MODEL APPLICATION

Year	Model	Beginning Frame No.
2008	KLX450A8F	JKALXGA1□8A000001 or JKALX450AAA000001
2009	KLX450A9F	JKALXGA1□9A010001 or JKALX450AAA010001
2010	KLX450AAF	JKALXGA1□AA013001 or JKALX450AAA013001

□:This digit in the frame number changes from one machine to another.

Kawasaki
KAWASAKI HEAVY INDUSTRIES, LTD.
Consumer Products & Machinery Company

Part No.99924-1385-03

Printed in Japan

Kawasaki

KLX450R

Motorcycle Service Manual

Quick Reference Guide

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, 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 vehicle:

- 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 Service 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 this manual, the product is divided into its major systems and these systems make up the manual's chapters. 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.

For example, if you want ignition coil information, 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 Ignition Coil section.

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

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

This manual contains four more symbols 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.

General Information

Table of Contents

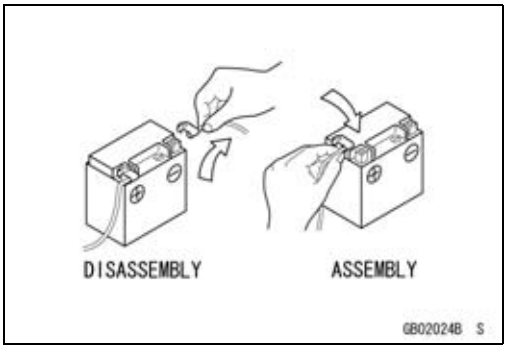
Before Servicing

Before starting to perform an inspection service or carry out a disassembly and reassembly operation on a motorcycle, read the precautions given below. To facilitate actual operations, notes, illustrations, photographs, cautions, and detailed descriptions have been included in each chapter wherever necessary. This section explains the items that require particular attention during the removal and reinstallation or disassembly and reassembly of general parts.

Especially note the following:

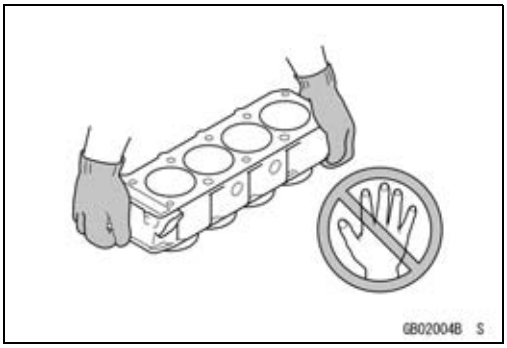
Battery Ground

Before completing any service on the motorcycle, disconnect the battery cables from the battery to prevent the engine from accidentally turning over. Disconnect the ground cable (–) first and then the positive (+). When completed with the service, first connect the positive (+) cable to the positive (+) terminal of the battery then the negative (–) cable to the negative terminal.



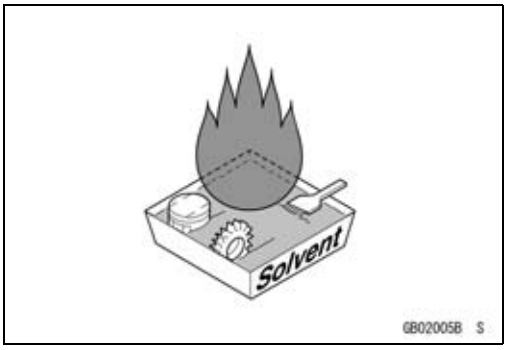
Edges of Parts

Lift large or heavy parts wearing gloves to prevent injury from possible sharp edges on the parts.



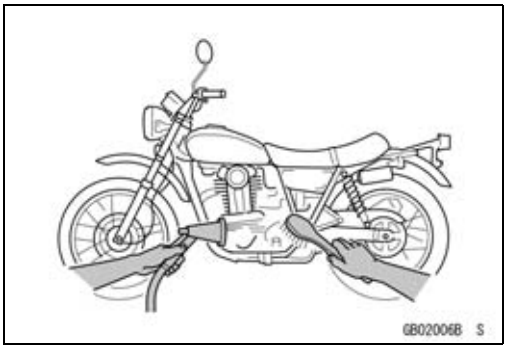
Solvent

Use a high-flash point solvent when cleaning parts. High -flush point solvent should be used according to directions of the solvent manufacturer.



Cleaning vehicle before disassembly

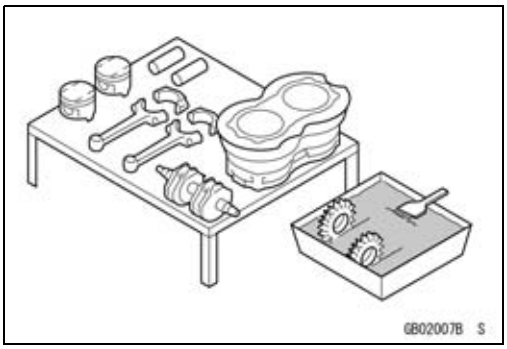
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



Before Servicing

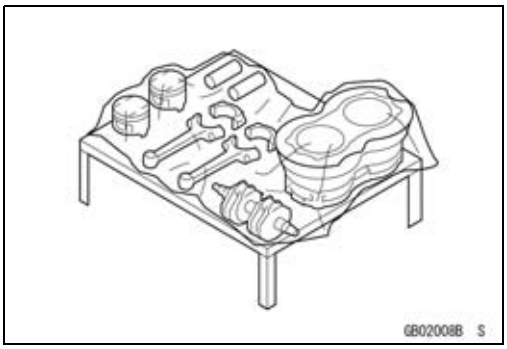
Arrangement and Cleaning of Removed Parts

Disassembled parts are easy to confuse. Arrange the parts according to the order the parts were disassembled and clean the parts in order prior to assembly.



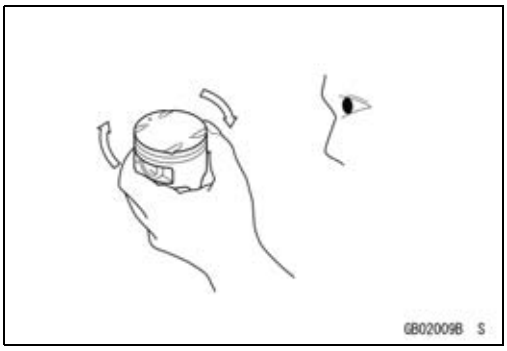
Storage of Removed Parts

After all the parts including subassembly parts have been cleaned, store the parts in a clean area. Put a clean cloth or plastic sheet over the parts to protect from any foreign materials that may collect before re-assembly.



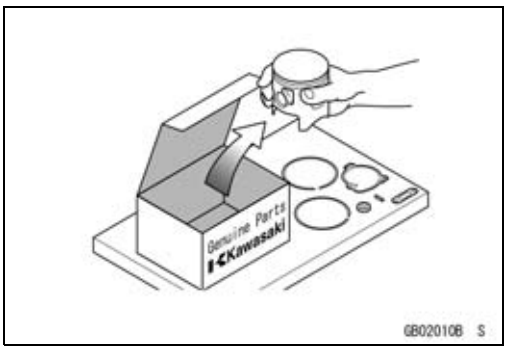
Inspection

Reuse of worn or damaged parts may lead to serious accident. Visually inspect removed parts for corrosion, discoloration, or other damage. Refer to the appropriate sections of this manual for service limits on individual parts. Replace the parts if any damage has been found or if the part is beyond its service limit.



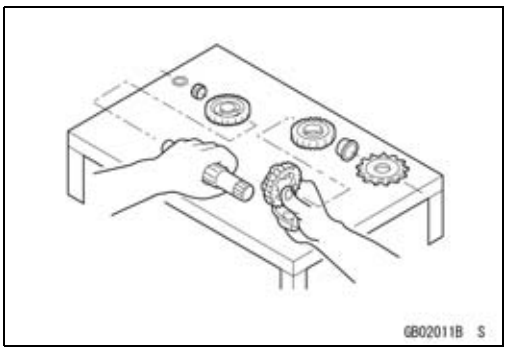
Replacement Parts

Replacement Parts must be KAWASAKI genuine or recommended by KAWASAKI. Gaskets, O-rings, Oil seals, Grease seals, circlips or cotter pins must be replaced with new ones whenever disassembled.



Assembly Order

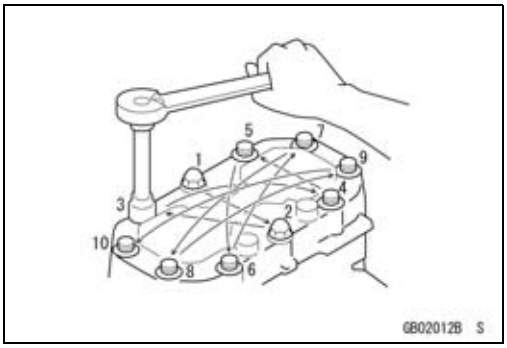
In most cases assembly order is the reverse of disassembly, however, if assembly order is provided in this Service Manual, follow the procedures given.



Before Servicing

Tightening Sequence

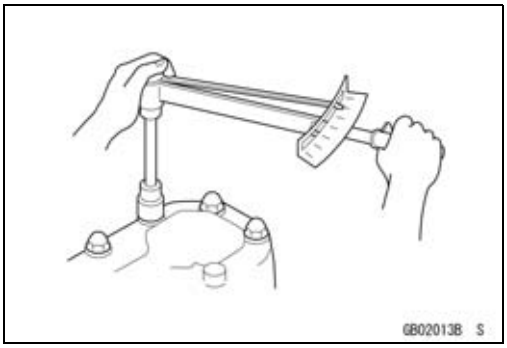
Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them according to the specified sequence to prevent case warpage or deformation which can lead to malfunction. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and them remove them. If the specified tightening sequence is not indicated, tighten the fasteners alternating diagonally.



Tightening Torque

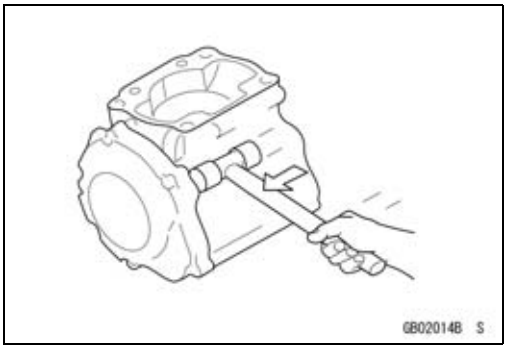
Incorrect torque applied to a bolt, nut, or screw may lead to serious damage. Tighten fasteners to the specified torque using a good quality torque wrench.

Often, the tightening sequence is followed twice-initial tightening and final tightening with torque wrench.



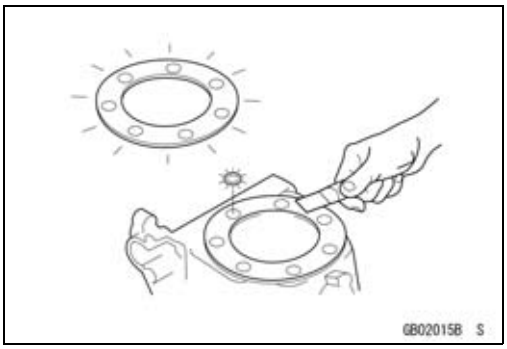
Force

Use common sense during disassembly and assembly, excessive force can cause expensive or hard to repair damage. When necessary, remove screws that have a non -permanent locking agent applied using an impact driver. Use a plastic-faced mallet whenever tapping is necessary.



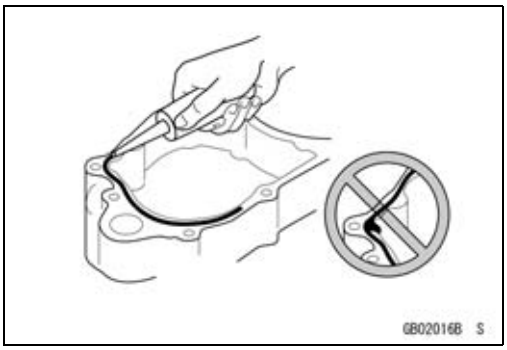
Gasket, O-ring

Hardening, shrinkage, or damage of both gaskets and O-rings after disassembly can reduce sealing performance. Remove old gaskets and clean the sealing surfaces thoroughly so that no gasket material or other material remains. Install new gaskets and replace used O-rings when re-assembling



Liquid Gasket, Non-permanent Locking Agent

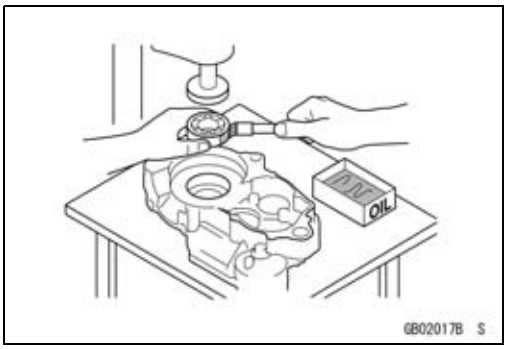
For applications that require Liquid Gasket or a Non-permanent Locking agent, clean the surfaces so that no oil residue remains before applying liquid gasket or Non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



Before Servicing

Press

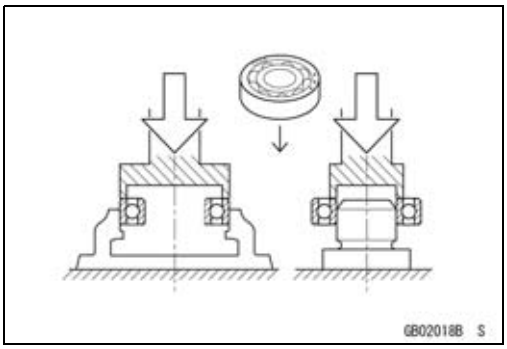
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



Ball Bearing and Needle Bearing

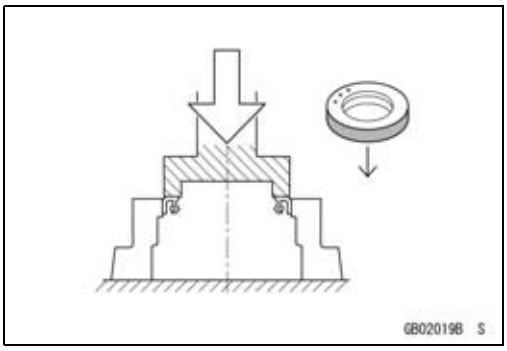
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

Pressing the incorrect race can cause pressure between the inner and outer race and result in bearing damage.

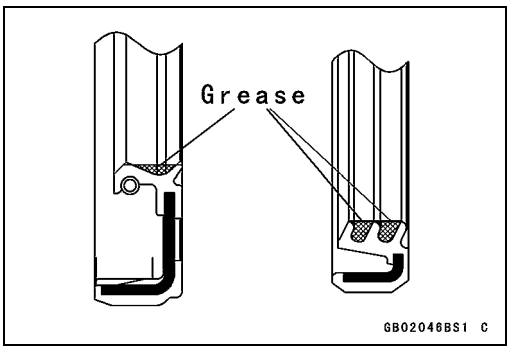


Oil Seal, Grease Seal

Do not remove pressed oil or grease seals unless removal is necessary. Replace with new ones whenever removed. Press new oil seals with manufacture and size marks facing out. Make sure the seal is aligned properly when installing.

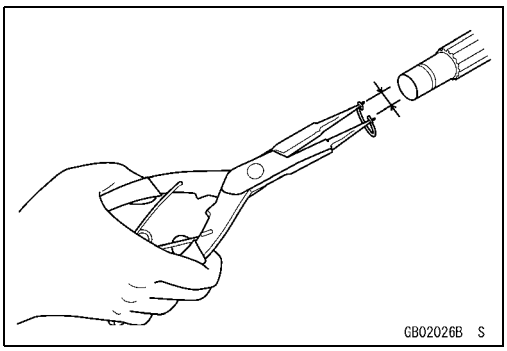


Apply specified grease to the lip of seal before installing the seal.



Circlips, Cotter Pins

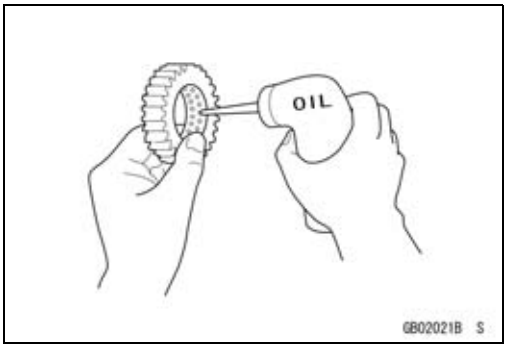
Replace circlips or cotter pins that were removed with new ones. Take care not to open the clip excessively when installing to prevent deformation.



Before Servicing

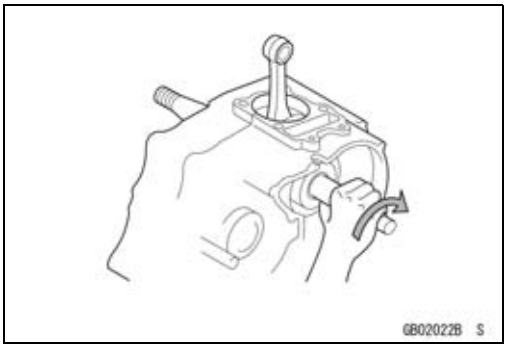
Lubrication

It is important to lubricate rotating or sliding parts during assembly to minimize wear during initial operation. Lubrication points are called out throughout this manual, apply the specific oil or grease as specified.



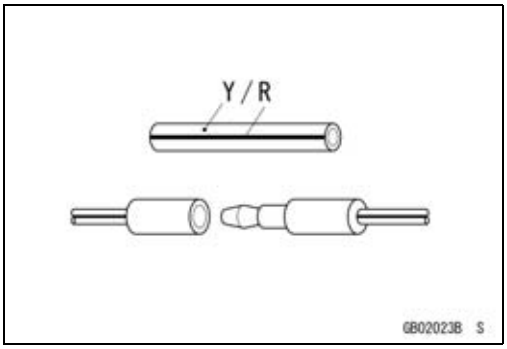
Direction of Engine Rotation

When rotating the crankshaft by hand, the free play amount of rotating direction will affect the adjustment. Rotate the crankshaft to positive direction (clockwise viewed from output side).



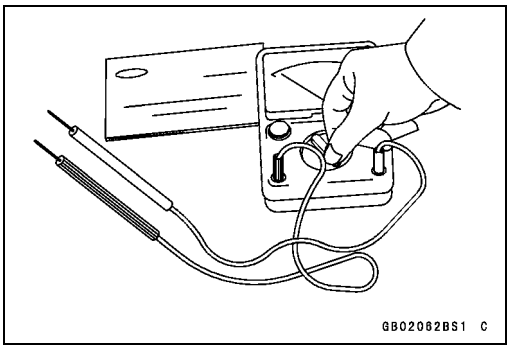
Electrical Leads

A two-color lead is identified first by the primary color and then the stripe color. Unless instructed otherwise, electrical leads must be connected to those of the same color.



Instrument

Use a meter that has enough accuracy for an accurate measurement. Read the manufacture's instructions thoroughly before using the meter. Incorrect values may lead to improper adjustments.

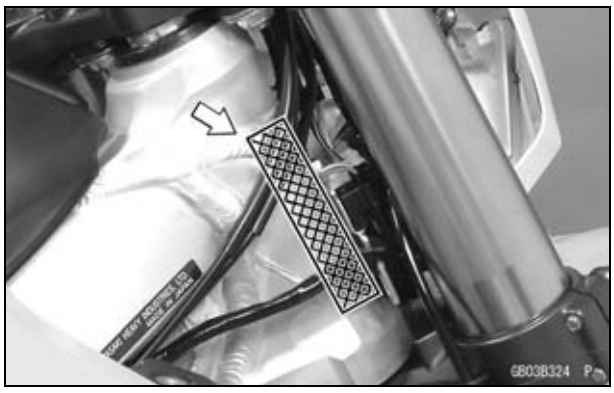


Model Identification

KLX450A8F Left Side View

KLX450A8F Right Side View

Frame Number



Engine Number

General Specifications

Items	KLX450A8F ~ AAF
Dimensions	
Overall Length	2 180 mm (85.83 in.), (AU) (EUR) 2 175 mm (85.63 in.)
Overall Width	820 mm (32.3 in.)
Overall Height	1 255 mm (49.41 in.), (AU) (EUR) 1 250 mm (49.21 in.)
Wheelbase	1 480 mm (58.27 in.)
Road Clearance	320 mm (12.6 in.), (AU) (EUR) 315 mm (12.4 in.)
Seat Height	940 mm (37.0 in.), (AU) (EUR) 935 mm (36.8 in.)
Dry Mass	(KLX450A8F) 115 kg (254 lb)
Curb Mass	(KLX450A9F ~ AAF) 126 kg (278 lb)
Fuel Tank Capacity	8 L (2.1 US gal)
Performance	
Minimum Turning Radius	–
Engine	
Type	4-stroke, single cylinder, DOHC 4 valve
Cooling System	Liquid-cooled
Bore and Stroke	96.0 × 62.1 mm (3.78 × 2.44 in.)
Displacement	449 cm^3 (27.4 cu in.)
Compression Ratio	12.0 : 1
Carburetion System	Carburetor, KEIHIN FCR-MX40
Starting System	Electric starter, Primary kick
Ignition System	Digital AC-CDI
Timing Advance	
Ignition Timing	BTDC 10.2° @1 800 r/min (rpm)
Spark Plug	NGK CPR8EB-9
Valve Timing:	
Inlet:	
Open	BTDC 38°
Close	ABDC 66°
Duration	284°
Exhaust:	
Open	BBDC 68°
Close	ATDC 36°
Duration	284°
Lubrication System	Forced lubrication (semi-dry sump)
Engine Oil:	
Type	API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2
Viscosity	SAE 10W-30, 10W-40, 10W-50
Capacity	1.3 L (1.4 US qt)
Drive Train	
Primary Reduction System:	
Type	Gear
Reduction Ratio	2.727 (60/22)
Clutch Type	Wet, multi disc

General Specifications

Items	KLX450A8F ~ AAF
Transmission:	
Type	5-speed, constant mesh, return shift
Gear ratios:	
1st	2.167 (26/12)
2nd	1.533 (23/15)
3rd	1.188 (19/16)
4th	0.950 (19/20)
5th	0.810 (17/21)
Final Drive System:	
Type	Chain drive
Reduction Ratio	3.846 (50/13)
Overall Drive Ratio	8.492 @Top gear
Frame	
Type	Tubular, semi-double cradle
Steering Angle	42° to either side
Caster (rake angle)	27.7°, (AU) (EUR) 28°
Trail	122 mm (4.80 in.)
Front tire:	
Size	80/100-21 51M, (AU) (EUR) 80/100-21 M/C 51P
Make/Type	BRIDGESTONE M401, Tube type, (AU) (EUR) ED03, Tube type
Rear tire:	
Size	110/100-18 64M, (AU) (EUR) 120/90-18 M/C 65P
Make/Type	BRIDGESTONE M402, Tube type, (AU) (EUR) ED04, Tube type
Rim size:	
Front	21 × 1.60
Rear	18 × 2.15
Front suspension:	
Type	Telescopic fork (up side down)
Wheel travel	305 mm (12.0 in.)
Rear suspension:	
Type	Swingarm (New Uni-trak)
Wheel travel	315 mm (12.4 in.)
Brake type:	
Front and Rear	Single disc
Effective disc diameter:	
Front (effect. dia.)	225 mm (8.86 in.)
Rear (effect. dia.)	215 mm (8.46 in.)
Electrical Equipment	
Battery	12 V 6 Ah
Headlight:	
Type	Semi-sealed beam
Bulb	12 V 35 W/35 W (Hi/Lo)

General Specifications

Items	KLX450A8F ~ AAF
Tail Light	LED
Magneto:	
Rated Output	2.0 A/14 V

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

Unit Conversion Table

Prefixes for Units:

Prefix	Symbol	Power
mega	M	× 1 000 000
kilo	k	× 1 000
centi	c	× 0.01
milli	m	× 0.001
micro	**μ**	× 0.000001

Units of Mass:

kg	×	2.205	=	lb
g	×	0.03527	=	oz

Units of Volume:

L	×	0.2642	=	gal (US)
L	×	0.2200	=	gal (imp)
L	×	1.057	=	qt (US)
L	×	0.8799	=	qt (imp)
L	×	2.113	=	pint (US)
L	×	1.816	=	pint (imp)
mL	×	0.03381	=	oz (US)
mL	×	0.02816	=	oz (imp)
mL	×	0.06102	=	cu in

Units of Force:

N	×	0.1020	=	kgf
N	×	0.2248	=	lb
kgf	×	9.807	=	N
kgf	×	2.205	=	lb

Units of Length:

km	×	0.6214	=	mile
m	×	3.281	=	ft
mm	×	0.03937	=	in

Units of Torque:

N·m	×	0.1020	=	kgf·m
N·m	×	0.7376	=	ft·lb
N·m	×	8.851	=	in·lb
kgf·m	×	9.807	=	N·m
kgf·m	×	7.233	=	ft·lb
kgf·m	×	86.80	=	in·lb

Units of Pressure:

kPa	×	0.01020	=	kgf/cm²
kPa	×	0.1450	=	psi
kPa	×	0.7501	=	cm Hg
kgf/cm²	×	98.07	=	kPa
kgf/cm²	×	14.22	=	psi
cm Hg	×	1.333	=	kPa

Units of Speed:

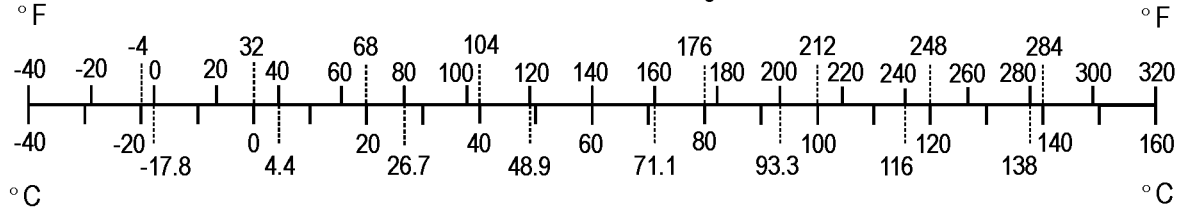
km/h	×	0.6214	=	mph

Units of Power:

kW	×	1.360	=	PS
kW	×	1.341	=	HP
PS	×	0.7355	=	kW
PS	×	0.9863	=	HP

Units of Temperature:

$$\frac{9(^\circ C + 40)}{5} - 40 = {}^\circ F \qquad \frac{5(^\circ F + 40)}{9} - 40 = {}^\circ C$$



Periodic Maintenance

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2-2 PERIODIC MAINTENANCE

Periodic Maintenance Chart

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

Periodic Inspection

	FREQUENCY / OPERATION	Traveled Distance km (mi)					See Page
		Every 100 (60) or 2.5 hr	Every 500 (300) or 7.5 hr	Every 1000 (600) or 15 hr	Every 1500 (900) or 30 hr	Every 2000 (1200) or 60 hr	
ENGINE	Spark plug-clean, gap †	Every 500 km (300 mi)					2 - 62
	Spark plug-inspect †		●	●	●	●	2 - 62
	Clutch cable-adjust	Every 100 km (60 mi)					2 - 26
	Clutch and friction plates-inspect †	●	●	●	●	●	2 - 26
		After 2000 km (1200 mi), every 1000 km (600 mi)					
	Throttle cable-adjust	Every 100 km (60 mi)					2 - 12
	Air cleaner element-clean †	●	●	●	●	●	2 - 14
		After 2000 km (1200 mi), every 1000 km (600 mi)					
	Carburetor-inspect and adjust	●	●	●	●	●	2 - 12
	Cylinder head, cylinder-inspect			●		●	2 - 23
	Valve clearance-inspect †	●		●		●	2 - 20
		After 2000 km (1200 mi), every 1000 km (600 mi)					
	Hot starter cable-adjust	Every 100 km (60 mi)					2 - 13
	Spark arrester-clean	Every 1500 km (900 mi)					2 - 24
	Vacuum switch valve-inspect †			●		●	2 - 19
	Kick pedal and shift pedal-clean	●	●	●	●	●	–
	Engine sprocket-inspect †	●	●	●	●	●	2 - 34
	Coolant-inspect †	●	●	●	●	●	2 - 18
	Radiator hoses and connections-inspect †	●	●	●	●	●	2 - 19
	Crankshaft-inspect			●		●	2 - 29
	Breather hose-inspect	●	●	●	●	●	2 - 28
CHASSIS	Brake adjustment-inspect †	●	●	●	●	●	2 - 35
	Brake pad wear-inspect †	●	●	●	●	●	2 - 39
	Brake fluid level-inspect †	●	●	●	●	●	2 - 36
	Brake hoses, connections-inspect †	●	●	●	●	●	2 - 44
	Spoke tightness and rim runout-inspect †	●	●	●	●	●	2 - 30
	Wheel bearing-inspect †	●	●	●	●	●	2 - 31
	Frame-inspect and clean	●	●	●	●	●	2 - 61
	Drive chain wear-inspect †	●	●	●	●	●	2 - 33
	Drive chain-inspect and adjust	●	●	●	●	●	2 - 32
	Drive chain-lubricate	●	●	●	●	●	2 - 34
	Wheels/tires-inspect	●	●	●	●	●	2 - 30

Periodic Maintenance Chart

	FREQUENCY / OPERATION	Traveled Distance km (mi) Every 100 (60) or 2.5 hr	Every 500 (300) or 7.5 hr	Every 1000 (600) or 15 hr	Every 1500 (900) or 30 hr	Every 2000 (1200) or 60 hr	See Page
CHASSIS	Rear sprocket-inspect †	●	●	●	●	●	2 - 35
	Front fork-inspect and clean	●	●	●	●	●	2 - 45
	Cable-inspect	●	●	●	●	●	2 - 62
	Fuel hose, connections-inspect †		●	●	●	●	2 - 12
	Fuel system-clean	●	●	●	●	●	2 - 17
	Steering play-inspect †	●	●	●	●	●	2 - 59
	Steering stem bearing-grease			●		●	2 - 61
	Swingarm and Uni-Trak linkage pivots-grease		●	●	●	●	2 - 59
	Swingarm and Uni-Trak linkage pivots-inspect †		●	●	●	●	2 - 59
	Nuts, bolts, fasteners-inspect †	●	●	●	●	●	2 - 63
	Rear shock absorber-inspect	●	●	●	●	●	2 - 54
	Chassis parts-lubricate	●	●	●	●	●	–

†: Replace, add, adjust, clean or torque if necessary.

Periodic Replacement Parts

FREQUENCY / OPERATION	Traveled Distance km (mi) Every 100 (60) or 2.5 hr	Every 500 (300) or 7.5 hr	Every 1000 (600) or 15 hr	Every 1500 (900) or 30 hr	Every 2000 (1200) or 60 hr	See Page
Engine oil-change	Every 1000 km (600 mi)					2 - 26
Piston and piston ring-replace	Every 1500 km (900 mi)					2 - 24
Piston pin-replace	Every 1500 km (900 mi)					2 - 24
Oil filter-replace	Every 1000 km (600 mi)					2 - 27
Brake fluid-change	Every 2 years					2 - 37
Brake master cylinder cup and dust seal-replace	Every 2 years					2 - 39
Brake caliper piston seal and dust seal-replace	Every 2 years					2 - 41
Brake hoses-replace	Every 4 years					2 - 44
Front fork oil-change			●		●	2 - 45
Rear shock oil-replace			●		●	2 - 54
Fuel hose-replace	Every 4 years					2 - 12

Torque and Locking Agent

Tighten all bolts and nuts to the proper torque using an accurate torque wrench. If insufficiently tightened, a bolt or nut may become damaged, strip an internal thread, or break and then fall out. The following table lists the tightening toque for the major bolts and nuts, and the parts requiring use of a non-permanent locking agent or liquid gasket.

When checking the tightening toque of the bolts and nuts, first loosen the bolt or nut by half a turn and then tighten to specified torque.

Letters used in the "Remarks" column mean:

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.
HL: Apply high-locking agent.
L: Apply a non-permanent locking agent to the threads.
Lh: Left-hand Threads
MO: Apply molybdenum disulfide oil.
S: Tighten the fasteners following the specified sequence.
Si: Apply Silicone grease.
R: Replacement Parts
2T: Apply 2-stroke oil.
T: First, tighten the stem locknut with 39 N·m (4.0 kgf·m, 29 ft·lb) of torque, then loosen it and retighten it with 4.9 N·m (0.50 kgf·m, 43 in·lb) of torque.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System				
Throttle Pulley Cover Bolt	3.4	0.35	30 in·lb	
Throttle Cable Mounting Bolts	6.9	0.70	61 in·lb	
Vacuum Switch Valve Bracket Bolts	9.8	1.0	87 in·lb	
Fuel Tap Knob Screws	0.80	0.080	7.0 in·lb	
Rear Frame Mounting Bolts	34	3.5	25	
Cooling System				
Water Pump Cover Bolts	9.8	1.0	87 in·lb	
Coolant Drain Plug	7.0	0.70	62 in·lb	
Water Pump Impeller Bolt	9.8	1.0	87 in·lb	
Right Engine Cover Bolts	9.8	1.0	87 in·lb	
Radiator Hose Clamp Screws	3.0	0.30	27 in·lb	
Engine Top End				
Cylinder Head Cover Bolts	9.8	1.0	87 in·lb	
Cylinder Head Bolts (M10)	59	6.0	44	S, MO
Cylinder Head Bolts (M6)	12	1.2	106 in·lb	S
Cylinder Bolt	12	1.2	106 in·lb	
Camshaft Cap Bolts	9.8	1.0	87 in·lb	S, MO
Camshaft Sprocket Bolts	12	1.2	106 in·lb	L
Carburetor Holder Clamp Screws	2.0	0.20	18 in·lb	
Plug	20	2.0	15	L
Rear Camshaft Chain Guide Bolt	15	1.5	11	
Oil Pump (Scavenge) Cover Bolts	9.8	1.0	87 in·lb	
Chain Tensioner Mounting Bolts	9.8	1.0	87 in·lb	
Chain Tensioner Cap Bolt	5.0	0.51	44 in·lb	
Water Hose Fitting Bolts	9.8	1.0	87 in·lb	
Oil Line Plug	3.0	0.31	27 in·lb	L
Decompressor Plug Plate Bolt	9.8	1.0	87 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Vacuum Hose Fitting	8.8	0.90	78 in·lb	L
Cylinder Head Pipe Mounting Bolt	9.8	1.0	87 in·lb	
Exhaust Pipe Cover Bolts	12	1.2	106 in·lb	
Rear Muffler Mounting Bolt	20	2.0	15	
Front Muffler Mounting Bolt (First)	9.8	1.0	87 in·lb	
Front Muffler Mounting Bolt (Final)	20	2.0	15	
Exhaust Pipe Holder Nuts	20	2.0	15	
Muffler End Mounting Bolts	10	1.0	89 in·lb	
Spark Arrester Mounting Bolts	10	1.0	89 in·lb	
Engine Right Side				
Primary Gear Nut	98	10	72	Lh,R
Clutch Cover Bolts	9.8	1.0	87 in·lb	
Right Engine Cover Bolts	9.8	1.0	87 in·lb	
Clutch Spring Bolts	8.8	0.90	78 in·lb	
Clutch Hub Nut	98	10	72	R
Ratchet Guide Bolt	8.8	0.90	78 in·lb	
Kick Pedal Bolt	25	2.5	18	L
Ratchet Plate Mounting Bolt	9.8	1.0	87 in·lb	S
Ratchet Plate Mounting Screw	6.4	0.65	56 in·lb	L,S
Gear Set Lever Nut	8.8	0.90	78 in·lb	
Shift Drum Cam Bolt	24	2.4	18	L
Engine Lubrication System				
Engine Oil Drain Plug (M10) (Main)	20	2.0	15	
Engine Oil Drain Plug (M6) (Sub)	7.0	0.71	62 in·lb	
Oil Pump (Scavenge) Cover Bolts	9.8	1.0	87 in·lb	
Oil Pump (Feed) Cover Bolts	9.8	1.0	87 in·lb	
Right Engine Cover Bolts	9.8	1.0	87 in·lb	
Piston Oil Nozzle	5.0	0.50	44 in·lb	
Oil Filter Cover Bolt	9.8	1.0	87 in·lb	
Oil Screen (Feed) Mounting Bolts	9.8	1.0	87 in·lb	
Oil Pressure Relief Valve	15	1.5	11	HL
Breather Fitting	15	1.5	11	L
Oil Filler Cap	–	–	–	Hand-tighten
Engine Removal/Installation				
Upper Engine Mounting Bolts (M10)	49	5.0	36	
Middle Engine Mounting Nut (M10)	49	5.0	36	
Lower Engine Mounting Nut (M10)	49	5.0	36	
Upper Engine Bracket Bolts (M8)	29	3.0	21	
Middle Engine Bracket Nuts (M8)	29	3.0	21	
Swingarm Pivot Shaft Nut	98	10	72	
Crankshaft/Transmission				
Crankcase Bolts (M6)	12	1.2	106 in·lb	S
Crankcase Bolts (M7)	15	1.5	11	S

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Gear Set Lever Nut	8.8	0.90	78 in·lb	
Engine Oil Drain Plug (M6)(Sub)	7.0	0.71	62 in·lb	
Engine Oil Drain Plug (M10)(Main)	20	2.0	15	
Shift Drum Cam Bolt	24	2.4	18	L
Piston Oil Nozzle	4.0	0.41	35 in·lb	
Bearing Retaining Screws	15	1.5	11	L
Balancer Weight Mounting Nut	52	5.3	38	
Gear Position Switch Screws	2.9	0.30	26 in·lb	L
Wheels/Tires				
Spoke Nipples	2.2	0.22	19 in·lb	
Front Axle Nut	79	8.0	58	
Front Axle Clamp Bolts	20	2.0	15	AL
Rear Axle Nut	110	11.2	81.1	
Final Drive				
Rear Sprocket Nuts	34	3.5	25	
Engine Sprocket Nut	127	13.0	93.7	
Brakes				
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
Brake Hose Banjo Bolts	25	2.5	18	
Brake Pad Bolt	17	1.7	13	
Caliper Bleed Valve	7.8	0.80	69 in·lb	
Caliper Mounting Bolts	25	2.5	18	
Front Brake Disc Mounting Bolts	10	1.0	89 in·lb	L
Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
Brake Lever Pivot Bolt	5.9	0.60	52 in·lb	Si
Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
Front Brake Light Switch Screw	1.2	0.12	10 in·lb	
Brake Hose Banjo Bolts	25	2.5	18	
Rear Master Cylinder Mounting Bolts	10	1.0	89 in·lb	
Rear Master Cylinder Push Rod Locknut	17	1.7	13	
Caliper Bleed Valve	7.8	0.80	69 in·lb	
Brake Pad Bolt	17	1.7	13	
Rear Brake Pad Bolt Plug	2.4	0.24	21 in·lb	
Caliper Holder Shaft	27	2.8	20	Si
Brake Pedal Mounting Bolt	25	2.5	18	G,L
Rear Brake Disc Mounting Bolts	23	2.3	17	L
Brake Reservoir Cap Bolts	1.5	0.15	13 in·lb	
Suspension				
Base Valve Assembly	28	2.9	21	
Front Fork Top Plug	30	3.1	22	
Front Fork Clamp Bolts (Upper)	20	2.0	15	AL
Front Fork Clamp Bolts (Lower)	20	2.0	15	AL
Steering Stem Head Nut	98	10	72	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Locknut/Adjuster Assembly	29	3.0	21	
Adjuster Assembly	55	5.6	41	L
Front Axle Clamp Bolts	20	2.0	15	AL
Swingarm Pivot Shaft Nut	98	10	72	
Rocker Arm Pivot Nut	59	6.0	44	
Tie-rod Mounting Nut (Front, Rear)	59	6.0	44	
Rear Shock Absorber Mounting Nut (Upper)	39	4.0	29	
Rear Shock Absorber Mounting Nut (Lower)	34	3.5	25	
Air Bleed Bolt	6.5	0.66	58 in·lb	
Steering				
Handlebar Clamp Bolts	25	2.5	18	2T
Steering Stem Head Nut	98	10	72	
Steering Stem Nut	4.9	0.50	43 in·lb	T
Front Fork Clamp Bolts (Upper)	20	2.0	15	AL
Front Fork Clamp Bolts (Lower)	20	2.0	15	AL
Frame				
Rear Frame Mounting Bolt	34	3.5	25	
Upper Footpeg Bracket Bolts	54	5.5	40	L
Electrical System				
Spark Plug	13	1.3	115 in·lb	
Starter Motor Terminal Nut	5.9	0.60	52 in·lb	
Starter Motor Mounting Bolts	9.8	1.0	87 in·lb	
Crankshaft Sensor Bolts	7.0	0.71	62 in·lb	
Stator Bolts	4.0	0.41	35 in·lb	L
Flywheel Nut	98	10	72	
Magneto Cover Bolts	9.8	1.0	87 in·lb	
Timing Inspection Cap	–	–	–	Hand-Tighten
Flywheel Nut Cap	–	–	–	Hand-Tighten
Torque Limiter Cover Bolts	9.8	1.0	87 in·lb	
Starter Motor Terminal Locknut	6.9	0.70	61 in·lb	
Starter Motor Through Bolts	3.4	0.35	30 in·lb	
Breather Fitting	15	1.5	11	L
Head Light Bracket Screws	1.4	0.14	12 in·lb	
Gear Position Switch Screws	2.9	0.30	26 in·lb	L

Torque and Locking Agent

Basic Torque for General Fasteners

Threads dia. (mm)	Torque		
	N·m	kgf·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

Specifications

Item	Standard	Service Limit
Fuel System		
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	– – –
Hot Starter Lever Free Play	0.5 ~ 1.0 mm (0.02 ~ 0.04 in.)	– – –
Air Cleaner Element Oil	High quality foam air filter oil	– – –
Cooling System		
Coolant:		
Type (recommended)	Permanent type antifreeze	– – –
Color	Green	– – –
Mixed Ratio	Soft water 50% and coolant 50%	– – –
Freezing Point	–35 °C (–31 °F)	– – –
Total Amount	1.05 L (1.11 US qt)	– – –
Engine Top End		
Valve Clearance:		
Exhaust	0.17 ~ 0.22 mm (0.0067 ~ 0.0087 in.)	– – –
Inlet	0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in.)	– – –
Cylinder Head Warp	– – –	0.05 mm (0.002 in.)
Cylinder Inside Diameter (see text)	96.000 ~ 96.012 mm (3.7795 ~ 3.7800 in.)	96.10 mm (3.783 in.)
Piston/Cylinder Clearance	0.020 ~ 0.042 mm (0.00079 ~ 0.0017 in.)	– – –
Engine Right Side		
Clutch Lever Free Play	8 ~ 13 mm (0.3 ~ 0.5 in.)	– – –
Friction Plate Thickness	2.92 ~ 3.08 mm (0.115 ~ 0.121 in.)	2.6 mm (0.10 in.)
Friction Plate Warp	0.15 mm (0.0059 in.) or less	0.3 mm (0.01 in.)
Steel Plate Warp	0.2 mm (0.008 in.) or less	0.3 mm (0.01 in.)
Engine Lubrication System		
Engine oil:		
Type	API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2	– – –
Viscosity	SAE 10W-30, 10W-40, or 10W-50	– – –
Capacity:		
Oil Change-When filter is not removed	1.06 L (1.12 US qt)	– – –
Oil Change-When filter is removed	1.08 L (1.14 US qt)	– – –
when engine is completely dry	1.3 L (1.4 US qt)	– – –
Crankshaft/Transmission		
Connecting Rod Big End Side Clearance	0.25 ~ 0.35 mm (0.0098 ~ 0.014 in.)	0.6 mm (0.02 in.)
Wheels/Tires		
Rim Runout:		
Axial	TIR 1.0 mm (0.039 in.) or less	TIR 2 mm (0.08 in.)
Radial	TIR 1.0 mm (0.039 in.) or less	TIR 2 mm (0.08 in.)
Front and Rear Tires Air Pressure	100 kPa (1.0 kgf/cm², 14 psi)	– – –

Specifications

Item	Standard	Service Limit
Standard Tire:		
Front:		
Size	80/100-21 51M	– – –
	(AU) (EUR) 80/100-21 M/C 51P	– – –
Make	BRIDGESTONE	– – –
Type	D401, Tube	– – –
	(AU) (EUR) ED03, Tube	– – –
Rear:		
Size	110/100-18 64M	– – –
	(AU) (EUR)120/90-18 M/C 65P	– – –
Make	BRIDGESTONE	– – –
Type	M402, Tube	– – –
	(AU) (EUR) ED04, Tube	– – –
Final Drive		
Drive Chain Slack	52 ~ 58 mm (2.0 ~ 2.3 in.)	– – –
Drive Chain 20 Link Length	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)	323 mm (12.7 in.)
Rear Sprocket Warp	0.4 mm (0.016 in.) or less	0.5 mm (0.020 in.)
Brakes		
Brake Lever Free Play	(to suit rider)	– – –
Brake Fluid:		
Type:		
Front	DOT3 or DOT4	– – –
Rear	DOT4	– – –
Brake pad lining thickness:		
Front	3.8 mm (0.15 in.)	1 mm (0.04 in.)
Rear	6.4 mm (0.25 in.)	1 mm (0.04 in.)
Suspension		
Fork Oil:		
Oil Viscosity	KHL15-10 (KAYABA 01) or equivalent	– – –
Oil Quantity:		(Adjustable range)
Outer (Outer/Inner Tubes)	335 mL (11.3 US oz.)	300 ~ 380 mL (10.1 ~ 12.8 US oz)
Inner (Subtank)	189 mL (6.4 US oz.)	– – –
Electrical System		
Spark Plug Gap	0.8 ~ 0.9 mm (0.03 ~ 0.04 in.)	– – –

TIR: Total Indicator Readings

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