Kawasaki

KLX650R
KLX650

Motorcycle
Service Manual

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LIST OF ABBREVIATIONS

A	ampere(s)	lb	pound(s)
ABDC	after bottom dead center	m	meter(s)
AC	alternating current	min	minute(s)
ATDC	after top dead center	N	newton(s)
BBDC	before bottom dead center	Pa	pascal(s)
BDC	bottom dead center	PS	horsepower
BTDC	before top dead center	psi	pound(s) per square inch
°C	degree(s) Celsius	r	revolution
DC	direct current	rpm	revolution(s) per minute
F	farad(s)	TDC	top dead center
°F	degree(s) Fahrenheit	TIR	total indicator reading
ft	foot, feet	V	volt(s)
g	gram(s)	W	watt(s)
h	hour(s)	Ω	ohm(s)
L	liter(s)		

Read OWNER'S MANUAL before operating.

Foreword

This Manual is designed primarily for use by trained mechanics in a properly equipped shop. However, it contains enough detail and basic information to make it useful to the owner who desires to perform his own basic maintenance and repair work. A basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily. Whenever the owner has insufficient experience or doubts his ability to do the work, all adjustments, maintenance, and repair should be carried out only by qualified mechanics.

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

For the duration of the warranty period, especially, we recommend that all repairs and scheduled maintenance be performed in accordance with this service manual. Any owner maintenance or repair procedure not performed in accordance with this manual may void the warranty.

To get the longest life out of your Motorcycle:

- Follow the Periodic Maintenance Chart in the Service Manual.
- Be alert for problems and non-scheduled maintenance.
- Use proper tools and genuine Kawasaki Motorcycle parts. Special tools, gauges, and testers that are necessary when servicing Kawasaki motorcycles are introduced by the Special Tool Catalog or Manual. Genuine parts provided as spare parts are listed in the Parts Catalog.
- Follow the procedures in this manual carefully. Don't take shortcuts.
- Remember to keep complete records of maintenance and repair with dates and any new parts installed.

How to Use this Manual

In preparing this manual, we divided the product into its major systems. These systems became the manual's chapters. All information for a particular system from adjustment through disassembly and inspection is located in a single chapter.

The Quick Reference Guide shows you all of the product's system and assists in locating their chapters. Each chapter in turn has its own comprehensive Table of Contents.

The Periodic Maintenance Chart is located in the General Information chapter. The chart gives a time schedule for required maintenance operations.

If you want spark plug information, for example, go to the Periodic Maintenance Chart first. The chart tells you how frequently to clean and gap the plug. Next, use the Quick Reference Guide to locate the Electrical System chapter. Then, use the Table of Contents on the first page of the chapter to find the Spark Plug section.

Whenever you see these WARNING and CAUTION symbols, heed their instructions! Always follow safe operating and maintenance practices.

⚠WARNING

This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury, or loss of life.

CAUTION

This caution symbol identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

This manual contains four more symbols (in addition to WARNING and CAUTION) which will help you distinguish different types of information.

NOTE

○ *This note symbol indicates points of particular interest for more efficient and convenient operation.*

● Indicates a procedural step or work to be done.
○ Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a NOTE.
★ Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

In most chapters an exploded view illustration of the system components follows the Table of Contents. In these illustrations you will find the instructions indicating which parts require specified tightening torque, oil, grease or a locking agent during assembly.

EMISSION CONTROL INFORMATION

To protect the environment in which we all live, Kawasaki has incorporated crankcase emission (1) and exhaust emission (2) control systems in compliance with applicable regulations of the United States Environmental Protection Agency and California Air Resources Board. Additionally, Kawasaki has incorporated an evaporative emission control system (3) in compliance with applicable regulations of the California Air Resources Board on vehicles sold in California only.

1. Crankcase Emission Control System
   This system eliminates the release of crankcase vapors into the atmosphere. Instead, the vapors are routed through an oil separator to the intake side of the engine. While the engine is operating, the vapors are drawn into combustion chamber, where they are burned along with the fuel and air supplied by the carburetion system.
2. Exhaust Emission Control System
   This system reduces the amount of pollutants discharged into the atmosphere by the exhaust of this motorcycle. The fuel and ignition systems of this motorcycle have been carefully designed and constructed to ensure an efficient engine with low exhaust pollutant levels.
3. Evaporative Emission Control System
   Vapors caused by fuel evaporation in the fuel system are not vented into the atmosphere. Instead, fuel vapors are routed into the running engine to be burned, or stored in a canister when the engine is stopped. Liquid fuel is caught by a vapor separator and returned to the fuel tank.

The Clean Air Act, which is the Federal law covering motor vehicle pollution, contains what is commonly referred to as the Act's "tampering provisions."

"Sec. 203(a) The following acts and the causing thereof are prohibited...

(3)(A) for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title prior to its sale and delivery to the ultimate purchaser, or for any manufacturer or dealer knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser.

(3)(B) for any person engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles or motor vehicle engines, or who operates a fleet of motor vehicles knowingly to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title following its sale and delivery to the ultimate purchaser..."

(Continued on next page.)

NOTE

- *The phrase "remove or render inoperative any device or element of design" has been generally interpreted as follows:*
  1. *Tampering does not include the temporary or rendering inoperative of devices or elements of design in order to perform maintenance.*
  2. *Tampering could include:*
     a. *Maladjustment of vehicle components such that the emission standards are exceeded.*
     b. *Use of replacement parts or accessories which adversely affect the performance or durability of the motorcycle.*
     c. *Addition of components or accessories that result in the vehicle exceeding the standards.*
     d. *Permanently removing, disconnecting, or rendering inoperative any component or element of design of the emission control systems.*

WE RECOMMEND THAT ALL DEALERS OBSERVE THESE PROVISIONS OF FEDERAL LAW, THE VIOLATION OF WHICH IS PUNISHABLE BY CIVIL PENALTIES NOT EXCEEDING $10,000 PER VIOLATION.

KLX650A/C, US

TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED

Federal law prohibits the following acts or the causing thereof: (1) The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below:

- Replacement of the original exhaust system or muffler with a component not in compliance with Federal regulations.
- Removal of the muffler(s) or any internal portion of the muffler(s).
- Removal of the air box or air box cover.
- Modifications to the muffler(s) or air intake system by cutting, drilling, or other means if such modifications result in increased noise levels.

Quick Reference Guide

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Fuel System	2
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Wheels / Tires	9
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This quick reference guide will assist you in locating a desired topic or procedure.

- Bend the pages back to match the black tab of the desired chapter number with the black tab on the edge at each table of contents page.
- Refer to the sectional table of contents for the exact pages to locate the specific topic required.

1

General Information

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Before Servicing

Before starting to service a motorcycle, careful reading of the applicable section is recommended to eliminate unnecessary work. Photographs, diagrams, notes, cautions, warnings, and detailed descriptions have been included wherever necessary. Nevertheless, even a detailed account has limitations, a certain amount of basic knowledge is also required for successful work.

Especially note the following:

(1) Dirt

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

(2) Battery Ground (KLX650C)

Remove the ground (−) lead from the battery before performing any disassembly operations on the motorcycle. This prevents:

(a) the possibility of accidentally turning the engine over while partially disassembled.

(b) sparks at electrical connections which will occur when they are disconnected.

(c) damage to electrical parts.

(3) Installation, Assembly

Generally, instalaltion or assembly is the reverse of removel or disassembly. But if this Service Manual has installation or assembly procedures, follow them.

(4) Tightening Sequence

Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them evenly in a cross pattern. This is to avoid distortion of the part and/or causing gas or oil leakage. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and then remove them. Where there is a tightening sequence indication in this Service Manual, the bolts, nuts, or screws must be tightened in the order and method indicated.

(5) Torque

When torque values are given in this Service Manual, use them. Either too little or too much torque may lead to serious damage. Use a good quality, reliable torque wrench.

(6) Force

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

(7) Edges

Watch for sharp edges, especially during major engine disassembly and assembly. Protect your hands with gloves or a piece of thick cloth when lifting the engine or turning it over.

(8) High-Flash Point Solvent

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

(9) Gasket, O-Ring

Do not reuse a gasket or O-ring once it has been in service. The mating surfaces around the gasket should be free of foreign matter and perfectly smooth to avoid oil or compression leaks.

(10) Liquid Gasket, Non-Permanent Locking Agent

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

(11) Press

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

(12) Ball Bearing, Needle Bearing

Do not remove a ball bearing or a needle bearing unless it is absolutely necessary. Replace any ball or needle bearings that were removed with new ones, as removal generally damages bearings.

Install bearings with the marked side facing out applying pressure evenly with a suitable driver. Only press on the race that forms the press fit with the base component to avoid damaging the bearings. This prevents severe stress on the balls or needles and races, and prevent races and balls or needles from being dented.

Press a ball bearing until it stops at the stop in the hole or on the shaft.

(13) Oil Seal and Grease Seal

Replace any oil or grease seals that were removed with new ones, as removal generally damages seals.

When pressing in a seal which has manufacturer's marks, press it in with the marks facing out. Seals should be pressed into place using a suitable driver, which contacts evenly with the side of seal, until the face of the seal is even with the end of the hole. Before a shaft passes through a seal, apply a little high temperature grease on the lips to reduce rubber to metal friction.

(14) Circlip, Retaining Ring

Replace any circlips and retaining rings that were removed with new ones, as removal weakens and deforms them. When installing circlips and retaining rings, take care to compress or expand them only enough to install them and no more.

(15) Cotter Pin

Replace any cotter pins that were removed with new ones, as removal deforms and breaks them.

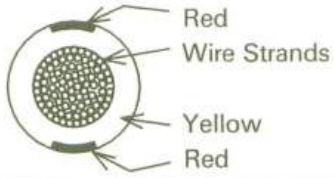
(16) Lubrication

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

Don't use just any oil or grease. Some oils and greases in particular should be used only in certain applications and may be harmful if used in an application for which they are not intended. This manual makes reference to molybdenum disulfide grease (MoS_2) in the assembly of certain engine and chassis parts. Always check manufacturer recommendations before using such special lubricants.

(17) Electrical Wires

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

Wire (cross-section)	Name of Wire Color
	Yellow/Red

(18) Replacement Parts

When there is a replacement instruction, replace these parts with new ones every time they are removed. These replacement parts will be damaged or lose their original function once removed.

(19) Inspection

When parts have been disassembled, visually inspect these parts for the following conditions or other damage. If there is any doubt as to the condition of them, replace them with new ones.

Abrasion	Crack	Hardening	Warp
Bent	Dent	Scratch	Wear
Color change	Deterioration	Seizure	

(20) Specifications

Specification terms are defined as follows:

"Standards" show dimensions or performances which brand-new parts or systems have.

"Service Limits" indicate the usable limits. If the measurement shows excessive wear or deteriorated performance, replace the damaged parts.

KLX650-A1 (US Model)





KLX650-A1 (Europe Model)





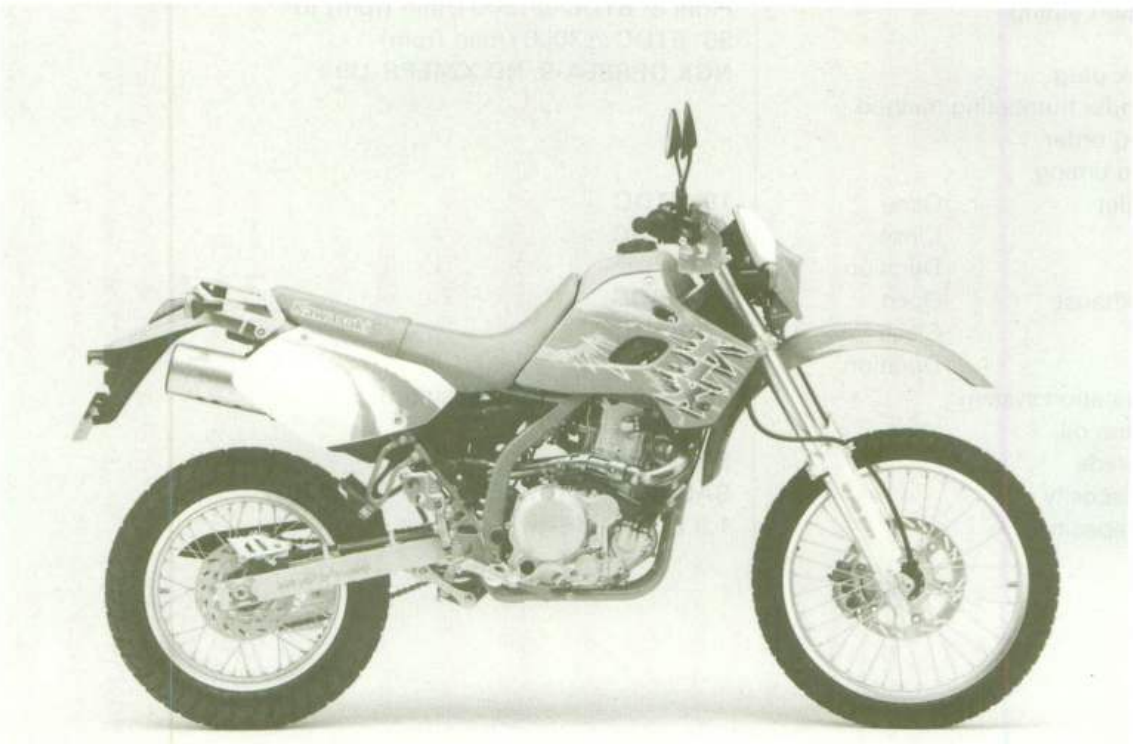
KLX650-C1 (US Model)





KLX650-C1 (Europe Model)





General Specifications

Items		KLX650-A1
Dimensions:		
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
Performance:		
Minimum turning radius		–
Engine:		
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		–
Maximum torque		–
Carburetion system		Carburetor, KEIHIN CVK40 ×1
Starting system		Primary kick
Ignition system		CDI
Timing advance		Electronically advanced
Ignition timing		From 8° BTDC @1300 r/min (rpm) to 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
Drive Train:		
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
Frame:		
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
Electrical Equipment:		
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.

Items		KLX650-C1
Dimensions:		
Overall length		2250 mm, (FG)(GR)(NR)(SD)(ST) 2265 mm (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
Performance:		
Minimum turning radius		2.4 m
Engine:		
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), (AR)20 kW (27 ps) @6000 r/min (rpm), (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) (AR)44.5 N-m (4.5 kg-m, 32.5 ft-lb) @3000 r/min (rpm) (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 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)
Engine oil:		
Grade		SE or SF class
Viscosity		SAE10W-40, 10W-50, 20W-40, or 20W-50
Capacity		2.1 L

Items		KLX650-C1
Drive Train:		
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
Frame:		
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
Electrical Equipment:		
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

Periodic Maintenance Chart - KLX650A

The maintenance must be done in accordance with this chart to keep the motorcycle in good running condition.

FREQUENCY / OPERATION	Traveled Distance km(mi)				
	100 (60)	500 (300)	1000 (600)	1500 (900)	2000 (1200)
ENGINE					
Clutch -- adjust	●	●	●	●	●
Clutch and friction plates -- check*			●		●
Throttle cables -- adjust	●	●	●	●	●
Spark plug -- clean, gap*	●	●	●	●	●
Valve clearance -- check*					●
Air cleaner element -- clean	Every 300 km (200 mi) or Every Race				
Air cleaner element -- replace	If damaged				
Carburetor -- inspect/adjust	●	●	●	●	●
Spark arrestor (US) -- clean	Every 4000 km (2500 mi)				
Oil filter -- replace	●		●		●
Engine oil -- change	●		●		●
Engine sprocket -- check			●		●
Coolant -- change	Every 2 years				
Radiator hoses, connections -- check*			●		●
CHASSIS					
Brake adjustment -- check*	●	●	●	●	●
Brake pad wear -- check*		●	●	●	●
Brake fluid level -- check*		●	●	●	●
Brake fluid -- change	Every 2 years				
Brake master cylinder cup and dust seal -- replace	Every 2 years				
Brake caliper piston seal and dust seal -- replace	Every 2 years				
Brake hose -- replace	Every 4 years				
Spoke tightness and rim runout -- check*	●	●	●	●	●
Drive chain -- adjust	Every 300 km (200 mi)				
Drive chain -- lubricate	Before and after each day of operation				
Drive chain wear -- check*		●	●	●	●
Chain slipper and guide -- check*	If damaged				
Front fork -- inspect/clean	●	●	●	●	●
Front fork oil -- change	Every year				
Steering play -- check*	●	●	●	●	●
Steering stem bearing -- grease					●

(Continued on next page.)

FREQUENCY / OPERATION	Traveled Distance km(mi)				
	100 (60)	500 (300)	1000 (600)	1500 (900)	2000 (1200)
Rear sprocket -- check*		●	●	●	●
Wheel bearing -- check*					●
Swingarm and uni-trak linkage pivots -- grease		●	●	●	●
Swingarm and uni-trak linkage pivots -- check*		●	●	●	●
Rear shock oil -- replace	Every year				
ENGINE and CHASSIS					
Fuel system -- clean	●	●	●	●	●
Fuel hose -- replace	Every 4 years				
Nuts, bolts, fasteners -- check*	●		●		●
General lubrication -- perform	●	●	●	●	●

(*) : Replace, add, adjust, clean, or torque if necessary.
R : Replace
● : Service more frequently when operated in a race.
(US) : U.S. model

Periodic Maintenance Chart – KLX650C

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

FREQUENCY / OPERATION	Whichever comes first ↓ Every	↓ †ODOMETER READING → 800 km	5000 km	10000 km	15000 km	20000 km	25000 km	30000 km
Spark plug -- clean and gap*			●	●	●	●	●	●
Valve clearance -- check*		●		●		●		●
Air cleaner element -- clean		●		●		●		●
Air cleaner element -- replace	5 cleanings					●		
Throttle grip play -- check*		●		●		●		●
Idle speed -- check*		●	●	●	●	●	●	●
Fuel system -- check				●		●		●
Evaporative emission control system (CA) -- check*		●	●	●	●	●	●	●
Spark arrestor (US) -- clean			●	●	●	●	●	●
Engine oil -- change	year	●		●		●		●
Oil filter -- replace		●		●		●		●
Radiator hoses, connections-- check	year	●		●		●		●
Coolant -- change	2 years							●
Fuel hose -- replace	4 years							
Clutch -- adjust		●	●	●	●	●	●	●
Drive chain wear - check*			●	●	●	●	●	●
Drive chain -- lubricate	300 km							
Drive chain slack -- check*	800 km							
Brake pad wear -- check*			●	●	●	●	●	●
Brake fluid level -- check*	month	●	●	●	●	●	●	●
Brake fluid -- change	2 years					●		
Brake hose and pipe -- replace	4 years							
Brake master cylinder cup and dust seal -- replace	2 years							
Caliper piston seal and dust seal -- replace	2 years							
Brake light switch --check*		●	●	●	●	●	●	●
Steering play -- check*		●	●	●	●	●	●	●

FREQUENCY / OPERATION	Whichever comes first / Every	†ODOMETER READING							
		800km	5000km	10000km	15000km	20000km	25000km	30000km	
Steering stem bearing -- lubricate	2 years					●			
Front fork oil -- change								●	
Tire wear -- check*			●	●	●	●	●	●	
Spoke tightness and rim runout -- check*		●	●	●	●	●	●	●	
Swingarm pivot , uni-trak linkage -- lubricate				●		●		●	
General lubrication -- perform			●	●	●	●	●	●	
Nut, bolt, and fastener tightness -- check*		●		●		●		●	

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

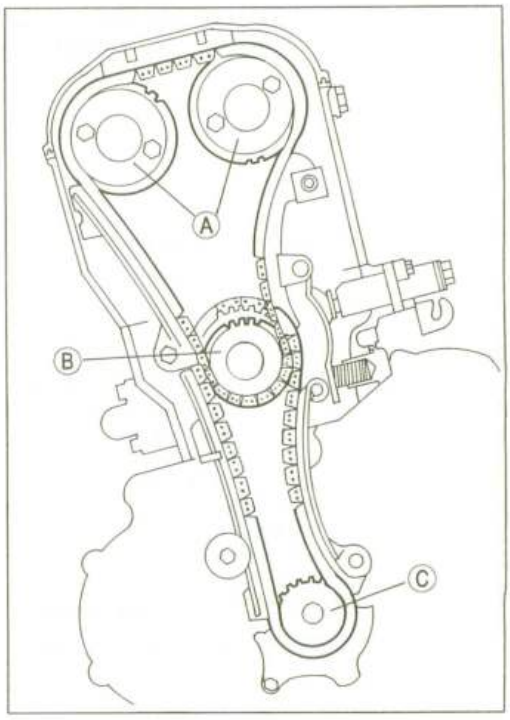
(CA) : California Model
(US) : U.S. Model

Technical Information 1 - Two - Stage Cam Drive System

By unsing a two-stage camshaft chain drive on this double overhead-cam engine, the camshaft sprockets can be made smaller.

Accordingly, the space between the camshafts can be narrowed for a better looking design, allowing the KLX650 to have such a compact engine that does not seem to have double overhead cams.

Cam Sprocket [A]
Intermediate Sprockets [B]
Crank Sprocket [C]



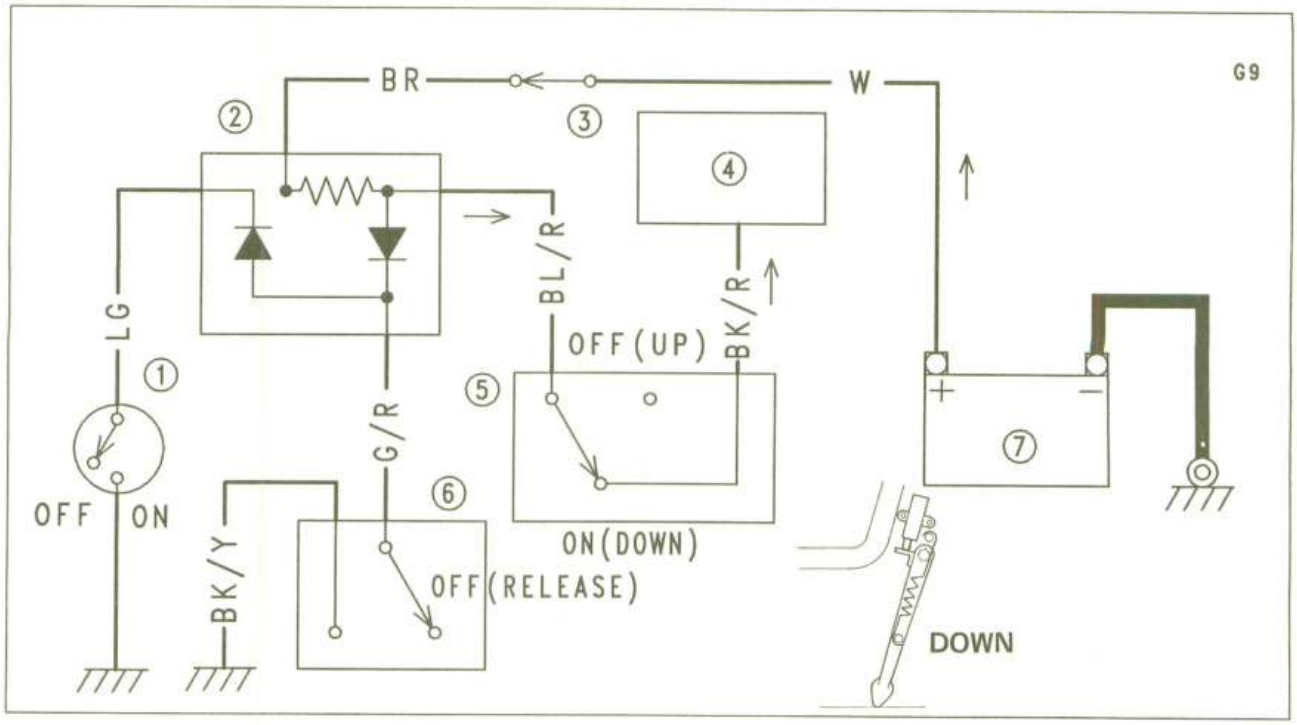
Technical Information 2 - Interlock Circuit (KLX650C)

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.

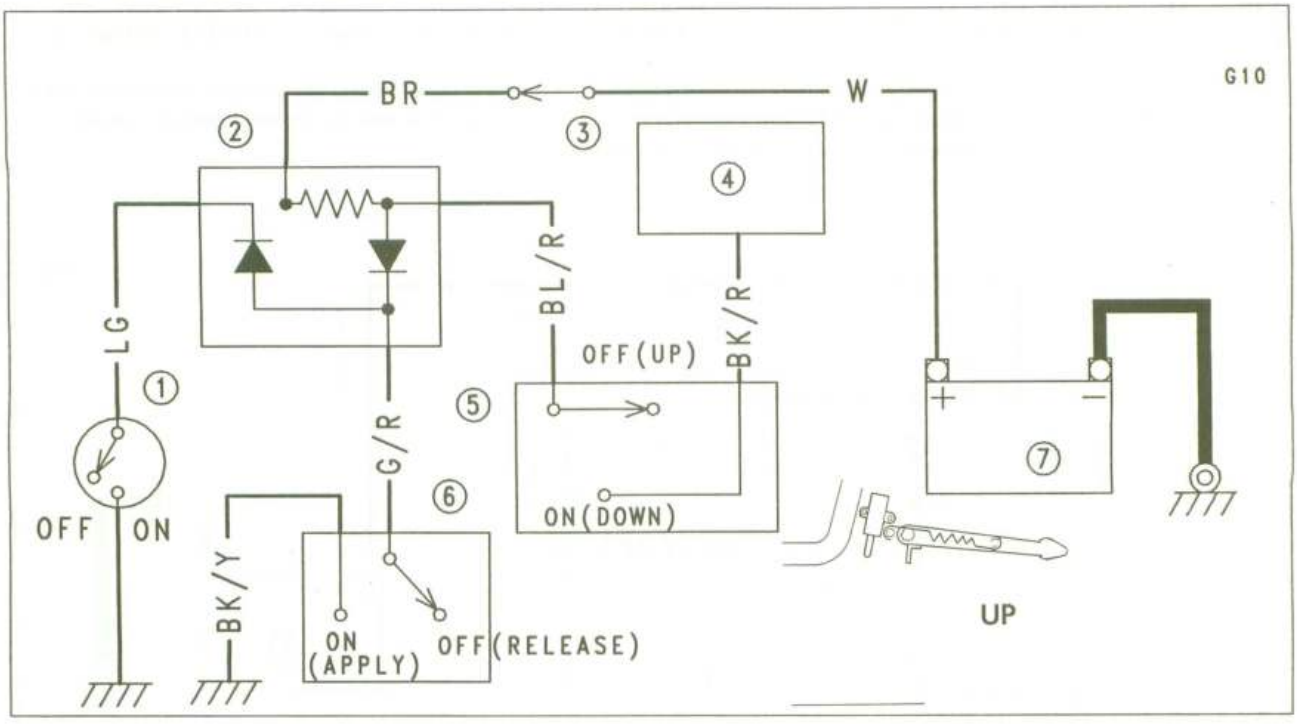
At this time, if the clutch lever is applied (starter lockout switch ON) or if the transmission is in neutral, the micro current is grounded and the ignition system can work. But the ignition system will not work and the motorcycle can not run with the transmission in gear and with the clutch lever released 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	When clutch lever is applied	ON	○	○
ON	ON	OFF	○	○
	When clutch lever is released	ON	○	○
	OFF	OFF	×	×
When side stand is up	When clutch lever is applied	ON	○	○
OFF	ON	OFF	○	○
	When clutch lever is released	ON	○	○
	OFF	OFF	×	○

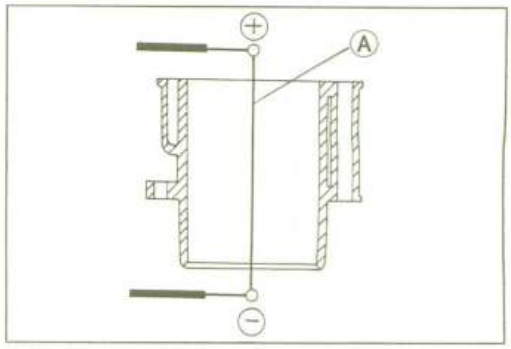
Conventional System

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

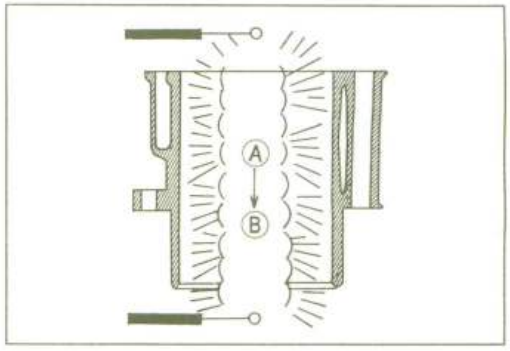
○ : work × : will not work

Technical Information 3 - Electrofusion Cylinder (KLX650A)

Electrofusion is a steel-molybdenum manufacturing treatment of the cylinder bore. The process involves using high voltage to alternately explode thin high-carbon steel wires [A] and thin molybdenum wires directly inside the aluminum cylinder bore.



Multiple explosions apply alternating layers of molybdenum and high-carbon steel. First, a 20000 volt current detonates a 1 mm molybdenum wire [A], spraying it onto the inner surfaces of the cylinder. This is repeated. Then 15000 volts passes through a 2 mm carbon steel wire [B], spraying it onto the cylinder wall. This entire three-explosion process is repeated more than 30 times to apply the Electrofusion coating.

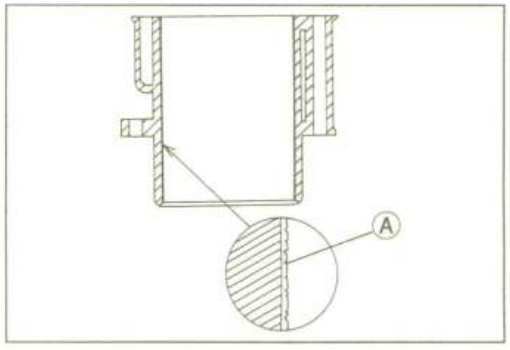


Features:

The wire materials fuse directly to the cylinder wall, forming a coating that has many advantages over conventional steel-lined or chrome-plated cylinder bores. Electrofusion is **VERY HARD** and **RESISTS WEAR,** but is also **POROUS ENOUGH TO HOLD A LUBRICATING FILM OF OIL.**

Hard and Porous Surface [A]

Since the coating is placed directly on the aluminum cylinder walls, electrofusion cylinders are very **LIGHTWEIGHT.** The electrofusion layer is an excellent conductor of heat, transferring heat to the cylinder evenly, without hot spots. The **EVEN HEAT TRANSFER** means the piston and cylinder expand at about the same rate, so **CLOSE PISTON TO CYLINDER TOLERANCES CAN BE MAINTAINED, REDUCING BLOW-BY AND INCREASING POWER.**



Benefits:

Electrofusion resists abrasion and seizure. It allows the use of closer tolerances and leaner carburetion for better fuel economy and lower exhaust emissions. In competition models, it permits higher engine performance.

Torque and Locking Agent

The following tables list the tightening torque for the major fasteners requiring use of a non-permanent locking agent or liquid gasket.

Letters used in the "Remarks" column mean:
- **L** : Apply a non-permanent locking agent to the threads.
- **LG** : Apply liquid gasket to the threads.
- **Lh** : Left-hand threads.
- **M** : Apply molybdenum disulfide grease.
- **O** : Apply an oil to the threads and seating surface.
- **S** : Tighten the fasteners following the specified sequence.
- **SS** : Apply silicone sealant.
- **St** : Stake the fasterners to prevent loosening.
- **R** : Replacement parts.

650A: KLX650A
650C: KLX650C

The table below, relating tightening torque to thread diameter, lists the basic torque for the bolts and nuts. Use this table for only the bolts and nuts which do not require a specific torque value. All of the values are for use with dry solvent-cleaned threads.

Basic Torque for General Fasteners

Threads dia. (mm)	Torque		
	N-m	kg-m	ft-lb
5	3.4 ~ 4.9	0.35 ~ 0.50	30 ~ 43 in-lb
6	5.9 ~ 7.8	0.60 ~ 0.80	52 ~ 69 in-lb
8	14 ~ 19	1.4 ~ 1.9	10.0 ~ 13.5
10	25 ~ 34	2.6 ~ 3.5	19.0 ~ 25
12	44 ~ 61	4.5 ~ 6.2	33 ~ 45
14	73 ~ 98	7.4 ~ 10.0	54 ~ 72
16	115 ~ 155	11.5 ~ 16.0	83 ~ 115
18	165 ~ 225	17.0 ~ 23.0	125 ~ 165
20	225 ~ 325	23 ~ 33	165 ~ 240

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Fuel System:				
Carburetor Holder Bolts	12	1.2	104 in-lb	
Fuel Tap Plate Screws	0.8	0.08	7 in-lb	
Fuel Tap Bolts (650C)	5.9	0.60	52 in-lb	
Cooling System:				
Radiator Hose Clamp Screws	2.0	0.20	17 in-lb	
Reserve Tank Bolts	–	–	–	L
Coolant Drain Plug (water pump)	8.8	0.90	78 in-lb	
Thermostatic Fan Switch (650C)	8.8	0.90	78 in-lb	
Coolant Temperature Switch (650C)	8.8	0.90	78 in-lb	
Water Pump Impeller Nut	8.8	0.90	78 in-lb	
Water Pump Cover Bolts	8.8	0.90	78 in-lb	
Engine Top End:				
Spark Plug	14	1.4	10.0	
Cylinder Head Cover Bolts	9.8	1.0	87 in-lb	
Oil Separator Bolts	5.9	0.60	52 in-lb	
Chain Tensioner Mounting Bolts	8.8	0.90	78 in-lb	
Chain Tenisoner Cap	25	2.5	18.0	
Chain Tension Spring Bolt	15	1.5	11.0	
Camshaft Cap Bolts	12	1.2	104 in-lb	S
Camshaft Sprocket Bolts	15	1.5	11.0	L
Water Hose Clamp Screws	2.0	0.20	17 in-lb	
Water Hose Fitting Bolts	8.8	0.90	78 in-lb	
Timing Inspection Plug	2.5	0.25	22 in-lb	
Magneto Flywheel Bolt Plug	2.5	0.25	22 in-lb	

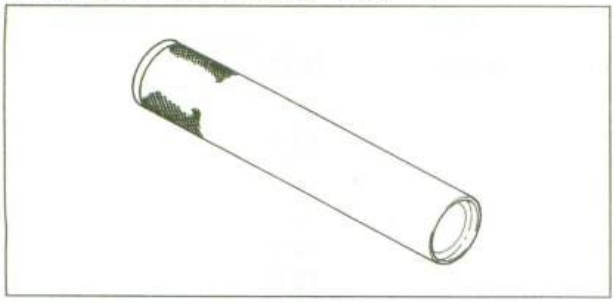
Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
10 mm Engine Mounting Bolts and Nuts	44	4.5	33	
8 mm Engine Mounting Bolts and Nuts	29	3.0	22	
Oil Pipe Bolt	8.8	0.90	78 in-lb	
Oil Pipe Banjo Bolts	20	2.0	14.5	
Cylinder Head Bolts Φ10	49	5.0	36	S, M (washer, threads)
Cylinder Head Allen Bolts Φ8	34	3.5	25	S
Cylinder Head Nuts Φ8	25	2.5	18.0	S
Cylinder Head Nuts Φ6	7.8	0.80	69 in-lb	S
Cylinder Head Jacket Plug	20	2.0	14.5	
Camshaft Chain Holder Bolts	8.8	0.90	78 in-lb	
Front Lower Chain Guide Bolts	8.8	0.90	78 in-lb	
Rear Lower Chain Guide Bolts	8.8	0.90	78 in-lb	L
Front Upper Chain Guide Bolts	29	3.0	22	
Rear Upper Chain Guide Bolt	29	3.0	22	
Intermediate Sprocket Shaft Plug	3.4	0.35	30 in-lb	
Cylinder Bolts Φ8	18	1.8	13.0	
Cylinder Nuts Φ8	25	2.5	18.0	S
Carburetor Holder Bolts	12	1.2	104 in-lb	
Clutch:				
Primary Gear Nut	155	16.0	115	
Oil Filter Cover Bolts	8.8	0.90	78 in-lb	
Clutch Cover Bolts	8.8	0.90	78 in-lb	
Clutch Cable Bracket Bolt	8.8	0.90	78 in-lb	
Clutch Cover Damper Bolts (650C)	5.9	0.60	52 in-lb	L
Oil Pressure Relief Valve	15	1.5	11.0	L
Main Oil Passage Plug	25	2.5	18.0	
Crankshaft Oil Seal Retainer Screw	4.9	0.50	43 in-lb	
Clutch Spring Bolts	8.8	0.90	78 in-lb	
Clutch Hub Nut	130	13.5	98	R
Kickstarter Stopper Bolts	8.8	0.90	78 in-lb	
Kick Pedal Screw	–	–	–	ST
Kick Pedal Allen Bolt	–	–	–	ST
Engine Lubrication System:				
Oil Filler Plug	1.5	0.15	13 in-lb	
Engine Drain Plug	29	3.0	22	
Engine Drain Allen Bolt	25	2.5	18.0	
Oil Filter Bolts	8.8	0.90	78 in-lb	
Oil Pressure Relief Valve	15	1.5	11.0	L
Clutch Cover Oil Pump Bolts	12	1.2	104 in-lb	
Oil Pump Cover Screws (Crankcase Pump)	4.9	0.50	43 in-lb	
Oil Pump Screw (Crankcase Pump)	4.9	0.50	43 in-lb	L
Oil Pipe Banjo Bolts	20	2.0	14.5	
Oil Pipe Bolt	8.8	0.90	78 in-lb	
Oil Passage Plug	25	2.5	18.0	
Engine Removal/Installation:				
10 mm Engine Mounting Bolts and Nuts	44	4.5	33	
8 mm Engine Mounting Bolts and Nuts	29	3.0	22	
Swingarm Pivot Nut	88	9.0	65	

Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Crankshaft/Transmission:				
Engine Drain Plug	29	3.0	22	
Engine Drain Allen Bolt	25	2.5	18.0	
Crankcase Bolts Φ8 mm	25	2.5	18.0	
Φ6 mm Allen	12	1.2	104 in-lb	
Φ6 mm	9.8	1.0	87 in-lb	
Kickstarter Stopper Bolts (650A)	8.8	0.90	78 in-lb	
Main Bearing Retainer Screws	4.9	0.50	43 in-lb	L
Bearing Retainer Screws	4.9	0.50	43 in-lb	
Primary Gear Nut	155	16.0	115	
Magneto Flywheel Bolt (650A)	120	12.0	87	M (seating surface)
Magneto Flywheel Bolt (650C)	216	22	159	M (seating surface)
Starter Motor Clutch Bolts (650C)	34	3.5	25	L
Rear Camshaft Chain Guide Bolts	8.8	0.90	78 in-lb	
Magneto Case Allen Bolts (650C)	12	1.2	104 in-lb	L (1)
External Shift Mechanism Cover Bolts	8.8	0.90	78 in-lb	
Engine Sprocket Nut	98	10.0	72	
Gear Positioning Lever Nut	8.8	0.90	78 in-lb	
Shift Shaft Return Spring Pin (Bolt)	29	3.0	22	L
Neutral Switch (650C)	15	1.5	11.0	
Shift Drum Cam Bolt	12	1.2	104 in-lb	L
Wheels/Tires:				
Front Axle	88	9.0	65	S
Front Axle Clamp Nuts	9.3	0.95	82 in-lb	S
Rear Axle Nut	98	10.0	72	
Tire Air Valve Nuts	1.5	0.15	13 in-lb	
Spoke Nipples	1.5 ~ 2.1	0.15 ~ 0.21	13 ~ 18 in-lb	
Final Drive:				
Rear Axle Nut	98	10.0	72	
Engine Sprocket Cover Bolt	–	–	–	L (1)
Engine Sprocket Nut	98	10.0	72	
Rear Sprocket Nuts (650A)	29	3.0	22	
Rear Sprocket Nuts (650C)	32	3.3	24	
Rear Sprocket Studs	–	–	–	L
Brakes:				
Bleed Valves	7.8	0.80	69 in-lb	
Brake Hose Banjo Bolts	25	2.5	18.0	
Brake Pipe Banjo Bolts	25	2.5	18.0	
Brake Pipe Joint Bolts	9.8	1.0	87 in-lb	
Brake Lever Pivot Locknut	5.9	0.60	52 in-lb	
Brake Lever Pivot Bolt	5.9	0.60	52 in-lb	
Brake Lever Adjuster Locknut	5.9	0.60	52 in-lb	
Front Brake Light Switch Screws (650C)	1.1	0.11	10 in-lb	
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in-lb	
Front Brake Reservoir Cap Screws	1.5	0.15	13 in-lb	
Rear Brake Reservoir Cap Screws	1.5	0.15	13 in-lb	
Caliper Bolts (Front)	25	2.5	18.0	
Brake Pad Bolts	18	1.8	13.0	
Front Disc Bolts (650A)	9.8	1.0	87 in-lb	
Front Disc Bolts (650C)	23	2.3	16.5	

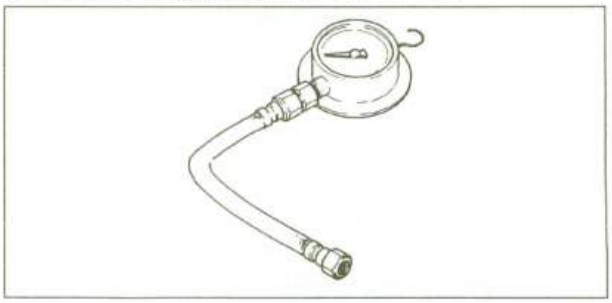
Fastener	Torque			Remarks
	N-m	kg-m	ft-lb	
Rear Disc Bolts	23	2.3	16.5	
Rear Master Cylinder Bracket Locknut	18	1.8	13.0	
Suspension:				
Front Fork Air Screws	1.2	0.12	10 in-lb	
Front Fork Upper Clamp Bolts	20	2.0	14.5	
Front Fork Lower Clamp Bolts	25	2.5	18.0	
Front Fork Top Plugs	29	3.0	22	
Push Rod Nut	15	1.5	11.0	
Front Fork Bottom Allen Bolts	54	5.5	40	L
Rear Shock Absorber Bolts	39	4.0	29	
Swingarm Pivot Nut	88	9.0	65	
Uni-Trak				
Rocker Arm Nut	98	10.0	72	
Tie-rod Nuts	81	8.3	60	
Steering:				
Steering Stem Head Nut	44	4.5	33	
Steering Stem Nut	Hand-Tight or 3.9	Hand-Tight or 0.40	Hand-Tight or 35 in-lb	
Handlebar Clamp Bolts	25	2.5	18.0	
Handlebar Switch Housing Screws	3.5	0.36	31 in-lb	
Front Fork Upper Clamp Bolts	21	2.1	15.0	
Front Fork Lower Clamp Bolts	24	2.4	17.5	
Electrical System:				
Spark Plug	14	1.4	10.0	
Pickup Coil Screws	2.5	0.25	22 in-lb	
Magneto Cover Bolts	8.8	0.90	78 in-lb	L (1), 650A
Magneto Cover Damper Bolts (650C)	8.8	0.90	78 in-lb	L
Magneto Case Allen Bolts (650C)	12	1.2	104 in-lb	L (1)
Timing Inspection Plug	2.5	0.25	22 in-lb	
Magneto Stator Bolts (650A)	8.8	0.90	78 in-lb	
Magneto Stator Bolts (650C)	12	1.2	104 in-lb	
Lead Clamp Screws	2.5	0.25	22 in-lb	
Magneto Flywheel Bolt (650A)	120	12.0	87	M (Seating surface)
Magneto Flywheel Bolt (650C)	216	22.0	159	R, M (Seating surface)
Starter Motor Terminal Locknut (650C)	11	1.1	95 in-lb	
Starter Motor Terminal Nut (650C)	4.9	0.50	43 in-lb	
Starter Relay Terminal Nut (650C)	4.9	0.50	43 in-lb	
Starter Motor Through Bolts (650C)	4.9	0.50	43 in-lb	
Starter Motor Mounting Bolts (650C)	8.8	0.90	78 in-lb	
Starter Clutch Bolts (650C)	34	3.5	25	L
Thermostatic Fan Switch (650C)	8.8	0.90	78 in-lb	
Coolant Temperature Switch (650C)	8.8	0.90	78 in-lb	
Neutral Switch (650C)	15	1.5	11.0	

Special Tools and Sealant

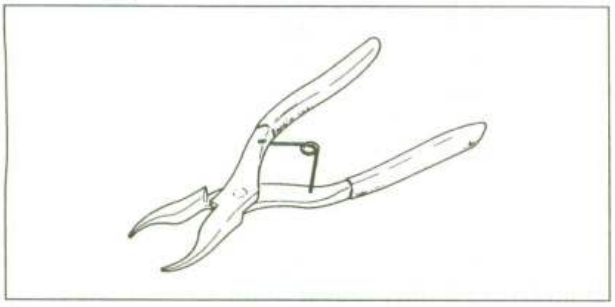
Steering Stem Bearing Driver: 57001-137



Oil Pressure Gauge, 5 kg/cm²: 57001-125



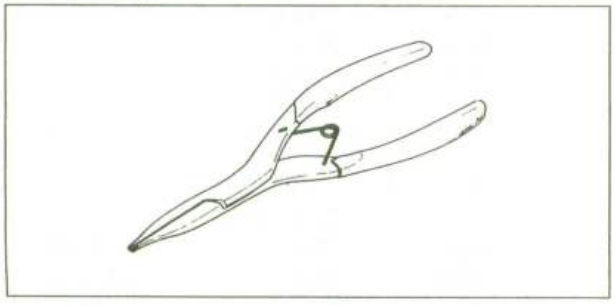
Inside Circlip Pliers: 57001-143



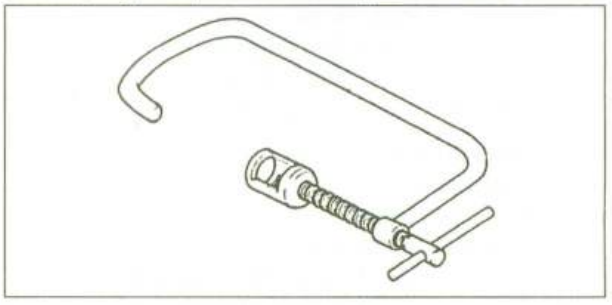
Compression Gauge: 57001-221



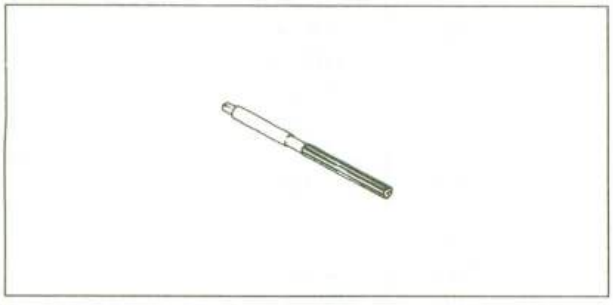
Outside Circlip Pliers: 57001-144



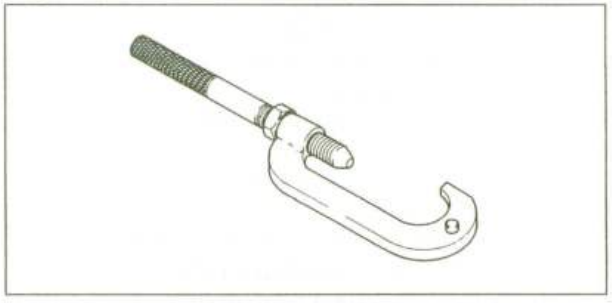
Valve Spring Compressor Assembly: 57001-241



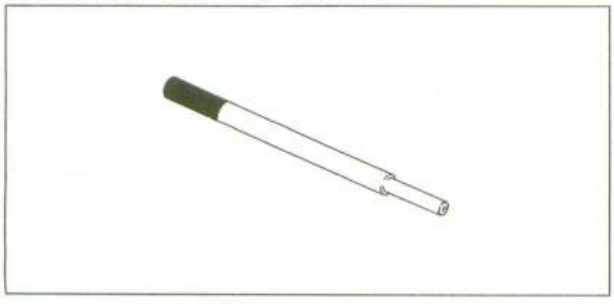
Valve Guide Reamer, Φ7: 57001-162



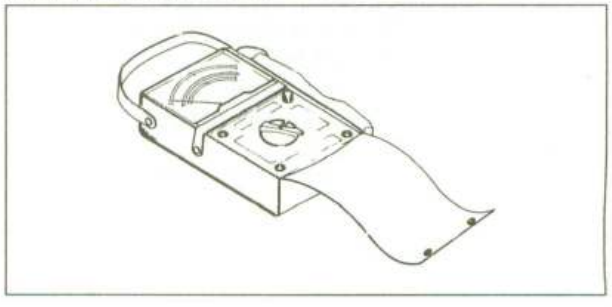
Engine Sprocket Holder: 57001-307



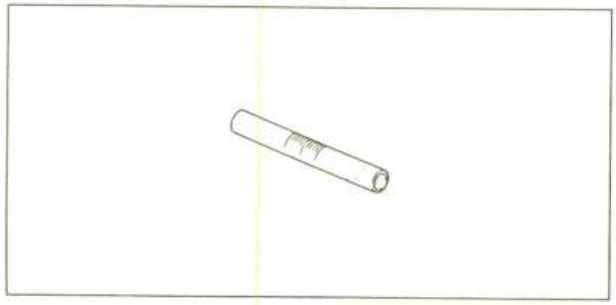
Valve Guide Arbor, Φ7: 57001-163



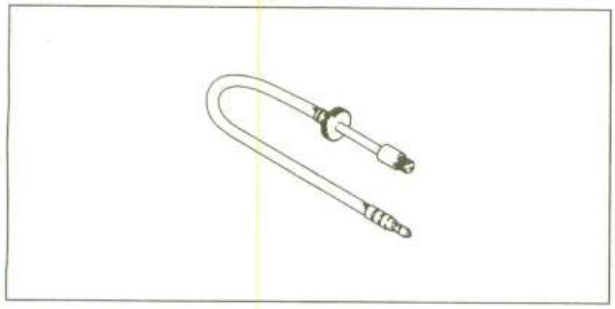
Hand Tester: 57001-983



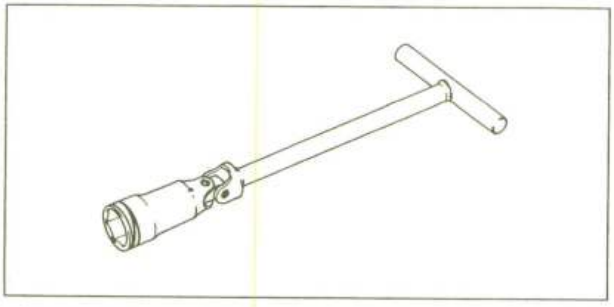
Fuel Level Gauge: 57001-1017



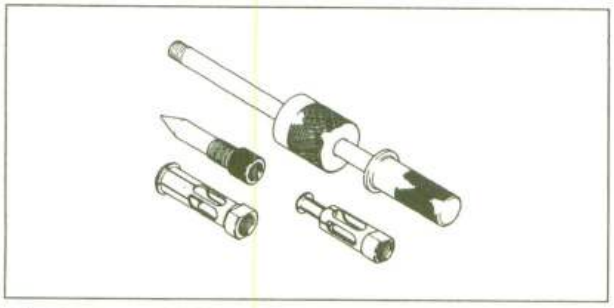
Compression Gauge Adapter, M12 x 1.25: 57001-1018



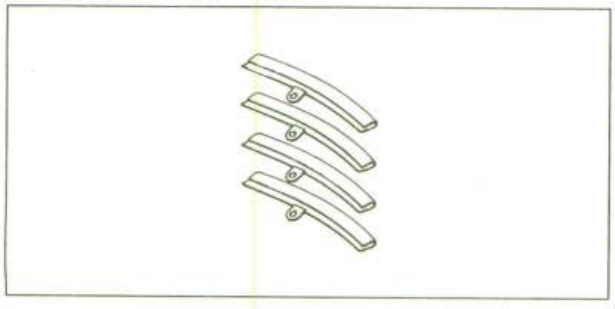
Spark Plug Wrench, Hex 18: 57001-1024



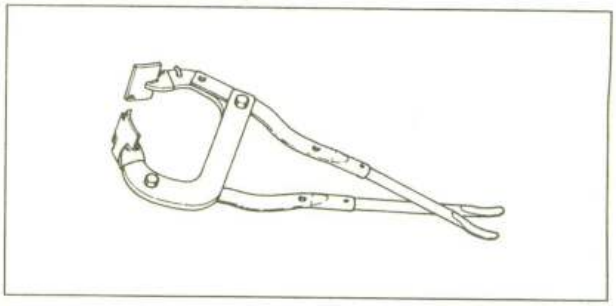
Oil Seal & Bearing Remover: 57001-1058



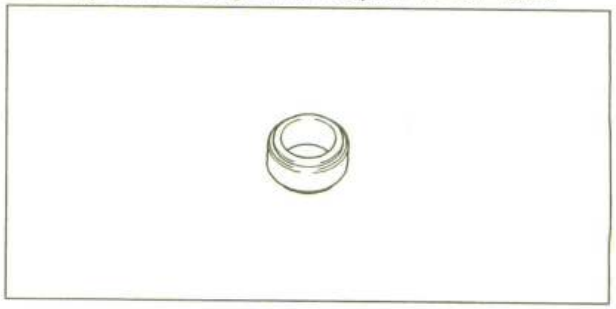
Rim Protector: 57001-1063



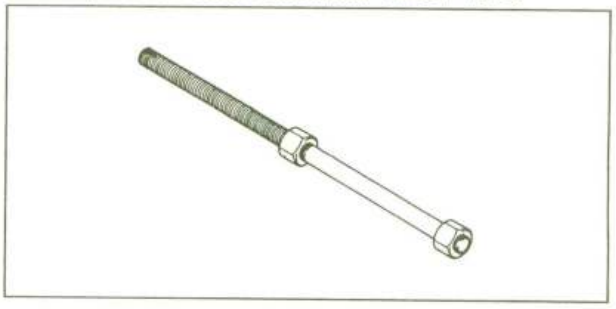
Bead Breaker Assembly: 57001-1072



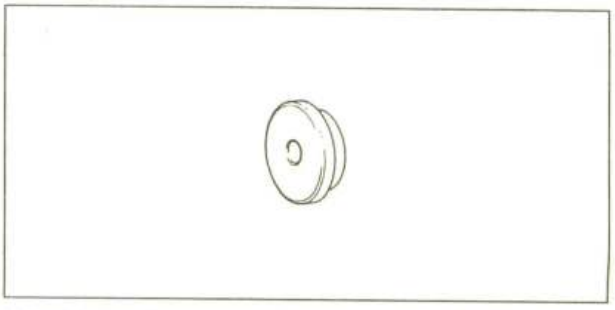
Steering Stem Bearing Driver Adapter: 57001-1074



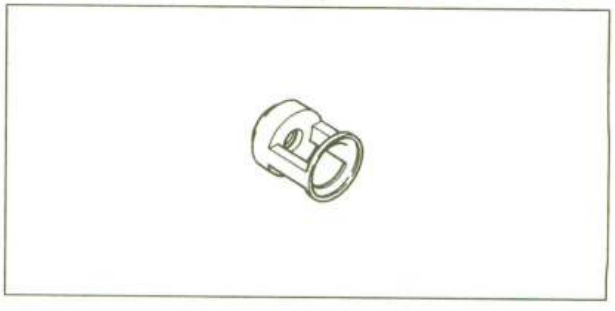
Head Pipe Outer Race Press Shaft: 57001-1075



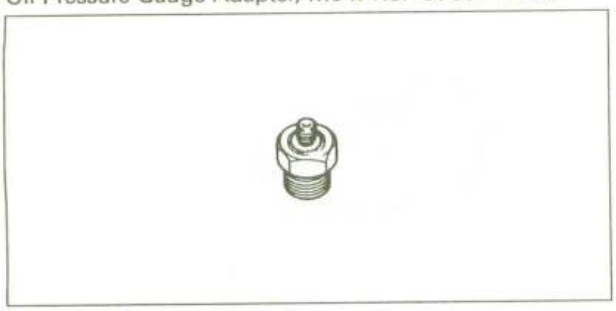
Head Pipe Outer Race Driver: 57001-1077



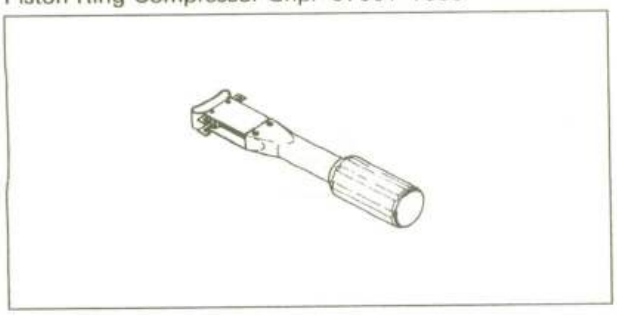
Valve Spring Compressor Adapter, Φ29.5: 57001-1078



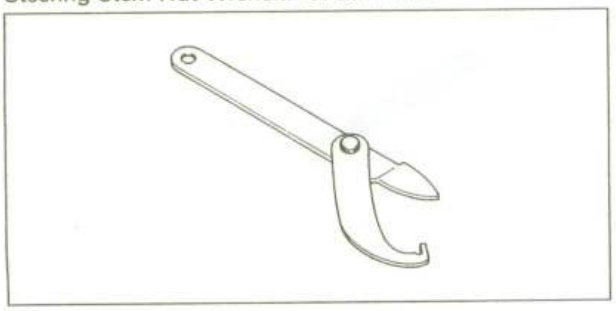
Oil Pressure Gauge Adapter, M6 x 1.0: 57001-1088



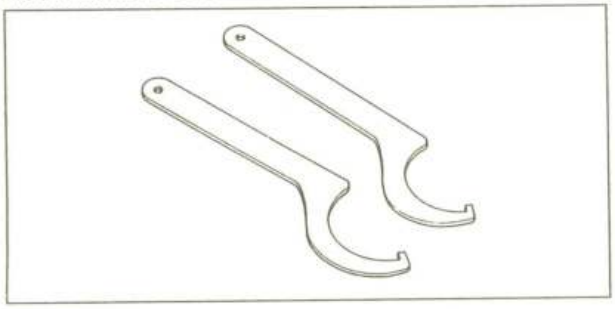
Piston Ring Compressor Grip: 57001-1095



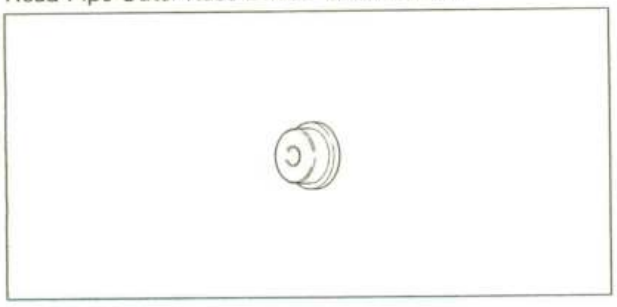
Steering Stem Nut Wrench: 57001-1100



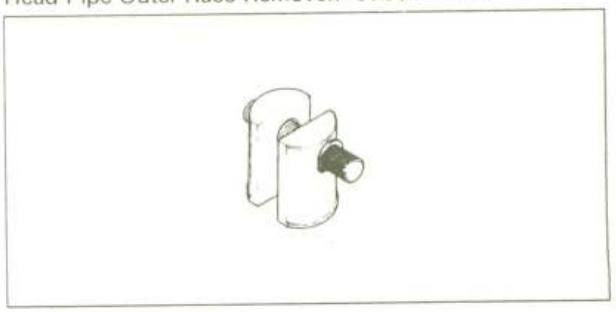
Hook Wrench: 57001-1101



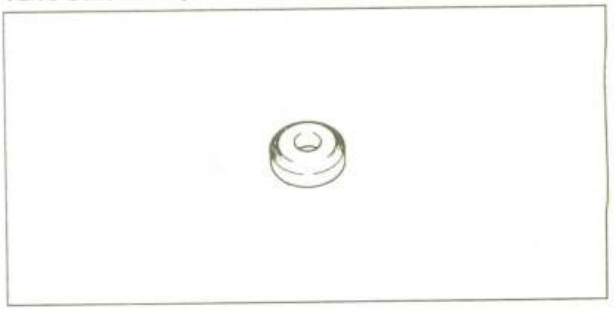
Head Pipe Outer Race Driver: 57001-1106



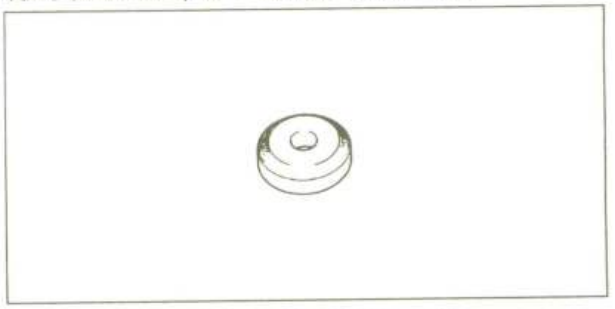
Head Pipe Outer Race Remover: 57001-1107



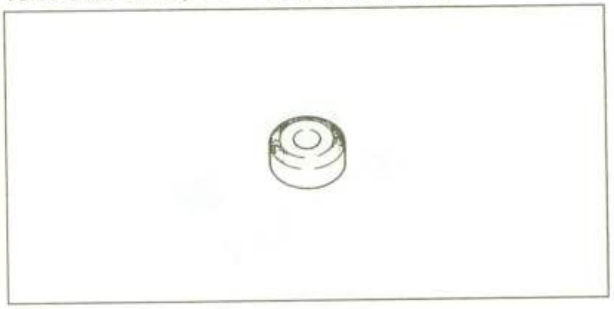
Valve Seat Cutter, 45° – Φ35: 57001-1116



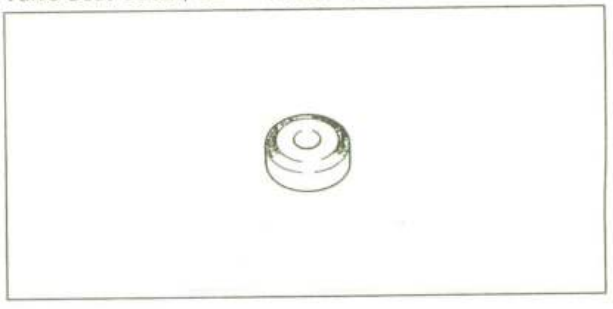
Valve Seat Cutter, 45° – Φ41.5: 57001-1117



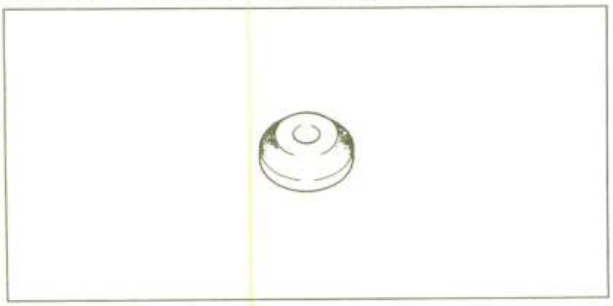
Valve Seat Cutter, 32° – Φ35: 57001-1121



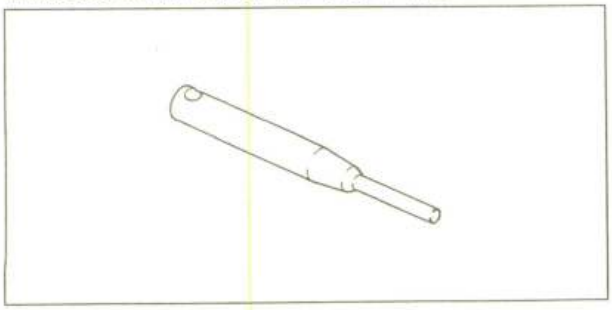
Valve Seat Cutter, 32° – Φ38.5: 57001-1122



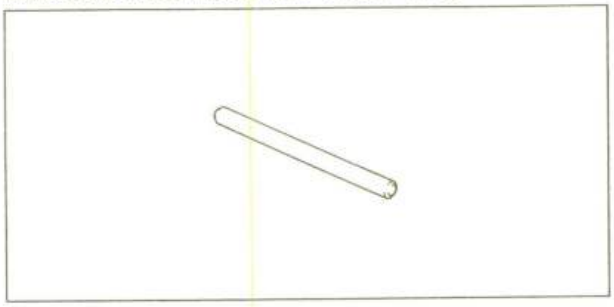
Valve Seat Cutter, 60° – Φ41: 57001-1124



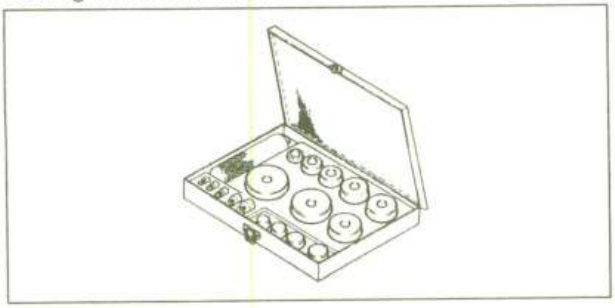
Valve Seat Cutter Holder, Φ7: 57001-1126



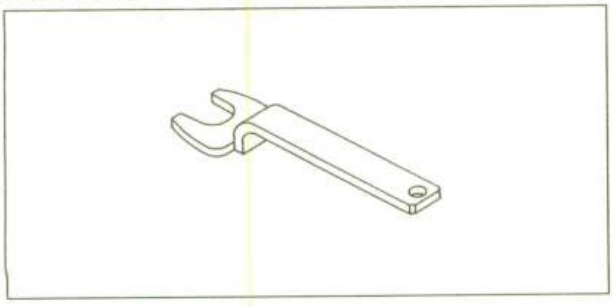
Valve Seat Cutter Holder Bar: 57001-1128



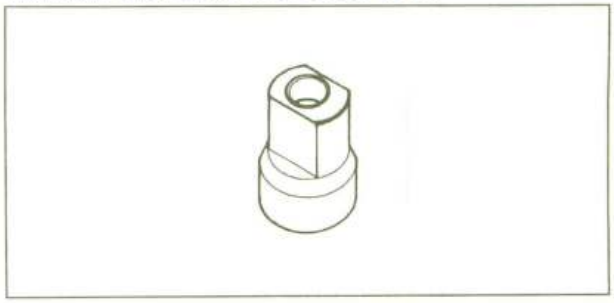
Bearing Driver Set: 57001-1129



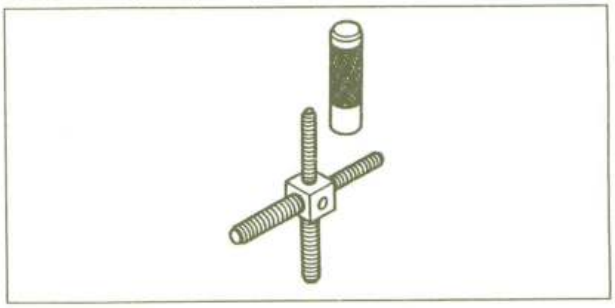
Rotor Holder: 57001-1184



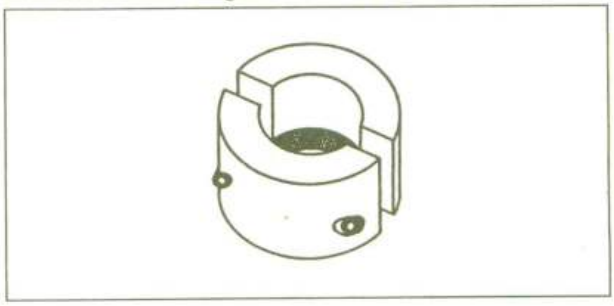
Flywheel Puller, M30 x 1.5: 57001-1191



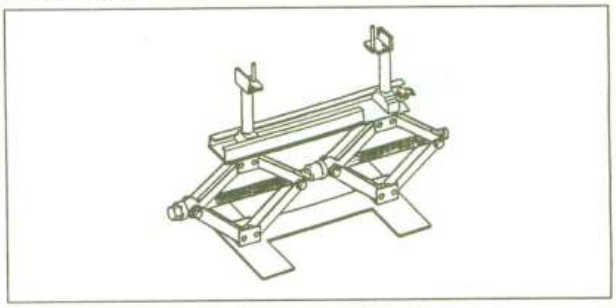
Rotor Puller, M16/M18/M20/M22 x 1.5: 57001-1216



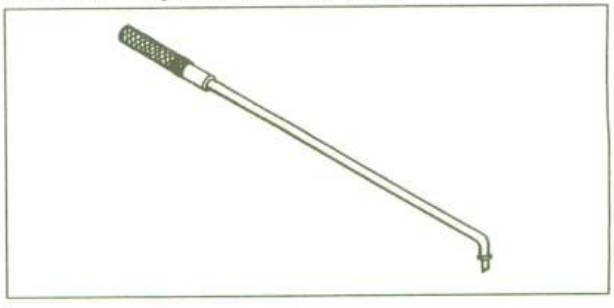
Fork Outer Tube Weight: 57001-1218



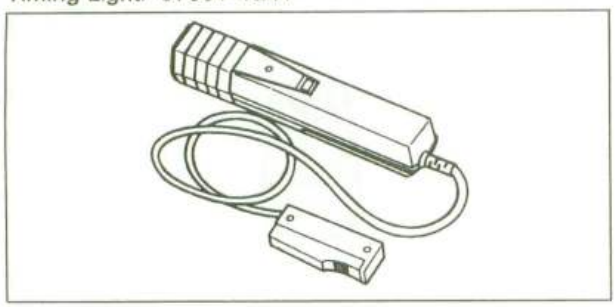
Jack: 57001-1238



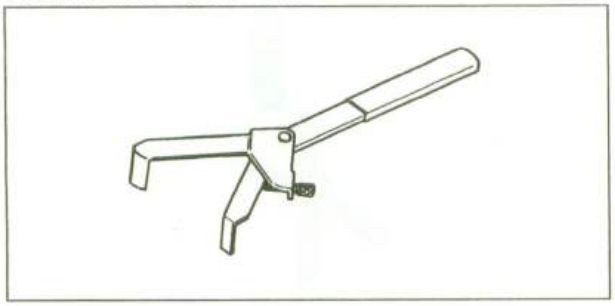
Pilot Screw Adjuster, A: 57001-1239



Timing Light: 57001-1241



Clutch Holder: 57001-1243



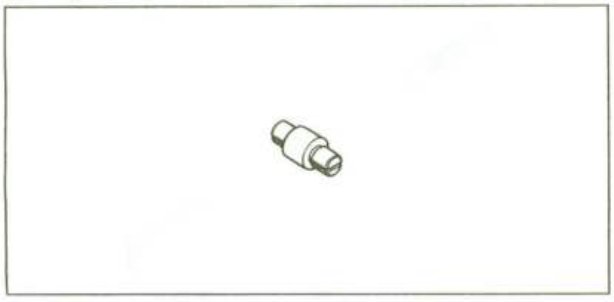
Valve Seat Cutter, 55° – Φ35: 57001-1247



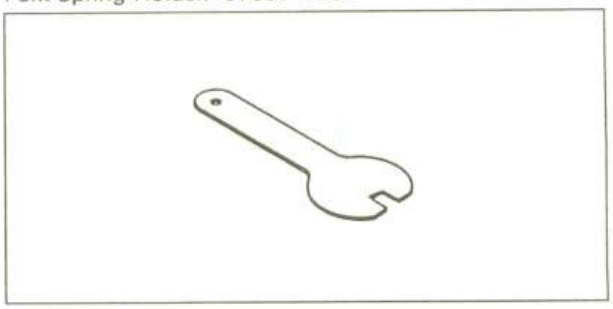
Bearing Remover Shaft: 57001-1265



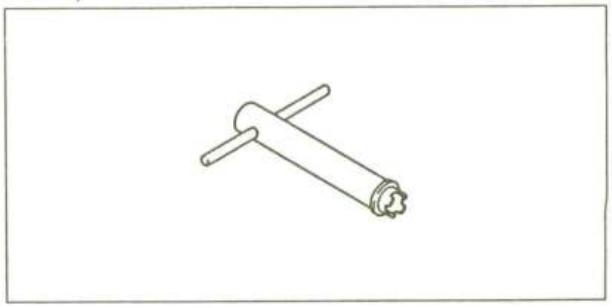
Bearing Remover Head, Φ15 x Φ17: 57001-1267



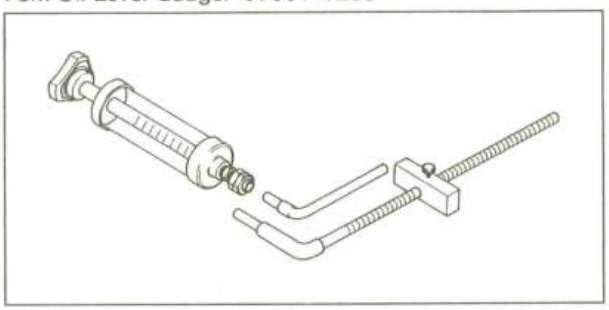
Fork Spring Holder: 57001-1286



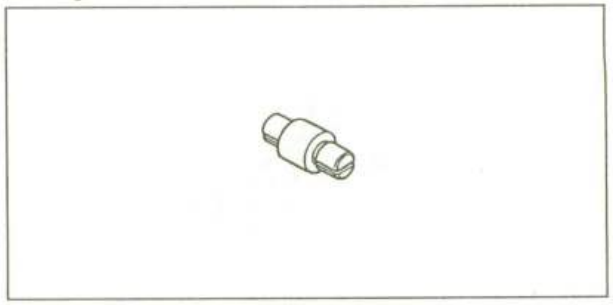
Fork Cylinder Holder: 57001-1287



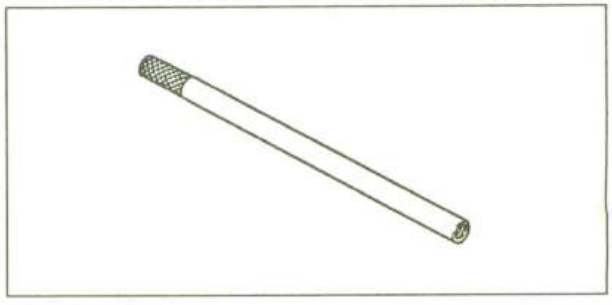
Fork Oil Level Gauge: 57001-1290



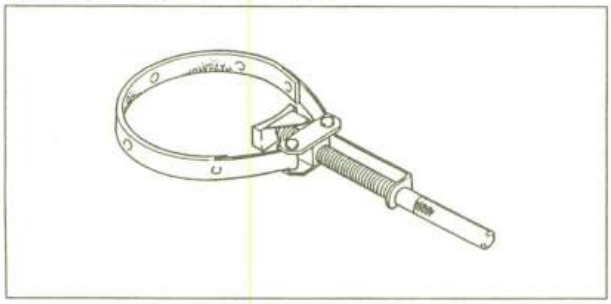
Bearing Remover Head, Φ20 x Φ22: 57001-1293



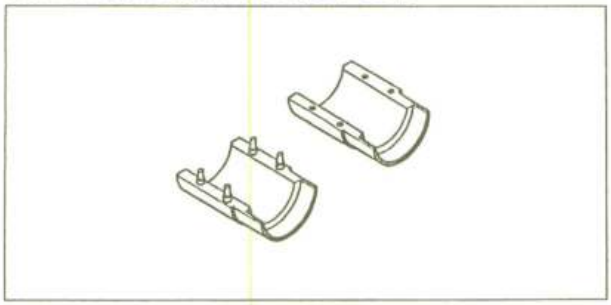
Fork Piston Rod Puller, M10 x 1.0: 57001-1298



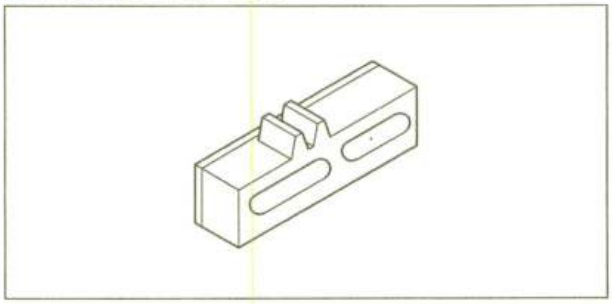
Flywheel Holder: 57001-1313



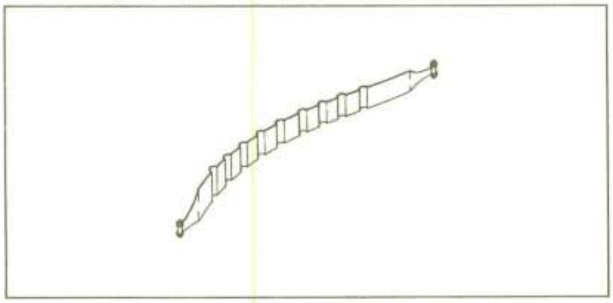
Fork Oil Seal Driver, Φ43: 57001-1340



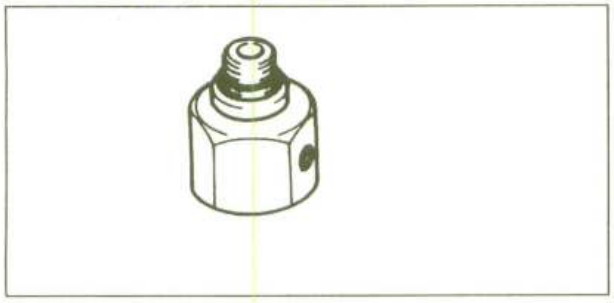
Gear Holder: 57001-1357



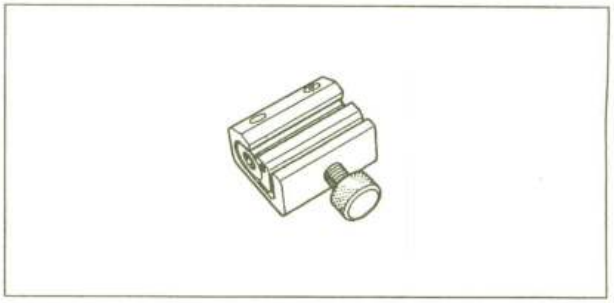
Piston Ring Compressor Belt, Φ95 ~ Φ108: 57001-1358



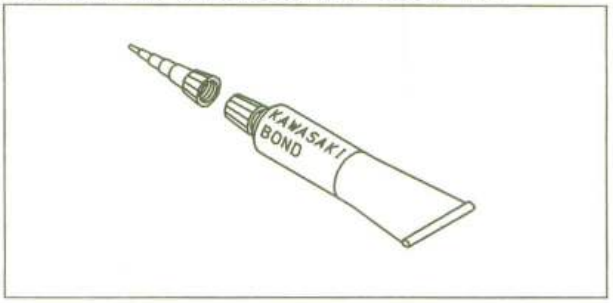
Oil Pressure Gauge Adapter: 57001-1359



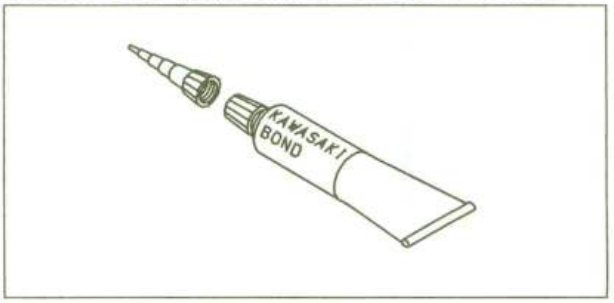
Pressure Cable Luber: K56019-021



Kawasaki Bond (Silicone Sealant): 56019-120

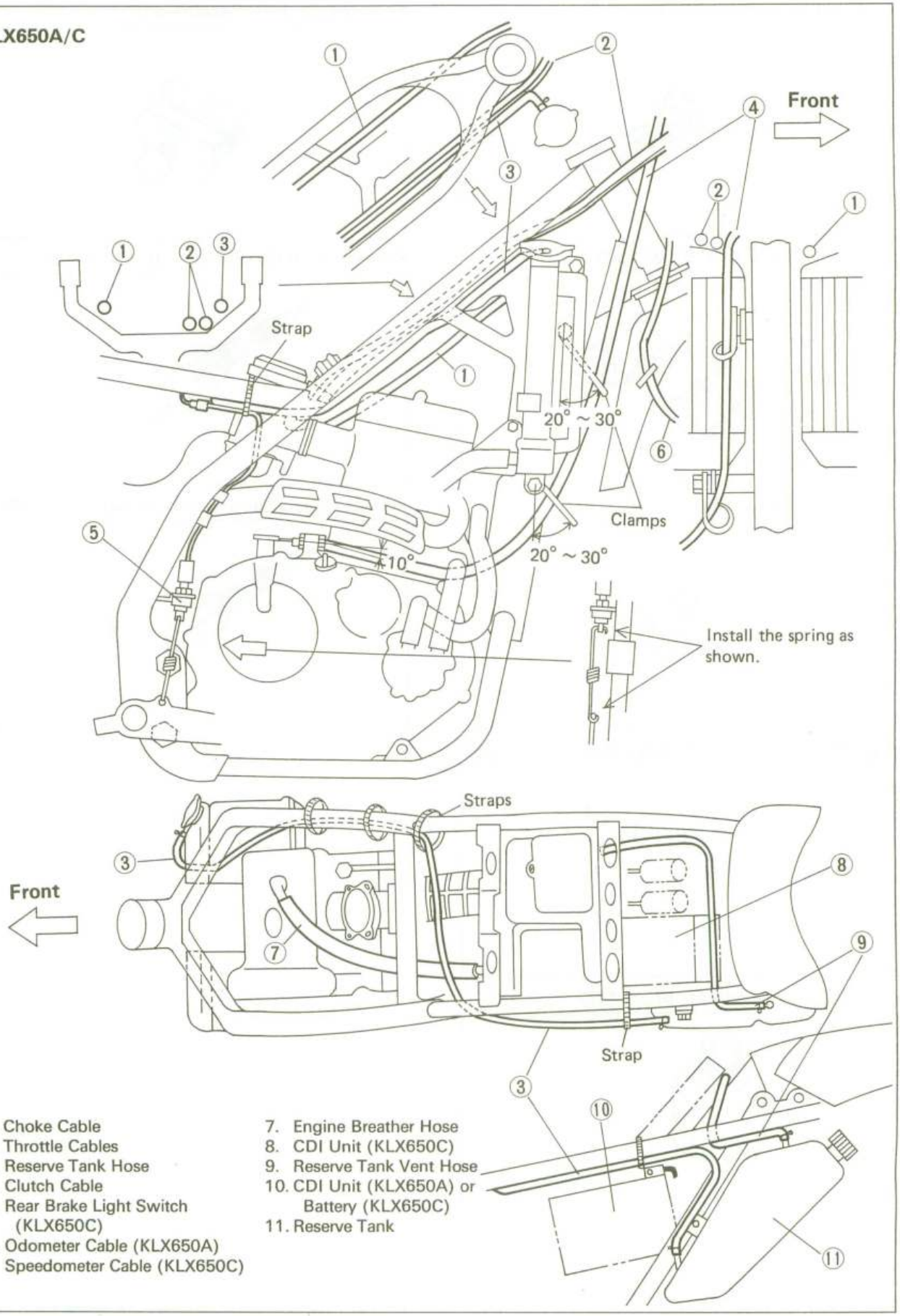


Kawasaki Bond (Liquid Gasket – Silver): 92104-002



Cable, Wire and Hose Routing

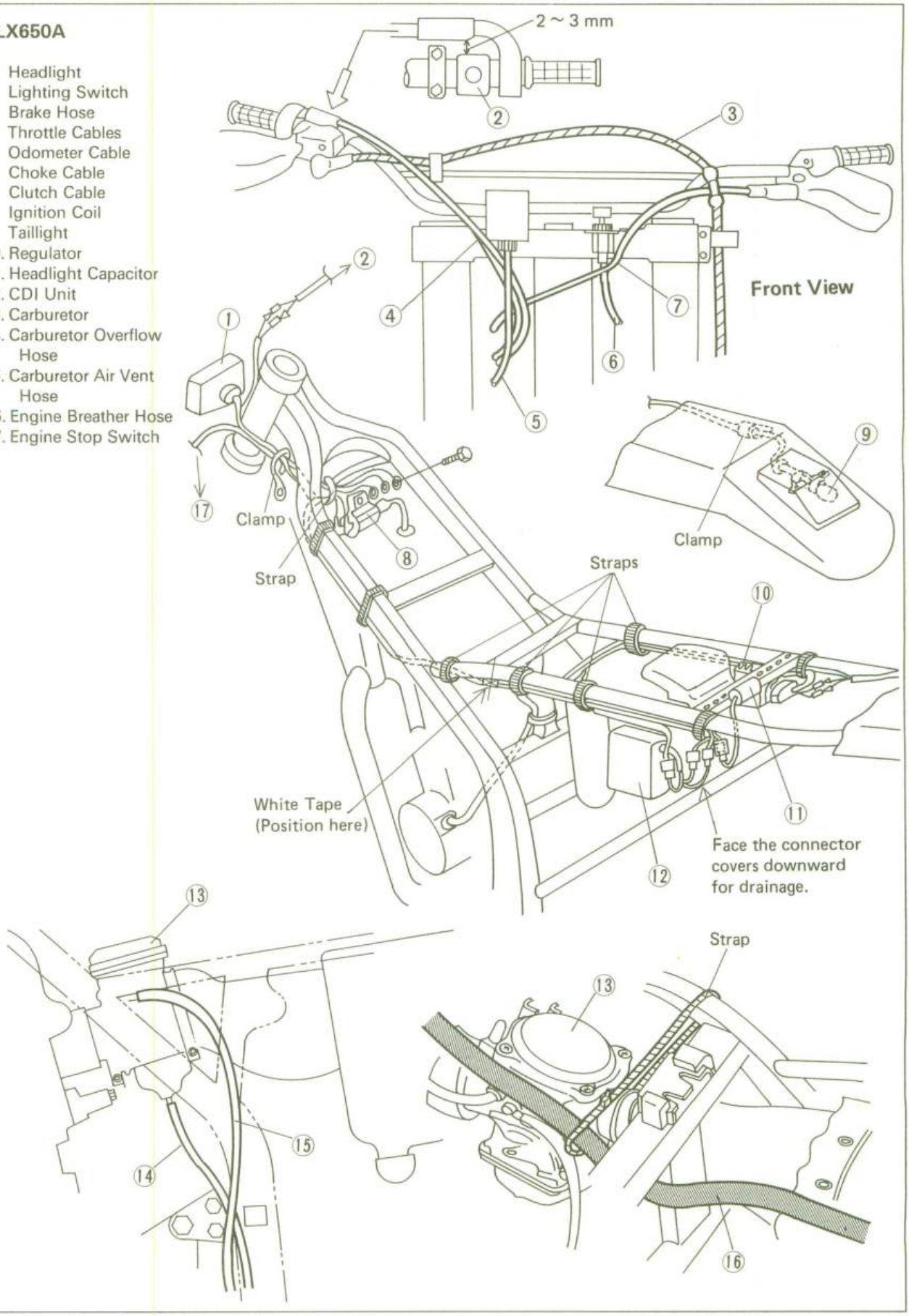
KLX650A/C



1. Choke Cable
2. Throttle Cables
3. Reserve Tank Hose
4. Clutch Cable
5. Rear Brake Light Switch (KLX650C)
6. Odometer Cable (KLX650A) Speedometer Cable (KLX650C)
7. Engine Breather Hose
8. CDI Unit (KLX650C)
9. Reserve Tank Vent Hose
10. CDI Unit (KLX650A) or Battery (KLX650C)
11. Reserve Tank

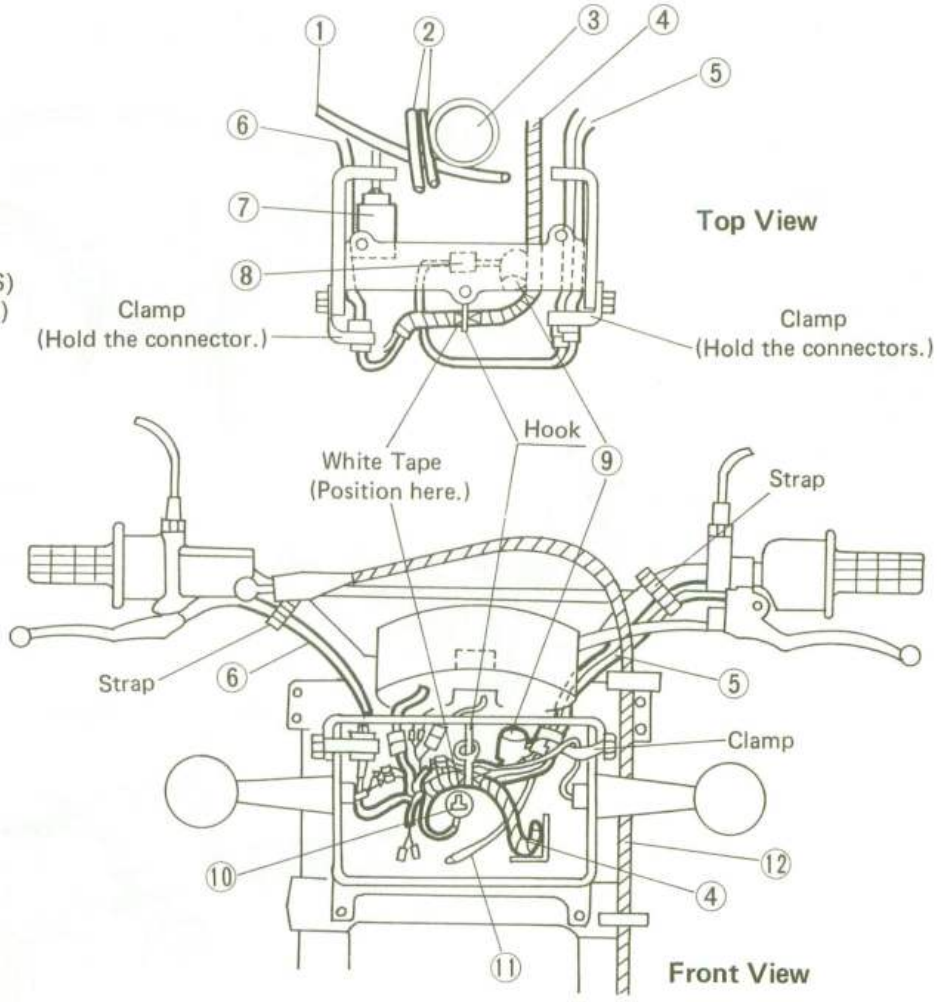
KLX650A

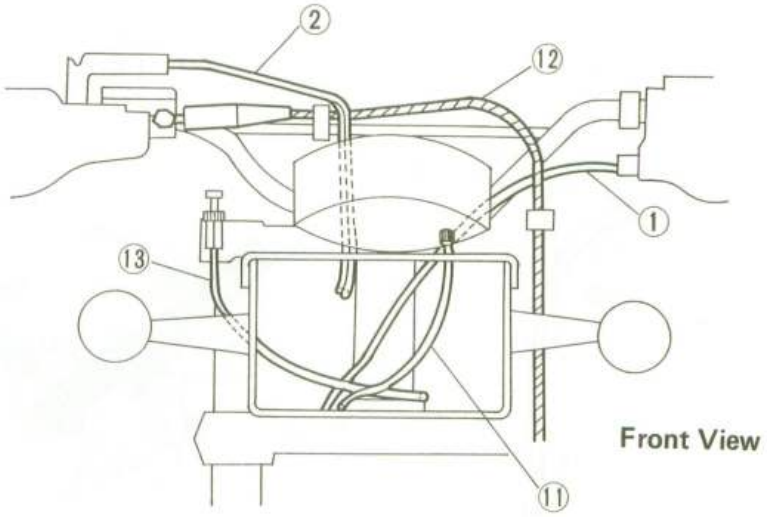
1. Headlight
2. Lighting Switch
3. Brake Hose
4. Throttle Cables
5. Odometer Cable
6. Choke Cable
7. Clutch Cable
8. Ignition Coil
9. Taillight
10. Regulator
11. Headlight Capacitor
12. CDI Unit
13. Carburetor
14. Carburetor Overflow Hose
15. Carburetor Air Vent Hose
16. Engine Breather Hose
17. Engine Stop Switch

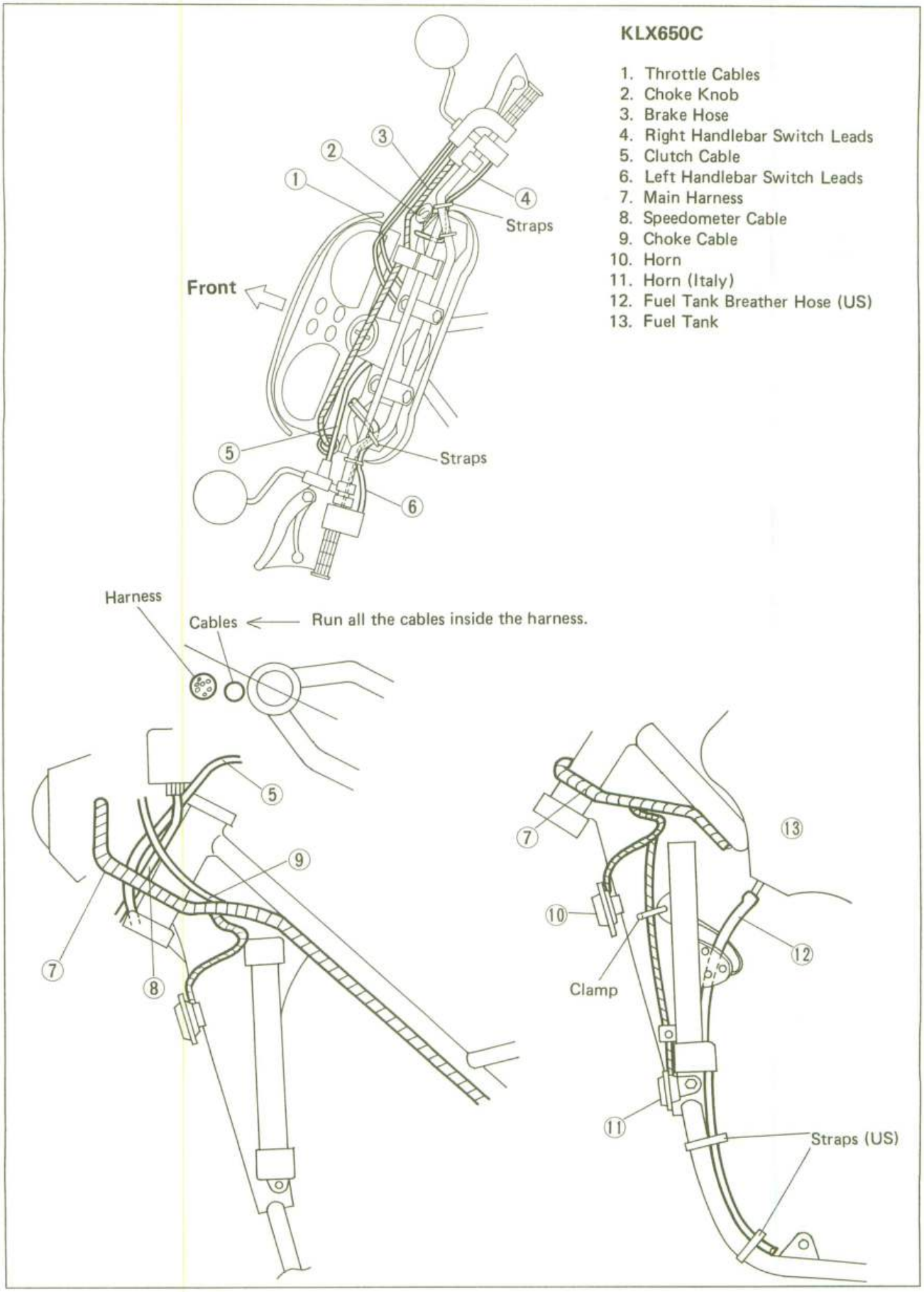


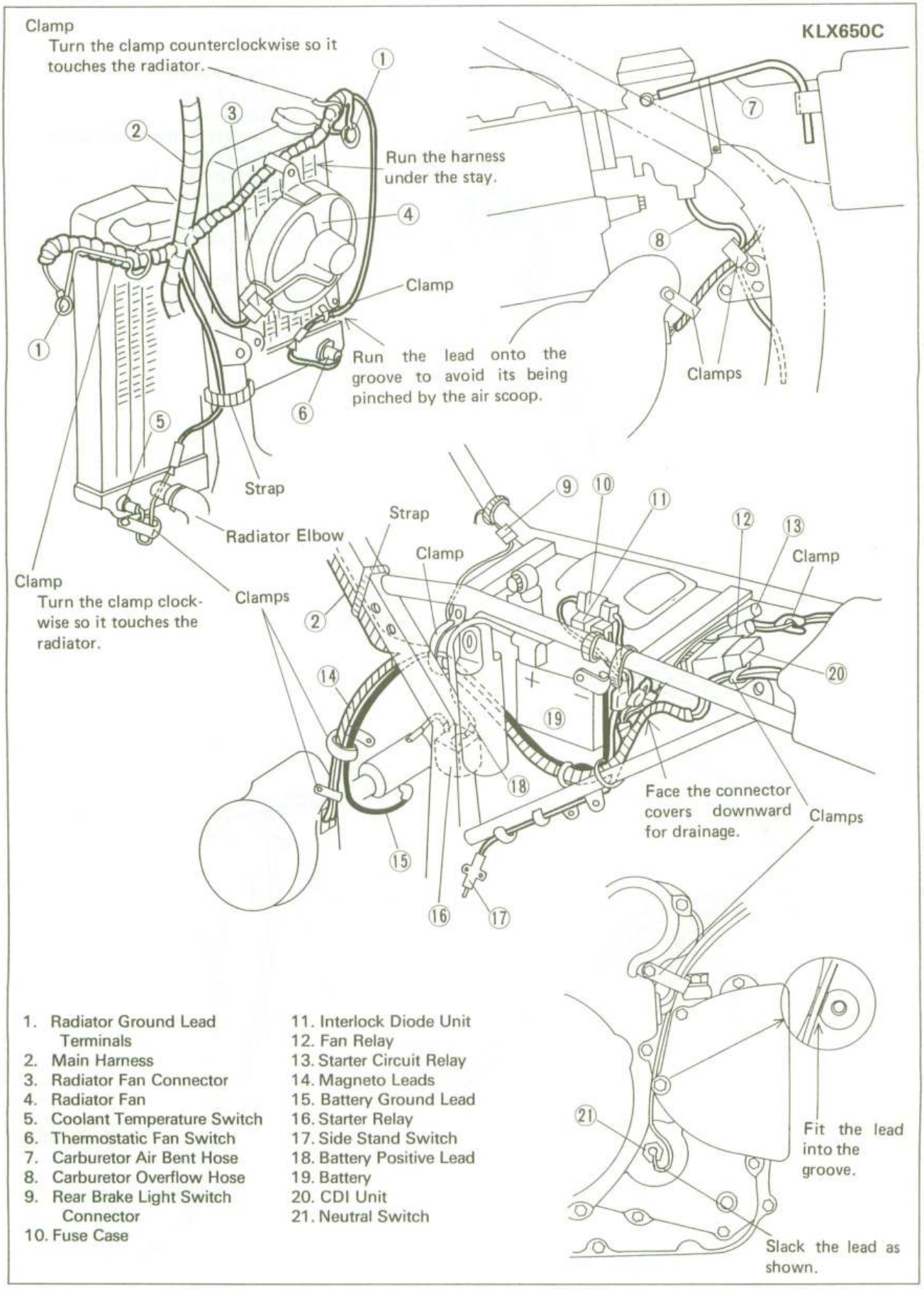
KLX650C

1. Clutch Cable
2. Throttle Cables
3. Head Pipe
4. Main Harness
5. Left Handlebar Switch Leads
6. Right Handlebar Switch Leads
7. Turn Signal Relay
8. Headlight Diode (US, AS)
9. Headlight Relay (US, AS)
10. Headlight Connector
11. Speedometer Cable
12. Brake Hose
13. Choke Cable

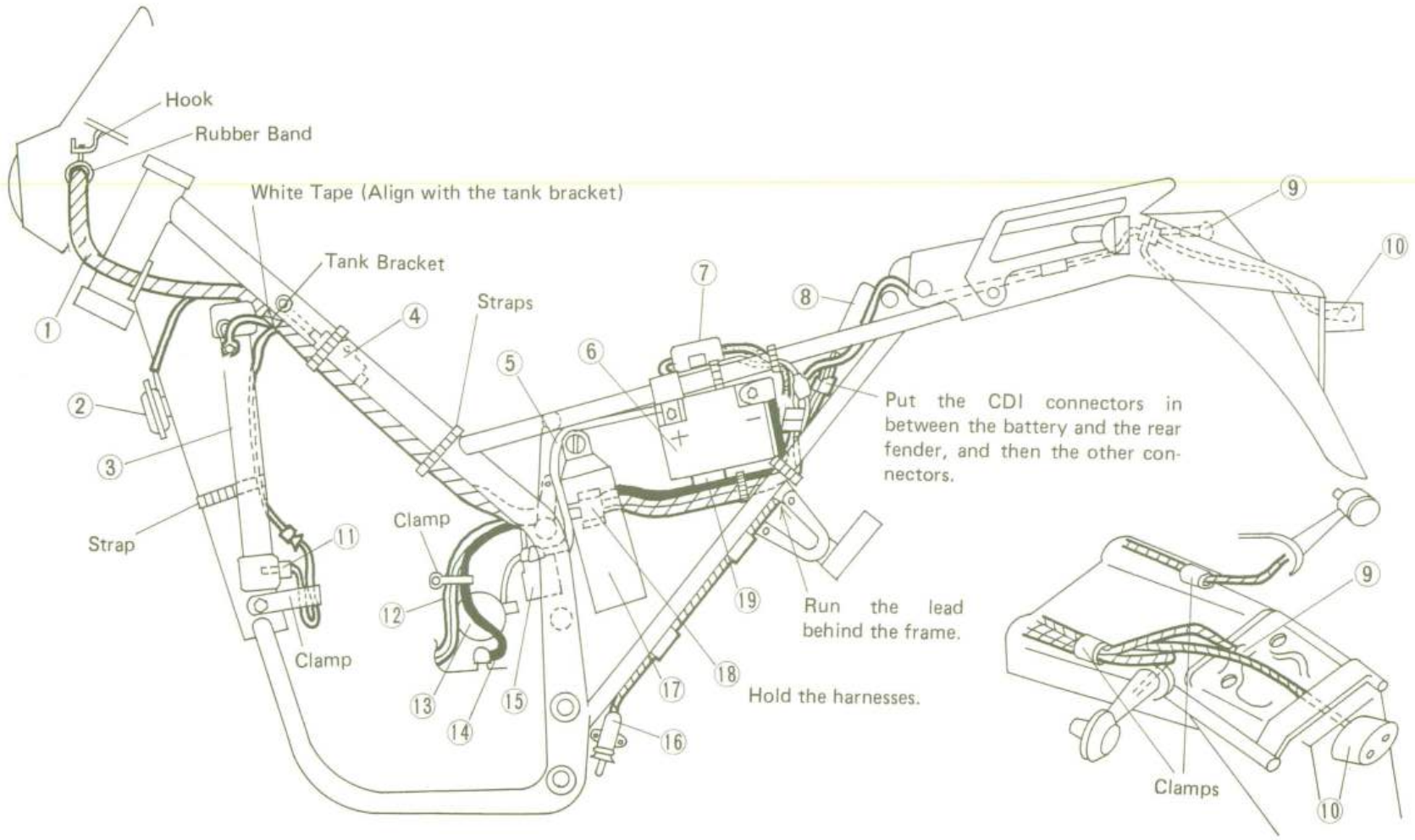





KLX650C
1. Throttle Cables
2. Choke Knob
3. Brake Hose
4. Right Handlebar Switch Leads
5. Clutch Cable
6. Left Handlebar Switch Leads
7. Main Harness
8. Speedometer Cable
9. Choke Cable
10. Horn
11. Horn (Italy)
12. Fuel Tank Breather Hose (US)
13. Fuel Tank
Front
Straps
Straps
Harness
Cables
Run all the cables inside the harness.
Clamp
Straps (US)



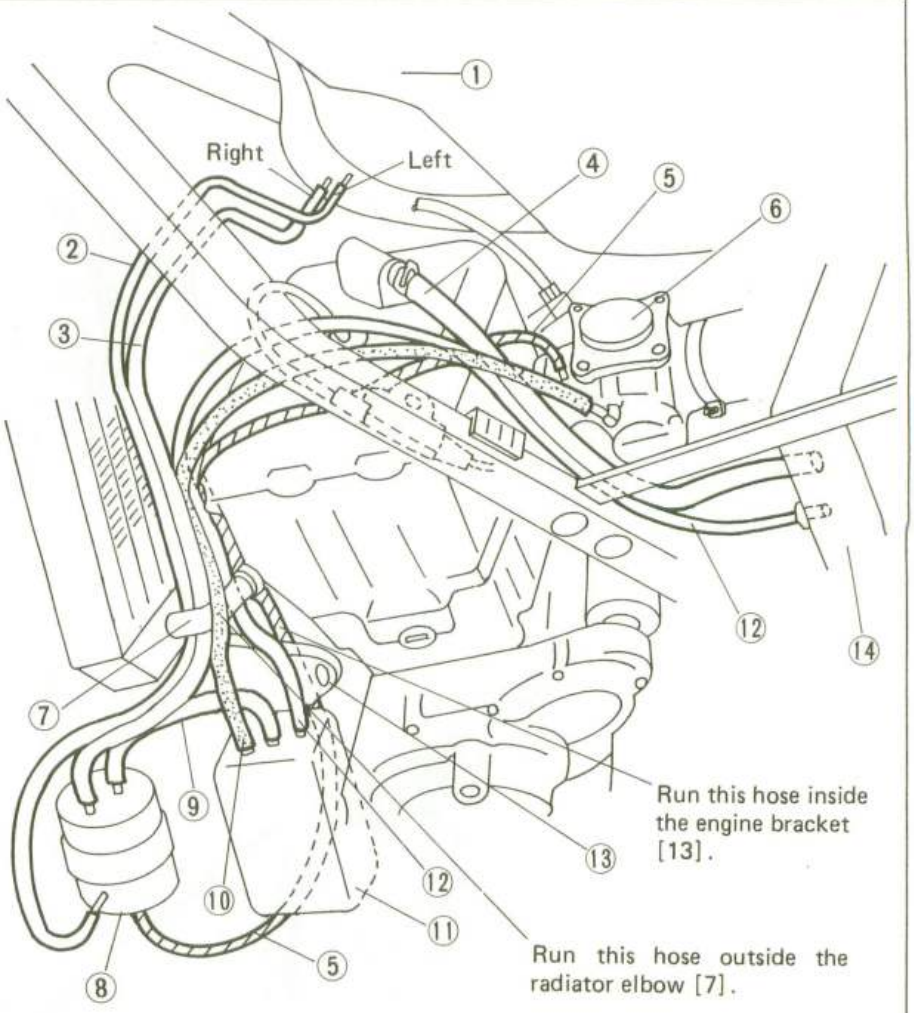
1. Radiator Ground Lead Terminals
2. Main Harness
3. Radiator Fan Connector
4. Radiator Fan
5. Coolant Temperature Switch
6. Thermostatic Fan Switch
7. Carburetor Air Bent Hose
8. Carburetor Overflow Hose
9. Rear Brake Light Switch Connector
10. Fuse Case
11. Interlock Diode Unit
12. Fan Relay
13. Starter Circuit Relay
14. Magneto Leads
15. Battery Ground Lead
16. Starter Relay
17. Side Stand Switch
18. Battery Positive Lead
19. Battery
20. CDI Unit
21. Neutral Switch

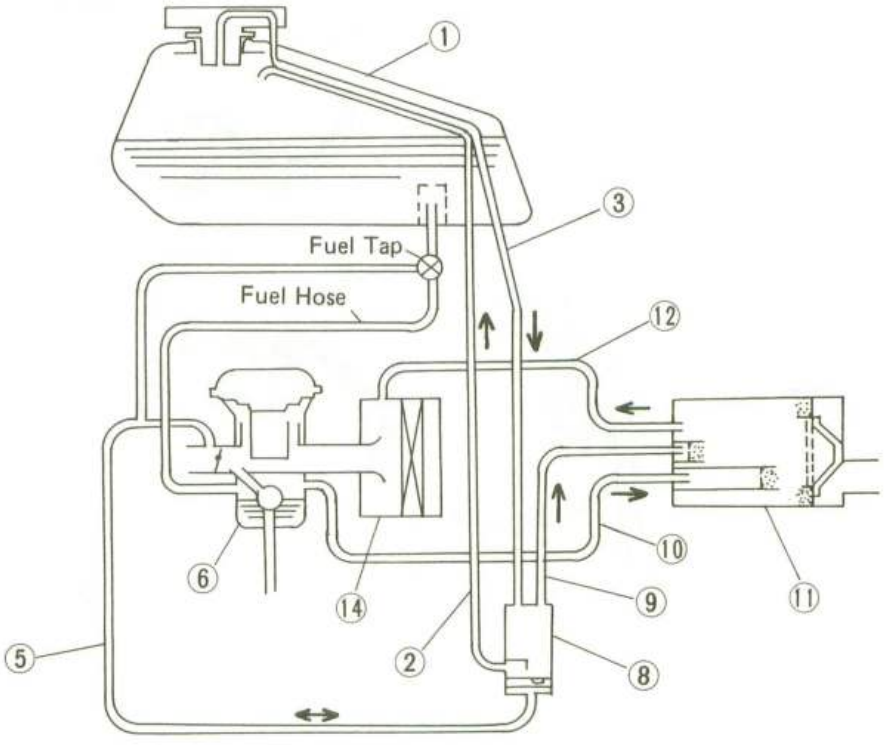


1. Main Harness
2. Horn
3. Radiator
4. Ignition Coil
5. Battery Positive Lead
6. Battery
7. Fuse Box
8. CDI Unit
9. Tail/Brake Light
10. License Light
11. Coolant Temperature Switch
12. Magneto Leads
13. Electric Starter
14. Battery Negative Lead
15. Starter Relay
16. Side Stand Switch
17. Tool Box
18. Tool Box Bracket
19. Regulator/Rectifier

KLX650C
(California)

1. Fuel Tank
2. Return Hose (Red)
3. Breather Hose (Blue)
4. Engine Breather Hose
5. Vacuum Hose (White)
6. Carburetor
7. Radiator Elbow
8. Separator
9. Breather Hose (Blue)
10. Carburetor Air Vent Hose
11. Canister
12. Purge Hose (Green)
13. Engine Bracket
14. Air Cleaner Housing





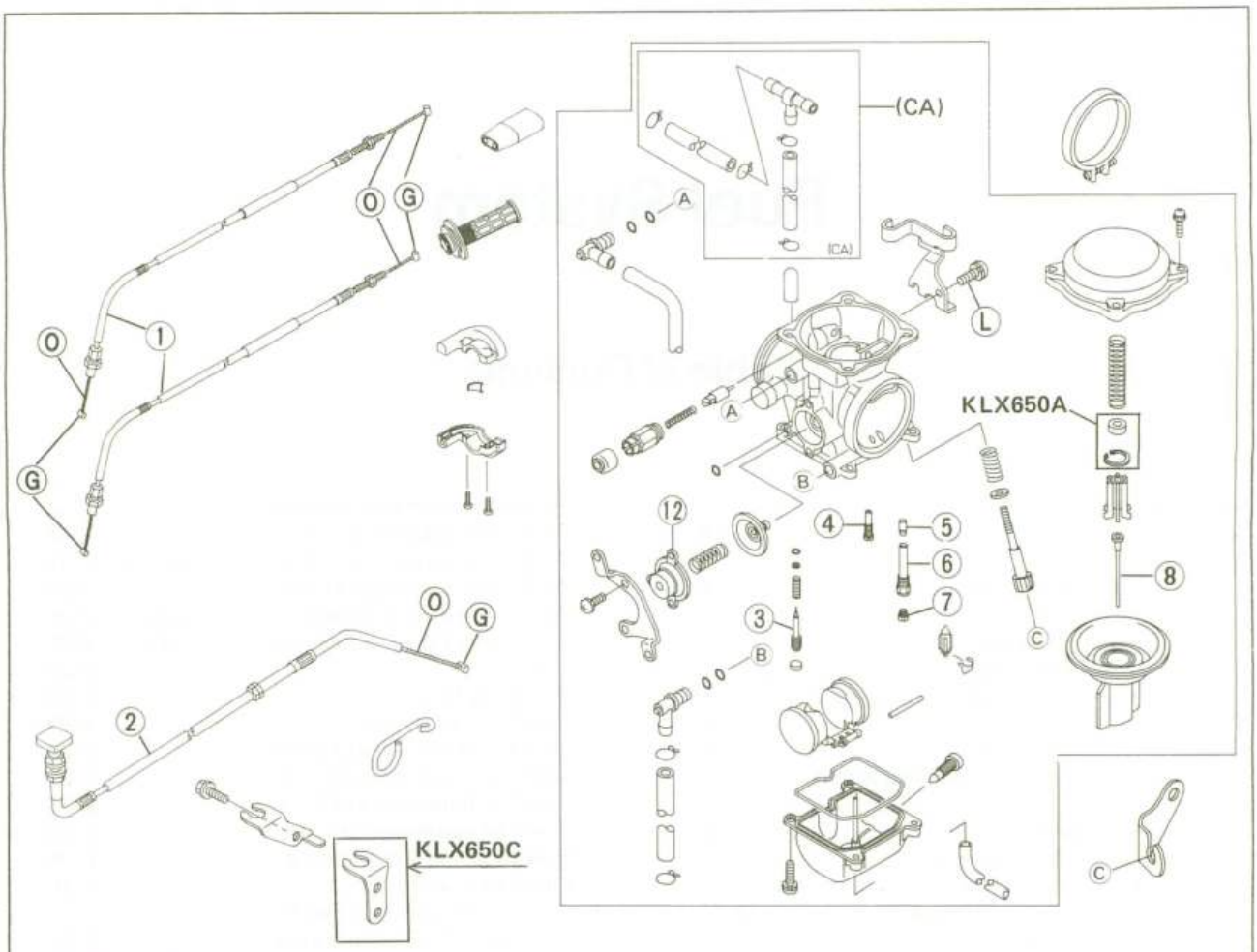
2

Fuel System

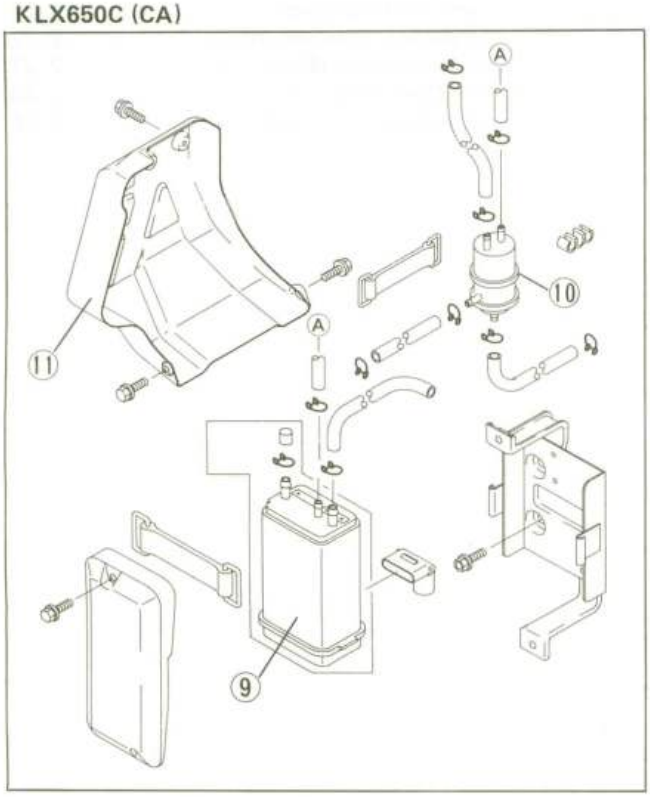
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  Separator Operation Test 2-28
  Canister Inspection (Periodic Inspection) 2-28

Exploded View



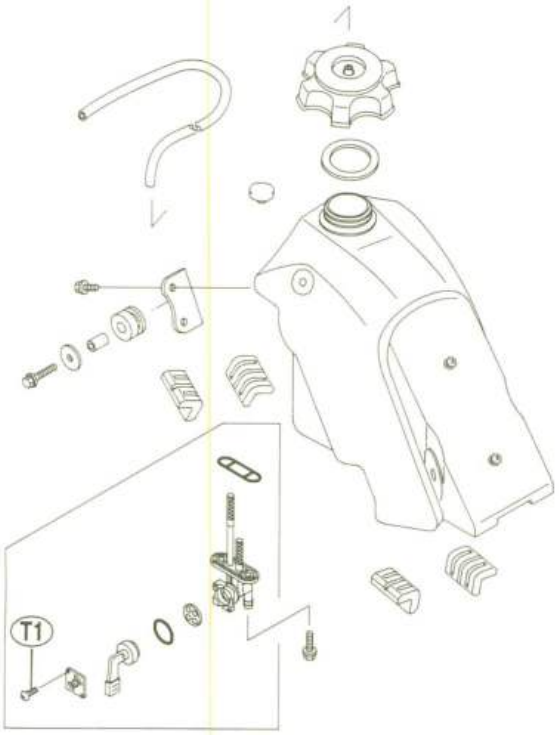
KLX650C (CA)



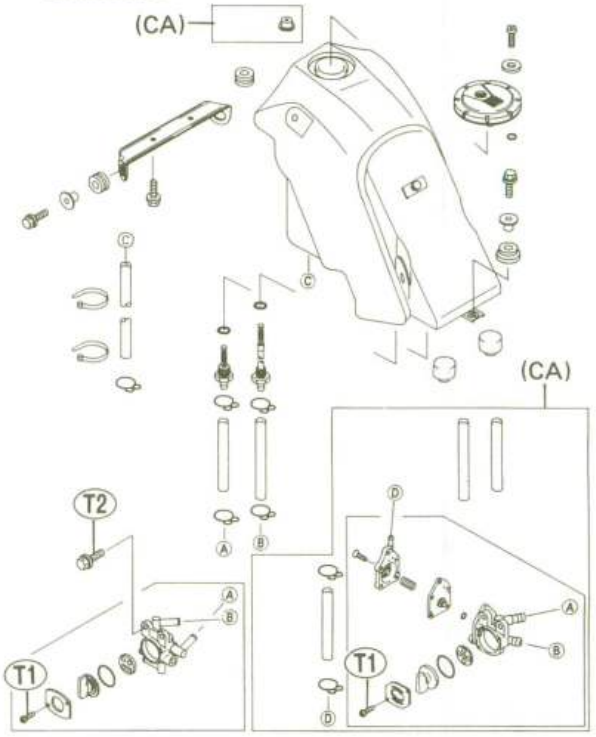
1. Throttle Cables
2. Choke Cable
3. Pilot Screw
4. Pilot Jet
5. Needle Jet
6. Needle Jet Holder
7. Main Jet
8. Jet Needle
9. Canister
10. Separator
11. Canister Guard
12. Coasting Enricher
    The device prevents back firing during engine braking by supplying a rich fuel mixture to the engine.

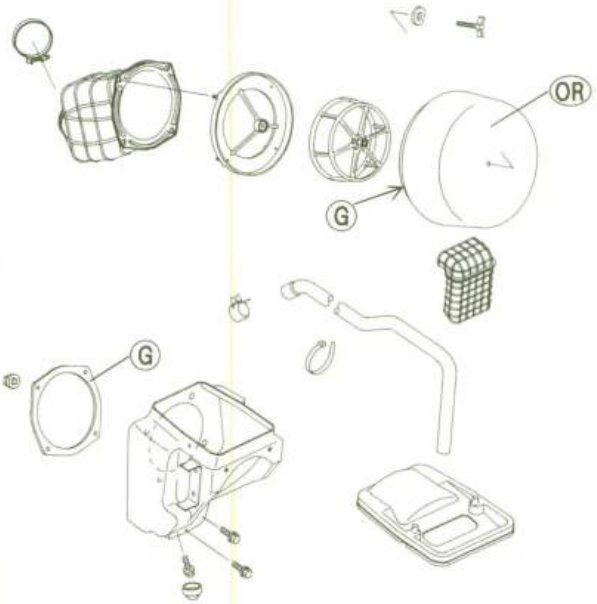
G: Apply grease.
L: Apply a non-permanent locking agent.
O: Apply oil.

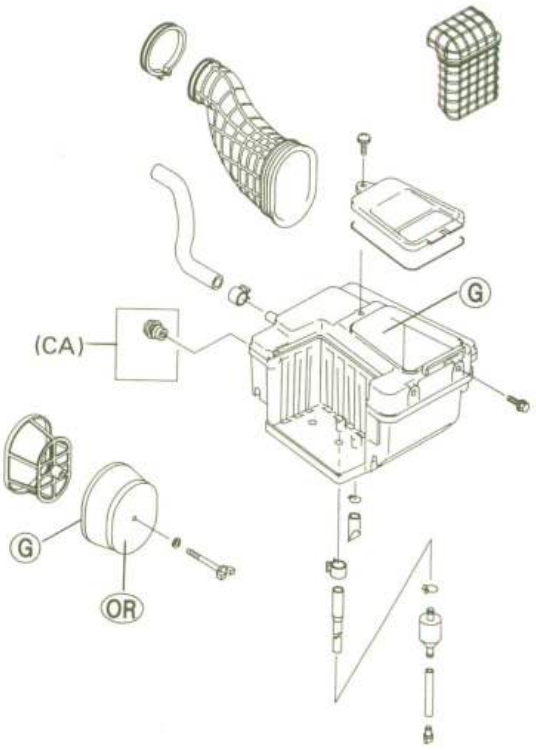
KLX650A



KLX650C







(CA): California
OR: Apply high-quality-foam-air-filter oil.
T1: 0.8 N-m (0.08 kg-m, 7 in-lb)
T2: 5.9 N-m (0.60 kg-m, 52 in-lb)

Specifications

KLX650A

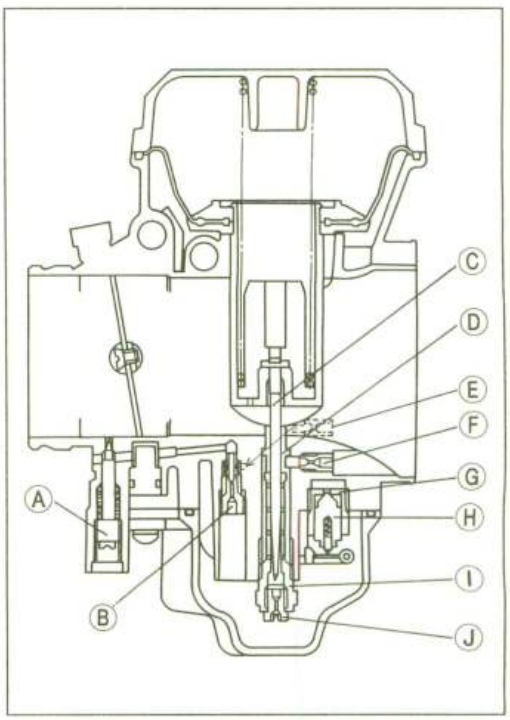
Item		Standard
Throttle Grip Free Play		2 ~ 3 mm
Carburetor		
Make, type		KEIHIN, CVK40
Idle speed		Slowest smooth idle speed
Pilot screw (turns out)		1 7/8 ± ¼
Service fuel level		1.5mm above ~ 0.5mm below the float bowl mating surface
Float height		17.5 ± 2 mm
Main jet		#155, (US) #135
Needle jet		P/No. 16017-1367
Jet needle mark		N1TB
Jet needle clip position		3rd groove from the top, (US) 1st groove from the top
Pilot jet (slow jet)		#40
Starter jet		#52 (unremovable)
Throttle valve angle		10°
Air Cleaner Element Oil		
	Grade	SE or SF class
	Viscosity	SAE30

(AR): Austria
(AS): Australia
(FG): Germany
(NZ): New Zealand
(ST): Switzerland
(US): U.S.

KLX650C

Item	Standard
Throttle Grip Free Play	2 ~ 3 mm
Carburetor	
Make, type	KEIHIN, CVK40
Idle speed	1300 ± 100 r/min (rpm)
Pilot screw (turns out)	2 3/8 ± ¼, (AR)(AS)(FG)(NZ)1 7/8 ± ¼ (ST)(US) ---
Service fuel level	1.5mm above ~ 0.5mm below the float bowl mating surface
Float height	17.5 ± 2 mm
Main jet	#138, (AS)(FG)(ST) #140
Needle jet	P/No. 16017-1367
Jet needle mark	N23P, (AS)(FG)(NZ) N23Q, (AR) N31H, (ST) N1RN, (US) N1RE
Jet needle clip position	---
Pilot jet (slow jet)	#40
Starter jet	#50 (unremovable)
Throttle valve angle	10°
High altitude carburetor specifications (US)	
Main Jet	#135 (92063-1014)
Pilot Jet	#38 (92064-1050)
Air Cleaner Element Oil	
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

Throttle Grip and Cables

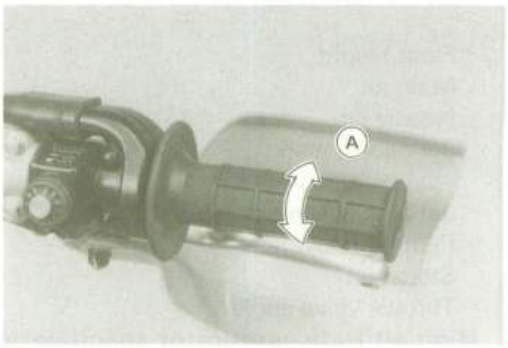
If the throttle grip has excessive free play due to cable stretch or maladjustment, there will be a delay in throttle response. Also, the throttle valve may not open fully at full throttle. On the other hand, if the throttle grip has no play, the throttle will be hard to control, and the idle speed will be erratic. Check the throttle grip play periodically in accordance with the Periodic Maintenance Chart, and adjust the play if necessary.

Grip Free Play Inspection

- Check throttle grip free play [A] by lightly turning the throttle grip back and forth.

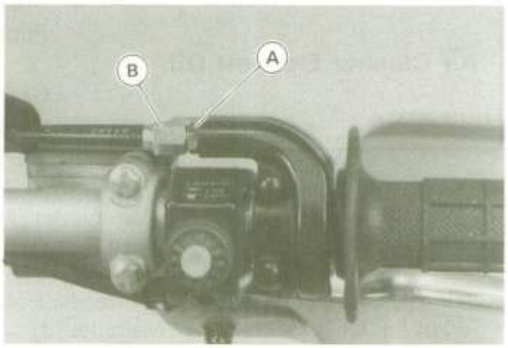
★If the free play is improper, adjust the throttle cable.

Throttle Grip Free Play
Standard: 2 ~ 3 mm

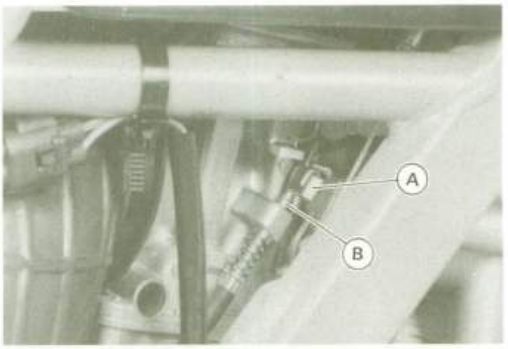


Grip Free Play Adjustment

- Slide the cable adjuster dust cover out of place.
- Loosen the locknut [A] and screw the throttle cable adjuster [B] in fully at the upper end of the throttle cable to give the throttle grip plenty of play.
- Turn the adjuster until the correct throttle grip free play is obtained.
- Tighten the locknut against the throttle pulley case.



- Check that the throttle linkage lever [A] stops against the idle adjusting screw [B] with the throttle grip closed.

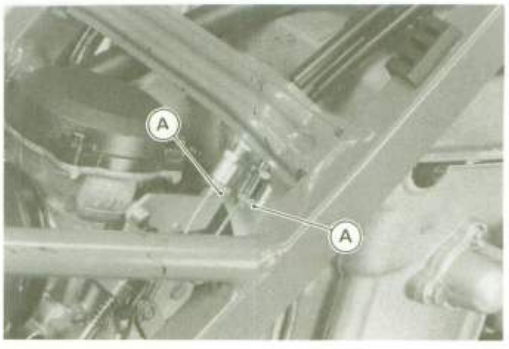


★If the throttle grip free play cannot be adjusted with the adjuster at the upper end of the throttle cable, use the cable adjusting nuts [A] at the carburetor. Remove the fuel tank (see this chapter).

○Make the necessary free play adjustment at the lower cable ends.

- Turn the handlebar from side to side while idling the engine.

★If idle speed varies, the cable may be poorly routed or damaged.

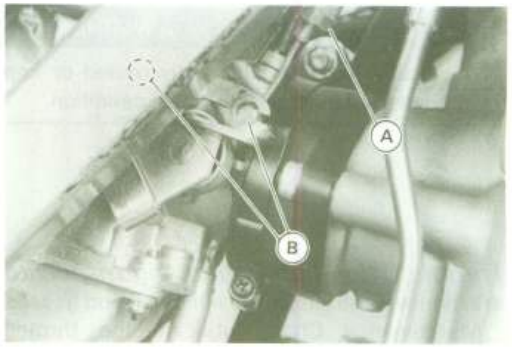


⚠WARNING

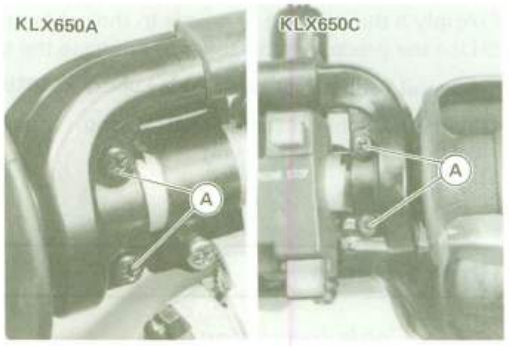
Operation with an improperly adjusted, incorrectly routed, or damaged cable could result in an unsafe riding condition.

Throttle Cable Removal

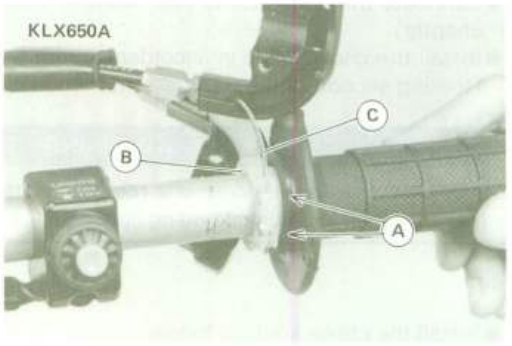
- Remove:
  Fuel Tank (see this chapter)
- Take off the adjusting nuts [A] at the carburetor.
- Slip the inner cable tips [B] out of the lever.

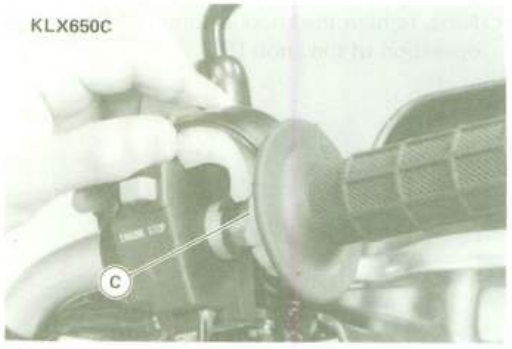


- Remove the right hand guard of the brake lever (KLX650A).
- Take out the two screws [A] holding the throttle pulley case halves together.



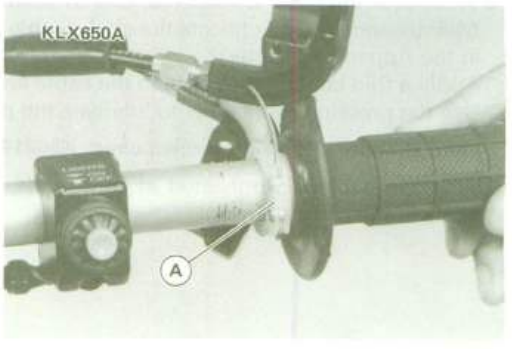
- Slip the inner cable tips from the catches on the throttle pulley, and free the cables from the handlebar.
  Inner Cable Tips [A]
  Pulley [B]
  Accelerator Cable [C]
- Remove the throttle cables.





Throttle Cable Installation

- Lubricate the throttle cables (see Throttle Cable Lubrication and Inspection).
- Be sure to fit the throttle cables into the grooves of the cable guide [A] while turning the throttle grip.
- Install the throttle cables in accordance with the Cable, Wire, and Hose Routing section of the General Information chapter.
- After installation, adjust the cables properly.



⚠WARNING

Operation with an incorrectly routed or improperly adjusted cable could result in an unsafe riding condition.

Throttle Cable Lubrication and Inspection

- Whenever the cables are removed, and in accordance with the Periodic Maintenance Chart, lubricate the throttle cables (see General Lubrication in the Appendix chapter).
  - Apply a thin coating of grease to the cable upper ends.
  - Use the pressure cable luber to lubricate the cables.

Special Tool – Pressure Cable Luber: k56019-021

  - With the cable disconnected at both ends, the cable should move freely in the cable housing.

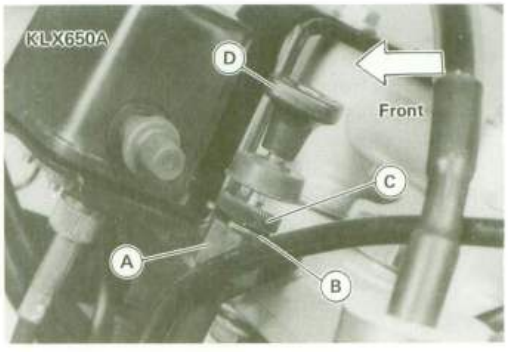
Choke Cable

Choke Cable Installation

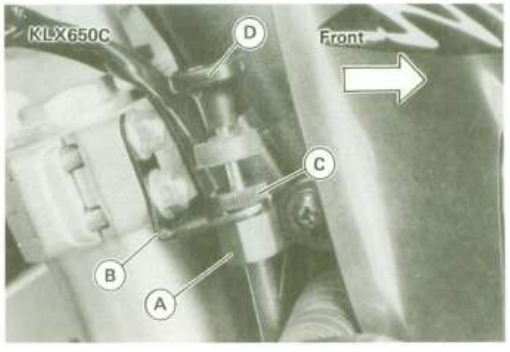
- Lubricate the choke cable (see General Lubrication in the Appendix chapter).
- Install the choke cable in accordance with the Cable, Wire, and Hose Routing section of the General Information chapter.

⚠WARNING

Operation with an incorrectly routed or improperly adjusted cable could result in an unsafe riding condition.



- Install the choke knob as follows.
  - First, tighten the knob nut [A] against the bracket [B].
  - Next, tighten the knob locknut [C] finger tight. This provides smooth operation of the knob [D].



Choke Cable Lubrication and Inspection

- Whenever the cable is removed, and in accordance with the Periodic Maintenance Chart, lubricate the choke cable (see General Lubrication in the Appendix chapter).
  - Apply a thin coating of grease to the cable lower end.
  - Use the pressure cable luber to lubricate the cable.

Special Tool – Pressure Cable Luber: K56019-021

  - With the cable disconnected at both ends, the cable should move freely in the cable housing.

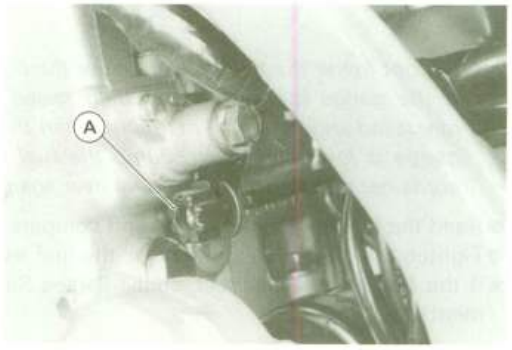
Carburetor

Since the carburetor regulates and mixes the fuel and air going into the engine, there are two general types of carburetor trouble: too rich a mixture (too much fuel), and too lean a mixture (too little fuel). Such trouble can be caused by dirt, wear, maladjustment, or improper fuel level in the float chamber. A dirty or damaged air cleaner can also alter the fuel to air ratio.

Idle Speed Adjustment

- Start the engine and warm it up thoroughly.
- With engine idling, turn the handlebar to each side. If handlebar movement changes idle speed, the throttle cable may be incorrectly routed, or it may be damaged.

- Turn the idle adjusting screw [A] to obtain the slowest smooth idle speed (KLX650A).
- Check idle speed. If the idle speed is out of the specified range, adjust it (KLX650C).



Idle Speed (KLX650C)
Standard: 1300 ± 100 r/min (rpm)

★If the engine idle is still not stable, adjust the pilot screw to obtain the proper idle speed using the pilot screw adjuster [A].

Special Tool – Pilot Screw Adjuster, A: 57001-1239

○Turn in the pilot screw fully but not tightly, and then back it out the specified turns.



Pilot Screw Setting
KLX650A: 1 7/8 ± ¼
KLX650C: 2 3/8 ± ¼
(AR)(AS)(FG)(NZ) 1 7/8 ± ¼
(ST)(US) –

⚠WARNING

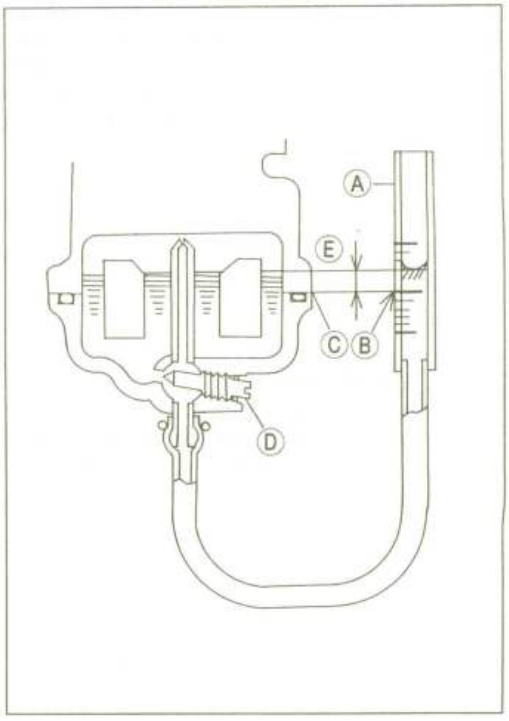
Operation with an improperly adjusted, incorrectly routed, or damaged cable could result in an unsafe riding condition.
To avoid a serious burn, never touch a hot engine or an exhaust pipe during carburetor adjustment.

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

Service Fuel Level Inspection

⚠WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.



- Remove the carburetor (see this chapter) and hold it upright on a stand.
- Put the fuel tank on a bench and connect the fuel tap to the carburetor using a suitable hose.
- Connect the fuel level gauge [A] to the open end of the carburetor overflow hose.

Special Tool – Fuel Level Gauge: 57001-1017

- Hold the gauge vertically against the side of the carburetor body so that the middle line [B] is several millimeters higher than the float bowl mating surface [C].
- Turn the fuel tap to the ON (CA, PRI) position to feed fuel to the carburetor and gauge, then turn out the carburetor drain plug [D] a few turns.
- Wait until the fuel level [E] in the gauge settles.
- Keeping the gauge vertical, slowly lower the gauge until the middle line [B] is even with the float bowl mating surface [C].

NOTE

○ *Do not lower the middle line below the float bowl mating surface. If the gauge is lowered and then raised it again, the fuel level measured shows somewhat higher than the actual fuel level. If the gauge is lowered too far, dump the fuel out of it into a suitable container and start the procedure over again.*

- Read the fuel level in the gauge and compare it to the specification.
- Tighten the drain plug and remove the fuel level gauge.

★ If the fuel level is incorrect, adjust it (see Service Fuel Level Adjustment).

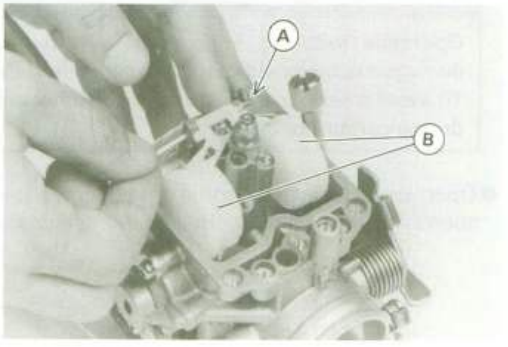
Fuel Level

1.5 mm above ~ 0.5 mm below the float bowl mating surface

Service Fuel Level Adjustment

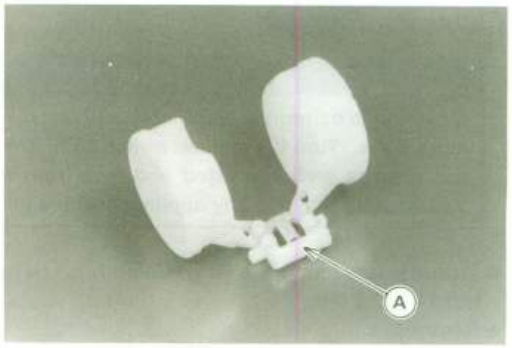
⚠WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.



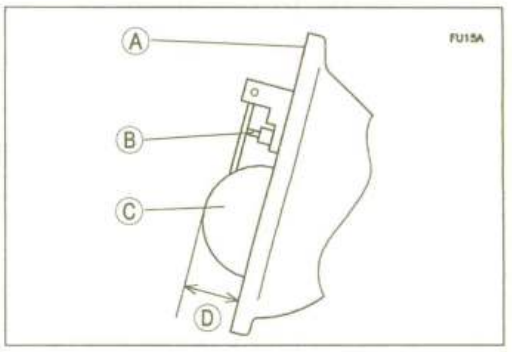
- Remove the carburetor and drain the fuel into a suitable container.
- Remove the float bowl by taking out the screws.
- Slide out the pivot pin [A] and remove the floats [B].

● Bend the tang [A] on the float arm very slightly to change the float height.



○ Increasing the float height lowers the fuel level and decreasing the float height raises the fuel level.

Float Height
Standard: 17.5 ± 2 mm



● Assemble the carburetor and recheck the fuel level.

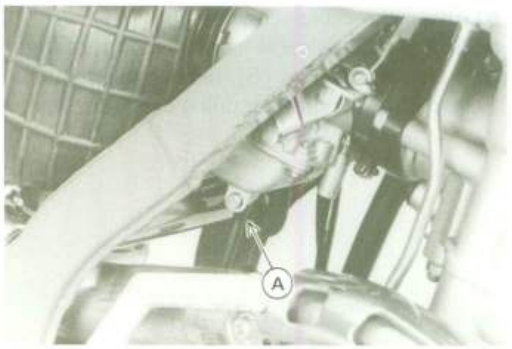
★ If the fuel level cannot be adjusted by this method, the float or the float valve is damaged.

Float Bowl Mating Surface [A]
Float Valve Needle Rod (contacted but unloaded) [B]
Float [C]
Float Height [D]

Fuel System Cleanliness Inspection

⚠WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.



● Run the lower end of the carburetor overflow hose to a suitable container.
● Turn the fuel tap to the ON (California, PRI) position.
● Turn out the carburetor drain screw [A] a few turns and drain the fuel system.
● Check to see if water or dirt comes out.
● Tighten the drain screw and turn the fuel tap to the OFF (California, ON) position.
★ If any water or dirt appears during the above inspection, clean the fuel system (see Carburetor Cleaning and Fuel Tank and Tap Cleaning).

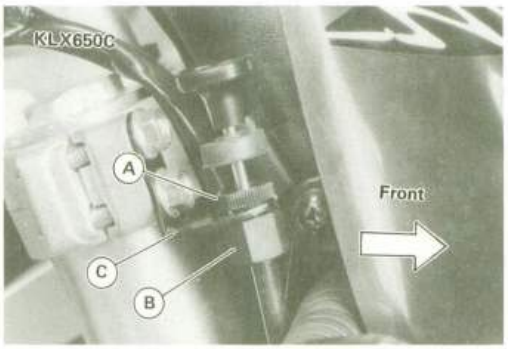
Carburetor Removal

⚠WARNING

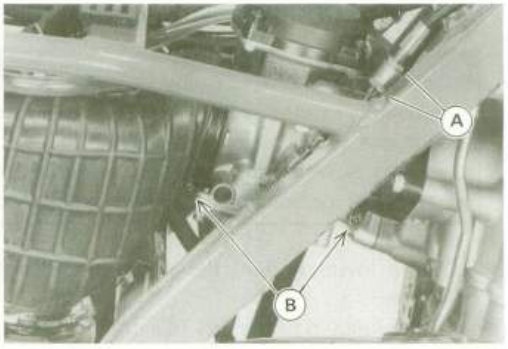
Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Turn the fuel tap to the OFF (California, ON) position and pull the fuel hose off the tap.
- Remove:
  Fuel Tank (see this chapter)
  Breather Hose
  Headlight Cover (KLX650A)

- Unscrew the choke knob locknut [A] and knob nut [B], then remove the knob from the bracket [C].



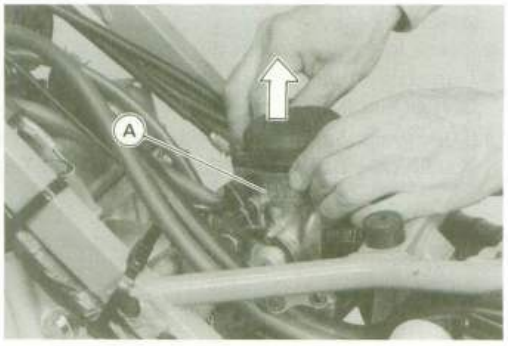
- Loosen the cable adjusting nuts [A].
- Slip the throttle cable lower ends out of the throttle lever.
- Loosen the clamps [B], remove the carburetor from the end of the air cleaner duct, and then pull it out of the carburetor holder.



- Remove the carburetor [A] upward.
- Push a clean, lint-free towel into the carburetor holder and the air cleaner duct to keep dirt or other foreign material from entering.

⚠WARNING

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



CAUTION

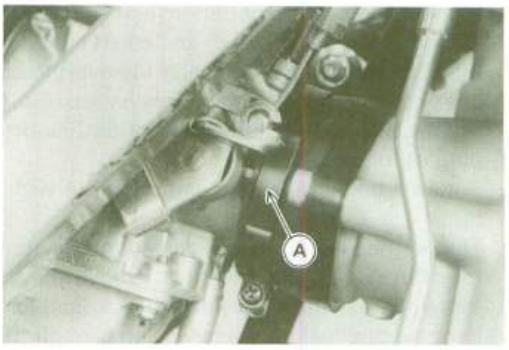
If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.

Carburetor Installation

- Adjust the pilot screw.

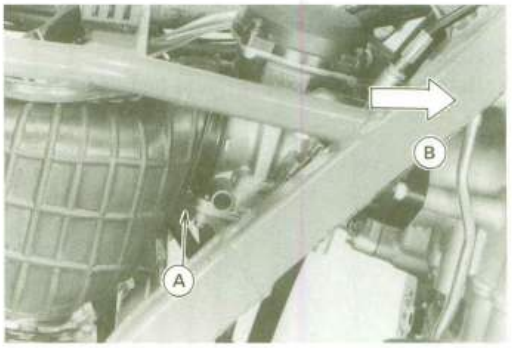
★If the carburetor has been disassembled, or if there is some other reason that the fuel level may be incorrect, inspect the fuel level (see Service Fuel Level Inspection).

- Fit the ridges [A] into the notches on the carburetor holder.



- Install the air cleaner duct clamp so that the screw head faces right and is below.

Duct Clamp Screw [A] Front [B]



- Run the carburetor vent hose and overflow hose as shown in the Cable, Wire, and Hose Routing section of the General Information chapter.
- Check fuel leakage from the carburetor.

⚠WARNING

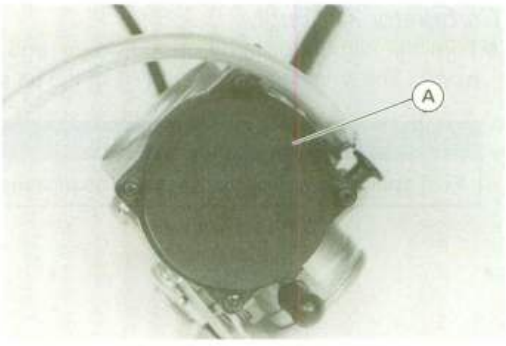
Fuel spilled from the carburetor is hazardous.

- Install the choke cable (see Choke Cable Installation).
- Adjust the throttle cable (see Grip Free Play Adjustment).
- Adjust the idle speed (see Idle Speed Adjustment).

Carburetor Disassembly

- Remove:

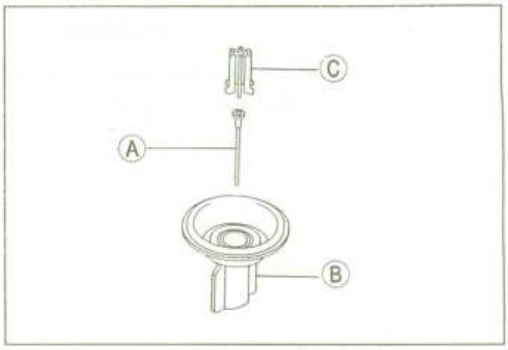
Carburetor (see Carburetor Removal)
Carburetor Top End [A]
Vacuum Piston with Diaphragm



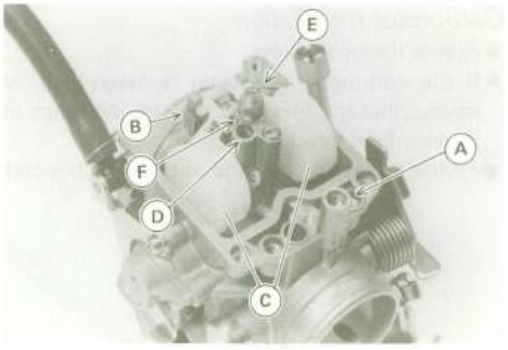
CAUTION

Be careful not to damage the diaphragm. Never use a sharp edge to remove the diaphragm.

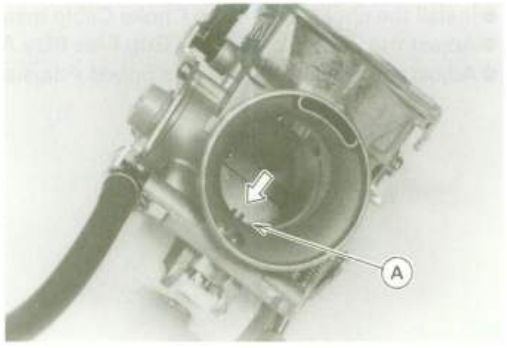
●Take the jet needle [A] out of the vacuum piston [B]. It comes out with a spring seat [C].



●Remove the carburetor bottom end as follows.
○Turn in the pilot screw [A] and count the number of turns until it seats fully but not tightly, and then remove the screw. This is to set the screw to its original position when assembling.
○For the U.S. and Switzerland KLX650C models, remove the pilot screw plug as follows:
Punch a hole in the plug and pry it out with an awl or other suitable tool.
Turn in the pilot screw [A] and count the number of turns until it seats fully but not tightly, and then remove the screw. This is to set the screw to its original position when assembling.
○Remove the float bowl screws and take off the float bowl and O-ring.
○Slide out the float pivot pin [B], remove the floats [C], and drop out the float needle valve with its hanger.
○Remove the pilot jet [D].
○Remove the main jet [E], and needle jet holder [F].



○Push the needle jet [A] out from the inside of the carburetor with your finger.

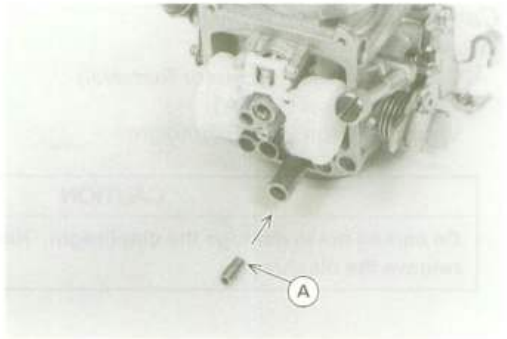


Carburetor Assembly

●Turn the carburetor body upside down, and drop the needle jet into place. The small diameter end [A] of the jet goes first.

⚠WARNING

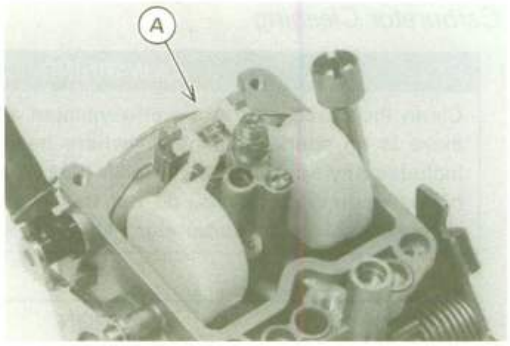
Fuel spilled from the carburetor is hazardous.



● Carefully screw in the needle jet holder. It will seat against the needle jet, pushing the end of the jet into the carburetor bore.

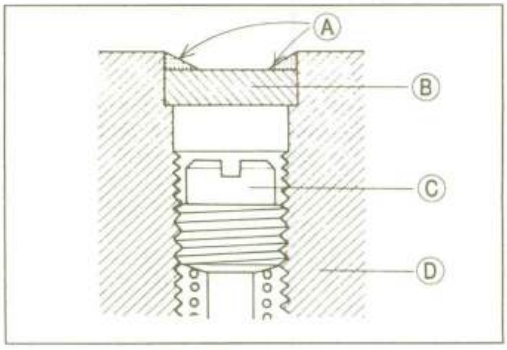
CAUTION
Do not force or overtighten the jets. The jets or the carburetor body could be damaged requiring replacement.

● Drop the float valve needle into the valve seat and hold the float in place with the tang hooked into the needle hanger [A].
● Slip the float pivot pin through the pivot posts and the float. The float stop tab must be on the correct side as shown.
● Turn in the pilot screw fully but not tightly, and then back it out the same number of turns counted during disassembly.



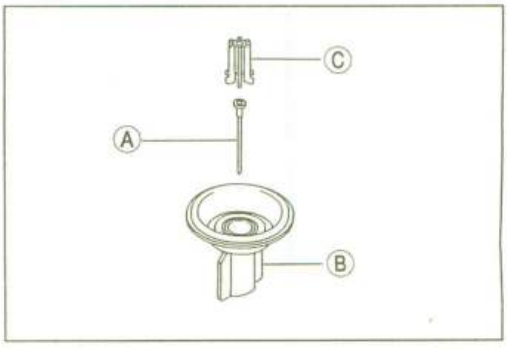
● For the U.S. and Switzerland KLX650C models, install the pilot screw plug as follows.
○ Turn in the pilot screw fully but not tightly and then back it out the same number of turns counted during disassembly.
○ Install a new plug in the pilot screw hole, and apply a small amount of bonding agent to the circumference of the plug to fix the plug.

CAUTION
Do not apply to much bonding agent to the plug or the pilot screw itself may be fixed.



Apply bonding agent [A]
Plug [B]
Pilot Screw [C]
Carburetor Body [D]

● Set the float height as specified (see Service Fuel Level Adjustment).
● Slip the jet needle [A] through the hole in the center of the vacuum piston [B], and put the spring seat [C] on the top of the needle.
● After installing the upper chamber cover, check that the vacuum piston slides up and down smoothly without binding in the carburetor bore.



Carburetor Cleaning

⚠WARNING

Clean the carburetor in a well-ventilated area, and take care that there is no spark 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 low-flash point solvents to clean the carburetor. A fire or explosion could result.

CAUTION

Do not use compressed air on an assembled carburetor, or the floats may be crushed by the pressure, and the vacuum piston diaphragm may be damaged.

Remove as many rubber or plastic parts from the carburetor as possible before cleaning the carburetor with a cleaning solution. This will prevent damage or deterioration of the parts.

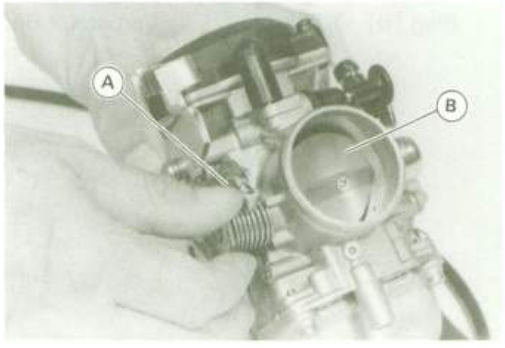
The carburetor body has plastic parts that cannot be removed. DO NOT use a strong carburetor cleaning solution which could attack these parts; instead, use a mild high-flash point cleaning solution safe for plastic parts.

- Disassemble the carburetor (see Carburetor Disassembly).
- Immerse all the metal parts in a carburetor cleaning solution.
- Rinse the parts in water.
- When the parts are clean, dry them with compressed air.
- Blow out the fuel passages with compressed air.
- Assemble the carburetor (see Carburetor Assembly).

Carburetor Inspection

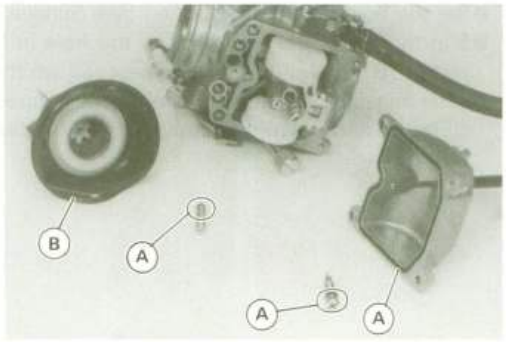
- Before removing the carburetor, check the fuel level (see Fuel Level Inspection).
- Remove the carburetor (see Carburetor Removal).
- Turn the throttle lever [A] to check that the throttle butterfly valve [B] moves smoothly and returns back with the spring force.

★If the throttle valve does not move smoothly, replace the carburetor.

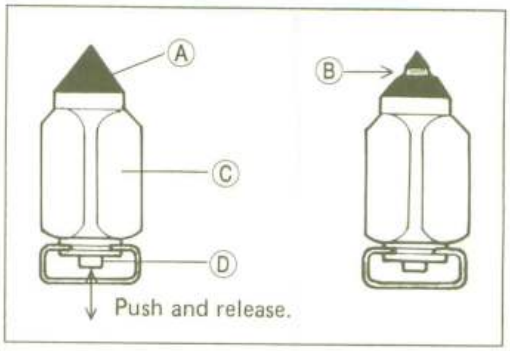


- Disassemble the carburetor (see Carburetor Disassembly).
- Clean the carburetor (see Carburetor Cleaning).
- Check the O-rings [A] on the float bowl, drain plug, and pilot screw, and the diaphragm [B] on the vacuum piston.

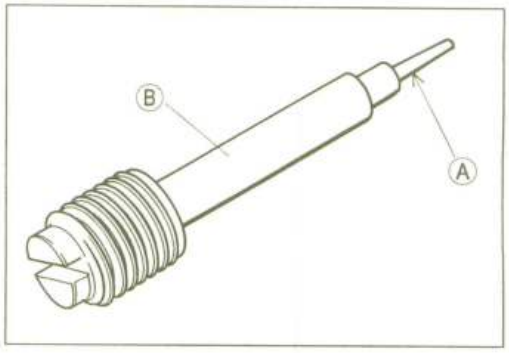
★If any of the O-rings or diaphragm are not in good condition, replace them.



- Check the plastic tip of the float valve needle. It should be smooth, without any grooves, scratches, or tears.
- ★If the plastic tip [A] is damaged [B], replace the needle [C].
- Push the rod [D] in the valve needle, then release it.
- ★If the rod does not spring out, replace the needle.

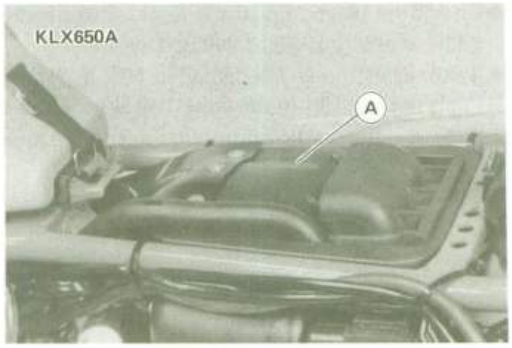


- Check the tapered portion [A] of the pilot screw [B] for wear or damage.
- ★If the pilot screw is worn or damaged on the tapered portion, it will prevent the engine from idling smoothly. Replace it.
- Check that the vacuum piston moves smoothly in the carburetor body. The surface of the piston must not be excessively worn.
- ★If the vacuum piston does not move smoothly, or if it is very loose in the carburetor body, replace the valve and/or the carburetor.

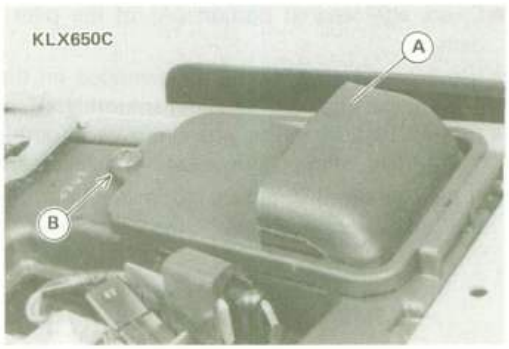


Air Cleaner

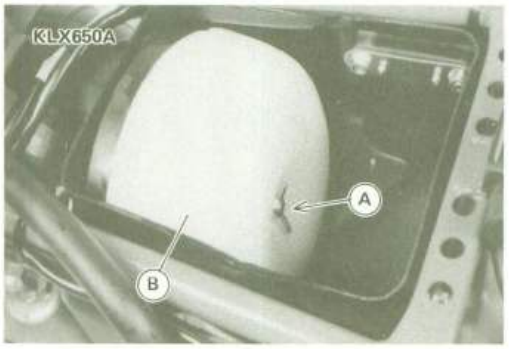
Air Cleaner Element Removal



- 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.

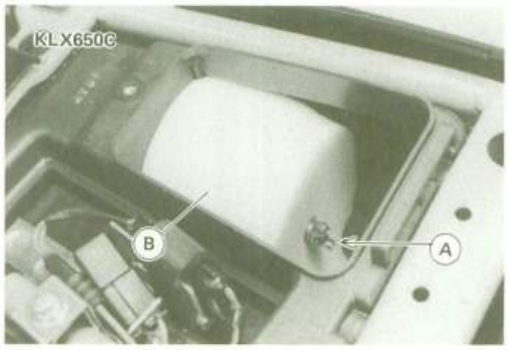


⚠WARNING

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

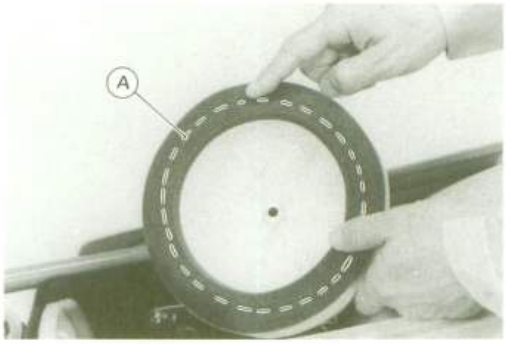
CAUTION

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



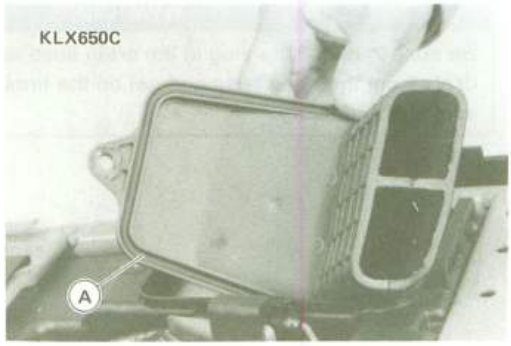
Air Cleaner Element Installation

- 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.



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





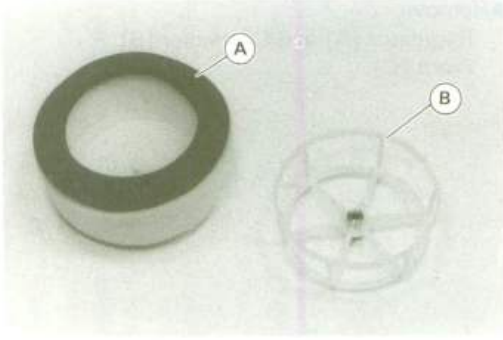
Air Cleaner Element Cleaning and Inspection

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.

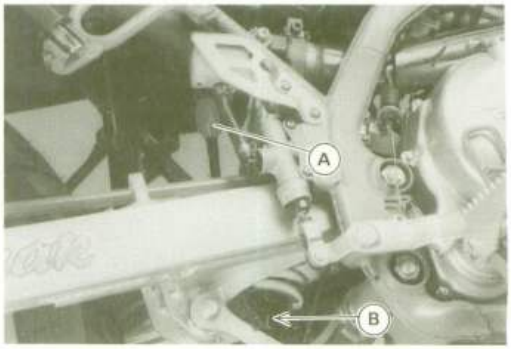
Air Cleaner Draining (KLX650C)

A catch tank [A] is provided beneath the air cleaner housing, and catches the water or oil from the bottom of the housing. Usually water or oil does not collect at the bottom of the housing. In the event that rain water is drawn in through the air cleaner, or if engine oil is blown back, drain the housing.

- Visually check the catch tank [A] if the water or oil accumulates in the tank.

★If any water or oil accumulates in the tank, drain it by taking off the drain plug [B] at the lower end of the drain hose.

- Be sure to install the plug firmly, or the air will be drawn in through it.

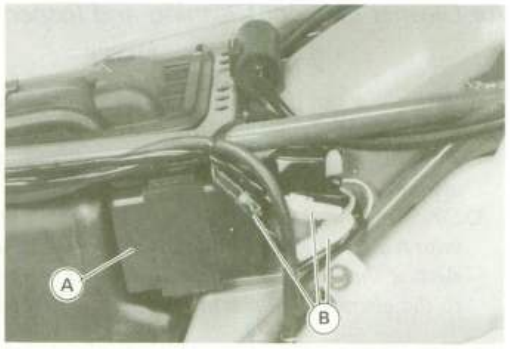


⚠WARNING

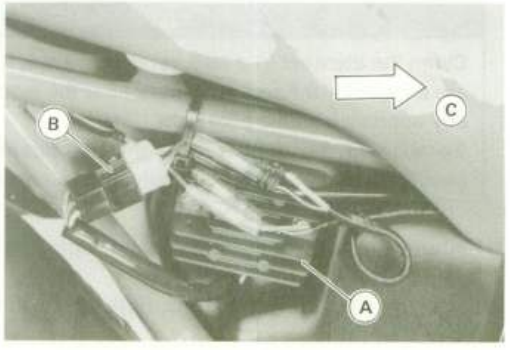
Be sure to install the plug in the drain hose after draining. Oil could drain from the open hose and get on the tires which could cause an accident and injury.

Air Cleaner Housing Removal (KLX650A)

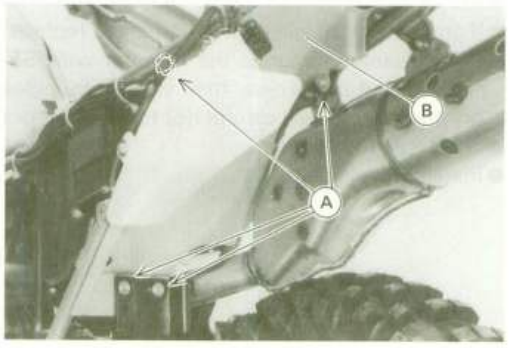
- Remove:
  Side Covers (see Frame chapter)
  Seat (see Frame chapter)
  CDI Unit [A] and Connectors [B] (see Electrical System chapter)
  Breather Hoses



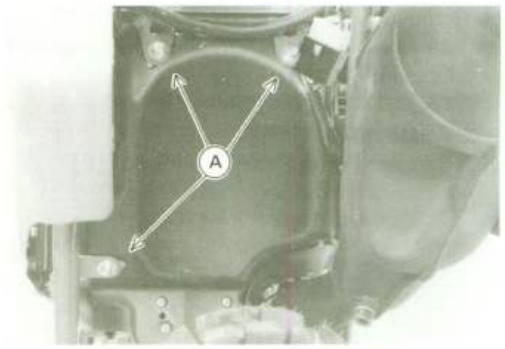
- Remove:
  Regulator [A] and Connector [B]
  Front [C]



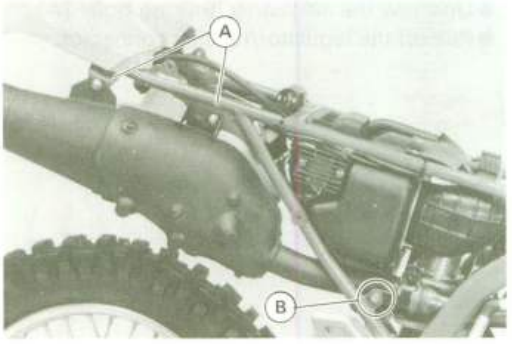
- Remove:
  Rear Fender Front Section Bolts [A]
  Rear Fender Front Section [B]
  Taillight Connectors
- Remove the rear shock absorber (see Suspension chapter).



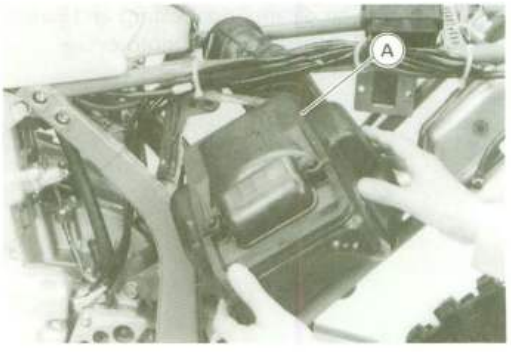
● Unscrew the air cleaner housing bolts [A].



● Remove the muffler bolts [A] and the muffler Allen bolt [B] to facilitate air cleaner housing removal.



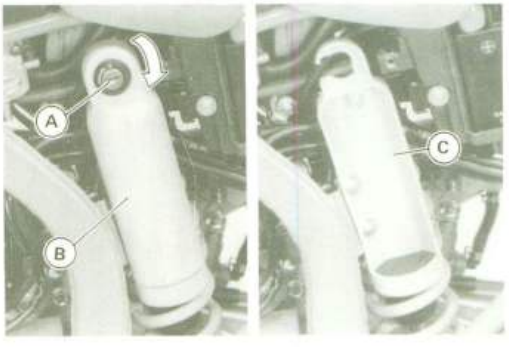
● Loosen the clamp, and remove the air cleaner housing from the end of the air cleaner duct.
● Take the air cleaner housing [A] out the left-hand side.



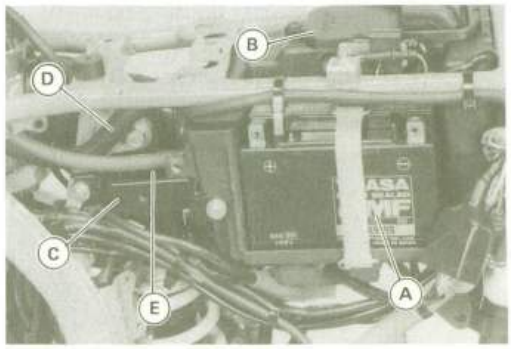
Air Cleaner Housing Removal (KLX650C)

● Remove:
Side Covers (see Frame chapter)
Seat (see Frame chapter)
Rear Fender Front Section (see Frame chapter)
Battery Cover

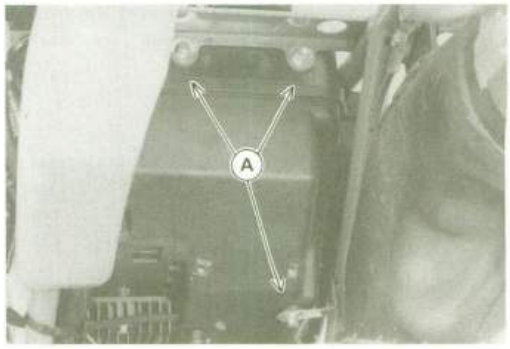
● Insert the ignition switch key into the tool box lock [A] and turn the key clockwise.
● Remove the lid [B] and tool.
● Unscrew the bolts and remove the tool box [C].



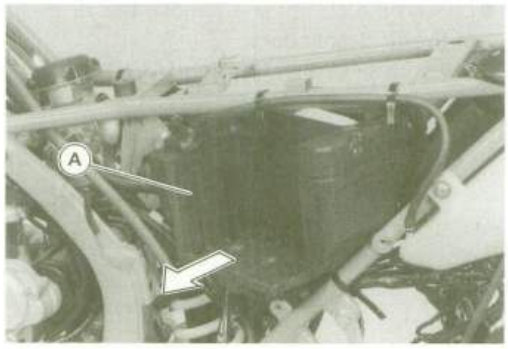
● Remove
Battery [A] (see Electrical System chapter)
Element Cap [B]
Tool Box Bracket [C]
Breather Hose [D]
Canister Purge Hose (California) [E]



● Unscrew the air cleaner housing bolts [A].
● Pull off the regulator/rectifier connector.



● Loosen the air cleaner duct clamp and remove the air cleaner housing [A] from the left side of the motorcycle.

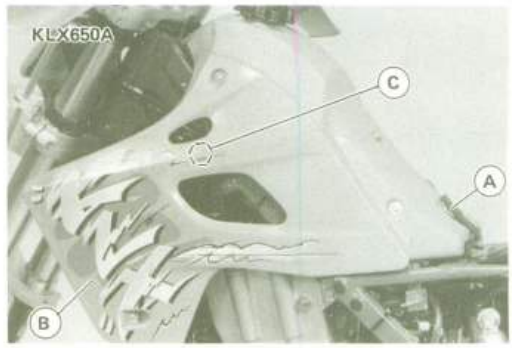


Fuel Tank

Fuel Tank Removal

⚠WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Always stop the engine and do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.



● Remove (KLX650A):
Seat (see Frame chapter)
Rubber Band [A]
Air Scoops [B]
Fuel Tank Bolt [C]

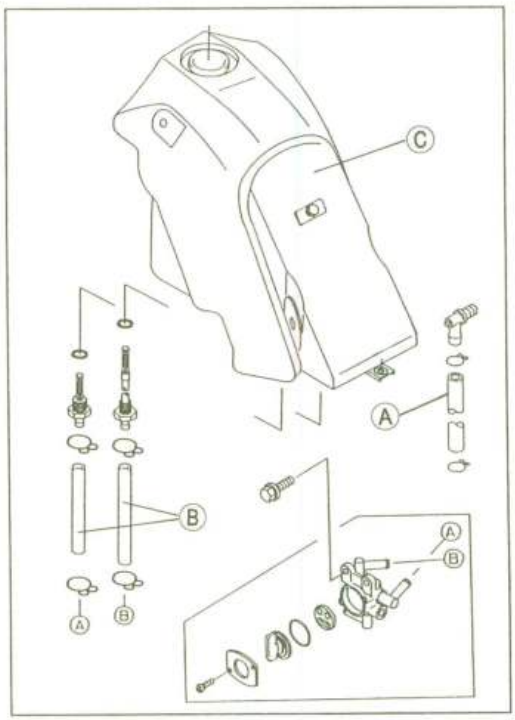


● Remove (KLX650C):
Seat (see Frame chapter)
Air Scoops
Fuel Tap Bolts [A]
Fuel Tank Bolts [B]
○ For California vehicles, disconnect the breather and fuel return hoses.

● Turn the fuel tap to the OFF (California, ON) position.
● Pull the fuel hose [A] off the fuel tap.

CAUTION

Do not pull off the fuel tap hoses [B]. The fuel spilled from the fuel tank is hazardous.



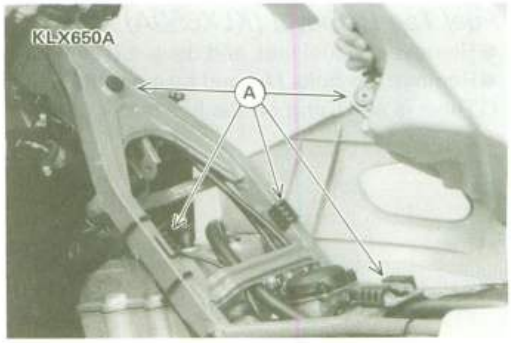
● Remove the fuel tank [C].
● Drain the fuel tank.

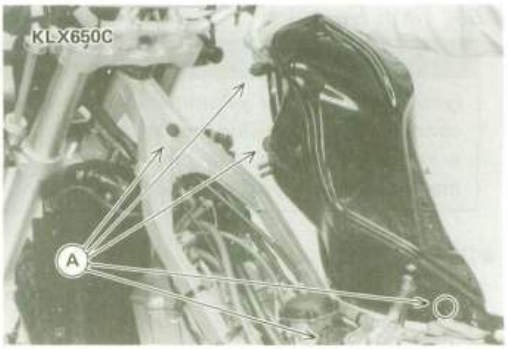
Fuel Tank Installation

● Check the rubber dampers [A] on the frame and fuel tank.
★ If the dampers are damaged or deteriorated, replace them.
● Be sure the fuel hose is clamped to the fuel tap to prevent leakage.

⚠WARNING

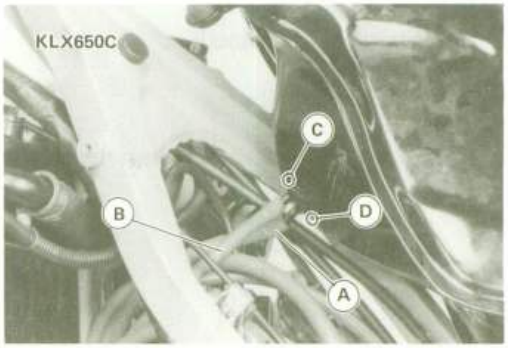
Fuel spilled from the fuel tap is hazardous.





● For California vehicles, install the blue breather hose [A] and the red fuel return hose [B] as shown.

Red Mark[C] Blue Mark [D]



● Tighten the fuel tap bolts [A].

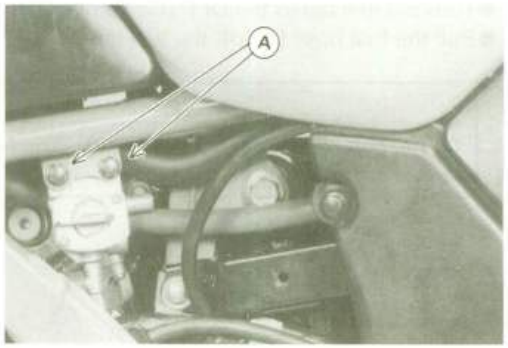
Torque – 5.9 N-m (0.60 kg-m, 52 in-lb)

⚠WARNING

Be sure to use the standard fuel tap bolts : Φ6 × L8 mm. Longer bolts contacts the fuel pipe and could damage the pipe, causing fuel leakage.

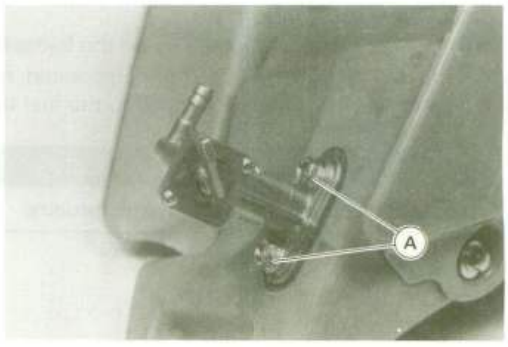
CAUTION

Be sure to use the standard fuel tap bolts : Φ6 × L8 mm. Shorter bolts could damage the tapped holes of the fuel tap.



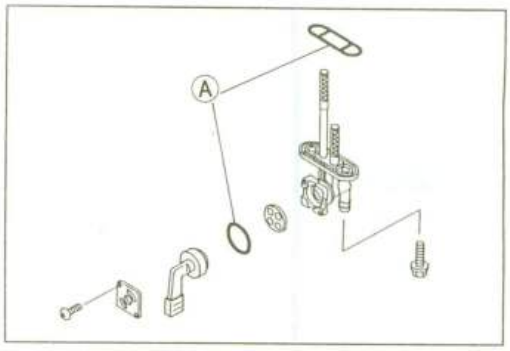
Fuel Tap Removal (KLX650A)

● Remove the fuel tank and drain it (see Fuel Tank Removal).
● Remove the bolts [A] and take out the fuel tap.
○ There is an O-ring on the fuel tap.



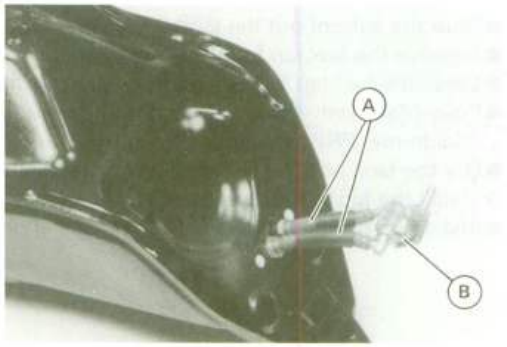
Fuel Tap Installation (KLX650A)

- Be sure the O-rings [A] are in good condition to prevent leakage.
- Clamp the fuel hose to the tap to prevent leakage.



Fuel Tap Removal (KLX650C)

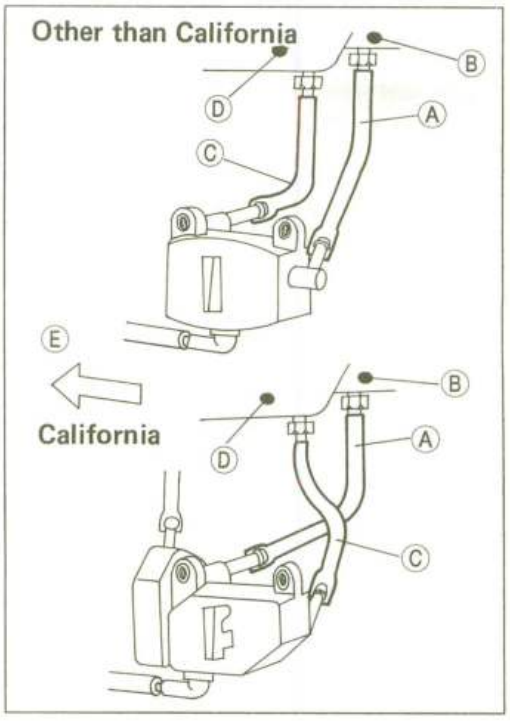
- Remove the fuel tank and drain it (see Fuel Tank Removal).
- Pull off the tap hoses [A] and take off the fuel tap [B].



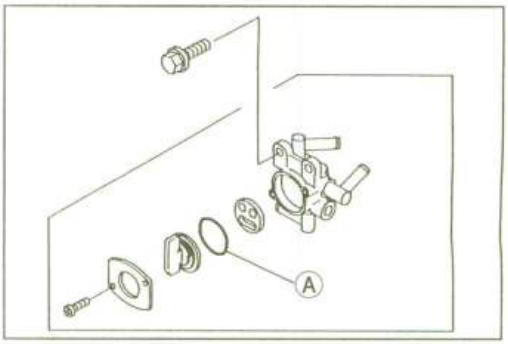
Fuel Tap Installation (KLX650C)

- Install the fuel tap and hoses as shown.

ON Hose (Yellow Hose) [A]
Yellow Mark [B]
RES Hose (White Hose) [C]
White Mark [D]
Front [E]



- Be sure the O-ring [A] is in good condition to prevent leakage.
- Clamp the tap hoses and the fuel hose to the tap to prevent leakage.



Fuel Tank and Tap Cleaning

- Remove the fuel tank and drain it (see Fuel Tank Removal).
- Pour some high-flash point solvent into the fuel tank and shake the tank to remove dirt and fuel deposits.

⚠WARNING

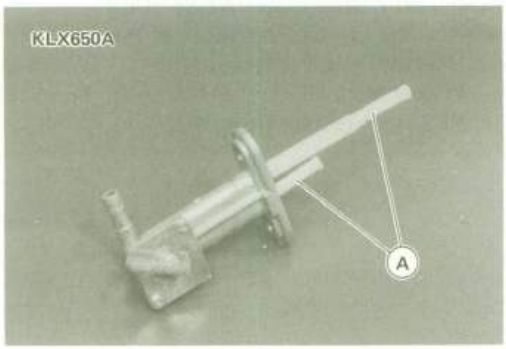
Clean the tank in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area; this includes any appliance with a pilot light. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents to clean the tank. A fire or explosion could result.

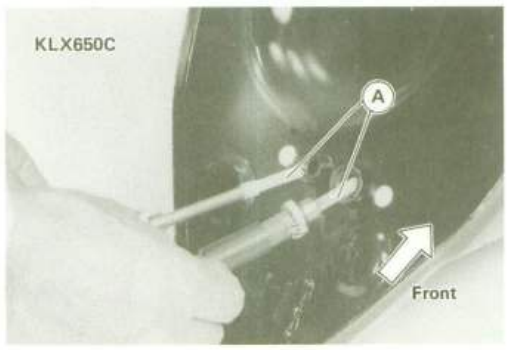
- Pour the solvent out the tank.
- Remove the fuel tap from the tank (see this chapter).
- Clean the fuel tap filter screens in a high-flash point solvent.
- Pour high-flash point solvent through the tap in both ON and RES (California, PRI) positions.
- Dry the tank and the tap with compressed air.
- Install the tap in the tank (see Fuel Tap Installation).
- Install the fuel tank (see Fuel Tank Installation).

Fuel Tap Inspection

- Check the fuel tap filter screens [A] for any breaks or deterioration.
- If the fuel tap screens have any breaks or are deteriorated, it may allow dirt to reach the carburetor, causing poor running. Replace the fuel tap (KLX650A) or the fuel filter (KLX650C).

★If the fuel tap leaks, or allows fuel to flow when it is OFF (KLX650C, California, ON or RES), replace the damaged O-rings.





Evaporative Emission Control System (KLX650C, US California Vehicle)

The Evaporative Emission Control System routes fuel vapors from the fuel system into the running engine or stores the vapors in a canister when the engine is stopped. Although no adjustments are required, a thorough visual inspection must be made at the intervals specified by the Periodic Maintenance Chart.

Parts Removal/Installation

⚠WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

CAUTION

If gasoline, solvent, water, or any other liquid enters the canister, the canister's vapor absorbing capacity is greatly reduced. If the canister does become contaminated, replace it with a new one.

- To prevent the gasloine from flowing into the canister or from flowing out of the canister, hold the separator perpendicular to the ground. Do not turn it upside down.
- Connect the hoses according to the diagram of the system (see Cable, Wire, and Hose Routing section of the General Information chapter). Make sure they do not get pinched or kinked.
- Route hoses with a minimum of bending so that the air or vapor will not be obstructed.
- Be sure to plug the return hose to prevent fuel spilling before fuel tank removal.

⚠WARNING

When removing the fuel tank, be careful not to spill the gasoline through the return hose. Spilled fuel is hazardous.

★If liquid gasoline flows into the breather hose, remove the hose and blow it clean with compressed air.

Hose Inspection (Periodic Inspection)

- Remove the canister guard.
- Check that the hoses are securely connected.
- Replace any kinked, deteriorated or damaged hoses.

Separator Inspection (Periodic Inspection)

- Remove the canister guard.
- Visually inspect the separator for cracks and other damage.

★If the separator has any cracks or is badly damaged, replace it with a new one.

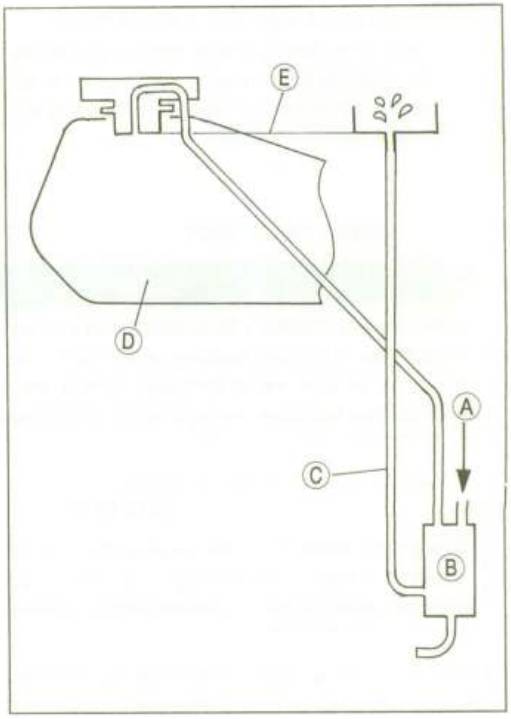
Separator Operation Test

⚠WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch OFF. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Remove the canister guard.
- Disconnect the breather hose from the canister and inject about **20 mL** of gasoline [A] into the separator [B] through the hose fitting.
- Disconnect the fuel return hose [C] from the fuel tank [D].
- Run the open end of the return hose into the container level with the tank top [E].
- Start the engine, and let it idle.

★If the gasoline in the separator comes out of hose, the separator works well. If it does not, replace the separator with a new one.



Canister Inspection (Periodic Inspection)

- Remove the canister guard.

★If the canister has any crack or bad damage, replace it with a new one.

NOTE

○*The canister is designed to work well through the motorcycle's life without any maintenance if it is used under normal conditions.*

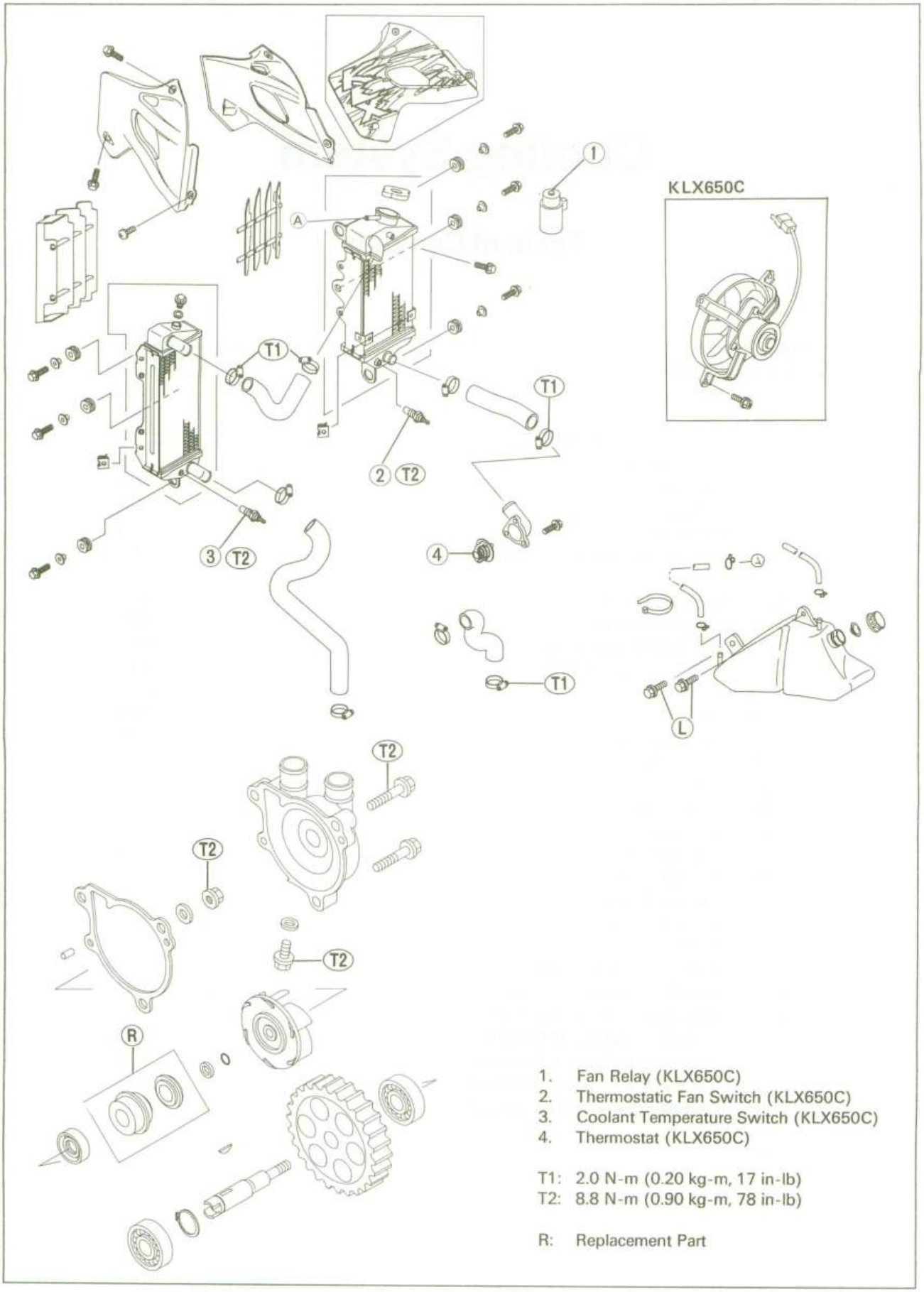
Cooling System

3

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Exploded View

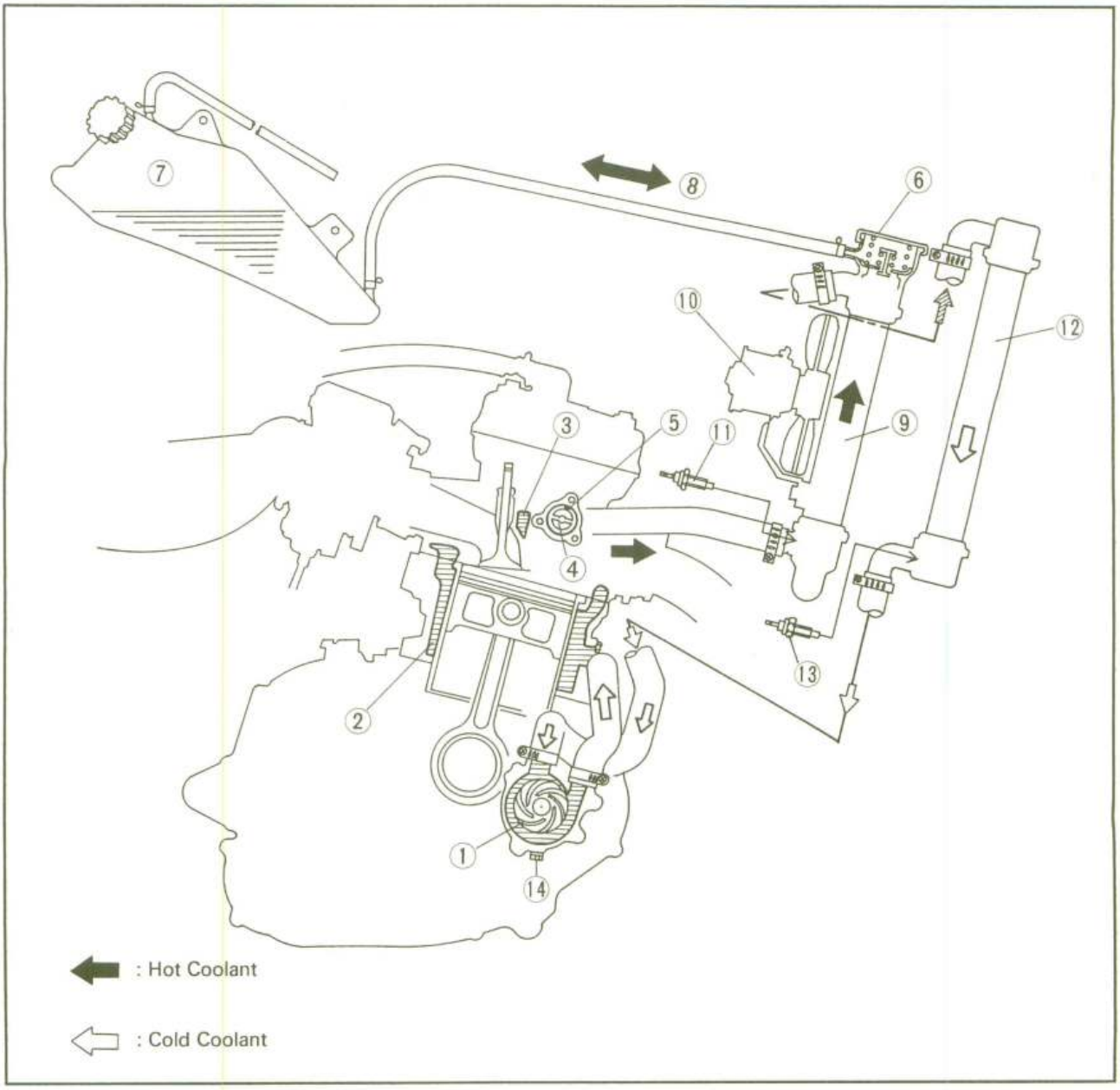


1. Fan Relay (KLX650C)
2. Thermostatic Fan Switch (KLX650C)
3. Coolant Temperature Switch (KLX650C)
4. Thermostat (KLX650C)

T1: 2.0 N-m (0.20 kg-m, 17 in-lb)
T2: 8.8 N-m (0.90 kg-m, 78 in-lb)

R: Replacement Part

Coolant Flow Chart



1. **Water Pump**
2. **Cylinder Jacket**
3. **Cylinder Head Jacket**
4. **Thermostat (KLX650C)**
5. **Hole (Air bleeder hole, KLX650C)**
   When the engine is cold, the thermostat is closed so that the coolant flow is restricted through the air bleeder hole, causing the engine to warm up more quickly.
6. **Radiator Cap**
7. **Reserve Tank**
8. **To reserve tank**
   When the engine is very hot, the pressure valve in the radiator cap allows air and vapor to escape into the reserve tank. When the engine cools down, the pressure drop draws the vacuum valve (another small valve) open, admitting coolant from the reserve tank into the radiator.
9. **Right Hand Radiator**
10. **Radiator Fan (KLX650C)**
11. **Thermostatic Fan Switch (KLX650C)**
12. **Left Hand Radiator**
13. **Coolant Temperature Switch (KLX650C)**
14. **Drain Bolt**

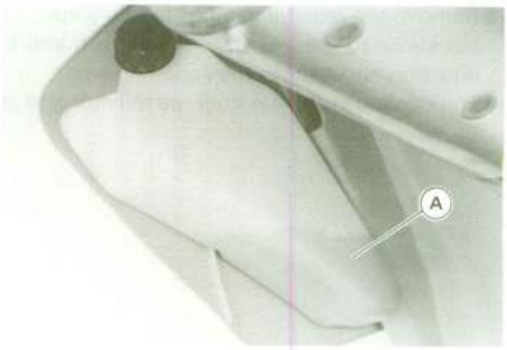
Specifications

Item		Standard
Recommended Coolant		
	Type	Permanent type of antifreeze (soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators)
	Color	Green
	Mixed ratio	Soft water 50%, coolant 50%
	Freezing point	−35°C (−31°F)
	Total amount	1.9L (reserve tank full level including radiator and engine)
Radiator Cap:	Relief pressure	93 ~ 123 kPa (0.95 ~1.25 kg/cm², 14 ~ 18 psi)
Thermostat (KLX650C):		
	Valve opening temperature	69.5 ~ 72.5°C (157 ~ 162°F)
	Valve full opening lift	3 mm or more @85°C (185°F)

Special Tools – Outside Circlip Pliers: 57001-144
Bearing Driver Set: 57001-1129

Coolant

Coolant Deterioration Inspection

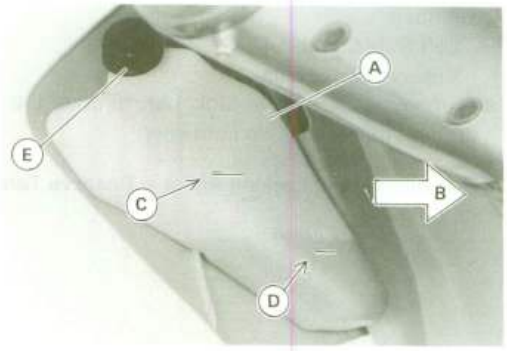


● Visually inspect the coolant [A] in the reserve tank.

★ If whitish cotton-like wafts are observed, aluminum parts in the cooling system are corroded. If the coolant is brown, iron or steel parts are rusting. In either case, flush the cooling system.

★ If the coolant gives off an abnormal smell, check for a cooling system leak. It may be caused by exhaust gas leaking into the cooling system.

Coolant Level Inspection



NOTE

○ *Check the level when the engine is cold (room or ambient temperature).*

● Check the coolant level in the reserve tank [A] with the motorcycle held upright.

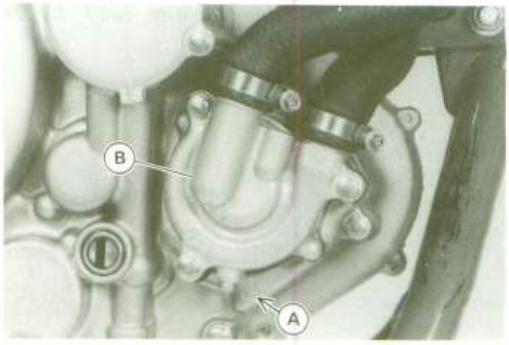
Tank [A]
Front [B]
FULL Mark [C]
LOW Mark [D]

★ If the coolant level is lower than the LOW mark, remove the reserve tank cap [E], then add coolant to the FULL mark.

CAUTION

For refilling, add the specified mixture of coolant and soft water. Adding water alone dilutes the coolant and degrades its anticorrosion properties.
The diluted coolant can attack the aluminum engine parts. In an emergency, soft water can be added. But the diluted coolant must be returned to the correct mixture ratio within a few days.
If coolant must be added often, or the reserve tank has run completely dry; there is probably leakage in the cooling system. Check the system for leaks.

Coolant Draining

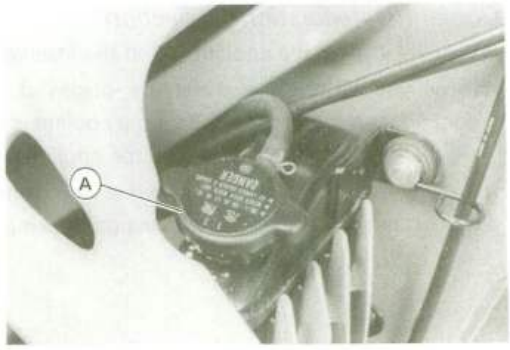


⚠WARNING

To avoid burns, do not remove the radiator cap or try to change the coolant when the engine is still hot. Wait until it cools down.
Coolant on tires will make them slippery and can cause an accident and injury. Immediately wash away any coolant that spills on the frame, engine, or wheels.
Since coolant is harmful to the human body, do not use for drinking.

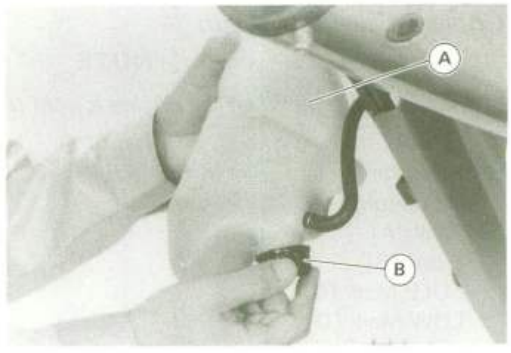
● Place a container under the drain plug [A] at the bottom of the water pump [B], then remove the drain plug.

● Remove the radiator cap [A] in two steps. First turn the cap counterclockwise to the first stop. Then push and turn it further in the same direction and remove the cap.
● *The coolant* will drain from the radiator and engine.



● Remove:
Left Side Cover
Reserve Tank Bolts
● Turn over the reserve tank [A], remove the cap [B], and pour the coolant into a suitable container.

Non-permanent Locking Agent – Reserve Tank Bolts

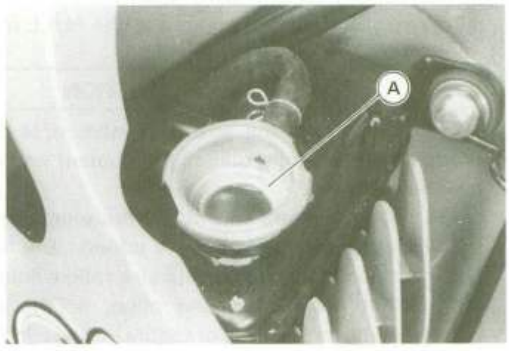


Coolant Filling

● Tighten the drain plug.

Torque – Coolant Drain Plug: 8.8 N-m (0.90 kg-m, 78 in-lb)

● Fill the radiator up to the radiator filler neck [A] with coolant.



NOTE

○ *Pour in the coolant slowly so that the air in the engine and radiator can escape.*

CAUTION

Soft or *distilled* water must be used with antifreeze (see Specifications in this chapter) in the cooling system.
If hard water is used in the system, it causes scale accumulation in the water passages, considerably reducing the efficiency of the cooling system.

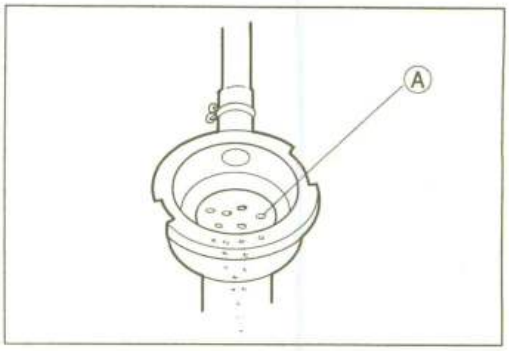
Water and Coolant Mixture Ratio (Recommended)

Soft Water	:	**50%**
Coolant	:	**50%**
Freezing Point	:	**- 35°C(- 31°F)**
Total Amount	:	**1.9 L**

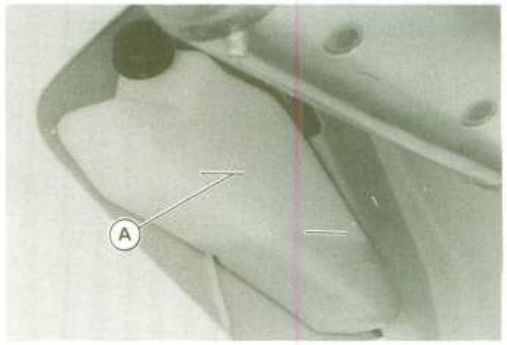
NOTE

○ *Choose a suitable mixture ratio by referring to the coolant manufacturer's directions.*

● Bleed the air from the cooling system as follows.
○ Start the engine with the radiator cap removed and run it until no more air bubbles [A] can be seen in the coolant.



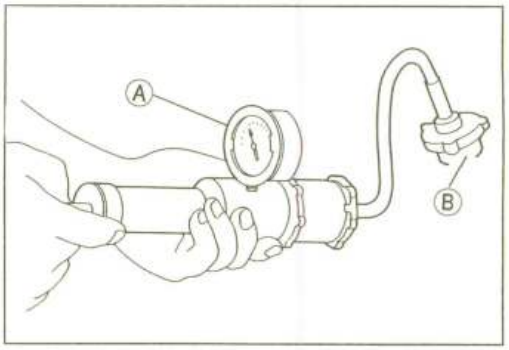
○ Tap the radiator hoses to force any air bubbles caught inside.
○ Stop the engine and add coolant up to the radiator filler neck.
● Install the radiator cap.
● Remove the reserve tank cap.
● Fill the reserve tank up to the FULL mark [A] with coolant and install the cap.



CAUTION
Do not add more coolant above the FULL mark.

Pressure Testing

● Remove the radiator cap, and install a cooling system pressure tester [A] on the radiator filler neck [B].



NOTE

○ *Wet the cap sealing surfaces with water or coolant to prevent pressure leakage.*

● Build up pressure in the system carefully until the pressure reaches 123 kPa (1.25 kg/cm², 18 psi).

CAUTION
During pressure testing, do not exceed the pressure for which the system is designed. The maximum pressure is 123 kPa (1.25 kg/cm², 18 psi).

● Watch the gauge for at least 6 seconds.
★ If the pressure holds steady, the system is all right.
● Remove the pressure tester, replenish the coolant, and install the radiator cap.
★ If the pressure drops and no external source is found, check for internal leaks. Droplets in the engine oil indicate internal leakage. Check the cylinder head gasket, the water pump mechanical seal and oil seal.

Cooling System Flushing

Over a period of time, the cooling system accumulates rust, scale, and lime in the water jacket and radiator. When this accumulation is suspected or observed, flush the cooling system. If this accumulation is not removed, it will clog up the water passage and considerably reduce the efficiency of the cooling system.

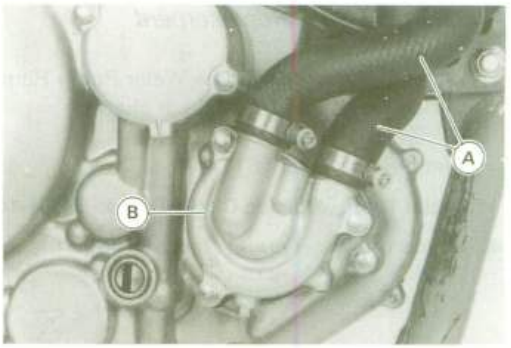
● Drain the cooling system (see Coolant Draining).
● Fill the cooling system with fresh water mixed with a flushing compound.

CAUTION
Do not use a flushing compound which is harmful to the aluminum engine and radiator. Carefully follow the instructions supplied by the manufacturer of the cleaning product.

- Warm up the engine, and run it at normal operating temperature for about ten minutes.
- Stop the engine, and drain the cooling system.
- Fill the system with fresh water.
- Warm up the engine and drain the system.
- Repeat the previous two steps once more.
- Fill the system with a permanent type coolant and bleed the air from the system (see Coolant Filling).

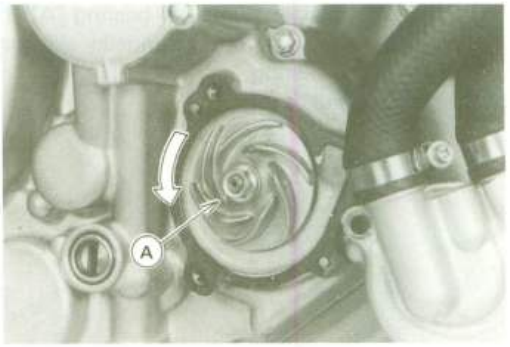
Water Pump

- Drain the coolant (see Coolant Draining).
- Remove:
  Radiator Hoses [A]
  Water Pump Cover [B]



- Turn the water pump impeller nut [A] counterclockwise and remove it.

○ The impeller has an O-ring. Turn the impeller counterclockwise during removal, and clockwise during installation. This prevents impeller O-ring damage by the shaft threads.



Water Pump Installation

- Turn the impeller clockwise during installation.
- Tighten the impeller nut.

Torque – Water Pump Impeller Nut: 8.8 N-m (0.90 kg-m, 78 in-lb)

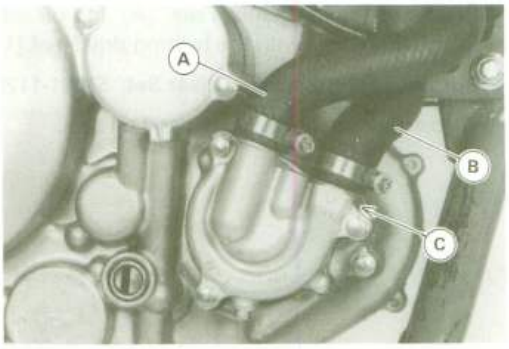
- Install the water pump cover.

Torque – Water Pump Cover Bolts: 8.8 N-m (0.90 kg-m, 78 in-lb)

- Install the hoses as shown.
  Hose from the Radiator [A]
  Hose to the Cylinder [B]
  Arrow and "CYL" Mark [C]

Torque – Radiator Hose Clamp Screws: 2.0 N-m (0.20 kg-m, 17 in-lb)

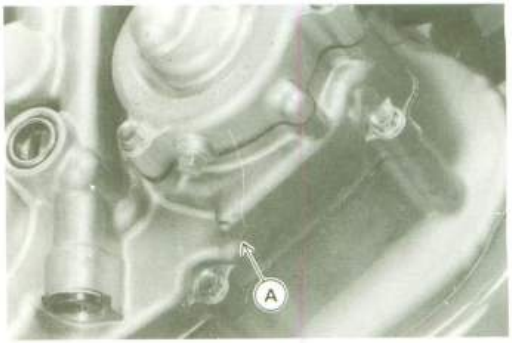
- Fill the coolant (see Coolant Filling).



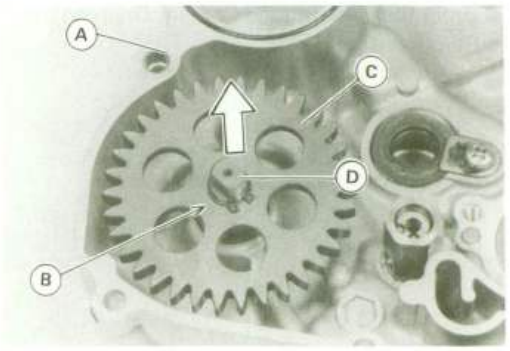
Water Pump Inspection

- Check the drainage outlet passage [A] at the bottom of the water pump body for coolant leakage.

★ If the mechanical seal is damaged, the coolant leaks through the seal, and drains through the passages. Replace the mechanical seal, ball bearing and oil seal (see Mechanical Seal Replacement).



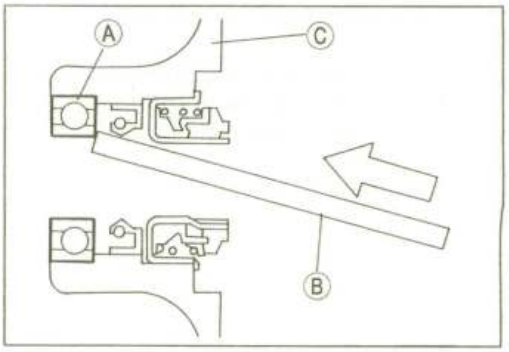
Mechanical Seal Replacement



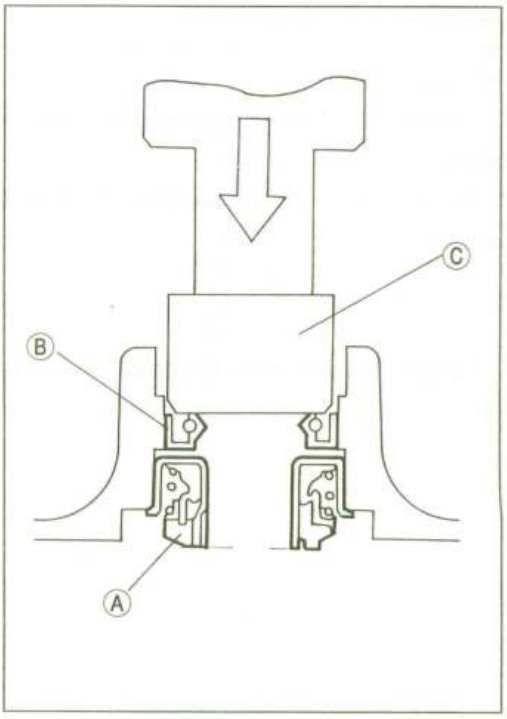
● Remove:
Water Pump Impeller (see Water Pump Removal)
Clutch Cover [A] (see Clutch chapter)
Circlip [B]
Water Pump Gear [C]

Special Tool – Outside Circlip Pliers: 57001-144

● Pull out the water pump shaft [D] from the inside of the clutch cover.



● To remove the water pump ball bearing [A], insert a metal rod [B] into the clutch cover [C] from the impeller side, and tap evenly around the bottom of the bearing.
○ Discard the ball bearing.

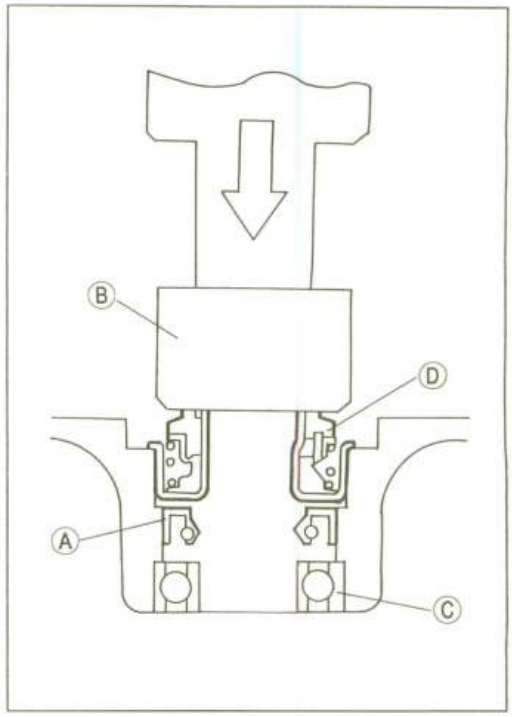


● Press out the mechanical seal [A] and oil seal [B] from the inside of the clutch cover with the bearing driver set [C].

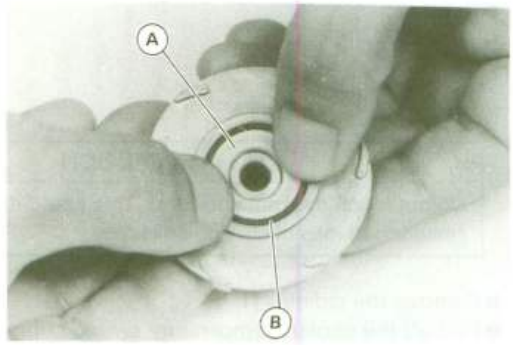
Special Tool – Bearing Driver Set: 57001-1129

○ Discard the mechanical seal and oil seal.

○ Be sure to replace the mechanical seal, oil seal and ball bearing.
● Apply plenty of high temperature grease to the oil seal lips.
● Press the oil seal [A] into the hole from the inside of the clutch cover with the bearing driver set (special tool) [B] so that the spring side of the seal lips are toward the inside of the cover.
○ Press the oil seal until the seal end is even with the end of the hole as shown.
● Press the ball bearing [C] until it bottoms out.
● Press the mechanical seal [D] into the hole with the bearing driver set [B] (special tool) until its flange touches the step.
● Install the water pump shaft from the inside of the clutch cover. This prevents oil seal damage.

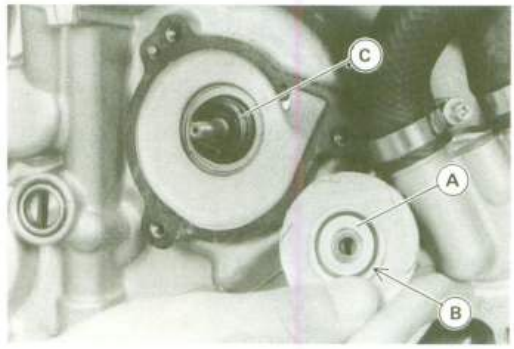


● Clean the sliding surface of a new mechanical seal with a high-flash point solvent, and apply a little coolant to the sliding surface to give the mechanical seal initial lubrication.
● Apply coolant to the surface of the rubber seal and sealing seat [A], and press the rubber seal [B] and sealing seat into the impeller by hand until the seat bottoms out.



Mechanical Seal Inspection

● Visually inspect the mechanical seal.
★ If any one of the parts is damaged, replace the mechanical seal as a unit.
Impeller Sealing Seat Surface [A]
Rubber Seal [B]
Mechanical Seal Diaphragm [C]



Radiator

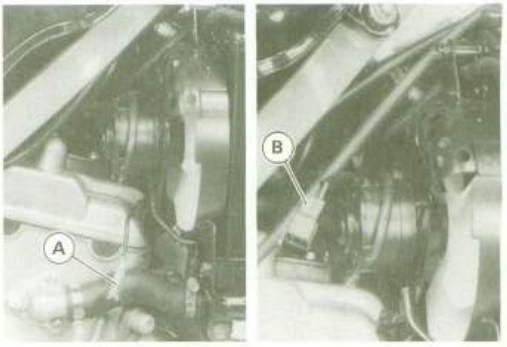
Radiator Removal

⚠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.

- Drain the coolant (see Coolant Draining).

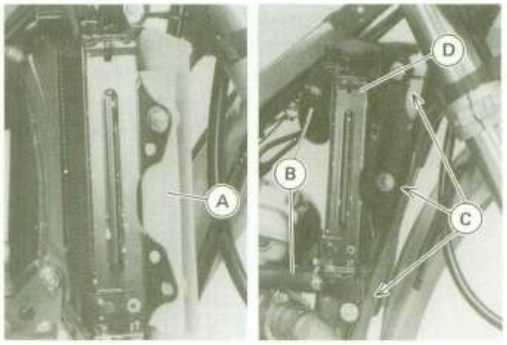
- Remove:
  Fuel Tank (see Fuel System chapter)
  Fan Switch Connector (KLX650C) [A]
  Radiator Fan Connector (KLX650C) [B]



- Remove:
  Louver [A]
  Radiator Hoses [B]
  Three Radiator Bolts [C]

CAUTION

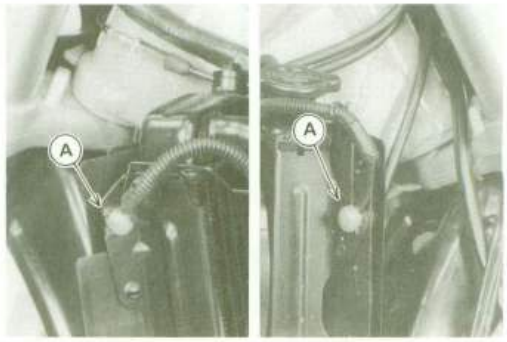
Do not touch the radiator core. This could damage the radiator fins, resulting in loss of cooling efficiency.



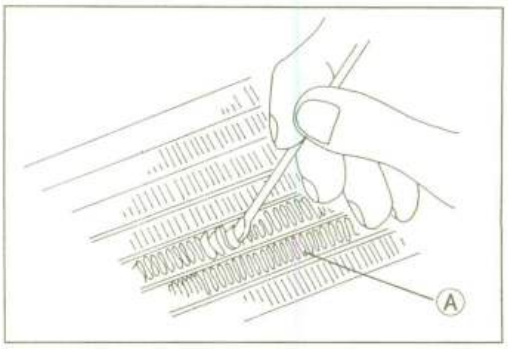
- Remove the radiator [D].
- Pull off the coolant temperature switch connector (KLX650C).
- Remove the other side radiator in the same manner.

Radiator Installation

- Be sure to install the radiator ground lead terminals [A] (KLX650C).
- Run the hoses and leads according to the Cable, Wire, and Hose Routing section in the General Information chapter.

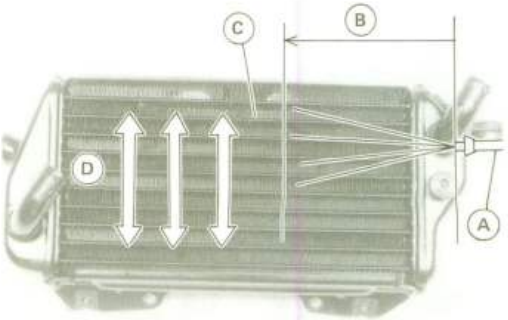


Radiator Inspection



- Check the radiator core.
- ★If there are obstructions to air flow, remove them.
- ★If the corrugated fins [A] are deformed, carefully straighten them.
- ★If the air passages of the radiator core are blocked more than 20% by unremovable obstructions or irreparably deformed fins, replace the radiator with a new one.

Radiator Cleaning

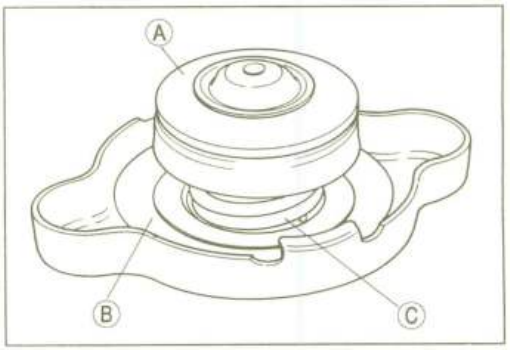


- Remove the radiator (see Radiator Removal).

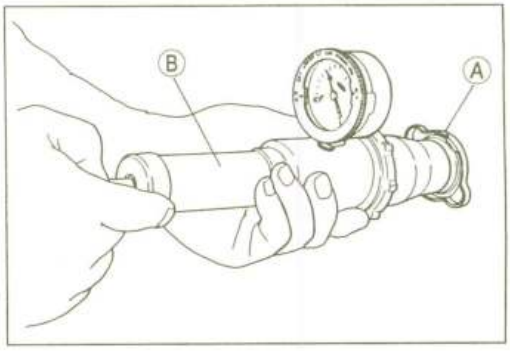
CAUTION

When cleaning the radiator with steam cleaner, be careful of the following to prevent radiator damage.
Keep the steam gun [A] away more than 0.5 m [B] from the radiator core [C]. Hold the steam gun perpendicular to the core surface.
Run the steam gun following the core fin direction [D].

Radiator Cap Inspection



- Check the condition of the top and bottom valve seals of the radiator cap.
- ★If any one of them shows visible damage, replace the cap.
  Bottom Valve Seal [A]
  Top Valve Seal [B]
  Valve Spring [C]



- Install the cap [A] on a cooling system pressure tester [B].

NOTE

○ *Wet the cap sealing surfaces with water or coolant to prevent pressure leakage.*

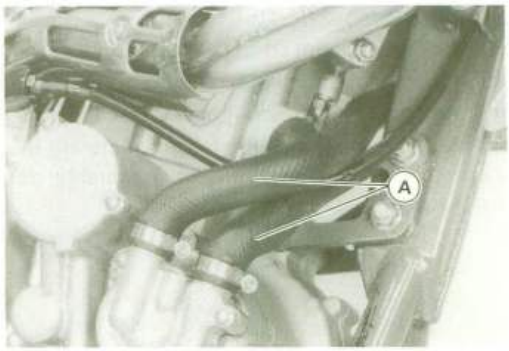
- Watching the pressure gauge, slowly pump the pressure tester to build up the pressure. The gauge pointer must remain within the relief pressure range in the table below at least 6 seconds. Continue to pump the tester until the relief valve opens, indicated by the gauge pointer flicks downward. The relief valve must open within the specified range.

Radiator Cap Relief Pressure
Standard: 93 ~ 123 kPa(0.95 ~ 1.25 kg/cm^2, 14 ~ 18 psi) for 6 seconds.

- ★If the cap cannot hold the specified pressure, or if it holds too much pressure, replace it with a new one.

Hose Inspection

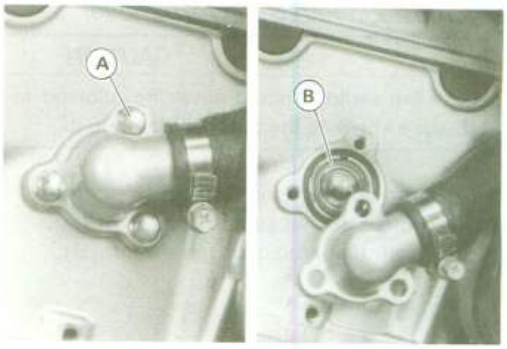
- In accordance with the Periodic Maintenance Chart, visually inspect the radiator hoses [A] for signs of deterioration. Squeeze the hose. A hose should not be hard and brittle, nor should it be soft or swollen.
- Replace any damaged hose.



Thermostat (KLX650C)

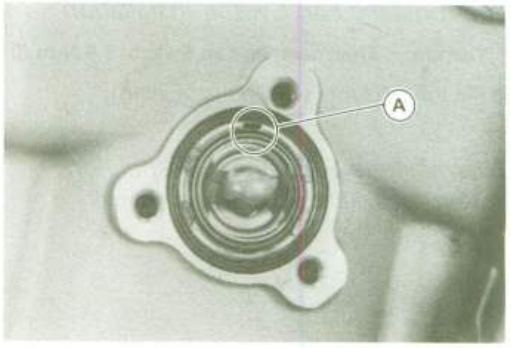
Thermostat Removal

- Drain the coolant (see Coolant Draining).
- Unscrew the housing bolts [A] and remove the thermostat [B].



Thermostat Installation

- Install the thermostat so that the air bleeder hole [A] is on top.
- Add coolant (see Coolant Filling).



Thermostat Inspection

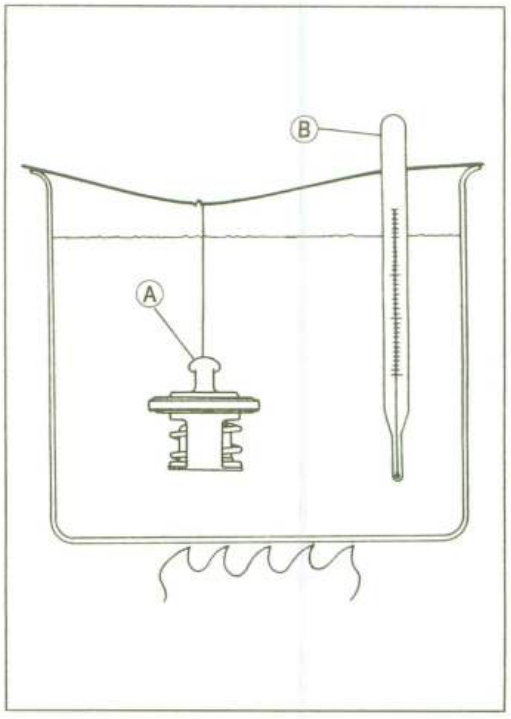
- Remove the thermostat, and inspect the thermostat valve at room temperature.

★If the valve is open, replace the valve with a new one.

- To check valve opening temperature, suspend the thermostat in a container of water and raise the temperature of the water.

Thermostat Valve Opening Temperature
69.5 ~ 72.5°C (157 ~ 162°F)

○The thermostat [A] must be completely submerged and must not touch the container sides or bottom. Suspend an accurate thermometer [B] in the water. It must not touch the container, either.

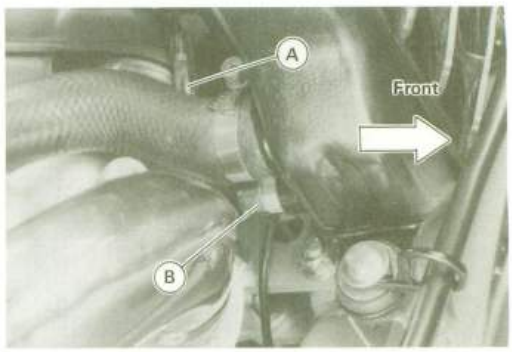


Thermostatic Fan Switch (KLX650C)

Thermostatic Fan Switch Removal

CAUTION

The fan switch should never be allowed to fall on a hard surface. Such a shock to the part can damage it.



- Drain the coolant (see Coolant Draining).
- Disconnect the fan switch connector [A].
- Remove the thermostatic fan switch [B].

Thermostatic Fan Switch Installation

Torque – Thermostatic Fan Switch: 8.8 N-m (0.90 kg-m, 78 in-lb)

- Fill the coolant (see Coolant Filling).

Thermostatic Fan Switch Inspection

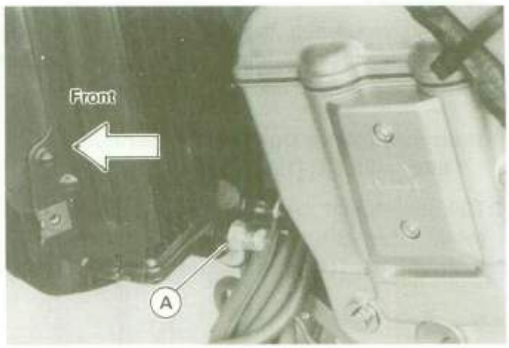
Refer to the Electrical System chapter.

Coolant Temperature Switch (KLX650C)

Coolant Temperature Switch Removal

CAUTION

The coolant temperature switch should never be allowed to fall on a hard surface. Such a shock to the part can damage it.



- Drain the coolant (see Coolant Draining).
- Disconnect the switch connector.
- Remove the coolant temperature switch [A].

Coolant Temperature Switch Installation

Torque – Coolant Temperature Switch: 8.8 N-m (0.90 kg-m, 78 in-lb)

- Fill the engine with coolant and bleed the air from the cooling system (see Coolant Filling).

Coolant Temperature Switch Inspection

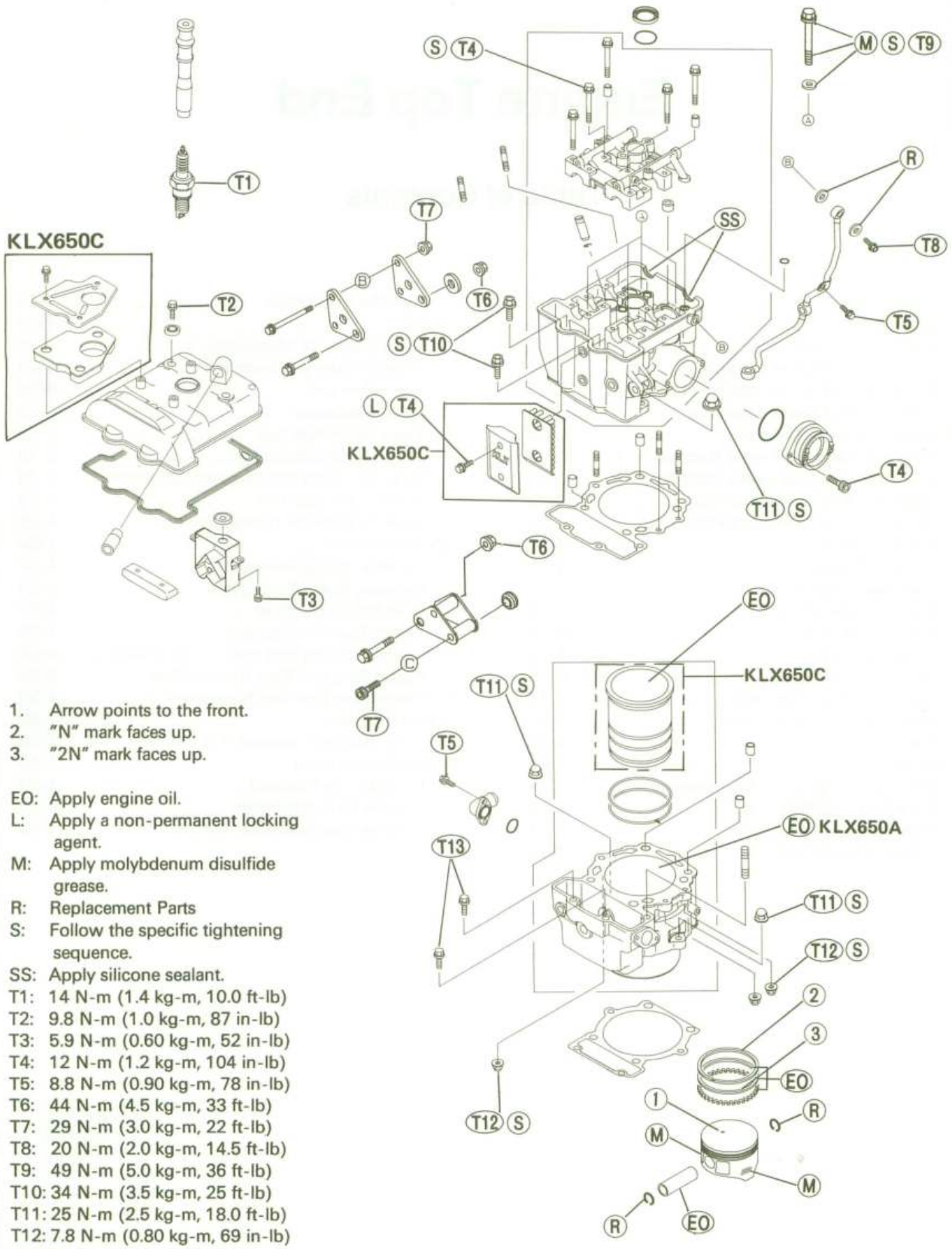
Refer to the Electrical System chapter.

Engine Top End

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Exploded View



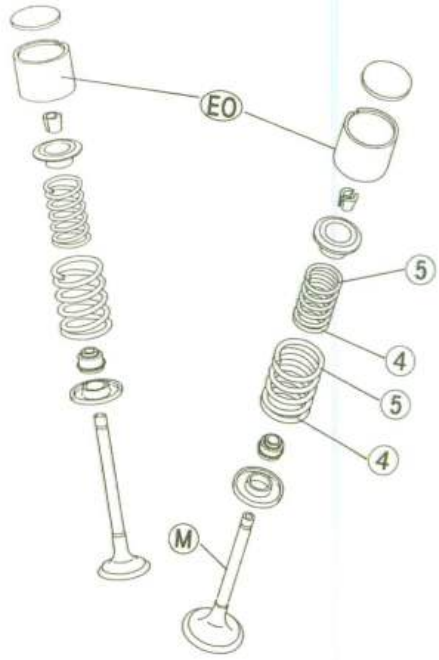
1. Arrow points to the front.
2. "N" mark faces up.
3. "2N" mark faces up.

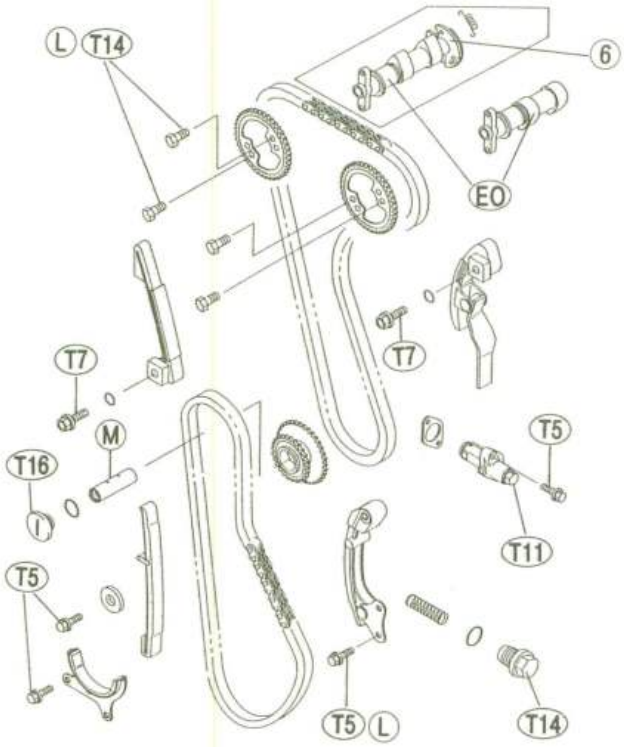
EO: Apply engine oil.
L: Apply a non-permanent locking agent.
M: Apply molybdenum disulfide grease.
R: Replacement Parts
S: Follow the specific tightening sequence.
SS: Apply silicone sealant.
T1: 14 N-m (1.4 kg-m, 10.0 ft-lb)
T2: 9.8 N-m (1.0 kg-m, 87 in-lb)
T3: 5.9 N-m (0.60 kg-m, 52 in-lb)
T4: 12 N-m (1.2 kg-m, 104 in-lb)
T5: 8.8 N-m (0.90 kg-m, 78 in-lb)
T6: 44 N-m (4.5 kg-m, 33 ft-lb)
T7: 29 N-m (3.0 kg-m, 22 ft-lb)
T8: 20 N-m (2.0 kg-m, 14.5 ft-lb)
T9: 49 N-m (5.0 kg-m, 36 ft-lb)
T10: 34 N-m (3.5 kg-m, 25 ft-lb)
T11: 25 N-m (2.5 kg-m, 18.0 ft-lb)
T12: 7.8 N-m (0.80 kg-m, 69 in-lb)
T13: 18 N-m (1.8 kg-m, 13.0 ft-lb)

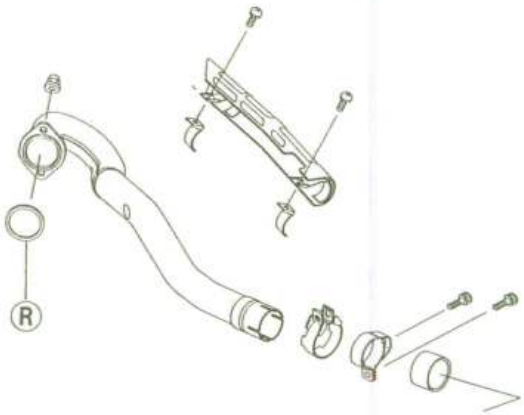
4. Closed coil end faces down.
5. White paint faces up.
6. KACR Unit

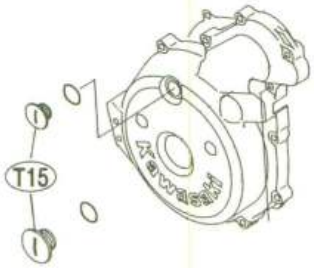
The Kawasaki Automatic Compression Release (KACR) momentarily opens one of the exhaust valves on the compression stroke at very low speeds. This allows some of the compression pressure to escape, making it easy to turn over the engine during starting.

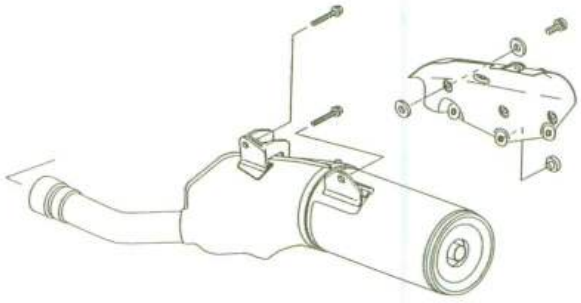
T14: 15 N-m (1.5 kg-m, 11.0 ft-lb)
T15: 2.5 N-m (0.25 kg-m, 22 in-lb)
T16: 3.4 N-m (0.35 kg-m, 30 in-lb)







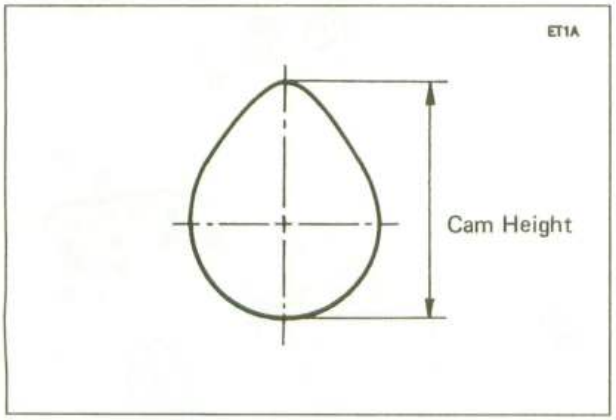




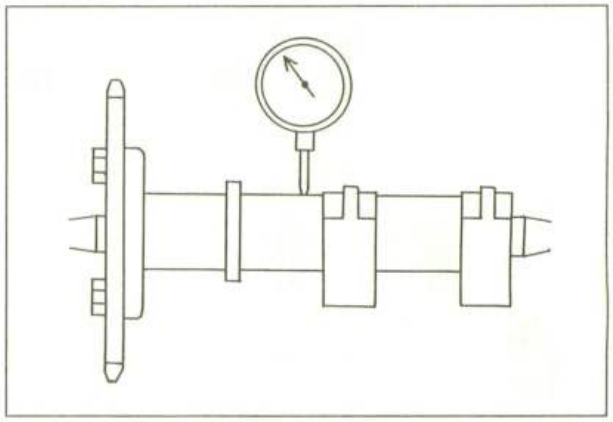
Specifications

Item		Standard	Service Limit
Camshaft:			
Cam height:			
	Exhaust	36.24 ~ 36.36 mm	36.14 mm
	Inlet	36.74 ~ 36.86 mm	36.64 mm
Camshaft, camshaft cap clearance		0.020 ~ 0.062 mm	0.15 mm
Camshaft journal diameter		22.959 ~ 22.980 mm	22.93 mm
Camshaft bearing inside diameter		23.000 ~ 23.021 mm	23.08 mm
Camshaft runout		TIR 0.02 mm or less	TIR 0.1 mm
Camshaft chain 20-link length			
	Upper	127.00 ~ 127.36 mm	128.9 mm
	Lower	127.00 ~ 127.36 mm	128.9 mm
Cylinder Head:			
Cylinder Compression			
	KLX650A	Usable range 345 ~ 590 kPa (3.5 ~ 6.0 kg/cm², 50 ~ 85 psi)	- - -
	KLX650C	Usable range 390 ~ 665 kPa (4.0 ~ 6.8 kg/cm², 57 ~ 97 psi) @330 r/min (rpm)	- - -
Cylinder head warp		- - -	0.05 mm
Valves:			
Valve clearance:	Exhaust	0.15 ~ 0.24 mm	- - -
	Inlet	0.10 ~ 0.19 mm	- - -
Valve head thickness:			
	Exhaust	0.9 ~ 1.1 mm	0.7 mm
	Inlet	0.9 ~ 1.1 mm	0.5 mm
Valve stem bend		TIR 0.01 mm or less	TIR 0.05 mm
Valve stem diameter:	Exhaust	6.955 ~ 6.970 mm	6.94 mm
	Inlet	6.965 ~ 6.980 mm	6.95 mm
Valve guide inside diameter:			
	Exhaust	7.000 ~ 7.015 mm	7.08 mm
	Inlet	7.000 ~ 7.015 mm	7.08 mm
Valve/valve guide clearance:			
(wobble method):	Exhaust	0.06 ~ 0.15 mm	0.34 mm
	Inlet	0.09 ~ 0.18 mm	0.37 mm
Valve seat cutting angle		45°, 32°, 55°, 60°	- - -

Cam Height Measurement

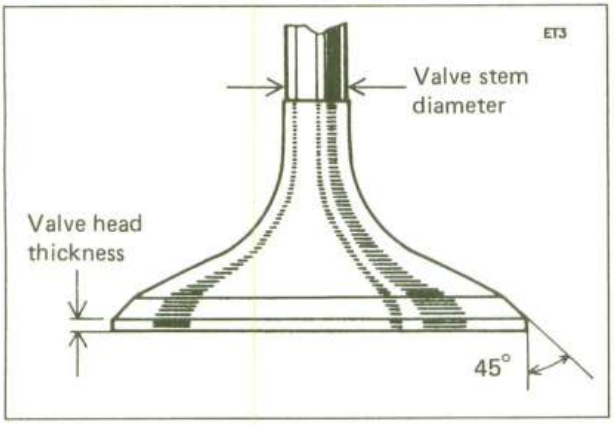


Camshaft Runout

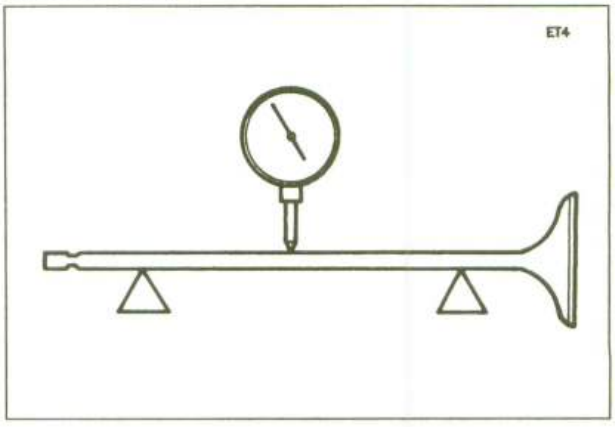


Item		Standard	Service Limit
Valve seat surface:			
Width:	Exhaust	0.8 ~ 1.2 mm	– – –
	Inlet	0.8 ~ 1.2 mm	– – –
Outside diameter:	Exhaust	31.9 ~ 32.1 mm	– – –
	Inlet	36.9 ~ 37.1 mm	– – –
Valve spring free length:			
	Outer	37.0 mm	35.1 mm
	Inner	35.2 mm	32.9 mm
Cylinder, Piston:			
Cylinder inside diameter:			
	KLX650A	100.000 ~ 100.012 mm	100.06 mm
	KLX650C	100.000 ~ 100.012 mm	100.10 mm
Piston diameter:			
	KLX650A	99.967 ~ 99.982 mm	99.82 mm
	KLX650C	99.922 ~ 99.937 mm	99.77 mm
Piston/cylinder clearance:			
	KLX650A	0.024 ~ 0.039 mm	– – –
	KLX650C	0.063 ~ 0.090 mm	– – –
Oversize piston and rings (KLX650C)		+ 0.5mm and + 1.0mm	– – –
Piston ring/groove clearance:			
	Top	0.03 ~ 0.07 mm	0.17 mm
	Second	0.02 ~ 0.06 mm	0.16 mm
Piston ring groove width:			
	Top	1.02 ~ 1.04 mm	1.12 mm
	Second	1.01 ~ 1.03 mm	1.11mm
Piston ring thickness:			
	Top	0.97 ~ 0.99 mm	0.9 mm
	Second	0.97 ~ 0.99 mm	0.9 mm
Piston ring end gap:	Top	0.25 ~ 0.40 mm	0.7 mm
	Second	0.35 ~ 0.50 mm	0.8 mm
	Oil	0.2 ~ 0.7 mm	1.0 mm

Valve Head



Valve Stem Bend



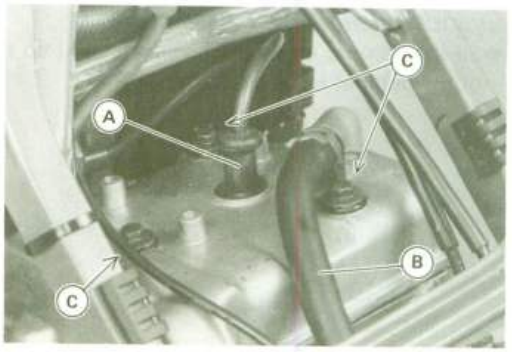
Special Tools – **Compression Gauge: 57001-221**
Compression Gauge Adapter, M12 x 1.25: 57001-1018
Valve Spring Compressor Assembly: 57001-241
Valve Spring Compressor Adapter, Φ29.5: 57001-1078
Valve Guide Arbor, Φ7: 57001-163
Valve Guide Reamer, Φ7: 57001-162
Valve Seat Cutter, 45° – Φ35: 57001-1116
Valve Seat Cutter, 32° – Φ35: 57001-1121
Valve Seat Cutter, 55° – Φ35: 57001-1247
Valve Seat Cutter, 45° – Φ41.5: 57001-1117
Valve Seat Cutter, 32° – Φ38.5: 57001-1122
Valve Seat Cutter, 60° – Φ41: 57001-1124
Valve Seat Cutter Holder, Φ7: 57001-1126
Valve Seat Cutter Holder Bar: 57001-1128
Piston Pin Puller Assembly: 57001-910
Piston Ring Compressor Grip: 57001-1095
Piston Ring Compressor Belt, Φ95 ~ Φ108: 57001-1358

Sealant – **Kawasaki Bond (Silicone Sealant): 56019-120**

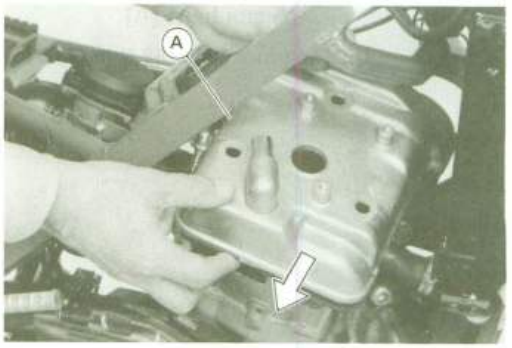
Cylinder Head Cover

Cylinder Head Cover Removal

- Remove:
  - Fuel Tank (see Fuel System chapter)
  - Radiator Fan (KLX650C, see Electrical System chapter)
  - Ignition Coil
  - Spark Plug Cap [A]
  - Breather Hose [B]
  - Cylinder Head Cover Bolts [C]



- Slide the cover [A] out the right-hand side.

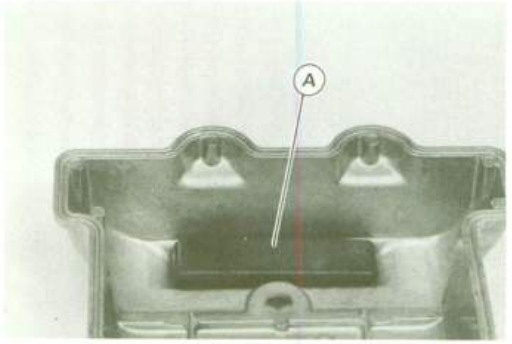


CAUTION

Do not touch the radiator core. This could damage the radiator fins, resulting in loss of cooling efficiency.

Cylinder Head Cover Installation

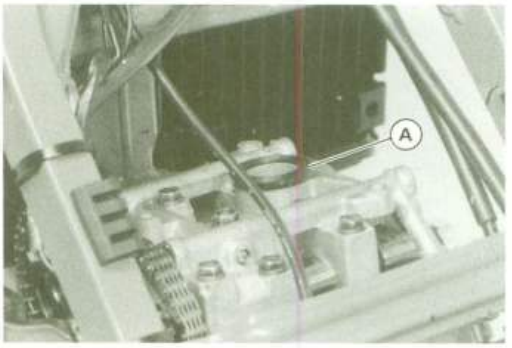
- Replace the head cover gasket with a new one if it is damaged.
- Check that the upper chain guide [A] bottoms out in the head cover.



CAUTION

If the upper chain guide does not bottom out, the camshaft chain can raise the guide and the cylinder head cover which could cause oil leakage.

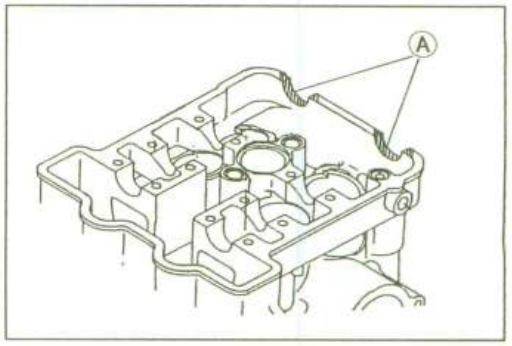
- Be sure to install the gasket [A].



- Apply silicone sealant [A] to the cylinder head as shown.

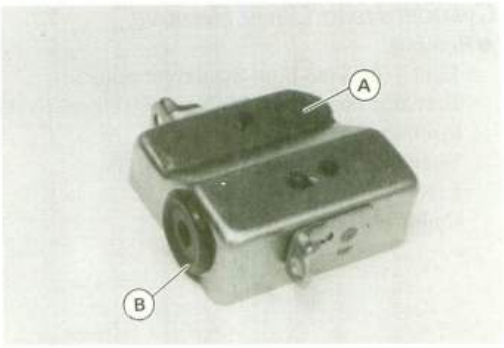
Sealant – Kawasaki Bond (Silicone Sealant): 56019-120

Torque – Cylinder Head Cover Bolts: 9.8 N-m (1.0 kg-m, 87 in-lb)



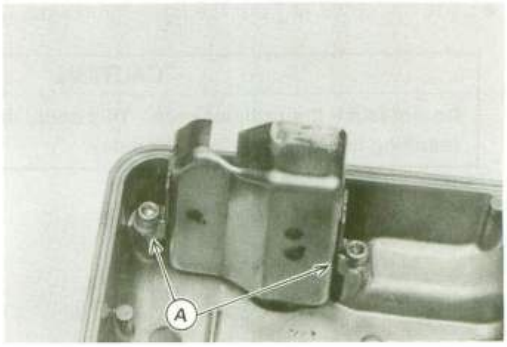
Cylinder Head Cover Assembly

● Fit the damper into the oil separator [A] so that the larger flange [B] of the damper faces outward.



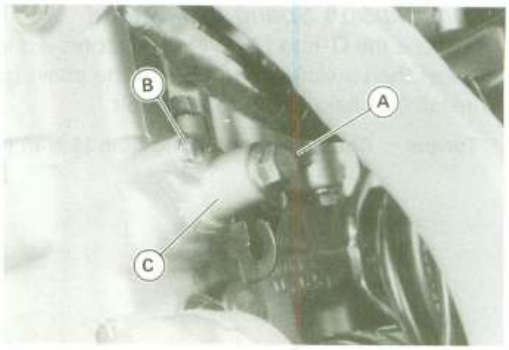
● Tighten the oil separator bolts [A].

Torque – Oil Separator Bolts: 59 N-m (0.60 kg-m, 52 in-lb)



Camshaft Chain Tensioner

Camshaft Chain Tensioner Removal

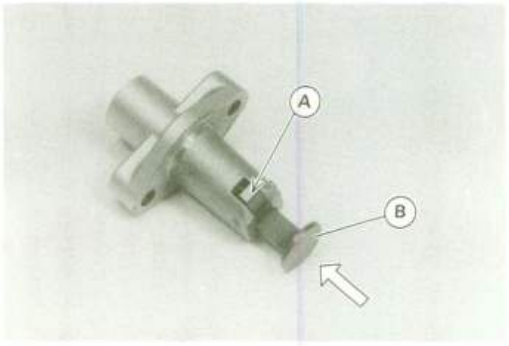


- Remove the idle adjusting screw.
- Remove the cap bolt [A] and spring.
- Remove the mounting bolts [B] and take off the camshaft chain tensioner [C].

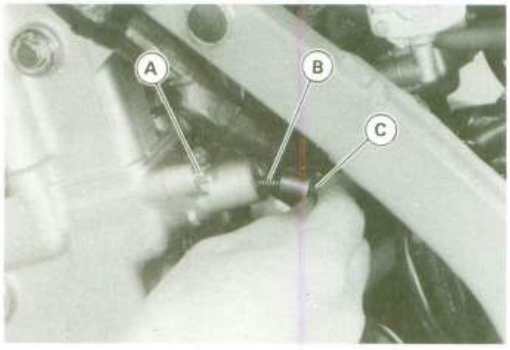
CAUTION

This is a non-return type cam chain tensioner. The push rod does not return to its original position once it moves out to take up cam chain slack. Observe all the rules listed below:
When removeing the tensioner, do not take out the mounting bolts only halfway. Retightening the mounting bolts from this position could damage the tensioner and the camshaft chain. Once the bolts are loosened, the tensioner must be removed and reset as described in "Camshaft Chain Tensioner Installation".
Do not turn over the crankshaft while the tensioner is removed. This could upset the cam chain timing, and damage the valves.

Camshaft Chain Tensioner Installation



- Push the stopper [A] to release the ratchet and push the push rod [B] into the tensioner body.

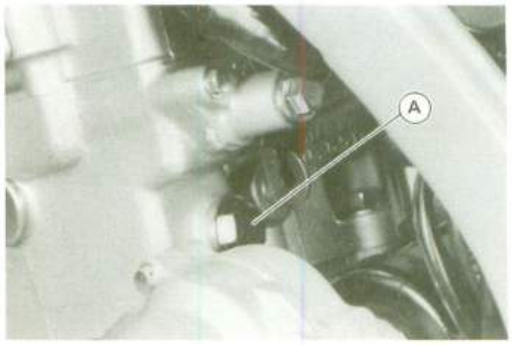


- Tighten the tensioner mounting bolts [A].

Torque – Chain Tensioner Mounting Bolts: 8.8 N-m (0.90 kg-m, 78 in-lb)
Chain Tensioner Cap: 25 N-m (2.5 kg-m, 18.0 ft-lb)

- Put the spring [B] in and tighten the cap [C].
- Remove the magneto flywheel bolt plug.
- Turn the crankshaft 2 turns counterclockwise to allow the tensioner to expand.

Chain Tension Spring Removal

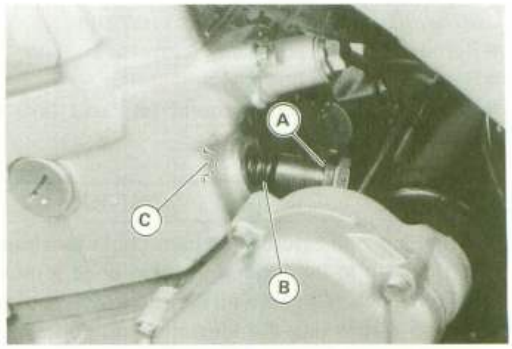


- Unscrew the tension spring bolt [A] and take out the chain tension spring.

Chain Tension Spring Installation

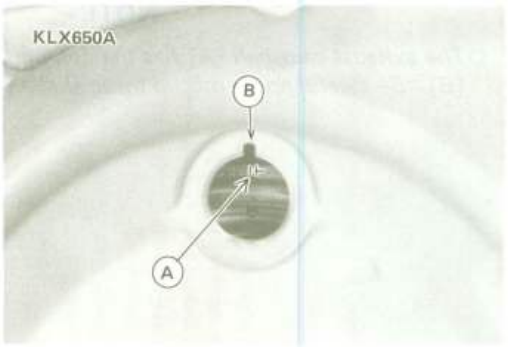
- Replace the O-ring [A] with a new one, if it is damage.
- Insert the tension spring [B] on the chain guide protrusion [C] and install the chain tension spring bolt.

Torque – Chain Tension Spring Bolt: 15 N-m (1.5 kg-m, 11.0 ft-lb)

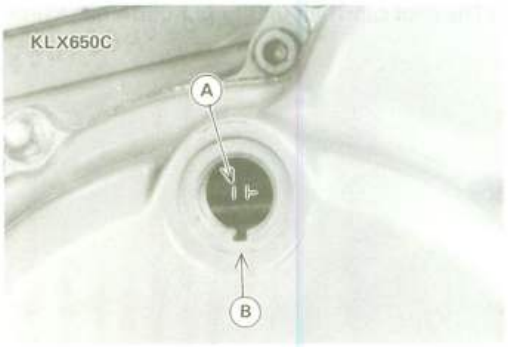


Camshaft, Camshaft Chain

Camshaft Removal

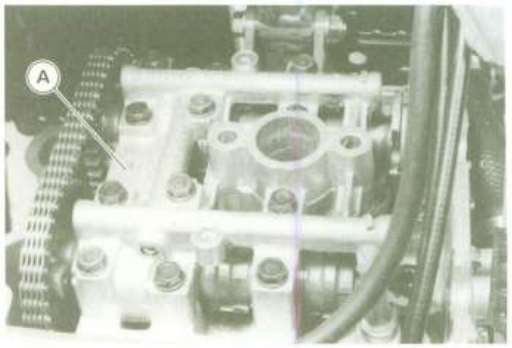


- Remove the two caps on the magneto cover.
- Position the crankshaft at TDC.
- Turn the crankshaft counterclockwise with a wrench on the magneto flywheel bolt and watch the intake valve. When the intake valves open and close, keep turning the crankshaft counterclockwise until the "T" mark [A] on the magneto flywheel aligns with the notch [B] as shown: the end of the compression stroke.



NOTE

Remove the cam chain tensioner and tension spring before removing the camshaft cap.



- Remove:
  Fuel Tank (see Fuel System chapter)
  Cylinder Head Cover (see this chapter)
  Camshaft Chain Tensioner (see this chapter)
  Chain Tension Spring (see this chapter)
  Camshaft Cap [A]
- Remove the camshafts.

CAUTION

The crankshaft may be turned, while the camshafts are removed. Always pull the chain taut while turning the crankshaft. This avoids kinking the chain on the idler sprocket. A kinked chain could damage both the chain and the sprocket.

Camshaft Installation

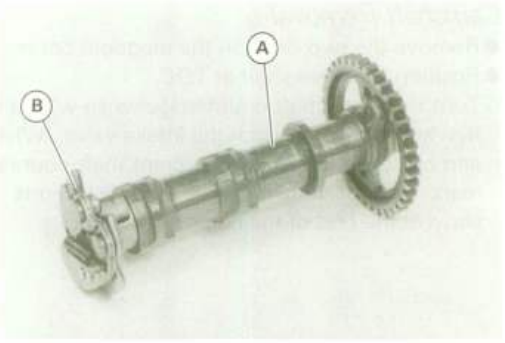
CAUTION

The camshaft cap is machined with the cylinder head, so if a new cylinder head is installed, use the cap that is supplied with the new head.

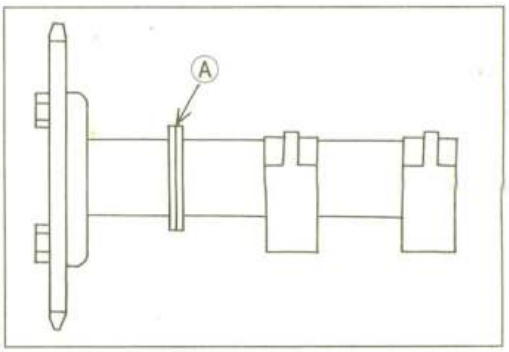
- Apply engine oil to all cam parts. If the camshaft(s) and/or cylinder head are replaced with new ones, apply a thin coat of molybdenum disulfide grease to the new cam part surfaces.

NOTE

○*The exhaust camshaft [A] has the compression release mechanism [B]. Be careful not to mix up these shafts when installing.*

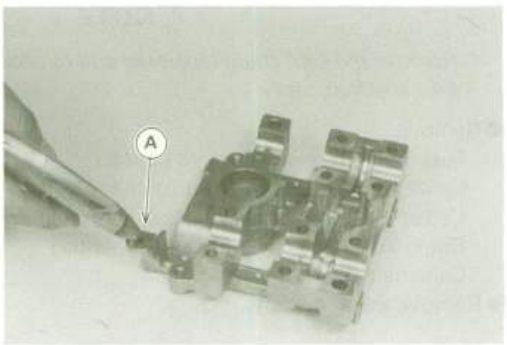


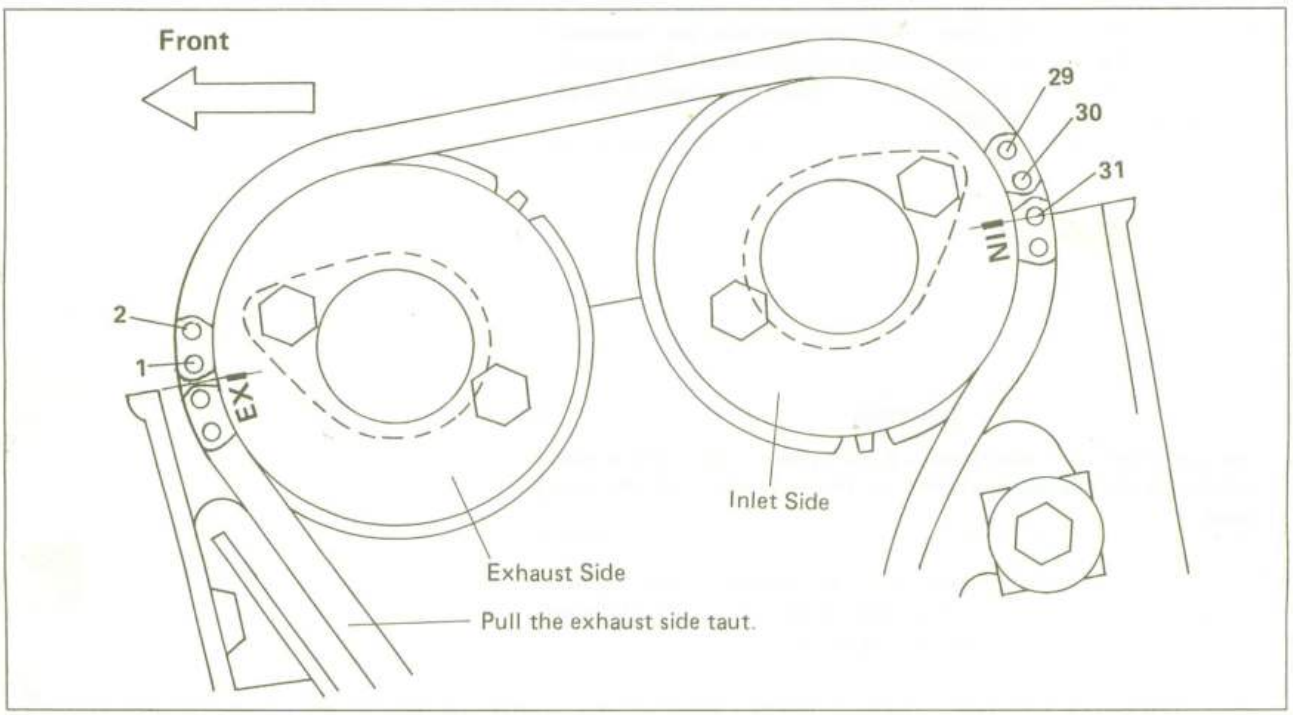
○The inlet camshaft for the KLX650A has a groove [A] for identification.



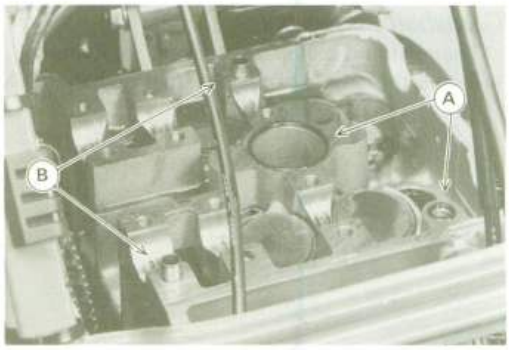
- Blow the oil passage [A] of the cap clean with compressed air.
- Apply engine oil to the camshaft bearing in the cylinder head.
- Engage the camshaft chain with the camshaft sprocket as shown.

○Pull the tension side (exhaust side) of the chain taut to install the chain.

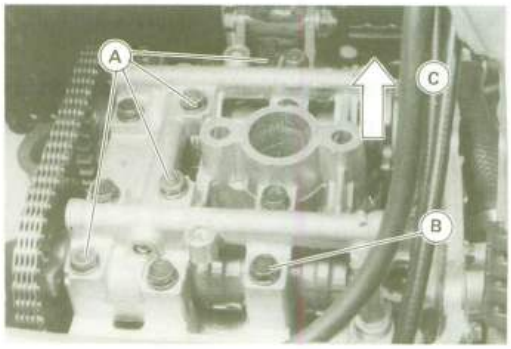




● Be sure to install the O-rings [A].
● Check that the two dowel pins [B] are in place.



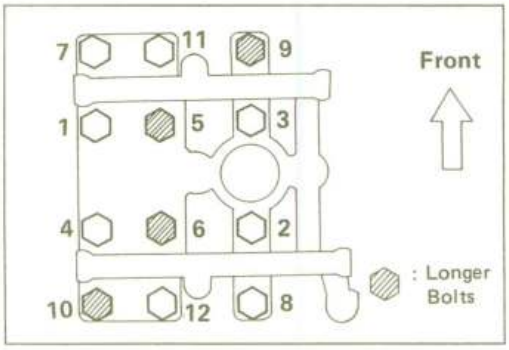
● Install the camshaft cap bolts as shown.
Four Bolts–46 L [A]
Eight Bolts–38 L [B]
Front [C]



● Tighten the cap bolts in the order shown.
○ The sequence numbers are marked on the cap.

Torque – Camshaft Cap Bolts: 12 N-m (1.2 kg-m, 104 in-lb)

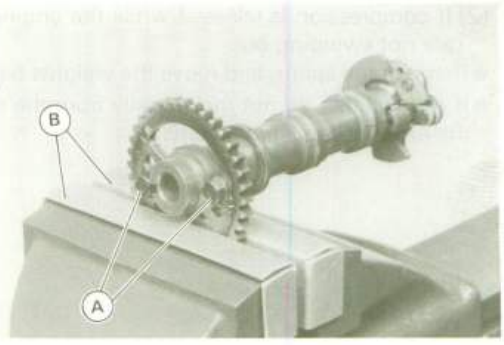
● Install:
Cam Chain Tensioner (see this chapter)
Cam Chain Tension Spring (see this chapter)



CAUTION
After this procedure, if any resistance is felt while turning over the crankshaft, stop immediately and check the camshaft chain timing. Valves will be bent if the timing is not properly set.

Camshaft Disassembly

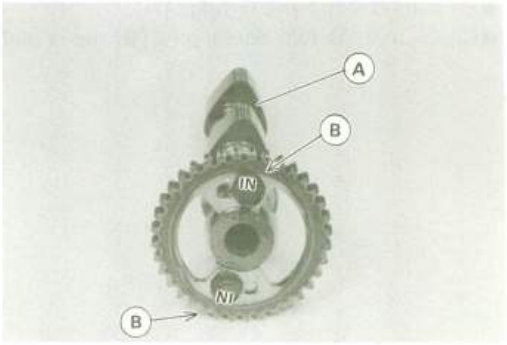
● Remove the camshaft assembly from the cylinder head (see Camshaft Removal).
● Hold the camshaft sprocket with a vise and unscrew the sprocket bolts [A].
○ Use aluminum plates [B] to prevent damage to the sprocket.



Camshaft Assembly

○The inlet and exhaust sprockets are identical.

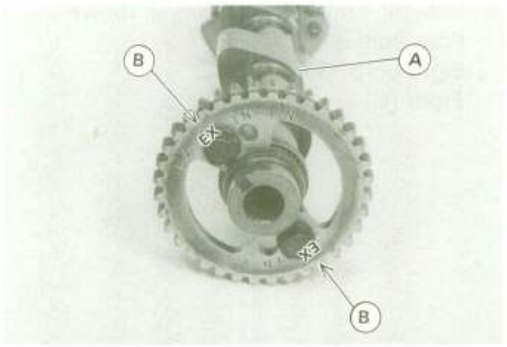
●Install the sprocket on the inlet camshaft [A], using "IN" bolt holes [B].



●Install the sprocket on the exhaust camshaft [A], using "EX" bolt holes [B].

Non-permanent Locking Agent – Camshaft Sprocket Bolts

Torque – Camshaft Sprocket Bolts: 15 N-m (1.5 kg-m, 11.0 ft-lb)

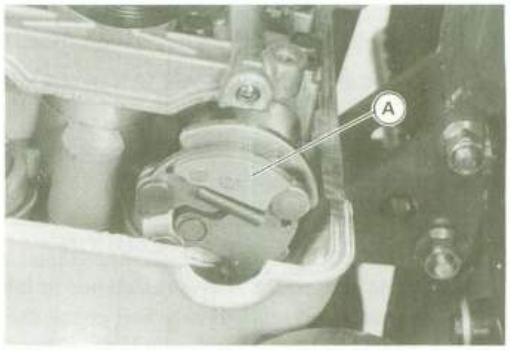


KACR Inspection

Due to the simplicity of the mechanism, no periodic maintenance is needed. There are only two symptoms of problems with the KACR mechanism [A]; compression is not released during starting, and compression is released during running.

(1) If compression is not released during starting, the weights are not returning to their rest position.

●Remove the cylinder head cover (see Cylinder Head Cover).



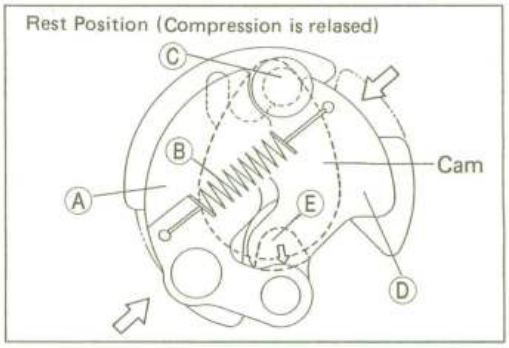
●Visually inspect the spring.

★If the spring is damaged, deformed, or missing, replace the spring.

●Remove the spring and move the weights back and forth.

★If the weights do not move smoothly all the way, replace the exhaust camshaft assembly.

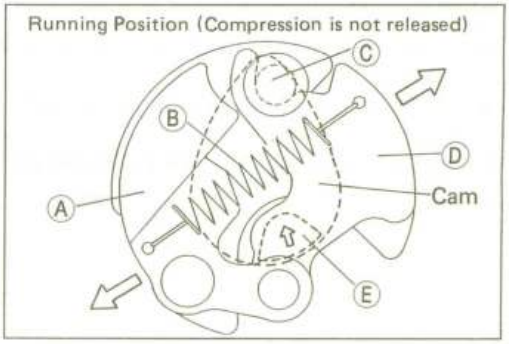
Weight 1 [A] Stopper[C] Lift Pin [E]
Spring [B] Weight 2 [D]



(2) If compression is released while the engine is running, the weights are not swinging out.

●Remove the spring and move the weights back and forth.

★If the weights do not move easily from the retracted position, replace the exhaust camshaft assembly.



Camshaft Bearing Wear

The journal wear is measured using plastigauge (press gauge), which is inserted into the clearance to be measured. The plastigauge indicates the clearance by the amount it is compressed and widened when the parts are assembled.

- Cut strips of plastigauge to journal width. Place a strip on each journal parallel to the camshaft with the camshaft installed in the correct position and so that the plastigauge will be compressed between the journal and camshaft cap.
- Install the camshaft cap , tightening the bolts in the correct sequence to the specified torque (see Camshaft Installation).

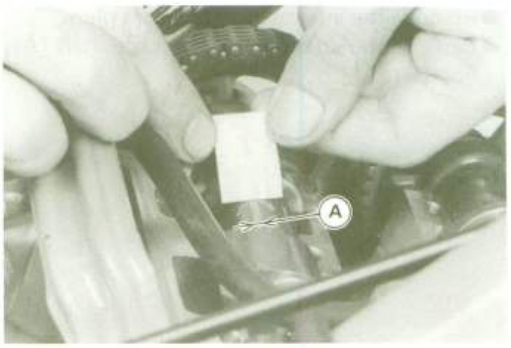
Torque – Camshaft Cap Bolts: 12 N-m (1.2 kg-m, 104 in-lb)

NOTE

○Do not turn the camshaft when the plastigauge is between the journal and camshaft cap.

○Journal clearance less than 0.025 mm can not be measured by plastigauge, however, using genuine parts maintains the minimum standard clearance.

- Remove the camshaft cap again, and measure the plastigauge width [A] to determine the clearance between each journal and the camshaft cap. Measure the widest portion of the plastigauge.



Camshaft Bearing Clearance
Standard: 0.020 ~ 0.062 mm
Service Limit: 0.15 mm

★If any clearance exceeds the service limit, measure the diameter of the camshaft journal with a micrometer.

Camshaft Journal Diameter
Standard: 22.959 ~ 22.980 mm
Service Limit: 22.93 mm

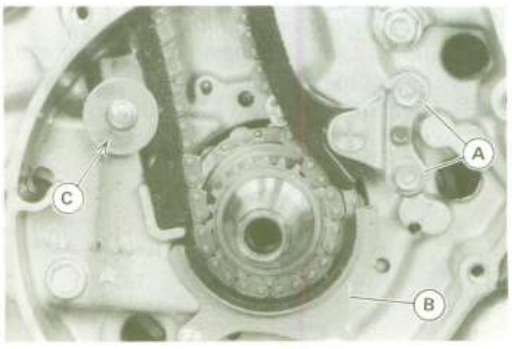
★If the camshaft journal diameter is less than the service limit, replace the camshaft with a new one and measure the clearance again.

★If the clearance still remains out of the limit, replace the cylinder head and the camshaft cap.

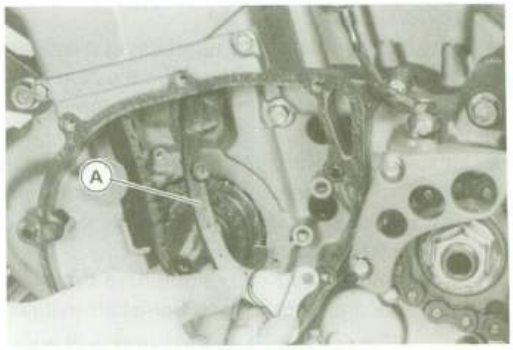
CAUTION
The cylinder head and camshaft cap are machined in the assembled state, so they must be replaced as a set.

Camshaft Chain Removal

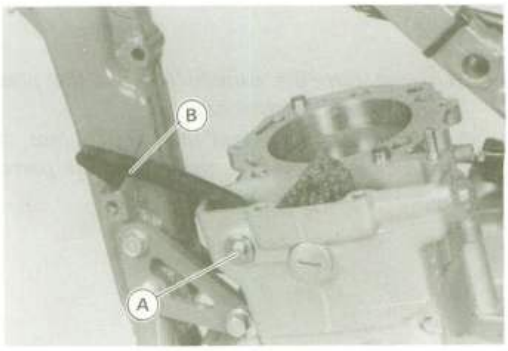
- Remove:
  Camshafts (see Camshaft Removal)
  Magneto Flywheel (see Electrical System chapter)
  Cylinder Head (see Cylinder Head Removal)
  Rear Lower Chain Guide Bolts [A]
  Camshaft Chain Holder [B]
  Front Lower Chain Guide Bolt [C]



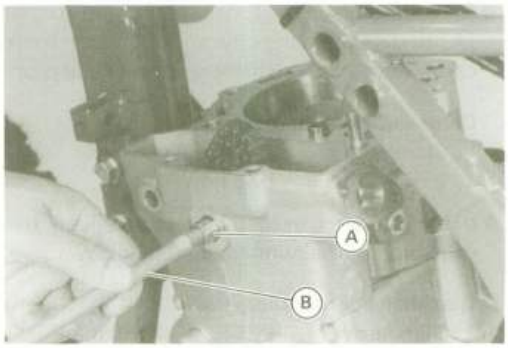
● Remove the rear lower chain guide [A].



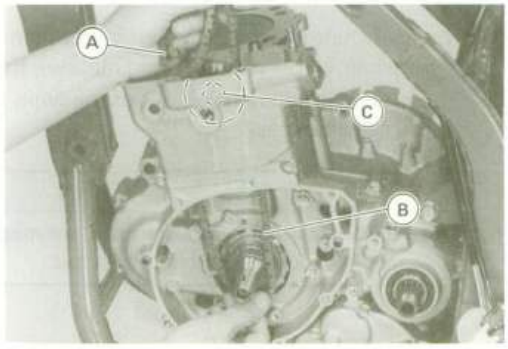
● Remove the front upper chain guide bolt [A] and guide [B].



● Remove the intermediate sprocket plug.
● Remove the intermediate sprocket shaft [A], using the cylinder head bolt [B].

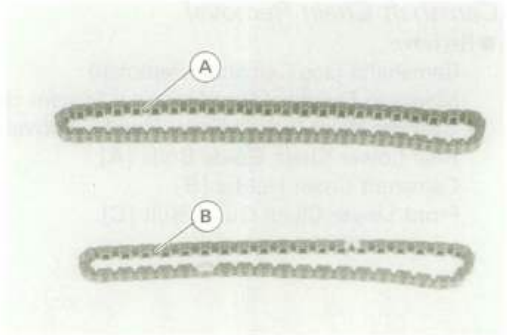


● Push up the front lower chain guide and remove it.
● Remove the upper camshaft chain [A] and lower camshaft chain [B] along with the intermediate sprocket [C].

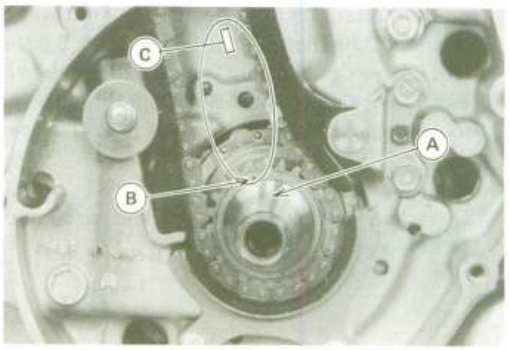


Camshaft Chain Installation

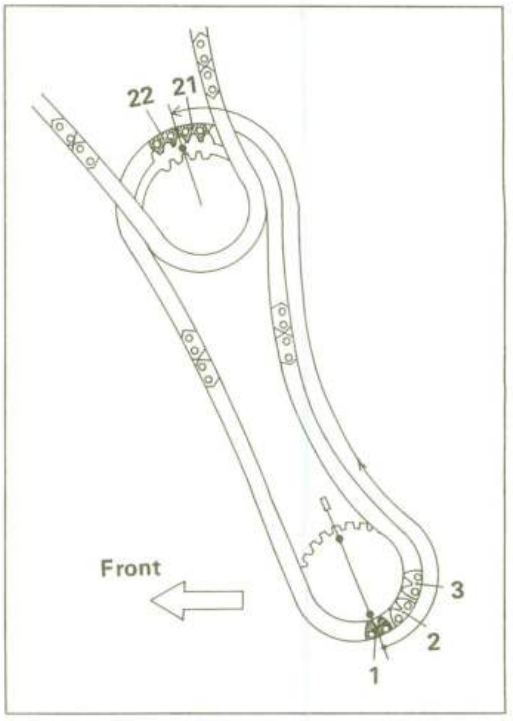
○ The upper camshaft chain [A] is longer and has wider plate links. Be careful not to mix it up with the lower camshaft chain [B].
● Remove the clutch cover (see Clutch chapter).



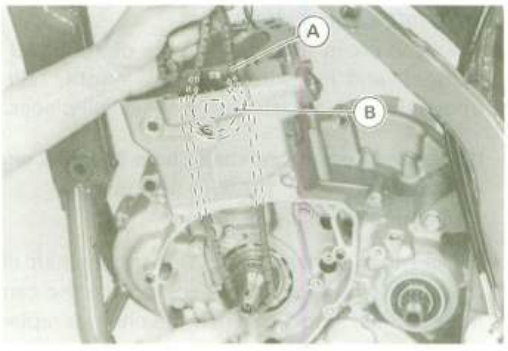
● Set the piston at TDC by turning the primary gear nut on the right side.
○ The key groove [A] should point upward and the crankshaft sprocket mark [B] should align with the crankcase mark [C] at TDC.



● Locate the three marked side plates on the lower camshaft chain as shown.
★ If no marks can be found, mark the side plate of any link in the lower camshaft chain, and from here count 21 and 22 plates. Mark the 1, 21 and 22 side plates.



● Apply a thin coat of molybdenum disulfide grease to the intermediate sprocket shaft.
● Slip the upper camshaft chain (wider one) [A] over the smaller intermediate sprocket [B].

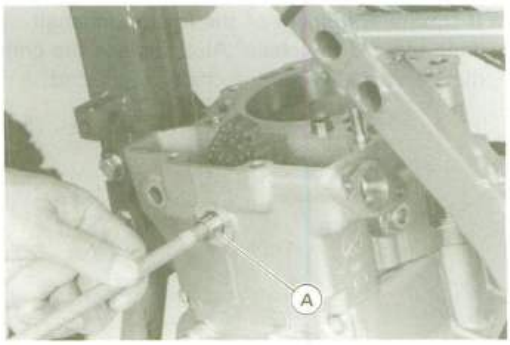


CAUTION

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

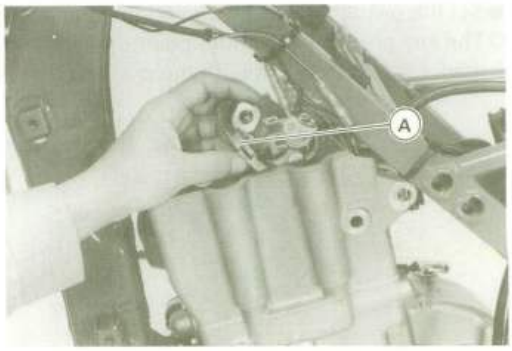
● While lifting up the intermediate sprocket, install the intermediate sprocket shaft [A] and plug.

Torque – Intermediate Shaft Plug: 3.4 N-m (0.35 kg-m, 30 in-lb)



● Install:
Camshaft Chain Holder Guide
Front Lower Chain Guide
Rear Lower Chain Guide
Front Upper Chain Guide

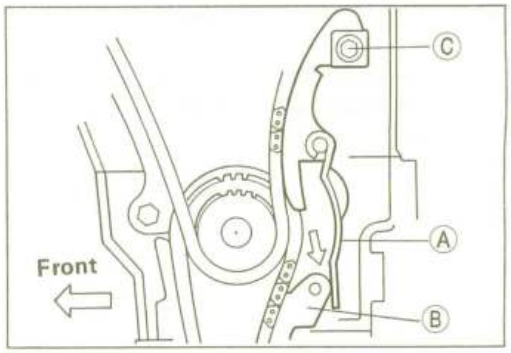
Non-permanent Locking Agent – Rear Lower Chain Guide Bolts
Torque – Camshaft Chain Holder Bolts: 8.8 N-m (0.90 kg-m, 78 in-lb)
Front Lower Chain Guide Bolt: 8.8 N-m (0.90 kg-m, 78 in-lb)
Rear Lower Chain Guide Bolts: 8.8 N-m (0.90 kg-m, 78 in-lb)
Front Upper Chain Guide Bolt: 29 N-m (3.0 kg-m, 22 ft-lb)



● Install:
Cylinder Head (see Cylinder Head Installation)
Rear Upper Chain Guide [A]

○ Insert the lever [A] of the rear upper chain guide behind the top of the lower chain guide [B] as shown.

Torque – Rear Upper Chain Guide Bolt [C]:
29 N-m (3.0 kg-m, 22 ft-lb)

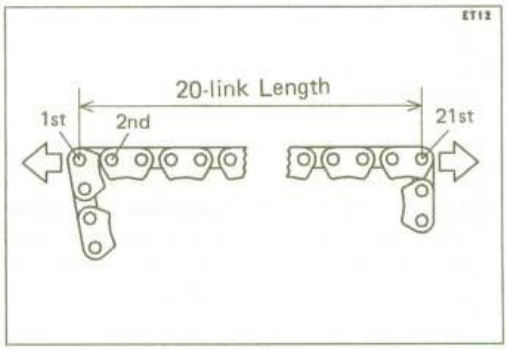


○ Position the piston at **TDC** by turning the primary gear nut clockwise.
○ The crankshaft sprocket mark should be aligned with the crankcase mark at **TDC** (left side view, see above).
○ While pulling the upper cam chain, install the camshafts so that the marks on the camshaft sprockets are positioned respectively as shown (see Camshaft Installation).
★ If the camshafts cannot be positioned as shown, re-check the lower cam chain timing.
○ After tightening the camshaft cap bolts to the specified torque, install the camshaft tensioner and tension spring.
○ Check the timing again.

Camshaft Chain Wear

● Hold the chain taut with a force of about 49 N (5 kg, 11 lb) in some manner, and measure a 20-link length. Since the chain may wear unevenly, take measurement at several places.

Upper and Lower Camshaft Chain 20-Link Length
Standard: 127.00 ~ 127.36 mm
Service Limit: 128.9 mm

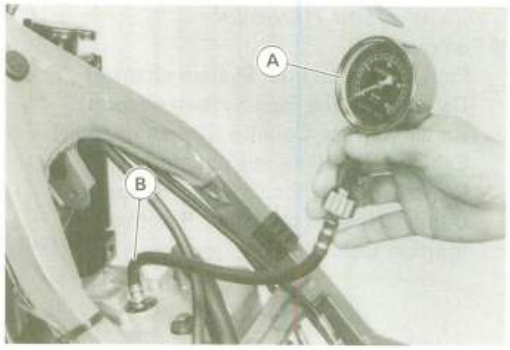


★ If the measurement of the upper camshaft chain exceeds the service limit, replace the chain. Also, replace the camshaft sprockets and the intermediate sprocket when the chain is replaced.

★ If the measurement of the lower camshaft chain exceeds the service limit, replace the chain. Also, replace the crankshaft and the intermediate sprocket when the chain is replaced.

Cylinder Head

Cylinder Compression Measurement



NOTE

○*Use the battery which is fully charged (KLX650C).*

- Warm up the engine thoroughly.
- Remove the fuel tank (see Fuel System chapter).
- Remove the spark plug (see Electrical System chapter).
- Attach the compression gauge [A] and adapter [B] firmly into the spark plug hole.

Special Tools – Compression Gauge: 57001-221
Compression Gauge Adapter, M12 x 1.25: 57001-1018

- For the KLX650A, with the throttle fully open, turn the engine over sharply with the kickstarter several times until the compression gauge stops rising; the compression is the highest reading obtainable.
- For the KLX650C, using the starter motor, turn the engine over with the throttle fully open until the compression gauge stops rising; the compression is the highest reading obtainable.

Cylinder Compression (Usable Range)
KLX650A: 345 ~ 590 kPa (3.5 ~ 6.0 kg/cm², 50 ~ 85 psi)
KLX650C: 390 ~ 665 kPa (4.0 ~ 6.8 kg/cm², 57 ~ 97 psi)
@330 r/min (rpm)

- Install the spark plug.

Torque – Spark Plug: 14 N-m (1.4 kg-m, 10.0 ft-lb)

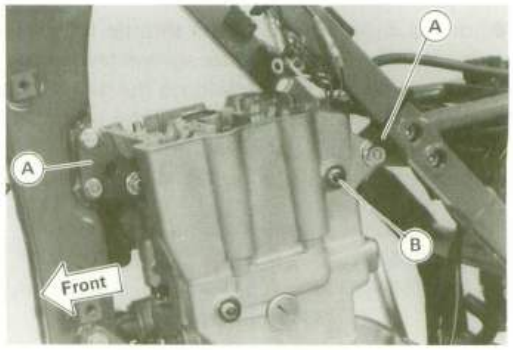
The following table should be consulted if the obtainable compression reading is not within the usable range.

Problem	Diagnosis	Remedy (Action)
Cylinder compression is higher than usable range	Carbon accumulation on piston and in combustion chamber possibly due to damaged valve stem oil seal and/or damaged piston oil rings (This may be indicated by white exhaust smoke).	Remove the carbon deposits and replace damaged parts if necessary.
	Incorrect cylinder head gasket thickness.	Replace the gasket with a standard part.
	Damaged or missing compression release cam spring	Replace the spring.
	Compression release weights do not move smoothly.	Replace the exhaust camshaft assembly.
Cylinder compression is lower than usable range	Gas leakage around cylinder head	Replace damaged gasket and check cylinder head warp.
	Bad condition of valve seating	Repair if necessary.
	Incorrect valve clearance.	Adjust the valve clearance.
	Incorrect piston/cylinder clearance	Replace the piston and/or cylinder
	Piston seizure.	Inspect the cylinder (and liner) and replace/repair the cylinder and/or piston as necessary.
	Bad condition of piston ring and/or piston ring grooves	Replace the piston and/or the piston rings
	Compression release weights do not move smoothly.	Replace the exhaust camshaft assembly.

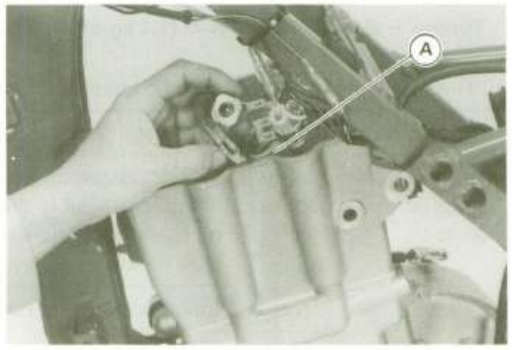
Cylinder Head Removal

● Remove:
Fuel Tank (see Fuel System chapter)
Carburetor (see Fuel System chapter)
Radiators (see Cooling System chapter)
Exhaust Pipe (see this chapter)
Water Hose on the Cylinder Head
Camshafts (see Camshaft Removal)
Ignition Coil

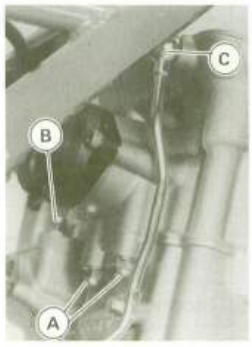
● Remove the engine mounting brackets [A].
● Loosen the rear upper chain guide bolt [B].



● Remove the rear upper chain guide [A].

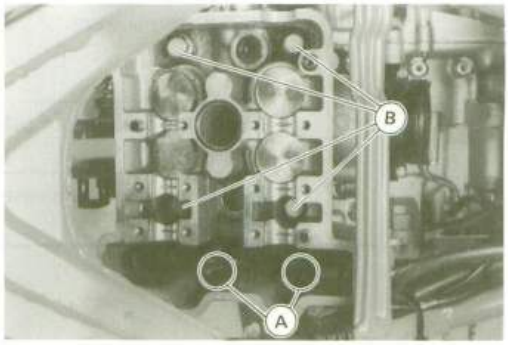


● Remove the 6 mm cylinder head nuts [A], and then 8 mm cylinder head nuts [B].
● Remove the oil pipe upper end [C].

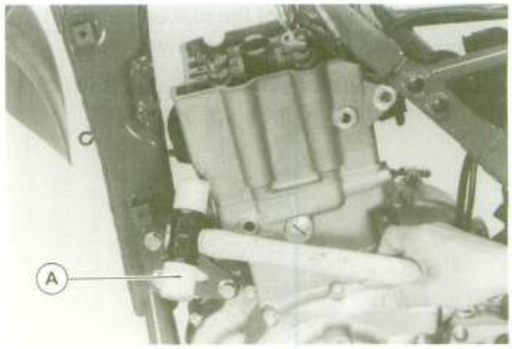




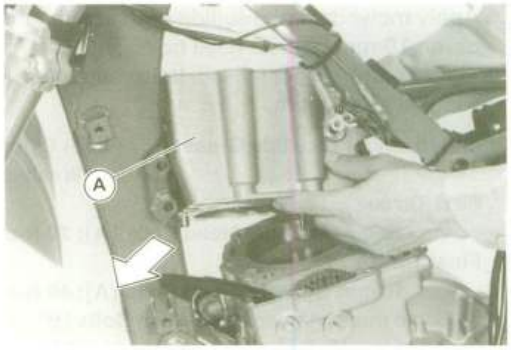
● Remove:
Cylinder Head Allen Bolts [A]
10 mm Cylinder Head Bolts [B]



● Tap lightly up the cylinder head with a plastic mallet [A] to separate from the cylinder.



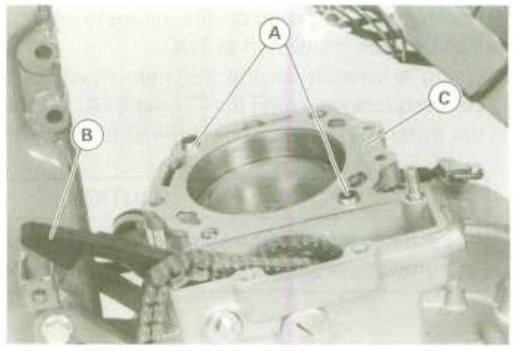
● Lift off the cylinder head [A] toward the left side.
● Remove the cylinder head gasket.



Cylinder Head Installation

● Install the cylinder (see Cylinder Installation).
○ The camshaft cap is machined together with the cylinder head, so if a new cylinder head is installed, use the cap that is supplied with the new head.

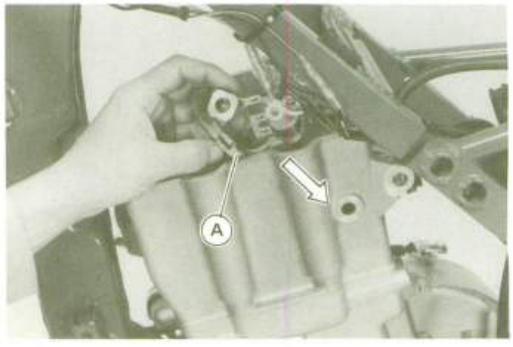
● See that two dowel pins [A] and the front upper chain guide [B] are in place on the cylinder.
● Install the new cylinder head gasket [C].



CAUTION

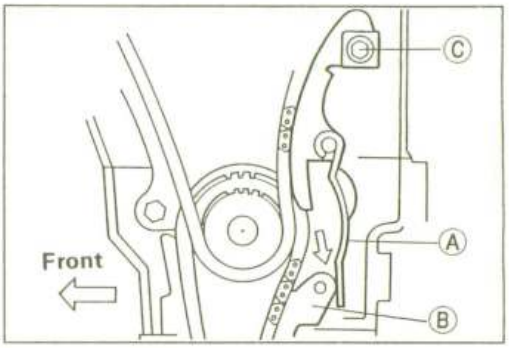
Always pull the camshaft chain taut while turning the crankshaft when the camshaft chain is loose. This avoids kinking the chain on the intermediate sprocket. A kinked chain could damage both the chain and the sprocket.

● Install:
Cylinder Head
Rear Upper Chain Guide [A]



○ Insert the lever [A] of the rear upper chain guide behind the top of the lower chain guide [B] as shown.

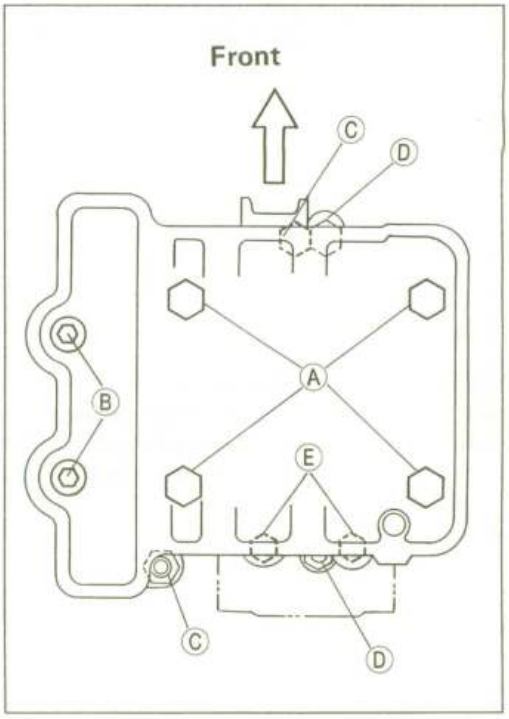
Torque – Rear Upper Chain Guide Bolt [C]: 29 N-m (3.0 kg-m, 22 ft-lb)



● Apply molybdenum disulfide grease to the threads and seating surface of the 10 mm cylinder head bolts.
● Tighten the cylinder head bolts and nuts following the tightening sequence as shown.

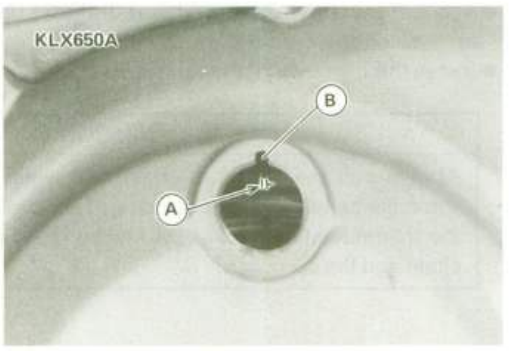
Molybdenum Disulfide Grease – 10mm Cylinder Head Bolt Threads and Washers

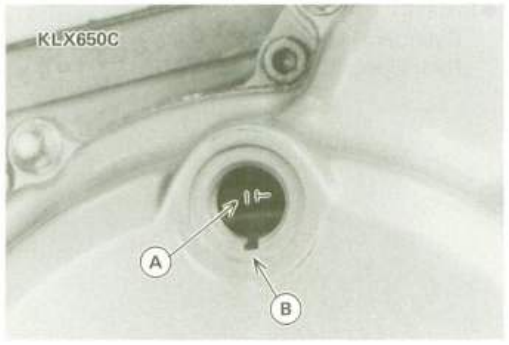
First Torque –
10 mm Cylinder Head Bolts [A]: 20 N-m (2.0 kg-m, 14.5 ft-lb)
Final Torque –
10 mm Cylinder Head Bolts [A]: 49 N-m (5.0 kg-m, 36 ft-lb)
8 mm Cylinder Head Allen Bolts [B]: 34 N-m (3.5 kg-m, 25 ft-lb)
8 mm Cylinder Head Nuts [C]: 25 N-m (2.5 kg-m, 18.0 ft-lb)
8 mm Cylinder Nuts [D]: 25 N-m (2.5 kg-m, 18.0 ft-lb)
6 mm Cylinder Head Nuts [E]: 7.8 N-m (0.80 kg-m, 69 in-lb)



● Remove the two caps on the magneto cover.
● Position the crankshaft at TDC.
○ Using a wrench on the magneto flywheel bolt, turn the crankshaft **counterclockwise** until the "T" mark [A] on the flywheel is aligned with the notch [B] of the upper hole in the magneto cover.

CAUTION
Be sure to turn the crankshaft counterclockwise with a wrench on the magneto flywheel bolt. This keeps correct camshaft chain timing.





● Engage the upper camshaft chain with the camshaft sprockets as shown (see Camshaft Installation).
● Install:
Cam Chain Tensioner (see this chapter)
Cam Chain Tension Spring (see this chapter)

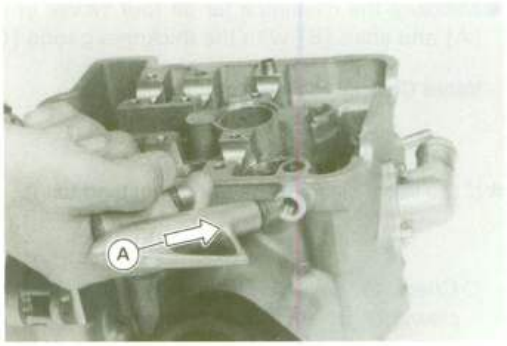
Torque – Oil Pipe Banjo Bolt: 20 N-m (2.0 kg-m, 14.5 ft-lb)
Oil Pipe Bolt: 8.8 N-m (0.90 kg-m, 78 in-lb)

● Install the engine brackets.

Torque – 10 mm Engine Mounting Bolts: 44 N-m (4.5 kg-m, 33 ft-lb)
8 mm Engine Mounting Bolts: 29 N-m (3.0 kg-m, 22 ft-lb)
Radiator Hose Clamp Screws: 2.0 N-m (0.20 kg-m, 17 in-lb)
Magneto Flywheel Bolt Plug: 2.5 N-m (0.25 kg-m, 22 in-lb)
Timing Inspection Plug: 2.5 N-m (0.25 kg-m, 22 in-lb)

Cylinder Head Cleaning

● Remove the cylinder head (see Cylinder Head Removal).
● Remove the valves (see Valve Removal).
● Wash the head with a high-flash point solvent.
● Scrape the carbon out of the combustion chamber and exhaust port with a suitable tool.
● Using compressed air, blow out [A] any particles which may obstruct the oil passage in the cylinder head.
● Install the valves (see Valve Installation).

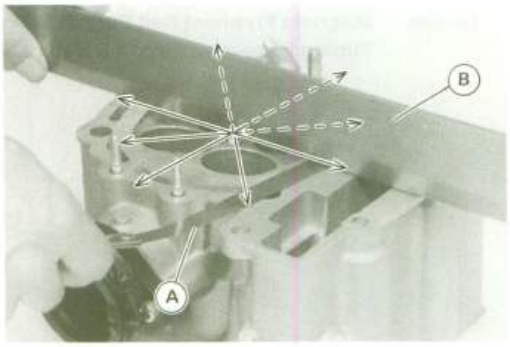


Cylinder Head Warp

● Clean the cylinder head (see Cylinder Head Cleaning).
● Lay a straightedge across the lower surface of the cylinder head at the positions shown.
● Use a thickness gauge [A] to measure the space between the straightedge [B] and the head.

Cylinder Head Warp
Standard: – – –
Service Limit: **0.05 mm**

★ If the cylinder head is warped more than the service limit, replace it.
★ If the cylinder head is warped less than the service limit, repair the head by rubbing the lower surface on emery paper secured to a surface plate (first No. 200, then No. 400).



Valves

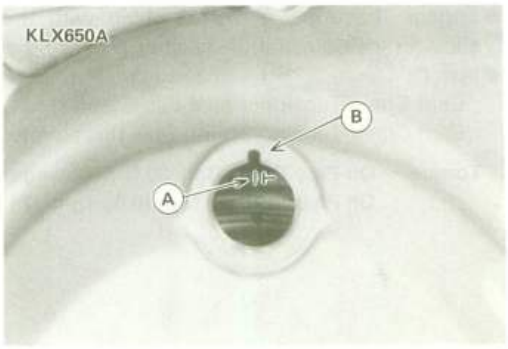
Valve Clearance Measurement

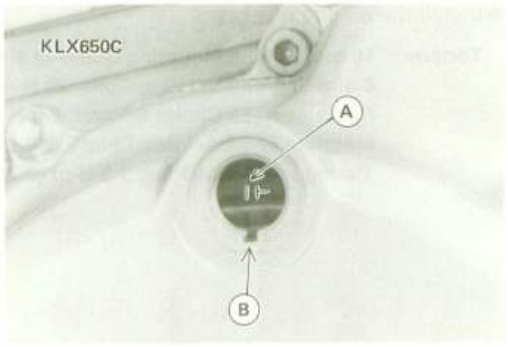
NOTE

○*Check the valve clearance when the engine is cold (at room temperature).*

● Remove:
Cylinder Head Cover (see Cylinder Head Cover Removal)
Two Plugs on Magneto Cover

● Turn the crankshaft counterclockwise with a wrench on the magneto flywheel bolt and watch the intake valve. When the intake valve opens and closes, keep turning the crankshaft counterclockwise until the "T" mark [A] on the flywheel aligns with the notch [B] as shown: the end of the compression stroke.

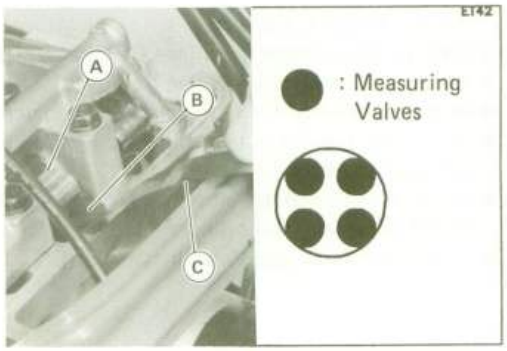




● Measure the clearance for all four valves at a time between the cam [A] and shim [B] with the thickness gauge [C].

Valve Clearance (when cold)
Exhaust : 0.15 ~ 0.24 mm
Intake : 0.10 ~ 0.19 mm

★ If the valve clearance is not correct, adjust it.



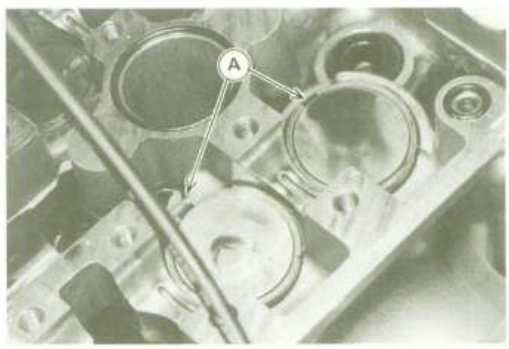
NOTE

○*Check the valve clearance using this method only. Checking the clearance at any other cam position may result in improper valve clearance.*

Torque – Magneto Flywheel Bolt Plug: 2.5 N-m (0.25 kg-m, 22 in-lb)
Timing Inspection Plug: 2.5 N-m (0.25 kg-m, 22 in-lb)

Valve Clearance Adjustment

● To change the valve clearance, remove the chain tensioner, the chain tension spring, the camshaft and the shim.
● To select a new shim which brings valve clearance within the specification, refer to the Valve Clearance Adjustment Charts.
● Position the lifter notches [A] so that they face upwards. This allows the shim to be lifted and removed.



NOTE

○*Mark and record the shim locations so that the shims can be reinstalled in their original positions.*

- Install the camshafts. Be sure to time the camshafts properly.
- Remeasure any valve clearance that was adjusted. Readjust if necessary.

CAUTION

Do not put shim stock under the shim. This may cause the shim to pop out at high rpm, causing extensive engine damage.
Do not grind the shim. This may cause it to fracture, causing extensive engine damage.
Do not grind the valve stem end to repair it or to permit additional valve clearance. If the valve end is ground, the lifter may contact the spring retainer and/or split keepers during operation, allowing the keeper to loosen. Consequently, the valve may drop into the engine, causing serious damage.

VALVE CLEARANCE ADJUSTMENT CHART
EXHAUST VALVE

	PRESENT SHIM (Example)																								
PART No. (12037-)	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025
MARK	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
THICKNESS (mm)	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20

VALVE CLEARANCE MEASUREMENT (Example)	INSTALL THE SHIM OF THIS THICKNESS (mm)																								
0.00 ~ 0.02	–	–	–	–	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00
0.03 ~ 0.07	–	–	–	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05
0.08 ~ 0.12	–	–	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10
0.13 ~ 0.14	–	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15
0.15 ~ 0.24	SPECIFIED CLEARANCE/NO CHANGE REQUIRED																								
0.25 ~ 0.27	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	
0.28 ~ 0.32	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20		
0.33 ~ 0.37	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20			
0.38 ~ 0.42	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20				
0.43 ~ 0.47	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20					
0.48 ~ 0.52	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20						
0.53 ~ 0.57	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20							
0.58 ~ 0.62	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20								
0.63 ~ 0.67	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20									
0.68 ~ 0.72	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20										
0.73 ~ 0.77	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20											
0.78 ~ 0.82	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20												
0.83 ~ 0.87	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20													
0.88 ~ 0.92	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20														
0.93 ~ 0.97	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20															
0.98 ~ 1.02	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20																
1.03 ~ 1.07	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20																	
1.08 ~ 1.12	2.90	2.95	3.00	3.05	3.10	3.15	3.20																		
1.13 ~ 1.17	2.95	3.00	3.05	3.10	3.15	3.20																			
1.18 ~ 1.22	3.00	3.05	3.10	3.15	3.20																				
1.23 ~ 1.27	3.05	3.10	3.15	3.20																					
1.28 ~ 1.32	3.10	3.15	3.20																						
1.33 ~ 1.37	3.15	3.20																							
1.38 ~ 1.42	3.20																								

1. Measure the clearance (with engine cold).
2. Check present shim size.
3. Match clearance in vertical column with present shim size in horizontal column.
4. Install the shim specified where the lines intersect. This shim will give the proper clearance.

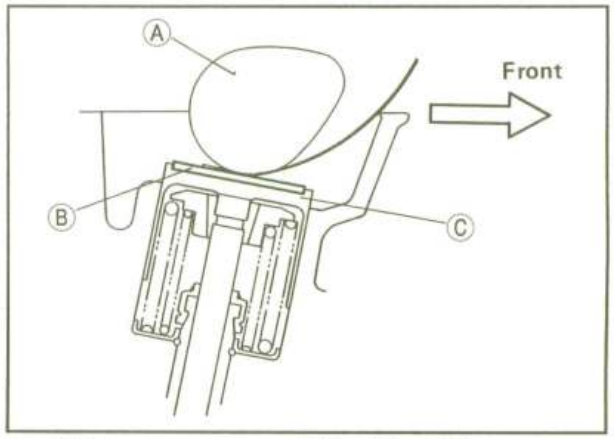
Example:

Present shim is **2.55 mm.**
Measured clearance is **0.42 mm.**
Replace **2.55 mm** shim with **2.75 mm** shim.

5. Remeasure the valve clearance and readjust if necessary.

NOTE

○ *If the valve clearance is smaller (larger) than the standard, select a thinner (thicker) shim and then measure the clearance again.*



Cam [A]
Shim [B]
Valve Lifter [C]

VALVE CLEARANCE ADJUSTMENT CHART
INLET VALVE

	PRESENT SHIM (Example ↓)																								
PART No. (12037-)	001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025
MARK	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
THICKNESS (mm)	2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20

VALVE CLEARANCE MEASUREMENT (Example ↓)	INSTALL THE SHIM OF THIS THICKNESS (mm) →
0.00 ~ 0.02	– – – 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05
0.03 ~ 0.07	– – 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10
0.08 ~ 0.09	– 2.00 2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15
0.10 ~ 0.19	SPECIFIED CLEARANCE/NO CHANGE REQUIRED
0.20 ~ 0.22	2.05 2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.23 ~ 0.27	2.10 2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.28 ~ 0.32	2.15 2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.33 ~ 0.37	2.20 2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.38 ~ 0.42	2.25 2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.43 ~ 0.47	2.30 2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.48 ~ 0.52	2.35 2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.53 ~ 0.57	2.40 2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.58 ~ 0.62	2.45 2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.63 ~ 0.67	2.50 2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.68 ~ 0.72	2.55 2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.73 ~ 0.77	2.60 2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.78 ~ 0.82	2.65 2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.83 ~ 0.87	2.70 2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.88 ~ 0.92	2.75 2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.93 ~ 0.97	2.80 2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
0.98 ~ 1.02	2.85 2.90 2.95 3.00 3.05 3.10 3.15 3.20
1.03 ~ 1.07	2.90 2.95 3.00 3.05 3.10 3.15 3.20
1.08 ~ 1.12	2.95 3.00 3.05 3.10 3.15 3.20
1.13 ~ 1.17	3.00 3.05 3.10 3.15 3.20
1.18 ~ 1.22	3.05 3.10 3.15 3.20
1.23 ~ 1.27	3.10 3.15 3.20
1.28 ~ 1.32	3.15 3.20
1.33 ~ 1.37	3.20

1. Measure the clearance (with engine cold).
2. Check present shim size.
3. Match clearance in vertical column with present shim size in horizontal column.
4. Install the shim specified where the lines intersect. This shim will give the proper clearance.

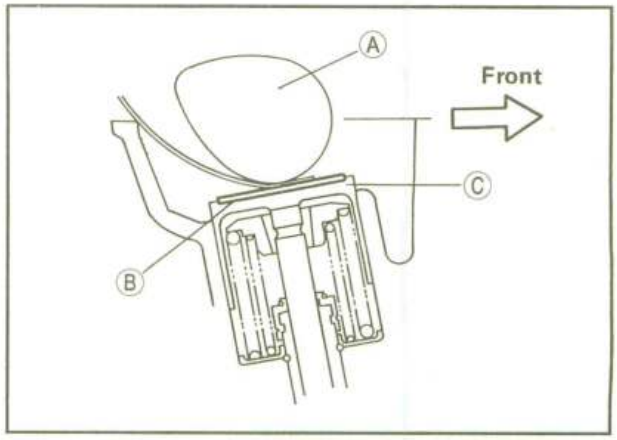
Example:

Present shim is **2.65 mm.**
Measured clearance is **0.35 mm.**
Replace **2.65 mm** shim with **2.85 mm** shim.

5. Remeasure the valve clearance and readjust if necessary.

NOTE

○ *If the valve clearance is smaller (larger) than the standard, select a thinner (thicker) shim and then measure the clearance again.*

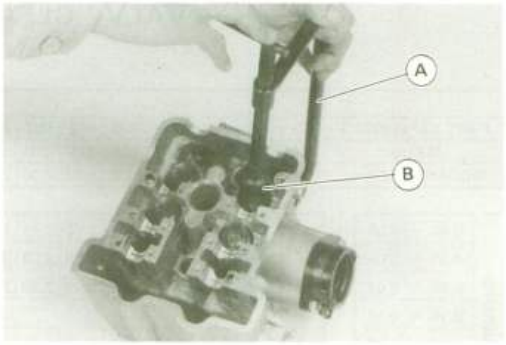


Cam [A]
Shim [B]
Valve Lifter [C]

Valve Removal

- Remove the cylinder head (see Cylinder Head Removal).
- Mark and record the valve location so it can be installed in the original position.
- Using the valve spring compressor assembly, remove the valve.

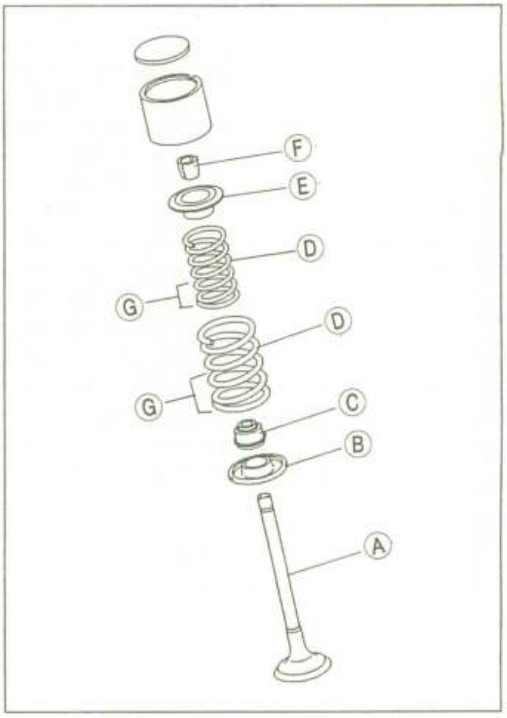
Special Tools – Valve Spring Compressor Assembly: 57001-241 [A]
Valve Spring Compressor Adapter, Φ29.5: 57001-1078 [B]



Valve Installation

- Replace the valve stem oil seal.
- If a new valve is to be used, check the valve-to-guide clearance (see this chapter).
- ★If there is too little clearance, ream the valve guide (see Valve Guide Installation).
- ★If there is too much clearance, install a new valve guide (see Valve Guide Removal and Valve Guide Installation).
- Check the valve seat (see Valve Seat Inspection).
- Apply a thin coat of molybdenum disulfide grease to the valve stem.
- Install each spring so that the closed coil end faces downwards; white paint faces upward.

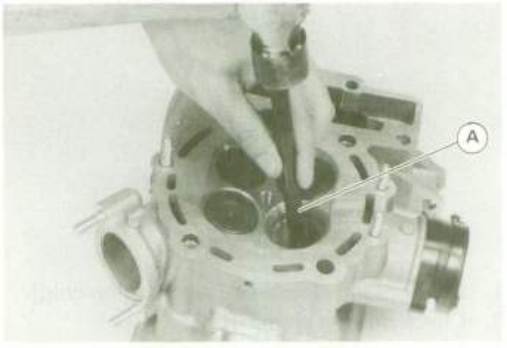
Valve Stem [A]
Spring Seat [B]
Oil Seal [C]
Spring [D]
Retainer [E]
Split Keepers [F]
Closed Coil End [G]



Valve Guide Removal

- Remove:
  Valve (see Valve Removal)
  Valve Stem Oil Seal
- Heat the area around the guide to 120° to 150°C (250° to 302°F), and hammer lightly on the valve guide arbor [A] to remove the guide from the top of the head.

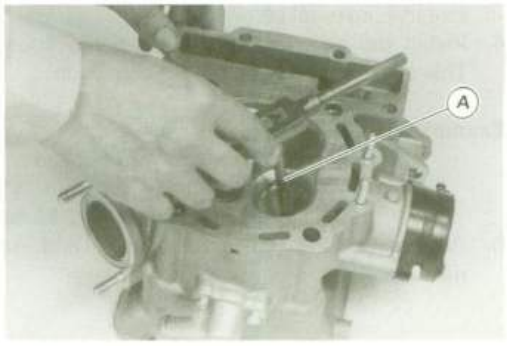
Special Tool – Valve Guide Arbor, Φ7: 57001-163



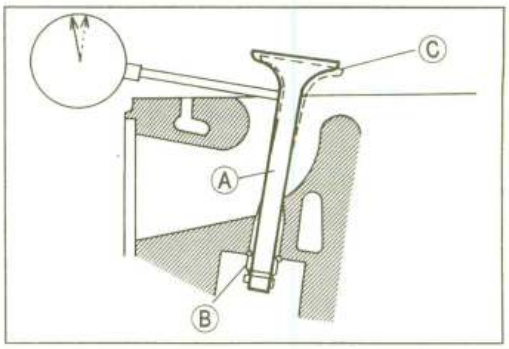
Valve Guide Installation

- Valve guides are identical.
- Lightly oil the valve guide outer surface.
- Heat the cylinder head around the valve guide hole to 120° to 150°C (250° to 302°F).
- Drive the valve guide in from the top of the cylinder head until the circlip stops the guide from going in too far.
- Allow the cylinder head to cool.
- Ream the valve guide with the valve guide reamer [A] even if the old guide is reused.

Special Tool – Valve Guide Reamer, Φ7: 57001-162



Valve-to-Guide Clearance Measurement



If a small bore gauge is not available, inspect the valve guide wear by measuring the valve to valve guide clearance with the wobble method as indicated below.

- Insert a new valve [A] into the guide [B] and set a dial gauge against the stem perpendicular to it as close as possible to the cylinder head mating surface.
- Move [C] the stem back and forth to measure valve/valve guide clearance.
- Repeat the measurement in a direction at a right angle to the first.

★If the reading exceeds the service limit, replace the guide.

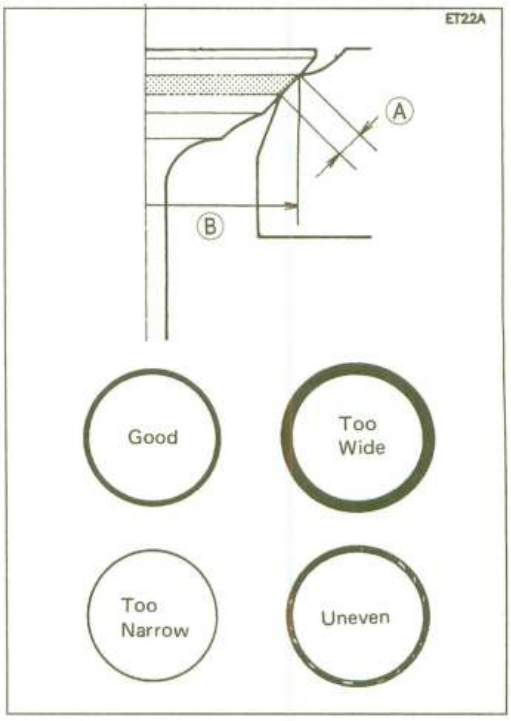
NOTE

○*The reading is not actual valve/valve guide clearance because the measuring point is above the guide.*

Valve/Valve Guide Clearance (Wobble Method)

	Standard	Service Limit
Exhaust	**0.06 ~ 0.15 mm**	**0.34 mm**
Inlet	**0.09 ~ 0.18 mm**	**0.37 mm**

Valve Seat Inspection



- Remove the valve (see Valve Removal).
- Check the valve seat width [A].

○Measure the seat width of the portion where there is no build-up carbon (white portion) of the valve seat with vernier calipers.

Valve Seating Surface Width
Standard: 0.5 ~ 1.0 mm

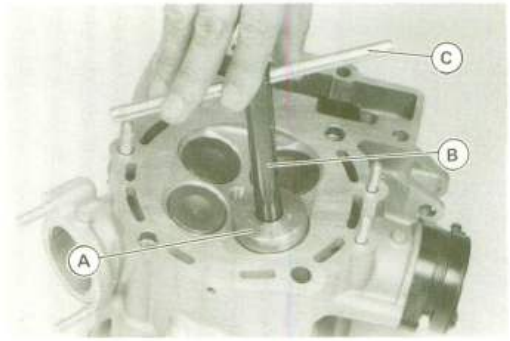
★If the valve seat width is not within the specified range, repair the valve seat.

- Measure the outside diameter [B] of the seating pattern on the valve seat.

★If the outside diameter of the valve seating pattern is too large or too small, repair the valve seat.

Valve Seating Surface Outside Diameter
Exhaust : 31.9 ~ 32.1 mm
Inlet : 36.9 ~ 37.1 mm

Valve Seat Repair (Valve Lapping)



- Using the valve seat cutters [A], repair the valve seat.

Special Tools - Valve Seat Cutters:

Exhaust Valves:	**Valve Seat Cutter, 45° – Φ35: 57001-1116**
	Valve Seat Cutter, 32° – Φ35: 57001-1121
	Valve Seat Cutter, 55° – Φ35: 57001-1247
Inlet Valves:	**Valve Seat Cutter, 45° – Φ41.5: 57001-1117**
	Valve Seat Cutter, 32° – Φ38.5: 57001-1122
	Valve Seat Cutter, 60° – Φ41: 57001-1124
Holder & Bar:	**Valve Seat Cutter Holder, Φ7: 57001-1126 [B]**
	Valve Seat Cutter Holder Bar: 57001-1128 [C]

★If the manufacturer's instructions are not available, use the following procedure.

Seat Cutter Operating Care:

1. This valve seat cutter is developed to grind the valve for repair. Therefore the cutter must not be used for other purpose than seat repair.
2. Do not drop or shock the valve seat cutter, or the diamond particles may fall off.
3. Do not fail to apply engine oil to the valve seat cutter before grinding the seat surface. Also wash off ground particles sticking to the cutter with washing oil.

CAUTION
Do not use a wire brush to remove the metal particles from the cutter. It will take off the diamond particles.

4. Setting the valve seat cutter holder in position, operate the cutter in one hand. Do not apply too much force to the diamond portion.

NOTE

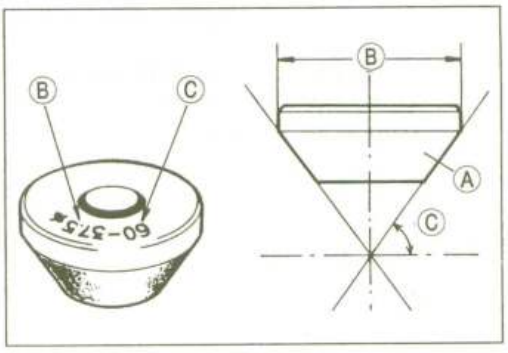
○*Prior to grinding, apply engine oil to the cutter and during the operation, wash off any ground particles sticking to the cutter with washing oil.*

5. After use, wash it with washing oil and apply thin layer of engine oil before storing.

Marks Stamped on the Cutter:

The marks stamped on the back of the cutter [A] represent the following.

37.5Φ..... Outer diameter of cutter [B]
60°..... Cutter angle [C]



Operating Procedures:

- Clean the seat area carefully.
- Coat the seat with machinist's dye.
- Fit a 45° cutter into the holder and slide it into the valve guide.
- Press down lightly on the handle and turn it right or left. Grind the seating surface only until it is smooth.

CAUTION

Do not grind the seat too much. Overgrinding will reduce valve clearance by sinking the valve into the head. If the valve sinks too far into the head, it will be impossible to adjust the clearance, and the cylinder head must be replaced.

- Measure the outside diameter of the seating surface with a vernier caliper.

★If the outside diameter of the seating surface is too small, repeat the 45° grind until the diameter is within the specified range.

★If the outside diameter of the seating surface is too large, make the 32° grind described below.

★If the outside diameter of the seating surface is within the specified range, measure the seat width as described below.

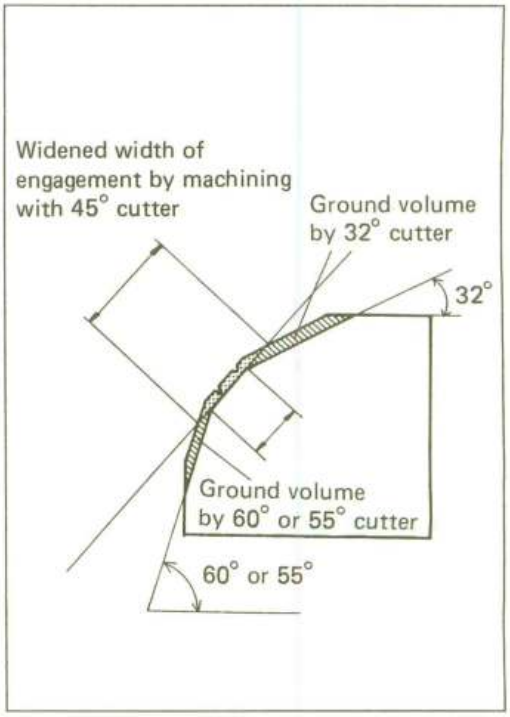
- Grind the seat at a 32° angle until the seat O.D. is within the specified range.

○To make the 32° grind, fit a 32° cutter into the holder, and slide it into the valve guide.

○Turn the holder one turn at a time while pressing down very lightly. Check the seat after each turn.

CAUTION

The 32° cutter removes material very quickly. Check the seat outside diameter frequency to prevent overgrinding.



○After making the 32° grind, return to the seat O.D. measurement step above.

- To measure the seat width, use a vernier caliper to measure the width of the 45° angle portion of the seat at several places around the seat.

★If the seat width is too narrow, repeat the 45° grind until the seat is slightly too wide, and then return to the seat O.D. measurement step above.

★If the seat width is too wide, make the 60° or 55° grind described below.

★If the seat width is within the specified range, lap the valve to the seat as described below.

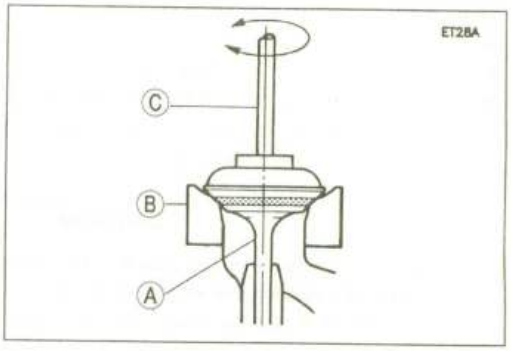
- Grind the seat at a 60° or 55° angle until the seat width is within the specified range.

○To make the 60° or 55° grind, fit 60° or 55° cutter into the holder, and slide it into the valve guide.

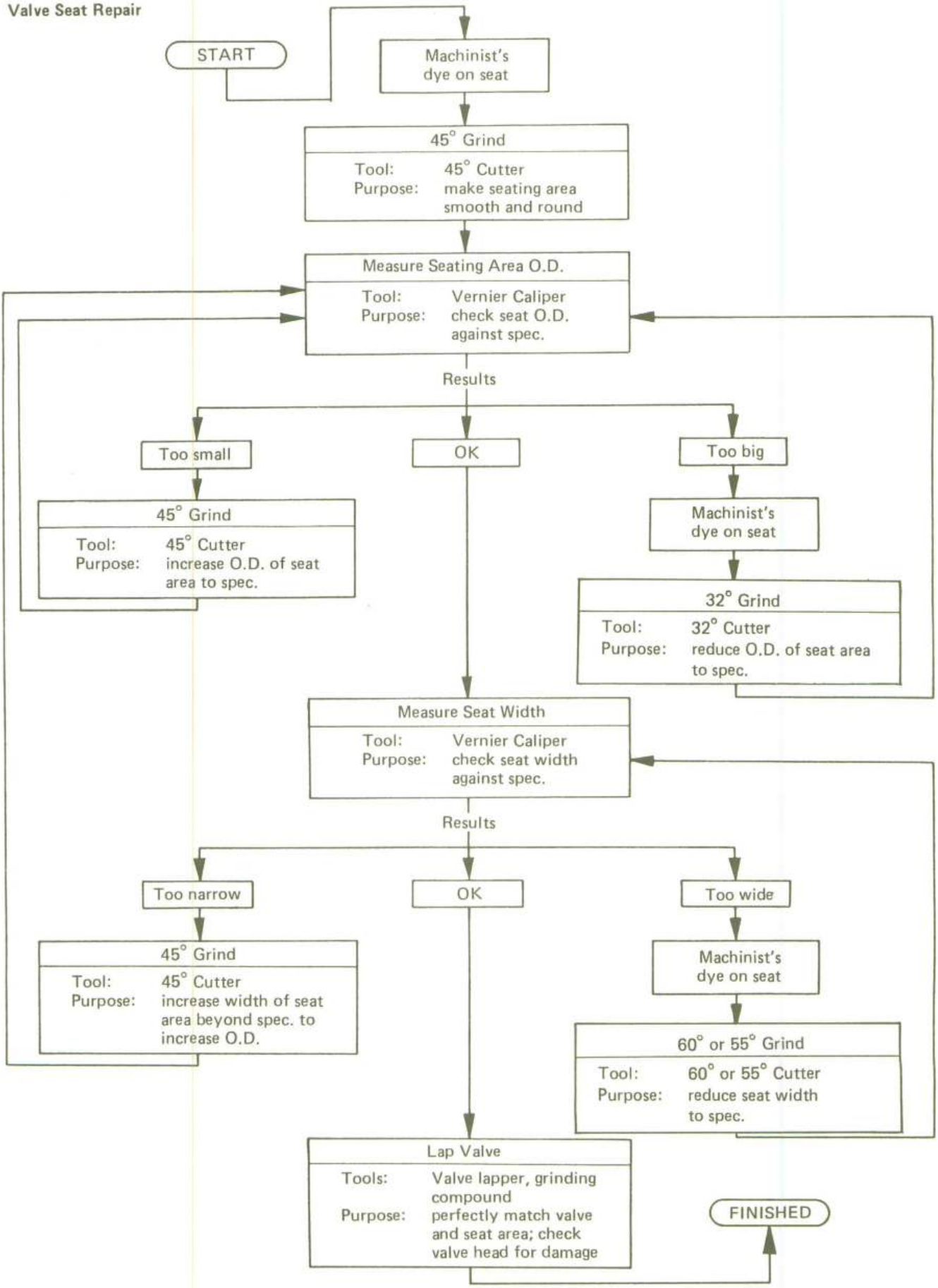
○Turn the holder, while pressing down lightly.

○After making the 60° or 55° grind, return to the seat width measurement step above.

- Lap the valve [A] to the seat [B], using a lapper [C] once the seat width and O.D. are within the ranges specified above.
  - Put a little coarse grinding compound on the face of the valve in a number of places around the valve head.
  - Spin the valve against the seat until the grinding compound produces a smooth, matched surface on both the seat and the valve.
  - Repeat the process with a fine grinding compound.
- The seating area should be marked about in the middle of the valve face.
- ★If the seat area is not in the right place on the valve, check to be sure the valve is the correct part. If the valve is correct, the valve may have been refaced too much; replace the valve.
- Be sure to remove all grinding compound before assembly.
- When the engine is assembled, be sure to adjust the valve clearance (see Valve Clearance Adjustment).



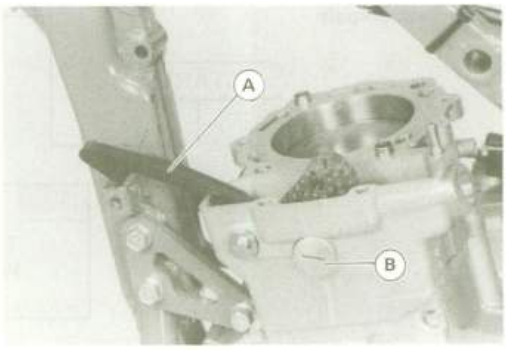
Valve Seat Repair



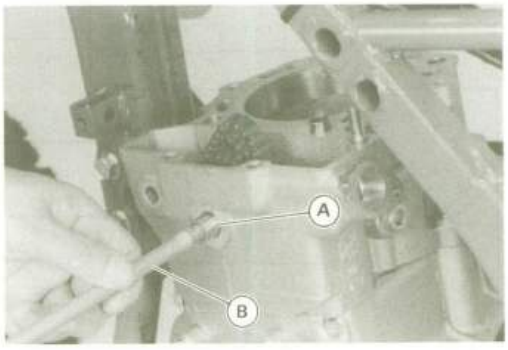
Cylinder, Piston

Cylinder, Piston Removal

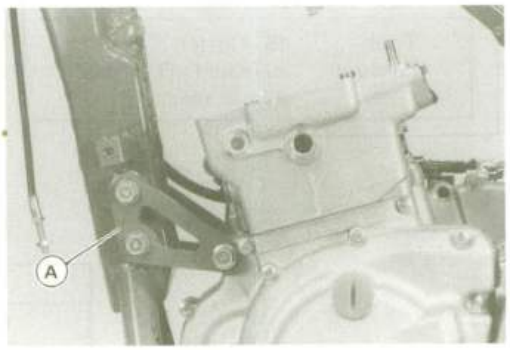
● Remove:
Cylinder Head (see Cylinder Head Removal)
Water Hose Fitting
Front Upper Chain Guide [A]
● Remove the intermediate sprocket shaft plug [B].



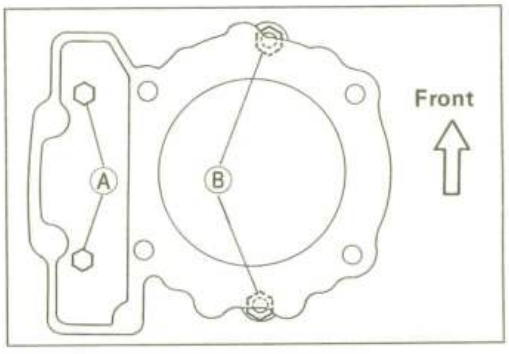
● Remove the intermediate sprocket shaft [A], using the cylinder head bolt [B].



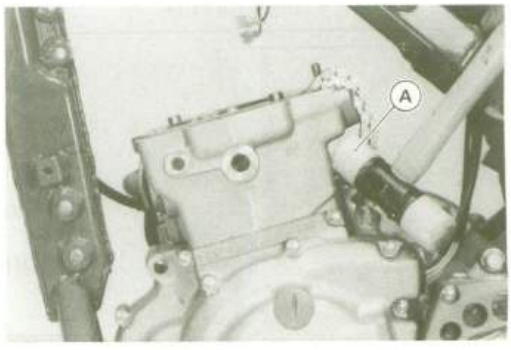
● Remove the engine mounting bracket [A].



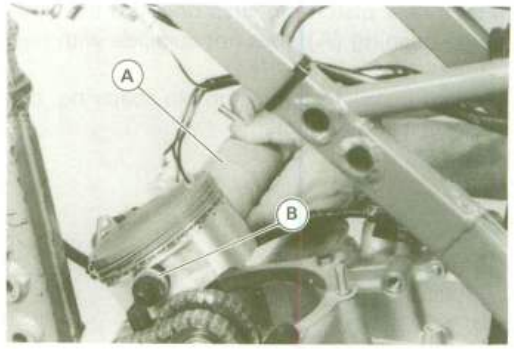
● Unscrew:
8 mm Cylinder Bolts [A]
8 mm Cylinder Nuts [B]



● Tap lightly up the cylinder head with a plastic mallet [A] to separate from the crankcase.
● Remove the cylinder base gasket.
○ Immediately stuff a clean cloth around the piston to prevent parts or dirt from falling into the case.



● Remove the snap ring from one side of each piston pin hole.

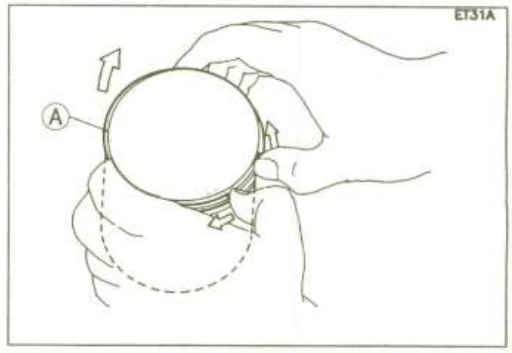


CAUTION
Do not reuse snap rings as removal weakens and deforms them. They could fall out and score the cylinder wall.

● Push out the piston pin and remove the piston.
○ If necessary, use the piston pin puller assembly [A] along with a 22 mm washer [B].

Special Tool – Piston Pin Puller Assembly: 57001-910

● Carefully spread the ring opening with your thumbs and then push up on the opposite side of the piston ring [A] to remove it.
● Remove the 3 - piece oil ring with your thumbs in the same manner.

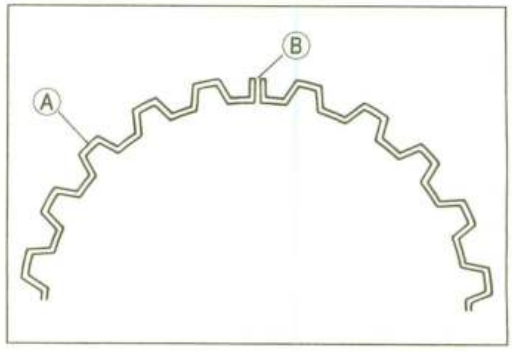


Cylinder, Piston Installation

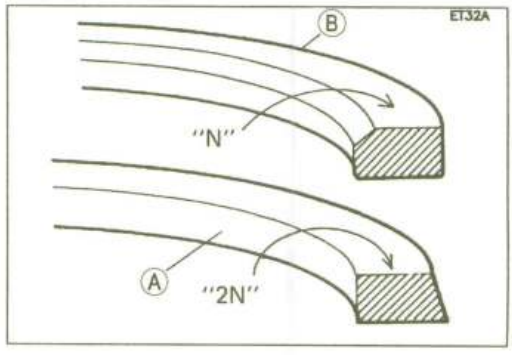
NOTE

○ *The oil ring rails have no "top" or "bottom".*

● Install the oil ring expander [A] in the bottom piston ring groove so the ends [B] butt together.
● Install the oil ring steel rails, one above the expander and one below it.
○ Spread the rail with your thumbs, but only enough to fit the rail over the piston.
○ Release the rail into the bottom piston ring groove.



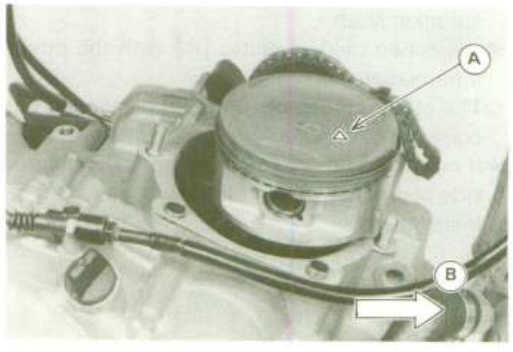
● With the marked side facing up, install the second ring [A] and top ring [B] in that order.



NOTE

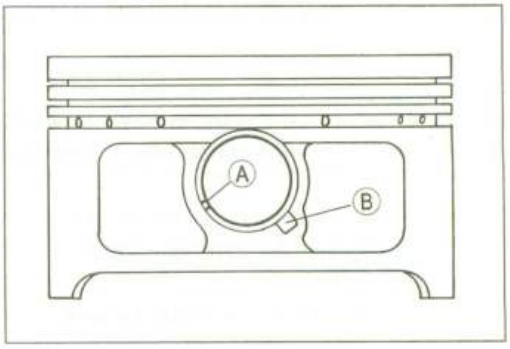
○ *If a new piston is used, check piston to cylinder clearance (see Piston/Cylinder Clearance), and use new piston rings.*

● The arrow [A] on the top of the piston must point toward the front [B].

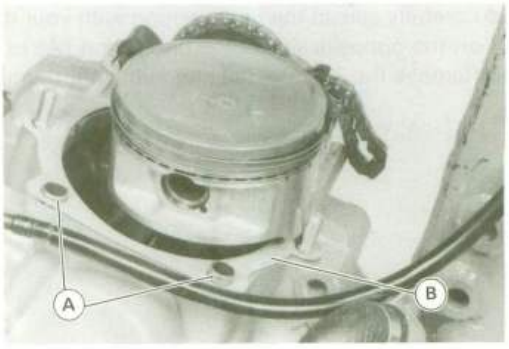


●Fit a new piston pin snap ring into the side of the piston so that the ring opening [A] does not coincide with the slit [B] of the piston pin hole.

○When installing the piston pin snap ring, compress it only enough to install it and no more.

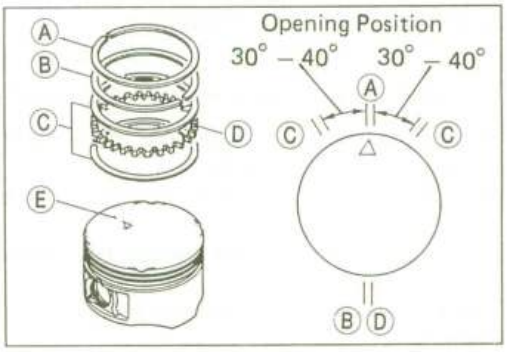


●Install:
Dowel Pins [A]
New Cylinder Base Gasket [B]



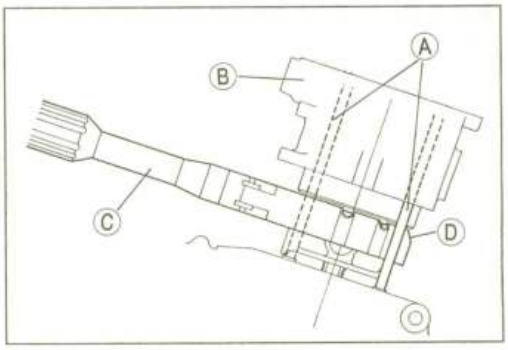
●The piston ring openings must be positioned as shown. The openings of the oil ring steel rails must be about 30° ~ 40° of angle from the opening of the top ring.

Top Ring [A]
Second Ring [B]
Oil Ring Steel Rails [C]
Oil Ring Expander [D]
Arrow [E]

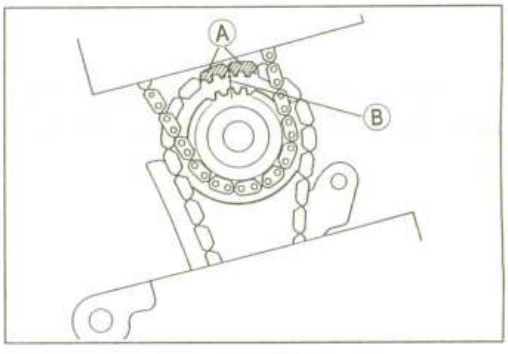


●Oil the piston rings and smear some oil inside the cylinder bore.
●Cut the head off two replacement cylinder head bolts.
●Screw the headless bolts [A] 5 mm into the crankcase in diagonal positions.
●When installing the cylinder [B], use the cylinder head bolts as a guide.
●Using the piston ring compressor assembly [C] with the chamfered side [D] upward, install the cylinder block.

Special Tools – Piston Ring Compressor Grip: 57001-1095
Piston Ring Compressor Belt, Φ95 ~ Φ108: 57001-1358



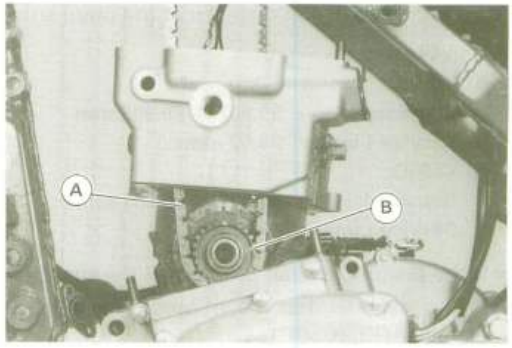
●Apply a thin coat of molybdenum disulfide grease to the intermediate sprocket shaft.
●Align two marked plates [A] with the punch mark [B] on the larger intermediate sprocket.
○The other marked plate should be aligned with the punch mark on the crankshaft sprocket.
★If no marks can be found, remove the magneto flywheel and mark the side plate of any link in the lower camshaft chain (see Camshaft Chain Installation).



● Slip the upper camshaft chain (wider one) [A] over the smaller intermediate sprocket [B].
● Be sure to pull the camshaft chains and intermediate sprockets up through the chain tunnel during cylinder installation.
● Install the intermediate sprocket shaft.

Torque – Intermediate Sprocket Shaft Plug: 3.4 N-m (0.35 kg-m, 30in-lb)

● Complete cylinder installation.

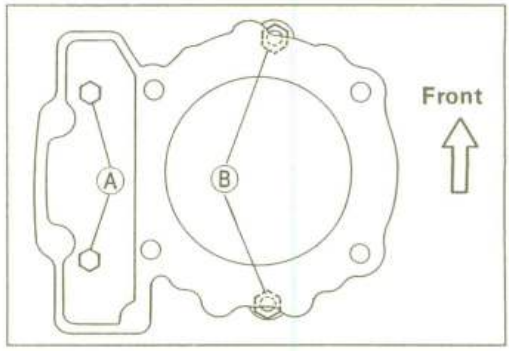


● Tighten:

Torque – 8 mm Cylinder Bolts [A]: 18 N-m (1.8 kg-m, 13.0 ft-lb)
First Torque – 8 mm Cylinder Nuts [B]: 15 N-m (1.5 kg-m, 11.0 ft-lb)

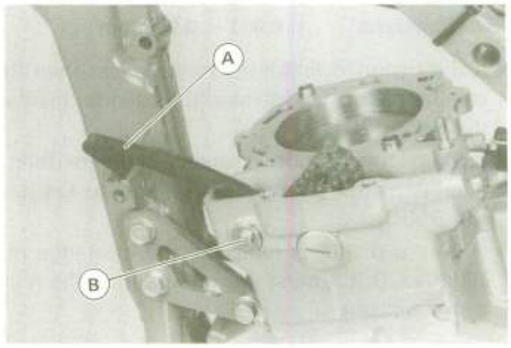
○ After installing the cylinder head, tighten the 8 mm cylinder nuts to **25 N-m (2.5 kg-m, 18 ft-lb)** of torque (see Cylinder Head Installation).

First Torque – Oil Pipe Banjo Bolts: 9.8 N-m (1.0 kg-m, 87 in-lb)
Final Torque– Oil Pipe Banjo Bolts: 20 N-m (2.0 kg-m, 14.5 ft-lb)
Torque – Oil Pipe Bolt: 8.8 N-m (0.90 kg-m, 78 in-lb)
10 mm Engine Mounting Bolts: 44 N-m (4.5 kg-m, 33 ft-lb)
8 mm Engine Mounting Bolts: 29 N-m (3.0 kg-m, 22 ft-lb)



● Install:
Front Upper Chain Guide [A]

Torque – Front Upper Chain Guide Bolt: 29 N-m (3.0 kg-m, 22 ft-lb)[B]

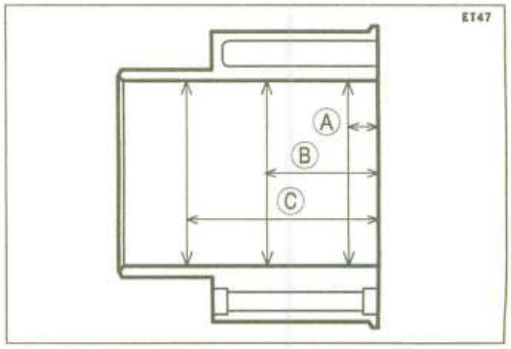


Cylinder/Piston Wear

● Since there is a difference in cylinder wear in different direction, take a side-to-side and a front-to-back measurement at each of the 3 locations (total of 6 measurements) shown in the figure.

★ If any of the cylinder inside diameter measurements exceeds the service limit, the cylinder must be replaced with a new one since the ELECTROFUSION cylinder cannot be bored or honed (KLX650A), or the cylinder will have to be bored to oversize and then honed (KLX650C).

10 mm [A]
60 mm [B]
100 mm [C]



Cylinder Inside Diameter

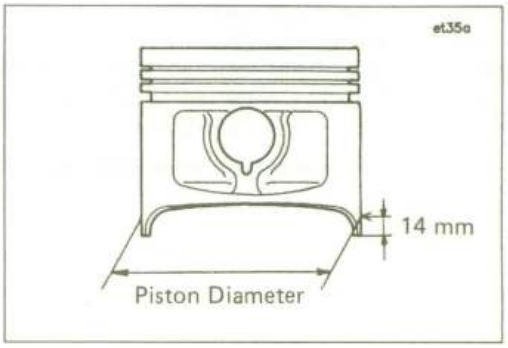
KLX650A:

Standard:	**100.000 ~ 100.012 mm, and less than 0.01 mm difference between any two measurements.**
Service Limit:	**100.06 mm, or more than 0.05 mm difference between any two measurements**

KLX650C:

Standard:	**100.000 ~ 100.012 mm, and less than 0.01 mm difference between any two measurements**
Service Limit:	**100.1 mm, or more than 0.05 mm difference between any two measurements**

● Measure the piston diameter at the point shown with a micrometer.



Piston Diameter

KLX650A:

Standard: **99.967 ~ 99.982 mm**

Service Limit: **99.82 mm**

KLX650C:

Standard: **99.922 ~ 99.937 mm**

Service Limit: **99.77 mm**

★ If the piston diameter is less than the service limit, replace it.

★ If the cylinder has been bored oversize, use the oversize piston diameter (KLX650C).

NOTE

○ *Whenever the piston or cylinder has been replaced with a new one or honed, the motorcycle must be broken in the same as with a new machine.*

Piston/Cylinder Clearance

● Subtract the piston diameter from the cylinder inside diameter to get the piston/cylinder clearance.

Piston/Cylinder Clearance

KLX650A:

Standard: **0.024 ~ 0.039 mm**

KLX650C:

Standard: **0.063 ~ 0.090 mm**

★ If the piston/cylinder clearance is less than the specified range, use a smaller piston (or increase the cylinder inside diameter by honing for the KLX650C).

★ If the piston/cylinder clearance is greater than the specified range, use a larger piston (or bore the cylinder to the next larger oversize for the KLX650C).

★ If only a piston is replaced, the clearance may exceed the standard slightly. But it must not be less than the minimum in order to avoid piston seizure.

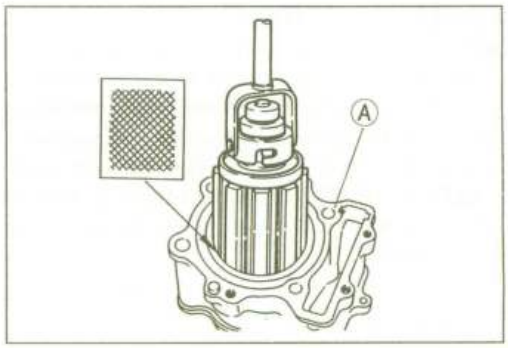
Cylinder Boring and Honing (KLX650C)

○ There are two sizes of oversize pistons available. Oversize pistons require oversize rings.

Oversize Pistons and Rings

0.5 mm Oversize

1.0 mm Oversize

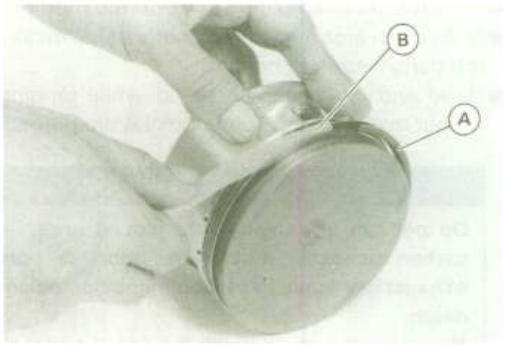


● Before boring a cylinder [A], first measure the exact diameter of the oversize piston, and then, according to the standard clearance in the Specifications, determine the rebore diameter. However, if the amount of boring necessary would make the inside diameter greater than **1.0 mm,** the cylinder block must be replaced.

○ Cylinder inside diameter must not vary more than **0.01 mm** at any point.

○ In the case of rebored cylinder and oversize piston, the service limit for the cylinder is the diameter that the cylinder was bored to plus **0.1 mm** and the service limit for the piston is the oversize piston original diameter minus **0.15 mm.** If the exact figure for the rebored diameter is unknown, it can be roughly determined by measuring the diameter at the base of the cylinder

Piston Ring and Ring Groove Wear

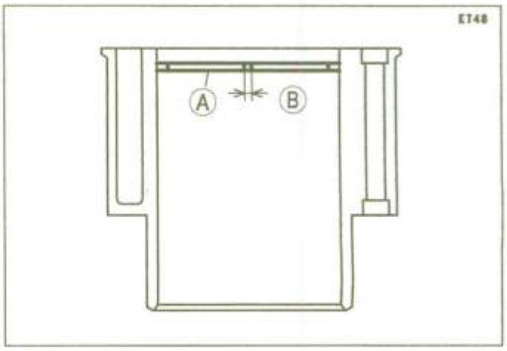


- Check for uneven groove wear by inspecting the ring seating.
- ★The rings should fit perfectly parallel to groove surfaces. If not, the piston must be replaced.
- With the piston rings [A] in their grooves, make several measurements with a thickness gauge [B] to determine piston ring/groove clearance.

Piston Ring/Groove Clearance

	Standard	Service Limit
Top	0.03 ~ 0.07 mm	0.17 mm
Second	0.02 ~ 0.06 mm	0.16 mm

Piston Ring End Gap Measurement



- Place the piston ring [A] inside the cylinder, using the piston to locate the ring squarely in place. Set it close to the top of the cylinder, where cylinder wear is low.
- Measure the gap [B] between the ends of the ring with a thickness gauge.

Piston Ring End Gap

	Standard	Service Limit
Top	0.25 ~ 0.40 mm	0.7 mm
Second	0.35 ~ 0.50 mm	0.8 mm
Oil	0.2 ~ 0.7 mm	1.0 mm

Exhaust System

These motorcycles are equipped with a spark arrester approved for off-road use by the U.S.Forest Service. It must be properly maintained to ensure its efficiency. In accordance with the Periodic Maintenance Chart, clean the spark arrester.

Spark Arrester Cleaning (US models)

⚠WARNING

To avoid burns, wear gloves while cleaning the spark arrester. Since the engine must be run during this procedure, the muffler will become hot.

CAUTION

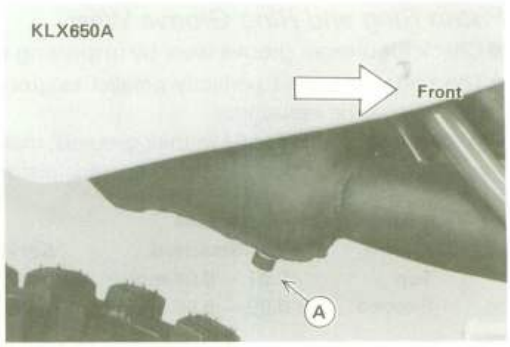
The spark arrester must be installed correctly and functioning properly to provide adequate fire protection.

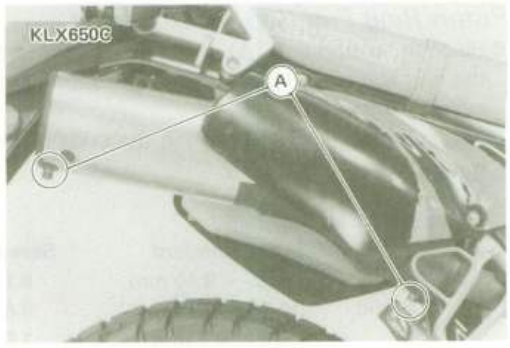
- Remove the drain plug(s) [A] on the muffler.
- In an open area away from combustible materials, start the engine with the transmission in neutral.
- Raise and lower engine speed while tapping on the muffler with a rubber mallet until carbon particles are purged from the muffler.

⚠WARNING

Do not run the engine in a closed area. Exhaust gases contain carbon monoxide; a colorless, odorless, poisonous gas. Breathing exhaust gas leads to carbon monoxide poisoning, asphyxiation, and death.
Never run the engine with the spark arrester removed. Hot carbon particles may start a fire.

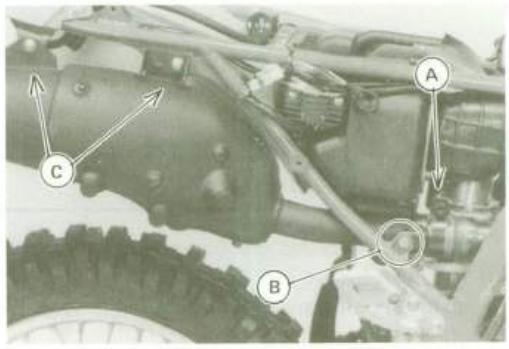
- Stop the engine.
- Install the drain plug(s).





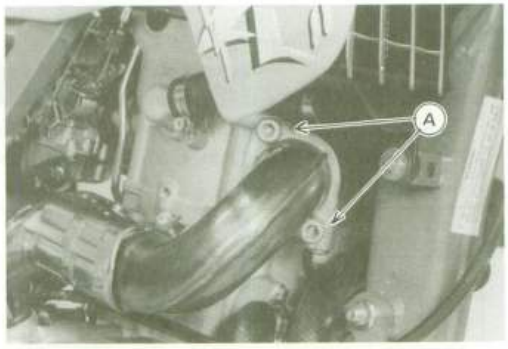
Muffler Removal

- Remove the right side cover.
- Loosen:
  Muffler Clamp Bolt [A]
- Remove:
  Muffler Allen Bolt [B]
  Muffler Bolts [C]
- Move the muffler backward to separate the front end from the exhaust pipe.
- Remove the muffler.



Exhaust Pipe Removal

- Remove the muffler (see this chapter).
- Loosen the exhaust pipe holder nuts [A].
- Remove the exhaust pipe from the engine.

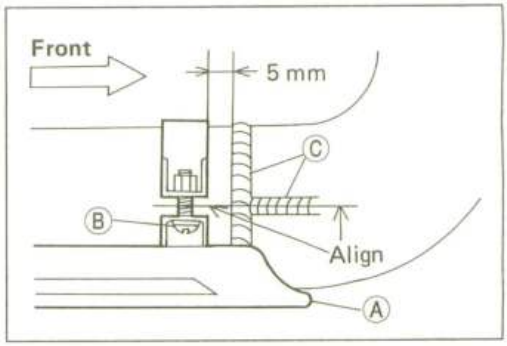


Exhaust Pipe Installation

- Replace the exhaust pipe gasket.
- Tighten:
  Exhaust Pipe Holder Nuts
  Muffler Clamp Bolt
- Thoroughly warm up the engine, wait until the engine cools down, and then retighten the clamp bolt and the holder nuts.

Exhaust Pipe Assembly

- Install the exhaust pipe guard [A] as shown. Note the clamp screw [B] and the weld bead [C] positions.



Clutch

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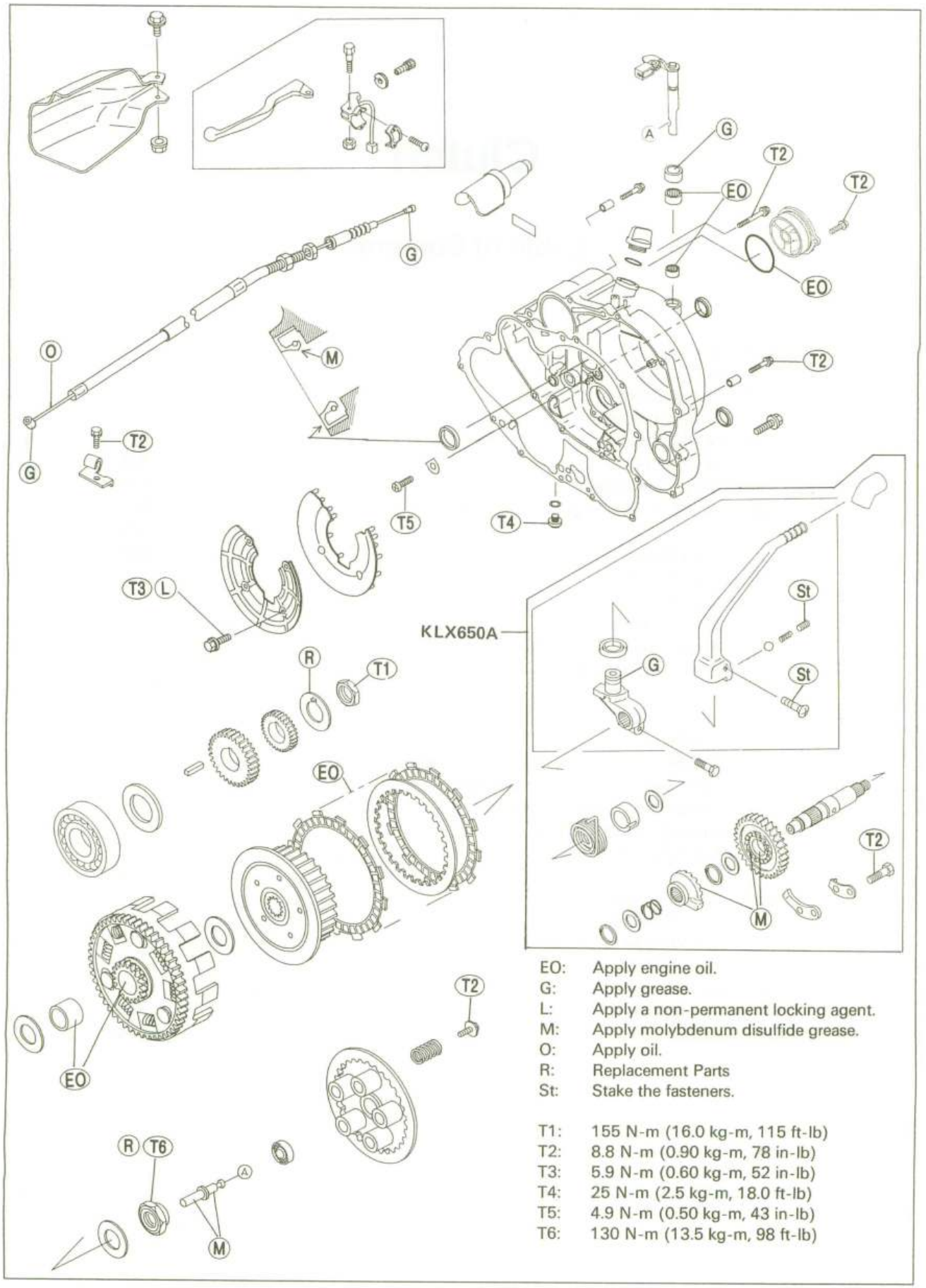
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Exploded View



Specifications

Item	Standard	Service Limit
Clutch Lever Free Play	2 ~ 3 mm	---
Clutch Lever Free Play (at lever end)	10 ~ 20 mm	---
Clutch		
Friction plate thickness	2.9 ~ 3.1 mm	2.75 mm
Friction and steel plate warp	0.2 mm or less	0.3 mm
Clutch spring free length		
KLX650A	33.6 mm	32.7 mm
KLX650C	34.2 mm	33.2 mm

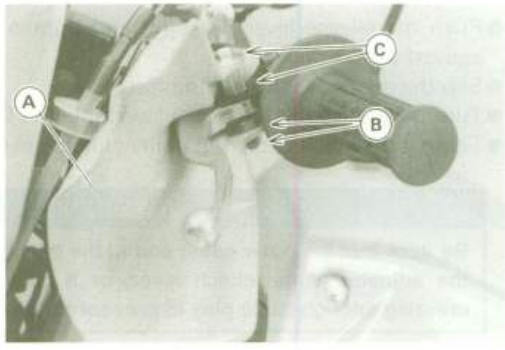
Special Tools – Pressure Cable Luber: K56019-021
Clutch Holder: 57001-1243
Gear Holder: 57001-1357
Outside Circlip Pliers: 57001-144

Clutch Lever and Cable

Lever Free Play Inspection

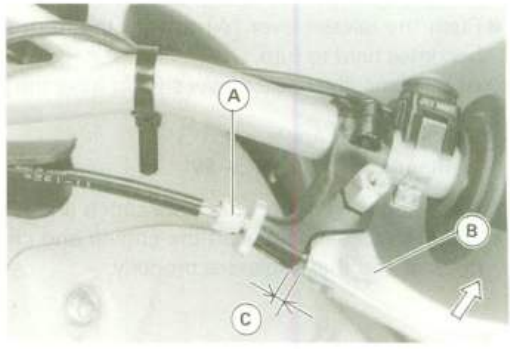
Due to friction plate wear and clutch cable stretch over a long period of use, the clutch must be adjusted in accordance with the Periodic Maintenance Chart.

● Remove the handguard.
Handguard [A]
Nuts [B]
Bolts [C]



● Check that the clutch cable upper end is fully seated in the adjuster [A].
● Pull the clutch lever [B] just enough to take up the free play.
○ Measure the gap [C] between the lever and the lever bracket.

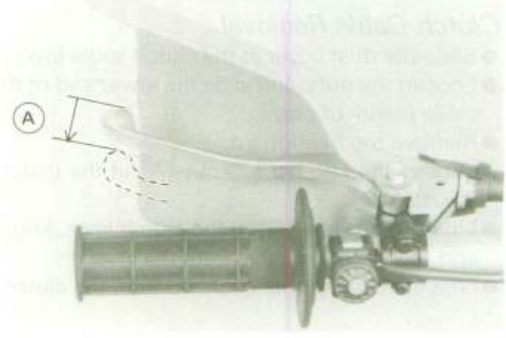
Lever Free Play
Standard: 2 ~ 3 mm



○ When checking the clutch lever play with the handguard installed, check the lever play [A] at the lever end.

Lever End Free Play
Standard: 10 ~ 20 mm

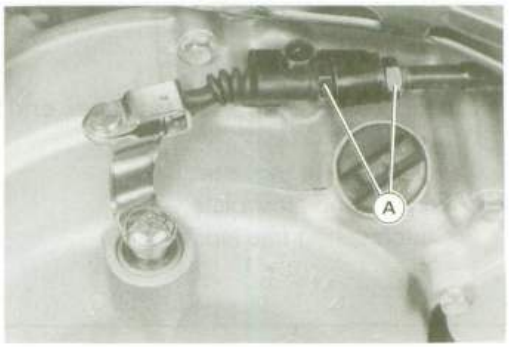
★ If the play is too large, the clutch may not release fully. If the play is too small, the clutch may not engage fully. In either case, adjust it.



Lever Free Play Adjustment

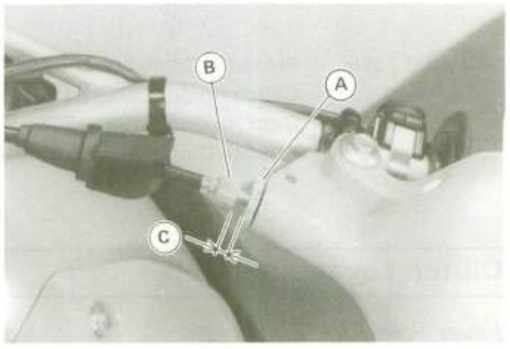
⚠WARNING

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



- Slide the dust cover at the clutch cable lower end out of place.
- Loosen both adjusting nuts [A] at the clutch cover as far as they will go.

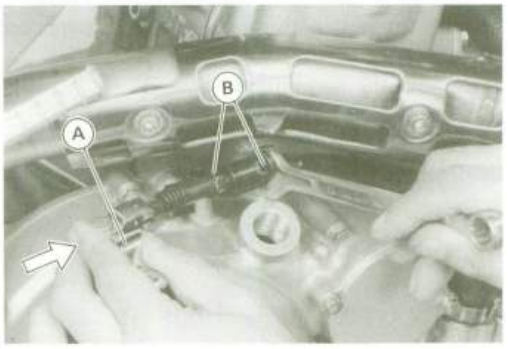
- Loosen the knurled locknut [A] at the clutch lever.
- Turn the adjuster [B] so that 5 ~ 6 mm [C] of threads are visible.



- Push the release lever [A] tight and tighten the adjusting nuts [B] against the bracket.
- Slip the dust cover back into place.
- Turn the adjuster at the clutch lever until the free play is correct.
- Tighten the knurled locknut at the clutch lever.

⚠WARNING

Be sure that the outer cable end at the clutch lever is fully seated in the adjuster at the clutch lever, or it could slip into place later, creating enough cable play to prevent clutch disengagement.



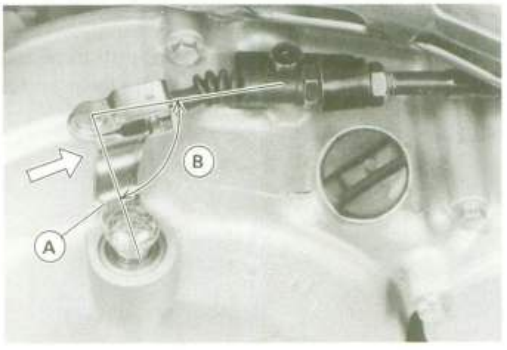
- Push the release lever [A] toward the front of the motorcycle until it becomes hard to turn.

○ At this time, the release lever should have the proper angle [B] shown.

Release Lever Angle
Standard: 80° ~ 90°

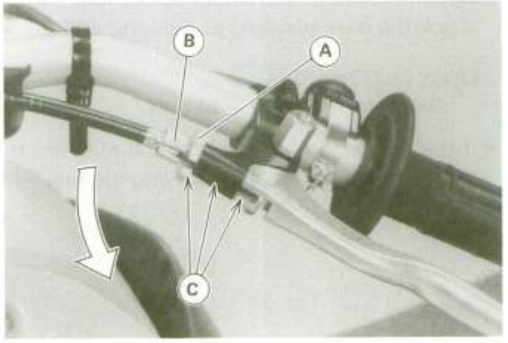
★ If the angle is wrong, check the clutch and release parts for wear.

- After the adjustment, start the engine and check that the clutch does not slip and that it releases properly.



Clutch Cable Removal

- Slide the dust cover at the clutch cable lower end out of place.
- Loosen the nuts, and slide the lower end of the clutch cable to give the cable plenty of play.
- Remove the handguard.
- Loosen the knurled locknut [A] at the clutch lever, and screw in the adjuster [B].
- Line up the slots [C] in the clutch lever, knurled locknut and adjuster, and then free the cable from the lever.
- Free the clutch inner cable tip from the clutch release lever.



CAUTION
Do not pull out the clutch release shaft unless it is absolutely necessary. Clutch release shaft removal damages the oil seal in the clutch cover, necessitating oil seal replacement.

● Pull the clutch cable out of the frame.

Clutch Cable Installation

● Run the clutch cable according to the Cable, Wire, and Hose Routing section of the General Information chapter.
● Adjust the clutch lever (see this chapter).

Clutch Cable Lubrication and Inspection

● Lubricate the clutch cable using the pressure cable luber in accordance with the Periodic Maintenance Chart.

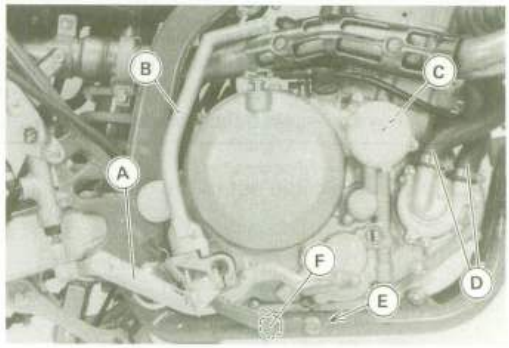
Special Tool – Pressure Cable Luber: K56019-021

● With the cable disconnected at both ends, the cable should move freely within the cable housing (see General Lubrication in the Appendix chapter).

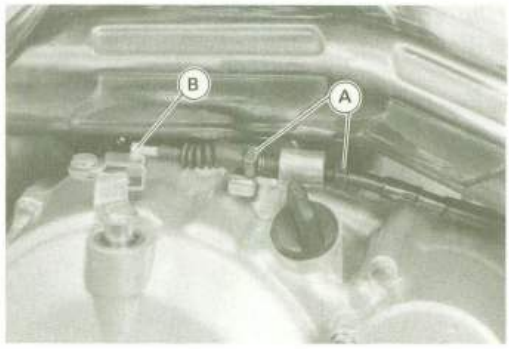
Clutch Cover

Clutch Cover Removal

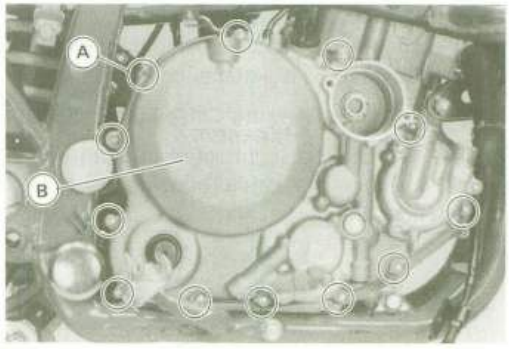
● Drain:
  Engine Oil (see Engine Lubrication System chapter)
  Coolant (see Cooling System chapter)
● Remove:
  Brake Pedal (see Brakes chapter) [A]
  Kick Pedal (KLX650A) [B]
  Oil Filter (see Engine Lubrication System) [C]
  Water Pump Hoses [D]
● Loosen the right footpeg bolt [E] and nut [F] (KLX650A).
● Remove the right footpeg (KLX650C).



● Free the clutch cable lower end as follows.
○ Loosen the knurled locknut at the clutch lever and screw in the adjuster.
○ Slide the dust cover at the clutch cable lower end out of place.
○ Loosen both adjusting nuts [A] at the clutch cover as far as they will go.
○ Free the clutch inner cable tip [B] from the clutch release lever.



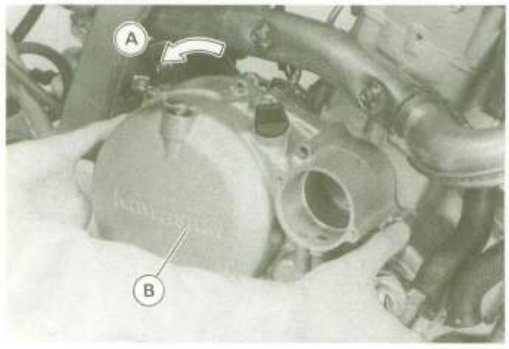
● Take out the bolts [A] and remove the clutch cover [B].



● Turn the clutch release lever toward the rear [A] to free the release shaft from the clutch spring plate pusher and remove the clutch cover [B].

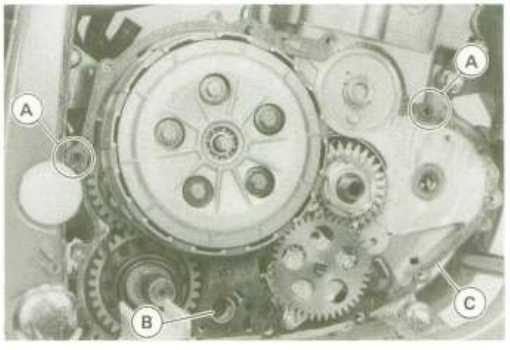
CAUTION

Do not pull out the clutch release shaft for clutch cover removal. Clutch release shaft removal damages the oil seal in the clutch cover, necessitating oil seal replacement.

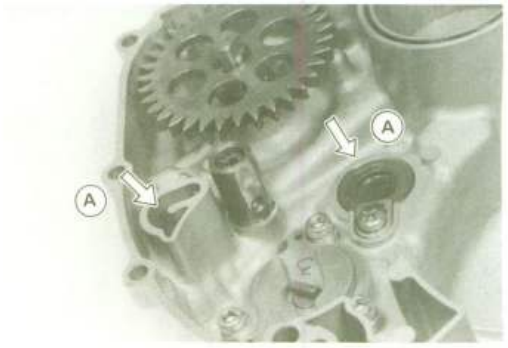


Clutch Cover Installation

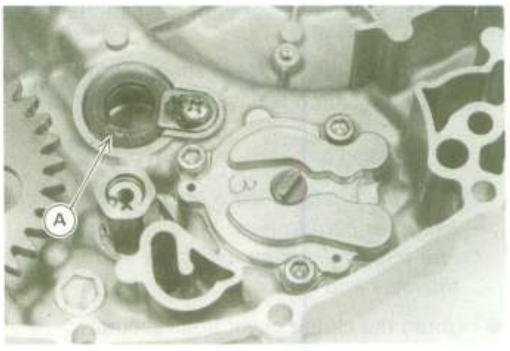
● Install:
  Dowel Pins [A]
  Oil Screen [B]
  New Clutch Cover Gasket [C]



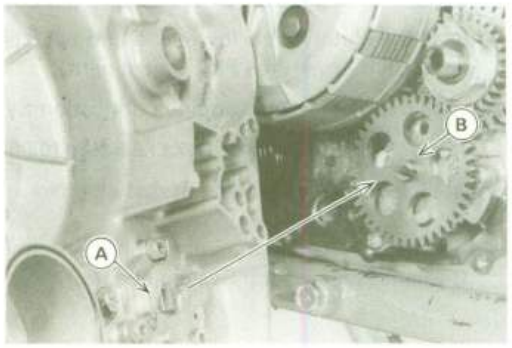
● Using compressed air, blow out [A] any particles which may obstruct the oil passage on the clutch cover.



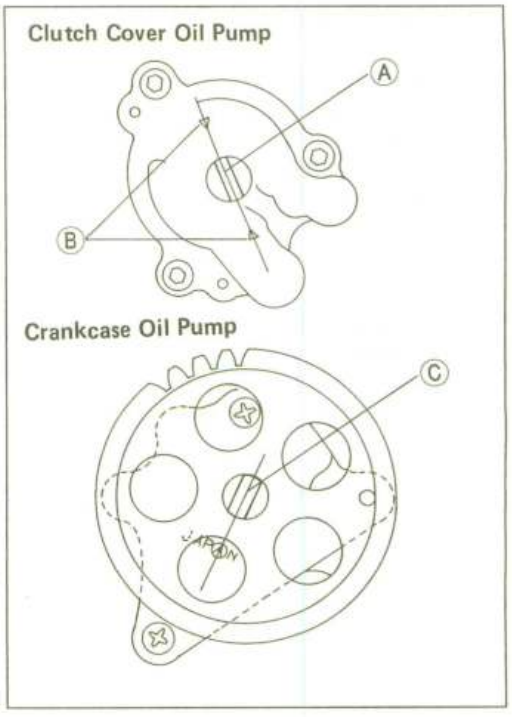
● Apply molybdenum disulfide grease to the crankshaft oil seal lips [A].



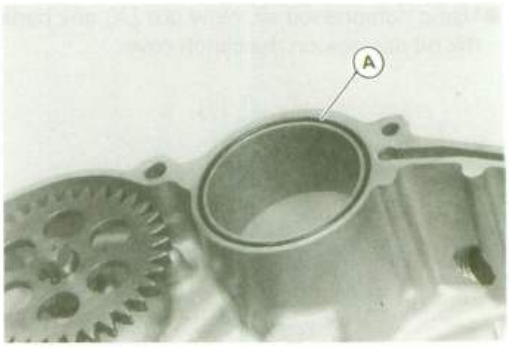
● Locate the oil pump shafts as shown so that the clutch cover oil pump shaft projection [A] fits the crankcase oil pump shaft slot [B] as shown.



○ Align the projection [A] of the clutch cover oil pump shaft with the marks [B].
○ Align the slot [C] of the crankcase oil pump shaft with a letter "A".

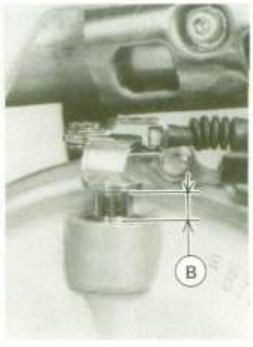


● Fit the O-ring [A] for the oil filter in, being careful not to twist the O-ring.



● Install the clutch cover with the clutch release lever turned toward the rear.
● Engage the clutch release shaft with the clutch spring plate pusher by turning the clutch release lever toward the front [A].





NOTE

○ *With the shaft pulled a little out of the cover, turn the lever until it becomes hard to turn.*
○ *The release lever should have about 9 mm [B] clearance between the lever and the cover.*

● Tighten the clutch cover bolts securely.

Torque – Clutch Cover Bolts : 8.8 N-m (0.90 kg-m, 78 in-lb)

● Install the clutch cable lower end and adjust the clutch lever free play (see Clutch Lever Free Play Adjustment).
● Install the oil filter (see Engine Lubrication System chapter).

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

● Install the brake pedal (see Brakes chapter).
● Fill:
Engine Oil (see Engine Lubrication System chapter)
Coolant (see Cooling System chapter)

Clutch Cover Disassembly

● Remove:
Clutch Cover Oil Pump (see Engine Lubrication System chapter)
Water Pump Shaft and Mechanical Seal (see Cooling System chapter)
● Remove the clutch release shaft.
● Using a suitable puller, remove the needle bearings for the clutch release.

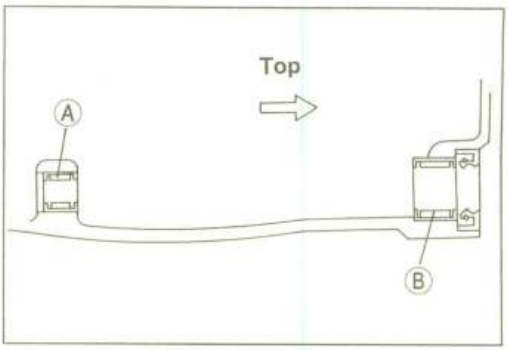
NOTE

○ *In the absence of the above mentioned tool, satisfactory results may be obtained by heating the cover to approximately 93°C (200°F) max., and tapping the bearing in or out.*

CAUTION
Do not heat the cover with a torch. This will warp the cover. Soak the cover in oil and heat the oil.

● Discard the needle bearings.

Clutch Cover Assembly



- Using a press and the bearing driver set, push each needle bearing until the face of the bearing is even with the end of the hole as shown.
- Install the lower bearing [A]. Either side of the bearing may face upward.
- Install the upper bearing [B] with the marked side facing up.

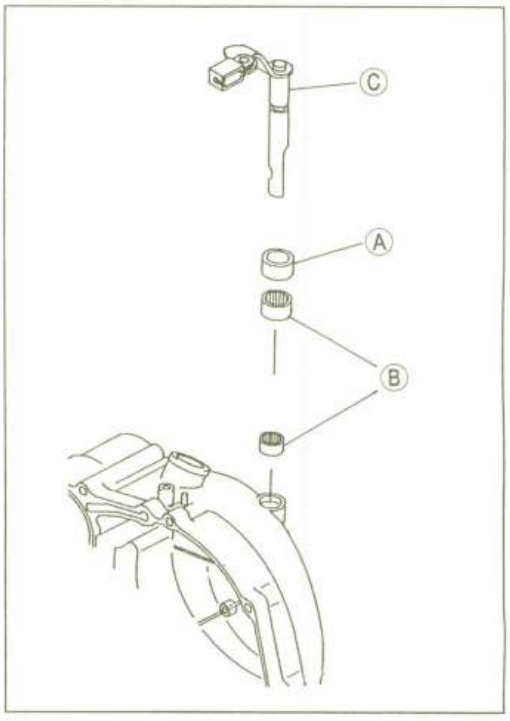
Special Tool – Bearing Driver Set: 57001-1129

- Install:
  Clutch Cover Oil Pump (see Engine Lubrication System chapter)
  Mechanical Seal (see Cooling System chapter)

Clutch Release Removal

CAUTION

Do not remove the clutch release lever and shaft assembly unless it is absolutely necessary. If removed, oil seal replacement may be required.



- Remove the clutch cable lower end (see Clutch Cover Removal).
- Turn the clutch release lever toward the rear, disengage the release shaft from the clutch spring plate pusher, and pull the shaft with the lever out of the cover.

Clutch Release Installation

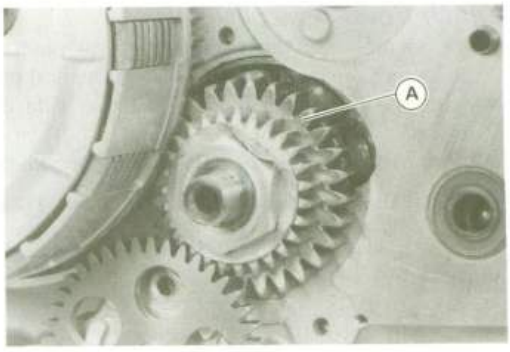
- Replace the oil seal [A] with a new one.
- Apply high-temperature grease to the oil seal lips in the clutch cover.
- Apply engine oil to the bearings [B] in the hole of the clutch cover.
- Apply engine oil to the release shaft [C].
- Turning the release lever toward the rear, insert the shaft straight into the upper hole of the clutch cover.
- Engage the clutch release shaft with the clutch spring plate pusher by turning the clutch release lever toward the front (see Clutch Cover Installation).
- Install the clutch cable lower end and adjust the clutch lever free play (see this chapter).

Clutch

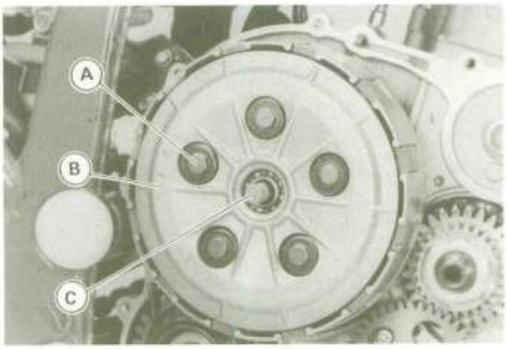
Clutch Removal

NOTE

○*If the primary gear [A] is to be removed, remove the primary gear nut before clutch removal (see Primary Gear Removal).*

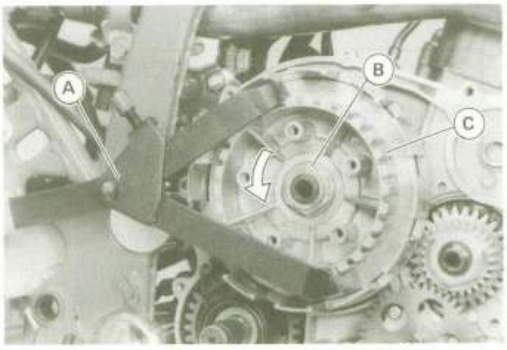


●Remove:
Clutch Spring Bolts [A], Washer, and Springs
Clutch Spring Plate [B], Thrust Bearing, and Pusher [C]
Friction Plates and Steel Plates

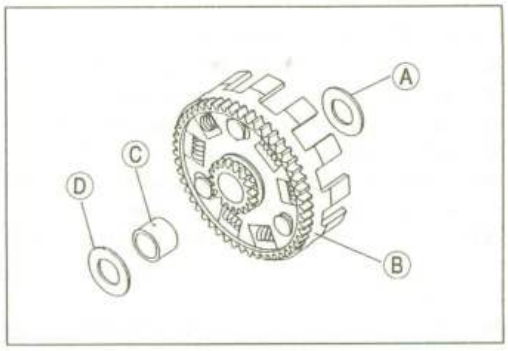


●Using the clutch holder [A], hold the clutch hub to remove the clutch hub nut [B] and the hub [C].

Special Tool – Clutch Holder: 57001-1243

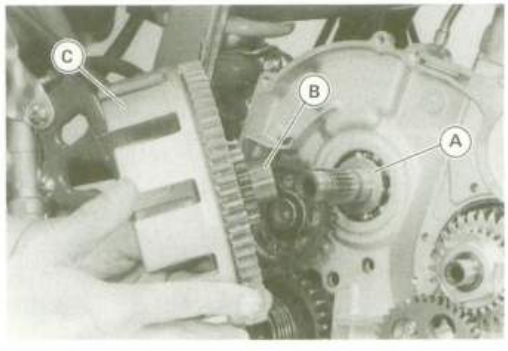


●Remove:
Washer [A]
Clutch Housing [B]
Sleeve [C]
Spacer [D]

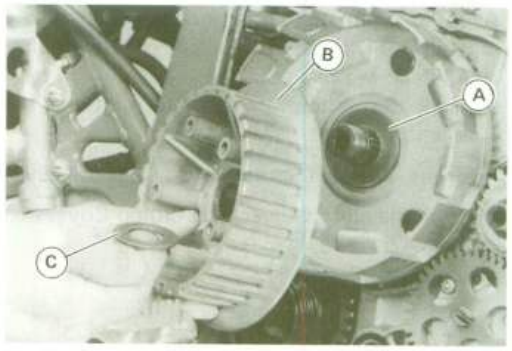


Clutch Installation

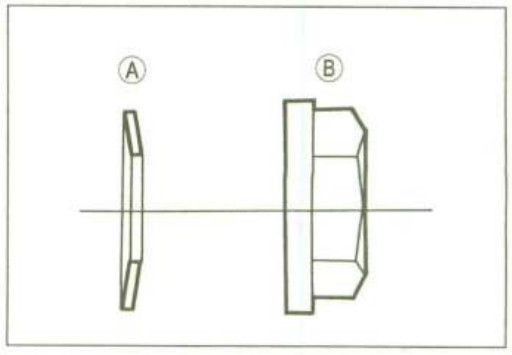
●Install:
Spacer [A]
Sleeve [B]
Clutch Housing [C]
○Oil the sleeve [B].



● Install:
Washer [A]
Clutch Hub [B]
Spring Washer [C]

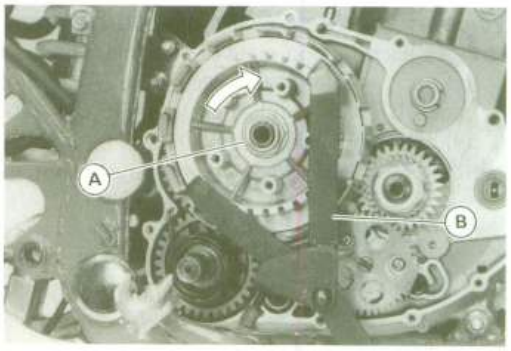


○ Install the spring washer [A] and the primary gear nut [B] as shown.



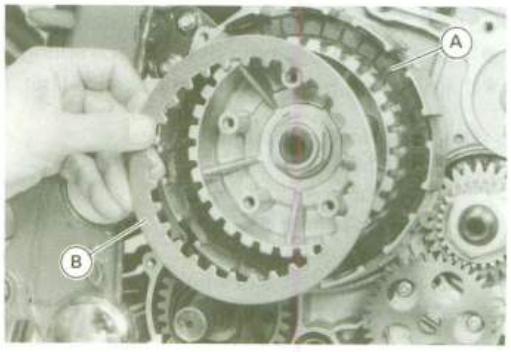
● Replace the clutch hub nut [A] with a new one.

Special Tool – Clutch Holder: 57001-1243 [B]
Torque – Clutch Hub Nut : 130 N-m (13.5 kg-m, 98 ft-lb)

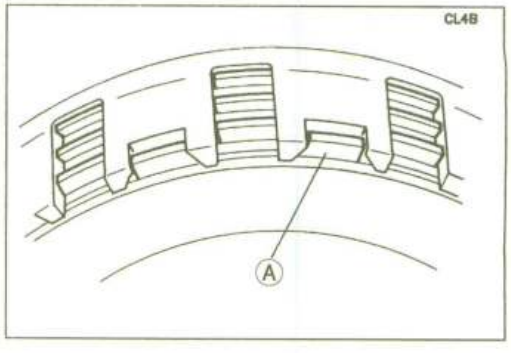


● Install the friction plates [A] and steel plates [B], starting with a friction plate and alternating them.

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



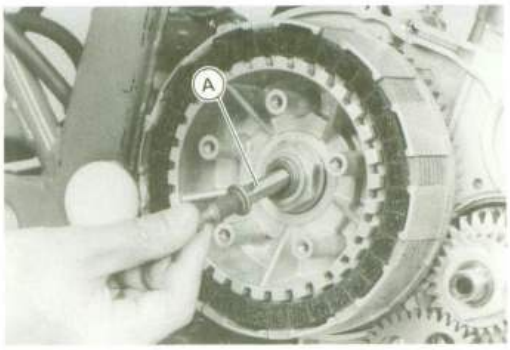
● Install the last friction plate [A] fitting the tangs in the grooves on the housing as shown.



- Apply engine oil to the thrust bearing.
- Apply molybdenum disulfide grease to the rubbing portion [A] of clutch spring plate pusher.
- Install the clutch spring plate with the thrust bearing and pusher assembled.

Torque – Clutch Spring Bolts : 8.8 N-m (0.90 kg-m, 78 in-lb)

- Install the clutch cover (see Clutch Cover Installation).

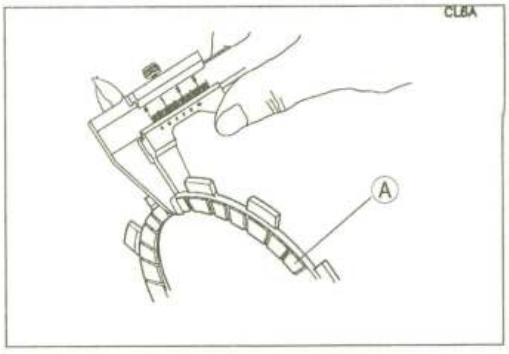


Friction and Steel Plate Damage, Wear Inspection

- Visually inspect the friction and steel plates for signs of seizure, overheating (discoloration), or uneven wear.
- Measure the thickness of the friction plates [A] at several points.

★If any plates show signs of damage, or if they have worn past the service limit, replace them with new ones.

Friction Plate Thickness
Standard: 2.9 ~ 3.1 mm
Service Limit: 2.75 mm

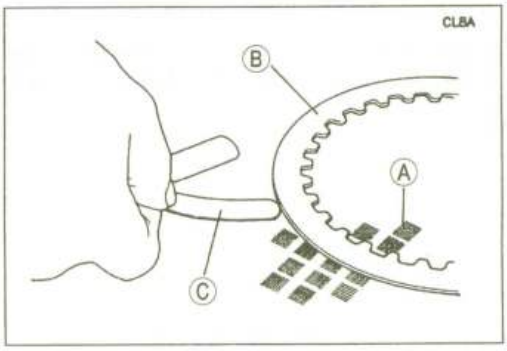


Friction and Steel Plate Warp Inspection

- Place each friction plate or steel plate on a surface plate, and measure the gap between the surface plate [A] and each friction plate or steel plate [B] with a thickness gauge [C]. The gap is the amount of friction or steel plate warp.

★If any plate is warped over the service limit, replace it with a new one.

Friction and Steel Plate Warp
Standard: 0.2 mm or less
Service Limit: 0.3 mm

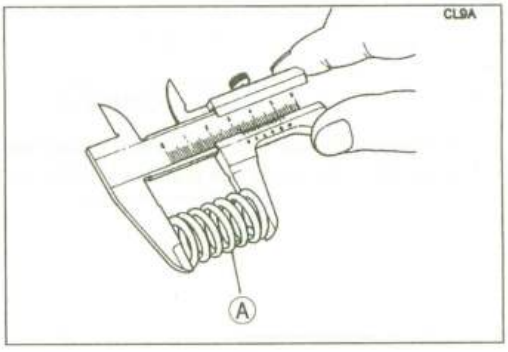


Clutch Spring Free Length Measurement

- Measure the free length of the clutch springs [A].

★If any spring is shorter than the service limit, it must be replaced.

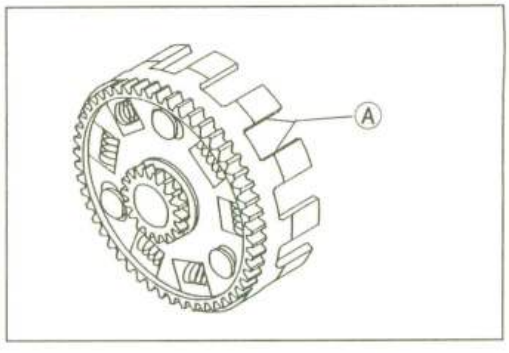
Clutch Spring Free Length
KLX650A:
Standard: 33.6 mm
Service Limit: 32.7 mm
KLX650C:
Standard: 34.2 mm
Service Limit: 33.2 mm



Clutch Housing Finger Damage

- Visually inspect the clutch housing fingers [A] where the friction plate tangs hit them.

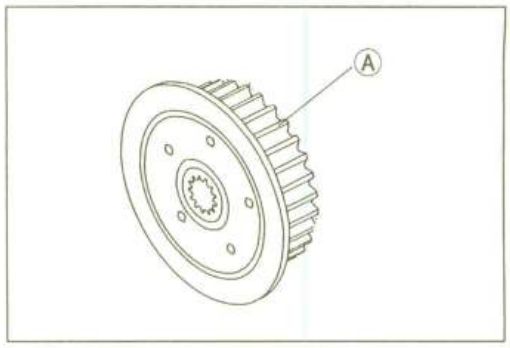
★If they are badly worn or if there are groove cuts where the tangs hit, replace the housing. Also, replace the friction plates if their tangs are damaged.



Clutch Hub Spline Damage

● Visually inspect where the teeth on the steel plates wear against the clutch hub splines.

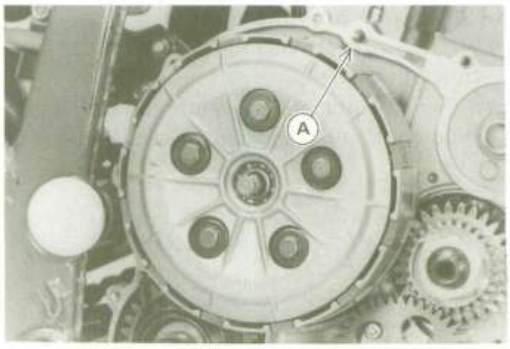
★ If there are notches worn into the clutch hub splines [A], replace the clutch hub. Also, replace the steel plates if their teeth are damaged.



Primary Gear

Primary Gear Removal

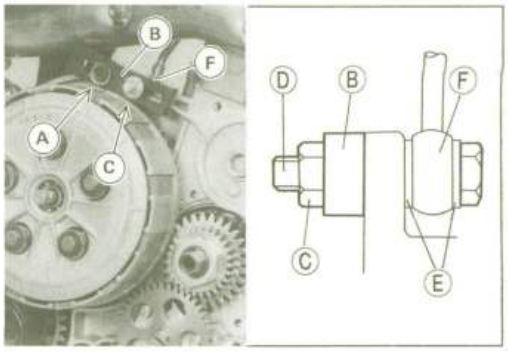
- Remove the clutch cover (see Clutch Cover Removal).
- Remove the oil pipe banjo bolt [A].



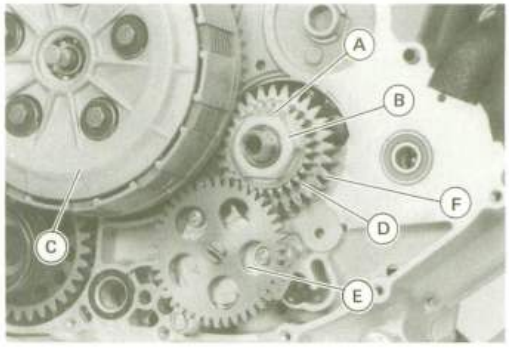
- Install the gear holder using suitable bolts and nut as shown.

Bolt, Φ6 × 25L [A]
Gear Holder [B]
Φ8 Nut [C]
Bolt, Φ8 × 60L [D]
Copper Washers [E]
Banjo [F]

Special Tool – Gear Holder: 57001-1357



- Bend the lockwasher tab up [A].
- Remove:
  Primary Gear Nut [B]
  Clutch [C] (see Clutch Removal)
  Oil Pump Drive Gear [D]
  Oil Pump [E] (see Engine Lubrication System chapter)
- Remove the primary gear [F].

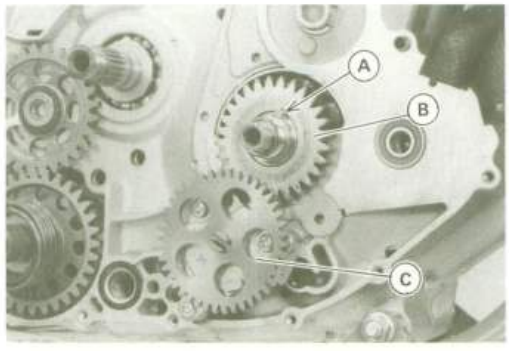


Primary Gear Installation

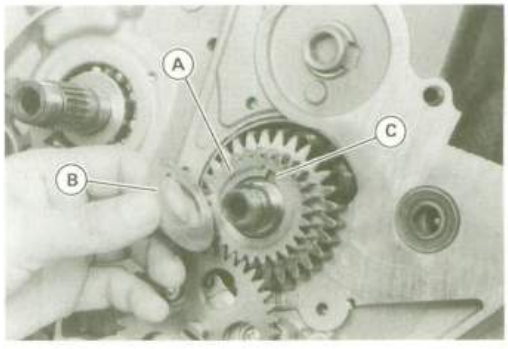
NOTE

○ *Either side of the primary gear and the oil pump drive gear may face outward.*

- Install
  Key [A]
  Primary Gear [B]
  Oil Pump [C]



- Install
  Oil Pump Drive Gear [A]
  Lockwasher [B]
- ○ Fit the lockwasher tab into the key groove [C].
- Install the clutch (see Clutch Installation).



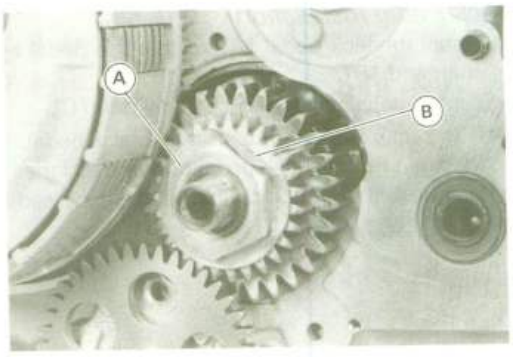
● Tighten the primary gear nut [A] using the gear holder.

Torque – Primary Gear Nut : 155 N-m (16.0 kg-m, 115 ft-lb)
Special Tool – Gear Holder: 57001-1357

● Bend the lockwasher tab [B] over the primary gear nut.
● Remove the gear holder.
● Using a new copper washer for each side of the fitting, tighten the banjo bolt.

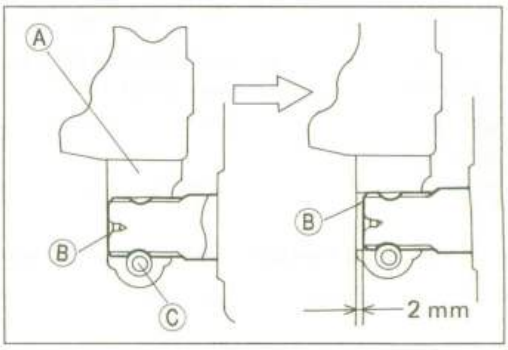
Torque – Oil Pipe Banjo Bolt : 20 N-m (2.0 kg-m, 14.5 ft-lb)

● Install the clutch cover (see Clutch Cover Removal).



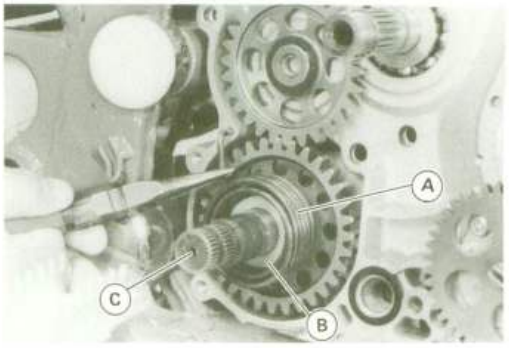
Kickstarter (KLX650A)

Kick Pedal Installation



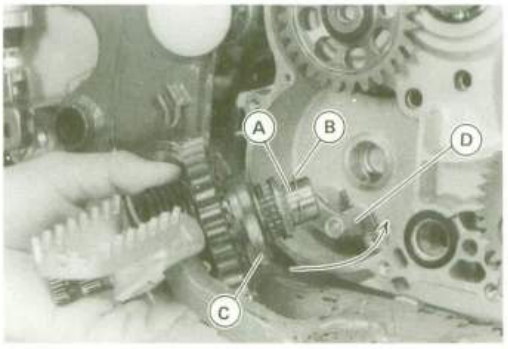
- Install the kick pedal [A] so that the pedal end is even with the kick shaft end [B].
- Temporarily install the kick pedal bolt [C].
- ★If the kick pedal contacts the brake pedal, install the kick pedal as follows. Pull the kick pedal outward as far as it will go and tighten the kick pedal bolt; the kick shaft end is recessed about 2 mm.
- Tighten the kick pedal bolt.

Kickstarter Removal



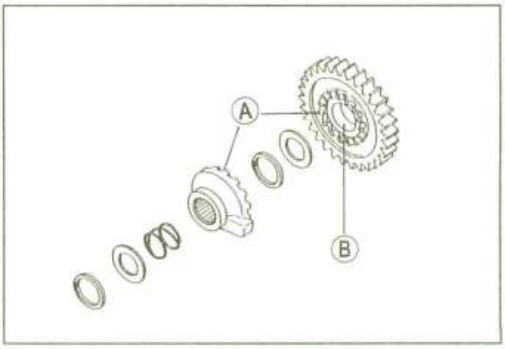
- Remove the clutch cover (see Clutch Cover Removal).
- Remove the return spring [A] with pliers.
- Remove:
  Spring Guide [B]
  Kick Shaft Assembly [C]

Kickstarter Installation

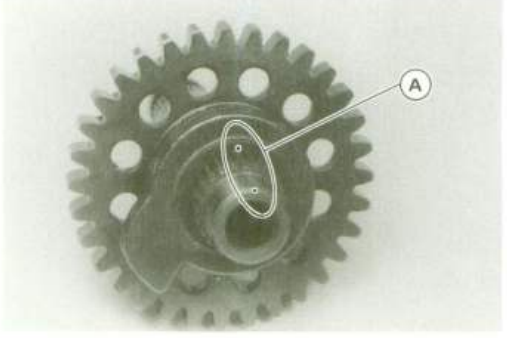


- Apply a thin coat of molybdenum disulfide grease to the kick shaft journal [A].
- Put the thrust washer [B] on the kick shaft end, and fit the kick shaft assembly in the right crankcase.
- ○Fit the ratchet arm [C] in the right side of the kick guide [D] and install the kick shaft assembly.
- Fit the return spring end into the kick shaft, turn the spring clockwise, and insert the other end of the spring into the crankcase.
- Install the plastic spring guide.

Kickstarter Assembly



- Apply a thin coat of molybdenum disulfide grease to the ratchet teeth [A] and the kick gear inside [B].



- Align [A] the ratchet punch mark with the punch mark on the kick shaft.

CAUTION

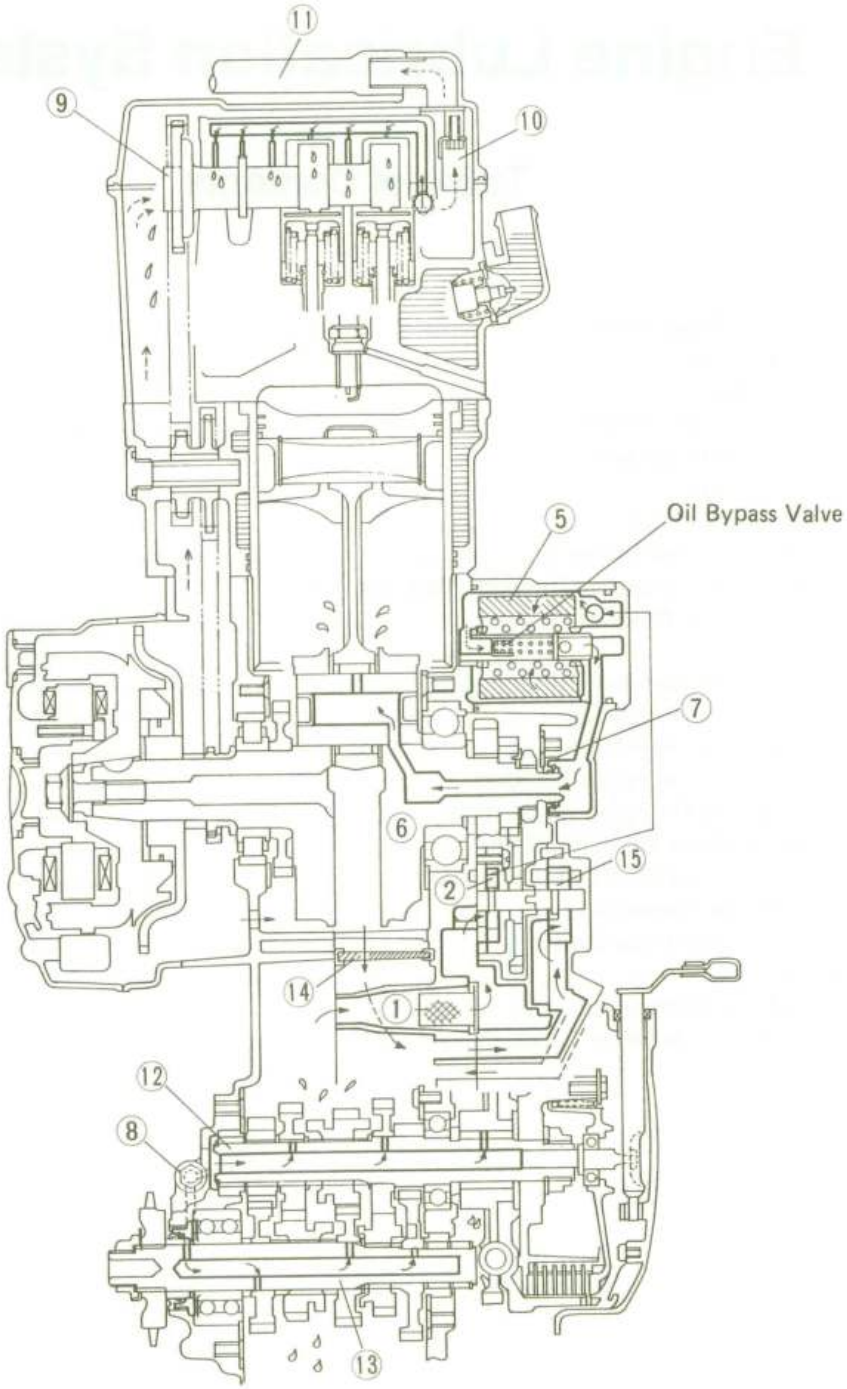
Misalignment of the ratchet changes the kick spring preload. Light preload could cause mechanism noise and heavy preload could weaken or break the spring.

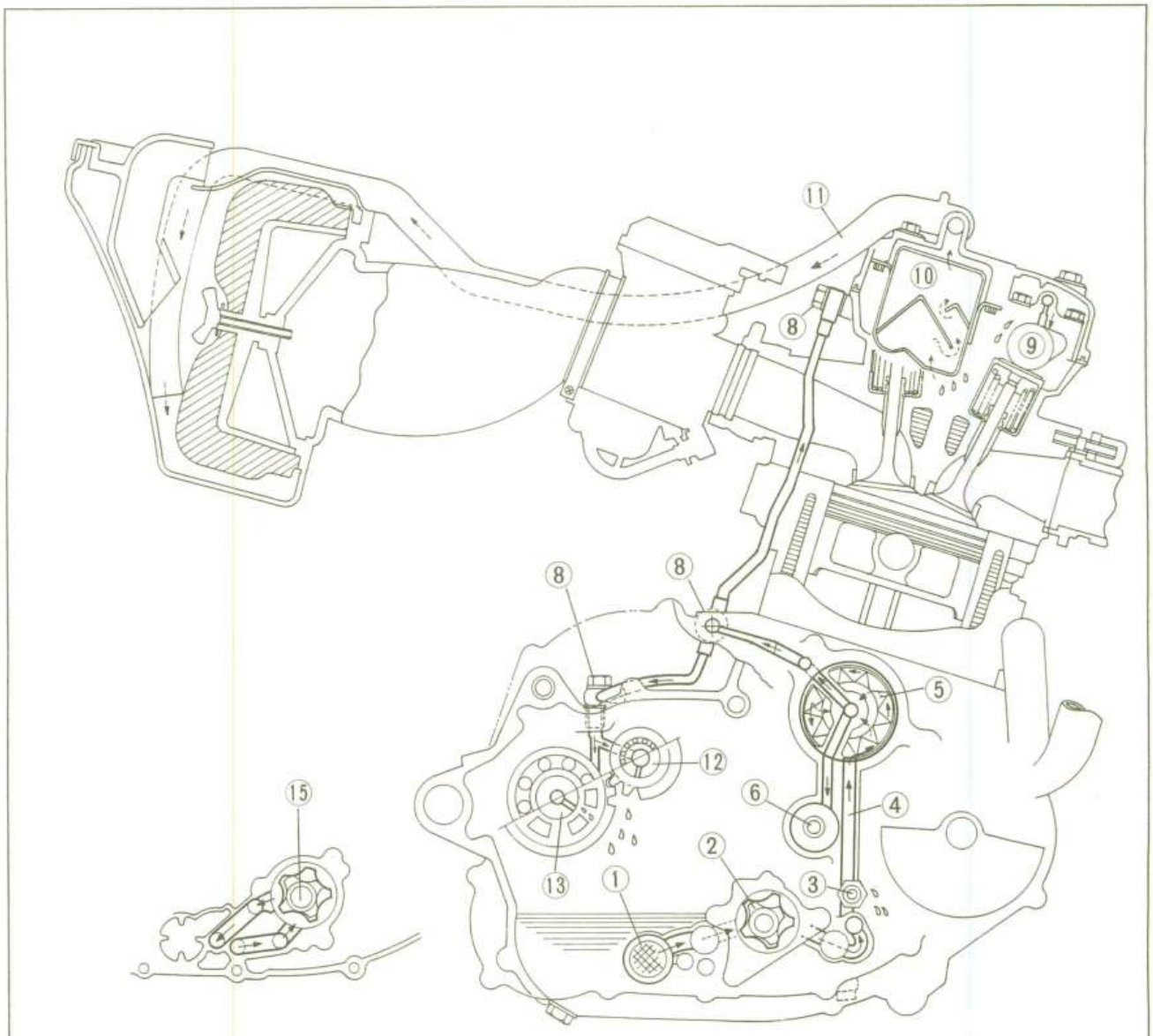
Engine Lubrication System

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Engine Oil Flow Chart

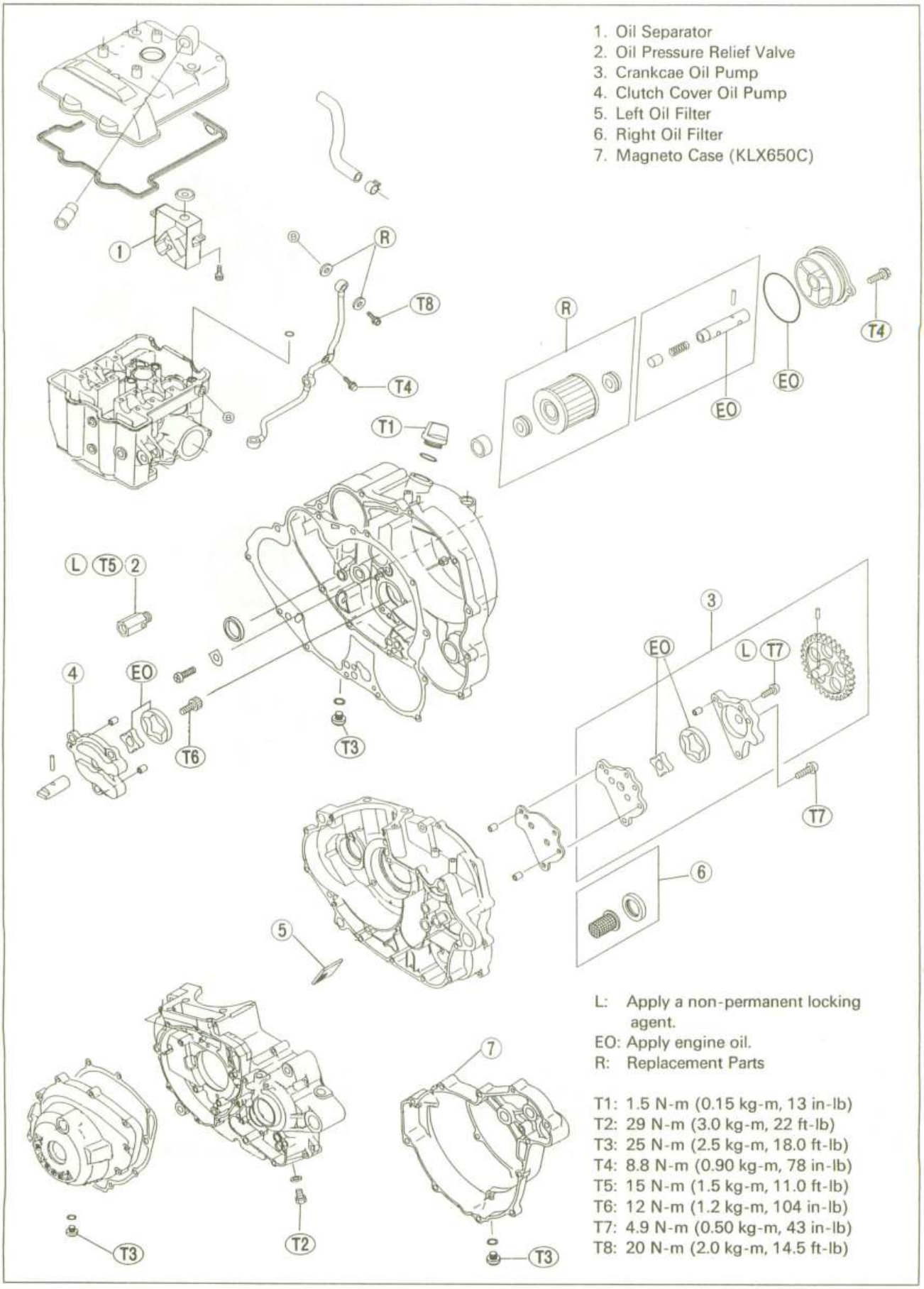




Oil Flow : [1] → [13], [14] → [15]

1. Right Oil Screen
2. Crankcase Oil Pump
3. Relief Valve
4. Clutch Cover Oil Passage
5. Oil Filter
6. Crankshaft
7. Crankshaft Oil Seal
8. Oil Pipe Banjo Bolts
9. Camshafts
10. Oil Separator
11. Breather Hose
12. Drive Shaft
13. Output Shaft
14. Left Oil Screen
15. Clutch Cover Oil Pump

Exploded View



Specifications

Item		Standard
Engine Oil:		
Grade		SE or SF class
Viscosity		SAE 10W-40, 10W-50, 20W-40, or 20W-50
Capacity	KLX650A	1.7 L (when filter is not removed) 1.7 L (when filter is removed) 1.9 L (when engine is completely dry)
	KLX650C	1.9 L (when filter is not removed) 1.9 L (when filter is removed) 2.1 L (when engine is completely dry)
Oil Pressure Measurement:		
Relief valve opening pressure		49 ~ 78 kPa (0.5 ~ 0.8 kg/cm², 7.1 ~ 11 psi)
Oil pressure @4000 r/min (rpm), oil temp. 90°C (194°F)		54 ~ 83 kPa (0.55 ~ 0.85 kg/cm², 7.8 ~ 12 psi)

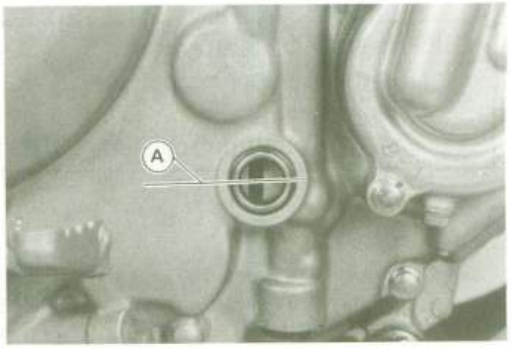
Special Tool – Oil Pressure Gauge, 5 kg/cm²: 57001-125
Oil Pressure Gauge Adapter : 57001-1359
Oil Pressure Gauge Adapter, M6 x 1.0: 57001-1088

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

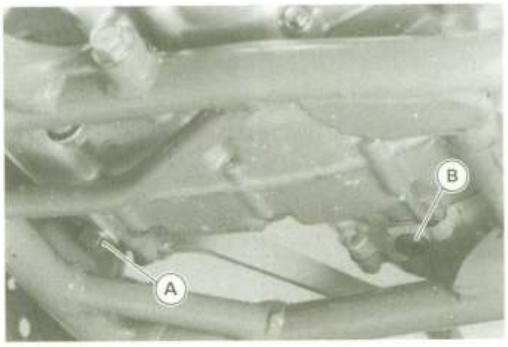
Racing the engine before the oil reaches every part can cause engine seizure.

- ●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)**
1.7L (when filter is removed)
1.9L (when engine is completely dry)
KLX650C: **1.9L (when filter is not removed)**
1.9L (when filter is removed)
2.1L (when engine is completely dry)

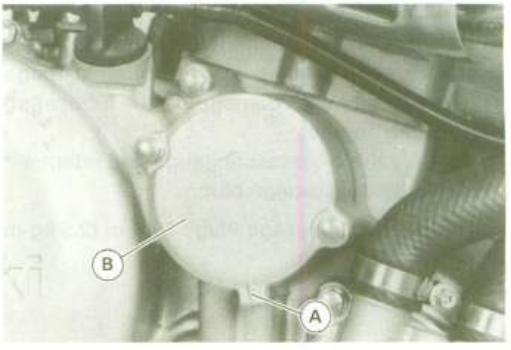
- Install the oil filler plug.

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

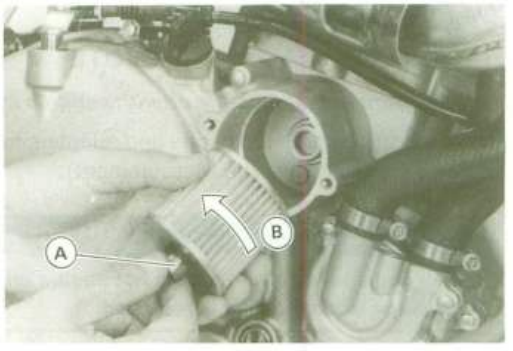
- Check the oil level (see Oil Level Inspection).

Oil Filter Change

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



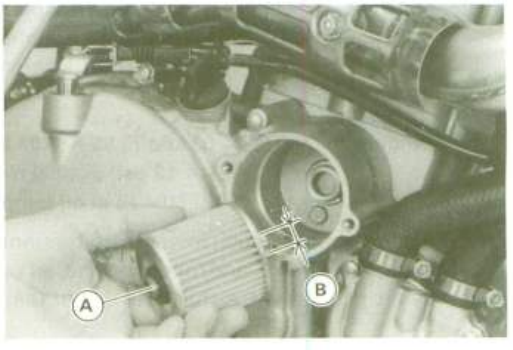
- Replace the filter element with a new one.
- Apply oil to the mounting pin [A] and turn the filter element [B] or the mounting pin to work the element into place. Be careful that the element grommets do not slip out of place.



- 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.

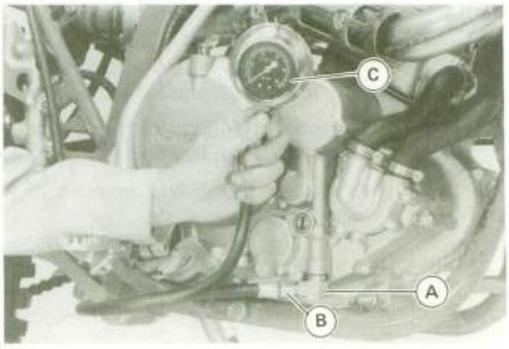
Torque – Oil Filter Cap Bolts : 8.8 N-m (0.90 kg-m, 78 in-lb)

- Pour in the specified type and amount of oil.



Oil Pressure Measurement

Relief Valve Opening Pressure Measurement



NOTE

○ *Measure the oil pressure before the engine is warmed up if you want to test relief valve opening pressure.*

- Remove the oil passage plug in the clutch cover and screw in the oil pressure gauge adapter [A] until the O-ring is adequately compressed.
- Screw the oil pressure gauge adapter, M6×1.0 [B] into the adapter [A] and attach the oil pressure gauge [C].

Special Tools – Oil Pressure Gauge Adapter: 57001-1359 [A]
Oil Pressure Gauge Adapter, M6×1.0: 57001-1088 [B]
Oil Pressure Gauge 5 kg/cm²: 57001-125 [C]

- Start the engine, and read the maximum oil pressure while running the engine at various speeds. A normal relief valve keeps the maximum oil pressure between the specified values.

Relief Valve Opening Pressure
Standard: 49 ~ 78 kPa (0.5 ~ 0.8 kg/cm²)
7.1 ~ 11 psi)

★ If the reading is much higher than the standard, the relief valve is stuck in its closed position.
★ If the reading is much lower than the standard, the relief valve may be stuck open, or there may be other damage (e.g. crankshaft oil seal damage, oil pump damage) in the lubrication system.

- Stop the engine.
- Remove the oil pressure gauge and adapter.
- Install the oil passage plug.

Torque – Oil Passage Plug : 25 N-m (2.5 kg-m, 18.0 ft-lb)

Oil Pressure Measurement

NOTE

○ *Measure the oil pressure after the engine is warmed up.*

- Attach the oil pressure gauge and adapters to the plug hole (see Relief Valve Opening Pressure Measurement).

⚠WARNING

You could receive burns from hot engine oil draining through the oil passage when the plug is removed.

Special Tools – Oil Pressure Gauge Adapter : 57001-1359
Oil Pressure Gauge Adapter, M6 x 1.0: 57001-1088
Oil Pressure Gauge, 5 kg/cm²: 57001-125

Oil Pressure
Standard: 54 ~ 83 kPa (0.55 ~ 0.85 kg-cm²,
7.8 ~ 12 psi) @4000 r/min (rpm),
90°C (194°F) of oil temp.

★ If the oil pressure is much lower than the standard, check the crankcase oil pump, relief valve, and/or crankshaft oil seal immediately.
★ If they are not at fault, inspect the rest of the lubrication system.

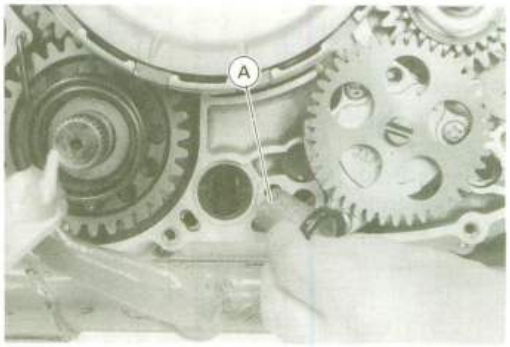
- Stop the engine.
- Remove the oil pressure gauge and adapter.
- Install the oil passage plug.

Torque – Oil Passage Plug : 25 N-m (2.5 kg-m, 18.0 ft-lb)

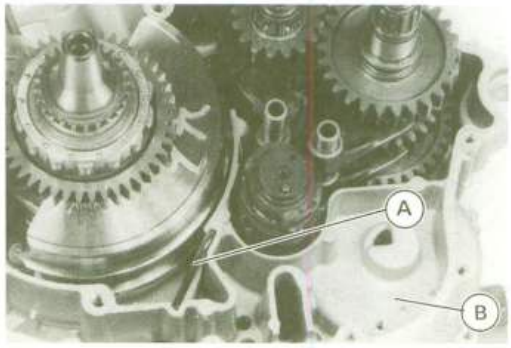
Oil Screens

Oil Screen Removal

- Remove the clutch cover (see Clutch chapter).
- Pull the right oil screen [A] out of the crankcase.



- Split the crankcase (see Crankshaft/Transmission chapter).
- Pull the left oil screen [A] out of the right crankcase [B].



Oil Screen Installation

- Clean the oil screen thoroughly whenever it is removed for any reason.
- Clean the oil screen with a high-flash point solvent and remove any particles stuck to it.

⚠WARNING

Clean the screen in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents.

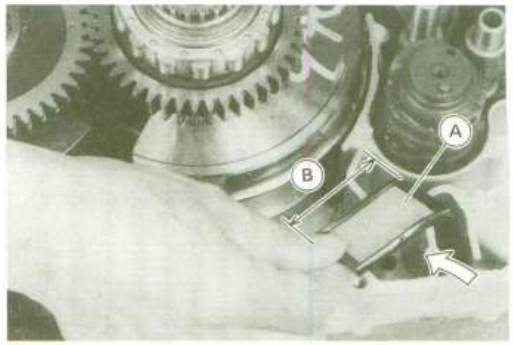
NOTE

○ *While cleaning the screen, check for any metal particles that might indicate internal engine damage.*

- Check the screen carefully for any damage, holes, broken wires, gasket pulling off.

★If the screen is damaged, replace it.

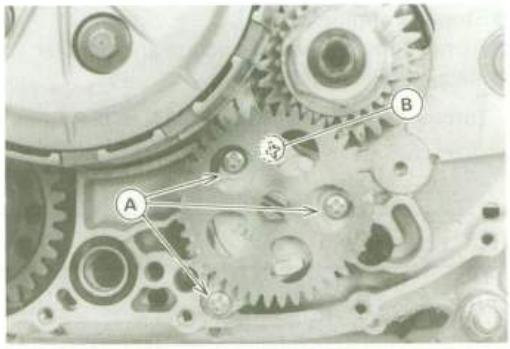
- Install the left oil screen [A] so that the narrow end [B] goes first.



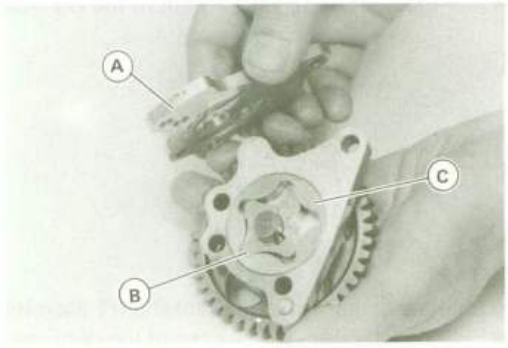
Oil Pump and Relief Valve

Crankcase Oil Pump Removal

- Remove the clutch cover (see Clutch chapter).
- Turn the crankshaft so that the pump cover screws [A] can be removed through the pump gear holes.
  - Do not remove the pump screw [B] yet.

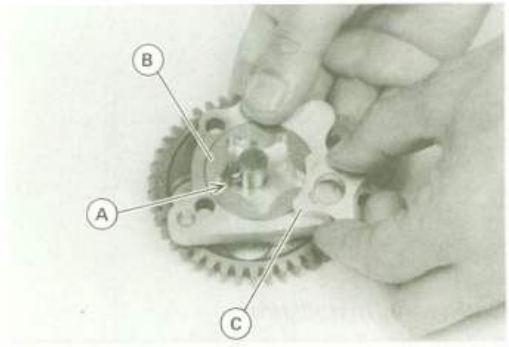


- Remove:
  Pump Screw
  Pump Plate [A]
  Inner Rotor [B]
  Outer Rotor [C]



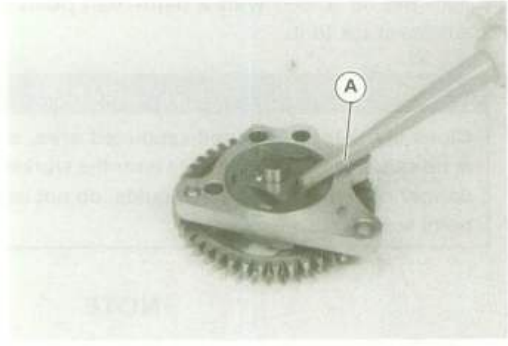
Crankcase Oil Pump Installation

- Install:
  Pin [A]
  Outer Rotor [B]
  Inner Rotor [C]



- Fill the pump with engine oil [A] for initial lubrication.
- Tighten the pump screw.

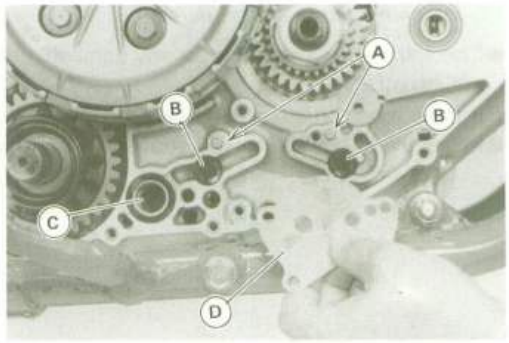
Non-permanent Locking Agent : Pump Screw
Torque – Pump Screw : 4.9 N-m (0.50 kg-m, 43 in-lb)



- Check to see that the dowel pins [A], plugs [B], the right oil screen [C], and new gasket [D] are in place.

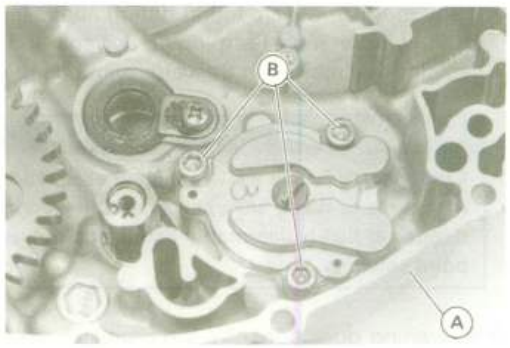
Torque – Pump Cover Screws : 4.9 N-m (0.50 kg-m, 43 in-lb)

- Install the clutch cover (see Clutch chapter).

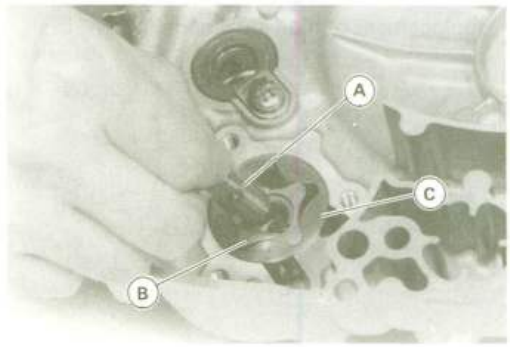


Clutch Cover Oil Pump Removal

- Remove the clutch cover [A] (see Clutch chapter).
- Remove the oil pump bolts [B].



- Remove:
  Oil Pump Shaft [A].
  Inner Rotor [B]
  Outer Rotor [C]

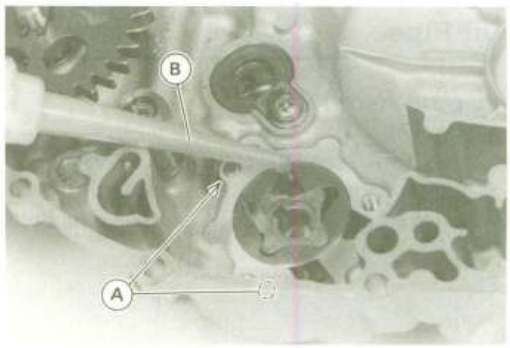


Clutch Cover Oil Pump Installation

- Install the dowel pins [A].
- Fill the pump with engine oil [B] for initial lubrication.

Torque – Oil Pump Bolts : 12 N-m (1.2 kg-m, 104 in-lb)

- Install the clutch cover (see Clutch chapter).



Oil Pump Inspection

- Disassemble the oil pump (see this chapter).
- Visually inspect the oil pump body, outer and inner rotors, and covers.

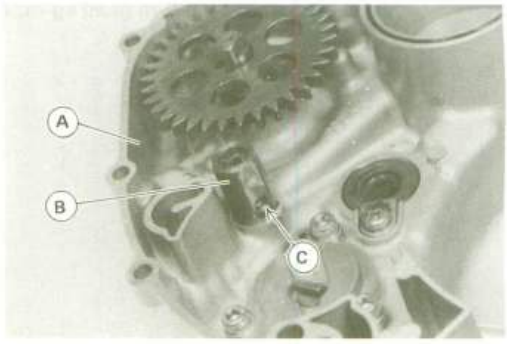
★If there is any damage or uneven wear, replace the rotors or the oil pump assembly.

Relief Valve Inspection

- Remove the clutch cover [A] (see Clutch chapter).
- Remove the relief valve [B].
- Check to see if the steel ball [C] inside the valve slides smoothly when pushing it in with a wooden or other soft rod, and see if it comes back to its seat by valve spring pressure.

NOTE

○*Inspect the valve in its assembled state. Disassembly and assembly may change the valve performance.*



★If any rough spots are found during above inspection, wash the valve clean with a high-flash point solvent and blow out any foreign particles that may be in the valve with compressed air.

⚠WARNING

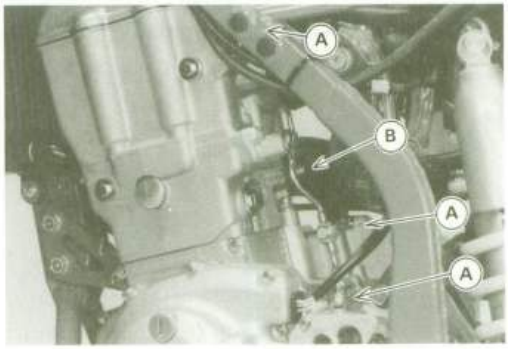
Clean the parts in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents.

★If cleaning does not solve the problem, replace the relief valve as an assembly. The relief valve is precision made with no allowance for replacement of individual parts.

Oil Pipe

Oil Pipe Removal

- Remove:
  Fuel Tank (see Fuel System chapter)
  Starter Motor (KLX650C, see Electrical System chapter)
- Remove the banjo bolts [A] and oil pipe bolts [B] to take off the pipe.



Oil Pipe Installation

- Before installation, flush out the pipe with a high-flash point solvent.
- Fill the pipe with engine oil to shorten air bleeding time and prevent engine damage.
- Discard the used copper washers and install new washers on each side of the pipe fittings.
- Lightly tighten the banjo bolts and oil pipe bolts to a snug fit, and tighten them to the specified torque.

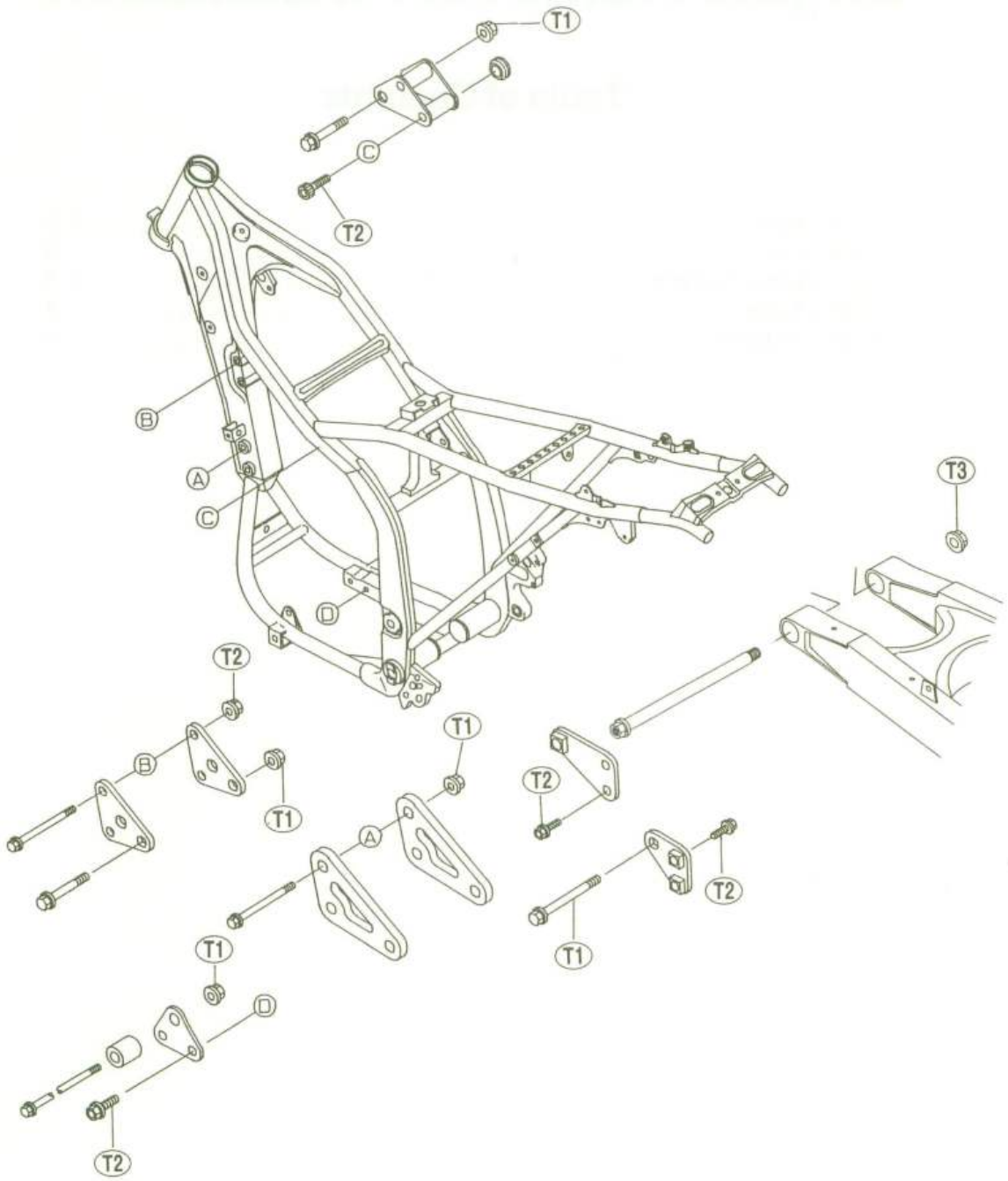
Torque – Oil Pipe Banjo Bolts : 20 N-m (2.0 kg-m, 14.5 ft-lb)
Oil Pipe Bolts : 8.8 N-m (0.90 kg-m, 78 in-lb)

Engine Removal / Installation

Table of Contents

Exploded View 7-2
Specifications 7-3
Engine Removal/Installation 7-3
  Engine Removal 7-3
  Engine Installation 7-5

Exploded View



T1: 44 N-m (4.5 kg-m, 33 ft-lb)
T2: 29 N-m (3.0 kg-m, 22 ft-lb)
T3: 88 N-m (9.0 kg-m, 65 ft-lb)

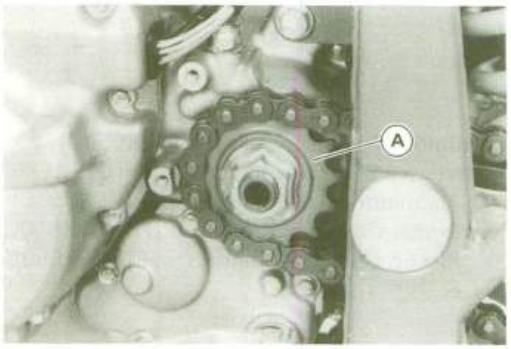
Specifications

Special Tool – Jack: 57001-1238

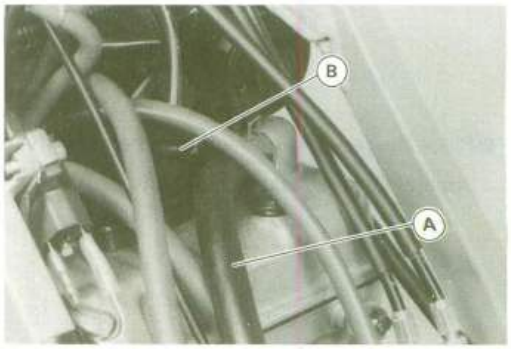
Engine Removal/Installation

Engine Removal

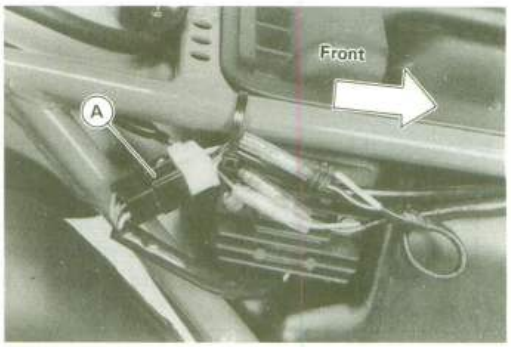
- Drain the coolant (see Cooling System chapter)
- Drain the engine oil (see Engine Lubrication System chapter).
- Remove:
  - Fuel Tank (see Fuel System chapter)
  - Carburetor (see Fuel System chapter)
  - Exhaust Pipe (see Engine Top End chapter)
  - Right Footpeg
  - Brake Pedal (see Brakes chapter)
  - Shift Pedal
  - Radiators (see Cooling System chapter)
  - Engine Sprocket [A] (see Final Drive chapter)
  - Kick Pedal (KLX600A)
  - Canister Guard (KLX650C, CA)



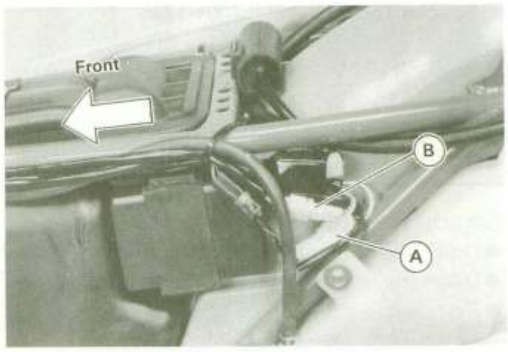
- Disconnect the following cables, hoses, and connectors from the engine.
  - Breather Hose [A]
  - Spark Plug Cap [B]
  - Radiator Hoses
  - Clutch Cable Lower End (see Clutch Cover Removal in the Clutch chapter)



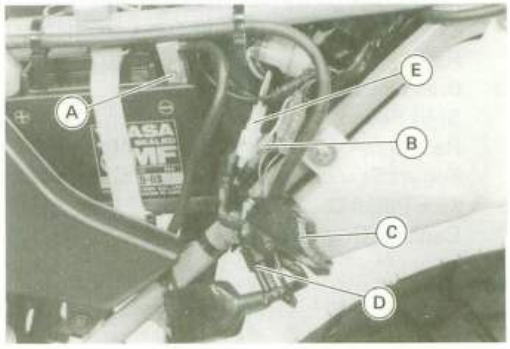
  - Alternator Lead Connector [A] (KLX650A)



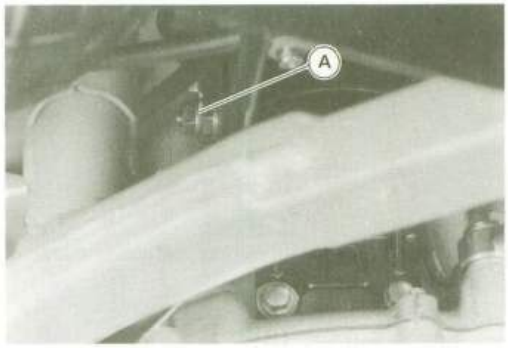
Pickup Coil Lead Connector [A] (KLX650A)
Exciter Coil Lead Connector [B] (KLX650A)



Battery Negative Lead [A] (KLX650C)
Neutral Switch Lead Connector [B] (KLX650C)
Alternator Lead Connector [C] (KLX650C)
Exciter Coil Lead Connector [D] (KLX650C)
Pickup Coil Lead Connector [E] (KLX650C)

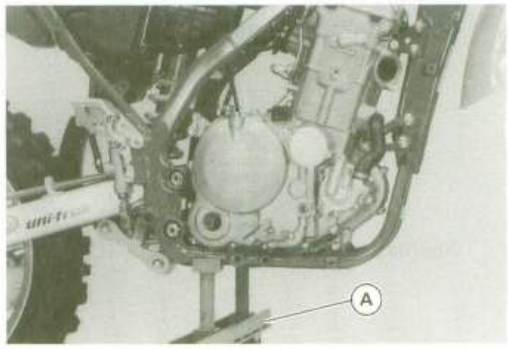


Starter Motor Cable [A] (KLX650C)



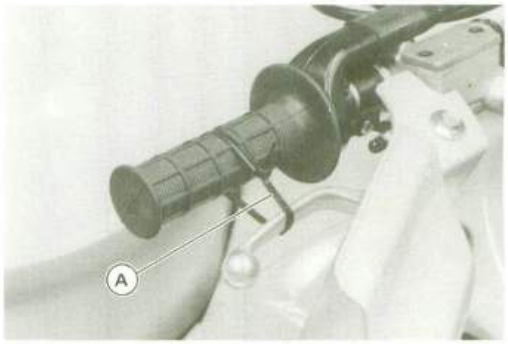
● Place the jack [A] under the frame to lift the rear wheel off the ground.

***Special Tool* – Jack: 57001-1238**



● Squeeze the brake lever slowly and hold it with a band [A].

CAUTION
Be sure to hold the front brake when removing the engine, or the motorcycle may fall over. The engine or the motorcycle could be damaged.

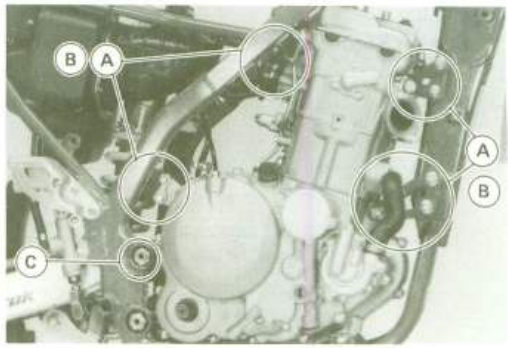


⚠WARNING

Be sure to hold the front brake when removing the engine, or the motorcycle may fall over. It could cause an accident and injury.

○The following parts may be removed with the engine in the frame if the crankcase is to be split.
Primary Gear (see Clutch chapter)
Clutch (see Clutch chapter)
Magneto Flywheel (see Electrical System chapter)

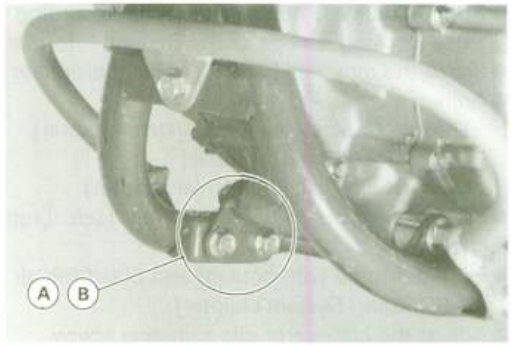
●Remove the engine mounting bolts [A] and brackets [B].



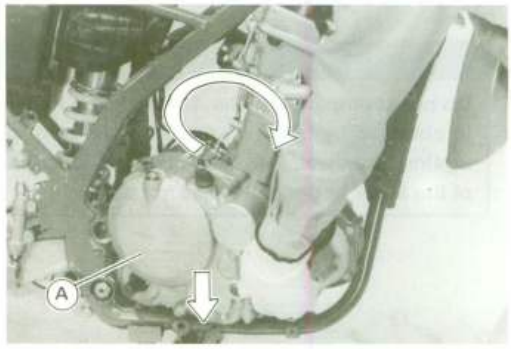
⚠WARNING

The swingarm pivot shaft also serves as the engine mounting bolt. Take precautions to insure the frame is well supported, so that the motorcycle will not fall over when the pivot shaft is removed.

●Remove the swingarm pivot nut.
●Pull out the swingarm pivot shaft [C] halfway so that the engine is free and the swingarm doesn't fall down.



●Twist the engine clockwise and remove the engine [A] from the vehicle's right side.

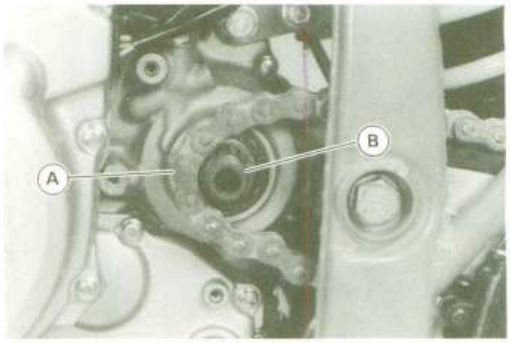


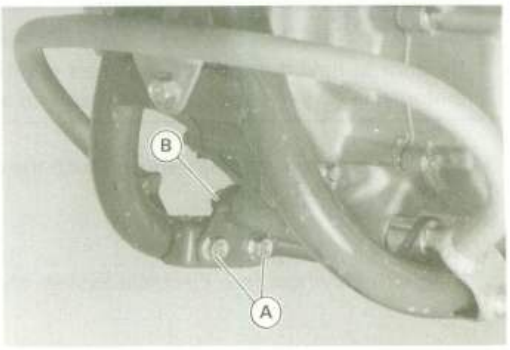
Engine Installation

●For the KLX650C model, hang the drive chain [A] over the output shaft [B] just before moving the engine into its final position in the frame.
●Insert the swingarm shaft.

NOTE

○*If the swingarm is removed and is difficult to install, remove the brake pedal and loosen the rocker arm nut.*





- Temporarily install:
  Front Lower Engine Mounting Bolts [A]
  Front Lower Engine Mounting Bolt and Nut [B]
  Other Engine Mounting Bolts and Nuts
- Tighten the following fasteners in the order listed.

Torque – Swingarm Pivot Nut: 88 N-m (9.0 kg-m, 65 ft-lb)
Rocker Arm Nut: 98 N-m (10.0 kg-m, 72 ft-lb)
10 mm Engine Mounting Bolts and Nuts:
44 N-m (4.5 kg-m, 33 ft-lb)
8 mm Engine Mounting Bolts and Nuts:
29 N-m (3.0 kg-m, 22 ft-lb)

- Install:
  Engine Sprocket (see Final Drive chapter)

- Run the cables, hoses, and leads according to the Cable, Wire, and Hose Routing section of the General Information chapter.
- Install the removed parts (see the appropriate chapters).
- Adjust:
  Throttle Cables (see Fuel System chapter)
  Clutch (see Clutch chapter)
  Drive Chain (see Final Drive chapter)
- Fill the engine with engine oil (see Engine Lubrication System chapter).
- Fill the engine with coolant and bleed the air from the cooling system (see Cooling System chapter).
- Adjust the carburetor idle adjusting screw.
- Check the brake effectiveness.

⚠WARNING

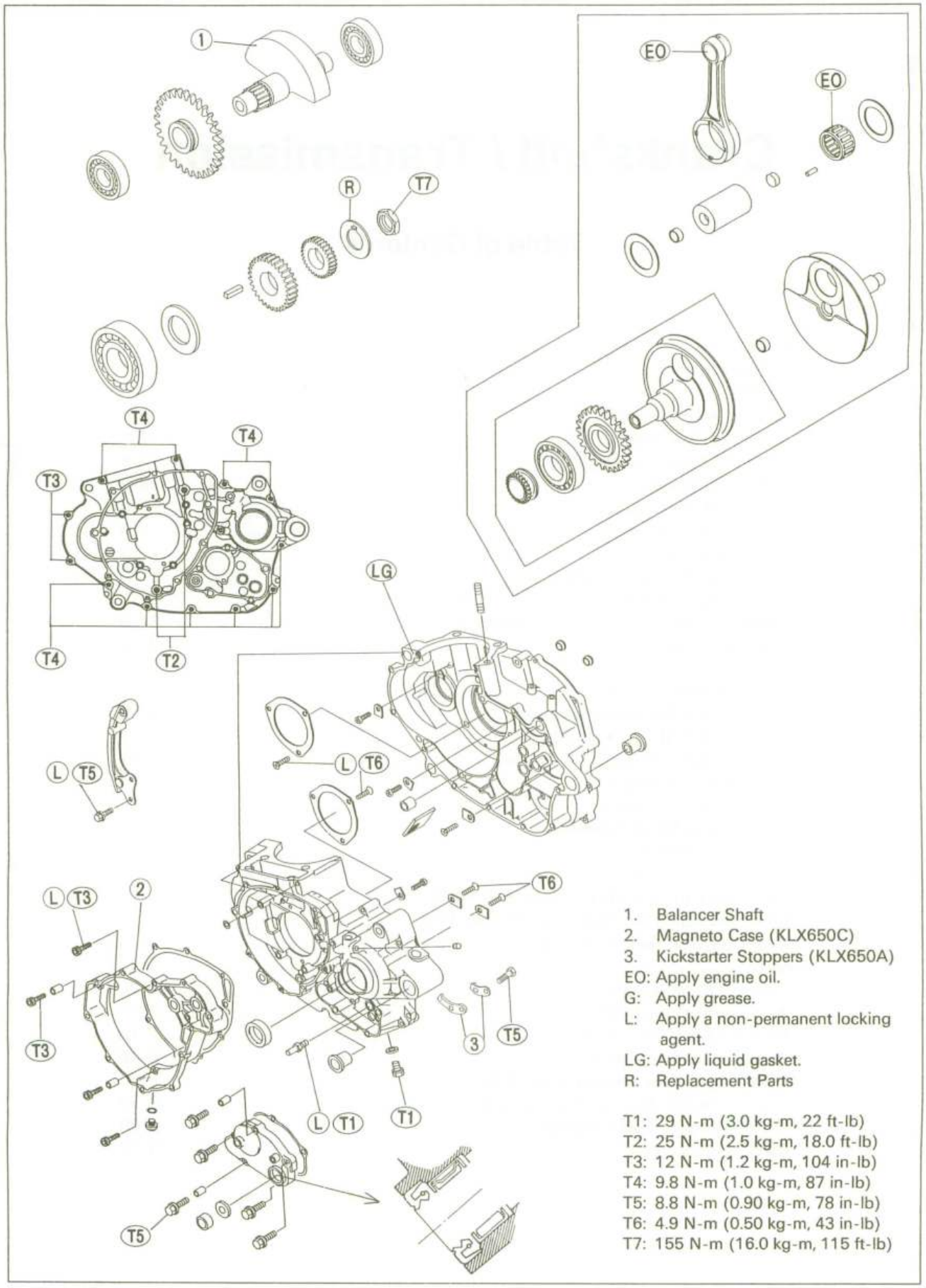
Do not attempt to ride the motorcycle until a full brake lever or pedal is obtained by pumping the brake lever or pedal until the pads are against the disc. The brake will not function on the first application of the lever or pedal if this is not done.

Crankshaft / Transmission

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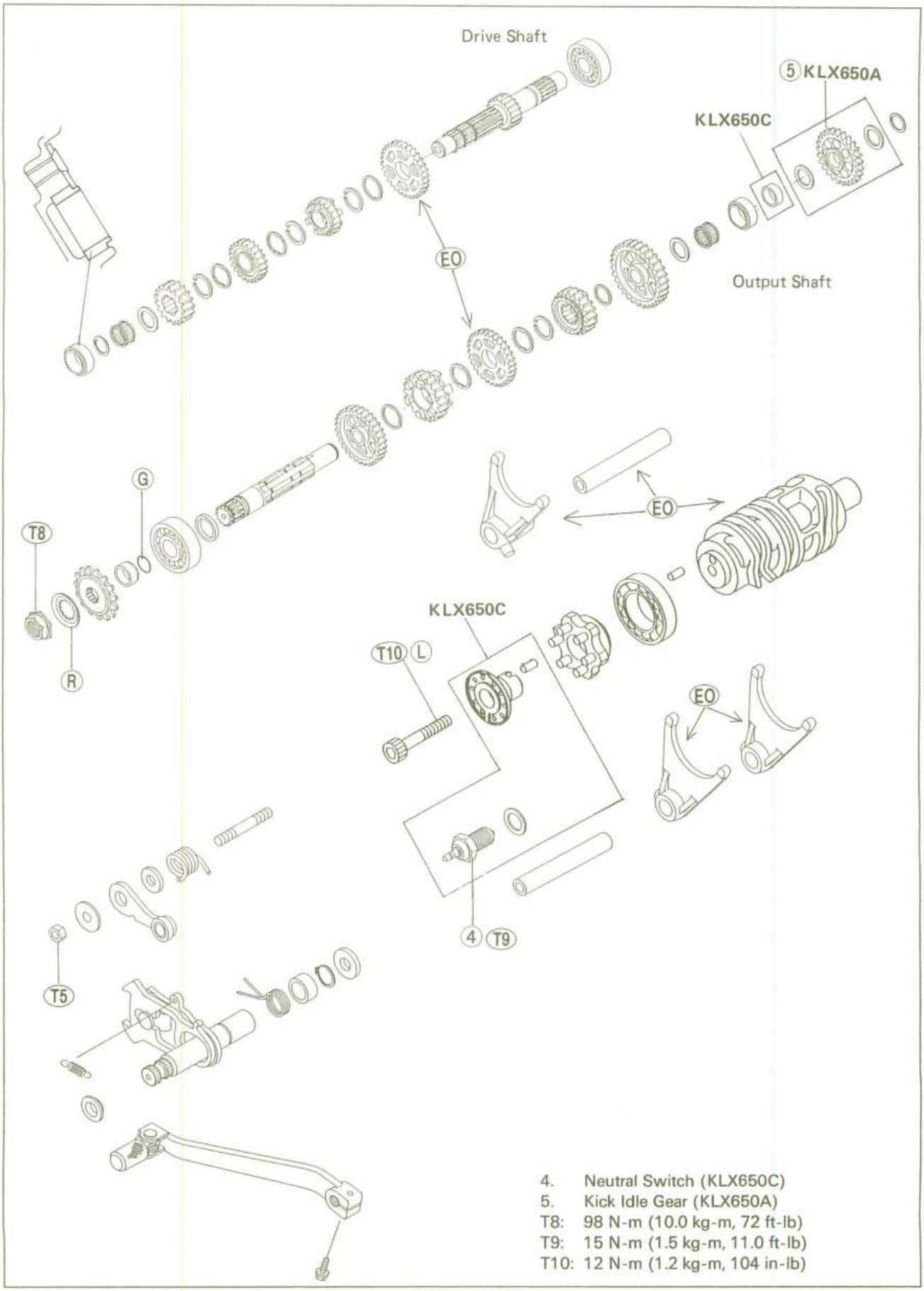
Exploded View



1. Balancer Shaft
2. Magneto Case (KLX650C)
3. Kickstarter Stoppers (KLX650A)

EO: Apply engine oil.
G: Apply grease.
L: Apply a non-permanent locking agent.
LG: Apply liquid gasket.
R: Replacement Parts

T1: 29 N-m (3.0 kg-m, 22 ft-lb)
T2: 25 N-m (2.5 kg-m, 18.0 ft-lb)
T3: 12 N-m (1.2 kg-m, 104 in-lb)
T4: 9.8 N-m (1.0 kg-m, 87 in-lb)
T5: 8.8 N-m (0.90 kg-m, 78 in-lb)
T6: 4.9 N-m (0.50 kg-m, 43 in-lb)
T7: 155 N-m (16.0 kg-m, 115 ft-lb)



4. Neutral Switch (KLX650C)
5. Kick Idle Gear (KLX650A)
T8: 98 N-m (10.0 kg-m, 72 ft-lb)
T9: 15 N-m (1.5 kg-m, 11.0 ft-lb)
T10: 12 N-m (1.2 kg-m, 104 in-lb)

Specifications

Item	Standard	Service Limit
Crankshaft, Connecting Rod:		
Connecting rod big end radial clearance	0.006 ~ 0.019 mm	0.07 mm
Connecting rod big end side clearance	0.25 ~ 0.35 mm	0.55 mm
Crankshaft runout: Right	TIR 0.04 mm or less	TIR 0.10 mm
Left	TIR 0.03 mm or less	TIR 0.08 mm
Cold fitting tolerance between crankpin and crankwebs	0.093 ~ 0.122 mm	---
Transmission:		
Shift fork ear thickness	4.4 ~ 4.5 mm	4.3 mm
Gear shift fork groove width	4.55 ~ 4.65 mm	4.75 mm
Shift fork guide pin diameter	5.9 ~ 6.0 mm	5.8 mm
Shift drum groove width	6.05 ~ 6.20 mm	6.3 mm

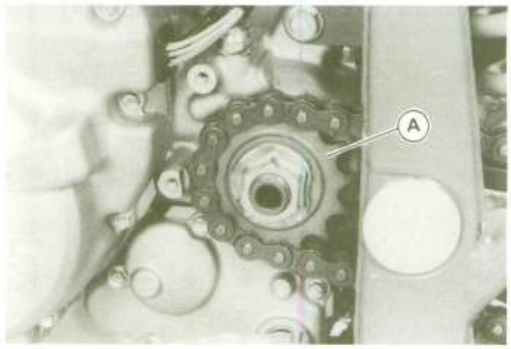
Special Tool – Outside Circlip Pliers: 57001-144
Bearing Driver Set: 57001-1129

Sealant – Kawasaki Bond (Liquid Gasket – Silver): 92104-002

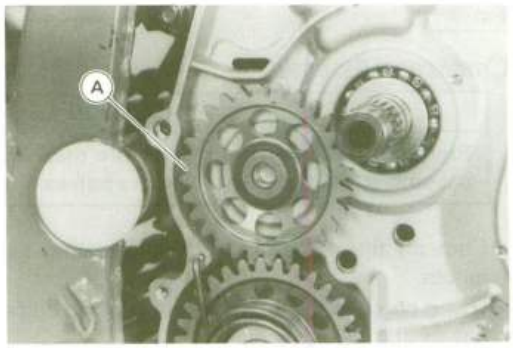
Crankcase

Crankcase Disassembly

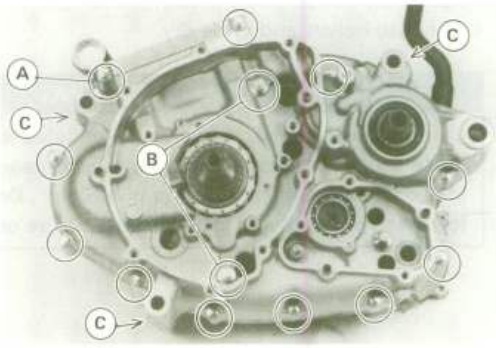
- Remove the engine sprocket [A] (see Final Drive chapter).
- Remove the engine (see Engine Removal/Installation chapter).
- Set the engine on a clean surface and hold the engine steady while parts are being removed.
- Remove:
  Primary Gear (see Clutch chapter)
  Clutch (see Clutch chapter)
  Starter Motor (KLX650C, see Electrical System chapter)
  Magneto Flywheel (see Electrical System chapter)
  Magneto Case (KLX650C, see Electrical System chapter)
  Main Oil Pipe
  Cylinder and Gasket (see Engine Top End chapter)
  Piston (see Engine Top End chapter)
  Camshaft Chains and Guides (see Engine Top End chapter)
  External Shift Mechanism (see this chapter)
  Shift Drum Cam (see this chapter)



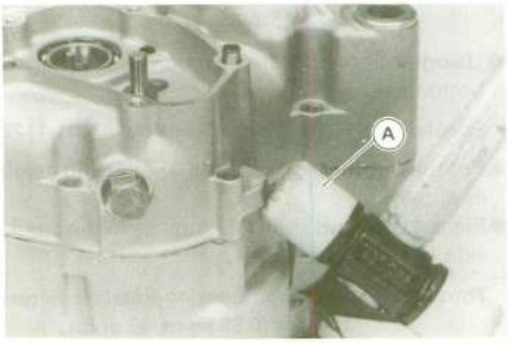
- Remove:
  Kick Idle Gear (KLX650A) [A]



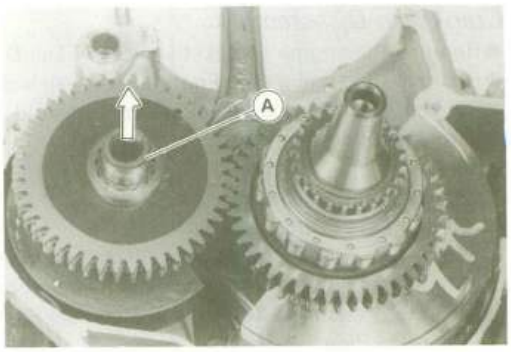
- Remove the crankcase bolts, starting with the 6mm bolts.
  Eleven 6 mm Bolts [A]
  Two 8 mm Bolts [B]
- ○ Pry three points [C] with a screwdriver to split the crankcase halves apart evenly. There are three dowel pins on the crankcase mating surface.



- Tap lightly around the crankcase joint with a plastic mallet [A].
- Lift off the left crankcase half.
- Remove the transmission shaft and gears (see this chapter).



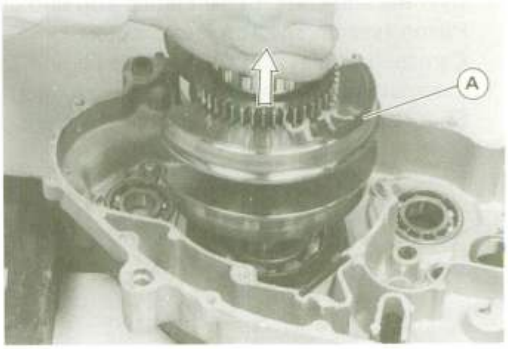
● Remove the balancer shaft assembly [A].



● Remove the crankshaft [A] from the crankcase half by hand.

CAUTION

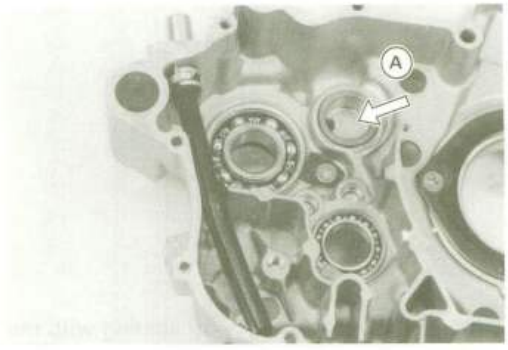
Do not remove the ball bearings and the oil seals unless it is necessary. Removal may damage them.



Crankcase Assembly

CAUTION

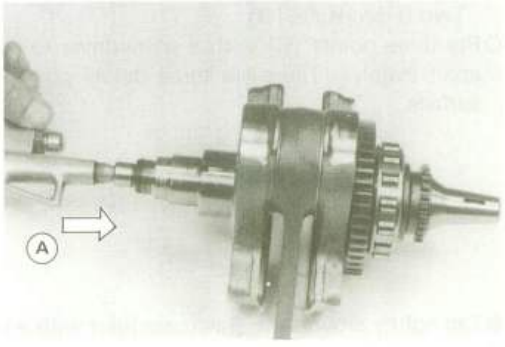
Right and left crankcase halves are machined at the factory in the assembled state, so the crankcase halves must be replaced as a set.



● Chip off the old gasket from the mating surfaces of the crankcase halves.
● Using compressed air, blow out [A] the oil passages in the crankcase halves and the crankshaft.
● With a high-flash point solvent, clean off the mating surfaces of the crankcase halves and wipe dry.

⚠WARNING

Clean the engine parts 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. Do not use gasoline or a low-flash point solvent to clean parts. A fire or explosion could result.

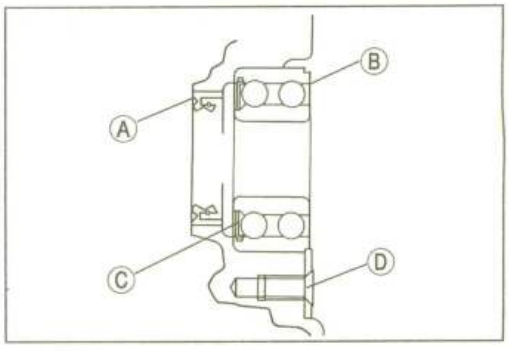


● Using a press and the bearing driver set, install a new bearing until it bottoms out.

Special Tool – Bearing Driver Set: 57001-1129

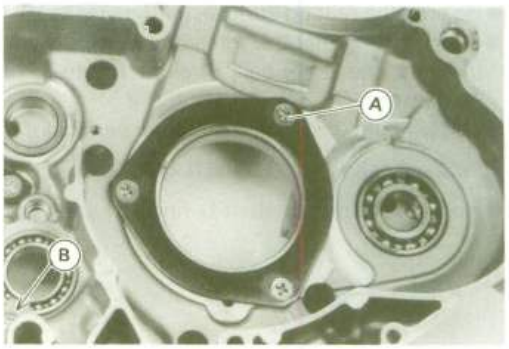
● Put the output shaft oil seal [A] in, being careful of the proper direction as shown.
● Press the output shaft bearing [B] in the crankcase so that the shielded side [C] faces to the oil seal.

Torque – Output Shaft Bearing Retainer Screw [D] :
4.9 N-m (0.50 kg-m, 43 in-lb)

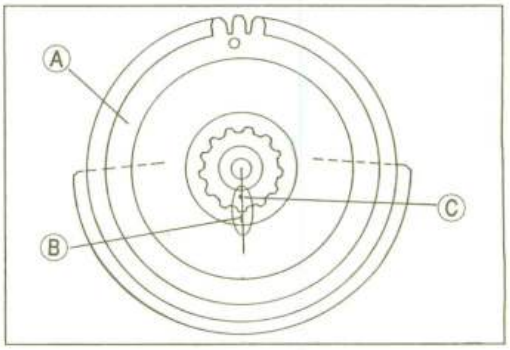


● Tighten the main bearing retainer screws [A].

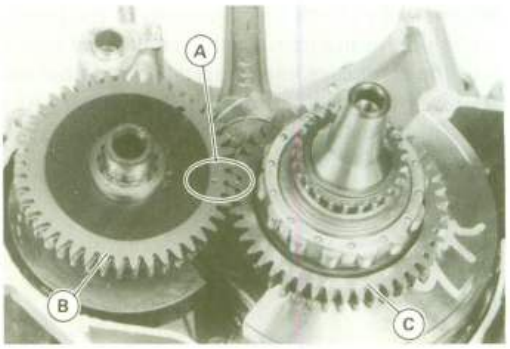
Non-permanent Locking Agent : Main Bearing Retainer Screws
Torque – Main Bearing Retainer Screws :
4.9 N-m (0.50 kg-m, 43 in-lb) [A]
Bearing Retainer Screws :
4.9 N-m (0.50 kg-m, 43 in-lb) [B]



● Install the crankshaft by hand.
● Install the balancer gear assembly [A] on the balancer shaft, aligning the gear line mark [B] with the shaft punch mark [C].



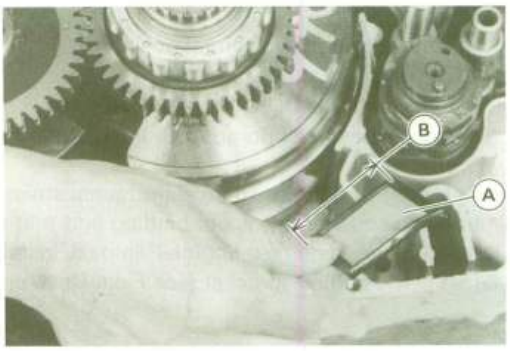
● Install the balancer shaft assembly, aligning the marks [A] on the balancer shaft gear [B] and the crankshaft balancer gear [C] as shown.
● Install:
Transmission Shaft and Shift Forks
(see Transmission Shaft Installation)



● Clean the left oil screen [A] thoroughly whenever the crankcase is split.
● Clean the oil screen with a high-flash point solvent and remove any particles stuck to it.

⚠WARNING

Clean the screen in a well-ventilated area, and take care that there is no spark or flame anywhere near the working area. Because of the danger of highly flammable liquids, do not use gasoline or low-flash point solvents.



NOTE

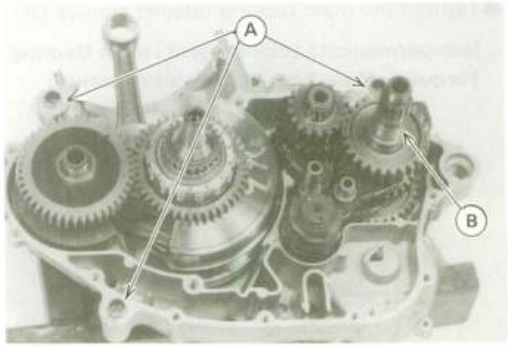
○ *While cleaning the screen, check for any metal particles that might indicate internal engine damage.*

● Check the screen carefully for any damage, holes, broken wires, gasket pulling off.
★ If the screen is damaged, replace it.
● Install the oil screen [A] so that the narrow end [B] goes first.

- Be sure the mating surfaces of the crankcase halves are clean and dry.
- Check to see that the three crankcase dowel pins [A] are in place on the right crankcase half. If either has been removed, replace it with a new one.
- Apply liquid gasket to the mating surface of the left crankcase half.

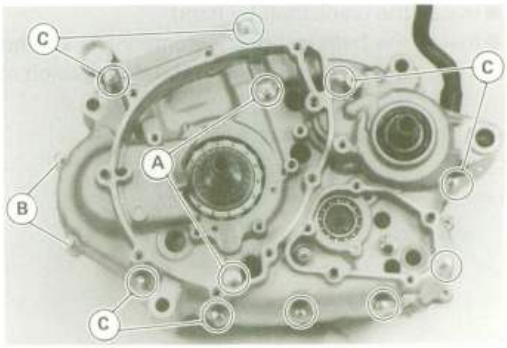
Sealant – Kawasaki Bond (Liquid Gasket – Silver): 92104-002

- Replace the output shaft O-ring [B] and grease the new O-ring.

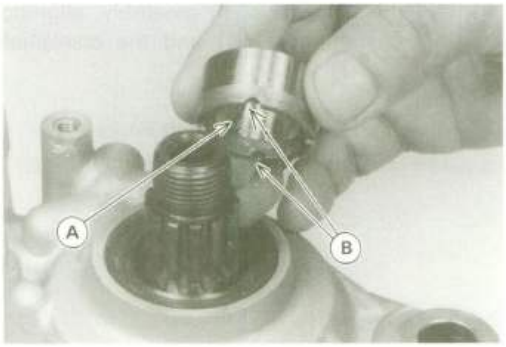


- Tighten the crankcase bolts in the order listed.

Torque – 8 mm Crankcase Bolts [A]: 25 N-m (2.5 kg-m, 18.0 ft-lb)
6 mm Crankcase Allen Bolts [B]: 12 N-m (1.2 kg-m, 104 in-lb)
6 mm Crankcase Bolts [C]: 9.8 N-m (1.0 kg-m, 87 in-lb)



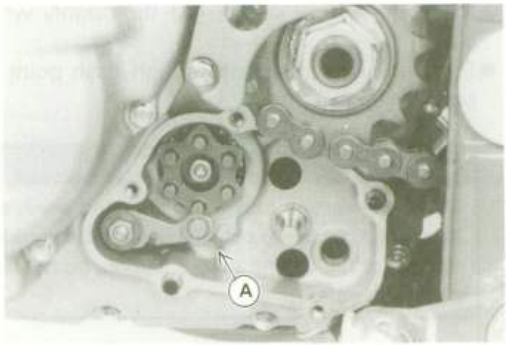
- Constantly check the alignment of the two crankcase halves, and the position of the transmission shafts and shift drum. The front and rear of the crankcase must be pushed together evenly.
- Grease the inside of output shaft collar [A] and install it by hand on the output shaft so that the oil grooves [B] go first and collar does not pinch the O-ring.



- Check:
  Shift drum is in the neutral position [A]
  Transmission shafts turn freely
  Crankshaft and balancer shaft turn freely

★If any of the shafts do not turn freely, split the crankcase to locate the problem.

- Spinning the output shaft, shift the transmission through all the gears to make certain there is not binding and that all gears shift properly.
- Install the engine (see Engine Removal/Installation chapter).
- Install the engine sprocket (see Final Drive chapter).



Crankshaft and Connecting Rod

Crankshaft Removal

See Crankcase Disassembly.

Crankshaft Installation

See Crankcase Assembly.

Crankshaft Disassembly

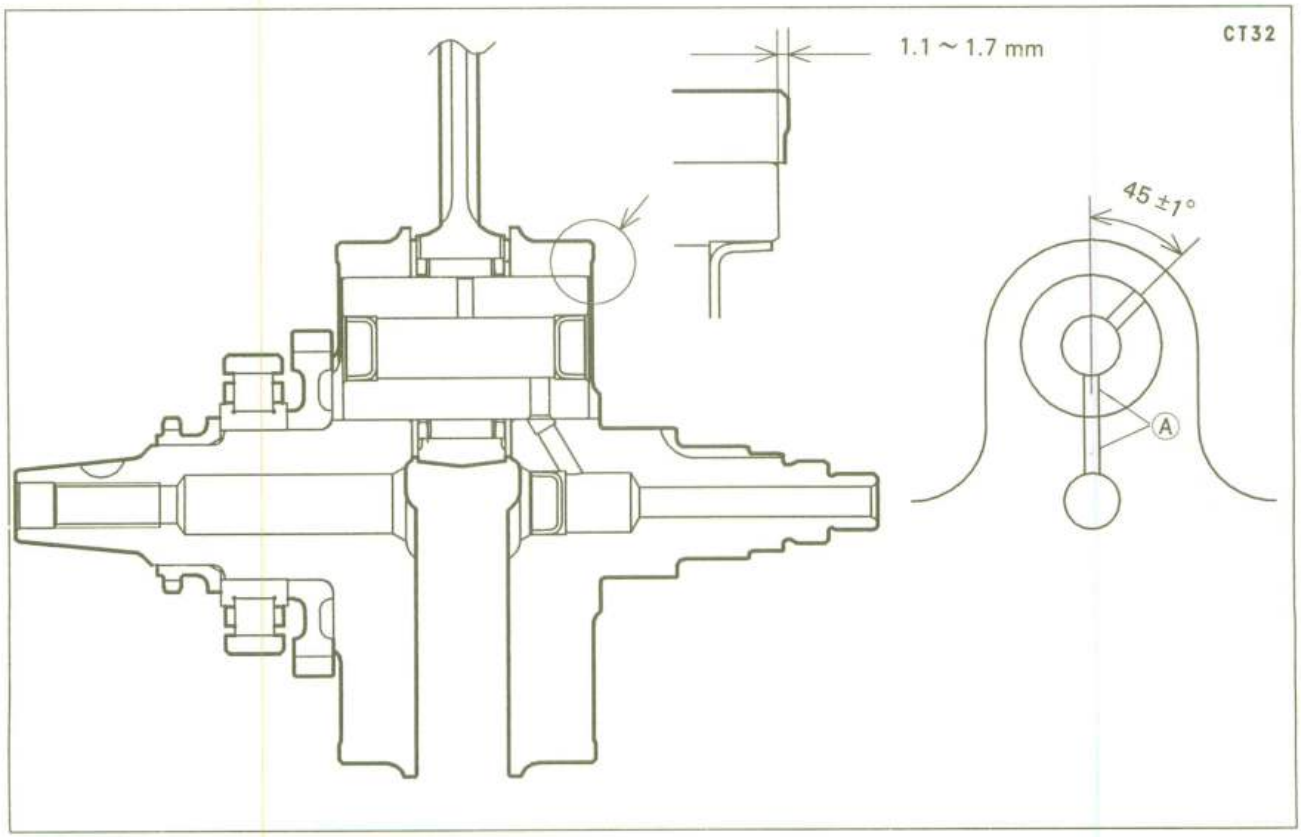
CAUTION

Since assembly of the crankshaft demands exacting tolerances, the disassembly and reassembly of the crankshaft should only be performed by experienced mechanics with the necessary tools and equipment.

The crankpin, connecting rod, and right crankshaft are available separately as spare parts, however, it is recommended that the crankshaft assembly be replaced rather than attempting to replace the components.

Crankshaft Assembly

- Press the crank halves onto the crankpin, noting the crankpin direction until connecting rod side clearance is within specification (see Connecting Rod Big End Side Clearance).
- Make sure oil passages [A] of the crank and crankpin are lined up during assembly as shown.
- Check that the connecting rod radial clearance is within specification (see Connecting Rod Big End Radial Clearance).
- Adjust crankshaft runout until runout is within specification (see Crankshaft Runout).



Connecting Rod Big End Seizure

★In the case of serious seizure with damaged flywheels, the crankshaft must be replaced.

★In the case of less serious damage, disassemble the crankshaft and replace the crankpin, needle bearing, side washers, and connecting rod.

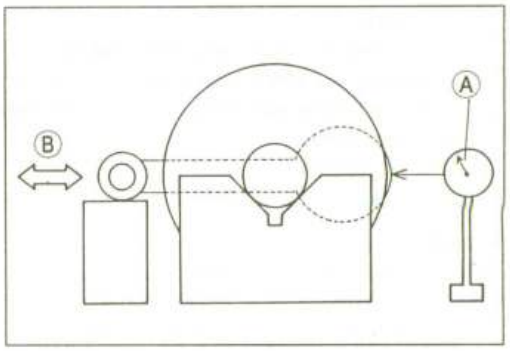
Connecting Rod Big End Radial Clearance

●Set the crankshaft on V blocks, and place a dial gauge [A] against the connecting rod big end.

★Push [B] the connecting rod first towards the gauge and then in the opposite direction. The difference between the two gauge readings is the radial clearance.

★If the radial clearance exceeds the service limit, the crankshaft assembly must be replaced or disassembled and the crankpin, needle bearing, and connecting rod big end examined for wear.

Connecting Rod Big End Radial Clearance
Standard: **0.006 ~ 0.019 mm**
Service Limit: **0.07 mm**



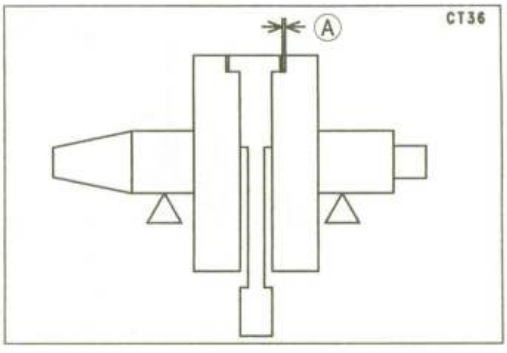
Connecting Rod Big End Side Clearance

●Set the crankshaft on V blocks.

●Measure the side clearance [A] of the connecting rod with a thickness gauge.

★If big end side clearance exceeds the service limit, the crankshaft assembly must be replaced or disassembled and the connecting rod and thrust washers visually inspected for wear.

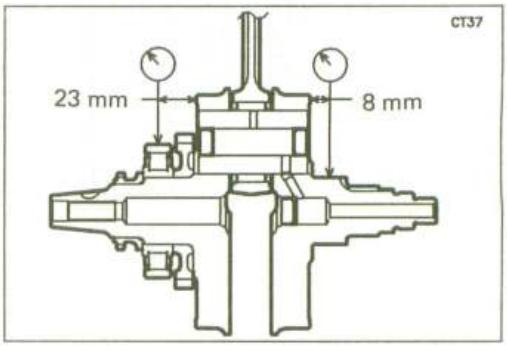
Connecting Rod Big End Side Clearance
Standard: **0.25 ~ 0.35 mm**
Service Limit: **0.55 mm**



Crankshaft Alignment

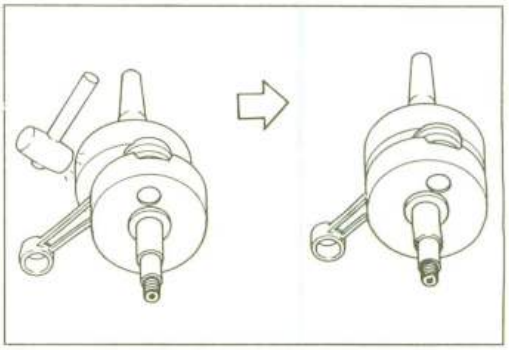
●With the crankshaft on V blocks, turn the crankshaft slowly and measure runout at each of the locations shown.

Crankshaft Runout
Right Half
Standard : TIR 0.04 mm or less
Service Limit : TIR 0.10 mm
Left Half
Standard : TIR 0.03 mm or less
Service Limit : TIR 0.08 mm



★If runout at either location exceeds the service limit, align the crankshaft so that runout is within the service limits.

- In the case of horizontal misalignment, strike the projecting crankshaft half with a plastic, soft lead, or brass hammer as shown.
- Recheck the runout and repeat the process until the runout is within service limits.
- ○Vertical misalignment is corrected either by driving a wedge in between the crank halves, or by squeezing the crank halves in a vise, depending on the nature of the misalignment.

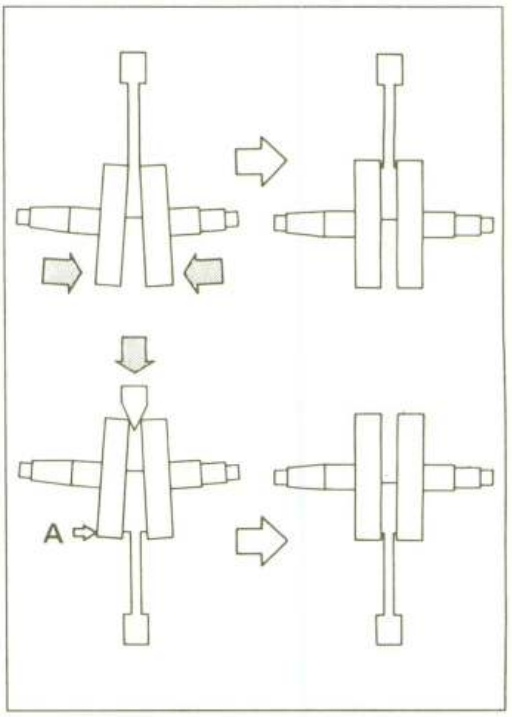


- In the case of both horizontal and vertical misalignment, correct the horizontal misalignment first.
- Recheck big end side clearance after aligning crankshaft (see Connecting Rod Big End Side Clearance).

NOTE

○*If crankshaft alignment cannot be corrected by the above method, replace the crankpin or crank halves as required.*

CAUTION
Don't hammer the flywheel at the point [A].

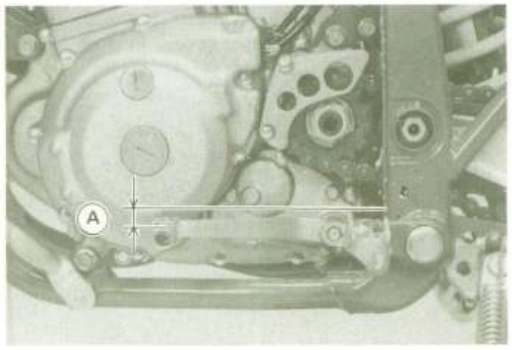


Transmission

Shift Pedal Installation

- Adjust the shift pedal position from the footpeg top to suit you.

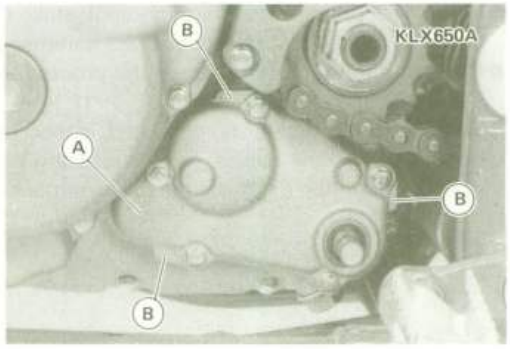
○ The standard shift pedal position [A] is about 40 mm below the footpeg top.

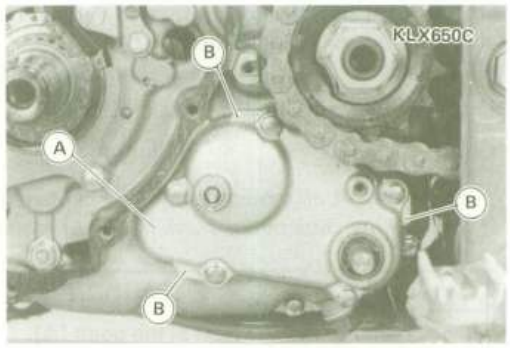


External Shift Mechanism Removal

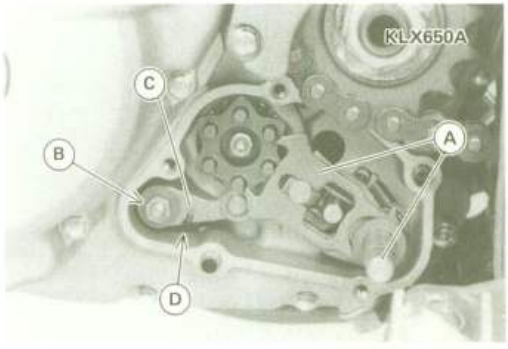
- Drain the engine oil (see Engine Lubrication System chapter).
- Remove the bolt and take off the shift pedal.
- For the KLX650C, remove the following parts.
  Engine Sprocket Cover
  Magneto Flywheel (see Electrical System chapter)
  Magneto Case (see Electrical System chapter)
- Remove the external shift mechanism cover [A] by taking out the bolts.

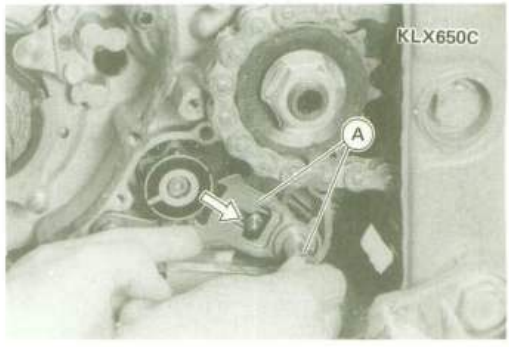
○ Pry the three points [B] with a screwdriver to remove the cover.



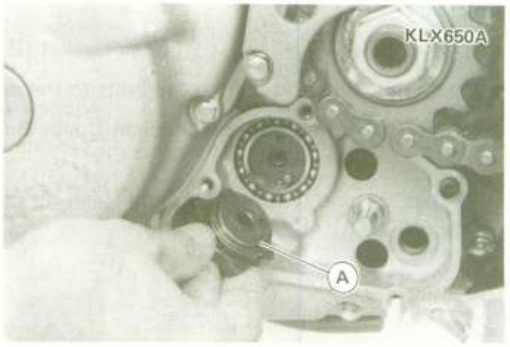


- Remove:
  Shift Shaft and Shift Mechanism Arm [A]
- Remove the gear positioning lever nut [B] and take off the lever [C] with its spring [D].

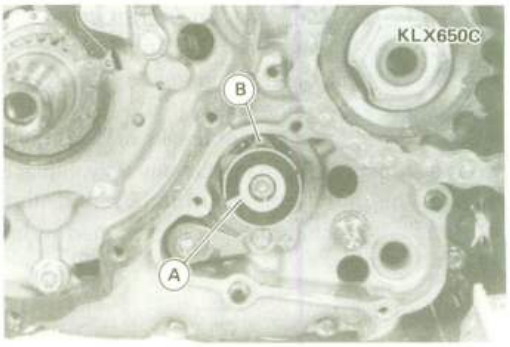




● For the KLX650A, remove the shift drum cam [A] by taking off the bolt.

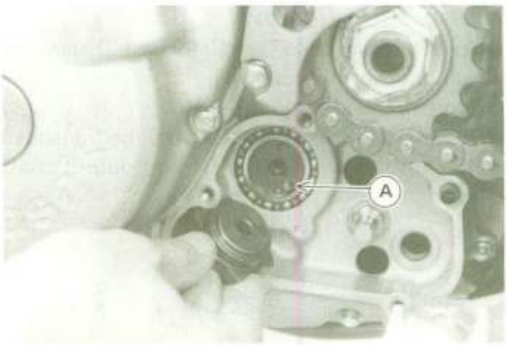


● For the KLX650C, remove the neutral switch plate [A] and the shift drum cam [B] by taking off the bolt.



External Shift Mechanism Installation

● Be sure to install the dowel pin [A] in the shift drum cam.

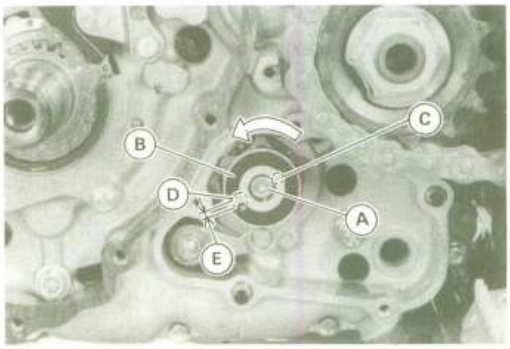


● Apply a non-permanent locking agent to the threads of the shift drum cam bolt [A].

○ In the early KLX650C models, if the neutral light flashes with the gear in low, reinstall the neutral switch plate as follows.

○ Install the neutral switch plate [B], fitting the pin [C]. Tighten the shift drum cam bolt while turning the neutral switch plate fully counterclockwise so that one of the cams [D] aligns with the switch contact [E].

Non-permanent Locking Agent : Shift Drum Cam Bolt
Torque – Shift Drum Cam Bolt : 12 N-m (1.2 kg-m, 104 in-lb)

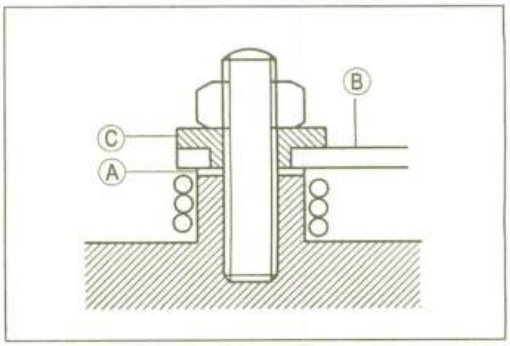


● Install the gear positioning lever and spring as shown.

Washer [A] Flanged Collar [C]
Gear Positioning Lever [B]

● Check to see that the gear positioning lever swings smoothly after tightening the lever nut.

Torque – Gear Positioning Lever Nut : 8.8 N-m (0.90 kg-m, 78 in-lb)



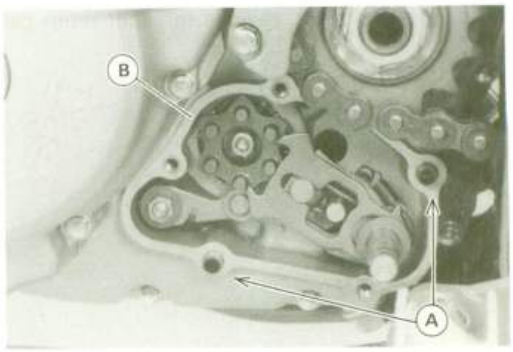
● Install:

Dowel Pins [A] New Gasket [B]

● Install the cover and tighten the bolts to the specified torque.

Torque – External Shift Mechanism Cover Bolts : 8.8 N-m (0.90 kg-m, 88 in-lb)

● Fill the engine with engine oil (see Engine Lubrication System chapter).



External Shift Mechanism Inspection

● Check the shift shaft for bending or serrations [A] for damage.

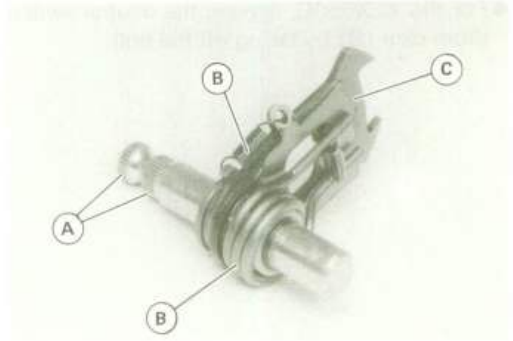
★ If the shaft is bent, straighten or replace it. If the serrations are damaged, replace the shaft.

● Check the springs [B] for breaks or distortion.

★ If the springs are damaged in any way, replace them.

● Check the shift mechanism arm [C] for distortion.

★ If the shift mechanism arm is damaged in any way, replace the shift shaft assembly.



Transmission Removal

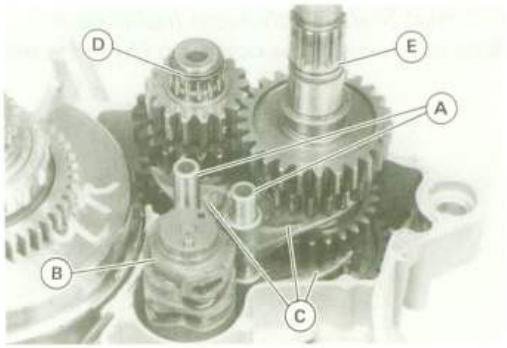
● Split the crankcase (see Crankcase Disassembly).

● Pull out the shift rods [A].

● Remove the shift drum [B].

● Remove the shift forks [C] from the transmission gears.

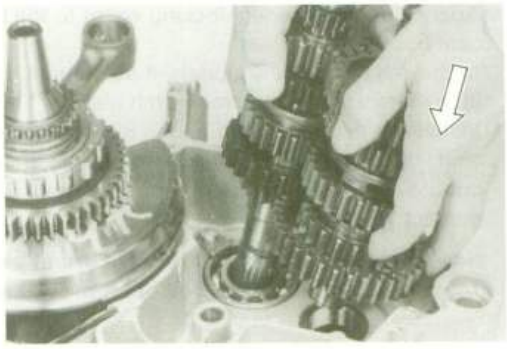
● Pull out the drive shaft [D] and output shaft [E] together with their gears meshed.



Transmission Installation

● Set the transmission shafts, shift drum, and shift forks together, and fit them into the right crankcase half.

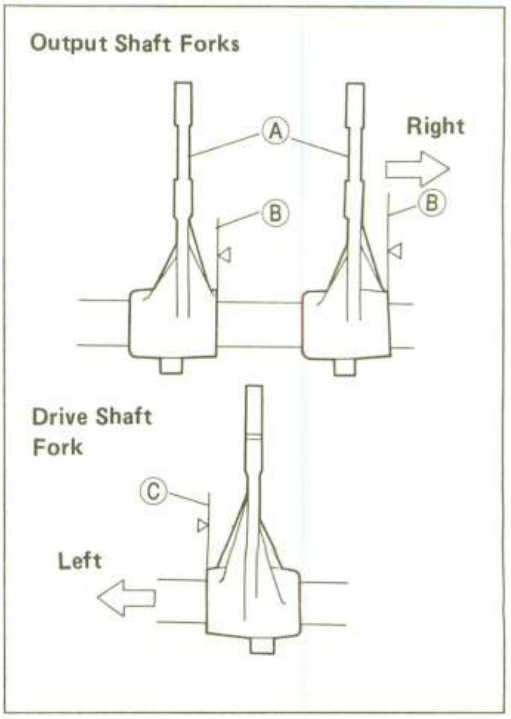
● Apply a small amount of engine oil to the transmission gears, bearings, shaft journals, and shift fork fingers.



NOTE

○ *The shift rods are identical.*
○ *The output shaft forks [A] are identical.*
○ *Be careful not to confuse the shift forks.*

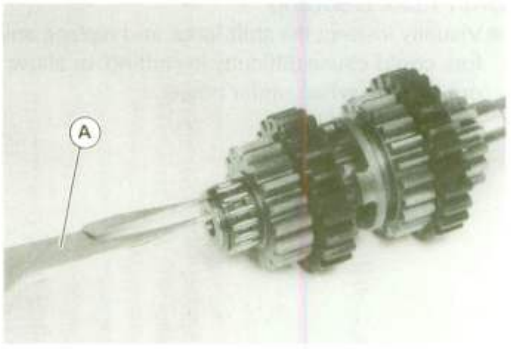
● Install the shift forks as shown.
○ The machined surfaces [B] of the output shaft forks face to the engine right side.
○ The machined surface [C] of the drive shaft fork faces to the engine left side.
● Install the shift drum.
● Apply a small amount of engine oil to the shift fork fingers.
● Fit each shift fork into the groove of the proper gear so that the shift fork guide pin is in proper groove on the shift drum.
● Position the one with shortest ears on the drive shaft, and place the pin in the center groove in the shift drum.
○ Apply a small amount of engine oil to the shift rod.
● Install the shift rods.



Transmission Shaft Disassembly

● Remove the transmission shafts (see Transmission Removal).
● Using the outside circlip pliers [A], remove the circlip and disassemble the transmission shafts completely.

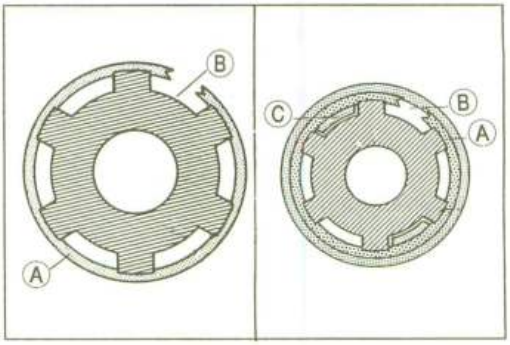
Special Tool – Outside Circlip Pliers: 57001-144

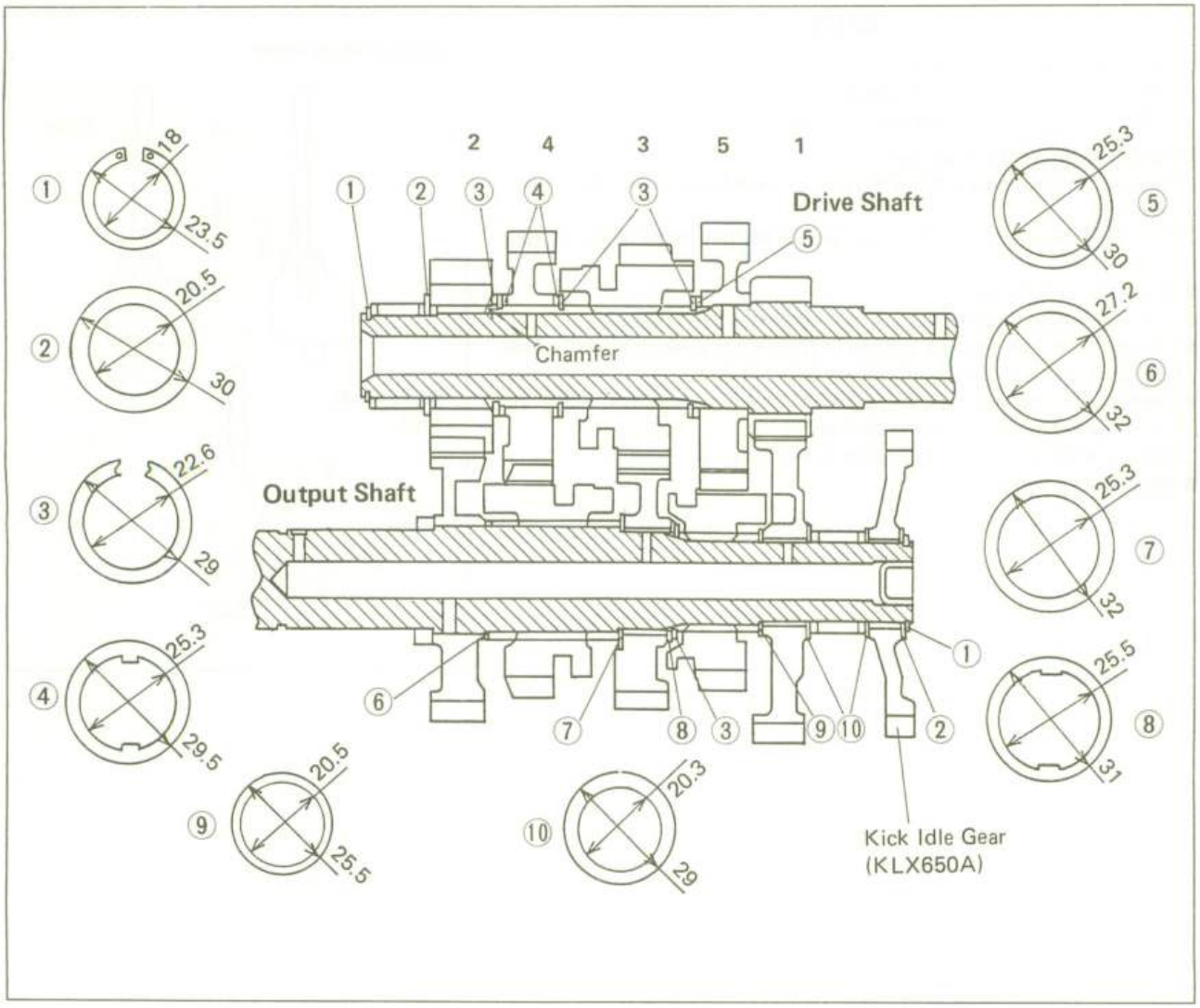


Transmission Shaft Assembly

● Replace any circlips that were removed with new ones.
● Install the circlips [A] so that the opening is aligned with a spline groove [B].
● Install the toothed washers [C] so that the teeth are not aligned with the opening of the circlip [A].
○ The transmission gears can be identified by size

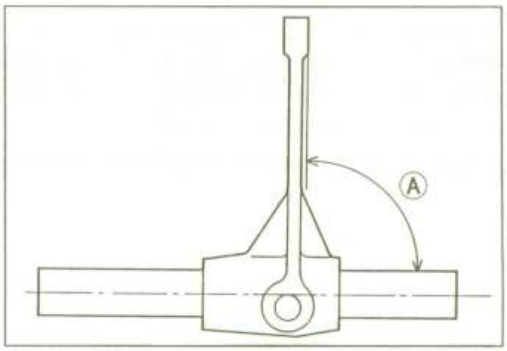
Drive shaft gears – the smallest diameter gear is low gear, and the largest is 5th.
Output shaft gears – the largest diameter gear is low gear, and the smallest is 5th.





Shift Fork Bending

- Visually inspect the shift forks, and replace any fork that is bent. A bent fork could cause difficulty in shifting, or allow the transmission to jump out of gear when under power.
  90°[A]



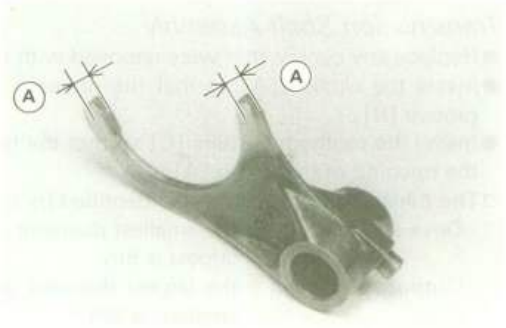
Shift Fork Ear/Gear Shift Fork Groove Wear

- Measure the thickness [A] of the shift fork ears.

★If the thickness of a shift fork ear is less than the service limit, the shift fork must be replaced.

Shift Fork Ear Thickness

Standard:	**4.4 ~ 4.5 mm**
Service Limit:	**4.3 mm**

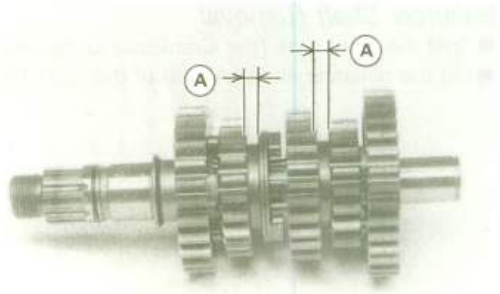


● Measure the width [A] of the gear shift fork grooves.

★ If a gear fork groove is worn over the service limit, the gear must be replaced.

Gear Shift Fork Groove Width

Standard:	**4.55 ~ 4.65 mm**
Service Limit:	**4.75 mm**



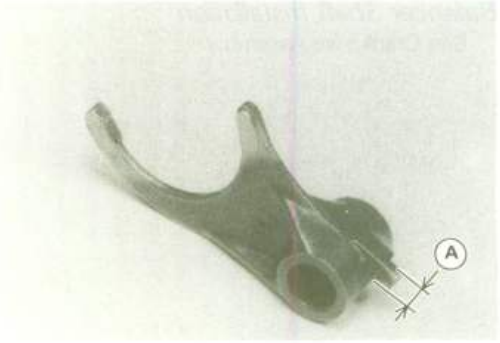
Shift Fork Guide Pin/Shift Drum Groove Wear

● Measure the diameter [A] of each shift fork guide pin, and measure the width [B] of each shift drum groove.

★ If the guide pin on any shift fork is less than the service limit, the fork must be replaced.

Shift Fork Guide Pin Diameter

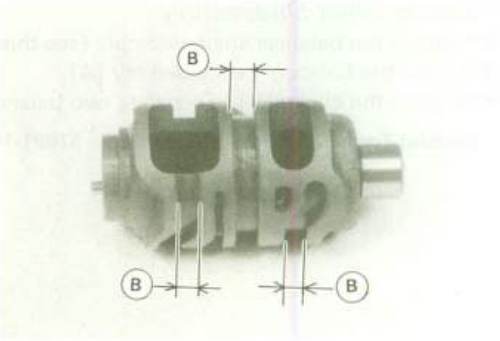
Standard:	**5.9 ~ 6.0 mm**
Service Limit:	**5.8 mm**



★ If any shift drum groove is worn over the service limit, the drum must be replaced.

Shift Drum Groove Width

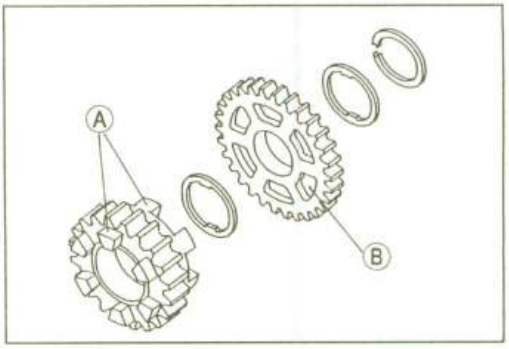
Standard:	**6.05 ~ 6.20 mm**
Service Limit:	**6.3 mm**



Gear Dog/Dog Recess Damage

● Visually inspect the gear dogs [A], and recesses [B].

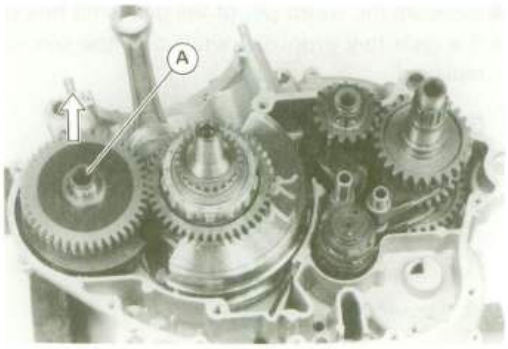
★ Replace any damaged gears or gears with excessively worn dogs, or recesses.



Balancer

Balancer Shaft Removal

- Split the crankcase (see Crankcase Disassembly).
- Lift the balancer shaft [A] out of the right-hand crankcase half.



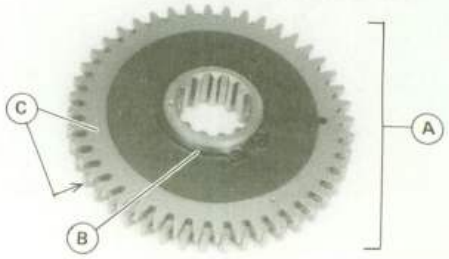
Balancer Shaft Installation

See Crankcase Assembly.

Balancer Shaft Disassembly

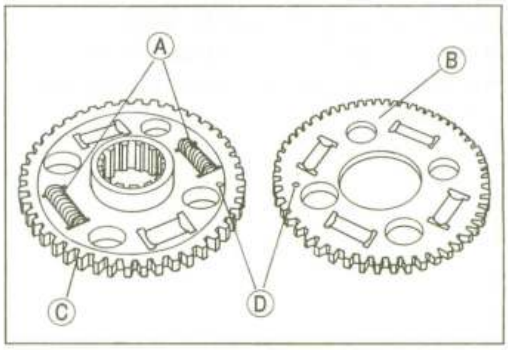
- Remove the balancer shaft assembly (see this chapter).
- Pull off the balancer gear assembly [A].
- Remove the circlip [B] to separate two balancer gears [C].

Special Tool – Outside Circlip Pliers: 57001-144

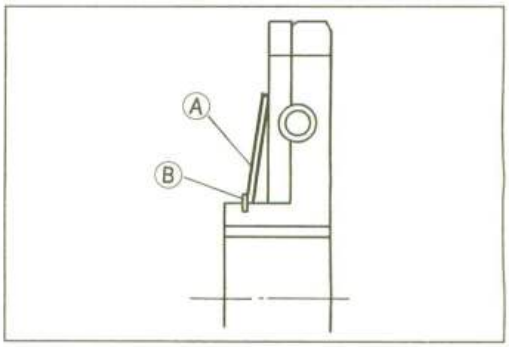


Balancer Shaft Assembly

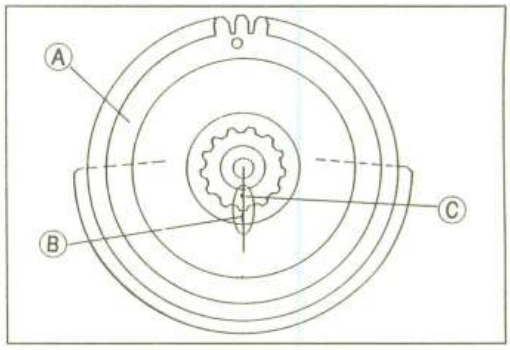
- Install the damper springs [A] diagonally.
- Install the left balancer gear [B] on the right balancer gear [C], aligning the holes [D].



- Install the coned disc spring [A] as shown.
- ○ Replace any circlip [B] that was removed with a new one.



● Install the balancer gear assembly [A] on the balancer shaft, aligning the gear line mark [B] with the shaft punch mark [C].



Ball Bearing, Needle Bearing, and Oil Seal

Ball and Needle Bearing Replacement

CAUTION
Do not remove the ball or needle bearings unless it is necessary. Removal may damage them.

● Using a press or puller, remove the ball bearing and/or needle bearing.

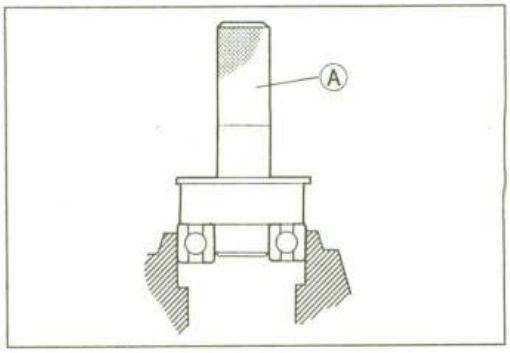
NOTE

○ *In the absence of the above mentioned tools, satisfactory results may be obtained by heating the case to approximately 93°C (200°F) max., and tapping the bearing in or out.*

CAUTION
Do not heat the case with a torch. This will warp the case. Soak the case in oil and heat the oil.

● Using a press and the bearing driver set [A], install the new bearing until it stops at the bottom of its housing.

Special Tool – Bearing Driver Set: 57001-1129



Ball and Needle Bearing Wear

CAUTION
Do not remove the bearings for inspection. Remove may damage them.

● Check the ball bearings.

○ Since the ball bearings are made to extremely close tolerances, the wear must be judged by feel rather than measurement. Clean each bearing in a high-flash point solvent, dry it (do not spin the bearing while it is dry), and oil it with engine oil.

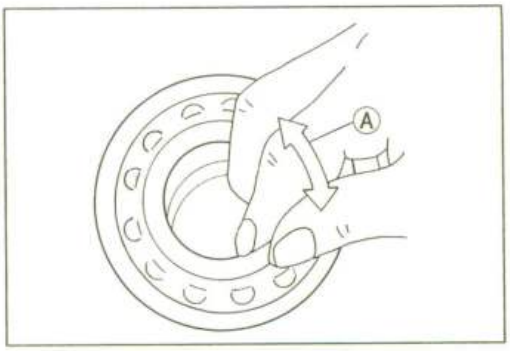
○ Spin [A] the bearing by hand to check its condition.

★ If the bearing is noisy, does not spin smoothly, or has any rough spots, replace it.

● Check the needle bearings.

○ The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing for abrasion, color change, or other damage.

★ If there is any doubt as to the condition of a needle bearing, replace it.



Oil Seal Inspection

● Inspect the oil seals.

★ Replace it if the lips are misshapen, discolored (indicating that the rubber has deteriorated), hardened or otherwise damaged.

Wheels / Tires

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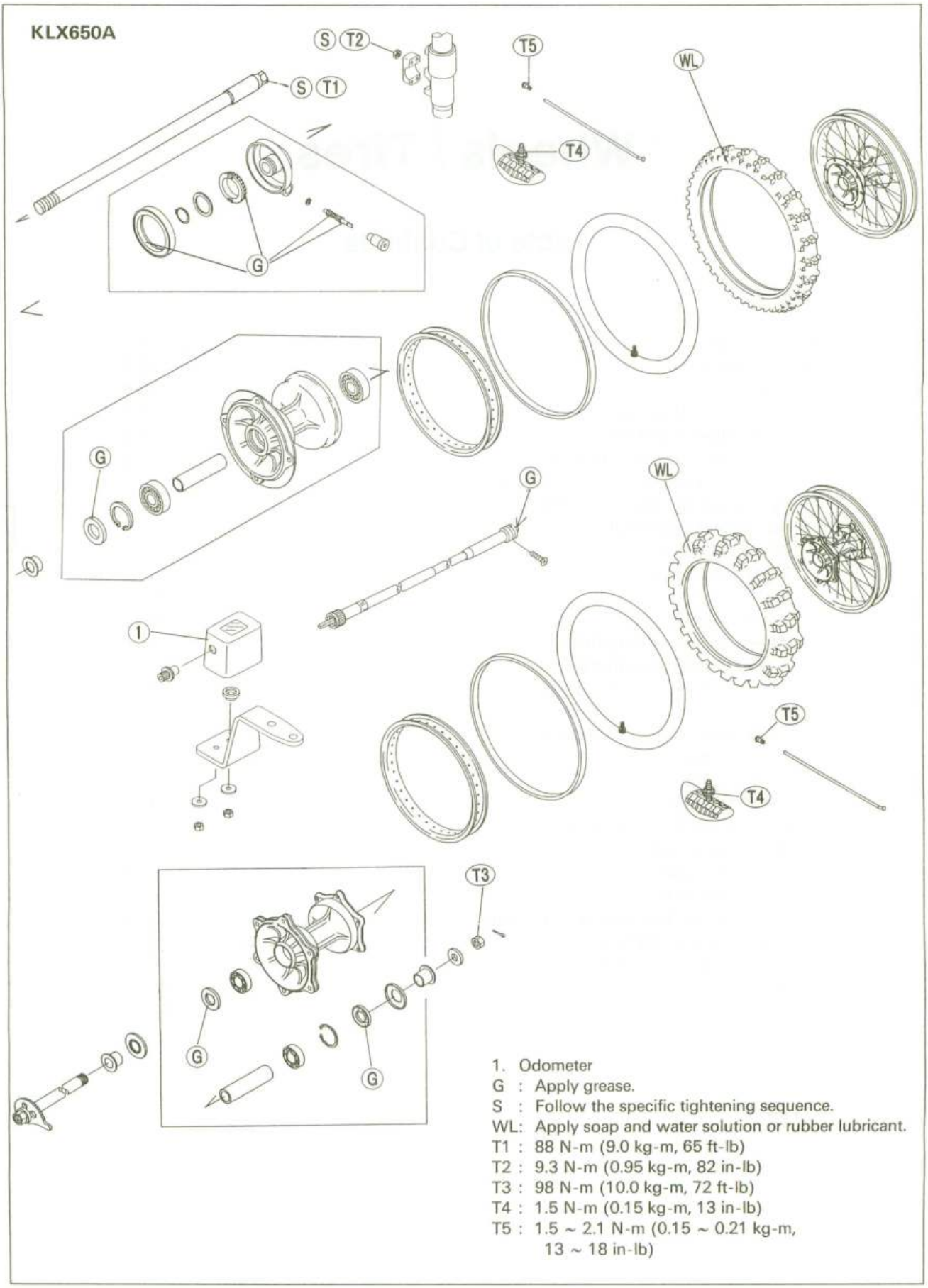
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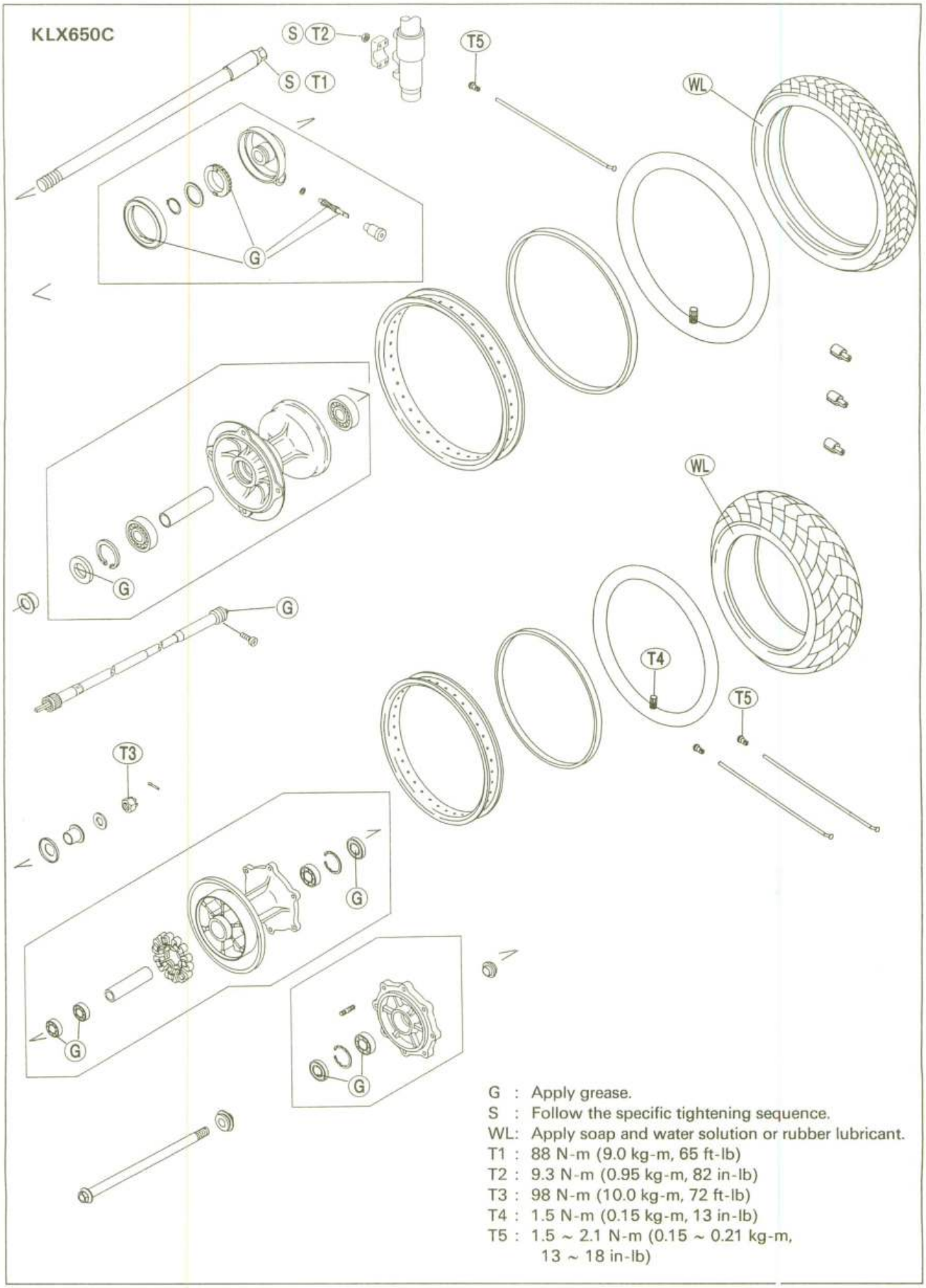
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Exploded View



1. Odometer
G : Apply grease.
S : Follow the specific tightening sequence.
WL: Apply soap and water solution or rubber lubricant.
T1 : 88 N-m (9.0 kg-m, 65 ft-lb)
T2 : 9.3 N-m (0.95 kg-m, 82 in-lb)
T3 : 98 N-m (10.0 kg-m, 72 ft-lb)
T4 : 1.5 N-m (0.15 kg-m, 13 in-lb)
T5 : 1.5 ~ 2.1 N-m (0.15 ~ 0.21 kg-m, 13 ~ 18 in-lb)



G : Apply grease.
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T4 : 1.5 N-m (0.15 kg-m, 13 in-lb)
T5 : 1.5 ~ 2.1 N-m (0.15 ~ 0.21 kg-m, 13 ~ 18 in-lb)

Specifications

Item			Standard	Service Limit
Rim runout:		Axial	0.5mm or less	2 mm
		Radial	0.8 mm or less	2 mm
Axle runout/100 mm			0.10 mm or less	0.2 mm
Wheel balance			10 g or less	---
Balance weights			10 g, 20 g, 30 g	---
Tire tread depth	KLX650A	Front	12.3 mm	2 mm
		Rear	16.7 mm	2 mm
	KLX650C	Front	6.9 mm	2 mm
		Rear	8.8 mm	2 mm

Tire air pressure		Load	Air Pressure (when cold)
KLX650A	Front	---	100 kPa (1.0 kg/cm², 14 psi)
	Rear	---	100 kPa (1.0 kg/cm², 14 psi)
KLX650C	Front	---	150 kPa (1.5 kg/cm², 21 psi)
	Rear	Up to 97.5 kg (215 lb)	150 kPa (1.5 kg/cm², 21 psi)
		97.5 ~ 185 kg (215 ~ 408 lb)	200 kPa (2.0 kg/cm², 28 psi)

Standard tire KLX650A	Front	Make, type	DUNLOP, D752F (Tube)
		Size	80/100 - 21 51M
	Rear	Make, type	DUNLOP, D752 (Tube)
		Size	110/100 - 18 64M
KLX650C	Front	Make, type	DUNLOP, TRAILMAX, (Tube) (AS) DUNLOP, TRAILMAX J (Tube) (US) DUNLOP, K850A (Tube)
		Size	90/90 - 21 54S
	Rear	Make, type	DUNLOP, TRAILMAX (Tube) (AS) DUNLOP, TRAILMAX J (Tube) (US) DUNLOP, K850AG (Tube)
		Size	130/80 - 17 65S

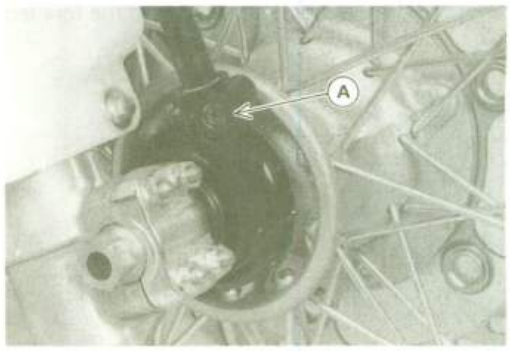
(AS) : Australia Model (US) : U.S. Model

Special Tools - Jack: 57001-1238
Bead Breaker Assembly: 57001-1072
Rim Protector: 57001-1063
Inside Circlip Pliers: 57001-143
Bearing Remover Shaft: 57001-1265
Bearing Remover Head, Φ15 x Φ17: 57001-1267
Bearing Remover Head, Φ20 x Φ22: 57001-1293
Bearing Driver Set: 57001-1129

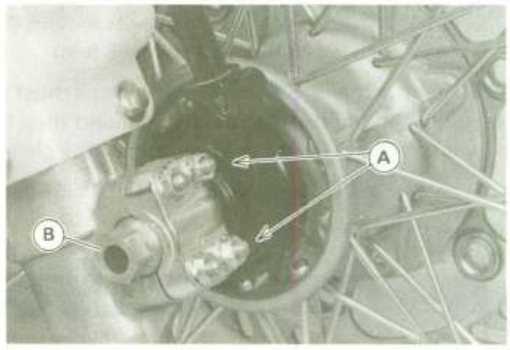
Wheels

Front Wheel Removal

- Remove:
  Speedometer (or Odometer) Cable Screw [A]
- Pull out the cable lower end.

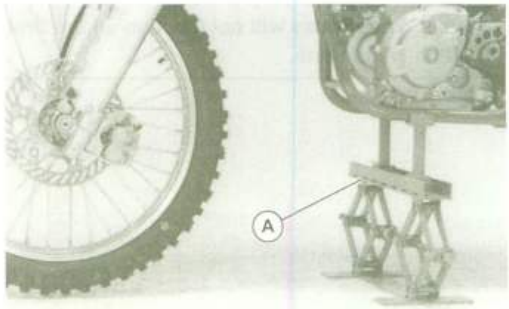


- Loosen:
  Right Side Axle Clamp Nuts [A]
  Axle [B]



- Using the jack [A], raise the front wheel off the ground.

Special Tool – Jack: 57001-1238

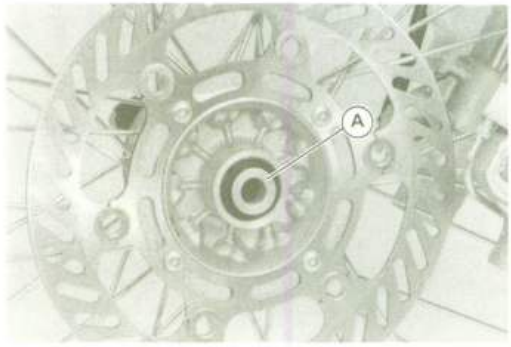


- Pull out the axle to the right and drop the front wheel out of the fork.

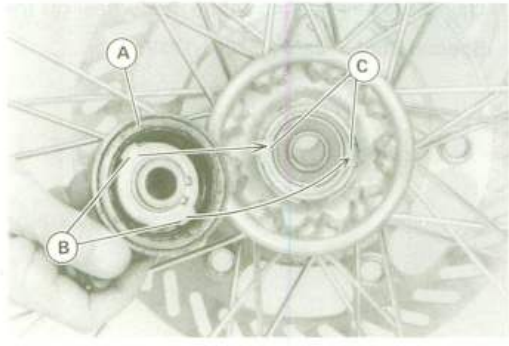
CAUTION
Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

Front Wheel Installation

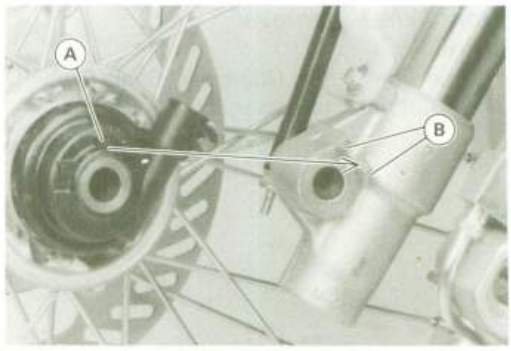
- Install the collar [A] on the left side of the hub.



- Install the gear housing [A] so that its projections [B] fit in the gear drive notches [C].



● Fit the gear housing stop [A] into the fork leg stops [B].



● Tighten the axle [A].

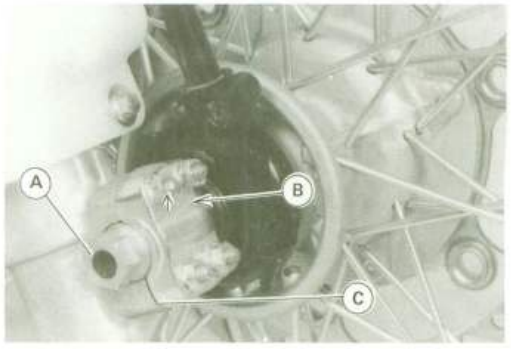
Torque – Axle : 88 N-m (9.0 kg-m, 65 ft-lb)

○ The arrow mark [B] on the axle clamps must point upward.

● Tighten the upper clamp nuts first, and then lower clamp nuts. There will be a gap [C] at the lower part of the clamp after tightening.

Torque – Axle Clamp Nuts : 9.3 N-m (0.95 kg-m, 82 in-lb)

● Check the front brake.

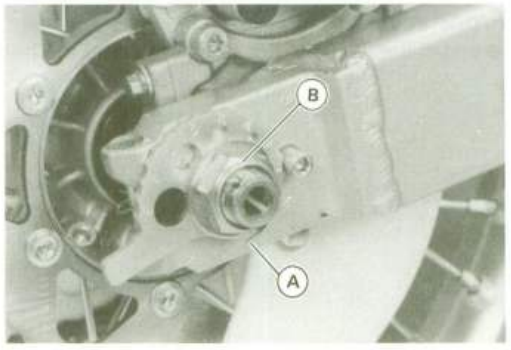


⚠WARNING

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 brakes will not function on the first application of the lever if this is not done.

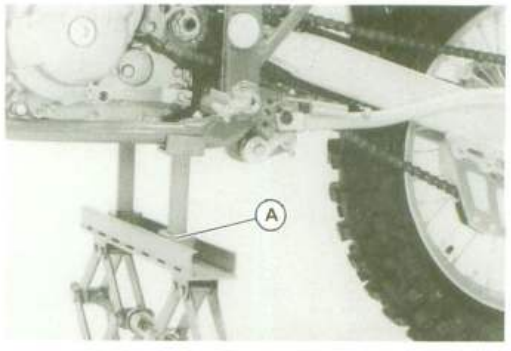
Rear Wheel Removal (KLX650A)

● Remove:
Cotter Pin [A]
Rear Axle Nut [B]

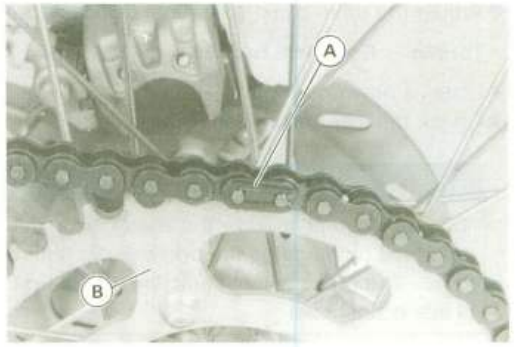


● Using the jack [A], raise the rear wheel off the ground.

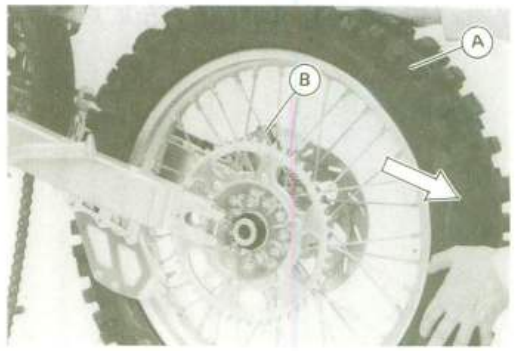
Special Tool – Jack: 57001-1238



● Remove the clip [A] from the master link using pliers and free the drive chain from the rear sprocket [B].



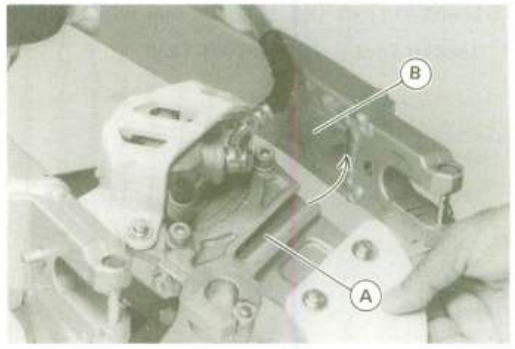
● Pull out the axle.
● Move the rear wheel [A] back and remove the wheel from the rear caliper [B].
● Remove the rear wheel.



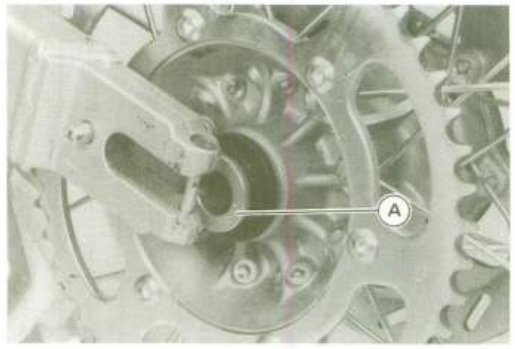
CAUTION
Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

Rear Wheel Installation (KLX650A)

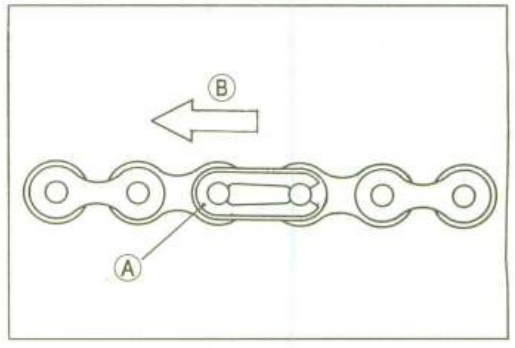
● Face the marks on the chain adjuster outward.
● Install the caliper bracket [A] onto the swingarm stop [B].
● Apply high-temperature grease to the grease seals.



● Install the collars [A] on the left and right sides of the hub.
● Insert the axle from the left side of the wheel.



● Install the drive chain back on the rear sprocket.
● Install the master link from the frame side.
● Install the clip [A] so that the closed end of the "U" pointed in the direction of chain rotation [B].



● Adjust the drive chain (see Final Drive chapter).

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

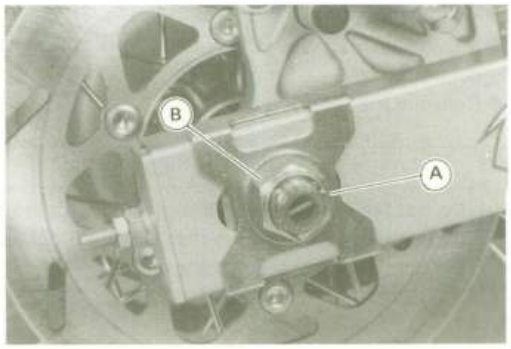
● Install a new cotter pin.
● Check the rear brake effectiveness.

⚠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.

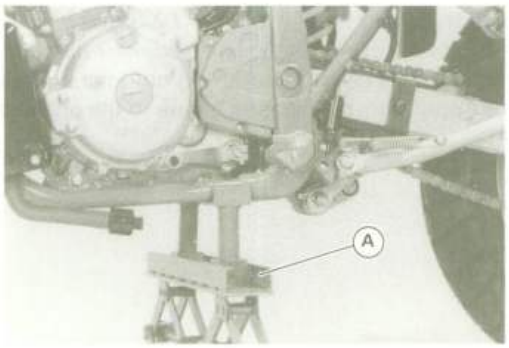
Rear Wheel Removal (KLX650C)

● Remove:
Cotter Pin [A]
Rear Axle Nut [B]

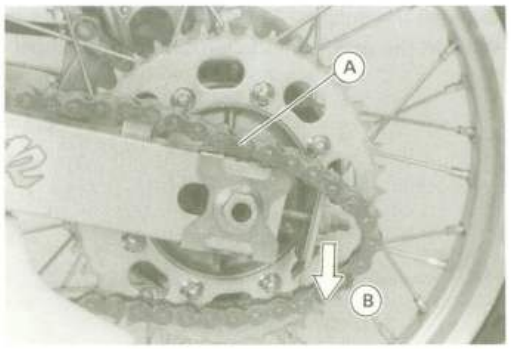


● Using the jack [A], raise the rear wheel off the ground.

Special Tool – Jack: 57001-1238



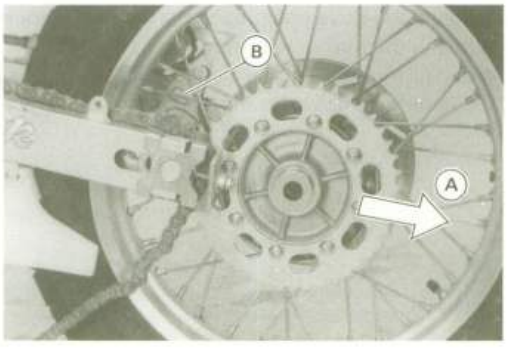
● Disengage the drive chain [A] from the rear sprocket toward the left [B].



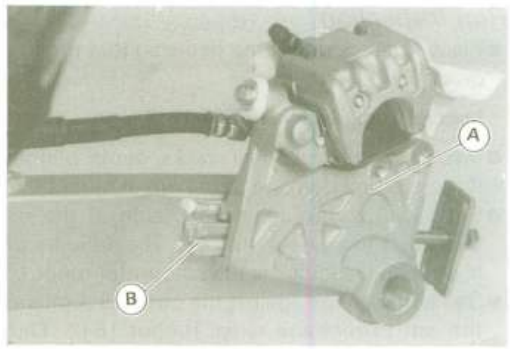
● Pull out the axle.
● Move the rear wheel back [A] with the rear caliper [B] installed.
● Remove the rear wheel.

CAUTION

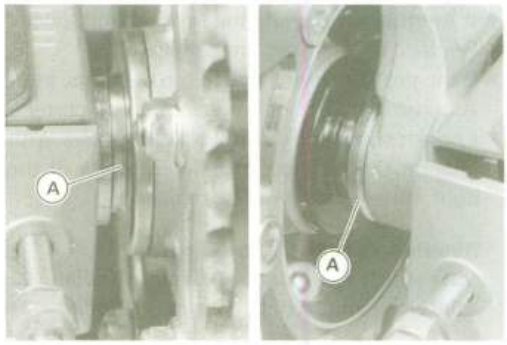
Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.



Rear Wheel Installation



- Install the caliper bracket [A] onto the swingarm stop [B].
- Apply high-temperature grease to the grease seals.
- Engage the drive chain with the rear sprocket and install the rear wheel.



- Install the collars [A] on the left and right sides of the hub.
- Insert the axle from the left side of the wheel.

- Adjust the drive chain (see Final Drive chapter).

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

- Install a new cotter pin.
- 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.

Wheel Inspection

- Place the jack under the frame so that the front or rear wheel is off the ground.

Special Tool – Jack: 57001-1238

- Spin the wheel lightly, and check for roughness or binding.

★If roughness or binding is found, replace the hub bearings.

- Visually inspect the front and rear axles for damage.

★If the axle is damaged or bent, replace it.

Spoke Inspection

- Check that all the spokes are tightened evenly.

★If spoke tightness is uneven or loose, torque the spoke nipples evenly.

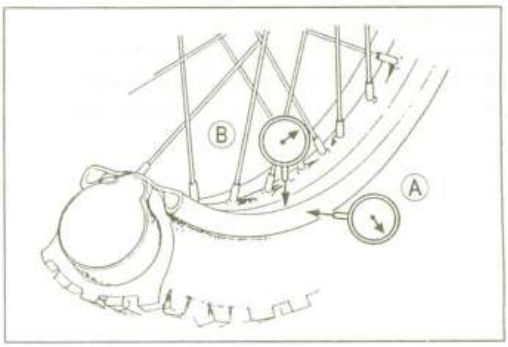
Torque – Spoke Nipples : 1.5 ~ 2.1 N-m (0.15 ~ 0.21 kg-m, 13 ~ 18 in-lb)

- Check the rim runout.

⚠WARNING

If any spoke breaks, it should be replaced immediately. A missing spoke places an additional load on the other spokes, which will eventually cause other spokes to break.

Rim Inspection



- Place the jack under the frame so that the front or rear wheel is off the ground.

Special Tool – Jack: 57001-1238

- Inspect the rim for small cracks, dents, bending, or warping.

★If there is any damage to the rim, it must be replaced.

- Set a dial gauge against the side of the rim, and rotate the rim to measure the axial runout [A]. The difference between the highest and lowest dial readings is the amount of runout.
- See a dial gauge against the outer circumference of the rim, and rotate the rim to measure radial runout [B]. The difference between the highest and lowest dial reading is the amount of runout.

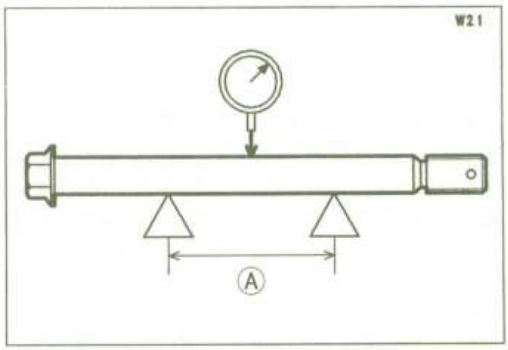
★If rim runout exceeds the service limit, check the wheel bearings first. Replace them if they are damaged.

★If the problem is not due to the bearings, correct the rim warp (runout). A certain amount of rim warp can be corrected by recentering the rim. Loosen some spokes and tighten others within the standard torque to change the position of different parts of the rim. If the rim is badly bent, however, it must be replaced.

Rim Runout (with tire installed)

Standard:	**Axial**	**0.5 mm**	**Radial**	**0.8 mm**
Service Limit:	**Axial**	**2 mm**	**Radial**	**2 mm**

Axle Inspection



- Place the axle in V blocks that are 100 mm [A] apart, and set a dial gauge on the axle at a point halfway between the blocks.
- Turn the axle to measure the runout. The difference between the highest and lowest dial readings is the amount of runout.

★If runout exceeds the service limit, replace the axle.

Axle Runout/100 mm

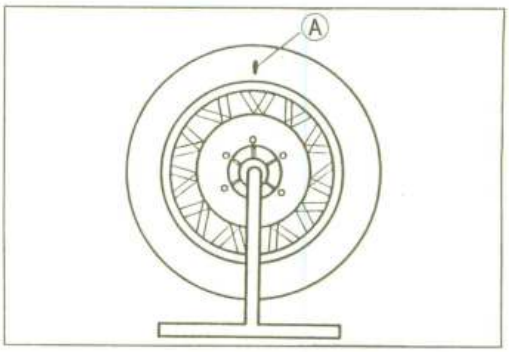
Standard:	**0.10 mm or less**
Service Limit:	**0.2 mm**

Wheel Balance (KLX650C)

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

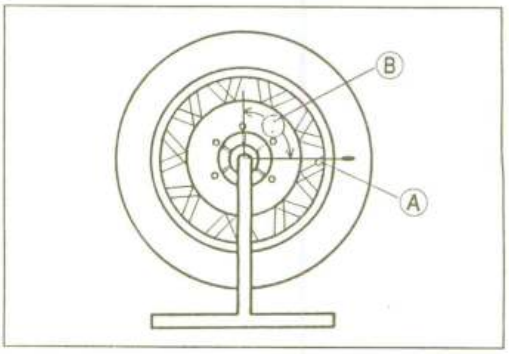
- Check and balance the wheels when required, or when a tire is replaced with a new one.

Balance Inspection (KLX650C)

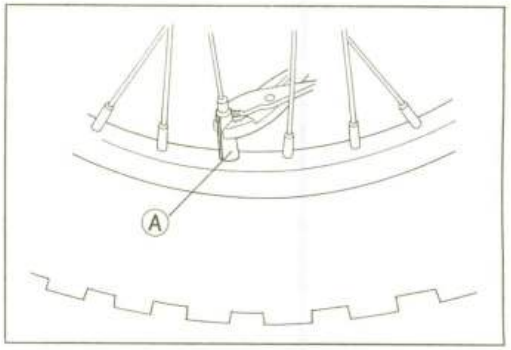


- ● Remove the wheel (see this chapter).
- ● Support the wheel so that it can be spun freely.
- ● Spin the wheel lightly, and mark [A] the wheel at the top when the wheel stops.
- ○ Repeat this procedure several times. If the wheel stops of its own accord in various positions, it is well balanced.
- ★ If the wheel always stops in one position, adjust the wheel balance.

Balance Adjustment (KLX650C)



- ● If the wheel always stops in one position, provisionally attach a balance weight [A] on the rim at the marking.
- ● Rotate the wheel ¼ turn [B], and see whether or not the wheel stops in this position. If it does, the correct balance weight is being used.



- ○ Attach a balance weight [A] loosely to the spoke using pliers.
- ★ If the wheel rotates and the weight goes up, replace the weight with the next heavier size. If the wheel rotates and the weight goes down, replace the weight with the next lighter size. Repeat these steps until the wheel remains at rest after being rotated ¼ turn.
- ● Rotate the wheel another ¼ turn and then another ¼ turn to see if the wheel is correctly balanced.
- ● Repeat the entire procedure as many times as necessary to achieve correct wheel balance.
- ● Permanently install the balance weight.
- ○ Clamp on the balance weight firmly using pliers.

Balance Weight

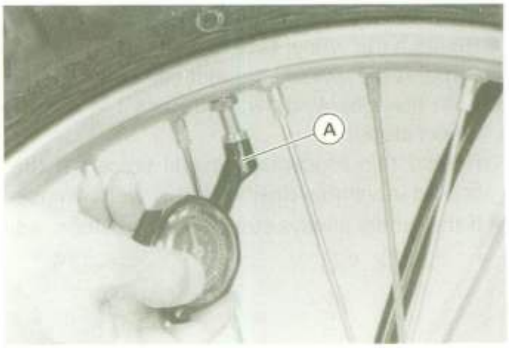
Part Number	Weight (grams)
41075-1007	10
41075-1008	20
41075-1009	30

NOTE

- ○ *Balance weights are available from Kawasaki Dealers in 10, 20, and 30 gram sizes. An imbalance of less than 10 grams will not usually affect running stability.*
- ○ *Do not use four or more balance weight (more than 90 gram). If the wheel requires an excess balance weight, remove and disassemble the wheel to find the cause.*

Tires

Air Pressure Inspection/Adjustment



- Using a tire air pressure gauge [A], measure the tire pressure when the tires are cold.

★Adjust the tire air pressure according to the following specifications, if necessary.

Air Pressure (when cold)

KLX650A:

Front: **100 kPa (1.0 kg/cm², 14 psi)**

Rear: **100 kPa (1.0 kg/cm², 14 psi)**

KLX650C:

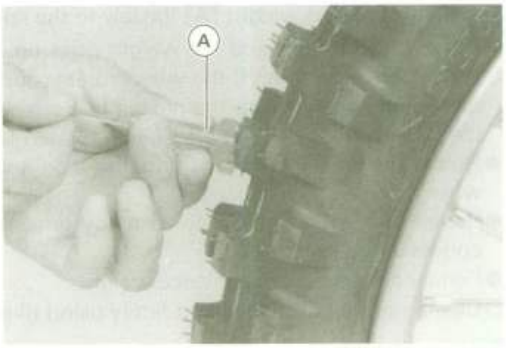
Front: **150 kPa (1.5 kg/cm², 21 psi)**

Rear:

up to 97.5 kg (215 lb) load : 150 kPa (1.5 kg/cm², 21 psi)

97.5 ~ 185 kg (215 ~ 408 lb) load : 200 kPa (2.0 kg/cm², 28 psi)

Tire Inspection



As the tire tread wears down, the tire becomes more susceptible to puncture and failure. An accepted estimate is that 90% of all tire failures occur during the last 10% of tread life (90% worn). So it is false economy and unsafe to use the tires until they are bald.

- Remove any imbedded stones or other foreign particles from the tread.
- Visually inspect the tire for cracks and cuts, replacing the tire in the case of bad damage. Swelling or high spots indicate internal damage, requiring tire replacement.
- Measure the tread depth at the center of the tread with a depth gauge [A].

○Take measurement at several places since the tire may wear unevenly.

★If any measurement is less than the service limit, replace the tire.

Tread Depth

KLX650A:		
Front	**Standard:**	**12.3 mm**
	Service Limit:	**2 mm**
Rear	**Standard:**	**16.7 mm**
	Service Limit:	**2 mm**
KLX650C:		
Front	**Standard:**	**6.9 mm**
	Service Limit:	**2 mm**
Rear	**Standard:**	**8.8 mm**
	Service Limit:	**2 mm**

⚠WARNING

To ensure safe handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure.

NOTE

○*Check and balance the wheel when a tire is replaced with a new one.*

Standard Tire

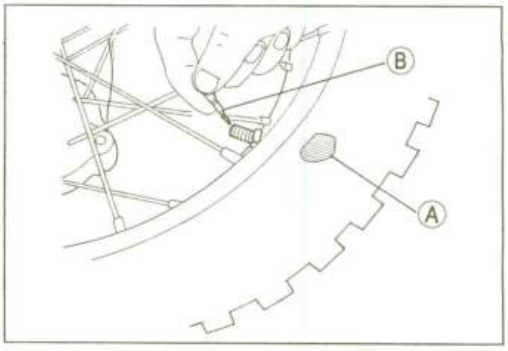
KLX650A:		
Front	**Make:**	**DUNLOP**
	Type:	**D752F (Tube)**
	Size:	**80/100-21 51M**
Rear	**Make:**	**DUNLOP**
	Type:	**D752 (Tube)**
	Size:	**110/100-18 64M**
KLX650C:		
Front	**Make:**	**DUNLOP**
	Type:	**TRAILMAX (Tube)** **(AS) TRAILMAX J (Tube)** **(US) K850A (Tube)**
	Size:	**90/90-21 54S**
Rear	**Make:**	**DUNLOP**
	Type:	**TRAILMAX (Tube)** **(AS) TRAILMAX J (Tube)** **(US) K850AG (Tube)**
	Size:	**130/80-17 65S**

(AS): Australia Model **(US): U.S. Model**

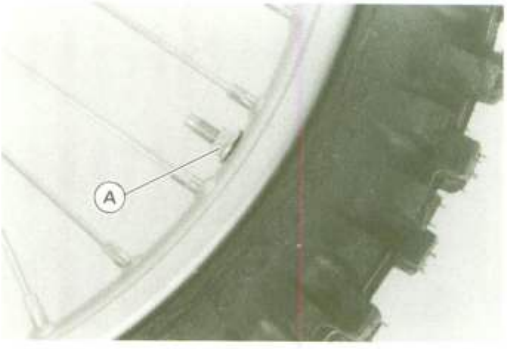
Tire Removal

CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.



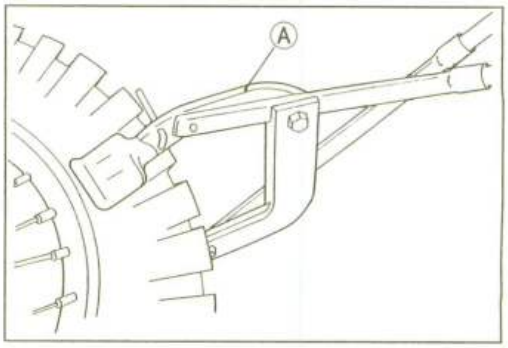
- Remove the wheel from the motorcycle (see this chapter).
- To maintain wheel balance, mark [A] the valve stem position on the tire with chalk so that the tire can be reinstalled in the same position.
- Take out the valve core [B] to let out the air.
- Fully loosen the bead protector nut [A].



- When handling the rim, be careful not to damage the rim flanges.
- Lubricate the tire beads and rim flanges on both sides with a soap and water solution or rubber lubricant. This helps the tire beads slip off the rim flanges.

CAUTION

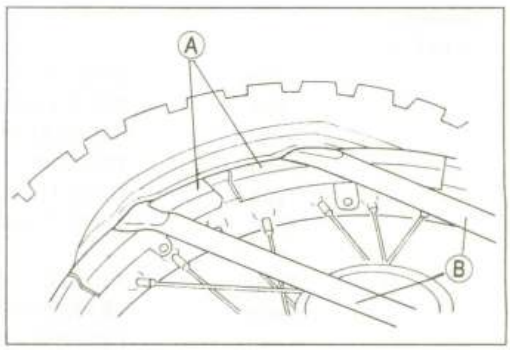
Never lubricate with mineral oil (engine oil) or gasoline because they will cause deterioration of the tire.



- Break the beads away from both sides of the rim with the bead breaker.
  Special Tool – Bead Breaker Assembly: 57001-1072 [A]

● Protecting the rim with rim protectors [A], pry the tire off.

Special Tool – Rim Protector: 57001-1063
Tire Irons of the Bead Breaker Assembly: 57001-1072 [B]

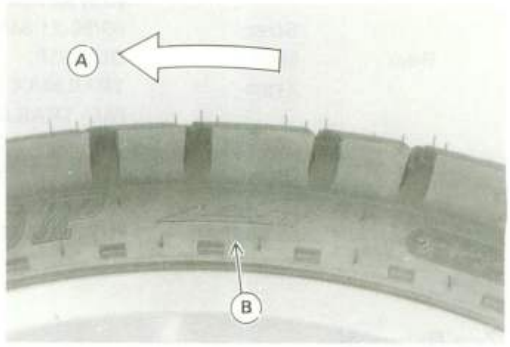


Tire Installation

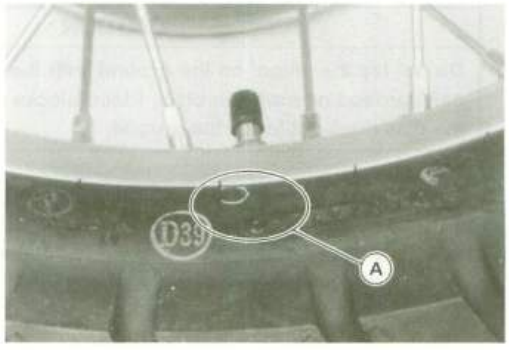
● Check the tire rotation mark on the front or rear tire and install it on the rim accordingly (KLX650C).

NOTE

○ *The direction of the tire rotation [A] is shown by an arrow [B] on the tire sidewall.*

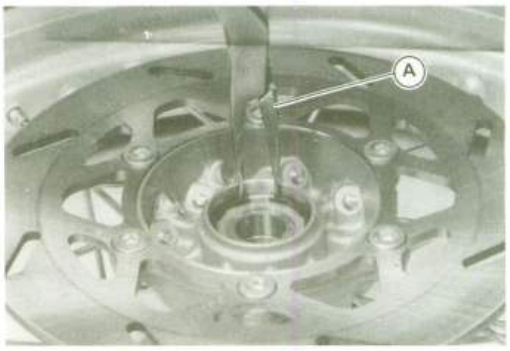


● Position the tire on the rim so that the valve is at the tire balance mark [A] (the chalk mark made during removal or the yellow paint mark on a new tire).
● Tighten the bead protector nut securely.
● Check and adjust the air pressure after installing.



Hub Bearings (Wheel Bearings)

Bearing Removal



- Remove the wheel, and take out the following:
  Collar(s)
  Coupling (rear hub, KLX650C)
  Grease Seals
  Circlip

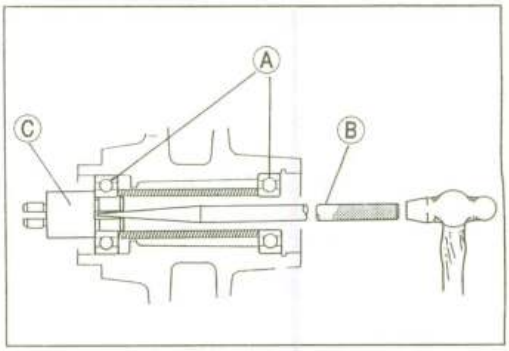
Special Tool – Inside Circlip Pliers: 57001-143 [A]

Speedometer (Odometer) Gear Drive (front hub)

- Take the bearings [A] out of the hub, using bearing remover.

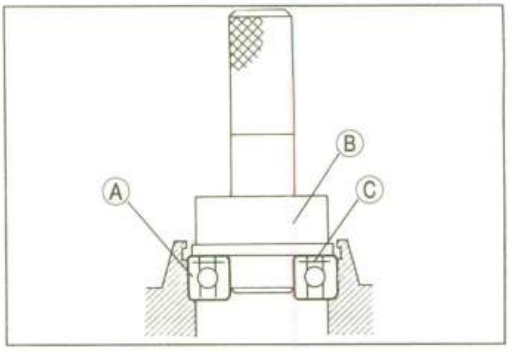
CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.



Special Tool – Bearing Remover Shaft: 57001-1265 [B]
Bearing Remover Head, Φ15 × Φ17:
57001-1267 [C] – Front
Bearing Remover Head, Φ20 × Φ22:
57001-1293 [C] – Rear

Bearing Installation



- Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.
- Replace the bearing with new ones.
- Press in the following bearings until they bottom out.
  Left Bearing (Front Hub) [A]
  Right Bearing (Rear Hub) [A]

Special Tool – Bearing Driver Set: 57001-1129 [B]

NOTE

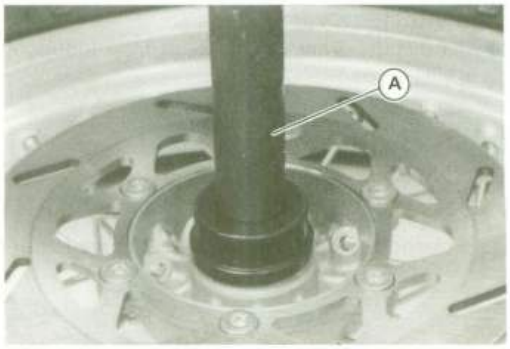
○ *Install the bearings so that the marked side or sealed side [C] faces out.*

- Install:
  New Circlip
  Distance Collar
  Right Bearing (Front Hub)
  Left Bearing(s) (Rear Hub)

Special Tool – Inside Circlip Pliers: 57001-143

● Replace the grease seals with new ones.
○ Apply high temperature grease to the grease seal lips.
● Press in the grease seal so that the seal surface is flush with the end of the hole.

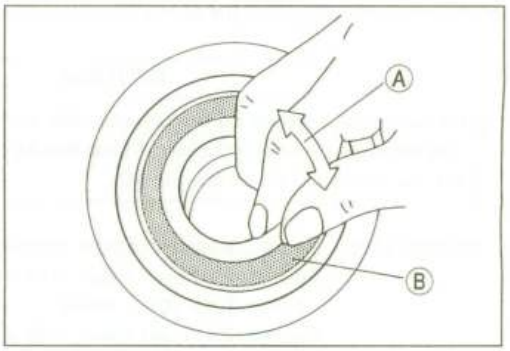
Special Tool – Bearing Driver Set: 57001-1129 [A]



Bearing Inspection

Since the hub bearings are made to extremely close tolerances, the clearance cannot normally be measured.

CAUTION
Do not remove any bearings for inspection. If any bearings are removed, they will need to be replaced with new ones.



● Turn each bearing in the hub back and forth [A] while checking for plays, roughness, or binding. If bearing play, roughness, or binding is found, replace the bearing.
● Examine the bearing seal [B] for damage or leakage.
★ If the seal is damaged or is leaking, replace the bearing.

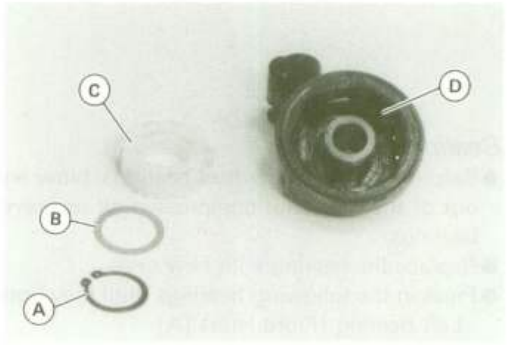
Speedometer or Odometer Gear Housing

Gear Housing Disassembly

● Remove:
Circlip [A]
Washer [B]
Gear [C]

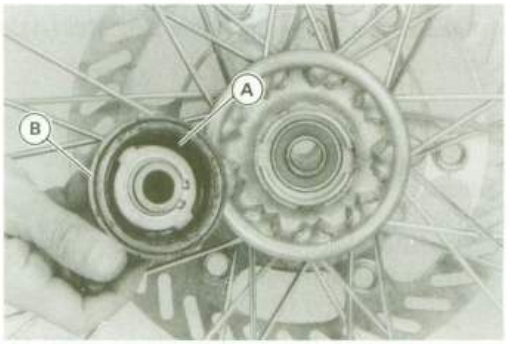
Gear Housing Assembly

● Clean and grease the gear housing [D] and gear.



Gear Housing Lubrication

● Clean and grease [A] the gear housing [B] in accordance with the Periodic Maintenance Chart.



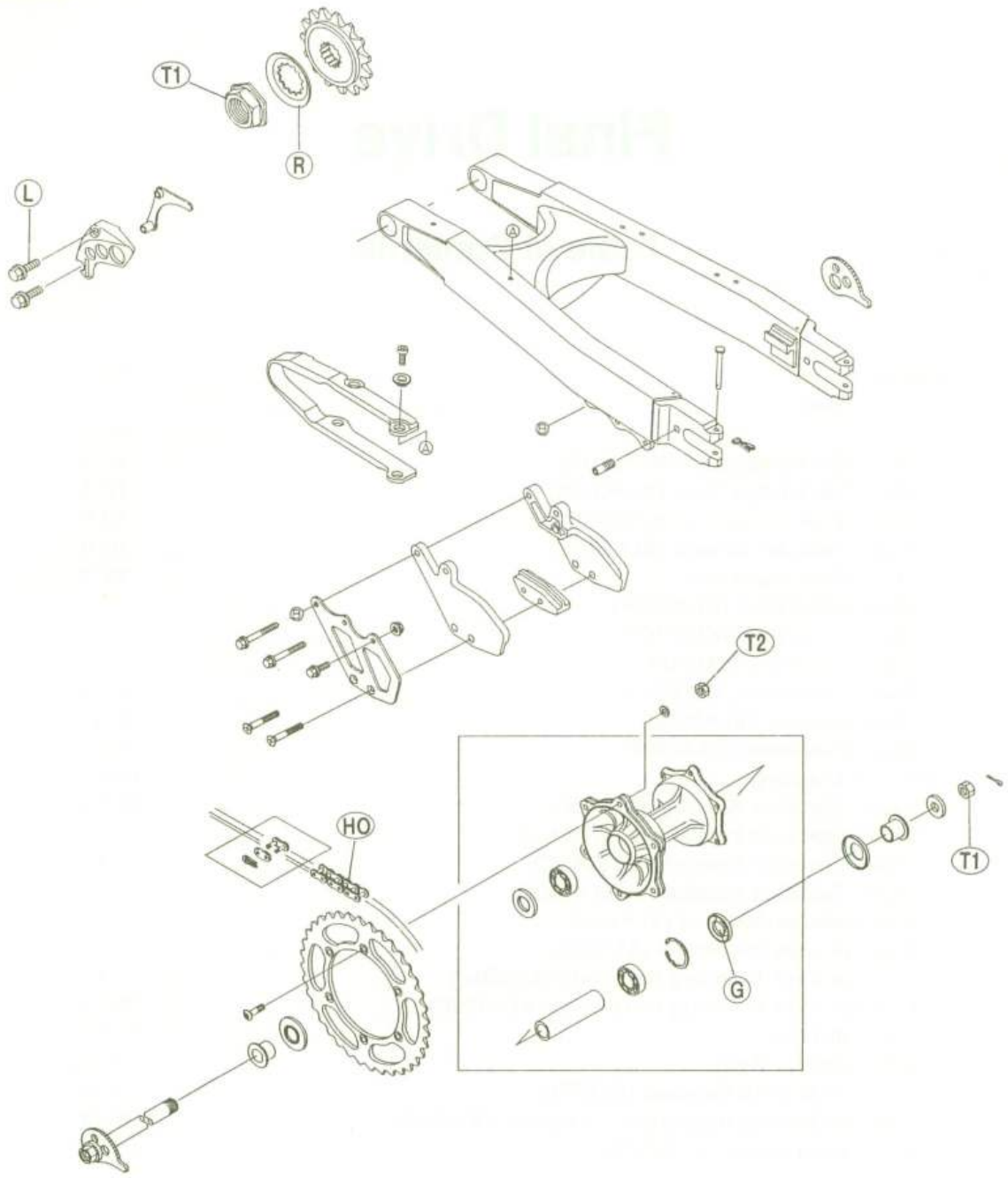
Final Drive

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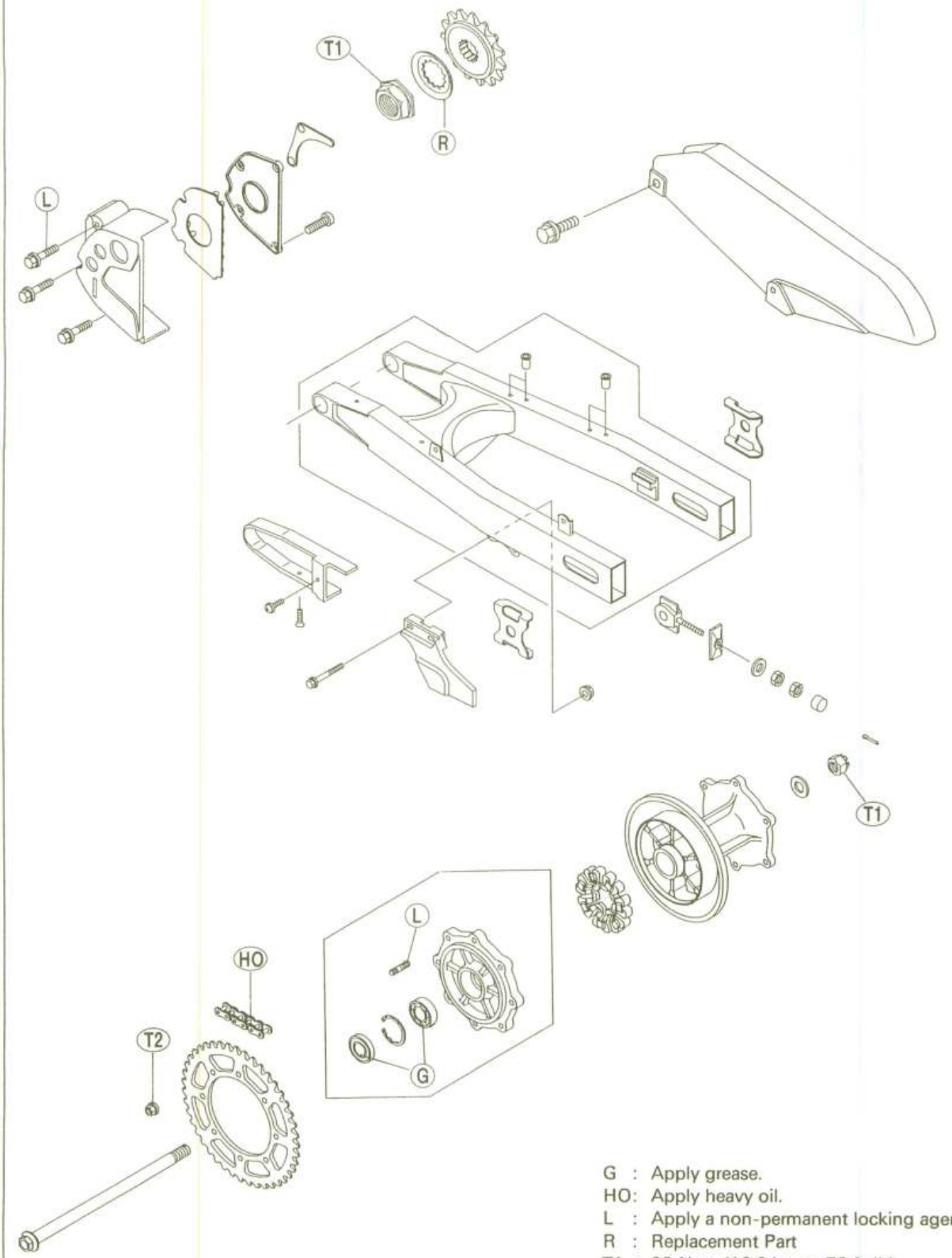
Exploded View

KLX650A



HO: Apply heavy oil.
L : Apply a non-permanent locking agent.
R : Replacement Part
T1 : 98 N-m (10.0 kg-m, 72 ft-lb)
T2 : 29 N-m (3.0 kg-m, 22 ft-lb)

KLX650C



G : Apply grease.
HO: Apply heavy oil.
L : Apply a non-permanent locking agent.
R : Replacement Part
T1 : 98 N-m (10.0 kg-m, 72 ft-lb)
T2 : 32 N-m (3.3 kg-m, 24 ft-lb)

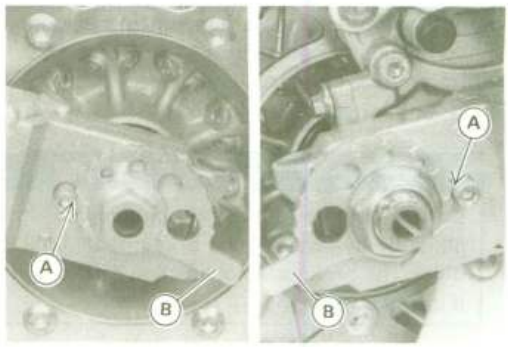
Specifications

Item		Standard	Service Limit
Drive Chain:			
Standard Chain			
KLX650A:	Make	DAIDO	---
	Type	D.I.D. 520K, Joint Endless	---
	Link	110 links	---
KLX650C:	Make	ENUMA	---
	Type	EK520SR-02, Endless	---
	Link	112 links	---
Chain slack		55 ~ 65 mm	Too tight: less than 55 mm Too loose: more than 70 mm
20-link length		317.5 ~ 318.2 mm	323 mm
Sprockets:			
Rear sprocket warp		0.4 mm or less	0.5 mm

Special Tool – Engine Sprocket Holder: 57001-307
(for KLX650A)
Jack: 57001-1238
Inside Circlip Pliers: 57001-143
Bearing Driver Set: 57001-1129

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.

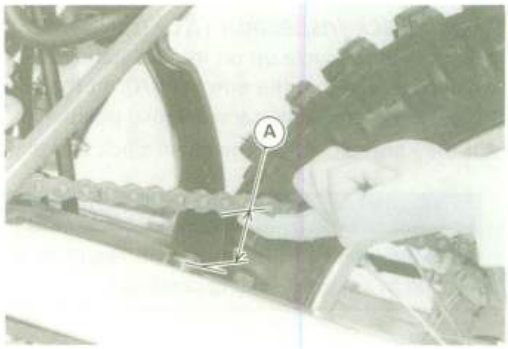
★If they are not, adjust the chain slack and align them.

⚠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

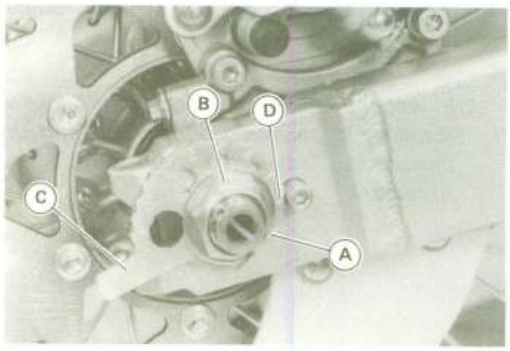
Standard:	**55 ~ 65 mm**
Too Tight:	**Less than 55 mm**
Too Loose:	**More than 70 mm**

- 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.

- 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.

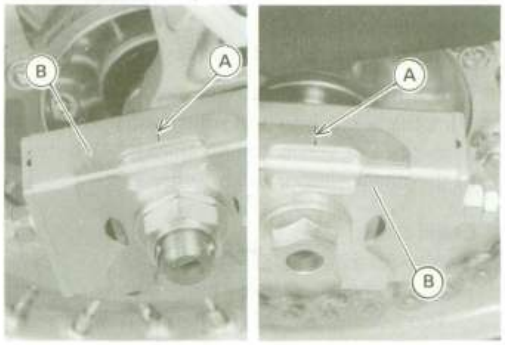
⚠WARNING

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.



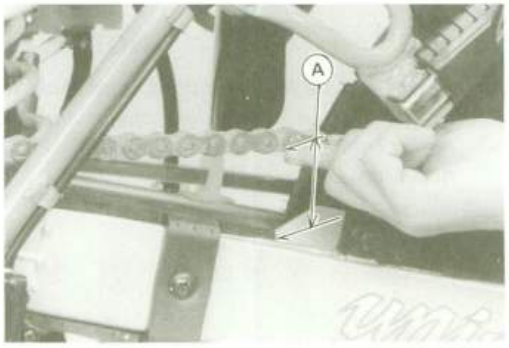
⚠WARNING

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.*

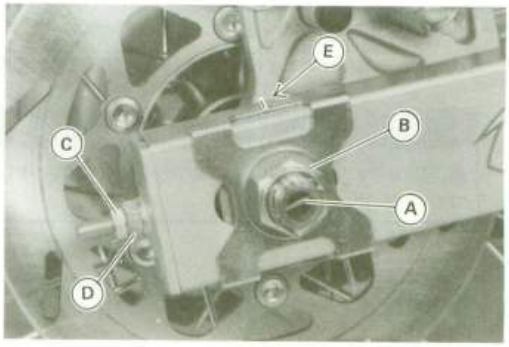
Chain Slack Adjustment (KLX650C)

- 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.



⚠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

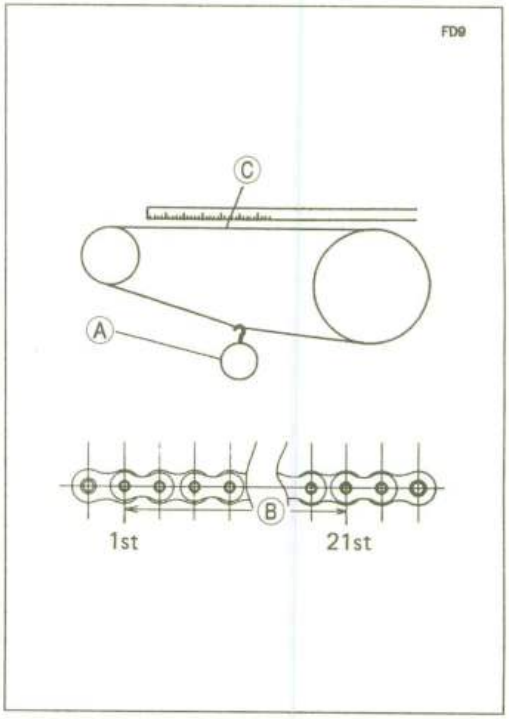
- Rotate the rear wheel to inspect the drive chain for damaged rollers, and loose pins and links.

★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

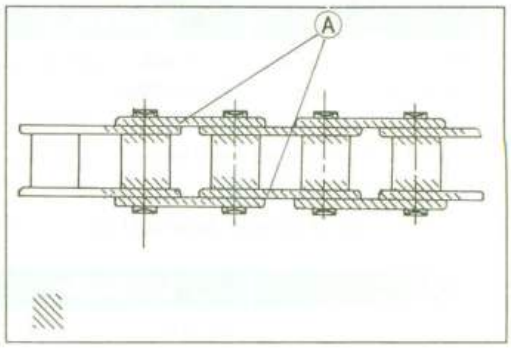
KLX650A:

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

KLX650C:

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

Chain Lubrication (KLX650A)



★If the chain is especially dirty, it should be washed in diesel oil or kerosene, and afterward soaked in a heavy oil. Shake the chain while it is in the oil so that oil will penetrate to the inside of each roller.

●An effective, good quality lubricant specially formulated for chains is best for regular chain lubrication.

★If a special lubricant is not available, a heavy oil such as SAE 90 is preferred to a lighter oil because it will stay on the chain longer and provide better lubrication.

●Apply the oil to the sides of the rollers and between the side plates of the links so that oil will penetrate to the rollers and bushings where most wear takes place.

Oil Applied Areas [A]

●Wipe off any excess oil.

Chain Lubrication (KLX650C)

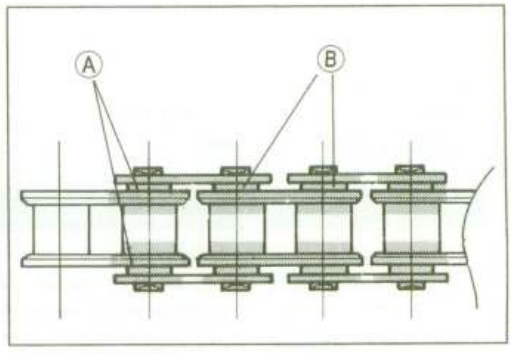
★If the chain is especially dirty, it should be washed in diesel oil or kerosene, and afterward soaked in a heavy oil. Shake the chain while it is in the oil so that oil will penetrate to the inside of each roller.

●An effective, good quality lubricant specially formulated for chains is best for regular chain lubrication.

★If a special lubricant is not available, a heavy oil such as SAE 90 is preferred to a lighter oil because it will stay on the chain longer and provide better lubrication.

CAUTION

The O-rings between the side plates seal in the lubricant between the pin and the bushing. To avoid damaging the O-rings and resultant loss of lubricant, observe the following rules.
Use only kerosene or diesel oil for cleaning an O-ring drive chain. Any other cleaning solution such as gasoline or trichloroethylene will cause deterioration and swelling of the O-rings.
Immediately blow the chain dry with compressed air after cleaning. Complete cleaning and drying the chain within 10 minutes.



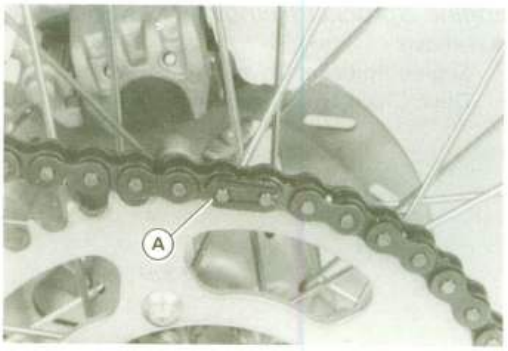
●Apply oil to the sides of the rollers so that oil will penetrate to the rollers and bushings. Apply the oil to the O-rings so that the O-rings will be coated with oil.

Oil Applied Areas [A] O-ring [B]

●Wipe off any excess oil.

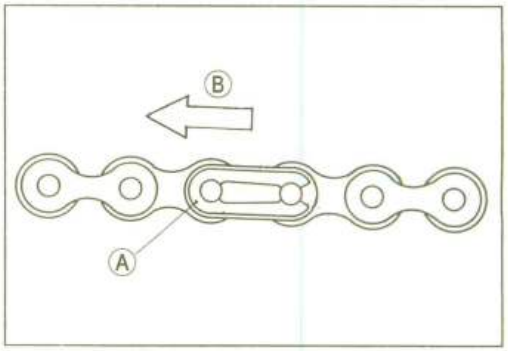
Chain Removal (KLX650A)

- Remove the engine sprocket cover.
- Remove the clip [A] from the master link using pliers, and free the drive chain from the sprockets.
- Remove the drive chain from the chassis, being careful that the chain does not get dirty from contact with the ground.



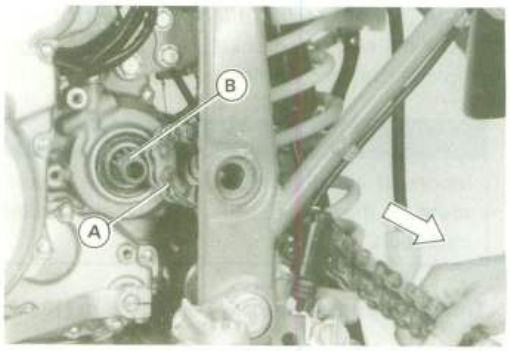
Chain Installation (KLX650A)

- Fit the drive chain back onto the sprockets with the ends at the rear sprocket.
- Install the master link from the frame side.
- Install the clip [A] so that the closed end of the "U" pointed in the direction of chain rotation [B].
- Adjust the drive chain slack (see Chain Slack Adjustment).



Chain Removal (KLX650C)

- Remove:
  Engine Sprocket (see this chapter)
  Rear Wheel (see Wheels/Tires chapter)
  Swingarm (see Suspension chapter)
- Remove the drive chain [A] from the engine output shaft [B].



Chain Installation (KLX650C)

⚠WARNING

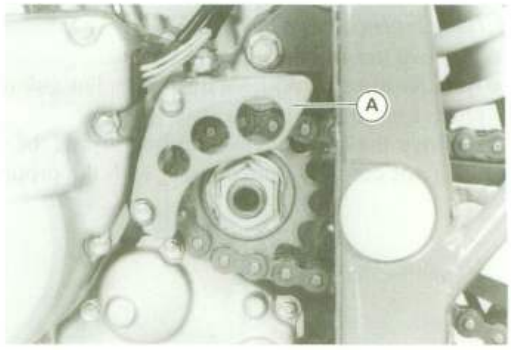
For safety, use only the standard chain. It is an endless type and should not be cut for installation.

- Install:
  Swingarm (see Suspension chapter)
  Rear Wheel (see Wheels/Tires chapter)
  Engine Sprocket (see this chapter)
- Adjust the drive chain (see this chapter).

Sprocket, Coupling

Engine Sprocket Removal (KLX650A)

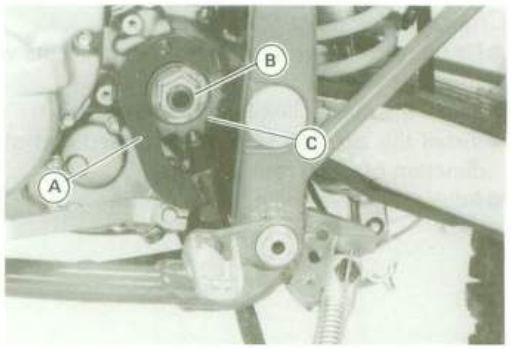
- Remove:
  Engine Sprocket Cover [A]
  Drive Chain (see Chain Removal)



- Bend the lockwasher tab up.
- Using the engine sprocket holder [A], loosen the engine sprocket nut [B].

Special Tool – Engine Sprocket Holder: 57001-307

- Pull off the engine sprocket [C].



Engine Sprocket Installation (KLX650A)

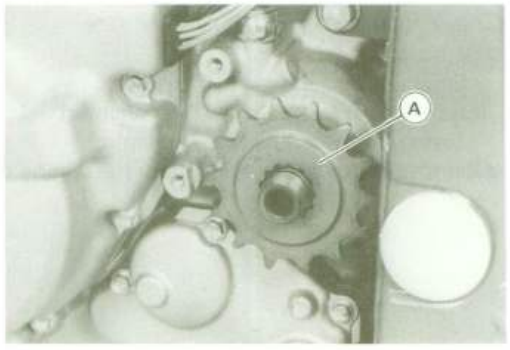
- Install the engine sprocket [A] as shown, noting the proper direction.
- Replace the sprocket lockwasher.

⚠WARNING

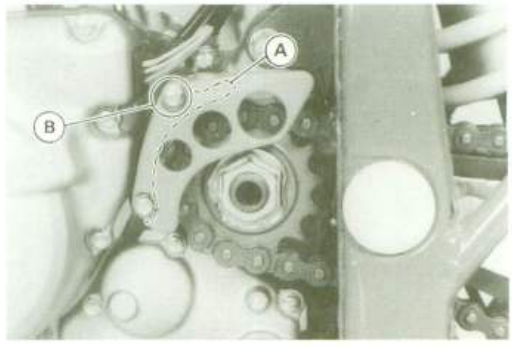
Incorrect installation of the engine sprocket could cause misalignment of the wheel, abnormal wear, resulting in an unsafe riding condition.

Torque – Engine Sprocket Nut : 98 N-m (10.0 kg-m, 72 ft-lb)

- Bend the lockwasher tab over the nut.

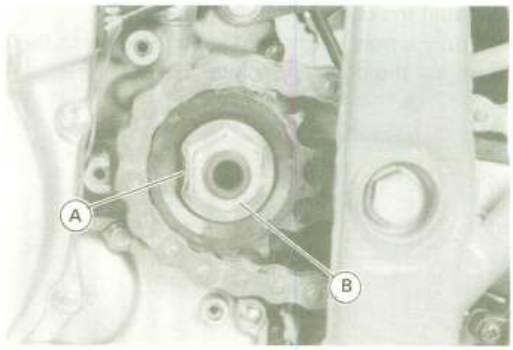


- Install the chain guide [A] as shown.
- Apply a non-permanent locking agent to the bolt [B] shown.
- Adjust the drive chain (see this chapter).



Engine Sprocket Removal (KLX650C)

- Remove the engine sprocket cover.
- Bend the lockwasher tab [A] up and loosen the engine sprocket nut [B].



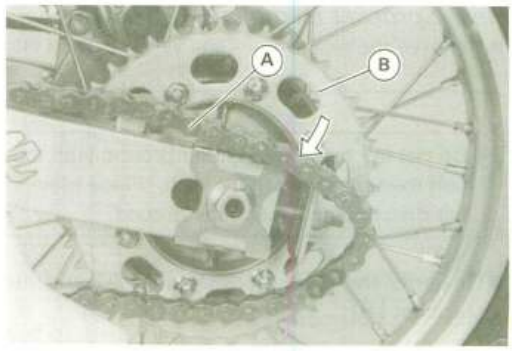
NOTE

○ *When loosening the engine sprocket nut, hold the rear brake on.*

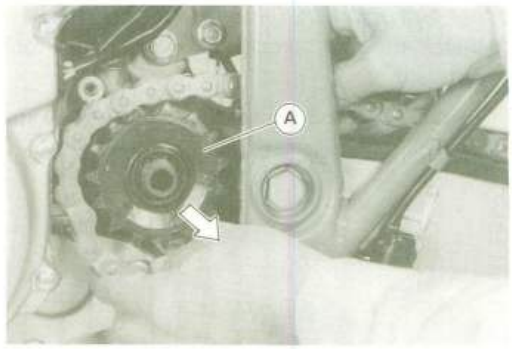
- Loosen the drive chain (see Drive Chain Slack Adjustment).
- Using the jack, raise the rear wheel off the ground (see Wheels/Tires chapter).

Special Tool – Jack: 57001-1238

- Remove the drive chain [A] from the rear sprocket [B] toward the left.

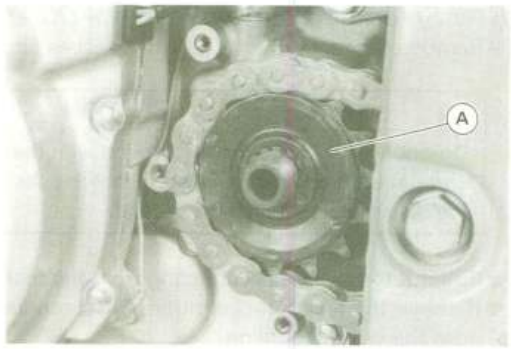


- Pull the engine sprocket [A] off the output shaft along with the chain.
- Remove the engine sprocket.



Engine Sprocket Installation (KLX650C)

- Replace the sprocket lockwasher and the rear axle cotter pin.
- Install the engine sprocket [A] as shown, noting the proper direction.



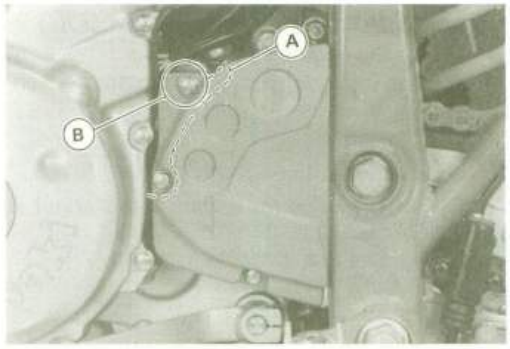
⚠WARNING

Incorrect installation of the engine sprocket could cause misalignment of the wheel, abnormal wear, resulting in unsafe riding condition.

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

- Bend the lockwasher tab over the nut.

- Install the chain guide [A] as shown.
- Apply a non-permanent locking agent to the bolt [B] shown.
- Adjust the drive chain (see this chapter).



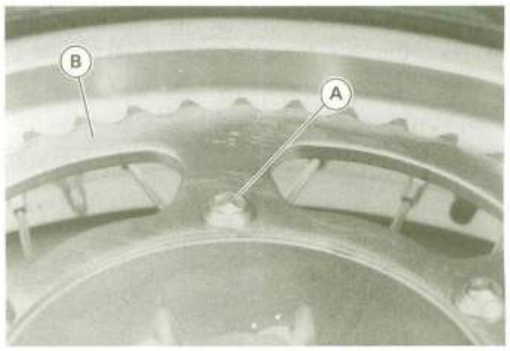
Rear Sprocket Removal (KLX650A)

- Remove the rear wheel (see Wheels/Tires chapter).

CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

- Unscrew the rear sprocket bolts [A] and nuts, then remove the rear sprocket [B].

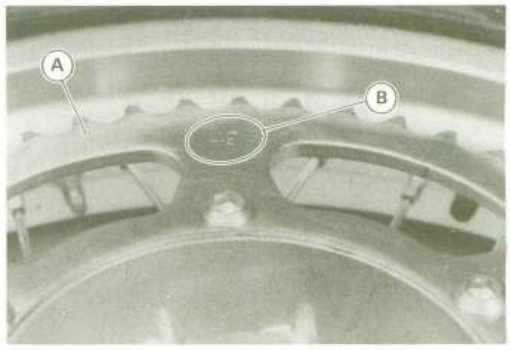


Rear Sprocket Installation (KLX650A)

- Install the rear sprocket [A] facing the tooth number marking [B] outward.

Torque – Rear Sprocket Nuts : 29 N-m (3.0 kg-m, 22 ft-lb)

- Install the rear wheel (see Wheels/Tires chapter).



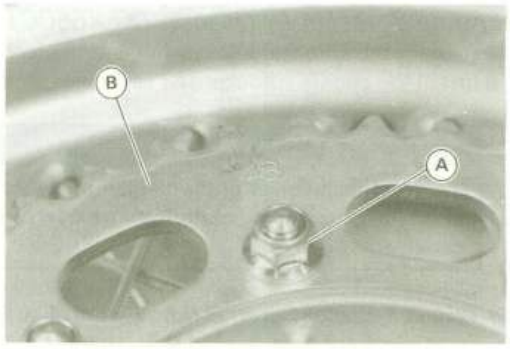
Rear Sprocket, Coupling Removal (KLX650C)

- Remove the rear wheel (see Wheels/Tires chapter).

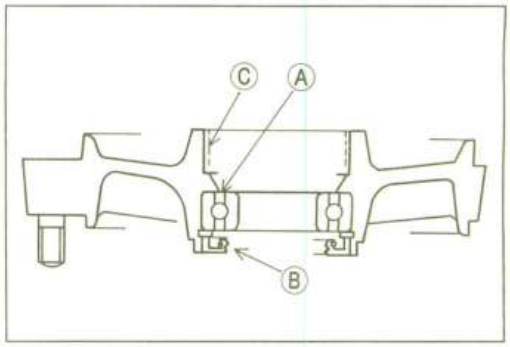
CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

- Pull out the rear wheel coupling from the rear wheel.
- Remove the rear sprocket nuts [A] to separate the rear sprocket [B] from the wheel coupling.



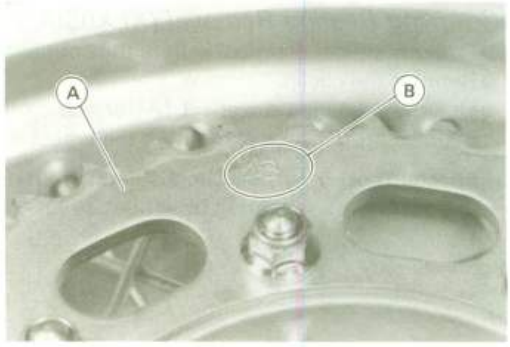
Rear Sprocket, Coupling Installation (KLX650C)



- Grease the following and install the coupling.
  Ball Bearing [A]
  Coupling Grease Seal [B]
  Coupling Internal Surface [C]

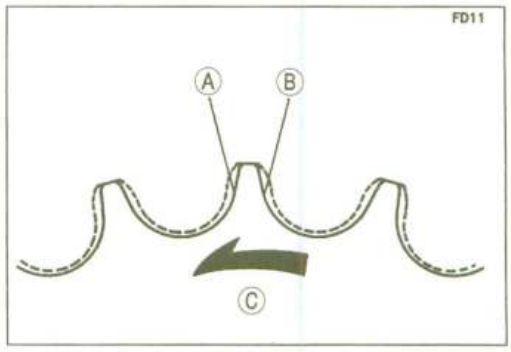
- Install the sprocket [A] facing the tooth number marking [B] outward.

Torque – Rear Sprocket Nuts : 32 N-m (3.3 kg-m, 24 ft-lb)



- Install the rear wheel (see Wheels/Tires chapter).

Sprocket Wear



- Visually inspect the engine and rear sprocket teeth.

★If the teeth are worn as illustrated, replace the sprockets, and inspect the drive chain (see Drive Chain Wear Inspection).

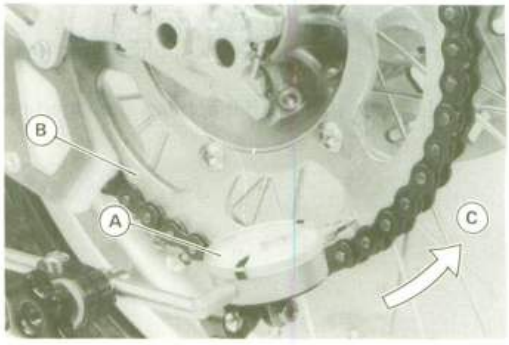
CAUTION
If a sprocket requires replacement, the drive chain is probably worn also. Upon replacing the rear sprocket, inspect the chain and engine sprocket.

NOTE

○*Sprocket wear is exaggerated for illustration.*

Worn Tooth (Engine Sprocket) [A]
Worn Tooth (Rear Sprocket) [B]
Direction of Rotation [C]

Rear Sprocket Warp



- Raise the rear wheel off the ground (see Wheels/Tires chapter) so that it will turn freely.

Special Tool – Jack: 57001-1238

- Set a dial gauge [A] against the rear sprocket [B] near the teeth as shown. Turn [C] the rear wheel. The difference between the highest and lowest dial gauge readings is the amount of runout (warp).

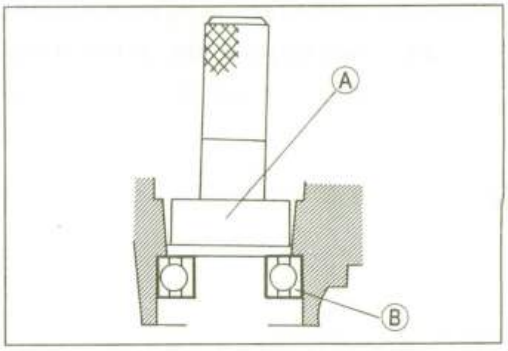
★If the runout exceeds the service limit, replace the rear sprocket.

Rear Sprocket Warp
Standard: 0.4 mm or less
Service Limit: 0.5 mm

Coupling Bearing Removal (KLX650C)

- Pull out the coupling collar from the coupling.
- Remove the circlip.
- Using the bearing driver set [A] or some other suitable tool, remove the bearing [B] by tapping from the wheel side.

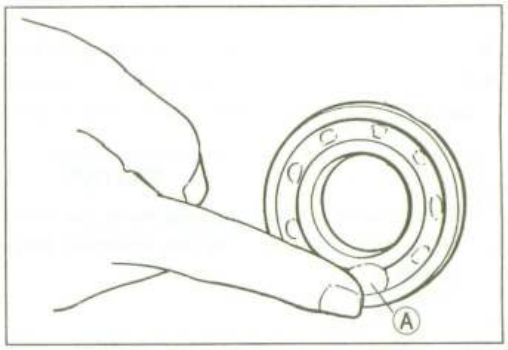
Special Tool – Inside Circlip Pliers: 57001-143
Bearing Driver Set: 57001-1129



Coupling Bearing Inspection, Lubrication (KLX650C)

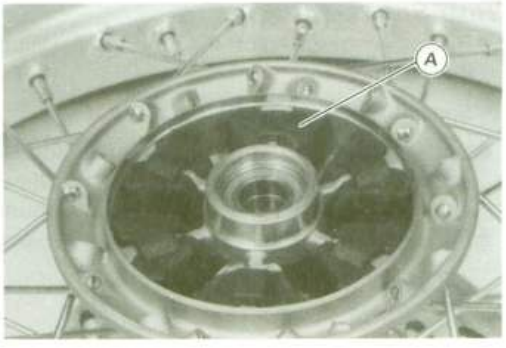
CAUTION
Do not remove the bearing for inspection or lubrication.

- Wipe the old grease out of the coupling.
- Wash the bearing with a high-flash point solvent, and dry it (do not spin it while it is dry).
- Turn the bearing back and forth while checking for play, roughness, or binding. If bearing play, roughness, or binding is found, replace the bearing.
- Pack the bearing with good quality bearing grease [A]. Turn the bearing around by hand a few times to make sure the grease is distributed uniformly inside the bearing.



Damper Inspection (KLX650C)

- Remove the rear wheel coupling, and inspect the rubber dampers [A].
- Replace the damper if it appears damaged or deteriorated.

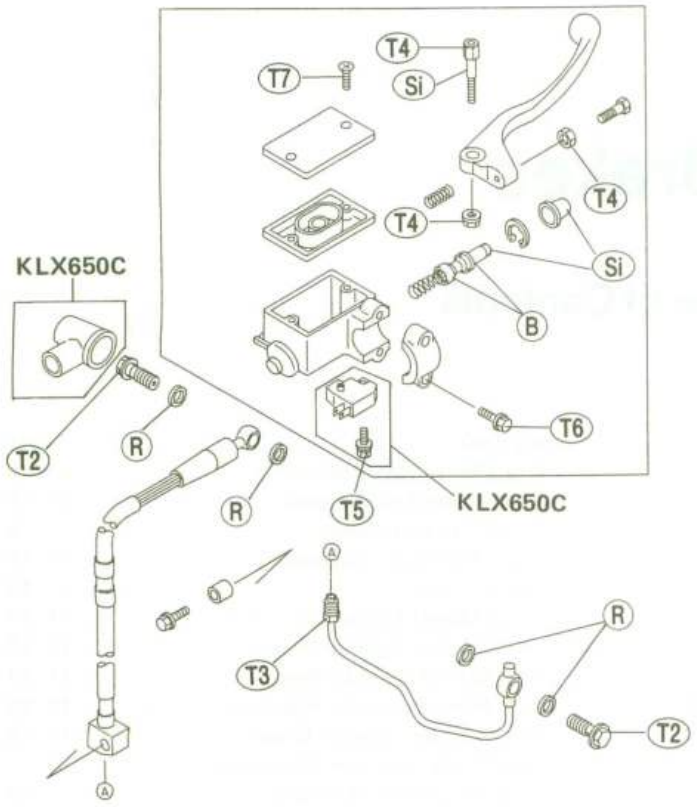


Brakes

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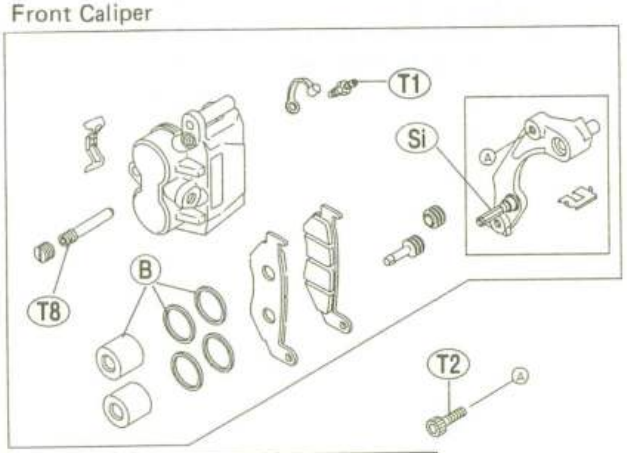
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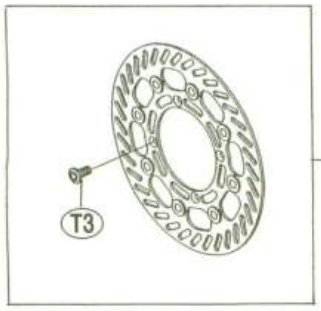
Exploded View

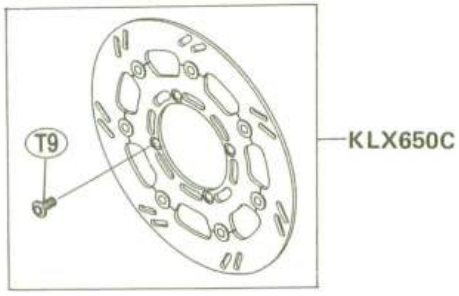


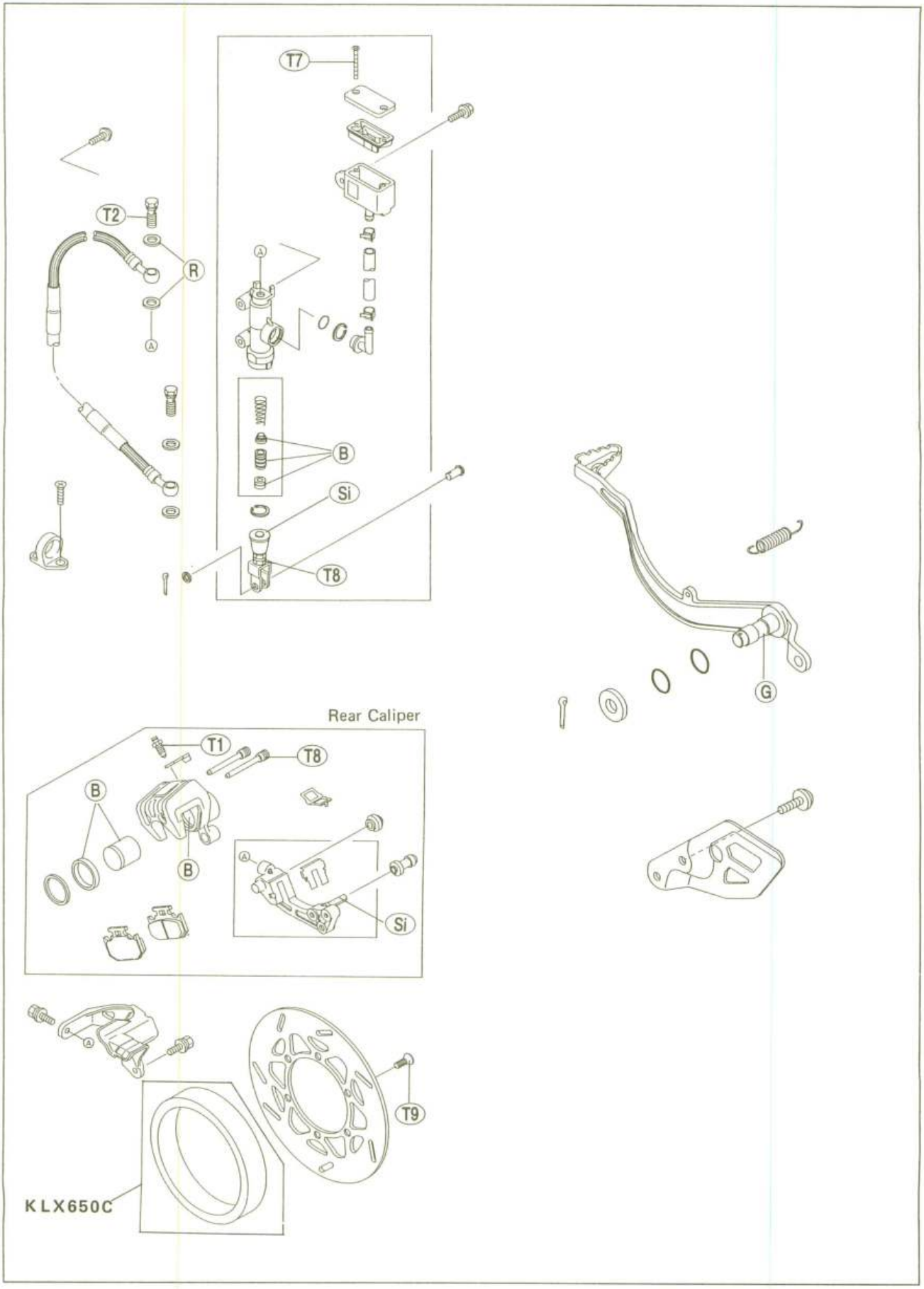
B : Apply brake fluid.
G : Apply grease.
R : Replacement Parts
Si : Apply silicone grease.
T1 : 7.8 N-m (0.80 kg-m, 69 in-lb)
T2 : 25 N-m (2.5 kg-m, 18.0 ft-lb)
T3 : 9.8 N-m (1.0 kg-m, 87 in-lb)
T4 : 5.9 N-m (0.60 kg-m, 52 in-lb)
T5 : 1.1 N-m (0.11 kg-m, 10 in-lb)
T6 : 8.8 N-m (0.90 kg-m, 78 in-lb)
T7 : 1.5 N-m (0.15 kg-m, 13 in-lb)
T8 : 18 N-m (1.8 kg-m, 13.0 ft-lb)
T9 : 23 N-m (2.3 kg-m, 16.5 ft-lb)

Front Caliper








T7
T2
R
A
B
Si
T8
G
Rear Caliper
T1
T8
B
B
Si
T9
KLX650C

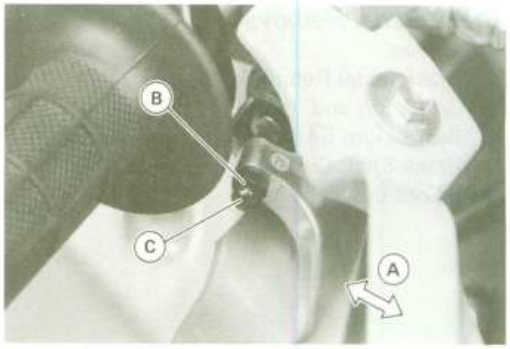
Specifications

Item		Standard	Service Limit
Brake Lever, Brake Pedal:			
Brake lever free play		Adjustable (to suit rider)	---
Pedal free play		Non-adjustable	---
Pedal position		Adjustable (to suit rider)	---
Brake Fluid:			
Grade		D.O.T.3	---
Brand (recommended)		Atlas Extra Heavy Duty Shell Super Heavy Duty Texaco Super Heavy Duty Wagner Lockheed Heavy Duty Castrol Girling – Universal Castrol GT (LMA) Castrol Disc Brake Fluid	
Grade		D.O.T.4	---
Brand (recommended)		Castrol Girling – Universal Castrol GT (LMA) Castrol Disc Brake Fluid Check Shock Premium Heavy Duty	
Brake Pads:			
Lining thickness:			
Front	KLX650A	3.8 mm	1 mm
	KLX650C	4.4 mm	1 mm
Rear		4.7 mm	1 mm
Brake Disc:			
Thickness:			
Front	KLX650A	2.85 ~ 3.15 mm	2.5 mm
	KLX650C	3.85 ~ 4.15 mm	3.3 mm
Rear		4.35 ~ 4.65 mm	3.8 mm
Runout		0.2 mm or less	0.3 mm

Special Tool – Inside Circlip Pliers: 57001-143
Jack: 57001-1238

Brake Lever, Brake Pedal

Brake Lever Play Adjustment



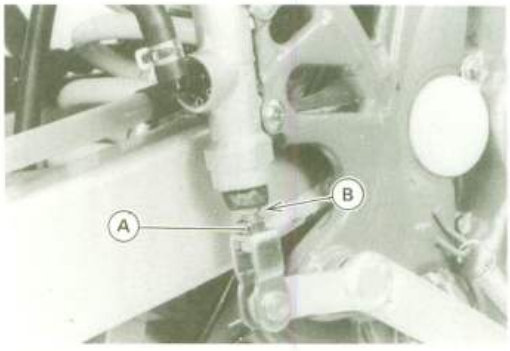
- Adjust the front brake lever play [A] to suit you.
- Loosen the adjuster locknut [B] and turn the adjuster [C] to either side.
- After adjustment, tighten the locknut.

Torque – Brake Lever Adjuster Locknut : 5.9 N-m (0.60 kg-m, 52 in-lb)

⚠WARNING

Always maintain proper brake adjustment. If adjustment is improper, the brake could drag and overheat. This could damage the brake assembly and possibly lock the wheel resulting in loss of control.

Brake Pedal Position Adjustment

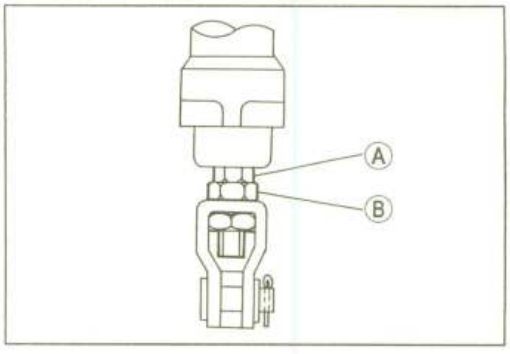


- Adjust the brake pedal position from the footpeg top to suit you.
- Loosen the master cylinder bracket locknut [A] and turn the push rod with the hex head [B] to achieve suitable pedal position.
- Tighten the locknut.

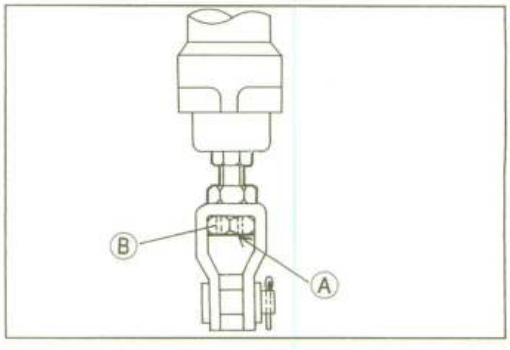
Torque – Master Cylinder Bracket Locknut : 18 N-m (1.8 kg-m, 13.0 ft-lb)

- For the KLX650C, check the brake light switch operation (see Electrical System chapter).

○When the brake pedal position is adjusted downward, the adjustment can be made until the hex head [A] touches the bracket locknut [B].



○When the brake pedal position is adjusted upward, the adjustment can be made until the push rod end [A] is even with the end of the bracket nut [B].

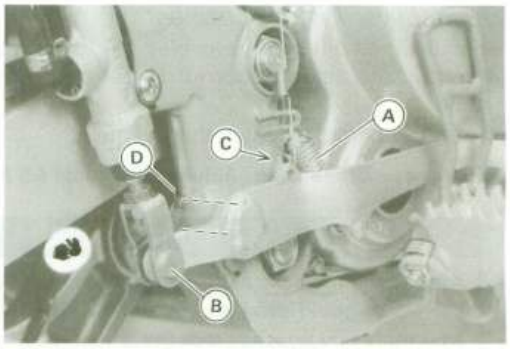


⚠WARNING

Always maintain proper brake adjustment. If adjustment is improper, the brake could drag and overheat. This could damage the brake assembly and possibly lock the wheel resulting in loss of control.

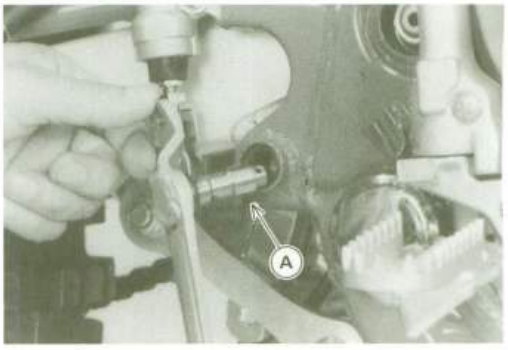
Brake Pedal Removal

- Remove:
  - Brake Pedal Return Spring [A]
  - Cotter Pin and Joint Pin [B]
  - Brake Light Switch Spring Lower End (KLX650C) [C]
  - Brake Shaft Cotter Pin [D]
- Pull out the brake pedal.



Brake Pedal Installation

- Grease [A] the brake pedal shaft.
- Replace the cotter pins.
- Check:
  - Brake Pedal Position (see this chapter)
  - Brake Light Switch Operation (KLX650C, see Electrical System chapter)

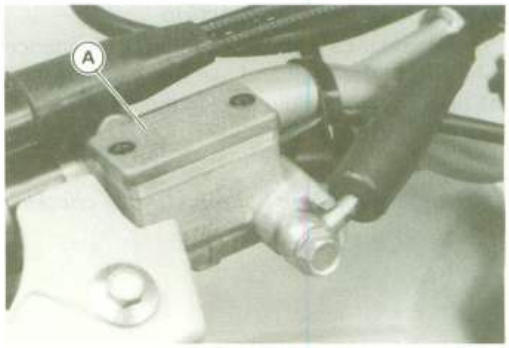


Brake Fluid

⚠WARNING

When working with the disc brake, observe the precautions listed below.

1. Never reuse old brake fluid.
2. Do not use fluid from a container that has been left unsealed or that has been open for a long time.
3. Do not mix two types and brands of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.
4. Don't leave the reservoir cap [A] off for any length of time to avoid moisture contamination of the fluid.
5. Don't change the fluid in the rain or when a strong wind is blowing.
6. Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely and will eventually deteriorate the rubber used in the disc brake.
7. When handling the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high-flash point solvent. Do not use one which will leave an oily residue. Replace the pads with new ones if they cannot be cleaned satisfactorily.
8. Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely washed away immediately.
9. If any of the brake line fittings or the bleed valve is opened at any time, the **AIR MUST BE BLED FROM THE BRAKE.**



Brake Fluid Recommendation

Recommended fluids are given in the table below. If none of the recommended fluids are available, use extra heavy-duty brake fluid only from a container marked D.O.T.3 or 4.

NOTE

○ Brake fluid of D.O. T.4 is installed in the brake system when shipped.

Recommended Disc Brake Fluid

Type	**D.O.T.3**
Brand:	**Atlas Extra Heavy Duty**
	Shell Super Heavy Duty
	Texaco Super Heavy Duty
	Wagner Lockheed Heavy Duty
	Castrol Girling-Universal
	Castrol GT (LMA)
	Castrol Disc Brake Fluid
Type:	**D.O.T.4**
Brand:	**Castrol Girling-Universal**
	Castrol GT (LMA)
	Castrol Disc Brake Fluid
	Check Shock Premium Heavy Duty

Brake Fluid Level Inspection

In accordance with the Periodic Maintenance Chart, inspect the brake fluid level in the front and rear brake fluid reservoirs.

● Check the brake fluid level in the reservoir.

NOTE

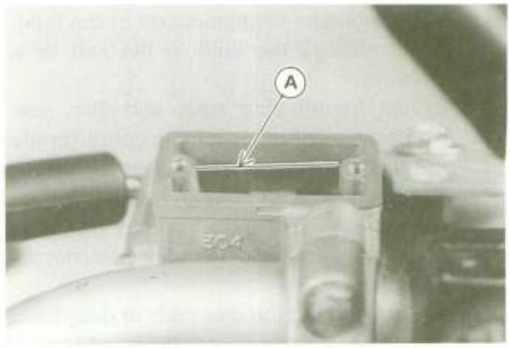
○ *Hold the reservoir horizontal when checking brake fluid level.*

○ For the KLX650A, the front reservoir must be kept more than half full [A] with brake fluid.

Torque – Front Brake Reservoir Cap Screws : 1.5 N-m (0.15 kg-m, 13 in-lb)

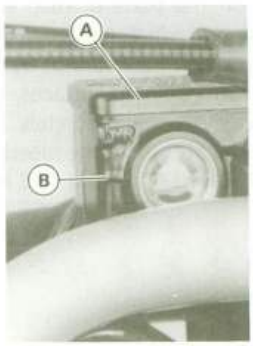
⚠WARNING

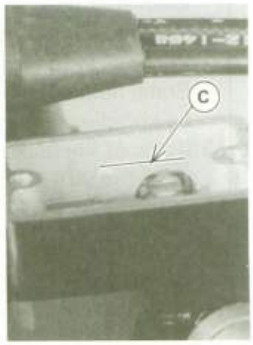
Change the fluid in the brake line completely if the fluid must be refilled but the type and brand of the fluid that already is in the reservoir are unidentified.



○ For the KLX650C, check that the brake fluid level in the front brake reservoir [A] is above the lower level line [B].

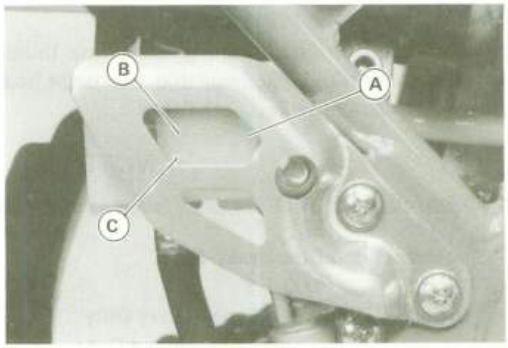
★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [C] in the reservoir with the same type and brand of the fluid that already is in the reservoir .



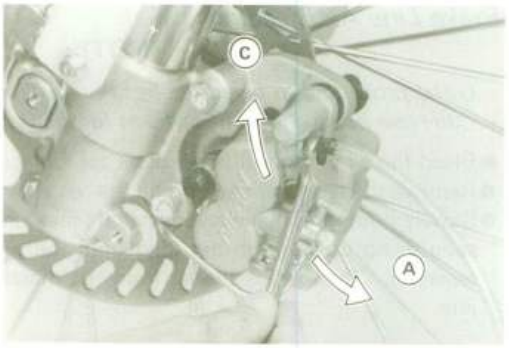


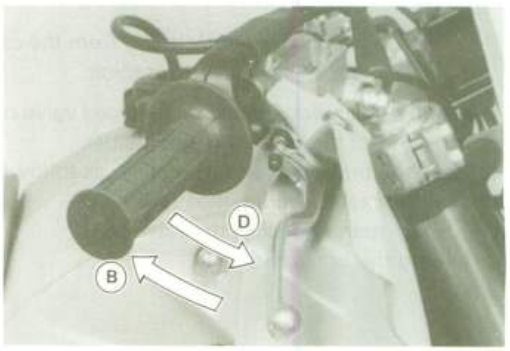
● Check that the brake fluid level in the rear brake reservoir [A] is between the upper [B] and the lower [C] level lines.

★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line.



Brake Fluid Changing





NOTE

○The procedure to change the front brake fluid is as follows. Changing the rear brake fluid is the same as for the front brake.

- Remove the reservoir cap and the rubber cap on the bleed valve.
- Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
- Fill the reservoir with new brake fluid.
- Change the brake fluid as follows:

○Open the bleed valve [A]
○Apply the brake lever and hold it [B].
○Close the bleed valve [C].
○Release the brake lever [D].

- Check the fluid level in the reservoir often, replenishing it as necessary.

NOTE

○If the fluid in the reservoir runs completely out any time during fluid changing, air will enter the line, and the system must be bled.

- Repeat this operation until fresh brake fluid comes out into the plastic hose or the color of the fluid changes.

⚠WARNING

Do not mix two brands of fluid. Change the brake fluid in the brake line completely if the brake fluid must be refilled but the type and brand of the brake fluid that is already in the reservoir are unidentified.

Torque – Bleed Valves : 7.8 N-m (0.80 kg-m, 69 in-lb)
Front Brake Reservoir Cap Screws : 1.5 N-m (0.15 kg-m, 13 in-lb)
Rear Brake Reservoir Cap Screws : 1.5 N-m (0.15 kg-m, 13 in-lb)

- Apply the brake lever forcefully for a few seconds, and check for fluid leakage around the fittings.

⚠WARNING

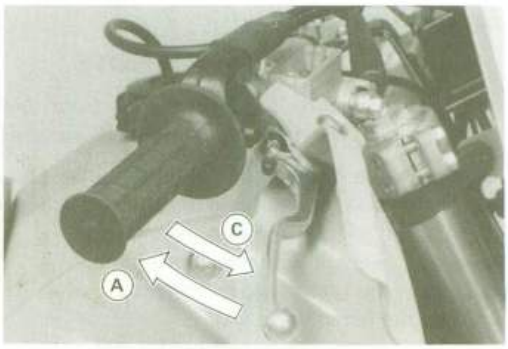
If the brake lever or pedal has a soft or "spongy feeling" when it is applied, there might be air in the brake line or the brake may be defective. Since it is dangerous to operate the motorcycle under such conditions, bleed the air from the brake line immediately.

Brake Line Air Bleeding

NOTE

○ *The procedure to bleed the front brake line is as follows. Bleeding the rear brake line is the same as for the front brake.*

- Bleed the air whenever brake parts are replaced or reassembled.
- Remove the reservoir cap and fill the reservoir with new brake fluid.
- Slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the hose at the bottom of the reservoir. This bleeds the air from the master cylinder and the brake line.

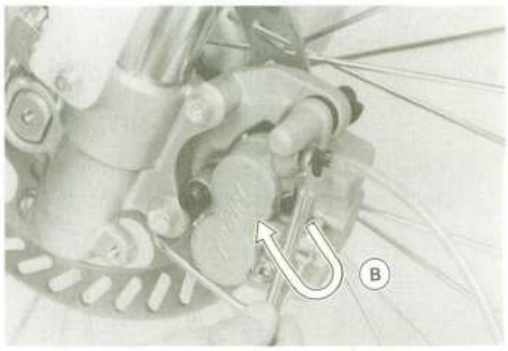


NOTE

○ *Tap the brake hose lightly going from the caliper to the reservoir side and bleed the air off at the reservoir.*

- Attach a clear plastic hose to the bleed valve on the caliper, and run the other end of the hose into a container.
- Bleed the brake line and the caliper as follows.

○ Hold the brake lever applied [A].
○ Quickly open and close the valve [B].
○ Release the brake lever [C].



- The fluid level must be checked several times during bleeding operation and replenished as necessary.

NOTE

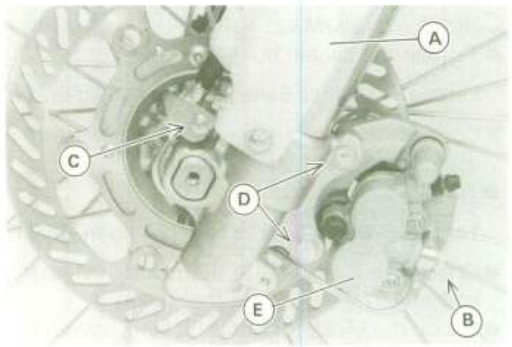
○ *If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.*
○ *If the brake lever or pedal action still feels soft or "spongy", tap the brake hose from bottom to top and air will rise up to the top part of the hose. Slowly pump the brake lever or pedal in the same manner as above.*

Torque – Bleed Valves : 7.8 N-m (0.80 kg-m, 69 in-lb)
Front Brake Reservoir Cap Screws : 1.5 N-m (0.15 kg-m, 13 in-lb)
Rear Brake Reservoir Cap Screws : 1.5 N-m (0.15 kg-m, 13 in-lb)

- Apply the brake lever forcefully for a few seconds, and check for fluid leakage around the fittings.

Calipers

Front Caliper Removal



- Drain the front brake fluid (see Brake Fluid Change).
- Remove the fork protector [A]
- Remove:
  Banjo Bolt [B]
  Brake Hose Joint Bolt [C]
- Remove the caliper bolts [D] and take off the caliper [E].

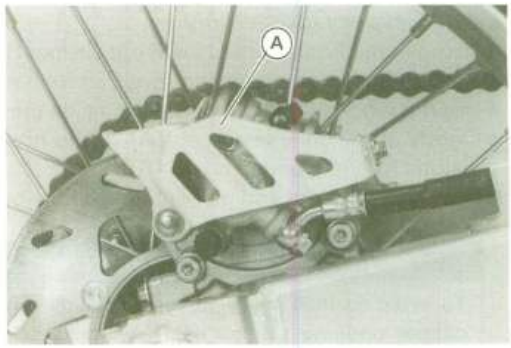
★If the caliper is to be disassembled after removal and if compressed air is not available, remove the pistons using the following steps before disconnecting the brake hose from the caliper.

○Remove the pads (see Brake Pad Removal).

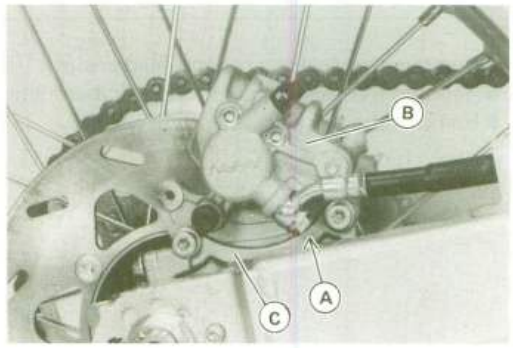
○Insert a wooden board 5 mm thick inside the caliper opening (see Caliper Disassembly).
○Pump the brake lever until the pistons push the wooden board.
○Remove the caliper.
○Remove the board and pull out the pistons by hand.

CAUTION
Immediately wash away any brake fluid that spills.

Rear Caliper Removal



- Remove the caliper cover [A].
- Drain the rear brake fluid (see Brake Fluid Change).



- Remove:
  Banjo Bolt [A]
  Rear Axle
- Take off the caliper [B] along with the caliper bracket [C].

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

○Remove the pads.
○Pump the brake pedal to remove the piston.

CAUTION
Immediately wash away any brake fluid that spills.

Caliper Installation

- Tighten the caliper bolts.

Torque – Caliper Bolts : 25 N-m (2.5 kg-m, 18.0 ft-lb)

- Connect the brake hose to the caliper putting a new flat washer on each side of the brake hose fitting.
- Tighten the banjo bolt.

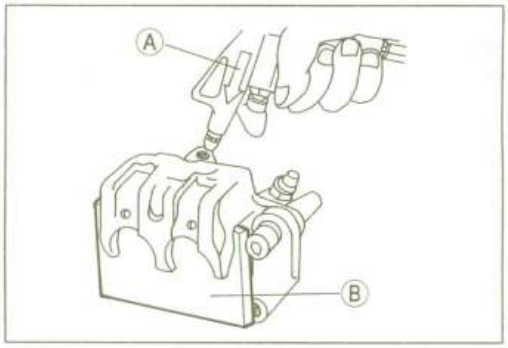
Torque – Banjo Bolt: 25 N-m (2.5 kg-m, 18.0 ft-lb)

- Check the fluid level in the master cylinder (reservoir) and bleed the brake line (see Bleeding the Brake).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

⚠WARNING

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

Front Caliper Disassembly



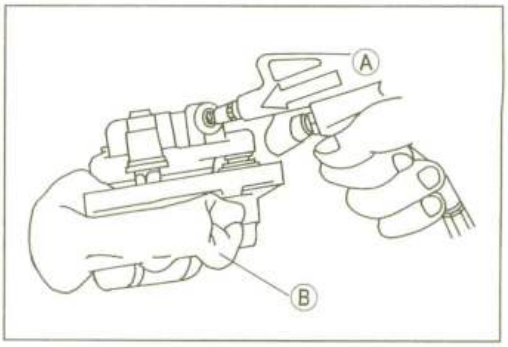
- Remove the front caliper (see Front Caliper Removal).
- Remove the pads and spring (see Pad Removal).
- Insert a wooden board 5 mm thick inside the caliper opening.
- Lightly apply compressed air [A] to the hose joint opening until the pistons hit the wooden board [B].
- Remove the board and pull out the pistons by hand.

⚠WARNING

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

- Remove the dust seal(s) and fluid seal(s).
- Remove the caliper holder, shaft rubber friction boot and dust cover.
- Remove the bleed valve and rubber cap.

Rear Caliper Disassembly



- Remove the caliper (see Caliper Removal).
- Remove the pads and spring (see Pad Removal).
- Using compressed air [A], remove the piston.
  - Cover the caliper opening with a clean, heavy cloth [B]
  - Remove the piston by lightly applying compressed air to the hose joint opening.

⚠WARNING

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

- Remove the dust seal and fluid seal.
- Remove the caliper holder, shaft rubber friction boot and dust cover.
- Remove the bleed valve and rubber cap.

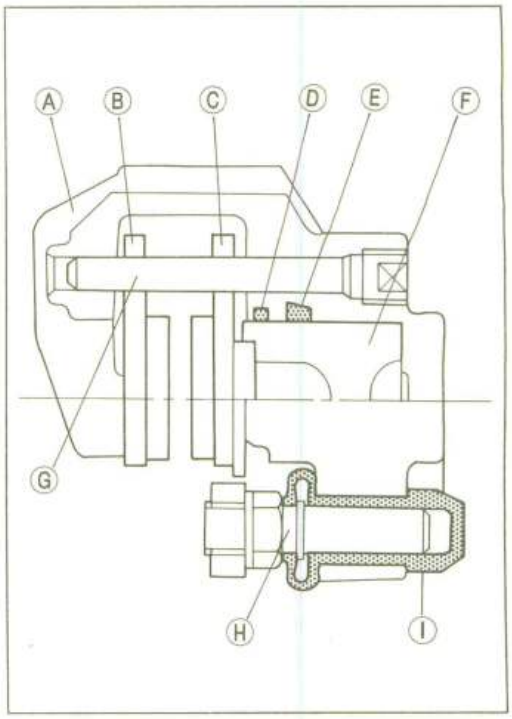
Caliper Assembly

- Tighten the bleed valve.

Torque – Bleed Valve : 7.8 N-m (0.80 kg-m, 69 in-lb)

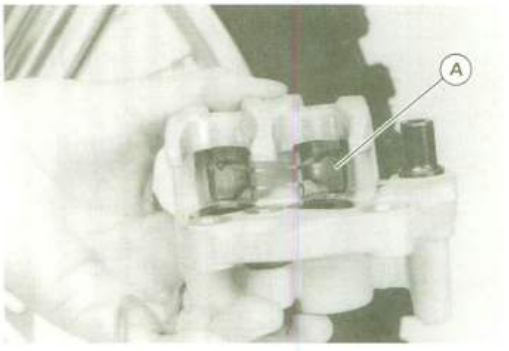
- It is recommended that the fluid seal, which is removed, be replaced with a new one.
- Replace the dust seals if they are damaged.
- Install the fluid seal. Either side of the seal may face outboard.
- Apply brake fluid to the cylinders, pistons, and fluid seals (piston seals), and push the pistons into the cylinders by hand. Take care that neither the cylinder nor the piston skirt gets scratched.

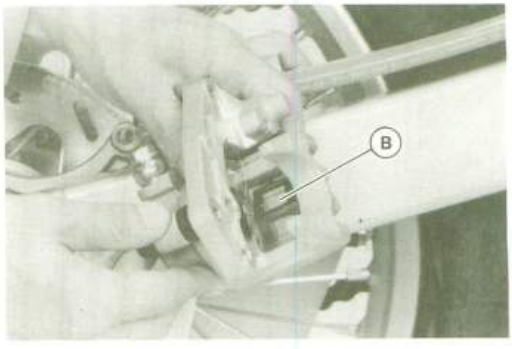
Caliper [A]
Outer Pad [B]
Inner Pad [C]
Dust Seal [D]
Fluid Seal [E]
Piston [F]
Pad Bolts [G]
Caliper Holder Shafts [H]
Friction Boot [I]



- Replace the caliper holder shaft rubber friction boot and dust cover if they are damaged.
- Apply a thin coat of silicone grease to the caliper holder shafts and holder holes. (Silicone grease is a special high temperature, water-resistance grease).
- Install the anti-rattle spring in the caliper as shown.
- Install the pads (see Brake Pad Installation).

Anti-rattle Spring for Front Caliper [A]
Anti-rattle Spring for Rear Caliper [B]



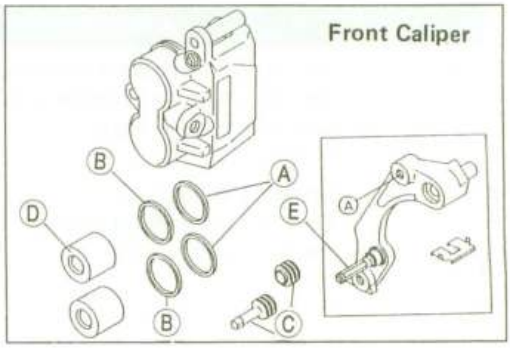


Caliper Fluid Seal Damage

The fluid seals [A] around the piston maintain the proper pad/disc clearance. If the seals are not satisfactory, pad wear will increase, and constant pad drag on the disc will raise brake and brake fluid temperature.

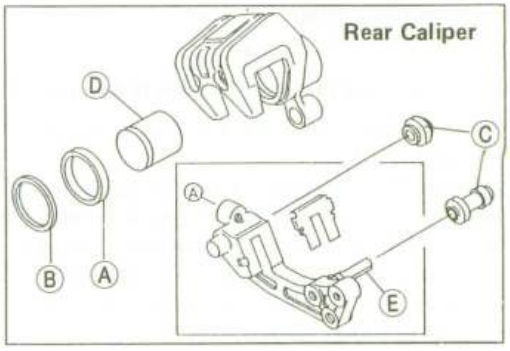
- Replace the fluid seals under any of the following conditions: (a) fluid leakage around the pad; (b) brakes overheat (c) there is a large difference in inner and outer pad wear; (d) the seal is stuck to the piston.

★If the fluid seal is replaced, replace the dust seal as well. Also, replace all seals every other time the pads are changed.



Caliper Dust Seal and Friction Boot Damage

- Check that the dust seals [B] and friction boots [C] are not cracked, worn, swollen, or otherwise damaged.
- If they show any damage, remove the caliper bracket and replace them.



Caliper Piston and Cylinder Damage

- Visually inspect the piston [D] and cylinder surfaces.

★Replace the caliper if the cylinder and piston are badly scored or rusty.

Caliper Holder Shaft Wear

The caliper body must slide smoothly on the caliper holder shafts [E]. If the body does not slide smoothly, one pad will wear more than the other, pad wear will increase, and constant drag on the disc will raise brake and brake fluid temperature.

- Check to see that the caliper holder shafts are not badly worn or stepped, and that the rubber friction boots are not damaged.

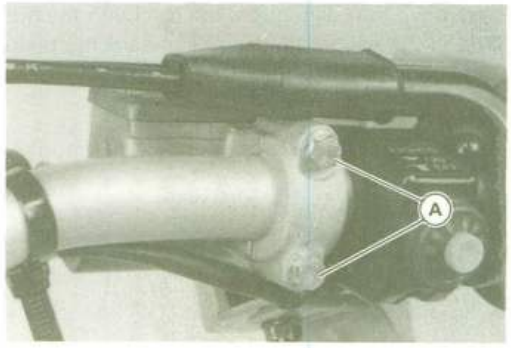
★If the rubber friction boot is damaged, replace the rubber friction boot. To replace the friction boot, remove the pads and the caliper bracket.

★If the caliper holder shaft is damaged, replace the caliper bracket.

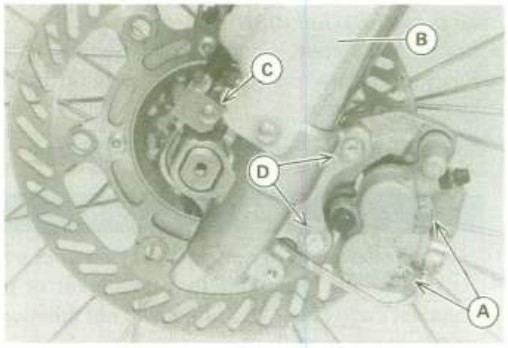
Brake Pads

Front Brake Pad Removal

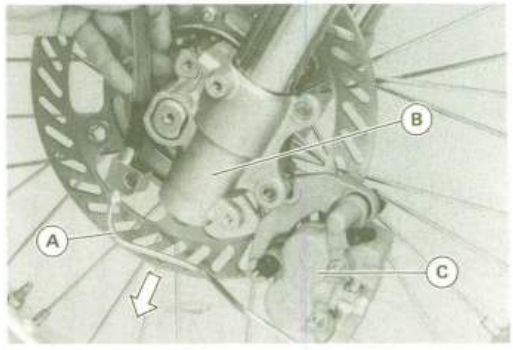
- Remove the front master cylinder clamp bolts [A] to slack the brake hose.



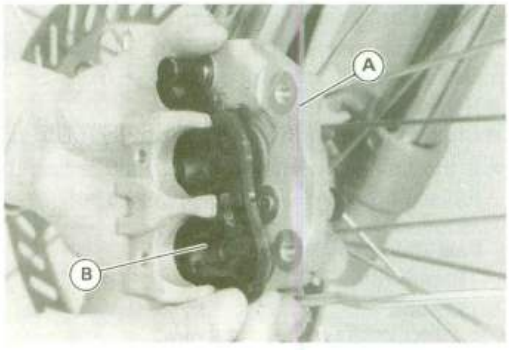
- Loosen the pad bolts [A].
- Remove:
  Fork Protectors [B]
  Brake Hose Joint Bolt [C]
  Caliper Bolts [D]



- Pull the brake pipe [A] downward to clear the front fork [B].
- Detach the caliper [C] from the disc with the pipe left installed.

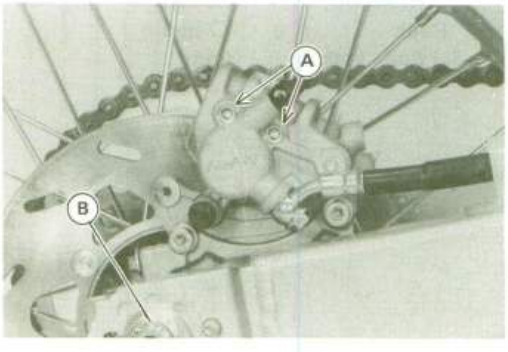


- Remove the pad bolts.
- Push the caliper holder [A] toward the piston side and then remove the pads [B].

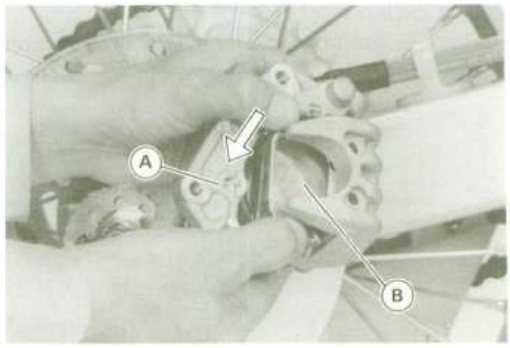


Rear Brake Pad Removal

- Remove:
  Caliper Cover
  Brake Pad Bolts [A]
  Rear Axle [B]



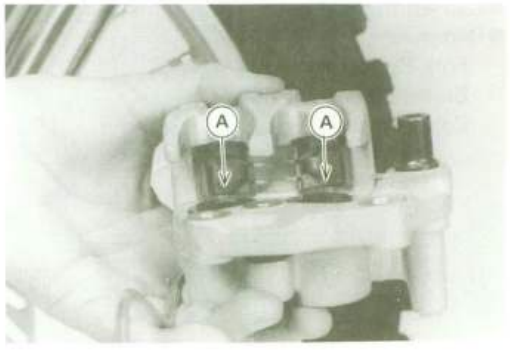
- Remove the caliper from the disc with the hose left installed.
- Push the caliper holder [A] toward the piston side and then remove the pads [B].



Brake Pad Installation

- Before installation, clean the pads with a high-flash point solvent.
- Push the caliper pistons [A] in by hand as far as it will go, and then install the pads.

Torque – Brake Pad Bolts : 18 N-m (1.8 kg-m, 13.0 ft-lb)



⚠WARNING

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

Brake Pad Wear Inspection

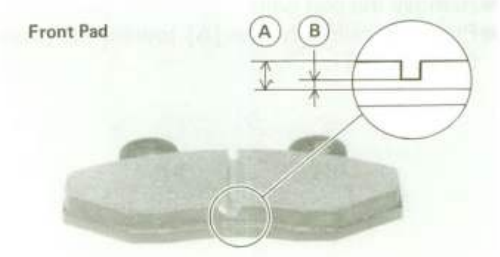
In accordance with the Periodic Maintenance Chart, inspect the brake pads for wear.

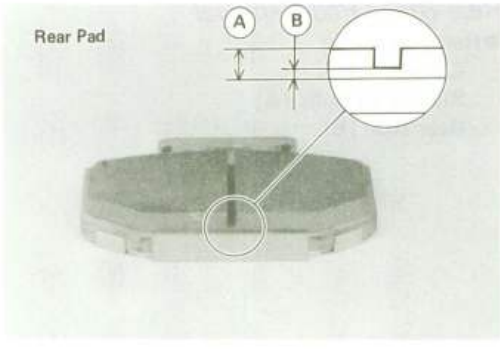
- Remove the pads.
- Check the lining thickness [A] of the pads in each caliper.

★If the lining thickness of either pad is less than the service limit [B], replace both pads in the caliper as a set.

Pad Lining Thickness

Standard	
Front:	
KLX650A:	**3.8 mm**
KLX650C:	**4.4 mm**
Rear:	**4.7 mm**
Service Limit:	**1mm**

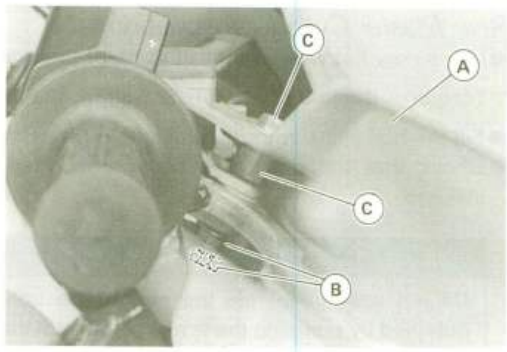




Master Cylinder

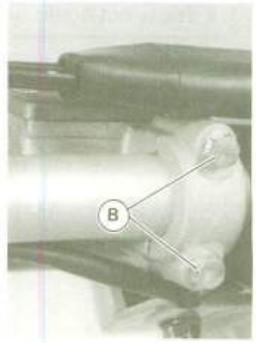
Front Master Cylinder Removal

- Drain the front brake fluid (see Brake Fluid Change).
- Remove:
  Handguard [A]
  Nuts [B]
  Bolts [C]



- Remove:
  Brake Hose Banjo Bolt [A]
  Master Cylinder Clamp Bolts [B]
- Remove the front master cylinder [C].





CAUTION
Brake fluid quickly ruins painted surface; any spilled fluid should be completely washed away immediately.

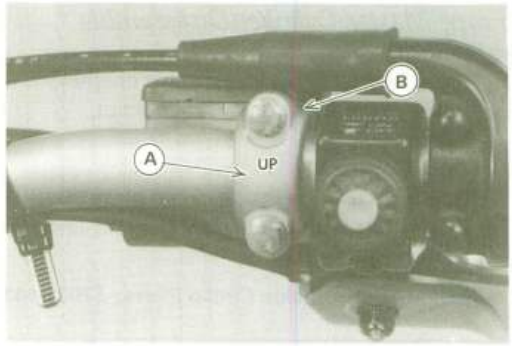
Front Master Cylinder Installation

- The master cylinder clamp must be installed with the UP mark [A] faced upwards.
- Tighten the upper clamp bolt first [B], and then the lower clamp bolt. There will be a gap at the lower part of the clamp after tightening.

  Torque – Master Cylinder Clamp Bolts : 8.8 N-m (0.90 kg-m, 78 in-lb)

- Use a new flat washer on each side of the brake hose fitting, and tighten the banjo bolt.

  Torque – Banjo Bolt : 25 N-m (2.5 kg-m, 18.0 ft-lb)

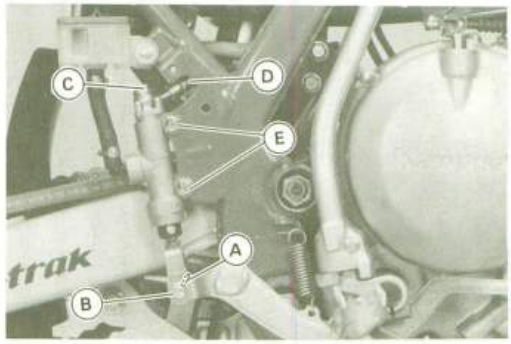


- Fill the brake line with the brake fluid (see Brake Fluid Changing).
- Check that the brake line has proper fluid pressure and no fluid leakage.

⚠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 each disc. The brakes will not function on the first application of the lever if this is not done.

Rear Master Cylinder Removal

- Drain the rear brake fluid (see Brake Fluid Change).
- Loosen the banjo bolt.
- Remove:
  Cotter Pin [A] and Brake Pedal Joint Pin [B]
  Reservoir Cover
  Banjo Bolt [C] and Brake Hose [D]
  Rear Master Cylinder Screws [E]
- Remove the rear master cylinder.



Rear Master Cylinder Installation

- Use a new flat washer on each side of the brake hose fitting.

Torque – Banjo Bolt : 25 N-m (2.5 kg-m, 18.0 ft-lb)

- Fill the brake line with the brake fluid (see Brake Fluid Changing).
- Check that the brake line has proper fluid pressure and no fluid leakage.

⚠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 each disc. The brake will not function on the first application of the pedal if this is not done.

Front Master Cylinder Disassembly

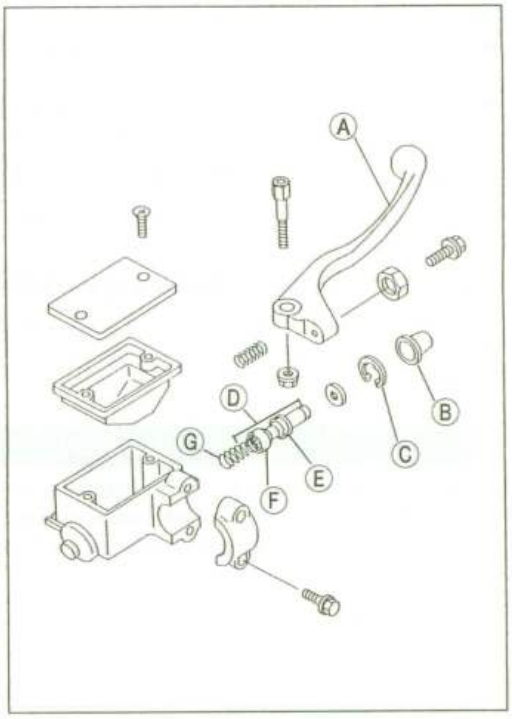
- Remove:

Front Master Cylinder (see this chapter)
Brake Lever Pivot Bolt and Locknut
Brake Lever [A]
Dust Cover [B]
Retainer (use the inside circlip pliers : 57001-143) [C]
Piston [D] with Secondary Cup [E] and Primary Cup [F]
Return Spring [G]

Special Tool – Inside Circlip Pliers: 57001-143

CAUTION

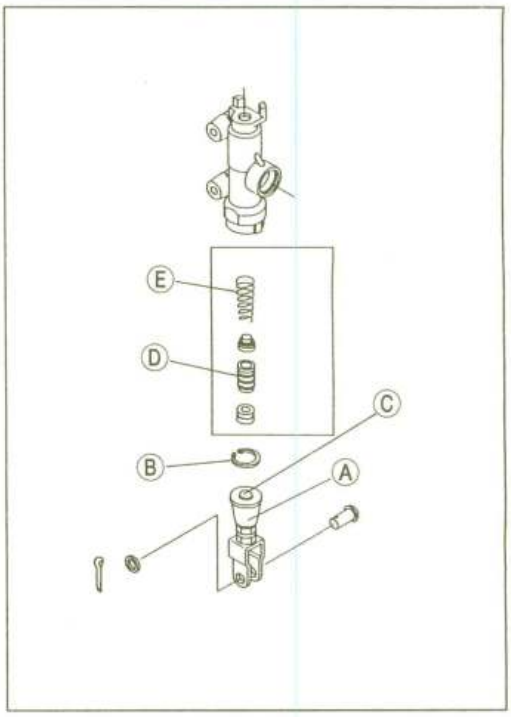
Do not remove the secondary and primary cups from the piston since removal will damage them.



Rear Master Cylinder Disassembly

NOTE

○*Do not remove the push rod clevis for master cylinder disassembly since removal requires brake pedal position adjustment.*



● Remove:
Rear Master Cylinder (see Rear Master Cylinder Removal)
Dust Cover [A] on Push Rod
Retainer [B] (use the inside circlip pliers : 57001-143)
Push Rod [C] with Clevis installed
Piston [D] with Secondary Cup and Primary Cup
Return Spring [E]

Special Tool – Inside Circlip Pliers: 57001-143

CAUTION
Do not remove the primary and secondary cups from the piston since removal will damage them.

Master Cylinder Assembly

● Before assembly, clean all parts including the master cylinder with brake fluid or alcohol.
● Apply brake fluid to the removed parts and to the inner wall of the cylinder.

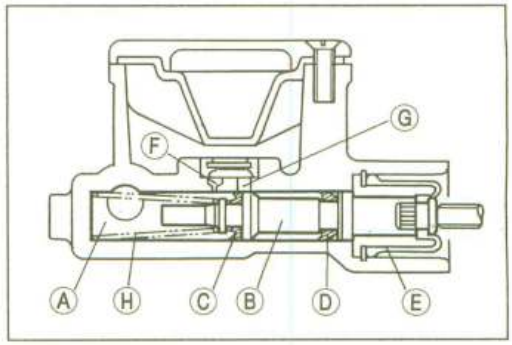
CAUTION
Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely, and will eventually deteriorate the rubber used in the disc brake.

● Take care not to scratch the piston or the inner wall of the cylinder.

Selicone Grease – Brake Lever Pivot Bolt
Brake Lever Pivot Contact
Push Rod Contact (Rear Master Cylinder)
Dust Cover

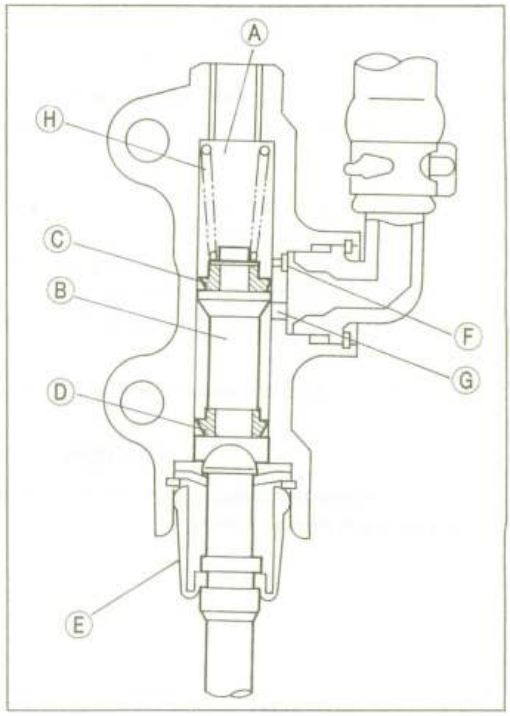
Torque – Brake Lever Pivot Bolt : 5.9 N-m (0.60 kg-m, 52 in-lb)
Brake Lever Pivot Locknut : 5.9 N-m (0.60 kg-m, 52 in-lb)

Master Cylinder Visual Inspection



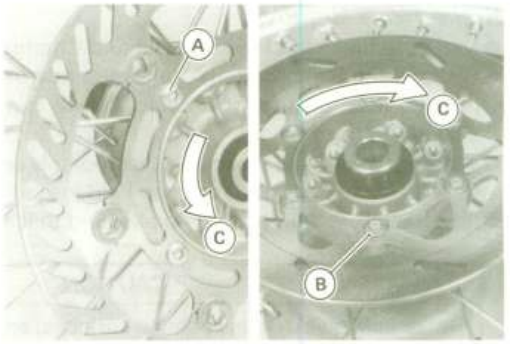
● Disassemble the front and rear master cylinders.
● Check that there are no scratches, rust or pitting on the inner wall of each master cylinder [A] and on the outside of each piston [B].
★ If a master cylinder or piston shows any damage, replace them.
● Inspect the primary [C] and secondary [D] cups.
★ If a cup is worn, damaged, softened (rotted), or swollen, the piston assembly should be replaced to renew the cups.
★ If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cups.

- Check the dust covers [E] for damage.
- ★If they are damaged, replace them.
- Check that the relief [F] and supply [G] ports are not plugged.
- ★If the relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.
- Check the piston return springs [H] for any damage.
- If a spring is damaged, replace it.



Brake Discs

Disc Installation



●Tighten the disc bolts.

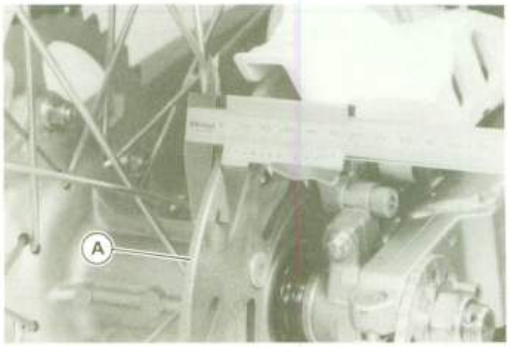
Torque — Front Disc Bolts (650A) : 9.8 N-m (1.0 kg-m, 87 in-lb) [A]
Front Disc Bolts (650C) : 23 N-m (2.3 kg-m, 16.5 ft-lb) [A]
Rear Disc Bolts : 23 N-m (2.3 kg-m, 16.5 ft-lb) [B]

○The disc must be installed as shown with the chamfered hole side facing toward the hub. Tire Rotation [C]

●After installing the discs, check the disc runout.

●Completely clean off any grease that has gotten on either side of the disc with a high-flash point solvent. Do not use one which will leave an oil residue.

Disc Wear



★Replace the disc [A] if the sliding surfaces have worn past the service limit.

Front Disc Thickness
KLX650A:
Standard: 2.85 ~ 3.15 mm
Service Limit: 2.5 mm
KLX650C
Standard: 3.85 ~ 4.15 mm
Service Limit: 3.3 mm

Rear Disc Thickness
Standard: 4.35 ~ 4.65 mm
Service Limit: 3.8 mm

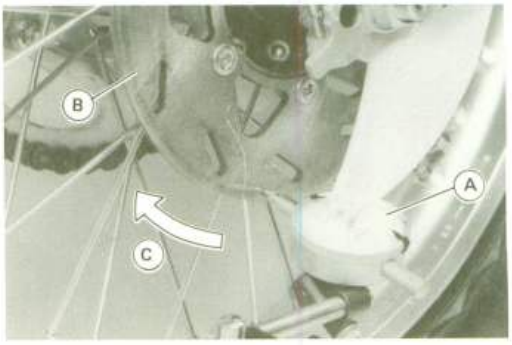
Disc Cleaning

Poor braking can be caused by oil on a disc. Oil on a disc must be cleaned off with an oilless cleaning fluid such as trichloroethylene or acetone.

⚠WARNING

These cleaning fluids are usually highly flammable and harmful if breathed for prolonged periods. Be sure to heed the fluid manufacturer's warnings.

Disc Warp Inspection



●Using the jack, raise the front or the rear wheel off the ground (see Wheels/Tires chapter).

●Set up a dial gauge [A] against the disc [B].

○For the front disc, turn the handlebar fully to one side.

●Rotate the wheel [C] to measure disc runout. The difference between the highest and lowest dial reading is the amount of runout.

★If disc runout exceeds the service limit, replace the disc.

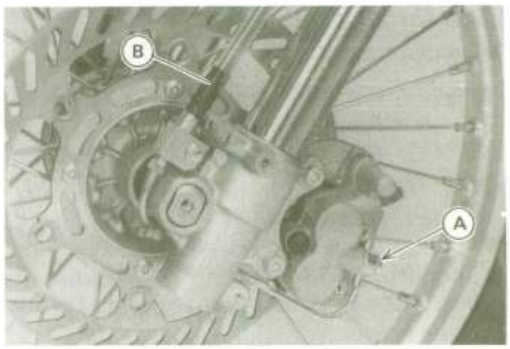
Disc Runout
Standard: 0.2 mm or less
Service Limit: 0.3 mm

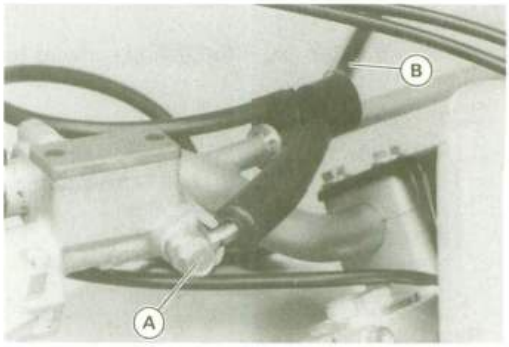
Brake Hoses

Brake Hose Removal

- Drain the brake fluid (see Brake Fluid Change).
- Remove the banjo bolts [A] at both ends of the brake hose [B] and pull the hose off the motorcycle. There is a copper washer on each side of the hose fitting.
- ○ When removing the brake hose, temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.

CAUTION
Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely washed away immediately.





Brake Hose Installation

- Using a new copper washer for each side of the hose fitting, tighten the banjo bolt.

Torque – Banjo Bolts : 25 N-m (2.5 kg-m, 18.0 ft-lb)

- When installing the hoses, avoid sharp bending, kinking, flattening or twisting.
- Run the brake hose according to the Cable, Wire, and Hose Routing section in the General Information chapter.
- Fill the brake line with the brake fluid (see Brake Fluid Changing).

Brake Hose Inspection

The high pressure inside the brake line can cause fluid to leak or the hose to burst if the line is not properly maintained.

- Bend and twist the rubber hose while examining it.

★ Replace it if any cracks or bulges are noted.

Suspension

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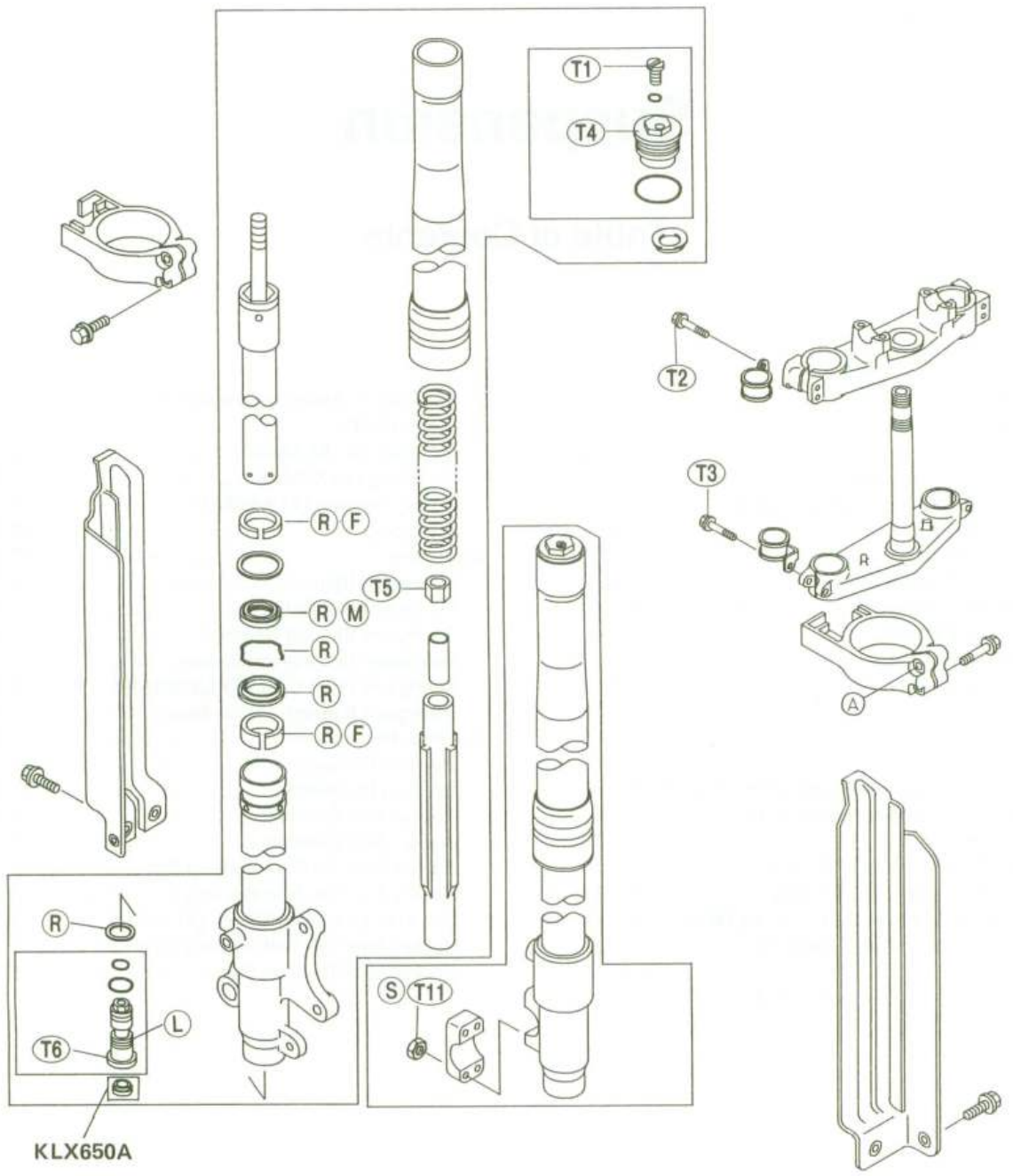
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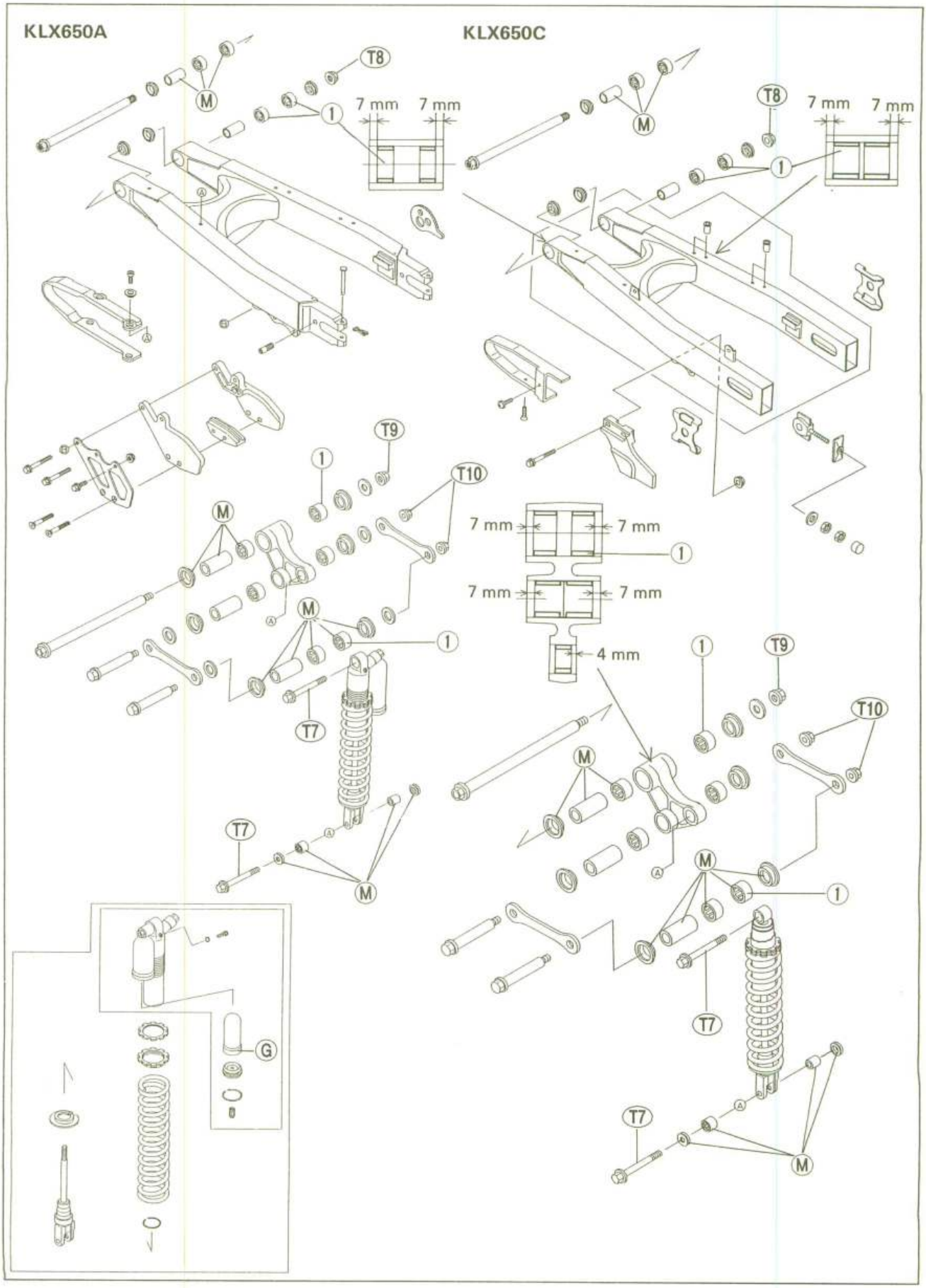
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Exploded View



1. Needle Bearings: Face the manufacturer's marks out.
F : Apply fork oil.
G : Apply grease.
L : Apply a non-permanent locking agent.
M : Apply molybdenum disulfide grease.
R : Replacement Parts
S : Follow the specific tightening sequence
T1 : 1.2 N-m (0.12 kg-m, 10 in-lb)
T2 : 20 N-m (2.0 kg-m, 14.5 ft-lb)
T3 : 25 N-m (2.5 kg-m, 18.0 ft-lb)
T4 : 29 N-m (3.0 kg-m, 22 ft-lb)
T5 : 15 N-m (1.5 kg-m, 11.0 ft-lb)
T6 : 54 N-m (5.5 kg-m, 40 ft-lb)
T7 : 39 N-m (4.0 kg-m, 29 ft-lb)
T8 : 88 N-m (9.0 kg-m, 65 ft-lb)
T9 : 98 N-m (10.0 kg-m, 72 ft-lb)
T10 : 81 N-m (8.3 kg-m, 60 ft-lb)
T11 : 9.3 N-m (0.95 kg-m, 82 in-lb)


KLX650A
KLX650C
T8
M
1
7 mm
7 mm
T9
T10
T7
4 mm
G

Specifications

Item		Standard
Front Fork (per one unit):		
Fork inner tube diameter		43 mm
Air pressure		Atomospheric pressure (Non-adjustable)
Compression damper setting	KLX650A	14th click from the first click of the fully clockwise position
Fork oil viscosity		KAYABA 01 or SAE5W
Fork oil capacity	KLX650A	547 ± 4 mL (completely dry) approx. 465 mL (when changing oil)
	KLX650C	540 ± 4 mL (completely dry) approx. 459 mL (when changing oil)
Fork oil level		Fully compressed, without fork spring, below from outer tube top
	KLX650A	115 ± 2 mm
	KLX650C	105 ± 2 mm
Fork spring free length		
	KLX650A	501.5 mm (Service limit : 491 mm)
	KLX650C	465.5 mm (Service limit: 456 mm)
Rear Shock Absorber:		
Rebound damper set	KLX650A	9th click from the first click of the fully clockwise position
Compression damper set	KLX650A	14th click from the first click of the fully clockwise position
Spring setting position	KLX650A	Standard adjusting nut position : 117.5 mm (4.65 in) Nut adjusting range : 106 ~ 126 mm (4.16 ~ 4.95 in) Standard spring preload : 1052 N (107.3 kg, 236 lb) Preload change per turn of the nut : 109 N (11.1 kg, 24.5 lb)
	KLX650C	3rd step from the weakest position (Usable range : 5 steps)
Gas pressure		980 kPa (10 kg/cm², 142 psi, Non-adjustable)
Oil type	KLX650A	KYB K2-C (SAE5W or Bel-Ray SE2 #40)
Oil capacity	KLX650A	305 mL
Spring free length	KLX650A	255 mm (Service limit : 250 mm)

Special Tools – **Jack: 57001-1238**
Fork Spring Holder: 57001-1286
Fork Piston Rod Puller, M10 x 1.0: 57001-1298
Fork Oil Level Gauge: 57001-1290
Fork Cylinder Holder: 57001-1287
Fork Outer Tube Weight: 57001-1218
Fork Oil Seal Driver, Φ43: 57001-1340
Hook Wrench: 57001-1101
Steering Stem Nut Wrench: 57001-1100
Oil Seal & Bearing Remover: 57001-1058
Bearing Driver Set: 57001-1129

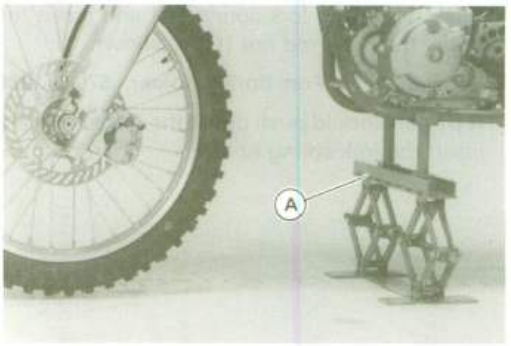
Front Fork

Air Pressure Adjustment

The standard air pressure in the fork legs is atmospheric pressure. The air pressure in the fork legs increases as the fork heats up, so the fork action will get stiffer as the vehicle operation progresses.

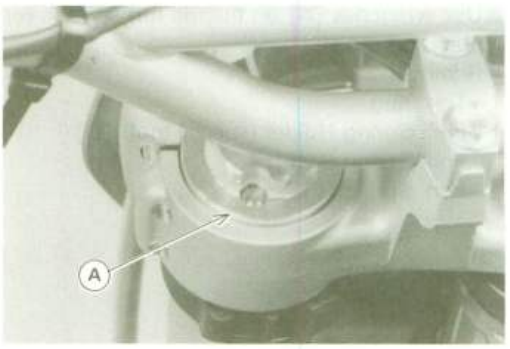
- Place the jack [A] under the frame so that the front wheel is off the ground.

Special Tool – Jack: 57001-1238



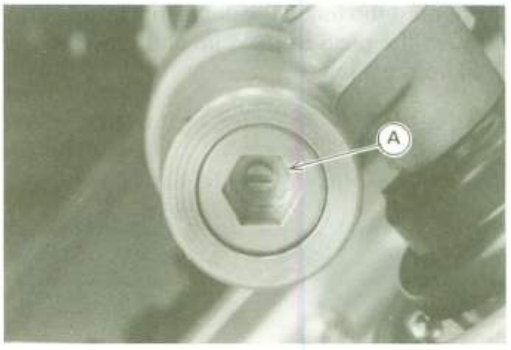
- Remove the screws [A] at the top of the front fork top plugs to let the air pressure equalize.
- Install the screws.

Torque – Front Fork Air Screws : 1.2 N-m (0.12 kg-m, 10 in-lb)



Compression Damping Adjustment (KLX650A)

- Clean the bottom of the fork tubes.
- Remove the caps on the bottom of the fork tubes.
- To adjust compression damping, turn the adjuster [A] on the front fork cylinder valve with the blade of a screwdriver until you feel a click.
- Adjust the compression damping to suit your preference under special conditions.



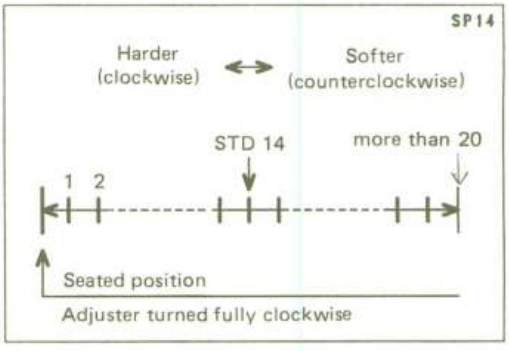
⚠WARNING

If both adjusters are not adjusted equally, handling may be impaired and a hazardous condition may result.

○ The standard adjuster setting for an average-build rider 68 kg (150 lb) is the **14th click** back from the 1st click of the fully clockwise position.

- Put the caps into the bottom of the fork tubes.

★ If the damper setting feels too soft or too stiff, adjust it in accordance with the table to the right.



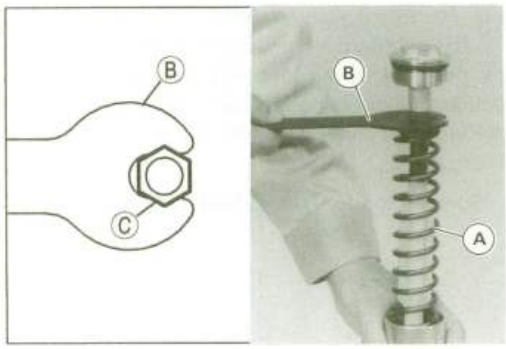
Fork Oil Change

- Loosen the fork top plug.
- Remove the front fork (see Front Fork Removal).
- Hold the inner tube in a vise.
- Unscrew the top plug out of the outer tube.
- Slowly compress the front fork fully.

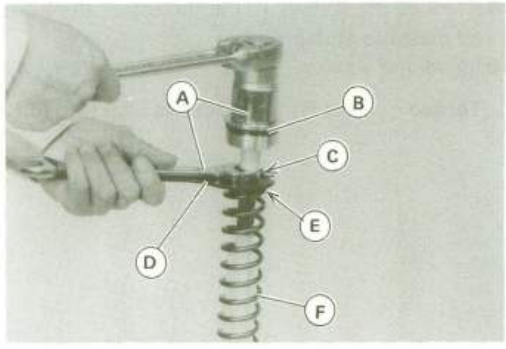
● Push down the fork spring [A] and insert the fork spring holder [B] under the push rod nut [C] as shown.

Special Tool – Fork Spring Holder: 57001-1286

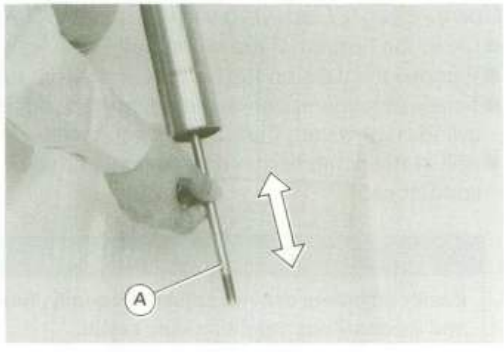
○ A person should push down the fork spring and another person should insert the fork spring holder.



● Use wrenches [A] on the rod nut and the top plug [B] to loosen the push rod nut [C].
● Remove:
Top Plug
Fork Spring Holder (special tool) [D]
Fork Spring Seat [E]
Fork Spring [F]



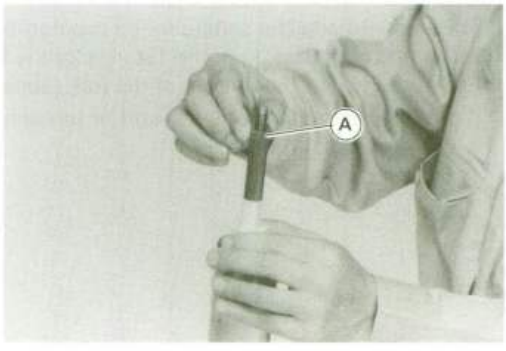
● Pour out the fork oil with the fork upside down.
○ Move the push rod [A] up and down at least ten times to expel the oil from the fork.



● Pull the piston rod up above the outer tube top.
● Tighten the rod nut [A] finger-tight.
● Hold the fork tube upright, press the outer tube and the push rod all the way down.

NOTE

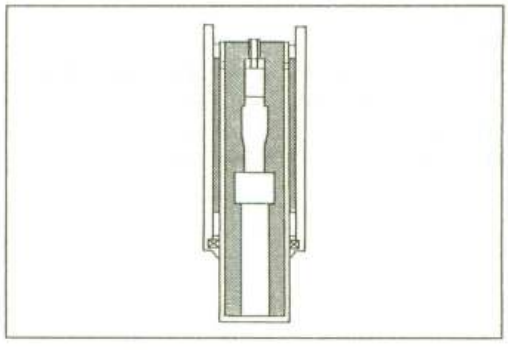
○ *Do not install the fork spring yet.*



● Fill the front fork to the top with the specified oil more than the specified amount.

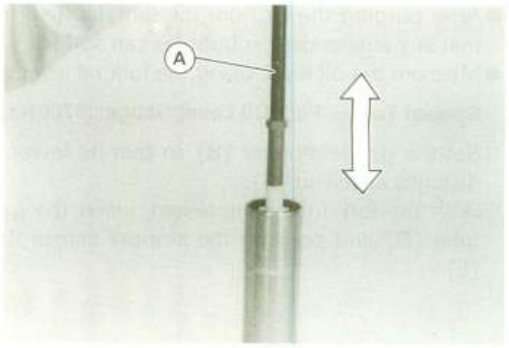
Fork Oil Viscosity:
KAYABA 01 or SAE5W

Fork Oil Capacity (when changing oil):
KLX650A : approx. 465 mL
KLX650C : approx. 459 mL

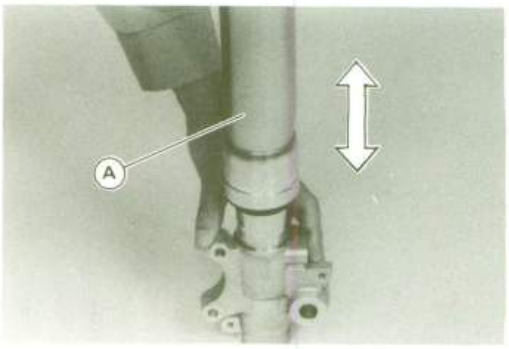


● Purge the air from the fork cylinder by gently moving the piston rod puller [A] up and down five times.

Special Tool – Fork Piston Rod Puller, M10 x 1.0: 57001-1298

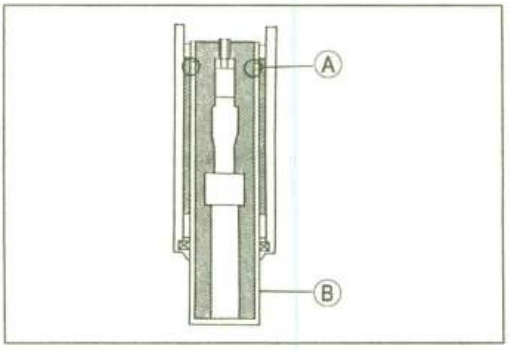


● Purge the air from between the inner and outer tubes by pumping the outer tube [A] up and down.



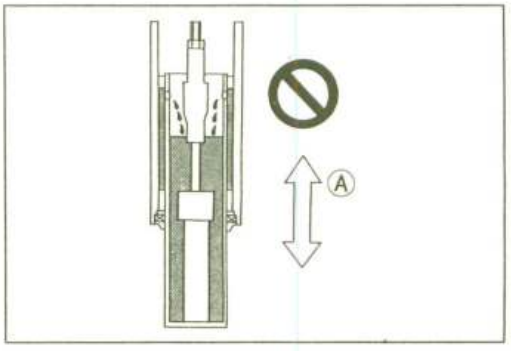
NOTE

○ *While doing this, take care to keep the oil level topped off so that it stays above the two large holes [A] near the top of the inner tube [B]*



CAUTION

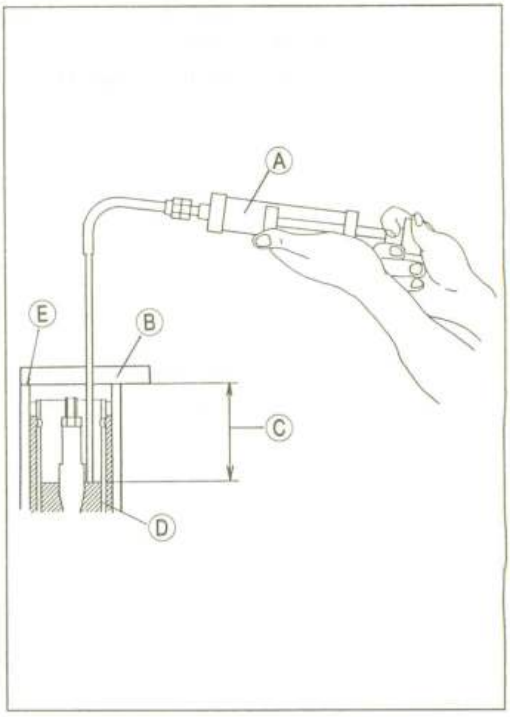
Never extend [A] the fork fully, since oil will be forced from between the tubes into the inner tube through the holes at the top of it. This raises the oil level in the inner tube. If the fork is extended to the full length of its normal travel, the oil level will be raised above 30 mm.



● After purging the air from the fork, let it sit for about five minutes so that any suspended air bubbles can surface.
● Measure the oil level, using the fork oil level gauge [A].

Special Tool – Fork Oil Level Gauge: 57001-1290

○ Set the gauge stopper [B] so that its lower side shows the oil level distance specified [C].
○ With the fork fully compressed, insert the gauge tube into the inner tube [D] and position the stopper across the top of the outer tube [E].



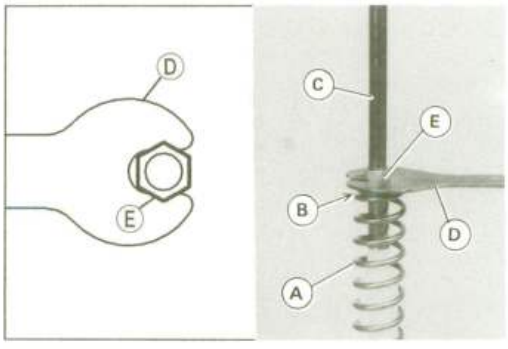
○ Pull the handle slowly to draw out the excess oil until no more oil comes up the tube.
★ If no oil is drawn out, there is not enough oil in the fork. Pour in some more oil, then draw out the excess.

Front Fork Oil Level (Fully compressed without fork spring)
KLX650A : 115 ± 2 mm
KLX650C : 105 ± 2 mm

● Pull the push rod up slowly with the fork piston rod puller (special tool) for the next procedure.
○ Pull up the push rod slowly so as not to spill the fork oil out of the fork tube.

● Install the fork spring [A] into the inner tube and then set the spring seat [B]. Either side of the fork spring may face up.
○ A person should push down the fork spring. Another person should pull up the fork piston rod puller [C] and insert the fork spring holder [D] under the push rod nut [E].

Special Tool – Fork Spring Holder: 57001-1286

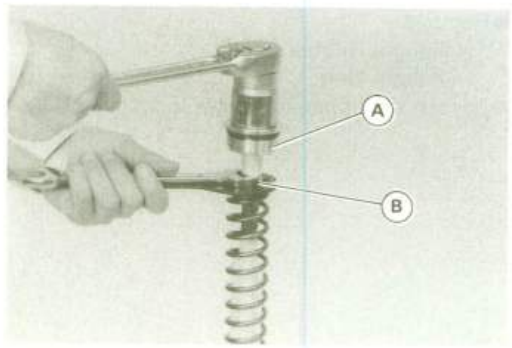


- Remove the fork piston rod puller (special tool).
- Check the O-ring on the top plug and replace it with a new one if damaged.
- Screw the top plug onto the push rod.
- Holding the top plug [A] with a wrench, tighten the push rod nut [B] against the top plug.

Torque – Push Rod Nut : 15 N-m (1.5 kg-m, 11.0 ft-lb)

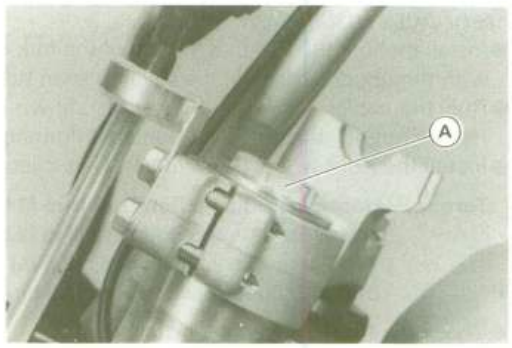
- Pull out the fork spring holder (special tool), raise the outer tube, and screw the top plug into the outer tube.
- Install the front fork (see Front Fork Installation).
- Tighten the top plug.

Torque – Fork Top Plug : 29 N-m (3.0 kg-m, 22 ft-lb)

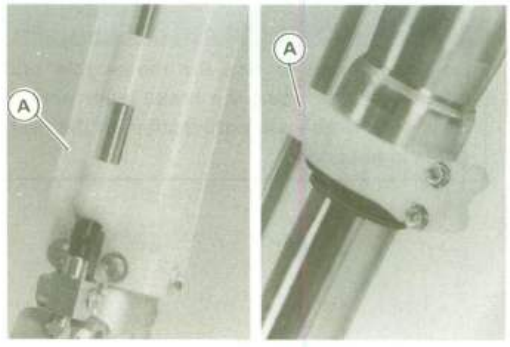


Front Fork Removal

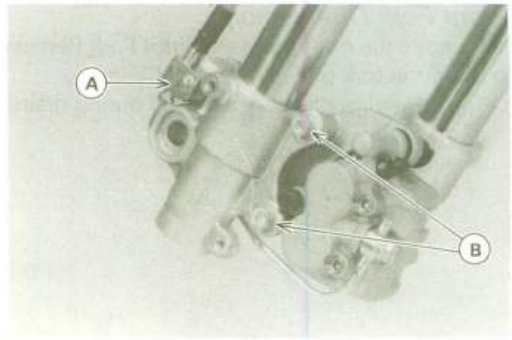
★If the fork leg is to be disassembled, loosen the fork top plug [A] beforehand. To loosen the fork top plug, remove the handlebar (see Steering chapter) and loosen the fork upper clamp bolts.



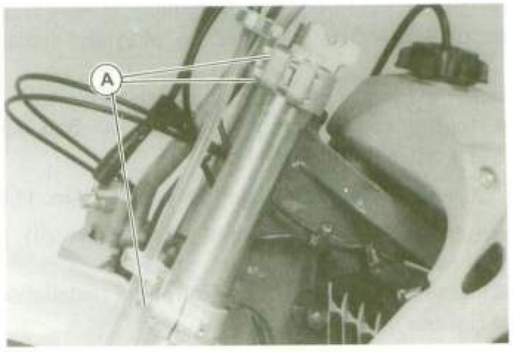
- Remove:
  Front Wheel (see Wheels/Tires chapter)
  Fork Protectors [A]



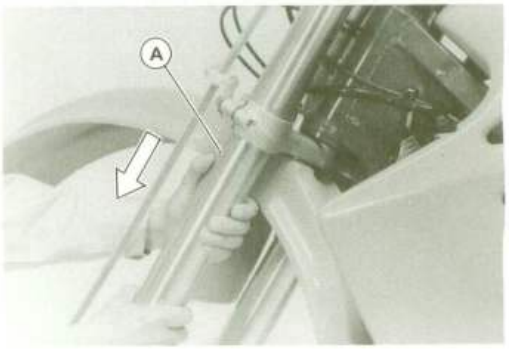
- Remove:
  Brake Hose Joint Bolt [A]
  Caliper Bolts [B]



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



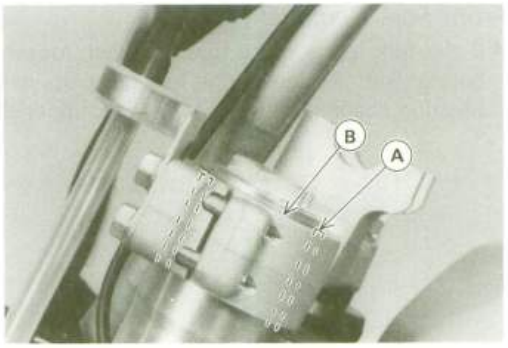
● With a twisting motion, work the fork leg [A] down and out.



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 Caliper Bolts : 25 N-m (2.5 kg-m, 18.0 ft-lb),



● Check the front brake after installation.

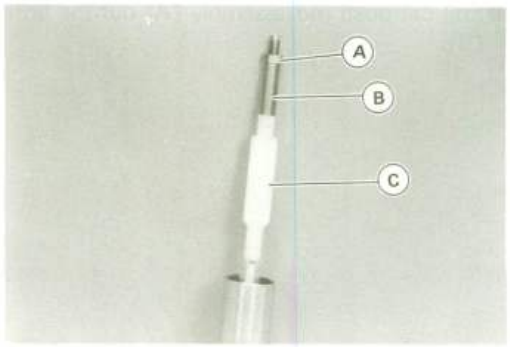
⚠WARNING

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

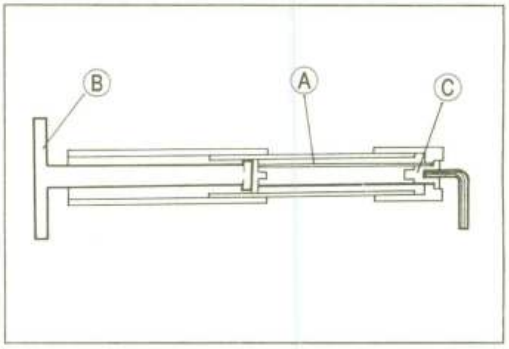
● Remove the front fork (see Front Fork Removal).
● Drain the fork oil (see Fork Oil Change).
○ The following parts are removed during draining the fork oil.
  Top Plug
  Fork Spring Seat
  Fork Spring

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

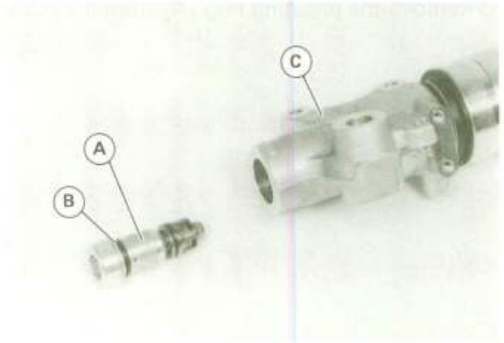


● Hold the front fork horizontally in a vise.
● Stop the cylinder unit [A] from turning by using the fork cylinder holder [B].
● Unscrew the cylinder valve assembly [C].

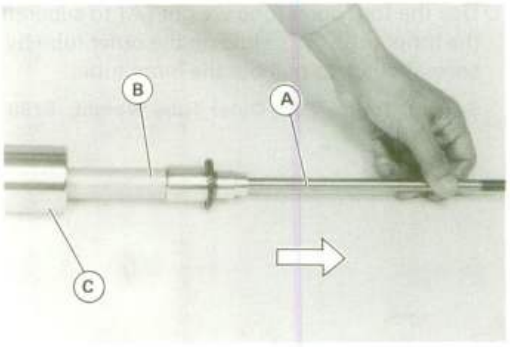
Special Tool – Fork Cylinder Holder: 57001-1287



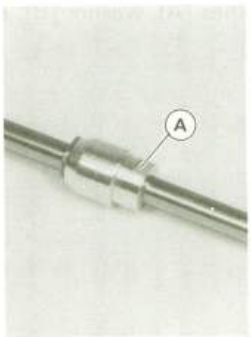
● Take the cylinder valve assembly [A] and gasket [B] out of the bottom of the inner tube [C].

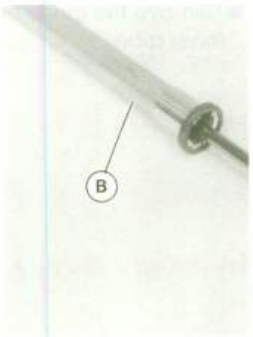


● Pull the push rod [A] and piston cylinder unit [B] out of the top of the outer tube [C].

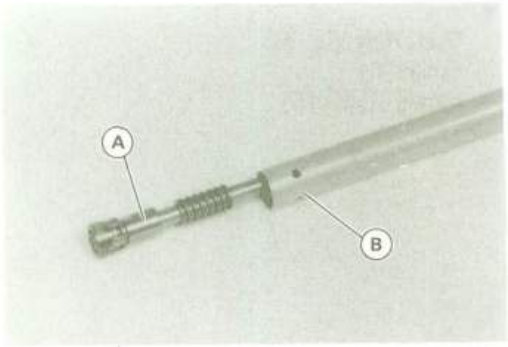


○ Do not unscrew the guide stay nut [A].
○ Do not disassemble the piston cylinder unit [B].

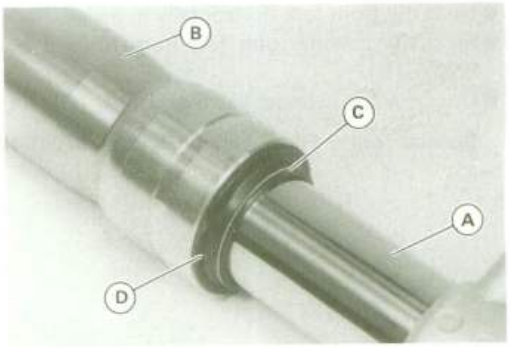




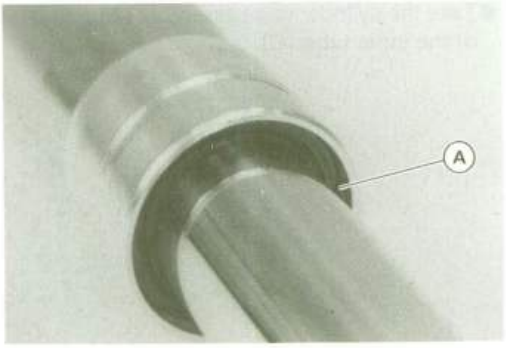
● Pull the push rod assembly [A] out the bottom of the inner cylinder [B].



● 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.

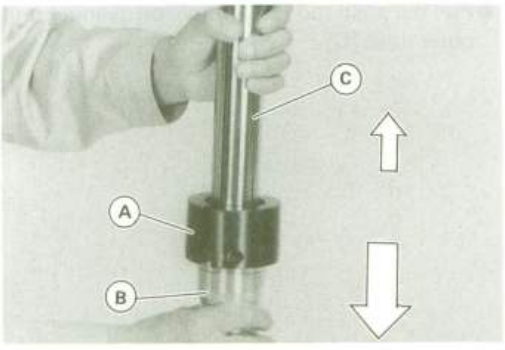


○ Remove the retaining ring [A] from the outer tube.

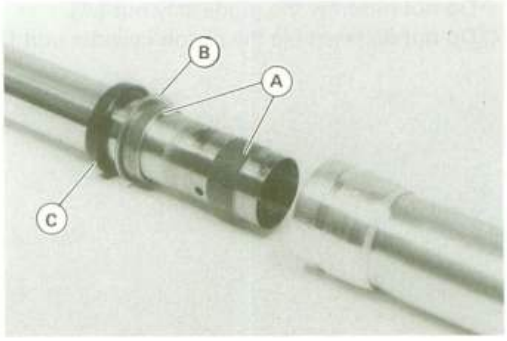


○ Use the fork outer tube weight [A] to separate the outer tube [B] from the inner tube [C]. Holding the outer tube by hand, pull the outer tube several times to pull out the inner tube.

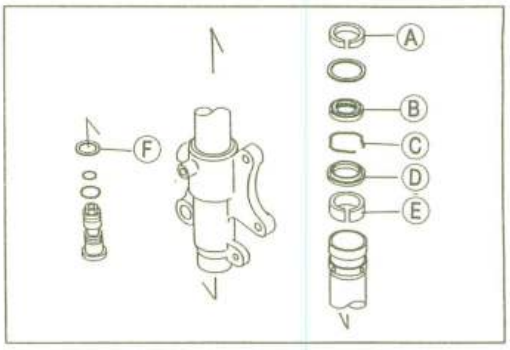
Special Tool – Fork Outer Tube Weight: 57001-1218



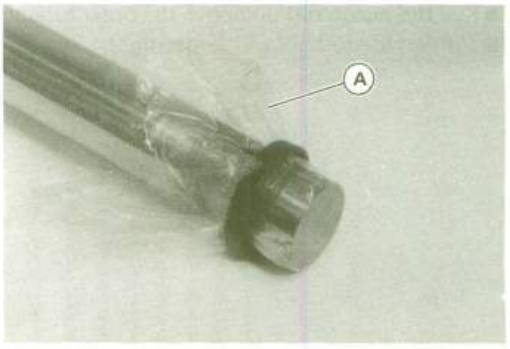
● Remove the guide bushes [A], washer [B], and oil seal [C] from the inner tube.



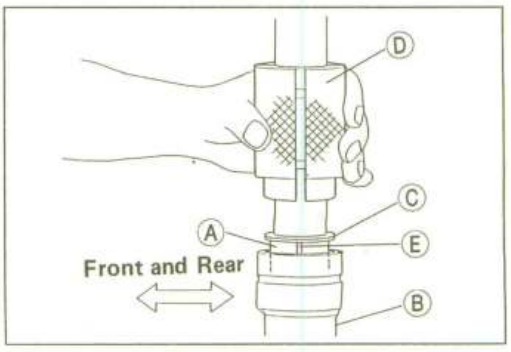
Front Fork Assembly



- 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.



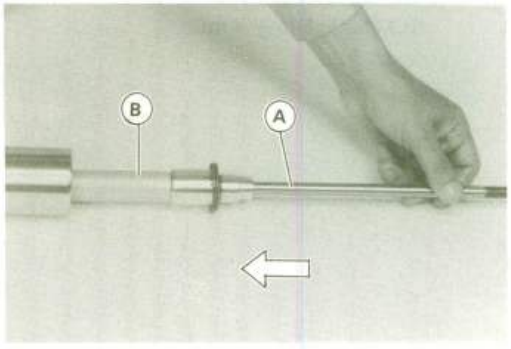
- When installing the new outer tube guide bush [A] into the outer tube [B], put the washer [C] on the guide bush, and tap the washer with the fork oil seal driver [D] until it stops.
- The split [E] of the bush must be faced toward the side of the vehicle.

Special Tool – Fork Oil Seal Driver, Φ43: 57001-1340

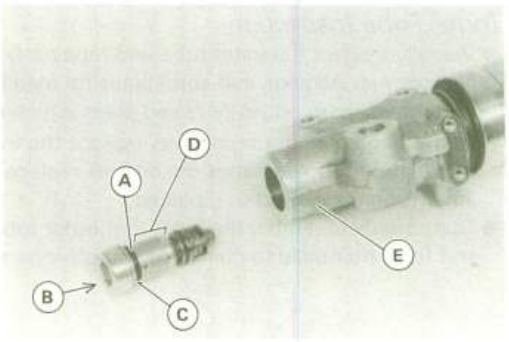
- Install the oil seal into the outer tube.

Special Tool – Fork Oil Seal Driver, Φ43: 57001-1340

- Install:
  Retaining Ring
  Dust Seal and Spring Band



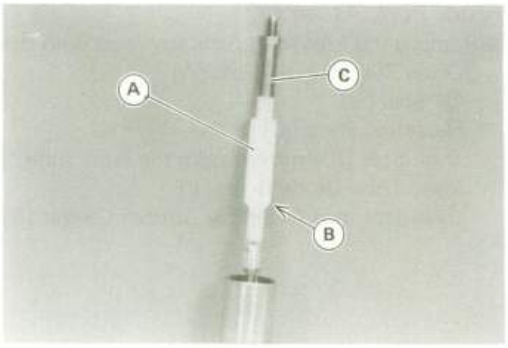
- Install the push rod [A] and the piston cylinder unit [B] in the inner tube.



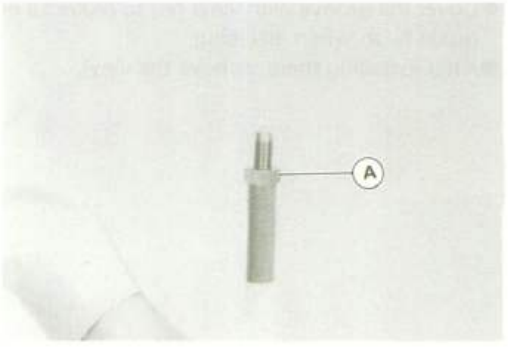
- Check the O-ring [A] on the cylinder valve assembly [B], and replace it with a new one if necessary.
- Replace the gasket [C] with a new one.
- Apply a non-permanent locking agent to the threads [D] of the cylinder valve assembly and screw the valve assembly into the bottom of the inner tube [E].
- 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)

● 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

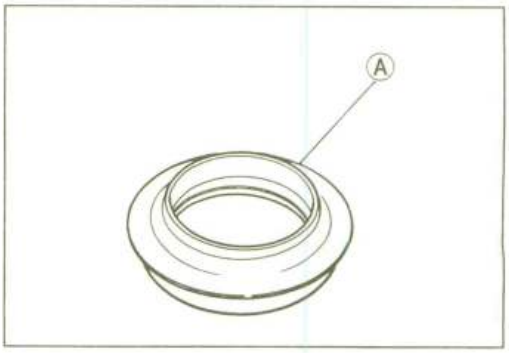
● Visually inspect the inner tube and repair any damage.
● Nick or rust damage can sometimes be repaired by using a wet-stone to remove sharp edges or raised areas which cause seal damage.
★ If the damage is not repairable, replace the inner tube. Since damage to the inner tube damages the oil seal, 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.

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.

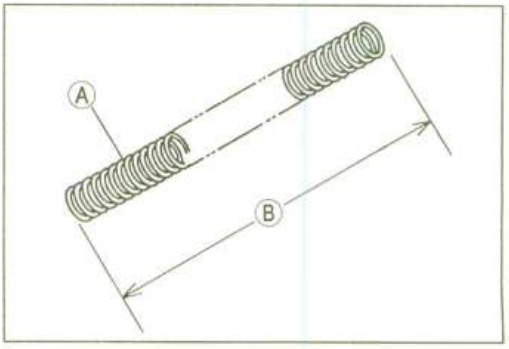
★ Replace it if necessary.



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

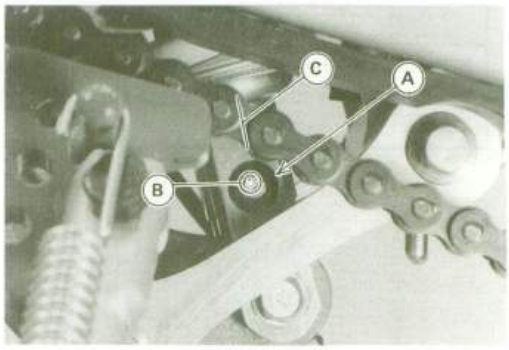
KLX650C:

Standard: 465.5 mm

Service Limit: 456 mm

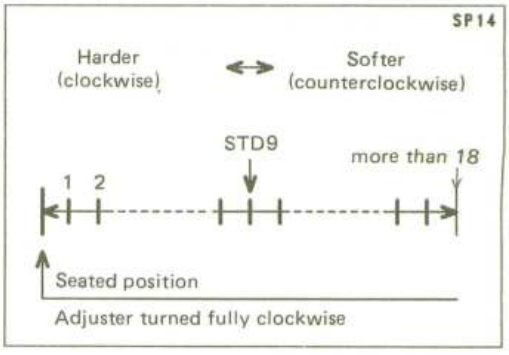
Rear Shock Absorber

Rebound Damping Adjustment (KLX650A)

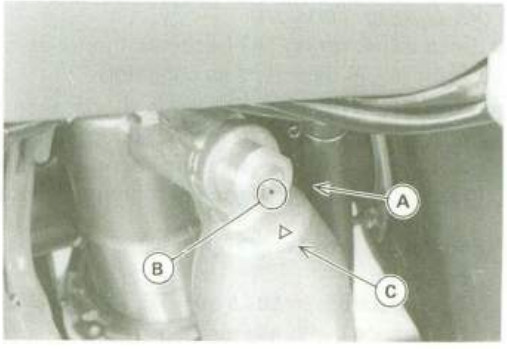


- ●Turn the rebound damping adjuster [A] the desired number of clicks.
- ○The standard adjuster setting for an average-build rider 68 kg (150 lb) is the **9th click** back from the 1st click of the fully clockwise position.
- ○The punch mark [B] should align with the middle line [C] of the shock as shown at the standard setting position.

★If the damper setting feels too soft or too stiff, adjust it in accordance with the table to the right.

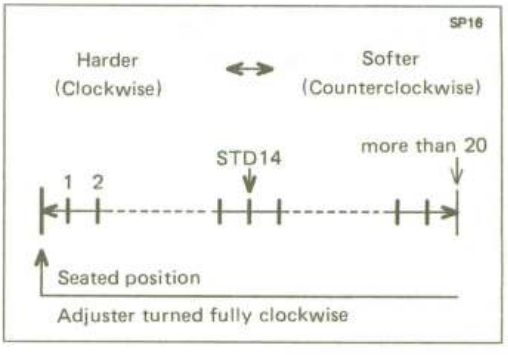


Compression Damping Adjustment (KLX650A)



- ●Turn the compression damping adjuster [A] on the gas reservoir until you feel a click.
- ○The standard adjuster setting for an average-build rider 68 kg (150 lb) is the **14th click** back from the 1st click of the fully clockwise position.
- ○The punch mark [B] should align with the triangular mark [C] at the standard setting position.

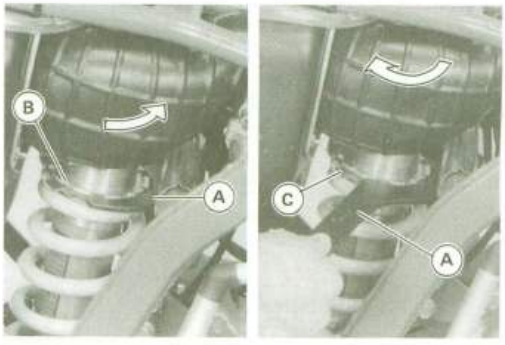
★If the damper setting feels too soft or too stiff, adjust it in accordance with the table to the right.



Spring Adjustment (KLX650A)

- ●Remove:
  - Side Covers (see Frame chapter)
  - Muffler (see Engine Top End chapter)
- ●Using the hook wrenches [A], loosen the locknut [B] and turn the adjusting nut [C] as required.

Special Tool – Hook Wrench: 57001-1101



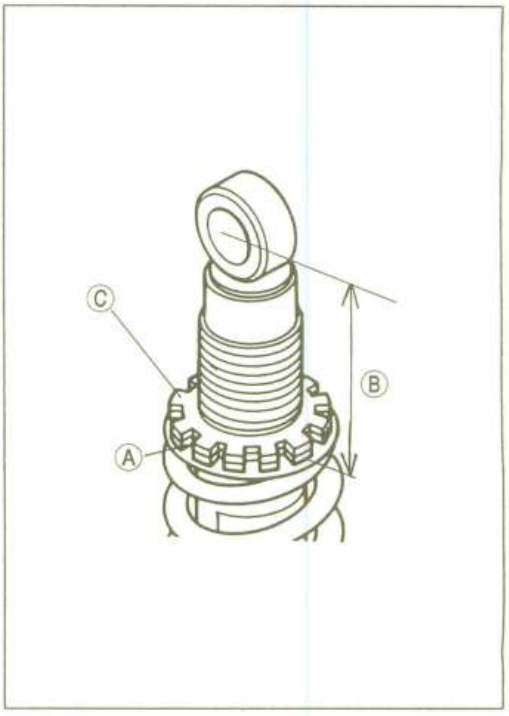
●Turning the adjusting nut [A] downward makes the spring action harder and upward softer.
●Measure the adjusting nut position shown and adjust the spring as follows.

Spring Preload Setting
Standard adjusting nut position [B] : 117.5 mm (4.65 in)
Nut adjusting range : 106 ~ 126 mm (4.16 ~ 4.95 in)
Standard spring preload : 1052 N (107.3 kg, 236 lb)
Preload change per turn of the nut : 109 N (11.1 kg, 24.5 lb)

NOTE

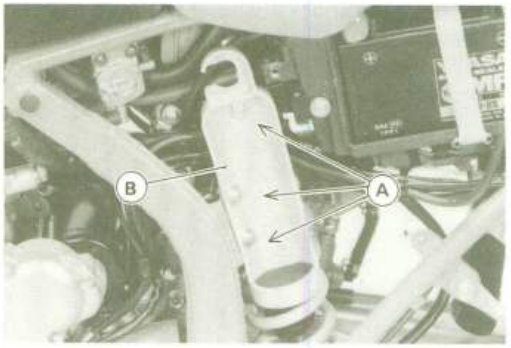
○*Adjusting nut position and nut adjusting range applies to the optional springs.*

●Tighten the locknut [C] securely.
●After adjustment, move the spring up and down to make sure that the spring is seated.
●Install the parts removed.



Spring Adjustment (KLX650C)

●Open the tool box by turning the key clockwise.
●Unscrew the bolts [A] and remove the tool box [B].



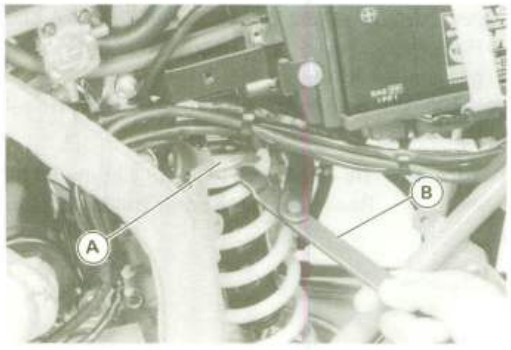
●Turn the adjuster sleeve [A] on the absorber to the desired position with the stem nut wrench [B].

Special Tool – Steering Stem Nut Wrench: 57001-1100

○The standard adjuster sleeve position is the **3rd step** from the weakest position for an average-build rider 68 kg (150 lb).
★If the spring action feels too soft or too stiff, adjust it in accordance with the table below.

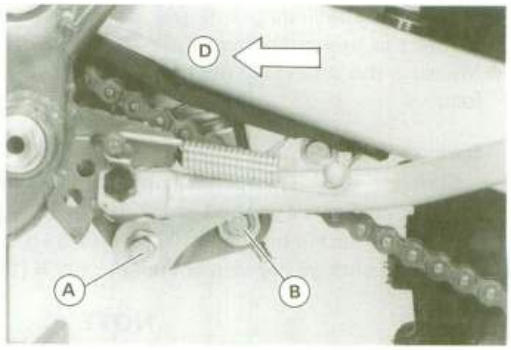
Spring Adjustment

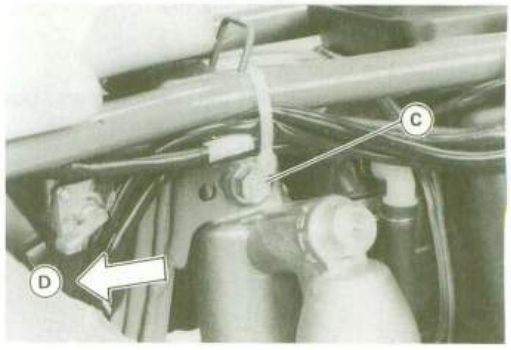
Adjuster Position	Spring Force	Setting	Load	Road	Speed
1 ↑ ↓ 5	Weak ↑ ↓ Strong	Soft ↑ ↓ Hard	Light ↑ ↓ Heavy	Good ↑ ↓ Bad	Low ↑ ↓ High



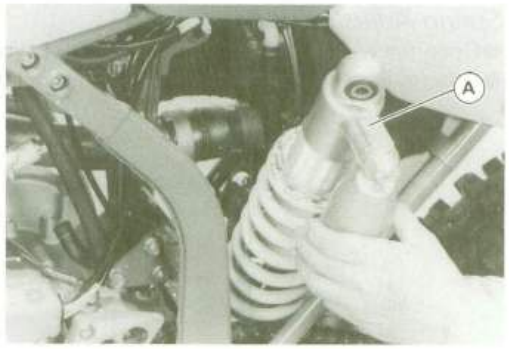
Rear Shock Absorber Removal (KLX650A)

- Using the jack (special tool), raise the rear wheel off the ground (see Wheels/Tires chapter).
- Remove:
  Lower Tie-rod Bolt [A]
  Lower Shock Absorber Bolt [B]
  Upper Shock Absorber Bolt [C]
  Front [D]
- Support the rocker arm to slide out the bolts.





- Remove the shock absorber [A] from the motorcycle left side.



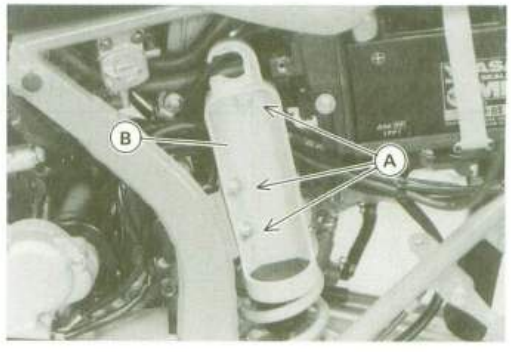
Rear Shock Absorber Installation (KLX650A)

- Pack the rocker arm needle bearings with molybdenum disulfide grease.
- Install the rear shock absorber so that the rebound damping adjuster faces left.

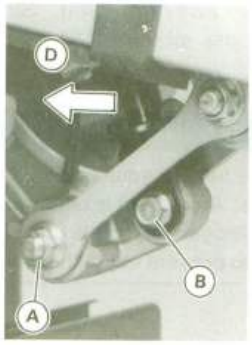
Torque – Tie-rod Nut : 81 N-m (8.3 kg-m, 60 ft-lb)
Rear Shock Absorber Bolts : 39 N-m (4.0 kg-m, 29 ft-lb)

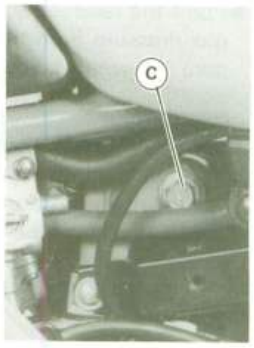
Rear Shock Absorber Removal (KLX650C)

- Open the tool box by turning the key clockwise.
- Unscrew the bolts [A] and remove the tool box [B].

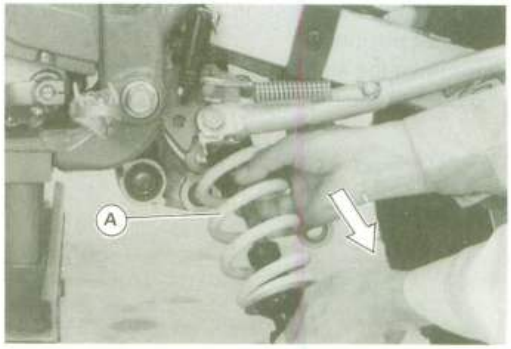


- Remove:
  Lower Tie-rod Bolt [A]
  Lower Shock Absorber Bolt [B]
  Upper Shock Absorber Bolt [C]
  Front [D]
- Support the rocker arm to slide out the bolts.





- Remove the shock absorber [A] from the motorcycle left side.



Rear Shock Absorber Installation (KLX650C)

- Pack the rocker arm needle bearings with molybdenum disulfide grease.
- Install the rear shock absorber so that the tapped hole of the lower bracket faces right.

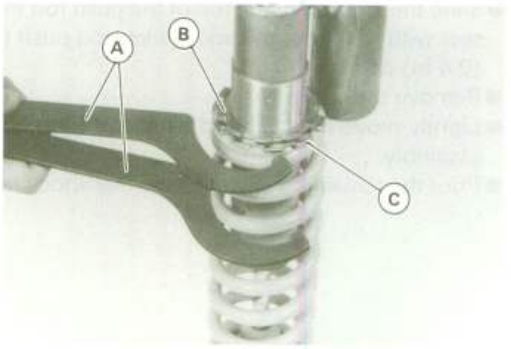
Torque – Tie-rod Nut : 81 N-m (8.3 kg-m, 60 ft-lb)
Rear Shock Absorber Bolts : 39 N-m (4.0 kg-m, 29 ft-lb)

Oil Draining (KLX650A)

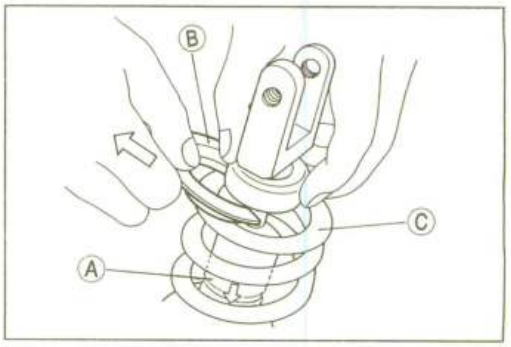
The oil should be changed in the rear shock absorber at least once per racing season. The frequency for best performance must be based upon riding conditions and rider ability.

- Remove the rear shock absorber from the frame (see Rear Shock Absorber Removal).
- Clean the threaded portion on the upper of the rear shock absorber.
- Hold the lower of the rear shock absorber with a vise.
- Using the hook wrenches [A], loosen the locknut [B] and turn the adjusting nut [C] all the way upward.

Special Tools – Hook Wrench: 57001-1101



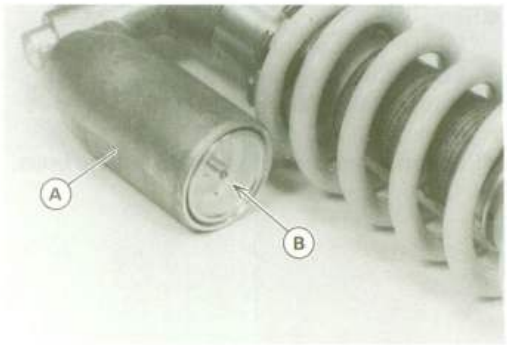
- Remove the rear shock absorber from the vise.
- Slide down the rubber bumper [A].
- Remove the spring guide [B] from the shock absorber and lift off the spring [C].



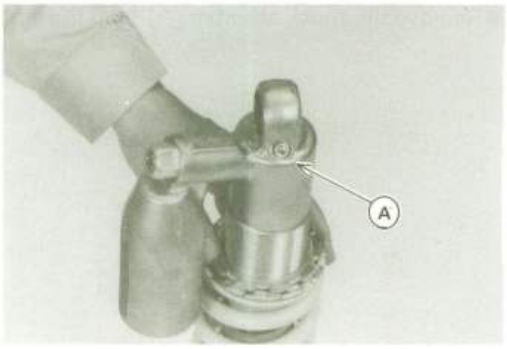
● Point the reservoir valve away from you. Slowly release the nitrogen gas pressure from the gas reservoir [A] by pushing down the valve core [B] with a screwdriver.

⚠WARNING

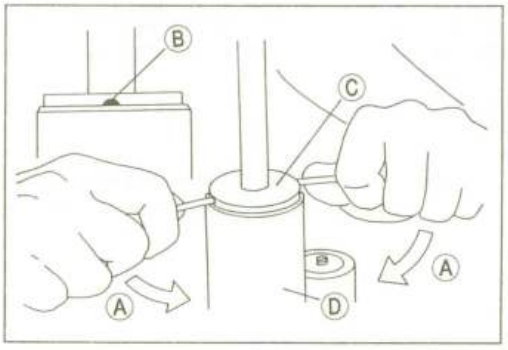
Do not point the valve toward your face or body when releasing the nitrogen gas pressure. An oil mist is often released with the nitrogen. Always release the nitrogen gas pressure before disassembling the rear shock absorber to prevent explosive separation of parts.



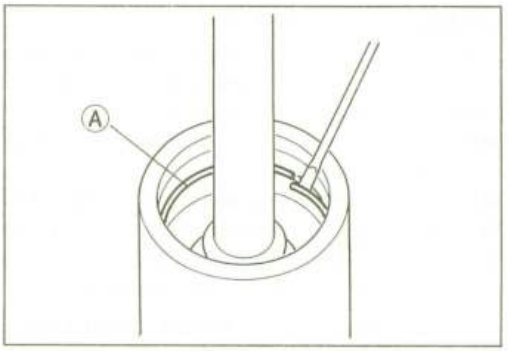
● Adjust the compression damping adjuster on the gas reservoir to the softest position.
● Remove the air bleeder bolt [A], and pump the rear shock to drain the oil out of the rear shock body.



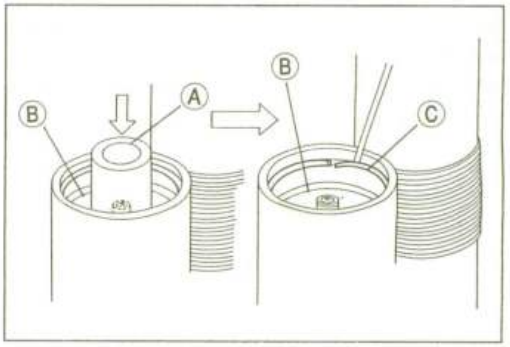
● Pry [A] at the gaps [B] in the stop [C] with suitable tools to free the stop from the rear shock body [D].



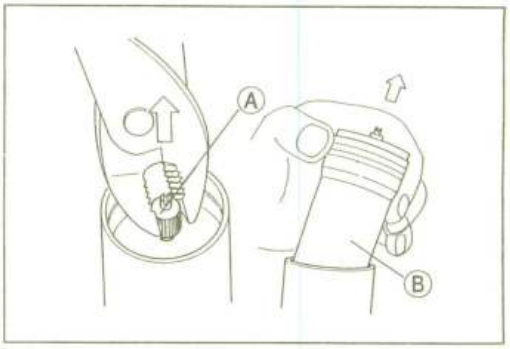
● Slide the stop up to the top of the push rod then lightly tap around the seal with a suitable rod and mallet, and push the seal assembly 10 mm (0.4 in) down.
● Remove the circlip [A].
● Lightly move the push rod back and forth, and pull out the push rod assembly.
● Pour the remaining oil out of the rear shock body.



● Using a suitable tool (collar or nut) [A] and a press, push the reservoir cap [B] in 10 mm.
● Remove the circlip [C] from the gas reservoir.



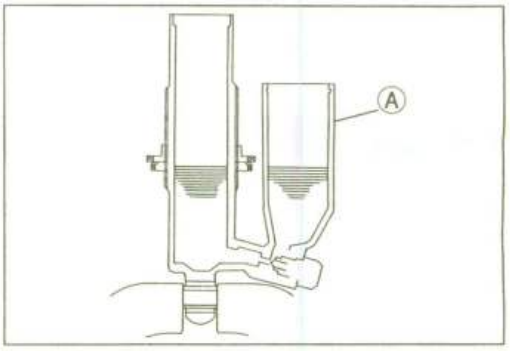
● Install a steel tire valve cap [A] on the gas reservoir valve and pull the gas reservoir cap out of the gas reservoir using pliers.
○ The bladder [B] comes out with the gas reservoir cap.



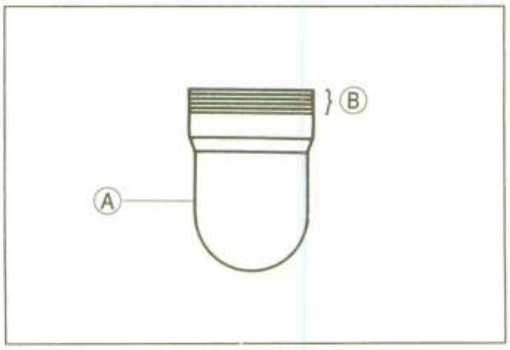
Oil Filling (KLX650A)

● Pour **KYB K2-C (SAE5W or Bel-Ray SE2 #40)** oil into the gas reservoir [A] half full.

Oil Capacity (Total amount) : 305 mL



● Check that the bladder [A] on the gas reservoir cap is not partially collapsed.
● If it is, push down the valve core with a screwdriver.
● Check the bladder for signs of damage or cracks. If necessary, replace it with a new one.



CAUTION
Do not use a damaged or partially collapsed bladder, because it may burst, gently reducing rear shock performance.

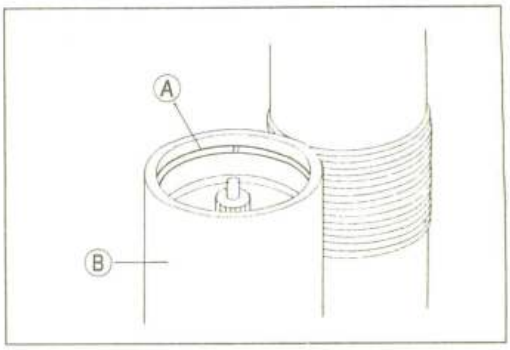
● Apply grease to the lip [B] of the bladder.
● Push the bladder and gas reservoir cap into the gas reservoir slowly until it just clears the circlip groove. Wipe out any spilled oil.

CAUTION
Ensure that no air remains in the system.

● Check the circlip for weakening, deformity and flaws. If necessary, replace it with a new one.

⚠WARNING
If weakened, deformed or flawed circlip is used, the gas reservoir cap may not hold when injecting the nitrogen gas. This would allow oil and internal parts to explode out of the reservoir.

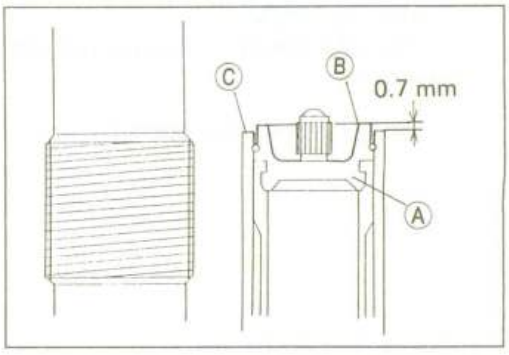
● Fit the circlip [A] in the groove in the gas reservoir [B].



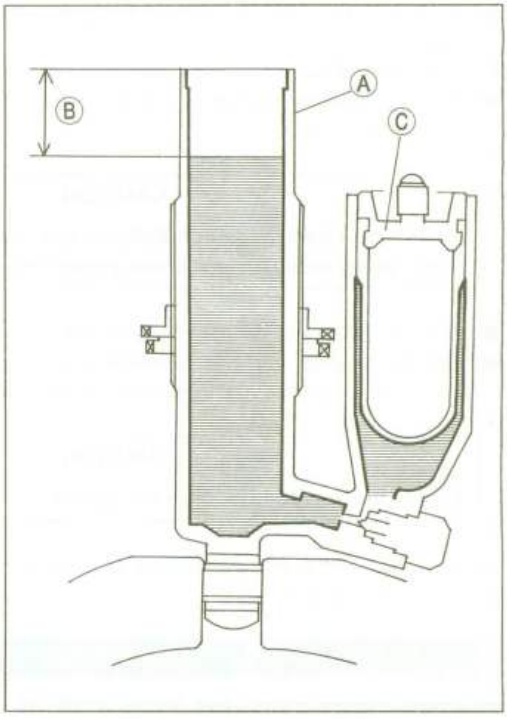
● Pull up the gas reservoir cap [A] against the circlip. The end [B] of the gas reservoir cap must be 0.7 mm upper than the end [C] of the gas reservoir.

⚠WARNING

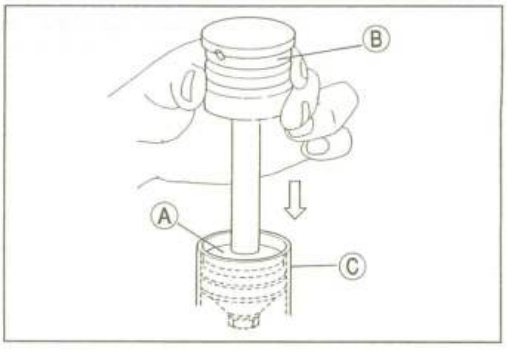
If the end of the gas reservoir cap is not 0.7 mm upper than the end of the gas reservoir, the circlip is not correctly fitted in the groove in the gas reservoir or is deformed. In this case, the oil and internal parts could explode out of the reservoir when injecting the nitrogen gas or while riding the motorcycle.



● Check the O-ring on the air bleeder bolt and replace it if necessary.
● Install the air bleeder bolt.
● Pour the rest of **KYB K2-C (SAE 5W or Bel-Ray SE2 #40)** oil into the rear shock body.
○ The oil level should be **50 ~ 54 mm** from the shock body lower end.
Rear Shock Body Lower End [A]
50 ~ 54 mm [B]
Gas Reservoir [C]



● Insert the piston end [A] of the push rod assembly into the rear shock body slowly. Do not insert the seal assembly [B] yet. Pump the push rod until all the air is forced out of the rear shock body [C].

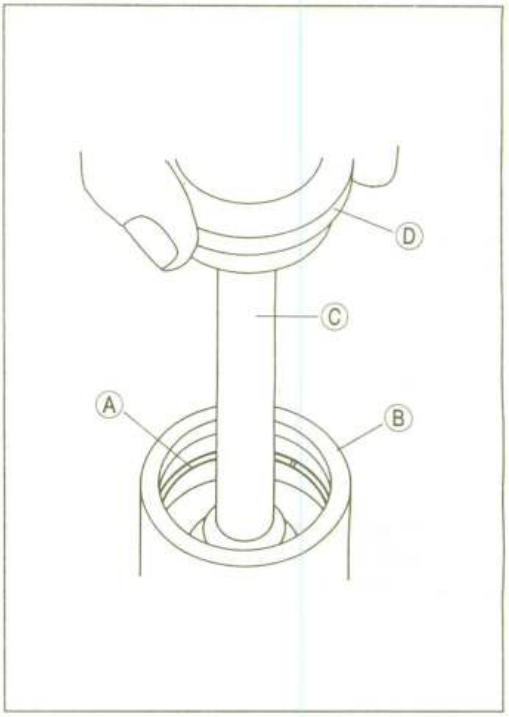


- Push the seal assembly into the rear shock body until it just clears the circlip groove.
- Check the circlip. If it is deformed or damaged, replace it with a new one.
- Fit the circlip [A] into the groove in the rear shock body [B].

⚠WARNING

If the circlip is not a certain fit in the groove in the rear shock body, the push rod assembly may come out of the shock absorber when injecting the nitrogen gas or riding the motorcycle.

- Pull up the push rod assembly [C] against the circlip [A].
- Force the stop [D] into the rear shock body by lightly tapping around the edge of the stop with a mallet.



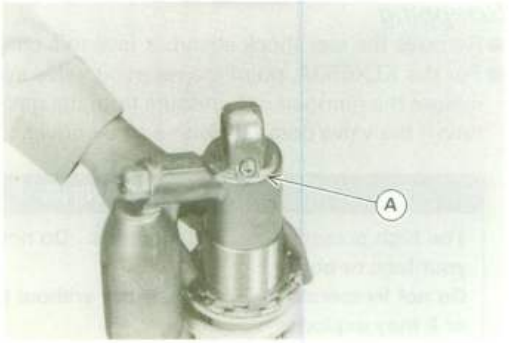
- Hold the lower end of the push rod assembly with a vise.
- Pump the rear shock up and down several times, and then leave it in the fully extended position for about three minutes.
- Remove the air bleeder bolt [A] from the upper part of the rear shock body.

★If oil comes out of the air bleeder bolt hole, let it overflow until it stops.

★If oil does not come out of the air bleeder bolt hole, add the specified oil into the air bleeder bolt hole until it overflows (that is, until all the remaining air is forced out).

- Install the air bleeder bolt securely.
- Fully extend the push rod assembly.
- Inject nitrogen gas to a pressure of **50 kPa (0.5 kg/cm², 7 psi)** through the valve on the gas reservoir.
- Check the rear shock body and gas reservoir for oil and gas leaks.

★If there are no leaks, inject the nitrogen gas up to **980 kPa (10 kg/cm², 142 psi).**



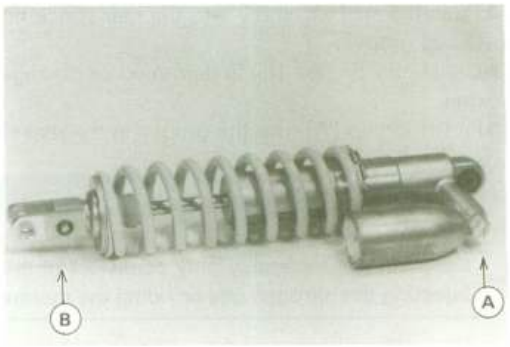
⚠WARNING

Pressurize the gas reservoir with nitrogen gas only. Do not use air or other gases, since they may cause premature wear, rust, fire hazard, or substandard performance.
High pressure gas is dangerous. Have a qualified mechanic perform this procedure.

NOTE

○*Check and adjust the gas pressure when the gas reservoir is cold (room temperature).*

● Install the spring and spring guide.
○ Both damping adjusters must be on the same side.
Compression Damping Adjuster [A]
Rebound Damping Adjuster [B]
● Adjust the following (see this chapter).
Spring Preload
Compression Damping Adjuster
Rebound Damping Adjuster
● Install the rear shock absorber (see this chapter).



Spring Tension (KLX650A)

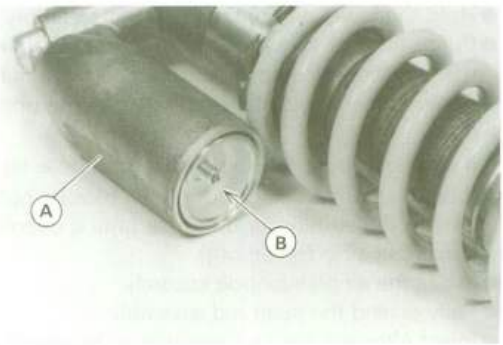
Since a spring becomes shorter as it weakens, check its free length to determine the condition.

★ If the springs is shorter than the service limit, it must be replaced.

Rear Shock Absorber Spring Length
Standard: 255 mm
Service Limit: 250 mm

Scrapping

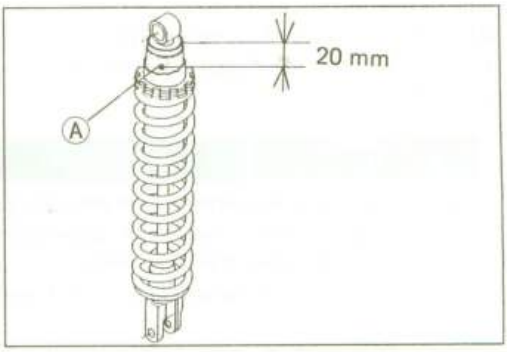
● Remove the rear shock absorber (see this chapter).
● For the KLX650A, point the reservoir valve away from you and slowly release the nitrogen gas pressure from the gas reservoir [A] by pushing down the valve core [B] with a screwdriver.



⚠WARNING

The high pressure gas is dangerous. Do not point the valve toward your face or body.
Do not incinerate a shock absorber without first removing the valve or it may explode.

● For the KLX650C, before a rear shock absorber is scrapped, drill a hole [A] at a point about **20 mm** down from the top of the cylinder to release the nitrogen gas completely.



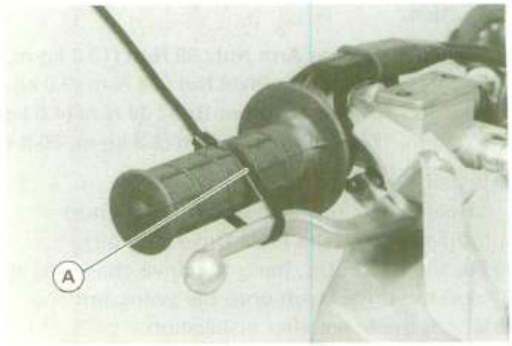
⚠WARNING

Since the rear shock absorber contains nitrogen gas, do not incinerate the rear shock absorber without first releasing the gas or it may explode.
Wear safety glasses when drilling the hole, as the gas may blow out bits of drilled metal when the hole opens.
To release the gas gradually, first drill a smaller hole, then enlarge the hole.

Swingarm

Swingarm Removal

● Squeeze the brake lever slowly and hold it with a band [A].



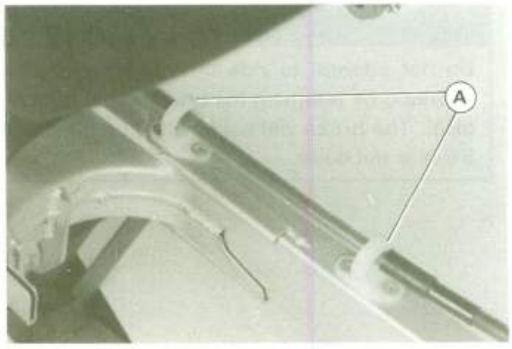
CAUTION

Be sure to hold the front brake when removing the swingarm or the motorcycle may fall over. The motorcycle could be damaged.

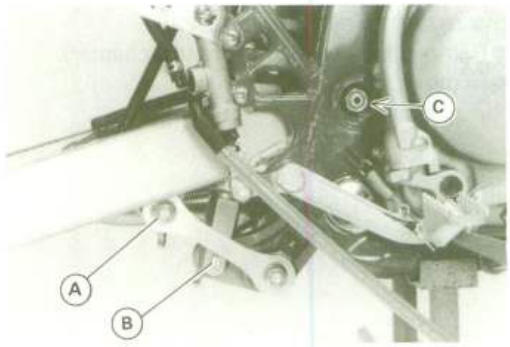
⚠WARNING

Be sure to hold the front brake when removing the swingarm, or the motorcycle may fall over. It could cause an accident and injury.

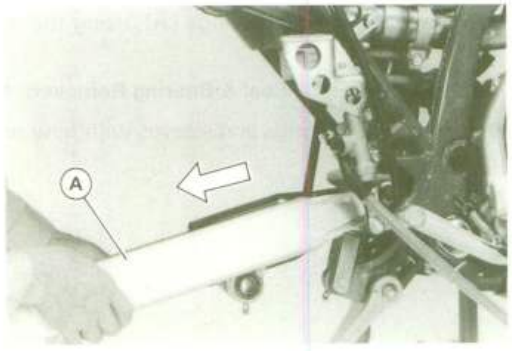
● Remove the rear brake hose holders [A].



● Remove
Upper Tie-rod Bolt [A]
Rear Shock Lower Bolt [B]
Swingarm Pivot Nut [C]
Chain Guide
Mud Flap
Rear Wheel (see Wheels/Tires chapter)



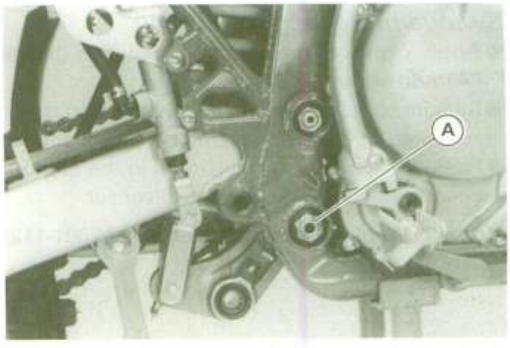
● Pull out the swingarm pivot shaft and remove the swingarm [A] rearward.



Swingarm Installation

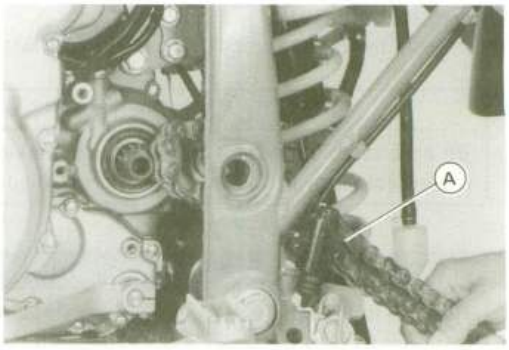
● Apply plenty of molybdenum disulfide grease to the inside of the needle bearings and sleeve.

★ If the swingarm is difficult to install, remove the brake pedal and loosen the rocker arm nut [A].



● Tighten:

Torque – Rocker Arm Nut : 98 N-m (10.0 kg-m, 72 ft-lb)
Swingarm Pivot Nut : 88 N-m (9.0 kg-m, 65 ft-lb)
Shock Absorber Bolt : 39 N-m (4.0 kg-m, 29 ft-lb)
Tie-rod Nut : 81 N-m (8.3 kg-m, 60 ft-lb)



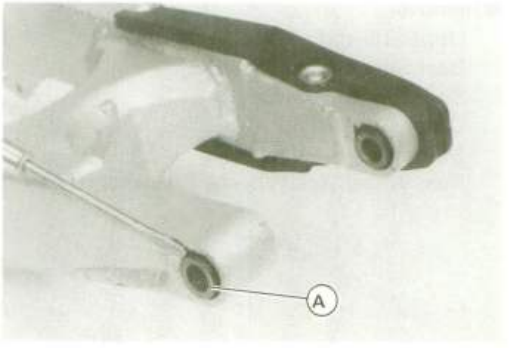
● Install:
Rear Wheel (see Wheels/Tires chapter)
Drive Chain (see Final Drive chapter)
○ For the KLX650C, hang the drive chain [A] over the output shaft and loop the drive chain onto the swingarm.
● Check the brake after installation.

⚠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.

Swingarm Bearing Removal

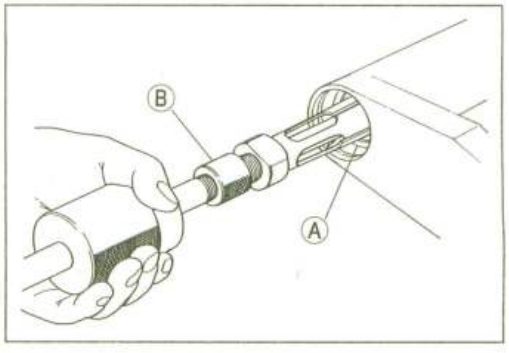
● Remove the swingarm (see this chapter).
● Remove the grease seals [A].



● Remove the needle bearings [A], using the oil seal & bearing remover [B].

Special Tool – Oil Seal & Bearing Remover: 57001-1058

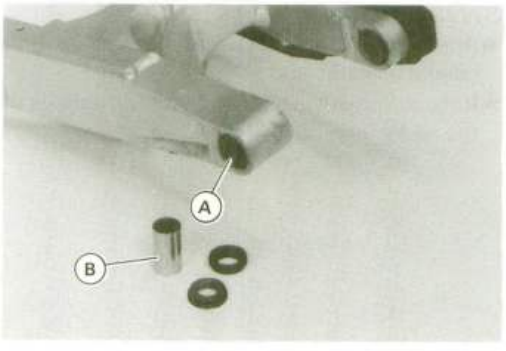
● Replace the bearings and sleeves with new ones.



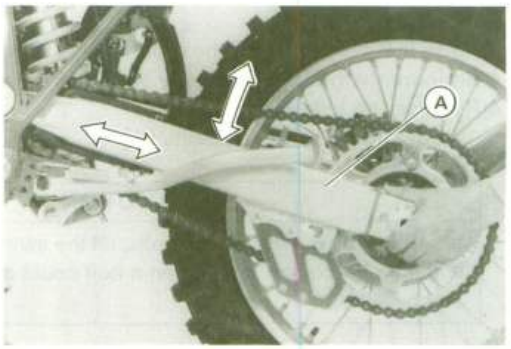
Swingarm Bearing Installation

● Apply plenty of molybdenum disulfide grease to new needle bearings [A] and sleeve [B].
● Be sure to install the needle bearings so that the manufacturer's marks are faced out. This prevents bearing damage.
● Position the bearings as shown in the Exploded View, using a suitable bearing driver in the bearing driver set.

Special Tool – Bearing Driver Set: 57001-1129



Swingarm Pivot Check (KLX650A)



- Check the pivot of the swingarm and uni-trak link (tie-rod and rocker arm) for wear periodically, or whenever excessive play is suspected.
- Raise the rear wheel off the ground (see Wheels/Tires chapter).
- Move the swingarm [A] up and down to check for abnormal friction, and push and pull it to check for bearing play.
- A small amount of play on the pivot is normal and no corrective action is needed. However, if excessive play is felt, check the swingarm and uni-trak link bearings for wear and replace them if necessary.

⚠WARNING

Installation of new bearing(s) in the swingarm and uni-trak link may cause too stiff rear suspension. Test ride the motorcycle slowly and prudently until the suspension becomes normal.

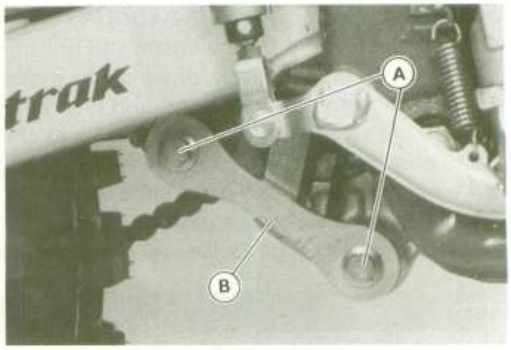
Swingarm Bearing, Sleeve Inspection

- The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing in the swingarm for abrasion, color change, or other damage.

★If there is any doubt as to the condition of any of the needle bearings or sleeves, replace all the sleeves, and needle bearings as a set.

Tie-Rod, Rocker Arm

Tie-Rod Removal



- Raise the rear wheel off the ground (see Wheels/Tires chapter).
- Squeeze the brake lever slowly and hold it with a band.
- Remove the following.
  Front and Rear Tie-rod Bolts [A]

CAUTION

When pulling out the tie-rod bolts, lift the swingarm or the rocker arm slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.

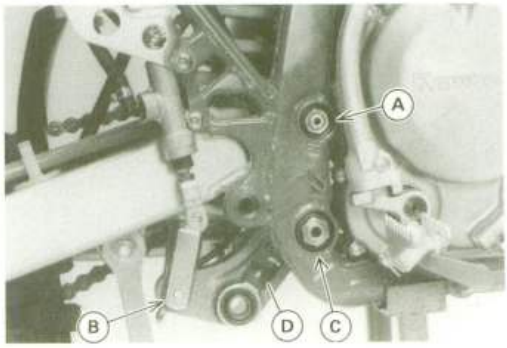
- Remove the tie-rods [B]

Tie-Rod Installation

- Apply plenty of molybdenum disulfide grease to the inside of needle bearings and sleeves.
  Rocker Arm Needle Bearings
  Tie-rod Needle Bearings
- Install the tie-rod bolts from the left side.

Torque – Tie-rod Nuts : 81 N-m (8.3 kg-m, 60 ft-lb)

Rocker Arm Removal



- Raise the rear wheel off the ground (see Wheels/Tires chapter).
- Squeeze the brake lever slowly and hold it with a band.
- Remove:
  Brake Pedal (see Brakes chapter)
  Tie-rod (see this chapter)
  Swingarm Pivot Nut [A]
  Rear Shock Bolt [B]
  Rocker Arm Bolt [C]

CAUTION

Remove the swingarm pivot nut for easy removal of the rocker arm bolt. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearings.

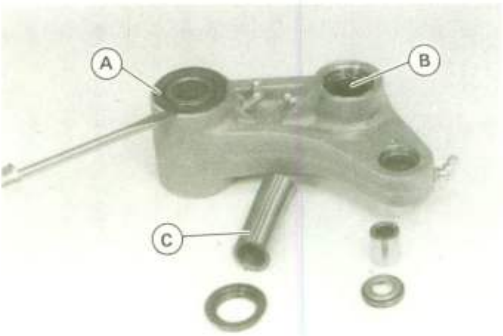
- Remove the rocker arm [D].

Rocker Arm Installation

● Apply plenty of molybdenum disulfide grease to the inside of needle bearings and sleeves.
  Rocker Arm Needle Bearings
  Tie-rod Needle Bearings

Torque – Rocker Arm Nut : 98 N-m (10.0 kg-m, 72 ft-lb)
Swingarm Pivot Nut : 88 N-m (9.0 kg-m, 65 ft-lb)
Rear Shock Absorber Bolt : 39 N-m (4.0 kg-m, 29 ft-lb)
Tie-rod Nuts : 81 N-m (8.3 kg-m, 60 ft-lb)

Rocker Arm/Tie-Rod Bearing Removal



● Remove the rocker arm for the rocker arm bearing removal (see this chapter).
● Remove the swingarm for the tie-rod bearing removal (see this chapter).
● Remove the grease seals [A].
● Remove the needle bearing [B] using a suitable bearing driver in the bearing driver set.

Special Tool – Bearing Driver Set: 57001-1129

● Replace the bearings and sleeves [C] with new ones.

Rocker Arm/Tie-Rod Bearing Installation

● Apply plenty of molybdenum disulfide grease to the inside of new needle bearings and sleeves.
● Be sure to install the needle bearings so that the manufacturer's marks are faced out. This prevents bearing damage.
○ Position the bearings as shown in the Exploded View, using a suitable bearing driver in the bearing driver set (special tool).

Special Tool – Bearing Driver Set: 57001-1129

Uni-Trak Link Pivot Check (KLX650A)

● Check the pivot of the swingarm and uni-trak link (tie-rod and rocker arm) for wear periodically, or whenever excessive play is suspected (see Swingarm Pivot Check).
● A small amount of play on the pivot is normal and no corrective action is needed. However, if excessive play is felt, check the swingarm, and uni-trak link bearings for wear, and replace them if necessary (see this chapter).

Rocker Arm/Tie-Rod Bearing Inspection

● The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing installed for abrasion, color change, or other damage.
★ If there is any doubt as to the condition of any of the needle bearings, replace all the sleeves, and needle bearings as a set.

Rocker Arm/Tie-Rod Sleeve Inspection

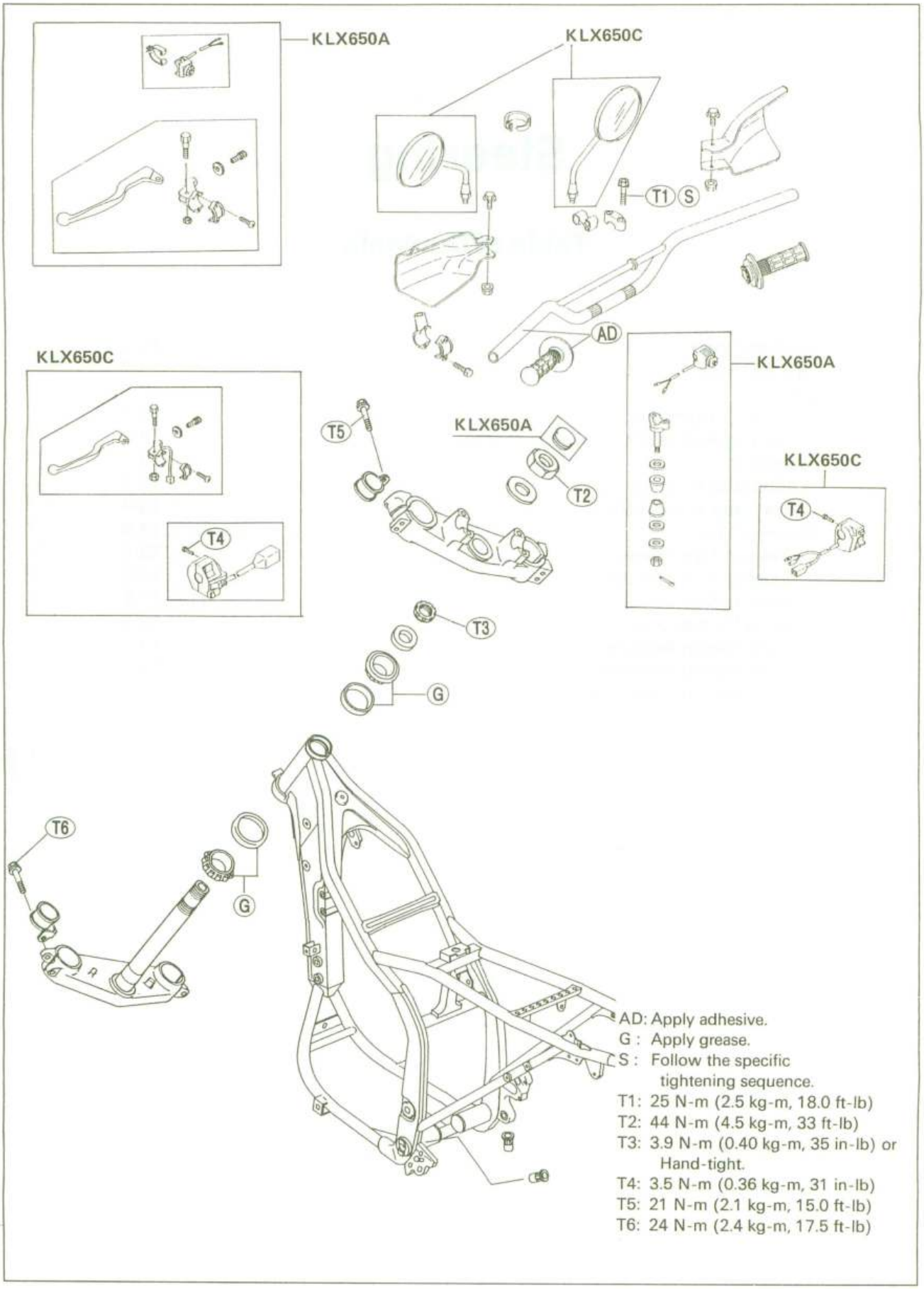
★If there is visible damage, replace the sleeves and all the needle bearings as a set.

Steering

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Exploded View

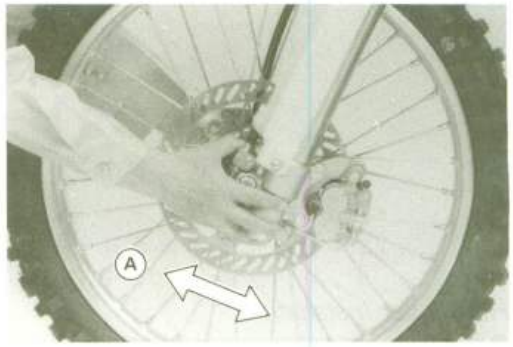


Specifications

Special Tools – Jack: 57001-1238
Steering Stem Nut Wrench: 57001-1100
Head Pipe Outer Race Remover: 57001-1107
Head Pipe Outer Race Press Shaft: 57001-1075
Head Pipe Outer Race Driver: 57001-1106
Head Pipe Outer Race Driver: 57001-1077
Steering Stem Bearing Driver: 57001-137
Steering Stem Bearing Driver Adapter: 57001-1074

Steering

Steering Inspection



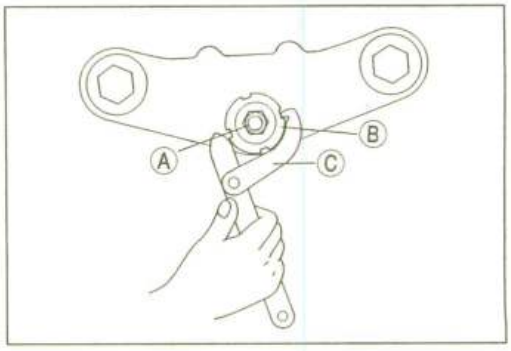
- Raise the front wheel off the ground.

Special Tool – Jack: 57001-1238

- With the front wheel pointing straight ahead, alternately nudge each end of the handlebar. The front wheel should swing fully left and right from the force of gravity until the fork hits the stop.
- ★If the steering binds or catches before the stop, check the routing of the cables, hoses, and harnesses.
- ★If the steering feels tight, adjust or lubricate the steering.
- Feel for steering looseness by pushing and pulling the fork [A].
- ★If you feel looseness, adjust the steering.

Steering Adjustment

- Remove:
  Fuel Tank (see Fuel System chapter)
  Front Fork Lower Clamp Bolts (loosen)
  Handlebar (place on one side with cables, harnesses and hoses installed)



- Loosen the steering stem head nut [A].
- With the front wheel raised off the ground, adjust the steering by turning the steering stem nut [B].
- ★If the steering is too tight, loosen the stem nut a fraction of a turn. If the steering is too loose, tighten the nut a fraction of a turn.

Torque – Steering Stem Nut : 3.9 N-m (0.40 kg-m, 35 in-lb)

Special Tool – Jack: 57001-1238
Steering Stem Nut Wrench: 57001-1100 [C]

NOTE

○*Turn the stem nut 1/8 turn at a time maximum.*

- Check the steering again.
- ★If the steering is still too tight or too loose in spite of correct adjustment, inspect the steering stem parts.
- Install the parts removed.
  Handlebar (see this chapter)

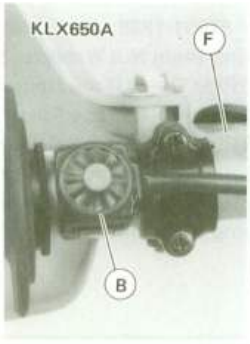
Torque – Steering Stem Head Nut : 44 N-m (4.5 kg-m, 33 ft-lb)
Front Fork Lower Clamp Bolts : 25 N-m (2.5 kg-m, 18.0 ft-lb)

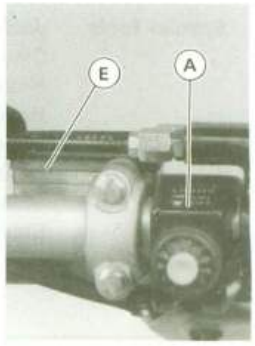
- Adjust the headlight beam on vertical direction (see Electrical System chapter).

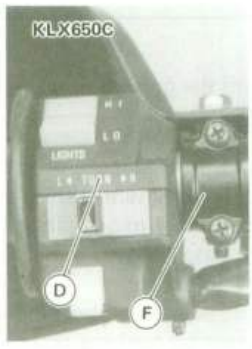
Handlebar

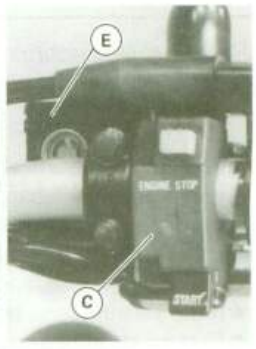
Handlebar Removal

- Remove:
  - Handguards
  - Lighting Switch (KLX650A) [A]
  - Engine Stop Switch (KLX650A) [B]
  - Right Handlebar Switch (KLX650C) [C]
  - Left Handlebar Switch (KLX650C) [D]
  - Throttle Cable Upper Ends and Throttle Grip
  - Front Brake Master Cylinder [E]
  - Clutch Lever Assembly [F]
- Unscrew the handlebar clamp bolts, and take off the clamps and the handlebar.



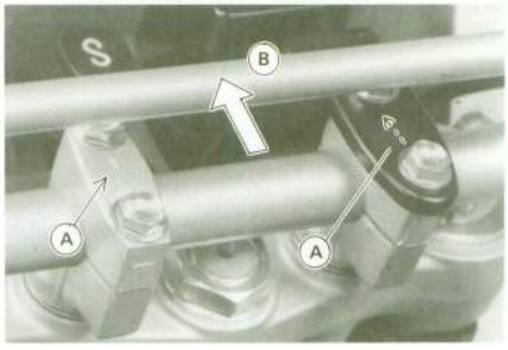






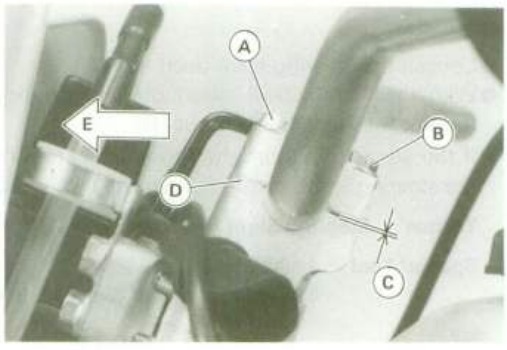
Handlebar Installation

- Install the handlebar clamps so that the arrow marks [A] on the clamps point to the front [B].



- Tighten the holder front bolts [A] first and then the rear bolts [B]. When the holder is correctly installed, there will be even gap [C] at the rear and no gap [D] at the front [E] after tightening.

Torque – Handlebar Clamp Bolts : 25 N-m (2.5 kg-m, 18.0 ft-lb)

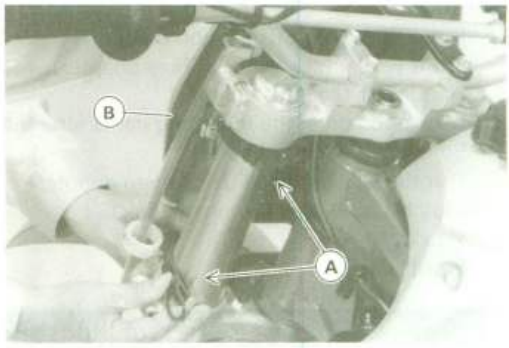


Steering Stem

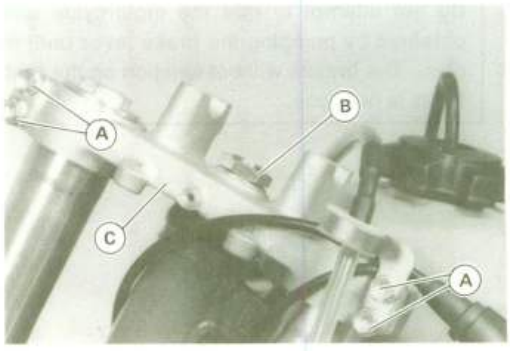
Steering Stem Removal

- Remove:
  Handlebar (see this chapter)
  Headlight Cover Bands [A]
  Headlight Cover [B]
- Raise the front wheel off the ground (see Wheels/Tires chapter).

Special Tool – Jack: 57001-1238

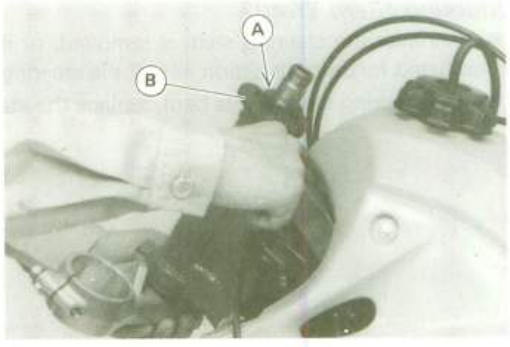


- Remove:
  Front Fork Upper Clamp Bolts (loosen) [A]
  Stem Head Nut [B]
- Push up the stem head [C] and remove it.

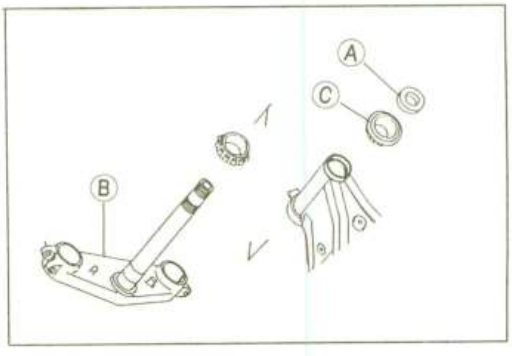


- Remove:
  Front wheel (see Wheels/Tires chapter)
  Front Fender and Front Fork
- Unscrew the stem nut [A].

Special Tool – Steering Stem Nut Wrench: 57001-1100 [B]



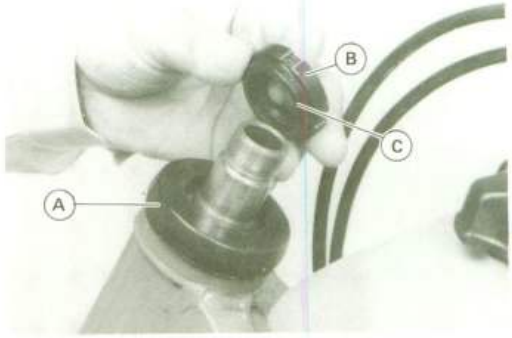
- Take off the stem cap [A].
- Pushing up on the stem base [B], take off the steering stem and stem base.
- Take off the upper stem bearing inner race [C].



Steering Stem Installation

- Route the cables, wires, and hoses as shown in the Cable, Wire, and Hose Routing section of the General Information chapter.
- Apply grease to the upper inner race, and install it in the head pipe.
- Install the stem through the head pipe and the upper bearing on the stem shaft while pushing up on the stem base.
- Install the stem cap [A], and hand tighten the stem nut [B].

Torque – Steering Stem Nut : 3.9 N-m (0.40 kg-m, 35 in-lb)



NOTE

○ *Install the steering stem nut so that the stepped side [C] faces down.*

● Install:
Front Fork (see Suspension chapter)
Front wheel (see Wheels/Tires chapter)
Handlebar (see this chapter)
● Check and adjust the following items after installation.
Steering (see this chapter)
Throttle Cables (see Fuel System chapter)
Clutch Cable (see Clutch chapter)
Headlight Aim
Front Brake

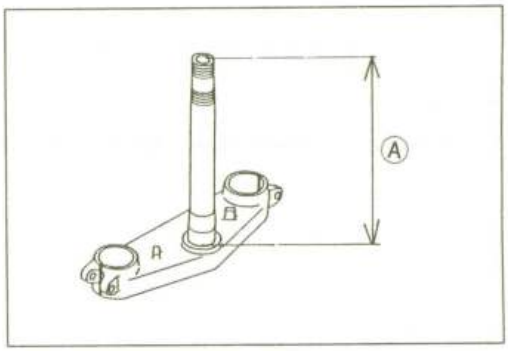
⚠WARNING

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 brakes will not function on the first application of the lever if this is not done.

Steering Stem Warp

● Whenever the steering stem is removed, or if the steering cannot be adjusted for smooth action, check the steering stem for straightness.

★ If the steering stem [A] is bent, replace the steering stem.

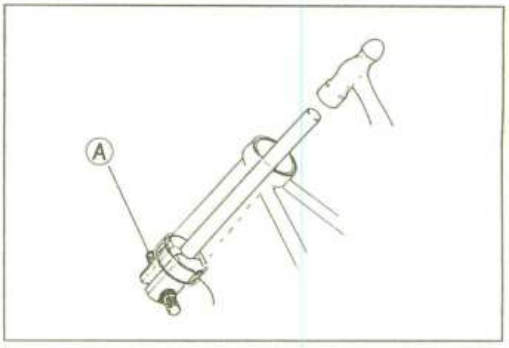


Steering Stem Bearing

Stem Bearing Removal

- Remove the steering stem (see this chapter).
- Drive out the bearing outer races from the head pipe.

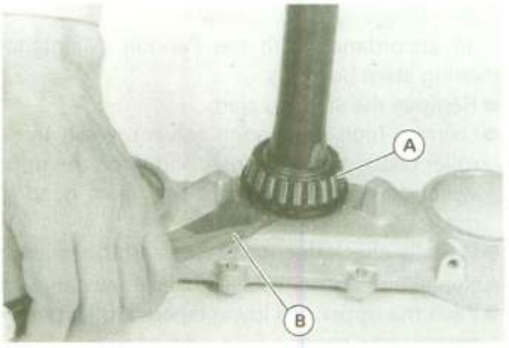
Special Tool – Head Pipe Outer Race Remover: 57001-1107 [A]



NOTE

○ *If either steering stem bearing is damaged, it is recommended that both the upper and lower bearings (including outer races) be replaced with new ones.*

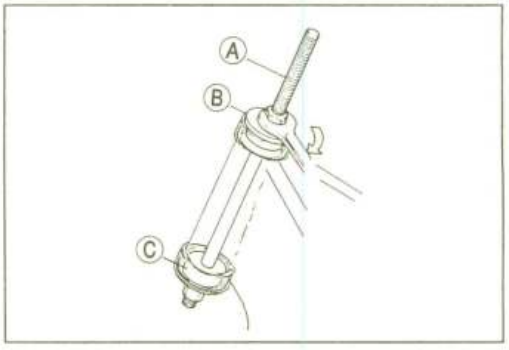
- Remove the lower inner race [A] which is pressed onto the steering stem with a chisel [B].



Stem Bearing Installation

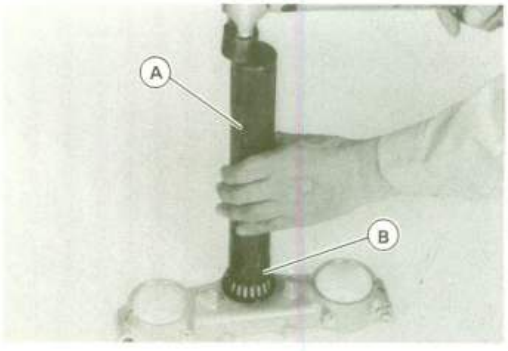
- Replace the bearing outer races with new ones.
- Apply grease to the outer races, and drive them into the head pipe at the same time.

Special Tools – Head Pipe Outer Race Press Shaft: 57001-1075 [A]
Head Pipe Outer Race Driver: 57001-1106 [B]
Head Pipe Outer Race Driver: 57001-1077 [C]



- Replace the stem bearing inner races with new ones.
- Apply grease to the lower inner race, and drive it onto the stem.

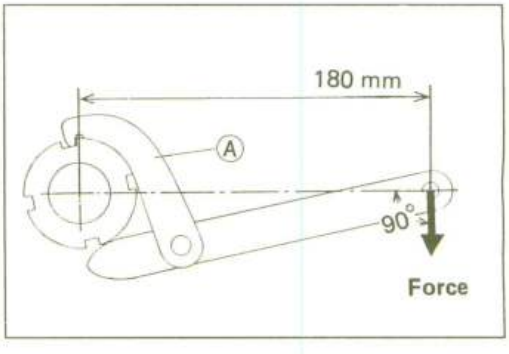
Special Tools – Steering Stem Bearing Driver: 57001-137 [A]
Steering Stem Bearing Driver Adapter: 57001-1074 [B]



- Install the stem head.
- Install the washer, and tighten the stem head nut lightly.
- Settle the bearings in place as follows:

○ Tighten the stem nut to **39 N-m (4.0 kg-m, 29 ft-lb)** of torque. (To tighten the steering stem nut to the specified torque, hook the wrench on the stem nut, and pull the wrench at the hole by **220 N (22.2 kg, 49 lb)** force in the direction shown.)

Special Tool – Steering Stem Nut Wrench: 57001-1100 [A]



○Check that there is no play and the steering stem turns smoothly without rattles. If not, the steering stem bearings may be damaged.
○Again back out the stem nut a fraction of a turn until it turns lightly.
○Turn the stem nut lightly clockwise until it just becomes hard to turn. Do not overtighten, or the steering will be too tight.

Torque – Steering Stem Nut : 3.9 N-m (0.40 kg-m, 35 in-lb)

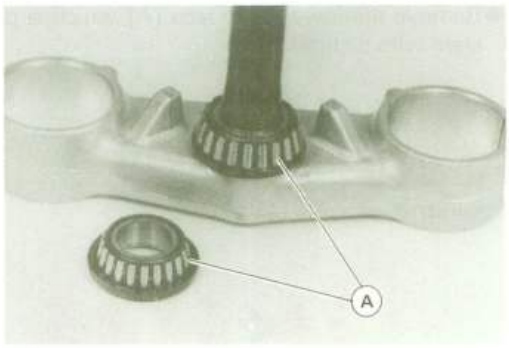
Stem Bearing Lubrication

In accordance with the Periodic Maintenance Chart, lubricate the steering stem bearings.

- Remove the steering stem.
- Using a high-flash point solvent, wash the upper and lower tapered roller bearing in the cages, and wipe the upper and lower outer races, which are press-fitted into the frame head pipe, clean of grease and dirt.
- Visually check the outer races and the rollers.

★Replace the bearing assemblies if they show wear or damage.

- Pack the upper and lower tapered roller bearings [A] in the cages with grease, and apply a light coat of grease to the upper and lower outer races.
- Install the steering stem, and adjust the steering.

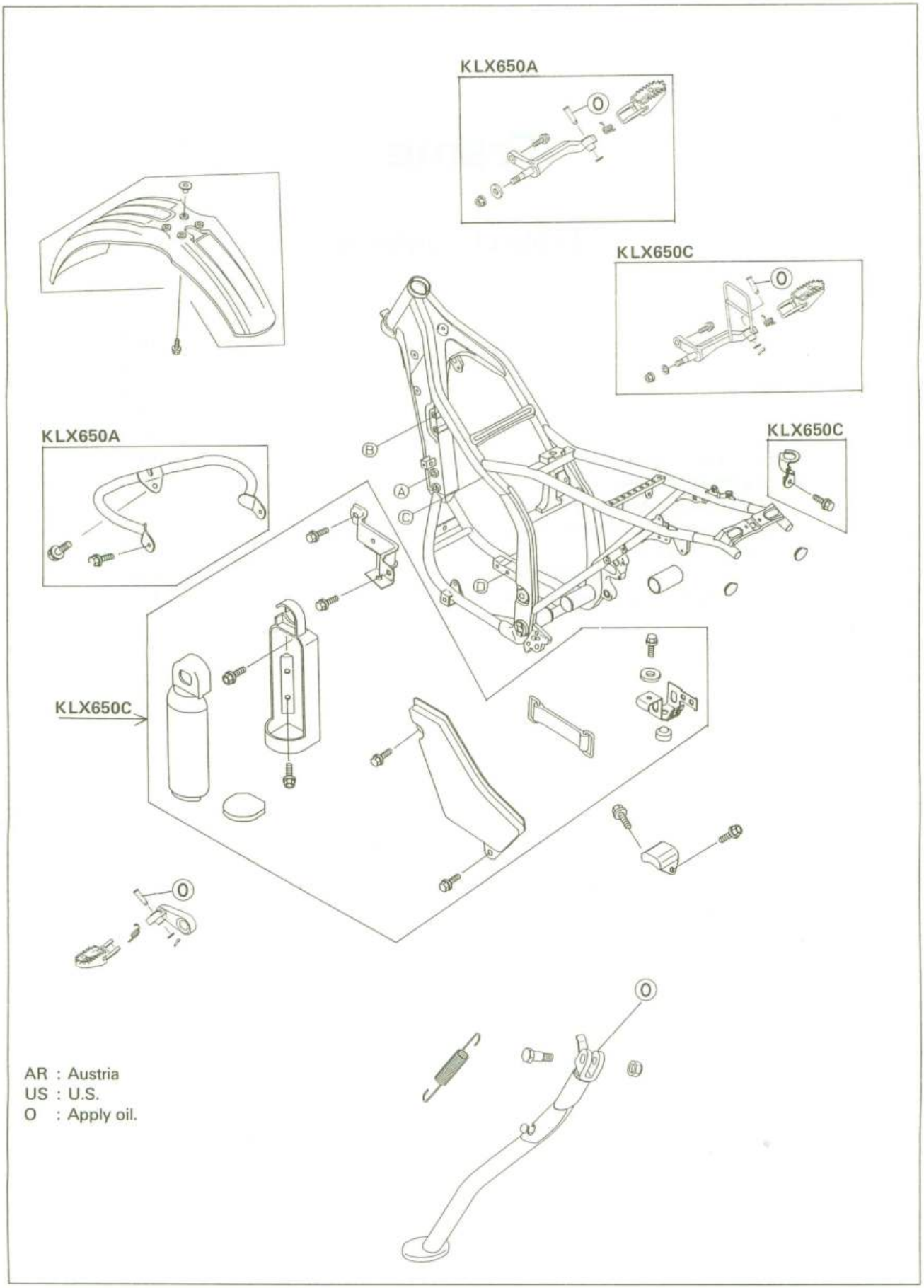


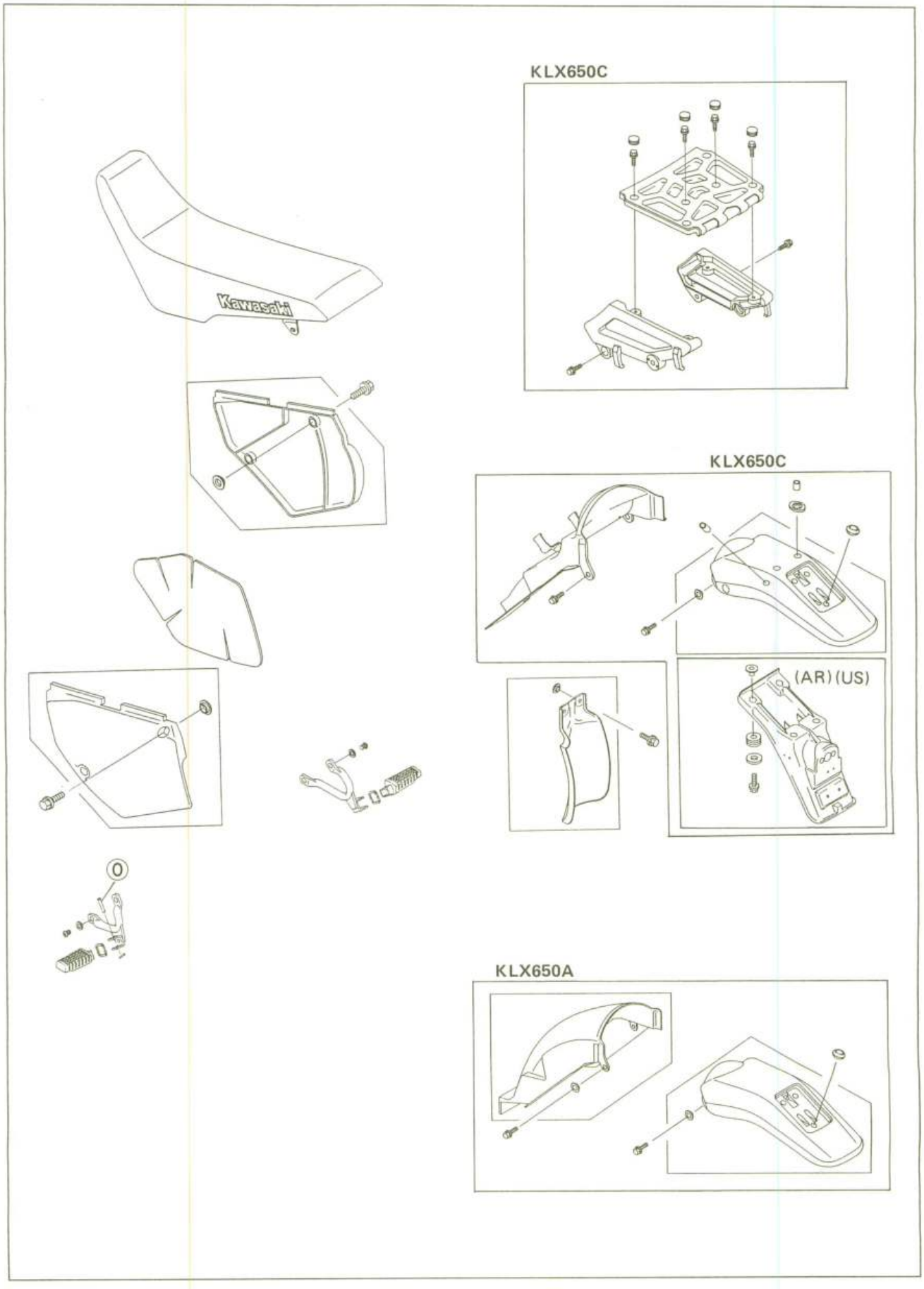
Frame

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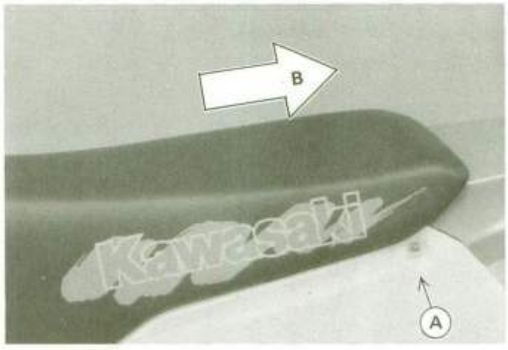



KLX650C
KLX650C
(AR) (US)
KLX650A

Seat

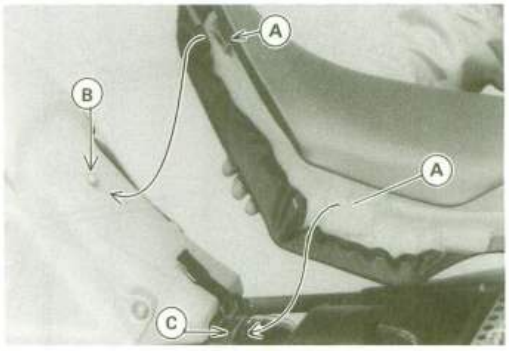
Seat Removal

- Remove the seat bolts [A] on both sides.
- Pull the seat rearward [B] and remove it.



Seat Installation

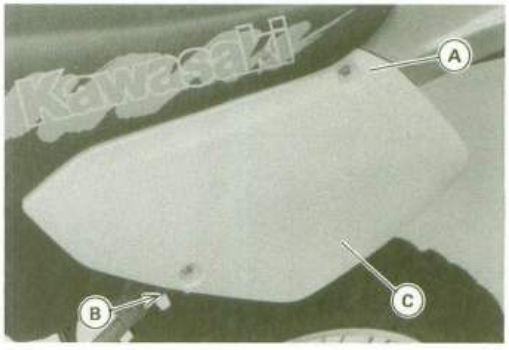
- Slip the seat hooks [A] under the washer [B] and the frame brace [C].



Side Covers

Side Cover Removal

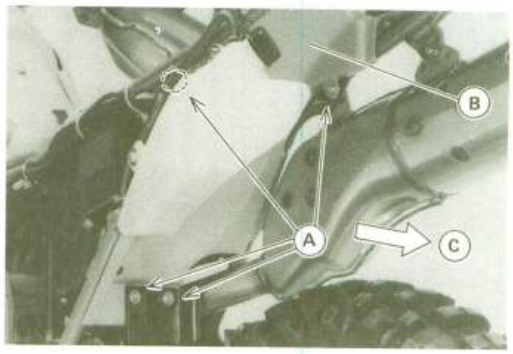
- Remove the seat bolt [A] and the side cover bolt [B] to remove the side cover [C].
- Remove the other side cover in the same manner.



Rear Fender (KLX650A)

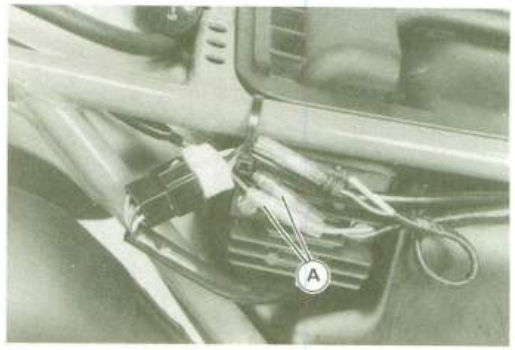
Rear Fender Front Section Removal

- Remove:
  Seat (see Seat Removal)
  Side Covers (see Side Cover Removal)
- Unscrew the rear fender front section bolts [A] and take off the rear fender front section [B] downward [C].

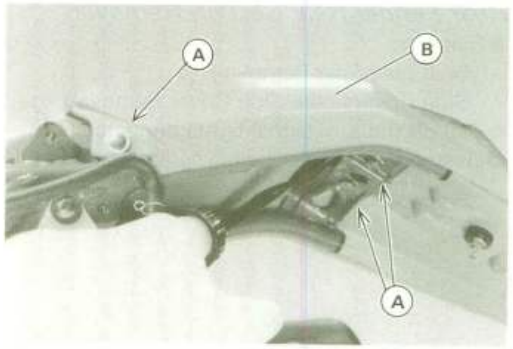


Rear Fender Rear Section Removal

- Remove:
  Seat (see Seat Removal)
  Side Covers (see Side Cover Removal)
- Disconnect the taillight connectors [A].



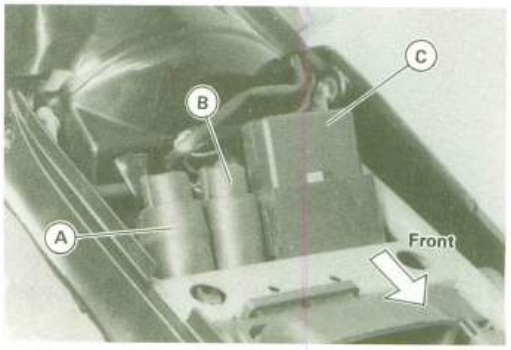
- Unscrew the rear fender rear section bolts [A] and take off the rear fender rear section [B].



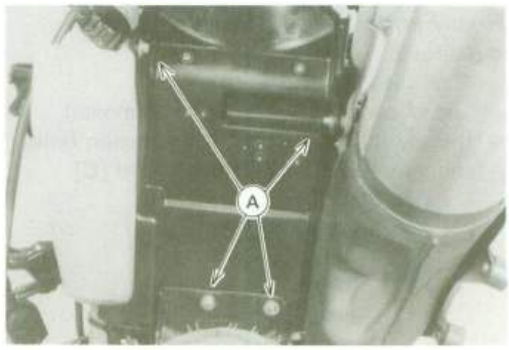
Rear Fender (KLX650C)

Rear Fender Front Section Removal

- Remove:
  Seat (see Seat Removal)
  Side Covers (see Side Cover Removal)
  Starter Circuit Relay [A]
  Fan Relay [B]
  CDI Unit [C]
- Pull out the reserve tank vent hose.



● Unscrew the rear fender front section bolts [A].

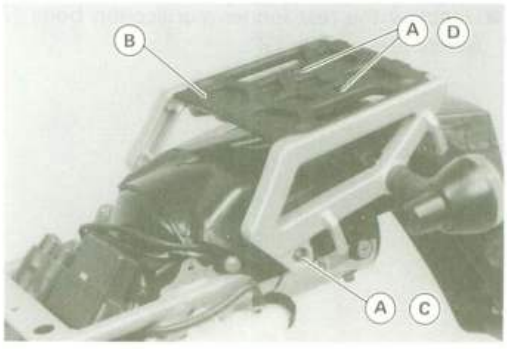


● Take off the rear fender front section [A] downward [B].

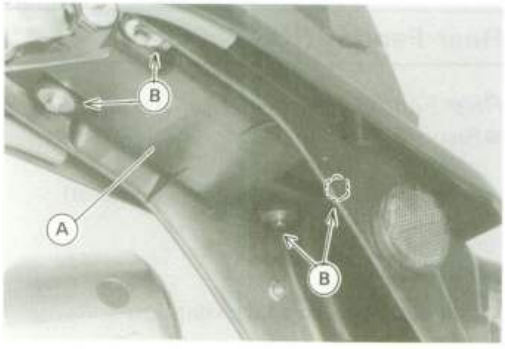


Rear Fender Rear Section Removal

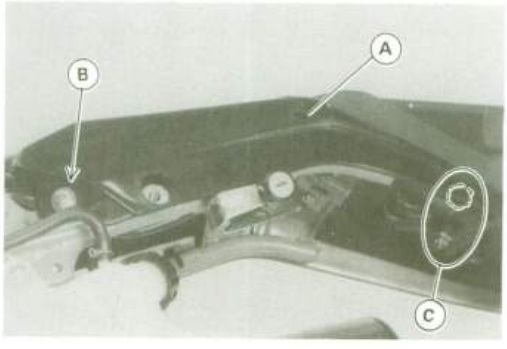
● Remove:
Seat (see Seat Removal)
Side Covers (see Side Cover Removal)
● Pull off the turn signal light connectors.
● Unscrew the carrier bolts [A] and remove the carrier [B].
Franged Collars [C] Collars and Dampers [D]



● Remove the under cover [A] by taking off the bolts [B].
○ Pull off the license light connectors.



● Remove the rear fender rear section [A] by taking off the bolts [B] and nuts [C].
● Pull off the taillight connectors.



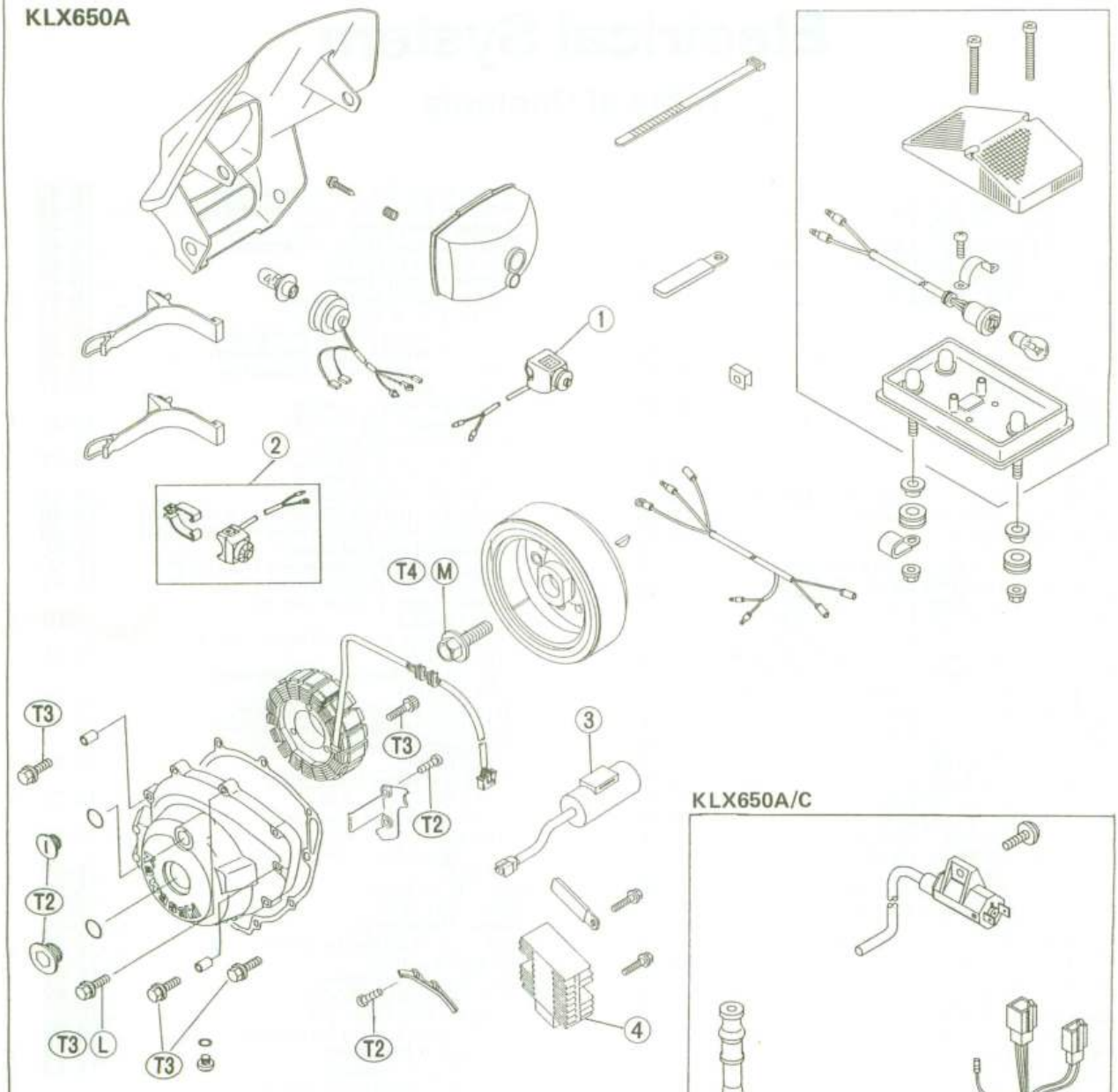
Electrical System

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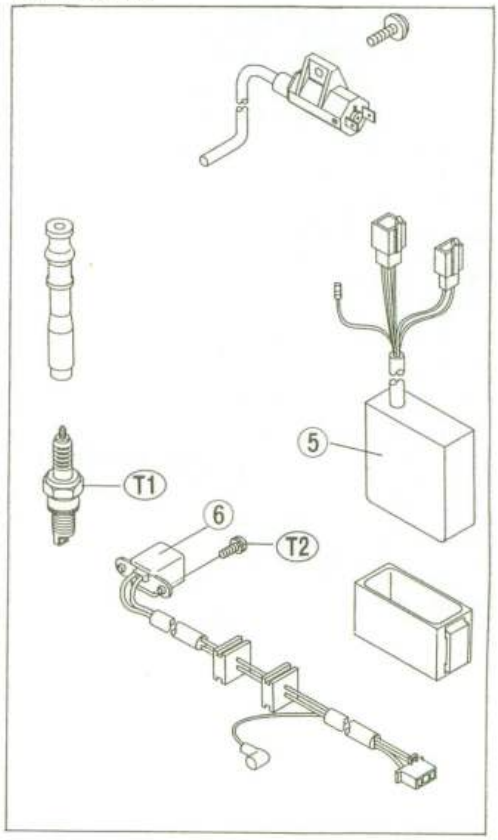
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Exploded View

KLX650A



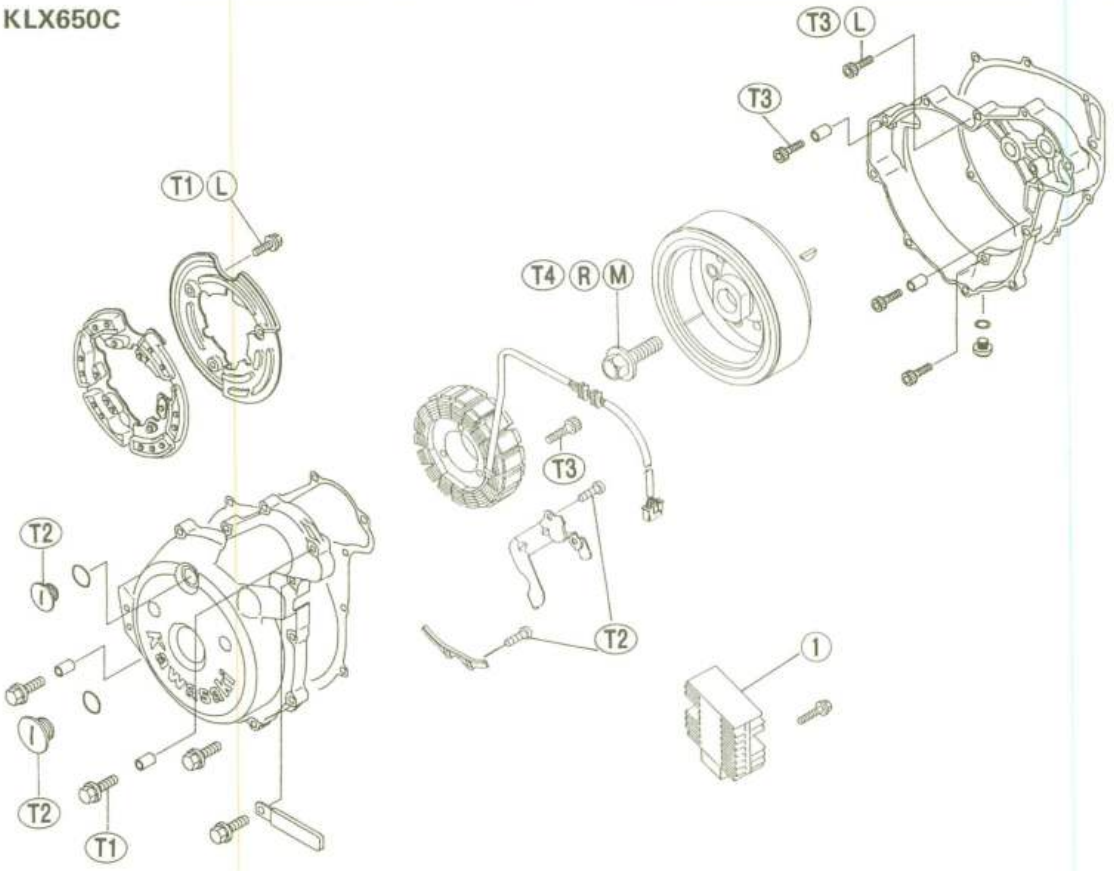
KLX650A/C

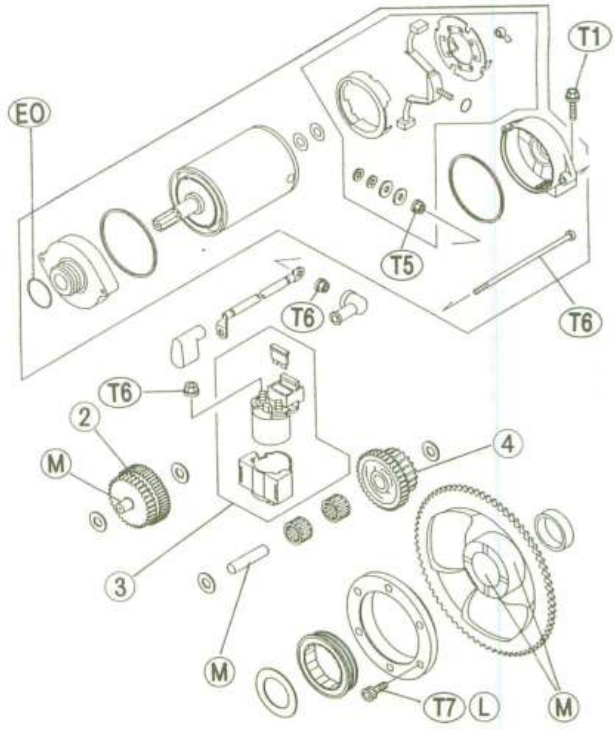


1. Lighting Switch
2. Engine Stop Switch
3. Headlight Capacitor
4. Regulator
5. CDI Unit
6. Pickup Coil

L: Apply a non-permanent locking agent.
M: Apply molybdenum disulfide grease to the seating surface.
T1: 14 N-m (1.4 kg-m, 10.0 ft-lb)
T2: 2.5 N-m (0.25 kg-m, 22 in-lb)
T3: 8.8 N-m (0.90 kg-m, 78 in-lb)
T4: 120 N-m (12.0 kg-m, 87 ft-lb)

KLX650C

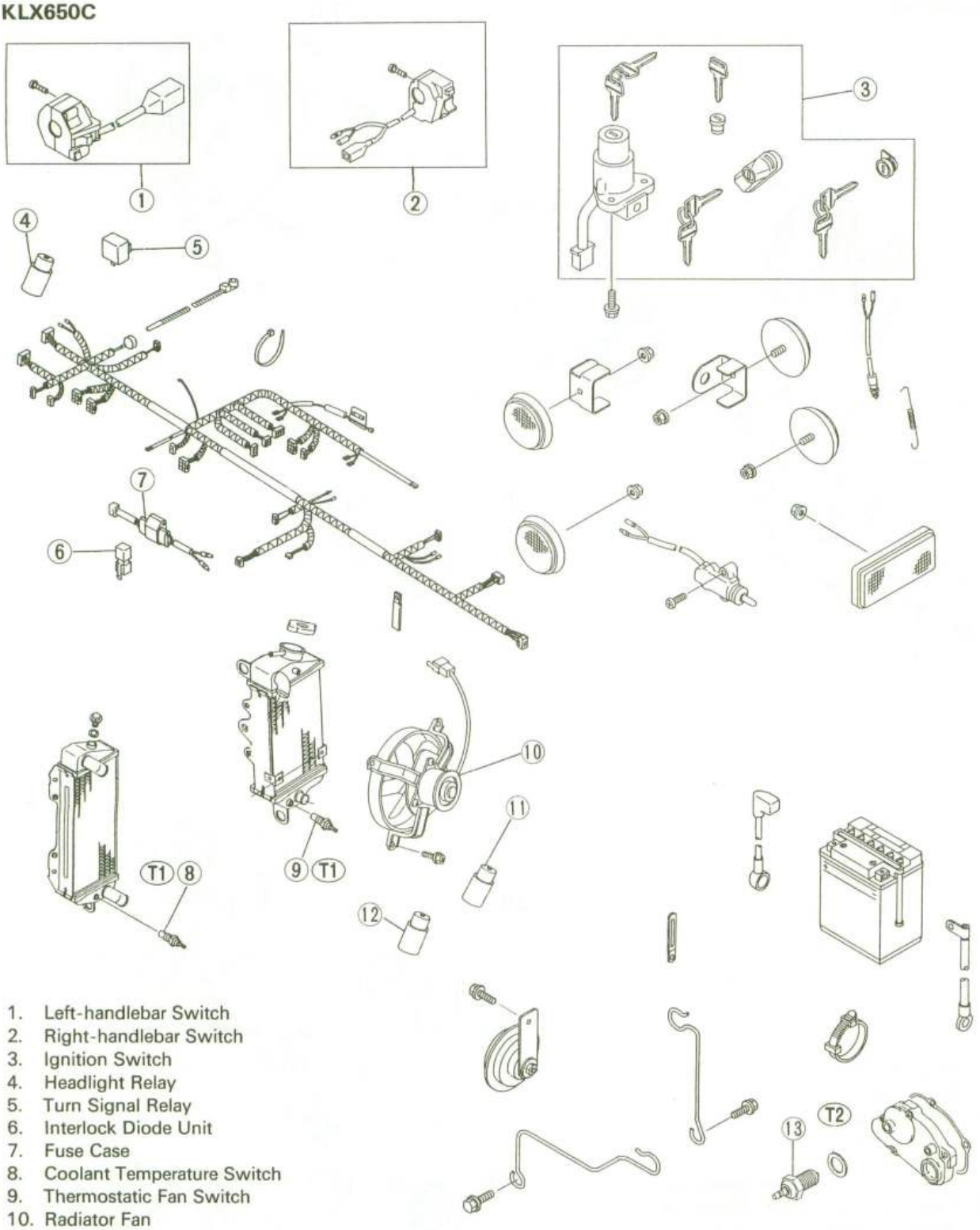




1. Regulator/Rectifier
2. Starter Torque Limiter
3. Starter Relay
4. Starter Clutch Idle Gear

EO: Apply engine oil.
L: Apply a non-permanent locking agent.
M: Apply molybdenum disulfide grease.
T1: 8.8 N-m (0.90 kg-m, 78 in-lb)
T2: 2.5 N-m (0.25 kg-m, 22 in-lb)
T3: 12 N-m (1.2 kg-m, 104 in-lb)
T4: 216 N-m (22.0 kg-m, 159 ft-lb)
T5: 11 N-m (1.1 kg-m, 95 in-lb)
T6: 4.9 N-m (0.50 kg-m, 43 in-lb)
T7: 34 N-m (3.5 kg-m, 25 ft-lb)

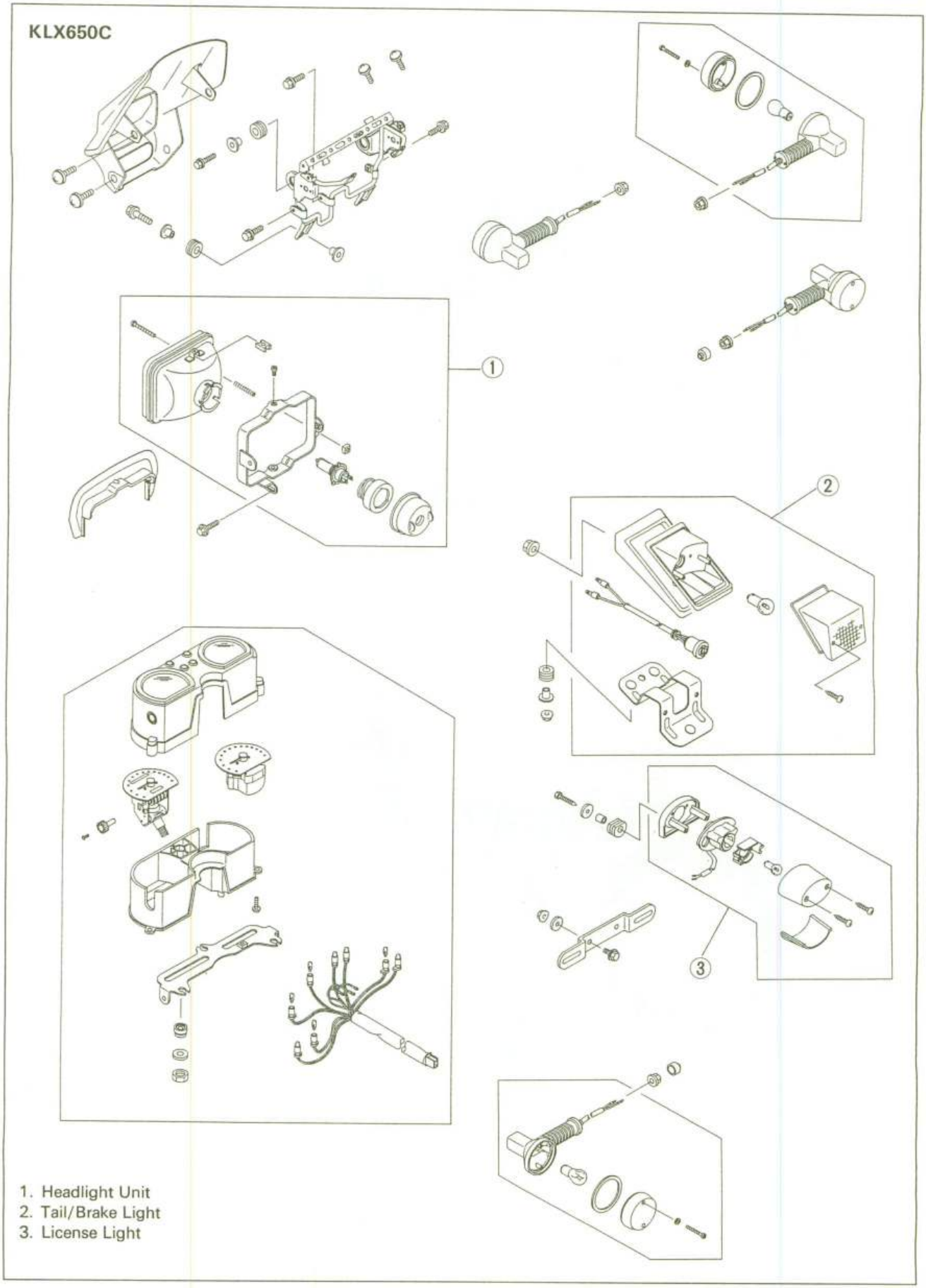
KLX650C



1. Left-handlebar Switch
2. Right-handlebar Switch
3. Ignition Switch
4. Headlight Relay
5. Turn Signal Relay
6. Interlock Diode Unit
7. Fuse Case
8. Coolant Temperature Switch
9. Thermostatic Fan Switch
10. Radiator Fan
11. Starter Circuit Relay
12. Fan Relay
13. Neutral Switch

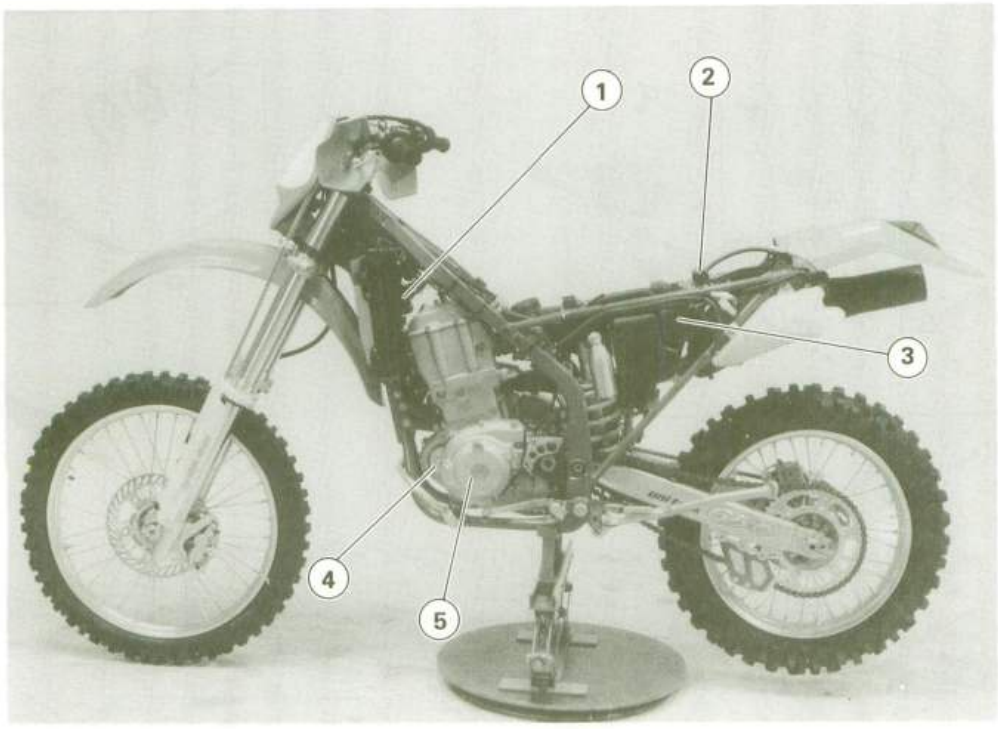
T1: 8.8 N-m (0.90 kg-m, 78 in-lb)
T2: 15 N-m (1.5 kg-m, 11.0 ft-lb)

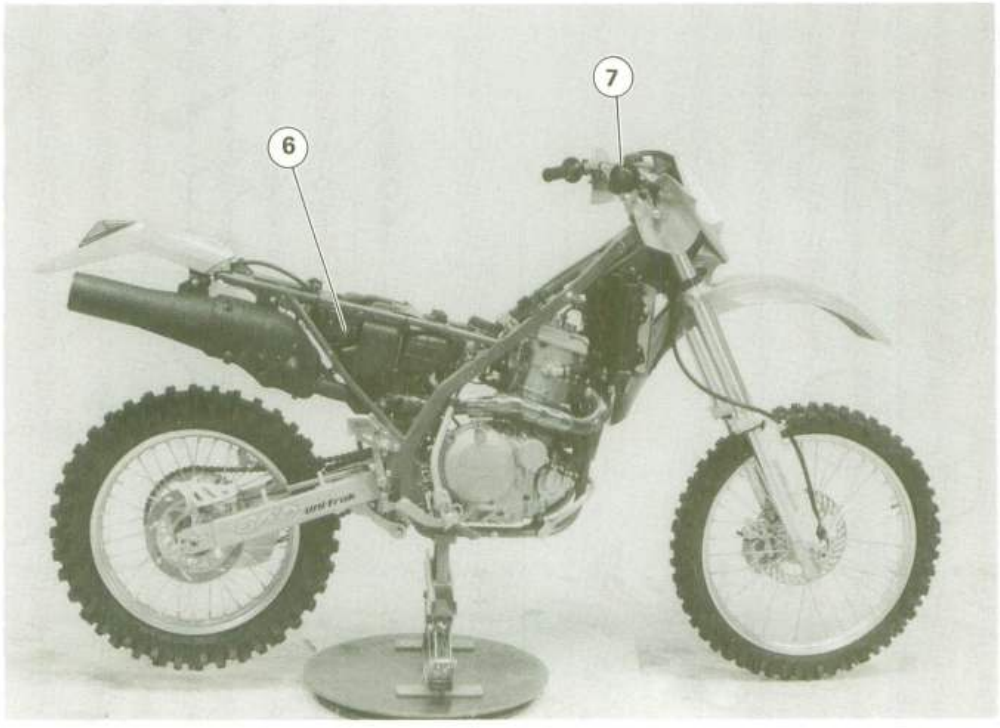
KLX650C



1. Headlight Unit
2. Tail/Brake Light
3. License Light

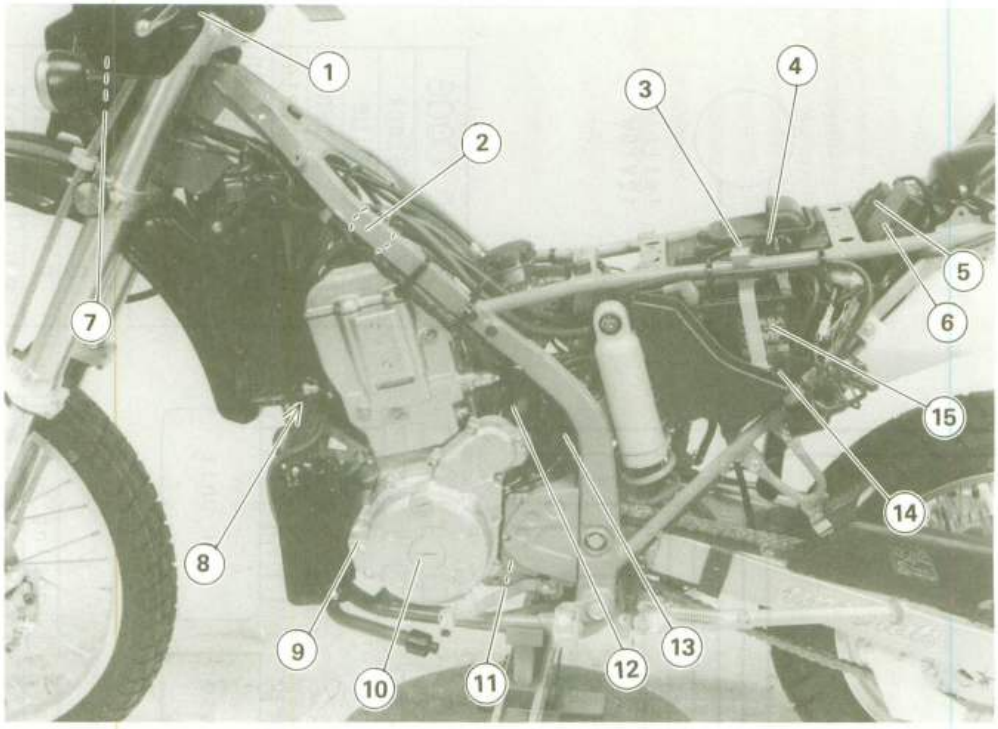
Parts Location (KLX650A)

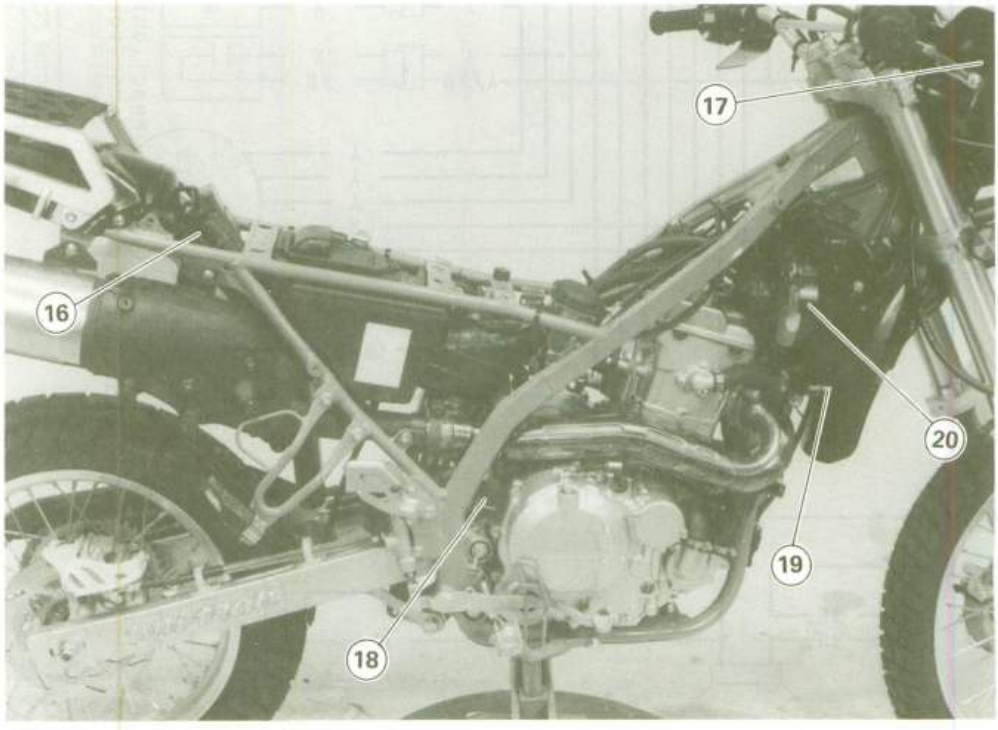




1. Ignition Coil
2. Headlight Capacitor
3. CDI Unit
4. Pickup Coil
5. Magneto Flywheel
6. Regulator
7. Lighting Switch

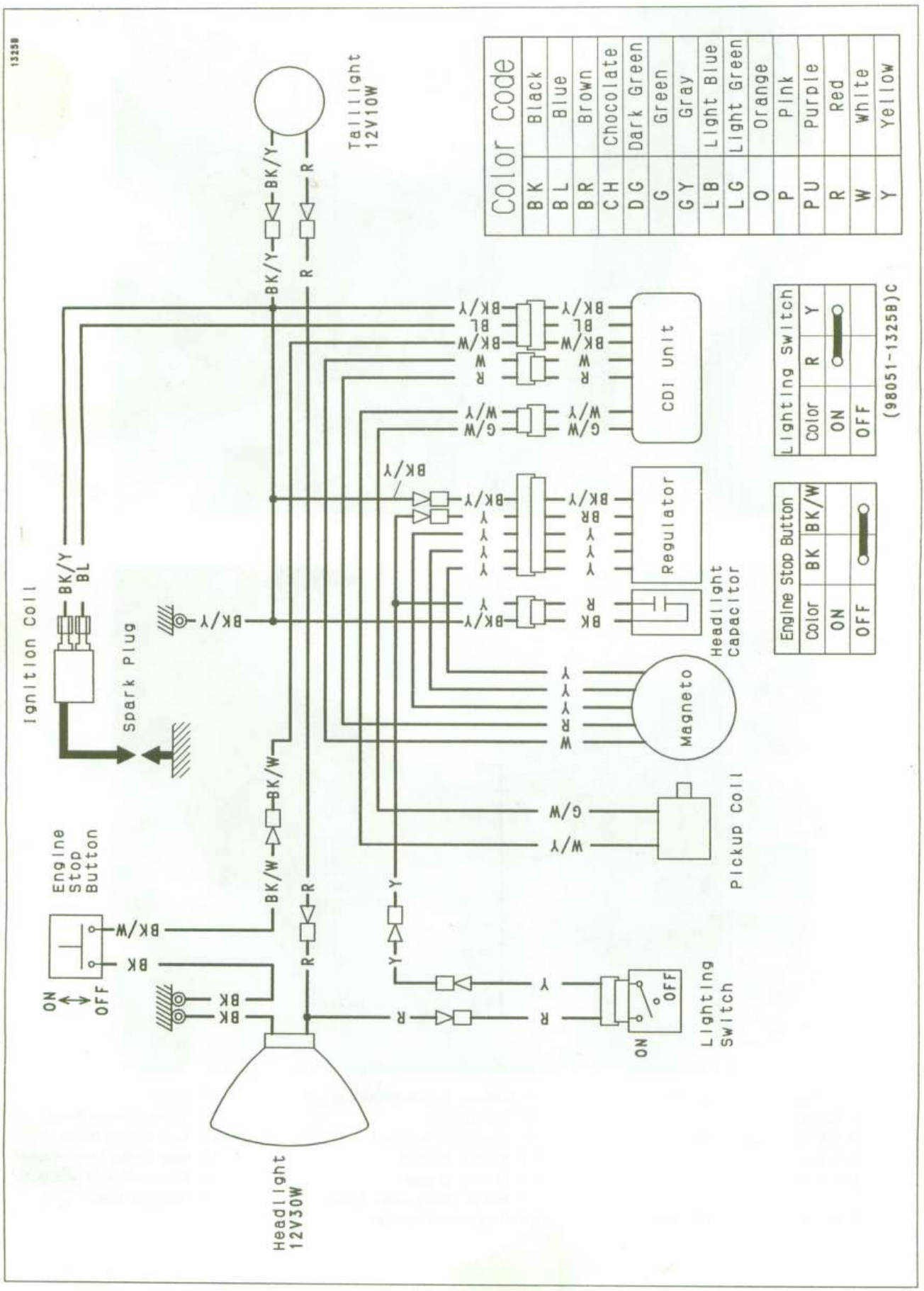
Parts Location (KLX650C)



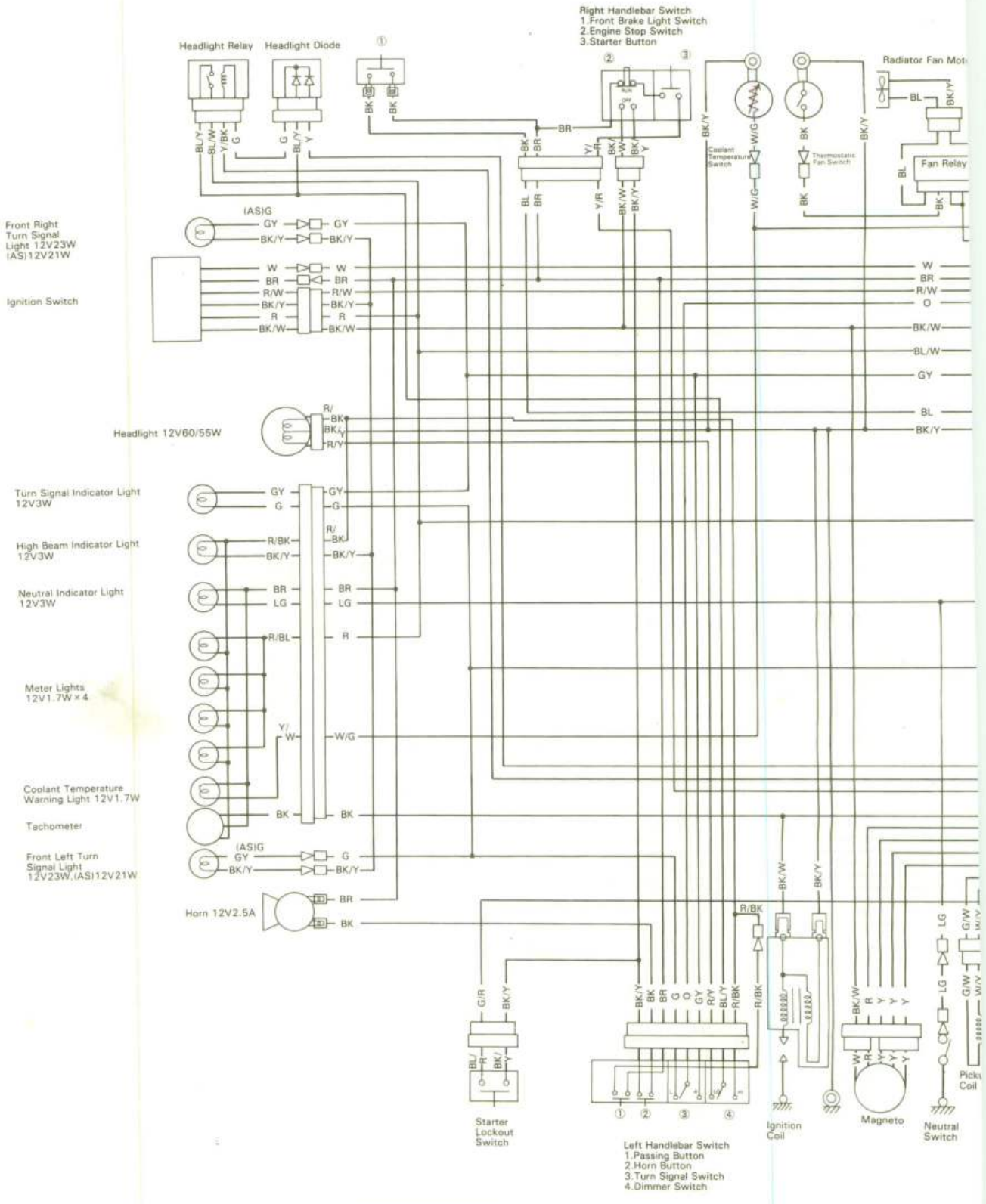


1. Starter Lockout Switch
2. Ignition Coil
3. Interlock Diode Unit
4. 10A Fuse
5. Fan Relay
6. CDI Unit
7. Headlight Relay (US, AS)
8. Coolant Temperature Switch
9. Pickup Coil
10. Magneto Flywheel
11. Neutral Switch
12. Electric Starter
13. Starter Relay, Main Fuse
14. Regulator/Rectifier
15. Battery
16. Starter Circuit Relay
17. Turn Signal Relay
18. Rear Brake Light Switch
19. Thermostatic Fan Switch
20. Radiator Fan

KLX650-A1 Wiring Diagram



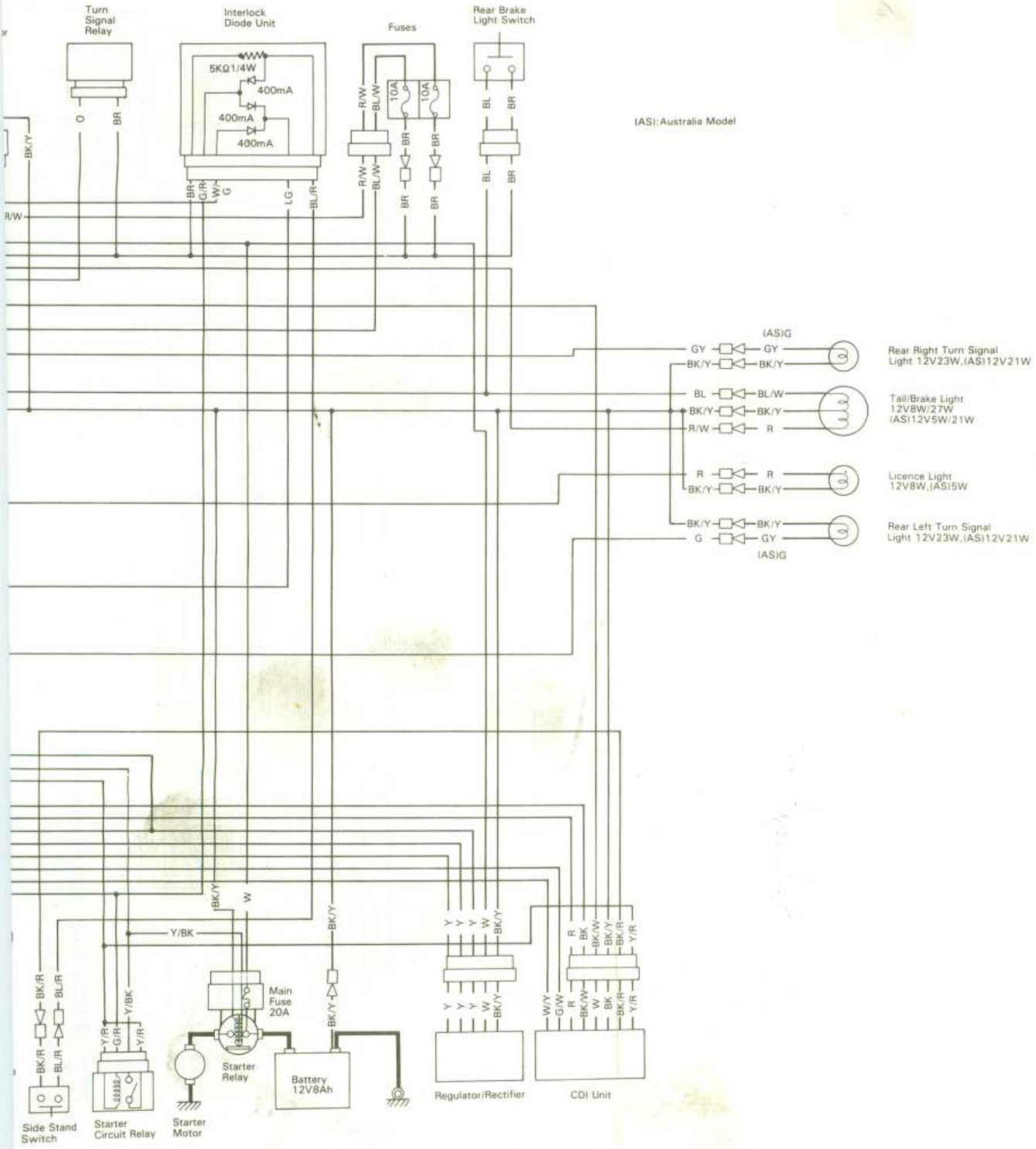
KLX650-C1 Wiring Diagram (US, Australia)



LEFT HANDLEBAR SWITCH CONNECTIONS

Passing Button			Horn Button			Turn Signal Switch				Dimmer Switch			
Color	R/BK	BR	Color	BK/Y	BK	Color	G	O	GY	Color	R/Y	BL/Y	R/BK
Free			Free			L	○	●		HI		●	
Push	●	○	Push	●	○	N(ush							
						R		●	○	LO	●		

IGNITION SW		
	Battery	Ignition
Color	W	BR
ON	●	○
OFF		
LOCK		
Park		



Color Code	
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

TCH CONNECTIONS

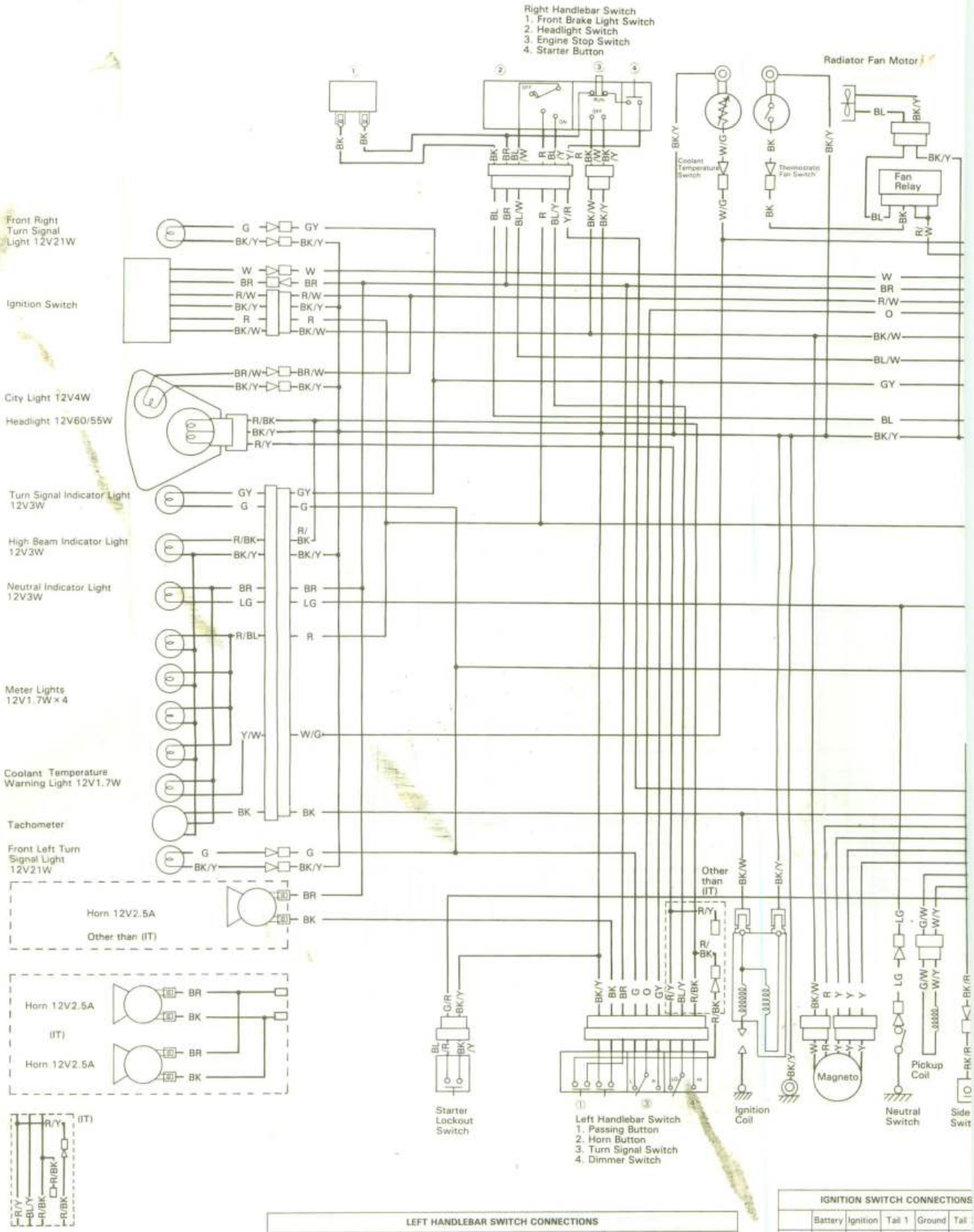
Tail 1	Ground	Tail 2	Ignition
R/W	BK/Y	R	BK/W

RIGHT HANDLEBAR SWITCH CONNECTIONS

Front Brake Light Switch			Engine Stop Switch					Starter Button		
Color	BK	BK	Color	BK/W	BK/Y	BR	●	Color	●	Y/R
Brake Lever			OFF					Free		
Pulled In			RUN					Push		

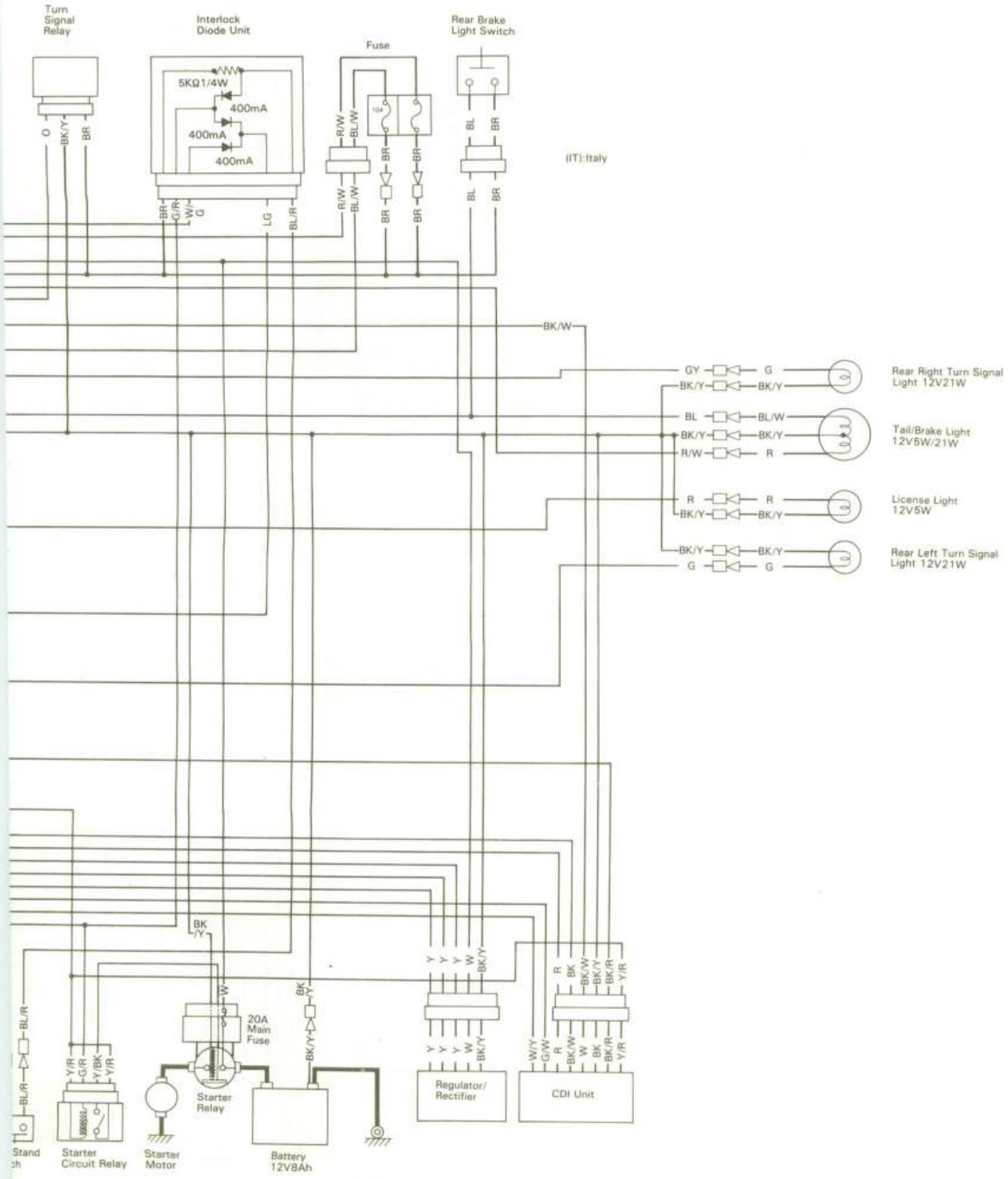
(98051-13338,13348)

KLX650-C1 Wiring Diagram (Other than US, Australia)



LEFT HANDLEBAR SWITCH CONNECTIONS												
Passing Button			Horn Button			Turn Signal Switch				Dimmer Switch			
Color	R/BK	BR	Color	BK/Y	BK	Color	G	O	GY	Color	R/Y	BL/Y	R/BK
Free			Free			L	○	●		HI		●	
Push	●	○	Push	●	○	N(uet							
						R		●	○	LO	●	○	

IGNITION SWITCH CONNECTIONS					
	Battery	Ignition	Tail 1	Ground	Tail
Color	W	BR	R/W	BK/Y	R
ON	○	●	●	●	
OFF				○	●
LOCK				○	●
Park	○	●	○	○	●



RIGHT HANDLEBAR SWITCH														
Front Brake Light Switch			Headlight Switch				Engine Stop Switch					Starter Button		
Color	BK	BK	Color	BL/W	R	BL/Y	Color	BK/W	BK/Y	BR	●	Color	●	Y/R
Brake Lever			OFF				OFF	○—●				Free		
Pulled In	○—●		■	○—●			RUN			○—●		Push	○—●	
			ON	○—●—○										

(98051-1331C, 1332A, 1378C)

Color Code	
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

Specifications

Item	Standard	Service Limit
Battery(KLX650C):		
Type	MF (Maintenance Free) Battery	– – –
Capacity	12 V 8 Ah	– – –
Voltage	12.6 V or more	– – –
Charging System(KLX650C):		
Alternator type	Three-phase AC	– – –
Charging voltage (regulator/rectifier output voltage)	14 ~ 15 V	– – –
Alternator output voltage	more than 34 V @4000 r/min (rpm)	– – –
Charging coil resistance	0.3 ~ 1.0 Ω (× 1 Ω)	– – –
Regulator/rectifier resistance	in the text	– – –
Ignition System:		
Pickup coil air gap	0.4 ~ 0.6 mm	– – –
Pickup coil resistance	100 ~ 148 Ω (× 10 Ω)	– – –
Ignition coil:		
3 needle arcing distance	7 mm or more	– – –
Primary winding resistance	0.14 ~ 0.22 Ω (× 1 Ω)	– – –
Secondary winding resistance	3.8 ~ 5.8 kΩ (× 1 kΩ)	– – –
Spark plug:		
Spark plug gap	0.8 ~ 0.9 mm	– – –
Spark plug cap resistance	3.75 ~ 6.25 kΩ (× 1 kΩ)	– – –
Exciter coil resistance		
KLX650A	90 ~ 170 Ω (× 10 Ω)	– – –
KLX650C	100 ~ 200 Ω (× 10 Ω)	– – –
CDI unit resistance	in the text	– – –
Electric Starter System (KLX650C):		
Starter motor:		
Brush length	12.5 mm	6.5 mm
Commutator diameter	28 mm	27 mm
AC Lighting System (KLX650A):		
Alternator type	Three - phase AC	– – –
Alternator output voltage	more than 36 V	– – –
AC lighting voltage	11.7 ~ 13.7 V @4000 r/min (rpm)	– – –
Lighting coil resistance	0.4 ~ 1.1 Ω (× 1 Ω)	– – –
Regulator resistance	in the text	– – –
Capacity of headlight capacitor	3700 ~ 5700 μF	– – –
Switch and Sensor (KLX650C):		
Rear brake light switch timing	ON after about 10 mm pedal travel	– – –
Fan switch connections		
Rising temperature	From OFF to ON @94 ~ 100°C (201 ~ 212°F)	– – –
Falling temperature	From On to OFF @90 ~ 93°C (194 ~ 199 °F)	– – –
	ON: Less than 0.5 Ω	
	OFF: More than 1MΩ	
Coolant temperature switch connections		
Rising temperature	From OFF to ON @ 107 ~ 113 °C (225 ~ 236°F)	– – –
Falling temperature	From ON to OFF @103 ~ 106°C (217 ~ 223°F)	– – –
	ON: Less than 0.5 Ω	
	OFF: More than 1 MΩ	

Special Tool – Hand Tester: 57001-983
Flywheel Holder: 57001-1313
Rotor Puller, M16/M18/M20/M22 x 1.5: 57001-1216
Flywheel Puller, M30 x 1.5: 57001-1191
Rotor Holder: 57001-1184
Spark Plug Wrench, Hex 18: 57001-1024
Timing Light: 57001-1241

Sealant – Kawasaki Bond (Silicone Sealant): 56019-120

Precautions

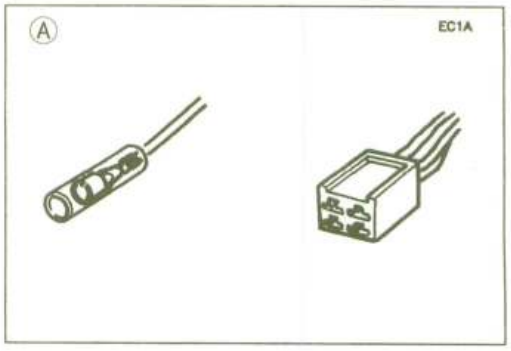
There are a number of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below.

- Do not reverse the battery lead connections. This will burn out the diodes in the electrical parts (KLX650C).
- Always check battery condition before condemning other parts of an electrical system. A fully charged battery is a must for conducting accurate electrical system tests (KLX650C).
- The electrical parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- To prevent damage to electrical parts, do not disconnect the battery leads or any other electrical connections when the ignition switch is on, or the engine is running.
- Because of the large amount of current, never keep the starter switch pushed when the starter motor will not turn over, or the current may burn out the starter motor windings (KLX650C).
- Do not use a meter illumination bulb rated for other than the voltage or wattage specified in the wiring diagram, as the meter panel could be warped by excessive heat radiated from the bulb (KLX650C).
- Take care not to short the leads that are directly connected to the battery positive (+) terminal to the chassis ground (KLX650C).
- Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was caused by some other item or items, they too must be repaired or replaced, or the new replacement will soon fail again.
- Make sure all connectors in the circuit are clean and tight, and examine wires for signs of burning, fraying, etc. Poor wires and bad connections will affect electrical system operation.
- Measure coil and winding resistance when the part is cold (at room temperature).
- Color Codes:

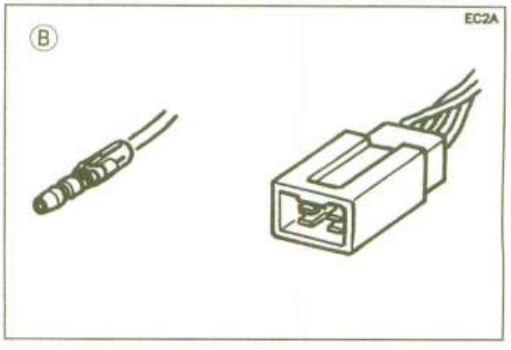
BK	Black	G	Green	P	Pink
BL	Blue	GY	Gray	PU	Purple
BR	Brown	LB	Light blue	R	Red
CH	Chocolate	LG	Light green	W	White
DG	Dark green	O	Orange	Y	Yellow

- Electrical Connectors

Female Connectors [A]

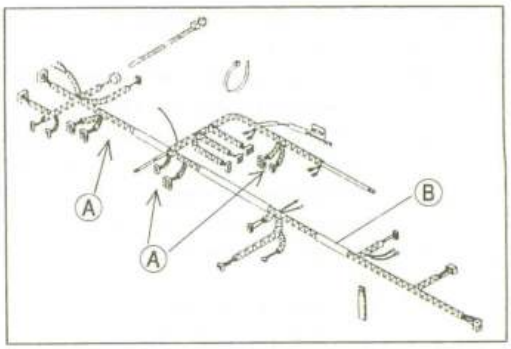


Male Connectors [B]



Electrical Wiring

Wiring Inspection



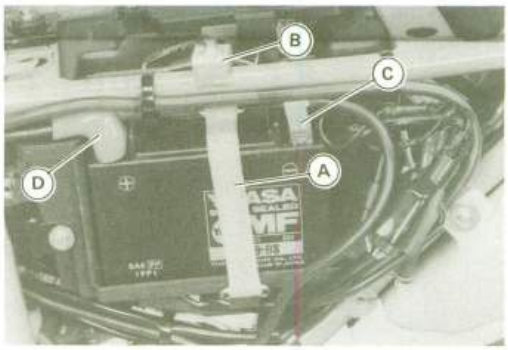
- ●Visually inspect the wiring for signs of burning, fraying, etc.
- ★If any wiring is poor, replace the damaged wiring.
- ●Pull each connector [A] apart and inspect it for corrosion, dirt, and damage.
- ★If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.
- ●Check the wiring for continuity.
- ○Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
- ○Connect the hand tester between the ends of the leads.

Special Tool – Hand Tester: 57001-983

- ○Set the tester to the × 1 Ω range, and read the tester.
- ★If the tester does not read 0 Ω, the lead is defective. Replace the lead or the wiring harness [B] if necessary.

Battery (KLX650C)

Battery Removal



- Remove:
  Seat (see Frame chapter)
  Left Side Cover (see Frame chapter)
  Battery Cover
  Band [A]
  Battery Holder [B]
- Disconnect the battery negative (−) cable [C] first, and then the positive (+) cable [D].
- Take out the battery.

Battery Installation

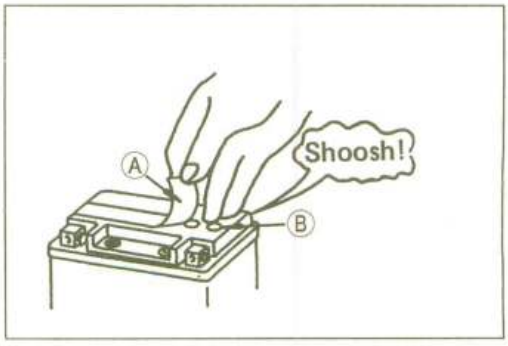
- Connect the positive (+) cable first, and then the negative (−) cable.
- Run the battery cables according to the Cable, Wire, and Hose Routing section of the General Information chapter.

Electrolyte Filling

CAUTION

Do not remove the aluminum seal sheet sealing the filler ports until just before use.
Be sure to use the dedicated electrolyte container for correct electrolyte volume.

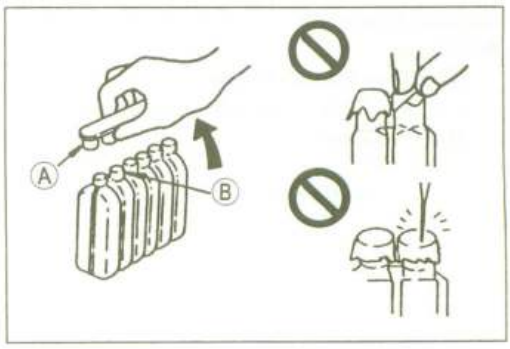
- Check to see that there is no peeling, tears or holes in the sealing sheet.
- Place the battery on a level surface.
- Remove the sealing sheet [A].
- ○ When removing, check to hear an air-sucking sound "Shoosh!" from filler ports [B].



NOTE

○ *A battery whose sealing sheet has any peeling, tears, holes, or from which the air-sucking sound was not heard requires a refreshing charge (initial charge).*

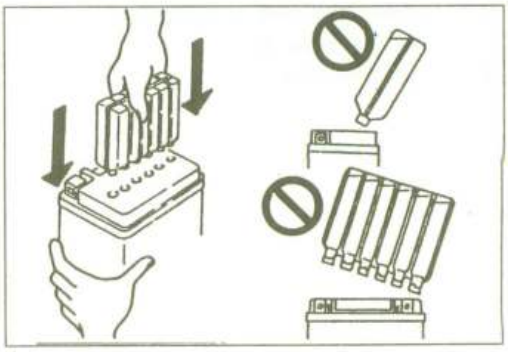
- Take the electrolyte container out of the vinyl bag.
- Detach the strip of caps [A] from the container.



NOTE

○ Do not discard the strip of caps because it is used as the battery plugs later.
○ Do not peel back or pierce the sealed areas [B].

- Place the electrolyte container upside down with the six sealed areas in line with the six battery filler ports.
- Push the container down strongly enough to break the seals. Now the electrolyte should start to flow into the battery.

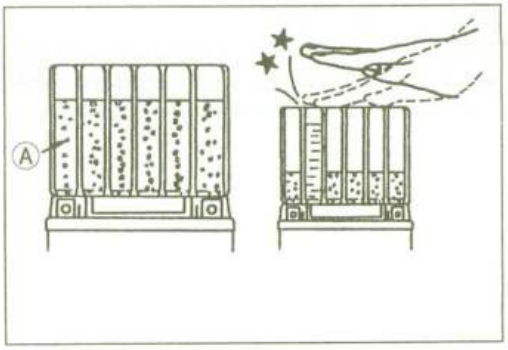


NOTE

○ Do not tilt the container as the electrolyte flow may be interrupted.

- Make sure air bubbles [A] are coming up from all six filler ports.

○ Leave the container this way for 5 minutes or longer.

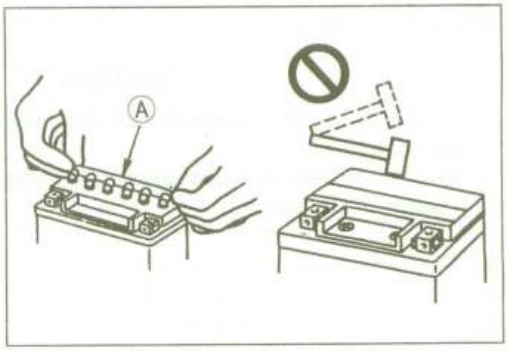


NOTE

○ If no air bubbles are coming up from a filler port, tap the bottom of the bottle two or three times. Never remove the container from the battery.

CAUTION
Fill the battery until the container is completely emptied.

- Be certain that all the electrolyte has flowed out.
- Tap the bottom in the same way as above if there is any electrolyte left in the container.
- Now pull the container gently out of the battery.
- Let the battery sit for **20** minutes. During this time, the electrolyte permeates the special separators and the gas generated by chemical reaction is released.
- Fit the strip of caps [A] tightly into the filler ports until the strip is at the same level as the top of the battery.



NOTE

○ Do not hammer. Press down evenly with both hands.

CAUTION
Once you installed the strip of caps after filling the battery, never remove it, nor add any water or electrolyte.

Initial Charge

While a maintenance free battery can be used after only filling with electrolyte, a battery may not be able to sufficiently move a starter motor to start an engine in the cases shown in the table below, where an initial charge is required before use. However, if a battery shows a terminal voltage of higher than 12.5 V after 10 minutes of filling (Note 1), no initial charge is necessary.

Condition requiring initial charge	Charging method
At low temperatures (lower than 0°C)	0.9 A × 2 ~ 3 hours
Battery has been stored in high temperature and humidity.	0.9 A × 15 ~ 20 hours
Seal has been removed, or broken – peeling, tear or hole. (If you did not hear the air-sucking sound "Shoosh!" as you removed the seal.)	
Battery as old as 2 years or more after manufacture. Battery manufacturing date is printed on battery top. Example) 12 (Day) 10 (Month) 90 (Year) T1 (Mfg. location)	

Note 1 : Terminal voltage – To measure battery terminal voltage, use a digital voltmeter.

Precautions

○ No need of topping-up

No topping-up is necessary in this battery until it ends its life under normal use. Forcibly prying off the sealing plug to add water is very dangerous. Never do that.

○ Refreshing charge

If an engine will not start, a horn sounds weak, or lights are dim, it indicates the battery has been discharged. Give refresh charge for 5 to 10 hours with charge current shown in the specification (see Refreshing Charge).

When a fast charge is inevitably required, do it following precisely the maximum charge current and time conditions indicated on the battery.

CAUTION

This battery is designed to sustain no unusual deterioration if refresh-charged according to the method specified above. However, the battery performance may be reduced noticeably if charged under conditions other than given above.
Never remove the sealing plug during refresh charge.
If by chance an excessive amount of gas is generated due to overcharging, the safety valve operates to keep the battery safe.

○ When you do not use the motorcycle for months, give a refresh charge before you store the motorcycle and store it with the negative lead removed. Give a refresh charge every six months during storage.

○ Battery life

If the battery will not start the engine even after several refresh charges, the battery has exceeded its useful life. Replace it. (Provided, however, the vehicle's starting system has no problem.)

⚠WARNING

Keep the battery away from sparks and open flames during charging, since the battery gives off an explosive gas mixture of hydrogen and oxygen. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals which could ignite any battery gases.
No fire should be drawn near the battery, or no terminals should have the tightening loosened.
The electrolyte contains sulfuric acid. Be careful not to have it touch your skin or eyes. If touched, wash it off with liberal amount of water. Get medical attention if severe.

Interchangeability with Ordinary Battery

A maintenance free battery can fully display its performance only when combined with a proper vehicle electric system. Therefore, replace a maintenance free battery only on a motorcycle which was originally equipped with a maintenance free battery.

● Be careful, if a maintenance free battery is installed on a motorcycle which had an ordinary battery as original equipment, the maintenance free battery's life will be shortened.

Charging Condition Inspection

Battery charging condition can be checked by measuring battery terminal voltage.

● Remove:
Seat (see Frame chapter)
Left Side Cover (see Frame chapter)

● Disconnect the battery terminal leads.

CAUTION
Be sure to disconnect the negative terminal lead first.

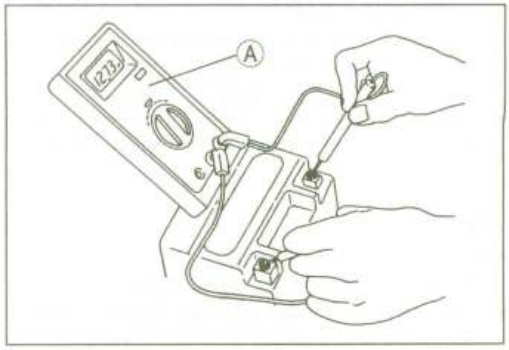
● Measure the battery terminal voltage.

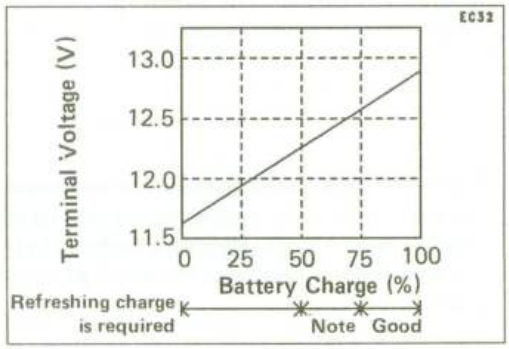
NOTE

○ *Measure with a digital voltmeter [A] which can be read one decimal place voltage.*

★ If the reading is below the specified, refreshing charge is required.

Battery Terminal Voltage
Standard: 12.6 V or more



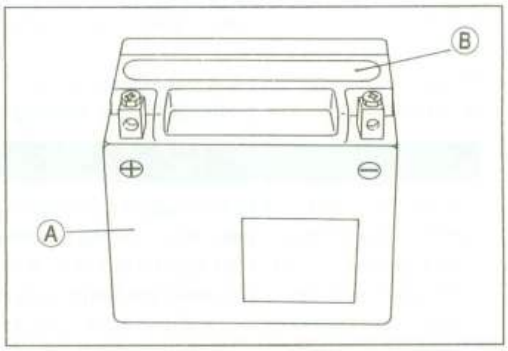


Refreshing Charge

● Remove the battery [A] (see Battery Removal).

● Refresh-charge by following method according to the battery terminal voltage.

CAUTION
This battery is a sealed type. Never remove the seal cap [B] even at charging. Never add water. Charge with current and time as stated below.

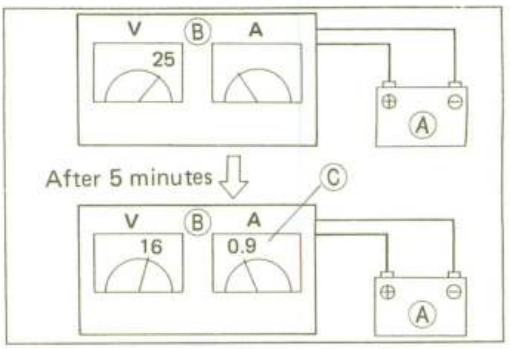


○ Terminal Voltage : **11.5 ~ less than 12.6 V**

Standard Charge : 0.9 A × 5 ~ 10 h (see following chart)
Quick Charge: 4.0 A × 1.0 h

CAUTION
If possible, do not quick charge. If the quick charge is done due to unavoidable circumstances, do standard charge later on.

○ Terminal Voltage : **less than 11.5 V**



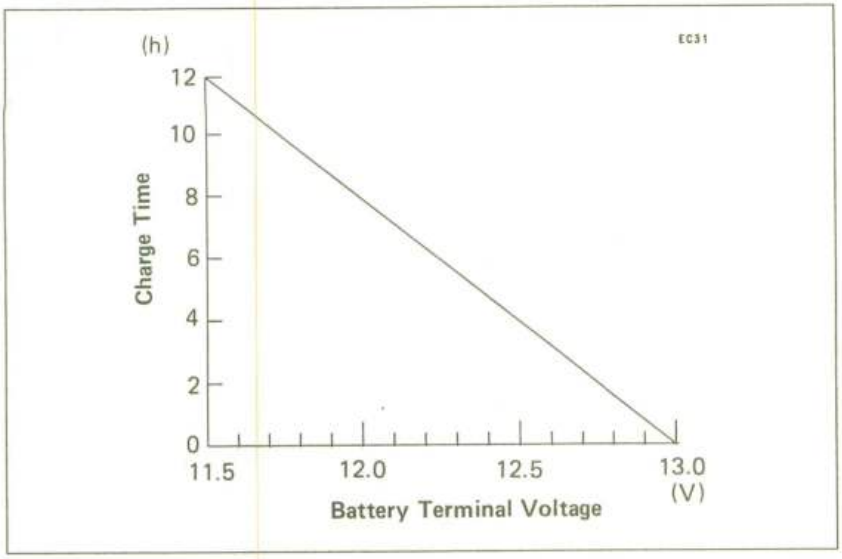
Charging Method : 0.9 A × 20 h

NOTE

○ *Raise the voltage (25 V as maximum), and charge for about 5 minutes as a yardstick. (If ammeter shows no change in current after 5 minutes, you need a new battery.) The current, if it can flow into the battery, tends to become excessive. Adjust the voltage as often as possible to keep the current at standard value (0.9 A).*

Battery [A]
Battery Charger [B]
Standard Value [C]

Battery Standard Charge Time Chart (1.4 A Regular Current Charge) – For Reference



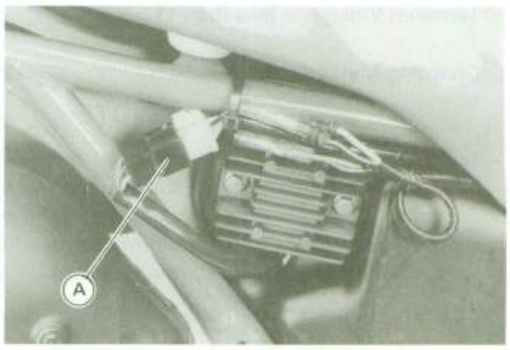
● Determine battery condition after refreshing charge.
○ Determine the condition of the battery 30 minutes after completion of the charge by measuring the terminal voltage according to the table below.

Criteria	Judgement
12.6 V or higher	Good
12.0 ~ 12.6 V or lower	Charge insufficient → Recharge.
12.0 V or lower	Unserviceable → Replace.

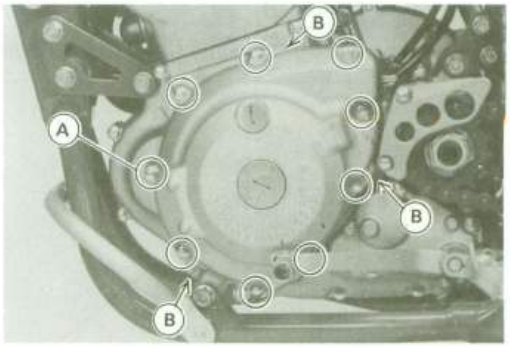
Flywheel Magneto

Magneto Cover Removal (KLX650A)

- Drain the oil (see Engine Lubrication System chapter).
- Remove:
  Side Covers (see Frame chapter)
  Seat (see Frame chapter)
- Pull off the magneto lead connector [A].

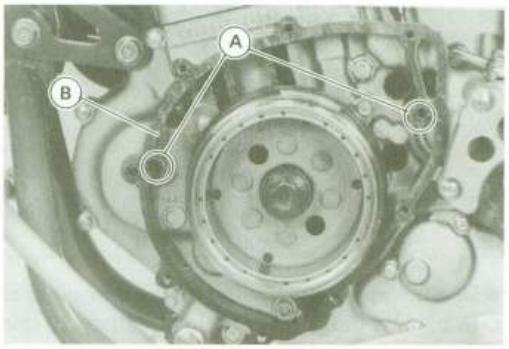


- Remove the magneto cover bolts [A].
- Pry [B] the magneto cover loose from the crankcase with a screwdriver and pull off the cover.

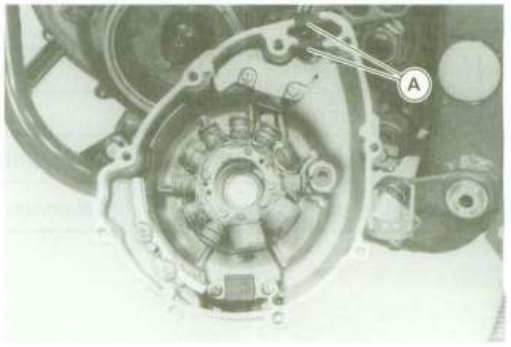


Magneto Cover Installation (KLX650A)

- Be sure all of the old gasket has been removed from the magneto cover and the left hand crankcase sealing surface.
- Check the dowel pins [A] are in place, and fit a new gasket [B] on the crankcase.



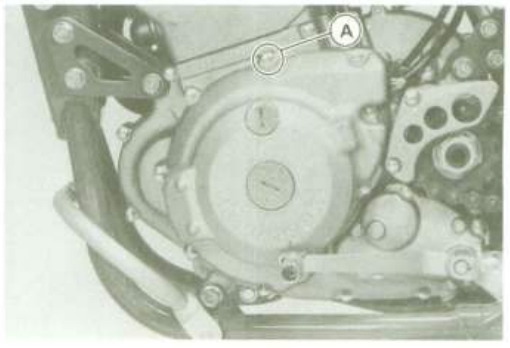
- Apply silicone sealant to the mating surface of the grommets [A].



- Apply a non-permanent locking agent to the bolt [A] shown.

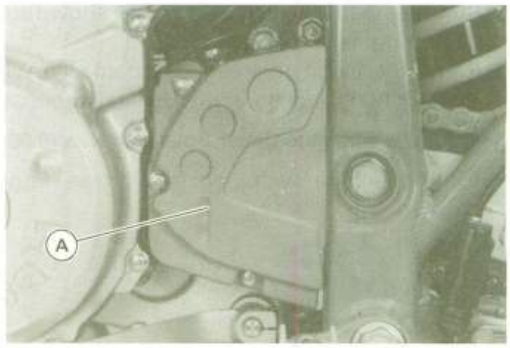
Torque – Magneto Cover Bolts : 8.8 N-m (0.90 kg-m, 78 in-lb)

- Fill the engine with engine oil (see Engine Lubrication System chapter).
- Route the magneto leads in accordance with the Cable, Wire, and Hose Routing section of the General Information chapter.



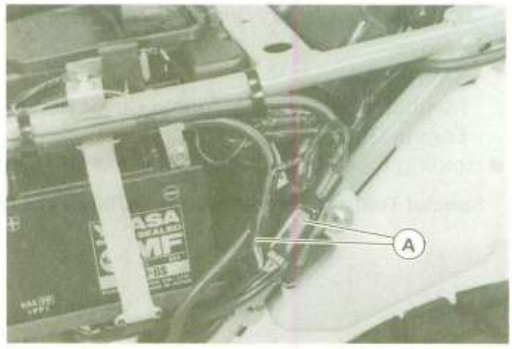
Magneto Cover Removal (KLX650C)

- Drain the oil (see Engine Lubrication System chapter).
- Remove:
  Left Side Cover (see Frame chapter)
  Battery Cover
  Engine Sprocket Cover [A]

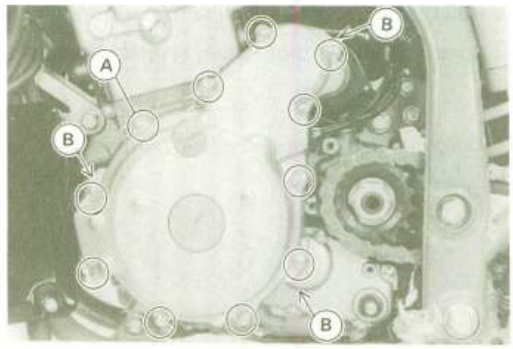


CAUTION
To avoid damage to the neutral switch lead, be sure to remove the engine sprocket cover.

- Pull off the magneto lead connectors [A].

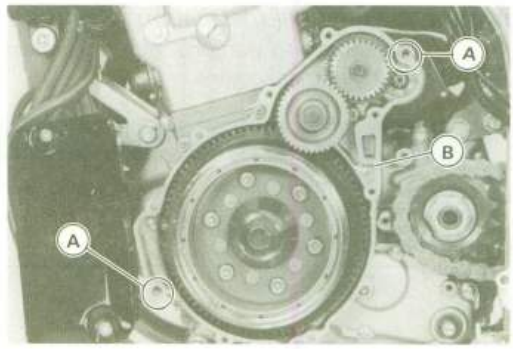


- Remove the magneto cover bolts [A].
- Pry [B] the magneto cover loose from the magneto case with a screwdriver and pull off the cover.

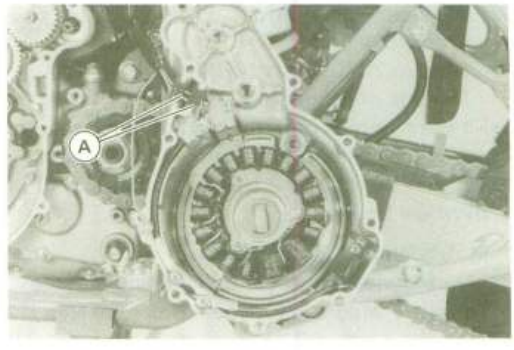


Magneto Cover Installation (KLX650C)

- Be sure all of the old gasket has been removed from the magneto cover and the magneto case sealing surface.
- Check that the dowel pins [A] are in place and fit a new gasket [B] on the magneto case.



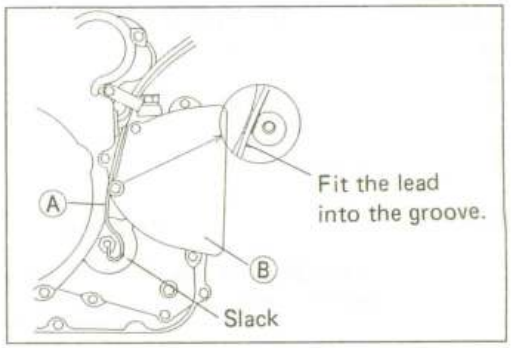
- Apply silicone sealant to the mating surface of the grommets [A].



- Run the neutral switch lead [A] as shown to avoid its being pinched by the engine sprocket cover [B].
- Route the magneto leads in accordance with the Cable, Wire, and Hose Routing section of the General Information chapter.

Torque – Magneto Cover Bolts : 8.8 N-m (0.90 kg-m, 78 in-lb)

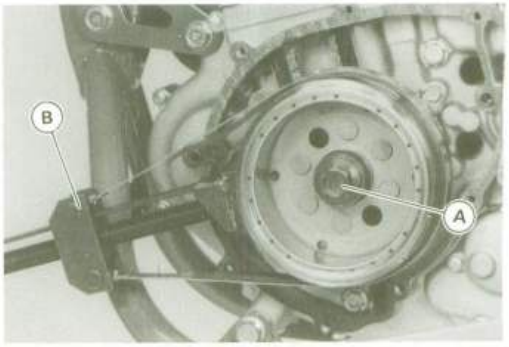
- Fill the engine with engine oil (see Engine Lubrication System chapter).



Magneto Flywheel Removal (KLX650A)

- Remove:
  Shift Pedal
  Magneto Cover (see Magneto Cover Removal)
  Engine Guard
- Holding the flywheel steady, unscrew the flywheel bolt [A].

Special Tool – Flywheel Holder: 57001-1313 [B]

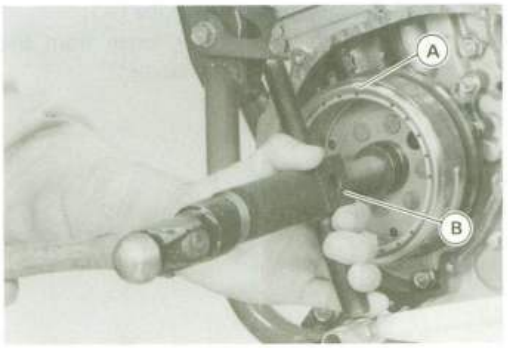


- Pull off the magneto flywheel [A] from the crankshaft.

Special Tool – Rotor Puller, M16/M18/M20/M22 x 1.5: 57001-1216 [B]

NOTE

○ *Screw in the puller while tapping the head of the puller with a hammer.*



Magneto Flywheel Installation (KLX650A)

- Clean the following portions with an oil-less cleaning fluid such as trichloroethylene or acetone.

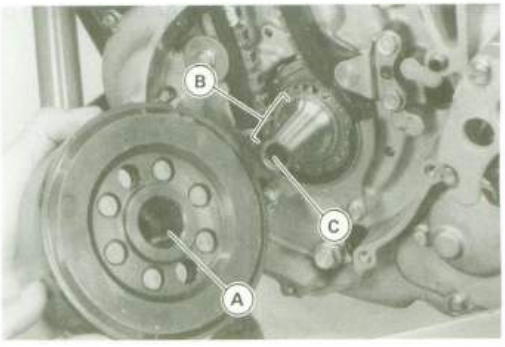
⚠WARNING

These cleaning fluids are usually highly flammable and harmful if breathed for prolonged periods. Be sure to heed the fluid manufacturer's warnings.

Flywheel Taper [A]
Crankshaft Taper [B]
Threads of Crankshaft [C]
Threads of Magneto Flywheel Bolt

- Fit the flywheel onto the crankshaft so that the woodruff key fits in the groove in the hub of the magneto flywheel.
- Tighten the flywheel bolt while holding the flywheel steady with the flywheel holder.

Molybdenum Disulfide Grease –
Magneto Flywheel Bolt Seating Surface
Torque – Magneto Flywheel Bolt : 120 N-m (12.0 kg-m, 87 ft-lb)

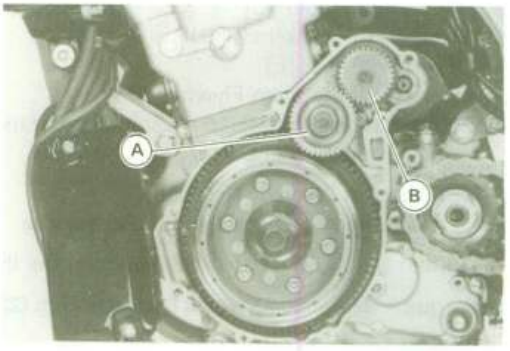


Special Tool – Flywheel Holder: 57001-1313

● Install a new gasket and the magneto cover (see this chapter).

Magneto Flywheel Removal (KLX650C)

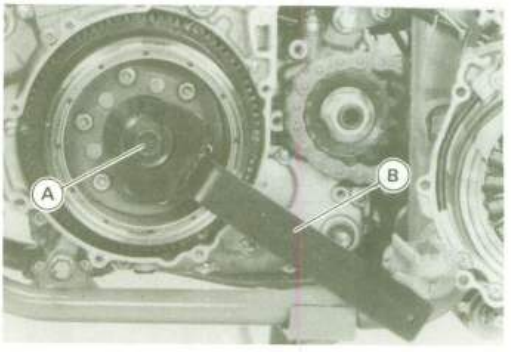
● Remove:
Shift Pedal
Magneto Cover (see Magneto Cover Removal)
Magneto Lead Clamp
Starter Clutch Idle Gear [A]
Starter Torque Limiter [B]



● Holding the magneto flywheel steady, unscrew the flywheel bolt [A].

Special Tool – Rotor Holder: 57001-1184 [B]

CAUTION
Use a 6-point socket instead of 12-point one to loosen the flywheel bolt.

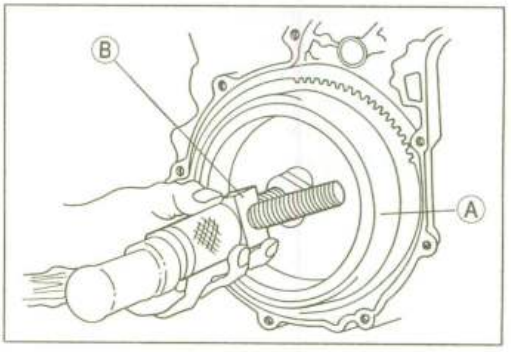


● Pull off the magneto flywheel [A] from the crankshaft.

Special Tool – Rotor Puller, M16/M18/M20/M22 x 1.5: 57001-1216 [B]

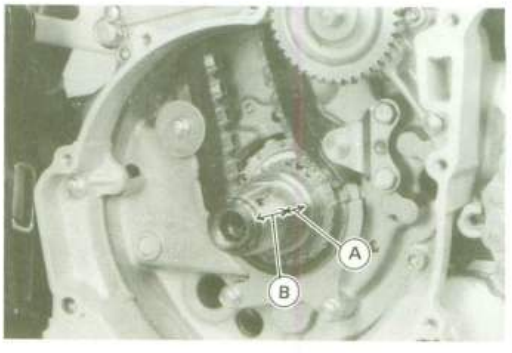
NOTE

○ *Screw in the puller while tapping the head of the puller with a hammer.*

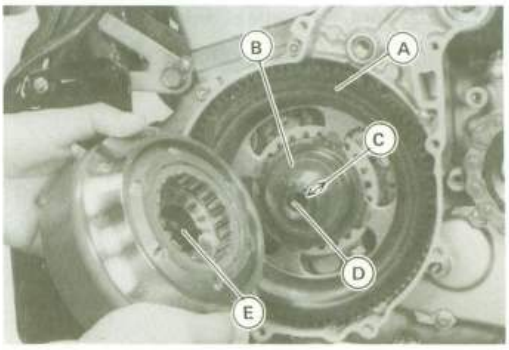


Magneto Flywheel Installation (KLX650C)

● Replace the magneto flywheel bolt with a new one. This bolt must be replaced if it has been tightened once to the specified torque.
● Apply molybdenum disulfide grease to the sliding surface [A] of the crankshaft as shown. Do not grease the crankshaft taper [B].



- Install the starter clutch gear [A] and the washer [B] on the crankshaft.
- Clean the following portions with an oil-less cleaning fluid such as trichloroethylene or acetone.



⚠WARNING

These cleaning fluids are usually highly flammable and harmful if breathed for prolonged periods. Be sure to heed the fluid manufacturer's warnings.

Crankshaft Taper [C]
Threads of Crankshaft [D]
Flywheel Taper [E]
Threads of Magneto Flywheel Bolt

- Fit the flywheel onto the crankshaft so that the woodruff key fits in the groove in the hub of the magneto flywheel.

Molybdenum Disulfide Grease –
Magneto Flywheel Bolt Seating Surface

- Tighten the flywheel bolt while holding the flywheel steady.

Torque – Magneto Flywheel Bolt : 216 N-m (22.0 kg-m, 159 ft-lb)

Special Tool – Rotor Holder: 57001-1184

★If any oil is deposited on the threads of the bolt, finally tighten it to **195 N-m (20 kg-m, 145 ft-lb)** of torque.

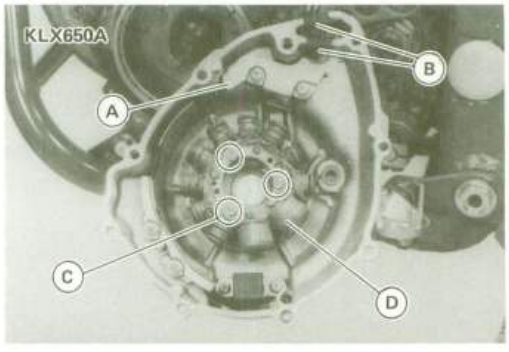
CAUTION

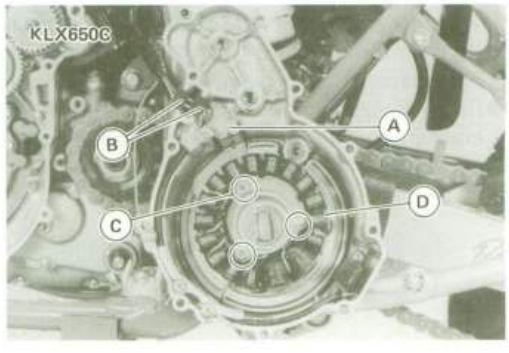
Use a 6-point socket instead of 12-point one to tighten the flywheel bolt to the specified torque.

- Install a new gasket and the magneto cover (see this chapter).

Magneto Stator Removal

- Remove the magneto cover (see Magneto Cover Removal).
- Remove the holding plate [A].
- Pull the pickup coil lead and stator coil lead grommets [B] out of the notch of the cover.
- Unscrew the stator bolts [C] and take off the stator [D].





Magneto Stator Installation

● Fit the stator coil lead grommet first, and the pickup coil lead grommet into the notch of the cover securely.

Torque – Magneto Stator Bolts :
KLX650A : 8.8 N-m (0.90 kg-m, 78 in-lb)
KLX650C : 12 N-m (1.2 kg-m, 104 in-lb)

Magneto Inspection

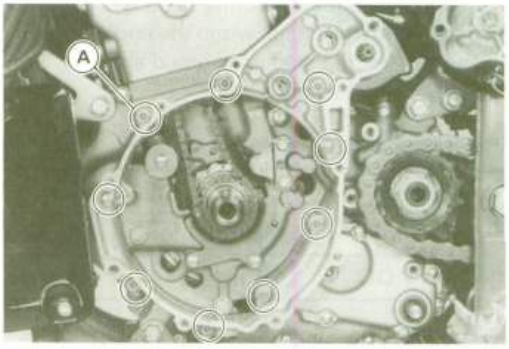
There are three types of magneto problems: short, open (wire burned out), or loss in flywheel magnetism. A short or open in one of the coil wires will result in either a low output, or not output at all. A loss in flywheel magnetism, which may be caused by dropping or hitting the flywheel, or just by aging, will result in low output. Therefore, inspecting the flywheel magneto, first measure the output, next, inspect the coils and the flywheel (see Charging System, Lighting System and Ignition System).

Magneto Case (KLX650C)

Magneto Case Removal

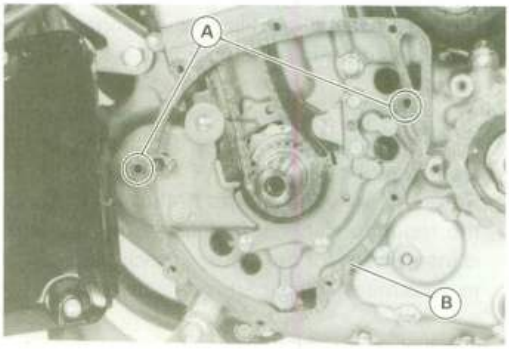
● Remove:
Starter Clutch Idle Gear
Starter Torque Limiter
Magneto Flywheel (see Electrical System chapter)
Starter Clutch Gear
Magneto Case Bolts [A]

● Prying the case upper end loose from the starter motor with a screwdriver, take off the magneto case.



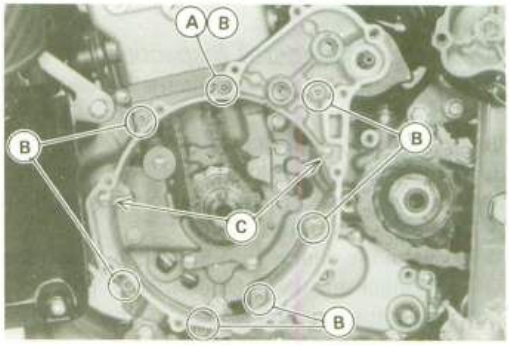
Magneto Case Installation

● Apply a little engine oil to the O-ring on the starter motor.
● Be sure all of the old gasket has been removed from the magneto case and the left hand crankcase sealing surface.
● Check that the dowel pins [A] are in place, and fit a new gasket [B] on the crankcase.



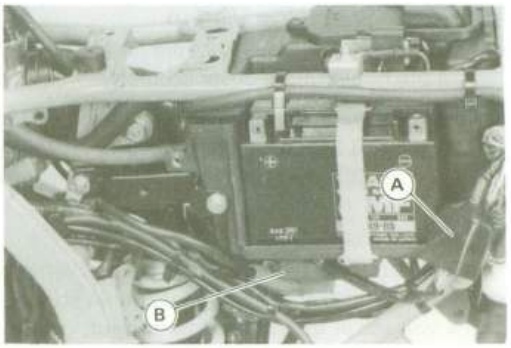
● Apply a non-permanent locking agent to the 22 mm Allen bolt [A] shown.
● Tighten:

Torque – Seven Magneto Case Allen Bolts : 12 N-m (1.2 kg-m, 104 in-lb) [B]
Two 35mm Magneto Case Bolts : 12 N-m (1.2 kg-m, 104 in-lb) [C]



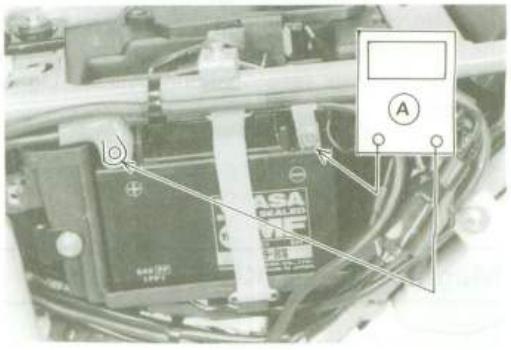
Charging System (KLX650C)

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

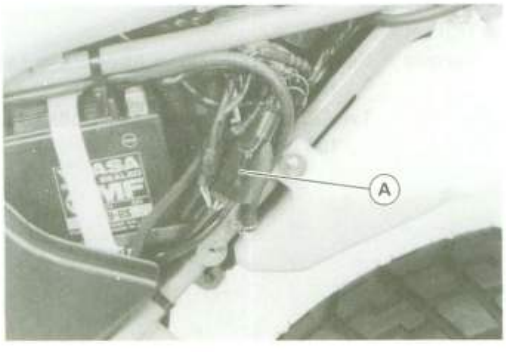
- Start the engine, and note the voltage readings at various engine speeds with the headlight turned on and then turned off. For the US and Australia models, to turn off the headlight, disconnect the headlight connector to the headlight unit. The readings should show nearly battery voltage when the engine 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	Connections		Reading
Range	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.

○ Note the voltage readings (total 3 measurements).

Alternator Output Voltage

Meter 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 Range	Connections		Reading
	Meter(+) to	Meter (−) to	
× 1 Ω	One yellow lead	Another yellow lead	0.3 ~ 1.0 Ω

★ 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 (∞) indicates a short, necessitating stator replacement.

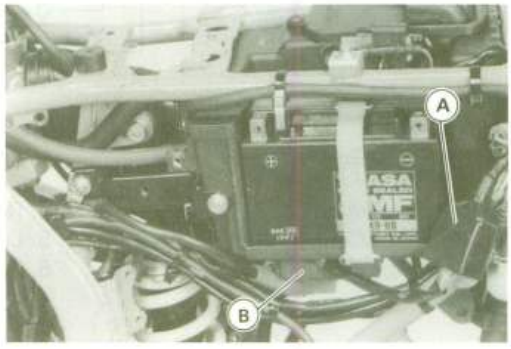
★ If the stator coils have normal resistance, but the voltage check showed the alternator to be defective, then the rotor magnetism has probably weakened, and the rotor must be replaced.

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 × 1 kΩ 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

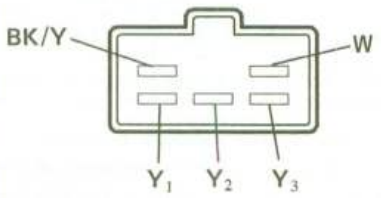
Use only Hand Tester 57001-983 for this test. A tester other than the Kawasaki Hand Tester may show different readings.
If a megger or a meter with a large-capacity battery is used, the regulator/rectifier will be damaged.

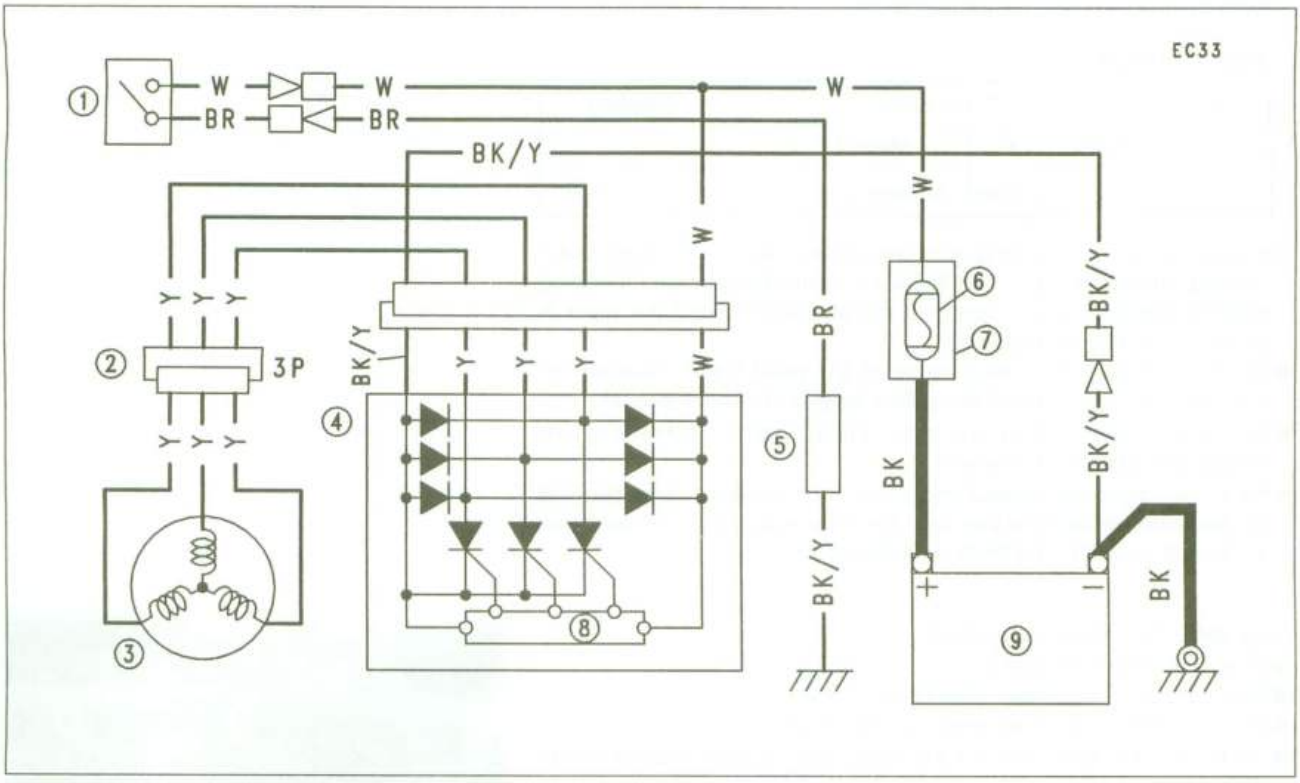
Regulator/Rectifier Resistance unit: kΩ

Range × 1 kΩ		Tester Positive (+) Lead Connections				
		W	Y1	Y2	Y3	BK/Y
* (−)	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

Ignition System

⚠WARNING

The ignition system produces extremely high voltage. Do not touch the spark plug, ignition coil, or spark plug lead while the engine is running, or you could receive a severe electrical shock.

CAUTION

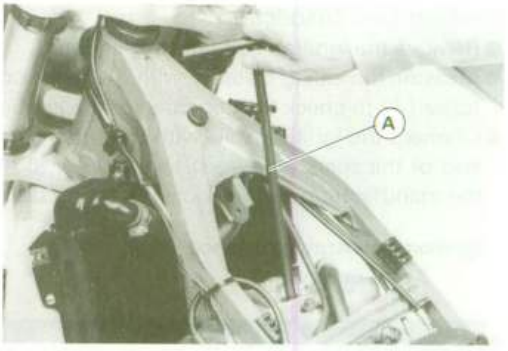
Do not disconnect the CDI connectors while the engine is running. This is to prevent CDI unit damage.

Spark Plug Removal/Installation

- Remove the fuel tank (see Fuel System chapter).
- Remove or install the spark plug using the spark plug wrench [A].

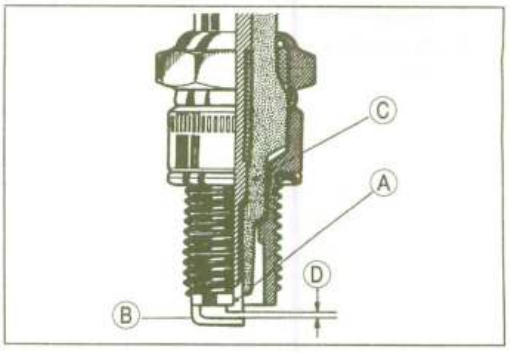
Special Tool – Spark Plug Wrench, Hex 18: 57001-1024 [A]

Torque – Spark Plug: 14 N-m (1.4 kg-m, 10.0 ft-lb)



Spark Plug Cleaning/Inspection

- Clean the spark plug, preferably in a sandblasting device, and then clean off any abrasive particles. The plug may also be cleaned using a high-flash point solvent and a wire brush or other suitable tool. If the center electrode [A] or side electrode [B] are corroded or damaged, or if the insulator [C] is cracked, replace the plug. Use the standard spark plug or its equivalent.



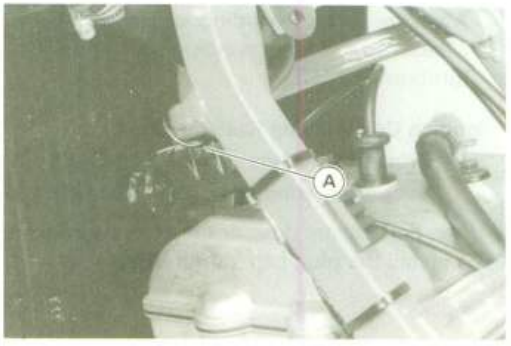
Spark Plug Gap

- Measure the gap [D] with a wire-type thickness gauge.
- If the gap is incorrect, carefully bend the outer electrode with a suitable tool to obtain the correct gap.

Spark Plug Gap
0.8 ~ 0.9 mm

Ignition Coil Removal

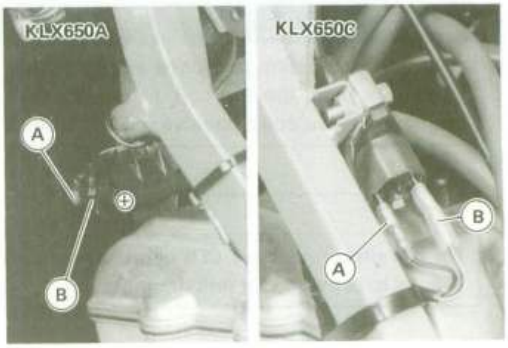
- Remove the fuel tank (see Fuel System chapter).
- Pull the spark plug lead off the spark plug.
- Disconnect the leads from the ignition coil.
- Take off the screw [A] and remove the coil.



Ignition Coil Installation

● Connect the primary winding leads to the ignition coil terminals as shown.

BK/Y Lead [A] → (−) Mark
BL (KLX650C, BK/W) Lead [B] → (+) Mark



Ignition Coil Inspection

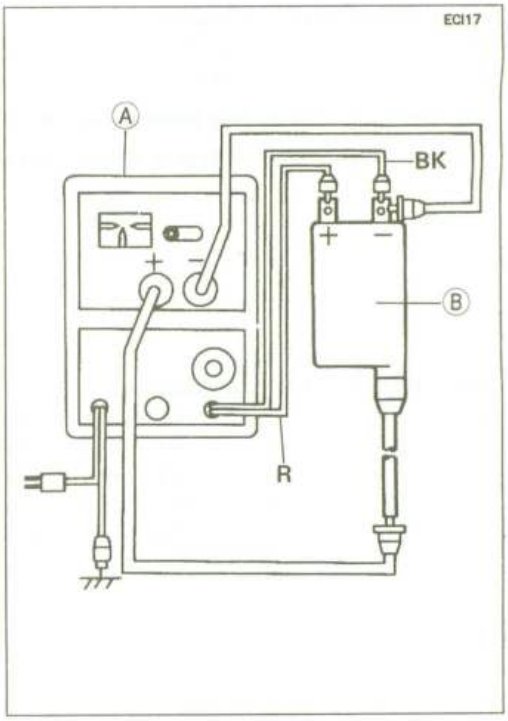
● Remove the ignition coil (see this chapter).
● Measure the arcing distance with a suitable commercially available coil tester [A] to check the condition of the ignition coil [B].
● Connect the ignition coil (with the spark plug cap left attached at the end of the spark plug lead) to the tester in the manner prescribed by the manufacturer and measure the arcing distance.

Ignition Coil Arcing Distance
7 mm or more

⚠WARNING

To avoid extremely high voltage shocks, do not touch the ignition coil body or leads.

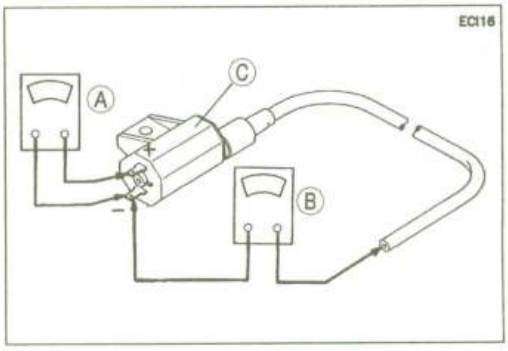
★ If the distance reading is less than the specified value, the ignition coil or spark plug cap is defective.
● To determine which part is defective, measure the arcing distance again with the spark plug cap removed from the ignition coil. Remove the cap by turning it counterclockwise.
★ If the arcing distance is subnormal as before, the trouble is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug cap.
● If the coil tester is not available, the coil can be checked for a broken or badly shorted winding with the hand tester (special tool).



NOTE

○ *The hand tester cannot detect layer shorts and shorts resulting from insulation breakdown under high voltage.*

● Measure the primary winding resistance as follows.
○ Connect the tester between the coil terminals.
○ Set the tester to the x 1 Ω range and read the tester.
● Measure the secondary winding resistance as follows.
○ Remove the plug cap by turning it counterclockwise.
○ Connect the tester between the spark plug lead and terminal.
○ Set the tester to the x 1 kΩ range and read the tester.



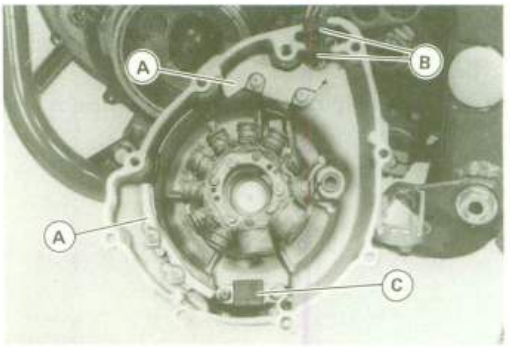
Measure primary winding resistance [A].
Measure secondary winding resistance [B].
Ignition Coil [C]

Ignition Coil Winding Resistance
Primary windings : 0.14 ~ 0.22 Ω (x 1 Ω)
Secondary windings : 3.8 ~ 5.8 kΩ (x 1 kΩ)

● If the hand tester does not read as specified, replace the coil.
○ To install the plug cap, turn it clockwise.

Pickup Coil Removal

- Remove the magneto cover (see Magneto Cover Removal).
- Remove the holding plates [A].
- Pull the pickup coil lead grommet [B] out of the notch of the cover.
- Remove the screws and take off the pickup coil [C].



Pickup Coil Inspection

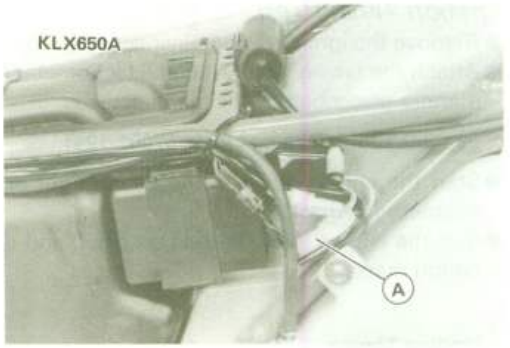
- Remove the left side cover (see Frame chapter).
- Disconnect the pickup coil lead connector [A].
- Connect the hand tester (special tool) between the G/W lead and the W/Y lead.
- Set the tester to the ×10 Ω range and read the tester.

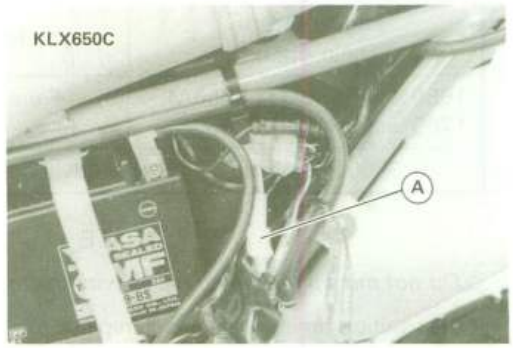
Pickup Coil Resistance (KLX650A/C)
100 ~ 148 Ω (× 10 Ω)

★If there is more resistance than the specified value, the coil has an open lead and must be replaced. Much less than this resistance means the coil is shorted, and must be replaced.

- Using the highest resistance range of the hand tester, measure the resistance between the pickup coil lead terminals and chassis ground.

★Any hand tester reading less than infinity (∞) indicates a short, necessitating replacement of the pickup coil assembly.





Exciter Coil Inspection

- Remove the left side cover (see Frame chapter).
- Pull off the exciter coil connector [A].
- Connect the hand tester (special tool) between the exciter coil leads (G/W and W/Y, W and R for KLX650C).

○Set the tester to the × 10 Ω range, and read the tester.

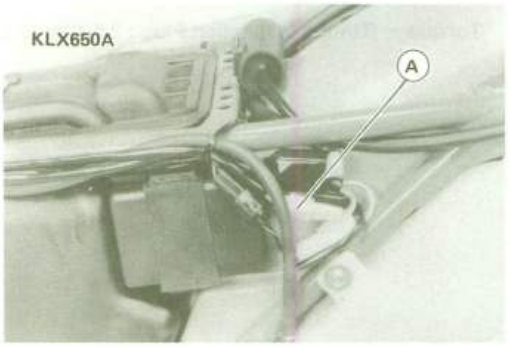
Exciter Coil Resistance

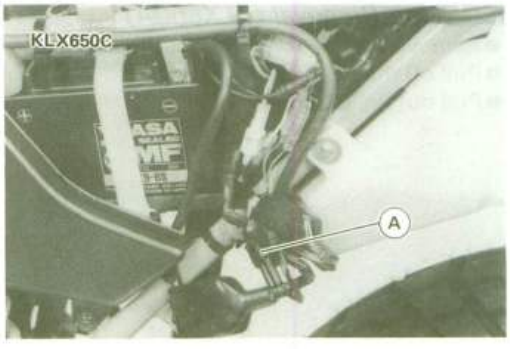
KLX650A :	**90 ~ 170 Ω**
KLX650C :	**100 ~ 200 Ω**

★If there is more resistance than the specified value, the coil has an open lead and must be replaced. Much less than this resistance means the coil is short, and must be replaced.

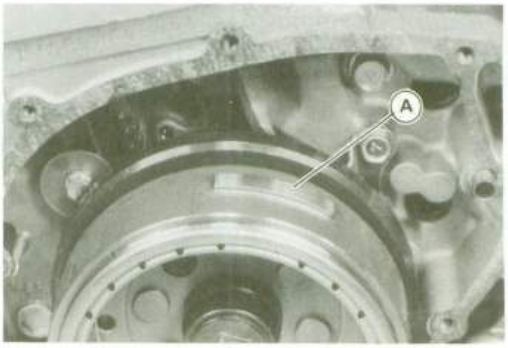
- Using the highest resistance range of the hand tester, measure the resistance between the exciter coil lead terminals (G/W and W/Y, W and R for KLX650C) and chassis ground.

★Any hand tester reading less than infinity (∞) indicates a short, necessitating replacement of the stator.





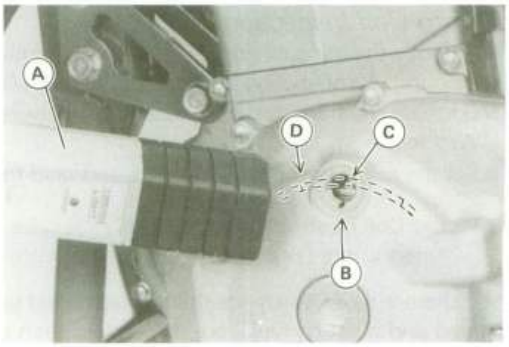
Magneto Flywheel Inspection



- Check the timing projection [A] for damage such as chipping or grooving.

★If the timing projection on the flywheel is visibly damaged, replace the magneto flywheel.

Ignition Timing Test



- Remove the ignition timing inspection plug.
- Attach the timing light [A] and a tachometer (for the KLX650A) in the manner prescribed by the manufacturer.

Special Tool – Timing Light: 57001-1241

- Start the engine and aim the timing light at the timing mark on the magneto flywheel.
- Run the engine at the speeds specified and note the alignment of the timing marks.

Ignition Timing

Engine speed r/min (rpm)	Notch [B] aligns with:
1650 and below (KLX650A) 1700 and below (KLX650C)	F mark [C] on flywheel
3000 and above	Advance mark [D] on flywheel

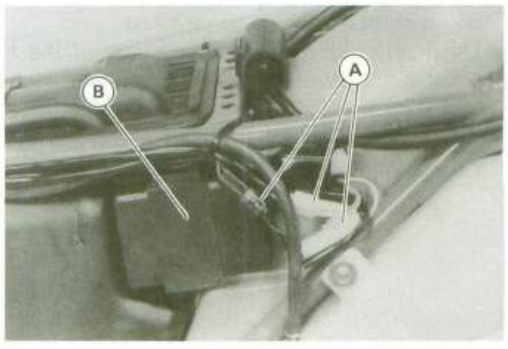
NOTE

○*Do not mix up the timing marks with the top mark "T".*

★If the ignition timing is incorrect, replace the CDI unit and the pickup coil.

Torque – Timing Inspection Plug : 2.5 N-m (0.25 kg-m, 22 in-lb)

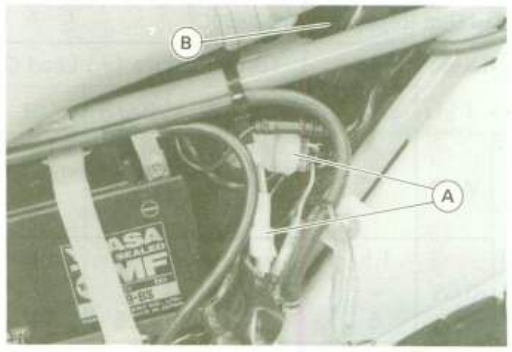
CDI Unit Removal (KLX650A)



- Remove the left side cover (see Frame chapter).
- Pull off the connectors [A].
- Pull out the CDI unit [B].

CDI Unit Removal (KLX650C)

- Remove:
  Seat (see Frame chapter)
  Left Side Cover (see Frame chapter)
- Pull off the CDI connectors [A].
- Pull out the CDI unit [B].

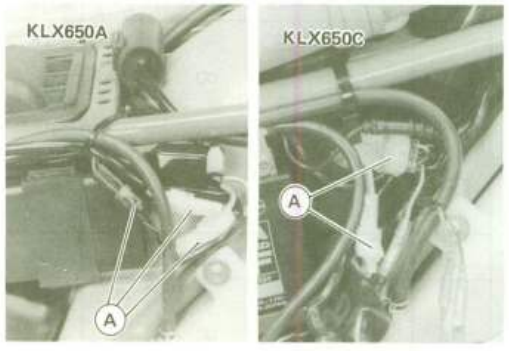


CDI Unit Inspection

- Remove:
  Left side Cover (see Frame chapter)
  CDI Unit Connectors [A]
- Set the hand tester to the × 1 kΩ 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 CDI unit.



CAUTION

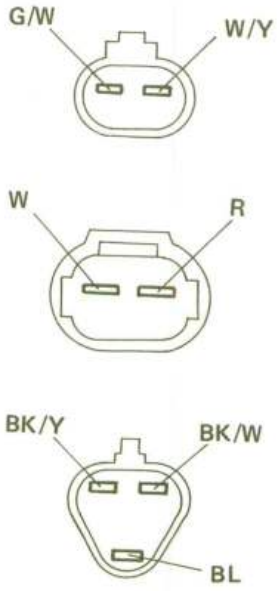
Use only Hand Tester 57001-983 for this test. A multi-meter other than the Kawasaki Hand Tester may show different readings.
If a megger or a meter with a large-capacity battery is used, the CDI unit will be damaged.

CDI Unit Resistance (KLX650A) **unit : kΩ**

Range × 1 kΩ		Tester Positive (+) Lead Connections						
		G/W	W/Y	W	R	BK/Y	BK/W	BL
*	G/W	–	∞	∞	∞	∞	∞	∞
	W/Y	26 ~ 104	–	2 ~ 8.5	2 ~ 8	0	2 ~ 8.5	∞
	W	∞	∞	–	∞	∞	0	∞
	R	175 ~ 700	13 ~ 51	65 ~ 250	–	13 ~ 51	65 ~ 250	∞
	BK/Y	26 ~ 104	0	2 ~ 8.5	2 ~ 8	–	2 ~ 8.5	∞
	BK/W	∞	∞	0	∞	∞	–	∞
	BL	∞	∞	∞	∞	∞	∞	–

* : Tester Negative (–) Lead Connections

CDI Unit Connectors



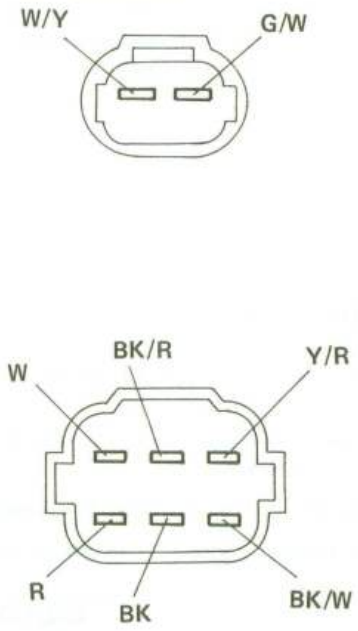
CDI Unit Resistance (KLX650C)

unit : kΩ

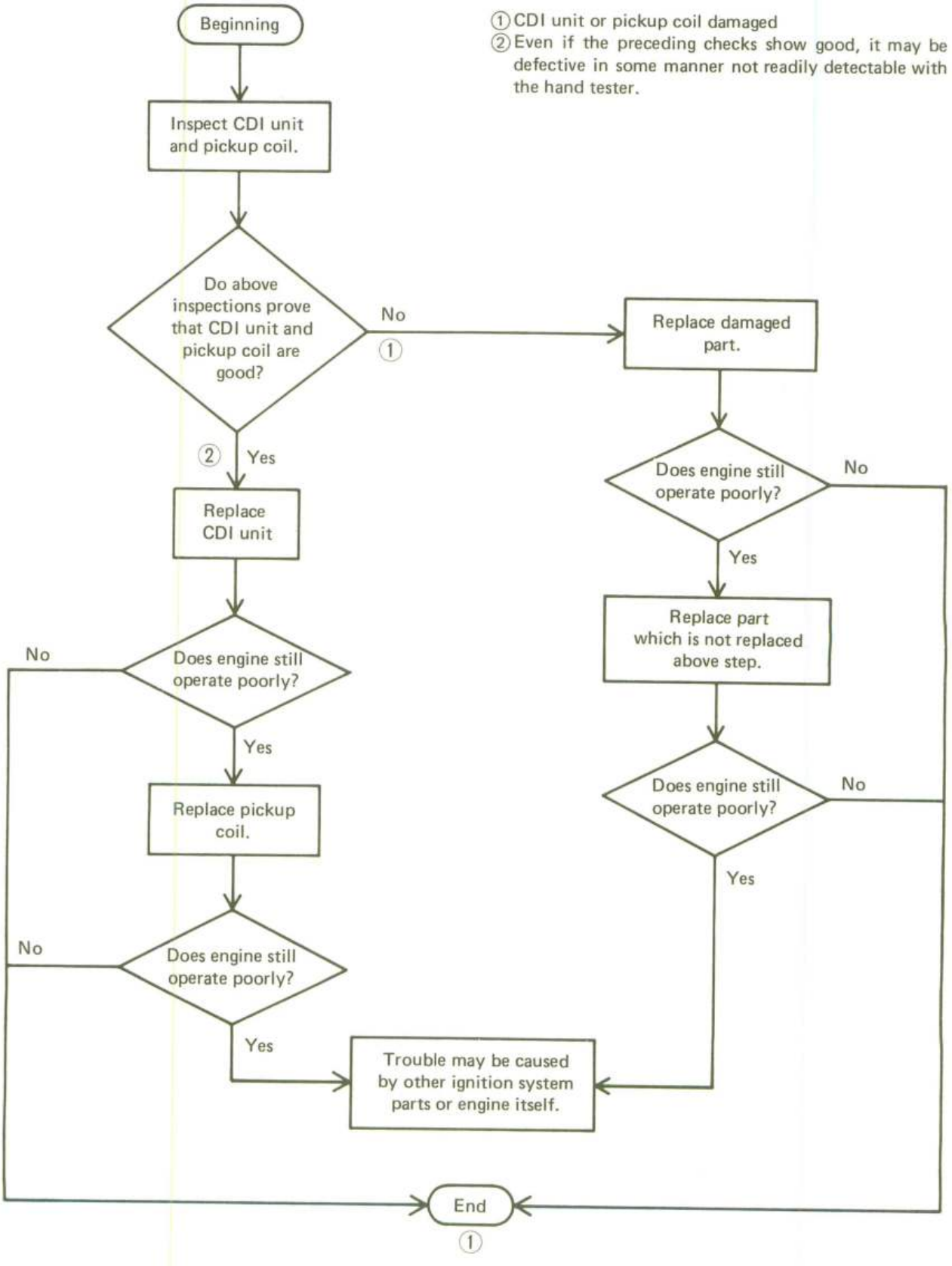
Range	Tester Positive (+) Lead Connections							
× 1 kΩ	W/Y	G/W	W	BK/R	Y/R	R	BK	BK/W
* W/Y	–	1.5 ~ 5	∞	5 ~ 20	12 ~ 48	2 ~ 8	0	∞
G/W	1.5 ~ 5	–	∞	6 ~ 25	14 ~ 54	4 ~ 16	1.5 ~ 5	∞
W	∞	∞	–	∞	∞	∞	∞	∞
BK/R	3 ~ 12	4.5 ~ 18	∞	–	16 ~ 66	7 ~ 28	3 ~ 12	∞
Y/R	12 ~ 48	13 ~ 52	∞	17 ~ 68	–	18 ~ 72	12 ~ 48	∞
R	∞	∞	∞	∞	∞	–	∞	∞
BK	0	1.5 ~ 5	∞	5 ~ 20	12 ~ 48	2 ~ 8	–	∞
BK/W	∞	∞	∞	∞	∞	∞	∞	–

* : Tester Negative (−) Lead Connections

CDI Unit Connectors



CDI Unit Troubleshooting:



① CDI unit or pickup coil damaged
② Even if the preceding checks show good, it may be defective in some manner not readily detectable with the hand tester.

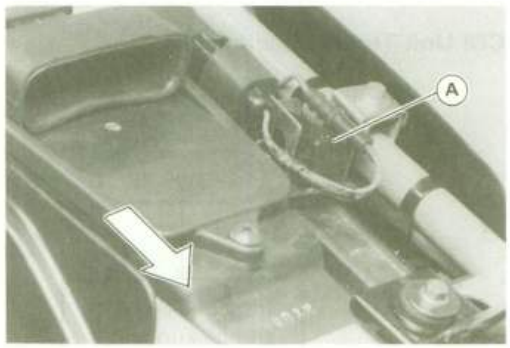
Interlock Diode Unit Inspection (KLX650C)

- Remove the seat (see Frame chapter).
- Remove the interlock diode unit [A] from the motorcycle.
- Zero the hand tester and connect it to the diode unit terminals.

Special Tool – Hand Tester: 57001-983

- Check the resistance between the terminals following the table.

★The diode resistance should be low in one direction and more than ten times as much in the other direction. If any two leads are low or high in both directions, the diode is defective and must be replaced.

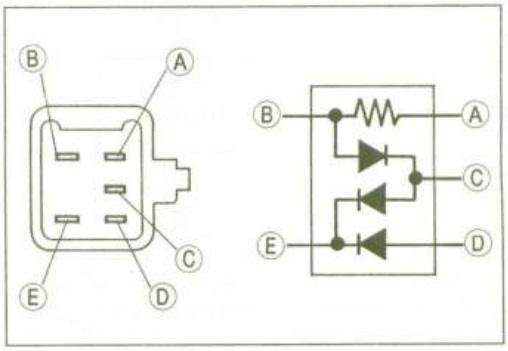


NOTE

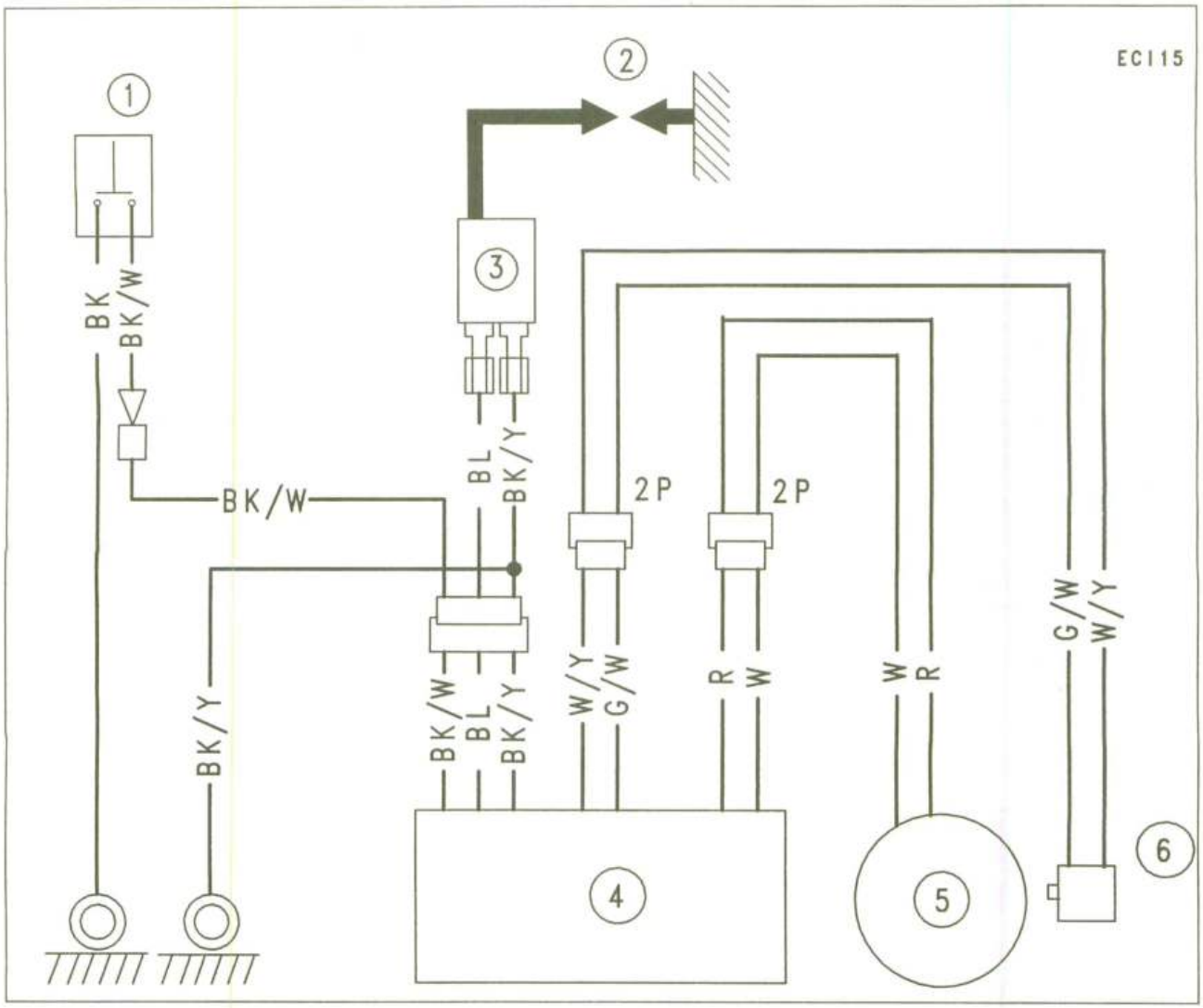
○*The actual meter reading varies with the meter used and the individual diode, but, generally speaking the lower reading should be from zero to one half the scale.*

Diode Unit Check

No.	Connections		Reading	Meter Range
	Meter (+) to	Meter (−) to		
1	A	B	4.5 ~ 5.5 kΩ	× 1 KΩ
2	B	A		
3	B	C	∞	× 10 Ω or × 100 Ω
4	C	E		
5	D	E		
6	C	B	0 ~ 1/2 scale	
7	E	C		
8	E	D		

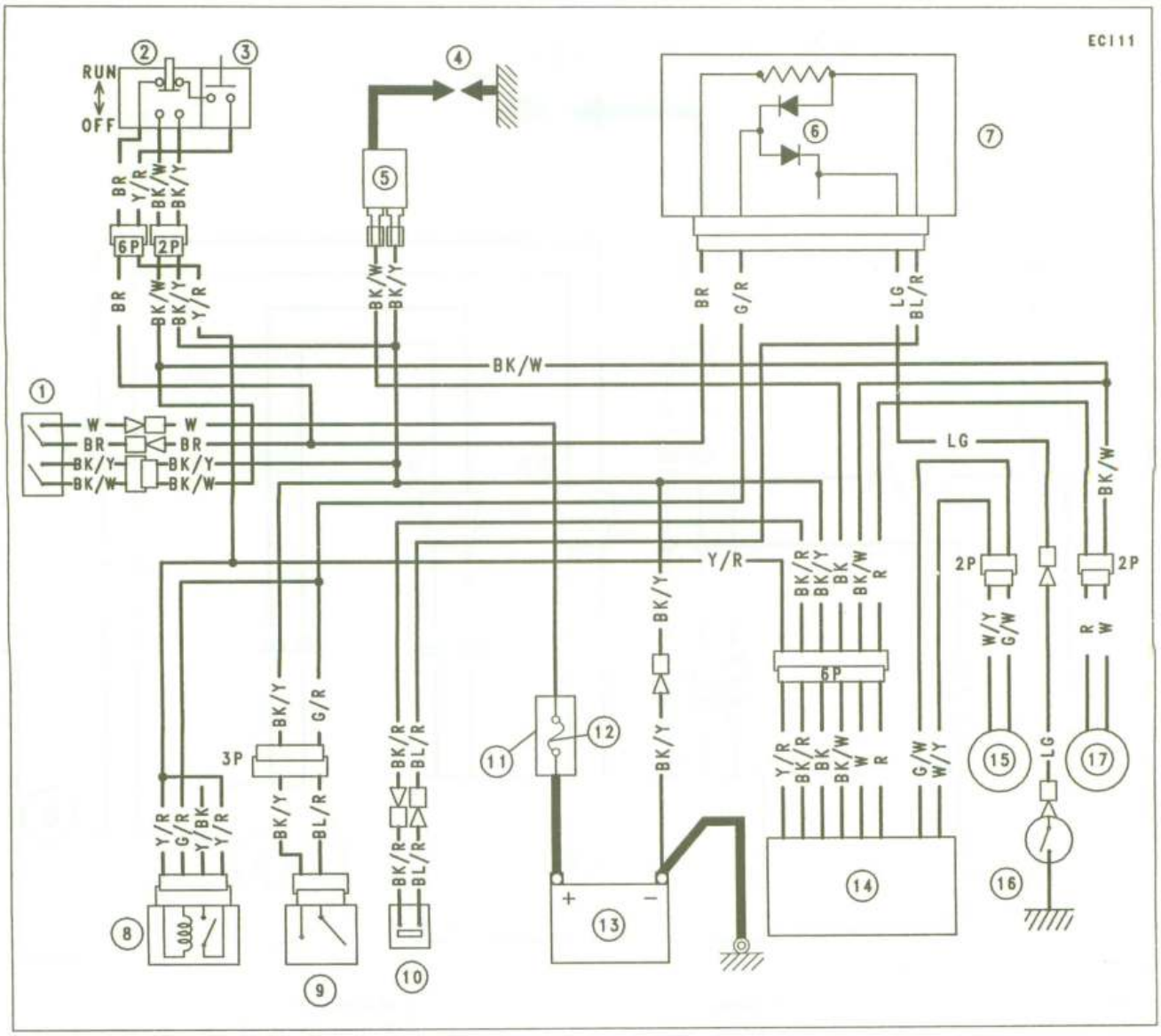


Ignition Circuit (KLX650A)



1. Engine Stop Switch
2. Spark Plug
3. Ignition Coil
4. CDI Unit
5. Magneto Flywheel
6. Pickup Coil

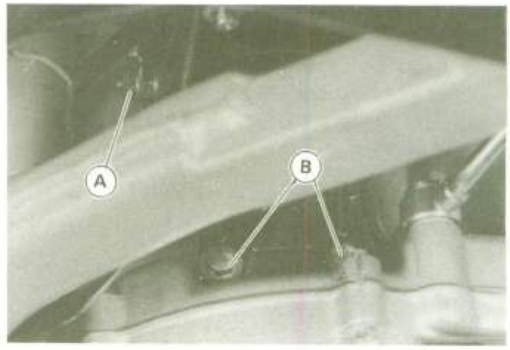
Ignition Circuits (KLX650C)



1. Ignition Switch
2. Engine Stop Switch
3. Starter Button
4. Spark Plug
5. Ignition Coil
6. Side Stand Control Diodes
7. Interlock Diode Unit
8. Starter Circuit Relay
9. Starter Lockout Switch
10. Side Stand Switch
11. Starter Relay
12. 20 A Main Fuse
13. Battery
14. CDI Unit
15. Pickup Coil
16. Neutral Switch
17. Exciter Coil

Electric Starter System (KLX650C)

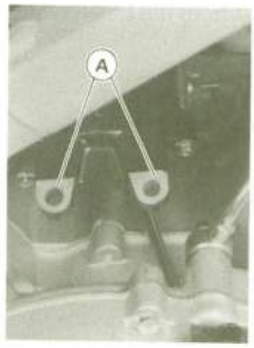
Starter Motor Removal

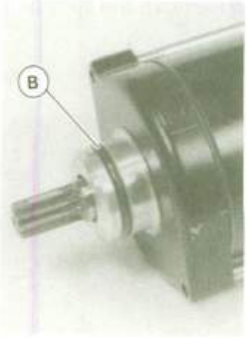


- Remove:
  - Exhaust Pipe and Muffler (see Engine Top End chapter)
  - Magneto Cover (see Magneto Cover Removal)
  - Magneto Flywheel (see Magneto Flywheel Removal)
  - Magneto Case Removal (see Magneto Case Removal)
- Slide back the rubber cover.
- Take off the starter motor terminal nut [A] and pull off the starter cable.
- Remove the starter motor mounting bolts [B].
- Gently pry the starter motor out of the crankcase.

CAUTION
Do not tap the end of the starter motor shaft or the motor may be damaged.

Starter Motor Installation





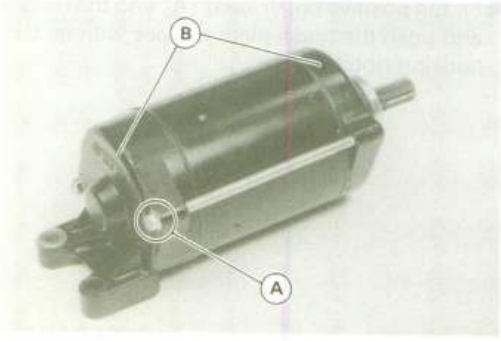
- When installing the starter motor, clean the starter motor legs [A] and crankcase where the starter motor is grounded.
- Apply a small amount of engine oil to the O-ring [B].

Torque – Starter Motor Mounting Bolts : 8.8 N-m (0.90 kg-m, 78 in-lb)

- Tighten the starter motor terminal nut.

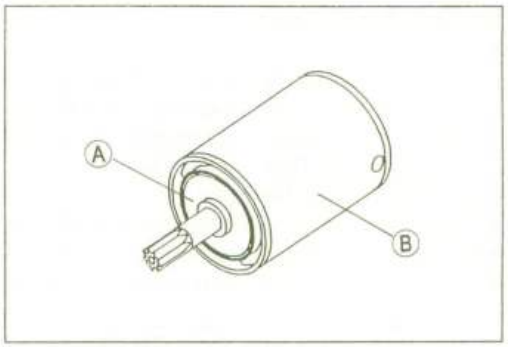
Torque – Starter Motor Terminal Nut : 4.9 N-m (0.50 kg-m, 43 in-lb)

Starter Motor Disassembly

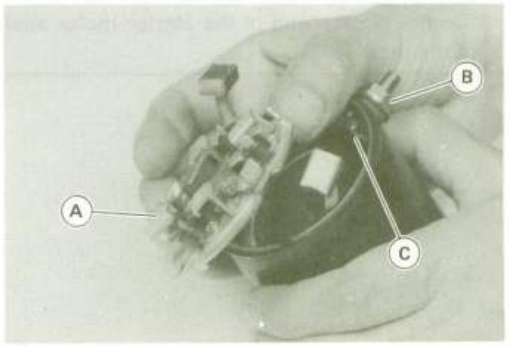


- Remove the starter motor (see Starter Motor Removal).
- Take out the through bolts [A].
- Remove both end covers [B].

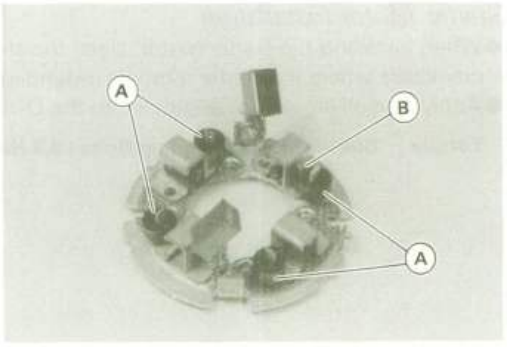
● Pull the armature [A] out of the yoke [B].



● Take off the brush plate assembly [A].
● Unscrew the terminal locknut [B], and take off the washers and positive brush assembly [C].



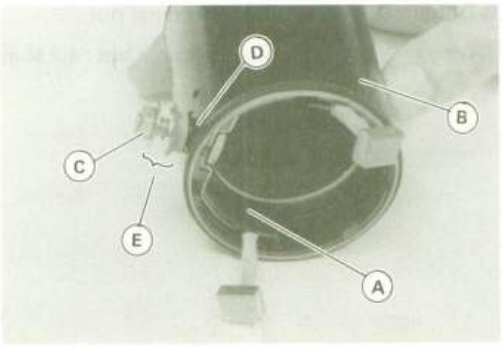
● Remove the springs [A] from the brush plate assembly [B].



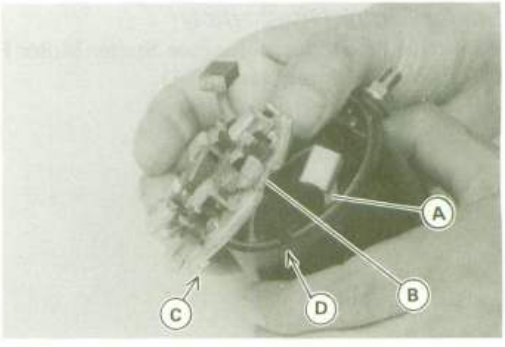
Starter Motor Assembly

● Replace all O-rings with new ones.
● Install the positive brush assembly [A] into the yoke housing [B], and tighten the terminal locknut [C] with O-ring [D] and four washers [E] as shown.

Torque – Starter Motor Terminal Locknut : 11 N-m (1.1 kg-m, 95 in-lb)



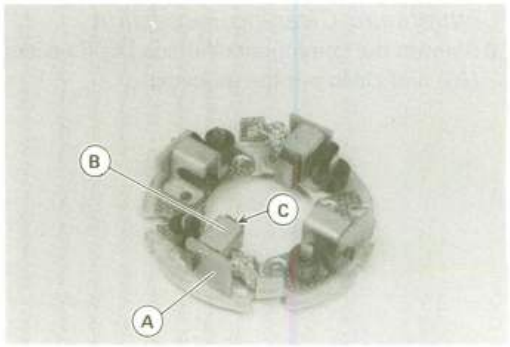
● Fit the positive brush leads [A] into the notches [B] in the brush plate, and push the brush plate in place with its tab [C] fitting into the yoke housing notch [D].



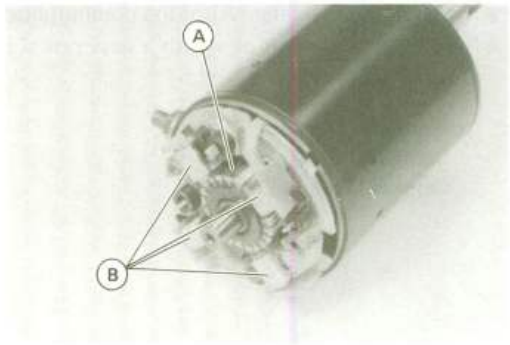
● Fit the brushes into the holders and install the armature.

NOTE

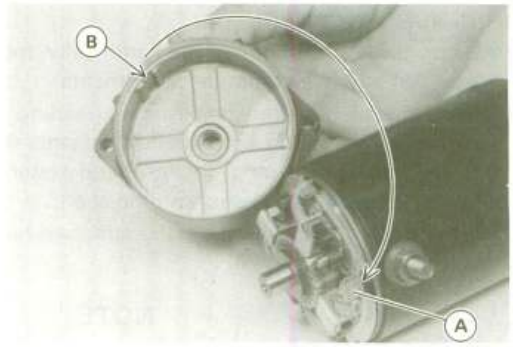
○ *Turning the spring end clockwise, insert the suitable plate [A] between the spring end and the brush holder [B] to prevent the brush [C] from pushing in by spring force.*



● Put the armature [A] among the brushes [B].

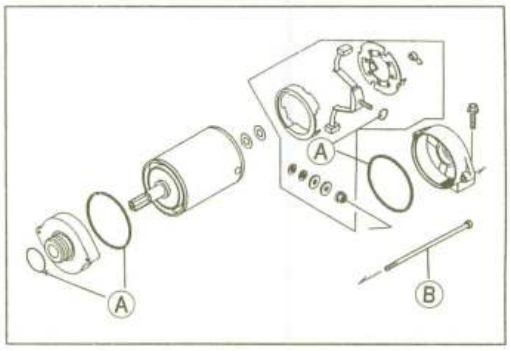


● Install the brush end cover so that the longer tab [A] fits in the slot [B] in the cover.

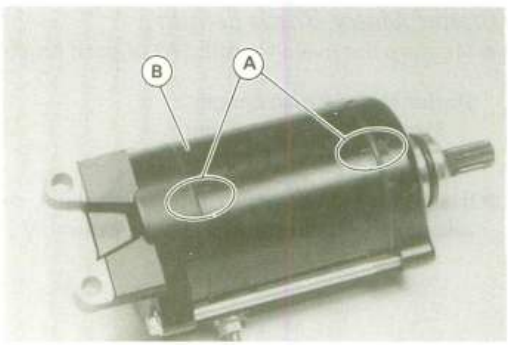


● Install new O-rings [A] as shown.
● Tighten the starter motor through bolts [B].

Torque – Starter Motor Through Bolts : 4.9 N-m (0.50 kg-m, 43 in-lb)

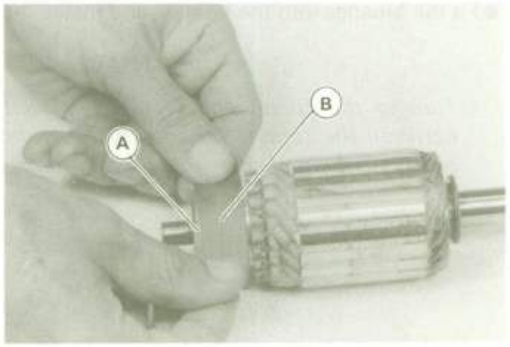


● Install the yoke.
○ Align the lines [A] marked on the yoke [B] with the end cover marks.



Commutator Cleaning/Inspection

● Smooth the commutator surface [A] if necessary with fine emery cloth [B], and clean out the grooves.

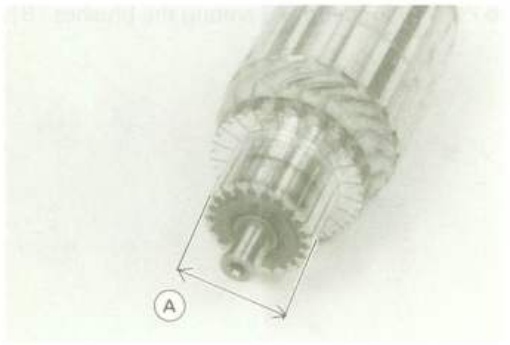


● Measure the diameter [A] of the commutator.

★ Replace the starter motor with a new one if the commutator diameter is less than the service limit.

Commutator Diameter

Standard:	**28 mm**
Service Limit:	**27 mm**



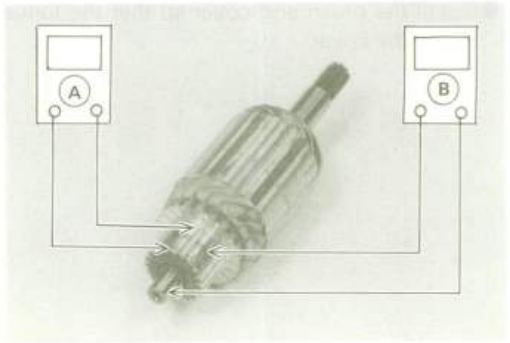
Armature Inspection

● Using the × 1 Ω range of the hand tester, measure the resistance [A] between any two commutator segments.

★ If there is a high resistance or no reading (∞) between any two segments, a winding is open and the starter motor must be replaced.

● Using the highest range of the hand tester, measure the resistance [B] between the segments and the shaft.

★ If there is any reading at all, the armature has a short and the starter motor must be replaced.



NOTE

○ *Even if the foregoing checks show the armature to be good, it may be defective in some manner not readily detectable with the hand tester. If all other starter motor and starter motor circuit components check good, but the starter motor still does not turn over or only turns over weakly, replace the starter motor with a new one.*

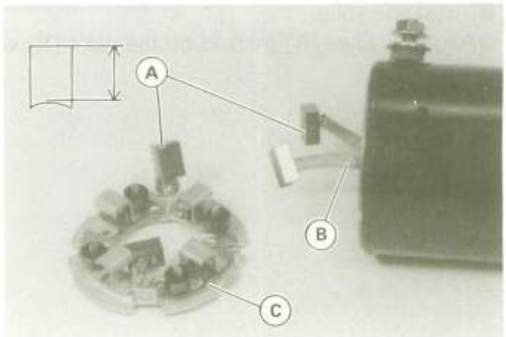
Starter Motor Brush Length

● Measure the overall length [A] of each brush.

Starter Motor Brush Length

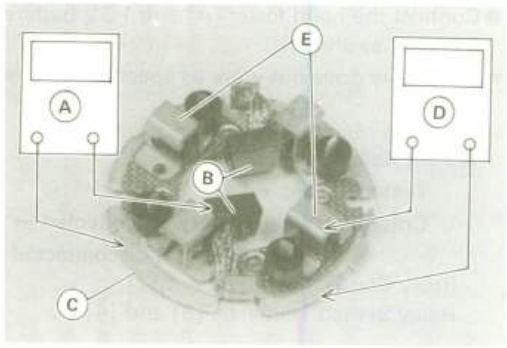
Standard:	**12.5 mm**
Service Limit:	**6.5 mm**

★ If any is worn down to the service limit, replace the positive brush assembly [B] and the brush plate assembly [C].



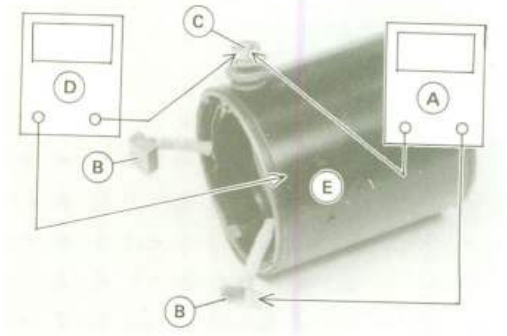
Brush Plate Assembly Inspection

- Using the × 1 Ω hand tester range, measure the resistance [A] between the negative brushes [B] and the metal plate [C].
- ★If there is not close to zero ohms, the brush plate assembly must be replaced.
- Using the highest hand tester range, measure the resistance [D] between the metal plate [C] and the positive brush holders [E].
- ★If there is any reading, the brush holder has a short and the brush plate assembly must be replaced.



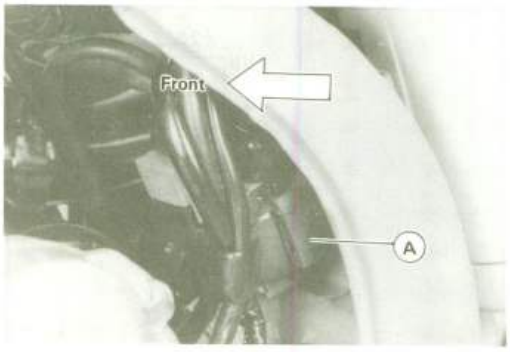
Positive Brush Assembly Inspection

- Using the × 1 Ω hand tester range, measure the resistance [A] between the positive brushes [B] and the terminal bolt [C].
- ★If there is a high resistance or no reading (∞), a lead is open and the positive brush assembly must be replaced.
- Using the highest hand tester range, measure the resistance [D] between the terminal bolt [C] and the yoke [E].
- ★If there is any reading, the insulation is faulty and the positive brush assembly must be replaced.

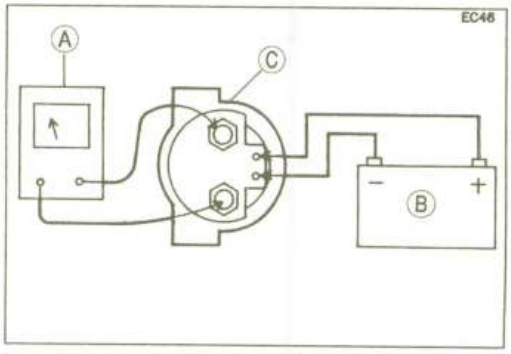


Starter Relay Inspection

- Remove the starter relay [A].



- Connect the hand tester [A] and 12 V battery [B] to the starter relay [C] as shown.
- ★If the relay does not work as specified, the relay is defective. Replace the relay.



Testing Relay

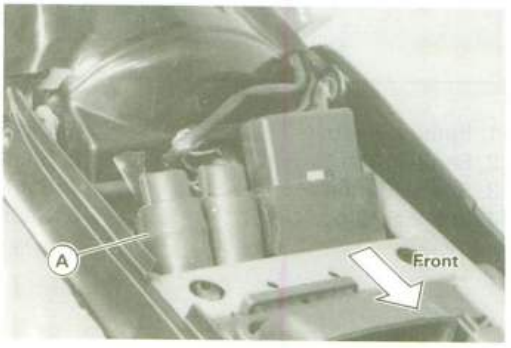
Hand Tester Range : × 1 Ω range

Criteria : When battery is connected → 0 Ω

When battery is disconnected → ∞ Ω

Starter Circuit Relay Inspection

- Remove the seat (see Frame chapter).
- Remove the starter circuit relay [A] connected Y/R, G/R, and Y/BK leads.



● Connect the hand tester [A] and 12 V battery [B] to the starter cirucit relay [C] as shown.

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

Testing Relay

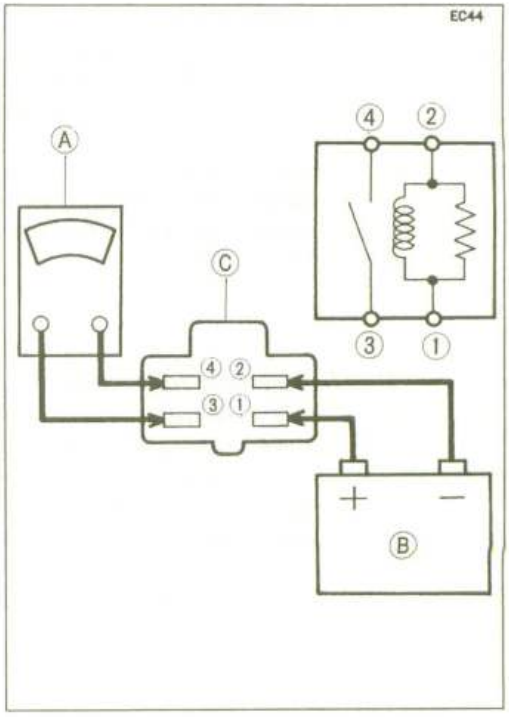
Tester Range: × 1 Ω

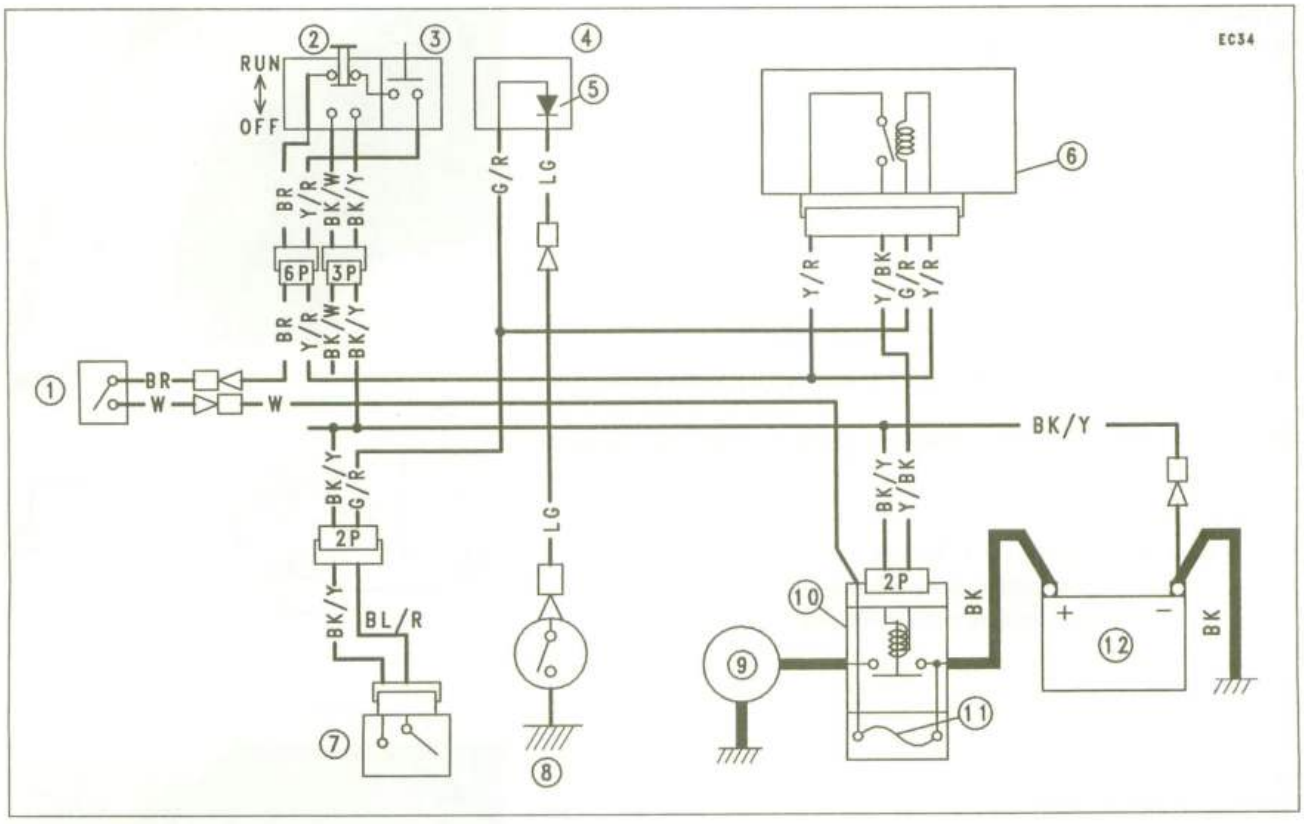
Criteria: **When battery is connected → 0 Ω**

When battery is disconnected → ∞Ω

Relay Coil Terminal [1] and [2]

Relay Switch Terminals [3] and [4]



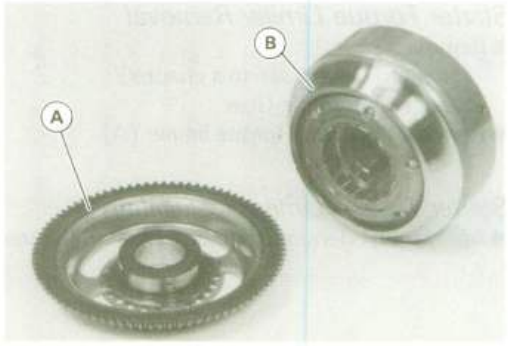


1. Ignition Switch
2. Engine Stop Switch
3. Starter Button
4. Interlock Diode Unit
5. Diode
6. Starter Circuit Relay
7. Starter Lockout Switch
8. Neutral Switch
9. Starter Motor
10. Starter Relay
11. 20 A Main Fuse
12. Battery

Starter Clutch (KLX650C)

Starter Clutch Removal

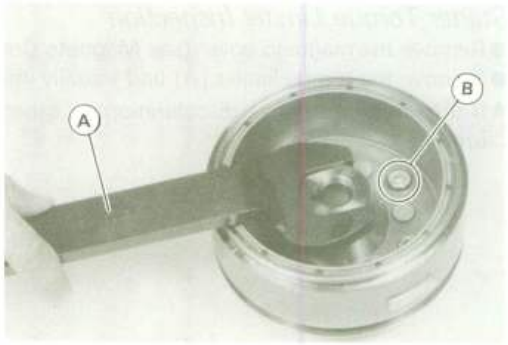
- Remove the magneto flywheel (see Magneto Flywheel Removal).
- Remove the starter gear [A] from the magneto flywheel [B].



- Hold the magneto flywheel with the rotor holder [A] and unscrew the starter clutch bolts [B].

  Special Tool – Rotor Holder: 57001-1184

- Take off the starter clutch.

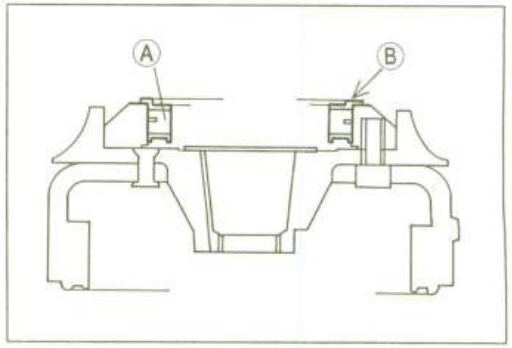


Starter Clutch Installation

- Install the one-way clutch [A] so that the flange [B] faces out.

  Non-permanent Locking Agents – Starter Clutch Bolts
  Torque – Starter Clutch Bolts : 34 N-m (3.5 kg-m, 25 ft-lb)

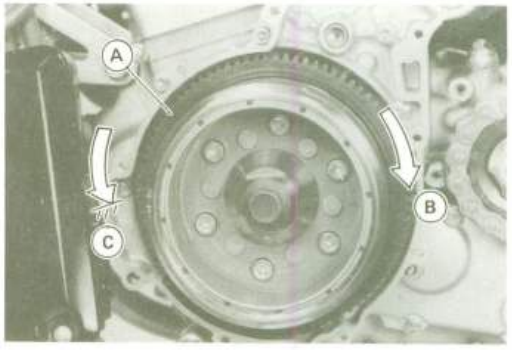
- Apply molybdenum disulfide grease to the inside diameter of the starter gear.



Starter Clutch Inspection

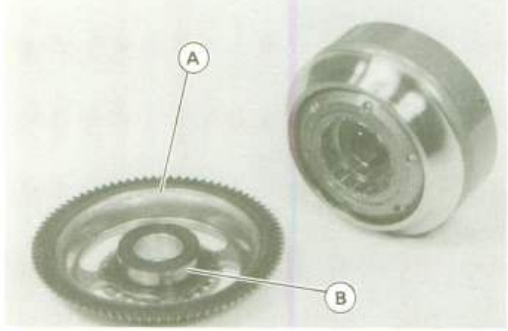
- Remove the magneto cover (see Magneto Cover Removal).
- Turn the starter gear [A] by hand. The starter gear should turn clockwise [B] freely, but should not turn counterclockwise [C].

★If the clutch does not operate as it should or if it makes noise, disassemble the starter clutch, examine each part visually, and replace any worn or damaged parts.



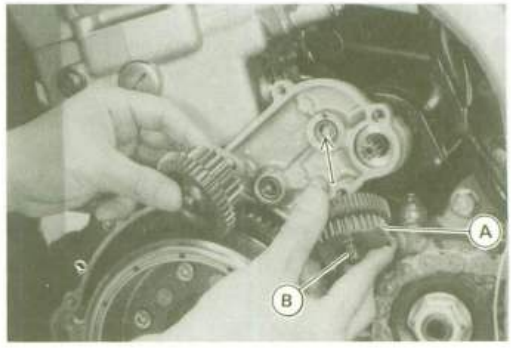
- Inspect the starter gear [A].

★If the sliding surfaces [B] are worn or damaged, replace the starter gear.



Starter Torque Limiter Removal

- Remove:
  Magneto Cover (see this chapter)
  Starter Clutch Idle Gear
- Remove the starter torque limiter [A].



Starter Torque Limiter Installation

- Apply molybdenum disulfide grease to the torque limiter shaft [B].

Starter Torque Limiter Inspection

- Remove the magneto cover (see Magneto Cover Removal).
- Remove the torque limiter [A] and visually inspect it.

★If the limiter has wear, discoloration, or other damage, replace it as a unit.

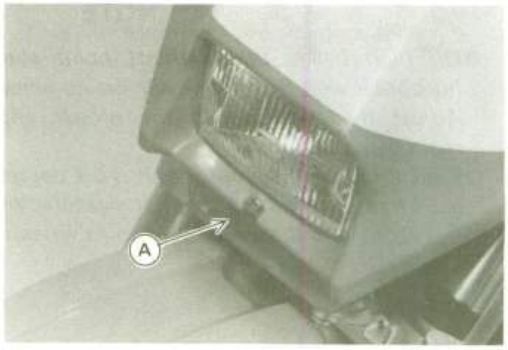
Lighting System

The KLX650C's US and Australia models have a headlight relay. In these models, the headlight does not go on when the ignition switch and the engine stop switch are first turned on. The headlight comes on after the starter button is released and stays on until the ignition switch is turned off. The headlight will go out momentarily whenever the starter button is pressed and come back on when the button is released.

Headlight Beam Vertical Adjustment (KLX650A)

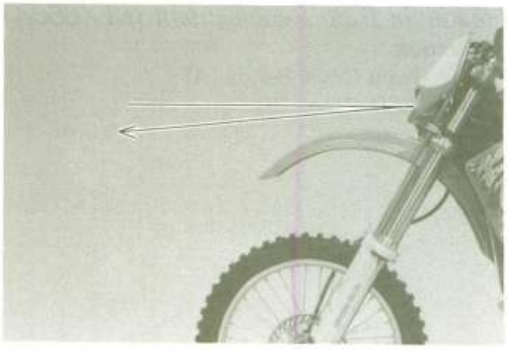
○The KLX650A's headlight beam is adjustable vertically only.

○Turning the adjusting screw [A] counterclockwise makes the headlight beam point downward.



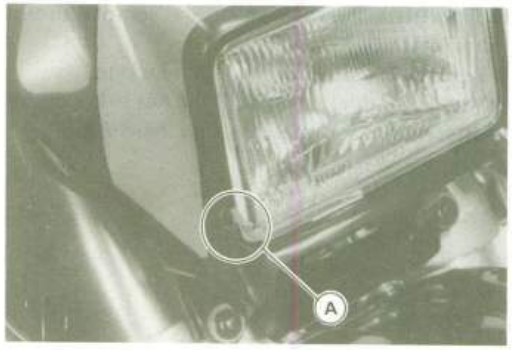
NOTE

○*On high beam, the brightest point should be slightly below horizontal with the motorcycle on its wheels and the rider seated.*



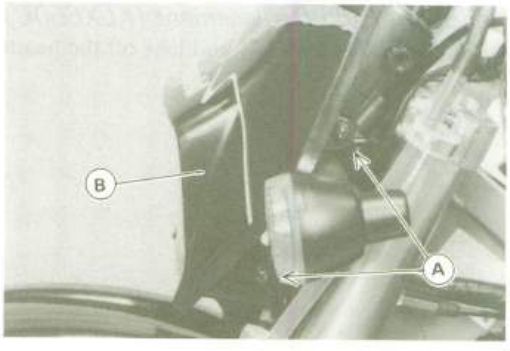
Headlight Beam Horizontal Adjustment (KLX650C)

●Turn the adjusting screw [A] on the headlight rim in or out until the beam points straight ahead. Turning the adjusting screw clockwise makes the headlight beam point to the right.

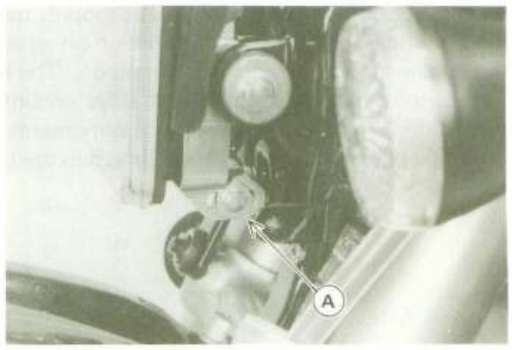


Headlight Beam Vertical Adjustment (KLX650C)

●Remove the screws [A] and take off the headlight cover [B].



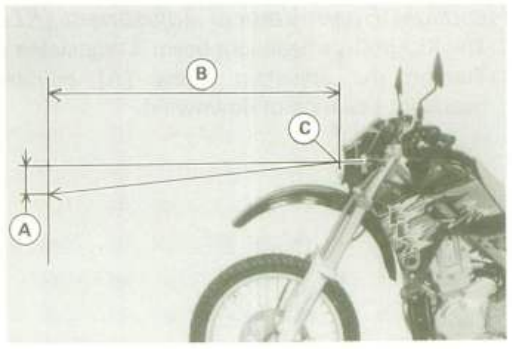
- Loosen the lower headlight bolt [A] and adjust the headlight vertically.
- Tighten the lower headlight bolt.
- Install the headlight cover and tighten the screws securely.



NOTE

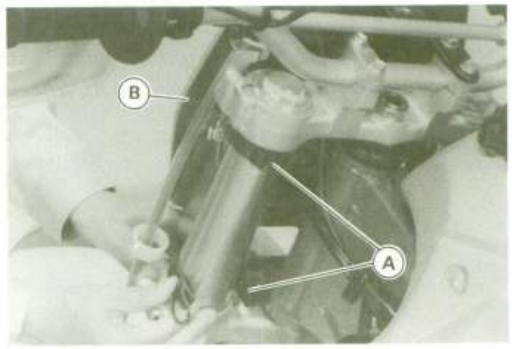
○On high beam, the brightest point should be slightly below horizontal with the motorcycle on its wheels and the rider seated. Adjust the headlight to the proper angle according to local regulations.

○For US model, the proper angle is 0.4 degree below horizontal. This is 50 mm [A] drop at 7.6 m [B] measured from the center [C] of the headlight with the motorcycle on its wheels and the rider seated.

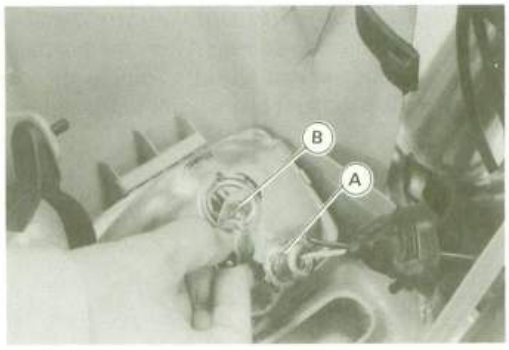


Headlight Bulb Replacement (KLX650A)

- Remove:
  Headlight Cover Bands [A]
  Headlight Cover [B]

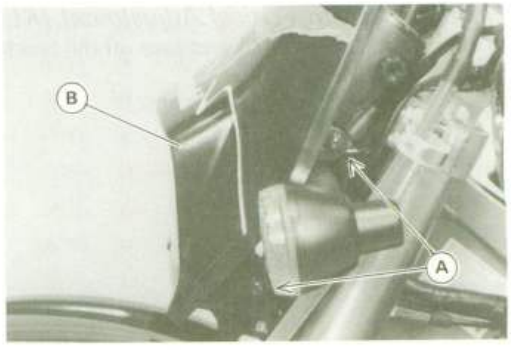


- Slide back the dust cover and remove the bulb socket [A] from the headlight unit.
- Replace the bulb [B] with a new one.
- Install the dust cover with the flat side downward.
- Check the headlight aim after installation.

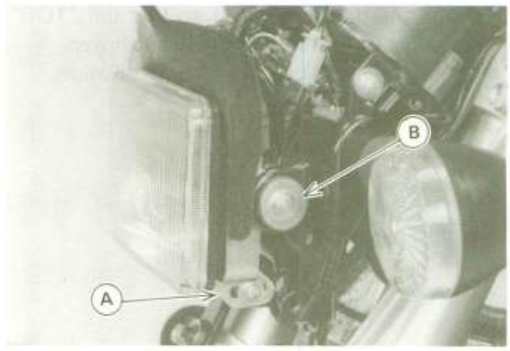


Headlight Bulb Replacement (KLX650C)

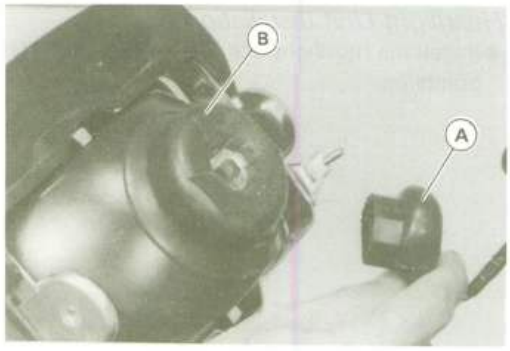
- Remove the screws [A] and take off the headlight cover [B].



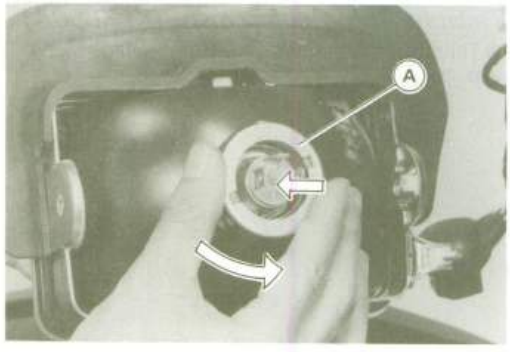
● Remove:
Lower Headlight Bolts [A]
Upper Headlight Bolts [B]



● Pull out the bulb socket [A] from the headlight unit.
● Slide back the dust cover [B]

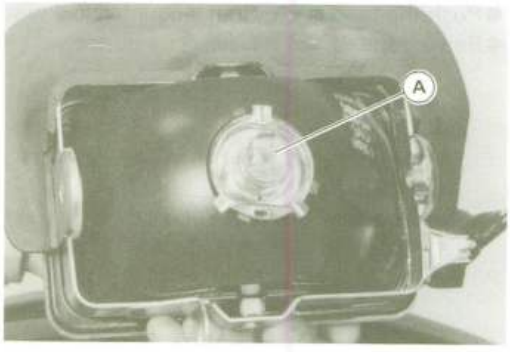


● Push the holder [A] in, turn it counterclockwise, and remove it.

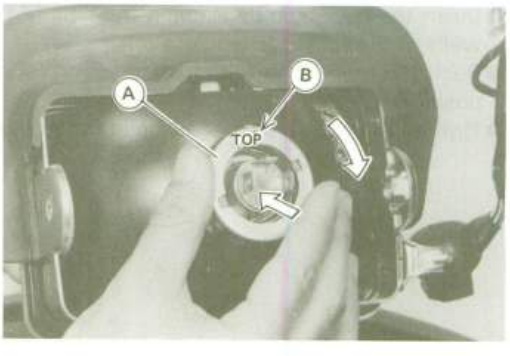


● Pull out the bulb [A] and replace it with a new one.

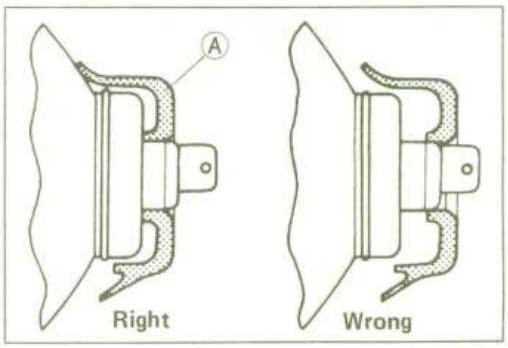
CAUTION
When handling the quartz-hologen bulb, never touch the glass portion with bare hands. Always use a clean cloth. Oil contamination from hands or dirty rags can reduce bulb life or cause the bulb to explode.



● Install the holder [A] so that the "TOP" mark [B] points up.
● Push the holder and turn it clockwise.

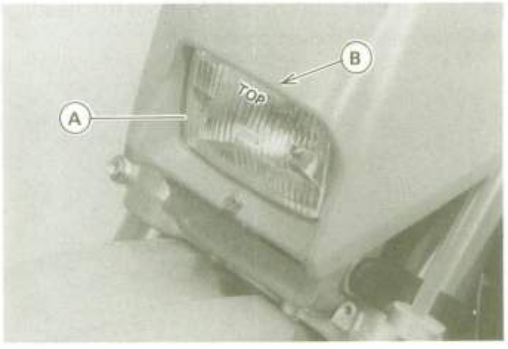


- Install the dust cover [A] so that the "TOP" mark points up and the cover fits onto the bulb firmly as shown.
- Check the headlight aim after installation.



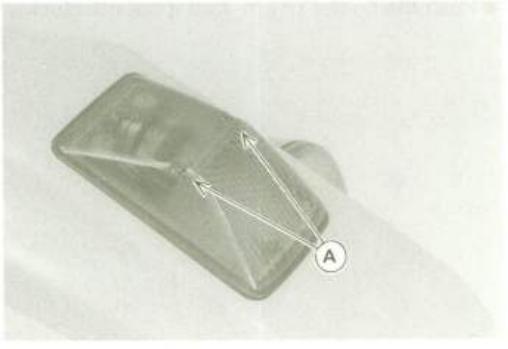
Headlight Unit Installation

- Install the headlight unit [A] so that the "TOP" mark [B] on the lens points up.

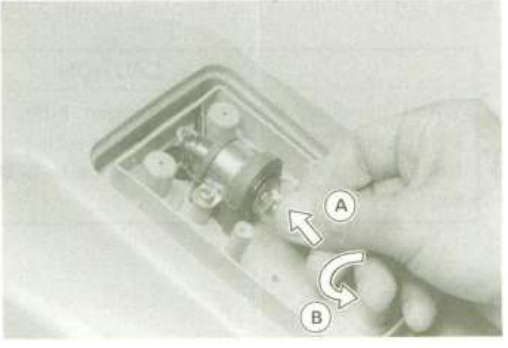


Taillight Bulb Replacement (KLX650A)

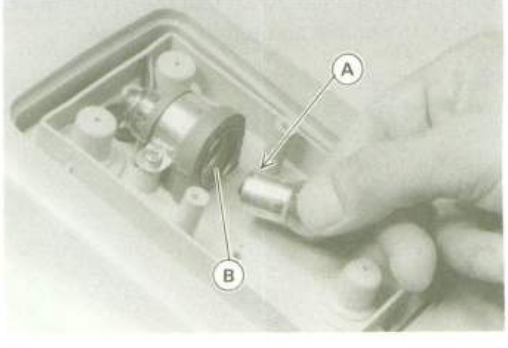
- Take out the screws [A] in the taillight lens.
- Pull the lens off.



- Push the bulb in [A], turn it counterclockwise [B], and pull it out.
- Be sure the socket is clean.

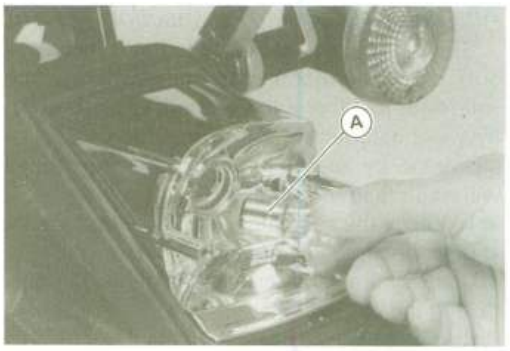


- Insert the new bulb by aligning the pins [A] with the grooves in the walls of the socket [B].
- Push the bulb in, turn it clockwise, and release it. It should lock in position.
- Tighten the two screws. Be careful not to overtighten them.



Taillight Bulb Replacement (KLX650C)

● Replace the taillight bulb [A] in the same manner as the KLX650A's taillight bulb.

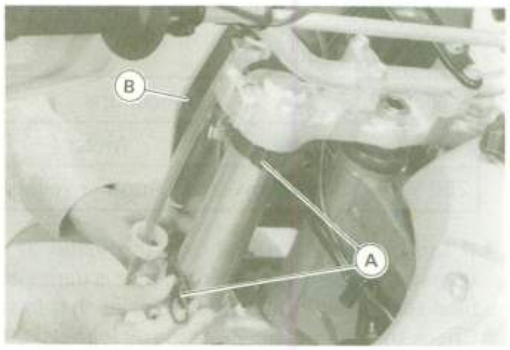


License Light Bulb Replacement (KLX650C)

● Replace the license light bulb in the same manner as the KLX650A's taillight bulb.

AC Lighting Voltage Measurement (KLX650A)

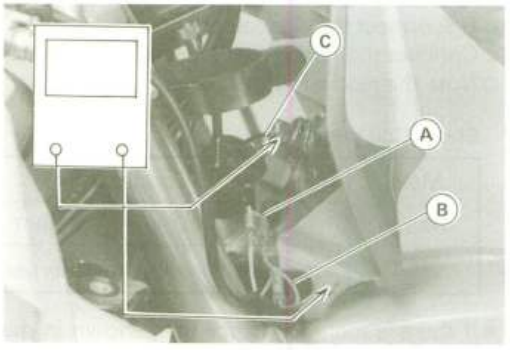
● Remove the headlight cover bands [A] and open the headlight cover [B].



● Connect the hand tester to the headlight unit using an auxiliary lead (parallel connection).
  Lighting Switch R Lead [A]
  Auxiliary Lead [B]
  BK Lead [C]

NOTE

○ *Perform test with headlight connected.*



● Turn on the lighting switch to the ON position.
● Start the engine and see that the headlight and the taillight are all lit.
● Measure the lighting voltage at 4000 rpm.

AC Lighting Voltage

Meter Range	Connections		Reading @ 4000 rpm
	Meter (+) to	Meter (−) to	
AC 25 V	Red lead	Black lead	11.7 ~ 13.7 V

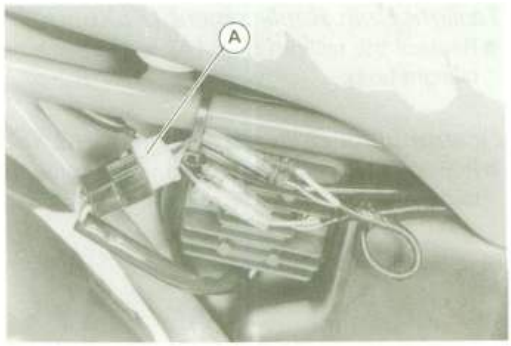
● Turn the engine stop switch to the OFF position to stop the engine and disconnect the hand tester.

★ If the output voltage is kept between the values given in the table, the AC lighting system is considered to be working normally.

★ If the output voltage is much higher than the values specified in the table, the regulator is defective or the regulator leads are loose or open.

● If the output voltage is much lower than the values specified in the table, the regulator is defective or the alternator output is insufficient for the loads. Check the alternator and regulator to determine which part is defective.

Alternator (Magneto) Inspection (KLX650A)



There are three types of alternator failures: short, open (wire burned out), or loss in rotor 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, or flywheel 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.
○ Note the voltage readings (total 3 measurements).

Alternator Output Voltage

Meter	Connections		Reading
Range	Meter (+) to	Meter (−) to	@ 4000 rpm
250 V AC	One yellow lead	Another yellow lead	more than 36 V

★ If the output voltage shows the value in the table, the alternator operates properly and the regulator 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	Connections		Reading
Range	Meter (+) to	Meter (−) to	
× 1 Ω	One yellow lead	Another yellow lead	0.4 ~ 1.1 Ω

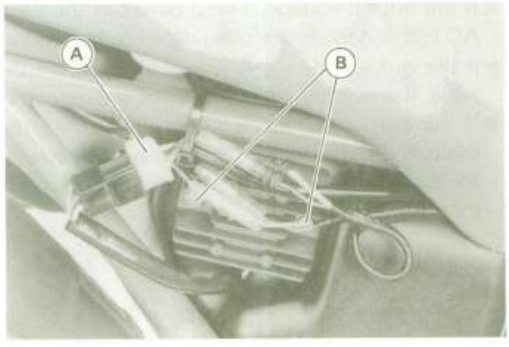
★ If there is more resistance than shown in the table, or no hand tester reading (infinity) for any two leads, the stator has an open lead and must be replaced. Much less than this resistance means the stator is shorted, and must be replaced.

● 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 (∞) indicates a short, necessitating stator replacement.

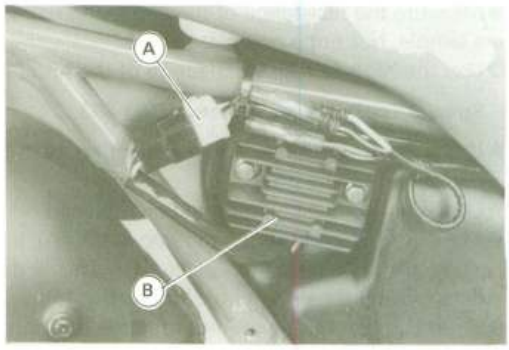
★ If the stator coils have normal resistance, but the voltage check showed the alternator to be defective, then the rotor magnetism has probably weakened, and the rotor must be replaced.

Regulator Removal (KLX650A)



● Remove the seat and the right side cover (see Frame chapter).
● Cut off the wiring strap and pull off the connector [A].
● Unscrew the bolts [B] and remove the regulator.

Regulator Inspection (KLX650A)



- Remove the seat (see Frame chapter).
- Remove the right side cover (see Frame chapter).
- Disconnect the alternator connector [A].
- Set the hand tester to the × 1 kΩ range and make the measurements shown in the table.

Special Tool – Hand Tester: 57001-983

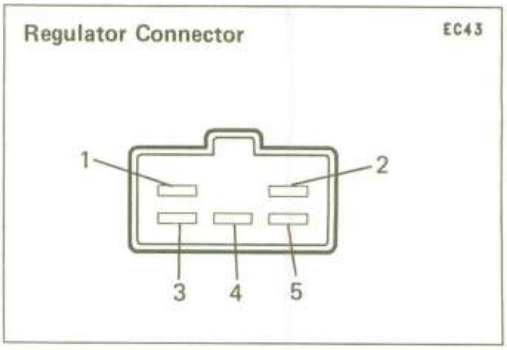
★If the tester readings are not as specified, replace the regulator [B].

CAUTION
Use only Hand Tester 57001-983 for this test. An ohmmeter 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 will be damaged.

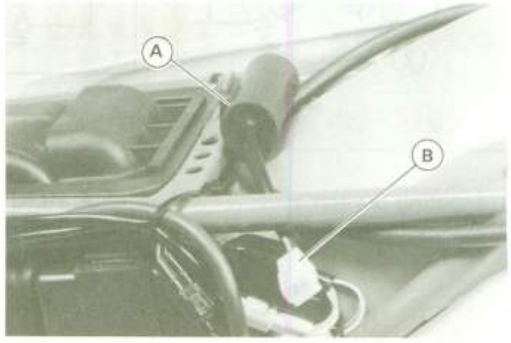
Regulator Resistance **unit: kΩ**

Range × 1 kΩ		Tester positive (+) Lead Connections				
		1	2	3	4	5
* (−)	1	–	2.5–10	1.5–6.0	1.5–6.0	1.5–6.0
	2	20~80	–	20~200	20~200	20~200
	3	20~200	1.5~6.0	–	40~500	40~500
	4	20~200	1.5~6.0	40~500	–	40~500
	5	20~200	1.5~6.0	40~500	40~500	–

(*): Tester Negative (−) Lead Connections



Headlight Capacitor Inspection (KLX650A)



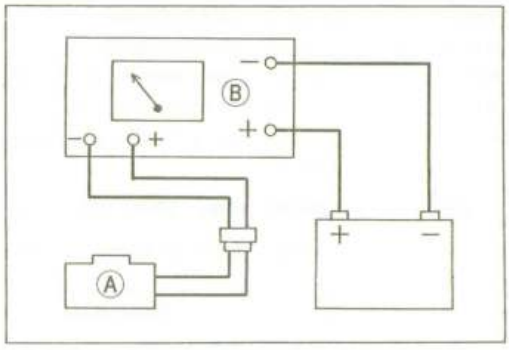
★If the headlight flickers, check the capacity of the headlight capacitor [A].

- Remove:
  Seat (see Frame chapter)
  Left Side Cover (see Frame chapter)
- Pull off the capacitor connector [B].
- Short the capacitor terminals in the connector together to discharge any residual voltage in the capacitor.

● Measure the resistance of the capacitor, using the hand tester. This is a simple, but not a complete check.
○ Use the highest resistance range of the hand tester.

Special Tool – Hand Tester: 57001-983

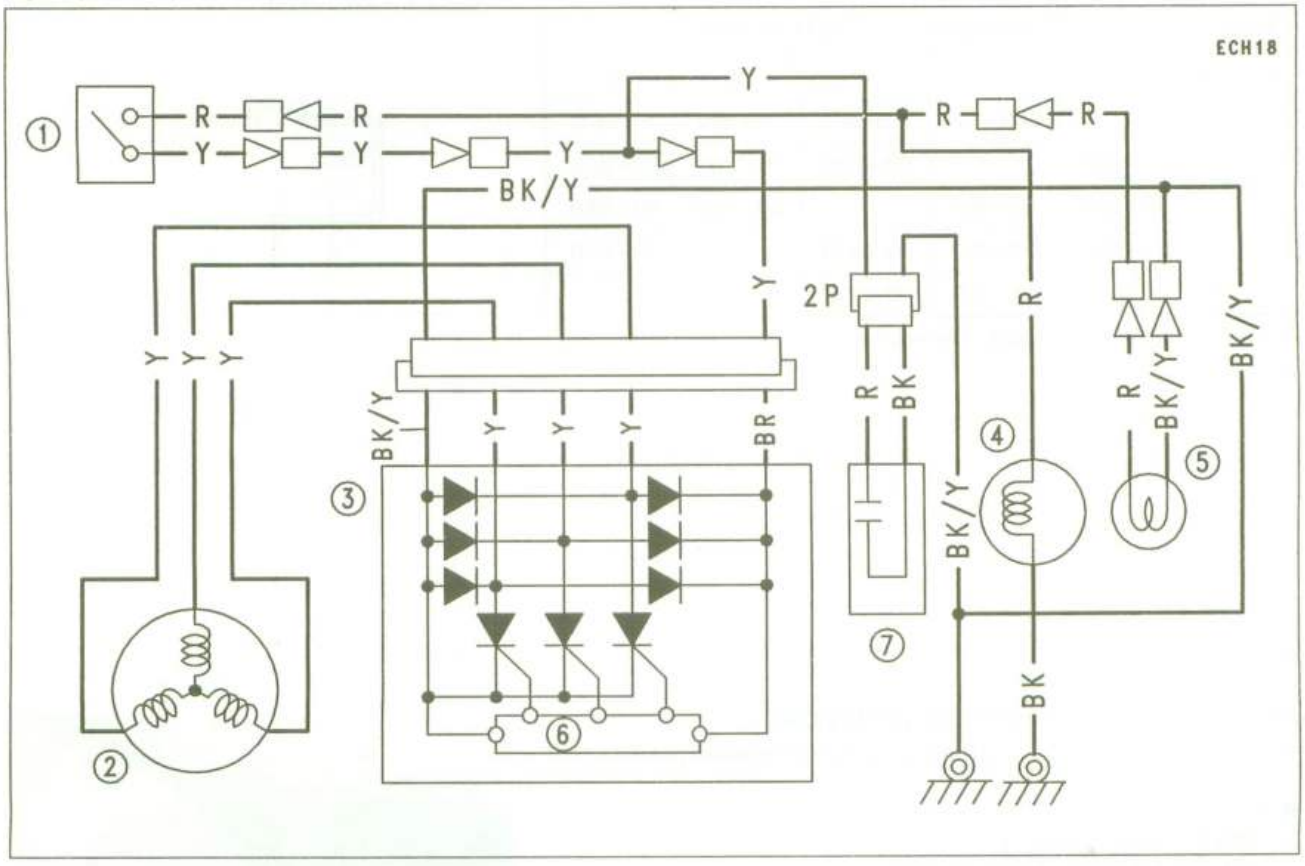
★ If the tester indicates some deflection of the hand and returns, the capacitor may be good.
★ Otherwise, the capacitor must be replaced.
● Measure the capacity of the capacitor [A] using a suitable commercially available capacitor tester [B]. This is the most accurate way for determining the condition of the capacitor.
● Short the capacitor terminals together to discharge any residual voltage in the capacitor.



Capacity of Capacitor
Standard: 3700 ~ 5700 μF
Pressure Resisting: 50 V

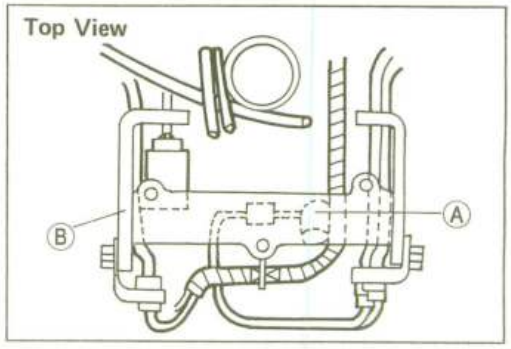
★ If the tester does not read as specified, replace the capacitor.

Lighting Circuit (KLX650A)

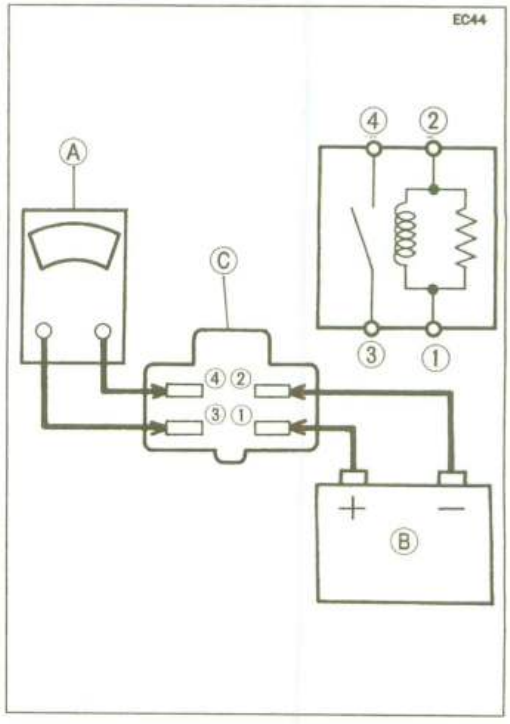


1. Lighting Switch
2. Alternator (Magneto)
3. Regulator
4. Headlight
5. Taillight
6. Controller
7. Headlight Capacitor

Headlight Relay Inspection (KLX650C-US, AS)



- Remove the headlight cover (see Headlight Bulb Replacement).
- Remove the headlight relay [A] from the headlight bracket [B].



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

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

Testing Relay

Tester Range: × 1 Ω

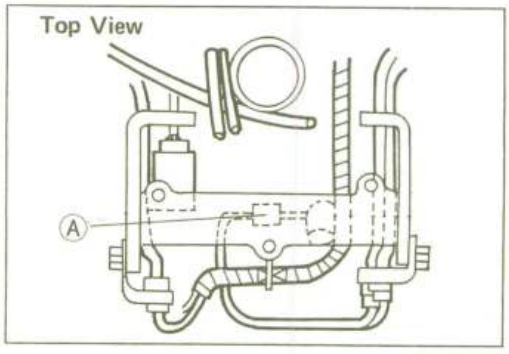
Criteria: When battery is connected → 0 Ω

When battery is disconnected → ∞ Ω

Relay Coil Terminal [1] and [2]

Relay Switch Terminals [3] and [4]

Headlight Diode Inspection (KLX650C-US, AS)



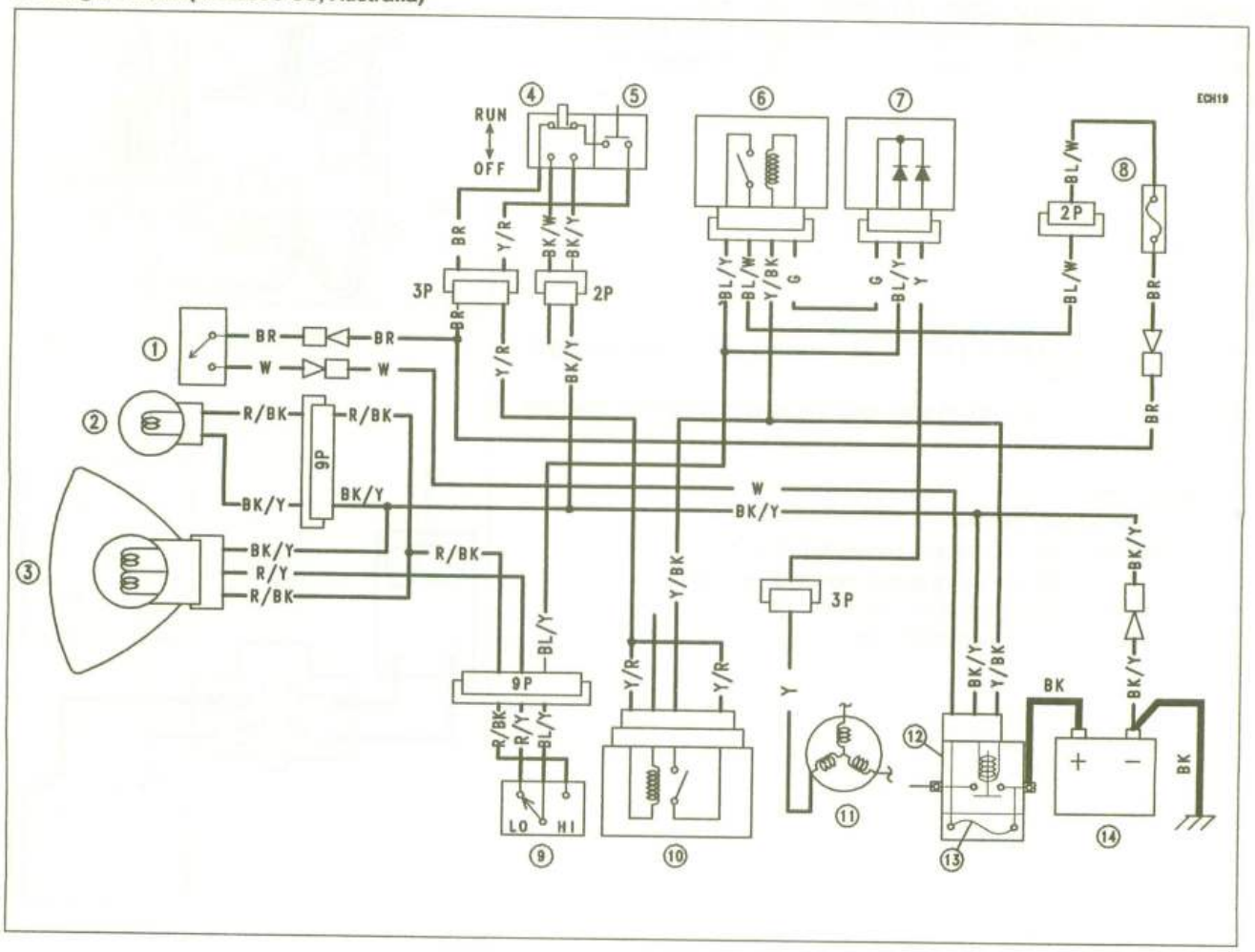
- Remove the headlight cover (see Headlight Bulb Replacement).
- Remove the headlight unit (see this chapter).
- Remove the headlight diode [A] from the harness.
- Zero the hand tester (special tool), and connect it to each terminal to check the resistance in both directions.

○The resistance should be low in one direction and more than ten times as much in the other direction. If the diode shows low or high in both directions, the diode is defective and the diode must be replaced.

NOTE

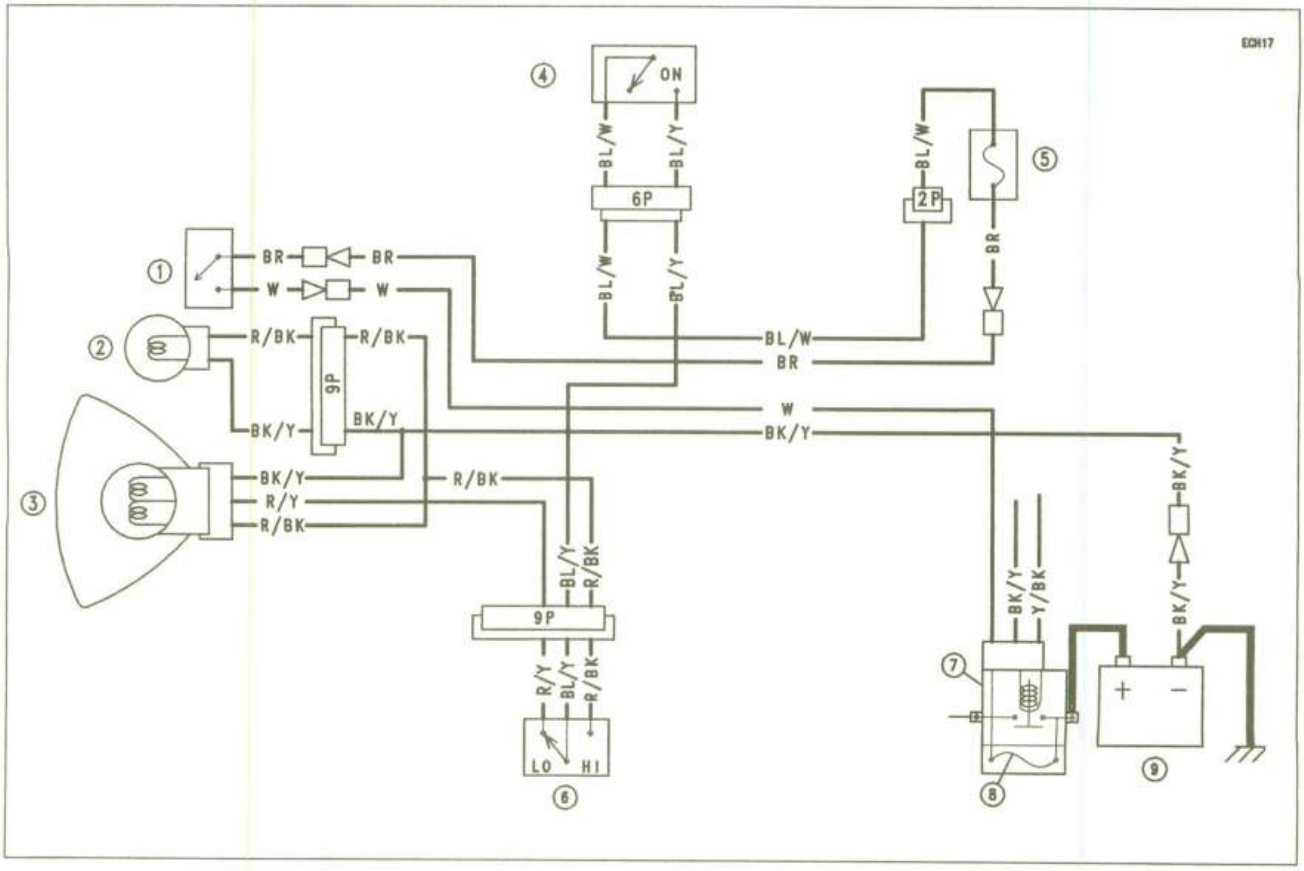
○*The actual meter reading varies with the meter used and the individual diode, but, generally speaking, the lower reading should be from zero to one half the scale.*

Headlight Circuit (KLX650C US, Australia)



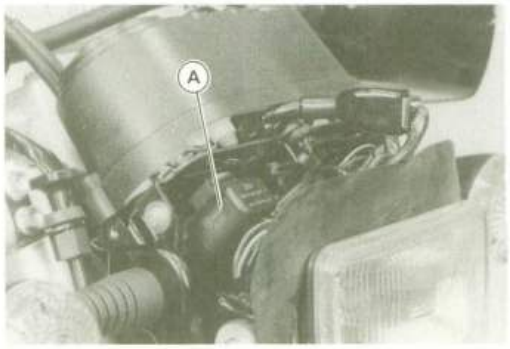
1. Ignition Switch
2. High Beam Indicator Light
3. Headlight
4. Engine Stop Switch
5. Starter Button
6. Headlight Relay
7. Headlight Diodes
8. 10A Headlight Fuse
9. Dimmer Switch
10. Starter Circuit Relay
11. Alternator (Magneto)
12. Starter Relay
13. 20A Main Fuse
14. Battery

Headlight Circuit (KLX650C, Other than US, Australia)



1. Ignition Switch
2. High Beam Indicator Light
3. Headlight
4. Headlight Switch
5. 10A Headlight Fuse
6. Dimmer Switch
7. Starter Relay
8. 20A Main Fuse
9. Battery

Turn Signal Relay Inspection (KLX650C)



Since the turn signal relay is designed to operate correctly only when two turn signals (one front and one rear) and the turn signal indicator light are properly connected in the circuit, trouble may result from a burned out bulb, a bulb of incorrect wattage, loose wiring, as well as from a defect in the relay itself. In general, if the trouble with the circuit is common to both right and left turn signals, it is probably caused by a defective turn signal relay, although it may be due to a bad switch, wiring, or battery. If the trouble is with only one side – either right or left – then the relay is not at fault since one relay is used for both sides.

- Remove the headlight cover (see Headlight Bulb Replacement).
- Check the condition of the relay [A] for the following problems.

(1) Neither right nor left turn signals come on at all:

- Check that battery voltage is normal.
- Unplug the relay leads and use the hand tester to check that there is continuity (close to zero ohms) between the relay terminals.

★If there is no tester reading (infinity) or if there are several ohms resistance, replace the relay with a new one.

- Turn the tester to the 25 V DC range, connect the (+) tester lead to the brown lead that was disconnected from the relay, and connect (–) tester lead to the orange lead.
- With the ignition switch on, first switch the turn signal switch to the R and then to the L position. The tester should register battery voltage at either position.

★If it does not, the fuse, ignition switch, or wiring is at fault.

(2) Both right or both left turn signals come on and stay on or flash too slowly:

- Check that battery voltage is normal.
- Check that all wiring connections are good.
- Check that the turn signal bulbs and indicator bulb are of the correct wattage.

★If all of the above check good, replace the relay.

(3) A single light on one side comes on and stays on:

- Either the light that does not come on is burned out or of the incorrect wattage, or the wiring is broken or improperly connected.

(4) Neither light on one side comes on:

- Unless both lights for that side are burned out, the trouble is with the turn signal switch.

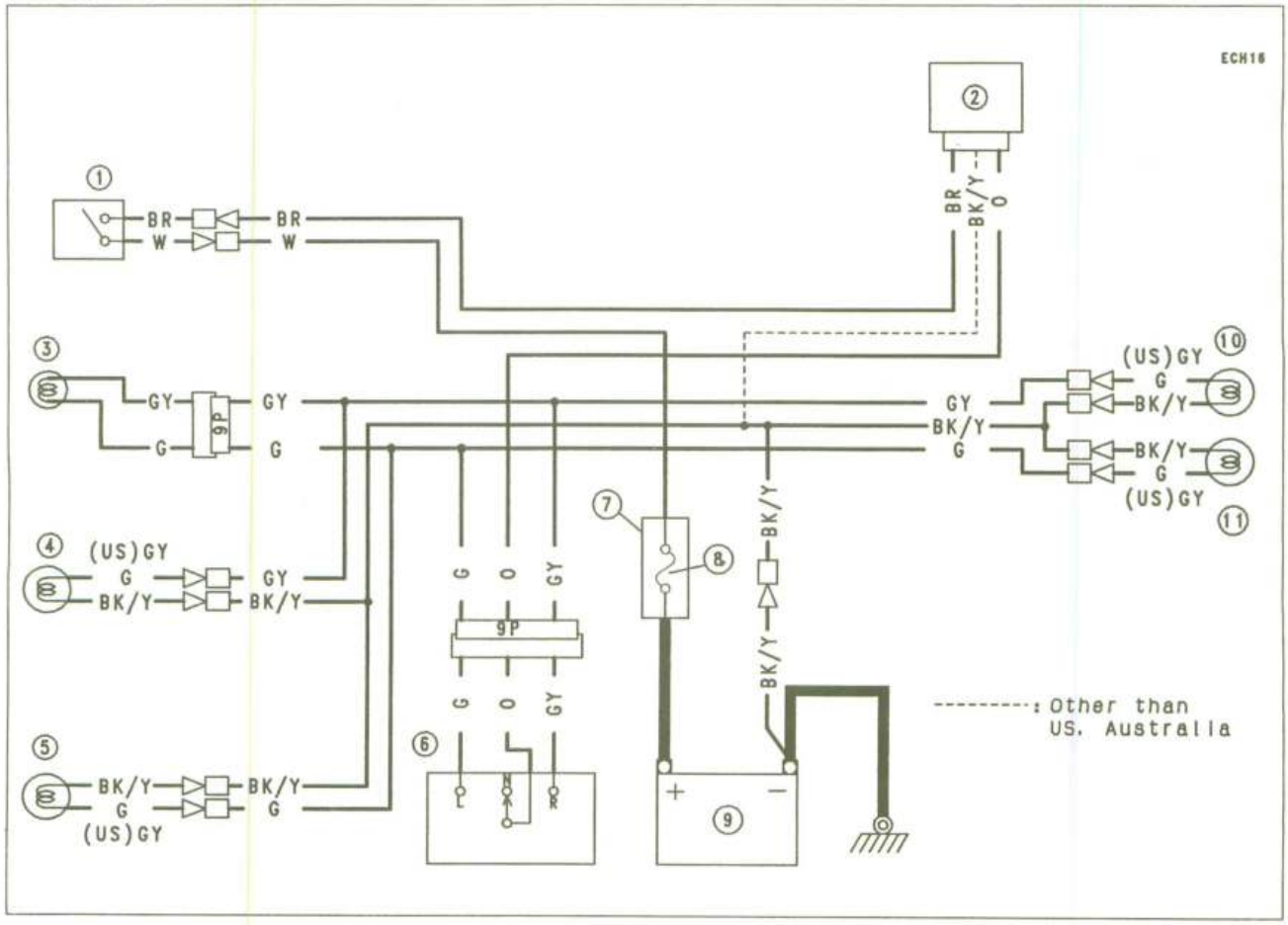
(5) Flashing rate is too fast:

- If this occurs on both the right and left sides, check that the battery is not being overcharged.

★If the magneto and the battery voltage are normal, replace the turn signal relay.

- If this occurs on only one side, one or both of the turn signal bulbs are of too high a wattage.

Turn Signal Light Circuit

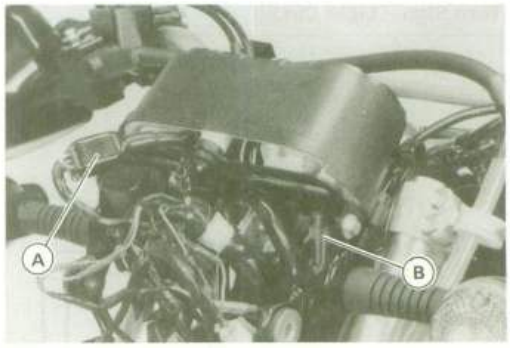


1. Ignition Switch
2. Turn Signal Relay
3. Turn Signal Indicator Light
4. Front Right Turn Signal Light
5. Front Left Turn Signal Light
6. Turn Signal Switch
7. Starter Relay
8. 20 A Main Fuse
9. Battery
10. Rear Right Turn Signal Light
11. Rear Left Turn Signal Light

Meters (KLX650C)

Meter Removal

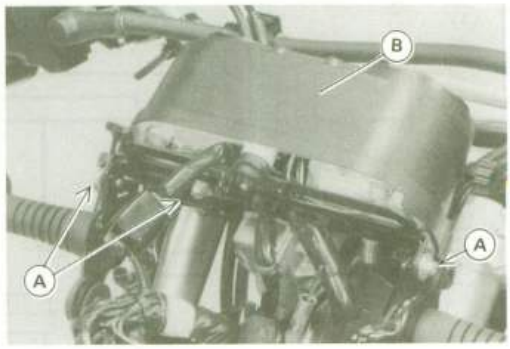
- Remove:
  Headlight Unit (see Headlight Bulb Replacement)
  Turn Signal Relay
- Disconnect the meter lead connector [A].
- Disconnect the speedometer cable upper end [B].



- Unscrew the mounting bolts [A] and remove the meter unit [B]

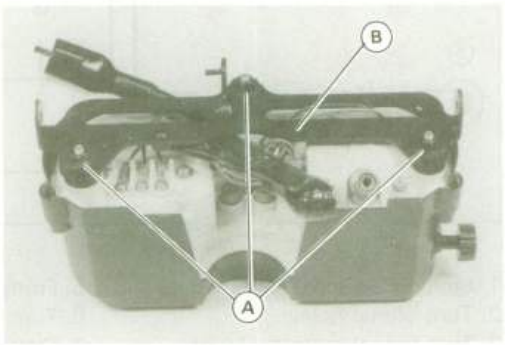
CAUTION

Place the meter so that the face is up. If a meter is left upside down or sideways for any length of time, it will malfunction.

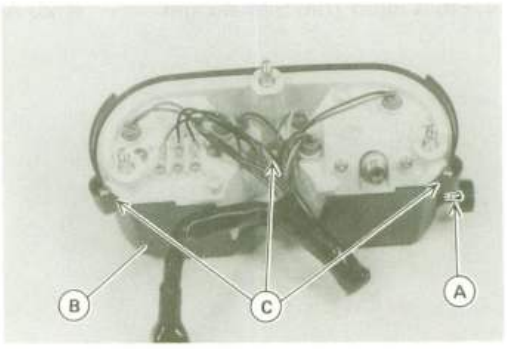


Meter Disassembly

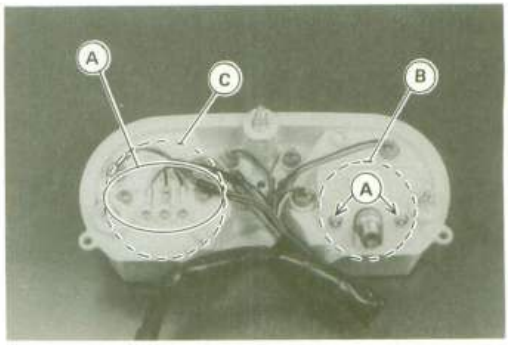
- Remove the meter unit (see this chapter).
- Remove the nuts [A] and take off the bracket [B].



- Unscrew the reset knob screw [A].
- Take off the cover [B] by removing the screws [C].

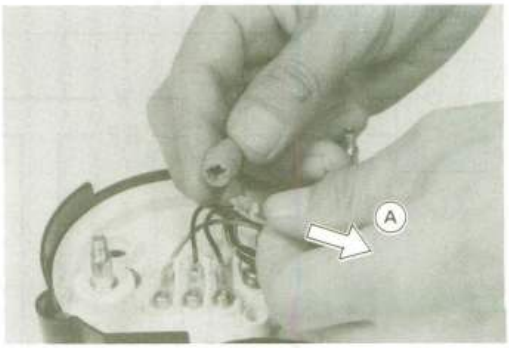


- Remove the screws [A] for speedometer [B] and tachometer [C] removal.



Indicator Bulb Replacement

CAUTION
Do not turn the bulb. Pull the bulb out to prevent damage to the bulb. **All the indicator bulbs are of a wedge-base type.** **Do not use bulb rated for greater wattage than the specified value.**

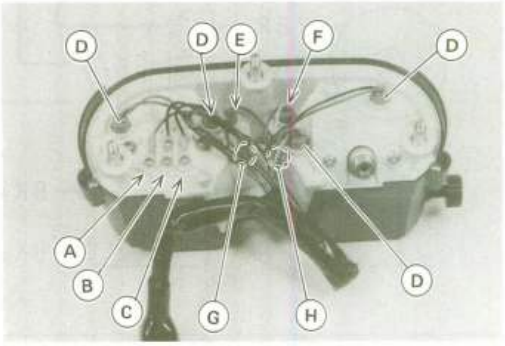


- Remove the sockets with the bulb attached.
- To remove each bulb, pull [A] the bulb out of the socket.

Meter Assembly

- Install each lead on the original position shown.

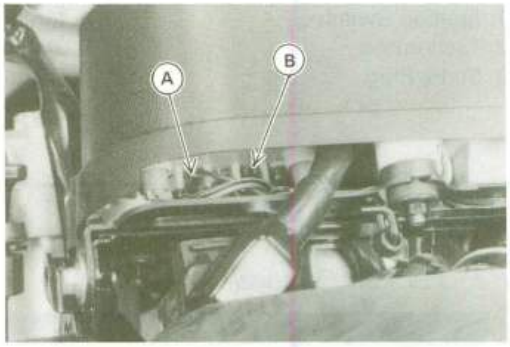
BR Lead [A]	GY, G Leads [E]
BK/Y Lead [B]	BR, LG Leads [F]
BK Lead [C]	R/BK, BK/Y Leads [G]
R/BL, BK/Y Leads [D]	BR, Y/W Leads [H]



Tachometer Inspection

- Check the tachometer circuit wiring.
- ★If all wiring and components other than the tachometer unit check out good, the unit is suspect. Check the unit as shown.
- Remove the headlight cover (see Headlight Bulb Replacement).
- Remove the left side cover and pull out the CDI unit connectors.

CAUTION
When inspecting the tachometer operation, remove the CDI unit connectors to avoid damage to the CDI unit.



- Turn the ignition switch ON.
- Open and connect the BR terminal [A] to the BK terminal [B] repeatedly, using an auxiliary lead.

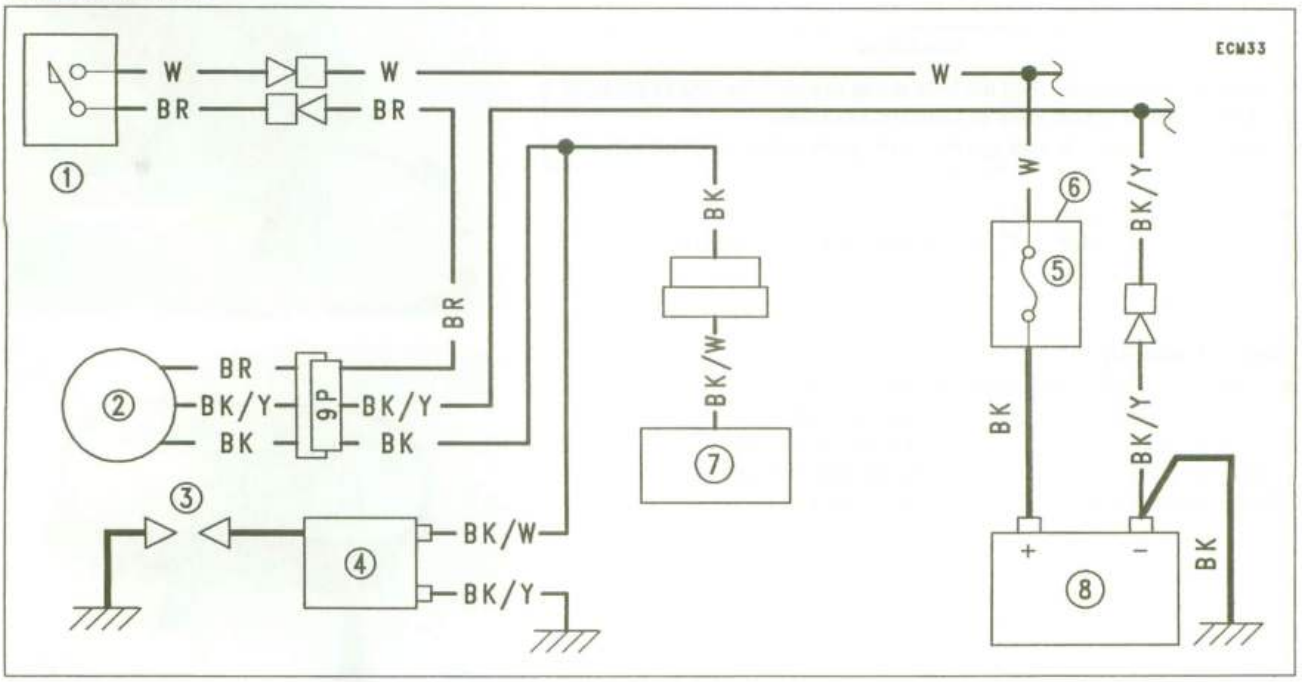
○Then the hand [A] should flick.

- Turn the ignition switch OFF.

★If the hand does not flick, replace the tachometer unit.



Tachometer Circuit



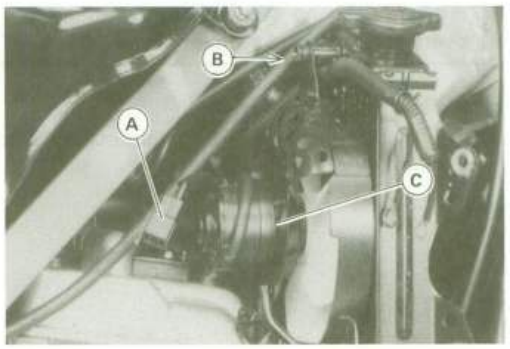
1. Ignition Switch
2. Tachometer
3. Spark Plug
4. Ignition Coil
5. 20A Main Fuse
6. Starter Relay
7. CDI Unit
8. Battery

Radiator Fan (KLX650C)

Radiator Fan Removal

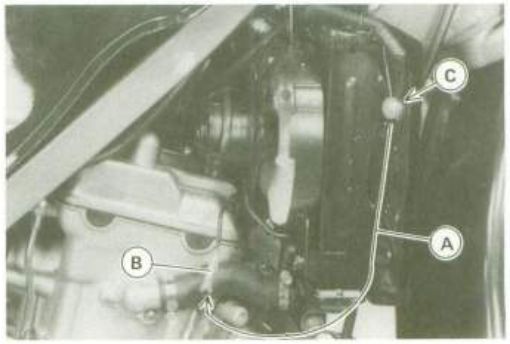
⚠WARNING

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].

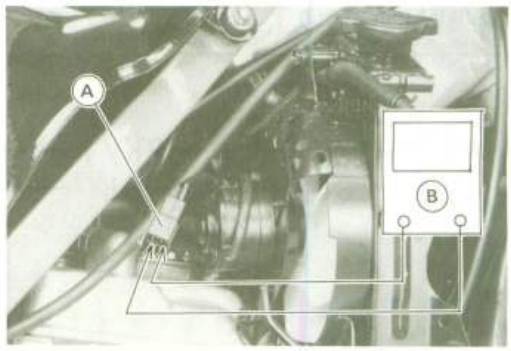
★If the fan rotates, inspect the fan switch.

★If the fan does not rotate, inspect the following.
Leads and Connectors Fan Fuse Fan Motor

Fan Motor Inspection

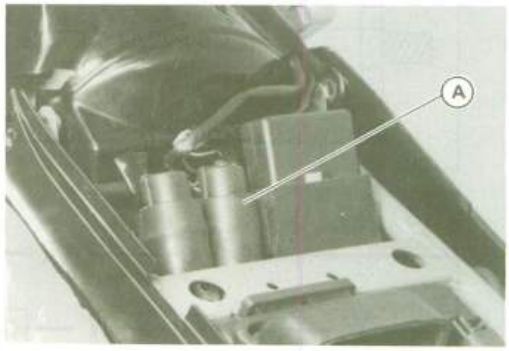
- Disconnect the 2-pin connector [A] in the fan leads.
- Using two auxiliary wires, supply battery power [B] to the fan motor.

★If the fan does not rotate at this time, the fan motor is defective and must be replaced.



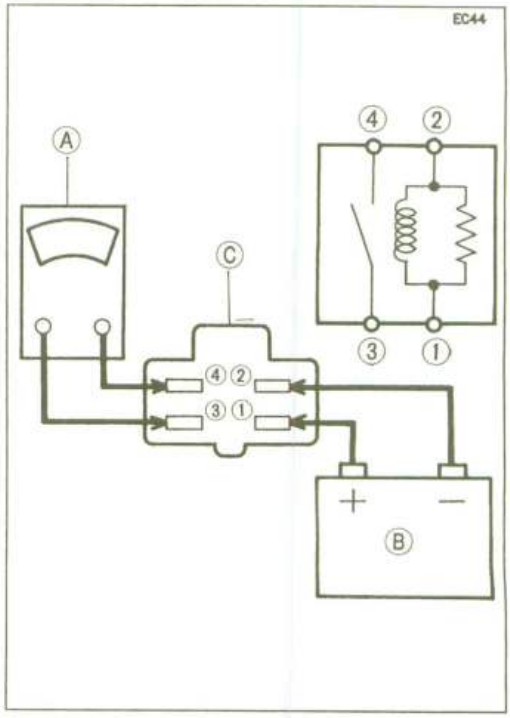
Fan Relay Inspection

- 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: × 1 Ω

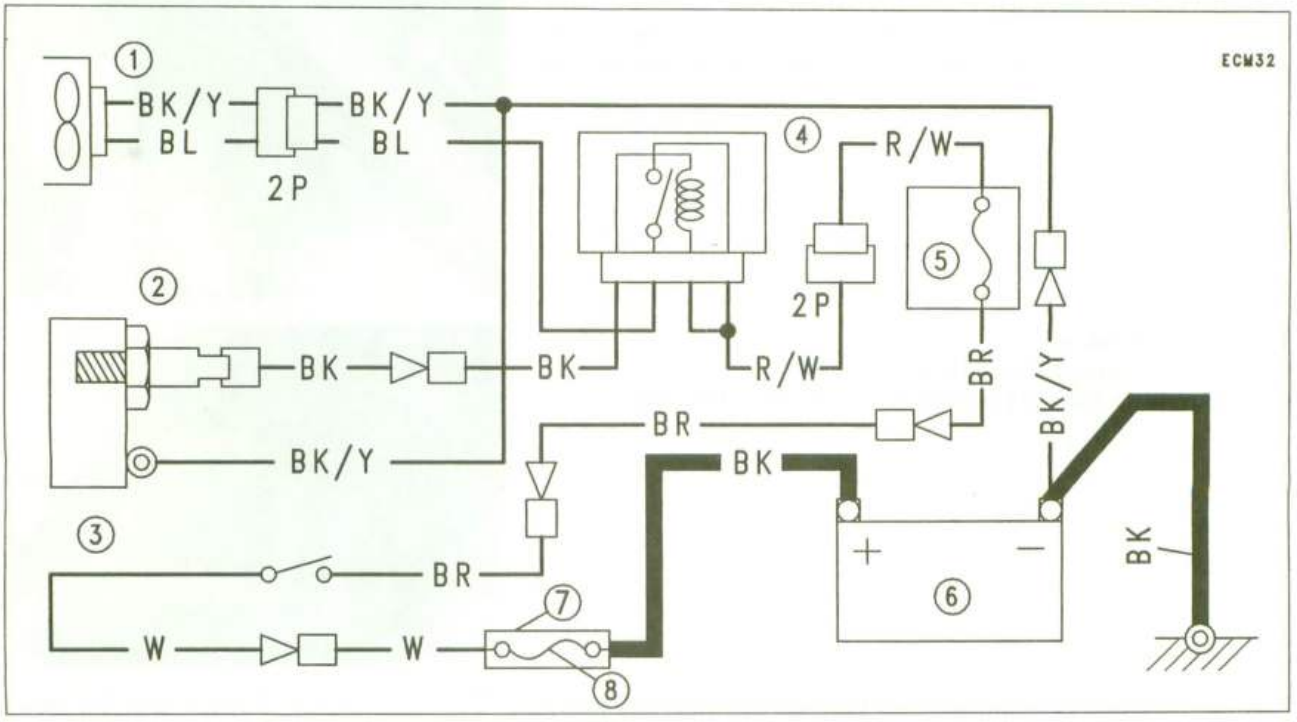
Criteria: **When battery is connected → 0 Ω**

When battery is disconnected → ∞ Ω

Relay Coil Terminal [1] and [2]

Relay Switch Terminals [3] and [4]

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

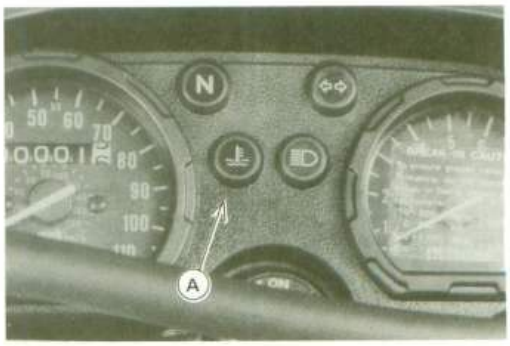
Coolant Temperature Warning System (KLX650C)

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).

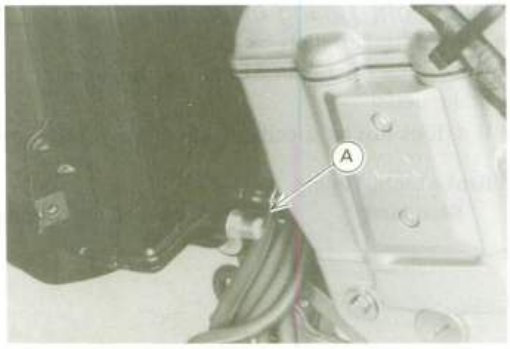


(2) The warning light does not flash when the coolant temperature is high with the transmission in gears.

● Check the coolant temperature warning light operation (see below).

(3) Coolant temperature is not high but the warning light stays on continuously.
- Check the warning circuit wiring.

★If it is good, check the coolant temperature switch [A] (see this chapter).



(4) Warning light goes on and off irregularly.
- Check that the wiring is not shorting out against other parts.
- Check that the battery charging voltage is normal.

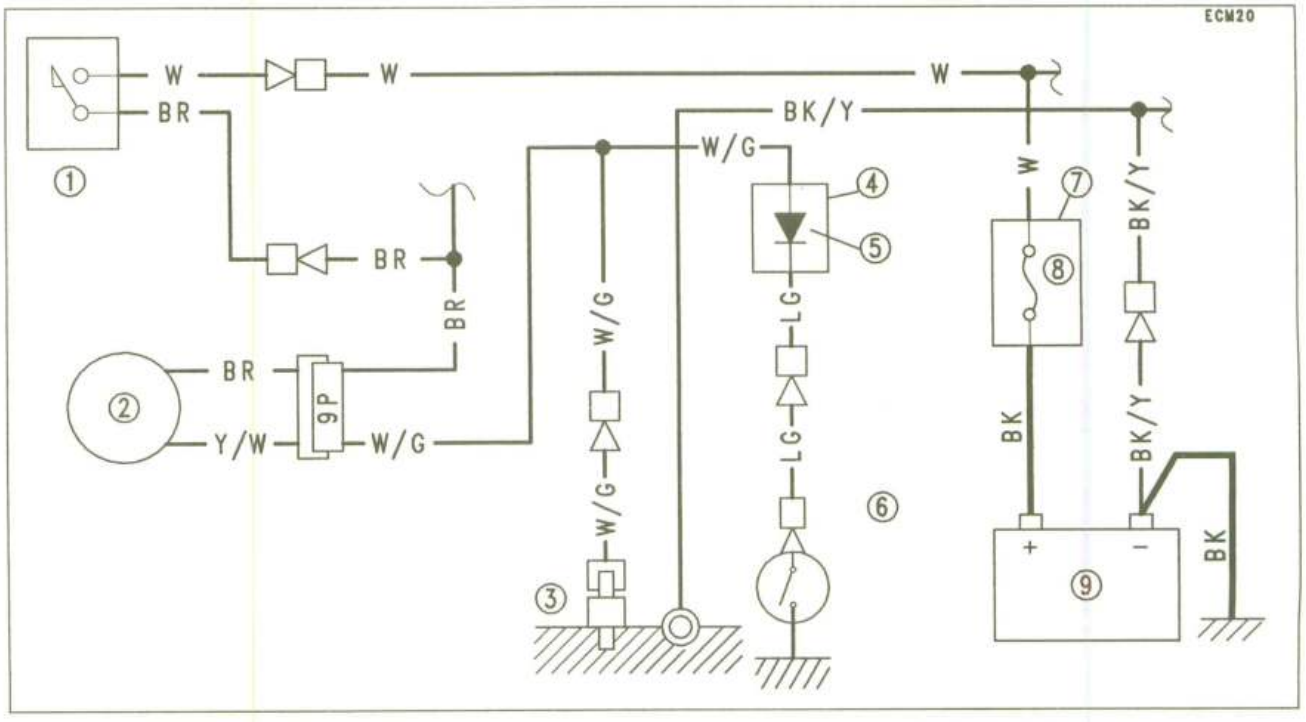
★If all the above checks are good, check the coolant temperature switch (see this chapter).

Warning Light Operation Inspection
- Pull off the neutral switch connector and the coolant temperature switch connector.
- Turn the ignition switch to the ON position.
- Ground the coolant temperature switch connecter to the engine.

★If the coolant temperature warning light does not come on, check the coolant temperature warning light and the warning circuit wiring (see Wiring Inspection).

★If the coolant temperature warning light comes on, check the coolant temperature switch (see this chapter).

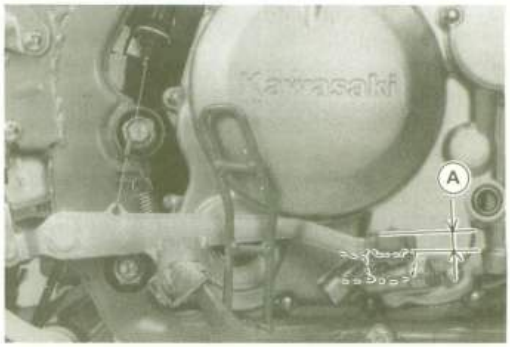
Coolant Temperature Warning Circuit



1. Ignition Switch
2. Coolant Temperature Warning Light
3. Coolant Temperature Switch
4. Interlock Diode Unit
5. Diode
6. Neutral Switch
7. Starter Relay
8. 20 A Main Fuse
9. Battery

Switches (KLX650C)

Brake Light Timing Inspection



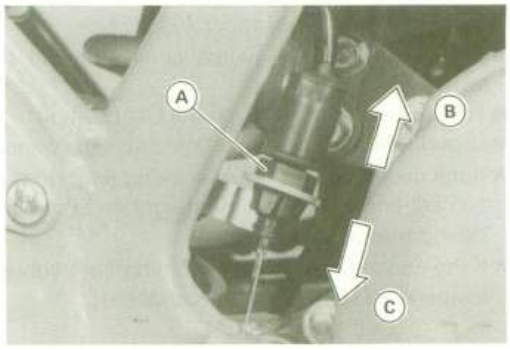
- Turn on the ignition switch.
- Check the operation of the rear brake light switch by depressing the brake pedal.

★If it does not as specified, adjust the brake light timing.

Brake Light Timing

Standard: **On after about 10 mm of pedal travel** [A]

Brake Light Timing Adjustment



Brake light timing is adjusted by changing the position of the rear brake light switch.

- Adjust the position of the switch so that the brake light goes on after the specified pedal travel by turning the adjusting nut [A].

Light sooner [B] Light later [C]

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

Switch Inspection

- Using the hand tester, check to see that only the connections shown in the table have continuity (about zero ohms).

○For the handlebar switches and the ignition switch, refer to the tables in the Wiring Diagram.

★If the switch has an open or short, repair it or replace it with a new one.

Special Tool – Hand Tester: 57001-983

Rear Brake Light Switch Connections

	BR	BL
When brake pedal is pushed down	○———	———○
When brake pedal is released		

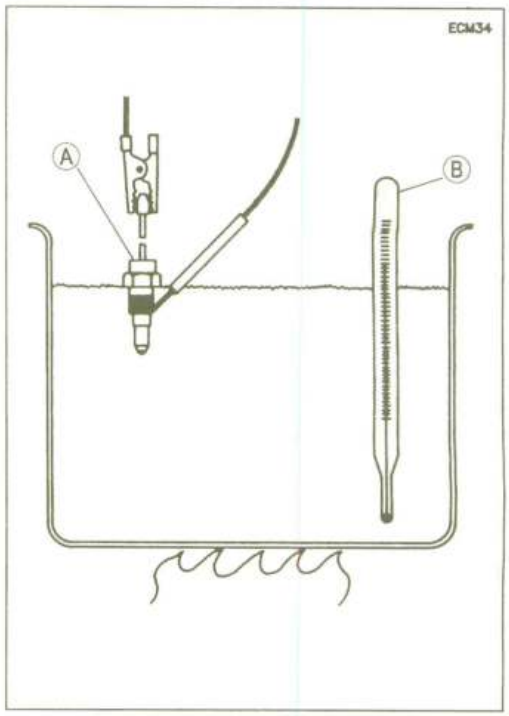
Side Stand Switch Connections

	BK/R	BL/R
When side stand is up		
When side stand is down	○———	———○

Neutral Switch Connections

	SW. Terminal	
When transmission is in neutral	○———	———○
When transmission is not in neutral		

Thermostatic Fan Switch Inspection



- Remove the fan switch from the radiator (see Thermostatic Fan Switch Removal in the Cooling System chapter).
- Suspend the switch [A] in a container of water so that the temperature-sensing projection and threaded portion are submerged.
- Suspend an accurate thermometer [B] in the water.

NOTE

○ *The switch and thermometer must not touch the container sides or bottom.*

- Place the container over a source of heat and gradually raise the temperature of the water while stirring the water gently.
- Using the hand tester (special tool), measure the internal resistance of the switch across the connector and the body at the temperatures shown in the table.

★If the hand tester does not show the specified values, replace the switch.

Fan Switch Resistance

○ **Rising temperature:**
From OFF to ON at 94 ~ 100°C (201 ~ 212°F)

○ **Falling temperature:**
From ON to OFF at 90 ~ 93°C (194 ~ 199°F)

ON : Less than 0.5 Ω
OFF : More than 1 MΩ

Coolant Temperature Switch Inspection

- Remove the coolant temperature switch (see Cooling System chapter).
- Suspend the switch [A] in a container of water so that the temperature-sensing projection and threaded portion are submerged.
- Suspend an accurate thermometer [B] in the water.

NOTE

○ *The switch and thermometer must not touch the container sides or bottom.*

- Place the container over a source of heat and gradually raise the temperature of the water while stirring the water gently.
- Using the hand tester, measure the internal resistance of the switch across the connector and the body at the temperatures shown in the table.

★If the hand tester does not show the specified values, replace the switch.

Coolant Temperature Switch Resistance

○ **Rising temperature:**
From OFF to ON at 107 ~ 113°C (225 ~ 236°F)

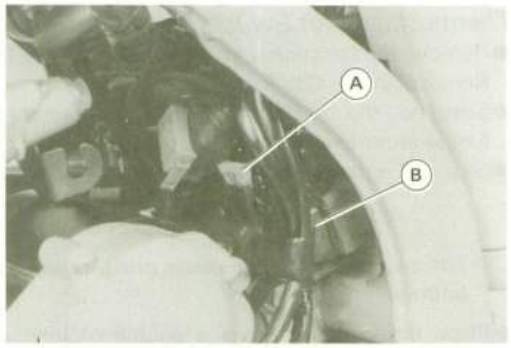
○ **Falling temperature:**
From ON to OFF at 103 ~ 106°C (217 ~ 223°F)

ON : Less than 0.5 Ω
OFF : More than 1 MΩ

Fuses (KLX650C)

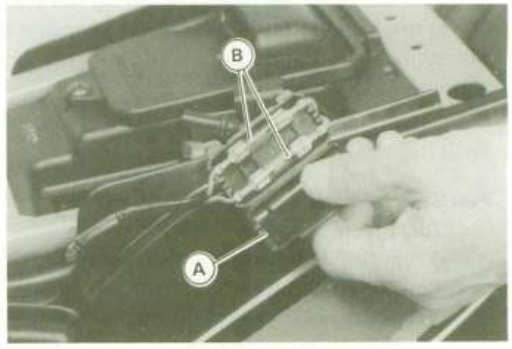
20 A Main Fuse Removal

● Remove the fuse [A] from the starter relay [B].



10 A Fan and Light Fuse Removal

● Remove the seat (see Frame chapter).
● Open the fuse case [A] and take out the fuses [B].



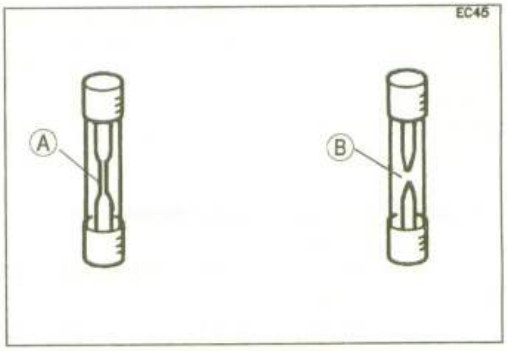
Fuse Installation

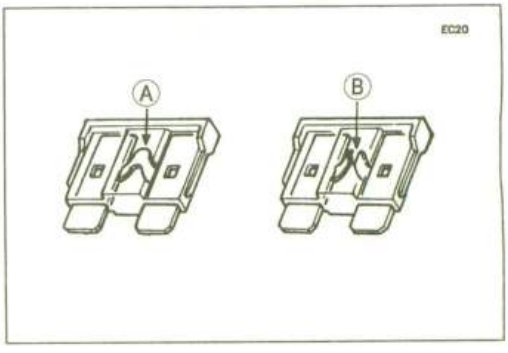
● If a fuse fails during operation, inspect the electrical system to determine the cause, and then replace it with a new fuse of proper amperage.

Fuse Inspection

● Remove the fuse (see Fuse Removal).
● Inspect the fuse element [A].
★ If it is blown out, replace the fuse. Before replacing a blown fuse [B], always check the amperage in the affected circuit. If the amperage is equal to or greater than the fuse rating, check the wiring and related components for a short circuit.

CAUTION
When replacing a fuse, be sure the new fuse matches the specified fuse rating for that circuit. Installation of a fuse with a higher rating may cause damage to wiring and components.





Appendix

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Additional Considerations for Racing (KLX650C)

This motorcycle has been manufactured for use in a reasonable and prudent manner and as a vehicle only. However, some may wish to subject this motorcycle to abnormal operation, such as would be experienced under racing conditions. KAWASAKI STRONGLY RECOMMENDS THAT ALL RIDERS RIDE SAFELY AND OBEY ALL LAWS AND REGULATIONS CONCERNING THEIR MOTORCYCLE AND ITS OPERATION.

Racing should be done under supervised conditions, and recognized sanctioning bodies should be contacted for further details. For those who desire to participate in competitive racing or related use, the following technical information may prove useful. However, please note the following important notes.

- You are entirely responsible for the use of your motorcycle under abnormal conditions such as racing, and Kawasaki shall not be liable for any damages which might arise from such use.
- Kawasaki's Limited Motorcycle Warranty and Limited Emission Control Systems Warranty specifically exclude motorcycles which are used in competition or related uses. Please read the warranty carefully.
- Motorcycle racing is a very sophisticated sport, subject to many variables. The following information is theoretical only, and Kawasaki shall not be liable for any damages which might arise from alterations utilizing this information.
- When the motorcycle is operated on public roads, it **must** be in its original state in order to ensure safety and compliance with applicable regulations.

Carburetor:

Sometimes an alteration may be desirable for improved performance under special conditions when proper mixture is not obtained after the carburetor has been properly adjusted, and all parts cleaned and found to be functioning properly.

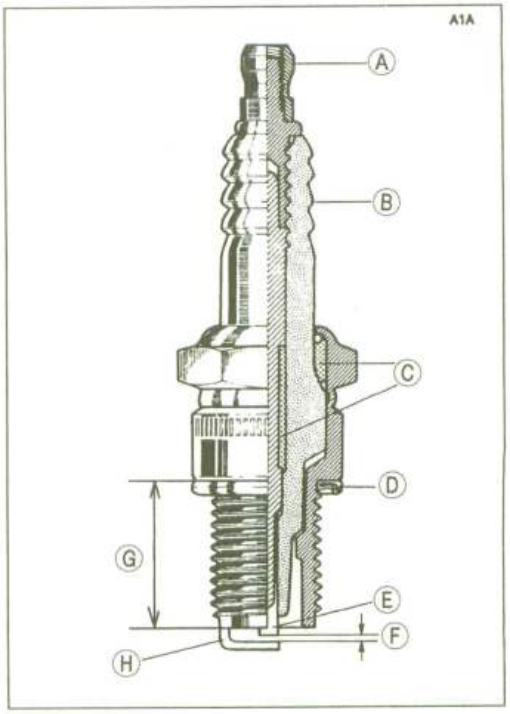
If the engine still exhibits symptoms of overly rich or lean carburetion after all maintenance and adjustments are correctly performed, the main jet can be replaced with a smaller or larger one. A smaller numbered jet gives a leaner mixture and a larger numbered jet a richer mixture.

Spark Plug:

The spark plug ignites the fuel and air mixture in the combustion chamber. To do this effectively and at the proper time, the correct spark plug must be used, and the spark plug must be kept clean and the gap adjusted.

Tests have shown the plug listed in the "General Information" chapter to be the best plug for general use.

Since spark plug requirements change with the ignition and carburetion adjustments and with riding conditions, whether or not a spark plug of the correct heat range is used should be determined by removing and inspecting the plug.



Terminal [A]
Insulator [B]
Cement [C]
Gasket [D]
Center Electrode [E]
Gap (0.8 ~ 0.9 mm) [F]
Reach [G]
Side Electrode [H]

When a plug of the correct heat range is being used, the electrodes will stay hot enough to keep all the carbon burned off, but cool enough to keep from damaging the engine and the plug itself. This temperature is about 400 ~ 800°C (750 ~ 1450°F) and can be judged by noting the condition and color of the ceramic insulator around the center electrode. If the ceramic is clean and of a light brown color, the plug is operating at the right temperature.

A spark plug for higher operating temperatures is used for racing. Such a plug is designed for better cooling efficiency so that it will not overheat and thus is often called a "colder" plug. If a spark plug with too cool a heat range is used – that is, a "cold" plug that cools itself too well – the plug will stay too cool to burn off the carbon, and the carbon will collect on the electrodes and the ceramic insulator.

The carbon on the electrodes conducts electricity, and can short the center electrode to ground by either coating the ceramic insulator or bridging across the gap. Such a short will prevent an effective spark. Carbon build-up on the plug can also cause other troubles. It can heat up red-hot and cause preignition and knocking, which may eventually burn a hole in the top of the piston.

Spark Plug Inspection

● Remove the spark plug and inspect the ceramic insulator.

★ Whether or not the right temperature plug is being used can be ascertained by noting the condition of the ceramic insulator around the electrode. A light brown color indicates the correct plug is being used. If the ceramic is black, it indicates that the plug is firing at too low a temperature, so the next hotter type should be used instead. If the ceramic is white, the plug is operating at too high a temperature and it should be replaced with the next colder type.

CAUTION

If the spark plug is replaced with a type other than the standard plug, make certain the replacement plug has the same thread pitch and reach (length of threaded portion) and the same type electrode (regular type or projected type) as the standard plug.
If the plug reach is too short, carbon will build up on the plug hole threads in the cylinder head, causing overheating and making it very difficult to insert the correct spark plug later.
If the reach is too long, carbon will build up on the exposed spark plug threads causing overheating, preigniton, and possibly burning a hole in the piston top. In addition, it may be impossible to remove the plug without damaging the cylinder head.

Standard Spark Plug Threads

Diameter:	**12 mm**
Pitch:	**1.25 mm**
Reach:	**19 mm**

NOTE

○ *The heat range of the spark plug functions like a thermostat for the engine. Using the wrong type of spark plug can make the engine run too hot (resulting in engine damage) or too cold (with poor performance, misfiring, and stalling).*



Carbon Fouling



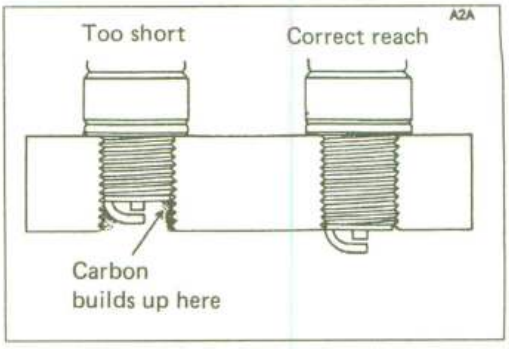
Oil Fouling



Normal Operation



Overheating



Troubleshooting Guide

NOTE

○ *This is not an exhaustive list, giving every possible cause for each problem listed. It is meant simply as a rough guide to assist the troubleshooting for some of the more common difficulties.*

Engine Doesn't Start, Starting Difficulty:

Starter motor not rotating(KLX650C):
- Starter lockout or neutral switch trouble
- Starter motor trouble
- Battery voltage low
- Starter relays not contacting or operating
- Starter button not contacting
- Wiring open or shorted
- Ignition switch trouble
- Engine stop switch trouble
- Fuse blown

Starter motor rotating but engine doesn't turn over(KLX650C):
- Starter clutch trouble

Engine won't turn over:
- Valve seizure
- Valve lifter seizure
- Cylinder, piston seizure
- Crankshaft seizure
- Balancer bearing seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Camshaft seizure
- Starter idle gear seizure (KLX650C)
- Compression release cam spring broken (K.A.C.R.)
- Compression release cam sticks close (K.A.C.R.)

No fuel flow:
- No fuel in fuel tank
- Fuel tap turned off
- Fuel tap vacuum hose clogged (KLX650C, CA)
- Fuel tank air vent obstructed
- Fuel tap clogged
- Fuel line clogged
- Float valve clogged

Engine flooded:
- Fuel level in carburetor float bowl too high
- Float valve worn or stuck open
- Starting technique faulty (When flooded, crank the engine with the throttle fully opened to allow more air to reach the engine.)

No spark; spark weak:
- Battery voltage low (KLX650C)
- Ignition switch not on (KLX650C)
- Engine stop switch turned off
- Clutch lever not pulled in or gear not in neutral (KLX650C)
- Spark plug dirty, broken, or maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- CDI unit trouble
- Pickup coil trouble
- Exciter coil shorted or open
- Ignition coil trouble
- Ignition coil resistor open
- Flywheel magneto damaged
- Ignition or engine stop switch shorted
- Neutral, or starter locknut switch trouble (KLX650C)
- Interlock diode unit trouble (KLX650C)
- Wiring shorted or open

Fuel/air mixture incorrect:
- Pilot screw and/or idle adjusting screw maladjusted
- Pilot jet, or air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Starter jet clogged

Compression Low:
- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/groove clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)
- Compression release cam (K.A.C.R.) sticks open (Engine stalls when moving off).

Poor Running at Low Speed:

Spark weak:
- Spark plug dirty, broken, or maladjusted
- Spark plug cap or high tension wiring trouble
- Spark plug cap shorted or not in good contact
- Spark plug incorrect
- CDI unit trouble
- Pickup coil trouble
- Exciter coil shorted or open
- Ignition coil trouble
- Flywheel magneto damaged

Fuel/air mixture incorrect:
- Pilot screw maladjusted
- Pilot jet, or air passage clogged
- Air bleed pipe bleed holes clogged
- Air cleaner clogged, poorly sealed, or missing
- Air cleaner duct loose
- Starter plunger stuck open
- Fuel level in carburetor float bowl too high or too low
- Fuel tank air vent obstructed
- Carburetor holder loose

Compression low:
- Spark plug loose
- Cylinder head not sufficiently tightened down
- No valve clearance
- Cylinder, piston worn
- Piston rings bad (worn, weak, broken, or sticking)
- Piston ring/groove clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)

Compression release cam (K.A.C.R.) sticks open (Engine stalls when moving off)

Other:
CDI unit trouble
Carburetor vacuum piston doesn't slide smoothly
Engine oil viscosity too high
Drive train trouble
Brakes dragging
Over heating
Clutch slipping
Throttle valve does not open fully

Poor Running or No Power at High Speed:

Firing incorrect:
Spark plug dirty, damaged, or maladjusted
Spark plug cap or high tension wiring damaged
Spark plug cap shorted or not in good contact
Spark plug incorrect
CDI unit trouble
Pickup coil trouble
Exciter coil shorted or open
Ignition coil trouble
Flywheel magneto damaged

Fuel/air mixture incorrect:
Main jet clogged or wrong size
Jet needle or needle jet worn
Air jet clogged
Fuel level in carburetor float bowl too high or too low
Air bleed pipe bleed holes clogged
Air cleaner clogged, poorly sealed, or missing
Air cleaner duct loose
Starter plunger stuck open
Fuel to carburetor insufficient
Water or foreign matter in fuel
Carburetor holder loose
Fuel tank air vent obstructed
Fuel tap clogged
Fuel line clogged

Compression low:
Spark plug loose
Cylinder head not sufficiently tightened down
No valve clearance
Cylinder, piston worn
Piston ring bad (worn, weak, broken, or sticking)
Piston ring/groove clearance excessive
Cylinder head gasket damaged
Cylinder head warped
Valve spring broken or weak
Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface.)
Compression release cam (K.A.C.R.) sticks open (Engine stalls when moving off)

Knocking:
Carbon built up in combustion chamber
Fuel poor quality or incorrect
Spark plug incorrect
CDI unit trouble

Miscellaneous:
Throttle valve won't fully open
Carburetor vacuum piston doesn't slide smoothly
Brakes dragging
Clutch slipping
Overheating
Engine oil level too high
Engine oil viscosity too high
Balancer mechanism malfunctioning
Drive train trouble
Crankshaft bearing worn or damaged

Overheating:

Firing incorrect:
Spark plug dirty, broken, or maladjusted
Spark plug incorrect
CDI unit trouble

Fuel/air mixture incorrect:
Main jet clogged or wrong size
Fuel level in carburetor float bowl too low
Carburetor holder loose
Air cleaner poorly sealed, or missing
Air cleaner duct poorly sealed
Air cleaner clogged

Compression high:
Carbon built up in combustion chamber

Engine load faulty:
Clutch slipping
Engine oil level too high
Engine oil viscosity too high
Brakes dragging

Lubrication inadequate:
Engine oil level too low
Engine oil poor quality or incorrect

Coolant temperature warning light incorrect
Coolant temperature warning light broken (KLX650C)
Coolant temperature switch broken (KLX650C)

Coolant incorrect:
Coolant level too low
Coolant deteriorated

Cooling system component incorrect:
Radiator clogged
Thermostat trouble (KLX650C)
Radiator cap trouble
Thermostatic fan switch trouble (KLX650C)
Fan relay trouble (KLX650C)
Fan motor broken (KLX650C)
Fan blade damaged (KLX650C)
Water pump not rotating
Water pump impeller damaged

Over Cooling

Cooling system component incorrect:
Thermostatic fan switch trouble(KLX650C)
Thermostat trouble (KLX650C)

Clutch Operation Faulty:

Clutch slipping:
No clutch lever play
Clutch cable maladjusted
Clutch inner cable catching

Friction plate worn or warped
Steel plate worn or warped
Clutch spring broken or weak
Clutch release mechanism trouble
Clutch hub or housing unevenly worn

Clutch not disengaging properly:
Clutch lever play excessive.
Clutch plate warped or too rough
Clutch spring compression uneven
Engine oil deteriorated
Engine oil viscosity too high
Engine oil level too high
Clutch housing frozen on drive shaft
Clutch release mechanism trouble
Clutch hub nut loose
Clutch hub spline damaged

Gear Shifting Faulty:

Doesn't go into gear; shift pedal doesn't return:
Clutch not disengaging
Shift fork bent or seized
Gear stuck on the shaft
Gear positioning lever binding
Shift return spring weak or broken
Shift return spring pin loose
Shift mechanism arm spring broken
Shift mechanism arm broken
Shift pawl broken

Jumps out of gear:
Shift fork worn, bent
Gear groove worn
Gear dogs and/or dog recesses worn
Shift drum groove worn
Gear positioning lever spring weak or broken
Shift fork pin worn
Drive shaft, output shaft, and/or gear splines worn

Overshifts:
Gear positioning lever spring weak or broken
Shift mechanism arm spring broken

Abnormal Engine Noise:

Knocking:
CDI unit trouble
Carbon built up in combustion chamber
Fuel poor quality or incorrect
Spark plug incorrect
Overheating

Piston slap:
Cylinder/piston clearance excessive
Cylinder, piston worn
Connecting rod bent
Piston pin, piston pin hole worn

Valve noise:
Valve clearance incorrect
Valve spring broken or weak
Camshaft bearings worn
Valve lifter worn

Other noise:
Connecting rod small end clearance excessive
Connecting rod big end clearance excessive
Piston ring worn, broken, or stuck
Piston seizure, damage
Cylinder head gasket leaking
Exhaust pipe leaking at cylinder head connection
Crankshaft runout excessive
Engine mounts loose
Crankshaft bearing worn
Primary gear worn or chipped
Magneto flywheel loose
Camshaft chain tensioner trouble
Camshaft chains, sprockets, guides worn
Balancer gear worn or chipped
Balancer position maladjusted
Balancer mechanism springs weak or broken
Balancer bearings worn

Abnormal Drive Train Noise:

Clutch noise:
Clutch rubber damper weak or damaged
Clutch housing/friction plate clearance excessive
Clutch housing gear/primary gear worn
Metal chip jammed in clutch housing gear teeth
Outside friction plate installed incorrectly

Transmission noise:
Bearings worn
Transmission gears worn or chipped
Metal chips jammed in gear teeth
Engine oil insufficient

Drive chain noise:
Drive chain adjusted improperly
Drive chain worn
Rear and/or engine sprocket(s) worn
Chain lubrication insufficient
Rear wheel misaligned

Abnormal Frame Noise:

Front fork noise:
Oil insufficient or too thin
Spring weak or broken

Rear shock absorber noise:
Shock absorber damaged

Disc brake noise:
Pad installed incorrectly
Pad surface glazed
Disc warped
Caliper trouble
Master cylinder damaged

Other noise:
Brackets, nuts, bolts, etc. not properly mounted or tightened

Exhaust Smokes Excessively:

White smoke:
Piston oil ring worn
Cylinder worn
Valve oil seal damaged
Valve guide worn
Engine oil level too high

Black smoke:
Air cleaner clogged
Main jet too large or fallen off
Starter plunger stuck open
Fuel level in carburetor float bowl too high

Brown smoke:
Main jet too small
Fuel level in carburetor float bowl too low
Air cleaner duct loose
Air cleaner poorly sealed or missing

Handling and/or Stability Unsatisfactory:

Handlebar hard to turn:
Cable routing incorrect
Hose routing incorrect
Wiring routing incorrect
Steering stem nut too tight
Steering stem bearing damaged
Steering stem bearing race dented or worn
Steering stem lubrication inadequate
Steering stem bent
Tire air pressure too low

Handlebar shakes or excessively vibrates:
Tire worn
Swingarm sleeve or needle bearing damaged
Rim warped, or not balanced
Front, rear axle runout excessive
Wheel bearing worn
Handlebar clamp loose
Steering stem head nut loose

Handlebar pulls to one side:
Frame bent
Wheel misalignment
Swingarm bent or twisted
Swingarm pivot shaft runout excessive
Steering maladjusted
Steering stem bent
Front fork leg bent
Right and left front fork oil level uneven

Shock absorption unsatisfactory:
(Too hard)
Front fork oil excessive
Front fork oil viscosity too high
Front fork damper adjustment too hard (KLX650A)
Front fork leg bent
Tire air pressure too high
Rear shock absorber adjustment too hard
(Too soft)
Front fork oil insufficient and/or leaking
Front fork oil viscosity too low
Front fork damper adjustment too soft (KLX650A)
Front fork, rear shock absorber spring weak
Rear shock absorber oil leaking
Rear shock absorber adjustment too soft
Tire air pressure too low

Brake Doesn't Hold:

Air in the brake line
Pad or disc worn
Brake fluid leakage
Disc warped
Contaminated pad
Brake fluid deteriorated
Primary or secondary cup damaged in master cylinder
Master cylinder scratched inside

Battery Discharged (KLX650C):

Battery faulty (e.g., plates sulphated, shorted through sedimentation)
Battery leads making poor contact
Load excessive (e.g., bulb of excessive wattage)
Ignition switch trouble
Alternator rotor damaged
Wiring faulty
Regulator/rectifier trouble

Battery Overcharged (KLX650C):

Regulator/rectifier trouble
Battery trouble

Nut, Bolt, and Fastener Tightness

Tightness Inspection

● Check the tightness of the bolts and nuts listed here in accordance with the Periodic Maintenance Chart. Also, check to see that each cotter pin is in place and in good condition.

NOTE

○ *For the engine fasteners, check the tightness of them when the engine is cold (at room temperature).*

★ If there are loose fasteners, retorque them to the specified torque following the specified tightening sequence. Refer to the Torque and Locking Agent section of the General Information chapter for torque specifications. For each fastener, first loosen it by 1/2 turn, then tighten it.

★ If cotter pins are damaged, replace them with new ones.

Nut, bolt and fastener to be checked

Wheels:
- Front Axle
- Front Axle Clamp Nuts
- Rear Axle Nut Cotter Pin
- Rear Axle Nut

Final Drive:
- Chain Adjuster Locknuts (KLX650C)
- Rear Sprocket Nuts

Brakes:
- Front Master Cylinder Clamp Bolts
- Caliper Bolts
- Rear Master Cylinder Bolts
- Brake Pedal Cotter Pin
- Brake Lever Pivot Nut
- Brake Rod Joint Cotter Pin

Suspension:
- Front Fork Clamp Bolts
- Front Fender Mounting Bolts
- Swingarm Pivot Shaft Nut
- Uni-trak Link Nuts
- Rear Shock Absorber Bolts

Steering:
- Stem Head Nut
- Handlebar Clamp Bolts

Engine:
- Engine Mounting Bolts, Nuts
- Cylinder Head Cover Bolts
- Shift Pedal Bolt
- Exhaust Pipe Holder Nuts
- Muffler Connecting Clamp Bolts
- Muffler Bolt and Nut
- Clutch Lever Pivot Nut

Others:
- Side Stand Nut
- Footpeg Bolts, Nuts

General Lubrication

Lubrication

- Before lubricating each part, clean off any rusty spots with rust remover and wipe off any grease, oil, dirt, or grime.
- Lubricate the points listed below with indicated lubricant in accordance with the Periodic Maintenance Chart.

NOTE

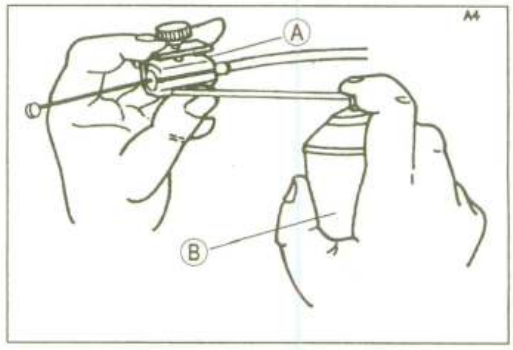
○ *Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure spray water, perform the general lubrication.*

Chain: Lubricate with Heavy Oil.
Pivots: Lubricate with Motor Oil.
Side Stand
Clutch Lever
Brake Pedal
Rear Brake Rod Joint
Footpegs
Cables: Lubricate with Cable Lubricant
Throttle Cables
Clutch Cable
Choke Cable

- Lubricate the cables by seeping the oil between the cable and housing.

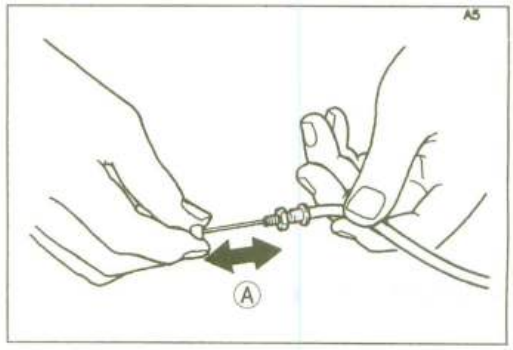
○ The cable may be lubricated by using a pressure cable luber [A] with an aerosol cable lubricant [B].

Special Tool – Pressure Cable Luber: K56019-021 [A]

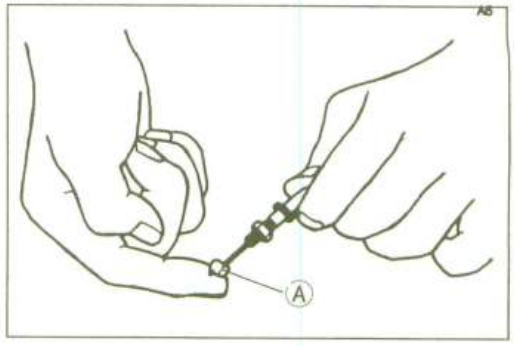


- With the cable disconnected at both ends, the cable should move freely [A] within the cable housing.

★ If cable movement is not free after lubricating, if the cable is frayed, or if the cable housing is kinked, replace the cable.



Points: Lubricate with Grease.
Throttle Inner Cable Lower Ends [A]
Choke Cable Lower End
Clutch Cable Ends [A]
Speedometer or Odometer Gear Housing and Inner Cable *
(*): Grease the lower part of the inner cable sparingly.



Unit Conversion Table

Prefixes for Units:

Prefix	Symbol	Power
mega	M	x 1 000 000
kilo	k	x 1 000
centi	c	x 0.01
milli	m	x 0.001
micro	μ	x 0.000001

Units of Mass:

kg	x	2.205	=	lb
g	x	0.03527	=	oz

Units of Volume:

L	x	0.2642	=	gal (US)
L	x	0.2200	=	gal (imp)
L	x	1.057	=	qt (US)
L	x	0.8799	=	qt (imp)
L	x	2.113	=	pint (US)
L	x	1.816	=	pint (imp)
mL	x	0.03381	=	oz (US)
mL	x	0.02816	=	oz (imp)
mL	x	0.06102	=	cu in

Units of Force:

N	x	0.1020	=	kg
N	x	0.2248	=	lb
kg	x	9.807	=	N
kg	x	2.205	=	lb

Units of Length:

km	x	0.6214	=	mile
m	x	3.281	=	ft
mm	x	0.03937	=	in

Units of Torque:

N-m	x	0.1020	=	kg-m
N-m	x	0.7376	=	ft-lb
N-m	x	8.851	=	in-lb
kg-m	x	9.807	=	N-m
kg-m	x	7.233	=	ft-lb
kg-m	x	86.80	=	in-lb

Units of Pressure:

kPa	x	0.01020	=	kg/cm²
kPa	x	0.1450	=	psi
kPa	x	0.7501	=	cm Hg
kg/cm²	x	98.07	=	kPa
kg/cm²	x	14.22	=	psi
cm Hg	x	1.333	=	kPa

Units of Speed:

km/h	x	0.6214	=	mph

Units of Power:

kW	x	1.360	=	PS
kW	x	1.341	=	HP
PS	x	0.7355	=	kW
PS	x	0.9863	=	HP

Units of Temperature:

$$\frac{9(°C+40)}{5} - 40 = °F \qquad \frac{5(°F+40)}{9} - 40 = °C$$

