

<http://pdftown.com>

Kawasaki KLX650.txt

| Items                        |              | KLX650-C1                                    |
|------------------------------|--------------|----------------------------------------------|
| <b>Drive Train:</b>          |              |                                              |
| Primary reduction system:    |              |                                              |
| Type                         |              | Gear                                         |
| Reduction ratio              |              | 2.272 (75/33)                                |
| Clutch type                  |              | Wet multi disc                               |
| Transmission:                |              |                                              |
| Type                         |              | 5-speed, constant mesh, return shift         |
| Gear ratios:                 | 1st          | 2.266 (34/15)                                |
|                              | 2nd          | 1.529 (26/17)                                |
|                              | 3rd          | 1.181 (26/22)                                |
|                              | 4th          | 0.954 (21/22)                                |
|                              | 5th          | 0.791 (19/24)                                |
| Final drive system:          |              |                                              |
| Type                         |              | Chain drive                                  |
| Reduction ratio              |              | 2.866 (43/15)                                |
| Overall drive ratio          |              | 5.157 @Top gear                              |
| <b>Frame:</b>                |              |                                              |
| Type                         |              | Tubular, semi double cradle                  |
| Caster (rake angle)          |              | 28.5°                                        |
| Trail                        |              | 122 mm                                       |
| Front tire:                  | Type         | Tube, TRAILMAX, (AS) TRAILMAX J, (US) K850A  |
|                              | Size         | 90/90-21 54S                                 |
| Rear tire:                   | Type         | Tube, TRAILMAX, (AS) TRAILMAX J, (US) K850AG |
|                              | Size         | 130/80-17 65S                                |
| Front suspension:            | Type         | Telescopic fork (pneumatic)                  |
|                              | Wheel travel | 285 mm                                       |
| Rear suspension:             | Type         | Swingarm (uni-trak)                          |
|                              | Wheel travel | 260 mm                                       |
| Brake type:                  | Front        | Single disc                                  |
|                              | Rear         | Single disc                                  |
| <b>Electrical Equipment:</b> |              |                                              |
| Battery                      |              | 12 V 8 Ah                                    |
| Headlight:                   | Type         | Semi-sealed beam                             |
|                              | Bulb         | 12 V 60/55 W (quartz-halogen)                |
| Tail/brake light             |              | 12 V 5/21 W, (US) 12 V 8/27 W                |
| Alternator:                  | Type         | Three-phase AC                               |
|                              | Rated output | 17 A/14 V @6000 r/min (rpm)                  |

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

(AR) : Austria Model

(AS) : Australia Model

(CA) : California Model

(FG) : Germany Model

(GR) : Greece Model

(IT) : Italy Model

(NR) : Norway Model

(SD) : Sweden Model

(ST) : Switzerland Model

(US) : U.S. Model

## 1-10 GENERAL INFORMATION

| Items                     |          | KLX650-C1                                                                                                                                                       |
|---------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dimensions:</b>        |          |                                                                                                                                                                 |
| Overall length            |          | 2250 mm, (FG)(GR)(NR)(SD)(ST) 2265 mm<br>(IT) 2285 mm                                                                                                           |
| Overall width             |          | 900 mm                                                                                                                                                          |
| Overall height            |          | 1190 mm                                                                                                                                                         |
| Wheelbase                 |          | 1510 mm                                                                                                                                                         |
| Road clearance            |          | 265 mm                                                                                                                                                          |
| Seat height               |          | 885 mm                                                                                                                                                          |
| Dry weight                |          | 153 kg, (CA) 154 kg                                                                                                                                             |
| Curb weight:              | Front    | 80 kg, (CA) 81 kg                                                                                                                                               |
|                           | Rear     | 90 kg                                                                                                                                                           |
| Fuel tank capacity        |          | 12 L                                                                                                                                                            |
| <b>Performance:</b>       |          |                                                                                                                                                                 |
| Minimum turning radius    |          | 2.4 m                                                                                                                                                           |
| <b>Engine:</b>            |          |                                                                                                                                                                 |
| Type                      |          | 4-stroke, DOHC, 1-cylinder                                                                                                                                      |
| Cooling system            |          | Liquid - cooled                                                                                                                                                 |
| Bore and stroke           |          | 100.0 × 83.0 mm                                                                                                                                                 |
| Displacement              |          | 651 mL                                                                                                                                                          |
| Compression ratio         |          | 9.5 : 1                                                                                                                                                         |
| Maximum horsepower        |          | 33 kW (45 ps) @6500 r/min (rpm),<br>(AR)20 kW (27 ps) @6000 r/min (rpm),<br>(ST)20 kW (27 ps) @5000 r/min (rpm),                                                |
| Maximum torque            |          | 53 N·m (5.4 kg·m, 39.1 ft·lb) @5000 r/min (rpm)<br>(AR)44.5 N·m (4.5 kg·m, 32.5 ft·lb) @3000 r/min (rpm)<br>(ST)40 N·m (4.1 kg·m, 29.6 ft·lb) @3500 r/min (rpm) |
| Carburetion system        |          | Carburetor, KEIHIN CVK40. ×1                                                                                                                                    |
| Starting system           |          | Electric starter                                                                                                                                                |
| Ignition system           |          | CDI                                                                                                                                                             |
| Timing advance            |          | Electronically advanced                                                                                                                                         |
| Ignition timing           |          | 5° BTDC @1300 r/min (rpm) to<br>31° BTDC @3000 r/min (rpm)                                                                                                      |
| Spark plug                |          | NGK DPR8EA-9, ND X24EPR-U9                                                                                                                                      |
| Cylinder numbering method |          | —                                                                                                                                                               |
| Firing order              |          | —                                                                                                                                                               |
| Valve timing:             |          |                                                                                                                                                                 |
| Inlet                     | Open     | 17° BTDC                                                                                                                                                        |
|                           | Close    | 63° ABDC                                                                                                                                                        |
|                           | Duration | 260°                                                                                                                                                            |
| Exhaust                   | Open     | 53° BBDC                                                                                                                                                        |
|                           | Close    | 27° ATDC                                                                                                                                                        |
|                           | Duration | 260°                                                                                                                                                            |
| Lubrication system        |          | Forced lubrication (wet sump)                                                                                                                                   |
| <b>Engine oil:</b>        |          |                                                                                                                                                                 |
| Grade                     |          | SE or SF class                                                                                                                                                  |
| Viscosity                 |          | SAE10W-40, 10W-50, 20W-40, or 20W-50                                                                                                                            |
| Capacity                  |          | 2.1 L                                                                                                                                                           |

## 6-6 ENGINE LUBRICATION SYSTEM

### Engine Oil and Oil Filter

#### ⚠WARNING

Motorcycle operation with insufficient, deteriorated, or contaminated engine oil will cause accelerated wear and may result in engine or transmission seizure, accident, and injury.

#### Oil Level Inspection

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

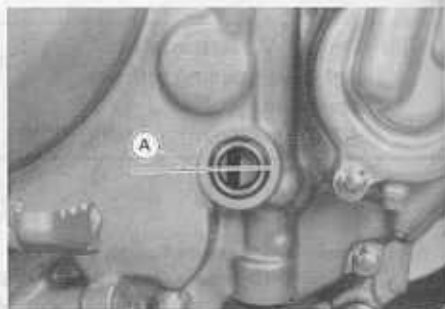
#### CAUTION

Racing the engine before the oil reaches every part can cause engine seizure.

- Stop the engine and leave it for more than 1 minute for all the oil to drain down.
- ★ If the motorcycle has just been ridden, run the engine for about 20 seconds at idle speed. Stop the engine and leave it for more than one minute.
- Check the engine oil level through the oil level gauge. With the motorcycle held upright, the oil level should be in the middle of the gauge [A].
- ★ If the oil level is difficult to check, rock the motorcycle both side-to-side, and front-to-rear.
- ★ If the oil level is too high, remove the excess oil through the filler opening, using a syringe or some other suitable device.
- ★ If the oil level is too low, add the correct amount of oil through the oil filler opening. Use the same type and make of oil that is already in the engine.

#### NOTE

○ If the engine oil type and make are unknown, use any brand of the specified oil to top off the level rather than running the engine with the oil level low. Then at your earliest convenience, change the oil completely.



#### Oil Change

#### ⚠WARNING

To avoid a serious burn, never touch the exhaust pipe during an oil change.

- Warm up the engine sufficiently with the motorcycle standing on its side stand, and stop the engine.
- Place an oil pan beneath the engine.
- Remove the oil filler plug.
- Remove the engine drain plug [A] and engine drain Allen bolt [B], and let the oil drain completely.



- If the oil filter is to be changed, replace it with a new one.
- Check the gaskets at the drain plug and Allen bolt for damage.
- ★ Replace the gasket with a new one if it is damaged.
- After draining, install the drain plug, Allen bolt and gaskets.

**Torque – Engine Drain Plug : 29 N-m (3.0 kg-m, 22 ft-lb) [A]**

**Engine Drain Allen Bolt : 25 N-m (2.5 kg-m, 18.0 ft-lb) [B]**

- Pour in the specified type and amount of engine oil through the oil filler.

#### Engine Oil

|            |                                                                                                            |
|------------|------------------------------------------------------------------------------------------------------------|
| Grade:     | SE or SF class                                                                                             |
| Viscosity: | SAE 10W-40, 10W-50, 20W-40, or 20W-50                                                                      |
| Capacity:  |                                                                                                            |
| KLX650A:   | 1.7L (when filter is not removed)<br>1.7L (when filter is removed)                                         |
|            | 1.9L (when engine is completely dry)                                                                       |
| KLX650C:   | 1.9L (when filter is not removed)<br>1.9L (when filter is removed)<br>2.1L (when engine is completely dry) |

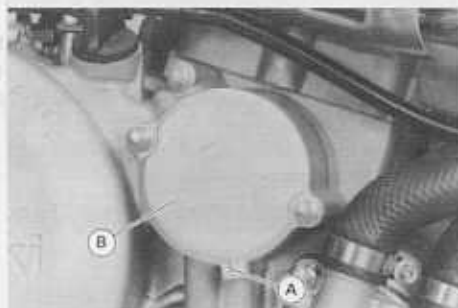
- Install the oil filler plug.

**Torque – Oil Filler Plug : 1.5 N-m (0.15 kg-m, 13 in-lb)**

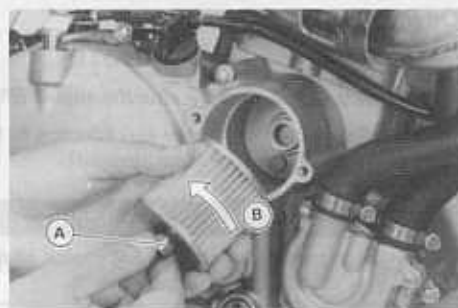
- Check the oil level (see Oil Level Inspection).

#### Oil Filter Change

- Pry [A] the oil filter cap loose with a screwdriver and pull off the cap [B].
- Take out the oil filter.



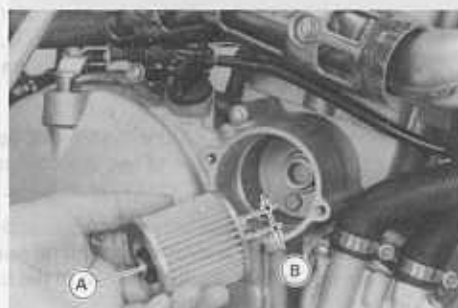
- Replace the filter element with a new one.
- Apply oil to the mounting pin [A] and turn the filter element [B] or the mounting pin to work the element into place. Be careful that the element grommets do not slip out of place.



- When installing the oil filter, put the mounting pin [A] into the filter so that the smaller diameter end [B] is inward.
- Install the oil filter cap so that the arrow points upward.

**Torque – Oil Filter Cap Bolts : 8.8 N-m (0.90 kg-m, 78 in-lb)**

- Pour in the specified type and amount of oil.



## Drive Chain

### Chain Slack Inspection (KLX650A)

- Set the motorcycle up on its side stand.
- Check to see that the notches [A] on the chain adjusters [B] on both sides are in the same relative position.
- ★ If they are not, adjust the chain slack and align them.

#### ⚠ WARNING

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

#### NOTE

○ Clean the chain if it is dirty, and lubricate it if it appears dry.

- Check the chain slack.
- Turn the rear wheel to find the position where the chain is tightest.
- Measure the space (chain slack) [A] between the chain and the step of the chain slipper as shown.

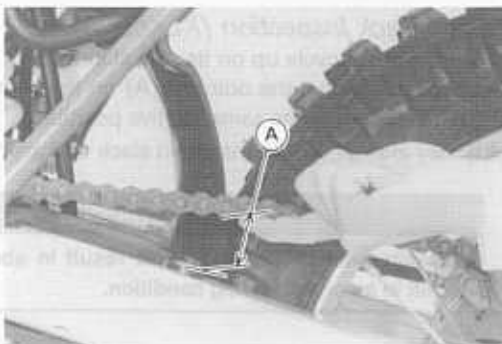
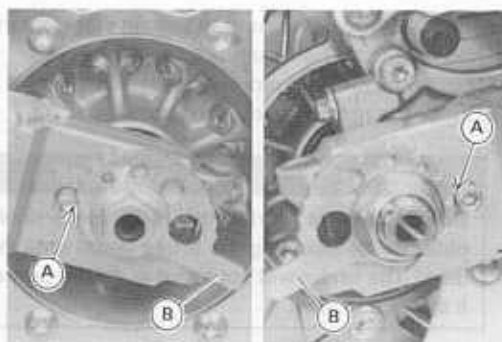
#### Chain Slack

|            |                 |
|------------|-----------------|
| Standard:  | 55 ~ 65 mm      |
| Too Tight: | Less than 55 mm |
| Too Loose: | More than 70 mm |

- If the chain slack exceeds the standard, adjust it.

#### NOTE

○ In wet and muddy conditions, mud sticks to the chain and sprockets resulting in an overly tight chain, and the chain may break. To prevent this, adjust the chain to 60 ~ 70 mm of slack whenever necessary.



### Chain Slack Adjustment (KLX650A)

- Remove the cotter pin [A].
- Loosen the axle nut [B].
- Turn the chain adjusters [C] evenly until the drive chain has the specified amount of slack.
- Check to see that the notches [D] on both sides are in the same relative position.

#### ⚠ WARNING

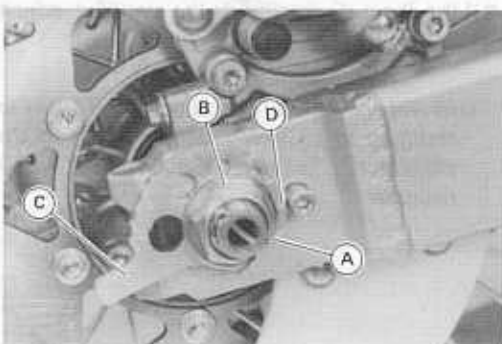
Misalignment of the wheel will result in abnormal wear and may result in an unsafe riding condition.

- Tighten the rear axle nut.

**Torque – Rear Axle Nut : 98 N-m (10.0 kg-m, 72 ft-lb)**

#### ⚠ WARNING

If the axle nut is not securely tightened, an unsafe riding condition may result.



**⚠WARNING**

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

- Tighten both chain adjuster locknuts securely.
- Tighten the rear axle nut.

Torque — Rear Axle Nut : 98 N·m (10.0 kg·m, 72 ft·lb)

**⚠WARNING**

If the axle nut is not securely tightened, an unsafe riding condition may result.

- Turn the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Insert a new cotter pin and spread its ends.
- Check the rear brake effectiveness.

**⚠WARNING**

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

**Chain Wear Inspection**

- Rotate the rear wheel to inspect the drive chain for damaged rollers, and loose pins and links.
- ★ If there is any irregularity, replace the drive chain.
- ★ Lubricate the drive chain if it appears dry (see this chapter).
- Stretch the chain taut by hanging a 98 N (10 kg, 20 lb) weight [A] on the chain.
- Measure the length of 20 links [B] on the straight part [C] of the chain from the pin center of the 1st pin to the pin center of the 21st pin. Since the chain may wear unevenly, take measurements at several places.
- ★ If any measurements exceed the service limit, replace the chain. Also, replace the front and rear sprockets when the drive chain is replaced.

**Chain 20-Link Length**

Standard: 317.5 ~ 318.2 mm  
Service Limit: 323 mm

**⚠WARNING**

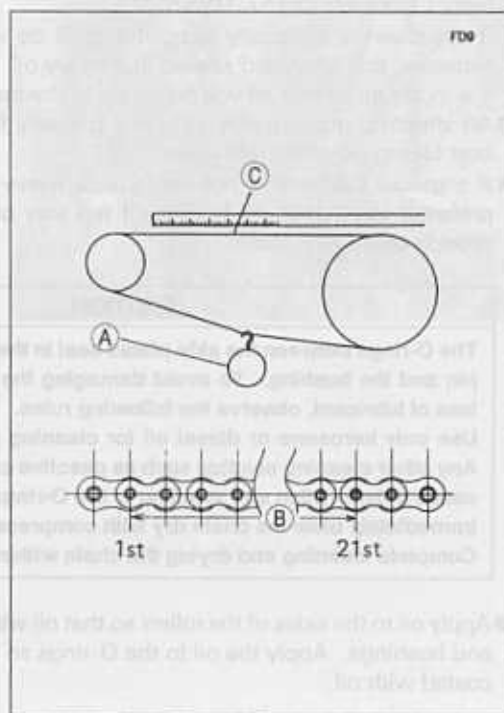
If the drive chain wear exceeds the service limit, replace the chain or an unsafe riding condition may result. A chain that breaks or jumps off the sprockets could snag on the engine sprocket or lock the rear wheel, severely damaging the motorcycle and causing it to go out of control.

**Standard Chain****KLX650A:**

Make: DAIDO  
Type: D.I.D. 520K, Joint Endless  
Link: 110 links

**KLX650C:**

Make: ENUMA  
Type: EK520SR-O2, Endless  
Link: 112 links



- Turn the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Insert a new cotter pin and spread its ends.
- Check the rear brake effectiveness.

**⚠ WARNING**

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

**Chain Slack Inspection (KLX650C)**

- Set the motorcycle up on its side stand.
- Check to see that the notches [A] on the alignment indicators [B] on both sides are in the same relative position.
- ★ If they are not, adjust the chain slack and align them.

**⚠ WARNING**

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

**NOTE**

○ Clean the chain if it is dirty, and lubricate it if it appears dry.

- Check the chain slack.
- Turn the rear wheel to find the position where the chain is tightest.
- Measure the space (chain slack) [A] between the chain and the swingarm upper surface at the rear of the chain slipper as shown.

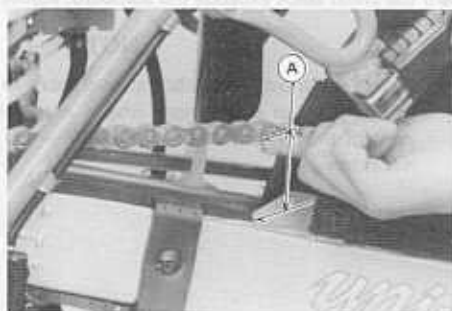
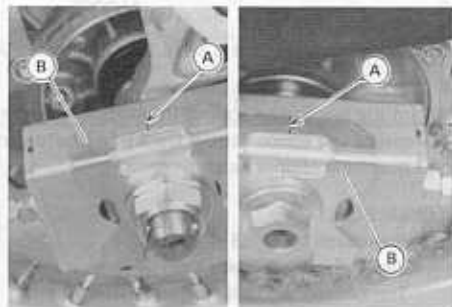
**Chain Slack**

|            |                 |
|------------|-----------------|
| Standard:  | 55 ~ 65 mm      |
| Too Tight: | Less than 55 mm |
| Too Loose: | More than 70 mm |

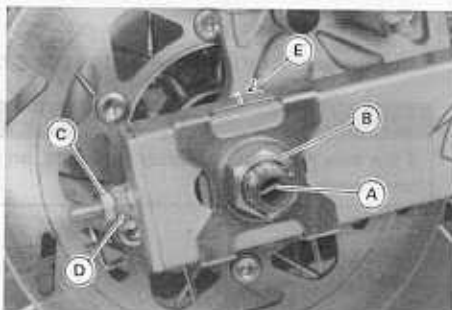
- If the chain slack exceeds the standard, adjust it.

**NOTE**

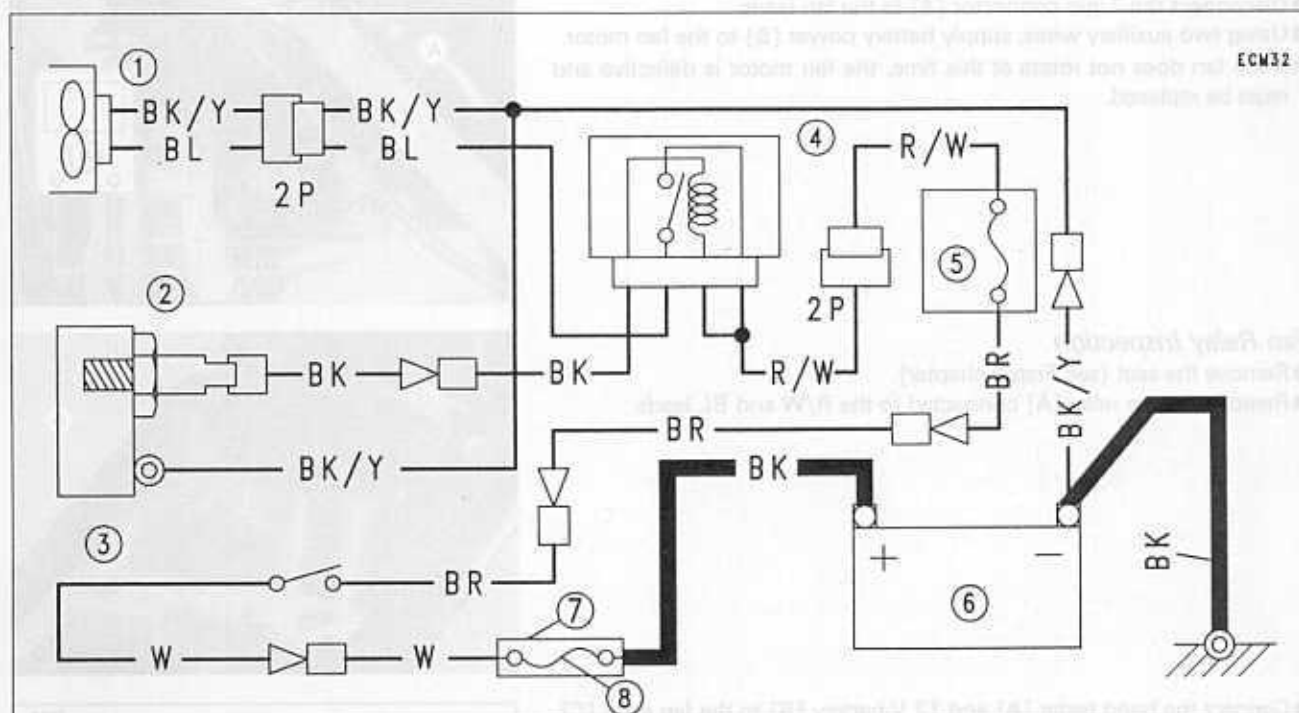
○ In wet and muddy conditions, mud sticks to the chain and sprockets resulting in an overly tight chain, and the chain may break. To prevent this, adjust the chain to 60 ~ 70 mm of slack whenever necessary.

**Chain Slack Adjustment (KLX650C)**

- Remove the cotter pin [A].
- Loosen:
  - Axle Nut [B]
  - Both Chain Adjuster Locknuts [C]
- ★ If the chain is too tight, back off the left and right chain adjusting nuts [D] evenly, and kick the wheel forward until the chain is too loose.
- ★ If the chain is too loose, turn both chain adjusting nuts evenly until the drive chain has the correct amount of slack.
- To keep the chain and wheel properly aligned, the notch [E] on the right alignment indicator should align with the same swingarm mark as the left alignment indicator.



## Radiator Fan Circuit



1. Radiator Fan Motor
2. Fan Switch
3. Radiator

4. Fan Relay
5. 10 A Fan Fuse
6. Battery

7. Starter Relay
8. 20 A Main Fuse

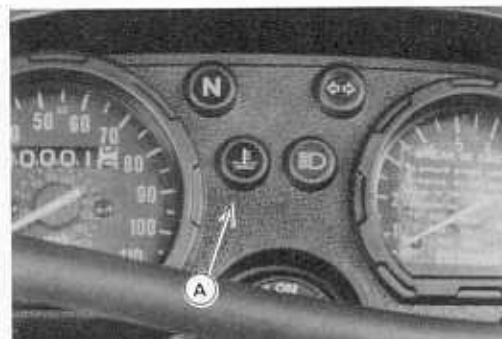
## Coolant Temperature Warning System (KLX650C)

When the ignition switch is turned on with the transmission in neutral, the warning light flashes regardless of coolant temperature. This is to show if the light bulb has burned out. If the coolant temperature is high, the warning light flashes even if the transmission is in gears until coolant temperature falls. If the system does not function properly, inspect it as follows.



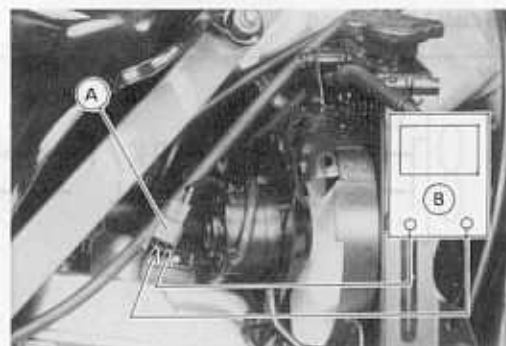
## Warning System Inspection

- (1) The warning light [A] does not flash when the ignition switch is turned on with the transmission in neutral.
  - Check the warning light bulb, the battery, the neutral switch, the interlock diode unit (see this chapter), and the wiring (see Wiring Inspection).
- (2) The warning light does not flash when the coolant temperature is high with the transmission in gears.
  - Check the coolant temperature warning light operation (see below).



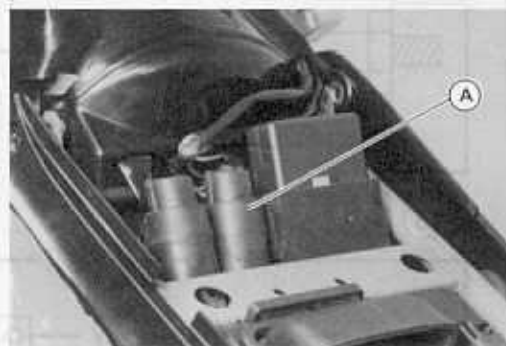
### Fan Motor Inspection

- Disconnect the 2-pin connector [A] in the fan leads.
- Using two auxiliary wires, supply battery power [B] to the fan motor.
- ★ If the fan does not rotate at this time, the fan motor is defective and must be replaced.



### Fan Relay Inspection

- Remove the seat (see Frame chapter).
- Remove the fan relay [A] connected to the R/W and BL leads.



- Connect the hand tester [A] and 12 V battery [B] to the fan relay [C] as shown.

- ★ If the relay does not work as specified, the relay is defective. Replace the relay.

### Testing Relay

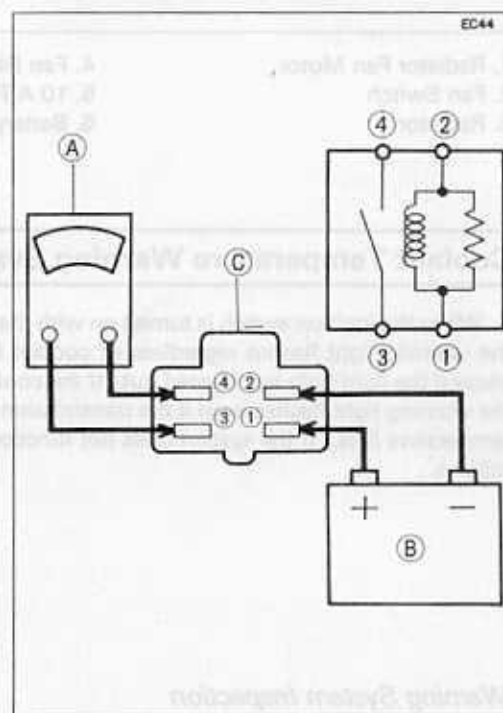
Tester Range:  $\times 1 \Omega$

Criteria: When battery is connected  $\rightarrow 0 \Omega$

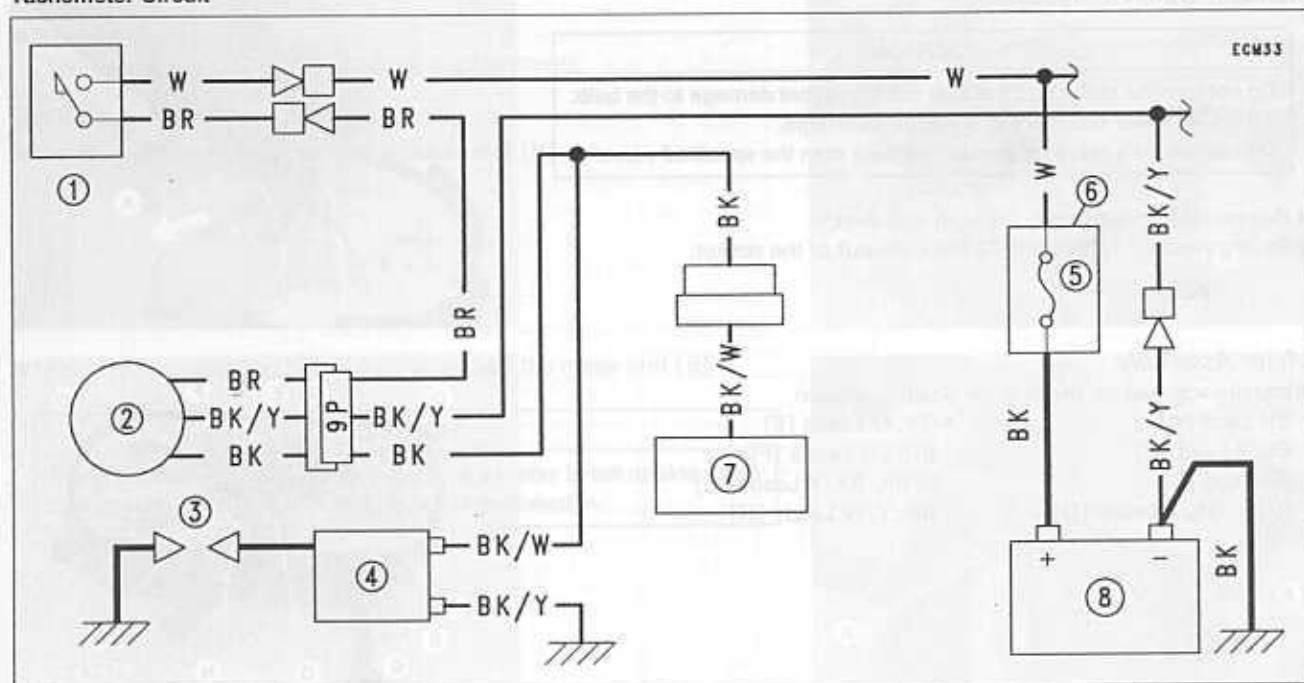
When battery is disconnected  $\rightarrow \infty \Omega$

Relay Coil Terminal [1] and [2]

Relay Switch Terminals [3] and [4]



# Tachometer Circuit



1. Ignition Switch
2. Tachometer
3. Spark Plug

4. Ignition Coil
5. 20A Main Fuse
6. Starter Relay

7. CDI Unit
8. Battery

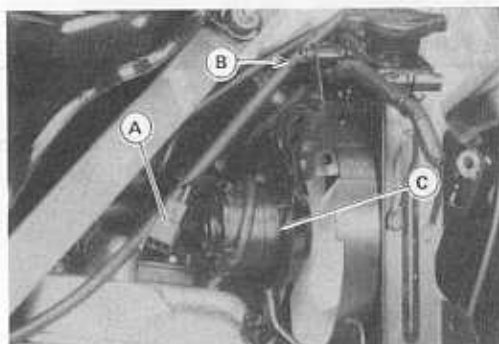
## Radiator Fan (KLX650C)

### Radiator Fan Removal

#### ⚠WARNING

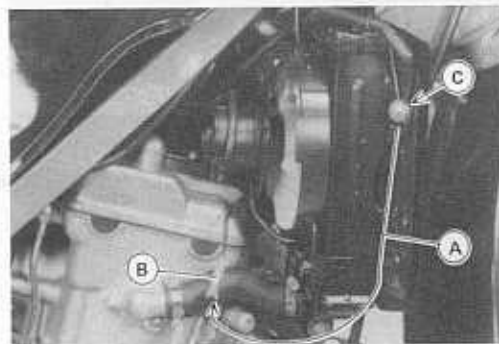
NEVER TOUCH THE RADIATOR FAN UNTIL THE IGNITION SWITCH IS TURNED OFF. TOUCHING THE FAN BEFORE THE IGNITION SWITCH IS TURNED OFF COULD CAUSE INJURY FROM THE FAN BLADES

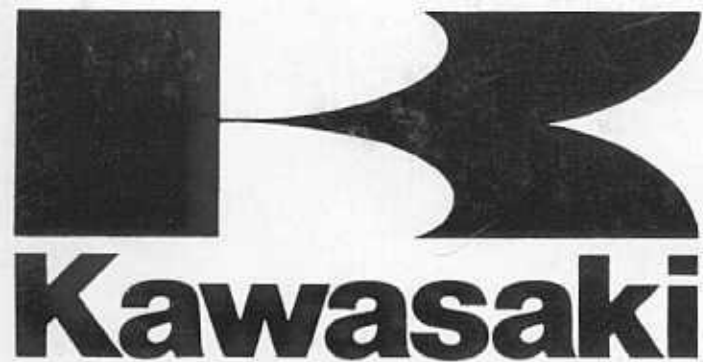
- Remove:  
Fan Switch Connector Radiator Fan Connector [A]
- Remove the fan motor bolts [B] and take off the fan motor [C].



### Fan System Circuit Inspection

- Remove:  
Seat (see Frame chapter) Right Air Scoop
- Pull off the connector from the thermostatic fan switch.
- Turn on the ignition switch to the ON position.
- Using an auxiliary wire [A], connect the thermostatic fan switch lead [B] to the radiator ground terminal [C].
- ★ If the fan rotates, inspect the fan switch.
- ★ If the fan does not rotate, inspect the following:  
Leads and Connectors Fan Fuse Fan Motor





**KLX650R**  
**KLX650**



# **Motorcycle Service Manual**

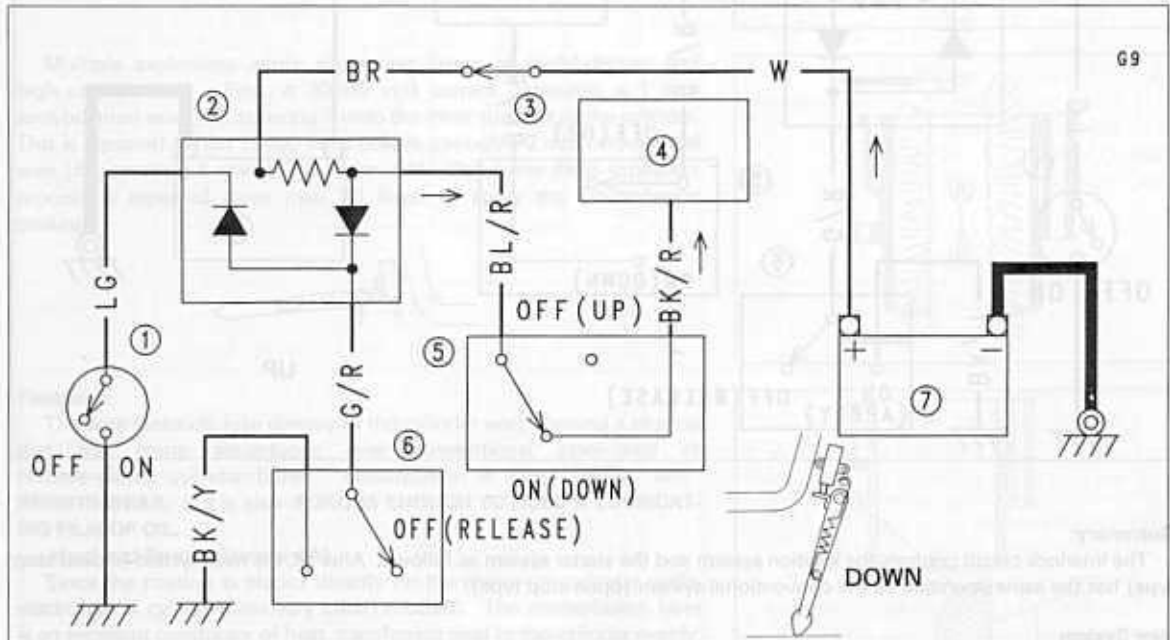
## Technical Information 2 - Interlock Circuit (KLX650C)

The interlock circuit is designed so the motorcycle will not run when the side stand is down. The side stand switch is operated by the side stand, and kills the engine by preventing ignition.

### When Side Stand is Down:

When the side stand is down, the side stand switch is turned ON and micro current flows into the CDI unit and stops ignition sparks.

At this time, if the clutch lever is applied (starter lockout switch ON) or if the transmission is in neutral, the micro current is grounded and the ignition system can work. But the ignition system will not work and the motorcycle can not run with the transmission in gear and with the clutch lever released for moving off.



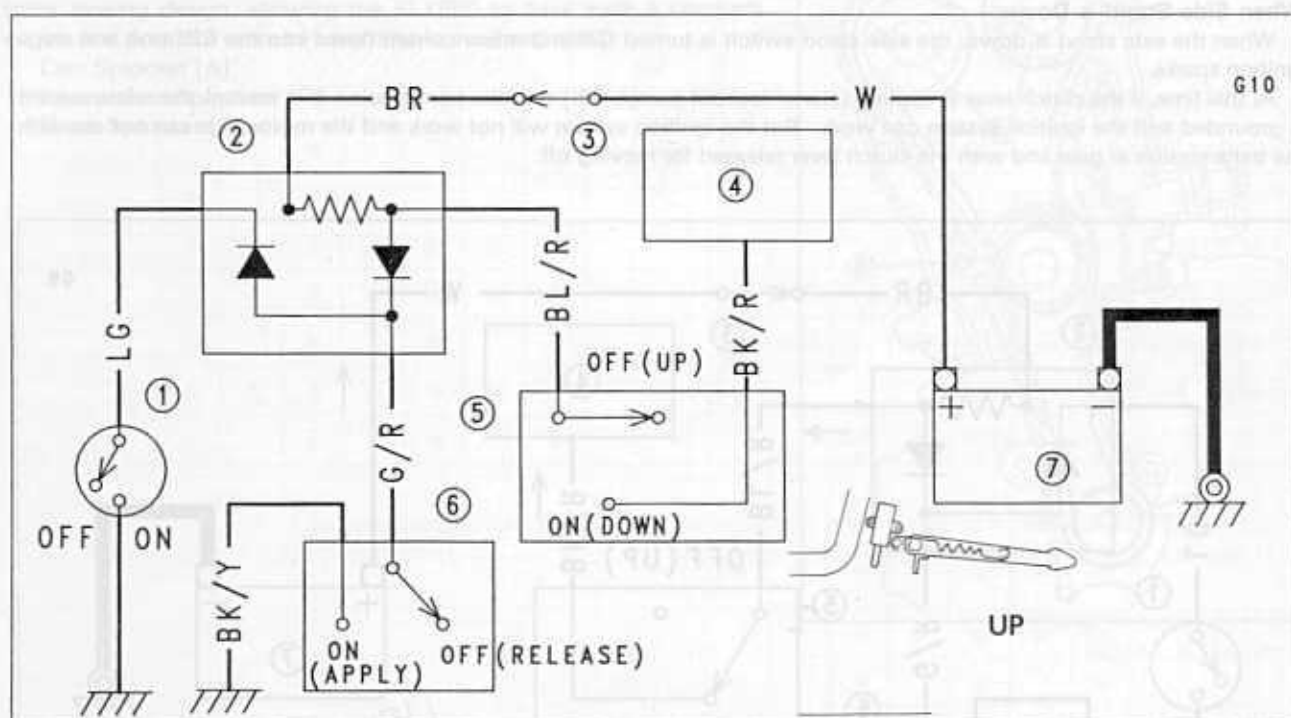
1. Neutral Switch
2. Diode Unit
3. Ignition Switch

4. CDI Unit
5. Side Stand Switch
6. Starter Lockout Switch

7. Battery

**When Side Stand is Up:**

When the side stand is up, the side stand switch is turned OFF and the ignition system can work.

**Summary:**

The interlock circuit controls the ignition system and the starter system as follows. After all, the new system (closed stop type) has the same operation as the conventional system (open stop type).

**New System**

| Side Stand Switch             | Starter Lockout Switch               | Neutral Switch | Starter Starting | Engine Ignition |
|-------------------------------|--------------------------------------|----------------|------------------|-----------------|
| When side stand is down<br>ON | When clutch lever is applied<br>ON   | ON             | ○                | ○               |
|                               |                                      | OFF            | ○                | ○               |
|                               | When clutch lever is released<br>OFF | ON             | ○                | ○               |
|                               |                                      | OFF            | ×                | ×               |
| When side stand is up<br>OFF  | When clutch lever is applied<br>ON   | ON             | ○                | ○               |
|                               |                                      | OFF            | ○                | ○               |
|                               | When clutch lever is released<br>OFF | ON             | ○                | ○               |
|                               |                                      | OFF            | ×                | ○               |

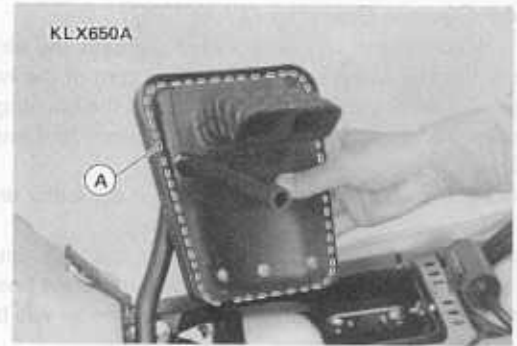
**Conventional System**

| Side Stand Switch              | Starter Lockout Switch               | Neutral Switch | Starter Starting | Engine Ignition |
|--------------------------------|--------------------------------------|----------------|------------------|-----------------|
| When side stand is down<br>OFF | When clutch lever is applied<br>ON   | ON             | ○                | ○               |
|                                |                                      | OFF            | ○                | ○               |
|                                | When clutch lever is released<br>OFF | ON             | ○                | ○               |
|                                |                                      | OFF            | ×                | ×               |
| When side stand is up<br>ON    | When clutch lever is applied<br>ON   | ON             | ○                | ○               |
|                                |                                      | OFF            | ○                | ○               |
|                                | When clutch lever is released<br>OFF | ON             | ○                | ○               |
|                                |                                      | OFF            | ×                | ○               |

○ : work

× : will not work

- Be sure the foam gasket [A] is in place in the groove in the element cap.



### Air Cleaner Element Cleaning and Inspection

#### NOTE

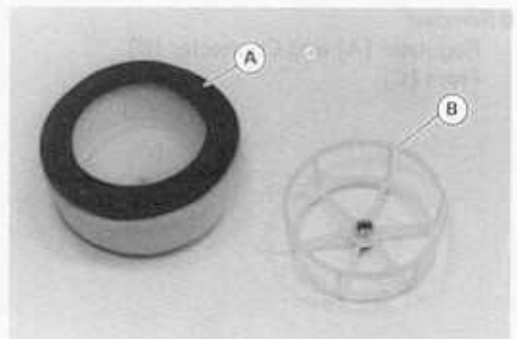
- In dusty areas, the element should be cleaned more frequently than recommended interval.
- After riding through rain or on muddy roads, the element should be cleaned immediately.
- Since repeated cleaning opens the pores of the element, replace it with a new one in accordance with the Periodic Maintenance Chart. Also, if there is a break in the element material or any other damage to the element, replace the element with a new one.

#### ⚠ WARNING

Clean the element in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area; this includes any appliance with a pilot light.

Because of the danger of highly flammable liquids, do not use gasoline or a low-flash point solvent to clean the element.

- Remove the air cleaner element, and separate the element [A] from the frame [B].
- Clean the element in a bath of high-flash point solvent, and squeeze the element dry.
- Check all the parts of the element for visible damage.
- ★ If any part of the element is damaged, replace it.
- After cleaning, saturate the element with SE or SF class SAE30 oil, squeeze out the excess, then wrap it in a clean rag and squeeze it as dry as possible. Be careful not to tear the sponge filter.
- Assemble the element.
- Install the element.

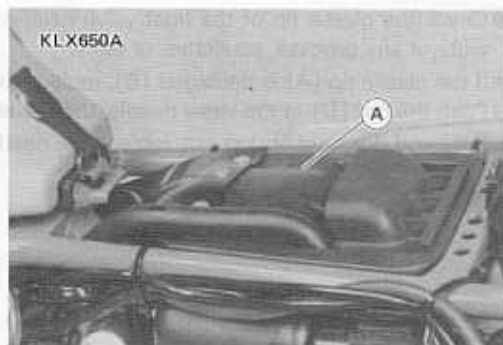


## Air Cleaner

## Air Cleaner Element Removal

## ● Remove:

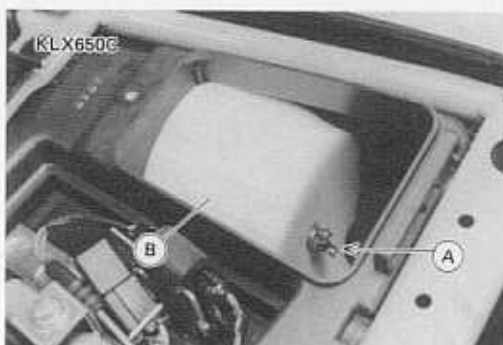
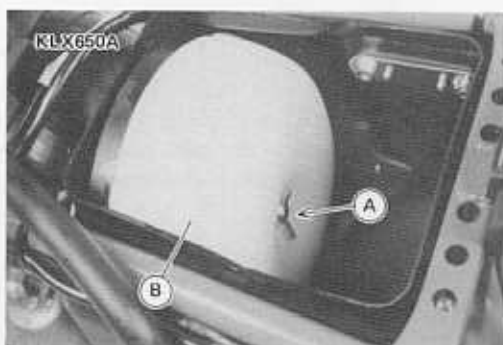
- Seat (see Frame chapter)
- Air Cleaner Housing Cap [A]
- Air Cleaner Housing Cap Screw [B]



## ● Remove:

- Wing Bolt [A]
- Element [B]

- After removing the element, stuff pieces of lint-free, clean cloth into the air cleaner duct to keep dirt out of the carburetor and engine.

**⚠ WARNING**

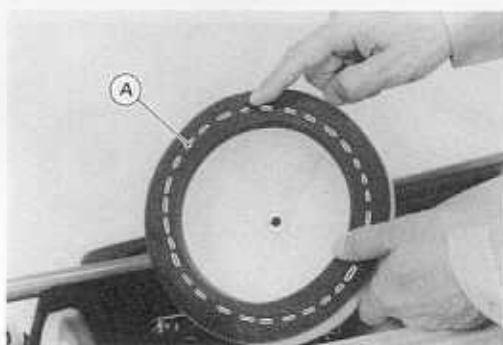
If dirt or dust is allowed to pass through into the carburetor, the throttle may become stuck, possibly causing an accident.

**CAUTION**

If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.

## Air Cleaner Element Installation

- When installing the element, coat the lip of the element with a thick layer of all purpose grease [A] to assure a complete seal against the air cleaner element base. Also, coat the base where the lip of the element fits.

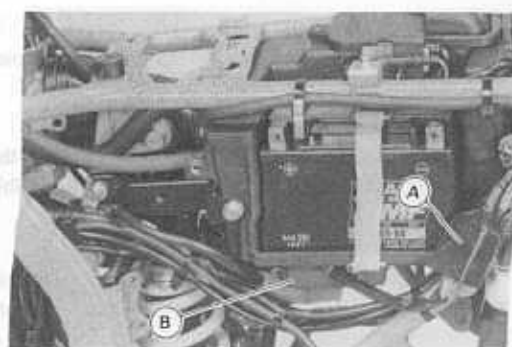


## 15-26 ELECTRICAL SYSTEM

### Charging System (KLX650C)

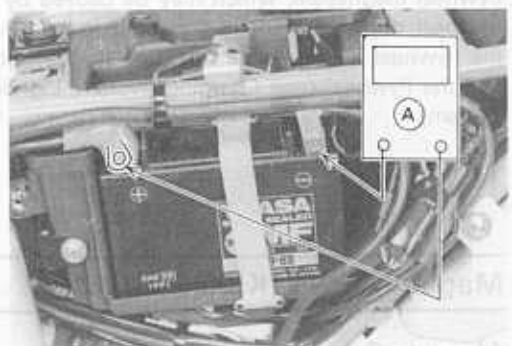
#### Regulator/Rectifier Removal

- Remove:
  - Left Side Cover (see Frame chapter)
  - Battery Cover
- Pull off the regulator/rectifier connector [A].
- Remove the regulator/rectifier [B] from the bottom of the battery case.



#### Regulator/Rectifier Output Voltage Inspection

- Check the battery condition (see Battery section).
- Warm up the engine to obtain actual alternator operating conditions.
- Remove the left side cover (see Frame chapter).
- Check that the ignition switch is turned off and connect the hand tester [A] to the battery terminals.



#### Special Tool - Hand Tester: 57001-983

- Start the engine, and note the voltage readings at various engine speeds with the headlight turned on and then turned off. For the US and Australia models, to turn off the headlight, disconnect the headlight connector to the headlight unit. The readings should show nearly battery voltage when the engine speed is low, and, as the engine speed rises, the readings should also rise. But they must be kept under the specified voltage.

#### Regulator/Rectifier Output Voltage

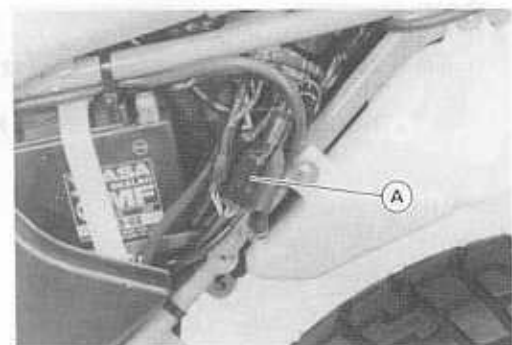
| Meter<br>Range | Connections |             | Reading   |
|----------------|-------------|-------------|-----------|
|                | Meter(+) to | Meter(-) to |           |
| 25 V DC        | Battery (+) | Battery (-) | 14 ~ 15 V |

- Turn off the ignition switch to stop the engine and disconnect the hand tester.
- ★ If the regulator/rectifier output voltage is kept between the values given in the table, the charging system is considered to be working normally.
- ★ If the output voltage is much higher than the values specified in the table, the regulator/rectifier is defective or the regulator/rectifier leads are loose or open.
- ★ If the battery voltage does not rise as the engine speed increases, then the regulator/rectifier is defective or the alternator (magneto) output is insufficient for the loads. Check the alternator and regulator/rectifier to determine which part is defective.

#### Alternator (Magneto) Inspection

There are three types of alternator failures: short, open (wire burned out), or loss in rotor, or flywheel magnetism. A short or open in one of the coil wires will result in either a low output, or no output at all. A loss in rotor magnetism, which may be caused by dropping or hitting the alternator by leaving it near an electromagnetic field, or just by aging, will result in low output.

- To check the alternator output voltage, do the following procedures.
  - Disconnect the alternator connector [A].
  - Connect the hand tester (special tool) as shown in the table.
  - Start the engine.
  - Run it at the rpm given in the table.



## Ignition System

- Note the voltage readings (total 3 measurements).

**Alternator Output Voltage**

| Meter<br>Range | Connections     |                     | Reading        |
|----------------|-----------------|---------------------|----------------|
|                | Meter(+) to     | Meter(-) to         |                |
| 250 V AC       | One yellow lead | Another yellow lead | more than 34 V |

- ★ If the output voltage shows the value in the table, the alternator operates properly and the regulator/rectifier is damaged. A much lower reading than that given in the table indicates that the alternator is defective.

- Check the stator coil resistance as follows:

- Stop the engine.
- Disconnect the alternator connector.
- Connect the hand tester (special tool) as shown in the table.
- Note the readings (total 3 measurement).

**Stator Coil Resistance**

| Meter<br>Range    | Connections     |                     | Reading               |
|-------------------|-----------------|---------------------|-----------------------|
|                   | Meter(+) to     | Meter(-) to         |                       |
| $\times 1 \Omega$ | One yellow lead | Another yellow lead | $0.3 \sim 1.0 \Omega$ |

- ★ If there is more resistance than shown in the table, or no hand tester reading (infinity) for any two leads, the stator has an open lead and must be replaced. Much less than this resistance means the stator is shorted, and must be replaced.

- Using the highest resistance range of the hand tester, measure the resistance between each of the yellow leads and chassis ground.

- ★ Any hand tester reading less than infinity ( $\infty$ ) indicates a short, necessitating stator replacement.

- ★ If the stator coils have normal resistance, but the voltage check showed the alternator to be defective, then the rotor magnetism has probably weakened, and the rotor must be replaced.

**Regulator/Rectifier Inspection**

- Turn off the ignition switch.
- Remove the left side cover (see Frame chapter).
- Disconnect the regulator/rectifier connector [A].
- Set the hand tester to the  $\times 1 \text{ k}\Omega$  range and make the measurements shown in the table.

**Special Tool – Hand Tester: 57001-983**

- ★ If the tester readings are not as specified, replace the regulator/rectifier [B].

**CAUTION**

Use only Hand Tester 57001-983 for this test. A tester other than the Kawasaki Hand Tester may show different readings.

If a megger or a meter with a large-capacity battery is used, the regulator/rectifier will be damaged.



## 15-28 ELECTRICAL SYSTEM

### Charging System (KLX500C)

#### Regulator/Rectifier Resistance

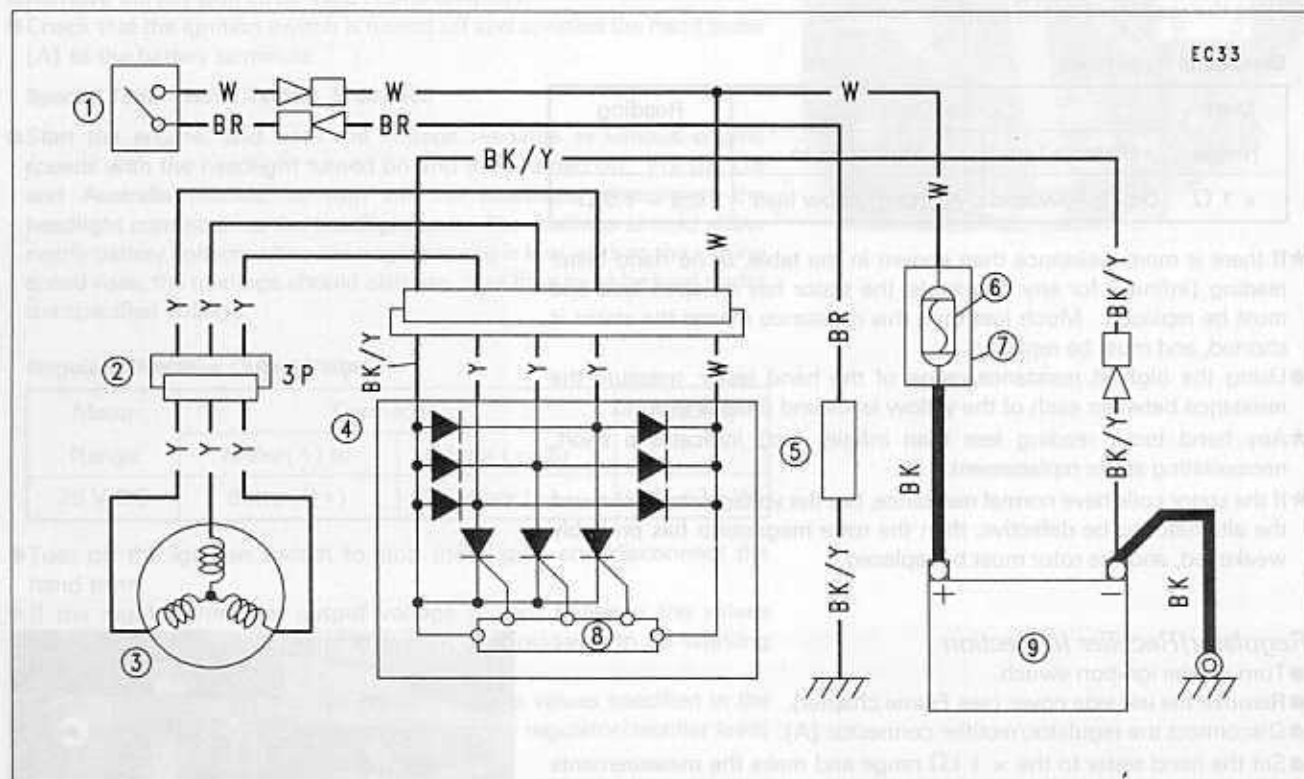
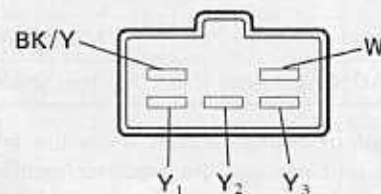
unit: k $\Omega$

| Range<br>$\times 1 \text{ k}\Omega$ |      | Tester Positive (+) Lead Connections |         |         |         |        |
|-------------------------------------|------|--------------------------------------|---------|---------|---------|--------|
|                                     |      | W                                    | Y1      | Y2      | Y3      | BK/Y   |
| *<br>(-)                            | W    | -                                    | 20~200  | 20~200  | 20~200  | 20~80  |
|                                     | Y1   | 1.5~6.0                              | -       | 40~500  | 40~500  | 20~200 |
|                                     | Y2   | 1.5~6.0                              | 40~500  | -       | 40~500  | 20~200 |
|                                     | Y3   | 1.5~6.0                              | 40~500  | 40~500  | -       | 20~200 |
|                                     | BK/Y | 2.5~10                               | 1.5~6.0 | 1.5~6.0 | 1.5~6.0 | -      |

\* : Tester Negative (-) Lead Connections

#### Regulator/Rectifier Connector

EC43



1. Ignition Switch
2. Alternator Connector
3. Alternator (Magneto)

4. Regulator/Rectifier
5. Load
6. 20 A Main Fuse

7. Starter Relay
8. Controller
9. Battery

### Front Fork Assembly

- Replace the following parts removed with new one.

Outer Tube Guide Bush [A]

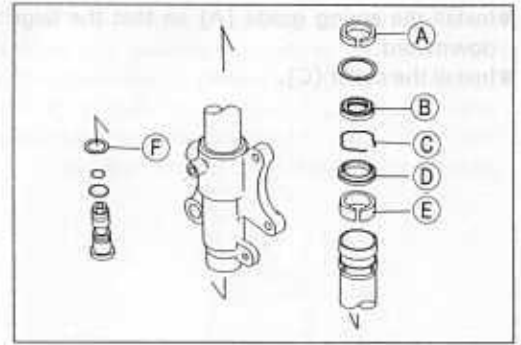
Oil Seal [B]

Retaining Ring [C]

Dust Seal (If removed from the inner tube) [D]

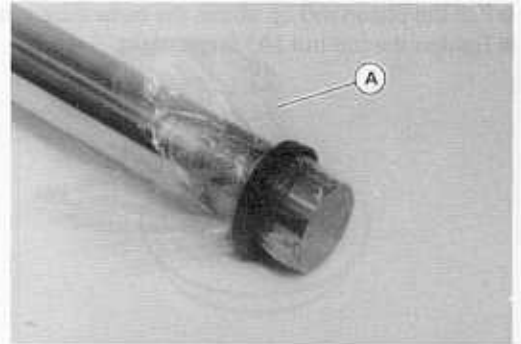
Inner Tube Guide Bush [E]

Cylinder Valve Assembly Bottom Gasket [F]



- Cover the groove with vinyl [A] to protect a new dust seal, oil seal, and guide bush when installing.

- After installing them, remove the vinyl.



- When installing the new outer tube guide bush [A] into the outer tube [B], put the washer [C] on the guide bush, and tap the washer with the fork oil seal driver [D] until it stops.

- The split [E] of the bush must be faced toward the side of the vehicle.

**Special Tool – Fork Oil Seal Driver,  $\Phi 43$ : 57001-1340**

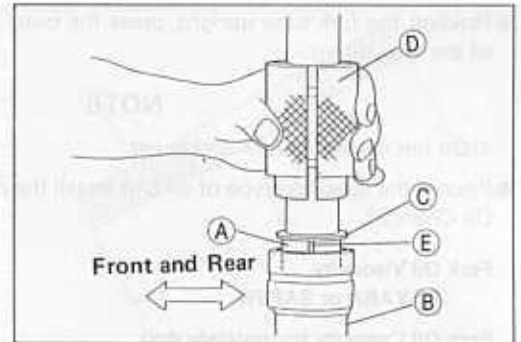
- Install the oil seal into the outer tube.

**Special Tool – Fork Oil Seal Driver,  $\Phi 43$ : 57001-1340**

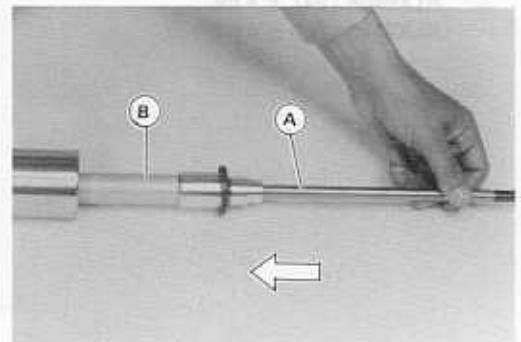
- Install:

Retaining Ring

Dust Seal and Spring Band



- Install the push rod [A] and the piston cylinder unit [B] in the inner tube.



- Check the O-ring [A] on the cylinder valve assembly [B], and replace it with a new one if necessary.

- Replace the gasket [C] with a new one.

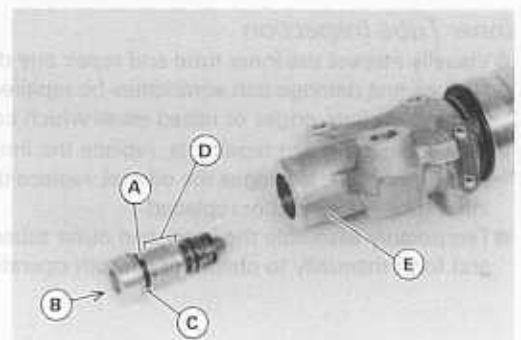
- Apply a non-permanent locking agent to the threads [D] of the cylinder valve assembly and screw the valve assembly into the bottom of the inner tube [E].

- Hold the inner cylinder with the fork cylinder holder and tighten the cylinder valve assembly.

**Special Tool – Fork Cylinder Holder: 57001-1287**

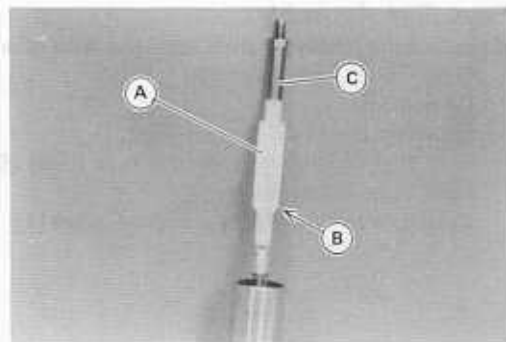
**Non-permanent Locking Agent – Cylinder Valve Assembly**

**Torque – Cylinder Valve Assembly : 54 N-m (5.5 kg-m, 40 ft-lb)**

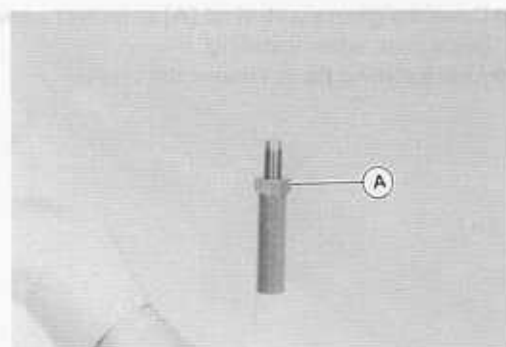


## 12-14 SUSPENSION

- Install the spring guide [A] so that the large chamfered side [B] is downward.
- Install the collar [C].



- Pull the piston rod up above the outer tube top.
- Tighten the rod nut [A] finger-tight.



- Holding the fork tube upright, press the outer tube and the push rod all the way down.

### NOTE

○ Do not install the fork spring yet.

- Pour in the specified type of oil and install the parts removed (see Fork Oil Change).

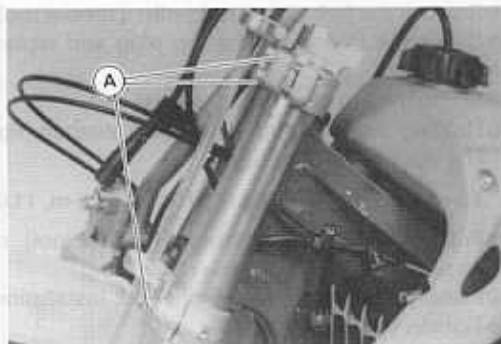
**Fork Oil Viscosity**  
**KAYABA or SAE5W**

**Fork Oil Capacity (completely dry)**  
KLX650A : 547 ± 4 mL  
KLX650C : 540 ± 4 mL

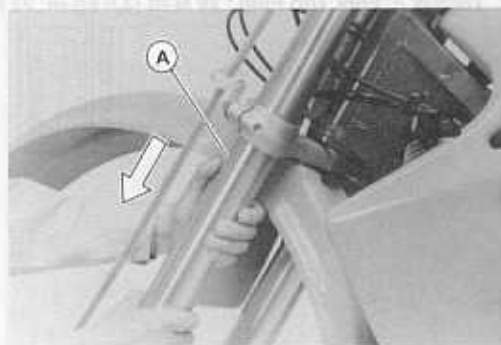
### Inner Tube Inspection

- Visually inspect the inner tube and repair any damage.
- Nick or rust damage can sometimes be repaired by using a wet-stone to remove sharp edges or raised areas which cause seal damage.
- ★ If the damage is not repairable, replace the inner tube. Since damage to the inner tube damages the oil seal, replace the oil seal whenever the inner tube is repaired or replaced.
- Temporarily assemble the inner and outer tubes, and pump them back and forth manually to check for smooth operation.

- Remove:
  - Headlight Rubber Bands
  - Headlight Unit
- Loosen the upper and lower fork clamp bolts [A].



- With a twisting motion, work the fork leg [A] down and out.

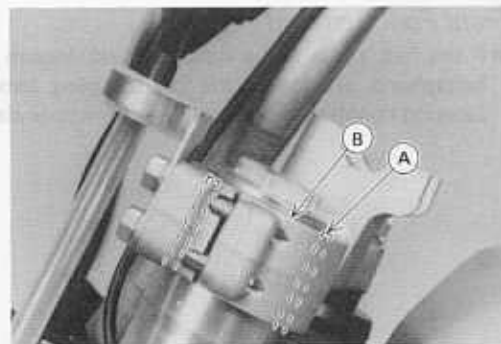


### Front Fork Installation

- Install the fork tube so that the top of the fork outer tube [A] is aligned with the upper surface of the steering stem head [B].
- Run the cables, wires, and hoses as shown in the Cable, Wire, and Hose Routing section of the General Information chapter.
- Install the front wheel (see Wheels/Tires chapter).

**Torque** – Upper Fork Clamp Bolts : 20 N-m (2.0 kg-m, 14.5 ft-lb)  
 Lower Fork Clamp Bolts : 25 N-m (2.5 kg-m, 18.0 ft-lb)  
 Top Plug : 29 N-m (3.0 kg-m, 22 ft-lb)  
 Brake Calliper Bolts : 25 N-m (2.5 kg-m, 18.0 ft-lb),

- Check the front brake after installation.



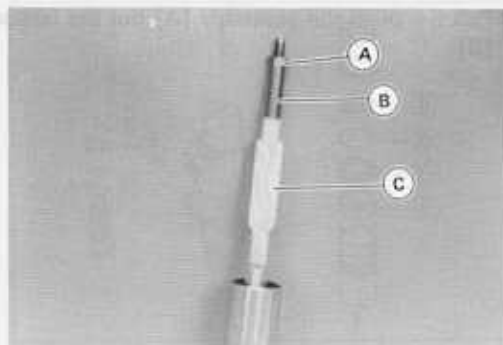
### ⚠ WARNING

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

### Front Fork Disassembly

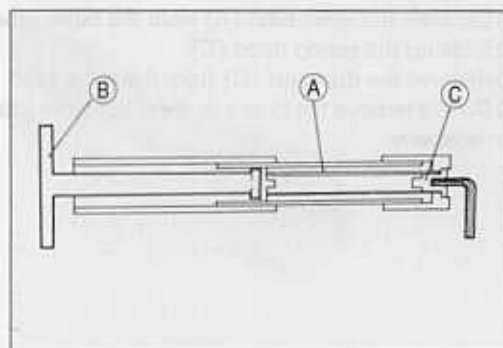
- Remove the front fork (see Front Fork Removal).
- Drain the fork oil (see Fork Oil Change).
- The following parts are removed during draining the fork oil.
  - Top Plug
  - Fork Spring Seat
  - Fork Spring

- Remove:
  - Push Rod Nut [A]
  - Collar [B]
  - Spring Guide [C]

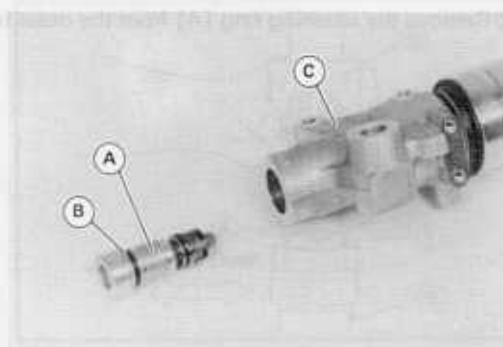


- Hold the front fork horizontally in a vise.
- Stop the cylinder unit [A] from turning by using the fork cylinder holder [B].
- Unscrew the cylinder valve assembly [C].

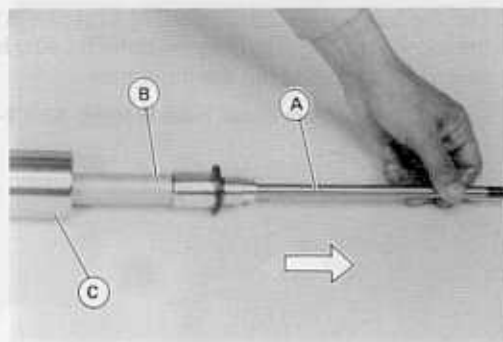
**Special Tool – Fork Cylinder Holder: 57001-1287**



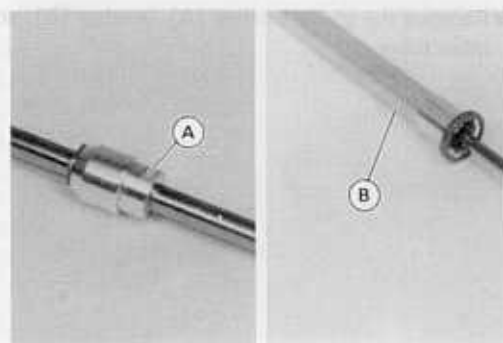
- Take the cylinder valve assembly [A] and gasket [B] out of the bottom of the inner tube [C].



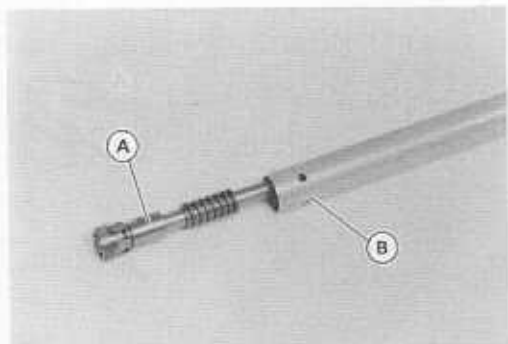
- Pull the push rod [A] and piston cylinder unit [B] out of the top of the outer tube [C].



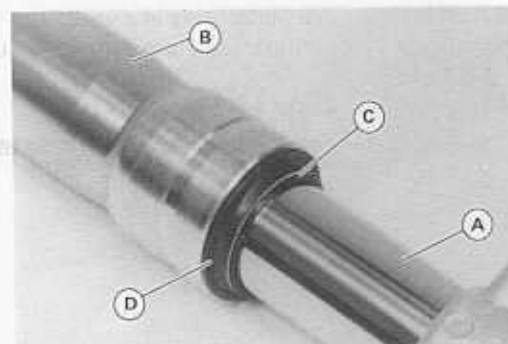
- Do not unscrew the guide stay nut [A].
- Do not disassemble the piston cylinder unit [B].



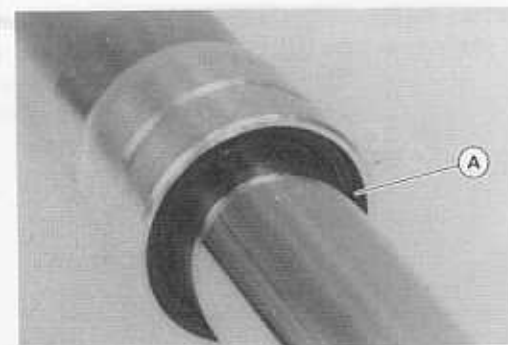
- Pull the push rod assembly [A] out the bottom of the inner cylinder [B].



- Separate the inner tube [A] from the outer tube [B] as follows:
  - Slide up the spring band [C].
  - Remove the dust seal [D] from the outer tube.
  - Do not remove the dust seal from the inner tube unless it is absolutely necessary.

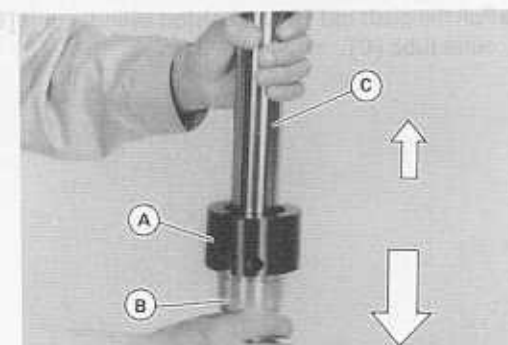


- Remove the retaining ring [A] from the outer tube.

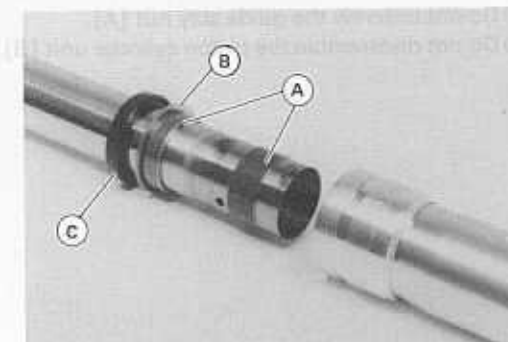


- Use the fork outer tube weight [A] to separate the outer tube [B] from the inner tube [C]. Holding the outer tube by hand, pull the outer tube several times to pull out the inner tube.

**Special Tool – Fork Outer Tube Weight: 57001-1218**



- Remove the guide bushes [A], washer [B], and oil seal [C] from the inner tube.

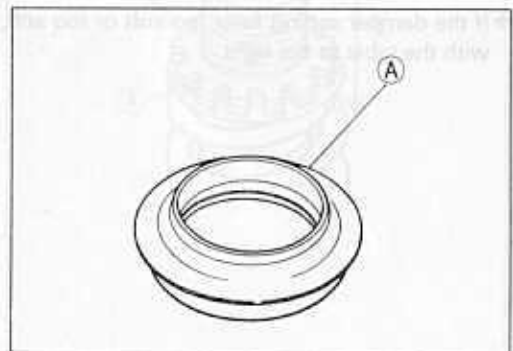


**CAUTION**

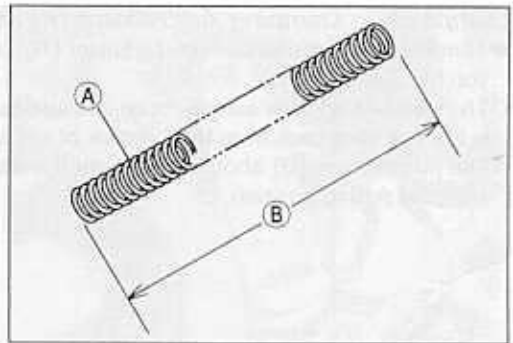
If the inner tube is badly bent or creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.

**Dust Seal Inspection**

- Inspect the dust seal [A] for any signs of deterioration or damage.
- ★ Replace it if necessary.

**Fork Spring Tension**

- Since a fork spring [A] becomes shorter as it weakens, check its free length [B] to determine its condition.
- ★ If the spring of either fork leg is shorter than the service limit, it must be replaced. If a replacement spring and the remaining spring vary greatly in length, the remaining spring should also be replaced in order to keep the fork legs balanced for motorcycle stability.

**Fork Spring Free Length****KLX650A:**

Standard: 501.5 mm

Service Limit: 491 mm

**KLX650C:**

Standard: 465.5 mm

Service Limit: 456 mm

## 2-4 FUEL SYSTEM

### Specifications

#### KLX650A

| Item                           | Standard                                                 |
|--------------------------------|----------------------------------------------------------|
| <b>Throttle Grip Free Play</b> | 2 ~ 3 mm                                                 |
| <b>Carburetor</b>              |                                                          |
| Make, type                     | KEIHIN, CVK40                                            |
| Idle speed                     | Slowest smooth idle speed                                |
| Pilot screw (turns out)        | $1\frac{7}{8} \pm \frac{1}{4}$                           |
| Service fuel level             | 1.5mm above ~ 0.5mm below the float bowl mating surface  |
| Float height                   | $17.5 \pm 2$ mm                                          |
| Main jet                       | #155, (US) #135                                          |
| Needle jet                     | P/No. 16017-1367                                         |
| Jet needle mark                | N1TB                                                     |
| Jet needle clip position       | 3rd groove from the top,<br>(US) 1st groove from the top |
| Pilot jet (slow jet)           | #40                                                      |
| Starter jet                    | #52 (unremovable)                                        |
| Throttle valve angle           | 10°                                                      |
| <b>Air Cleaner Element Oil</b> |                                                          |
| Grade                          | SE or SF class                                           |
| Viscosity                      | SAE30                                                    |

(AR): Austria  
(AS): Australia  
(FG): Germany

(NZ): New Zealand  
(ST): Switzerland  
(US): U.S.

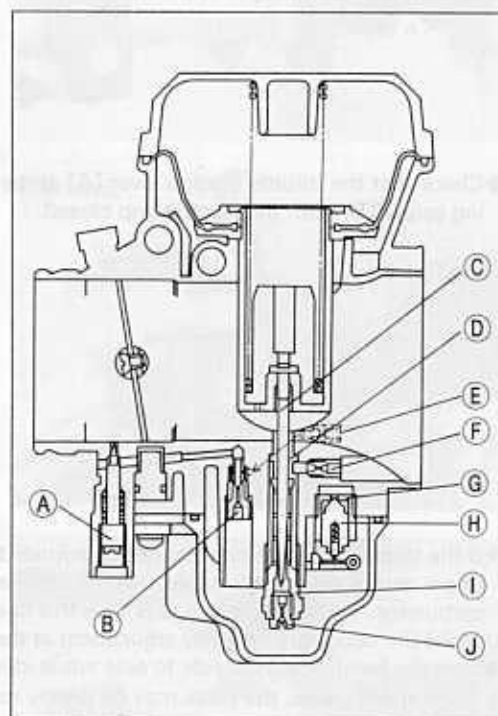
## KLX650C

| Item                                                | Standard                                                             |
|-----------------------------------------------------|----------------------------------------------------------------------|
| <b>Throttle Grip Free Play</b>                      | 2 ~ 3 mm                                                             |
| <b>Carburetor</b>                                   |                                                                      |
| Make, type                                          | KEIHIN, CVK40                                                        |
| Idle speed                                          | 1300 $\pm$ 100 r/min (rpm)                                           |
| Pilot screw (turns out)                             | 2 3/8 $\pm$ 1/4,<br>(AR)(AS)(FG)(NZ) 1 7/8 $\pm$ 1/4<br>(ST)(US) --- |
| Service fuel level                                  | 1.5mm above ~ 0.5mm below the float bowl<br>mating surface           |
| Float height                                        | 17.5 $\pm$ 2 mm                                                      |
| Main jet                                            | #138, (AS)(FG)(ST) #140                                              |
| Needle jet                                          | P/No. 16017-1367                                                     |
| Jet needle mark                                     | N23P, (AS)(FG)(NZ) N23Q,<br>(AR) N31H, (ST) N1RN, (US) N1RE<br>---   |
| Jet needle clip position                            | #40                                                                  |
| Pilot jet (slow jet)                                | #50 (unremovable)                                                    |
| Starter jet                                         | 10°                                                                  |
| Throttle valve angle                                |                                                                      |
| <b>High altitude carburetor specifications (US)</b> |                                                                      |
| Main Jet                                            | #135 (92063-1014)                                                    |
| Pilot Jet                                           | #38 (92064-1050)                                                     |
| <b>Air Cleaner Element Oil</b>                      |                                                                      |
| Grade                                               | SE or SF class                                                       |
| Viscosity                                           | SAE30                                                                |

Pilot Screw [A]  
Pilot Jet [B]  
Jet Needle [C]  
Needle Jet [D]  
Pilot Air Jet [E]

Main Air Jet [F]  
Valve Seat [G]  
Float Valve [H]  
Jet Needle Holder [I]  
Main Jet [J]

**Special Tools** — Pressure Cable Luber: K56019-021  
Pilot Screw Adjuster, A: 57001-1239  
Fuel Level Gauge: 57001-1017



## 1-8 GENERAL INFORMATION

### General Specifications

| Items                     |          | KLX650-A1                                                       |
|---------------------------|----------|-----------------------------------------------------------------|
| <b>Dimensions:</b>        |          |                                                                 |
| Overall length            |          | 2215 mm                                                         |
| Overall width             |          | 925 mm                                                          |
| Overall height            |          | 1230 mm                                                         |
| Wheelbase                 |          | 1490 mm                                                         |
| Road clearance            |          | 330 mm                                                          |
| Seat height               |          | 950 mm                                                          |
| Dry weight                |          | 127 kg                                                          |
| Curb weight:              | Front    | 63 kg                                                           |
|                           | Rear     | 74 kg                                                           |
| Fuel tank capacity        |          | 8 L                                                             |
| <b>Performance:</b>       |          |                                                                 |
| Minimum turning radius    |          | -                                                               |
| <b>Engine:</b>            |          |                                                                 |
| Type                      |          | 4-stroke, DOHC, 1-cylinder                                      |
| Cooling system            |          | Liquid - cooled                                                 |
| Bore and stroke           |          | 100.0 x 83.0 mm                                                 |
| Displacement              |          | 651 mL                                                          |
| Compression ratio         |          | 9.5 : 1                                                         |
| Maximum horsepower        |          | -                                                               |
| Maximum torque            |          | -                                                               |
| Carburetion system        |          | Carburetor, KEIHIN CVK40 x1                                     |
| Starting system           |          | Primary kick                                                    |
| Ignition system           |          | CDI                                                             |
| Timing advance            |          | Electronically advanced                                         |
| Ignition timing           |          | From 8° BTDC @1300 r/min (rpm) to<br>30° BTDC @3000 r/min (rpm) |
| Spark plug                |          | NGK DPR8EA-9, ND X24EPR-U9                                      |
| Cylinder numbering method |          | -                                                               |
| Firing order              |          | -                                                               |
| Valve timing:             |          |                                                                 |
| Inlet                     | Open     | 19° BTDC                                                        |
|                           | Close    | 65° ABDC                                                        |
|                           | Duration | 264°                                                            |
| Exhaust                   | Open     | 53° BBDC                                                        |
|                           | Close    | 27° ATDC                                                        |
|                           | Duration | 260°                                                            |
| Lubrication system        |          | Forced lubrication (wet sump)                                   |
| Engine oil:               |          |                                                                 |
| Grade                     |          | SE or SF class                                                  |
| Viscosity                 |          | SAE10W-40, 10W-50, 20W-40, or 20W-50                            |
| Capacity                  |          | 1.9 L                                                           |

| Items                        |              | KLX650-A1                            |
|------------------------------|--------------|--------------------------------------|
| <b>Drive Train:</b>          |              |                                      |
| Primary reduction system:    |              |                                      |
| Type                         |              | Gear                                 |
| Reduction ratio              |              | 2.272 (75/33)                        |
| Clutch type                  |              | Wet multi disc                       |
| Transmission:                |              |                                      |
| Type                         |              | 5-speed, constant mesh, return shift |
| Gear ratios:                 | 1st          | 2.266 (34/15)                        |
|                              | 2nd          | 1.529 (26/17)                        |
|                              | 3rd          | 1.181 (26/22)                        |
|                              | 4th          | 0.954 (21/22)                        |
|                              | 5th          | 0.791 (19/24)                        |
| Final drive system:          |              |                                      |
| Type                         |              | Chain drive                          |
| Reduction ratio              |              | 3.500 (49/14)                        |
| Overall drive ratio          |              | 6.290 @Top gear                      |
| <b>Frame:</b>                |              |                                      |
| Type                         |              | Tubular, semi double cradle          |
| Caster (rake angle)          |              | 28.5°                                |
| Trail                        |              | 122 mm                               |
| Front tire:                  | Type         | Tube, D752F                          |
|                              | Size         | 80/100-21 51M                        |
| Rear tire:                   | Type         | Tube, D752                           |
|                              | Size         | 110/100-18 64M                       |
| Front suspension:            | Type         | Telescopic fork (pneumatic)          |
|                              | Wheel travel | 300 mm                               |
| Rear suspension:             | Type         | Swingarm (uni-trak)                  |
|                              | Wheel travel | 285 mm                               |
| Brake type:                  | Front        | Single disc                          |
|                              | Rear         | Single disc                          |
| <b>Electrical Equipment:</b> |              |                                      |
| Headlight:                   | Type         | Semi-sealed beam                     |
|                              | Bulb         | 12 V 30 W                            |
| Taillight                    |              | 12 V 10 W                            |
| Alternator:                  | Type         | Three-phase AC                       |
|                              | Rated output | -                                    |

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