017)
2. Overflow Tube

WHEELS (KZ400-G)

Rims

Rim runout measurement

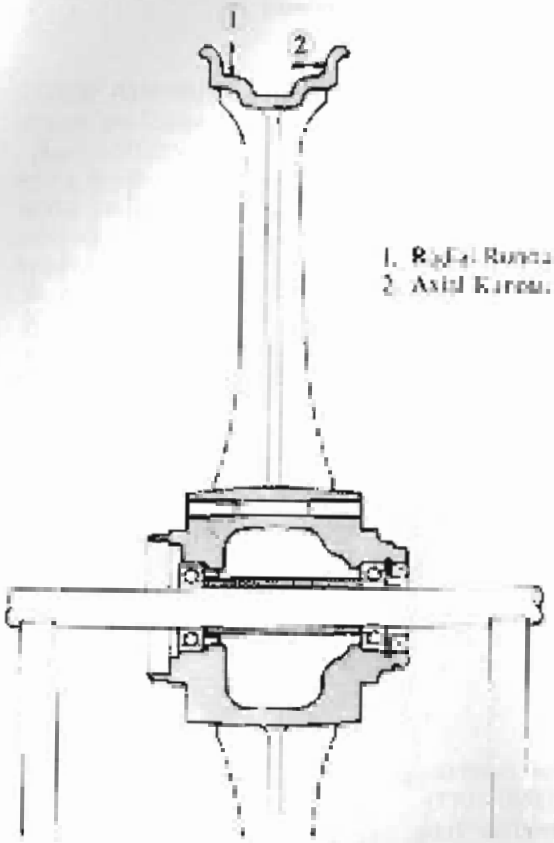
If there is any doubt as to the condition of the wheel, or if the wheel has received a heavy impact, check the rim runout as follows:

Remove the tire and suspend the wheel by the axle. Set a dial gauge against the side of the rim, and rotate the wheel to measure the axial runout. The difference between the highest and lowest dial readings is the amount of runout.

Table N5 Carburetor Specifications (West German Models)

Type	Jet Needle	Main Jet		Air Jet			Pilot Jet	Pilot Screw	Fuel Level	
		Primary	Secondary	Pilot	Primary Main	Secondary Main			Design	Service
VB32	003303	70	85	115	150	60	35	1.5±.5 turns out	32~34 mm	1.5~3.5 mm

Rim Runout Measurement (N14)



1. Radial Runout
2. Axial Runout

Table N6 Rim Runout (With tire removed)

	Axial	Radial
Service Limit	0.5 mm	0.8 mm

Set the dial gauge against the outer circumference of the rim, and rotate the wheel to measure radial runout. The difference between the highest and lowest dial readings is the amount of runout.

If rim runout exceeds the service limit, check the wheel bearings first. Replace them if they are damaged. If the problem is not due to the bearings, the wheel must be replaced. Do not attempt to repair a damaged wheel.

Rim damage

Carefully inspect the wheel for small cracks, dents, bents, or warp. If there is any damage to the wheel, it must be replaced. The rim sizes are shown in Table N7.

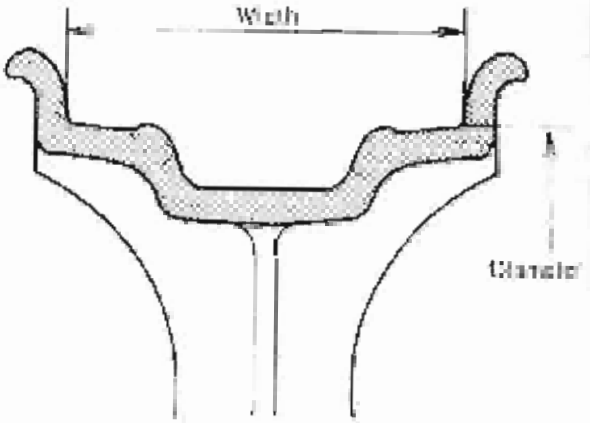
WARNING **Never attempt to repair a damaged wheel. If there is any damage besides wheel bearings, the wheel must be replaced to insure safe operational condition.**

Table N7 Rim Size*

Front	Rear
1.60 x 18	1.85 x 18

* The rim size shown in the table is the inner width of the rim flanges and body size diameter, both in inches.

Rim Sizes (N15)



Axle

Use the service data for KZ400-B (Table 15 on Pg. 196).

Wheel Bearings, Grease Seals

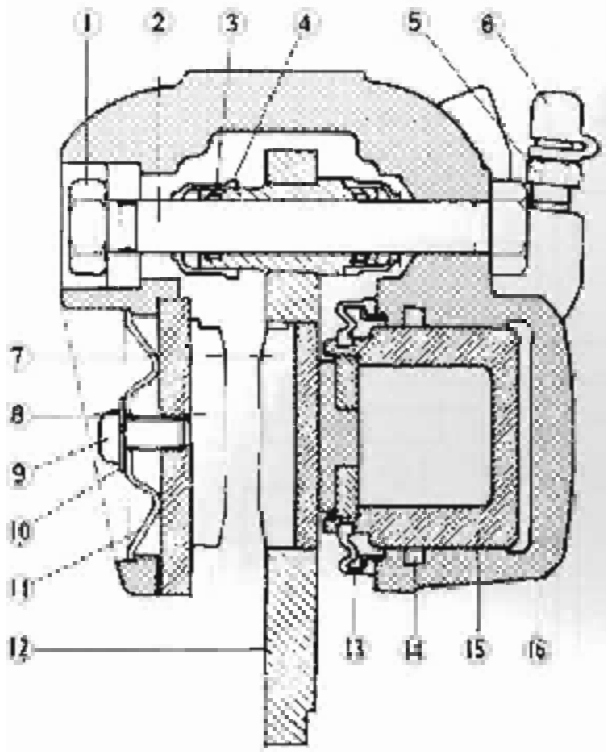
The front wheel bearings and grease seals of KZ400-G are the same ones as of KZ400-C. See Table 16 on Pg. 197.

DISC BRAKE (KZ400-G)

Refer to Pgs. 250 ~ 255 for other service information not specifically mentioned here.

The front wheel of KZ400-G has a sliding type caliper. The caliper assembly includes pad A 7, pad B 8, and the piston 3, which is inside the caliper cylinder. Through the caliper are two shafts 2, which also pass through the caliper holder 12 to mount the assembly to the left fork. When the piston forces pad A against the disc, the shaft portion of the caliper assembly slides through the holder such that pad B is also forced against the disc, both brake pads being kept parallel to the disc.

Caliper (N16)

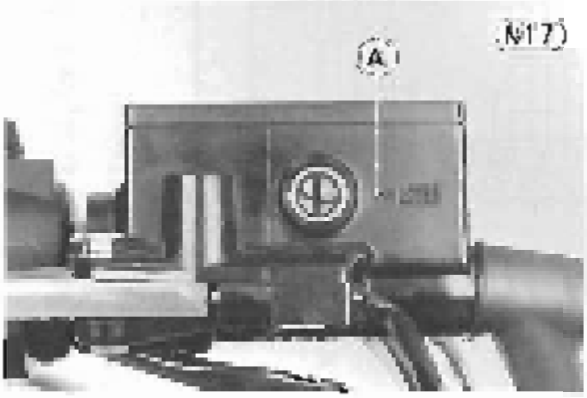


1. Nut
2. Caliper Holder Shaft
3. O Ring
4. Dust Cover
5. Bleed Valve
6. Bleed Valve Cap
7. Pad A
8. Pad B
9. Screw
10. Lockwasher
11. Metal Plate
12. Caliper Holder
13. Dust Seal
14. Fluid Seal
15. Piston
16. Caliper

Disc brake fluid

Fill the reservoir up to more than lower level line (reservoir held horizontal).

(N17)



A. Lower Level Line

Caliper parts wear

Check the thickness of the pad linings, and replace both pads at a set if the thickness of either pad is less than the service limit.

Lining Thickness (N18)

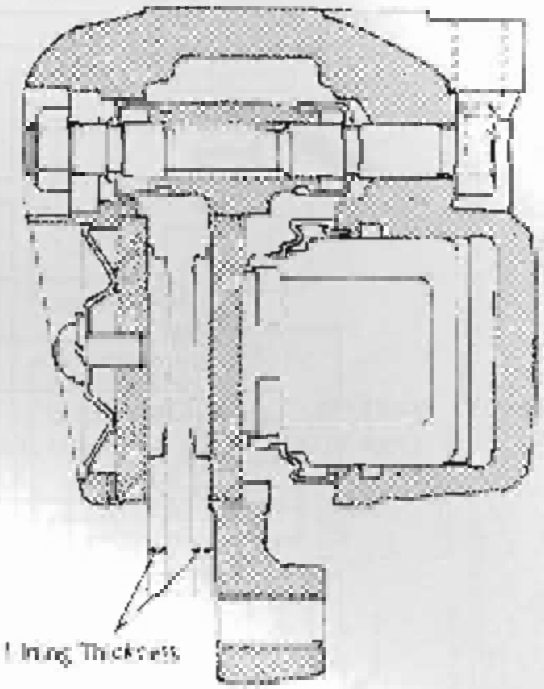


Table N8 Lining Thickness

Service Limit	1 mm

Measure the cylinder inside diameter and piston outside diameter.

Replace the cylinder and piston if they are worn out of tolerance limits several or more.

Table N9 Caliper Parts

	Standard	Service Limit
Cylinder inside diameter	42.850 ~ 42.900 mm	42.92 mm
Piston outside diameter	42.796 ~ 42.820 mm	42.75 mm

Disc wear warp

Table N10 Disc Thickness

Standard	Service Limit
4.8 ~ 5.1 mm	4.5 mm

Appendix

SPECIAL TOOLS

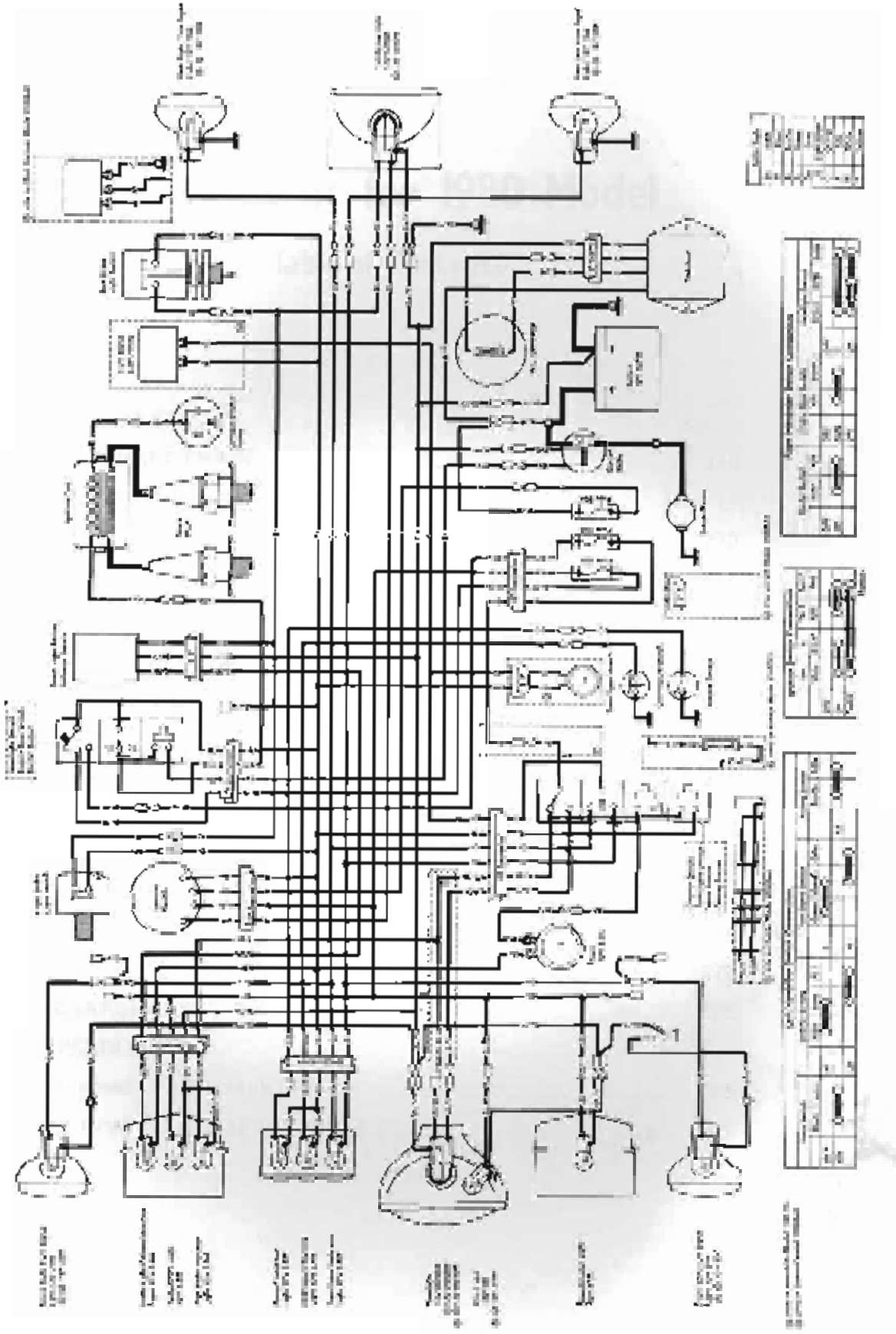
Refer to Pgs. 243 ~ 246, noting the following

(M19)



REF NO.	PART NO.	DESCRIPTION
46	57001-1017	FUEL LEVEL GAUGE

Z400-B2,G1 Wiring Diagram



Supplement for 1980 Model

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Adjustment

CAMSHAFT CHAIN

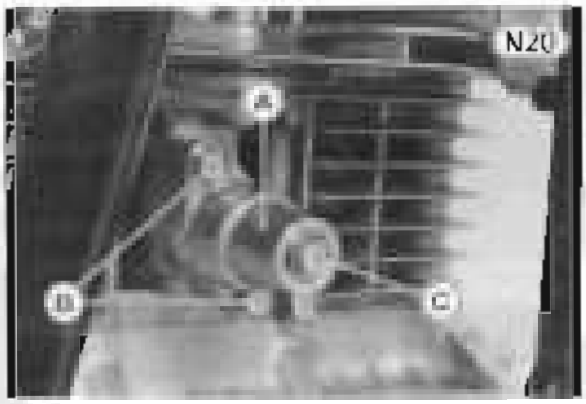
The camshaft chain tensioner on the 1980 KZ400 is automatic. No periodic maintenance of the camshaft chain is required because the tensioner automatically adjusts it. Refer to the "Camshaft Chain Tensioner" in the disassembly section (Pg. 270) when handling the camshaft chain tensioner parts.

Disassembly

CAMSHAFT CHAIN TENSIONER

Removal:

- Loosen the lock bolt ⑧ before tensioner removal.
- Unscrew the bolts, and remove the camshaft chain tensioner body ⑦ and O ring ⑤.



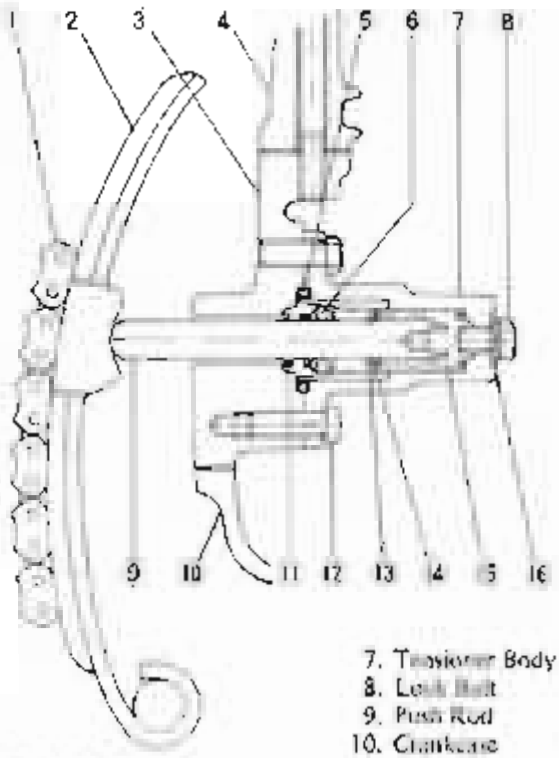
A. Tensioner B. Mounting Bolts C. Lock Bolt

CAUTION

1. **When removing the chain tensioner, do not take out the mounting bolts only halfway. Retightening the mounting bolts from this position could damage the chain tensioner and the camshaft chain. Once the bolts are loosened, the tensioner must be removed and reset as described below.**
2. **Do not turn over the crankshaft while the camshaft chain tensioner is removed. This could upset the camshaft chain timing, and damage the engine.**

- Take the long spring ⑮, flat washer ⑭, balls and retainer ⑥, short spring ⑫, and push rod ⑨ and circlip ⑬ out of the cylinder block.

Camshaft Tensioner (N21)



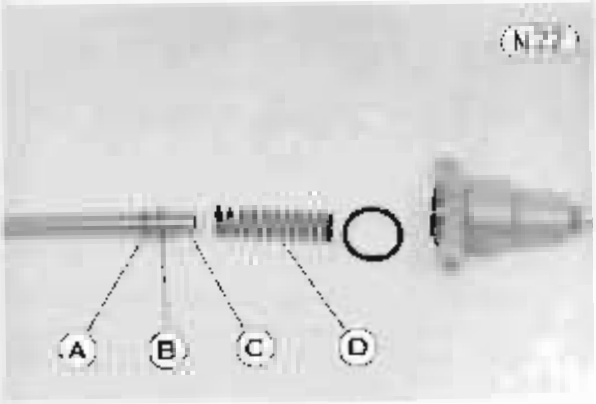
1. Camshaft Chain
2. Chain Guide
3. Cylinder Block
4. Cylinder Head
5. O Ring
6. Balls and Retainer
7. Tensioner Body
8. Lock Bolt
9. Push Rod
10. Crankcase
11. Short Spring
12. Mounting Bolt
13. Circlip
14. Flat Washer
15. Long Spring
16. Flat Washer

Installation:

- Clean all parts of the tensioner using a high flash-point solvent, and apply clean engine oil to the parts.

CAUTION The dirt or grime on the push rod can cause the tensioner malfunctioning.

- Back out the lock bolt several turns.
- Put the flat washer and long spring on the push rod and that has two parallel flat surfaces.



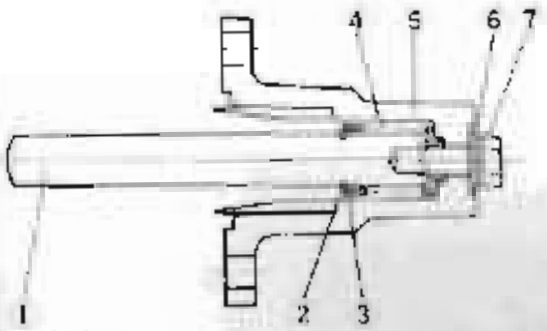
A. Circlip
B. Flat Washer
C. Flat Surface
D. Long Spring

- Compressing the spring, push the push rod into the tensioner body until the rod flattened end engages with the recess at the bottom of the tensioner body.
- Holding the push rod in this position, turn in the lock bolt through the tensioner body into the rod to keep the rod in place.

CAUTION Do not use any bolt longer than 14 mm. A bolt longer than 14 mm could damage the camshaft chain.

WARNING Never loosen the lock bolt before installing the tensioner on the cylinder block. Loosening the lock bolt may cause injury by jumping the push rod out of the tensioner body.

Locking Push Rod



1. Push Rod
2. Circlip
3. Flat Washer
4. Long Spring
5. Tensioner Body
6. Washer
7. Lock Bolt

- Put the balls and retainer, and shaft spring on the push rod in this sequence, and fit the O-ring into the groove.
- Install the tensioner on the cylinder block, and tighten the mounting bolts.
- Loosen the lock bolt several turns until it releases the push rod.
- Tighten the lock bolt to 1.0 kg-m (87 in-lbs) of torque.

CAMSHAFT, CAMSHAFT SPROCKET
Removal and Installation:

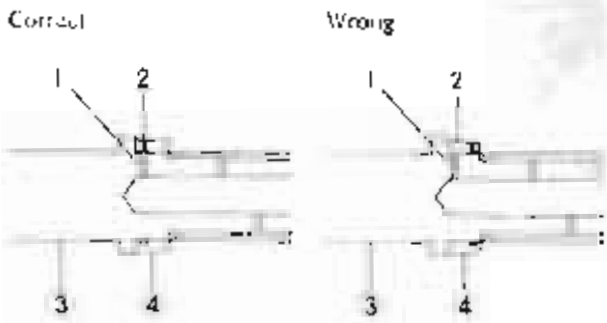
Though the camshaft chain is changed from the roller-chain type to the silent-chain type, procedures to time the camshaft with the crankshaft are not changed. Refer to Pgs. 52~54.

TRANSMISSION
Output Shaft Disassembly and Assembly:

The bushing for the 2nd gear is changed from a press-fitting type to a floating type (Fig. F56 on Pg. 97).

When installing the bushing on the output shaft, align the oil hole in the bushing with the hole in the shaft.

Bushing Installation



1. Oil Hole
2. Oil Hole
3. Shaft
4. Bushing

BALANCER MECHANISM, MAIN BEARING CAP
Removal and Installation:

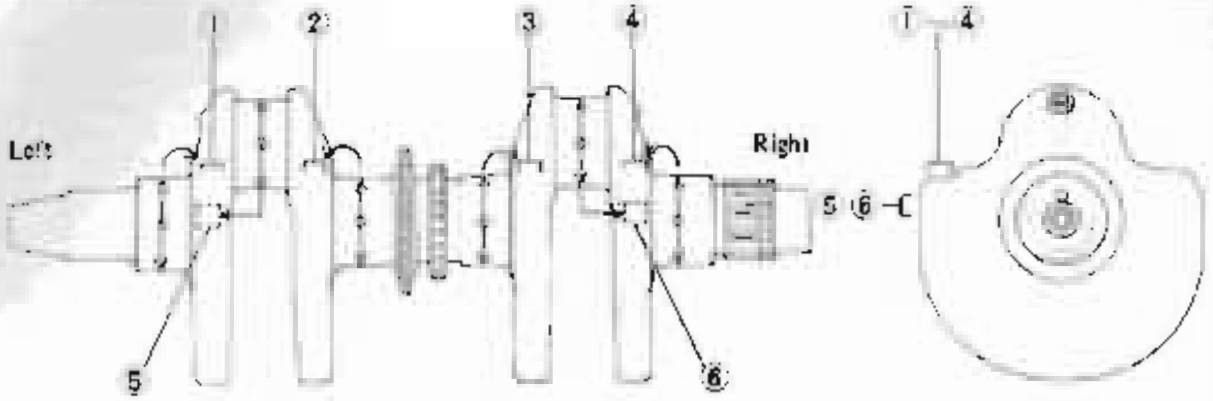
If the crankcase halves and main bearing cap are replaced, select the proper mating insert for the crankshaft main journals in accordance with the combination of the crankshaft and the crankcase marks (Pg. 272).

CONNECTING ROD
Removal and Installation:

The procedures are the same as those for the 1978 KZ400-B1 with the following exceptions. See Pgs. 102~105.

1. The locations for the crankshaft marks, which show the connecting rod journal (crankpin) diameter, are changed. See Fig. N25.

Locations for Journal-Size Marks (N25)



1. "1" or no mark for #1 main journal size
2. "2" or no mark for #2 main journal size
3. "3" or no mark for #3 main journal size
4. "4" or no mark for #4 main journal size
5. "○" or no mark for left camshaft journal size
6. "○" or no mark for right camshaft journal size

2. The part numbers for the connecting rod bearing inserts are changed. Use the table below for bearing insert selection.

Table N11 Connecting Rod Bearing Insert Selection

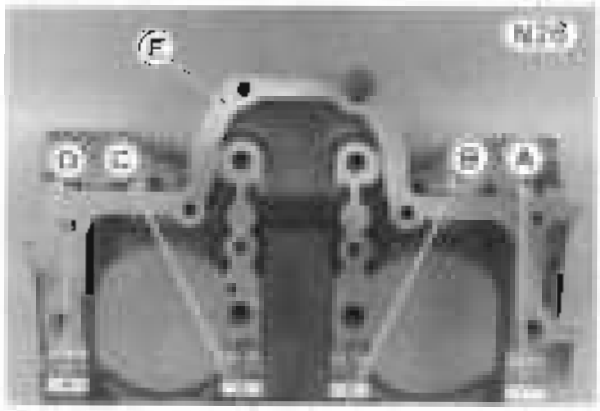
Con-Rod Marking / Crankshaft Marking	○	No mark
○	Black P/N: 13034-1026	Brown P/N: 13034-1027
No mark	Green P/N: 13034-1025	Black P/N: 13034-1026

3. The size of the big end cap bolts and nuts is changed from φ7 to φ8 mm in diameter. Tightening torque for φ8 nuts is 3.7 kg-m (27 ft-lbs).

Table N12 Main Bearing Insert Selection

Crankcase Marking / Crankshaft Marking	○	No mark
1	Brown P/N: 13034-1027	Black P/N: 13034-1026
No mark	Black P/N: 13034-1026	Blue P/N: 13034-1019

2. See Fig. N25 for the locations of the crankshaft marks, and see Fig. N26 for the locations of the crankcase marks.



A. "○" or no mark for #1 bearing
B. "○" or no mark for #2 main bearing
C. "○" or no mark for #3 main bearing
D. "○" or no mark for #4 main bearing
E. Upper Crankcase Half

3. The size of the big end cap bolts and nuts is changed from φ7 to φ8 mm in diameter. Tightening torque for φ8 nuts is 3.7 kg-m (27 ft-lbs).

CRANKSAHFT, CAMSHAFT CHAIN

Removal and Installation:

The procedures are the same as those for the 1978 KZ400-B1 with the following exception. See Fig. (N1).

1. If a crankshaft, crankcase halves, and/or main bearing caps are replaced, select the proper main bearing inserts in accordance with the combination of the crankcase and crankshaft marks, which show the size of the crankcase main bearings and the crankshaft main journals.

FRONT WHEEL (KZ400-B)

The procedures are the same as those for the 1978 KZ400-B1 with the following exceptions. Refer to Pgs. 109~110.

Front Hub Disassembly and Assembly:

1. The sizes of the bearings and grease seal are changed. Use the bearing driver (special tool: P/N 57001 – 288) to drive in the bearings and the seal.

FRONT DISC BRAKE (KZ400-B)

The procedures are the same as those for the 1979 KZ400-C1. Refer to Pgs. 260~262.

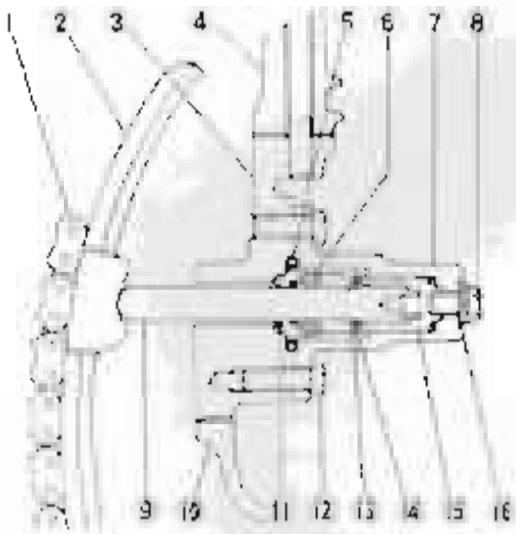
Maintenance

CAMSHAFT CHAIN, GUIDES, TENSIONER

The camshaft chain, which is driven by crankshaft, drives the camshaft at one-half crankshaft speed. For maximum durability and minimum noise, an endless-type silent chain with no master link is used.

The automatic camshaft chain tensioner of ball lock type is utilized for this machine. No periodic adjustment of the tensioner is required since chain slack is removed automatically.

Camshaft Chain Tensioner (N27)



1. Camshaft Chain
2. Chain Guide
3. Cylinder Block
4. Cylinder Head
5. O Ring
6. Balls and Retainer
7. Tensioner Body
8. Lock Bolt
9. Push Rod
10. Gasket
11. Short Spring
12. Mounting Bolt
13. Circlip
14. Flat Washer
15. Long Spring
16. Flat Washer

The tensioner consists of push rod 9, short spring 11, balls and retainer 6, washer 14, long spring 15, sleeve (pressfitted into the tensioner body), tensioner body 7, and lock bolt 8. When the slack appears on the chain, the push rod is pushed out to the chain by the long spring, and it cannot be pushed back in because of the lock balls locking on the cams of the sleeve pressed into tensioner body. The bolt 8 is used to keep the push rod from flying out during installation.

Camshaft chain wear

Hold the chain taut with a force of about 3 kg in same manner, and measure a 20-link length. Since the camshaft chain may wear unevenly, take measurements at several places. If any measurement exceeds the service limit, replace the chain.

Chain Length Measurement (N28)

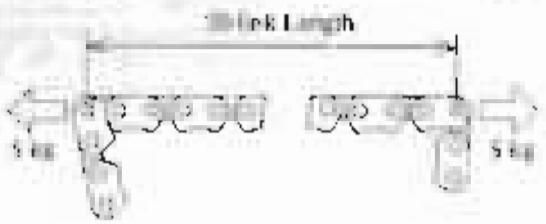


Table N13 Camshaft Chain 20-link Length

Service Limit	128.8 mm

Chain guide wear

Remove the chain guides, and inspect them visually. Replace the guide if the rubber or any other portion is damaged.

Measure the depth of the grooves where the chain links run. Replace the guide if the wear exceeds the service limit.

Chain Guide Rubber Wear (N29)

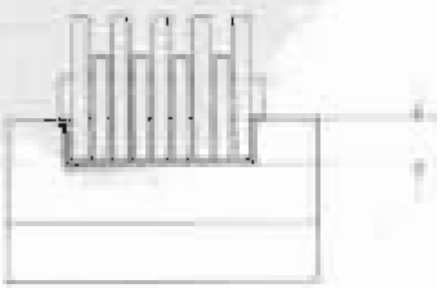


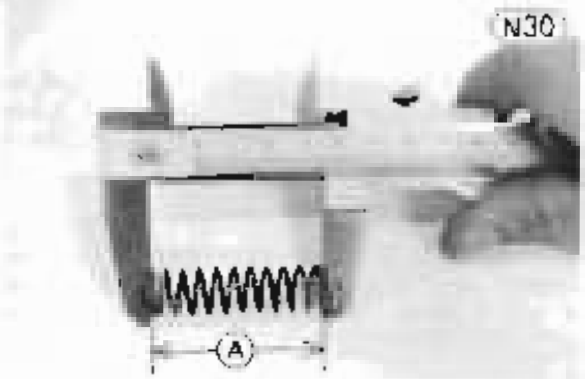
Table N14 Camshaft Chain Guide Wear

	Front	Rear
Service Limit	3.6 mm	4.5 mm

Chain tensioner inspection

Remove the camshaft chain tensioner. Visually inspect the push rod, the sleeve in the tensioner body, and the lock bolt. If there is any damage or dent, replace the part with a new one.

Measure the long spring free length. Replace the spring if the free length exceeds the service limit.



A. Free Length

Table N15 Spring Free Length

Service Limit	40 mm

CRANKSHAFT, CONNECTING RODS

The procedures are the same as those for the 1978 KZ400-B1 with the following exceptions. Refer to Pgs. 170~171.

Connecting rod bearing insert/journal wear

The part numbers for the connecting rod bearing inserts are changed. Use the table below for bearing insert selection.

Table N16 Connecting Rod Bearing Insert Selection

Crankshaft Marking \ Con-Rod Marking	O	No mark
O	Black P/N 13034-1008	Brown P/N 13034-1007
No mark	Green P/N 13034-1025	Black P/N 13034-1026

Crankshaft main bearing insert/journal wear

Measure the crankshaft main bearing insert/journal wear as explained in the "Maintenance Section" (Pgs. 172~173).

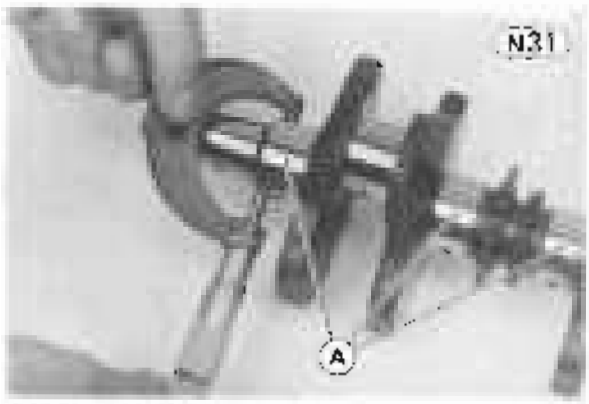
Table N17 Crankshaft Bearing Insert/Journal Clearance

Service Limit	0.08 mm

If any clearance exceeds the service limit, replace all bearing inserts (S) as follows.

1. Measure the diameter of the crankshaft main journals which wear on plain bearing inserts. Mark each flywheel in accordance with the journal diameter (Table N18). If the measurement is less than the service limit, replace the crankshaft. If the measurement is less than the standard value, but is not under the service limit, use bearing inserts painted blue.

NOTE: Any mark already on the flywheel should not be referred to during servicing.

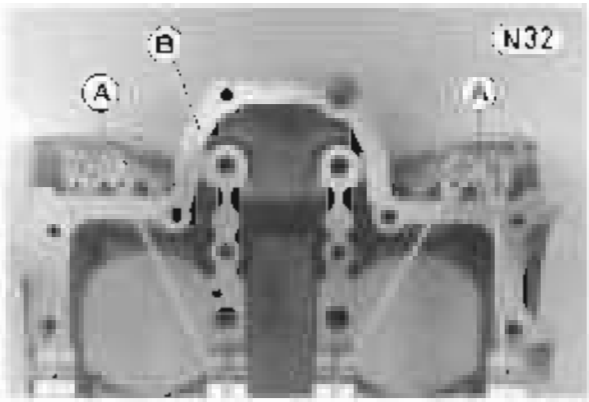


A. Crankshaft Main Journals

Table N18 Crankshaft Main Journal Diameter

Marking	Standard	Service Limit
I	35.992 ~ 36.000 mm	35.96 mm
No mark	35.984 ~ 35.992 mm	

2. Put the lower crankcase half on the upper crankcase half without the bearing inserts, and tighten the bolts to the specified torque (Fig. 37). Measure the crankshaft main bearing bore diameter, and mark the upper crankcase half in accordance with the inside diameter (Table N19).



A. Markings
B. Upper Crankcase Half

Table N19 Crankshaft Main Bearing Bore Diameter

Marking	Standard
O	39.000 ~ 39.008 mm
No mark	39.009 ~ 39.016 mm

3. Select the proper main bearing inserts in accordance with the combination of the crankcase and the crankshaft marks (Table N20).

Table N20 Crankshaft Main Bearing Insert Selection

Crankcase Marking / Crankshaft Marking	O	No Mark
1	Brown P/N: 13034-1021	Black P/N: 13034-1020
No Mark	Black P/N: 13034-1020	Blue P/N: 13034-1019

Table N21 Crankshaft Main Bearing Insert Thickness

Color	Thickness
Brown	1.490 ~ 1.494 mm
Black	1.494 ~ 1.498 mm
Blue	1.498 ~ 1.502 mm

DISC BRAKE (KZ400-B)

The disc brake system of the 1980 KZ400-B3 is same as that for the 1979 KZ400-G1. Refer to Pgs. 264 ~ 265.

CHARGING SYSTEM

The voltage regulating system for the dynamo output is changed from the open-circuit type to the short-circuit type.

There are a number of important precautions that are musts when servicing the charging system. Cautions that apply to the individual parts are listed below. Failure to observe these rules can result in serious system damage. Learn and observe all the rules below.

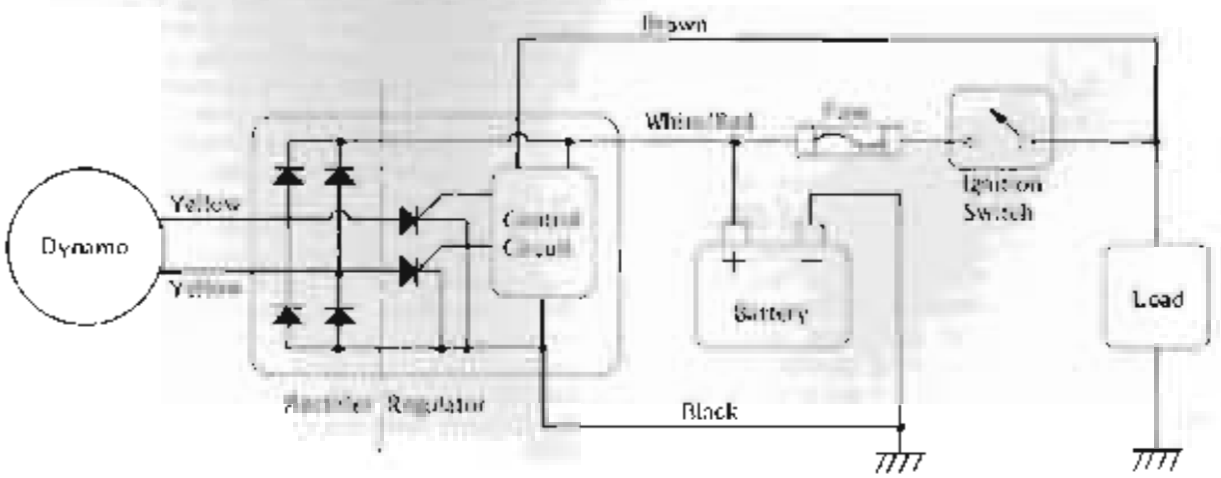
CAUTION **When handling the regulator/rectifier, observe the following to avoid damage to the regulator/rectifier:**

1. **Do not reverse the battery lead connections. This will burn out the zener diode.**
2. **For the regulator/rectifier to function properly, the battery must be charged to near capacity. If the battery is badly discharged, charge it before installing it in the motorcycle.**

When handling the dynamo flywheel:

3. **Do not allow the flywheel to suffer sharp impacts such as striking it with a hammer or letting it fall on a hard surface. Such a shock to the flywheel can cause the magnets to lose their magnetism.**

Charging System



Regulator/Rectifier

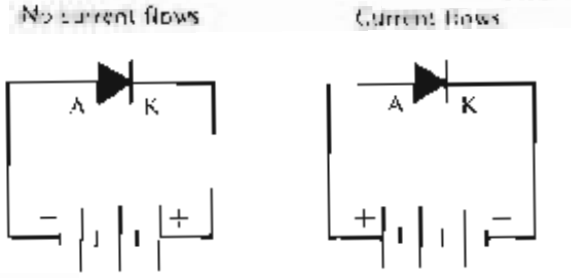
The regulator and rectifier are solid state type, and integrated into one unit. Since it contains no contacts or other moving parts, it does not wear out and never needs to be adjusted. It is therefore manufactured as a sealed unit, and must be replaced as a unit should it become defective. The rectifier in the unit rectifies (change to direct current, DC) the alternating current (AC) from the dynamo. It contains four silicon diodes which are connected in a bridge circuit arrangement for efficient, full-wave rectification. The regulator in the unit keeps the battery (+) terminal voltage level to a maximum of the specified range. The control circuit in the diagram checks on the voltage level, and triggers the thyristors.

Though the actual regulator/rectifier circuit performs full-wave rectification, a simplified single-phase circuit of half-wave rectification is explained here to aid the technician in troubleshooting and in understanding test procedures. Fig. N37 shows the basic circuit of the regulator/rectifier. The main components of the regulator/rectifier circuit are a thyristor (Th), or Silicon Controlled Rectifier (SCR) as it is also called, and a diode. The diode, thyristor (Th), and zener diode (ZD) function as follows:

1. Diode

A current of electrons can flow only from the cathode to the anode of the diode. However, a defective diode will either conduct in both directions (a short) or not conduct at all (an open). If any of the diodes is shorted or open, the voltage from the regulator/rectifier will be below normal, and the battery may not be charged adequately.

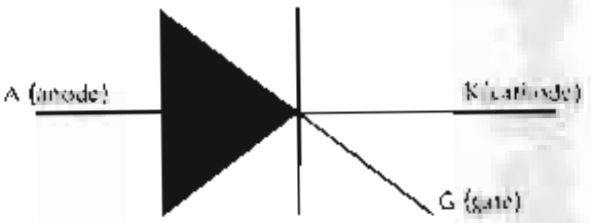
Diode Current Flow (N34)



2. Thyristor

The current of electrons will flow from the cathode to the anode but will not flow in the reverse direction. The thyristor differs from a diode in two respects: (a) even though a voltage of the correct polarity (negative to cathode) may be applied, the thyristor will not conduct until a signal is received at the gate input lead; (b) once started, it will not stop conducting (even if the gate lead signal voltage stops) until the anode to cathode voltage is removed or reversed.

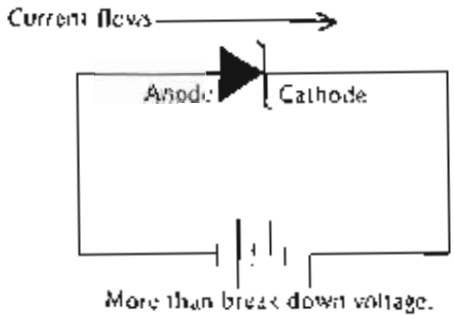
Thyristor (N35)



3. Zener diode

As in a normal diode, current will flow easily from the cathode to anode, and will not usually flow in the opposite direction. Unlike a normal diode, however, the zener diode will "break down", or conduct in the reverse direction, if enough voltage is applied in the reverse direction. When this voltage is lowered or removed, the diode will stop conducting and return to its normal state. The voltage at which the diode begins reverse conduction is called the breakdown voltage, and is set at the desired level when the diode is manufactured. This property of the zener diode makes it very useful in voltage regulator circuits.

Zener Diode (N36)



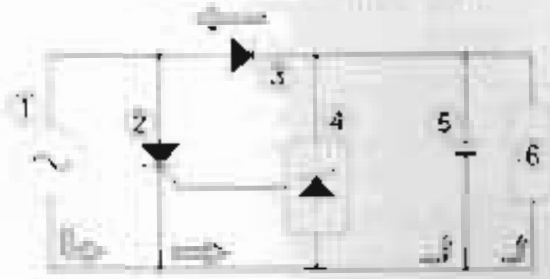
In the regulator/rectifier circuit, the diode is connected in series with the dynamo to rectify the dynamo output, and the thyristor is connected in parallel with the dynamo. Detailed circuit operation is as follows:

When the battery voltage is lower than the specified value, the zener diode does not conduct and the control unit does not trigger the thyristor. At this time, the thyristor does not conduct, and all dynamo output current flows through the battery and loads to supply adequate charging current (Fig. N37).

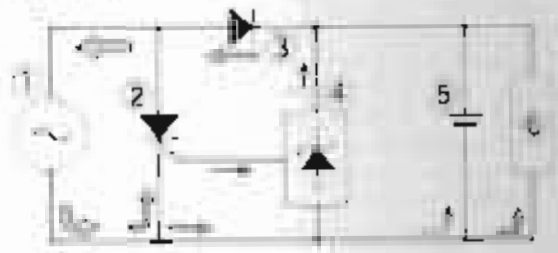
When the battery voltage is equal to or higher than the predetermined voltage, the zener diode conducts and the control circuit signals the thyristor to start conducting. Then, instead of current going through the battery and overcharging it, it flows through the thyristor and back directly to the dynamo (Fig. N37).

Basic Regulator/Rectifier Circuit (N37)

1. When battery voltage is low (Thyristor is off).



2. When battery voltage is high (Thyristor is on).



1. Dynamo
2. Thyristor
3. Diodes
4. Control Circuit
5. Battery
6. Load

Charging System Inspection

Initial inspection

If there are any problems indications in the charging system, give the system a quick initial inspection or check before starting a series of time consuming tests, or worse yet, removing parts for repair or replacement. Such a check will often lead to the source of the trouble.

Make sure all connections in the circuit are clean and tight. Examine wires for signs of burning, fraying, etc. Poor wire and bad connections will affect electrical system operation. Check the dynamo flywheel and regulator/rectifier for evidence of physical damage.

A worn out or badly undercharged battery will produce numerous problems that cannot be corrected until the battery is replaced. **ALWAYS CHECK BATTERY CONDITION BEFORE CONDEMNING OTHER PARTS OF THE SYSTEM. A FULLY CHARGED BATTERY IS A MUST FOR CONDUCTING ACCURATE CHARGING SYSTEM TESTS.**

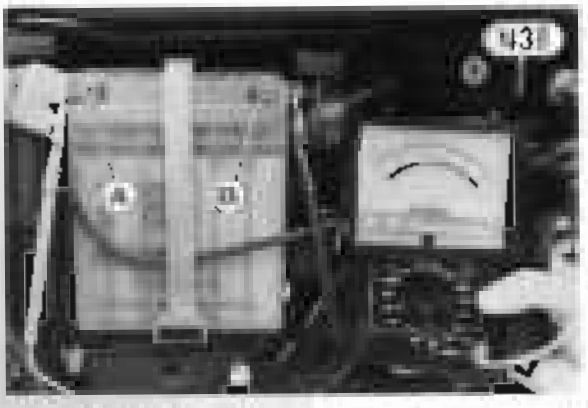
Charging system malfunctions can be traced to either the battery, dynamo, regulator/rectifier, or the wiring. Trouble may involve one item or in some cases all items. Never replace a defective part without determining what **CAUSED** the failure. If the failure was brought on by some other item or item, they too must be repaired or replaced, or the new replacement will soon fail again.

Operational inspection of charging system

•Warm up the engine to obtain actual dynamo operating conditions.

•Remove the left side cover.

•Set the multimeter to the 25V DC range, and connect the meter (+) lead to the battery (+) terminal and the meter (–) lead to the battery (–) terminal.



A. Battery (+) Terminal B. Battery (–) Terminal

•Start the engine, and note the voltage readings at various engine speeds with the headlight turned on and then turned off. The readings should show nearly battery voltage when the engine speed is low, and, as the engine speed rises, the readings should also rise. But they must be kept under the specified voltage.

Table N22 Regulator/Rectifier Output Voltage

Meter Range	Connection	Reading
25V DC	Meter (+) → Battery (+) Meter (–) → Battery (–)	Battery Voltage ~15V

•Turn off the ignition switch to stop the engine, and disconnect the multimeter.

If the regulator/rectifier output voltage are kept between the values given in Table N22, the charging system is considered to be working normally.

If the output voltage is much higher than the values specified in the table, the regulator/rectifier is defective or the regulator/rectifier leads are loose or open.

If the battery voltage does not rise as the engine speed increases then the regulator/rectifier is defective or the dynamo output is insufficient for the loads. Check the dynamo and regulator/rectifier to determine which part is defective.

Dynamo inspection

There are three types of dynamo failure: short, open (wire burned out), or loss in flywheel magnetism. A short or open in one of the coil wires will result in either a low output, or no output at all. A loss in flywheel magnetism, which may be caused by dropping,

or hitting the flywheel, by having it near an electromagnetic field, or just by aging, will result in low output.

- Remove the engine sprocket cover (Pg. 61) and disconnect the yellow leads from the dynamo.
- Connect the multimeter as shown in Table K23 to check the dynamo output voltage with no electrical loads.



A. Dynamo Yellow Leads

Table N23 Dynamo Output Voltage

Meter Range	Connections	Reading @4,000 rpm
250 VAC	One meter lead – One yellow lead The other meter lead + The other yellow lead	about 15 V

- Start the engine, run it at the rpm given in Table N23, and note the voltage reading.

If the output voltage shows the value in Table N23, the dynamo operates properly and the regulator/rectifier is damaged. A much lower reading than that given in the table indicates that the dynamo is defective. Check the armature resistance as follows.

- Stop the engine, set the multimeter to the x 1 Ω range, and measure by carefully across the dynamo yellow leads. If there is more resistance than shown in Table N24, or no meter reading (infinity), the armature has an open lead and must be replaced. Much less than this resistance means the armature is shorted, and must be replaced.

Table N24 Armature Resistance (measured when cold)

Meter Range	Connections	Reading
x 1 Ω	One meter lead – One yellow lead The other meter lead + The other yellow lead	0.36 – 0.44 Ω

- Using the highest resistance range of the multimeter, measure the resistance between each of the yellow leads and chassis ground. Any meter reading less than infinity (∞) indicates a short, necessitating armature replacement.

If the armature has normal resistance, but the voltage check showed the dynamo to be defective, then the flywheel magnets have probably weakened, and the flywheel must be replaced.

Regulator/Rectifier

Rectifier inspection

- With the ignition switch turned off, remove the right or left side cover, and disconnect the 3-pin connector of the white/red lead, and brown lead from the regulator/rectifier.
- Using the x 10 or x 100 Ω range, check the resistance in both directions between the white/red lead and each yellow lead, and between the black lead and each yellow lead. There is a total of 6 measurements. The resistance should be low in one direction and more than ten times as much in the other direction. If any two leads are low or high in both directions, the rectifier is defective and must be replaced.



A. Regulator/Rectifier

NOTE: The actual meter reading varies with the meter used and the individual rectifier, but, generally speaking, the lower reading should be within 1/3 scale of zero ohms.

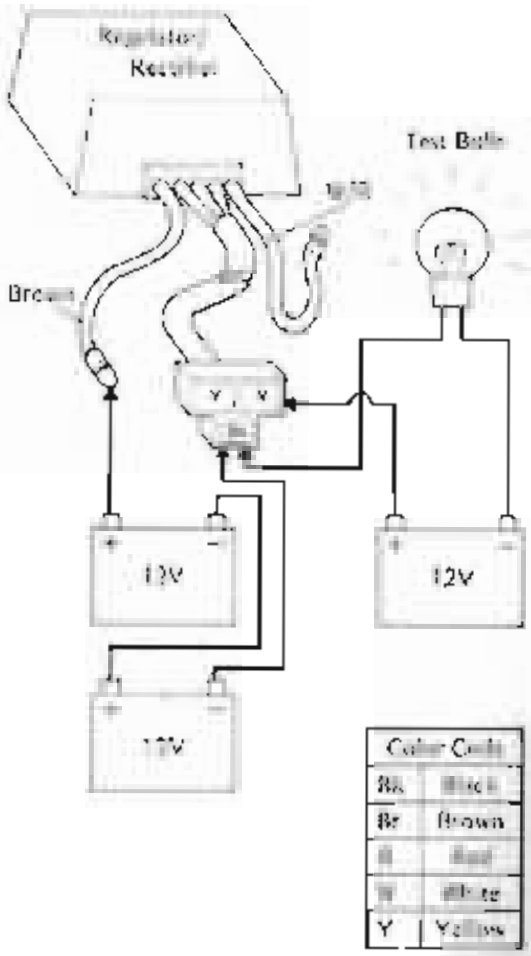
Regulator test

To test the regulator out of circuit, use three 1.5-volt batteries and a test light made from a 12V 3 – 6W bulb in a socket with leads.

- Remove the regulator/rectifier from the frame.
- Using auxiliary leads, connect one of the yellow leads to the battery (+) terminal, and connect the test light between the black lead and the battery (–) terminal. At this time the bulb should not be lit.

CAUTION **The test light works as an indicator and also as a current limiter to protect the regulator/rectifier from excessive current. Do not use an ammeter instead of a test light.**

Regulator Test (N41)



Color Code	
Bk	Black
Br	Brown
R	Red
W	White
Y	Yellow

- Connect the brown lead to the other battery (+) terminal and connect the black lead to the battery (−) terminal momentarily. At this time the bulb should not light.
- To apply 24 volts to the regulator/rectifier, connect two 12 volt batteries in series and connect the brown lead to the battery (+) terminal and the black lead to the battery (−) terminal momentarily. The bulb should now light and stay on until the bulb circuit is opened.

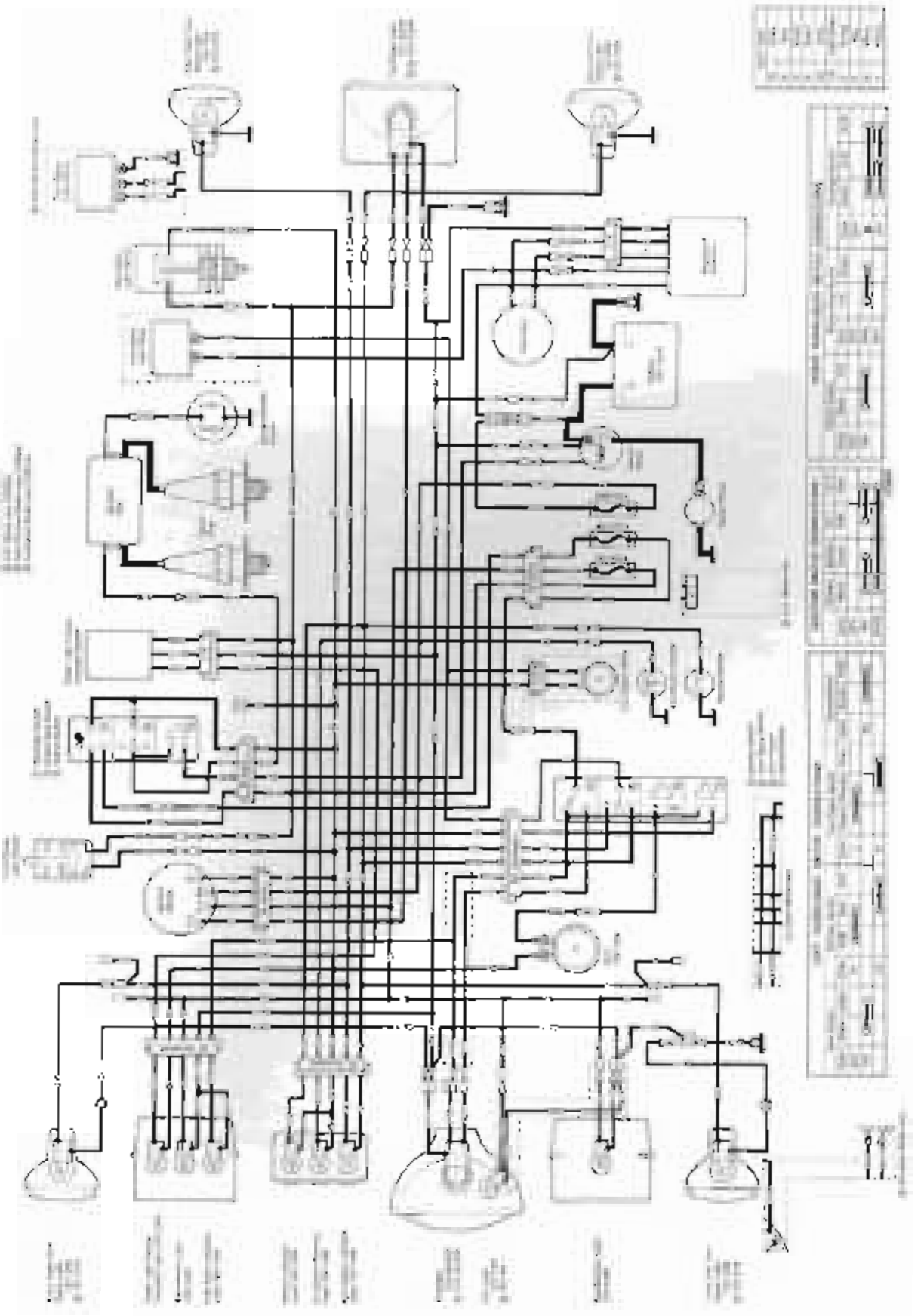
CAUTION **Do not apply more than 24 volts. If more than 24 volts is applied, the regulator/rectifier may be damaged. Do not apply 24 volts more than a few seconds. If 24 volts is applied for more than a few seconds, the regulator/rectifier may be damaged.**

- Repeat the above three steps for the other yellow lead (in the 4-pin connector which leads to the regulator/rectifier).
- Replace the regulator/rectifier if the bulb does not light as described above.

NOTE The above test is not foolproof. If the above checks show the regulator/rectifier is not damaged, but there is still trouble in the charging system, first carefully inspect the dynamo, battery, wiring, and all connections. Replace the regulator/rectifier if all these other components turn out good.



Z400-B3,G2 Wiring Diagram



Supplement for 1981 Model

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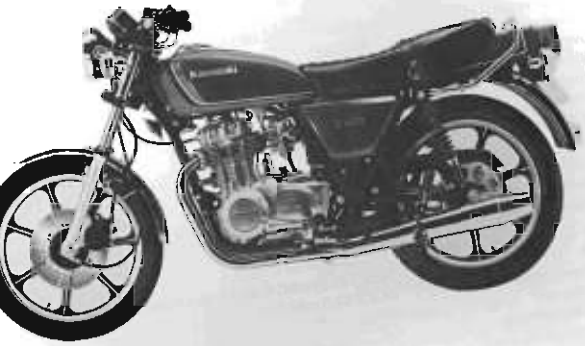
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Model Identification

KZ400-H







00-B



Specifications

SPECIFICATIONS

		KZ400-H	KZ400-G
Dimensions			
Overall length		2,120 mm, Ⓒ2,080 mm	2,070 mm
Overall width		810 mm	755 mm
Overall height		1,180 mm	1,060 mm
Wheelbase		1,390 mm	1,365 mm
Road clearance		140 mm	135 mm
Dry weight		170 kg, Ⓒ 169 kg	164 kg
Fuel tank capacity		12 ℓ	14 ℓ
Performance			
Climbing ability		24°	"
Braking distance		13.5 m from 50 kph	12.5 m from 50 kph
Minimum turning radius		2.4 m	2.3 m
Engine			
Type		SOHC, 2 cylinder, 4 stroke, air-cooled	"
Bore and stroke		64.0 x 62.0 mm	"
Displacement		398 cc	"
Compression ratio		9.5	"
Maximum horsepower		36 HP @8,500 rpm	"
Maximum torque		3.2 kg-m @7,000 rpm	3.3 kg-m @7,000 rpm
Valve timing			
Inlet	Open	27° BTDC	"
	Close	73° ABDC	"
	Duration	280°	"
Exhaust	Open	70° BBDC	"
	Close	30° ATDC	"
	Duration	280°	"
Carburetors		Keihin CV32 x 2	"
Lubrication system		Forced lubrication (wet sump)	"
Engine oil		SE class SAE 10W40, 10W50, 20W40, or 20W50	"
Engine oil capacity		2.9 ℓ	"
Starting system		Electric starter	"
Ignition system		Battery and coil (transistorized ignition)	"
Ignition timing (Mechanical advance)		From 10° BTDC @1,100 rpm to 40° BTDC @3,200 rpm	"
Spark plugs		NGK B7ES or ND W22ES-U, Ⓒ NGK BR7ES or ND W22ESR-U	"
Transmission			
Type		6 speed, constant mesh, return shift	"
Clutch		Wet, multi disc	"
Gear ratio:	1st	2.54 (33/13)	"
	2nd	1.75 (28/16)	"
	3rd	1.32 (25/19)	"
	4th	1.10 (23/21)	"

		KZ400-H	KZ400 G
5th		0.96 (22/23)	"
6th		0.88 (21/24)	"
Primary reduction ratio		2.43 (56/23)	"
Final reduction ratio		3.00 (45/15)	"
Overall drive ratio		6.39 (Top gear)	"
Electrical Equipment			
Alternator		Nippon Denso 037000 1370	"
Regulator/Rectifier		Shindengen S-1222-12B	"
Ignition coil		Toyo Denso 2C006-TR12V	"
Battery		Yuasa 12N 12A-4A 1 (12V 12AH)	"
Starter		Mitsuba SM-223	"
Headlight type		Semi-sealed	"
Headlight		12V 35/35W, (C) 12V 50/35W, (F) 12V 36/36W	"
Tail/Brake light		12V 5/21W, (C) 12V 8/27W	"
Meter lights		12V 3.4W	"
Indicator lights		12V 3.4W	"
Turn signal lights		12V 23W, (E) 12V 21W	"
Horn		12V 2.5A	"
Frame			
Type		Tubular, double cradle	"
Steering angle		40° to either side	41° to either side
Caster		27.5°	27°
Trail		112 mm	100 mm
Tire size	Front	3.25S-19 4PR	3.00S-18 4PR
	Rear	130/90-16 67S	3.50S-18 4PR
Suspension	Front	Telescopic fork	"
	Rear	Swing arm	"
Suspension stroke	Front	150 mm	"
	Rear	115 mm	95 mm
Front fork oil capacity (each fork)		145 ~ 155 cc	"
Front fork oil type		SAE 5W20	"
Brakes			
Type	Front	Disc brake	"
	Rear	Internal expansion, leading-trailing	"
Effective disc diameter		230 mm	226 mm
Brake drum inside diameter and width		160 x 30 mm	"

(C) : Canadian model (E) : European model (F) : French model

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

PERIODIC MAINTENANCE CHART (KZ400-G, H)

The maintenance and adjustments for the 1981 KZ400 G and H must be done in accordance with this chart to keep the motorcycle in good running condition. The initial maintenance is vitally important and must not be neglected.

OPERATION \ FREQUENCY	Whichever comes first ➡ Every	ODOMETER READING* 800 km	5,000 km	10,000 km	15,000 km	20,000 km	25,000 km	30,000 km	See Page
Battery electrolyte level — check †	month	•	•	•	•	•	•	•	218
Brake adjustment — check †		•	•	•	•	•	•	•	25
Brake wear — check †			•	•	•	•	•	•	302
Brake fluid level — check †	month	•	•	•	•	•	•	•	203,206
Brake fluid — change	year			•		•		•	202
Clutch — adjust		•	•	•	•	•	•	•	19
Carburetors — adjust		•	•	•	•	•	•	•	289
Throttle cable — adjust		•	•	•	•	•	•	•	289
Steering play — check †		•	•	•	•	•	•	•	28
Drive chain wear — check †			•	•	•	•	•	•	198,302
Front fork — inspect/clean		•	•	•	•	•	•	•	211
Rear shock absorbers — inspect		•	•	•	•	•	•	•	212
Nuts, bolts, fasteners — check and torque		•		•		•		•	30
Spark plugs — clean and gap †		•	•	•	•	•	•	•	12
Valve clearance — check †		•	•	•	•	•	•	•	14
Air cleaner element — clean			•		•		•		49,301
Air cleaner element — replace	5 cleanings			•		•		•	301
Fuel system — clean		•	•	•	•	•	•	•	257
Tire tread wear — check †			•	•	•	•	•	•	195,301
Engine oil — change	year	•	•	•	•	•	•	•	20
Oil filter — replace		•		•		•		•	20,188
General lubrication — perform			•	•	•	•	•	•	257,290
Front fork oil — change				•		•		•	211,303
Timing advancer — lubricate				•		•		•	226
Swing arm — lubricate				•		•		•	305
Wheel bearings — grease	2 years					•			194
Speedometer gear housing — grease	2 years					•			197
Brake camshaft — grease	2 years					•			207
Steering stem bearings — grease	2 years					•			208
Drive chain — lubricate	Every 300 km								198
Drive chain — adjust	Every 800 km								24

*For higher odometer readings, repeat at the frequency interval established here.
†Replace, add or adjust if necessary.

Adjustment

IGNITION TIMING (KZ400-G, H)

The ignition system for the 1981 models is transistorized and controls the current for the primary circuit by use of a solid-state electronic switching unit called a Darlington power transistor. The power transistor is triggered by pickup coil and there are no mechanical breaker points, so the only periodic maintenance needed is automatic timing advancer lubrication (Pg. 236). Since contact bounce, fuel wear and breaker point pitting or burning are eliminated, periodic inspection and adjustment of the ignition timing are not required.

See the "Ignition System" section (Pg. 305) for the inspection of the ignition system.

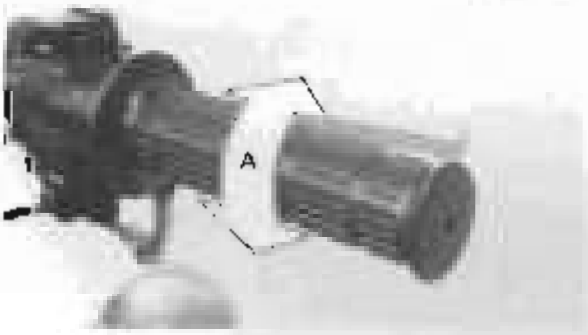
THROTTLE CABLE

For the 1981 models, there is a throttle cable to open the butterfly valves in the carburetors. If the cable is too loose due either to cable stretch or maladjustment, the excessive play in the throttle grip will cause a delay in throttle response, which will be especially noticeable at low rpm. Also, the butterfly valves may not open fully at full throttle. On the other hand, if the cable is too tight, the throttle will be hard to control, and the idle speed will be erratic.

To check the throttle cable adjustment:

- Check that there is 2 – 3 mm throttle grip play when lightly turning the throttle grip back and forth.

(N42)



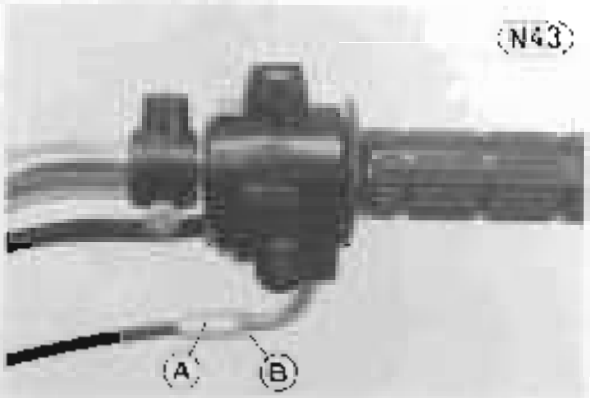
A. 2 – 3 mm

To adjust the throttle cable:

If the cable has excessive play, adjust it as follows.

- Loosen the locknut at the throttle grip end and turn the adjusting nut until the proper amount of throttle grip play is obtained. Tighten the locknut.

(N43)



A. Adjusting Nut B. Locknut

NOTE: If the throttle cable cannot be adjusted by using the cable adjusting nut at the upper end of the throttle cable, use the cable adjuster at the lower end of the throttle cable (at the carburetor). Do not forget to securely tighten the adjuster locknut.

(N44)



A. Adjuster B. Locknut

CARBURETORS

The adjustment procedures for the 1981 models are the same as those for the 1978 models with the following exceptions. See Pg. [illegible].

1. The pilot screw location are illustrated.
2. The standard pilot screw setting is the 2½ turns out position.

WHEEL BALANCE (KZ400-H)

See Pg. 257 for wheel balancing procedures.

LUBRICATION (KZ400-H)

In addition to the points listed on Pgs. 271~ 82, check and lubricate regularly the following area.

Front Brake Lever

Apply a light coat of grease to the surface that the push rod of the front brake light switch pushing against (Fig. N8 on Pg. 277).

Disassembly

TORQUE AND LOCKING AGENT (KZ400-H)

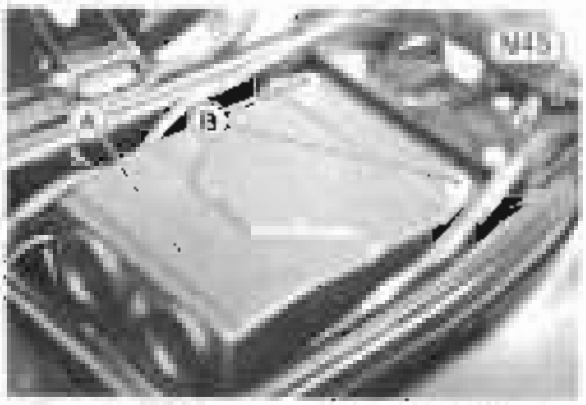
Tighten the engine parts of KZ400-H to the specified amount of torque listed on Pgs. 37~ 38, using the chart wise for the installation of the connecting rod (Pg. 272). But tighten the chassis parts of KZ400-H to the specified values listed in Table N25.

NOTE: Parts marked with an asterisk (*) must be tightened according to the Periodic Maintenance Chart (Pg. 288). One at a time, loosen each bolt or nut ½ turn, then tighten it to the specified torque. Follow the sequence if specified. For engine fasteners, retorque them when the engine is cold (at room temperature).

AIR CLEANER ELEMENT (KZ400-H)

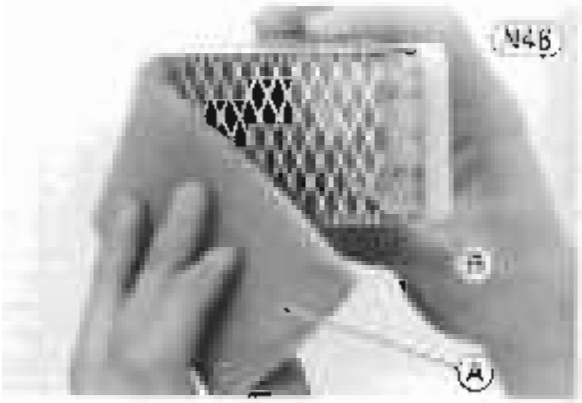
Removal:

- Unhook the seat, and swing it open.
- Unscrew the mounting screws and flat washers (2 ea), and take off the air cleaner body.



A. Air Cleaner Body B. Mounting Screws

- Pull out the element.
- Unhook the sponge filter at both ends, and remove it from the wire frame.

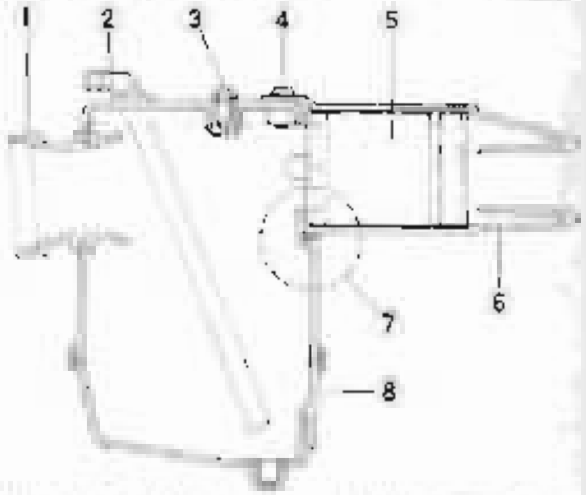


A. Sponge Filter B. Wire Frame

Installation Notes:

1. Fit the ridge of the air cleaner body into the groove in the air cleaner housing, and secure the mounting screws (2).

Air Cleaner Body Installation



1. Air Cleaner Duct
2. Breather Hose Fitting
3. Mounting Mounting Bolts
4. Body Mounting Screws
5. Air Cleaner Element
6. Air Cleaner Body
7. Fit the ridge into the groove.
8. Air Cleaner Housing

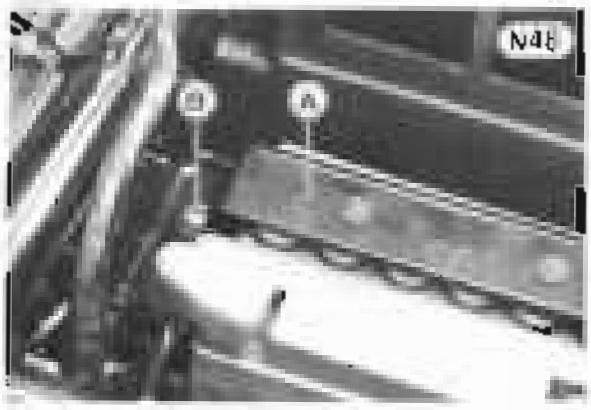
Table N25 Tightening Torque (KZ400-H)

Chassis Part	Locking Agent (●), Liquid Gasket (★) Required	Quantity	Metric (kg-m)	English (ft-lbs)	See Pg
*Brake cam lever bolt	–	1	–	–	–
*Brake pedal pivot nut	–	1	–	–	–
*Clutch lever holder bolt φ6 P1.0	–	1	–	–	–
*Disc brake parts	See Table N2 on Pg. 260.				
*Front axle nut φ14 P1.5	–	1	8.0	58	296
*Front fender mounting bolts φ8 P1.25	–	4	–	–	–
*Front footpeg mounting bolts	–	2	–	–	–
Front fork bottom Allen bolts φ10 P1.0	●,★	2	1.8	13.0	142
*Front fork clamp bolts					
upper φ8 P1.25	–	2	1.8	13.0	138,140
lower φ10 P1.25	–	2	3.0	22	29,138,140
Handlebar clamp bolts φ8 P1.25	–	4	1.8	13.0	135
Pad mounting screw	●	1	–	–	296
*Rear axle nut φ16 P1.5	–	1	12.0	87	25
*Rear footpeg (muffler) mounting bolts	–	2	–	–	50
*Rear shock absorber mounting					
bolts φ10 P1.25	–	2	3.0	22	120,143,144
nuts φ10 P1.25	–	2	3.0	22	143
Rear sprocket nuts φ10 P1.25	–	4	4.0	29	122
*Shift pedal bolt φ6 P1.0	–	1	–	–	–
*Steering stem head bolt φ16 P1.5	–	1	4.5	33	29,138
*Steering stem head clamp bolt φ8 P1.25	–	1	1.8	13.0	29,138
Steering stem locknut φ30 P1.0	–	1	3.0	22	29,138
*Swing arm pivot shaft nut φ14 P1.5	–	1	8.0	58	143
*Torque link nuts φ10 P1.25	–	2	3.0	22	25,111,145

AIR CLEANER HOUSING (KZ400-H)

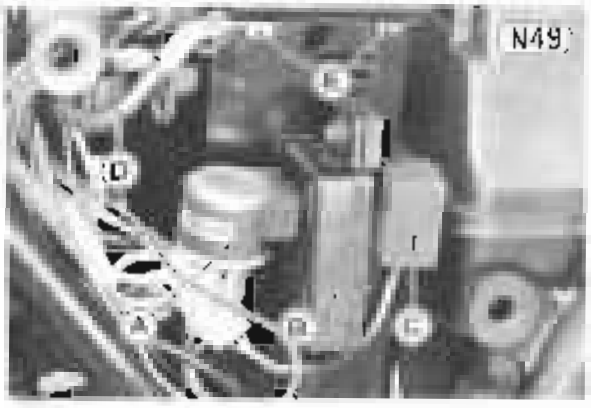
Removal:

- Remove the fuel tank (Fig. 2B3).
- Unscrew the mounting screws, and remove the air cleaner body.
- Unscrew the screw, and remove the battery stay plate.



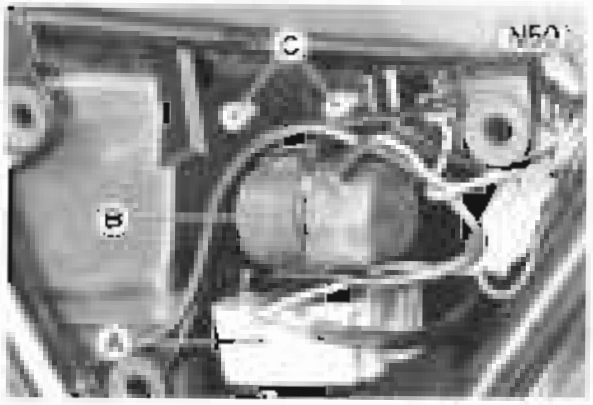
A. Stay Plate B. Screw

- Disconnect first the negative (−) lead, and then positive (+) lead from the battery.
- Remove the battery.
- Pull off the right side cover, and free the turn signal relay, fuse box, and brake light failure indicator switch from the battery case.



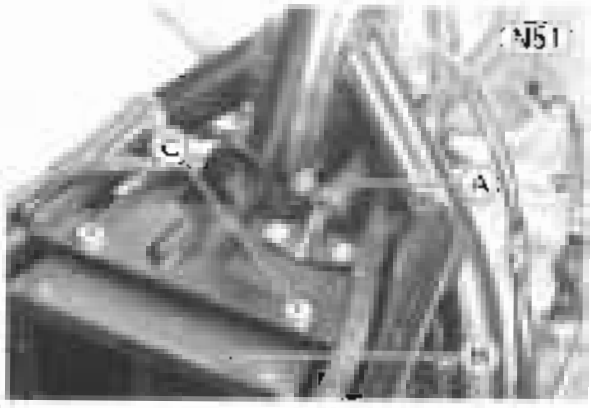
A. Turn Signal Relay
B. Fuse Box
C. Indicator Switch
D. Battery Ground Lead
E. Battery Case Mounting Bolts

- Pull off the left side cover, disconnect the 3-pin connector, brown lead, and white/red lead from the regulator/rectifier, and free the starter relay from the battery case.



A. Regulator/Rectifier
B. Starter Relay
C. Battery Case Mounting Bolts

- Unscrew the battery mounting bolts (4), and remove the battery case. The front of the battery case bottom is caught in the air cleaner housing, and the rear is caught on the bottom end of the rear fender.
- Loosen the air cleaner duct clamps (1), slide the hose clamp forward, and pull the breather hose off the fitting on the air cleaner housing.

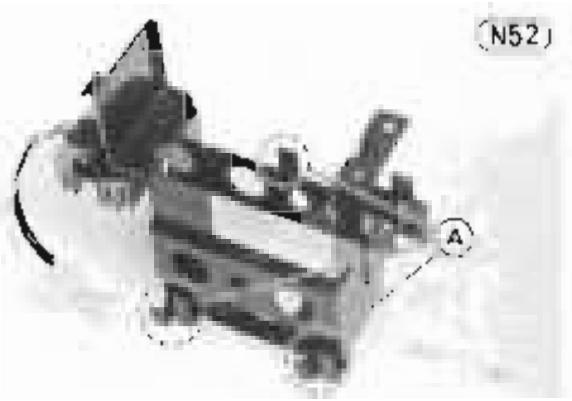


A. Breather Hose
B. Air Cleaner Housing
C. Mounting Bolts

- Unscrew the mounting bolts (2), and remove the air cleaner housing rearward.
- Cover the carburetor bores with a clean cloth to keep dirt out of the carburetors.

Installation Notes:

1. Hook the pawls at the front and the rear of the battery case on the rear fender and in the air cleaner housing.



A. Pawls

2. Secure the battery ground lead together with the battery case. See Fig. N53.
3. Route the battery vent hose as shown on the caution label.

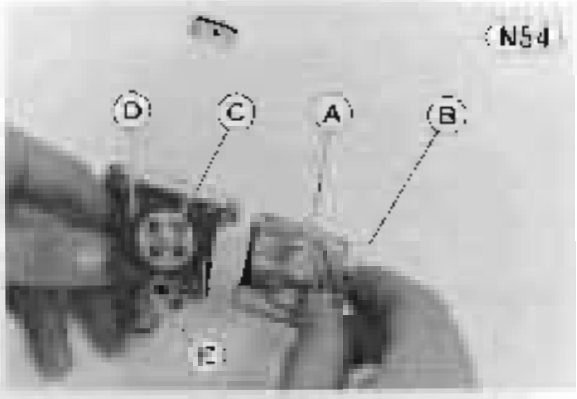
CAUTION **Make sure the battery vent hose is kept away from the chain and exhaust system. Battery electrolyte can corrode and dangerously weaken the chain. Do not let the vent hose become kinked, pinched, or melted by the exhaust system. An unvented battery will not keep a charge and is may crack from built up gas pressure.**

FUEL TAP (KZ400-G, H)

Disassembly and Assembly Note:

Refer to Figs. 43 ~ 45, noting the following.

1. The location of the vacuum hose fitting is different from that of KZ400-B. Install the diaphragm cover in the direction shown in Fig. N54, making sure that the spring is compressed at the center of the diaphragm between the diaphragm and the cover.



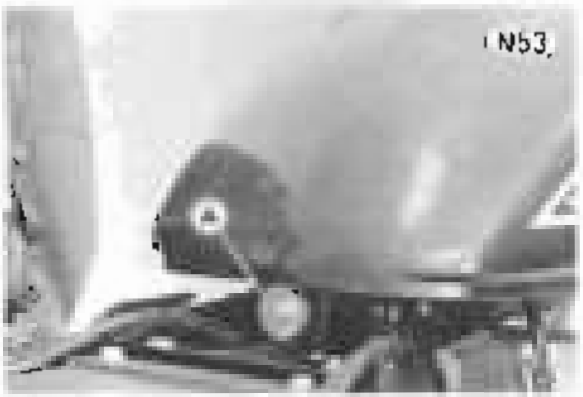
A. Diaphragm Cover
B. Vacuum Hose Fitting
C. Spring
D. Diaphragm
E. Fuel Hose Fitting

FUEL TANK (KZ400-H)

Removal and Installation:

Refer to Figs. 43 ~ 44, noting the following:

1. The fuel tank is secured on the frame with the screw at the rear end.

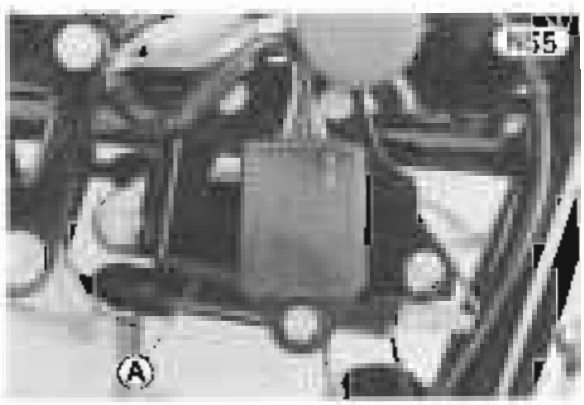


A. Mounting Screw

IGNITION COIL (KZ400-G, H)

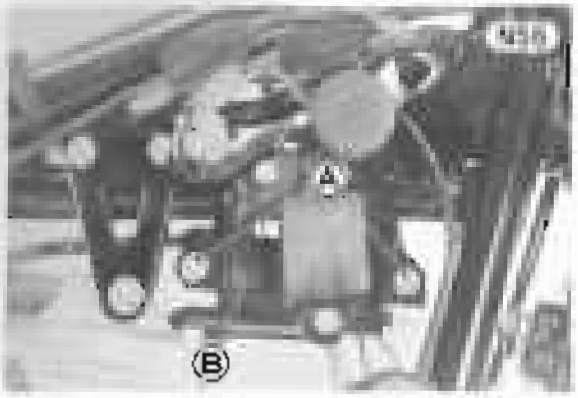
Removal:

- Remove the fuel tank (Fig. 43 or 293).
- Pull the spark plug leads off the spark plugs.
- Disconnect the yellow/blue and yellow/red leads from the ignition coil terminals.



A. Ignition Coil

•Remove the mounting nuts (2), and remove the ignition coil from the bracket.



A. Nuts B. Bracket

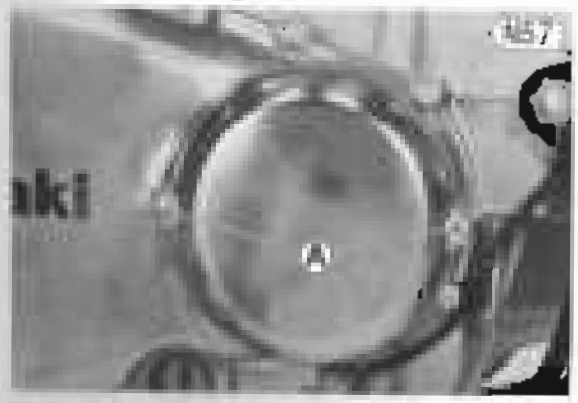
Installation Note:

1. The "+" and "−" markings near the primary terminals on the ignition coil body indicate the polarity of the terminal. (See the "Theory and Maintenance" section, Pg. 307.) Both leads (positive yellow/red and negative yellow/blue) can be connected with either terminal on the ignition coil without changing the engine performance.

PICKUP COIL ASSEMBLY (KZ400-G, H)

Removal:

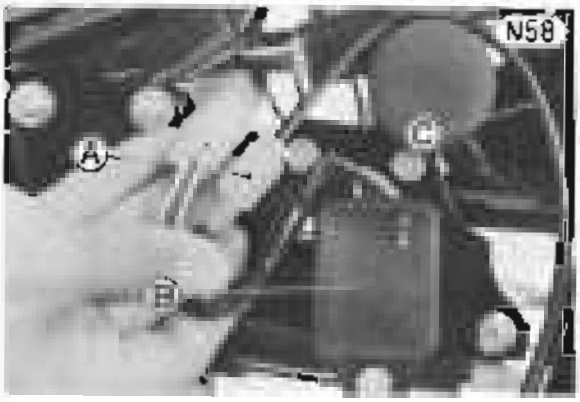
•Remove the pickup coil cover screws (2), and take off the cover and gasket.



A. Pickup Coil Cover Screws

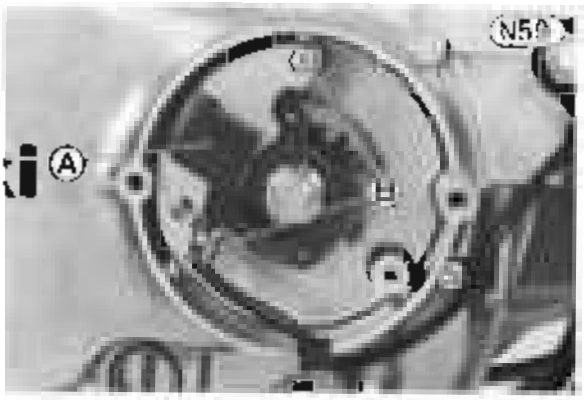
•Remove the fuel tank.

•Disconnect the 2-pin connector that links the pickup coil leads to the IC igniter, and slide the leads free from the clamps.



A. 2-pin Connector C. Pickup Coil Leads
B. IC Igniter

•Remove the mounting screws (2), and take off the pickup assembly.



A. Pickup Coil Assembly B. Screws

Installation Note:

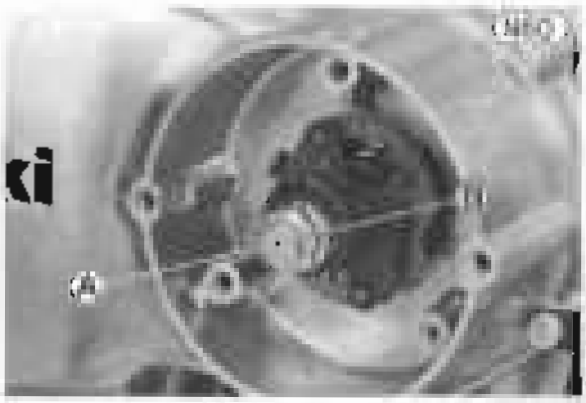
1. No adjustment is needed after installation of the pickup coil assembly.

TIMING ADVANCER (KZ400-G, H)

Removal:

•Remove the pickup coil assembly (Pg. 294).

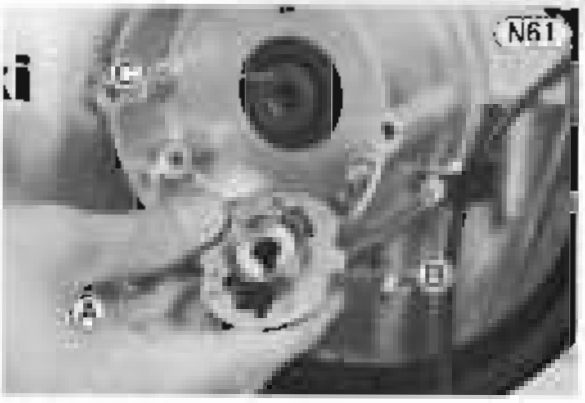
•With a 17 mm wrench on the crankshaft rotation nut to keep the shaft from turning, remove the mounting bolt, and take off the rotation nut and the timing advancer.



A. Mounting Bolt B. Rotation Nut

Installation:

•Fit the timing advancer onto the crankshaft, matching its notch with the pin in the end of the crankshaft, and install the crankshaft rotation nut and advancer mounting bolt. The notches in the nut fit the projections on the timing advancer. Tighten the bolt to 2.5 kgm (18.0 ft-lbs) of torque.

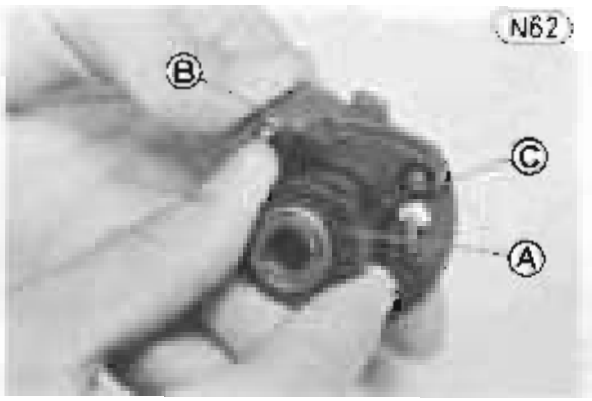


A. Timing Advancer B. Notch C. Pin

•Install the pickup coil assembly.

Disassembly:

•Pull off the timing rotor by turning it counterclockwise.



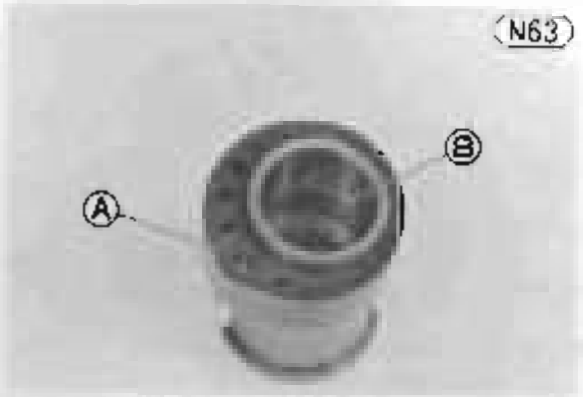
A. Timing Rotor B. Weight C. Clip

•Remove the clip, washer, weight, and another washer from each weight shaft.

•Remove the thrust washer(s) from the rotor shaft.

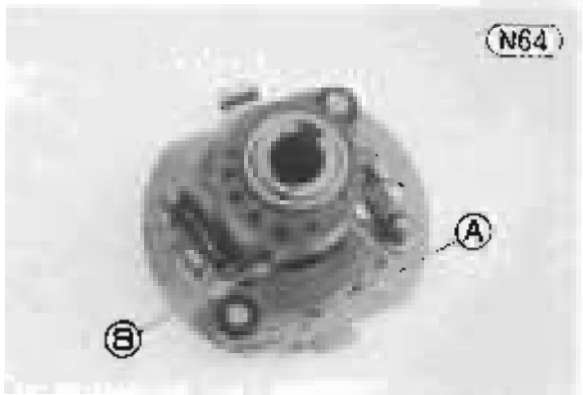
Assembly Notes:

1. Wipe the advancer clean, and fill the grooves in the timing rotor with grease.



A. Timing Rotor B. Grease

2. When installing the timing rotor, align the projection on the rotor with the "TEC" mark on the advancer body.



A. "TEC" Mark B. Projection

CONTACT BREAKER, CAPACITOR (KZ400-G, H)

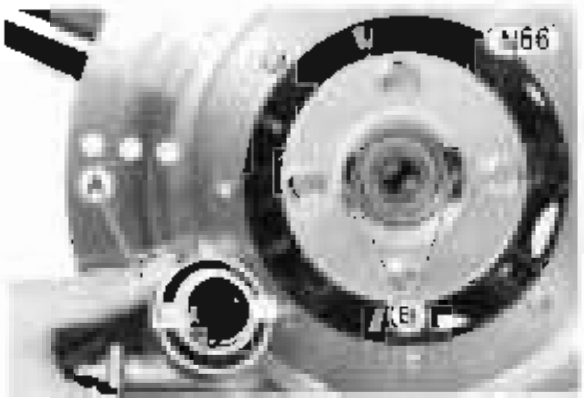
The ignition system for the 1981 KZ400-G and H is transistorized and controls the current for the primary circuit by use of a solid-state electronic switching unit called a Darlington power transistor. So there are no mechanical contact breaker points and capacitor

CYLINDER BLOCK, PISTON, PISTON RINGS

Removal and Installation:

Piston ring installation procedures are changed. See Fig. 338 with the following exception.

1. Install the top ring in the top most groove. If the top ring has an "N" mark near the ring end, install the top ring so that the "N" mark side faces up. If there is no marks on the ring, the ring can be installed with the either side facing up.



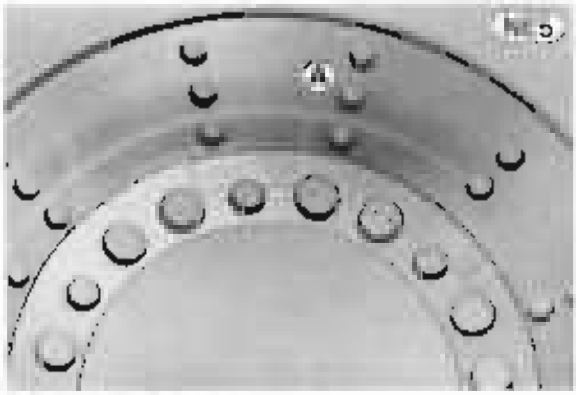
A. Speedometer Gear Receiver B. Recesses

FRONT WHEEL (KZ400-G)

The procedures are the same as those for the 1980 KZ400-H3 with the following exception. See Fig. 373.

Front Hub Disassembly and Assembly (including disc removal):

1. Mount the brake disc on the hub so that the indication of "MIN TH 4.5 MM" faces out. If not, the disc will not seat on the hub closely, causing brake drag, overheating, and poor braking efficiency with the possibility of loss of control.



A. "MIN TH 4.5 MM"

2. Tighten the disc mounting Allen bolts to 2.3 kg-m (16.5 ft-lbs) of torque.

Front Hub Disassembly and Disassembly (including disc removal):

1. Install the ball bearings with the sealed or shield bearing facing outside.
2. Use the bearing driver and the holder (special tools: P/N 57001-268, 57001-1189) to press the ball bearings in.
3. Use the bearing driver and the holder (special tools: P/N 57001-1266, 57001-1189) to press the grease seal in.

FRONT WHEEL (KZ400-H)

The procedures are the same as those for the 1980 KZ400-H3 with the following exception. See Fig. 373.

Removal and Installation:

1. Fit the speedometer gear housing onto the front hub so that the speedometer gear receiver fits in the hub recesses.

FRONT DISC BRAKE (KZ400-H)

The procedures are the same as those for the 1979 KZ400-A1. Refer to Pgs. 260 – 262.

FRONT DISC BRAKE (KZ400-G)

The procedures are the same as those for the 1979 KZ400-C1 with the following exception. See Pgs. 260 – 252.

Tightening torque for the parts related to the disc brake is changed as shown in Table N26.

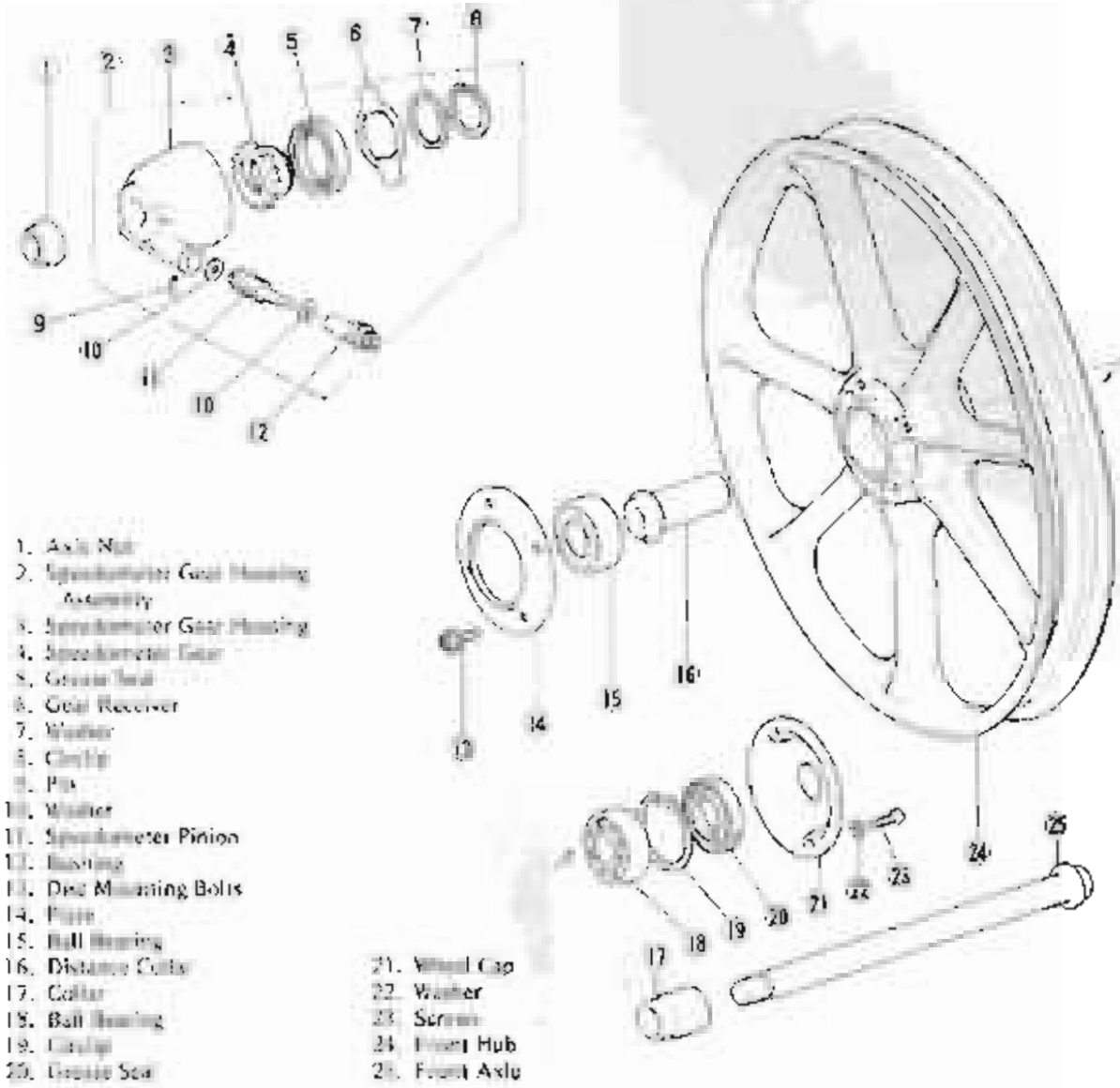
Table N26 Disc Brake Torque

Bleed valve	0.80 kg-m	69 in-lbs
Brake lever pivot bolt	0.10 kg-m	86 in-lbs
Brake lever pivot bolt lock nut	0.60 kg-m	52 in-lbs
Caliper holder shaft bolts	1.80 kg-m	13.0 ft-lbs
*Caliper mounting bolts	4.0 kg-m	29 ft-lbs
Disc mounting Allen bolts	2.3 kg-m	16.5 ft-lbs
Fitting (banjo) bolts	3.0 kg-m	22 ft-lbs
*Master cylinder clamp bolts	0.80 kg-m	78 in-lbs

* : Remember these parts according to Periodic Maintenance Chart (Pg. 28).

Front Hub

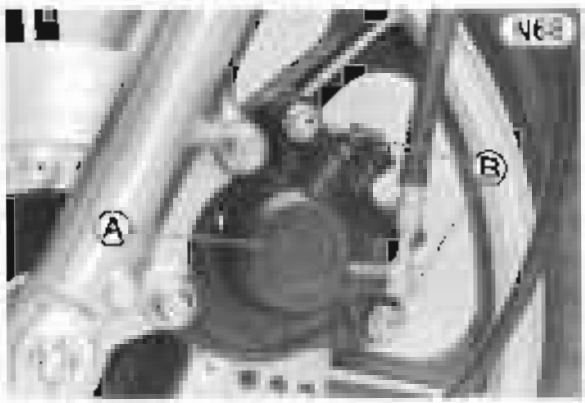
(N67)



1. Axle Nut
2. Speedometer Gear Housing Assembly
3. Speedometer Gear Housing
4. Speedometer Gear
5. Grease Seal
6. Gear Receiver
7. Washer
8. Circlip
9. Pin
10. Washer
11. Speedometer Pinion
12. Bushing
13. Disc Mounting Bolts
14. Plate
15. Ball Bearing
16. Distance Collar
17. Collar
18. Ball Bearing
19. Circlip
20. Grease Seal
21. Wheel Cap
22. Washer
23. Screw
24. Front Hub
25. Front Axle

Pad Removal:

•Remove the caliper holder shaft bolts (B).



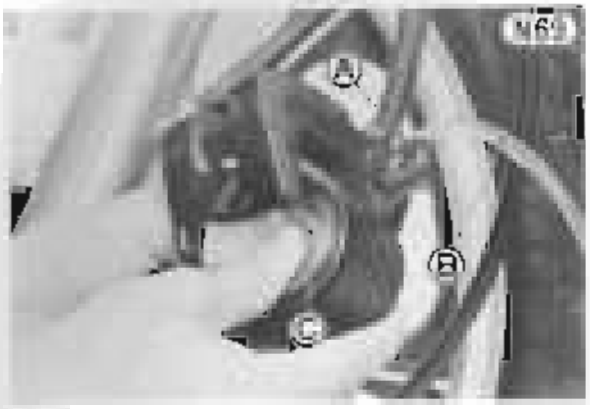
A. Caliper B. Holder Shaft Bolts

•Lift the caliper off the holder, and remove the pads.

Pad Installation:

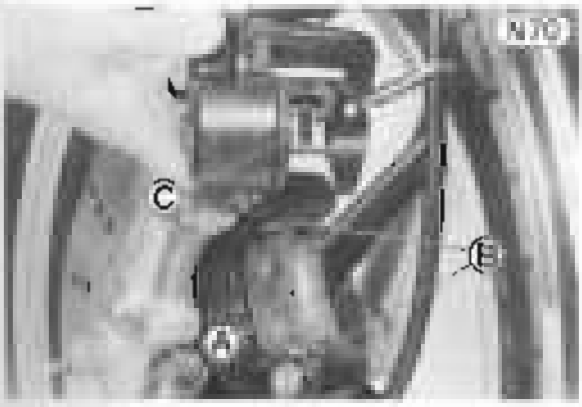
•Remove the bleed valve cap on the caliper, attach a clear plastic hose to the bleed valve, and run the other end of the hose into a container.

•Open (loosen) the valve slightly, push the piston in by hand as far as it will go, and then close (tighten) the valve. Wipe up any spilled fluid, and recap the bleed valve. The bleed valve must be tightened to 0.80 kgm (69 inch-lbs) of torque.



A. Bleed Valve B. Hose C. Piston

•Check that the sliders (2) are in place.
•Fit the pads against the disc.



A. Pads B. Sliders C. Anti-Rattle Spring

•Check that the anti-rattle spring is in place. If it was removed, install it to the caliper as shown in Fig. 3-73.
•Install the caliper, and tighten the caliper holder shaft bolts to 1.8 kg-m (13.0 ft-lbs) of torque.
•Some more brake fluid was lost when the bleed valve was opened, check the fluid level in the master cylinder and bleed the air from the brake system (Pg. 2-11).
•Check the disc.

WARNING **Do not attempt to drive the motorcycle until a full brake lever or pedal is obtained by pumping the brake lever or pedal until the pads are against the disc. The brake will not function on the first application of the lever or pedal if this is not done.**

Caliper Removal:

•If the caliper is to be disassembled, loosen the caliper holder shaft bolts (2).



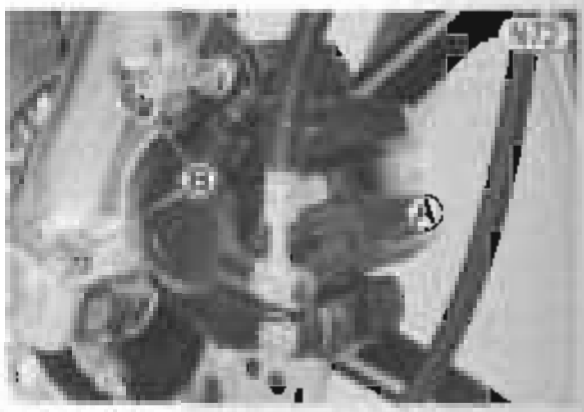
A. Holder Shaft Bolts

NOTE: If the caliper is to be disassembled after caliper removal and compressed air is not available, remove the pistons using the following two steps before disconnecting the brake hose fitting from the caliper.

①Remove the pads (Pg. 297).

②Pump the pistons out with the brake lever.

•Remove the banjo bolt at the caliper, and temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum. There is a flat washer on each side of the hose fitting.



A. Banjo Bolt B. Mounting Bolts

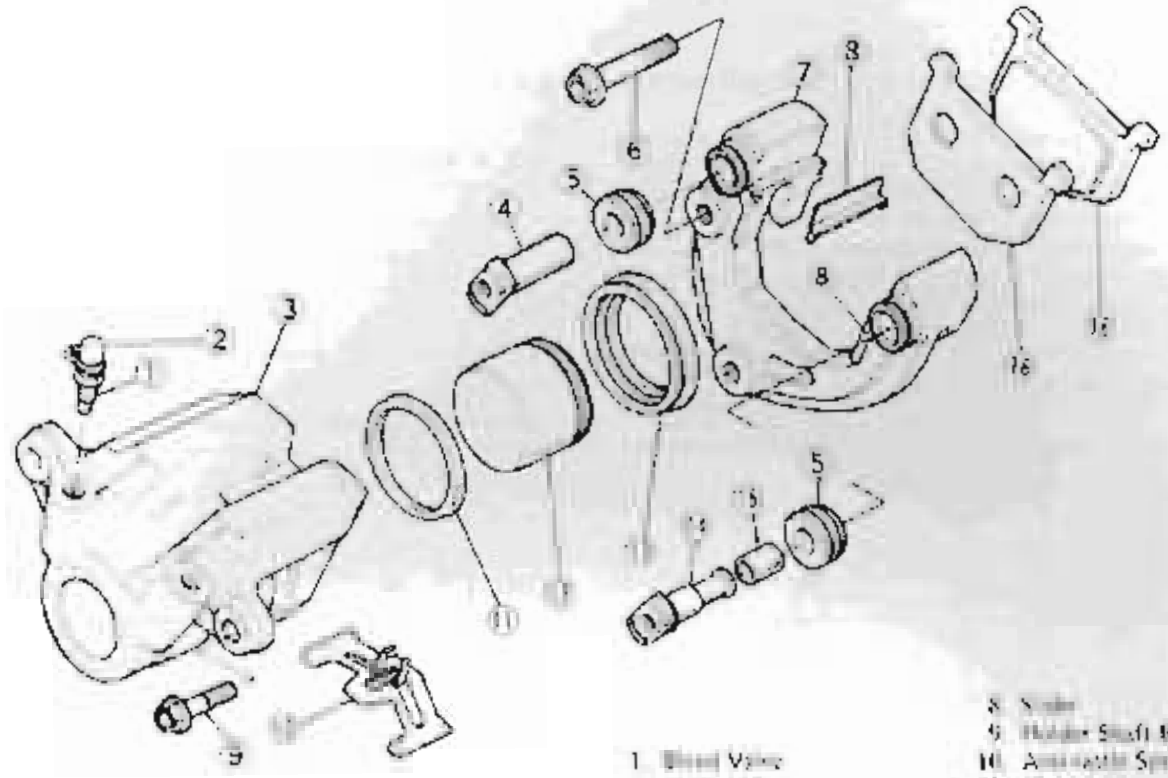
•Remove the mounting bolts (2), and take off the caliper.

Caliper Installation Notes:

1. Tighten the front caliper mounting bolts to 4.0 kg-m (29 ft-lbs) of torque.
2. Tighten the caliper holder shaft bolts to 1.8 kg-m (13.0 ft-lbs) of torque.
3. Connect the brake hose to the caliper putting a new flat washer on each side of the brake hose fitting. Tighten the banjo bolt to 3.0 kg-m (22 ft-lbs) of torque.

Front Caliper

(N73)



1. Bleed Valve
2. Rubber Cap
3. Caliper
4. Holder Shaft
5. Dust Cover
6. Mounting Bolt
7. Caliper Holder
8. Spider
9. Holder Shaft Bolt
10. Anti-rattle Spring
11. Pad Shim
12. Piston
13. Dust Seal
14. Holder Shaft
15. Friction Boot
16. Pad

4. Check the fluid level in the master cylinder, and bleed the brake line (Pg. 301).

WARNING **Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.**

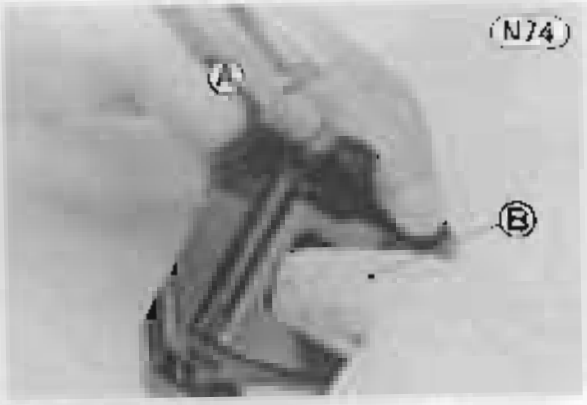
Caliper Disassembly:

- Remove the caliper holder shaft bolts 9 (2), and pull out the caliper holder 7 and the pads 8 (2).
- Remove the holder shafts 4 and 14 with the dust covers 5. There is the friction boot 15 on the shaft 14 of which diameter is smaller than the other.
- Remove the anti-rattle spring 10.
- Remove the dust seal 13 around the piston 12.
- Cover the caliper opening with a clean, heavy cloth, and remove the piston by lightly applying compressed air to where the brake line fits into the caliper.

WARNING **To avoid serious injury, never place your fingers or palm inside the caliper opening. If you apply compressed air into the caliper, the piston may crush your hand or fingers.**

NOTE: If compressed air is not available, disconnect the brake line and pump the piston out with the brake lever.

(N74)



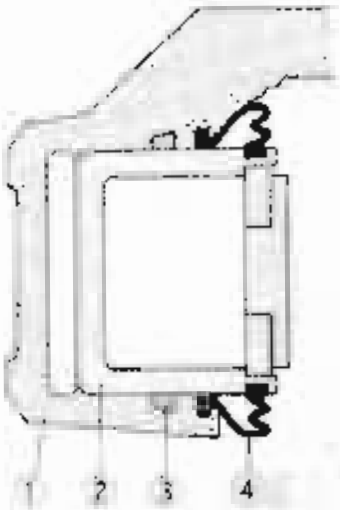
A. Compressed Air B. Heavy Cloth

- Taking care not to damage the cylinder surface, remove the dust seal 13 with a hook.

Caliper Assembly Notes:

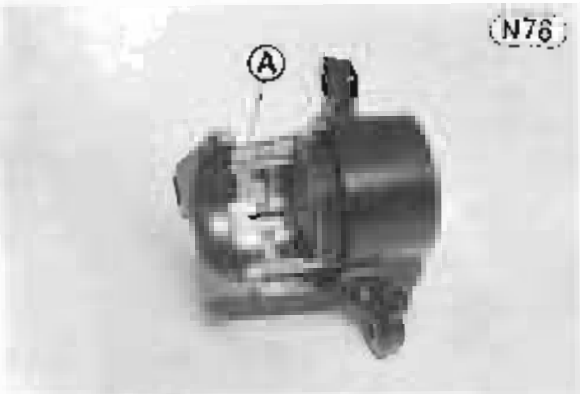
1. Clean the caliper parts with brake fluid or alcohol (See CAUTION — Pg. 114).
2. It is recommended that the fluid seal, which is removed, be replaced with a new one.
3. Replace the dust cover and friction boot if they were damaged.
4. Apply brake fluid to the outside of the piston and the fluid seal, and push the piston into the cylinder by hand. Take care that neither the cylinder nor the piston skirt get scratched.
5. Install the dust seal around the piston. Check that the dust seal is properly fitted into the grooves in the piston and caliper.

Caliper Dust Seal, Fluid Seal (N75)



1. Caliper
2. Piston
3. Fluid Seal
4. Dust Seal

6. Apply a thin coat of PBC (Poly Butyl Cuprysil) grease to the caliper holder shafts and holder holes. (PBC grease is a special high temperature, water-resistant grease.)
7. Install the anti-rattle spring to the caliper as shown.



A. Anti-rattle Spring

8. Do not forget to tighten the holder shaft bolts after installing the caliper on the motorcycle (Pg. 286).

Maintenance

CARBURETORS

Refer to Pg. 203, noting the following.

1. Table N27 and N28 show the 1981 model carburetor specifications.

Table N27 Carburetor Specifications (KZ400-B, G)

Type	Jet Needle	Main Jet		Air Jet			Pilot Jet	Pilot Screw	Service Fuel Level
		Primary	Secondary	Pilot	Primary Main	Secondary Main			
CV3[illegible]	[illegible]	[illegible]	88	110	150	60	35	2½ turns out	2.5 ± 1 mm

Table N28 Carburetor Specifications (KZ400-H)

Type	Jet Needle	Main Jet		Air Jet			Pilot Jet	Pilot Screw	Service Fuel Level
		Primary	Secondary	Pilot	Primary Main	Secondary Main			
CV3[illegible]	[illegible]	[illegible]	80	[illegible]	150	80	35	2½ turns out	2.5 ± 1 mm

AIR CLEANER (KZ400-H)

Refer to Pg. 145, noting the following.

Cleaning

- Remove the air cleaner element (Pg. 290).
- Clean the sponge filter in a bath of a high flash-point solvent, and squeeze it dry.
- After cleaning, saturate the sponge filter with SE class SAE 30 oil, squeeze out the excess, then wring it in a clean rag and squeeze it dry as possible. Be careful not to tear the sponge filter.

WARNING

1. **Clean the element in a well-ventilated area, and take ample care that there are no sparks or flame anywhere near the working area.**
2. **Because of the danger of highly flammable liquids, do not use gasoline or a low flash-point solvent to clean the element.**
3. **A break in the element material or damage to the sponge gasket will allow dirt and dust to pass through into the carburetor and eventually damage the engine. If any part of the element is damaged, the element must be replaced.**

WHEELS (KZ400-H)

Tires:

Refer to Pg. 192 – 197, noting the following.

Table N29 Tires, Air Pressure (measured when cold)

	Air Pressure		Size	Make, Type
Front	1.75 kg/cm² (25 psi, 175 kPa)		3.25S-19 4PR	Yokohama Y-928
Rear	Up to 97.5 kg load	1.50 kg/cm² (21 psi, 150 kPa)	130/90-16 67S	Yokohama Y-928 or Y-907①
	97.5 – 155 kg load	1.75 kg/cm² (25 psi, 175 kPa)		

① Canadian model

Table N30 Tire Tread Depth

Tire	Standard	Service Limit	
		Under 110 kph	Over 110 kph
Front	4.4 mm	1 mm	1 mm
Rear	9.2 mm	3 mm	3 mm

Rims:

The procedures for the KZ400-H are the same as those for the 1979 KZ400-G with the following exceptions. See Pg. 203 – 204.

Table N31 Rim Size*

Front	Rear
19 x 1.85	16 x 2.50

*The rim size shown in the table is the load seat diameter and rim width of the tire flanges, both in inches.

Axle:

Use the service data for KZ400-H (Table 15 on Pg. 196).

Wheel Bearings, Grease Seals:

The front wheel bearings and grease seals of KZ400-H are the same ones as of KZ400-G. See Table 16 on Pg. 197.

DRIVE CHAIN (KZ400-H)

Refer to Pgs. 197 – 199, noting the following:

1. The standard chain for KZ400-H is shown in the table below.

Table N32 Drive Chain

Make	Type	Links
Enuma	EK530HO	104 link

2. See Table 18 on Pg. 198 for the chain length.

DISC BRAKE (KZ400-H)

See the information for the 1979 KZ400-G1 on Pgs. 264 – 265.

DISC BRAKE (KZ400-G)

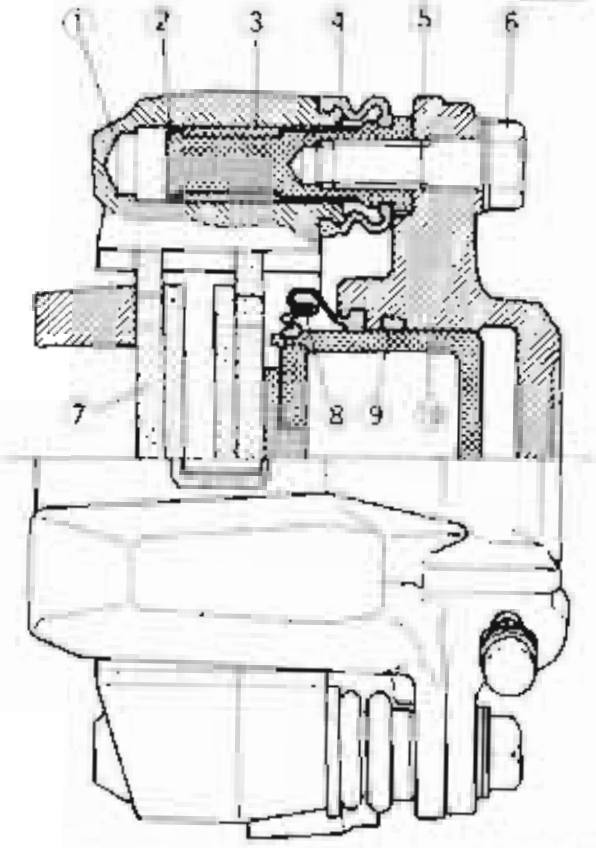
Refer to Pgs. 200 – 205 for other information not specifically mentioned here.

Caliper:

The caliper on the 1981 KZ400-G1 is essentially a sliding type caliper. The caliper holder 1 is fixed on the front fork outer tube, and the caliper 5 can move from side to side by guiding the holder shafts 2, 2 in the holes in the caliper holder. When the brake is applied, the piston 10 presses the pad 7 on the piston side against the disc, but since the disc is immovable, further pressure cannot move the pad any further. Instead, the caliper 5 moves in the opposite direction such that the pad 7 opposite the piston is also forced against the disc. In this manner, the disc is gripped between the two pads, and the resulting friction slows wheel rotation.

The caliper on the 1981 KZ400-G1 differs from the previous caliper in the following respect. The caliper holder 1 supports directly both pads which are dragged by the frictional force between the disc and the pads. Therefore, the holder shafts 2 do not bear the frictional force unlike the previous type.

Front Caliper (N77)



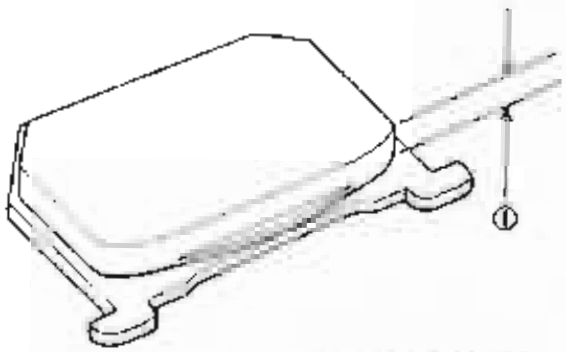
1. Caliper Holder
2. Holder Shaft
3. Friction Boot
4. Dust Cover
5. Caliper
6. Holder Shaft Bolt
7. Pad
8. Dust Seal
9. Fluid Seal
10. Piston

Pad wear

Inspect the pads for wear. Check the thickness of the pad linings, and replace both pads as a set if the thickness of either pad is less than 1 mm.

If any grease or oil spills on the pads, wash it off with trichloroethylene or a high flash-point solvent. Do not use one which will leave an oily residue. If the oil cannot be thoroughly cleaned off, replace the pads.

Brake Pad (N78)

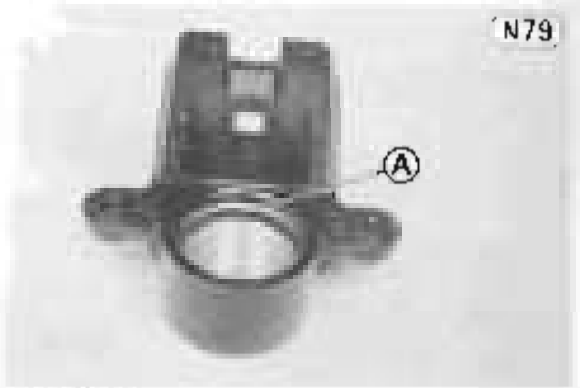


① Lining Thickness

Fluid seal damage

The fluid seal around the piston maintains the proper pad/disc clearance. If this seal is not satisfactory, pad wear will increase, and constant pad drag on the disc will cause brake and brake fluid temperatures.

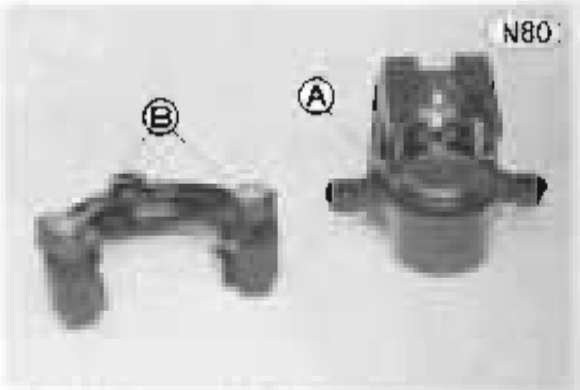
Replace the fluid seal under any of the following conditions: (a) fluid leakage around the pad, (b) brakes overheat, (c) there is a large difference in left and right pad wear, (d) the seal is stuck to the groove. If the fluid seal is replaced, replace the dust seal as well. Also, replace both the dust seal and fluid seal every other time the pads are changed.



A. Fluid Seal

Dust seal, dust cover damage

Check the dust seal and dust covers, and replace any that are cracked, worn, swollen, or otherwise damaged.

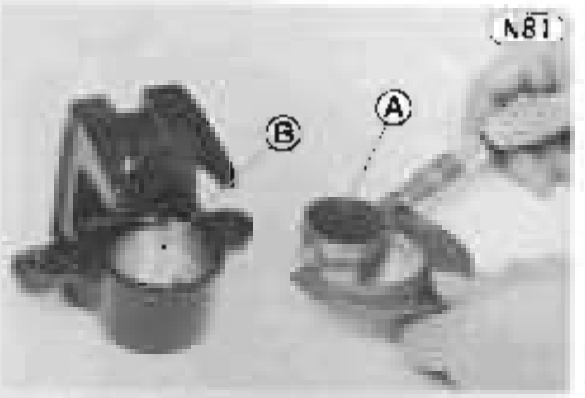


A. Dust Seal B. Dust Cover

Piston, cylinder wear

Measure the cylinder inside diameter and piston outside diameter.

Replace the cylinder and piston if they are worn out of tolerance, badly scored, or rusty.



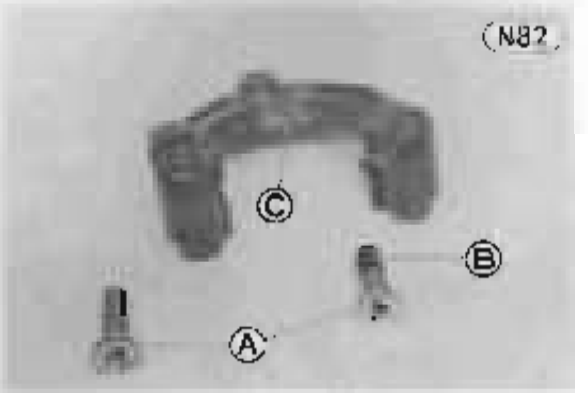
A. Piston B. Cylinder

Table N Caliper Parts

Measurement	Service Limit
Cylinder Inside Diameter	42.85 mm
Piston Outside Diameter	42.75 mm

Caliper holder shaft wear

Caliper holder shafts must slide smoothly in the caliper holder. If the shafts do not slide smoothly, one end will wear more than the other, and wear will increase and constant drag on the disc will cause brake and brake fluid temperature. Check to see if the caliper holder shafts are not badly worn or scored or rubber friction boot are not damaged. If the shafts or rubber friction boot are damaged, replace the shafts, rubber friction boot, and the caliper holder.



A. Caliper Holder Shafts C. Caliper Holder
B. Friction Boot

FRONT FORK (KZ400-H)

Refer to Pgs. 209 ~ 212 noting the following
1. Fig. N83 shows the spring lower of KZ400-H

Front Fork Spring Force (N83)

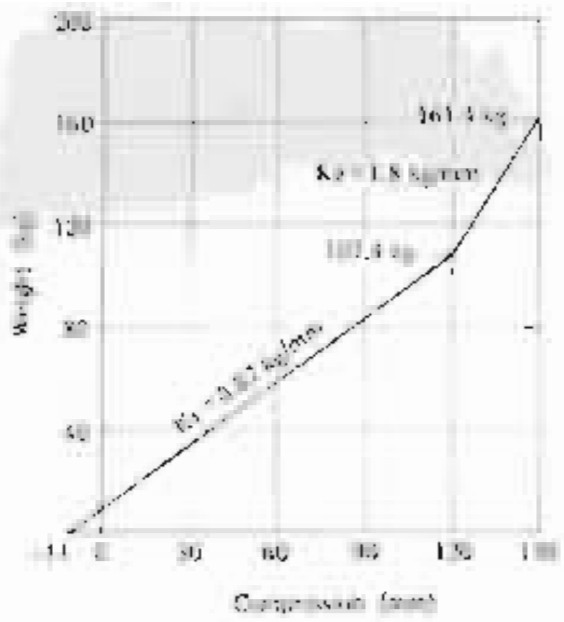


Table N34 Fork Oil

Type	Filling fork oil capacity: When changing oil	After disassembly and completely dry	Oil Level*
SAE 10W30	about 125 cc	145 – 155 cc	475 mm from top of inner tube

* : Measure the oil level with the spring being removed.

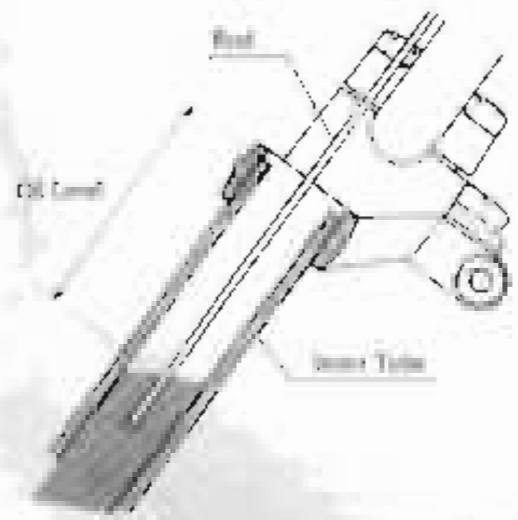
3. Table N35 shows the spring free length.

Table N35 Fork Spring Free Length

Standard	Service Limit
519.1 mm	510 mm

2. Measure the oil level as following. To check the fork oil level, first place a jack or stand under the engine so that the wheel is raised off the ground. Remove the cap plug from the inner tube, and pull out the fork spring. Insert a thin rod down into the tube and measure the distance from the top of the inner tube to the oil level. If the oil is below the correct level, add enough oil to bring it up to the proper level. Leaving care not to overfill.

Fork Oil Level (N84)

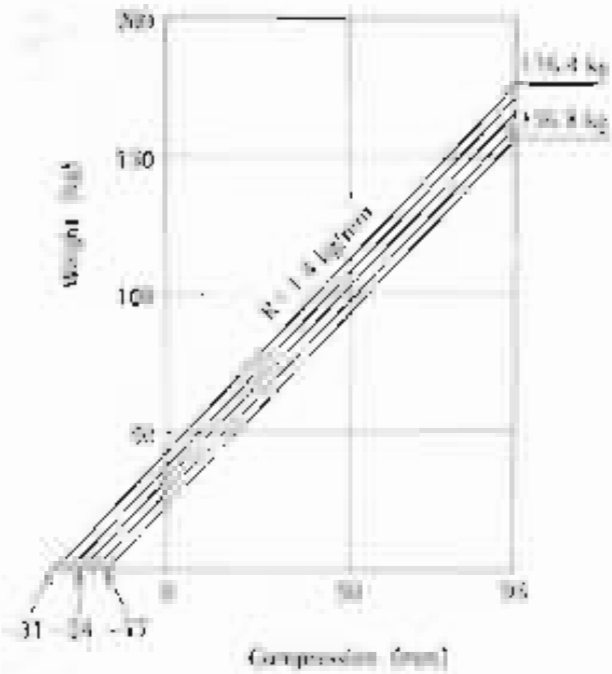


REAR SHOCK ABSORBERS (KZ400-H)

See Figs. 212 – 213, making the following:

1. Fig. N85 shows the spring force of KZ400-H

Rear Shock Absorber Spring Force (N85)



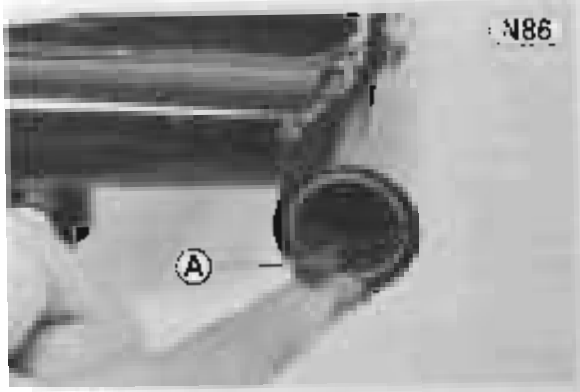
SWING ARM

Refer to Pgs. 213 ~ 214 for other service information not specifically mentioned here.

Swing arm lubrication

In order for the swing arm to function safely and wear slowly, it should be properly lubricated in accordance with the Periodic Maintenance Chart (Pg. 288). Lubrication is also necessary after disassembly.

Remove the swing arm (Pg. 145), clean out the old grease, and apply grease to the bearings.



A. Grease

IGNITION SYSTEM (KZ400-G, H)

Introduction:

The ignition system for this model is essentially a battery and coil ignition system where the battery supplies the current for the primary circuit in the ignition system. However, this system is transistorized and controls the current for the primary circuit by use of a solid-state electronic switching unit called a Darlington power transistor. The power transistor is triggered by pickup coil, and there are no mechanical breaker points, so the only periodic maintenance needed is automatic timing advancer lubrication (Pg. 288). Since contact breaker point wear (with resultant retarded ignition timing) and breaker point pitting or burning are eliminated, periodic inspection and adjustment of the ignition timing are not required.

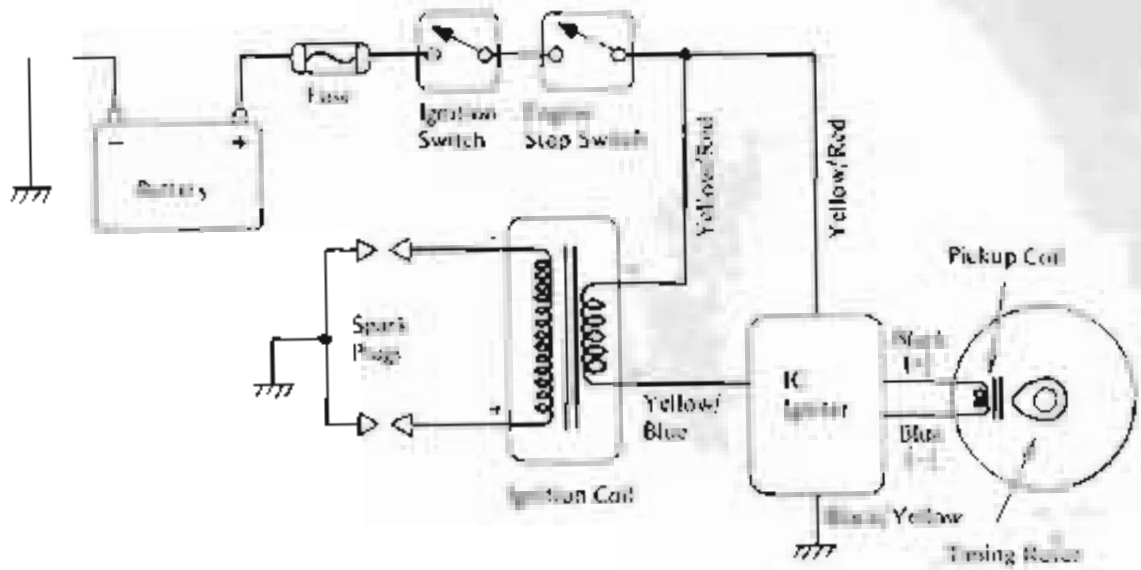
The working electrical part of the ignition system consists of a battery, a pickup coil, an IC igniter, an ignition coil, and two spark plugs. To advance the ignition timing as engine rpm rises, an automatic centrifugal type timing advancer is used. Each spark plug fires every time the piston rises. However, if a spark does not jump across the electrodes during the exhaust stroke, it has no effect on engine operation since there is no compression and no fuel to burn.

Main Component Parts:

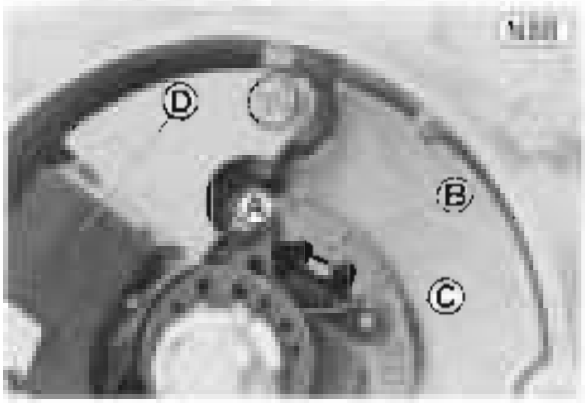
Pickup coil:

The pickup coil assembly (inductor type) resembles the standard contact breaker assembly in most respects except that the actual breaker points has been eliminated. In its place is an iron timing rotor and a magnetic pickup coil. The pickup coil assembly consists of a permanent magnet and a pickup coil on a mounting plate. The timing rotor which is attached to the timing advancer has one projection. As the projection on the timing rotor passes through the magnetic field created by the permanent magnet on the mounting plate, a magnetic field alternately builds up and collapses. Each time the projection passes a pickup coil core an electric current is developed. Each voltage pulse is conducted to the IC igniter where it is amplified and switches the Darlington

Ignition Circuit

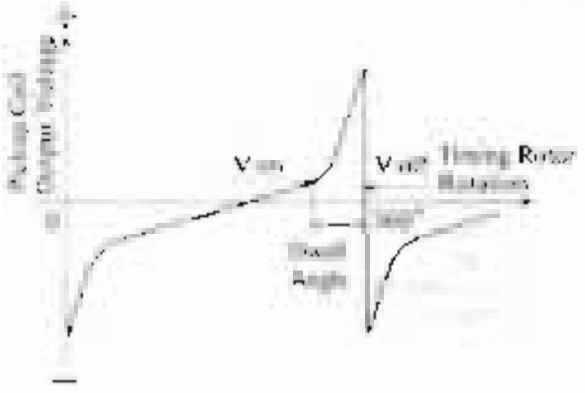


power transistor on and off to control the primary current. The output voltage of the pickup coil alternates as shown in Fig. N89.



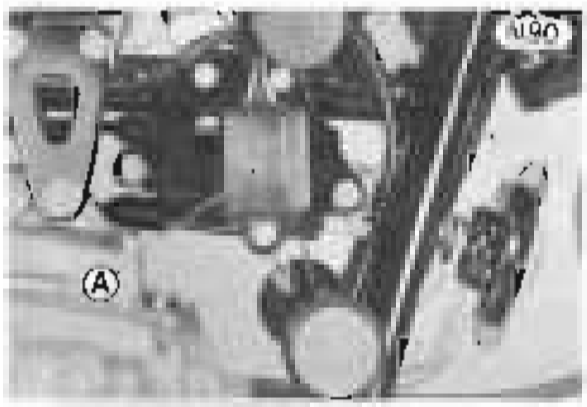
A. Permanent Magnet
B. Timing Advancer
C. Timing Rotor
D. Pickup Coil

Output Voltage of Pickup Coil (N89)



IC Igniter

The IC igniter utilizes the voltage pulse sent from the pickup coil as follows to obtain stable induced high tension voltage from low to high engine speeds.

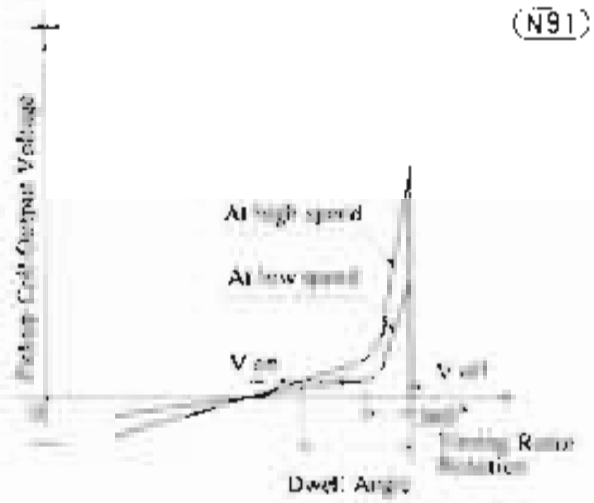


A. IC Igniter

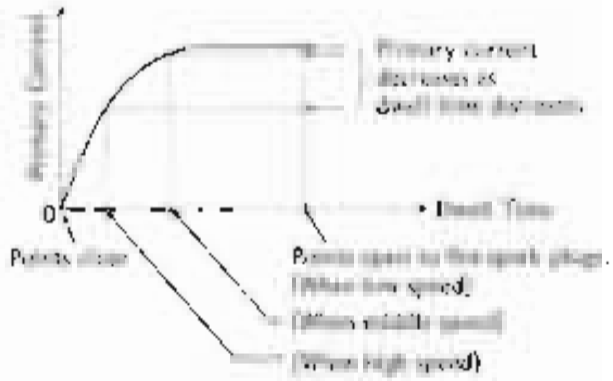
With rotation of the timing rotor the pickup coil output voltage rises, and the power transistor conducts and permits primary current to flow when the pickup coil output reaches the power voltage (Von). When the output voltage drops to the other preset voltage (Voff) after passing the voltage peak, the power transistor no longer conducts, stopping the current flow in the ignition coil primary winding and inducing a high tension voltage that jumps across the spark plug electrodes. In the case of a standard breaker point ignition system the dwell time (the time during which current can flow in the primary circuit) decreases as the engine speed increases. This results in less current flow through the ignition coil primary winding and decreased induced voltage at high rpm. Conversely the dwell time in the transistorized ignition system is kept relatively constant by virtue of the pickup coil output voltage. This is because the faster the engine runs, the higher the output voltage of the pickup coil becomes and the sooner the Von voltage is reached. Therefore the dwell angle increases to keep the dwell time long enough at high engine rpm so that the induced high voltage does not decrease.

Pickup Coil Output Voltage at Low and High Speeds

(N91)



Dwell Time and Primary Current (Breaker Point System) (N92)

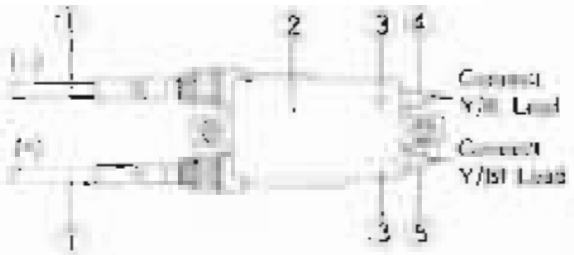


If the pickup coil stops sending signals, the primary current will be cut off preventing ignition coil and ignitor unit from overheating.

Ignition coil:

Every time both pistons rise, the ignition coil fires both spark plug simultaneously which are connected in series. The polarity of the two spark plug leads are as shown in the figure when the primary leads are connected as indicated on the ignition coil body.

Polarity of Ignition Coil (N93)



1. Spark Plug Lead
2. Ignition Coil
3. Marking
4. Primary Terminal
5. Primary Lead

Safety Instructions:

There are a number of important precautions that must be observed when servicing the transistor ignition system. Failure to observe these precautions can result in serious system damage. Learn and observe all the safety instructions listed below.

1. **Because of limited capacity of the voltage regulate circuit in the IC Igniter, do not disconnect the battery leads or any other electrical connections when the ignition switch is on, or while the engine is running. This is to prevent IC igniter damage.**
2. **Do not install the battery backwards. The negative side is grounded. This is to prevent damage to the diodes.**

Ignition System Troubleshooting Guide:

If trouble is suspected in the ignition system, check the system by the following procedure.

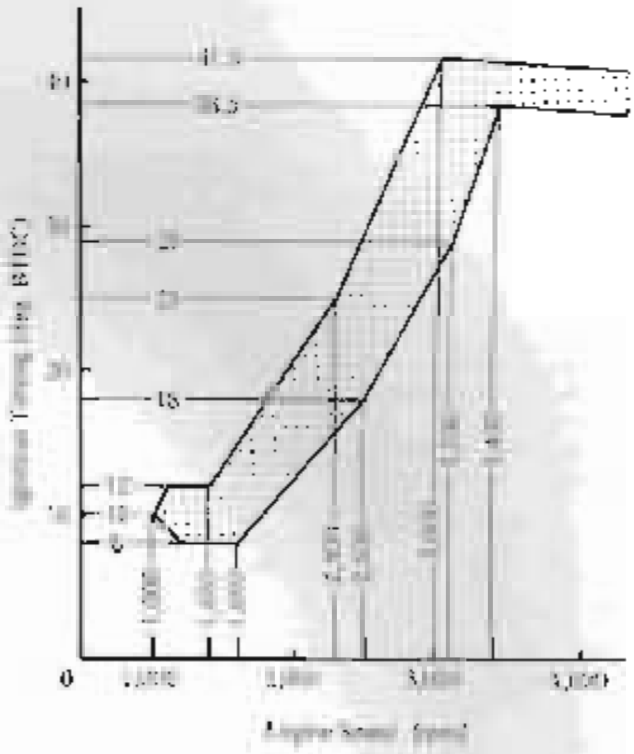
An example of troubleshooting is shown in Fig. N96. To use this chart, follow the arrows on the chart which mig a "yes" or "no" answer at each diamond-shaped step until you reach the "end". Each test procedure is explained more clearly.

Description of each testing procedure:

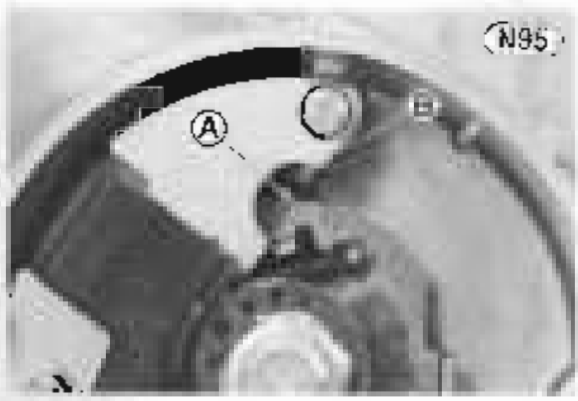
1. General ignition timing test

Check the ignition timing with a timing light for both low and high speed operation.

Ignition Timing/Engine Speed Relationship (N94)



- Connect a timing light to one of the spark plug leads in the manner prescribed by the manufacturer in order to check the ignition timing under operating conditions.
- Start the engine, and direct the timing light at the timing marks.
- At idle, the "F" mark (the line next to the letter "F") on the timing advancer must be aligned with the fixed timing mark on the right engine cover for correct low speed ignition timing (Fig. N95).



A. "F" Mark
B. Timing Mark on Right Engine Cover

- Raise the engine speed to 4,000 rpm, and check the ignition timing. At this time, the fixed timing mark should be between the advanced timing marks (a part of the parallel lines) on the timing advancer for correct high speed ignition timing (Fig. N97).

Ignition System Troubleshooting Guide (N96)

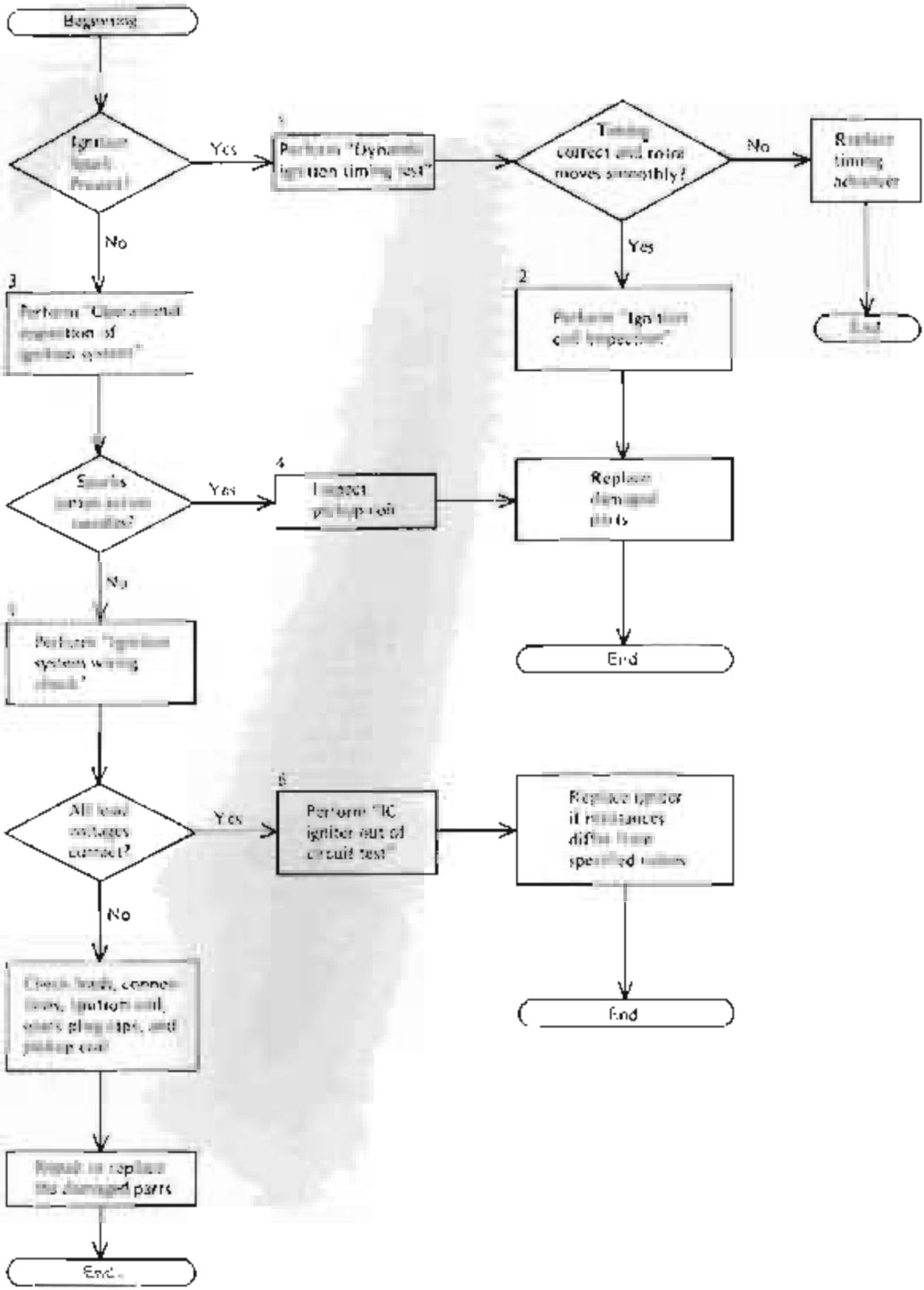
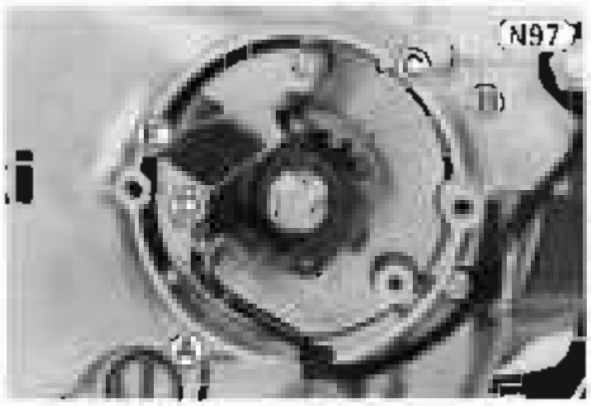


Table N36 Timing Advancing

	Engine Speed
Advance Begins	1,300 ± 200 rpm
Full Advance	3,000 ± 400 rpm

- If the timing is not correct, check that the rotor on the timing advancer turns smoothly on the shaft by hand and that no parts are visually damaged. A damaged timing advancer must be replaced with a new one.
- If the timing advancer binds on the shaft, lubricate it and re-check the ignition timing.
- If advancer lubrication does not remedy the problem, replace the advancer with a new one.



A. Timing Advancer
B. "T" Mark (not used for ignition timing test)
C. "F" Mark
D. Advanced Timing Marks
E. Timing Mark on Right Engine Cover

2. Ignition coil inspection

Measuring arcing distance

The most accurate test for determining the condition of the ignition coil is made by measuring arcing distance with the Kawasaki Electrotester.

NOTE: Since a tester other than the Kawasaki Electrotester may produce a different arcing distance, the Kawasaki Electrotester is recommended for reliable results.

- Remove the ignition coil (Fig. 239).
- Connect the ignition coil (with the spark plug caps left installed at the ends of the spark plug leads) to the Kawasaki Electrotester as shown in Fig. N98.
- Turn on the tester switches.

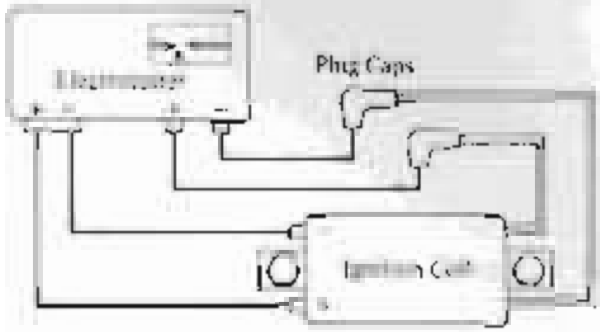
WARNING **To avoid extremely high voltage shocks, do not touch the coil or leads.**

- Gradually move the arcing distance adjusting knob from left to right (small distance to large distance) carefully in checking the arcing.
- Stop moving the knob at the point where the arcing begins to fluctuate, and note the knob position in mm. The reading should show the value in Table N37.

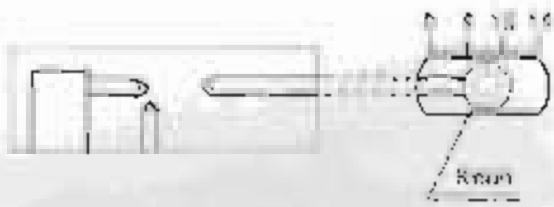
Table N37 Arcing Distance (N98)

Standard
7 mm or more

Ignition Coil Test



Arcing Distance Measurement (N99)



- If the distance reading is less than the value shown in the table, the ignition coil or spark plug caps are defective. To determine which part is defective, measure the arcing distance again with the spark plug caps removed from the ignition coil. If the arcing distance is still normal as before, the trouble is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug caps.

Measuring coil resistance

If an Electrotester is not available, the coil can be checked for a broken or badly shorted winding with an ohmmeter. However, an ohmmeter cannot detect layer shorts and shorts resulting from insulation breakdown under high voltage.

- Remove the ignition coil.
- Set the ohmmeter to the x 1 Ω range, and measure the resistance across the primary winding (+) and (–).



A. Ignition Coil
B. (+) Terminal
C. (–) Terminal

•To measure the secondary winding resistance, remove the spark plug caps from the spark plug leads.
•Set the ohmmeter to the × 1 kΩ range, and connect one ohmmeter lead to one of the spark plug leads and the other ohmmeter lead to the remaining spark plug lead.



Table N38 Ignition Coil Resistance

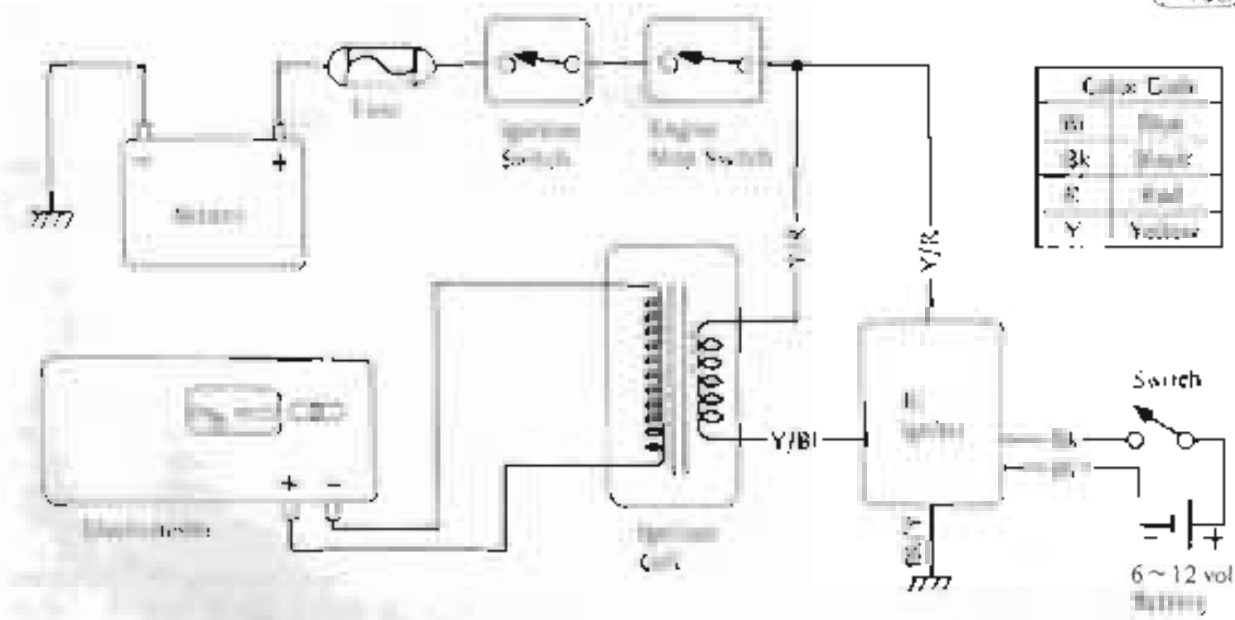
	Meter Range	Reading*
Primary Winding	× 1 Ω	1.8 ~ 2.8 Ω
Secondary Winding	× 1 kΩ	10.8 ~ 15.6 kΩ

*Measured when the coil is cold (room or atmospheric temperature).

•If the coil does not produce an adequate spark, or if either the primary or secondary winding does not have the correct resistance, replace the ignition coil.
•With the highest ohmmeter range, check the continuity between each primary winding terminal, and one spark plug lead coil (be sure there is no cap on each coil). If there is any reading, the coil is shorted and must be replaced. Also, replace the ignition coil if either spark plug lead shows visible damage.

3. Operational inspection of ignition system
•Have a DC voltage source of 6 ~ 12 volts output such as a motorcycle battery.
•Remove the fuel tank, and disconnect the 2-pin connector which connects the IC igniter and the pickup coil.
•Pull the spark plug caps off the spark plugs and connect the spark plug leads to the Electrotester in the same way as for measuring the arcing distance. For this test, the Electrotester need not be supplied with electric power (See Fig. N102).
•Turn the selecting knob to set the arcing distance to 7 mm.
•To the 2-pin connector from the IC igniter, connect the DC voltage source positive (+) lead to the black lead and the negative (–) lead to the blue lead.

Operational Inspection of Ignition System



•Turn the ignition switch to the ON position, and switch the DC voltage source repeatedly on and off.

CAUTION **Do not apply DC voltage to the IC igniter blue and black leads continuously more than 30 seconds. The primary coil current will flow during the DC voltage is applied. This overheats the ignition coil and the igniter, and could damage them.**

•When the DC voltage source is switched off, a spark should jump across the needles in the Electrotester.

4. Pickup coil inspection

•Remove the fuel tank, and disconnect the 2-pin connector which connects the pickup coil with the igniter.

•Connect the multimeter to the pickup coil leads to measure the coil resistance as shown in Table N39.



A. Pickup Coil 2-pin Connector

Table N39 Pickup Coil Resistance

Meter Range	Connections	Reading*
× 100 Ω	One meter lead → Black lead The other meter lead → Blue lead	360 ~ 540 Ω

*Measured when the coil is cold (room or atmospheric temperature).

•If there is more resistance than shown in the Table N39, the coil has an open lead and must be replace. Much less than this resistance means the coil is shorted, and must be replaced.

•Using the highest resistance range of the multimeter, measure the resistance between the pickup coil leads and chassis ground. Any meter reading less than infinity (∞) indicates a short, necessitating replacement of the pickup coil assembly.

•Visually inspect the pickup coil assembly. If the permanent magnet and coil are damaged, replace the pickup coil assembly.



A. Magnet **B. Pickup Coil**

5. Ignition system wiring check

•Reconnect all leads and connectors which were disconnected.

•Connect the multimeter to the IC igniter leads in the 2-pin and 3-pin connectors as shown in Table N40, turn on the ignition switch, and note the meter readings. Measure the lead voltages with the engine stopped.



A. Igniter 3-pin Connector
B. Igniter 2-pin Connector

Table N40 Wiring Inspection

Meter Range	Connections*	Reading
25V DC	Meter (+) → Yellow/Red or Yellow/Blue	Battery voltage
	Meter (+) → Black	0.5 ~ 1.0 V
	Meter (+) → Blue	0.8 ~ 3.0 V

* : Connect the meter (–) lead to ground.

6. IC igniter out of circuit test

- Turn off the ignition switch, and disconnect the 2-pin and 3-pin connectors from the IC igniter.
- Connect the multimeter to the igniter leads in the 2-pin and 3-pin connectors as shown in Table N41 to check the internal resistance of the igniter.

Table N41 Resistance of IC Igniter

Meter Range	Connections	Reading*
x 100 Ω	Meter (+) → Yellow/Red Meter (−) → Black/Yellow	0.3 ~ 1.2 kΩ
	Meter (+) → Black/Yellow Meter (−) → Yellow/Red	1 ~ 3 kΩ
	Meter (+) → Yellow/Blue Meter (−) → Black/Yellow	200 ~ 700 Ω
x 1 kΩ	Meter (+) → Black/Yellow Meter (−) → Yellow/Blue	∞
	Meter (+) → Blue Meter (−) → Black	30 ~ 130 kΩ
	Meter (+) → Black Meter (−) → Blue	20 ~ 70 kΩ

*: Measured with the Kawasaki Hand Tester (P/N: 57001-983). A tester other than the Kawasaki Hand Tester may show slightly different readings.

Spark Plug:

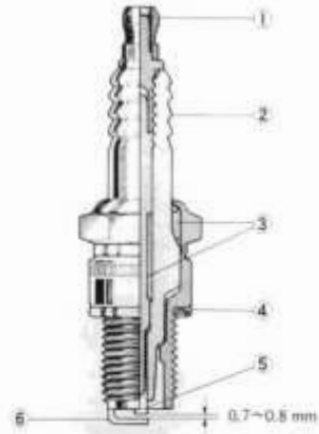
The spark plugs ignite the fuel/air mixture in the combustion chamber. To do this effectively and at the proper time, the correct spark plugs must be used, and the spark plugs must be kept clean and adjusted.

Tests have shown the plugs shown in Table N42, set to a 0.7 ~ 0.8 mm gap to be the best plug for general use.

If a plug of the wrong heat range is used, the electrodes may not hot enough to keep all the carbon burned off, but cool enough to keep from damaging the engine and the plug itself – about 400 ~ 800°C (750 ~ 1,450°F).

CAUTION **The carbon on the electrodes conducts electricity, and can short the center electrode to ground by either coating the ceramic insulator or bridging across the gap. Such a short will prevent an effective spark. Carbon build-up on the plug can also cause other troubles. It can heat up red-hot and cause preignition and knocking, which may eventually burn a hole in the top of the piston. The heat range of the spark plug functions like a thermostat for the engine. Using the wrong type of spark plug can make the engine run too hot (resulting in engine damage) or too cold (with poor performance, misfiring, and stalling). The standard plug has been selected to match the normal usage of this motorcycle in combined street and highway riding.**

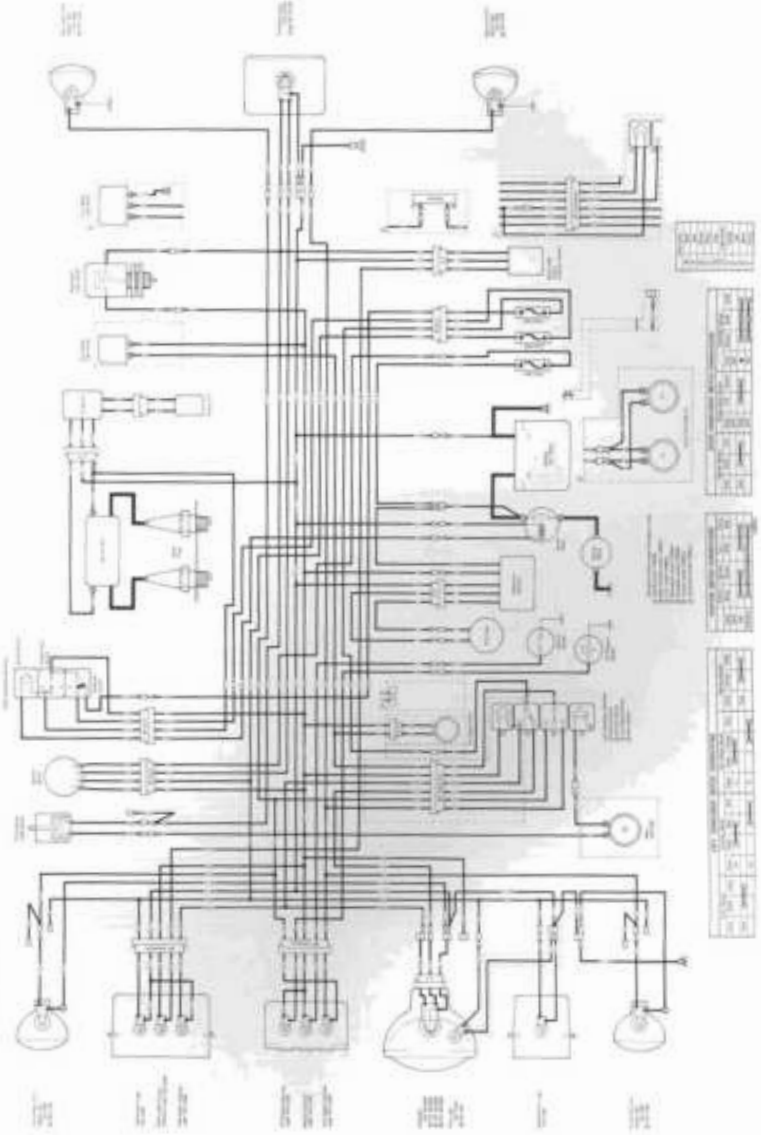
Spark Plug N106



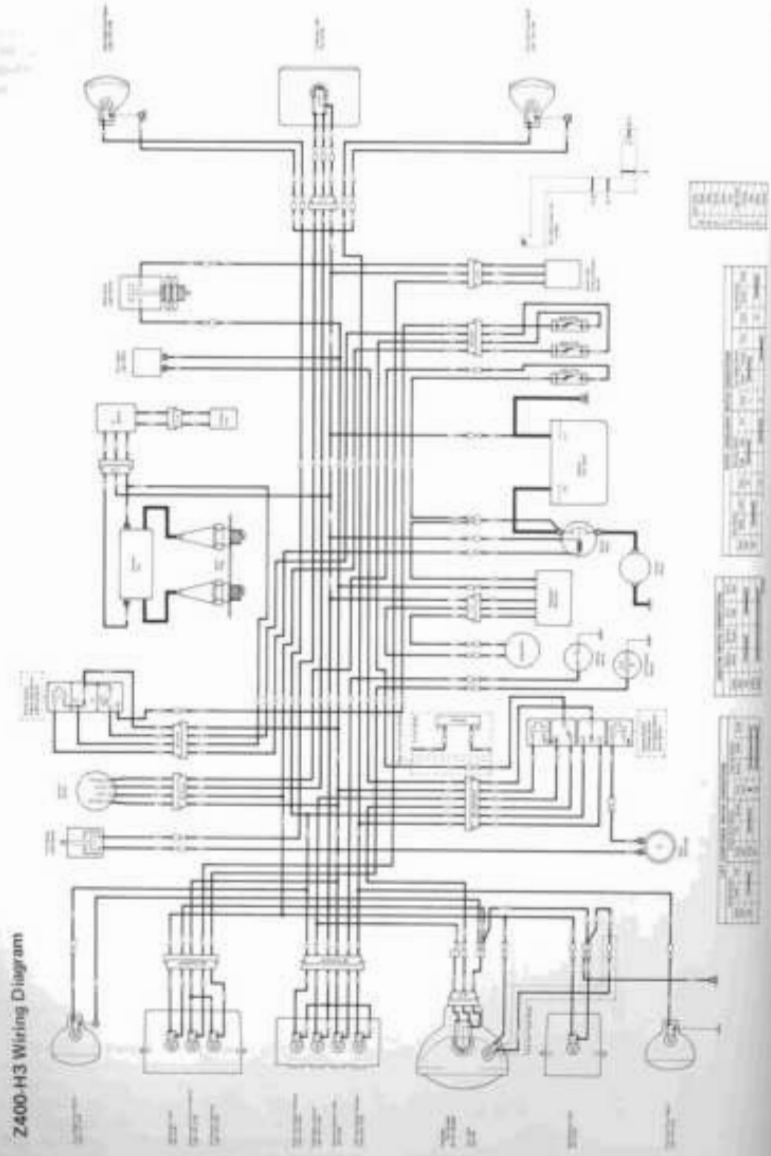
1. Terminal
2. Insulator
3. Cement
4. Gasket
5. Center Electrode
6. Side Electrode

Table N42 Spark Plug Specifications

Required Plug Threads	Riding Condition	Heat Range	Type*
Diameter: 14 mm Pitch: 1.25 mm Reach: 19 mm	Normal	Normal	NGK B7ES ND W22ES-U (Canadian model) NGK BR7ES ND W22ESR-U



Z400-G3 Wiring Diagram



Z400-H3 Wiring Diagram

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MODEL APPLICATION

Year	Model	Beginning Frame No.	Remarks
1978	KZ400-B1	K4-077801 ~	Front disc and rear drum brake system, 2-into-2 exhaust system, electric starter and kickstarter, six gear
	KZ400-C1	K4S-24701 ~	Front drum and rear drum brake system, 2-into-1 exhaust system, kickstarter only, five gears
1979	KZ400-B2	K4-099501 ~	Color and graphic changed
	KZ400-G1	K4-099501 ~	Cast-wheeled KZ400-B except front caliper, color and graphic
1980	KZ400-B3	K4-115001 ~	Kickstarter system discontinued, color and graphic changed, front caliper changed, automatic cam chain tensioner
	KZ400-G2	K4-115001 ~	Kickstarter system discontinued, automatic cam chain tensioner
1981	KZ400-B4	K4-116801 ~	...
	KZ400-G3	K4-116801 ~	Transistorized ignition system, color and graphic changed
	KZ400-H3	KZ400H-017201 ~	Stepped seat, pullback handlebar, cast wheels, and transistorized ignition system

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Part No. 99924-1003-03

Printed in Japan