

# Kawasaki KLT 110/160

## MODEL COVERAGE

KLT 110-A1  
KLT 110-A2  
KLT 160-A1

## INDEX

<b>GENERAL SPECIFICATIONS</b> .....	556	Oil Pump.....	576
<b>MAINTENANCE</b> .....	556	External Shift Mechanism.....	577
Lubrication.....	556	Lower End and Transmission.....	577
Motor Oil.....	556	Splitting the Crankcases.....	577
Checking Oil Level.....	556	Crankcase Assembly.....	577
Changing Oil.....	556	Engine Specifications.....	580-581
Filter Screen.....	557	Engine Torque Specifications.....	579
Final Gear Case.....	557	<b>FUEL SYSTEMS</b> .....	582
Front Forks.....	557	Gas Tank.....	582
Drive Chain (KLT 110).....	557	Carburetor (KLT 110).....	582
General Lubrication.....	558	Carburetor (KLT 160).....	582
Service Checks and Adjustments.....	558	Fuel Petcock.....	583
Drive Chain (KLT 110).....	558	Air Cleaner.....	584
Clutch.....	558	Fuel Lines.....	584
Throttle Cable.....	558	Carburetor Specifications.....	584
Front Brake.....	558	<b>ELECTRICAL SYSTEM</b> .....	584
Rear Brake.....	559	Ignition System.....	584
Steering Stem.....	559	Lighting System.....	588
Fuel System.....	559	Wiring Diagrams.....	586-587
Air Filter.....	560	<b>CHASSIS</b> .....	588
Petcock.....	560	Component Removal and Installation.....	588
Carburetor.....	560	Seat.....	588
Recommended Lubricants.....	561	Front Fender.....	588
Periodic Maintenance Intervals.....	561	Rear Fender.....	588
Maintenance Data.....	560	Front Wheel.....	588
<b>TUNE-UP</b> .....	561	KLT 110-A1.....	588
Compression Test.....	561	KLT 110-A2, KLT 160.....	589
Cam Chain Tensioner.....	561	Rear Wheels.....	590
Valve Adjustment.....	562	Front Wheel Bearings.....	590
Ignition Timing.....	562	Inspection.....	590
Carburetor.....	562	Removal.....	590
Adjusting Float Level.....	562	Installation.....	590
Idle Speed and Mixture.....	562	Front Brake.....	590
Spark Arrestor Cleaning.....	563	Removal and Disassembly.....	590
Tune-Up Specifications.....	563	Inspection.....	590
<b>ENGINE AND TRANSMISSION</b> .....	563	Assembly and Installation.....	590
Engine Removal and Installation.....	563	Front Forks (KLT 110-A1).....	591
KLT 110.....	563	Removal.....	591
KLT 160.....	564	Inspection.....	591
Top End.....	564	Installation.....	591
KLT 110.....	564	Hydraulic Front Forks.....	591
KLT 160.....	566	Removal.....	591
Crankcase Cover Components.....	569	Disassembly.....	591
KLT 110.....	569	Inspection.....	592
Recoil Starter.....	569	Assembly.....	592
Left Crankcase Cover.....	570	Changing Fork Oil.....	592
Engine Sprocket.....	570	Installation.....	592
Magneto.....	570	Steering Stem.....	592
Clutch.....	570	KLT 110-A1.....	592
Clutch Release.....	572	KLT 110-A2, KLT 160.....	592
Primary Drive.....	572	Rear Axle.....	593
Oil Pump.....	572	KLT 110.....	593
External Shift Mechanism.....	572	KLT 160.....	593
KLT 160.....	573	Rear Brake.....	594
Recoil Starter.....	573	Removal and Disassembly.....	594
Left Crankcase Cover.....	573	Inspection.....	594
Magneto.....	574	Assembly and Installation.....	595
Reverse Lever.....	574	Rear Axle Bearings.....	595
Clutches.....	574	KLT 110.....	595
Clutch Release.....	575	KLT 160.....	595
Primary Drive.....	576	General Torque Specifications.....	595
		Chassis Torque Specifications.....	595

# Kawasaki KLT 110/160

## GENERAL SPECIFICATIONS

	KLT 110	KLT 160
<b>ENGINE</b>		
Type	4-stroke, SOHC	4-stroke, SOHC
Bore × Stroke (mm/in.)	51.0 × 50.6/2.01 × 1.99	61.0 × 52.4/2.40 × 2.06
Displacement (cc/ci)	103/6.2	153/9.3
Compression ratio	8.2:1	9.5:1
Carburetor	Keihin PC18	Mikuni VM22SS
Ignition system	CDI	CDI
Starting system	Rope	Rope
Lubrication	Wet sump	Wet sump
<b>TRANSMISSION</b>		
Clutch	Centrifugal	Centrifugal
Primary reduction	3.619 (76/21)	3.695 (85/23)
Transmission type	5-speed, constant mesh	5-speed, constant mesh
Gear ratios		
1st	3.307 (43/13)	3.076 (40/13)
2nd	2.111 (38/18)	1.842 (35/19)
3rd	1.545 (34/22)	1.304 (30/23)
4th	1.285 (27/21)	1.076 (28/26)
5th	1.111 (30/27)	0.928 (26/28)
Reverse	—	3.384 (28/13 × 33/21)
Final drive	Chain	Shaft
Final reduction	4.166 (50/12)	3.712 (21/18 × 35/11)
Overall reduction	16.754 (5th gear)	12.738 (5th gear)
<b>DIMENSIONS</b>		
Overall length (mm/in.)	1700/66.9	1730/68.1
Overall width (mm/in.)	975/38.4	1000/39.4
Overall height (mm/in.)	970/38.2	1000/39.4
Wheelbase (mm/in.)	1075/42.3	1110/43.7
Ground clearance (mm/in.)	130/5.1	135/5.3
Seat height (mm/in.)	705/27.8	695/27.4
Dry weight (kg/lbs.)	109/240	124/273
Turning radius (min.) (m/ft.)	1.8/5.9	1.7/5.6
Fuel tank capacity (1/gal.)	9.5/2.5	9.5/2.5
<b>FRAME</b>		
Type	Tubular, single cradle	Tubular, semi-double cradle
Caster	19.5°	23°
Trail (mm/in.)	10/0.39	17/0.70
Track (mm/in.)	700/27.6	740/29.1
Front tire	22 × 11.00-8	21 × 9.00-8
Rear tires	22 × 11.00-8	22 × 11.00-8
Brakes (f/r)	Drum	Drum

## MAINTENANCE

NOTE: Common maintenance procedures are explained in detail in the "General Information" section of this manual.

### LUBRICATION

#### Motor Oil

1. Use motor oil service rated "SE" or "SF."
2. For all-temperature use, the following grades are recommended: SAE 10W-40, 10W-50, 20W-40 or 20W-50.

#### Checking Oil Level

1. Oil level should be checked every time before riding the machine.
2. A sight glass for checking oil level is fitted to the right crankcase cover.

3. Be sure the machine is parked on a level surface to ensure an accurate reading.

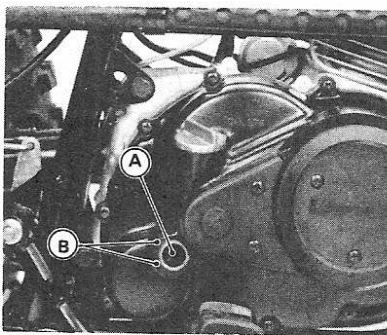
4. Level should be checked after the engine has been running for a few minutes. Shut it off and let the oil settle for a minute or so.

5. Oil level should be between the upper and lower level marks inscribed on the crank-

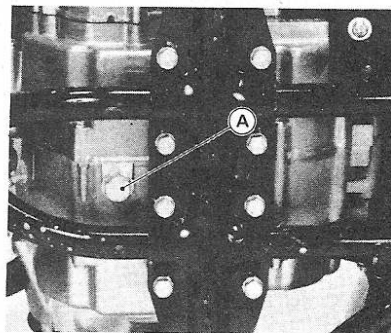
case. If the level is too low, add just enough lubricant of the correct grade to bring it up between the marks. Do not overfill.

#### Changing Oil

1. The oil should be changed every 30 days when the machine is in regular use.



Oil level sight glass (A) and level marks (B)



Oil drain plug (A) (110)

2. Oil should be drained when the engine is at operating temperature. This ensures more complete draining and makes it more likely that the oil will carry off any particulates with it.

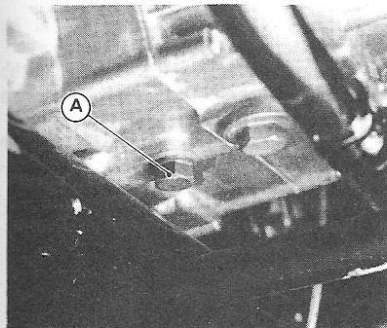
3. Park the machine on a level surface.

4. Place a suitable container (about 2 qts. capacity) beneath the drain plug.

5. Remove the drain plug and allow the oil to drain for several minutes.

6. Clean the drain plug in a safe solvent. Check gasket condition. Replace it if damaged.

7. After the oil has drained completely, install the drain plug. Tighten it to 22 ft. lbs. on 110 models and 58 ft. lbs. on 160 models.



Oil drain plug (A) and filter screen plug (160)

8. If the filter screen is to be cleaned, see below. This procedure should be carried out at every third oil change (90 days).

9. Remove the crankcase filler cap and add the correct quantity and grade of oil.

10. Crankcase capacities are:

KLT 110: 1.2 qts. (1.1 L)

KLT 160: 1.8 qts. (1.7 L)

These are approximations. Determine the exact amount of oil to be added by watching the sight glass.

11. When the sight glass indicates that oil level is correct, install the filler cap, start the engine and allow it to run for several minutes. Check for leaks. Shut the engine off and recheck the level after a minute or so.

## Filter Screen

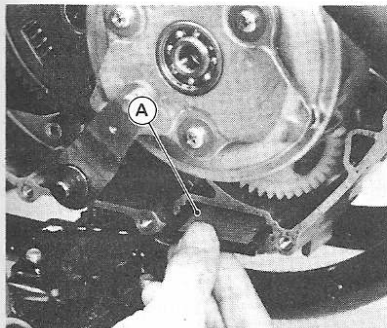
### KLT 110

1. The engine is fitted with an oil filter screen inside the right crankcase cover. The screen should be cleaned every third oil change, or after every 90 days of operation.

2. Have a new crankcase cover gasket on hand.

3. Drain the oil as outlined above.

4. Place a drip pan beneath the right crankcase cover.



Filter screen (A)(110)

5. Disconnect the oil line at the front of the cover.

6. Remove the crankcase cover screws.

7. Remove the crankcase cover. If it is stuck, tap around the top and bottom with a plastic mallet to free it.

8. Remove the cover gasket.

9. Remove the filter screen.

10. Clean the screen in a safe solvent. Remove all foreign matter.

11. Check the debris for metal particles. If any are present, severe engine wear is taking place. Determine the cause. This may be due to a leaking air filter, insufficient engine oil, etc.

12. If the screen is punctured or cannot be cleaned effectively, replace it.

13. Install the screen.

14. Clean the gasket surface thoroughly, removing all traces of old gasket material.

15. Install the new gasket.

16. Check that the two cover dowel pins are in place. Check that the clutch release lever and clutch bearing are in place.

17. Install the crankcase cover.

18. Tighten the cover screws evenly.

19. Fill the crankcase with the proper quantity and grade of oil. Check level with the sight glass. Run the engine for several minutes and check for leaks.

### KLT 160

1. The engine is fitted with a filter screen in a plug located near the oil drain plug.

2. The screen should be cleaned at every third oil change, or after every 90 days.

3. Drain the oil as outlined above.

4. Remove the filter screen bolt near the drain bolt.

5. Clean the filter screen in a clean, safe solvent. Remove all foreign matter.

6. Check the debris for metal particles. If any are present, severe engine wear is taking place. This may be due to a leaking air filter, insufficient engine oil, etc or other, more serious, problems.

7. If the screen is punctured or cannot be cleaned effectively, replace it.

8. Inspect the plug gasket and replace it if damaged.

9. Install the plug and tighten it to 58 ft. lbs.

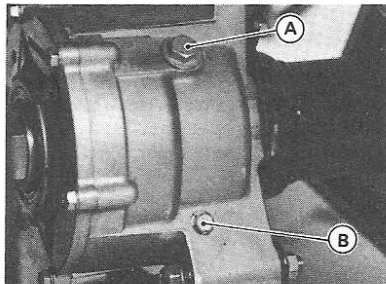
10. Fill the crankcase with the proper grade and quantity of oil. Check level with the sight glass. Run the engine for several minutes and check for leaks.

## Final Gear Case

1. SAE 10W-40 motor oil, service rated "SE" or "SF" is recommended.

2. Gear case capacity is 0.2 qts. (0.2 L).

3. The gear case oil should be changed once a year under conditions of normal use.



Final gear case filler plug (A), and level plug (B)

## CHECKING OIL LEVEL

1. Park the machine on a level surface.

2. Remove the level plug from the gear case. Oil should just begin to come out of the level hole. If it does not, add just enough SAE 10W-40 SF motor oil so that the oil starts to come out.

3. Check the condition of the level plug gasket and replace it if it is crushed or otherwise damaged.

4. Tighten the level plug to about 7 ft. lbs.

## CHANGING OIL

1. Run the machine until operating temperature is reached.

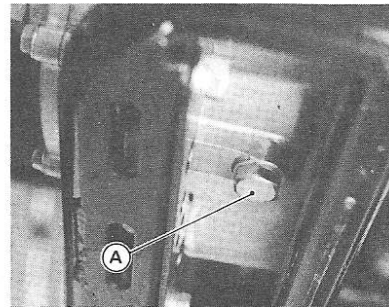
2. Park the machine on a level surface.

3. Place a drip pan beneath the final gear case.

4. Remove the filler plug. Remove the gear case drain plug. Allow the oil to drain for several minutes.

5. Clean the drain plug thoroughly in a safe solvent. Check gasket condition. Using a new gasket is recommended.

6. Install the drain plug. Tighten it to 22 ft. lbs.



Final gear case drain plug (A)

7. Inspect the drained oil for metal particles. If present, it indicates that the drive train is undergoing severe wear. The cause should be determined before the machine is operated any more.

8. Fill the gear case with about 0.2 qts of SAE 10W-40 motor oil, service rated SF.

9. Remove the level plug. Add more oil, if necessary, until oil just begins to seep out of the level hole.

10. Install the level plug and the filler plug. The level plug should be tightened to about 7 ft. lbs. The filler plug should be tightened to 22 ft. lbs.

**CAUTION:** Check that none of the drained oil has gotten on the tire. If it has, wipe it off.

## Front Forks

1. Oil in hydraulic-type front forks should be changed every 90 days.

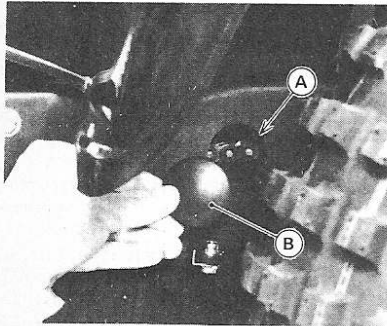
2. Forks use SAE 5W-20 motor oil.

3. The change procedure involves removing each fork leg and dumping the fluid out. This procedure is given in the "Chassis" section under "Hydraulic Front Forks."

## Drive Chain (KLT 110)

1. The drive chain is fitted with rubber O-rings between the chain plates to seal in lubricant and keep out dirt. Therefore, the chain should be lubricated only with oil (SAE 90 is recommended). Do not use commercial chain lubricants or petroleum-based solvents as they may damage the O-rings.

# Kawasaki KLT 110/160



Chain case inspection hole (A) and cap (B)

2. Remove the rubber inspection cap from the chain case and check chain condition. If it is dirty, it should be removed and thoroughly cleaned before lubrication. Refer to "Rear Axle" in the "Chassis" section for removal and installation procedures.

3. Support the rear wheels off the ground.

4. Slowly rotate the rear wheels while brushing SAE 90 oil onto the chain. Be sure that the lubricant is applied to both the inner and outer plates.

5. After the chain has been thoroughly lubricated, adjust slack as outlined under "Service Checks and Adjustments", below.

## General Lubrication

1. General lubrication points include control cables, control lever pivots and joints, brake cams, the propeller shaft joint (KLT 160), wheel and steering bearings and the throttle lever housing.

2. The service interval will depend on how the machine is used. Cables, levers and chassis pivots should be lubricated about every 30 days of use under normal operating conditions. Wheel and steering bearings should be attended to about every 90 days of use.

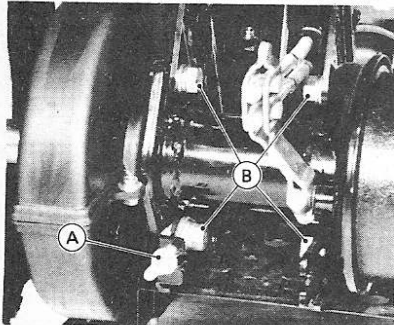
3. Refer to the "Chassis" section for procedures to reach wheel and steering bearings.

## SERVICE CHECKS AND ADJUSTMENTS

### Drive Chain (KLT 110)

1. The drive chain should have 0.4-1.0 in. (10-25mm) of total up and down slack when measured at the inspection hole on the chain case.

2. Before checking or adjusting chain slack, the following conditions must be met:



Chain adjuster locknut (A) and axle mounting bolts (B)

a. The rear wheels of the machine should be supported off the ground.

b. The chain must be clean and well lubricated.

c. The chain should have been checked for tight spots by slowly rotating the rear wheels and checking tension at several points. If a tight spot exists, the chain should be adjusted to the proper slack at the tight spot. Note, however, that such a condition indicates that chain, sprockets or both are worn and should be inspected and probably replaced as soon as possible.

3. If total up-and-down chain slack at the inspection hole is not within the 0.4-1.0 in. (10-25mm) range, refer to the illustration and proceed as follows.

4. Loosen the chain adjuster locknut (A).

5. Loosen the four axle mounting bolts (B).

6. Turn the adjuster locknut clockwise (as seen from the back of the machine) to tighten a slack chain. To provide more slack to a tight chain, turn the locknut counterclockwise and push the axle forward.

7. When slack is correct, tighten the four axle mounting bolts (torque is 43 ft. lbs.). Tighten the adjuster locknut (43 ft. lbs.).

8. Recheck chain slack. Repeat the procedure if it is not within specification.

## Clutch

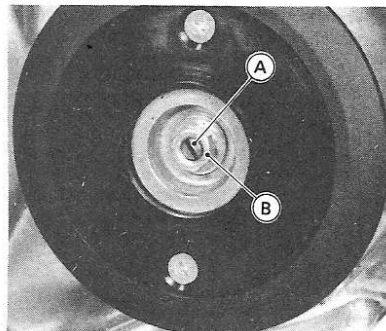
### KLT 110

1. The clutch should be adjusted after every 10 days of operation.

2. Remove the clutch adjusting screw rubber cap on the right crankcase cover.

3. Loosen the adjusting screw locknut.

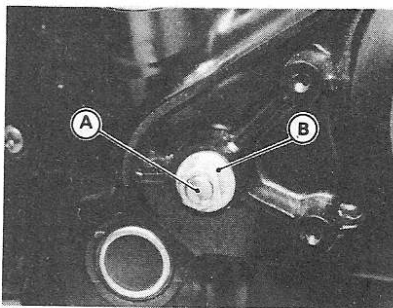
4. Back the adjusting screw off (CCW) a bit, then turn it clockwise until resistance is felt.



Clutch adjusting screw (A) and locknut (B) (110)

5. Hold the adjusting screw in this position and tighten the locknut.

6. Install the rubber cap.



Clutch adjusting screw (A) and locknut (B) (160)

### KLT 160

1. The clutch should be adjusted after every 10 days of operation.

2. Remove the clutch adjusting screw rubber cap on the right crankcase cover below the oil filler cap.

3. Loosen the adjusting screw locknut.

4. Turn the adjusting screw clockwise until resistance is felt. Stop.

5. Turn the adjusting screw counterclockwise until resistance is felt.

6. Hold the adjusting screw in this position and tighten the locknut.

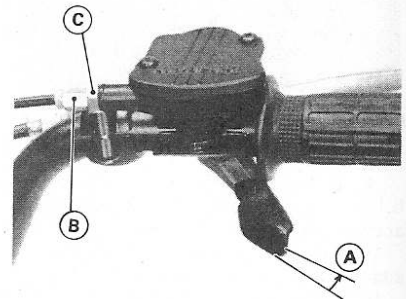
7. Install the rubber cap.

## Throttle Cable

1. Throttle cable free-play should be checked about every 10 days of operation.

2. The throttle cable has adjusters at the hand lever and at the carburetor. Either can be used for adjustment.

3. The throttle lever should be able to move 2-3mm (0.08-0.12 in.) before the throttle slide starts to open.



Throttle lever free-play (A), adjuster (B) and locknut (C)

4. To make this adjustment, slide back the rubber adjuster cover. Loosen the adjuster locknut and turn the adjuster in or out until lever free-play is correct. Tighten the adjuster locknut and put the cover back in place.

5. Let the engine idle and turn the handlebars slowly from lock-to-lock. Idle speed must not change. If it does, the cable is either too tightly adjusted, or is binding somewhere along its route. Determine the cause before operating the machine.

**CAUTION:** Throttle cable adjustment is an important safety item.

## Front Brake

### KLT 110-A1

1. The brake cable adjuster is fitted to the drum end of the cable.

2. When the brake hand lever is applied, the gap between the hand lever and the lever holder should be 4-5mm (0.16-0.20 in.) before the linings contact the drum.

3. To make this adjustment, turn the adjusting screw at the lower end of the cable.

4. Check that the brake wear indicator stays within the "Usable Range" when the brake is fully applied. If it does not, the brake shoes must be replaced.

5. After adjusting the cable, support the front wheel off the ground and spin the tire. There should be no noise indicating dragging brakes. Apply the brake hand lever several times and ensure that the brakes release each

time. If they do not, determine the cause and remedy the condition. Possible causes include a binding cable due to dirt, corrosion or incorrect routing, worn or damaged brake return springs or a corroded or damaged brake cam.

6. When the brake hand lever is fully applied, the angle formed by the lever at the drum and the cable should be 80-90° for maximum brake effectiveness. If not within this specification, it is possible to remove the lever from the splined shaft and reposition it so that the angle is correct.

**CAUTION:** Do not change the position of the brake wear indicator.

## KLT 110-A2, KLT 160

1. Brake cable adjusters are fitted to the hand lever bracket and to the brake drum. Use the upper adjuster for minor brake adjustments. When it starts to pass about half of its adjustment range, use the adjuster at the drum.

2. When the brake hand lever is applied, the gap between the hand lever and the lever holder should be 4-5mm (0.16-0.20 in.) before the linings contact the drum.

3. Make minor adjustments with the adjuster at the hand lever. Loosen the adjuster locknut and screw the adjuster in or out until the gap is correct, then tighten the locknut.

4. For major adjustments, or when the handlebar adjuster has used up more than half of its usable range, use the adjuster at the drum.

5. Loosen the upper adjuster locknut and turn the adjuster in all the way. Tighten the locknut.

6. Back off the drum adjuster mounting nuts and slide the adjuster on its bracket so that hand lever free movement is 4-5mm (0.16-0.20 in.).

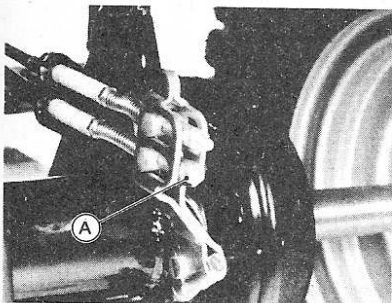
7. Tighten the mounting nuts. Recheck adjustment and make minor corrects, if required, with the hand lever adjuster.

8. After adjusting the cable, support the front wheel off the ground and spin the tire. There should be no noise indicating dragging brakes. Apply the lever several times and ensure the brakes release each time. If they do not, determine the cause and remedy the condition. Possible causes include a cable binding due to dirt, corrosion or incorrect routing, worn or damaged brake return springs or corroded or damaged brake cam.

## Rear Brake

1. The rear brake is controlled by both a hand lever and a foot pedal. Both lever and pedal must be adjusted at the same time.

2. The brake pedal on KLT 160 models is adjustable for position. To position the pedal, back off the rod adjuster, loosen the stop bolt



Brake pedal adjuster (A)

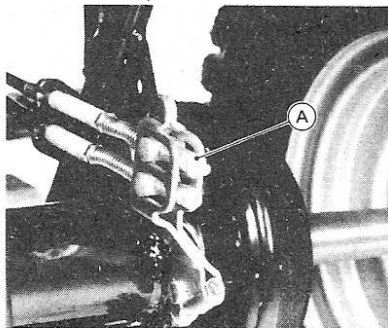
locknut and turn the stop bolt so that the pedal at rest position is comfortable for the operator. Adjust the pedal travel as outlined in the following steps.

3. Adjust the brake pedal first. The pedal should have about 25mm (1 in.) of free movement before the linings contact the drum. Adjust by means of the adjuster on the end of the rod or cable at the rear brake drum.

4. To adjust the hand lever, adjusters are fitted to the hand lever bracket and to the end of the cable at the brake drum.

5. Use the hand lever adjuster for minor adjustments. When it starts to pass about half of its adjustment range, use the adjuster at the brake drum end of the cable.

6. The hand lever should have 4-5mm (0.16-0.20 in.) of free movement before the linings contact the drum. This distance is measured between the hand lever and the lever holder.



Brake hand lever adjuster (A)

7. To adjust at the handlebar, loosen the adjuster locknut and turn the adjuster in or out until free play is correct. Tighten the locknut.

8. To adjust at the drum, first screw the handlebar adjuster all the way in.

9. Turn the adjuster at the brake drum until hand lever free play is correct. Make minor corrections, if required, with the adjuster at the handlebar.

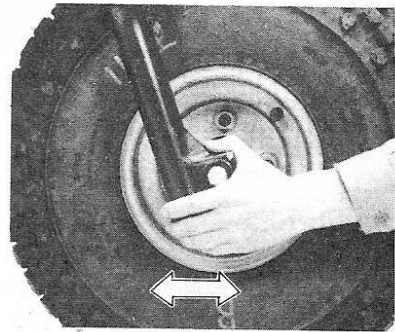
10. After adjusting both the brake pedal and the brake hand lever, support the rear wheels off the ground and check operation. Spin the wheels and apply both pedal and lever several times. Ensure that the brakes release fully after every application. There should be no noise to indicate dragging. If there is, determine the cause and remedy the condition. Possible causes include weak or damaged brake return springs, a corroded or damaged brake cam, an unlubricated or corroded brake cable, pedal or lever pivot or incorrectly routed cable.

## Steering Stem

1. Steering stem bearing adjustment should be checked every 90 days of operation.

2. To check bearing adjustment, support the front wheel off the ground. Grasp the lower ends of the fork tubes and attempt to move the forks back and forth in line with the machine. There should be no detectable movement. If there is, bearings must be adjusted.

3. Turn the forks slowly from lock-to-lock, again with the front wheel off the ground. Movement should be smooth, silent and effortless. If any binding or uneven movement is felt, the balls and races are



Checking steering stem bearing adjustment

either too tightly adjusted or are worn. If the steering feels uniformly stiff, the bearings are too tightly adjusted. If any noise is noted, the bearings are damaged and/or some are missing.

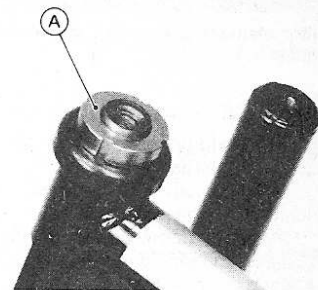
4. With the front wheel off the ground, release the forks from a position a few degrees to either side of the centered position. They should fall freely to the lock of their own accord. If they do not, the bearings are too tightly adjusted, the steering stem is bent, the races are worn or some of the bearings are missing.

5. Remove the gas tank.

6. Remove the upper triple clamp rubber cover.

7. Loosen the upper triple clamp bolts above the fork tubes.

8. Loosen the steering stem bolt.



Steering stem bearing adjuster nut (A)

9. Use a pin wrench to turn the adjuster nut beneath the upper triple clamp until bearing action conforms to behavior described above—i.e., no play and smooth movement. Do not turn the adjuster nut more than 1/8 turn at a time.

10. When bearing movement is correct, tighten the bolts above the fork tubes (22 ft. lbs.) and the steering stem bolt (40 ft. lbs.).

11. Recheck bearing operation.

**NOTE:** If correct bearing operation cannot be achieved, or if it is necessary to turn the adjuster nut more than two turns, suspect worn or damaged bearings and/or races. See "Chassis" for disassembly instructions.

## FUEL SYSTEM

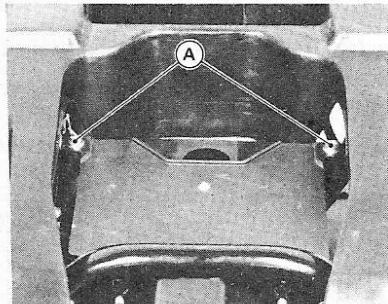
Fuel system maintenance involves cleaning the air filter element, cleaning the fuel petcock screens and cleaning the carburetor float bowl. The air filter element should be cleaned every 10 days of use. The petcock and carburetor should be attended to every 90 days of use.

# Kawasaki KLT 110/160

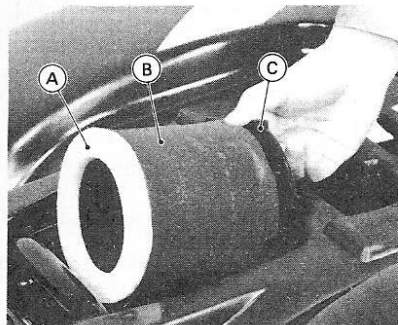
## Air Filter

### REMOVAL

1. Remove the seat.
2. Remove the air cleaner cover which is secured by two screws.
3. Lift the air cleaner element with holder straight up and out.



Air cleaner cover screws (A)



Filter element gasket (A), element (B) and holder (C)

### SERVICE

1. Carefully remove the air cleaner element from the frame.
2. In a well-ventilated area, clean the element in a safe solvent.

**CAUTION:** Low flash point solvents such as gasoline should not be used as they present a safety hazard.

3. Squeeze the element to dry it. Do not wring it out as the pores may be damaged or the element itself may be ripped.

4. When all dirt has been purged, dry the element thoroughly.

5. Inspect element condition. If it cannot be cleaned effectively, or if the fabric is worn, torn or otherwise damaged, the element should be replaced.

6. Soak the element in clean SAE 30 motor oil or a commercial air cleaner oil. Squeeze out the excess.

### INSTALLATION

1. Pull the element back over the frame.  
2. Install the element holder in the air cleaner case engaging the lower end in the slot provided.

3. Grease the element gasket with a light-weight general purpose grease.

4. Slip the element into the case with the gasket side towards the engine. Be sure it is fully seated.

5. Fit the air cleaner cover with the intake tube towards the rear of the machine.

6. Be sure to hook the lip on the front edge of the cover under the forward edge of the case.

7. Secure the cover screws.

### Petcock

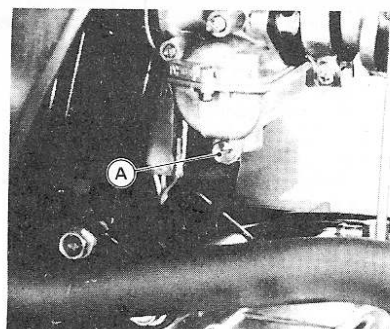
1. The fuel petcock is fitted with filter screens on the pipes inside the fuel tank. The petcock should be removed and the screens cleaned after every 90 operating days.

2. The procedure involves removing the fuel tank. Refer to "Fuel Systems" for procedures.

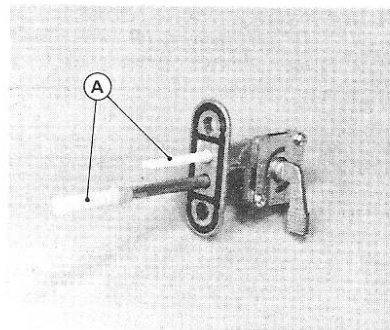
### Carburetor

1. Although a thorough cleaning of the carburetor necessitates its removal from the machine, water and foreign matter can be removed from the float bowl by unscrewing the float bowl drain plug and allowing the gasoline to drain into a suitable container.

**CAUTION:** Be sure to do this in a well-ventilated area a safe distance from sparks or open flames.



Carburetor float bowl drain plug (A)



Fuel petcock filter screens (A)

2. Check the drained gasoline for foreign matter, water, etc. If there seems to be a fair amount of it, check that the air filter is clean and properly installed.

3. Turn the petcock to the "RES" position with the drain plug unscrewed and watch the gasoline which drains out. If it has more foreign matter in it, the tank should be removed and purged and the petcock filter screens should be cleaned.

4. If flow from the carburetor float bowl seems sluggish, a clogged filter or clogged fuel cap vent may be the problem. Check the fuel system and clean it thoroughly. Refer to "Fuel Systems" for procedures.

## MAINTENANCE DATA

	KLT 110	KLT 160
Fuel tank capacity (gal/L)	2.5/9.5	2.5/9.5
Engine oil capacity (qts./L)	1.2/1.1	1.8/1.7
Final gear case (qts./L)	—	0.2/0.2
Hydraulic forks (oz./cc each leg)	3.0/88 <sup>①</sup>	3.0/88 <sup>①</sup>
Tire pressure (psi)		
Front	2	3
Rear	2	2
Chain slack (mm/in.)	25/1.0	—

<sup>①</sup> Total capacity

## TUNE-UP

NOTE: Common tune-up procedures are explained in detail in the "General Information" section.

### COMPRESSION TEST

1. A compression test should be performed before and after a complete tune-up, as it will provide clues to the general mechanical condition of the engine.

2. A hold-in type gauge can be used if it is so constructed that clearance is not a problem. If a screw-in type gauge is used, a 12mm adapter is required to fit the spark plug hole.

3. Run the engine until it is at operating temperature.

4. Disconnect the spark plug lead and remove the plug.

5. Fit the compression gauge. Hold the throttle wide open while cranking the engine and note the compression reading. The highest reading is the measurement to be considered.

NOTE: The KLT 160 is equipped with an automatic compression release which will make a dramatic difference in compression readings. The ACR may also be a cause of compression problems. Be aware of this before troubleshooting for a possible engine problem.

6. Standard compression for the KLT 110 is 164-192 psi. The minimum acceptable reading is 125 psi and the maximum acceptable reading is 192 psi.

7. Standard compression for the KLT 160 is 14-43 psi. This is due to the operation of the ACR and is not true engine compression.

8. If the compression reading is too high, it is likely that the piston crown and/or combustion chamber is carboned up. The cylinder head should be removed and the head and piston decarbonized. On the KLT 160, a higher-than-normal compression reading may also indicate a defective ACR. The unit should be removed and inspected before further work is done. Refer to "Top End" in the "Engine And Transmission" section.

9. If the compression is too low, squirt some motor oil into the cylinder and repeat the test. If the compression reading increases, suspect a worn piston, cylinder and/or rings. If it does not increase, suspect worn, damaged or poorly adjusted valves, leaking seats, etc. Low compression may also be due to a defective ACR on the KLT 160. The unit should be removed and inspected before further work is done. Refer to "Top End" in the "Engine And Transmission" section.

10. Other causes of low compression include a warped head and/or blown head gasket. The compression will not increase when oil is added to the cylinder if this is the problem.

### CAM CHAIN TENSIONER

Cam chain tension is maintained automatically. No routine adjustments are required as long as the tensioner is functioning properly. See "Engine And Transmission" under "Top End" for tensioner removal and inspection.

## PERIODIC MAINTENANCE INTERVALS<sup>①</sup>

Before each ride

- Safety items
- Operation of lights
- Chain adjustment (KLT 110)
- Throttle operation
- Brake operation
- Engine oil level
- Tire pressure (check when cold)

Every 10 days of operation

- Brake wear
- Control cable adjustments
- Tightness of critical fasteners
- Clutch adjustment
- Air filter cleaning

Every 30 days of operation

- Change engine oil
- General lubrication

Every 90 days of operation

- Clean oil filter screen
- Clean carburetor and petcock
- Grease propeller shaft joint (KLT 160)
- Change fork oil (hydraulic forks)
- Lubricate wheel and steering head bearings
- Grease brake cams

Every year

- Change final gear case oil (KLT 160)
- Clean spark arrestor

① Based on normal usage after initial service and break-in are completed.

## RECOMMENDED LUBRICANTS

Engine

- SAE 10W-40, service rating "SE" or "SF"
- SAE 10W-50, service rating "SE" or "SF"
- SAE 20W-40, service rating "SE" or "SF"
- SAE 20W-50, service rating "SE" or "SF"

Final Gear Case

- SAE 10W-40, service rating "SE" or "SF"

Front Forks (Hydraulic)

- SAE 5W-20

Drive Chain (KLT 110)

- SAE 90 oil

Air Filter Element

- SAE 30

Control cables

- Light motor oil
- Graphite-based lubricant
- Molybdenum disulphide-based lubricant
- Commercial motorcycle cable lubes

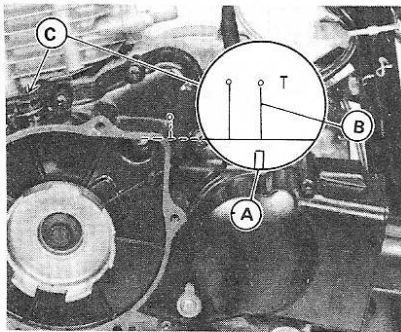
# Kawasaki KLT 110/160

## VALVE ADJUSTMENT

### Checking Clearance

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

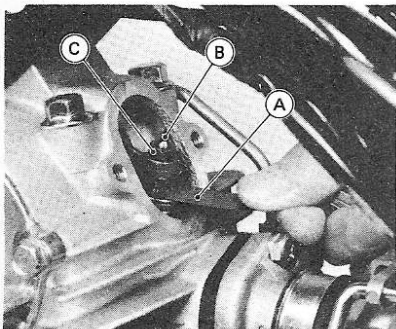
1. Remove the seat. See "Chassis."
2. Remove the gas tank. See "Fuel Systems."
3. Remove the spark plug.
4. Remove the intake and exhaust valve covers.
5. Remove the timing inspection plug on top of the left crankcase cover.
6. Remove the recoil starter case.
7. Use a wrench on the bolt or nut on the end of the crankshaft and carefully turn the engine over in a counterclockwise direction until the intake valve opens and closes.
8. Continue turning the engine in the same direction while watching the magneto rotor through the inspection hole.



Timing indicator (A), "T" mark (B) and inspection plug (C)

9. When the "T" mark on the rotor aligns with the indicator, stop and hold the engine in this position. The piston is now at TDC on the compression stroke, both valves are closed and adjustment can be checked.

10. Check for clearance at both valves by attempting to move the rocker arms with your fingers. If one seems tight, it may be that the piston is at TDC on the exhaust stroke. In this case, repeat the procedure until you are sure that both valves are closed.



Checking valve clearance: feeler gauge (A), adjuster (B), locknut (C)

11. Valve clearances are as follows:

KLT 110:

Intake: 0.12-0.17mm/0.005-0.007 in.

Exhaust: 0.12-0.17mm/0.005-0.007 in.

KLT 160:

Intake: 0.12-0.17mm/0.005-0.007 in.

Exhaust: 0.18-0.23mm/0.007-0.009 in.

12. A feeler gauge blade of the thickness shown above should be a slip fit between the adjuster and stem of a correctly adjusted

## RECOMMENDED LUBRICANTS

Wheel and steering stem bearings  
Waterproof, medium-weight bearing grease

Throttle lever housing  
Waterproof, light duty grease

General chassis lubrication  
Waterproof, medium-weight chassis grease

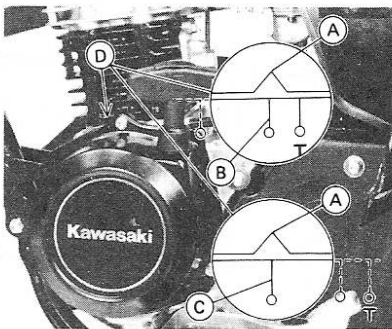
valve. If the blade is too loose or too tight, adjust the valves as outlined below.

### Adjusting Clearance

1. Check clearance as outlined above.
2. Loosen the valve adjuster locknut and turn the adjuster so that a feeler gauge blade of the correct thickness is a light slip fit between adjuster and valve stem.
3. Hold the adjuster in place and tighten the locknut.
4. Recheck clearance. Often it will change when the adjuster locknut is tightened.

## IGNITION TIMING

1. Ignition timing requires a stroboscopic timing light and a tachometer.
2. Timing can be checked by removing the timing inspection plug on the left crankcase cover and noting the alignment of the magneto rotor timing marks with the indicator. The "F" mark should align below 1500 rpm for the 110 and 1350 rpm for the 160. The advance mark should align at 4000 rpm and above for the 110 and at 5000 rpm and above for the 160.



Ignition timing: indicator (A), "F" mark (B), advance mark (C) and inspection plug (D)

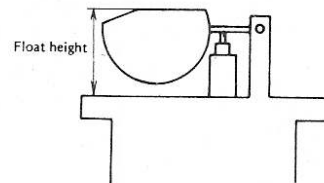
3. Timing is not adjustable, however, and if the proper alignments are not made, the CDI unit must be replaced. Refer to "Electrical Systems."

## CARBURETOR

Carburetor adjustments to be made during a tune-up include float level, idle speed and mixture.

### Adjusting Float Level

1. Float level is a measure of the amount of gasoline that remains in the carburetor during operation. While it is a critical



Carburetor float height

specification, it will not normally need readjustment once properly set. Float level, therefore, need not be adjusted at every tune-up, but should be attended to from time to time.

2. If a fuel level gauge is available, service fuel level can be obtained without removing the carburetor from the machine. Service fuel levels are as follows:

KLT 110: 2.5 ± 1mm (0.10 ± 0.04 in.)

KLT 160: 5.0 ± 1mm (0.20 ± 0.04 in.)

3. To adjust float height, remove the carburetor (see "Fuel Systems".)

4. Remove the float bowl.

5. Remove the float bowl gasket.

6. Carefully lower the float until the tang just touches the tip of the float needle.

7. The distance from the float bowl mating surface to the top of the float is the float height. It should be:

KLT 110: 20mm (0.8 in.)

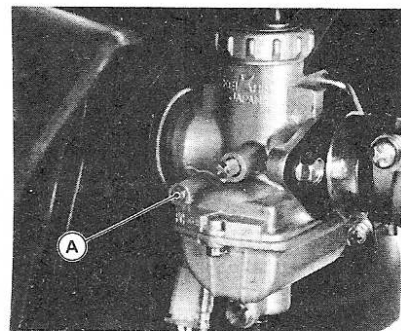
KLT 160: 33.3mm (1.3 in.)

8. If the measurement is not correct, remove the float and bend the tang so the float height is brought within specification.

NOTE: The float height adjustment will be incorrect if the float needle is worn or if there is foreign matter on the needle or needle seat.

### Idle Speed And Mixture

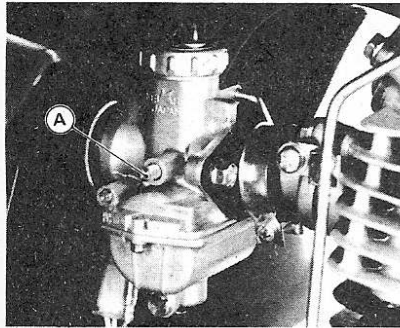
NOTE: The following adjustments should be performed when the engine is at operating temperature. Other adjustments (valves, air cleaner, etc.) should be done first.



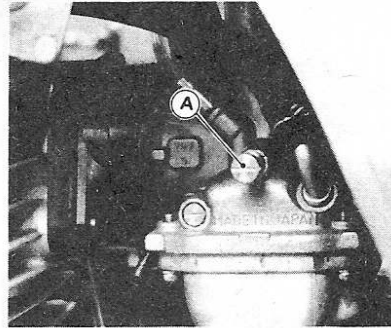
Pilot screw (A)(110)



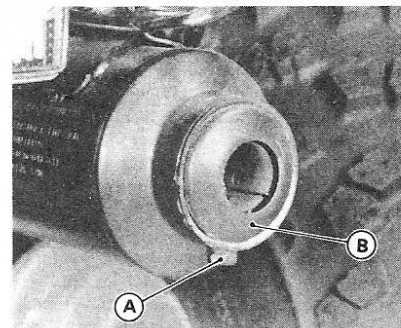
# Kawasaki KLT 110/160



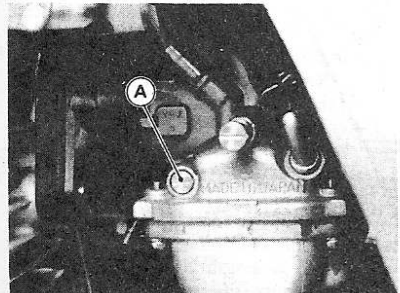
Throttle stop screw (A)(110)



Throttle stop screw (A)(160)



Spark arrestor (B) and mounting bolt (A)



Pilot screw (A)(160)

1. Locate the pilot screw on the side of the carburetor.

2. Turn the screw in carefully until it is lightly seated, then back it out the following number of turns:  
 KLT 110: 1-3/8  
 KLT 160: 1-1/4  
**CAUTION: Do not overtighten the screw or the calibrated tip will be damaged.**  
 3. Locate the throttle stop screw.  
 4. Turn the screw as required until the engine is running at the lowest smooth idle speed.

## SPARK ARRESTOR CLEANING

1. The spark arrestor should be decarbonized every year.

2. Remove the bolt that secures the spark arrestor in the muffler.  
 3. Pull out the spark arrestor.  
 4. In an open, well-ventilated area clear of flammable materials, start the engine.  
 5. When operating temperature is reached, rev the engine while tapping the muffler with a plastic mallet. This will dislodge built-up carbon particles.

**CAUTION: This procedure must be carried out in a safe area. Hot carbon particles are a fire hazard.**

6. Shut off the engine.  
 7. Scrape carbon build-up from the arrestor.  
 8. Install the arrestor and secure it with the bolt.

## TUNE-UP SPECIFICATIONS

	KLT 110	KLT 160
<b>SPARK PLUG</b>		
Type	D-7EA	D-8EA
<b>COMPRESSION</b>		
Standard (psi)	164-192	14-43 <sup>①</sup>
Minimum (psi)	125	14
Maximum (psi)	192	43
<b>VALVE CLEARANCE</b>		
Intake (mm/in.)	0.12-0.17/0.005-0.007	0.12-0.17/0.005-0.007
Exhaust (mm/in.)	0.12-0.17/0.005-0.007	0.18-0.23/0.007-0.009
<b>IGNITION TIMING</b>		
Retarded	10° @ 1500 rpm	10° @ 1350 rpm
Full advance	35° @ 4000 rpm	35° @ 4600 rpm
<b>CARBURETOR</b>		
Float height (mm/in.)	20/0.8	33.3/1.3
Service fuel level (mm/in.)	2.5 ± 1/0.10 ± 0.04	5.0 ± 1/0.20 ± 0.04
Pilot screw (turns out)	1 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>

<sup>①</sup> ACR-affected

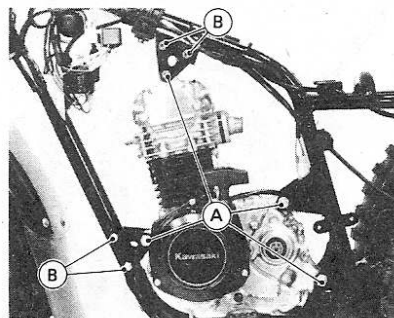
## ENGINE AND TRANSMISSION

**NOTE:** Engine rebuilding techniques and procedures are explained in detail in the "General Information" section of this manual.

### ENGINE REMOVAL AND INSTALLATION

#### KLT 110

1. Drain the engine oil.
2. Remove the seat.



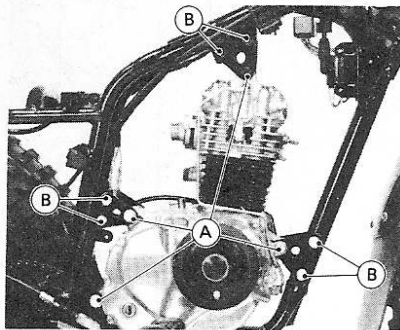
Engine mounting bolts (A) and bracket bolts (B) (110)

3. Remove the rear fender.
4. Remove the gas tank. See "Fuel Systems."
5. Remove the carburetor. See "Fuel Systems."
6. Remove the air cleaner case.
7. Loosen the muffler clamp on the exhaust pipe. Remove the muffler bracket bolts on the frame. Remove the nuts securing the exhaust pipe at the cylinder head. Remove the exhaust system.
8. Remove the three screws from the engine sprocket cover on the left side of the engine. Remove the sprocket cover.
9. Back off the chain adjuster nut at the

# Kawasaki KLT 110/160

rear axle and push the axle forward to increase chain slack.

10. Remove the engine sprocket circlip from the shaft.

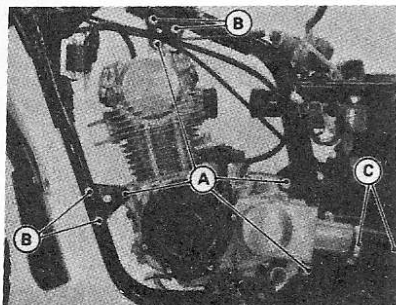


Engine mounting bolts (A) and bracket bolts (B) (110)

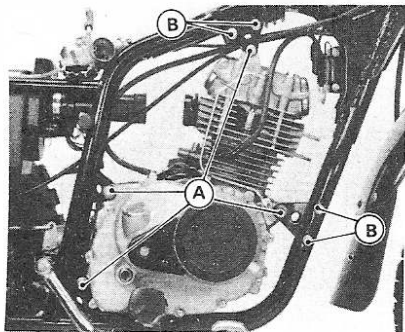
11. Pull off the engine sprocket and chain.
12. Remove the securing hardware and take off the upper half of the chain case.
13. Remove the shift lever from its shaft.
14. Disconnect the lead from the spark plug.
15. Disconnect the magneto wiring at the plastic connectors.
16. Remove the chain guard (just to the rear of the engine sprocket).
17. Remove the engine mounting bolts and bracket bolts at the front and rear of the engine and at the cylinder head. See illustrations.
18. Installation is the reverse of removal. Tighten the cylinder head mounting bolt and bracket bolts to 13 ft. lbs. Tighten the front and rear bracket bolts to 13 ft. lbs. and the front and rear engine mounting bolts to 22 ft. lbs.
19. The engine sprocket must be installed with the number facing outward. If the sprocket collar was removed from the mainshaft, a new O-ring should be used. Install the collar with the bevelled side in.
20. Do not forget to refill the crankcase with motor oil.

## KLT 160

1. Drain the engine oil.
2. Remove the seat.
3. Remove the rear fender.
4. Remove the gas tank. Refer to "Fuel Systems."
5. Remove the carburetor. See "Fuel Systems."
6. Loosen the muffler clamp. Remove the two muffler bracket bolts. Remove the exhaust pipe nuts at the cylinder head. Remove the exhaust system.



Engine mounting bolts (A) and bracket bolts (B) (160)



Engine mounting bolts (A) and bracket bolts (B) (160)

7. Remove the pinch bolt and pull the shift lever from its shaft.
8. Disconnect the lead from the spark plug.
9. Disconnect the magneto wiring at the plastic connectors on the frame behind the engine.
10. Loosen the propeller shaft clamp screws.
11. Remove the engine mounting bolts and the bracket bolts.
12. Pull the engine forward to clear the rear mounting brackets and then out to the right side of the frame.
13. Installation is the reverse of removal. Note the following.
14. Lubricate the propeller shaft joints with bearing grease.
15. Be sure the joint spring is installed on the pinion gear nut.
16. Turn the rear wheel to align the joint splines and the pinion gear splines.
17. Tighten the engine mounting bolts at the front and rear of the engine to 22 ft. lbs. Tighten the bracket bolts and the mounting bolt at the cylinder head to 15 ft. lbs.
18. Be sure to refill the crankcase with motor oil before attempting to start the engine.

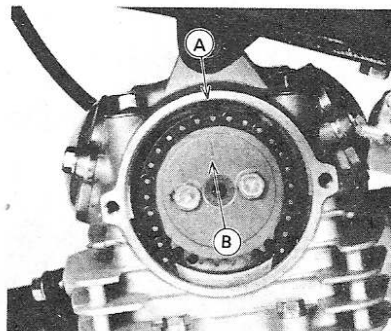
## TOP END

### KLT 110

#### REMOVAL

The top end components (cylinder head, cylinder and piston) can be removed without removing the engine from the frame.

1. Remove the seat.
2. Remove the gas tank. Remove the carburetor. See "Fuel Systems" for procedures.



Align pointer (A) and sprocket slash mark (B) prior to cylinder head removal

3. Loosen the muffler clamp. Remove the muffler bracket bolts. Remove the exhaust pipe nuts at the cylinder head. Remove the exhaust system.

4. Remove the recoil starter assembly.

5. Remove the two bolts and take off the camshaft sprocket cover. Pry slots are provided under the bolt hole bosses.

6. Use a wrench on the magneto rotor nut to turn the engine over until the slash mark on the cam sprocket aligns with the pointer on the top of the cylinder head.

7. Remove the cam chain tensioner in the following manner:

a. Remove the lock bolt from the top of the cam chain tensioner.

b. Screw in a longer bolt of the same dimensions (6mm dia./1.0mm pitch). Tighten the bolt securely to hold the push-rod in place.

c. Remove the tensioner mounting bolts and take off the tensioner.

**CAUTION: Do not turn the engine over with the tensioner removed or damage may result.**

8. Remove the cam sprocket bolts.

9. Pull the sprocket off the cam and disengage it from the chain.

10. Loop a length of wire through the chain and secure it to prevent the chain from falling into the cylinder.

11. Disconnect the lead from the spark plug.

12. Loosen the spark plug.

13. Remove the cylinder head mounting brackets.

14. Remove the cylinder head oil pipe banjo bolts at the head and the crankcase.

15. Remove the oil pipe mounting screws and remove the pipe.

16. Remove the 6mm cylinder head bolts near the cam sprocket housing.

17. Remove the 8mm cylinder head bolts on the top of the head.

18. Lift the cylinder head from the cylinder and remove it.

19. Note the locations of the dowel pins on the cylinder head/cylinder mating surface.

20. Remove the head gasket.

21. To remove the cylinder, lift it up while turning the front cam chain guide.

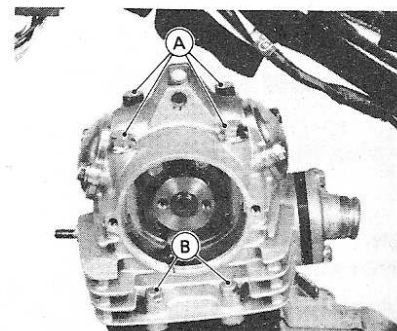
22. Note the location of the dowel pins on the crankcase mating surface.

23. Remove the wrist pin circlips and push out the wrist pin to remove the piston.

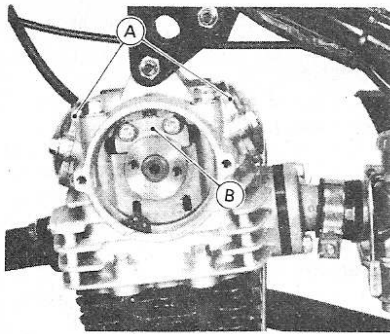
24. Remove the cylinder base gasket.

#### DISASSEMBLY

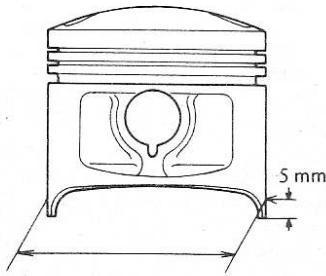
1. Remove the valve adjuster caps from the head.



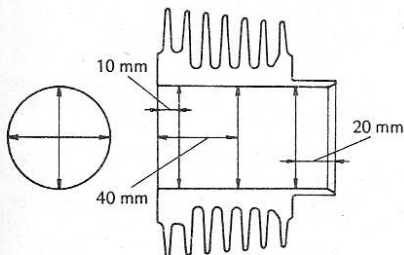
Cylinder head 8 mm bolts (A) and 6 mm bolts (B)



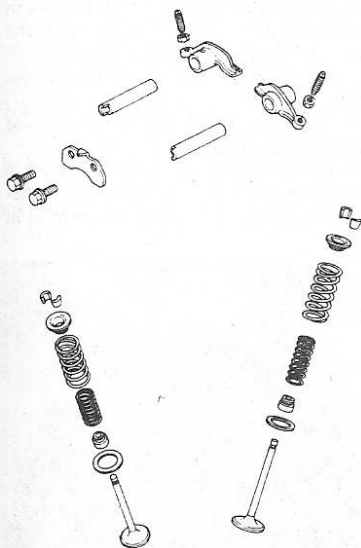
Valve adjuster caps (A) and rocker arm shaft retainer (B)



Measure piston diameter 5 mm above the edge of the skirt



Cylinder bore measurement points



Valve train

2. Remove the two bolts which secure the rocker arm shaft retainer.

3. Pull the rocker arm shafts out of the head and remove the rocker arms.

**NOTE:** Keep all assemblies together so that they may be reinstalled in their original locations.

4. Remove the camshaft by pulling it straight out of the head.

5. Check the valves for leakage. If service is required, compress the valve springs and remove the valve keepers. Remove the spring retainer, springs, spring seat and valve on each side.

6. Remove the valve seals from the guides by prying off the seal clip and pulling off the seal.

### INSPECTION

Refer to the "Engine Rebuilding" section of "General Information" for standard inspection techniques and procedures. Compare component condition against the standard values and service limits given in the "Engine Specifications" chart.

Note the following points:

1. To determine piston and cylinder wear and clearance, measure the piston diameter 5mm above the edge of the skirt. Measure the cylinder diameter 10mm from the top, 40mm from the top and 20mm from the bottom of the bore.

2. Oversized pistons are available in 0.5 and 1.0mm. The sizes are stamped on the piston crown.

### ASSEMBLY

1. Use new seals and gaskets.

2. Clean the ends of the valve guides.

3. Lubricate the inside of each valve seal and slip it over the end of the guide. Push down until the seal is seated in the guide groove.

4. Lubricate the valve stems with engine-assembly lube before inserting them in the guides.

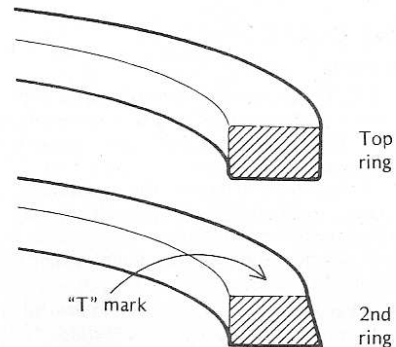
5. Check valve springs. Progressively wound springs must be installed with the close coils against the head.

**NOTE:** If you are reusing the original valve train components, ensure that they are all installed in their original locations.

6. Lubricate the camshaft with clean motor oil. Insert the camshaft into the head with the cam lobes point down.

7. Lubricate and install the rocker arm shafts slipping them into the rocker arm on each side. Be sure the cutaways face the center of the head.

8. Install and secure the rocker arm shaft retainer.



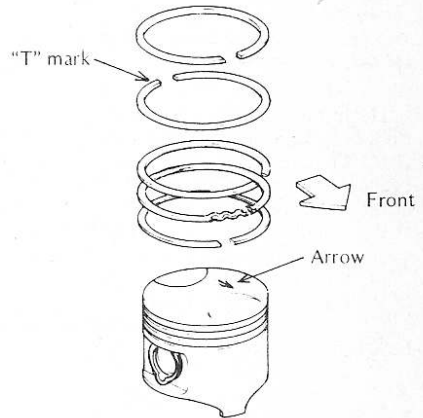
Top and 2nd compression ring profiles. "T" mark must face up when rings are fitted

### INSTALLATION

1. Install the oil ring expander on the piston and then the two oil rails. The rails are interchangeable. Be sure that the expander ring ends butt together.

2. Check the compression ring profiles. The lower compression ring is wedge-shaped; the top compression ring has a plain profile. Be sure to install each in the proper groove.

3. Compression rings are to be fitted with the manufacturer's mark (near the end-gap) facing up.



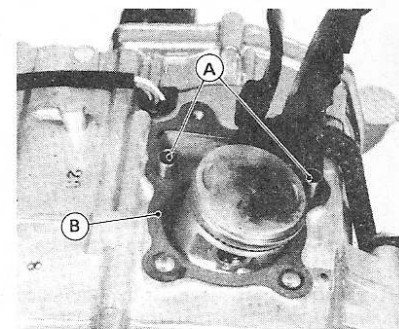
Ring end-gaps must be positioned as shown. Arrow on piston crown must point towards the exhaust port

4. When installing the piston on the connecting rod, be sure the arrow on the piston crown points towards the exhaust port.

5. After pushing the wrist pin into place, install the circlips.

**NOTE:** New circlips must be used. Never reuse old circlips.

6. Be sure the circlips are well seated. When installing them, do not compress them any more than is necessary to effect installation.



Be sure the dowel pins (A) and cylinder base gasket (B) are in place

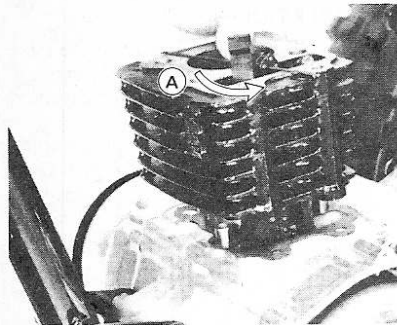
7. Arrange the piston ring end-gaps around the piston so that the end-gap of the top ring and the oil expander ring face the front of the engine and the end-gap of the lower compression ring faces the rear of the engine. The end-gaps of the two oil rails should be positioned about 30° on either side of the expander end-gap.

8. Lubricate the rings and piston skirt with fresh motor oil.

9. Be sure the two dowel pins are in place in the crankcase.

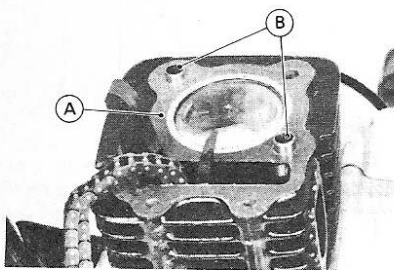
10. Use a new cylinder base gasket.

# Kawasaki KLT 110/160

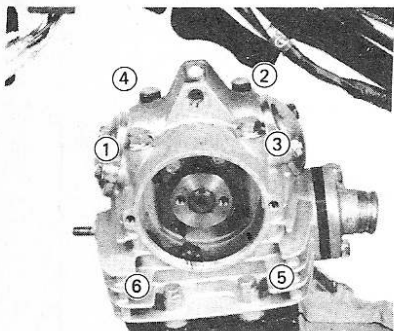


Turn the cam chain guide as shown when installing the cylinder

11. Install the cylinder while turning the front cam chain guide for clearance.
12. Compress the rings and slide the cylinder down over the piston until it is seated on the crankcase.
13. Install the two dowel pins in their positions on the cylinder head mounting surface.
14. Fit a new cylinder head gasket.
15. Install the cylinder head.
16. Install the 8mm and the 6mm cylinder head bolts.



Cylinder head gasket (A) and dowel pins (B)



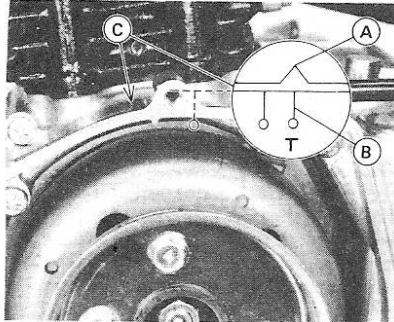
Cylinder head bolt tightening sequence

17. The 8mm bolts must be tightened gradually and in a cross pattern. Tighten each bolt to 8 ft. lbs., then go around again until the final torque of 16 ft. lbs. is reached.
18. Tighten the two 6mm bolts to 7.3 ft. lbs.

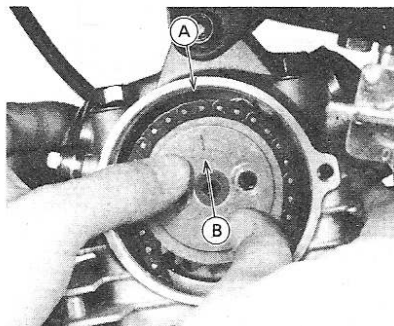
19. Remove the timing inspection plug on top of the left crankcase cover.
20. Check that the "T" mark on the magneto rotor is aligned with the pointer. If not, put some tension on the cam chain so that it will not get caught on anything and turn the rotor slowly until the "T" mark is aligned.
21. Check that the camshaft is positioned with the lobes downward as it was installed.
22. Pull the cam chain taut without moving the crankshaft. Engage the cam sprocket with the chain and install it on the cam so that the slash mark on the sprocket aligns with the

pointer at the top of the head. Do not turn the crankshaft to make this alignment. If necessary, move the sprocket after disengaging it from the chain. For valve timing to be correct, the magneto rotor "T" mark must be aligned with the pointer at the crankcase and the sprocket slash mark must be aligned with the pointer at the top of the head.

23. Install the two cam sprocket bolts. The bolts should be secured with a non-permanent thread-locking compound and tightened to 8.7 ft. lbs.



Position the piston at TDC on the compression stroke: pointer (A) and "T" mark (B) must align when seen through the inspection plug hole (C)



Align cylinder head pointer (A) and cam sprocket slash mark (B)

24. Bolt the cam chain tensioner into place. Remove the long bolt which was fitted when the unit was removed and install the stock bolt in its place.

25. Turn the engine over slowly with a wrench on the magneto rotor nut and ensure that the timing marks align after a crankshaft revolution. If any resistance is felt when turning the engine over, stop immediately and determine the cause. If the sprocket is not correctly timed, the valves may strike the piston.

26. The remainder of the procedure is the reverse of disassembly.

## CAM CHAIN TENSIONER

### Removal

**CAUTION:** Do not turn the engine over when the cam chain tensioner is removed.

1. Remove the lock bolt from the top of the cam chain tensioner.
2. Install a longer bolt (6mm diameter, 1.0mm thread pitch) and tighten it securely to hold the pushrod in place.
3. Remove the tensioner mounting bolts. Remove the tensioner.

### Disassembly

1. Remove the lock bolt.
2. Pull out the pushrod. Note the ball and retainer assembly and spring.

3. Remove the ball and retainer assembly and spring from the pushrod.

### Inspection

1. Clean all parts in solvent.
2. Check the pushrod for scoring.
3. Lubricate the pushrod and move it in and out of the tensioner body. Movement must be perfectly smooth. The assembly must be replaced if the pushrod sticks or binds when moved.

### Assembly

1. Lubricate the internals before assembly.
2. Slip the spring over the end of the pushrod and compress it so that the hole in the pushrod is clear.
3. Insert a piece of wire into the pushrod hole to hold the spring in place.
4. Insert the ball and retainer assembly into the pushrod.
5. Push the pushrod into the tensioner body as far as it will go and hold it there. Install the lock bolt.
6. Pull out the wire to release the spring.

### Installation

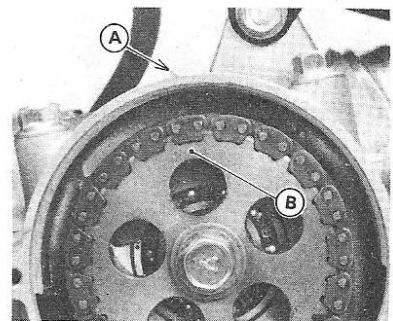
Installation is the reverse of removal. When the piston is positioned at TDC on the compression stroke, loosen the lock bolt and then tighten it. The spring will position the pushrod automatically, taking up chain slack.

## KLT 160

### REMOVAL

The top end components (cylinder head, cylinder and piston) can be removed without taking the engine out of the frame.

1. Remove the seat.
2. Remove the gas tank. Remove the carburetor. See "Fuel Systems" for procedures.
3. Loosen the muffler clamp at the exhaust pipe. Remove the muffler bracket bolts. Remove the exhaust pipe nuts at the cylinder head. Remove the exhaust system.
4. Remove the recoil starter assembly.
5. Remove the two screws and take off the camshaft sprocket cover. Pry slots are provided under the screw hole bosses.
6. Use a wrench on the recoil starter pulley bolt to turn the engine over until the slash mark on the cam sprocket aligns with the pointer on the top of the cylinder head.
7. Remove the cam chain tensioner in the following manner:
  - a. Remove the lock bolt from the top of the cam chain tensioner.
  - b. Screw in a longer bolt of the same dimensions: 6mm dia./1.0mm pitch. Tighten the bolt securely to hold the pushrod in place.



Align pointer (A) and cam sprocket slash mark (B) before removing the cylinder head

c. Remove the tensioner mounting bolts and take off the tensioner.

**CAUTION:** Do not turn the engine over with the tensioner removed or damage may result.

8. Holding the crankshaft with a wrench on the recoil starter pulley bolt, remove the cam sprocket bolt.

9. Pull the sprocket off the cam and disengage it from the chain.

10. Loop a length of wire through the chain and secure it to prevent the chain from falling into the cylinder.

11. Disconnect the lead from the spark plug.

12. Loosen the spark plug.

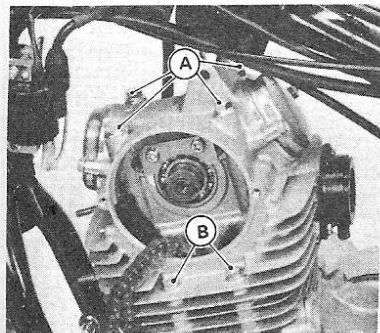
13. Remove the cylinder head mounting brackets.

14. Remove the cylinder head oil pipe banjo bolts at the head and the crankcase.

15. Remove the oil pipe.

16. Remove the 6mm cylinder head bolts near the cam sprocket housing.

17. Remove the 8mm cylinder head bolts on the top of the head.



Cylinder head 8 mm bolts (A) and 6 mm bolts (B)

18. Lift the cylinder head from the engine and remove it.

19. Note the locations of the dowel pins on the cylinder head/cylinder mating surface.

20. Remove the head gasket.

21. To remove the cylinder, lift it up while feeding the cam chain through until the piston comes out.

22. Note the locations of the dowel pins on the crankcase mating surface.

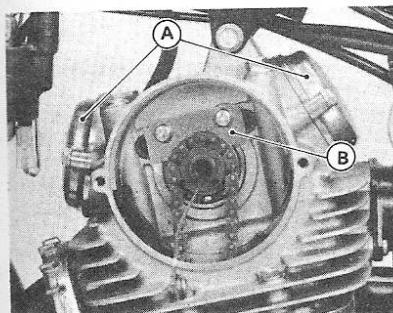
23. Remove the wrist pin circlips and push out the wrist pin to remove the piston.

24. Remove the cylinder base gasket.

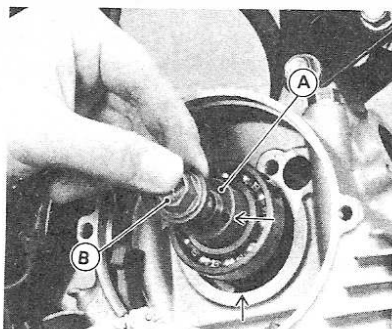
## DISASSEMBLY

1. Remove the valve adjuster caps from the head.

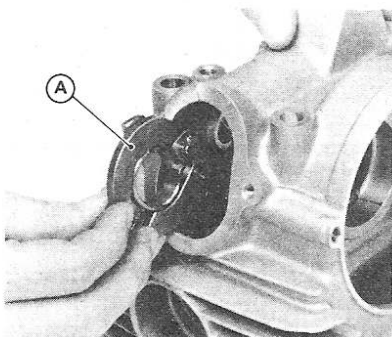
2. Remove the two screws which secure the rocker arm shaft retainer. Remove the retainer.



Valve adjuster caps (A) and rocker arm shaft retainer (B)



Removing the camshaft (A) with the sprocket bolt (B). Position the cam as shown (arrows) so that lobes will clear



Removing the automatic compression release

3. To remove the rocker arm shafts, thread the cam sprocket bolt into each of them in turn and pull them out of the head. Remove the rocker arms.

**NOTE:** Keep all assemblies together so that they may be reinstalled in their original locations.

4. Remove the camshaft from the head in the following manner:

a. Thread the cam sprocket bolt into the camshaft.

b. Turn the cam so that the intake lobe (on the left side of the engine) points downward.

c. Pull out the cam and bearing assembly.

5. Remove the automatic compression release from the cylinder head.

6. Check the valves for leakage. If service is required, compress the valve springs and remove the spring keepers. Remove the spring retainer, springs, spring seat and valve on each side.

7. Remove the valve seals from the guides by prying off the seal clip and pulling off the seal.

## INSPECTION

Refer to the "Engine Rebuilding" section of "General Information" for standard inspection techniques and procedures. Compare component condition against the standard values and service limits given in the "Engine Specifications" chart. Note the following points:

1. Check the automatic compression release unit by cleaning it in a solvent and lubricating it lightly with motor oil. Check the condition of the spring. Replace it if deformed or otherwise damaged. Check that the weights move smoothly. If they do not, or if the release pin is damaged, the ACR must be replaced.

2. To determine piston and cylinder wear and clearance, measure the piston diameter 5mm above the edge of the skirt. Measure the cylinder diameter 10mm from the top, 40mm from the top and 20mm from the bottom of the bore.

3. Oversized pistons are available in 0.5 and 1.0mm. The sizes are stamped on the piston crown.

## ASSEMBLY

1. Use new seals and gaskets.

2. Clean the ends of the valve guides.

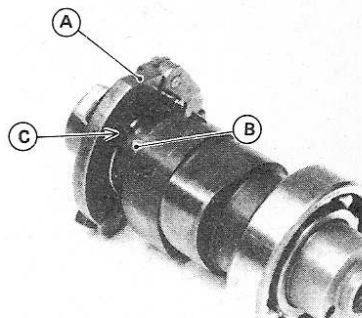
3. Lubricate the inside of each valve seal and slip it over the end of the guide. Push down until the seal is seated in the guide groove.

4. Lubricate the valve stems with engine-assembly lube before inserting them in the guides.

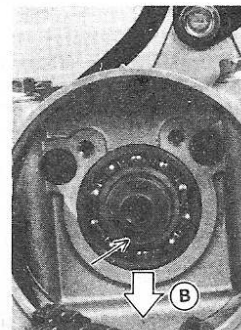
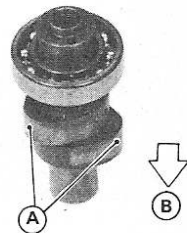
5. Slip the ACR into the head if it was removed before installing the valve spring assemblies.

6. Progressively wound valve springs must be installed with the close coils against the head.

**NOTE:** If you are reusing the original valve train components, ensure that they are all installed in their original locations.



Install the ACR (A) so that the cam dowel pin (B) fits into the notch (C)



When installing the cam, the lobes (A) must point down (B); the pin hole (arrow) must be in the lowest position

# Kawasaki KLT 110/160

7. Lubricate the camshaft and bearing before installation.

8. Hold the ACR in place and insert the cam into the head with the intake lobe pointing down.

9. Rotate the cam until the dowel pin engages the notch on the ACR, then push the cam into place.

10. Turn the camshaft so that the lobes point down. The pin hole in the end of the cam will be in the lowest position.

11. Lubricate the rocker arm shafts.

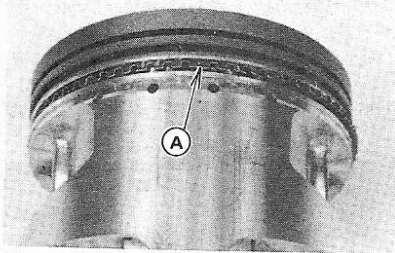
12. Hold the rocker arms in place and insert the shafts. The cutaways must face the center of the head.

13. Install and secure the rocker arm shaft retainer. The chamfered edge of the retainer faces the front of the engine.

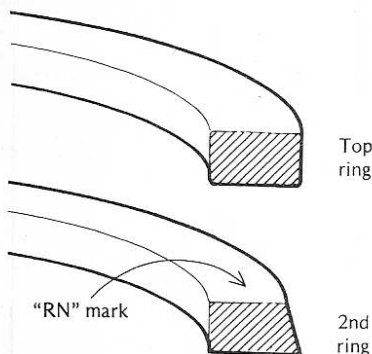
## INSTALLATION

1. Install the oil ring expander on the piston and then the two oil rails. The rails are interchangeable. Be sure that the expander ring ends butt together.

2. Check the compression ring profiles. The lower compression ring is wedge-shaped; the top compression ring has a plain profile. Be sure to install each in the proper groove.



Oil expander ring ends must not overlap (A)



Top and 2nd compression ring profiles; the "RN" mark must face up when the rings are fitted

3. Compression rings are to be fitted with the manufacturer's mark (near the end-gap) facing up.

4. When installing the piston on the connecting rod, be sure the arrow on the piston crown points towards the exhaust port.

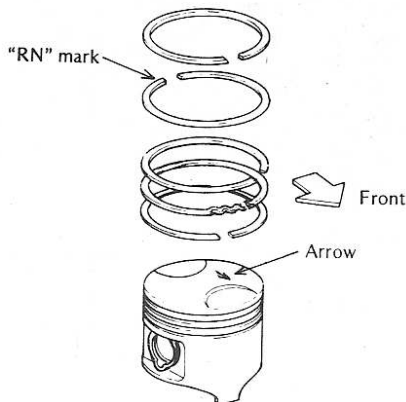
5. After pushing the wrist pin into place, install the circlips.

**NOTE: New circlips must be used. Never reuse old circlips.**

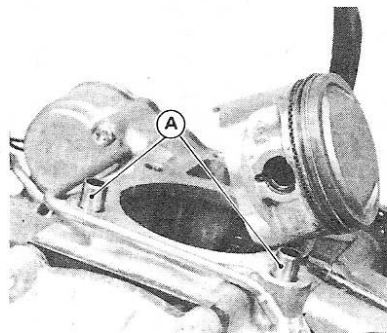
6. Be sure the circlips are well seated. When installing them, do not compress them any more than is necessary to effect installation.

7. Arrange the piston ring end-gaps around the piston so that the end-gap of the top ring and the oil expander ring face the front of the engine and the end-gap of the

lower compression ring faces the rear of the engine. The end-gaps of the two oil rails should be positioned about 30° on either side of the expander end-gap.



Position the ring end-gaps as shown. "RN" marks must face up and arrow on piston crown must face the exhaust port



Be sure the cylinder dowel pins (A) are in place

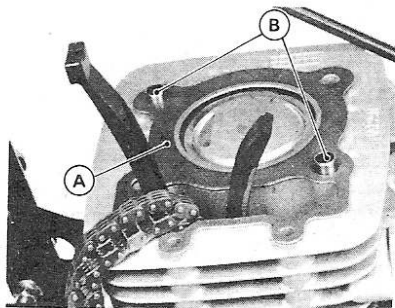
8. Lubricate the rings and piston skirt with fresh motor oil.

9. Be sure the two dowel pins are in place in the crankcase.

10. Use a new cylinder base gasket.

11. Install the cylinder while pulling the cam chain through.

12. Compress the rings and slide the cylinder down over the piston until it is seated on the crankcase.



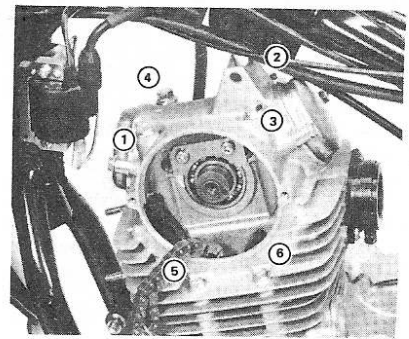
Cylinder head gasket (A) and dowel pins (B)

13. Install the two dowel pins in their positions on the cylinder head mounting surface.

14. Fit a new cylinder head gasket.

15. Install the cylinder head.

16. Install the 8mm and the 6mm cylinder head bolts. The bolt threads should be lubricated with motor oil before installation.

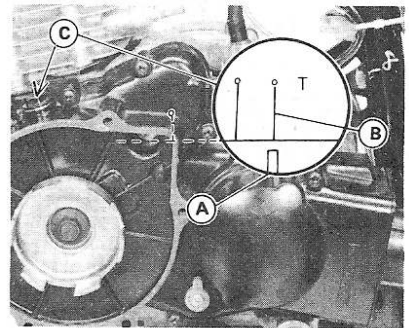


Cylinder head bolt tightening sequence

17. The cylinder head bolts must be tightened gradually and in a cross pattern.

Tighten the 8mm bolts to 9.4 ft. lbs. and the 6mm bolts to 4.3 ft. lbs. on the first time around, then do it again until the final torque of 18 ft. lbs. for the 8mm bolts and 7.3 ft. lbs. for the 6mm bolts is reached.

18. Remove the timing inspection plug on the left crankcase cover.

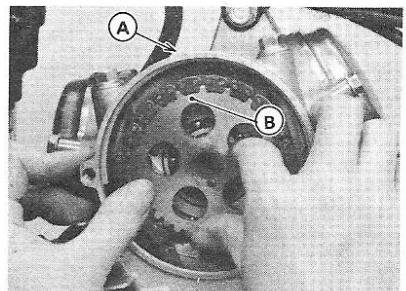


Pointer "A" and "T" mark (B) must align when viewed through the inspection plug (C) when the cam sprocket is being fitted

19. Check that the "T" mark on the magneto rotor is aligned with the pointer. If it is not, put some tension on the cam chain so that it will not get caught on anything and turn the rotor slowly until the "T" mark is aligned.

20. Check that the camshaft is positioned with the lobes downward as it was installed.

21. Pull the cam chain taut without moving the crankshaft. Engage the cam sprocket with the chain and install it on the cam so that the slash mark on the sprocket aligns with the pointer at the top of the head. Do not turn the crankshaft to make this alignment. If necessary, move the sprocket after disengaging it from the chain. For valve timing to be correct, the magneto rotor "T" mark must align with the pointer at the crankcase and the sprocket slash mark must be aligned with the pointer at the top of the head.



Pointer (A) and cam sprocket slash mark (B) must align for valve timing to be correct

22. Be sure that the cam timing pin and the sprocket hole are aligned.

23. Lubricate the threads of the sprocket bolt and tighten it to 22 ft. lbs. Hold the crankshaft with a wrench on the recoil starter pulley bolt while the cam sprocket nut is tightened.

24. Bolt the cam chain tensioner into place. Remove the long bolt which was fitted when the unit was removed and install the stock bolt in its place.

25. Turn the engine over slowly with a wrench on the recoil starter pulley bolt and ensure that the timing marks align after a crankshaft revolution. If any resistance is felt when turning the engine over, stop immediately and determine the cause. If the sprocket is not correctly timed, the valves may strike the piston.

26. The remainder of the procedure is the reverse of removal.

## CAM CHAIN TENSIONER

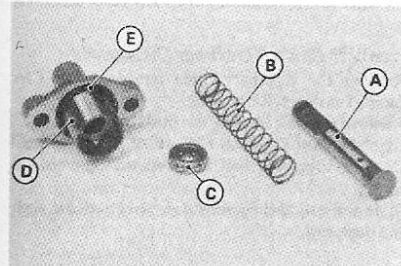
### Removal

**CAUTION:** Do not turn the engine over when the cam chain tensioner is removed.

1. Remove the lock bolt from the top of the cam chain tensioner.

2. Install a longer bolt (6mm diameter, 1.0mm thread pitch) and tighten it securely to hold the pushrod in place.

3. Remove the tensioner mounting bolts. Remove the tensioner.



Cam chain tensioner components: pushrod (A), spring (B), ball and retainer assembly (C), body (D) and o-ring (E)

### Disassembly

1. Remove the lock bolt.
2. Pull out the pushrod. Note the ball and retainer assembly and spring.
3. Remove the ball and retainer assembly and spring from the pushrod.

### Inspection

1. Clean all parts in solvent.
2. Check the pushrod for scoring.
3. Lubricate the pushrod and move it in and out of the tensioner body. Movement must be perfectly smooth. The assembly must be replaced if the pushrod sticks or binds when moved.

### Assembly

1. Lubricate the internals before assembly.
2. Slip the spring over the end of the pushrod and compress it so that the hole in the pushrod is accessible.
3. Insert a piece of wire into the pushrod hole to hold the spring in place.
4. Insert the ball retainer assembly into the pushrod.
5. Push the pushrod into the tensioner as far as it will go and hold it there. Insert the lock bolt.

6. Pull out the wire to release the spring.

### Installation

Installation is the reverse of removal. When the piston is positioned at TDC on the compression stroke, loosen the lock bolt and then tighten it. The spring will position the pushrod automatically, taking up chain slack.

## CRANKCASE COVER COMPONENTS

### KLT 110

#### RECOIL STARTER

##### Removal

1. Remove the three screws securing the recoil starter assembly to the crankcase cover.
2. Remove the assembly.
3. Remove the four bolts to remove the starter pulley.



Recoil starter case screws (A)

##### Disassembly

1. Remove the e-ring and thrust washer from the reel shaft.
2. Remove the cover.
3. Remove the spring and thrust washer.
4. Remove the pawls and springs.
5. Pull the rope out about 1 1/2 ft. until the reel notch is near the rope hole. Clamp the rope so that it cannot retract with locking pliers.
6. Remove the handle cap.
7. Pull the rope out of the handle and untie the knot.
8. Remove the handle.
9. Hold the reel with one hand and unlatch the locking pliers from the rope.
10. Allow the reel to wind the rope in slowly.

**CAUTION:** The coil spring is under tension. If it is to be removed, take adequate safety precautions to prevent personal injury.

11. Check that the reel tension is released. Turn it 1/4 turn CCW past the rest position and slowly lift it straight up and out of the housing. Watch the coil spring beneath it. There must be no tension felt on the reel while it is removed. If there is, push it back into place and move it back and forth until it feels free.

12. To remove the coil spring, place the housing face down on a bench and strike the bench with a plastic mallet to knock the spring loose.

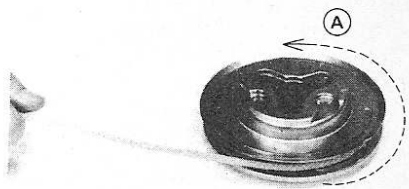
**CAUTION:** Strike the bench, not the housing.

### Inspection

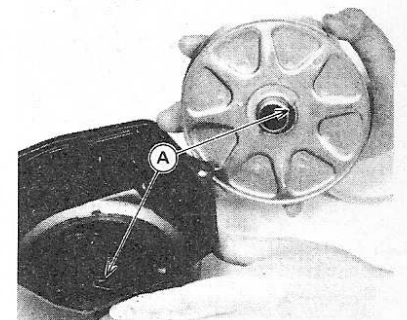
1. Clean metal parts in a safe solvent.
2. Check the pawls for chipping or excessive wear. Replace them if damaged.
3. Inspect the rope for fraying or wear.
4. Inspect all springs for rust, weakness, distortion or other signs of wear and replace them if necessary.

### Assembly

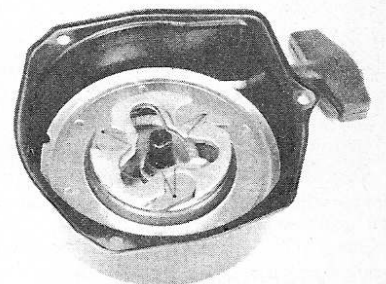
1. Grease the coil spring.
2. Wear gloves to prevent injury while installing the coil spring.
3. Install the coil spring in the housing, hooking the outer end of the spring onto the tab in the housing.



Wind the rope around the reel in a clockwise direction (A)



Engage the tab on the reel with the inner hook on the coil spring (A)



Install pawls and springs as shown

4. Wind the rope around the reel in a clockwise direction.
5. Insert the reel in the housing, turning it so that the tab on the reel engages the inner hook on the coil spring.
6. Rotate the reel two full turns clockwise to preload the coil spring.
7. Be sure the pawls and springs are installed as shown.
8. The remainder of the procedure is the reverse of disassembly.

# Kawasaki KLT 110/160

## Installation

1. Use a non-permanent thread-locking compound on the pulley bolts and tighten them securely.
2. Install the assembled housing and tighten the three screws.

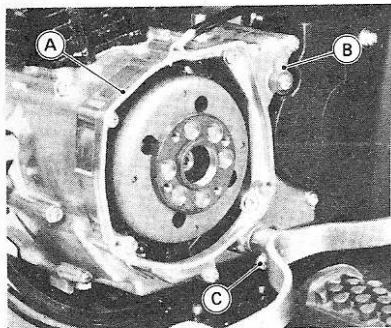
## LEFT CRANKCASE COVER

### Removal

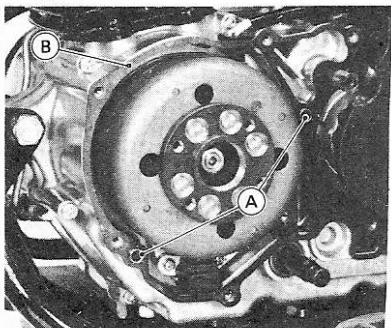
1. Remove the recoil starter.
2. Remove the pulley from the magneto flywheel.
3. Place a drip pan beneath the left side of the engine to catch any oil which may come out when the cover is removed.
4. Remove the neutral indicator switch on the rear part of the crankcase cover.
5. Remove the shift lever pinch bolt and carefully pull the shift lever off the shaft.
6. Remove the left crankcase cover screws and take off the cover.

### Installation

1. Use a new cover gasket.
2. Be sure that the two locating dowel pins are in place on the cover mating surface.
3. Check oil level after installation and top up if necessary.



Left crankcase cover (A), neutral indicator switch (B) and shift lever pinch bolt (C)



Be sure the two dowel pins (A) are in place on the mating surface (B)

## ENGINE SPROCKET

### Removal

1. Remove the engine sprocket cover (three screws).
2. Remove the circlip from the transmission mainshaft.
3. Pull the sprocket off the shaft. If necessary, increase chain slack by backing off the chain adjuster and pushing the axle forward.
4. Remove the transmission shaft collar.
5. Remove the O-ring from the shaft.

### Inspection

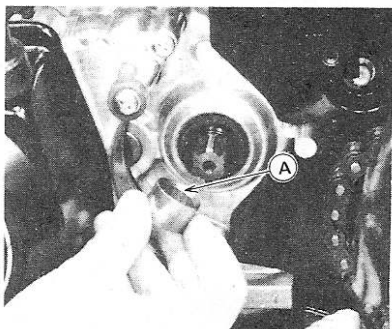
See "General Information" for generic

570

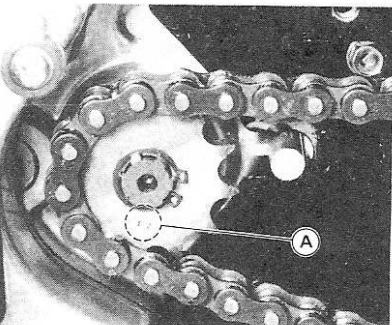
sprocket inspection. Diameter across the base of the teeth must be at least 40.4mm (1.59 in.).

### Installation

1. Use a new mainshaft O-ring and lubricate it before installing it on the shaft.
2. Install the collar with the bevelled side facing the engine.
3. Engage the sprocket with the chain. The sprocket must be fitted so that the side stamped with the number faces out.
4. Install the cover.



Install the collar with the bevelled side (A) facing the engine

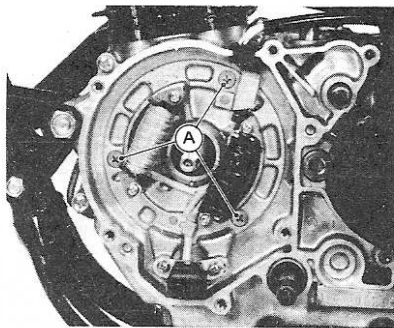


Sprocket numbers (A) must face outward

## MAGNETO

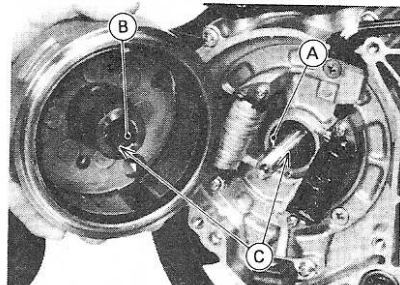
### Removal

1. Remove the recoil starter housing.
  2. Remove the pulley from the rotor.
  3. Remove the left crankcase cover.
  4. Secure the magneto rotor and remove the nut.
  5. Pull the rotor off the shaft with the special tool.
- CAUTION:** Do not strike the rotor to knock it loose or the magnetic properties may be impaired.
6. Remove the pin from the crankshaft.
  7. Disconnect the magneto wiring at the plastic connectors.



Stator screws (A)

8. Remove the three stator mounting screws.
9. Remove the stator.
10. Remove the gasket.



Clean surfaces (C); align pin (A) and slot (B) before installation

8. Remove the three stator mounting screws.
9. Remove the stator.
10. Remove the gasket.

### Inspection

1. See "Electrical System" for system tests.
2. Check the physical condition of all components.
3. Check the stator oil seal for torn or otherwise damaged lips.

### Installation

1. Clean all parts thoroughly. Be sure there is no foreign matter on the crankshaft or on the inside of the magneto rotor.
  2. Use a new stator gasket.
  3. Lubricate the lips of the stator oil seal before installation.
  4. Tighten the stator mounting screws securely.
  5. Insert the wiring grommet into the cutout in the crankcase and route the wires as they were originally.
  6. Clean off the crankshaft taper.
  7. Insert the pin into the taper slot.
  8. Push the magneto rotor into place.
- CAUTION:** Do not strike the rotor to force it home. Be certain that the pin is not knocked out when the rotor is installed.
9. Tighten the rotor nut to 31 ft. lbs.

## CLUTCH

### Removal

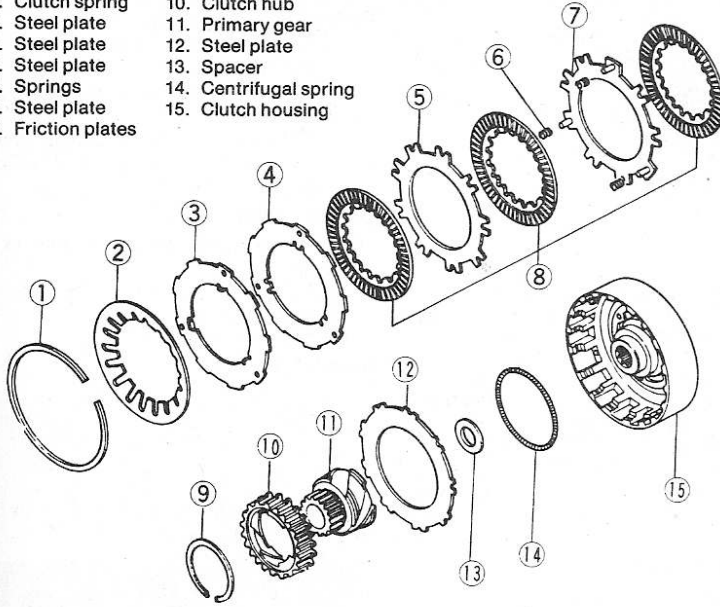
1. Drain the engine oil. Place a drip pan beneath the right crankcase cover.
2. Remove the screw holding the oil pipe to the right crankcase cover.
3. Remove the right crankcase cover screws. Remove the cover. Tap the cover with a plastic mallet to break it free if it is stuck. The clutch release assembly will come away with the cover.
4. Pull out the clutch release lever.
5. Remove the clutch pusher plate by removing the three mounting screws and flatwashers.
6. Remove the bushings with collars and pusher pins.
7. Holding the clutch in place, remove the housing nut and washer.
8. Remove the clutch assembly and collar from the crankshaft.

### Disassembly

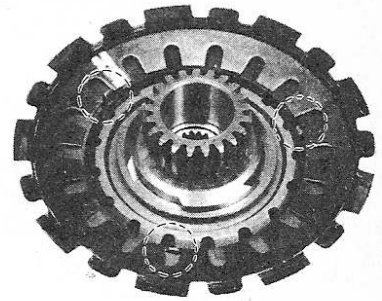
1. Hold the large retainer to keep it from flying free and remove it.



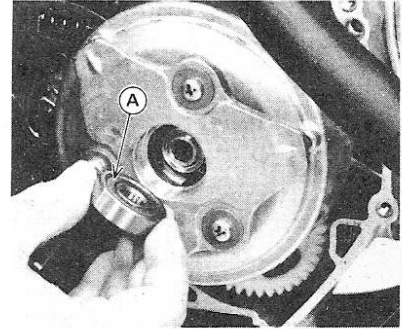
- |                    |                        |
|--------------------|------------------------|
| 1. Retainer        | 9. Circlip             |
| 2. Clutch spring   | 10. Clutch hub         |
| 3. Steel plate     | 11. Primary gear       |
| 4. Steel plate     | 12. Steel plate        |
| 5. Steel plate     | 13. Spacer             |
| 6. Springs         | 14. Centrifugal spring |
| 7. Steel plate     | 15. Clutch housing     |
| 8. Friction plates |                        |



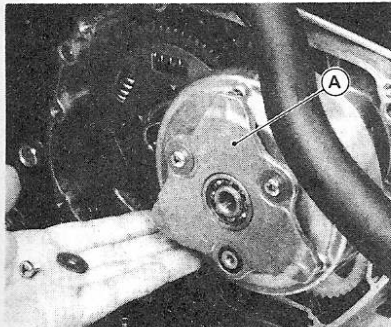
Clutch assembly



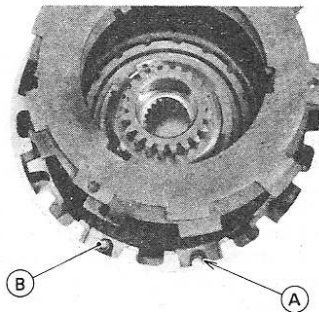
Engage the teeth of the spring with the teeth of the top steel plate



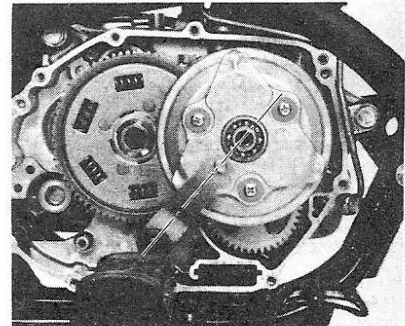
Install the pusher plate bearing so that the sealed side (A) faces in



Clutch pusher plate (A)



Steel plate with press-fit pins (B) must be installed in the clutch housing (A) as shown



Clutch release lever must align with the center of the clutch

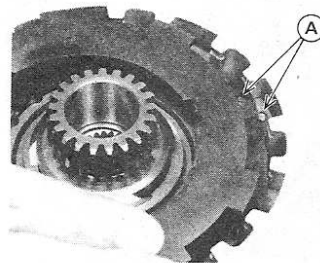
2. Separate the clutch components.
3. Remove the circlip from the primary gear and separate the gear from the clutch hub.

### Inspection

1. Clean all metal parts in a solvent and dry thoroughly.
2. Refer to the "General Information" section of this manual under "Engine Rebuilding" for clutch inspection techniques and procedures.
3. Friction plate thickness limit is 2.6mm (0.10 in.).
4. Plate warpage limit is 0.3mm (0.012 in.).
5. Check the clutch housing grooves for wear. If notches are worn into the housing from the steel plates, the housing should be replaced.
6. Check the housing groove where the centrifugal spring bears against the housing. If worn, replace the housing.
7. Check the spring for wear.
8. Check the clutch hub splines for damage due to the movement of the friction plates. Check the grooves of the hub for wear. Replace the hub if damage is evident.

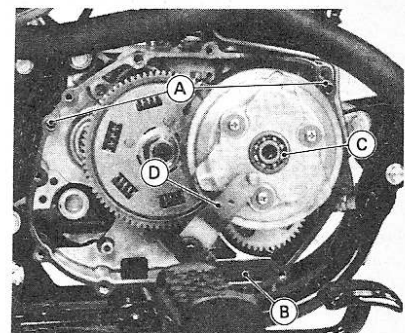
### Assembly

1. Lubricate the plates with motor oil before assembly.



Fit last two steel plates so that holes align with pins

2. Refer to the exploded view of the clutch as a guide to assembly.
3. The steel plate with the press-fitted pins must be installed in the clutch housing as shown.
4. The last two steel plates must be installed so that the holes on the plates align with the pins on the middle steel plate.
5. Engage the teeth of the spring with the teeth of the top steel plate.
6. When all components are assembled, compress the clutch and install the large retainer into the groove.

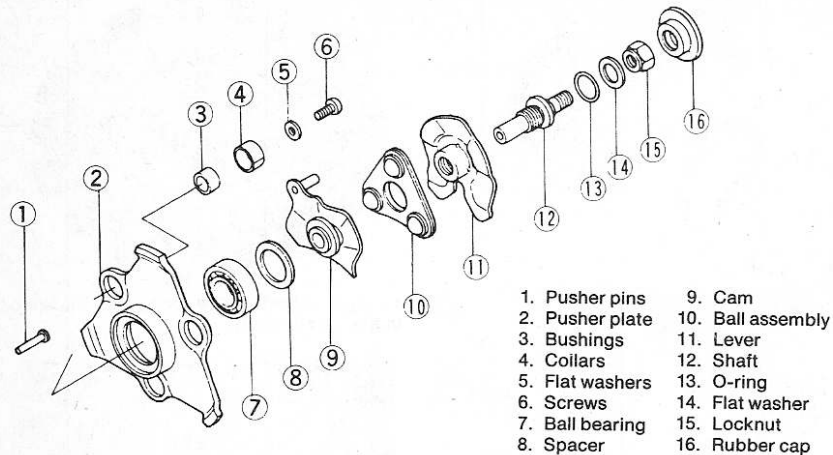


Be sure the dowel pins (A) are in place; check that the filter screen (B), bearing (C) and release lever (D) are in place before fitting the cover

### Installation

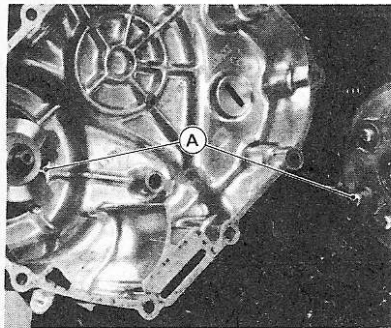
1. Tighten the housing nut to 46 ft. lbs.
2. Be sure the bearing in the clutch pusher plate is installed with the sealed side in.
3. The clutch release lever must point towards the center of the clutch.
4. Be sure the dowel pins are in place in the right crankcase cover mating surface.

# Kawasaki KLT 110/160



Clutch release assembly

- |                 |                   |
|-----------------|-------------------|
| 1. Pusher pins  | 9. Cam            |
| 2. Pusher plate | 10. Ball assembly |
| 3. Bushings     | 11. Lever         |
| 4. Coillars     | 12. Shaft         |
| 5. Flat washers | 13. O-ring        |
| 6. Screws       | 14. Flat washer   |
| 7. Ball bearing | 15. Locknut       |
| 8. Spacer       | 16. Rubber cap    |



Clutch release lever boss must engage the notch on the release cam (A)

5. Check clutch release assembly installation if it was removed. See below.
6. Use a new crankcase cover gasket.
7. When fitting the cover, fit the clutch release lever boss into the notch on the release cam.
8. Attach the oil pipe to the crankcase cover.
9. Fill the engine with oil.
10. Adjust the clutch as outlined in "Maintenance."

## CLUTCH RELEASE

### Removal

1. Remove the right crankcase cover.
2. Remove the clutch release cam, ball assembly and lever from the right crankcase cover.
3. Remove the rubber adjuster cap from the outside of the crankcase cover.
4. Unscrew the adjuster locknut. Remove the washer and O-ring.
5. Remove the release shaft.

### Inspection

1. Clean all metal parts in solvent.
2. Check parts for wear.

### Installation

1. Lubricate components before installation.
2. Reverse the removal procedure. Adjust the clutch as outlined in "Maintenance."
3. Refer to the exploded view as a guide to component installation.

## PRIMARY DRIVE

### Removal

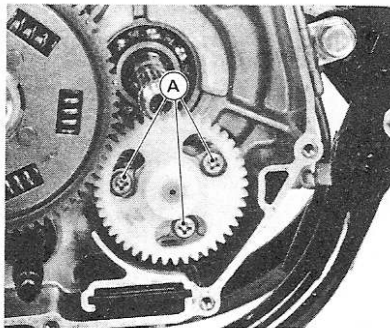
1. The primary gear is a part of the clutch assembly and is removed along with it.
2. To remove the secondary gear, lock the gear train and remove the nut.
3. Remove the gear.
4. Remove the collar behind the gear.

### Inspection

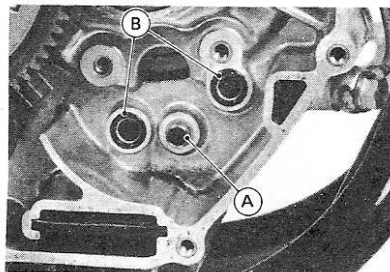
1. Check the gear teeth for wear, pitting and other damage. Minor imperfections can be removed with an oilstone. If damage is more extensive, replace the gear(s).
2. Measure the inside diameter of the primary gear and the outside diameter of the primary gear collar and compare the measurements with the specifications given.

### Installation

1. Reverse the removal procedure.
2. Tighten the secondary gear nut to 53 ft. lbs.



Oil pump mounting screws (A)



Dowel pin (A) and o-rings (B) must be in place behind the pump

## OIL PUMP

### Removal

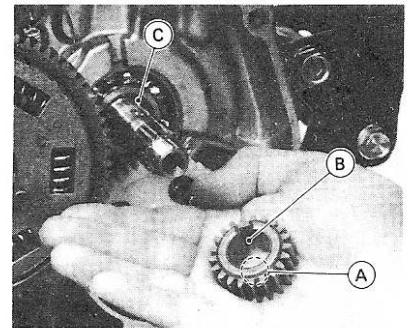
1. Remove the right crankcase cover.
2. Remove the clutch.
3. Remove the oil pump drive gear from the crankshaft.
4. Remove the pump mounting screws (3) and remove the pump. Note the dowel pin and O-rings behind the pump.

### Disassembly

1. Remove the cover screw on the back of the pump.
2. Remove the shaft circlip.
3. Remove the pump cover.
4. Separate the rotors.

### Inspection

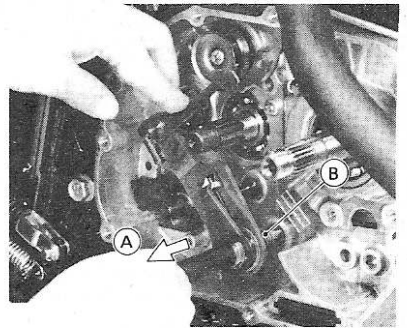
1. Clean all pump metal parts in clean motor oil.
2. Check the driven gear for wear or damage.
3. Check the rotors for scoring.
4. After the pump is assembled, check for free and effortless rotation of the shaft.



Pump drive gear must be installed with the marked side out (A) and the groove (B) engaged with the crankshaft pin (C)

### Assembly and Installation

1. Lubricate all pump parts with clean motor oil before assembly.
2. Fill the pump with clean motor oil before installation.
3. Be sure the dowel pin and O-rings positioned behind the pump are in place.
4. Tighten the mounting screws securely.
5. Install the pump drive gear with the marked side out and the groove engaging the crankshaft pin.



Removing the external shift mechanism

## EXTERNAL SHIFT MECHANISM

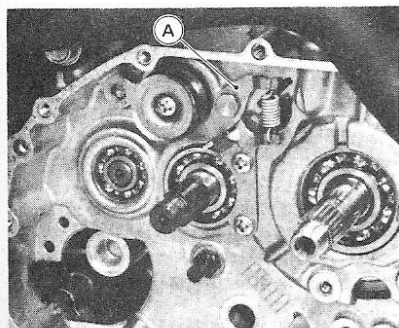
### Removal

1. Remove the right crankcase cover.
2. Remove the gearshift lever (left side).
3. Remove the left crankcase cover.

4. Remove the footpegs.
5. Remove the secondary gear.
6. Thoroughly clean off and deburr the gearshift lever splines on the left side of the gearshift shaft to prevent damage to the oil seal when the shaft is pulled through.
7. Disengage the shift fingers from the shift drum. Pull the external shift assembly out to the right side of the engine.
8. Disconnect the shift drum position lever spring from the lever.
9. Remove the lever bolt and take off the lever.

## Inspection

1. Check the shaft for a bent condition.
2. Check the gearshift shaft splines for damage.



Shift drum position lever (A)

3. Check the shift arm fingers for a bent condition.
4. Check the pawl spring for weakness or deformity.
5. Check the shift drum position lever spring for condition.
6. Check the shift arm spring for condition.
7. Check that the pawl spring pin in the crankcase is tight.

## Installation

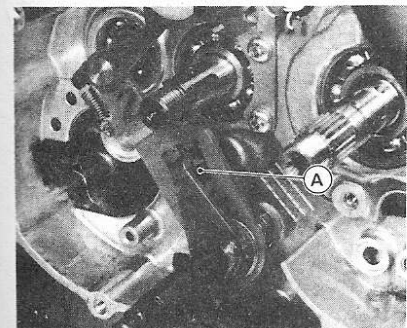
1. Check that the shift drum position lever moves freely after its bolt is tightened.
2. Lubricate the shift shaft lightly with oil before installation to avoid damage to the oil seal on the left side.
3. Position the pawl spring arms on either side of the pin when installing it.
4. The remainder of the procedure is the reverse of removal.

## KLT 160

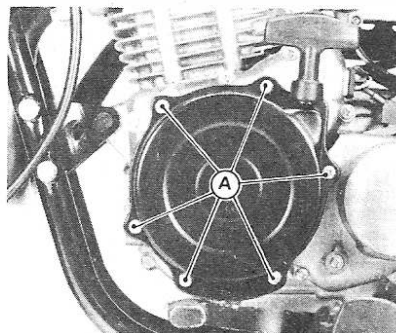
### RECOIL STARTER

#### Removal

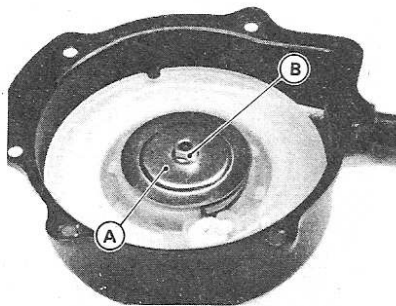
1. Remove the six screws securing the recoil starter case to the crankcase cover.



Position the pawl spring arms (A) on either side of the pin



Recoil starter case screws



Ratchet cover (A) and nut (B)

2. Remove the assembly.
3. Remove the starter pulley bolt.
4. Remove the pulley.

#### Disassembly

1. Remove the ratchet cover nut.
2. Remove the ratchet cover.
3. Remove the recoil guide, cover, shaft and spring.
4. Remove the pawl.
5. Pull the rope out about 1 1/2 ft. and clamp it with locking pliers so that it will not retract.
6. Remove the handle cap.
7. Pull the rope out of the handle and untie the knot.
8. Remove the handle.
9. Hold the reel with one hand and unlatch the locking pliers from the rope.
10. Allow the reel to wind the rope in slowly.

**CAUTION:** The coil spring is under tension. If it is to be removed, take adequate safety precautions to prevent personal injury.

11. Check that the reel tension is released. Turn it 1/4 turn CCW past the rest position and slowly lift it straight up and out of the housing. Watch the coil spring beneath it. There must be no tension felt on the reel while it is removed. If there is, push it back into place and move it back and forth until it feels free.

12. To remove the coil spring, place the housing face down on a bench and strike the bench with a plastic mallet to knock the spring loose.

**CAUTION:** Strike the bench, not the housing.

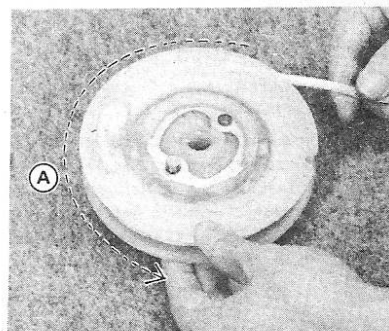
#### Inspection

1. Clean metal parts in a safe solvent.
2. Check the pawl for chipping or excessive wear. Replace it if damaged.

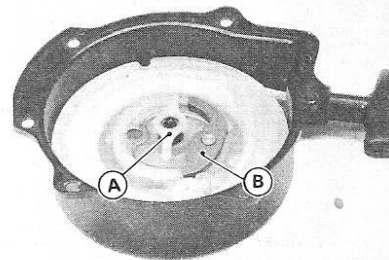
3. Inspect the rope for fraying or wear.
4. Inspect the springs for rust, weakness, distortion or other signs of wear and replace them if necessary.

#### Assembly

1. Grease the coil spring.
2. Wear gloves to prevent injury while installing the coil spring.
3. Install the coil spring in the housing, hooking the outer end of the spring onto the tab in the housing.
4. Wind the rope around the reel in a clockwise direction.
5. Insert the reel in the housing, turning it so that the tab on the reel engages the inner hook on the coil spring.
6. Rotate the reel two full turns clockwise to preload the coil spring.
7. Be sure the pawl and recoil guide are installed as shown.



Wind the rope around the reel as shown (A)



Be sure the recoil guide (A) and the pawl (B) are installed as shown

8. The remainder of the procedure is the reverse of disassembly.

9. Tighten the ratchet cover nut to 8.7 ft. lbs.

#### Installation

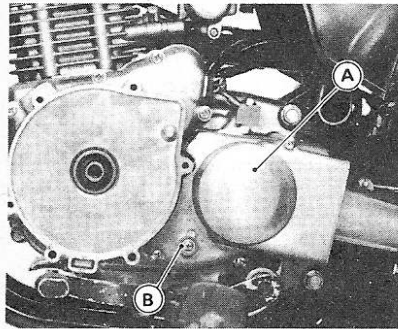
1. Align the pulley keyway with the key in the crankshaft and install the pulley.
2. Tighten the pulley bolt to 43 ft. lbs.

### LEFT CRANKCASE COVER

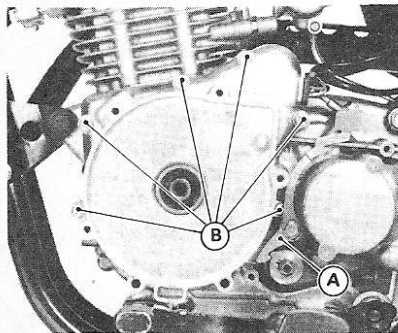
#### Removal

1. Remove the recoil starter.
2. Remove the pulley from the crankshaft.
3. Disconnect the magneto wires from the harness at the plastic connectors.
4. Place a drip pan beneath the left side of the engine to catch any oil which may come out when the cover is removed.
5. Remove the neutral indicator switch on the gear case cover.
6. Remove the gear case cover.
7. Remove the reverse lever bolt and take off the reverse lever.
8. Remove the six left crankcase cover screws and take off the cover.

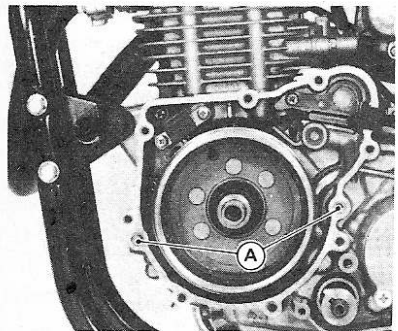
# Kawasaki KLT 110/160



Gear case cover (A) and neutral indicator switch (B)



Reverse lever (A) and crankcase cover screws (B)



Be sure dowel pins (A) are in place before fitting the cover

## Installation

1. Use a new cover gasket.
2. Be sure the dowel pins are in place on the cover mating surface.
3. Check oil level after installation and top up if necessary.

## MAGNETO

### Removal

1. Remove the recoil starter housing.
2. Remove the pulley from the crankshaft.
3. Remove the left crankcase cover.
4. Remove the magneto rotor from the crankshaft with the puller.

**CAUTION:** Do not strike the rotor to knock it loose or the magnetic properties may be impaired.

5. Remove the woodruff key from the crankshaft.
6. To remove the stator from the crankcase cover, remove the screw and take off the wiring holder.

7. Remove the three stator mounting screws and take off the stator.

574

## Inspection

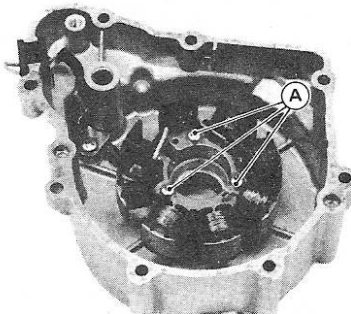
1. See "Electrical System" for system tests.
2. Check the physical condition of all components.

## Installation

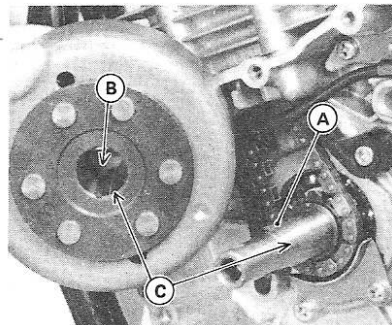
1. Clean all parts thoroughly. Be sure there is no foreign matter on the crankshaft or on the inside of the rotor or stator.
2. Tighten the stator mounting screws securely.
3. Be sure that wiring is protected and correctly arranged.
4. Clean off the crankshaft taper.
5. Check that the woodruff key is in place in the crankshaft slot.
6. Align the keyway with the key and push the rotor into place.

**CAUTION:** Do not strike the rotor to force it home. Be certain the key is not knocked out of place when the rotor is installed.

7. Pulley bolt torque is 43 ft. lbs.



Stator mounting screws (A)



Clean areas (C); align slot (B) and key (A) before fitting the rotor

## REVERSE LEVER

### Removal

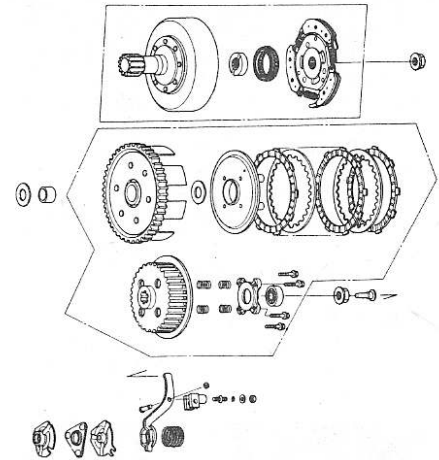
1. Unscrew the neutral indicator mounting screw and remove the washer and indicator.
2. Remove the gear case screws.
3. Remove the gear case.
4. Remove the reverse lever pivot bolt and take off the lever and spring.
5. Remove the shift drum stopper from the end of the drum.
6. Remove the dowel pin.

### Inspection

1. Check the lever for a bent condition.
2. Check spring condition.

### Installation

1. Reverse the removal procedure.



Clutch assembly

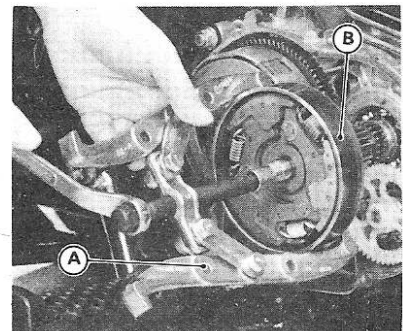
2. Check that the lever moves smoothly after the bolt is tightened.

## CLUTCHES

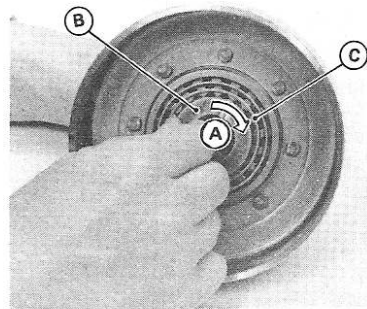
### Removal

1. Drain the engine oil.
2. Place a drip pan beneath the right crankcase cover.

3. Remove the right crankcase cover screws. Remove the cover. If it is stuck, tap it with a plastic mallet until free. The clutch release assembly will come away with the cover.



Removing the primary clutch housing (B) with a gear puller (A)



Remove the inner race (B) from the one-way clutch (C) by turning it clockwise (A)

4. Remove the recoil starter housing.
5. Stop the engine from turning over with a device on the recoil starter pulley.
6. Remove the primary clutch hub nut.
7. Loosen the secondary clutch spring bolts.

8. Remove the primary clutch housing from the crankshaft with a gear puller.

9. Remove the primary clutch hub assembly.

10. Remove the inner race by turning it clockwise.

11. Remove the one-way clutch.

12. Remove the pusher and ball bearing from the secondary clutch spring plate.

13. Unscrew the secondary clutch spring bolts evenly.

14. Remove the spring plate.

15. Remove the clutch springs.

16. Secure the secondary clutch hub, remove the hub nut.

17. Remove the hub.

18. Remove the clutch plate assembly and clutch wheel.

19. Remove the secondary clutch housing and sleeve. Note that there are flat washers on both ends of the sleeve.

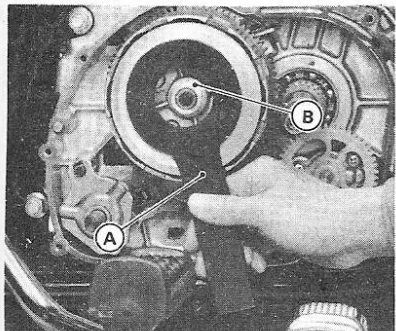
## Inspection

1. Clean all metal parts in a solvent and dry thoroughly.

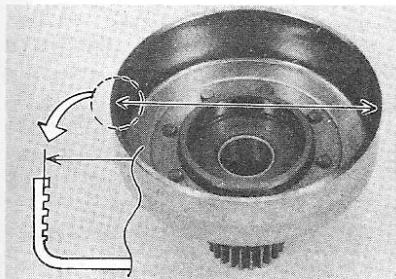
2. Refer to the "Engine Rebuilding" section of "General Information" for clutch inspection techniques and procedures.

3. Secondary clutch wear limits are:

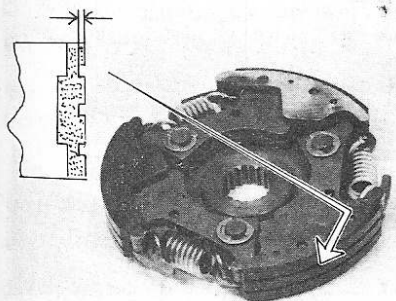
Friction plate min. thickness: 2.4mm (0.095 in.)



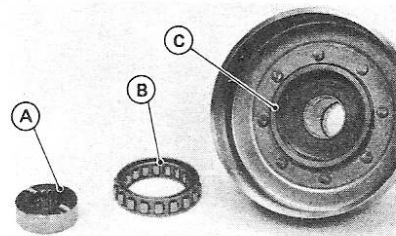
Secure the secondary clutch hub with a holder (A) and remove the nut (B)



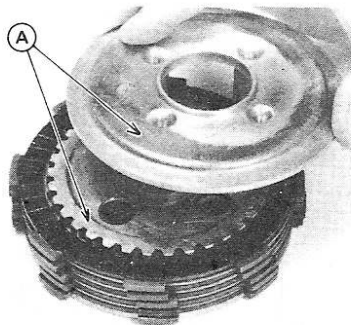
Measure the inside diameter of the primary clutch housing; check for wear of the grooves



Measure primary clutch shoe lining groove depth



Inner race (A), one-way clutch (B), outer race (C)



Align the marks on the clutch wheel and hub (A)

Plate warpage (max.): 0.3mm (0.012 in.)  
Clutch spring free length: 23.5mm (0.93 in.)

4. Measure the inside diameter of the primary clutch housing at several places. If any measurement exceeds 116.5mm (4.59 in.), replace it.

5. Check the primary clutch shoe lining for damage.

6. Measure the shoe groove depth and replace the shoes as a set if any of the measurements are under 0.5mm (0.02 in.).

7. Check the one-way clutch, inner race and outer race for damage.

## Installation

1. Lubricate secondary clutch plates with motor oil before installation.

2. Refer to the exploded view of the clutches as a guide to assembly.

3. Assemble the secondary clutch hub by installing a friction plate and then alternating steel and friction plates.

4. Install the clutch wheel, aligning the marks on the wheel and the hub.

5. Install the spring plate with springs and bolts, but do not tighten the bolts fully.

6. Install the clutch housing on its shaft.

7. Install the partially assembled clutch hub onto the shaft turning the shaft gear by hand so that the shaft splines will mesh with the hub splines.

8. Remove the clutch spring plate assembly.

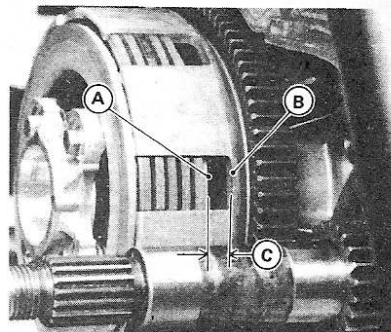
9. Oil the threads and the seating surface of the clutch hub nut.

10. Install the hub nut and tighten it to 14.5 ft. lbs.

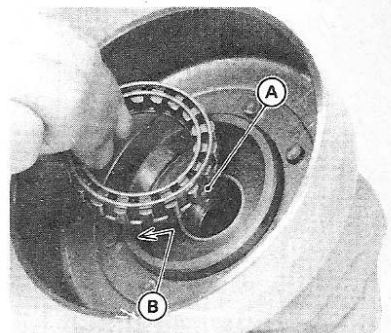
11. Install the spring plate assembly.

12. Tighten the spring bolts gradually and evenly. Bolt final torque is to be done after the primary clutch is fitted. While tightening, ensure that the clutch wheel splines engage the hub splines. There should be a gap between the wheel and clutch housing and no play in the plates.

13. Fit the one-way clutch into the primary clutch housing by first fitting the



When the clutch is installed, there should be a gap (C) between the wheel (B) and the housing (A)



Fit the projection on the cage (A) into the groove on the housing (B)

projection on the cage into the groove on the housing.

14. Install the primary clutch hub assembly on the crankshaft.

15. Lubricate the hub nut threads and seating surface.

16. Install the primary clutch hub nut and tighten it to 14.5 ft. lbs.

17. Tighten the secondary clutch spring bolts to 11 ft. lbs. Be sure to tighten the bolts in a cross pattern.

18. Grease the secondary clutch pusher and install it.

19. Remove all old gasket from the right crankcase cover mating surface.

20. Install the clutch release cams and ball assembly. Note that the projection on the ball assembly must face in.

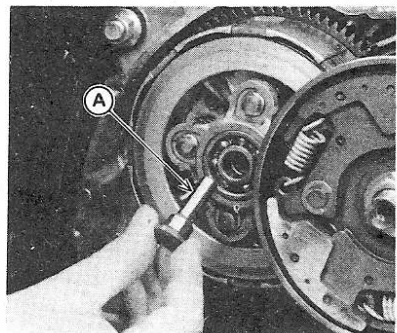
21. Be sure the locating dowel pins are in place on the crankcase mating surface.

## CLUTCH RELEASE

### Removal

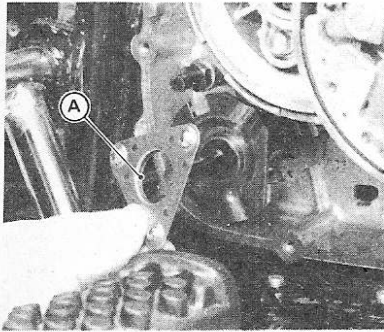
1. Remove the right crankcase cover.

2. Remove the clutch release adjusting screw plug from the outside of the cover.

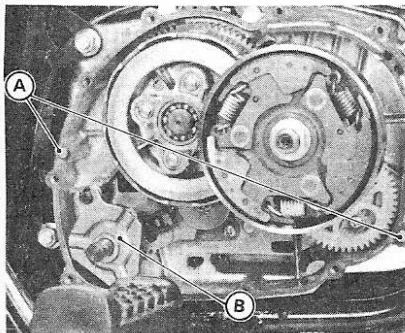


Grease the secondary clutch pusher (A) before installation

# Kawasaki KLT 110/160



The projection (A) on the ball assembly must face in



Be sure dowel pins (A) are installed; be sure the clutch release is properly seated

3. Remove the triangular cover from the crankcase cover.
4. Unscrew and remove the locknut and adjusting screw.
5. Remove the flat washer and O-ring.
6. Remove the clutch release lever and spring from the right engine cover.
7. Remove the E-ring and pull the clevis pin from the clutch release lever clevis.
8. Pull the release cams and ball assembly from the shift shaft.

### Inspection

1. Clean all metal parts in solvent.
2. Check parts for wear.

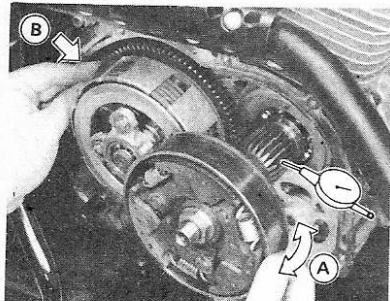
### Installation

1. Lubricate components before installation.
2. Reverse the removal procedure. Adjust the clutch as outlined in "Maintenance."
3. Refer to the exploded view as a guide to installation.

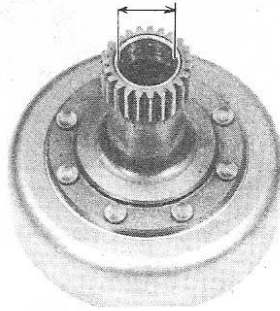
## PRIMARY DRIVE

### Removal

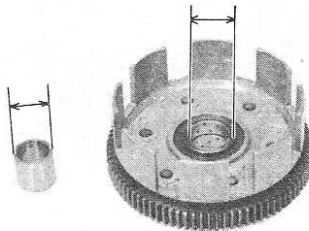
1. The primary and secondary gears are a part of the primary and secondary clutch assemblies, respectively, and are removed/installed along with the clutches.



Checking primary (A) and secondary (B) gear backlash



Measure the inside diameter of the primary gear



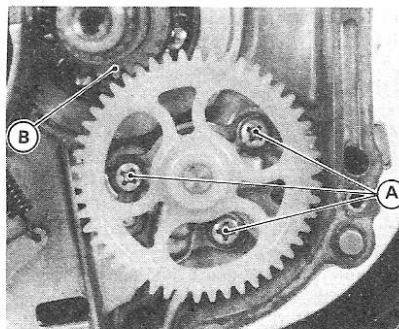
Measure the inside diameter of the secondary gear and the outside diameter of the secondary gear collar

### Inspection

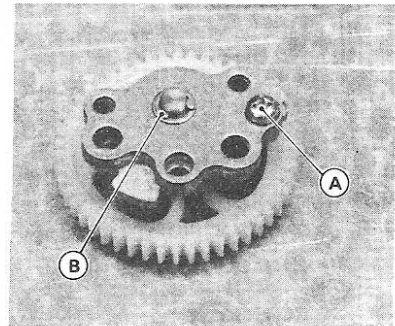
1. Check gear backlash with both clutches installed on their shafts.
2. Maximum allowable backlash is 0.14mm (0.006 in.). If the measurement exceeds this specification, both gears should be replaced.
3. Check the gear teeth for wear, pitting and other damage. Minor imperfections can be removed with an oilstone. If damage is more extensive, replace the gear(s).
4. Measure the inside diameter of the primary gear and the diameter of the crankshaft on the area on which the primary gear rides. Compare the measurements to the specifications. Replace worn parts as required.
5. Measure the inside diameter of the secondary gear and the outside diameter of the secondary gear collar. Compare the measurements obtained against the specifications. Replace worn parts as required.

### Installation

1. See "Installation" under "Clutches", above.



Oil pump mounting screws (A) and drive gear (B)



Pump cover screw (A) and shaft circlip (B)

## OIL PUMP

### Removal

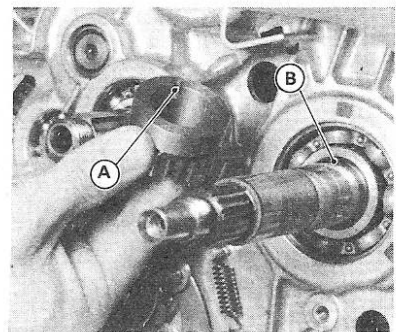
1. Remove the right crankcase cover.
2. Remove the primary clutch.
3. Remove the oil pump mounting screws (3) and remove the pump. Note the dowel pin and O-rings behind the pump.
4. If removal of the drive gear is required, the secondary clutch must be removed.

### Disassembly

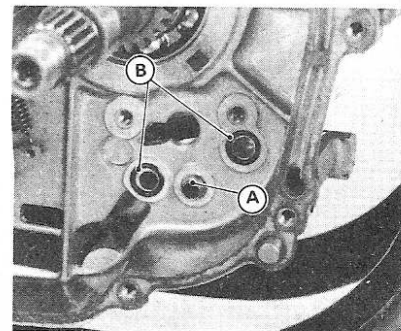
1. Remove the pump cover screw on the back of the pump.
2. Remove the shaft circlip.
3. Remove the pump cover.
4. Separate the rotors.

### Inspection

1. Clean all pump metal parts in clean motor oil.
2. Check the driven gear for wear or damage.
3. Check the rotors for scoring.
4. After the pump is assembled, check for free rotation of the shaft.



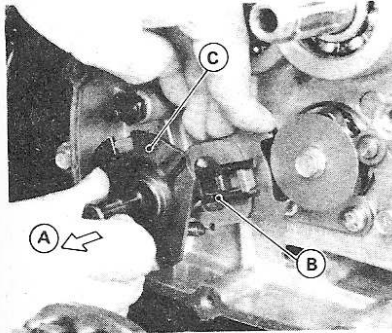
Engage the pump drive gear cutout (A) with the pin (B)



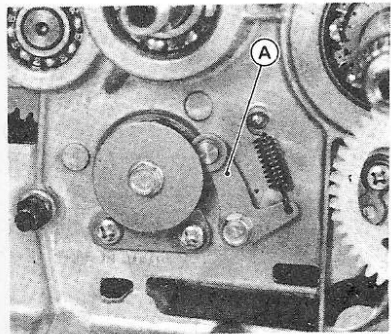
Be sure the dowel pin (A) and o-rings (B) are in place behind the oil pump

## Assembly and Installation

1. Lubricate all pump parts with clean motor oil before assembly.
2. Fill the pump with clean motor oil before installation.
3. Be sure the dowel pin and O-rings positioned behind the pump are in place.
4. If the drive gear was removed, be sure to engage the cutout in the back of the gear with the crankshaft pin.
5. Tighten the pump mounting screws securely.



Removing the external shift mechanism (C) and return spring (B)



Shift drum positioning lever (A)

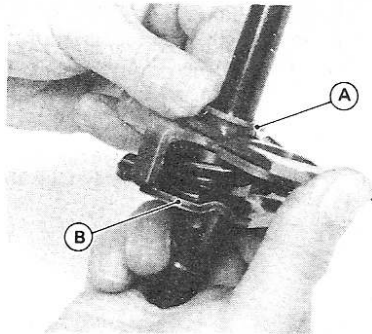
## EXTERNAL SHIFT MECHANISM

### Removal

1. Remove the right crankcase cover.
2. Remove the clutches.
3. Remove the clutch release cam and ball assembly.
4. Remove the gearshift lever (left side).
5. Thoroughly clean off and deburr the gearshift lever splines on the left side of the gearshift shaft to prevent damage to the oil seal when the shaft is pulled through.
6. Disengage the shift fingers from the shift drum. Pull the external shift assembly out to the right side of the engine.
7. Disconnect the shift drum positioning lever spring from the lever.
8. Remove the lever bolt and take off the lever.

### Inspection

1. Check the shaft for a bent condition.
2. Check the gearshift shaft splines for damage.
3. Check that the ends of the shift fingers are not chipped. Check the shift drum pins.
4. Check the springs for weakness or deformity.
5. Check that the pins in the crankcase are tight.



Be sure the shift arm collar (A) and the clutch release cam (B) are in place before installing the mechanism

## Installation

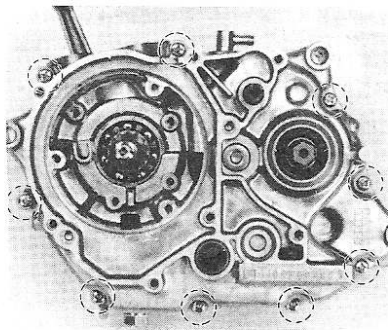
1. Check that the shift drum position lever moves freely after its bolt is tightened.
2. Lubricate the shift shaft lightly with oil before installation to avoid damage to the oil seal on the left side.
3. Be sure the shift arm collar and clutch release cam are in place.
4. Position the spring arms on either side of the pin when the assembly is installed.
5. The remainder of the procedure is the reverse of removal.

## LOWER END AND TRANSMISSION

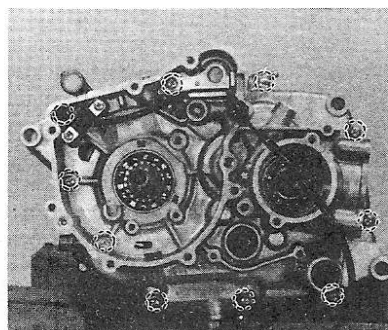
### Splitting The Crankcases

#### KLT 110

1. Remove the engine from the frame.
2. Remove the top end components.
3. Remove the crankcase cover components: recoil starter, magneto rotor and stator, engine sprocket, clutch and drive gears, oil pump, external shift mechanism, etc.



Crankcase screws (110)



Crankcase screws (160)

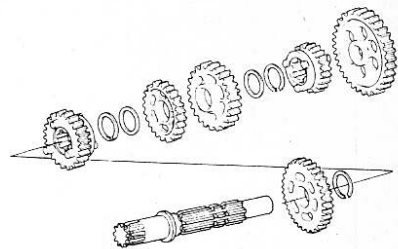
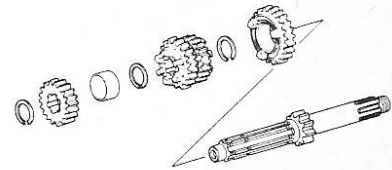
4. Remove the crankcase screws.
5. Separate the case halves by prying carefully at the slots provided.
6. The crankshaft and transmission will remain in the left crankcase half.

#### KLT 160

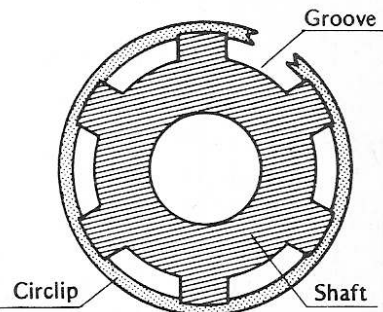
1. Remove the engine from the frame.
2. Remove the top end components.
3. Remove the crankcase cover components: recoil starter, magneto, clutches, drive gears, oil pump, external shift mechanism, reverse lever and front bevel gears.
4. Remove the pickup coil.
5. Remove the oil pipe banjo bolts. Remove the oil pipe mounting screw and take off the pipe.
6. Remove the crankcase screws and separate the case halves.

## Inspection

Refer to the "Engine Rebuilding" section under "General Information" for lower end and transmission component inspection procedures. Compare measurements against those given in the "Engine Specifications" charts.



Gear cluster (110)



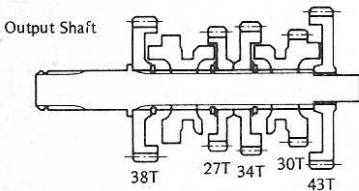
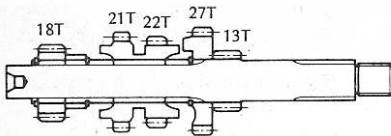
Install transmission shaft circlips as shown

## Crankcase Assembly

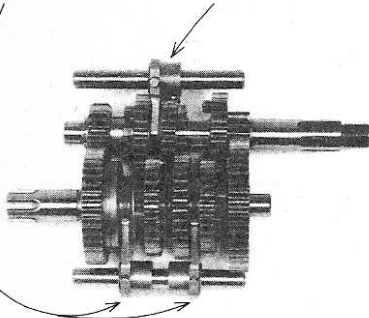
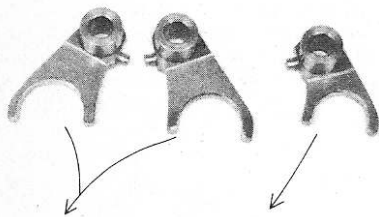
#### KLT 110

1. Clean all parts thoroughly.
2. Be sure transmission shaft circlips are installed as shown in the illustration.
3. Lubricate the crankshaft and transmission components before assembling the cases.

# Kawasaki KLT 110/160



**Gear positions (110)**

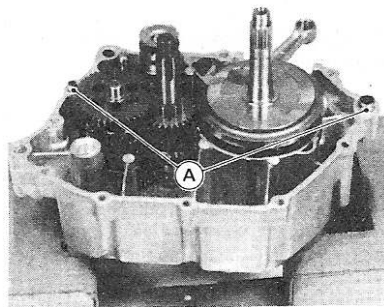


**Shift fork positions (110)**

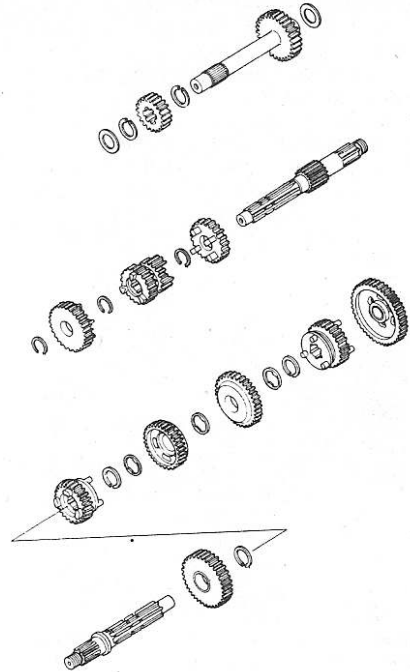
4. Check that the crankcase half mating surfaces are perfectly clean and smooth.
5. Be sure the two locating dowel pins are in place in the left crankcase half.
6. Apply a liquid gasket compound to the left crankcase half mating surface.
7. Join the halves and tighten the crankcase screws gradually and evenly until the cases are joined.
8. Check for free rotation of the transmission shafts and the crankshaft.

## KLT 160

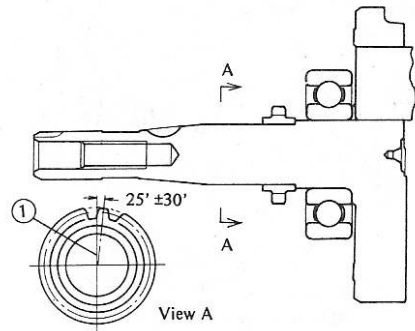
1. Clean all parts thoroughly.
2. Lubricate the crankshaft and transmission components before assembling the cases.
3. Be sure that transmission shaft circlips are installed as shown in the illustration.
4. Check that the crankcase half mating surfaces are perfectly smooth and clean.
5. Be sure the two locating dowel pins are in place in the right case half.
6. Apply a liquid gasket compound to the right crankcase half mating surface.
7. Join the halves and tighten the crankcase screws gradually and evenly until the cases are joined.
8. Check for free rotation of the transmission shafts and the crankshaft.



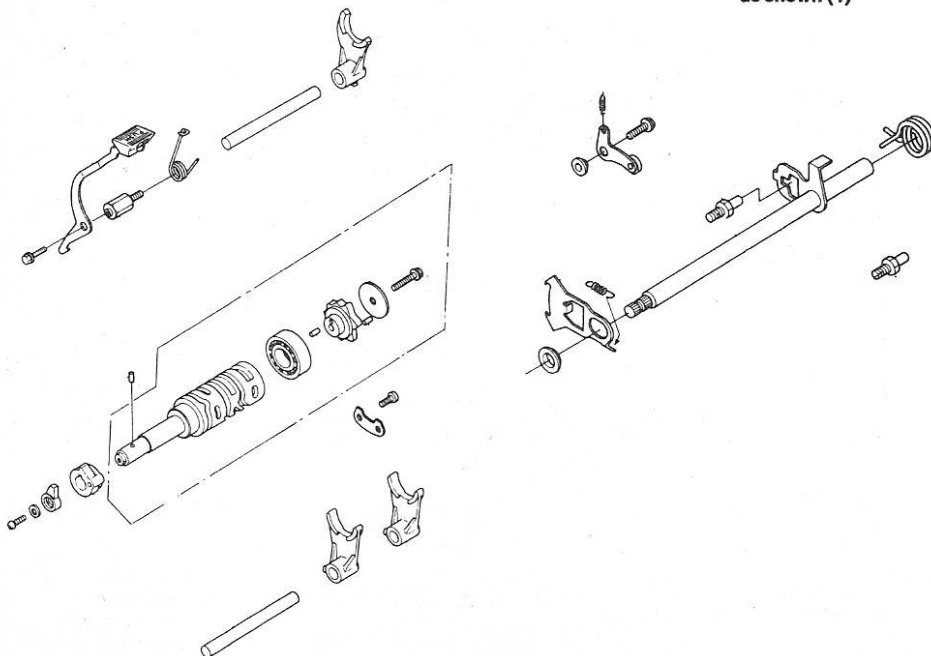
**Be sure the crankcase dowel pins (A) are in place**



**Gear cluster (160)**



**Install the cam chain sprocket on the crank as shown (1)**

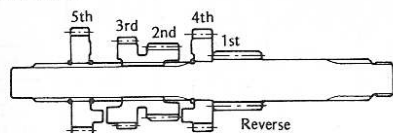


**Shift assembly (160)**

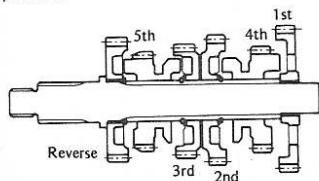


# Kawasaki KLT 110/160

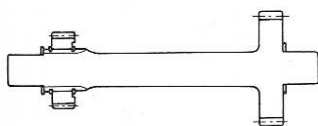
Drive Shaft



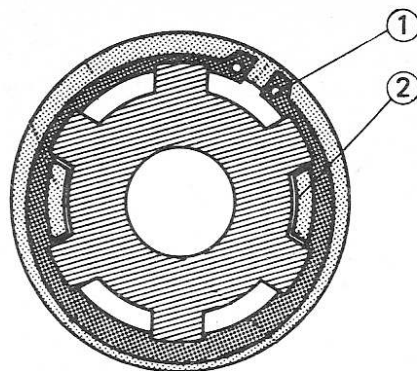
Output Shaft



Reverse Shaft



Gear positions (160)

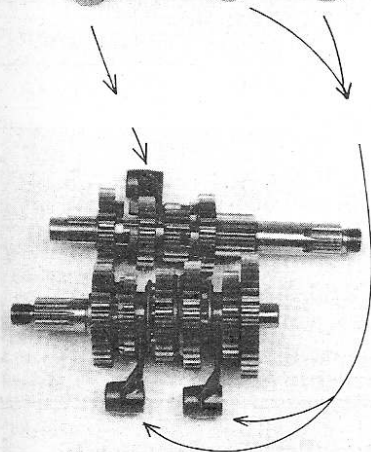


Install circlips (1) and toothed washers (2) on the transmission shafts as shown

## ENGINE TORQUE SPECIFICATIONS KLT110

Component	Torque (ft lbs.)
Cylinder head bolts	
8 mm	16
6 mm	7.3
Manifold bolts	7.3
Valve adjuster locknuts	6.5
Oil pipe banjo bolts	13
Cam sprocket bolts	8.7*
Clutch housing nut	46
Secondary gear nut	53
Oil drain plug	22
Engine mounting bolts	
Front and rear	22
Cylinder head	13
Engine bracket bolts	13
Magneto rotor nut	31
Spark plug	10

\*Use a non-permanent thread-locking compound

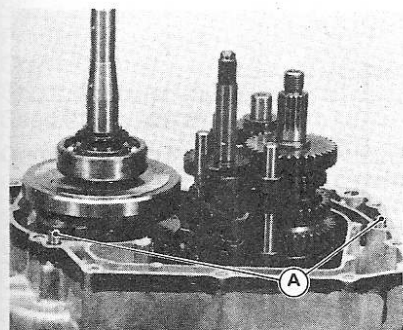


Shift fork positions (160)

## ENGINE TORQUE SPECIFICATIONS KLT 160

Component	Torque (ft lbs.)
Cylinder head bolts	
8 mm	18 (oiled)
6 mm	7.3 (oiled)
Oil pipe banjo bolts	11
Cam sprocket bolt	22 (oiled)
Valve adjuster locknuts	8.7
Recoil starter pulley bolt	43
Recoil starter shaft nut	8.7
Secondary clutch hub nut	14.5 (oiled)
Secondary clutch spring bolts	11
Primary clutch nut	14.5 (oiled)
Oil drain plug	58
Oil filter screen plug	58
Engine mounting bolts	
Front and rear	22
Cylinder head	15
Engine bracket bolts	15
Final gear bearing retainer	6.5*
Oil pipe banjo bolts	11
Shift/clutch release pins	33*
Spark plug	14.5

\*Use a non-permanent thread-locking compound



Be sure the crankcase dowel pins (A) are in place

# Kawasaki KLT 110/160

## ENGINE SPECIFICATIONS KLT 110

Component	Standard Specification (mm/in.)	Service limit (mm/in.)
Cylinder head warp	—	0.05/0.0020
Valve seating surface angle	45°	—
Valve head thickness		
Intake	0.55-0.85/0.022-0.034	0.4/0.016
Exhaust	0.85-1.15/0.034-0.045	0.5/0.020
Valve bend	—	0.05/0.002
Valve stem diameter		
Intake	5.495-5.510/0.2163-0.2169	5.48/0.2157
Exhaust	5.480-5.495/0.2157-0.2163	5.47/0.2153
Valve guide ID	5.520-5.532/0.2173-0.2178	5.60/0.2210
Valve seat width		
Intake	0.80-1.15/0.031-0.0453	—
Exhaust	0.85-1.15/0.034-0.0453	—
Valve seating surface dia.		
Intake	25.1-25.3/0.988-0.996	—
Exhaust	22.2/0.874	—
Valve spring free length		
Inner (plain)	33.5/1.32	32.01.26
Inner (progressively wound)	34.8/1.37	33.2/1.31
Outer (plain)	36.8/1.45	35.5/1.40
Outer (progressively wound)	37.5/1.48	36.0/1.42
Rocker arm ID	10.000-10.015/0.3937-0.3943	10.05/0.3957
Rocker arm shaft OD	9.980-9.995/0.3929-0.3935	9.95/0.3917
Cam lobe height (IN & EX)	28.750-28.858/1.1319-1.1361	28.65/1.1280
Cam chain length (21 pins)	127.00-127.48/5.00-5.02	128.9/5.07
Cylinder ID	51.000-51.012/2.0078-2.0083	51.10/2.012
Max. allowable variation	0.001/0.0004	0.005/0.002
Piston diameter	50.965-50.980/2.0065-2.0070	50.83/2.001
Piston/cylinder clearance	0.020-0.047/0.0008-0.0019	—
Piston ring/groove clearance		
Top	0.01-0.05/0.0004-0.0020	0.15/0.006
Second	0.01-0.045/0.0004-0.0018	0.15/0.006
Piston ring groove width		
Top, second	1.20-1.22/0.047-0.048	1.30/0.051
Oil	2.50-2.52/0.098-0.099	2.60/0.102
Piston ring thickness		
Top	1.170-1.190/0.0461-0.0469	1.10/0.0433
Second	1.175-1.190/0.0463-0.0469	1.10/0.0433
Piston ring end-gap		
Top	0.10-0.30/0.004-0.012	0.6/0.024
Second	0.15-0.30/0.006-0.012	0.6/0.024
Engine sprocket dia.	41.10-41.30/1.62-1.63	40.4/1.59
Clutch friction plate thickness	2.95-3.05/0.116-0.120	2.6/0.102
Plate warpage	—	0.3/0.118
Primary gear ID	22.020-22.041/0.8669-0.8678	22.05/0.8681
Primary gear collar dia.	21.972-21.993/0.8650-0.8659	21.95/0.8642
Connecting rod bend	—	0.2 @ 100mm/0.008 @ 3.9 in.
Connecting rod twist	—	0.2 @ 100mm/0.008 @ 3.9 in.
Big end radial clearance	0.008-0.022/0.00032-0.00087	0.7/0.0028
Big end side clearance	0.3-0.5/0.012-0.020	0.7/0.028
Crankshaft run-out	—	0.1/0.0039 TIR
Shift fork finger thickness	4.9-5.0/0.193-0.197	4.8/0.189
Shift fork groove width	5.05-5.15/0.199-0.203	5.3/0.209
Shift fork guide pin dia.	4.9-5.0/0.193-0.197	4.8/0.189
Shift drum groove width	5.05-5.20/0.199-0.205	5.3/0.209

# Kawasaki KLT 110/160

## ENGINE SPECIFICATIONS KLT160

Component	Standard Specification (mm/in.)	Service limit (mm/in.)
Cylinder head warp	—	0.05/0.0020
Valve seating surface angle	45°	—
Valve head thickness		
Intake	0.55-0.85/0.022-0.034	0.4/0.016
Exhaust	0.85-1.15/0.034-0.045	0.5/0.020
Valve bend	—	0.05/0.002
Valve stem diameter		
Intake	5.495-5.510/0.2163-0.2169	5.48/0.2157
Exhaust	5.480-5.495/0.2157-0.2163	5.47/0.2153
Valve guide ID	5.520-5.532/0.2173-0.2178	5.60/0.2210
Valve seat width (IN & EX)	0.5-1.0/0.020-0.040	—
Valve seating surface dia.		
Intake	28.9-29.1/1.14-1.15	—
Exhaust	24.9-25.1/0.98-0.99	—
Valve spring free length		
Inner	37.8/1.49	36.2/1.43
Outer	40.35/1.59	38.7/1.52
Rocker arm ID	13.000-13.018/0.5118-0.5125	13.05/0.5138
Rocker arm shaft OD	12.976-12.994/0.5109-0.5116	12.96/0.5102
Cam lobe height (IN & EX)	40.071-40.179/1.5776-1.5818	39.97/1.5736
Cam chain length (21 pins)	127.00-127.36/5.00-5.02	129.9/5.11
Cylinder ID	60.990-61.002/2.4012-2.4016	61.10/2.406
Max. allowable variation	0.01/0.0004	0.05/0.002
Piston diameter	60.950-60.965/2.3996-2.4002	60.81/2.394
Piston/cylinder clearance	0.025-0.52/0.00098-0.0020	—
Piston ring/groove clearance		
Top	0.015-0.065/0.0006-0.0026	0.17/0.007
Second	0.03-0.07/0.0012-0.008	0.17/0.007
Piston ring groove width		
Top	0.81-0.83/0.0319-0.0327	0.91/0.0358
Second	1.02-1.04/0.0402-0.0409	1.12/0.0440
Oil	2.51-2.53/0.0988-0.0996	2.61/0.103
Piston ring thickness		
Top	0.765-0.795/0.0301-0.0313	0.70/0.028
Second	0.97-0.99/0.0381-0.0390	0.90/0.035
Piston ring end-gap		
Top	0.15-0.30/0.006-0.012	0.6/0.024
Second	0.15-0.35/0.006-0.014	0.6/0.024
Primary clutch housing ID	116.0-116.2/4.567-4.575	116.5/4.587
Primary clutch shoe groove depth	1.0-1.3/0.04-0.05	0.5/0.02
Secondary clutch friction plate thickness	2.8-2.9/0.110-0.004	2.4/0.095
Secondary clutch plate warpage	0.15/0.006 (max)	0.3/0.012
Secondary clutch spring free length	24.0-25.0/0.96-1.0	23.5/0.94
Primary drive gear backlash	0.02-0.11/0.0008-0.0043	0.14/0.006
Crank diameter	23.959-23.980/0.9433-0.9441	23.94/0.943
Secondary gear ID	25.000-25.021/0.9843-0.9851	25.03/0.9854
Secondary gear collar dia.	24.970-24.985/0.9831-0.9837	24.95/0.9823
Connecting rod bend	—	0.2 @ 100 mm/0.008 @ 3.9 in.
Connecting rod twist	—	0.2 @ 100 mm/0.008 @ 3.9 in.
Big end radial clearance	0.008-0.019/0.00032-0.00075	0.07/0.0028
Big end side clearance	0.2-0.3/0.008-0.012	0.5/0.020
Crankshaft run-out	—	0.1/0.0039 TIR
Shift fork finger thickness	4.9-5.0/0.193-0.197	4.8/0.189
Shift fork groove width	5.05-5.15/0.199-0.203	5.3/0.209
Shift fork guide pin dia.	5.9-6.0/0.232-0.236	5.8/0.228
Shift drum groove width	6.05-6.20/0.238-0.244	6.3/0.248

# Kawasaki KLT 110/160

## Fuel Systems

### GAS TANK

#### Removal

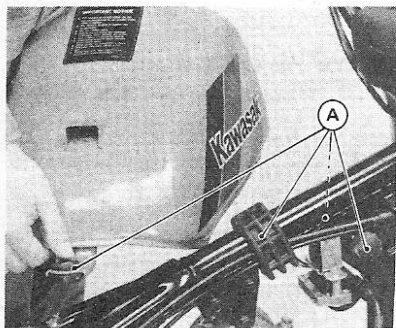
1. Remove the seat.
2. Be sure the fuel petcock is "OFF."
3. Disconnect the fuel line at the petcock.
4. Remove the bolt at the rear of the gas tank.
5. Tilt the tank up and remove it from the frame.

#### Inspection

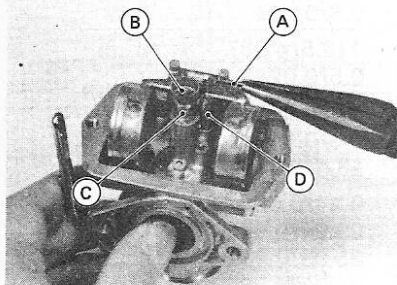
1. Pour the gasoline out into a suitable container and check it for water, foreign matter, etc.
2. Remove the petcock (see below) and clean it thoroughly.

#### Installation

1. Be sure the rubber cushions on the frame tubes are in place.
2. Slip the tank into position. Install the bolt.
3. When fitting the fuel line, be sure it is pushed onto the fitting as far as possible and secured with the safety clip.
4. Turn on the petcock and check for leaks before operating the machine.



Be sure the rubber cushions on the frame (A) are in place when installing the tank



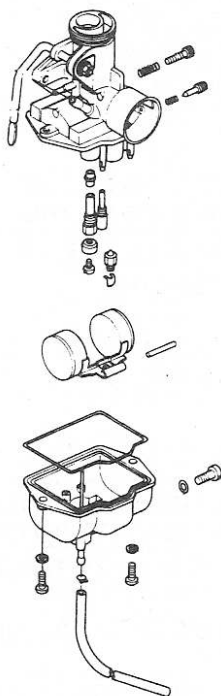
Float bowl components: float pivot pin (A), main jet (B), bleed pipe (C) and pilot jet (D)

### CARBURETOR (KLT 110)

#### Removal

1. Be certain that the fuel petcock is "OFF."
2. Disconnect the fuel line from the petcock.

582



Keihin carburetor (110)

3. Disconnect the overflow line from the carburetor float bowl. Disconnect the bleed line from the side of the carburetor.
4. Loosen the carburetor cap.
5. Loosen the carburetor's manifold clamp screw.
6. Move the air cleaner hose spring away from the carburetor.
7. Pull the air cleaner hose off of the carburetor intake.
8. Pull the carburetor out of the manifold.
9. Unscrew the carb cap and pull out the throttle slide assembly.
10. Drain the gasoline remaining in the float bowl into a safe container and dispose of it properly.
11. If the throttle slide assembly is not to be serviced, wrap it in a clean cloth and arrange it out of the way to avoid damaging it.

#### Disassembly

1. To disassemble the throttle slide, compress the spring and disengage the cable from the slide.
2. Separate the spring and slide.
3. Remove the needle keeper spring clip. Shake the needle out of the slide.

**CAUTION:** Do not remove the needle clip from the needle. Position is critical.

4. Remove the float bowl screws.
5. Remove the float bowl carefully, taking care not to damage the float assembly. If the float bowl resists, hold it tightly and strike it with the screwdriver handle until it breaks free.
6. Pull out the float pivot pin.



7. Lift out the float assembly and needle.
8. Unscrew and remove the main jet.
9. Unscrew and remove the pilot jet.
10. Unscrew and remove the bleed pipe.
11. Push the needle jet out from the top of the carburetor with your finger or a wooden dowel.
12. Remove the throttle stop screw and pilot jet from the side of the carb. Do not loose the springs.

#### Inspection

1. Refer to the "General Information" section of this manual for detailed carburetor inspection procedures.
2. Clean all metal parts in a safe, mild solvent.

**CAUTION:** The carburetor has non-removable plastic parts which may be damaged by a strong solvent.

3. Clean air and fuel passages by blowing with compressed air. Do not insert wire or the like into passages as this may alter their calibrated dimensions.

#### Assembly

Assembly is the reverse of disassembly. Note the following points:

1. Use new O-rings, gaskets, etc.
2. The needle jet is inserted from the bottom of the carburetor, small diameter first. It will be pushed into its final position when the bleed pipe is tightened.
3. Do not overtighten jets.
4. Check that the needle clip is positioned in the fourth groove from the top.
5. When installing the pilot screw, turn it in gently until it is lightly seated, then back it out 1-3/8 turns.
6. When inserting the throttle slide assembly into the carburetor body, align the slot in the slide with the tab in the body. Do not force the slide in. Be sure the needle enters the jet correctly.
7. Be sure the floats are correctly installed. The needle tang must be lower than the pivot.
8. Check float level (see "Maintenance").

#### Installation

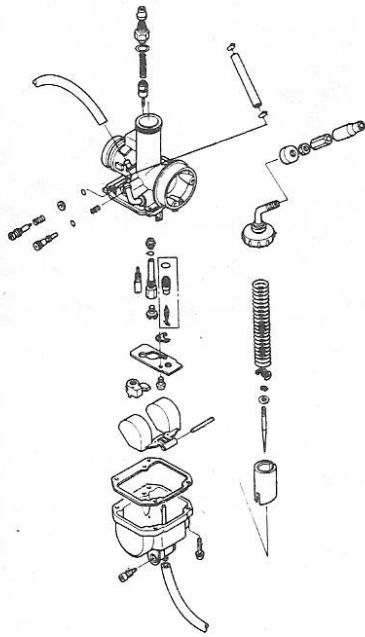
Installation is the reverse of removal. Note the following points:

1. Be sure the carburetor is firmly seated in the manifold and positioned vertically. Tighten the clamp screw securely.
2. Be sure all lines are firmly connected and are secured with safety clips.
3. Turn on the fuel and check for leaks before operating the machine.
4. Check throttle operation before attempting to start the machine.
5. Be certain the air cleaner hose is seated all around the carb intake and not folded or crimped.

### CARBURETOR (KLT 160)

#### Removal

1. Be certain that the fuel petcock is "OFF."
2. Disconnect the fuel line from the petcock.
3. Disconnect the overflow line from the carburetor float bowl.



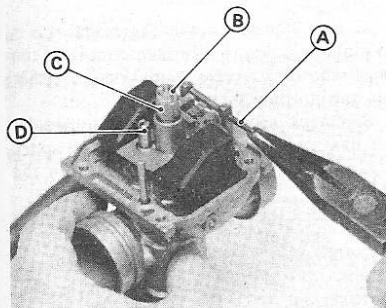
Mikuni carburetor (160)

4. Disconnect the bleed line from the side of the carburetor.
5. Unscrew the starter plunger assembly from the carburetor body.
6. Loosen the carburetor cap.
7. Loosen the carburetor's manifold clamp screw.
8. Move the air cleaner hose spring away from the carburetor.
9. Pull the air cleaner hose off of the carburetor intake.
10. Pull the carburetor out of the manifold.
11. Unscrew the carb cap and pull out the throttle slide assembly.
12. Drain the gasoline remaining in the float bowl into a safe container and dispose of it properly.
13. If the throttle slide assembly is not to be serviced, wrap it in a clean cloth and arrange it out of the way to avoid damaging it.

### Disassembly

1. To disassemble the throttle slide, compress the spring and disengage the cable from the slide.
2. Separate the spring and slide.
3. Remove the needle keeper spring clip. Shake the needle out of the slide.

**CAUTION:** Do not remove the needle clip from the needle. Position is critical.



Float bowl components: float pivot pin (A), main jet (B), bleed pipe (C) and pilot jet (D)

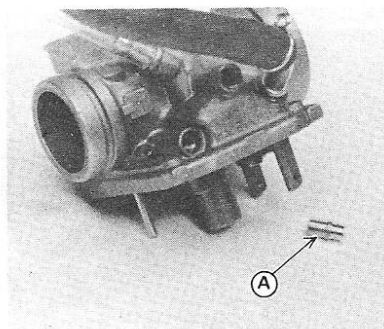
4. Remove the float bowl screws.
5. Remove the float bowl carefully, taking care not to damage the float assembly. If the float bowl is stuck, hold it tightly and strike it with the screwdriver handle until it breaks free.
6. Remove the plastic main jet cup from the float bowl.
7. Pull out the float pivot pin.
8. Lift out the float assembly and needle.
9. Remove the plate mounting screw.
10. Remove the needle seat holder.
11. Remove the needle seat and O-ring.
12. Unscrew and remove the main jet.
13. Unscrew and remove the pilot jet.
14. Unscrew and remove the bleed pipe. There is an O-ring above the bleed pipe. Shake it out now or with the needle jet.
15. Push the needle jet out from the top of the carburetor with your finger or with a wooden dowel. Note the O-ring located below the jet, if it has not already been removed.
16. Remove the throttle stop and pilot screws along with their springs and O-rings.

### Inspection

1. Refer to the "General Information" section of this manual for detailed carburetor inspection procedures.
2. Clean all metal parts in a safe, mild solvent.  
**CAUTION:** The carburetor has non-removable plastic parts which may be damaged by a strong solvent.
3. Check the condition of the starter plunger O-ring and replace it if it is knicked or damaged.
4. Clean air and fuel passages by blowing with compressed air. Do not insert wire or the like into passages as this may alter their calibrated bores.

### Assembly

- Assembly is the reverse of disassembly. Note the following points:
1. Use new O-rings and gaskets.
  2. The needle jet is inserted into the bottom of the carburetor, long end first. It will be pushed into its final position when the bleed pipe is tightened.



The long end on the needle jet (A) is inserted first

3. Do not forget the O-ring installed above the bleed pipe.
4. Do not forget the throttle stop and pilot screw O-rings.
5. Check that the needle clip is positioned in the fourth groove from the top.
6. When installing the pilot screw, turn it in gently until it is lightly seated, then back it out 1-1/4 turns.

7. When installing the throttle slide in the carburetor, be sure it is positioned correctly. Do not force the slide in. Be sure the needle enters the jet correctly.
8. Check float level (see "Maintenance").

### Installation

Installation is the reverse of removal. Note the following points:

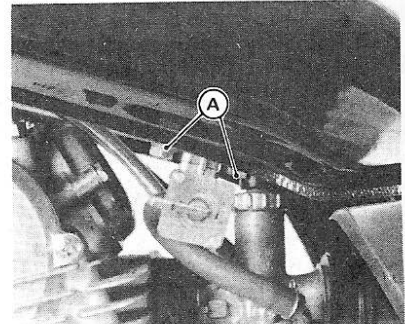
1. Be sure the carburetor is firmly seated in the manifold and positioned vertically. Tighten the clamp screw securely.
2. Be sure all lines are firmly connected and are secured with safety clips.
3. Turn on the fuel and check for leaks before operating the machine.
4. Check throttle operation before attempting to start the machine.
5. Be certain the air cleaner hose is seated all around the carburetor intake and not folded or crimped.

### FUEL PETCOCK

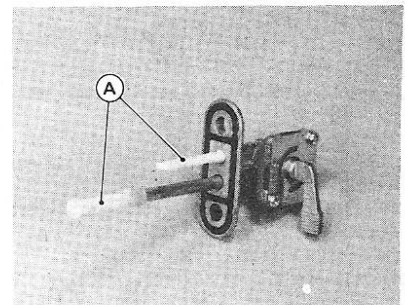
The fuel petcock is fitted with filter screens on the pipes inside the fuel tank.

### Removal

1. Remove the fuel tank.
2. Drain off the gasoline.
3. Remove the petcock securing bolts with washers and remove the petcock.



Petcock mounting screws (A)



Petcock filter screens

### Inspection

1. Clean the filter screens in a solvent to remove all dirt and other foreign matter.
2. Check filter screen condition. If punctured, or if they cannot be properly cleaned, replace them.
3. Check the condition of the petcock O-ring and replace it if deformed, knicked or otherwise defective.

# Kawasaki KLT 110/160

4. Check the condition of the nylon washers and replace as necessary.
5. Clean the petcock mating surface on the tank to ensure a good seal.

## Installation

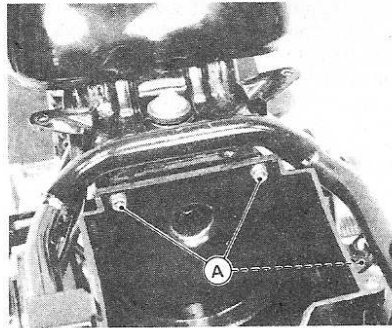
1. Fit the petcock, nylon washers and bolts. Tighten them evenly.
2. Connect the fuel line and ensure it is secured with the safety clip.
3. Check for leaks before operating the machine.

## AIR CLEANER

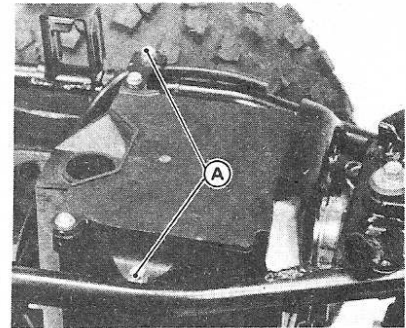
NOTE: See "Maintenance" for filter element service.

## Removal

1. Remove the seat.
2. Remove the rear fender.
3. Remove the filter element.
4. Remove the air cleaner mounting bolts.
5. Disconnect the hose to the mouth of the carburetor.
6. Lift the air cleaner out of the frame.



Air cleaner mounting screws (A) (110)



Air cleaner mounting screws (A) (160)

## Installation

Installation is the reverse of removal.

## FUEL LINES

1. Fuel lines should be checked periodically for condition.
2. Whenever fuel lines are disconnected,

be sure that the ends of the lines are not rotted, cracked or otherwise damaged.

3. When connecting lines, always be sure that safety clips are in place.

4. Whenever lines are disconnected, always check for leaks after they are connected and before operating the machine.

5. Fuel lines which are hardened, cracked, have suffered abrasion or other damage must be replaced.

## CARBURETOR SPECIFICATIONS

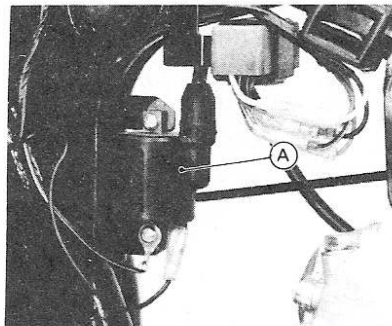
	KLT 110	KLT 160
Make	Keihin	Mikuni
Type	PC 18	VM22SS
Main jet	102	110
Main air jet	130	—
Pilot jet	35	22.5
Starter jet	—	35
Throttle slide cutaway	3.0	3.5
Jet needle	N17A	5J14
Needle clip position	4th from top	4th from top
Needle jet	—	0-2
Pilot screw (turns out)	1 $\frac{3}{8}$	1 $\frac{1}{4}$
Service fuel level (mm/in.)	2.5 $\pm$ 1/0.10 + 0.04	5.0 $\pm$ 1/0.20 $\pm$ 0.04
Float Height (mm/in.)	20/0.8	33.3/1.3

## Electrical System

### IGNITION SYSTEM

CAUTION: Do not run the engine with any wiring leads disconnected. This may cause damage to sensitive electronic components.

1. In the event of no spark or a weak spark, first check spark plug condition.
2. If a new plug does not remedy the problem, remove the spark plug cap from the high tension lead and check cap resistance with an ohmmeter. If the cap is electrically open, replace it.
3. Before beginning extensive system troubleshooting procedures, first check wiring and connectors. Be sure that all connectors are clean and dry. Check wiring for defective insulation, breaks and other obvious signs of damage.
4. If the problem cannot be isolated in this manner, check ignition system components as follows.



Ignition coil (A) (110)

### Ignition Coil

1. The ignition coil is located beneath the fuel tank and can be checked in place.
2. An ohmmeter is used to check primary and secondary coil resistance.
3. Remove the seat. See "Chassis."

4. Remove the gas tank. See "Fuel Systems."

5. Disconnect the low tension lead from the ignition coil. The lead is black on the 110 and green/white on the 160.

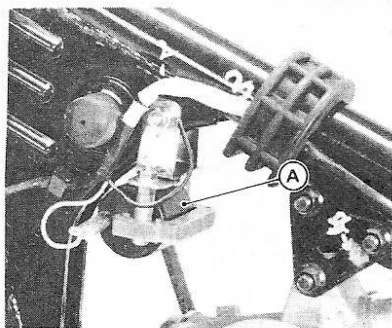
6. Measure the resistance between the low tension terminal on the coil and the coil core. It should be:

KLT 110: 0.34-0.52 ohms  
KLT 160: 0.18-0.28 ohms

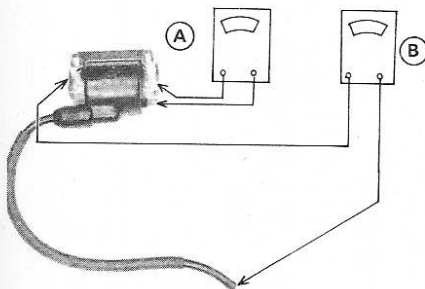
7. If the primary winding resistance is too high, it indicates a broken circuit. If too low, it shows defective insulation. In either case, the ignition coil must be replaced.

8. Check secondary coil resistance by first disconnecting the lead from the spark plug. Remove the spark plug cap from the lead.

9. Check the resistance between the high tension lead and the coil core. It should be 3.2-4.8 K ohms for both models. Resistance which is too low indicates a short in the coil; resistance which is too high indicates broken wiring. In either case, the coil must be replaced.



Ignition coil (A) (160)



Checking primary winding (A) and secondary winding (B) resistance

NOTE: When replacing the coil, ensure that the contact surfaces are clean and all connections clean and tight.

### Exciter Coil

#### KLT 110

1. To check the exciter coil, disconnect the red lead from the harness on the frame behind the engine.

2. Check resistance between the red lead and ground on the engine.

3. The reading should be 180-280 ohms. If exciter coil resistance is not within this range, replace the magneto stator.

#### KLT 160

1. To check the exciter coil, disconnect the red and black/red leads at the plastic connector on the frame behind the engine.

2. Check resistance across the red and black/red leads.

3. The reading should be 100-190 ohms. If the exciter coil resistance is not within this range, replace the magneto stator.

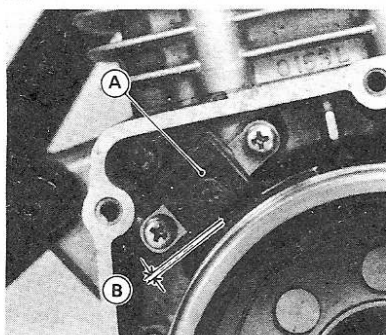
### Pickup Coil

#### KLT 110

1. To check pickup coil resistance, disconnect the magneto wires at the plastic connector behind the engine.

2. Measure the resistance between the brown and the white leads.

3. It should be 90-140 ohms. If the reading is not within this range, replace the pickup coil.



Pickup coil (A) air gap (B) should be 0.7 mm (0.03 in.)

#### KLT 160

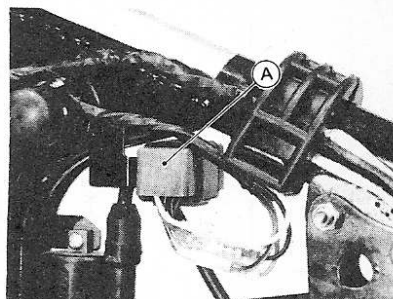
1. To check pickup coil resistance, disconnect the pickup coil leads (black and black/yellow) at the plastic connector.

2. Check resistance between the black and black/yellow wires. It should be 90-160 ohms.

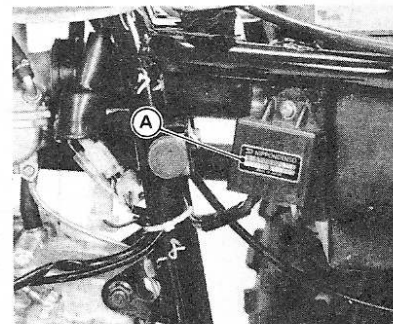
3. If the reading is not within this range, replace the pickup coil.

4. Remove the left side engine cover.

5. Check the air gap between the pickup coil and the projection on the magneto rotor.



CDI unit (110)



CDI unit (160)

		Meter Positive (+) Lead Connection				
		Pickup Coil (White)	Pickup Coil (Chocolate)	Ground (Black/Yellow)	Ignition Coil (Black)	Exciter Coil (Red)
Meter Negative (-) Lead Connection	Pickup Coil (White)		40 - 160 kΩ	40 - 160 kΩ	∞	60 - 500 kΩ
	Pickup Coil (Chocolate)	30 - 150 kΩ		0 Ω	∞	1 - 6 kΩ
	Ground (Black/Yellow)	30 - 150 kΩ	0 Ω		∞	1 - 6 kΩ
	Ignition Coil (Black)	60 - 240 kΩ	1 - 6 kΩ	1 - 6 kΩ		5 - 20 kΩ
	Exciter Coil (Red)	250 - 1,000 kΩ	60 - 240 kΩ	60 - 240 kΩ	∞	

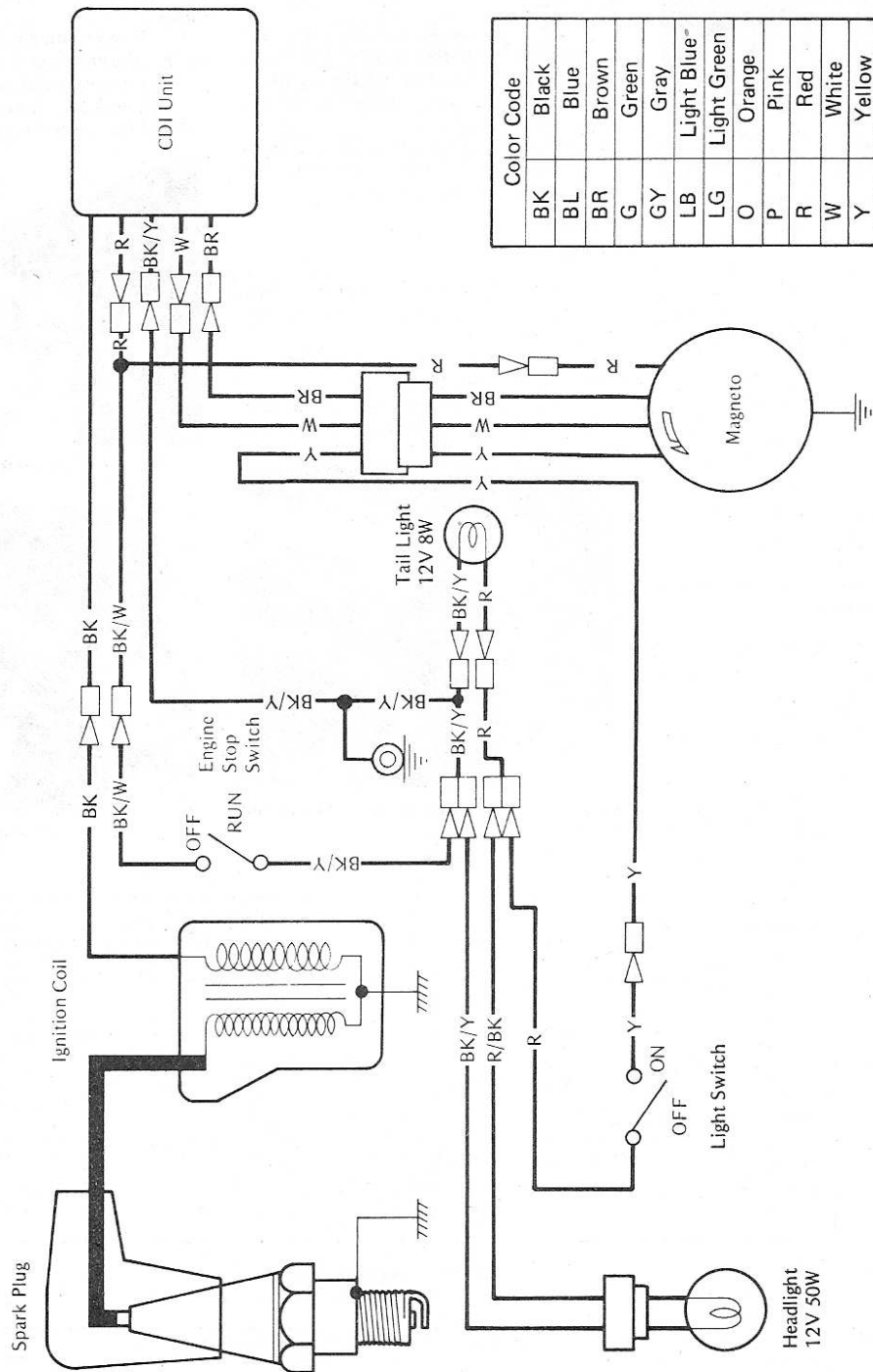
CDI unit specifications (110)

Unit: kΩ

		Meter Positive (+) Lead Connection						
		R	BK/R	BK	BL	G/W	BK/W	BK/Y
Meter Negative (-) Lead Connection	R		∞	∞	∞	∞	∞	∞
	BK/R	25 - 180		10 - 50	10 - 50	∞	35 - 180	10 - 50
	BK	2 - 10	2 - 10		0.1 - 0.4	∞	2 - 10	0.1 - 0.4
	BL	2 - 9	2 - 10	0.1 - 0.4		∞	2 - 10	0
	G/W	∞	∞	∞	∞		∞	∞
	BK/W	0	∞	∞	∞	∞		∞
	BK/Y	2 - 10	2 - 10	0.1 - 0.4	0	∞	2 - 10	

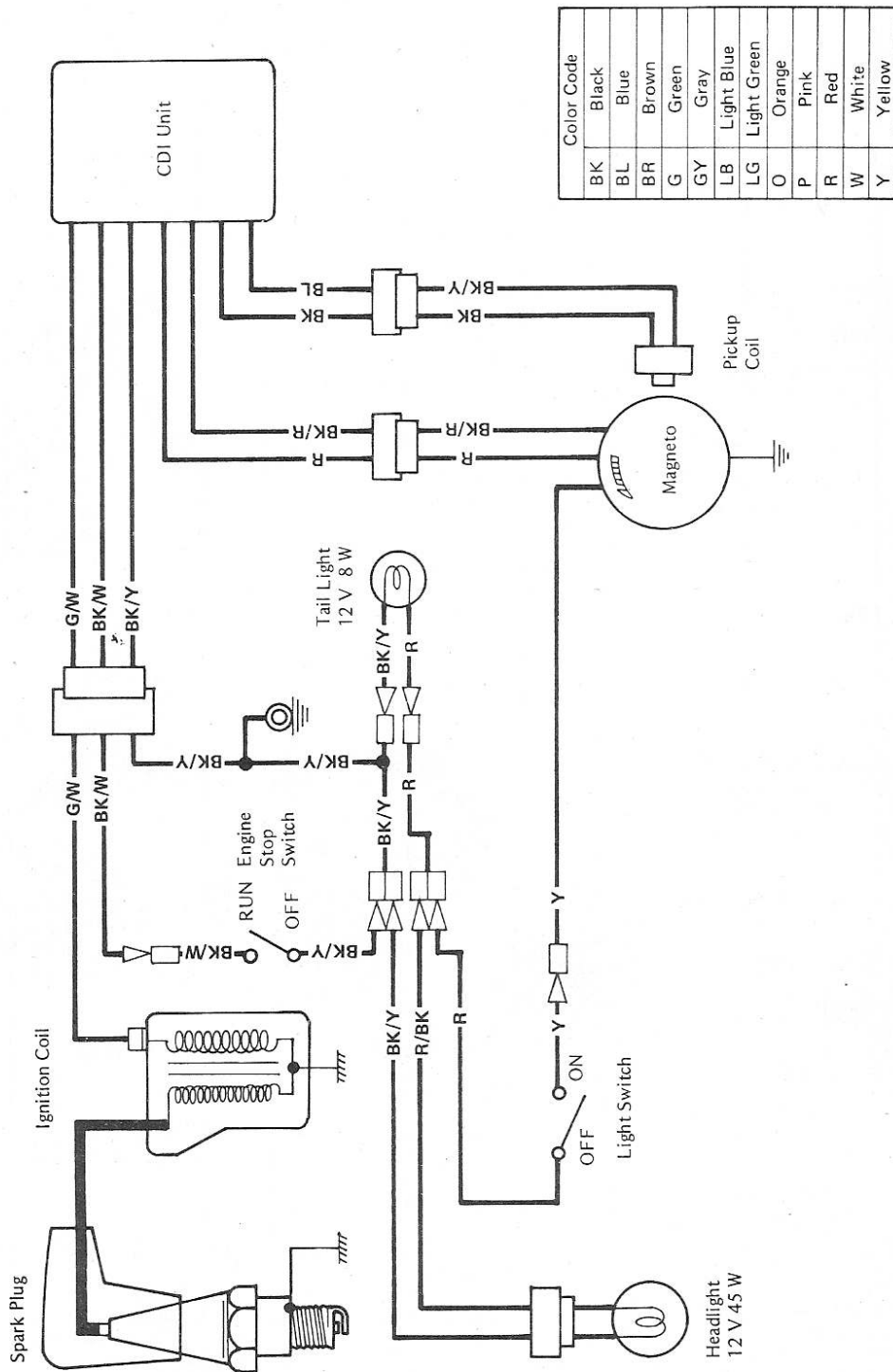
CDI unit specifications (160)

# Kawasaki KLT 110/160





# Kawasaki KLT 110/160



Color Code	Color
BK	Black
BL	Blue
BR	Brown
G	Green
GY	Gray
LB	Light Blue
LG	Light Green
O	Orange
P	Pink
R	Red
W	White
Y	Yellow

# Kawasaki KLT 110/160

6. The air gap should be 0.7mm (0.03 in.). If it is not correct, loosen the two mounting screws and reposition the coil to give the correct gap.

## CDI Unit

1. The CDI unit can be checked with an ohmmeter if inspection of the other ignition system components does not reveal the source of the problem.

2. The CDI unit is located beneath the fuel tank on the KLT 110 and under the seat on the left side of the frame on the KLT 160.

3. Disconnect the CDI leads at the plastic connector and carry out resistance tests according to accompanying tables.

4. If any reading is not within specification, replace the CDI unit.

## Engine Stop Switch

1. Switch leads are black/yellow and black/white.

2. When the switch is in the "RUN" position, there should be continuity between the two leads.

3. When the switch is in the "OFF" position (either one), there must be no continuity.

4. If both of these conditions are not met, replace the switch.

## LIGHTING SYSTEM

### AC Output

1. This test is carried out with an AC voltmeter. Set the meter to the 25 VAC range or equivalent.

2. Leaving the headlight leads connected, connect the voltmeter across them. Leads are black/yellow and red/black and are accessible at the connectors near the steering head lug.

3. Turn the headlight "ON."

4. Start the engine and note the meter readings at various rpm.

5. At 3,000 rpm, the meter reading should be at least 10 VAC on the KLT 110 and at least 11.5 VAC on the KLT 160.

6. If this specification is not met, check lighting coil resistance.

### Lighting Coil Resistance

1. Lighting coil resistance can be checked with an ohmmeter at the coil wire connector on the frame behind the engine.

2. Disconnect the plastic connector.

3. Measure the resistance between the yellow lead and ground on the engine.

4. Resistance should be 0.56-0.84 ohms on the KLT 110 and 0.8-1.5 ohms on the KLT 160.

5. If the measurement is not within this specification, replace the magneto stator.

6. If the lighting coil resistance checks out, but AC voltage output is low, the magneto rotor magnets may be defective. Replacing the rotor is the solution.

### Light Switch

1. Check the light switch by disconnecting the yellow and red switch leads at the connectors near the steering head lug.

2. When an ohmmeter is placed across the leads, it should show no resistance when the switch is in the "ON" position and infinite

resistance when the switch is in the "OFF" position.

3. If both of these conditions are not met, replace the light switch.

## Bulb Specifications

Headlight  
KLT 11012V, 50W  
KLT 16012V, 45W  
Tailight 12V, 8W

## Chassis

### COMPONENT REMOVAL AND INSTALLATION

#### Seat

##### KLT 110

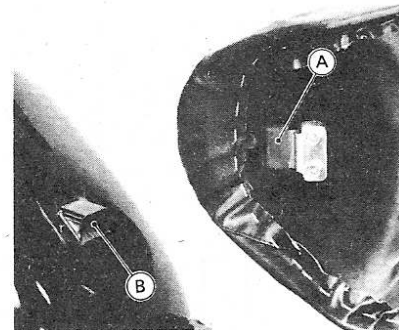
1. Pull the seat lock lever towards the rear of the machine.

2. Lift the rear of the seat, slide it towards the back of the machine and lift it off.

3. To install the seat, first be sure the rubber damper is in place on the hook at the front of the seat.

4. Position the seat so that the rubber damper enters the bracket provided for it on the gas tank.

5. Push the rear end of the seat down so that the latch catches.



Rubber damper (A) is inserted in bracket (B)

##### KLT 160

1. Remove the trunk cover by unhooking the rubber band and pulling the cover towards the rear of the machine.

2. Pull the seat lock lever towards the rear of the machine.

3. Lift the rear of the seat, slide it towards the back of the machine and lift it off.

4. To install the seat, first be sure the rubber damper is in place on the hook at the front of the seat.

5. Position the seat so that the rubber damper enters the bracket provided for it on the gas tank.

6. Push the rear end of the seat down so that the latch catches.

7. Slip the hooks on the front of the trunk cover into the slots on the seat bracket. Connect the rubber band.

#### Front Fender

##### ALL MODELS

1. Remove the front wheel.

2. Remove the four fender mounting bolts and lockwasher and flat washer on each.

3. Remove the fender.

4. Installation is the reverse of removal.

#### Rear Fender

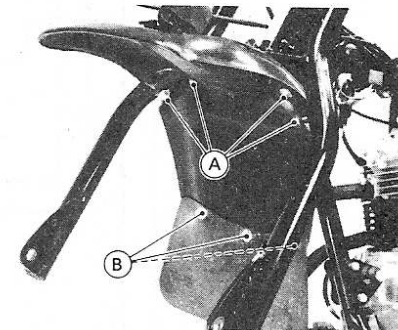
##### ALL MODELS

1. Remove the seat.

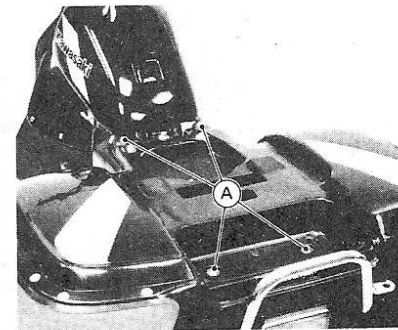
2. Remove the four rear fender mounting bolts (two front, two rear).

3. Remove the rear fender.

4. Installation is the reverse of removal. Be sure that the collars are in place in the dampers before the fender is mounted.



Front fender mounting screws (A) and mud-flap screws (B)



Rear fender mounting bolts (A)

## FRONT WHEEL

### KLT 110-A1

#### REMOVAL

1. Back off the brake cable adjuster at the brake drum until the cable is slack.

2. Loosen the axle nut.

3. Support the front wheel off the ground using a safe, sturdy support beneath the frame.

4. Remove the axle nut.

5. Pull out the axle noting location of the left and right spacers, bearing cap (right side) and flat washers.

6. Remove the wheel from the forks.

7. Remove the brake plate from the drum.

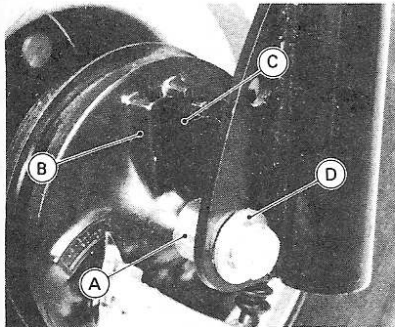
8. Remove the lug nuts and separate the hub from the wheel.

NOTE: If the wheel bearings are going to be removed, leave the hub on the wheel.

#### INSTALLATION

1. Mount the hub on the wheel, positioning it so that the valve stem is on the opposite side of the wheel from the drum.

2. Install the lug nuts and tighten them in a cross pattern until the correct torque of 30 ft. lbs. is reached.
3. Place the brake plate in the drum.
4. Lightly grease the axle with a medium-weight chassis grease.
5. Install the left-side flat washer and left-side spacer on the axle.
6. Position the wheel/brake assembly in the forks, ensuring that the fork lug engages the slot on the brake plate.
7. Slide the wheel in place and slide the axle through enough to hold it.
8. Position the bearing cap and the right-side spacer between the wheel and the fork and push the axle through.
9. Place the flat washer on the axle.
10. Install the axle nut.
11. Adjust the brake and apply it several times to center the brake plate.
12. Tighten the axle nut to 54 ft. lbs.
13. Make final brake adjustment as outlined in "Maintenance."

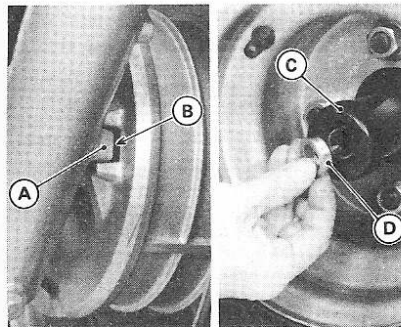


Be sure spacer (A) and flat washer (D) are in place; engage fork lug (C) with slot (B)

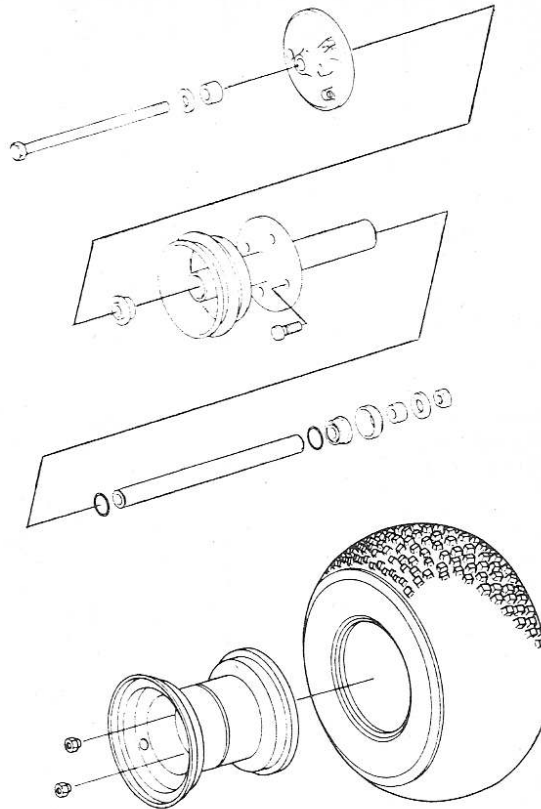
## KLT 110-A2, KLT 160

### REMOVAL

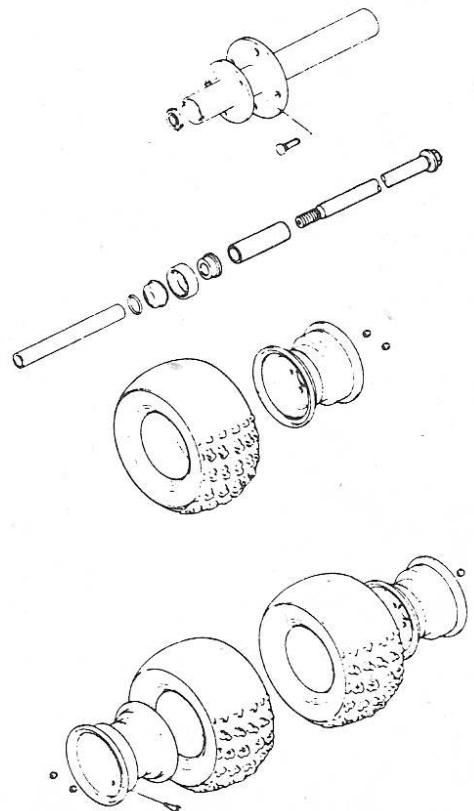
1. Run the cable adjuster at the brake drum down until the cable is slack.
2. Loosen the four axle clamp nuts on the right side of the axle.
3. Support the front wheel a couple of inches off the ground by placing a sturdy, safe support beneath the frame.
4. Unscrew and remove the axle, sliding it out to the right side.
5. Note the locations of the spacers and bearing cap.
6. Remove the wheel from the forks.
7. Remove the brake plate from the drum.
8. Remove the four lug nuts and separate the hub from the wheel.



Engage fork lug (A) with slot (B); be sure dust seal (C) and spacer (D) are in place



Front wheel assembly (110-A1)



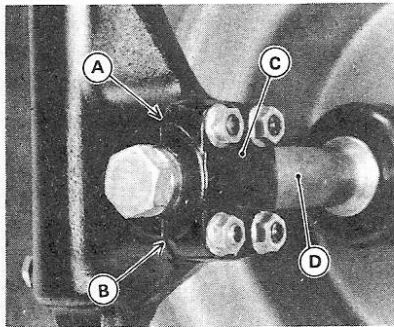
Front wheel assembly (110-A2, 160)

# Kawasaki KLT 110/160

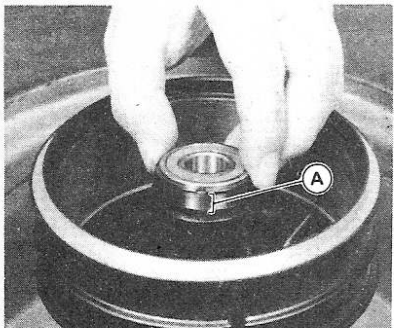
**NOTE:** If the wheel bearings are going to be removed, leave the hub on the wheel.

## INSTALLATION

1. Mount the hub on the wheel, positioning it so that the valve stem is on the opposite side of the wheel from the drum.
2. Install the lug nuts and tighten them in a cross pattern until the correct torque of 30 ft. lbs. is reached.
3. If the axle clamp was removed from the fork leg, be sure it is installed with the "UP" mark pointing up.
4. Grease the axle lightly with a medium-weight chassis grease.
5. Position the long spacer on the right fork tube and insert the axle in far enough to hold it.
6. Install the brake plate in the drum.
7. Check that the dust cap and the short spacer are in place on the right side of the wheel.
8. Position the wheel in the forks, engaging the fork lug with the slot in the brake plate.
9. Slide the axle into place. Tighten it to 51 ft. lbs.
10. Tighten the axle clamp nuts. Proper torque is 7.3 ft. lbs. Tighten the two top nuts first, then the lower nuts. When finished, the clamp should have a gap at the lower end, but not the upper.
11. Adjust the front brake. See "Maintenance."



Long spacer (D) is installed on the right side of the axle. The "UP" mark on the axle clamp (C) must be correctly positioned with a gap at (B) and flush surfaces at (A)



The long side of the bearing (A) goes in first

## REAR WHEELS

### All Models

#### REMOVAL

1. Loosen the four lug nuts on the wheel(s) you wish to remove.

2. Support the wheel(s) an inch or so off the ground using a sturdy, safe stand beneath the frame.
3. Remove the lug nuts.
4. Remove the wheel(s).

#### INSTALLATION

1. Install the wheel(s) so that the valve stem is on the outside.
2. Tighten the lug nuts in a cross pattern until the proper torque of 30 ft. lbs. is reached.

## FRONT WHEEL BEARINGS

### Inspection

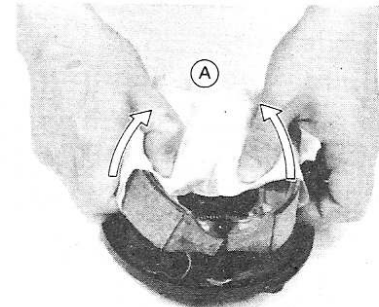
1. Wheel bearing condition can be checked with the wheel installed in the forks by spinning it slowly and listening for any noise. Place a hand on the fork tube to detect vibration, rough rotation, etc. If there are signs such as these, the wheel bearings may be in need of replacement.
2. If the wheel is removed from the machine, turn the bearings by hand to check action. Check for play between inner and outer races.

**NOTE:** Wheel bearings must be replaced in pairs.

### Removal

**NOTE:** The removal procedure usually damages wheel bearings. Do not remove the bearings unless replacement is intended.

1. Remove the front wheel from the machine.
2. Remove the brake plate from the drum.
3. Heat the hub with a propane torch in the area around one of the bearings.  
**CAUTION:** Do not overheat. Bearings spacer rubber O-rings will be damaged. Heat enough to begin to discolor the paint on the hub and then remove heat source.
4. Reach through the hub with a long drift. Move the spacer aside. Tap out the bearing.
5. Remove the spacer.
6. Remove the remaining bearing in the same manner.



Removing brake shoes (A) from the drum

### Installation

1. Clean old grease out of the hub.
2. Pack each new bearing with a good grade of waterproof, medium-weight bearing grease. Place a quantity of the grease in the hub.

3. Clean and deburr the bearing seats in the hub.

4. Install one bearing. The long side of the bearing (relative to the circlip) goes in first (sealed side out). Use a suitably-sized bearing driver to drive the bearing straight into its seat. Be sure it is not cocked or tilted.

5. Before the spacer is installed, check O-ring condition. Replace the O-rings if they show signs of damage.

6. Position an O-ring about 6mm from each end of the spacer.

7. Install the spacer.

8. Install the remaining bearing (long side in, sealed side out).

## FRONT BRAKE

### Removal And Disassembly

1. Run down the front brake cable adjusters as far as possible.
2. Disconnect the cable from the brake lever on the drum.
3. Remove the front wheel from the machine.
4. Remove the brake plate from the drum.
5. Remove the drum, if required, by taking off the three nuts and bolts.
6. Brake components can be inspected in place. See below.

### Inspection

1. Check the general condition of the brake linings. If the linings are scored, grooved or otherwise damaged, replace them.
2. Check the linings for an oil-soaked condition. If there are signs of lubricant penetration, they must be replaced.
3. Measure lining thickness. If either of them measures less than 1.5mm (0.6 in.) at the thinnest point, replace them.
4. Check the condition of the brake drum. If the inner surface is scored or grooved, the drum may have to be replaced. It may be possible to have the drum turned down on a lathe to remove minor scoring, but the final drum inside diameter must not exceed the wear limit specification (see below).
5. Measure the inside diameter of the brake drum. If it exceeds 110.75mm (4.36 in.), replace it.
6. Check that the drum is not cracked.
7. Remove rust, dirt and corrosion from the brake drum with emery cloth.
8. Break the glaze on brake linings with emery cloth.  
**CAUTION:** Do not blow out brake components with compressed air or breathe the brake dust. It represents a health hazard.
9. To replace the linings, grasp both of the shoes and fold them towards the center of the brake plate.
10. Check the condition of the brake return springs. Replace the pair if they are broken, deformed, badly rusted or seem weak.
11. To remove the brake cam from the plate, first scribe a mark on lever and cam to position the lever for easy installation.
12. Remove the brake lever pinch bolt and carefully pull the lever off the cam.
13. Tap the cam out of the brake plate from the outside. Note O-ring location.
14. Clean the cam in solvent and use emery cloth to remove any rust or corrosion.

15. Check the diameter of the cam bushing area and replace it if the measurement is less than 11.8mm (0.47 in.).
16. Check the diameter of the brake plate hole and replace the plate if the measurement exceeds 12.7mm (0.51 in.).
17. Check that the cam is not bent and that the lever splines are not torn or broken.
18. Check the brake plate for cracks.

## Assembly And Installation

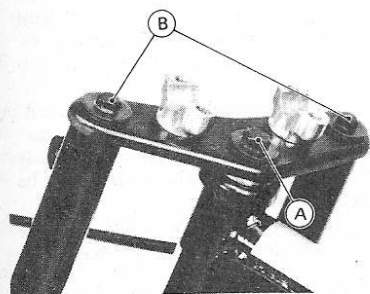
1. Clean all metal parts thoroughly in a solvent.
  2. Lubricate the brake cam bushing area and brake shoe seat with a waterproof, medium-weight chassis grease.
  3. Install the cam in the brake plate. The mark on the brake shoe seat must point towards the center of the plate.
  4. Fit the brake cam O-ring.
  5. Fit the brake lever on the cam, aligning the position marks made prior to removal.
  6. Install and tighten the lever pinch bolt.
  7. Lightly grease the brake shoe pivot on the brake plate. Lubricate the brake shoe holes to which the return springs attach.
- CAUTION:** *Keep lubricant well clear of the linings. Do not use too much as it may work its way onto the linings.*
8. Assemble the shoes and return springs.
  9. Install the shoes and springs onto the brake plate. Ensure that they are firmly seated.
  10. Install the brake drum on the hub if it was removed. Tighten the bolts and nuts to 22 ft. lbs.

11. The remainder of the procedure is the reverse of removal.

## FRONT FORKS (KLT 110- A1)

### Removal

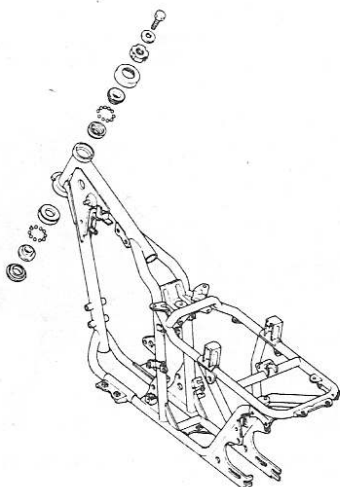
1. Remove the front wheel.
2. Remove the front fender (four bolts, washers).
3. Remove the gas tank. See "Fuel Systems."
4. Disconnect the brake cables from both hand levers. The front brake cable is already free. The rear brake adjusters must be run down to provide enough slack to effect removal.
5. Remove the throttle lever housing mounting bolts.
6. Remove the screws which secure the switch housing to the left side of the handlebars.
7. Remove the screws which secure the rubber cover to the upper triple clamp. Remove the cover.



Steering stem bolt (A); upper triple clamp bolts (B)

8. Remove the handlebar clamp bolts.
9. Remove the handlebars.
10. Remove the headlight.
11. Remove the steering stem bolt and washer.
12. Remove the upper triple clamp bolts above the fork tubes. Remove the washers.
13. Remove the upper triple clamp.
14. Support the fork assembly with one hand and unscrew the steering stem bearing adjuster nut.

**CAUTION:** *Steering stem bearing balls may come out as the nut is loosened.*



Steering stem bearing assembly (all models)

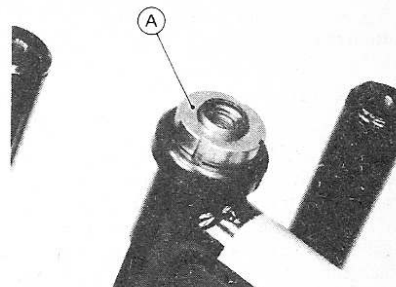
15. Remove the dust cover from the steering stem.
16. Remove the upper race from the steering stem.
17. Lower the forks until they are clear of the frame.
18. Remove the bearing balls from the lower race to avoid loss.

### Inspection

1. If the fork tubes or the steering stem are bent, the assembly must be replaced.
2. Wash the bearing balls in a safe solvent.
3. Clean the bearing races with a solvent-soaked rag to remove all traces of old grease.
4. Check the balls for rust, pitting, wear and/or flat spots. All of the bearings should be replaced if damage is noted.
5. Should the surfaces of the bearing races be pitted, rusted or rippled, they should be replaced.
6. Run a finger around the races. The surfaces must be smooth and without indentations, ripples or other imperfections.
7. To replace the races in the frame lug, drive them out with a hammer and drift. The race on the steering stem is removed with a hammer and chisel.

### Installation

1. New steering stem races are fitted to the head lug by driving them in with a suitable driver. Be sure that they are driven straight in and are fully seated.
2. Smear the races with a good grade of waterproof, medium-weight bearing grease and imbed the bearing balls in the frame race and the steering stem race.



Steering stem bearing adjuster nut (A)

3. Bearing ball specifications are:  
Upper: 6mm, 23 ea.  
Lower: 8mm, 19 ea.
4. Slip the forks into the frame head lug ensuring that none of the balls in the lower race are lost.
5. Hold the forks in place while installing the upper race, dust cover and adjuster nut.
6. Adjust the bearings as outlined in "Maintenance."
7. The remainder of the procedure is the reverse of removal. Note the following torque ratings:  
Upper triple clamp bolts: 22 ft. lbs.  
Steering stem bolt: 40 ft. lbs.  
Handlebar clamp bolts: 13 ft. lbs.

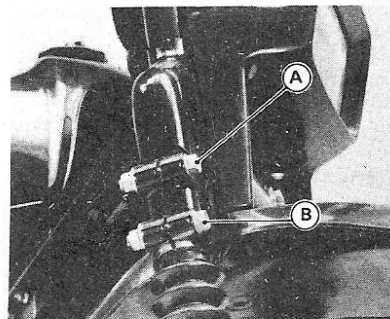
## HYDRAULIC FRONT FORKS

### Removal

1. Remove the front wheel.
2. Loosen the two clamp bolts securing each fork tube to the steering stem assembly.
3. Hold the fork tube. Remove the upper clamp bolt.
4. Remove the fork tube.

### Disassembly

1. Loosen the clamp screw and pull off the rubber boot.
2. Press down on the plug at the top of the fork tube and remove the retaining ring.
3. Holding the plug against the fork spring tension, release pressure slowly until spring tension is released.
4. Remove the top plug with the O-ring.
5. Remove the short spring.
6. Remove the spring seat.
7. Remove the long spring.
8. Pour off the old fork oil.
9. Remove the allen bolt and gasket from the bottom of the fork slider. Separate the fork components.



Upper (A) and lower (B) fork the tube clamp bolts

# Kawasaki KLT 110/160

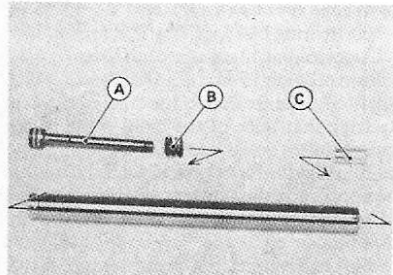
10. Remove the piston assembly from the top of the fork tube.

11. Remove the cylinder base from the bottom of the fork tube.

## Inspection

1. Inspect the fork tubes for bends such as might have been incurred in an accident. Replacement is recommended rather than attempting to straighten bent fork tubes.

2. On the fork tubes the chrome plating must be in perfect condition in the area on which the slider oil seal rides, or leaks will result. If the chrome in this area is peeled or damaged, the tube should be replaced.



Hydraulic fork components: piston and cylinder assembly (A), spring (B) and cylinder base (C)

3. Minor rust and corrosion on the fork tubes should be removed by a low-abrasive method.

4. Check the condition of the fork springs. Compare the heights of the springs from each fork leg. Spring heights should be equal.

5. Clean all damper components in a safe solvent. Be sure they are clean before installation.

6. Clean all metal parts in a safe solvent. Lubricate them lightly with fork oil before installation.

7. New fork slider seals should be used once the forks have been disassembled.

8. Remove the dust cover from the top of each slider.

9. Remove the slider oil seal circlip.

10. Pry out the old seal with a small screwdriver or the like, taking care to protect the top edge of the slider which you are using as a fulcrum.

11. Drive the new seal straight in. Be sure it is not cocked or otherwise damaged as it is driven in. The seal must be far enough in the slider so that the circlip can be installed.

12. Oil the seal lips before installation.

## Assembly

Assembly is the reverse of disassembly. Note the following points.

1. Use a non-permanent thread-locking compound on the threads of the slider allen bolt. Tighten the bolt to 14.5 ft. lbs.

2. Add fork oil as outlined below.

## Changing Fork Oil

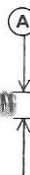
1. SAE 5W-20 oil is recommended for the forks.

2. Fork oil should be changed every 90 days of machine use.

3. Fork capacity is 88cc (3 oz.) after a rebuild and 75cc (2.6 oz.) for a routine change. This is the capacity of each fork leg.

4. Tighten the upper clamp bolt to 22 ft. lbs.

5. Tighten the lower clamp bolt to 22 ft. lbs.



## STEERING STEM

### KLT 110-A1

The steering stem and front forks constitute one assembly. Refer to the "Front Forks" section.

### KLT 110-A2, KLT 160

## REMOVAL

1. Remove the front wheel.  
2. Remove the front fender.  
3. Remove the fork tubes from the steering stem assembly.

4. Remove the gas tank. See "Fuel Systems."

5. Disconnect the brake cables from the hand levers. The front brake cable should already be free. The rear brake adjusters must be run down to provide enough slack to effect removal.

6. Remove the throttle lever housing mounting bolts.

7. Remove the screws which secure the switch housing to the left side of the handlebars.

8. Remove the screws which secure the rubber cover to the upper triple clamp. Remove the cover.

9. Remove the handlebar clamp bolts.

10. Remove the handlebars.

11. Remove the headlight.

12. Remove the steering stem bolt and washer.

13. Remove the upper triple clamp bolts above the fork leg holders. Remove the washers.

14. Remove the upper triple clamp.

15. Support the steering stem assembly with one hand and unscrew the steering stem bearing adjuster nut.

**CAUTION: Steering stem bearing balls may come out as the nut is loosened.**

16. Remove the dust cover from the steering stem.

17. Remove the upper race from the steering stem.

18. Lower the steering stem until it is clear of the frame.

19. Remove the bearing balls from the lower race to avoid loss.

## INSPECTION

1. Check that the steering stem assembly is not bent or deformed. If it is, it should be replaced. Attempts to straighten bent components may result in an unsafe part.

2. Wash the bearing balls in a safe solvent.

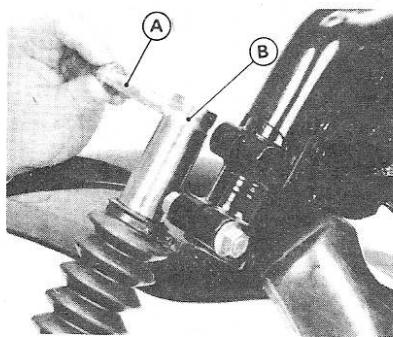
3. Clean the bearing races with a solvent-soaked rag to remove all traces of old grease.

4. Check the balls for rust, pitting, wear and/or flat spots. All the bearings should be replaced if damage is noted.

5. Should the surfaces of the bearings races be pitted, rusted or rippled, they should be replaced.

6. Run a finger around the races. The surfaces must be smooth and without indentations, ripples or other imperfections.

The smaller diameter end of the long spring (A) is positioned at the lower end of the fork tube



Upper clamp bolt (A) and fork tube groove (B)

4. Remove the fork leg from the steering head assembly as outlined above.

5. Remove the top plug retaining ring and the plug as noted in the "Disassembly" section, above. Remove the springs.

6. Pour off the old oil.

7. Add the proper grade and quantity of oil to the fork leg.

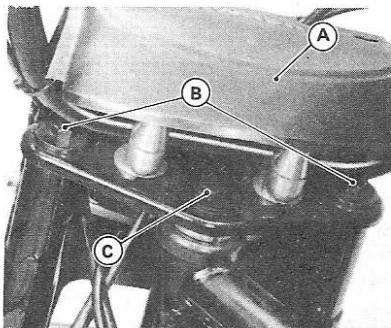
8. With the fork fully compressed and held vertically, measure the distance from the top of the fork tube to the oil. It should be 140mm (5.5 in.). If necessary, add or drain off oil until this specification is obtained.

## Installation

1. When installing the fork springs, install the long spring so that the smaller diameter end is facing down.

2. When installing the fork legs on the steering stem, be sure the leg with the axle clamp is on the right side.

3. Insert the fork leg into the holder and slip the top clamp bolt into place. Note that the fork leg must be properly positioned so that the groove at the top aligns with the bolt hole.



Rubber cover (A), upper triple clamp bolts (B) and steering stem bolt (C)

7. To replace the races in the frame lug, drive them out with a hammer and drift. The race on the steering stem is removed with a hammer and chisel.

## ASSEMBLY

1. New steering stem races are installed in the head lug by driving them in with a suitable driver. Be sure that they are driven straight in and are fully seated.

2. Smear the races with a good grade of waterproof, medium-weight bearing grease and imbed the bearing balls in the frame race and the steering stem race.

3. Bearing ball specifications are:

Upper: 6mm, 23 ea.

Lower: 8mm, 19 ea.

4. Slip the steering stem into the frame head lug ensuring that none of the balls in the lower race are lost.

5. Hold the assembly in place while installing the upper race, dust cover and adjuster nut.

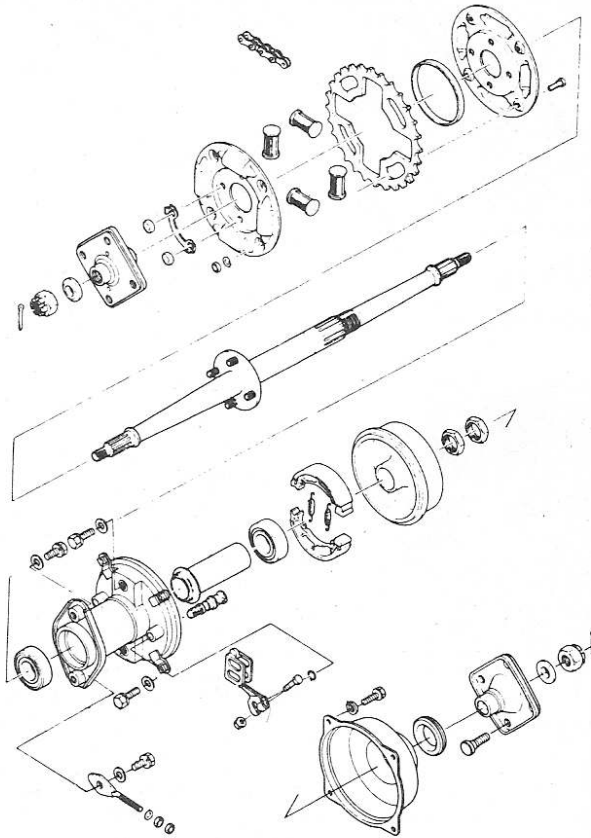
6. Adjust the bearings as outlined in "Maintenance."

7. The remainder of the procedure is the reverse of removal. Note the following torque ratings:

Upper triple clamp bolts: 22 ft. lbs.

Steering stem bolt: 40 ft. lbs.

Handlebar clamp bolts: 13 ft. lbs.



Rear axle assembly (110)

## REAR AXLE

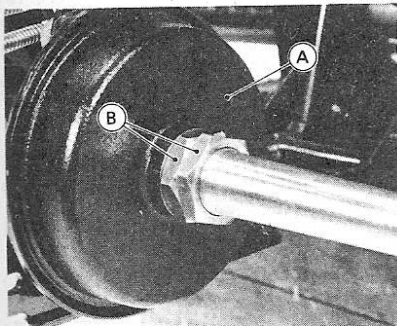
### KLT 110

#### REMOVAL

1. Support the rear wheels off the ground by placing a safe, sturdy support beneath the frame. Don't obstruct access to the skid plate. It must be removed to take off the axle.

2. Remove the lug nuts and take off the wheels.

3. Remove the axle nut cotter pin on each side.



Brake drum (A) and axle shaft nuts (B)

4. Remove each axle nut and washer.  
5. Pull off the hubs.  
6. Remove the air cleaner case. See "Fuel Systems."

7. Remove the engine sprocket cover.

8. Remove the chain case screws and pull the upper half of the case back and clear of the machine.

9. Remove the skid plate.

10. Remove the lower half of the chain case.

11. Remove the engine sprocket by removing the circlip from the shaft.

12. Remove the drive chain.

13. To disassemble the brake, remove the brake drum cover bolts. Remove the cover.

14. Apply the rear brake to secure the axle. Remove the axle shaft nuts (two).

15. Pull off the brake drum.

16. Bend down the sprocket nut locking tabs.

17. Remove the sprocket nuts.

18. Remove the sprocket assembly.

19. Disconnect the brake cables from the brake plate.

20. Remove the axle mounting bolts.

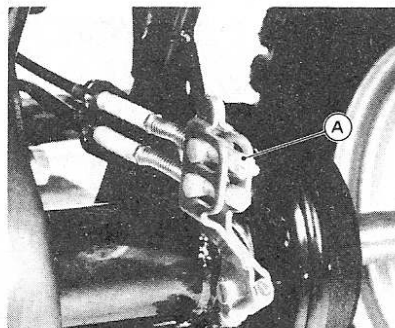
21. Remove the axle.

#### INSTALLATION

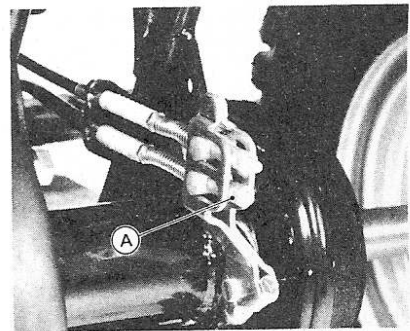
1. Installation is the reverse of removal. Note the following points.

2. Tighten the axle mounting bolts to 43 ft. lbs.

3. Tighten axle shaft nuts to 58 ft. lbs. Tighten the inner nut first; then tighten the outer nut while holding the inner in place.



Hand lever adjuster (A)



Foot pedal adjuster (A)

4. When connecting the rear brake cables, the pedal cable is attached to the lower slot on the brake drum lever and the hand lever cable is attached to the upper slot.

5. Tighten sprocket nuts to 22 ft. lbs. The nuts should be tightened evenly in a cross pattern. After the proper torque is reached, bend up the locking tabs.

6. Grease the splines on each end of the axle before fitting the hubs.

7. Tighten axle nuts to 65 ft. lbs.

8. Use new cotter pins on the axle nuts.

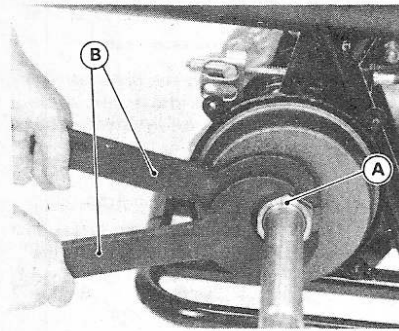
### KLT 160

#### REMOVAL

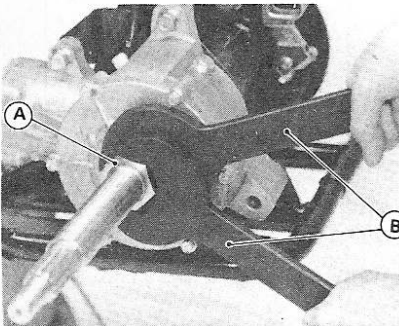
1. Remove the axle nut cotter pin on each side.

2. Loosen the axle nuts.

# Kawasaki KLT 110/160



Removing the brake drum mounting nuts (A) with tools (B)

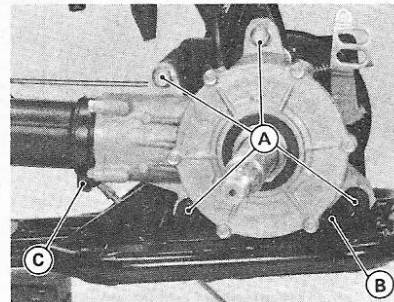


Removing the final gear case mounting nuts (A) with tools (B)

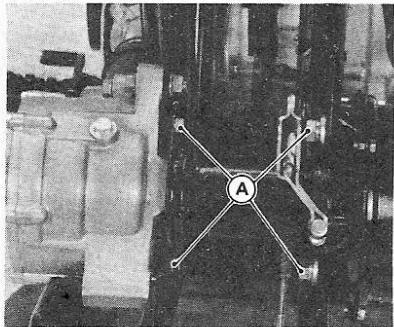
3. Support the rear wheels off the ground by placing a safe, sturdy support beneath the frame.

4. Remove the axle nuts and pull off the wheels with hubs.

5. If the brake components are to be serviced, remove the brake drum cover bolts and remove the cover. Remove the two brake drum mounting nuts on the axle shaft. The axle can be secured while this is done by applying the rear brake. Remove the brake drum.



Final gear case mounting bolts (A), bracket (B) and boot clamp screw (C)



Bearing housing/brake plate mounting bolts (A)

594

6. If service to the final gear case internals is to be carried out, loosen the final gear case mounting nuts on the left side of the axle shaft.

7. Disconnect the brake cable and rod from the lever at the brake plate.

8. Loosen the rear clamp at the propeller shaft boot.

9. Remove the final gear case mounting nuts and bolts.

10. Remove the bearing housing/brake plate mounting bolts.

11. Remove the case bracket bolts.

12. Remove the case bracket.

13. Watching for the breather tube, pull the final gear case assembly clear of the frame.

*NOTE: If there is still oil in the case, place it right side up so the lubricant will not drain out of the breather tube.*

## Installation

1. Lubricate the propeller shaft splines with a good grade of waterproof, medium-weight bearing grease.

2. Slide the final gear case assembly into position, engaging the sliding joint and the pinion joint by turning the rear axle.

3. Tighten the final gear case mounting bolts and nuts and the left-side bearing housing/brake plate bolts to 22 ft. lbs. Tighten the larger right-side bearing housing/brake plate bolts to 40 ft. lbs.

4. Brake drum mounting nuts and final gear case mounting nuts on the axle shaft should be secured with a non-permanent thread-locking compound and tightened to 61 ft. lbs.

5. If the brake drum cover was removed, check that the lip side of the dust seal faces out. Lubricate the lip with a bit of grease.

6. Be sure to install the cover so that the drain hole points down.

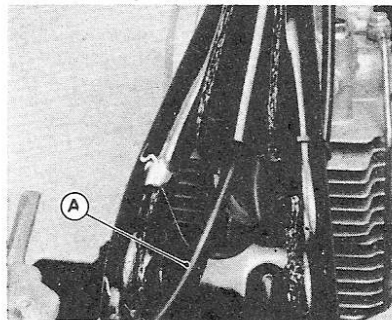
7. Tighten the final gear case mounting bolts and nuts and the left-side bearing housing/brake plate bolts to 22 ft. lbs. Tighten the larger right-side bearing housing/brake plate bolts to 40 ft. lbs.

8. Brake drum mounting nuts and final gear case mounting nuts on the axle shaft should be secured with a non-permanent thread-locking compound and tightened to 61 ft. lbs.

9. If the brake drum cover was removed, check that the lip side of the dust seal faces out. Lubricate the lip with a bit of grease.

10. Be sure to install the cover so that the drain hole points down.

11. Route the breather hose along the left side of the frame and insert it into the rear end of the frame top tube.



Insert the breather hose (A) into the rear end of the frame top tube

8. Connect the brake rod and cable. The rod is connected to the lower slot on the brake plate lever.

9. Grease the splines on the ends of the axle shaft with a good grade of waterproof, medium-weight bearing grease.

10. Install the wheels with hubs.

11. Tighten the axle nuts to 110 ft. lbs.

12. Use new cotter pins on the axle nuts.

13. Check final gear case oil level before operating the machine.

## REAR BRAKE

### Removal and Disassembly

1. Remove the cotter pin from the axle nut on the right hand rear wheel.

2. Loosen the axle nut.

3. Support the rear wheels off the ground by placing a safe, sturdy support beneath the frame.

4. Remove the axle nut.

5. Remove the right hand rear wheel and hub.

6. Remove the brake drum cover.

7. Remove the two axle shaft (brake drum mounting) nuts.

8. Remove the brake drum.

9. Brake components can be inspected in place. See below.

### Inspection

1. Check the general condition of the brake linings. If they are scored, grooved or otherwise damaged, replace them.

2. Check the linings for an oil-soaked condition. If there are indications of this, the linings must be replaced.

3. Measure lining thickness. If either of them measures less than 2mm (0.8 in.) at the thinnest point, replace them.

4. Check the condition of the brake drum. If the inner surface is scored or grooved, the drum may have to be replaced. It may be possible to have it turned down on a lathe to remove minor scoring, but the final drum inside diameter must not exceed the wear limit specification (see below).

5. Measure the inside diameter of the brake drum. If it exceeds 130.75 mm (5.15 in.), replace it.

6. Check that the brake drum is not cracked.

7. Remove rust, dirt and corrosion from the brake drum with emery cloth.

8. Break the glaze on brake linings with emery cloth.

**CAUTION: Do not blow out brake components with compressed air or breathe brake dust. It represents a health hazard.**

9. To replace the linings, grasp both of the shoes and fold them towards the center of the brake plate.

10. Check the condition of the brake return springs. Replace the pair if they are broken, deformed, badly rusted or seem weak.

11. To remove the brake cam from the plate, first scribe a mark on lever and cam to indicate their relative positions for reassembly.

12. Disconnect the brake rod and/or brake cable(s) from the brake plate lever.

13. Remove the brake lever pinch bolt and carefully pull it off the cam.



14. Tap the cam out of the bearing housing from the left side. Note O-ring location.

15. Clean the cam in solvent and use emery cloth to remove any rust or corrosion.

16. Check the diameter of the cam bushing area and replace it if the measurement is less than 11.8mm (0.47 in.).

17. Check the diameter of the bearing housing cam hole and replace the housing if the measurement exceeds 12.7mm (0.51 in.).

**NOTE:** Replacement of the bearing housing requires removal of the axle assembly.

18. Check that the cam is not bent and that the lever splines are not torn or broken.

19. Check for stress cracks around the cam hole in the bearing housing.

## Assembly And Installation

1. Clean all metal parts thoroughly in a solvent.

2. Lubricate the brake cam bushing area and brake shoe seat with a waterproof, medium-weight chassis grease.

3. Install the brake cam in the bearing housing. The mark on the brake shoe seat must point towards the center of the bearing housing.

4. Fit the brake cam O-ring.

5. Install the brake lever on the cam, aligning the position marks made prior to removal.

6. Install and tighten the lever pinch bolt.

7. Lightly grease the brake shoe pivot on the bearing housing. Lubricate the brake shoe holes to which the return springs attach.

**CAUTION:** Keep lubricant well clear of the linings. Do not use too much of it as it may work its way onto the linings.

8. Assemble the shoes and return springs.

9. Install the shoes and springs onto the bearing housing. Ensure that they are firmly seated.

10. Install the brake drum on the axle shaft.

11. Install and tighten the two large axle shaft (brake drum mounting) nuts. These nuts should be secured with a non-permanent thread-locking compound on the KLT 160. Proper torques are:

KLT 110: 58 ft. lbs.

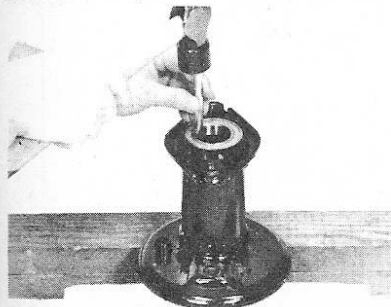
KLT 160: 61 ft. lbs.

Tighten the innermost nut first, then torque the outer nut while holding the inner in place.

12. Grease the lips of the dust seal in the brake drum cover.

13. Install the cover. Be sure the water drain hole points down.

14. The remainder of the procedure is the reverse of disassembly. Grease the axle splines before installing the hubs. Be certain that the axle nuts are correctly torqued and that new cotter pins are used on them:



Removing a rear axle bearing

KLT 110: 65 ft. lbs.  
KLT 160: 110 ft. lbs.

## REAR AXLE BEARINGS

### KLT 110

1. Remove the rear axle.  
2. Remove the sprocket and the brake components. Refer to "Rear Axle, Removal" for procedures.

3. Inspect and replace the bearings in the same manner as the front wheel bearings. See "Front Wheel Bearings," above for procedures.

### KLT 160

Replacement of the axle bearings requires disassembly of the final gear case. This requires special tools and critical assembly skills and should be left to a qualified expert.

## GENERAL TORQUE SPECIFICATIONS<sup>①</sup>

	Thread dia. (mm)	Torque (ft lbs.)
5	2.5-3.6	
6	4.3-5.6	
8	10-14	
10	19-25	
12	33-45	
14	54-72	
16	83-115	
18	125-165	
20	165-240	

① Unless otherwise noted.

## CHASSIS TORQUE SPECIFICATIONS

### KLT 110

Component	Torque (ft lbs.)
Engine bracket bolts	13
Front wheel lug nuts	30
Front axle nut (A1)	54
Rear sprocket nuts	22
Rear axle nuts	65
Axle shaft locknuts	58
Axle mounting bolts	43
Steering stem bolt	40
Steering stem adjusting nut	14.5
Upper triple clamp bolts	22
Handlebar clamp bolts	13
Front axle (A2)	51
Fork slider allen bolts (A2)	14.5*
Front axle clamp nuts (A2)	7.3
Fork tube clamp bolts (A2)	22
Front brake drum mounting bolts (A2)	22

\* Use a non-permanent thread-locking compound

## CHASSIS TORQUE SPECIFICATIONS

### KLT 160

Component	Torque (ft lbs.)
Engine bracket bolts	14.5
Front wheel lug nuts	30
Front axle	51
Axle shaft (brake drum mounting) locknuts	61
Rear axle nuts	110
Final gear case mounting bolts	22
Axle bearing housing mounting bolts	40
Front brake drum mounting bolts	22
Steering stem bolt	40
Steering stem adjusting nut	14.5
Upper triple clamp bolts	22
Fork tube clamp bolts	22
Fork slider allen bolts	14.5*
Front axle clamp nuts	7.3
Handlebar clamp bolts	13

\* Use a non-permanent thread-locking compound