Foreword

Congratulations for choosing this KAWASAKI Motorcycle, which has been developed through Kawasaki engineering to produce a light weight, high performance machine with superb handling and stability for racing and sporting use.

Your new KX400 is a highly, tuned production racer, and thus does not require tuning modification for participation in racing events. However, as with any mechanical device, proper care and maintenance are important for trouble-free operation and top performance. This guide is written to enable you to keep your KX400 properly tuned and adjusted.

First Issue : June 26, 1975 (K)

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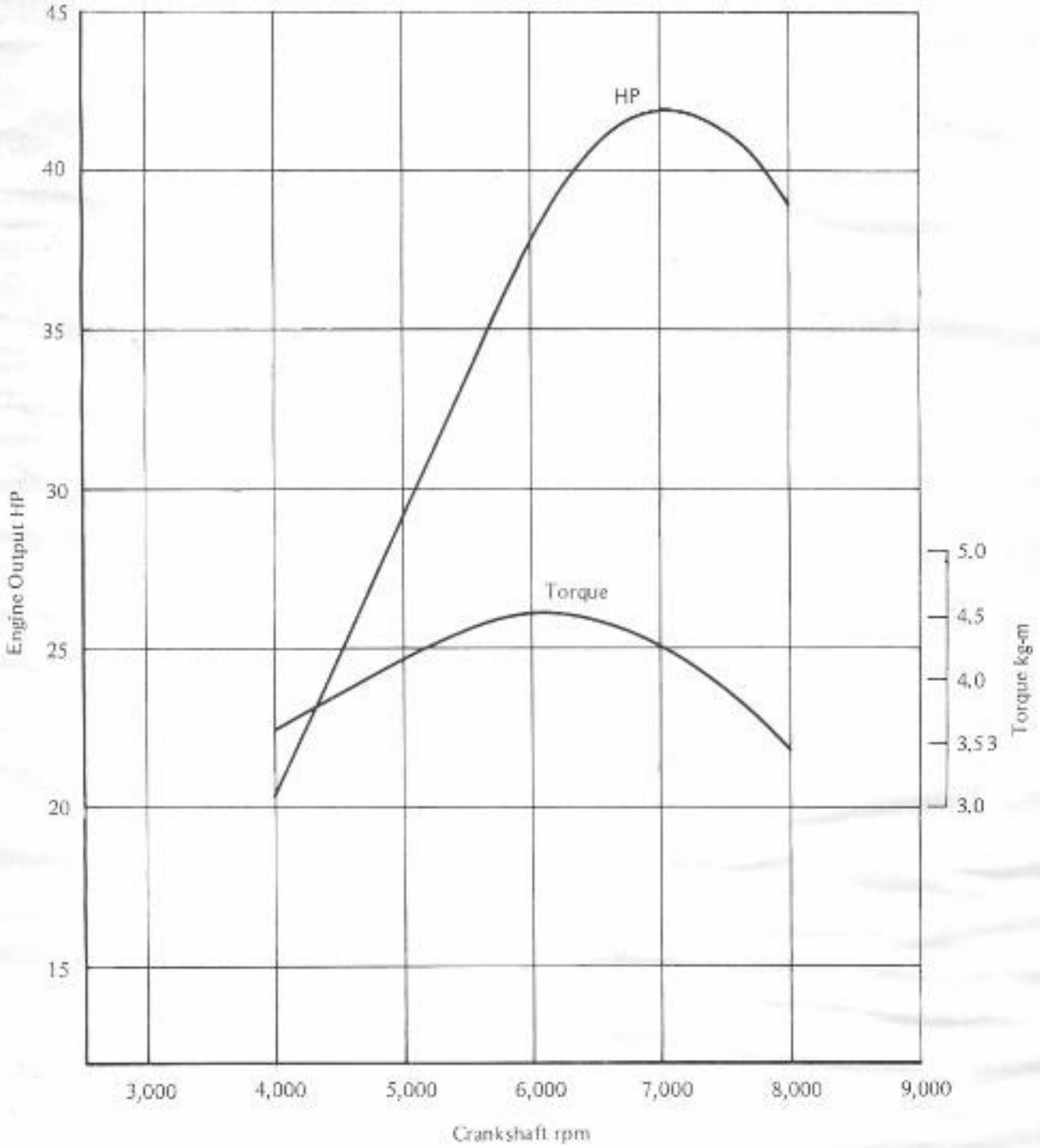
Specifications

Dimensions		
Overall Length		2,110 mm
Overall Width		940 mm
Overall Height		1,165 mm
Wheelbase		1,415 mm
Ground Clearance		230 mm
Dry Weight		106 kg
Fuel Tank Capacity		9 ℓ
Engine		
Type		2-stroke, single cylinder, piston valve
Bore and Stroke		82.0 x 76.0 mm
Displacement		401 cc
Compression Ratio		6.5:1
Port Timing		
Inlet	Open	BTDC 76°
	Close	ATDC 76°
Scavenging	Open	BBDC 63°30'
	Close	ABDC 63°30'
Exhaust	Open	BBDC 90°30'
	Close	ABDC 90°30'
Max. Horsepower		42 HP @7,000 rpm
Max. Torque		4.5 kg-m (32.5 ft-lbs) @6,000 rpm
Carburetor		Mikuni VM36SS
Lubrication System		Petrol mix 20:1
Transmission Oil Type		SAE 10W30 or 10W40
Transmission Oil Capacity		0.95 ℓ (1.0 US qt)
Starting System		Primary kick
Ignition System		Electronic CDI
Ignition Timing		23° BTDC @6,000 rpm
Spark Plug		NGK B9EV
Transmission		
Type		5 speed, constant mesh, return shift
Clutch		Wet, multi-disc
Gear Ratios:	1st	2.50 (25/10)
	2nd	1.77 (23/13)
	3rd	1.40 (21/15)
	4th	1.19 (19/16)
	5th	1.06 (18/17)
Primary Reduction Ratio		2.52 (58/23)
Final Reudction Ratio		3.07 (46/15)
Overall Drive Ratio		8.19 (5th)
Frame		
Type		Tubular, single down tube
Steering Angle		50° to either side
Castor		59°
Trail		142 mm
Tire Size:	Front	3.00-21 4PR
	Rear	4.60-18 4PR
Suspension:	Front	Telescopic fork
	Rear	Swing arm
Suspension Stroke:	Front	195 mm
	Rear	100 mm
Front Fork Oil (per shock absorber)		SAE 10W 224 cc
Brake:	Front	140 x 28 mm
	Rear	150 x 28 mm

Specifications subject to change without notice.

Engine Performance Curves



General Information

BREAK-IN

To obtain the proper operating clearances in the engine and transmission that are necessary for smooth engine performance, a brief break-in procedure must be carried out. For the first hour of operation, run the engine at low and moderate rpm.

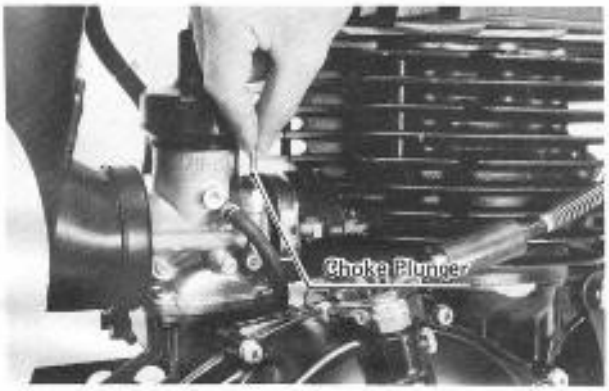
- Start the engine, and let it run at idle until the engine is thoroughly warmed up. Race the engine slightly, but never open to full throttle.
- Next, move off and run at half throttle.
- Occasionally stop and make a general inspection. Check bolt and nut tightness. In particular, check and, if necessary, adjust chain slack and spoke tightness. Also, check the condition of the spark plug. If it is excessively black or sooty, change to the lower heat range B8EV spark plug for the remainder of the break-in.
- After the break-in procedure has been properly carried out, the motorcycle is ready for regular operation. However, since recklessly high rpm will lead to engine trouble, take care to use the necessary skill and technique in operating the motorcycle in the power band and rpm range for which it was designed.

NOTE: After break-in, switch back to the standard B9EV spark plug, and change the transmission oil.

ENGINE STARTING

Cold Engine:

- Open the fuel tap.
- Pull up the choke plunger.



- Leave the throttle grip fully closed.
- Kick the engine over strongly.
- Wait until the engine warms up, and close the choke plunger.

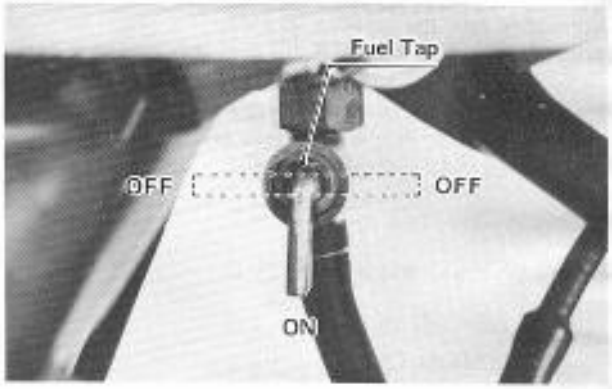
Warm Engine:

- Do not use the choke plunger.
- Open the throttle grip slightly, and then kick the engine over.

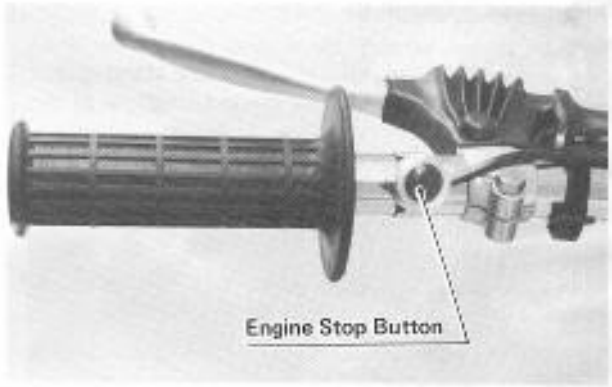
NOTE: Since the starting system is a primary kick type, the engine can be started even if the transmission is in any gear by pulling in the clutch lever and kicking the engine over.

ENGINE STOPPING

- Shift the transmission into neutral.
- Close the fuel tap.

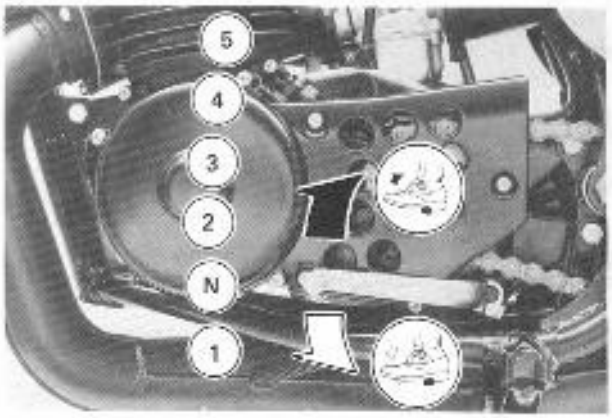


- After racing the engine slightly, release the throttle or push the engine stop button to stop the engine.



TRANSMISSION

The transmission is a 5 speed, return shift type. 1st is at the bottom end of the shifting range and 5th is at the top. When the transmission is in neutral, push down the shift pedal to reach 1st. Next, shift to 2nd, 3rd, 4th, and 5th gears by repeatedly lift up the shift pedal.



FUEL

The fuel is a mixture of gasoline and oil.

Gasoline	High Octane Gasoline
Recommended Oil	Two Stroke Racing Oil
Mixture Ratio	20:1

•Thoroughly mix the gasoline and oil.

NOTES: 1. The lubricative quality of this mixture deteriorates rapidly; use a fresh mixture for each day of operation.
2. Do not mix a vegetable oil with a mineral oil.

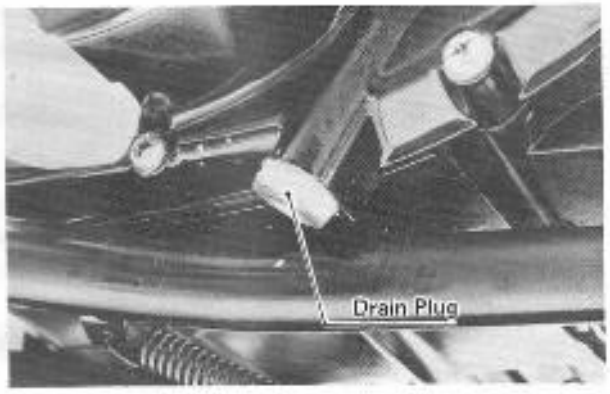
TRANSMISSION OIL

Oil Change

Change the oil immediately after break-in and after every 5th race.

•If the engine is not already warm, warm the engine up thoroughly so that the oil will flow freely and drain completely.

•Place an oil pan beneath the engine, remove the drain plug, and position the vehicle off its side stand so that it is fully perpendicular to the ground to allow all the oil to drain out.



•Replace the drain plug, remove the dipstick, and slowly pour in 950 cc (1.0 US qt) of fresh SAE 10W30 or 10W40 oil.

•After 2 ~ 3 minutes, check the oil level to make sure that the oil level is correct.

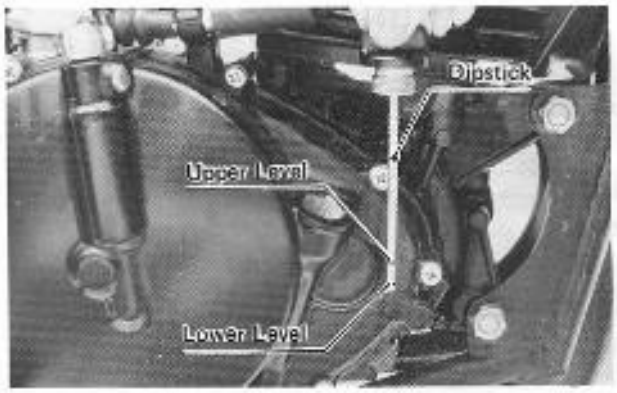
•Replace the dipstick.

Oil Level

Check the oil level with the dipstick on the oil filler plug. When checking the oil, have the vehicle off its side stand so that it is fully perpendicular to the ground.

•Remove the dipstick, and wipe off any oil on the end.

•Insert the dipstick without screwing it in, and pull it back out. The oil should be above the lower and below the upper dipstick marks.



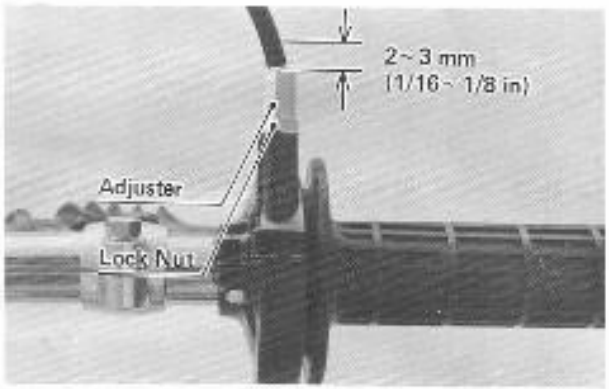
•If there is not enough oil, add oil until the level reaches the upper dipstick mark.

•Replace the dipstick, making sure that the O ring is in place that the dipstick is fully screwed in.

Adjustment

THROTTLE CABLE

- Lightly move the outer cable up and down the distance which it moves without resistance. This distance (play) should be 2~3 mm ($\frac{1}{16}$~$\frac{1}{8}$ in).
- If the play is incorrect, loosen the lock nut, turn the adjuster to obtain the correct amount of play, and tighten the lock nut.

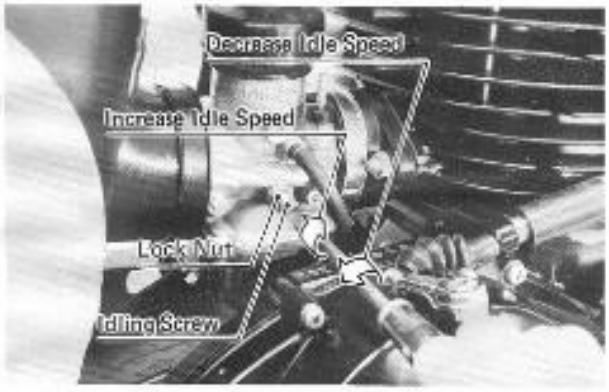


CARBURETOR

Idling adjustment

The idling adjustment is made by turning the idling screw. Turning the screw clockwise increases idling speed by raising the height of the throttle valve at zero throttle. Turning the screw counterclockwise decreases idling speed. Ordinarily for motocross the idling screw is backed out so that the engine stops at zero throttle when the machine is not in motion.

- Thoroughly warm up the engine.
- Loosen the lock nut, and turn the idling screw to obtain the desired idling speed. If no idling is desired, turn out the screw until the engine stops.
- Tighten the lock nut.

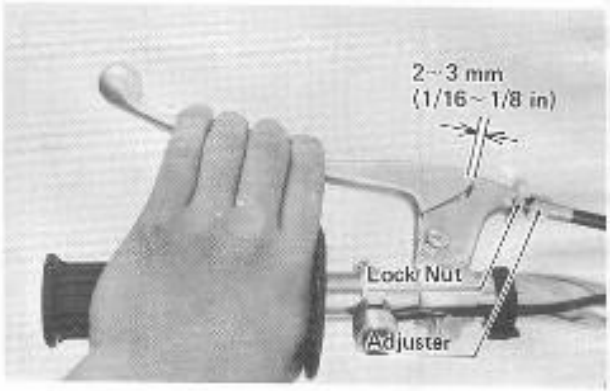


CLUTCH

Proper clutch play is a 2~3 mm ($\frac{1}{16}$~$\frac{1}{8}$ in) of inner cable travel before the cable begins to disengage the clutch. This play increases with cable stretch and friction plate wear necessitating clutch adjustment.

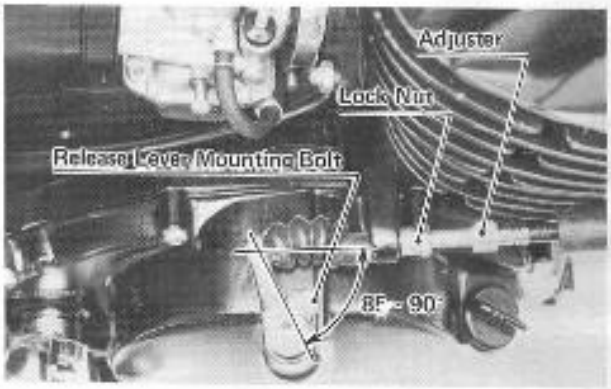
When lever play has become excessive, adjust it as follows:

- Loosen the lock nut, screw out the adjuster at the clutch lever to obtain the proper play, and retighten the lock nut.



If the proper amount of play cannot be obtained with the adjuster at the clutch lever, adjust the cable adjuster of the lower end of the clutch cable in following manner.

- To give the inner cable play, loosen the lock nut at the upper end and the lock nut at the lower end of the clutch cable, and screw in the adjusters.
- Remove the release lever mounting bolt, and remove the release lever from the release shaft.
- Replace the release lever at a new position on the release shaft so that the angle between the release lever and the cable will be 85~90°. Tighten the mounting bolt.



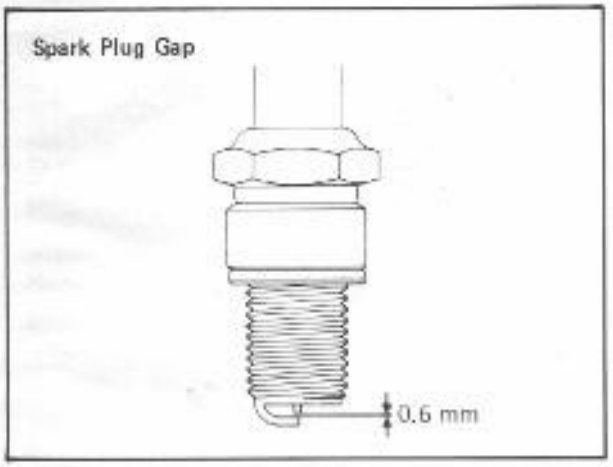
- Set the adjuster at the lower end of the cable so that there will be 2~3 mm ($\frac{1}{16}$~$\frac{1}{8}$ in) of play at the clutch lever, and then tighten the lock nut.
- Tighten the lock nut on the adjuster at the clutch lever.

SPARK PLUG

Inspection of the spark plug is the simpliest means of judging the condition of the engine. From inspection of the spark plug, a spark plug of the proper heat range can be determined and the carburetor settings altered.

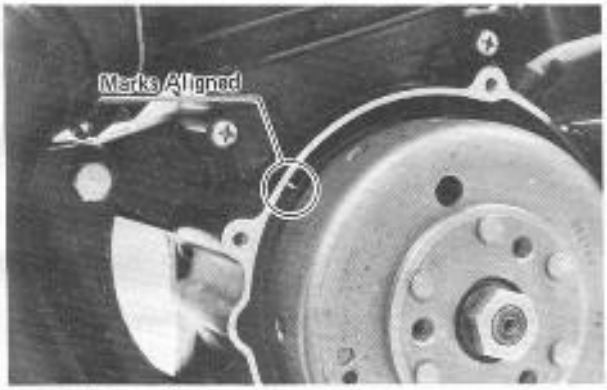
The standard spark plug is the long reach NGK B9EV. If the spark plug is burned to a light brown color, the correct plug is being used. However, if the plug becomes black, switch to the hotter B8EV plug; if the plug is burned white, switch to the colder B10EV.

The proper spark plug gap is 0.6 mm. If the gap is incorrect, bend the outer electrode to obtain the proper gap.



IGNITION TIMING

Because CDI ignition is used on this motorcycle, the ignition timing should never require adjustment unless the magneto base is incorrectly installed during engine reassembly. However, if there is any doubt as to the timing, remove the magneto cover, and check to see whether or not the magneto base timing mark is aligned with the crankcase timing mark.



If the marks are not aligned, proceed as follows:

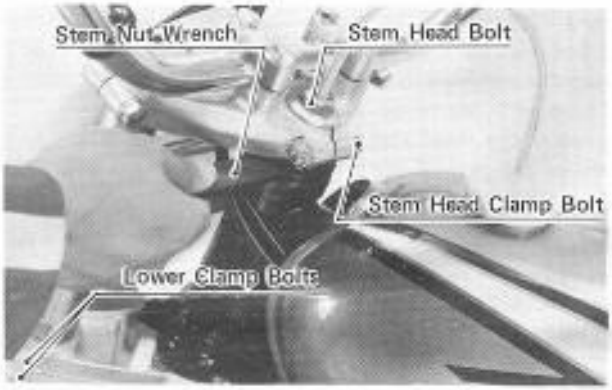
- Remove the right engine cover.
- Install the primary gear holder (special tool).
- Remove the flywheel magneto nut.
- Using the magneto puller (special tool), remove the flywheel, and then the woodruff key.
- Loosen the magneto base screws (3), shift the position of the base so that the marks are aligned, and tighten the screws securely.

STEERING

The steering must be adjusted so that the handlebar will turn freely but not have excessive play.

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

- Place a stand under the frame to raise the front wheel off the ground.
- Loosen the clamp bolt at the top of the steering stem.
- Loosen the steering stem head bolt and the front fork lower clamp bolts (4).
- Turn the steering stem lock nut with a stem nut wrench to obtain the proper adjustment.



- Tighten the steering stem head bolt and the clamp bolt at the top of the steering stem.
- Tighten the front fork lower clamp bolts (4).
- Check the steering again, and readjust it if necessary.

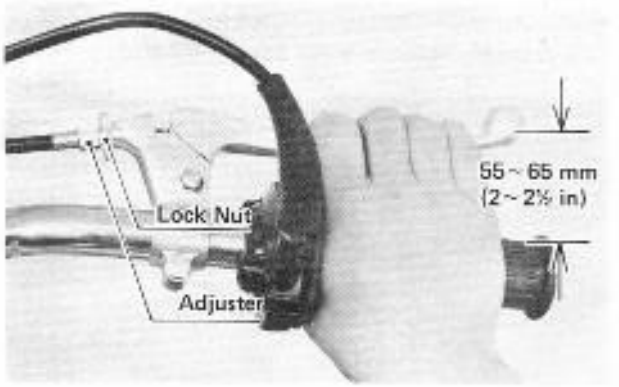
BRAKES

Front Brake

The front brake is adjusted so that when the brake is fully applied there is 55 ~ 65 mm (2 ~ 2⅝ in) of space left between the throttle grip and the end of the brake lever.

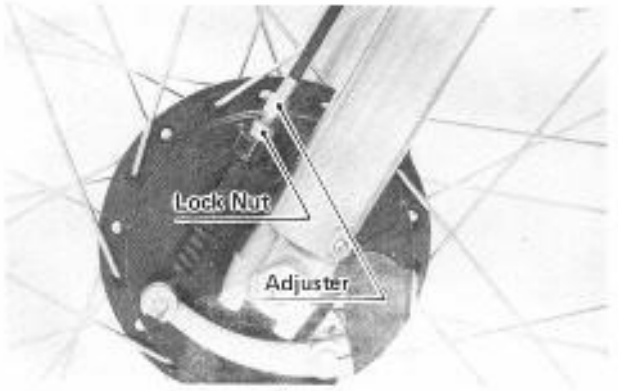
If the lever play is incorrect, first try adjusting the play at the brake lever.

•Loosen the lock nut at the front brake lever, turn the adjuster to obtain the proper amount of play, and tighten the lock nut.



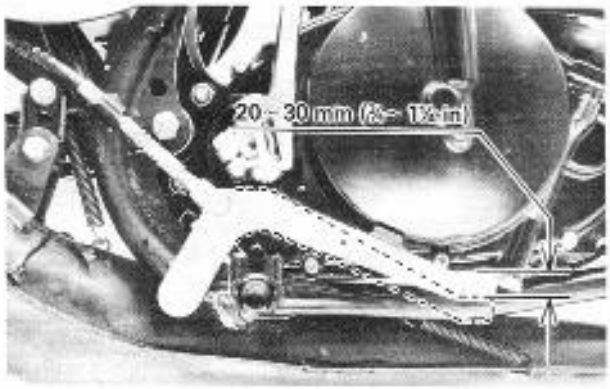
If the adjuster at the brake lever has reached its limit, adjust the cable with the adjuster on the lower end of the cable.

•Loosen the lock nut at the front brake lever, screw the adjuster at the lever fully in, and tighten the lock nut.
•Loosen the lock nut for the adjuster at the lower end of the cable, turn the adjuster to obtain the proper amount of play, and tighten the lock nut.

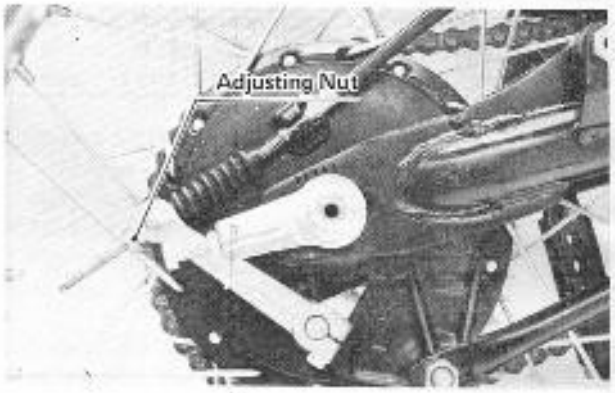


Rear Brake

Adjust the rear brake cable with the adjusting nut at the rear of the brake cable so that the brake pedal has 20 ~ 30 mm (¾ ~ 1¼ in) of travel from the rest position to the fully applied postiion.

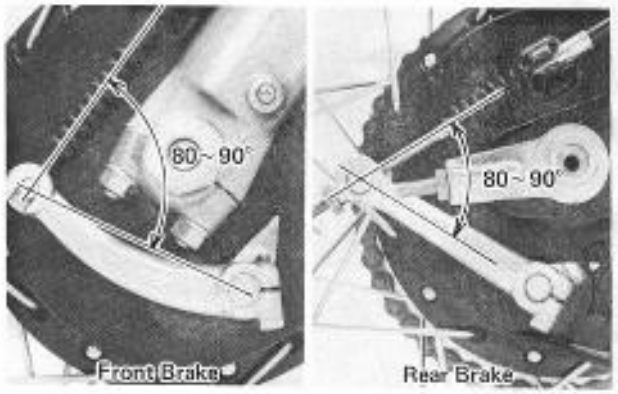


•Turn the adjusting nut at the rear of the brake cable to obtain the proper amount of play.



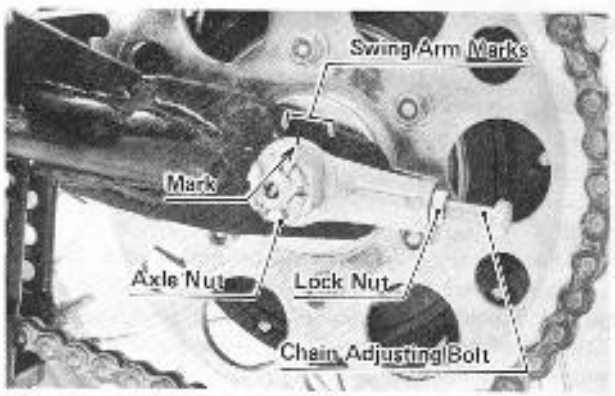
Cam Lever Angle

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

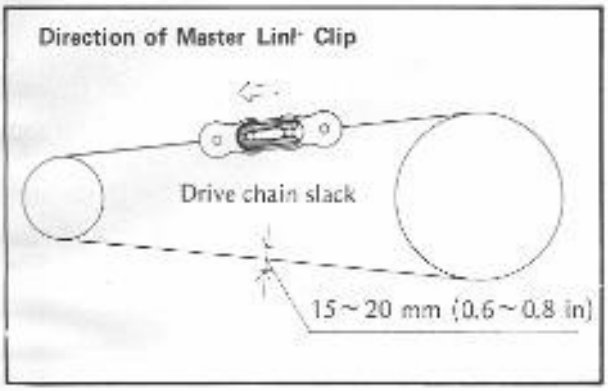


DRIVE CHAIN

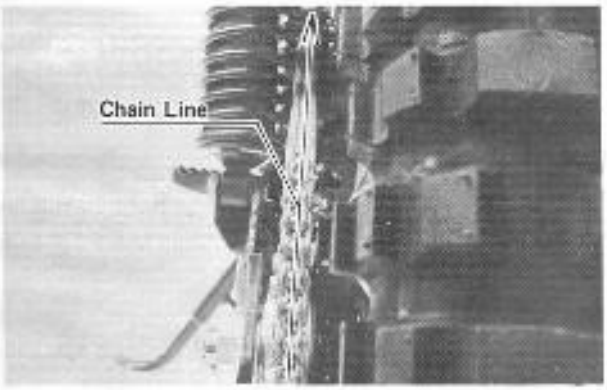
•Place a stand under the frame to raise the rear wheel off the ground.
•Loosen the torque link nut.
•Remove the cotter pin, and loosen the axle nut.
•Loosen both chain adjuster lock nut.



•With the chain adjusters, adjust the chain slack to 15 ~ 20 mm (5/8 ~ 3/4 in). Adjust so that the mark on the left chain adjuster comes to the same swing arm mark that the right chain adjuster mark comes to.



•Tighten the chain adjuster lock nuts and the axle nut.
•Rotate the rear wheel and sight along the drive chain from the rear to check wheel alignement.



•Insert a new cotter pin into the axle, and tighten the torque link nut.
•Check the rear brake pedal travel.

NOTE: In wet and muddy conditions, mud sticks to the chain and sprockets resulting in an overly tight chain, and the chain may break. To prevent this, adjust the chain to 30 ~ 40 mm (1 1/4 ~ 1 1/2 in) of slack whenever necessary.

REAR SHOCK ABSORBERS

Since the rear shock absorbers are De Carbon-type (sealed in nitrogen) and can not be disassembled, only external checks of operation are necessary.

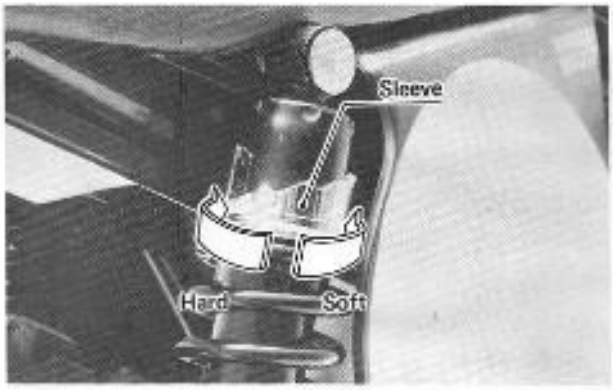
WARNING: 1) Do not throw the shock absorbers into fire when discarding them. They contain nitrogen gas under pressure and will explode if exposed to excessive heat.

2) For safety, a hole should be drilled into the side of each shock absorber to release the gas pressure before the unit is discarded. Wear safety glasses when drilling the hole, as the gas may blow out bits of drilled metal when the hole opens.

Check that the rear shock absorbers function properly and make sure that the mountings are tight.

The rear shock absorbers may be adjusted to one of 5 positions to suit rider preference and course conditions.

•Turn the adjusting sleeve on each shock absorber to the desired position with the lever.



NOTE: Adjust both rear shock absorbers to the same position.

Disassembly

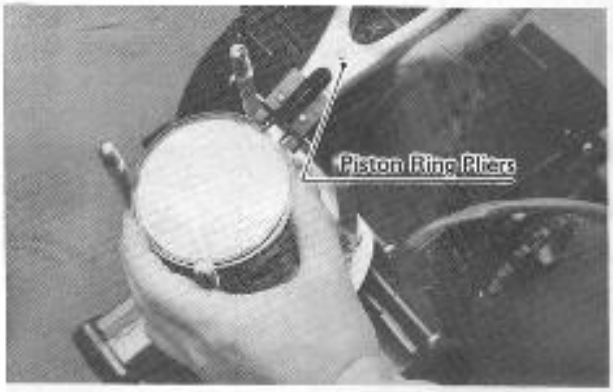
ENGINE REMOVAL

- Put the transmission into the neutral.
- Remove the expansion chamber springs (5).
- Remove the mounting bolt and the expansion chamber.
- Drain the transmission oil.
- Make certain the fuel tap is closed, and pull off the fuel hose.
- Remove the seat mounting bolts (2), lock washers, flat washers, and the seat.
- Remove the fuel tank mounting bolts (2), lock washers, flat washers, and tank retainer band, and then remove the fuel tank.
- Remove the cylinder head stay bolts (3), lock washers, flat washers, and cylinder head stays (2).
- Loosen the lock nuts at both ends of the clutch cable, and screw in the adjusters.
- Remove the clutch release lever mounting bolt, and then remove the clutch release lever together with the cable.
- Loosen the rear brake adjusting nut, and remove the brake pedal spring. Remove the brake pedal bolt and lock washer, cap washer, and take the seal from each side of the pedal.
- Remove the chain cover screws (3) and take off the chain cover.
- Remove the shift pedal bolt and shift pedal.
- Undo the clip carefully from the drive chain master link using pliers, remove the master link, and free the chain from the engine sprocket.
- Remove the spark plug lead from the spark plug.
- Remove the strap that holds the wiring harness to the frame, and disconnect the harness at the connector.
- Remove the engine mounting bolts (4).
- Lifting up on the rear part of the engine, move the engine a little forward and then out the right side of the frame.

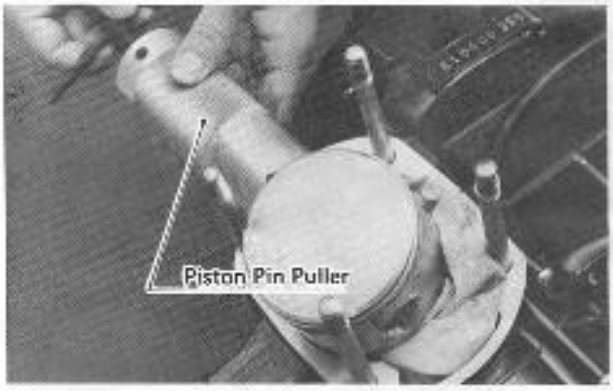
NOTE: Engine installation is the reverse of engine removal.

ENGINE DISASSEMBLY

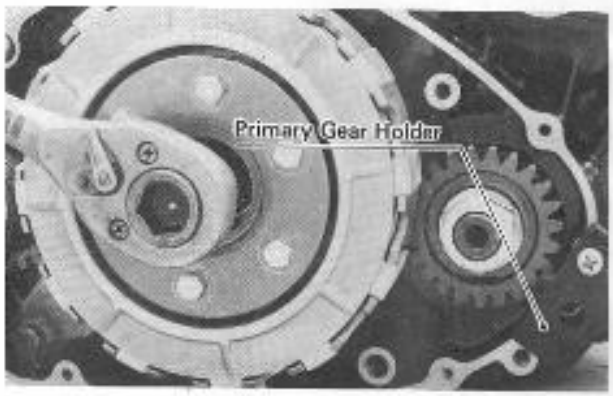
- Remove the kick pedal bolt (14 mm) and kick pedal.
- Remove the spark plug.
- Remove the cylinder head bolts (19 mm, 13 mm), and take off the cylinder head and head gasket.
- Remove the cylinder and cylinder base gasket.
- Wrap a clean cloth around the connecting rod at the crankcase opening so that no parts or dirt will fall into the crankcase.
- Remove the piston rings (2).



- Remove one of the piston pin snap rings with needle nose pliers.
- Using the piston pin puller (special tool), remove the piston pin from the side the snap ring was removed.



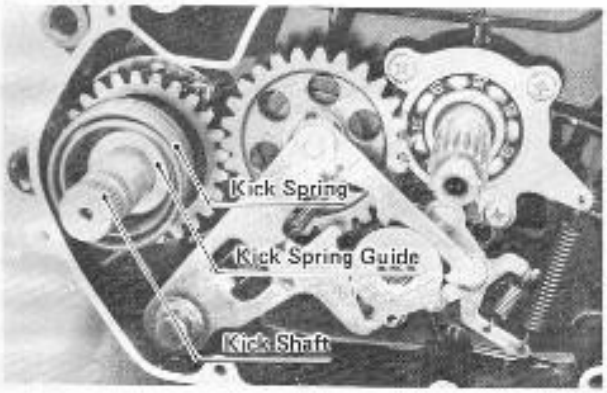
- Remove the piston and connecting rod small end needle bearing.
- Take off the right engine cover and gasket. The spring plate pusher may fall out when the cover comes off.
- Using the gear holder (special tool), remove the clutch hub nut, toothed washer, and lock washer. Leave the gear holder in place.



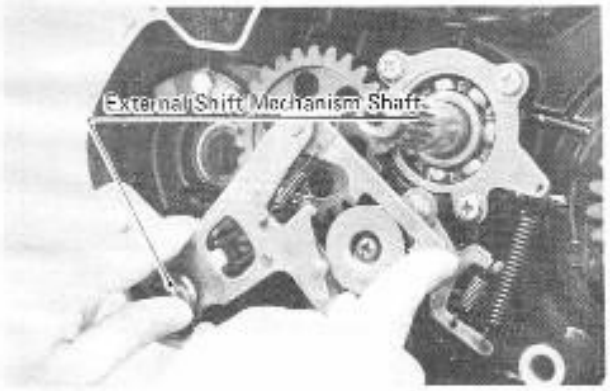
- Remove the clutch spring bolts (6), spring plate, and clutch springs (6).

12 DISASSEMBLY

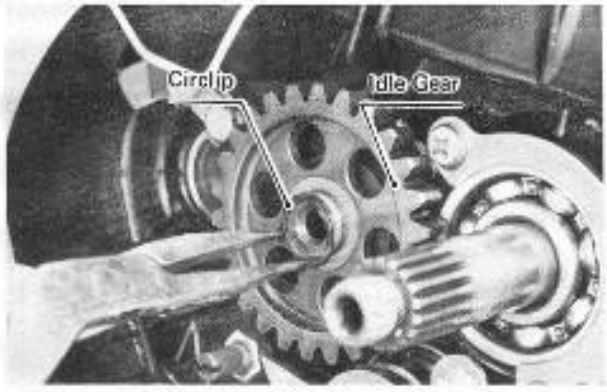
- Remove the clutch plates and hub assembly.
- Remove the thrust washer and clutch housing.
- Remove the kick starter pinion, bushing, and thrust washer.
- Pull out the kick spring, kick spring guide, kick shaft, and thrust washer.



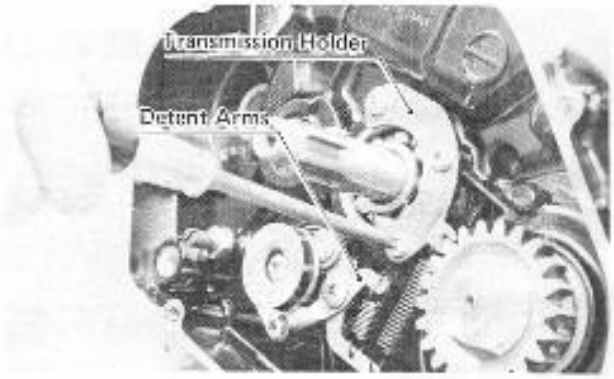
- Move the external shift mechanism pawls out of position on the end of the shift drum, and pull the external shift mechanism shaft and its collar out of the crankcase.



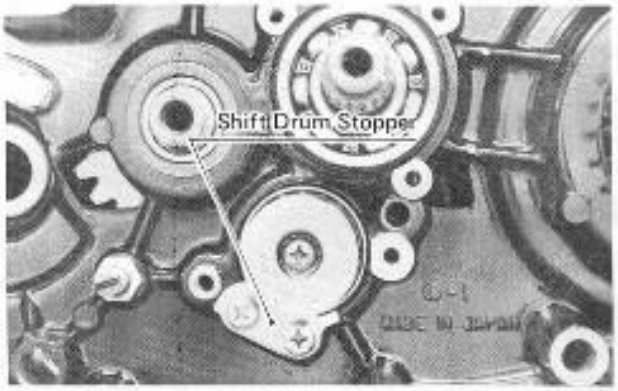
- Remove the circlip, thrust washer, and idle gear.



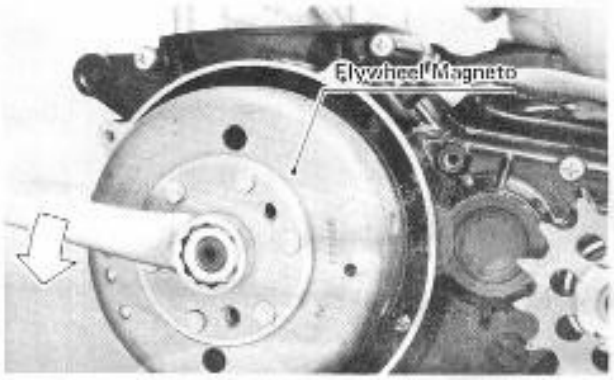
- Remove the transmission holder screws (3), holder, and spring.
- Remove the detent arm screw, and then the arms and spring.
- Remove the over shift stop lever bolt, lever, and spring.



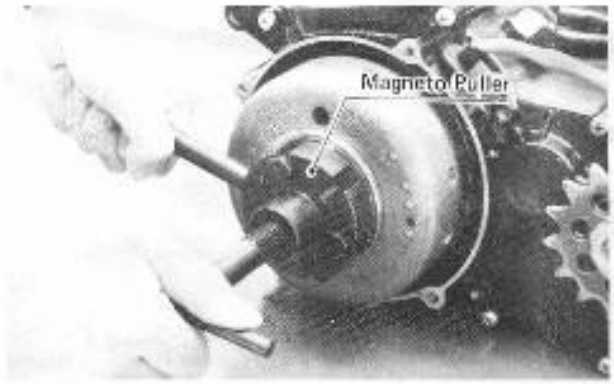
- Remove the shift drum stopper screws (2) and stopper.



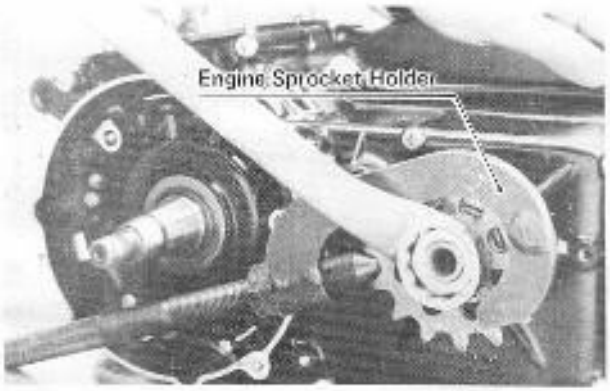
- Remove the magneto cover screws (3), magneto cover, and cover gasket.
- Using the gear holder (special tool), remove the flywheel magneto mounting nut (22 mm), lock washer and flat washer.



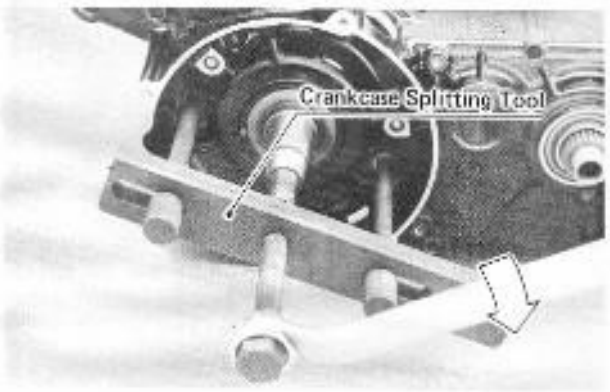
- Using the magneto puller (special tool), remove the flywheel magneto, and then take out the woodruff key.



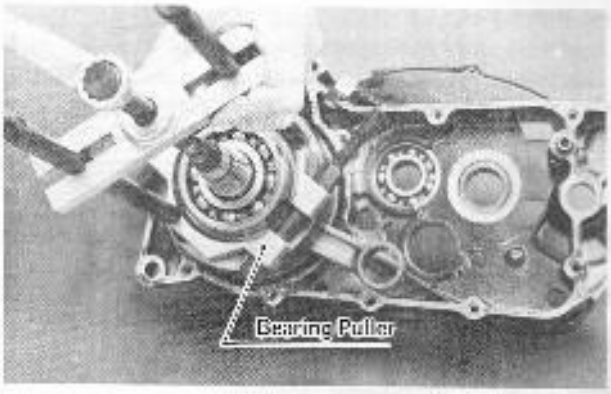
- Remove the magneto base screws (3), lock washers, flat washers and magneto base.
- Apply a little oil to the magneto output leads if necessary, and pull them through the magneto side as far as they will go.
- To free the magneto output leads, push the grommet carefully out of the crankcase.
- Straighten the bent portion of the engine sprocket washer.
- Using the engine sprocket holder (special tool), remove the engine sprocekt nut, tooth washer, engine sprocket, collar and O ring.



- Remove all the crankcase screws (12).
- Split the crankcase with the crankcase splitting tool (special tool). Pry open the rear of the crankcase with a screwdriver, so that the crankcase will come apart more easily. After the crankcase halves have been separated split, the transmission gears will remain in the left crankcase half.



- Remove the breather, breather tube, and grommet.
- Straighten the bent portion of the primary gear washer, and remove the nut, washer, and then finally remove the primary gear holder (special tool).
- Pull off the primary gear, and remove the woodruff key.
- Remove the crankshaft collar and O ring.
- Remove the crankshaft bearing from the crankshaft using the bearing puller (special tool).



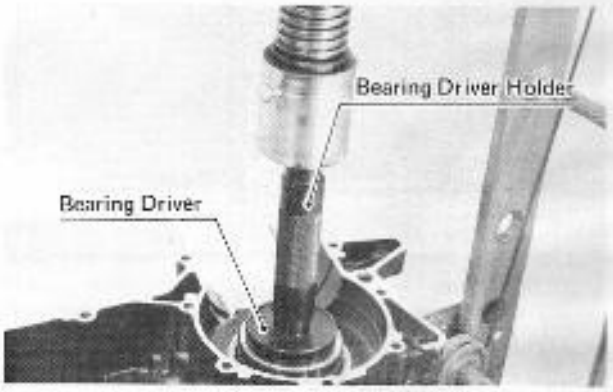
- Striking the end of the crankshaft with a mallet, remove the crankshaft from the right crankcase half.

NOTE: The bearing in the left side of the crankcase does not need to be removed unless it is worn or damaged, in which case it must be replaced.

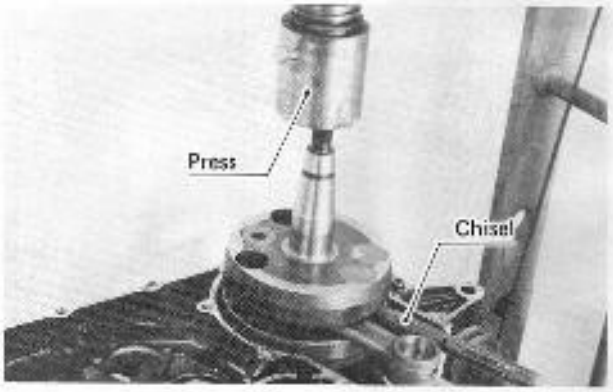
- Take out the shift rods (2) and then the shift forks (3).
- Remove the shift drum, output and drive shaft assemblies.

ENGINE ASSEMBLY

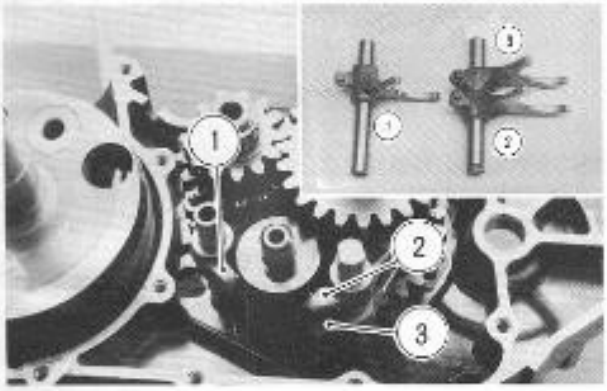
- Clean the mating surfaces of the crankcase halves.
- Insert a chisel or wedge between the crankshaft flywheels opposite the connecting rod big end to protect, the alignment of the flywheels as shown in the illustration.
- Using a press and the bearing driver and driver holder (special tools), press the left crankcase bearing into the left crankcase half.



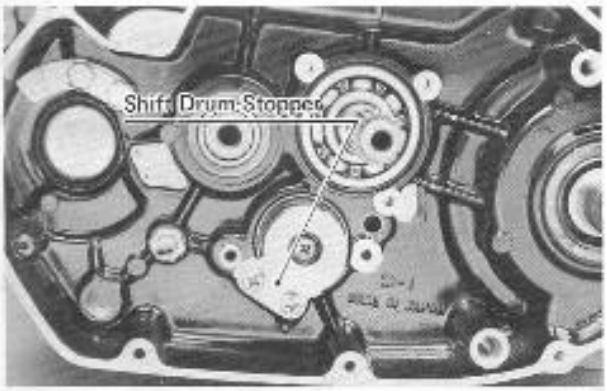
- Install the crankshaft in the right crankcase half using a press.



•Mesh the output shaft gears and drive shaft gears together, and fit this assembly together with the shift drum into the right crankcase half.
•Fit each shift fork into the groove on its gears, and each shift fork guide pin into its shift drum groove. Be sure that the shift forks are in the correct locations.

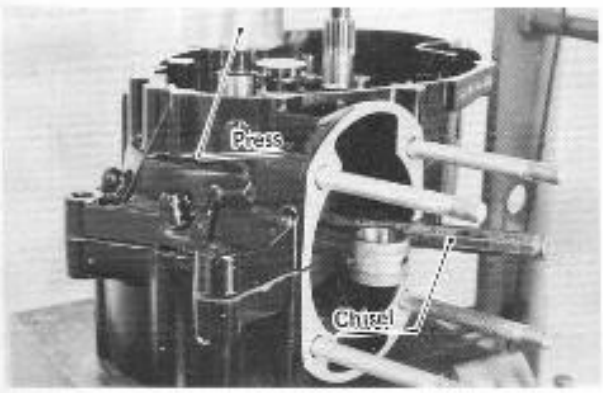


•Insert the shift rods (2).
•Replace the shift drum stopper, and tighten the screws (2).



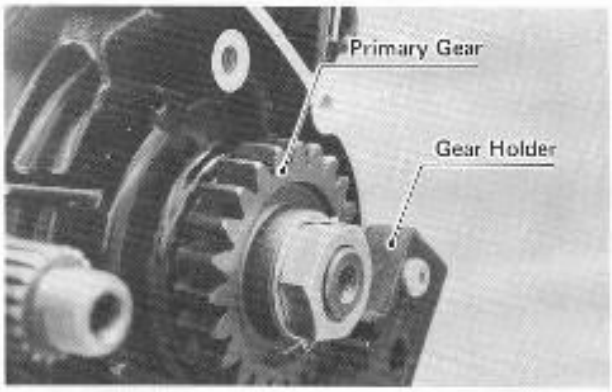
•Put the breather, tube, and grommet back into the right crankcase.
•Apply liquid gasket to the mating surface of the left crankcase half.
•Fit the crankcase halves together using a press on the end of the crankshaft.

CAUTION: To avoid damage to the crankcase, be sure that the crankcase halves go straight onto the knock pins.

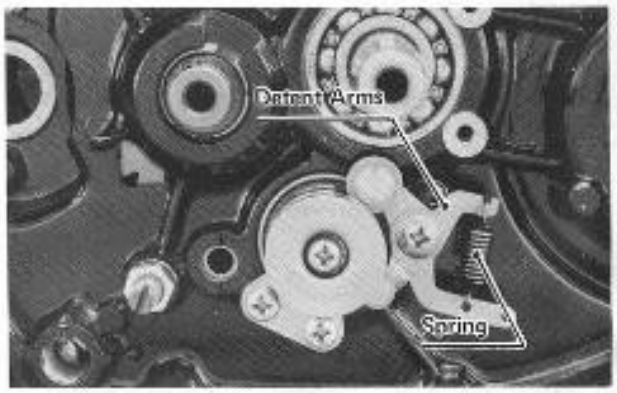


•Replace all the crankcase screws (12), tightening them evenly.
•Check to see that the crankshaft and the transmission gears turn easily.
•Wrap a clean cloth around the connecting rod at the crankcase opening so that no parts or dirt will fall into the crankcase.
•Put the collar and O ring onto the right side of the crankshaft, and fit the woodruff key into the crankshaft.
•Install the primary gear and toothed washer.
•Using the gear holder (special tool) to hold primary gear steady, tighten the primary gear nut, and bend one part of the washer over the nut.

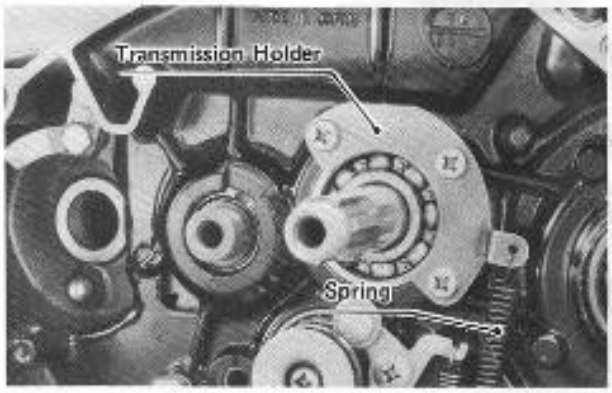
NOTE: Replace the primary gear with the protruding side out as shown in the illustration.



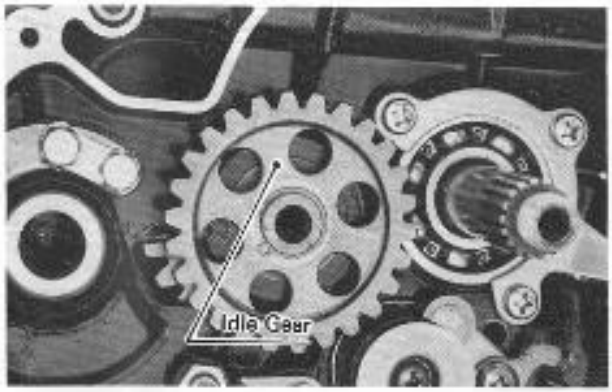
•Replace the detent arms, tighten the screw, and hook on the spring.



•Turn the shift drum to check that it moves properly.
•Mount the transmission holder, and hook the spirng between the transmission holder and the detent arms.

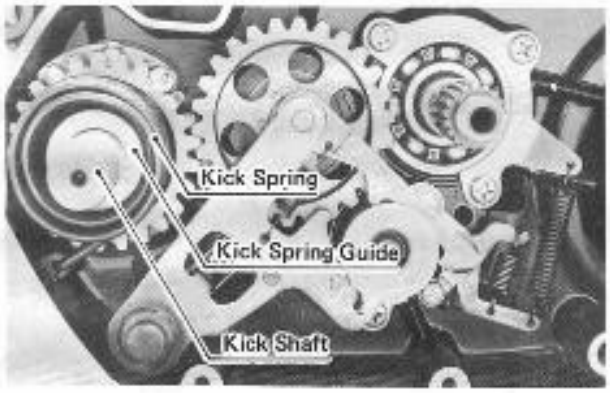


•Mount the idle gear and thrust washer onto the output shaft, and put on the circlip.

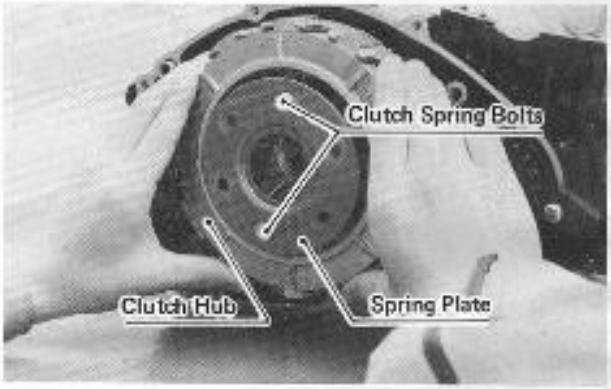


•Insert the external shift mechanism shaft with its collar into the crankcase, and fit the pawls back onto the shift drum pins.

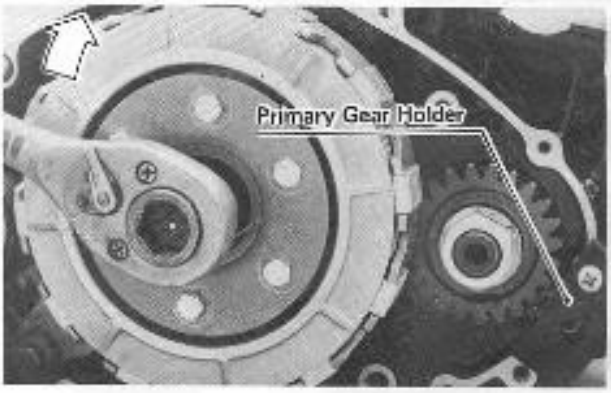
•Replace the thrust washer onto the kick shaft. Insert the kick shaft into the crankcase with the ratchet lever to the left.
•Fit the kick spring back onto the stopper and replace the spring guide.



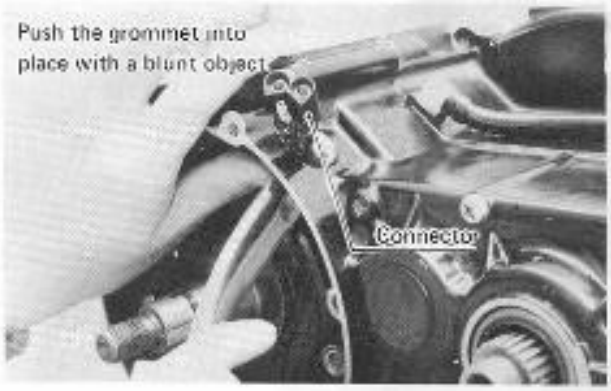
•Put the thrust washer, collar, and kick starter pinion onto the drive shaft.
•Rotate the kick starter pinion so that the clutch housing notches mesh with the kick starter pinion, and put the clutch housing and thrust washer onto the drive shaft.
•Put the steel plates and friction plates onto the clutch hub.
•Put only two springs and the spring plate onto the clutch hub assembly, and screw in the two spring bolts slightly.
•Install the clutch hub assembly in the clutch housing, turning the output shaft so that the clutch hub assembly will fit onto the drive shaft.



•Replace the lock washer and toothed washer, and screw on the nut loosely.
•Remove the spring bolts and plate.
•Replace the clutch springs (6) and spring plate, and tighten the spring bolts (6).
•Tighten the clutch hub nut using the primary gear holder (special tool).

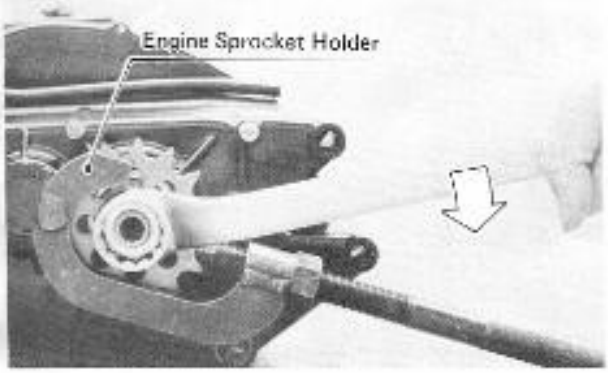


•Push the magneto lead grommet into place in the crankcase. Pull out the leads, and install the magneto so that the lead comes out of the magneto opposite the grommet hole.

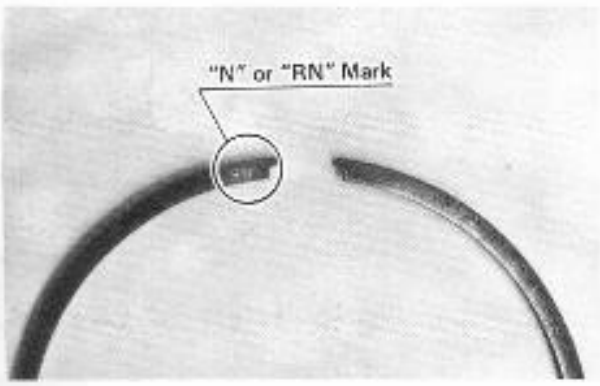


•Install the magneto base so that the mark on the magneto base is aligned with the mark on the crankcase, replace the flat washers and lock washers, and tighten the screws (3).

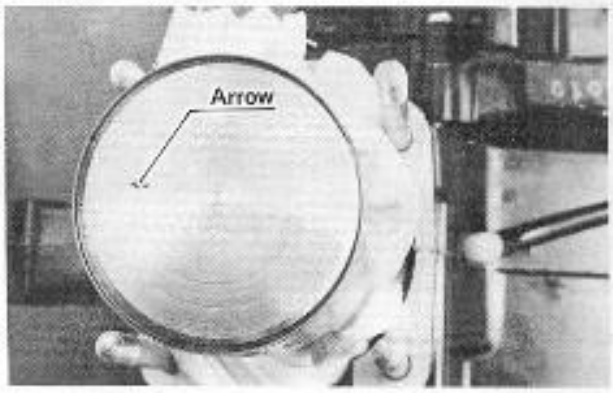
•Fit the woodruff key into the left side of the crankshaft.
•Using the primary gear holder (special tool), replace the flywheel magneto, flat washer, and lock washer, and tighten the nut.
•Replace the magneto cover and gasket and tighten the screws (3).
•Replace the clutch plate pusher.
•Replace the left crankcase, and tighten the screws (9).
•Replace the O ring, collar, engine sprocket, and lock washer. Using the engine sprocket holder (special tool), tighten the engine sprocket nut, and bend one part of the washer over the nut.



•Install the top piston ring with the "RN" mark facing down, and the 2nd ring with the "R" mark facing up. See that the pin in each piston pin groove is between the ends of the piston ring.



•Insert the needle bearing into the connecting rod small end.
•Replace the piston, piston pin, and snap ring. The arrow on the top of the piston must point towards the front.



•Remove the cloth and install a new cylinder base gasket.
•Set the piston at BDC, and fit the base of the cylinder over the rings, pressing in the opposite sides of the rings as necessary. Be certain that the rings do not slip out of position.
•Replace the cylinder base gasket and cylinder head.
•Tighten the cylinder head bolts (8).
•Replace the spark plug.
•Replace the kick pedal.

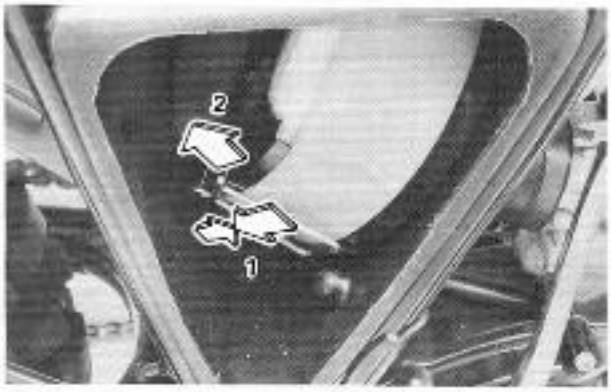
Maintenance

AIR CLEANER

The air cleaner box is specially designed for operation under wet conditions. The element is a large size, special fabric unit for effective protection against dirt and dust.

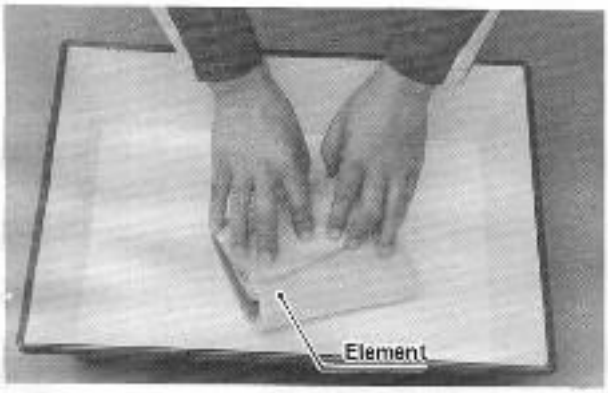
Some masking may be necessary depending on the course, but be sure not to appreciably reduce the amount of air intake.

Inspect the element after each race or practice session without fail, and clean if necessary.



Push in on the lower rear portion of the right side cover, and free the rubber retainer on the underside of the cover to pull off the right side cover, and pull out the element.

- Clean the element by swishing it around in bath of some kind of solvent having a high flash point, and squeeze it dry.



- After cleaning, saturate the element with SAE 30 oil, squeeze out the excess, then wrap it in a clean rag and squeeze it dry as possible. Be careful not to tear the element.

NOTE: Replace the element after cleaning it 5 times or if it is damaged.

CAUTION: Because of the danger of highly flammable liquids, clean the element in a well-ventilated area, and take ample care that there are no sparks or flame anywhere near the working area.

CYLINDER HEAD

If carbon is allowed to accummulate in the combustion chamber, the compression ratio will rise, causing preignition, detonation, and overheating. Periodically, decarbonization must be carried out.

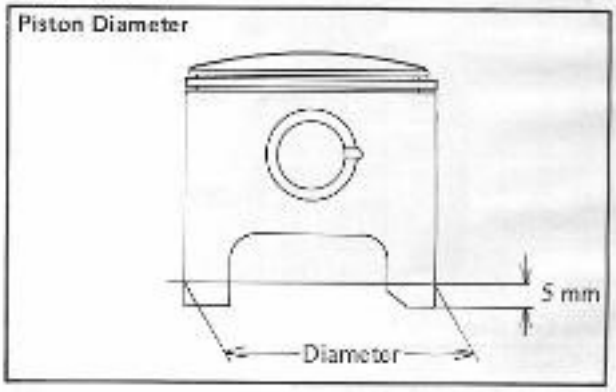
PISTON, CYLINDER

Remove the carbon from the head of the piston. Inspect for sticking rings, scratches or other damage on the piston skirt, and damage to the piston pin holes.

Remove the carbon from the piston ring grooves. Even if the piston rings look good with no wear, replace them after every third race.

Piston wear

Measure the outside diameter of the piston 5 mm up from the bottom of the piston at a right angle to the direction of the piston pin using a micrometer. If the measurement is under the service limit, replace the piston.



Piston Diameter

Standard	Service Limit
81.935~81.965 mm	81.80 mm

Cylinder wear

Inspect the inside of the cylinder for scratches and abnormal wear. In case the cylinder is damaged or badly worn, replace it.

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 three locations (total of six measurements) using an inside micrometer or a cylinder gauge. If any measurement exceeds the service limit, or if there is a difference of more than 0.05 mm between any two measurements, the cylinder must be replaced for a new one.

Cylinder Inside Diameter

Standard	Service Limit
82.000~82.022 mm	82.100 mm

Piston/cylinder clearance

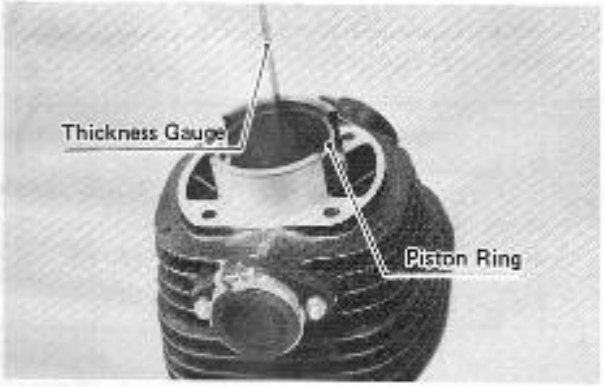
In order to maintain proper piston/cylinder clearance, the piston/cylinder clearance is determined whenever the piston or cylinder is replaced with a new one. The most accurate way to find the clearance is to make separate piston and cylinder measurements and then compute the difference between the two values. Measure the piston diameter as just described, and measure the cylinder diameter at the very bottom of the cylinder.

Piston/Cylinder Clearance

Standard
0.063 ~ 0.072 mm

Piston ring end gap

Place the piston ring being checked inside the cylinder close to the bottom where the wear is low. Measure the gap between the ends of the rings with a thickness gauge. If the gap is wider than the service limit, the ring is overworn and must be replaced.

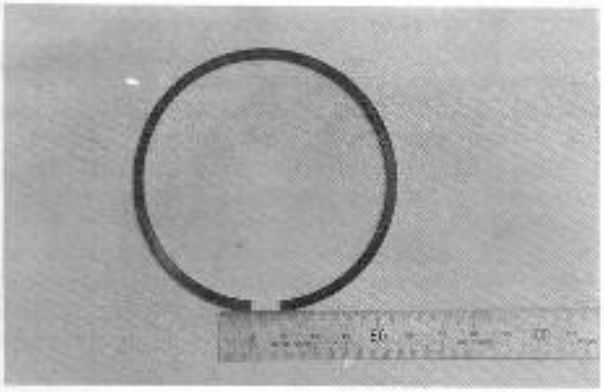


Ring End Gap

Standard	Service Limit
0.2~0.4 mm	0.6 mm

Piston ring tension

Piston ring tension can be evaluated by measuring the gap between the ends of the ring with the ring free of any restraint. If the gap is less than the service limit, the ring is weak and must be replaced.



Ring Free Gap

	Standard	Service Limit
1st	6.5 mm	3 mm
2nd	8.5 mm	4 mm

Piston, piston pin, connecting rod small end wear

Measure the diameter of the piston pin with a micrometer. If the piston pin diameter is less than the service limit at any point, replace the piston pin.

Using a cylinder gauge, measure the diameter of both piston pin holes in the piston and the inside diameter of the connecting rod small end. If either piston pin hole diameter exceeds the service limit, replace the piston. If the connecting rod small end diameter exceeds the service limit, replace the connecting rod.

Piston Pin, Pin Hole, Small End Dia

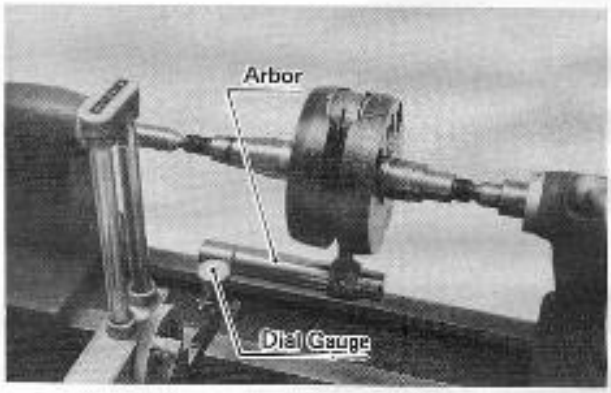
	Standard	Service Limit
Piston Pin	18.994 ~ 19.000 mm	18.98 mm
Pin Hole	19.001 ~ 19.010 mm	19.10 mm
Small End	24.003 ~ 24.014 mm	24.05 mm

CRANKSHAFT, CONNECTING ROD

Connecting rod bending, twisting

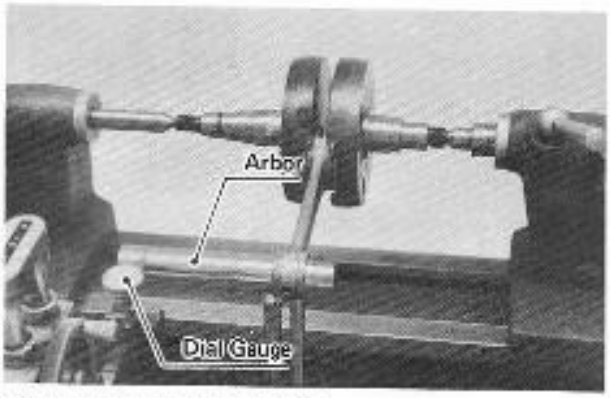
Set the crankshaft in a flywheel alignement jig or on V blocks on a surface plate. Select an arbor of the same diameter as the piston pin and of optional length, and insert it through the small end of the connecting rod.

Using a height gauge or dial gauge, measure the difference in the height of the rod above the surface plate over a 100 mm length to determine the amount the connecting rod is bent.



Using the arrangement shown in the figure, measure the amount that the arbor varies from being parallel with the crankshaft over a 100 mm length of the arbor to determine the amount the connecting rod is twisted.

If either of the above measurements exceeds the service limit, the crankshaft assembly must be replaced.



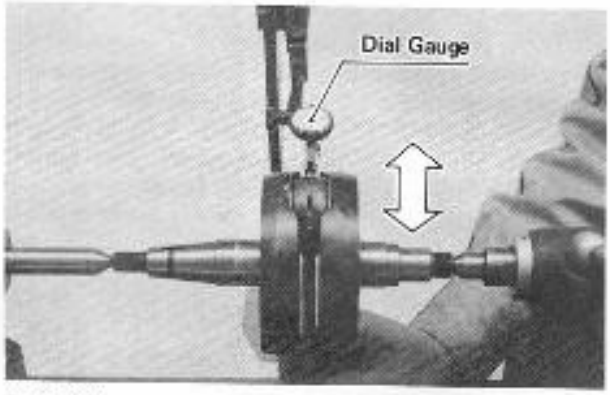
Connecting Rod Bend, Twist

	Standard	Service Limit
Bend	0.05/100 mm	0.2 mm
Twist	0.05/100 mm	0.2 mm

Connecting rod big end radial clearance

Set the crankshaft in a flywheel alignment jig or on V blocks. Placing a dial gauge against the connecting rod big end, push the connecting rod first towards the gauge and then in the opposite direction. The difference between the high and low reading is the radial clearance.

If the radial clearance exceeds the service limit, replace the crankshaft assembly.

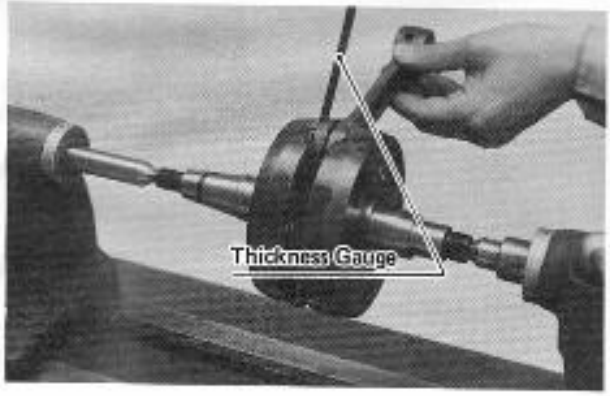


Radial Clearance

Standard	Service Limit
0.030~0.041 mm	0.1 mm

Crankshaft big end side clearance

Measure the side clearance of the connecting rod with a thickness gauge. If the clearance exceeds the service limit, replace the crankshaft assembly.

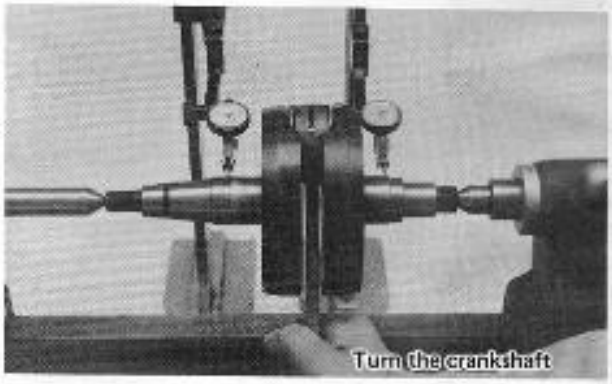


Side Clearance

Standard	Service Limit
0.50~0.60 mm	1.0 mm

Crankshaft runout

Set the crankshaft in a flywheel alignment jig or on V blocks, and place a dial gauge on each side of the crankshaft. Turn the crankshaft slowly. The maximum difference in gauge readings is the crankshaft runout. If the runout exceeds the service limit, replace the crankshaft assembly.



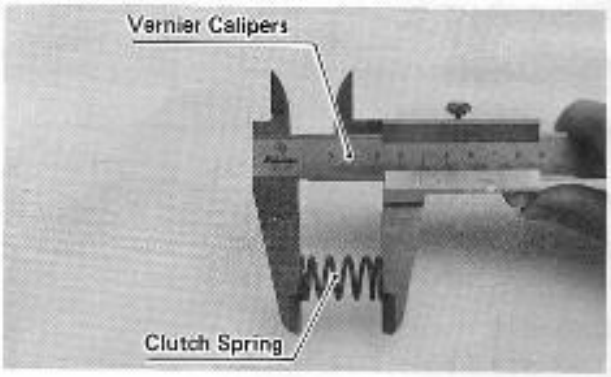
Crankshaft Runout

Standard	Service Limit
0.04 mm	0.1 mm

CLUTCH

Clutch spring tension

Measure the free length of the clutch springs with vernier calipers. If any spring is shorter than the service limit, replace all the springs as a set to ensure even tension on the clutch plates.

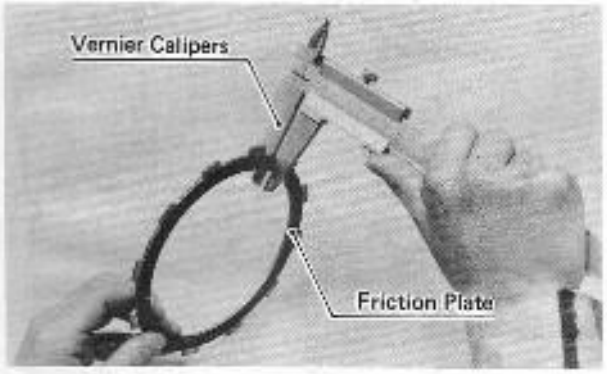


Clutch Spring Free Length

Standard	Service Limit
36 mm	34.5 mm

Friction plate wear, damage

Visually inspect the friction plates to see whether or not they show any signs of heat seizure or have become rough or unevenly worn. 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.



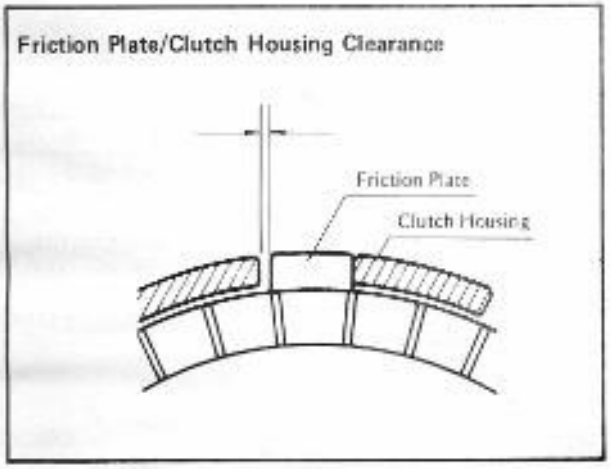
Friction Plate Thickness

Standard	Service Limit
2.9 ~ 3.1 mm	2.5 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.

Friction Plate/Clutch Housing Clearance

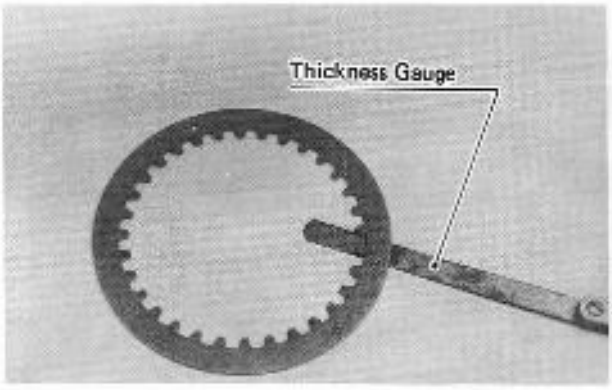


Friction Plate/Clutch Housing Clearance

Standard	Service Limit
0.09 ~ 0.040 mm	0.65 mm

Clutch plate warp

Place each friction plate and each steel 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.



Clutch Plate Warp

Standard	Service Limit
under 0.2 mm	0.4 mm

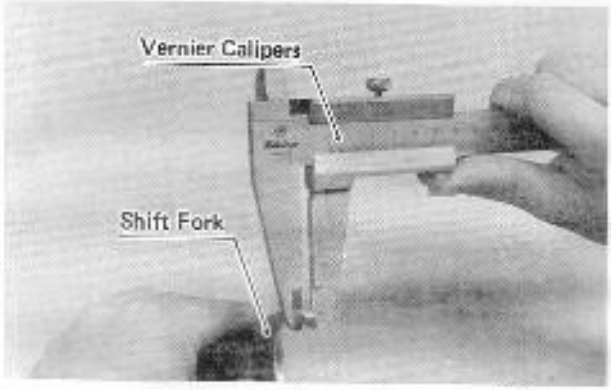
TRANSMISSION

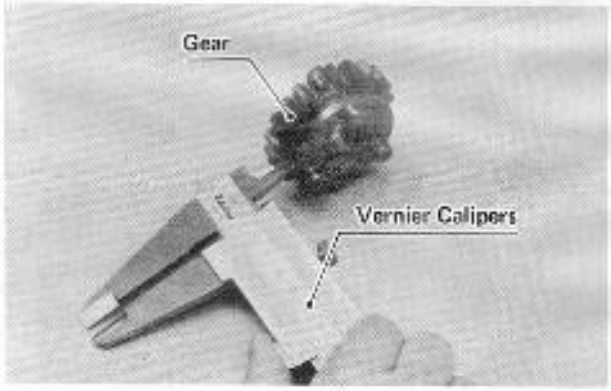
Shift fork bending

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.

Shift fork, gear groove wear

Measure the thickness of the ears on each shift fork, and measure the width of each gear shift fork groove with vernier calipers. If the thickness of a shift fork ear is under the service limit, replace the shift fork. If a gear shift fork groove is worn over the service limit, replace the gear.





Shift Fork Thickness

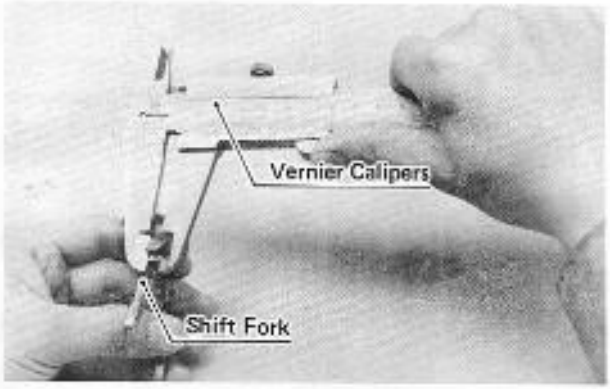
Standard	Service Limit
4.9~5.0 mm	4.8 mm

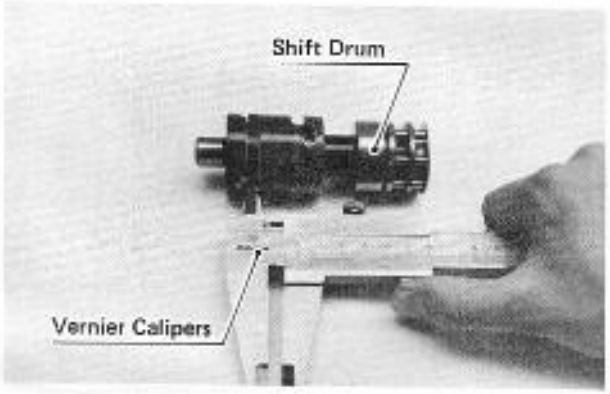
Gear Shift Fork Groove Width

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 shift fork on which the guide pin has worn past the service limit. If a shift drum groove is worn past the service limit, replace the shift drum.





Shift Fork Guide Pin Diameter

Standard	Service Limit
5.9~6.0 mm	5.85 mm

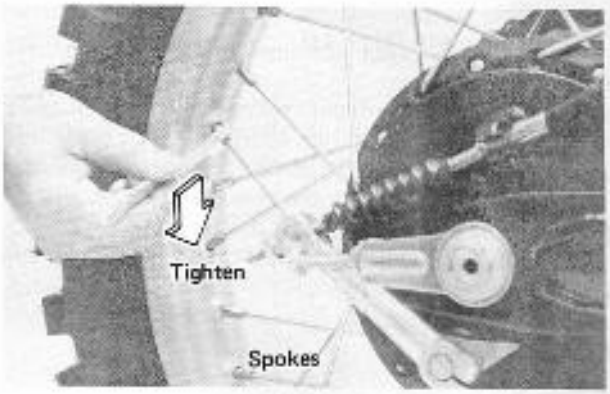
Shift Drum Groove Width

Standard	Service Limit
6.05~6.20 mm	6.25 mm

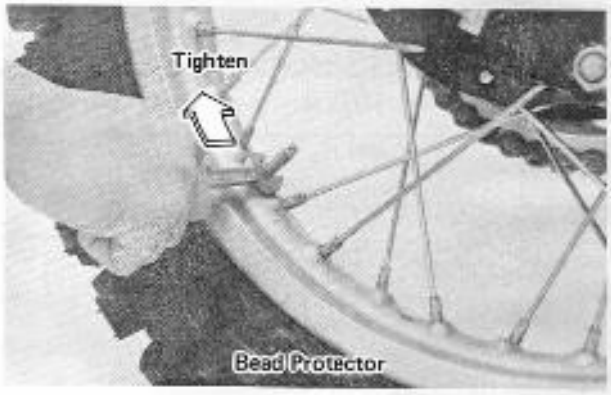
SPOKES, RIMS

The spokes on both wheels must be all tightened securely and evenly and not allowed to become loose. Unevenly tightened or loose spokes will cause the rim to warp, hasten nipple and overall spoke fatigue, and may result in spoke breakage.

The rim axial runout should be under 3 mm and the rim radial runout should be under 3 mm.



There are one bead protector on the front wheel and two on the rear. The use of bead protectors is to prevent severe stress from causing the tire and tube from slipping on the rim and damaging the valve stem. Valve stem damage may cause the tube to leak, necessitating tube replacement. In order that the tire and tube will remain in fixed in their position on the rim, inspect the bead protectors before riding, and tighten them if necessary.



Rim runout

Set a dial gauge to the side of the rim, and rotate the wheel to measure axial runout. The difference between the highest and lowest dial reading is the amount of runout.

Set the dial gauge to the inner circumference of the rim, and rotate the wheel to measure radial runout. The difference between the highest and lowest dial reading is the amount of runout.

A certain amount of rim warp (runout) can be corrected by recentering the rim, that is, 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.

Rim Runout

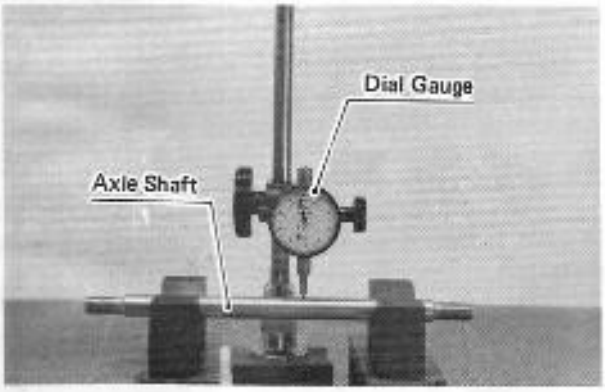
	Standard	Service Limit
Axial	under 1.0 mm	3.0 mm
Radial	under 1.0 mm	2.0 mm

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.

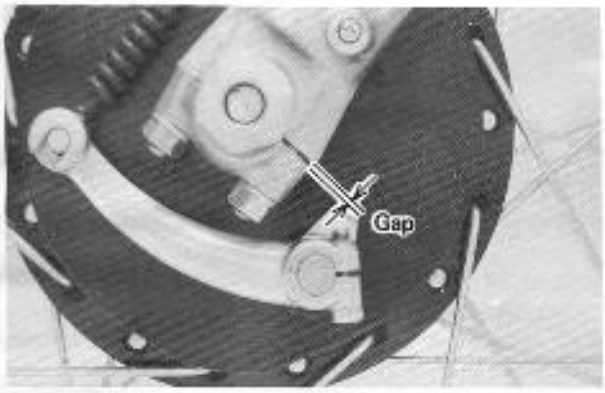
If runout exceeds the service limit, straighten the axle or replace it. If the axle cannot be straightened to within tolerance, or if runout exceeds 0.7 mm replace the axle.



Axle Bend

	Standard	Service Limit
Front Axle	under 0.1 mm	0.2 mm
Rear Axle	under 0.15 mm	0.2 mm

NOTE: The axle clamp has a front and rear. First tighten the front axle clamp nut and then the rear nut for each side, so that there will be a gap at the rear after tightening.

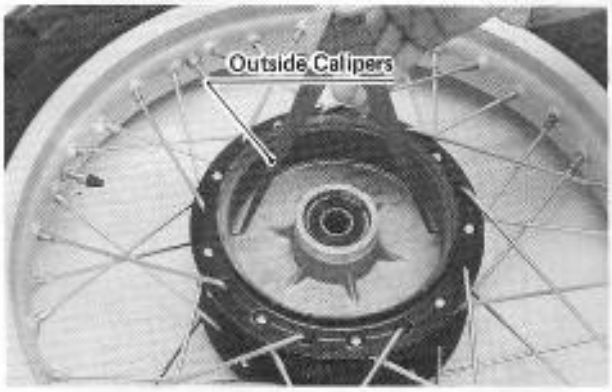


BRAKES

On both the front and rear brake panels there is a brake lining wear indicator. If an indicator points beyond the USABLE RANGE when the brake is fully applied, the brake linings for that brake have worn past the service limit. When this happens, the brake shoes must be replaced and the drum and other brake parts examined.

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 any diameter measurement exceeds the service limit, the hub must be replaced.

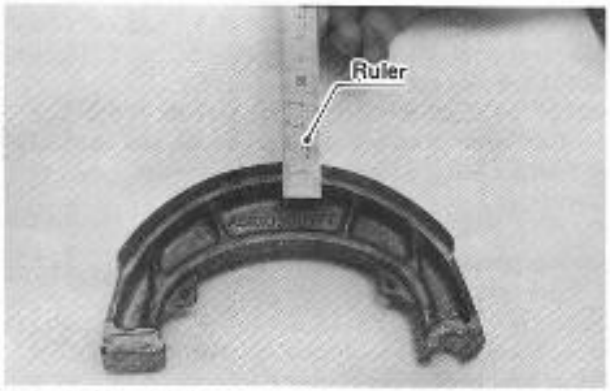


Brake Drum Inside Diameter

	Standard	Service Limit
Front	140~140.16 mm	140.75 mm
Rear	150~150.16 mm	150.75 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 gasoline. In case the linings are damaged or the surface cannot be restored by sanding and cleaning, the shoes must be replaced.

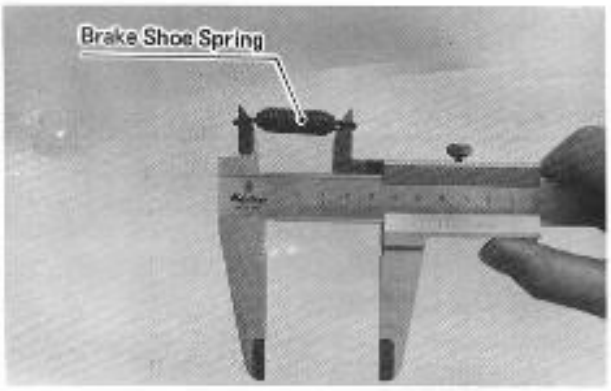


Brake Lining Thickness

	Standard	Service Limit
Front	4 mm	2 mm
Rear	5 mm	2.5 mm

Brake shoe spring tension

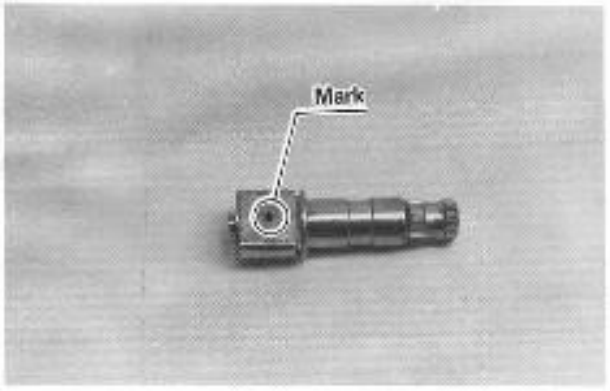
If the brake springs become stretched, they will not pull the shoes back away from the drum after the brake lever or pedal is released, causing the shoes to drag on the drum. Remove the springs, and check their free length with vernier calipers. If either is stretched beyond the service limit, replace both springs.



Brake Spring Free Length

Standard	Service Limit
47.5~48.5 mm	51 mm

NOTE: Assembling the rear brake panel, the camshaft must be installed so that the triangular mark on the cam surface points to the center of the panel.



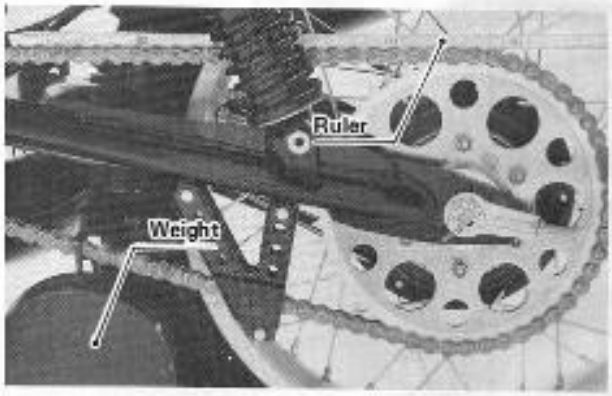
DRIVE CHAIN

Drive chain link action stiffens if the chain runs out of oil. This not only shortens the service life of the chain but may adversely affect the sprockets and the engine itself. After each day of operation, clean the chain thoroughly and lubricate with a suitable lubricant such as SAE 90 oil. If possible, boil the chain in grease.

Drive chain wear

When the chain has worn so much that it 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.

Since it is impractical to measure the entire length of the chain, determine the degree of wear by measuring a 20 links length of the chain. Stretch the chain taut either by using the chain adjuster, or by hanging a 10 kg (20 lb) weight on the chain. Measure the length of 20 links on a straight part of the chain from pin center of the 1st pin to pin center of the 21st pin. If the length is greater than the service limit, the chain should be replaced.



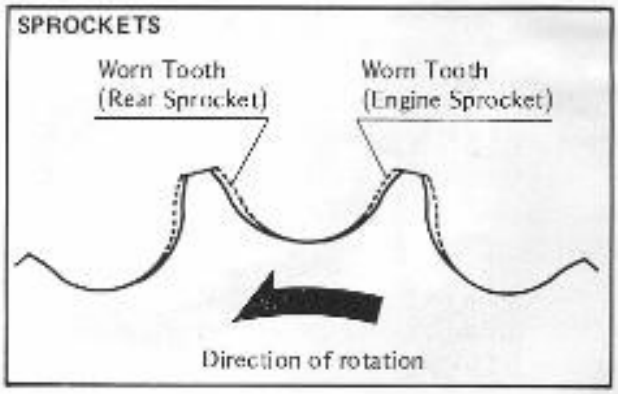
Drive Chain Length

	Standard	Service Limit
20-links Length	317.5 mm	323 mm

SPROCKETS

Visually inspect the sprocket teeth. If they are worn as illustrated, repalce 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.



Sprocket Diameter

	Standard	Service Limit
Engine	65.78 mm	65 mm
Rear	222.48 mm	220 mm

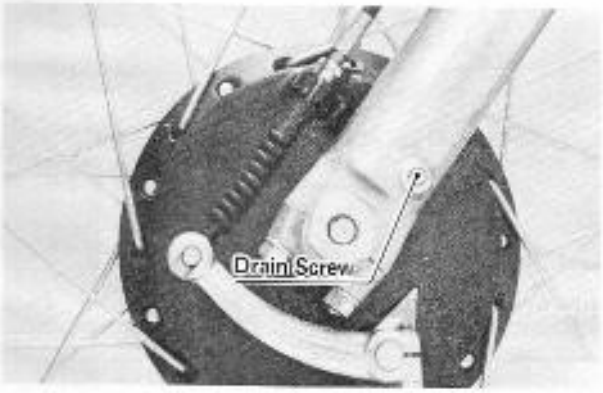
NOTE: Inspect the sprockets for wear, warp and cracks.

FRONT FORK

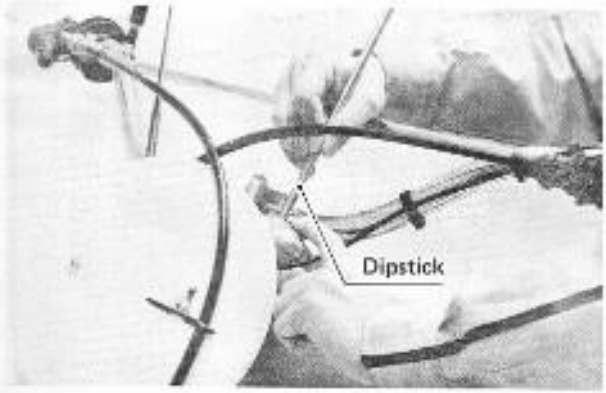
The condition of the front fork is very important for steering stability, and front fork performance is dependent on front fork oil viscosity, quantity, and quality. Deteriorated oil may foam when violent fork action causes the oil to heat, resulting in unsatisfactory fork performance. When the motorcycle is used for racing, change the oil every 5th race.

Oil change

Remove the drain screw that is near the base of each shock absorber, and pump the shock absorbers as necessary to completely drain out the oil. After the oil has drained out, replace and tighten the drain screws.



Remove the bolt at the top of each shock absorber. Pour in 200 cc of SAE 10W oil. To check the oil level, first place a stand under the frame to raise the front wheel off the ground. With the shock absorbers thus fully extended, see if the oil level is 458 mm below the top os the tube.

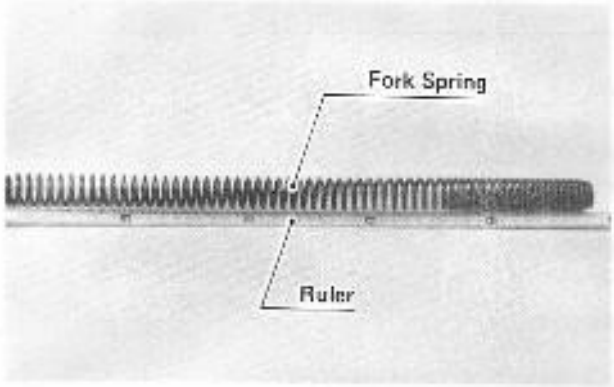


If the quantity of oil is insufficient, add oil a little at a time until the proper oil level is reached. Tighten each shock absorber top bolt.

NOTE: Sand or dirt left on the outside of the shock absorber inner tube will damage the oil seal and cause oil leaks. Make it a point to always wipe the inner tube clean.

Spring tension

Since the springs become shorter as they weaken, check their free length to determine their condition. Replace any spring which is shorter than its service limit. 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 shock absorbers balanced for motorcycle stability.



Front Spring Free Length

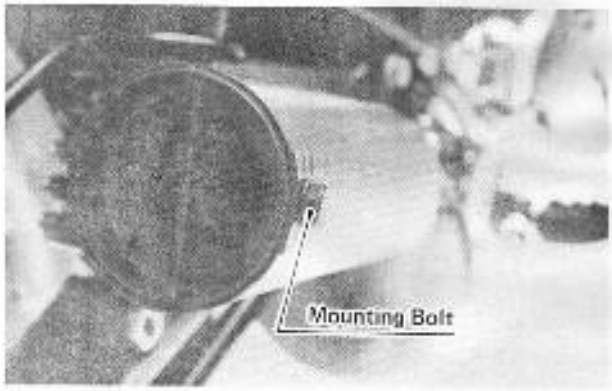
Standard	Service Limit
481 mm	470 mm

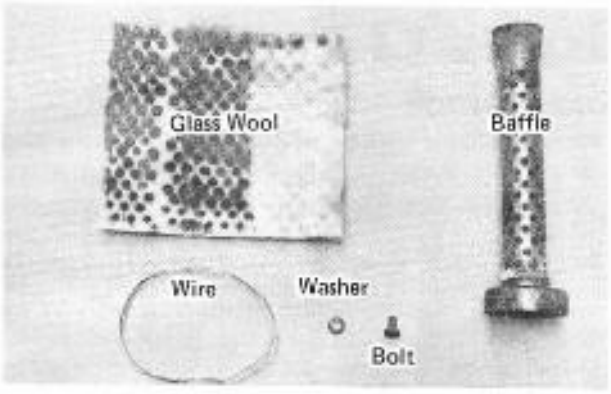
EXPANSION CHAMBER

The expansion chamber is the most important part affecting engine performance.

Large dents, breaks, or other damage may cause a drop in horsepower. Repair a damaged expansion chamber with sheet metal welding or replace it for a new one.

Clean out the expansion chamber every 2nd or 3rd race. Carbon built up in the baffle will cause less efficiency in noise reduction, and the resulting increase of back pressure inside the chamber will reduce horsepower.





FUEL SYSTEM

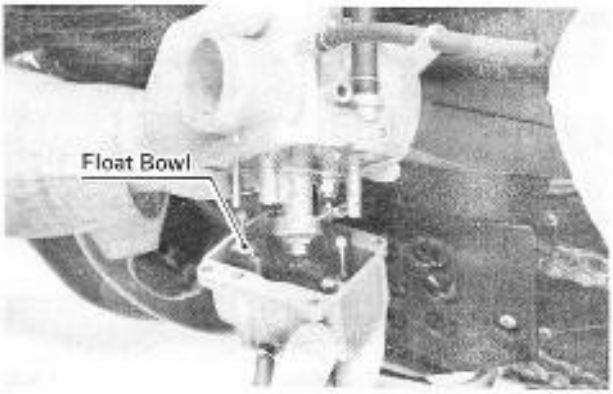
Water or dirt anywhere in the fuel system can cause starting difficulty, poor running, and lack of power.

Periodically clean out the lines as follows:

Close the fuel tap, and pull off the fuel hose. Loosen sufficiently the clamps on the air cleaner and intake manifold, and remove the carburetor.

Remove the float bowl screws (4) to take off the float bowl.

Inspect the float bowl. If there was water or dirt inside the bowl, there may also be some in the fuel tank. In such cases, clean out the fuel tank, fuel tap and fuel hose.



Alterations

TIRES

Tire patterns differ considerably from one maker to the next. Choose tires according to personal preference and the suggestions given below:

Pebbles sand

Choose tires which have a relatively shallow pattern so that the tires will not dig a hole in the ground and have extra width to reduce pressure per unit of ground contact. Inflate to a reduced air pressure.

Grass

Choose tires which have large blocks even if the width is not large. To increase tire response, inflate to slightly higher than standard air pressure.

Hard surfaces

In the case of hard surfaces, the pattern depth is not so important, but generally a wide pattern is preferred. Since too high a response may cause the tire to bounce, inflate to slightly below standard air pressure.

Mud

Choose broader than average tires with widely spaced, large, protrusive blocks. Inflate to as low an air pressure as feasible.

FRONT FORK

Alteration of the stiffness or softness of the shock absorption can be achieved by using fork oil of a different viscosity. It may be desirable to change from the standard viscosity somewhat in order to suit individual body weight, riding technique, or other factors.

- The oil capacity per shock absorber is 228 cc (6.42 US fl oz) and the standard oil is SAE 10W.
- Add only 200 cc (5.63 US fl oz) of fresh oil when changing the oil since about 30 cc (1.0 US fl oz) remains inside the shock absorber.
- After adding the oil, measure the oil level, and adjust the quantity if necessary.
- To stiffen shock absorption, use oil of a higher viscosity.

NOTE: Since oil quantity greatly influences damping performance do not change from the specified quantity.

SPROCKETS

There are 2 sprockets, the engine sprocket and the rear sprocket. The sprockets may be exchanged with sprockets of a different tooth ratio to adapt the motorcycle to course conditions.

- Choose sprockets to obtain the rear sprocket to engine sprocket tooth ratio that is appropriate for the course.
- High speed courses generally require a lower ratio and low speed courses a higher ratio.

Engine Sprocket	Rear Sprocket	Final Reduction Ratio
STD 15	44	2.93
15	46	3.07
15	48	3.20
14	44	3.14
14	46	3.29
14	48	3.43

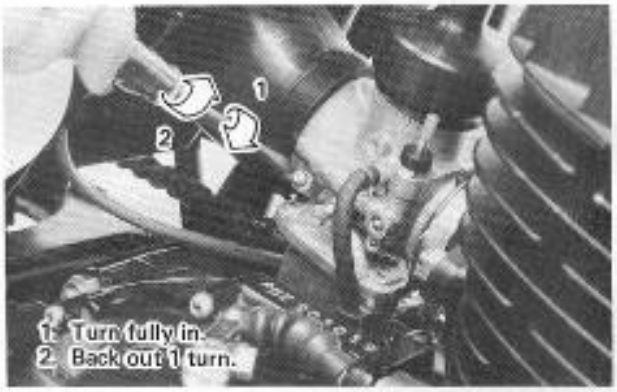
CARBURETOR

- Before carrying out any adjustments on the carburetor, thoroughly warm up the engine. Use the standard B9EV spark plug when making adjustments.

0~ 1/8 throttle

The fuel is metered by the pilot jet in this throttle range, which provides the rich mixture necessary at low rpm. Alteration of this mixture is effected by the position of the air screw. As the air screw is turned in, the mixture enriches.

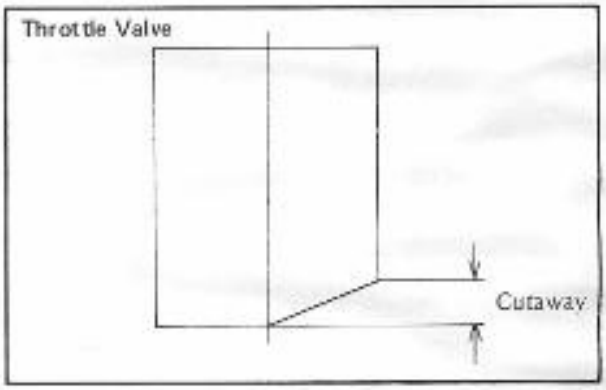
To achieve the standard air screw setting, turn in the air screw lightly until it stops, and then back it out 1 turn.



NOTE: Do not screw in the air screw forcefully; turn it just until it stops.

1/8~ 1/4 throttle

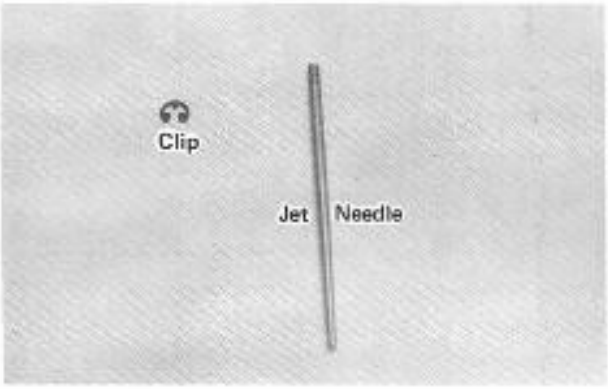
Alteration of the fuel mixture within this range is effected largely by the amount of throttle valve cutaway. The greater the amount of the cutaway, the leaner the mixture in this throttle range.



1/4~ 3/4 throttle

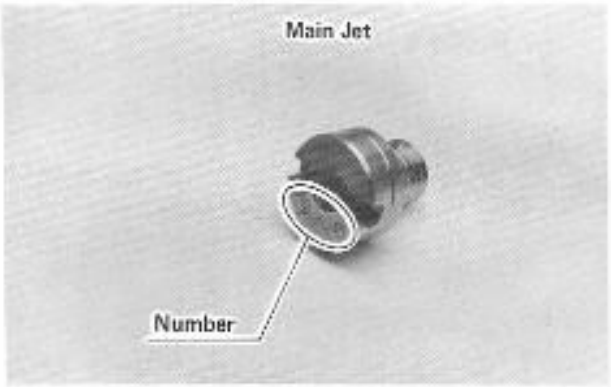
Alteration of the mixture in this range is effected by repositioning jet needle in the needle jet. The bottom part of the jet needle is tapered; as the throttle is opened, the cross sectional area of the jet needle/needle jet clearance becomes greater, increasing the fuel flow.

To change the position of the jet needle in the needle jet at a given throttle opening, move the clip, which is in one of 5 grooves at the upper part of the needle, to a higher or lower groove. Moving the clip to a higher groove makes the fuel/air mixture leaner; conversely, moving it lower makes the mixture richer.



3/4~ 1 throttle

Alteration of the mixture in this range is effected by main jet size. The larger the main jet, the greater the flow of fuel at a given throttle.



Standard setting

Main Jet	142.5R
Air Jet	0.5
Jet Needle	6DH3-4
Needle Jet	P-0
Cutaway	2.5
Pilot Jet	50
Air screw (turn out)	1
Fuel level	33±1 mm

Influence of atmoipheric pressure and temperature on carburetor settings

- In areas at high altitude, where the air density is low due to the lower atmospheric pressure, less air enters the carburetor resulting in too rich a mixture for a carburetor that was adjusted properly at low altitude. To obtain the proper carburetor fuel/air mixture, it may be necessary to raise the clip on the jet needle and to exchange the main jet for one a size smaller.
- In particularly cold weather, the increased density of the air may necessitate a lower clip position on the jet needle and a size larger main jet to avoid an overly lean fuel/air mixture.
- Rainy weather also may influence the fuel/air mixture. As the temperature drops and the moisture content of the air rises, the air density decreases, which may result in too rich a fuel/air mixture.

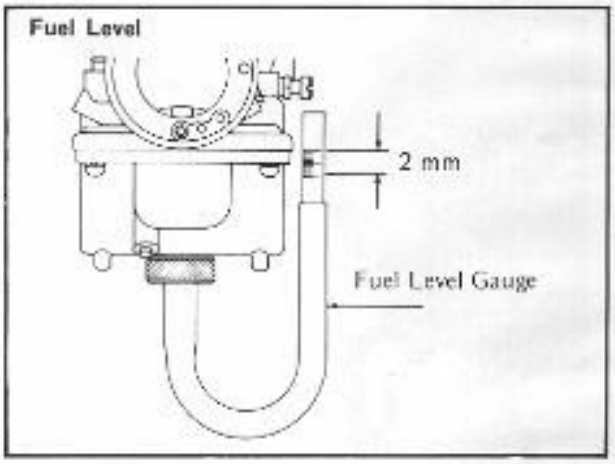
Selecting the correct main jet

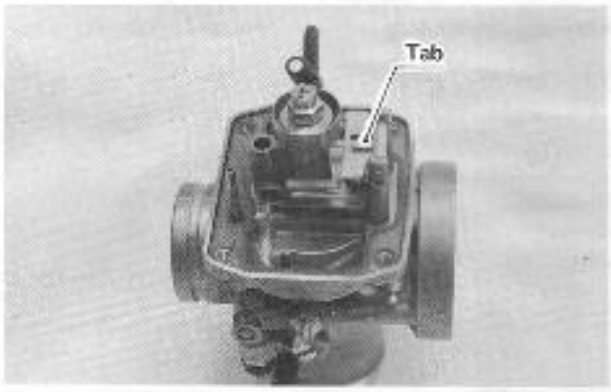
Choose a main jet that fulfills the following conditions:

- Highest rpm.
- Smooth transmission when accelerating from low rpm.
- Spark plug burning properly.
- Engine lugs without knocking.

Adjusting the fuel level

- Close the fuel tap, and remove the main jet cover.
- Fit the fuel level gauge (special tool) into place.
- Open the fuel tap so that fuel will flow into the carburetor.
- Line up the uppermost part of the ruled portion of the gauge hose where the bottom edge of the carburetor body connects to the float bowl. The proper fuel level is 2 mm from the top of the ruled portion.
- If the fuel level is incorrect, open the float chamber, bend the tab on the float arm a slight amount, and then recheck the level readjusting if necessary.



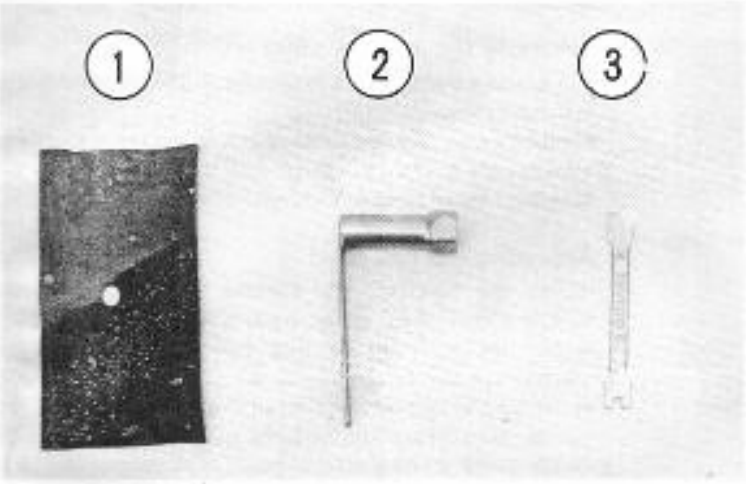


HANDLEBAR

Alter or replace the handlebar for preference in height and width, and adjust the handlebar angle to attain the best riding position.

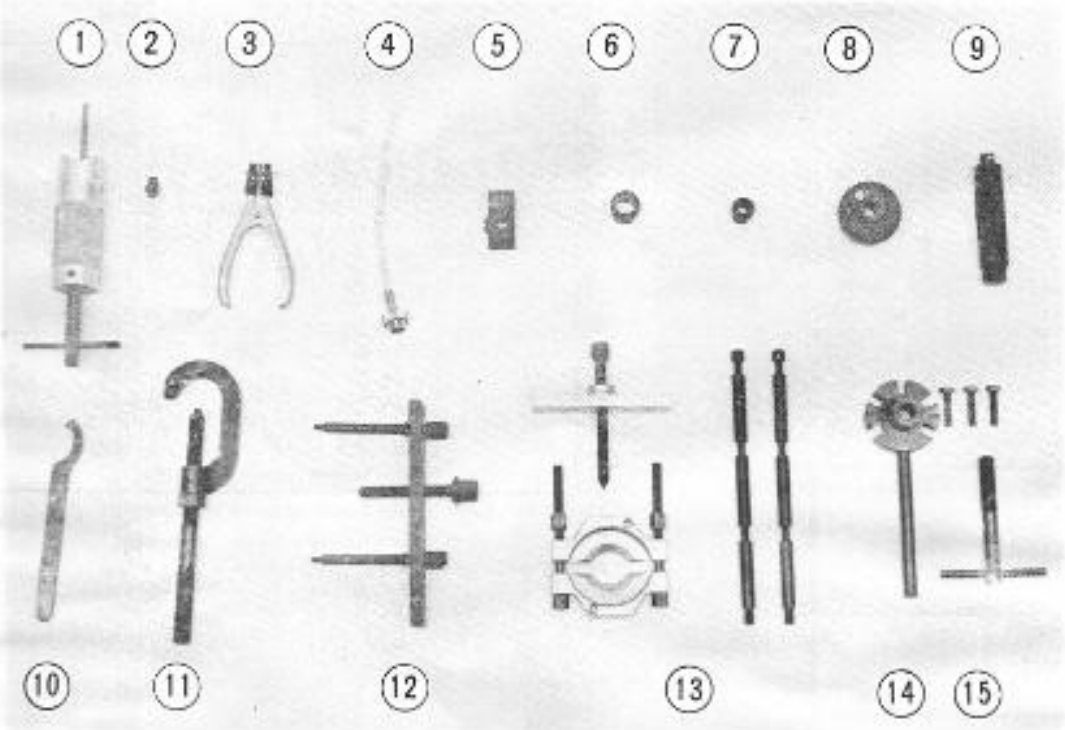
Appendix

TOOLS
Tool Kit



1. Tool Case
2. Spark Plug Wrench
3. Spoke Wrench #9 x #10

Special Tools

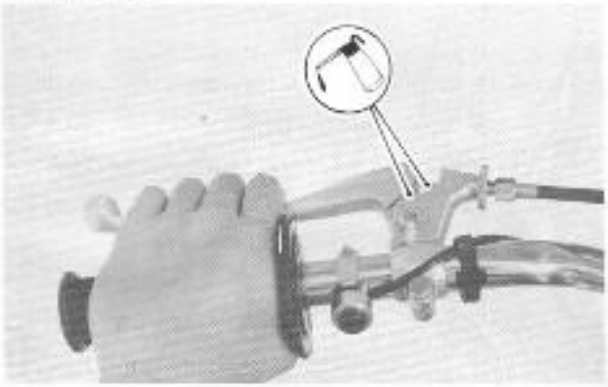


REF NO.	TOOL NO.	DESCRIPTION
1	57001-910	Piston Pin Puller
2	57001-914	Piston Pin Puller Adapter "C"
3	57001-115	Piston Ring Pliers
4	57001-202	Fuel Level Gauge
5	57001-302	Primary Gear Holder
	57001-265	Kick Shaft Oil Seal Guide
7	57001-264	Shift Shaft Oil Seal Guide
8	57001-296	Bearing Driver
9	57001-139	Bearing Driver Holder
10	57001-320	Stem Nut Wrench
11	56019-040	Engine Sprocket Holder
12	57001-153	Crankcase Splitting Tool
13	57001-135	Bearing Puller
14	57001-259	Magneto Puller
15	57001-116	Rotor Puller

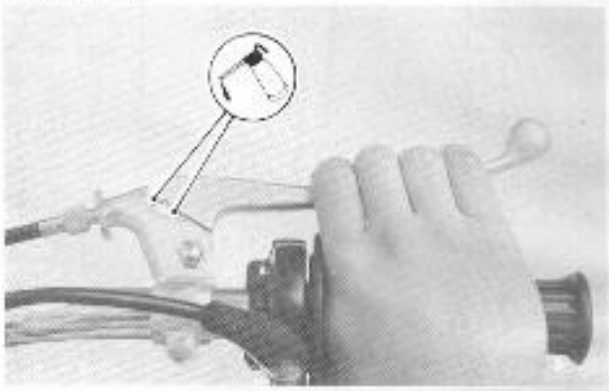
GENERAL LUBRICATION

The general lubrication depicted in the following illustrations is important for long service life and for avoiding trouble during vehicle operation. Carry out this lubrication during vehicle inspection and everytime the vehicle is washed. Use SAE 30 oil.

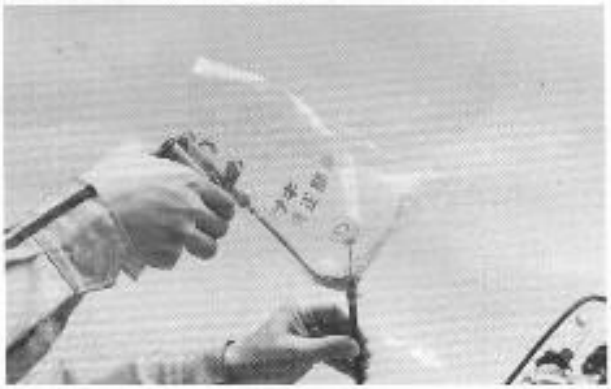
Clutch Lever



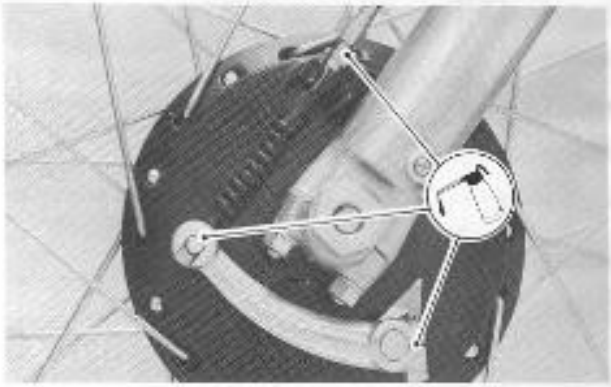
Brake Lever



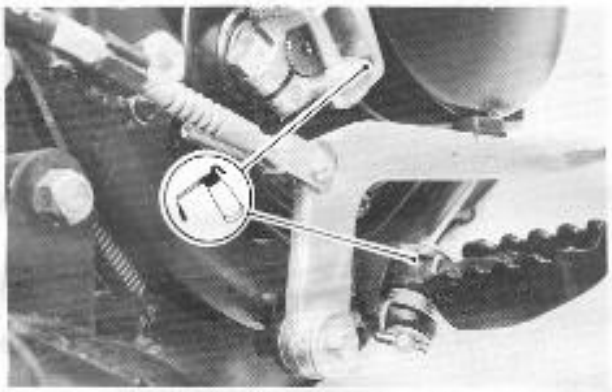
Clutch and Brake Cables



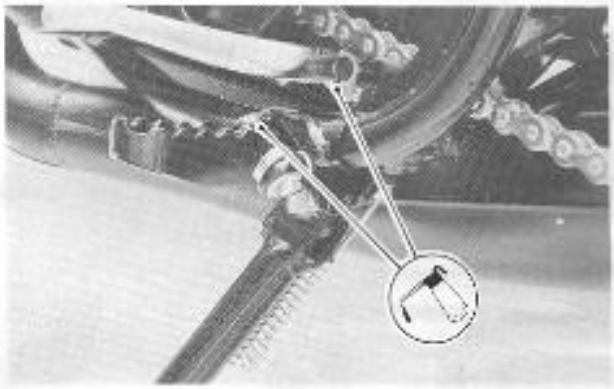
Front Brake Cable Adjuster and Cam Lever



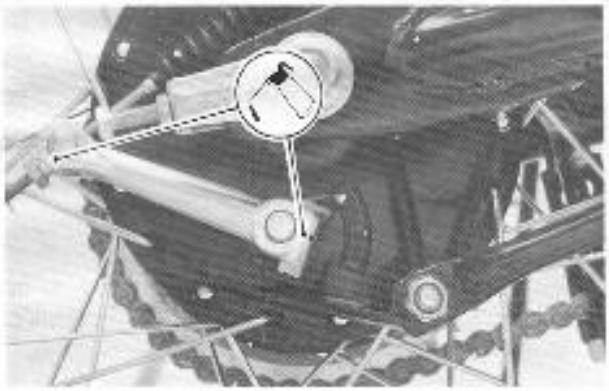
Brake Pedal, Kick Pedal, and Foot Peg Pivots



Shift Pedal and Foot Peg

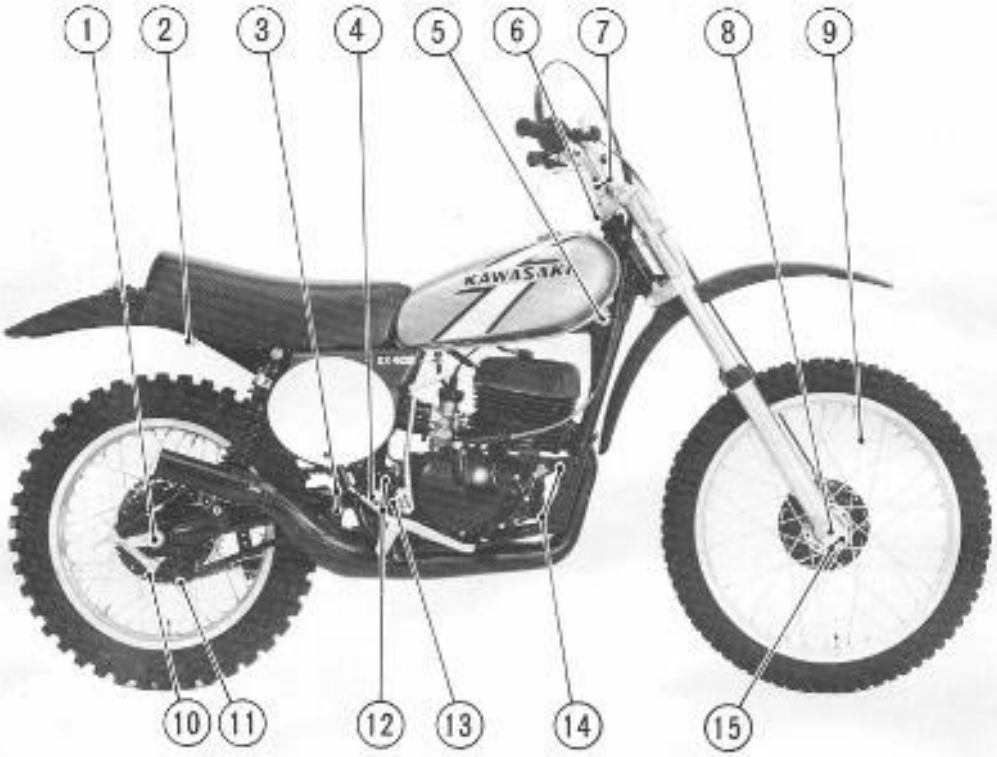


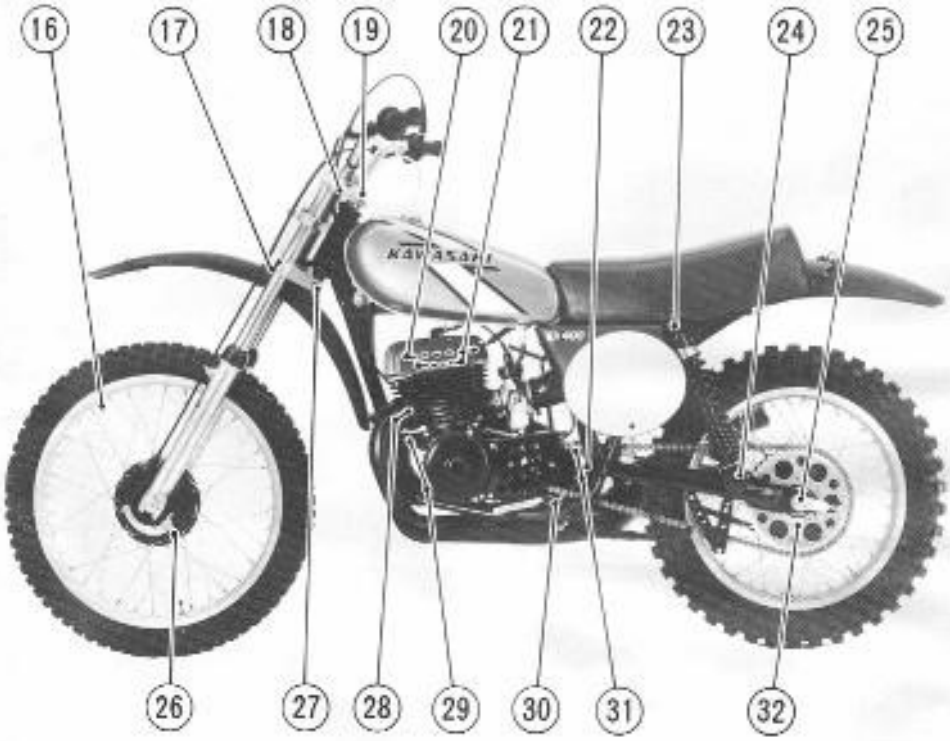
Rear Brake Cable Joint and Cam Lever



Drive Chain (Use SAE 90 oil)

BOLT AND NUT TIGHTENING





	PART	TOOL SIZE (mm)	TORQUE
1.	Rear Axle	13	
2.	Seat Mounting Bolts (2)	13	
3.	Muffler Mounting Bolts (2)	13	
4.	Swing Arm Pivot Shaft	19	
5.	Fuel Tank Mounting Bolts (2)	10	
6.	Steering Stem Head Clamp Bolt	13	1.6~2.2 kg-m (11.5~16.0 ft-lbs)
7.	Handlebar Clamp Bolts (4)	13	1.6~2.2 kg-m (11.5~16.0 ft-lbs)
8.	Front Axle Nuts (2)	27	7~11 kg-m (51~80 ft-lbs)
9.	Spokes	#9	0.25~0.3 kg-m (22~26 in-lbs)
10.	Rear Brake Cam Lever Bolt	10	0.7~0.8 kg-m (61~69 in-lbs)
11.	Torque Link Nut	17	2.6~3.5 kg-m (19~25 ft-lbs)
12.	Engine Mounting Nuts (2)	17	3.4~4.6 kg-m (25~33 ft-lbs)
13.	Kick Pedal Bolt	14	
14.	Engine Mounting Nuts (2)	17	3.4~4.6 kg-m (25~33 ft-lbs)
15.	Front Axle Clamp Nuts (4)	13	1.6~2.2 kg-m (11.5~16.0 ft-lbs)
16.	Bead Protector Nuts (1) (2)	12	
17.	Front Fork Lower Clamp Bolts (4)	13	3.1~3.8 kg-m (22~27 ft-lbs)
18.	Front Fork Upper Clamp Bolts (2)	13	3.1~3.8 kg-m (22~27 ft-lbs)
19.	Steering Stem Head Bolt	19	3.0 kg-m (22 ft-lbs)
20.	Cylinder Head Bolts (4)	13	2.2 kg-m (16.0 ft-lbs)
21.	Cylinder Head Bolts (4)	19	4.2 kg-m (30 ft-lbs)
22.	Swing Arm Pivot Shaft Nut	19	4.0~6.0 kg-m (29~43 ft-lbs)
23.	Rear Shock Absorber Bolts (2)	10	0.6~0.8 kg-m (52~69 in-lbs)
24.	Rear Shock Absorber Nuts (2)	17	2.6~3.5 kg-m (19~25 ft-lbs)
25.	Rear Axle Nut	27	10~14 kg-m (72~101 ft-lbs)
26.	Front Brake Cam Lever Bolt	10	0.7~0.8 kg-m (61~69 in-lbs)
27.	Steering Stem Base Bolt	14	3.1~3.8 kg-m (22~27 ft-lbs)
28.	Exhaust Screws (2)		
29.	Engine Mounting Bolts (2)	14	
30.	Shift Pedal Bolt	10	
31.	Engine Mounting Bolts (2)	14	
32.	Rear Sprocket Nuts (6)	13	2.2~2.6 kg-m (16.0~19.0 ft-lbs)

TORQUE TABLE

Torque value listed below should be used in tightening all nuts and bolts. Where a different value is prescribed in the Shop Manual text, the text supersedes this table.

Coarse threads

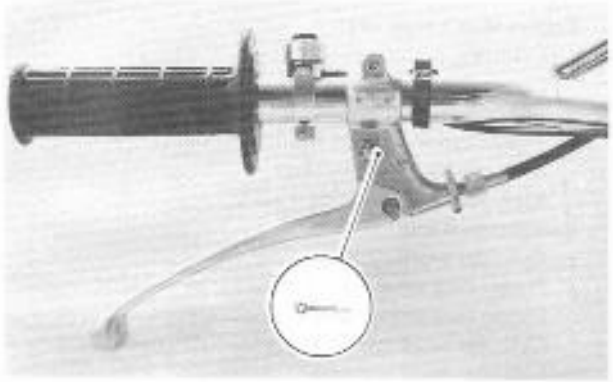
dia (mm)	Pitch (mm)	ft-lbs	kg-m
5	0.90	2.5~3.5	0.35~0.50
6	1.00	4.6~6.5	0.6~0.9
8	1.25	11.5~16.0	1.6~2.2
10	1.50	22~30	3.1~4.2
12	1.75	39~54	5.4~7.5
14	2.00	60~83	8.3~11.5
16	2.00	94~130	13~18
18	2.50	130~181	18~25
20	2.50	188~253	26~35

Fine threads

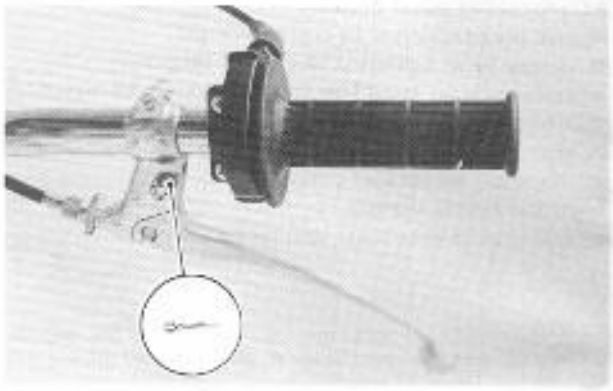
dia (mm)	Pitch (mm)	ft-lbs	kg-m
5	0.50	2.5~3.5	0.35~0.50
6	0.75	4.5~5.5	0.6~0.8
8	1.00	10.0~13.5	1.4~1.9
10	1.25	19.0~25	2.6~3.5
12	1.50	33~45	4.5~6.2
14	1.50	54~74	7.4~10.2
16	1.50	83~116	11.5~16
18	1.50	123~166	17~23
20	1.50	166~239	23~33

COTTER PIN LOCATIONS

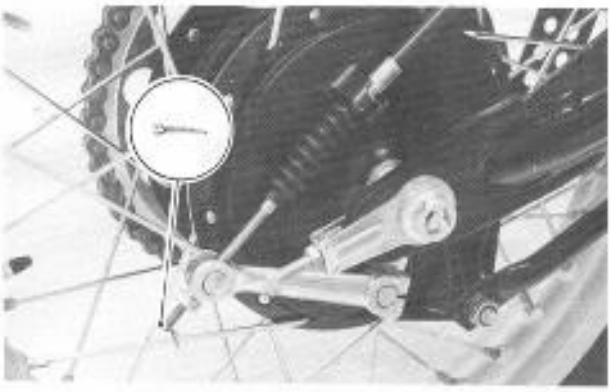
Clutch Lever Pivot Nut



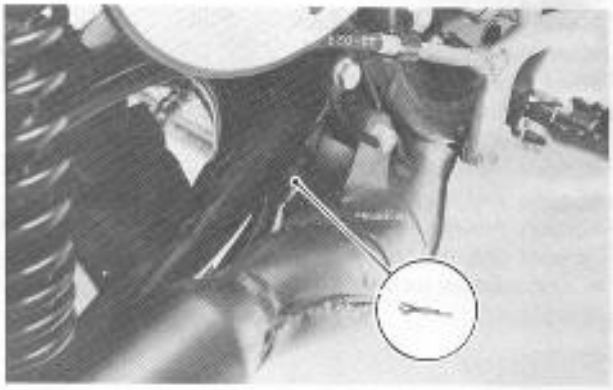
Brake Lever Pivot Nut



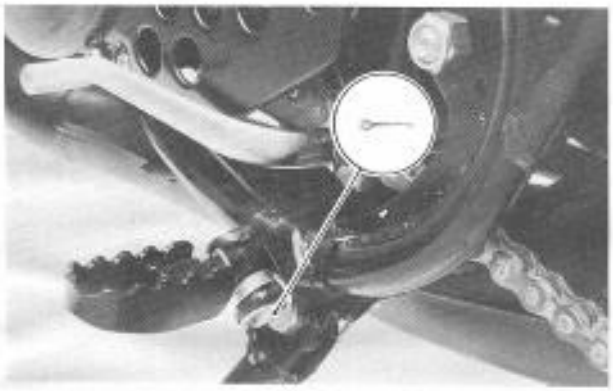
Rear Brake Cable End



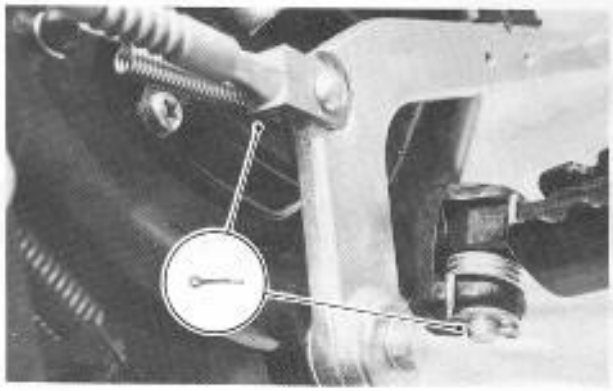
Torque Link Pivot



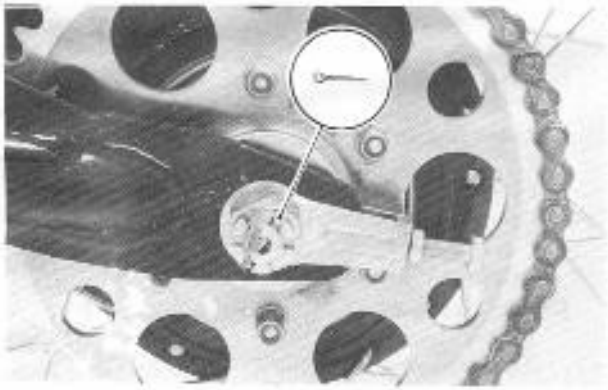
Left Foot Peg Pivot



Right Foot Peg Pivot and Cable Joint



Rear Axle Nut



PRE–RACE CHECK POINTS

Engine

- Transmission oil at proper level
- Spark plug tightened to correct torque
- Cylinder head tightened to correct torque
- Piston, cylinder head free from carbon build-up
- Clutch functioning properly
- Clutch friction plates not worn
- Carburetor, air cleaner connect properly
- Ignition timing correct
- Expansion chamber not damaged

Frame

- Tires of correct specification and inflated to correct pressure
- Spokes not loose
- Bead protectors not loose
- Drive chain at proper slack
- Steering properly adjusted
- Fuel tank mounted securely
- Torque link tightened properly
- Pivot shaft tightened to correct torque
- Engine mounting nuts tightened to correct torque
- Engine and rear sprockets not worn or damaged
- Brakes function properly and brake lever, pedal with proper play or travel
- Chain adjuster lock nuts not loose

TROUBLESHOOTING

Engine Doesn't Start or Starting Difficulty

Engine won't turn over
- Cylinder, piston seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Kick return spring broken
- Kick gear not engaging

Compression low
- Cylinder worn
- Piston ring worn, weak, broken, or sticking
- Piston ring groove and ring clearance excessive
- Cylinder head not sufficiently tightened down
- Cylinder head warped
- Cylinder head gasket damaged
- Crankshaft oil seal defective

No spark or spark weak
- Spark plug defective
- Spark plug cap poorly connected or shorted
- Ignition coil defective
- Wiring open or shorted
- Magneto defective (layer short)

No fuel flow
- No gasoline in fuel tank
- Fuel hose clogged
- Float valve clogged
- Pilot jet clogged

Flooded
- Fuel level too high
- Float valve worn or stuck open

Poor Running at Low Speed

Spark weak
- Spark plug defective
- Ignition coil defective
- Spark plug cap, high tension cord short
- Spark plug gap excessive

Mixture too rich or too lean
- Air screw maladjusted
- Pilot jet or air passage clogged
- Throttle stop screw maladjusted
- Starter plunger stuck open
- Fuel level too high or too low
- Air cleaner clogged
- Intake manifold loose
- Tank cap air vent obstructed

Compression low
- Cylinder worn
- Piston ring worn, weak, broken, or sticking
- Piston ring groove and ring clearance excessive
- Cylinder head not sufficiently tightened down
- Cylinder head warped
- Cylinder head gasket damaged
- Crankshaft oil seal defective

Other
- Ignition timing incorrect
- Transmission oil viscosity too high

Poor Running or No Power at High Speed

Mixture too rich or too lean
- Air cleaner clogged
- Intake manifold loose
- Main jet clogged or wrong size
- Jet needle or needle jet worn
- Starter plunger stuck open
- Tank cap air vent obstructed
- Fuel level too high or too low

Compression low
- Cylinder worn
- Piston ring worn, weak, broken, or sticking
- Piston ring groove and ring clearance excessive
- Cylinder head not sufficiently tightened down
- Cylinder head warped
- Cylinder head gasket damaged
- Crankshaft oil seal defective

Firming incorrect
- Spark plug defective
- Spark plug cap poorly connected or shorted
- Ignition coil defective
- High tension cord defective

Knocking
- Ignition timing advanced
- Fuel poor quality
- Carbon built up in combusion chamber

Other
- Ignition timing incorrect
- Brakes dragging
- Overheating
- Clutch slipping
- Throttle valve does not fully open
- Transmission oil quantity excessive
- Transmission oil viscosity too high

Overheating

- Ignition timing retarted
- Carbon built up in combustion chamber
- Brakes dragging
- Clutch slipping
- Intake manifold loose or damaged
- Main jet clogged
- Fuel level too low

Clutch Not Operating Smoothly

Clutch slipping
- No clutch lever play
- Friction plates worn
- Clutch springs weak
- Clutch inner cable not sliding smoothly

Clutch doesn't disengage properly
- Clutch lever play excessive
- Clutch springs not evenly tightened
- Transmission oil deteriorated or of too high a viscosity
- Clutch inner cable not sliding smoothly

Shift Operation Not Smooth

Doesn't go into gear or shift pedal doesn't return
- Clutch not disengaging
- Shift return spring weak or broken
- Shift return spring pin loose
- Shift lever spring broken
- Shift fork bent or seized
- Shift drum damaged

Jumps out of gear
- Shift fork worn
- Gear dog or dog recess worn
- Drive shaft, output shaft, or gear splines worn

Poor Handling or Stability

Handlebar hard to turn
- Steering stem nut too tight
- Tire pressure too low
- Steering stem lubrication insufficient

Handlebar vibrates or shakes
- Swing arm bent
- Front fork bent
- Frame bent
- Wheel alignment incorrect
- Pivot shaft warped
- Right/left front fork oil level uneven

Shock absorption too stiff
- Front fork oil quantity excessive
- Front fork oil viscosity too high
- Front fork air pressurized
- Tire air pressure too high

Shock absorption too soft
- Oil quantity insufficient
- Oil viscosity too low
- Fork spring wear
- Suspension oil leak

Brakes don't hold

- Brake maladjustment (cable play excessive)
- Linings or drum worn
- Brakes overheated
- Water in brakes
- Brake cam worn
- Oil on drum

WIRING DIAGRAM