KLX450R Motorcycle

OWNER'S MANUAL

A Read this manual carefully. It contains safety information.



Quick Reference Guide

This Quick Reference Guide will assist you in finding the information you're looking for.

GENERAL INFORMATION

MAINTENANCE AND ADJUSTMENT

TROUBLESHOOTING GUIDE

STORAGE

A Table of Contents is included after the Foreword.

IMPORTANT INFORMATION

- This vehicle is designed for the operator only, no passengers.
- This vehicle is an off-road motorcycle only and was not manufactured for use on public streets, roads or highways.
- Respect the environment and the rights of other people.
- Read owner's manual.

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

A DANGER

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

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

NOTICE

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

NOTE

○ NOTE indicates information that may help or guide you in the operation or service of the vehicle.

IMPORTANT

Off-road motorcycling is a wonderful sport, and we hope you will enjoy it to the fullest. However, if improperly conducted, this sport has the potential to cause environmental problems as well as conflicts with other people.

Responsible use of your off-road motorcycle will ensure that these problems and conflicts do not occur. TO PROTECT THE FUTURE OF YOUR SPORT, MAKE SURE YOU USE YOUR MOTOR-CYCLE LEGALLY, SHOW CONCERN FOR THE ENVIRONMENT, AND RESPECT THE RIGHTS OF OTHER PEOPLE.

- THIS VEHICLE IS AN OFF-ROAD VEHICLE ONLY AND WAS NOT MANUFACTURED FOR USE ON PUBLIC STREETS, ROADS, OR HIGH-WAYS.
- USE YOUR BIKE LEGALLY.
- RESPECT THE ENVIRONMENT AND THE RIGHTS OF OTHER REOPLE.

FOREWORD

We wish to thank you for choosing this Kawasaki Motorcycle. It is the end product of Kawasaki's advanced engineering, exhaustive testing, and continuous striving for superior reliability, and performance. By giving your motorcycle the proper care and maintenance outlined in this manual, you will be helping to ensure it a long, trouble-free life.

Before starting to ride your motorcycle, please read this manual thoroughly in order to know your motorcycle's capabilities, its limitations, and above all, how to operate it safety.

Due to improvements in design and performance made during production, in some cases there may be minor discrepancies between the actual vehicle and the illustrations and text in this manual.

KAWASAKI HEAVY INDUSTRIES, LTD. Motorcycle & Engine Company

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Feb. 22, 2014. (1)

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SPECIFICATIONS

DIMENSIONS

Overall length	2 175 mm (85.6 in.)
Overall width	820 mm (32.3 in.)
Overall height	1 250 mm (49.2 in.)
Wheelbase	1 480 mm (58.3 in.)
Road clearance	315 mm (12.4 in.)
Curb mass	126 kg (278 lb)
Fuel tank capacity	8 L (2.1 US gal)

ENGINE

Type Bore × stroke Displacement Compression ratio Carburetor Starting system Ignition system Ignition timing Lubrication system Spark plug Spark plug terminal DOHC, 4-valve, single-cylinder, 4-stroke, liquid-cooled 96.0 × 62.1 mm (3.8 × 2.4 in.) 449 cm³ (27.4 cu in.) 12.0 : 1 KEIHIN FCR-MX40 Electric, Primary kick CDI 10.2° BTDC @1 800 r/min (rpm) Forced Lubrication (semi dry sump) NGK CPR8EB-9 Solid-post

8 SPECIFICATIONS

TRANSMISSION

5-speed, constant-mesh, return shift	
Wet, multi disc	
Chain drive	
2.167 (26/12)	
1.533 (23/15)	
1.188 (19/16)	
0.950 (19/20)	
0.810 (17/21)	
2.727 (60/22)	
3.846 (50/13)	
8.492	
1.3 L (1.4 US qt)	
API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2	
SAE 10W-40	
1.1 L (1.2 US qt)	
Semi-double cradle	
42° to either side	
28°	
122 mm (4.8 in.)	

SPECIFICATIONS 9

Tire size, type:	
Front	80/100-21 M/C51P, BRIDGESTONE ED03
Rear	120/90-18 M/C65P, BRIDGESTONE ED04
Rim size:	
Front	21 × 1.60
Rear	18 × 2.15
Suspension:	
Front	Upside-down telescopic fork
Rear	New Uni-trak [®] swingarm
Front suspension travel	305 mm (12.0 in.)
Rear wheel travel	315 mm (12.4 in.)
Front fork oil:	
Туре	Kawasaki Fork Oil KHL15-10
Amount (per fork leg) :	
Inner Damper	189 mL (6.4 US oz)
Inner/Outer Tubes	335 mL (11.3 US oz)
BRAKES	
Type (Front & Rear)	Disc
ELECTRICAL EQUIPMENT	
Battery	12 V 6 Ah
Headlight	12 V 35 W

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

Location of Labels

All warning labels which are on your vehicle are repeated here. Read labels on your vehicle and understand them thoroughly. They contain information which is important for your safety and the safety of anyone else who may operate your vehicle. Therefore, it is very important that all warning labels be on your vehicle in the locations shown. If any label is missing, damaged, or worn, get a replacement from your Kawasaki dealer and install it in the correct position.

NOTE

• The sample warning labels in this section have part numbers to help you and your dealer obtain the correct replacement.



1. Brake Fluid (Front)





- Brake Fluid (Rear)
 Radiator Cap Danger
 Rear Shock Absorber Warning





5. Battery Poison/Danger 6. Important Information



VC02074B S

2)







4)

🛦 🕷 A R N I N G

This unit contains high pressure nitrogen gas. Mishandling can cause explosion.

Read service manual for instructions.
 Do not incinerate, puncture or open.

🕰 A V E R T I S S E M E N T

Cette unite contient de l'azote à haute pression. Une mauvaise manipulation peut entraîner d'explosion. © Voir le manuel d'utilisateur pour les instructions. © Ne pas brûler ni perforer ni ouvrir.

KANASAKI

VC02097BM2 C

KYB

4) Brazil model

A CUIDADO

Esta unidade contém gás nitrogêrio sob alta pressão. O Manuseio incorreto pode causar explosão.

• Não incinere, não perfure ou desmonte(abra)

5) Brazil model



VC02221B S

6)

5)



INPORTANT INFORMATION

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VC02125B S

6) Brazil model

IMPORTANT INFORMATION

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 Respect the environment ond the rights of other people.
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INFORMAÇÕES IMPORTANTES

Este voículo foi projetado somente para um pileto, sem passegeiros. Este voículo é una netocicteto exclusivemente fora cerestraca e nõe foi fobricace para uso en rucs, estradas pultodovias públicos. Respeite e nacio ambiente e os direitos cas denais pessoas. Leia o encuel do proprietório.

> 56071-0479 VC02223B S

Location of Parts



1. Clutch Lever

- 2. Engine Stop Button
- 3. Hot Starter Lever

4. Meter Unit

5. Front Brake Fluid Reservoir

6. Front Brake Lever

- 7. Throttle Grip
- 8. Starter Button
- 9. Fuel Tank Cap



- 9. Front Fork
- 10. Radiator
- 11. Fuel Tank
- 12. Fuel Tap
- 13. Carburetor

- 14. Seat
- 15. Air Cleaner Element
- 16. Brake Disc
- 17. Brake Caliper
- 18. Shift Pedal

- 19. Rear Shock Absorber
- 20. Swingarm
- 21. Drive Chain
- 22. Chain Guide



- 23. Silencer
- 24. Rear Brake Fluid Reservoir
- 25. Rear Shock Absorber Gas Reservoir
- 26. Battery
- 27. Fuse

- 28. Uni-Trak[®] Tie Rod and Rocker Arm
- 29. Rear Brake Pedal
- 30. Kick Pedal
- 31. Engine Oil Level Inspection Window
- 32. Exhaust Pipe

Side Stand

The motorcycle is equipped with a side stand.



A. Side Stand

Whenever the side stand is used, make it a practice to kick the fully up before sitting on the motorcycle.

Riding with the side stand down could cause an accident resulting in serious injury or death. Always be sure the side stand is fully raised before riding.

Fuel

Fuel Requirements:

Your Kawasaki engine is designed to use only unleaded gasoline with a minimum octane rating shown below. Never use gasoline with an octane rating lower than the minimum specified by Kawasaki to prevent severe engine damage.

The octane rating of a gasoline is a measure of its resistance to detonation or "knocking". The term commonly used to describe a gasoline's octane rating is the Research Octane Number (RON).

NOTICE

If engine "knocking" or "pinging" occurs, use a different brand of gasoline of a higher octane rating. If this condition is allowed to continue, it can lead to severe engine damage. Gasoline quality is important. Fuels of low quality or not meeting standard industry specifications may result in unsatisfactory performance.

Fuel Type and Octane Rating

(Except for Brazil Specification)

Use clean, fresh unleaded gasoline with an octane rating equal to or higher than that shown in the table.

Fuel Type	Unleaded Gasoline
Ethanol Content	E10 or less
Minimum Octane Rating	Research Octane Number (RON) 95

NOTICE

Do not use any fuel that contains more ethanol or other oxygenates than specified for E10 fuel* in this vehicle. Damage to the engine and fuel system, or engine starting and/or performance problems may result from the use of improper fuel.

*E10 means fuel containing up to 10% ethanol.

(For Brazil Specification)

Use clean, fresh unleaded gasoline with an Antiknock Index equal to or higher than that shown in the table.

The Antiknock Index is posted on service station pumps. The Antiknock Index is an average of the Research Octane Number (RON) and the Motor Octane Number (MON) as shown in the table.

Fuel Type	Unleaded Gasoline	
Ethanol Content	E25	
Minimum Octane Rating	Antiknock Index	(RON + MON)
		2
	90	

NOTICE

Do not use any fuel that contains more ethanol or other oxygenates than specified for E25 fuel* in this vehicle. Damage to the engine and fuel system, or engine starting and/or performance problems may result from the use of improper fuel.

*E25 means fuel containing up to 25% ethanol.

Filling the Tank:

Avoid filling the tank in the rain or where heavy dust is blowing so that the fuel does not get contaminated.



- A. Tank Cap
- **B. Fuel Tank**
- C. Top Level
- D. Filler Neck

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. Never fill the tank so the fuel level rises into the filler neck. If the tank is overfilled, heat may cause the fuel to expand and overflow through the vents in the tank cap. After refueling, make sure the fuel tank cap is closed securely. If gasoline is spilled on the fuel tank, wipe it off immediately.

NOTICE

Certain ingredients in gasoline may cause paint fading or damage. Be extra careful not to spill gasoline or gasoline oxygenates blends during refueling.

Fuel Tap:

The fuel tap has three position: OFF, ON, and RES (reserve). For normal operation, turn the fuel tap lever to the ON position. If the fuel runs out with the tap in the ON position, the last approximately 0.7 L (0.18 US gal) of usable fuel remains can be used by turning the tap lever to the RES position.



- A. Fuel Tap B. ON Position
- C. OFF Position
- **D. RES Position**

Turn the fuel tap lever to the OFF position when the fuel tank is removed for maintenance and adjustments or the motorcycle is stored for a long time.

NOTE

 Since riding distance is limited when on RES, refuel at the earliest opportunity.

 Make certain that the fuel tap lever is turned to ON (not RES), after filling up the fuel tank.

Practice operating the fuel tap with the motorcycle stopped. To prevent an accident you should be able to operate the fuel tap while riding without taking your eyes off the road. Be careful not to touch the hot engine while operating the fuel tap.

Meter Unit

In the meter instruments face are the speedometer, odometer/clock, and trip meter. Pushing the odometer/clock (ODO/CLOCK) mode button shifts the display in the odometer/clock through the two modes; odometer and clock. Pushing the trip meter A/B (Trip A/B) mode button shifts the display in the trip meter through the two modes; trip A and B. When starting the engine, all segments come on for three seconds, then the clock or meters operate normally depending on the mode selected.



- A. Speedometer
- B. Trip Meter A/B
- C. Clock/Odometer
- D. ODO/CLOCK Mode Button
- E. TRIP A/B Mode Button

Speedometer:

The speedometer shows the speed of the vehicle.

Odometer:

The odometer shows the total distance in the kilometers (mph) that the vehicle has been ridden. The meter cannot be reset.

NOTE

- The date is maintained even if the battery is disconnected,
- ○When the figures come to 999999, they are stopped and locked.



Clock:

To adjust hours and minutes:

• Push the ODO/CLOCK mode button to display the clock.

• Push the ODO/CLOCK mode button while holding the TRIP A/B mode button. Both the hour and minute displays start flashing.



• Again push the TRIP A/B mode button. When only the hour display flashes, push the ODO/CLOCK mode button to advance the hours.



• Push the TRIP A/B mode button. The hour display stops flashing and the minute display starts flashing. Push the ODO/CLOCK mode button to advance the minutes.



- Push the TRIP A/B mode button. Both the hour and minute displays start flashing again.
- Push the ODO/CLOCK mode button. The displays stop flashing and the clock starts working.

NOTE

- Pushing the ODO/CLOCK mode button momentarily advances the hour or minute step by step. Pushing and holding the button advance the hour or minute continuously.
- When the battery is disconnected, the clock resets to 1:00, and starts working again when the battery is connected.

Trip Meter:

The trip meter shows the distance in kilometers traveled since it was last reset to zero.

TRIP A: 0.0 ~ 999.9

TRIP B: $0 \sim 9999$

To reset the trip meter:

- 1. Push the TRIP A/B button and hold it in.
- 2. After two seconds the figure display turns to 0.0 (TRIP A) or 0 (TRIP B), and then starts counting when the vehicle is operated. The meter counts until it is next reset.

NOTE

- When the trip meter is reset while the vehicle is stopped, it starts counting as soon as the vehicle starts moving.
- When the figures come to 999.9 (TRIP A) or 9999 (TRIP B) when the vehicle is running, they turn back to 0.0 or 0 and start counting again.

○ When the battery is disconnected, the meter display resets to 0.0 or 0.



Engine Stop Button

The engine stop button is located on the left side of the handlebar. For ordinary engine stoppage and, if some emergency requires stopping the engine, press the button until the engine stops.



A. Engine Stop Button

Kick Pedal

This motorcycle has a kick pedal.



A. Kick Pedal

Starter Button

This motorcycle has the starter button. The starter button operates the electric starter when the clutch lever pulled in.



A. Starter Button

Starting the Engine

- Shift the transmission into neutral.
- Turn the fuel tap lever to the ON position.



A. Fuel Tap B. ON Position

Riding with the side stand in the down position can cause a crash resulting in injury. Do not start the engine or attempt to ride the motorcycle when the side stand is down.

NOTICE

This motorcycle's radiator does not incorporate cooling fan. Prolonged idling of the engine with no airflow through the radiator can cause coolant loss and engine overheating resulting in possible engine damage. Any riding conditions that increase engine temperature will further reduce idling time before coolant loss occurs. These conditions include high ambient temperature, sandy or muddy terrain, or other conditions causing high engine loads at low speeds. Furthermore, warming the engine up excessively before operation, or leaving idling with the hot engine temperature after operation results in the engine overheating, too.

NOTE

 Do not repeatedly operate the throttle with the engine starting, stopping and idling. The accelerator pump may foul the spark plugs with excess fuel.

When engine is cold-

• Pull out the choke knob.



A. Choke Knob

• Leaving the throttle completely closed, push the starter button or kick the engine over until the engine starts.

NOTE

- When using the starter button for starting the engine, make sure that the clutch lever is pulled in.
 When using the kick pedal for starting the engine.
- find the kick pedal position around the top so that

the resistance to depress the kick pedal is fully felt by pushing down the kick pedal slowly.
When the clutch lever is pulled, the motorcycle can be started with the transmission in any gear.



A. Starter Button B. Kick Pedal

• Even after the engine has started, do not push back immediately the choke knob until the engine is thoroughly warmed up.

When engine is already warm or restarts-

• Pull the hot starter lever on the clutch lever.



A. Hot Starter Lever

- Kick the engine over or push the starter button, leaving the throttle closed without using the choke knob.
- Return the hot starter lever back immediately after the engine starts.

NOTE

- If the engine fails starting, open the throttle fully and depress the kick pedal slowly about 4 ~ 5 times to clear too rich fuel mixtures in the engine. Then, kick the engine over or push the starter button, leaving the throttle closed with the hot starter lever pulled in.
- Hot starter lever or choke knob is used as following table.

Engine	Hot Starter	Chaka Knah
Condition	Lever	CHOKE KHOD
Already	Dull in (ON)	Duch book (OEE)
Warm		FUSIT DACK (OFF)
Restarting		Push back (OFF)
after falling		
Cold	No use (OFF)	Use (ON)

Moving Off

- Check that the side stand is up.
- Shift into 1st gear.
- Open the throttle slowly.

Shifting Gears

This motorcycle is equipped with a 5-speed "return shift" transmission. The neutral is located halfway between 1st and 2nd gear. "Return shift" means that when shifting up or down, each gear must be engaged before the next higher or lower gear may be selected.

- To engage first gear from the neutral position, pull in the clutch lever and push down on the shift pedal, gently release the clutch lever, then release the shift pedal.
- To shift up to the next gear, pull in the clutch lever, lift the shift pedal with your toes, gently release the clutch lever, and then release the shift pedal.
- To shift down to the next gear, pull in the clutch lever, push the shift pedal down as far as it will go, gently release the clutch lever, then release the shift pedal.

NOTICE

When changing gears, press firmly on the shift pedal to ensure proper shifting. Careless, incomplete shifting can cause the transmission to jump out of gear and lead to engine damage.



Stopping the Motorcycle

For maximum deceleration, close the throttle and apply both front and rear brakes. Pull in the clutch lever as the motorcycle comes to a stop. Independent use of the front or rear brake may be advantageous in certain circumstances. Shift down progressively to ensure good engine response at all speeds.

A. Shift Pedal

Stopping the Engine

- Shift the transmission into the neutral position.
- Close the throttle completely and push the engine stop button.



A. Engine Stop Button

• Turn the fuel tap lever to the OFF position.

Break-In

A brief break-in procedure must be carried out to obtain the proper operating clearances in the engine and transmission, which are necessary for performance and reliability.

NOTICE

For the first hour or 20 km (12 mi) of operation, run the engine at low and moderate engine speeds. See details below.

Break in the engine as follows.

- 1. Start the engine and let it idle until it is thoroughly warmed up.
- 2. Ride the motorcycle for about 20 minutes within 1/2 throttle opening.
- 3. Stop and let the engine cool completely. Be sure to check the tightness of nuts and bolts, oil leakage, coolant leakage and any irregularities.
- 4. Start the engine and ride the motorcycle for about 40 minutes within 3/4 throttle opening.
- 5. Stop and let the engine cool completely. Be sure to fully check the tightness of nuts and bolts, oil leakage, and any irregularities, especially, each cable elongation, brake play, chain slack and spoke tightness.
- 6. Change the engine oil, oil filter and front fork/rear shock absorber oil to the new one.
- 7. After the break-in procedure has been properly carried out, the motorcycle is ready for regular

operation. Using the proper riding skills and techniques and avoiding recklessly high engine speeds will keep the engine trouble-free.

NOTICE

When any following parts have been replaced, the same break-in procedure as the new motorcycle must be carried out for one hour or 20 km (12 mi): Cylinder, Piston, Piston pin, Piston ring, Valve, Valve lifter, Camshaft, Crankshaft, Mission gear, etc.

Daily Pre-Ride Checks

Check the following items each day before you ride. The time required is minimal, and habitual performance of these checks will help ensure a safe, reliable ride.

If any irregularities are found during these checks, refer to the appropriate section and take the action required to return the motorcycle to a safe operating condition.

Failure to perform these checks before operation may result in serious damage or an accident. Always perform daily checks before operation.

A DANGER

Exhaust gas contains carbon monoxide, a colorless, odorless poisonous gas. Inhaling carbon monoxide can cause serious brain injury or death. Do not run the engine in enclosed areas. Operate only in a well-ventilated area.

Engine

Engine Oil	No leakage
-	Level correct
Coolant	No leakage
	Level correct (engine cold)
Radiator Cap	Properly installed
Spark Plug	Correctly torqued
Cylinder Head Cover	Correctly torqued
Clutch	Functions properly
Carburetor	Properly tuned
Air Cleaner	Clean
	Apply oil to air cleaner element
	Properly installed

No damage
Properly installed
No wear or damage
Overall condition good
No wear or damage
Pressure correct
Air valve cap installed
No looseness
Overall condition good
Chain slack correct
Oil if necessary
Function properly
Lever and pedal play correct
No fluid leakage
Functions properly
Throttle grip returns smoothly
Smooth but not loose from lock to lock
No binding due to control cables
Functions properly
No oil leakage
Functions properly
No oil leakage
Mounted securely
No fuel leakage
No wear or damage
Functions properly
Properly tightened
After-Race Checks

After racing, first clean the motorcycle (see p. 137), then inspect the entire motorcycle with special attention to the air cleaner, carburetor, brakes, etc. Carry out the general lubrication (see p. 139) and make necessary adjustments.

Periodic Maintenance Chart

The maitenance and adjustments outlined in this chapter are easily carried out and must be done in accordance with the Periodic Maintenance Chart to keep the motorcycle in good running condition.

1. Periodic Inspection (Engine Related Item)

FREQUENCY		Traveled Distance km (mi)					
	OPERATION	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
Hot starter cable-adjust		Every 100 km (60 mi)					
	Throttle cable-adjust		Every	100 km (60	mi)		59
	Valve clearance-inspect †	•		•		•	70
Е		After 2 000 km (1 200 mi), every 1 000 km (600 mi)					10
N G	Air cloanar cloment cloan t	•	•	•	•	•	56
Ī		After 2 000 km (1 200 mi), every 1 000 km (600 mi)					50
N E	Clutch and friction plates-inspect +	•	•	•	•	•	65
	Clutch and metion plates-inspect	After 2 000 km (1 200 mi), every 1 000 km (600 mi)					00
	Spark plug-clean, gap †	Every 500 km (300 mi)					52
	Spark plug - inspect †		•	•	•	•	52
Clutch cable-adjust			Every	100 km (60	mi)		62

1. Periodic Inspection (Engine Related Item)

	FREQUENCY		Traveled	Distance km	n (mi)		
	OPERATION	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
	*Carburetor-inspect and adjust	٠	٠	•	٠	•	61
	*Cylinder head, cylinder-inspect			٠		•	-
	*Crankshaft-inspect			•		•	-
	Spark arrester-clean (Brazil model only)	Every 6 000 km (3 750 mi)					
E	Kick pedal and shift pedal-clean	٠	٠	•	٠	•	-
G	Engine sprocket-inspect †	٠	٠	•	٠	•	82
l N	Coolant-inspect †	٠	٠	٠	٠	•	48
E	Breather hose - inspect	٠	٠	•	٠	•	-
	Radiator hoses and connections - inspect †	•	•	•	•	•	47
	*Vacuum switch valve - inspect †			•		•	_

2. Periodic Inspection (Chassis Related Item)

FREQUENCY		Traveled Distance km (mi)					
	OPERATION	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
	Brake adjustment - inspect †	•	•	•	•	•	85
	Brake pad wear - inspect †	•	•	•	•	•	88
	Brake fluid level - inspect †	•	•	•	•	•	86
	Brake hoses, connections-inspect †	•	•	•	•	•	126
С	Spoke tightness and rim runout - inspect †	•	•	•	•	•	124
Ĥ	*Wheel bearing-inspect †	•	•	•	٠	•	-
A S	Frame-inspect and clean	•	•	•	٠	•	-
S	Drive chain wear - inspect †	•	•	•	٠	•	80
S	Drive chain-inspect and adjust	•	•	•	٠	•	78
	Drive chain-lubricate	•	•	•	•	•	83
	Wheels/tires-inspect	•	•	•	•	•	123
	Rear sprocket-inspect †	•	•	•	•	•	82
	Front fork-inspect and clean	•	•	•	•	•	91
	Cable-inspect	•	•	•	•	•	_

2. Periodic Inspection (Chassis Related Item)

	FREQUENCY		Traveled	Distance km	n (mi)		
	OPERATION	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
	Fuel hose, connections-inspect †		•	•	•	•	126
	*Fuel system-clean	٠	٠	•	٠	•	-
_	Steering play-inspect †	٠	٠	•	٠	•	89
C H	*Steering stem bearing-grease			•		•	-
A S	*Swingarm and Uni-Trak linkage pivots-grease		•	•	•	•	-
S I S	*Swingarm and Uni-Trak linkage pivots-inspect †		•	•	•	•	-
Ū	Nuts, bolts, fasteners-inspect †	•	•	•	•	•	132
	Rear shock absorber-inspect	•	•	•	•	•	119
	Chassis parts-lubricate	•	•	•	•	•	139

3. Periodic Replacement (Engine and Chassis Related Item)

FREQUENCY	Y Traveled Distance km (mi)					
OPERATION	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 (f)		Every 1	000 km (600) mi)		43
*Piston and piston ring-replace		Every 1	500 km (900) mi)		—
*Piston pin-replace	Every 1 500 km (900 mi)					
Oil filter-replace (f)	Every 1 000 km (600 mi)					43
*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 hoses and pipe-replace		Every 4 years				—
Front fork oil-change			•		•	95
*Rear shock oil-replace			•		•	-
Fuel hose-replace	Every 5 years					_

†: Replace, add, adjust, clean or torque if necessary.* : Should be serviced by referring to the Service Manual or an authorized Kawasaki dealer.

f : Replace after the first break-in ride.

Engine Oil

In order for the engine, transmission and clutch to function properly, maintain the engine oil at the proper level, and change the oil and oil filter periodically.

Not only do dirt and metal particles collect in the oil, but the oil itself loses its lubricative quality if used too long.

A 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. Check the oil level before each ride and change the oil according to the periodic maintenance chart in the Owner's Manual.

Because of the semi-dry sump lubrication system, the engine oil level indicated on the oil level inspection window will fluctuate depending on the motorcycle's position and engine speed when the engine's shut off. To ensure a proper reading of the engine oil level, follow the Oil Level Inspection procedures closely.

NOTICE

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

Oil Level Inspection

- If the oil has just been changed, let the motorcycle sit a few minutes allowing the oil to settle.
- Start the engine and run it for several minutes at idle speed. Do not run the engine at high engine speed.
- Stop the engine and wait several minutes for the oil to settle.
- Check the engine oil level with the motorcycle vertical through the oil level inspection window on the lower right side of the engine. The oil level should come up between the high and low level lines next to the window.
- If the oil level is too high, remove the excess oil using a syringe or other suitable device.
- If the oil level is too low, add the correct amount of oil through the oil filler opening. Use oil of the same type and brand as those of the one that is already in the engine.

NOTE

○ If no oil appears in the oil level inspection window, tip the motorcycle slightly to the right until oil is visible then return to an upright position. If no oil appears even when tipped at an extreme angle, remove drain plugs to empty any oil that may be in the transmission and crankcase, reinstall the drain plugs and refill with the specified amount of oil.



- A. Oil Level Inspection Window
- B. High Level Line
- C. Low Level Line
- D. Oil Filler Cap

Oil and/or Oil Filter Change

The engine oil and/or oil filter should be changed periodically to ensure long engine life.

- Warm up the engine thoroughly so that the oil will pick up any sediment and drain easily.
- Stop the engine, and place a container beneath it.
- Remove the oil filler cap.
- Remove the oil drain plugs and position the vehicle perpendicular to the ground to allow all the oil to drain.



A. Drain Plug (M6) B. Drain Plug (M10)

Engine oil is a toxic substance. Dispose of used oil properly. Contact your local authorities for approved disposal methods or possible recycling.

• When the oil filter is replaced, remove the exhaust pipe by removing the clamp bolt and holder nuts.



- A. Exhaust Pipe
- B. Bolt
- C. Nuts

• Replaced, remove the oil filter cover and take off the cover with O-ring.



A. Oil Filter Cover B. Bolts

• Replace the oil filter element with a new one.



A. Oil Filter Element B. Grommet

- Apply the grease oil to the grommet.
- Install the oil filter element with the grommet toward the oil filter cover.

NOTICE

Inside-Out installation stop oil flow, causing engine seizure.

• Install the oil filter cover with the grease applied to a new O-ring and tighten its bolts to the specified torque.

Oil Filter Cover

9.8 N·m (1.0 kgf·m, 87 in·lb)

• After the oil has completely drained out, install the drain plugs with their new gaskets. Proper torque for them is shown in the table.

Engine Oil Drain Plugs Tightening Torque

Drain Plug (M6)	7.0 N·m (0.7 kgf·m, 5.2 ft·lb)
Drain Plug (M10)	20 N·m (2.0 kgf·m, 15 ft·lb)

NOTE

- Replace any gaskets or O-ring with their new ones.
- Fill the engine up to the high level line with good quality engine oil specified in the table.

Recommended Engine Oil

Castrol "Power1 Racing 4T" 5W-40

- Install the oil filler cap.
- Install the exhaust pipe with the molybdenum disulfide grease applied to a new gasket and tighten the bolt and nuts.
- Start the engine.
- Check the oil level and oil leakage.

Engine Oil Capacity

1.06 L (1.12 US qt)	[When filter is not removed]
1.08 L (1.14 US qt)	[When filter is removed]
1.30 L (1.37 US qt)	[When engine is completely dry]

NOTE

○ If unavailable, use equivalent engine oil in accordance with the following table.

Туре:	API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2

Viscosity: SAE 10W-40

NOTE

O Do not add any chemical additive to the oil. Oils fulfilling the above requirements are fully formulated and provide adequate lubrication for both the engine and the clutch. The oil viscosity may need to be changed to accommodate atmospheric conditions in your riding area.



Cooling System

Cooling Hoses

Check the cooling hoses for cracks or deterioration, and the connections for looseness in accordance with the Periodic Maintenance Chart.

Radiator

Check the radiator fins for obstruction by insects or mud. Clean off any obstructions with a low-pressure stream of water.

NOTICE

Using high-pressure water, as from a car wash facility, could damage the radiator fins and impair the radiator's effectiveness.

Do not obstruct or deflect airflow by installing unauthorized accessories in front of the radiator.

Interference with the cooling airflow can lead to overheating and consequent engine damage.

Coolant

Coolant absorbs excessive heat from the engine and transfers it to the air through the radiator. If the coolant level becomes low, the engine overheats and may suffer severe damage. Check the coolant level each day before riding the motorcycle, and replenish coolant if the level is low.

Hot engine coolant can cause serious burns. To avoid burns, do not remove the radiator cap or try to inspect the coolant level or change the coolant when the engine is still hot. Wait until it cools down.

NOTE

○ The coolant originally filled into the cooling system contains 50% of a permanent, ethylene-glycol -based antifreeze, has a freezing point of −35°C (−31°F) and a green appearance.

Coolant Level Inspection

• Check the coolant level through the coolant level gauge on the reserve tank located inside the left side cover. The coolant level should be between the F (FULL) and L (LOW) level lines.

NOTE

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



A. Reserve Tank B. FULL Level Line C. LOW Level Line D. Tank Cap

- If the amount of coolant is insufficient, unscrew the cap from the reserve tank and add coolant through the filler opening to the F (FULL) level line.
- Install the cap.

Water and Antifreeze Mixing Ratio

1:1 (water: antifreeze)

Recommended Antifreeze

Permanent type of antifreeze (ethylene glycol base plus corrosion and rust inhibitors for aluminum engines and radiators)

Coolant Total Amount

1.1 L (1.2 US qt)

Coolant Change

The coolant should be changed periodically to ensure long engine life.

- Wait for the engine to cool completely.
- Remove the guard.



A. Guard B. Bolt

- Situate the motorcycle perpendicular to the ground until the radiator cap is level to the ground.
- Remove the radiator cap in two steps.
- First, turn the cap counterclokwise to the first stop and wait there for a few seconds.
- Then, push and turn the cap further in the same direction and remove it.



A. Radiator Cap

- Drain the coolant from the engine and radiator in the following way.
- Place a container under the coolant drain plug on the water pump cover and remove the drain plug.



A. Coolant Drain Plug B. Water Pump Cover

NOTICE

Immediately wash away any coolant that spills on the frame, engine, or wheel.

Coolant on tires will make them slippery and can cause loss of traction resulting in an accident and injury. Thoroughly clean any coolant that might have splashed on the tires.

- Remove the left side cover.
- Remove the reserve tank mounting bolt and take out the reserve tank from the frame.
- Unscrew the cap and pour the coolant into a container.



- A. Reserve Tank B. Mounting Bolt C. Cap
- . Install the recence tenk on
- Install the reserve tank on the frame.
- Visually inspect the old coolant.

- If whitish cotton-like wafts are observed, aluminum parts in the cooling system are corroded and the system must be flushed.
- If the coolant is brown , iron or steel parts are rusting and the system must be flushed.
- Check the cooling system for damage, loose connections, and leaks.
- Install the coolant drain plug with its new gasket at the water pump cover and apply the specified torques.

NOTE

○ Always replace any gasket with a new one.

Coolant Drain Plug Tightening Torque

7.0 N·m (0.7 kgf·m, 62 in·lb)

- Fill the reserve tank up to the F (FULL) Level line with coolant, and install the cap.
- Fill the radiator up to the bottom of the radiator filler neck with coolant.



A. Coolant Level B. Filler Neck

• Situate the motorcycle perpendicular to the ground until the radiator filler neck is level to the ground so that the filler neck is located uppermost in order to exhaust the air accumulated in the radiator.

NOTICE

Use coolant containing corrosion inhibitors made specifically for aluminum engines and radiators in accordance with the instruction of the manufacture. Soft or distilled water must be used with the antifreeze in the cooling system. If hard water is used in the system, it causes scale accumulation in the water passages, and considerably reduces the efficiency of the cooling system.

NOTE

- Pour in the coolant slowly so that it can expel the air from the engine and radiator.
- Install the radiator cap.
- Check the cooling system for leaks.
- Start the engine and warm up thoroughly, then stop it.
- Check the coolant level in the reserve tank after the engine has cooled down. If the coolant level is low, add coolant up to the F (FULL) level line.
- Install the left side cover.

Spark Plug

The spark plug should be taken out periodically for inspection and regapping. Measure the gap with a wire-type thickness gauge. If incorrect, adjust the gap to the specified value by bending the outer electrode.

Spark Plug Gap





A. Gap B. Outer Electrode

If the plug is oily or has carbon built up on it, clean it. The plug may also be cleaned using a high-flash -point solvent and a nonmetal brush (nylon etc.). If the spark plug electrodes are corroded, or damaged, or if the insulator is cracked, replace the plug. The standard spark plug is shown in the table below.

Standard Spark Plug

CPR8EB-9

NOTE

○ If the spark plug is replaced, use the genuine Kawasaki spark plug.

Spark Plug Removal and Installation

- Clean the cylinder head cover around the spark plug cap hole before removing the spark plug.
- Pull the spark plug cap off the plug before removing the spark plug.
- Apply a suitable wrench to the spark plug.
- Loosen and remove the spark plug.
- When reinstalling the spark plug, torque it to specification.

Spark Plug Tightening Torque

13 N·m (1.3 kgf·m, 9.6 ft·lb)

• Fit the plug cap securely onto the spark plug, and pull the cap lightly to make sure that it is properly installed.

• Check the spark plug lead is not damaged, or correctly routed.

Air Cleaner

A clogged air cleaner restricts the air intake, increases fuel consumption, reduces engine power, and can cause spark plug fouling. Inspect the air intake system, which includes the air filter and air duct to the carburetor, and the duct clamps and carburetor, before each race or practice session.

Dirt in the engine can cause engine damage or failure leading to an accident resulting in serious injury. Regularly inspect the air intake system for dirt or dust. If any dirt or dust is found in the system, the entire system must be cleaned to help prevent engine damage or failure.

NOTICE

A clogged air cleaner will affect fuel mixture to the engine and reduce engine power and cause spark plug fouling.

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.

Element Removal and Inspection

• Remove the screw and remove the front left side cover.



A. Front Left Side Cover B. Screw

• Remove the wing bolt, and take out the air cleaner element.



A. Air Cleaner Element B. Wing Bolt

- Check inside of the intake tract and carburetor for dirt. If dirty, clean the intake tract and carburetor thoroughly.
- Stuff a clean, lint-free towel into the carburetor to keep dirt from entering the carburetor.
- Wipe out the inside of the air cleaner housing with a clean, damp towel.

• Take the element off its frame.

NOTICE

Do not twist or wring the element, as it gets easily torn or damaged.

• Inspect the element. If it is dirty, clean it. Also check if the element is in good condition (no tears, hardening or shrinkage). If damaged, replace the element or it will allow dirt into the carburetor.

A clogged air cleaner may allow dirt and dust to enter the carburetor and the throttle may stick resulting in a hazardous operating condition. Clean the air filter according to the periodic maintenance chart; more often if the vehicle is used in extremely dusty conditions.

NOTICE

A clogged air cleaner may allow dirt and dust to enter the engine, causing it to wear excessively or to become damaged.



- A. Air Cleaner Element
- **B. Element Frame**

Element Cleaning and Installation

- Clean the element in a bath of a high flash-point solvent or hot soapy water. Rinse the element with clear water to remove all traces of the cleaning solution.
- Squeeze the element dry in a clean towel.

NOTICE

Do not twist, wring or blow the element dry to avoid damaging it.





Gasoline and low flash-point solvents can be flammable and/or explosive and cause severe burns. Clean the element in a well-ventilated area, and take care that there is no spark or flame anywhere near the working areas. Do not use gasoline or low flash-point solvents to clean the element.

• After cleaning, let the filter dry completely. Saturate the element with a high-quality foam air filter oil and make sure that the oil is evenly applied throughout the element. Squeeze out the excess oil, but do not wring the element as this could

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cause tearing. In this case, too much oil is better than too little. Finally pat the inside of the element with a paper towel to remove any excess oil.

- Before installation, check the element for damage such as tears, hardening, or shrinkage. If damaged, replace the element.
- Apply grease to all mating surfaces and to the screw hole in the air cleaner housing and intake tract.
- Remove the towel from the carburetor.
- Install the element onto its frame, and coat the element lip and lip seat with a thick layer of all -purpose grease to assure a complete seal.



A. Apply Grease.

• Install the air cleaner element so that its tab faces leftside.



A. Tab

Oil Draining

• Inspect the hose or plug to see if any oil or water has run down.



A. Drain Hose B. Plug

• If there are any oil, remove the plug and drain the oil.

Oil on tires will make them slippery and can cause an accident and injury. Be sure to install the plug in the drain hose after draining.

NOTE

○ The projections align with the holes in the housing.



- A. Projections
- B. Holes
- C. Insert
- Install the front left side cover.

Throttle Cable

Throttle Cable Adjustment

Inspect the throttle grip for smooth operation in all steering positions. Check and adjust the throttle cable in accordance with the Periodic Maintenance Chart.

• Check that the throttle grip has 2 \sim 3 mm (0.08 \sim 0.12 in.) of play and turns smoothly.



A. Throttle Grip B. 2 ~ 3 mm (0.08 ~ 0.12 in.)

• If the play is incorrect, loosen the locknut on the upper end of the throttle cable and turn the adjuster to obtain the specified play. Then, tighten the locknut toward the adjuster.



A. Adjuster B. Locknut

• With the engine idling, turn the handlebar both ways and check if handlebar movement changes the idling speed. If so, the throttle cable may be improperly adjusted or incorrectly routed, or damaged. Be sure to correct any of these conditions before riding.

Operation with improperly adjusted, incorrectly routed, or damaged cables could result in an unsafe riding condition. Be sure the control cables are adjusted and routed correctly, and are free from damage.

Carburetor

Idling Adjustment

Idling adjustment is carried out using the idling adjusting screw.

- Thoroughly warm up the engine.
- Turn the idling adjusting screw to adjust the idling speed 1 750 ~ 1 850 r/min (rpm) by using the engine revolution tester (The tester should be followed by the method described by the manufacture).



A. Idling Adjusting Screw B. Tester

• Open and close the throttle a few times to make sure the idling speed does not change, and read-just if necessary.

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• With the engine idling, turn the handlebar both ways and check if handlebar movement changes the idling speed. If so, the throttle cable may be improperly adjusted, incorrectly routed, or damaged. Be sure to correct any of these conditions before riding.

Operation with a damaged cable could result in an unsafe riding condition. Replace a damaged control cable before operation.

NOTICE

This motorcycle's radiator does not incorporate cooling fan. Prolonged idling of the engine with no airflow through the radiator can cause coolant loss and engine overheating resulting in possible engine damage. Any riding conditions that increase engine temperature will further reduce idling time before coolant loss occurs. These conditions include high ambient temperature, sandy or muddy terrain, or other conditions causing high engine loads at low speeds. Furthermore, warming the engine up excessively before operation, or leaving idling with the hot engine temperature after operation results in the engine overheating, too.

Clutch

Clutch Lever Adjustment

Proper clutch lever play is $8 \sim 13 \text{ mm} (0.3 \sim 0.5 \text{ in.})$. Lever play increases with cable stretch and friction plate wear, requiring periodic adjustment.

When the clutch lever play is out of specification, first try adjusting it at the clutch lever as follows.

• Turn the adjuster to obtain the proper amount of clutch lever play.



A. Clutch Lever B. Adjuster C. 8 ~ 13 mm (0.3 ~ 0.5 in.)

If the clutch lever play cannot be adjusted at the clutch lever, make the adjustment further down the cable as follows.

- Turn the adjuster in all the way.
- Loosen the locknut at the lower end of the clutch cable, and turn the adjusting nut so that the clutch lever play is $8 \sim 13 \text{ mm} (0.3 \sim 0.5 \text{ in.}).$



A. Nuts B. Clutch Cable

• Tighten the locknut.

Too much cable play can prevent clutch disengagement and cause an accident resulting in serious injury or death. When adjusting the clutch or replacing the cable, be sure the upper end of the clutch outer cable is fully seated in its fitting, or it could slip into place later, creating enough cable play to prevent clutch disengagement.

NOTE

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

Friction Plate Removal

- Drain the engine oil. (see the "Engine Oil" section).
- Remove the brake pedal pivot bolt and the rear brake master cylinder mounting bolts.
- Remove the rear brake pedal return spring.



- A. Brake Pedal Pivot Bolt
- B. Rear Brake Master Cylinder Mounting Bolts
- C. Rear Brake Master Cylinder
- D. Brake Pedal
- E. Return Spring

• Remove the clutch cover mounting bolts.



A. Bolts B. Clutch Cover

- Remove the clutch cover and gasket.
- Remove the clutch spring bolts, clutch pressure plate and springs while pressing the push rod holder.



A. Clutch Spring Bolts B. Clutch Pressure Plate C. Push Rod Holder

- Remove the friction and steel plates.
- Remove the clutch hub nut with using the clutch holder (special tool) to prevent the clutch hub from rotating.
- Remove the clutch hub.



- A. Clutch Hub
- **B. Clutch Hub Nut**
- C. Clutch Holder (P.N. 57001-1243)
- **D. Clutch Housing**

Friction and Steel Plate Wear/Damage Inspection

- Visually inspect the friction and steel plates to see if they show any signs of seizure, or uneven wear.
- ★ If any plates show signs of damage, replace all friction plates and steel plates as a set.
- Measure the thickness of the friction plates with vernier calipers.
- ★ If they have worn past the service limit, replace them with new ones.

Friction Plate Thickness Measurement

Standard	2.92 ~ 3.08 mm (0.115 ~ 0.121 in.)
Service Limit	2.6 mm (0.102 in.)

If the steel plates are replaced, measure the clutch plate assembly length, and use the steel plates in the following table so that the clutch plate assembly length is standard. When measuring the clutch plate assembly length, assemble the clutch plate assembly (clutch hub, friction plates, steel plates, clutch pressure plate, clutch spring bolts, springs).

Clutch Spring Bolt Tightening Torque

8.8 N·m (0.9 kgf·m, 78 in·lb)



- A. Clutch Hub
- **B. Friction Plates**
- C. Steel Plates
- **D. Clutch Pressure Plate**
- E. Clutch Spring Bolt
- F. Spring
- G. Standard Length

Standard Clutch Plate Assembly Measurement

34.9 ~ 35.5 mm (1.37 ~ 1.40 in)

Steel Plate (P.N.)	Thickness
13089-1095 (Standard)	1.6 mm (0.062 in.)
13089-1005	2.0 mm (0.079 in.)
13089-1010	1.2 mm (0.047 in.)

NOTE

○ Do not use the steel plate of 2.0 mm (0.079 in.) and 1.2 mm (0.047 in.) thickness at the same time.



A. Thickness B. Friction Plate

Friction and Steel Plate Warp Inspection

 Place each friction plate and steel plate on a surface plate, and measure the amount of friction plate and steel plate warp with a thickness gauge (i.e., the gap between the surface plate and each friction plate or steel plate).

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

Friction and Steel Plate Warp

Friction	Standard	Maximum 0.15 mm (0.006 in.)
Fiale	Service Limit	0.3 mm (0.012 in.)
Steel Plate	Standard	Maximum 0.2 mm (0.008 in.)
	Service Limit	0.3 mm (0.012 in.)



- A. Surface Plate
- **B.** Friction or Steel Plate

C. Thickness Gauge

Clutch Hub Installation

- Install all parts in the reverse order of removal.
- Install the clutch hub.
- Tighten the clutch hub nut with using the clutch holder (special tool) to the specified torque.

Clutch Hub Nut Tightening Torque

98 N·m (10 kgf·m, 72 in·lb)

Friction and Steel Plate Installation

- Install all parts in the reverse order of removal.
- Install the friction plates and steel plates, alternating between the two; be sure to start and finish with a friction plate.



A. Friction and Steel Plates

NOTE

• The friction lining intervals on the first and last friction plate surfaces is different from one of the other friction plate surfaces as shown in the figure.



- A. First and Last Friction Plates
- **B. Other Friction Plates**
- C. Friction Lining

NOTICE

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

- Apply molybdenum disulfide grease to the contact area of the push rod holder.
- Install the push rod holder.



- A. Apply Molybdenum Disulfide Grease.
- B. Push Rod Holder
- C. Push Rod
- Install the clutch pressure plate and springs.
- Tighten the clutch spring bolts to the specified torque.

Clutch Spring Bolt Tightening Torque

8.8 N·m (0.9 kgf·m, 78 in·lb)

- Place a new clutch cover gasket in position with a thin layer of grease and tighten the bolts.
- When installing the brake pedal, apply the grease to the contact area of the brake pedal pivot.
- Install the parts removed.
- Check the engine oil level.

Hot Starter Cable

Proper hot starter lever play between the hot starter lever and holder is $0.5 \sim 1 \text{ mm} (0.02 \sim 0.04 \text{ in.})$. Lever play increases with cable stretch, and requires periodic adjustment.

- Check the hot starter lever play when pulling it lightly, and if it's play is out of specification, adjust the lever play.
- Loosen the locknut, turn the adjuster to obtain the proper hot starter lever play, then tighten the locknut.



- A. Hot Starter Lever
- **B. Adjuster**
- C. Locknut
- D. 0.5 ~ 1 mm (0.02 ~ 0.04 in.)

Valve Clearance

Valve and valve seat wear decreases valve clearance, upsetting valve timing.

NOTICE

If valve clearance is left unadjusted, wear will eventually cause the valves to remain partly open, which lowers performances, burns the valves and valve seats, and may cause serious engine damage.

Valve clearance for each valve should be checked and adjusted in accordance with the Periodic Maintenance Chart. Inspection and adjustment should be done only by an authorized Kawasaki dealer.

NOTE

If the engine is hot, wait until the engine cools.
Valve clearance must be checked when the engine is cold (room temperature).

Valve Clearance Inspection

- Turn the fuel tap lever to the OFF position.
- Remove the seat and left and right side covers.
- Remove the bolt of the fuel tap mounting bolt.
- Disconnect the fuel hose from the fuel tap.



- A. Fuel Tap Mounting Bolt
- B. Fuel Tap
- C. Fuel Hose

- Remove the fuel tank mounting bolts, left and right shroud bolt.
- Unhook the rubber band and then remove the fuel tank with left and right shroud.



- A. Fuel Tank
- B. Shroud
- C. Bolt
- D. Rubber Band

• Remove the spark plug cap, spark plug, cylinder head cover bolts, and cylinder head cover.



A. Spark Plug Cap B. Cylinder Head Cover Bolts C. Cylinder Head Cover • Remove the head cover gasket.



A. Head Cover Gasket
• Remove the two caps from the generator cover.



A. Caps

• Bring the piston to the Top Dead Center (TDC) of its compression stroke to inspect the valve clearance (the position at the end of the compression stroke) by aligning the top mark with the groove on the generator cover while turning the crankshaft counterclockwise.



- A. Top Mark
- B. Groove on Generator Cover
- **C. Crankshaft Rotation Direction**

• At this point, the timing marks on the camshaft sprockets must be almost aligned with the cylinder head upper surface as shown in the figure.



- A. Timing Mark
- B. Camshaft Sprockets
- C. Cylinder Head Upper Surface

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• Using the thickness gauge, measuring the clearance between each cam lobe and valve lifter, for all four valves.

NOTE

○ Record the measured valves clearance.



A. Thickness Gauge

Standard Valve Clearance (Between cam and valve lifter)

Exhaust	0.20 ~ 0.25 mm (0.0079 ~ 0.0098 in.)
Intake	0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in.)

• If the valve clearance is not within the specified range, adjust by an authorized Kawasaki dealer or a competent mechanic following the instructions in the Service Manual.

Cylinder Head Cover Installation

- Using a high-flash point solvent, clean off any oil or dirt that may be on the silicone sealant coating area. Dry them with a clean cloth.
- Apply the silicone sealant to the new cylinder head cover gasket as shown in the figure and install the new cylinder head cover gasket to the cylinder head.



A. Apply Silicone Sealant.

• Make sure that the upper chain guide is bottomed to the cylinder head cover.



A. Upper Chain Guide B. Cylinder Head Cover

NOTICE

Unless the upper chain guide is bottomed, the camshaft chain could push the cylinder head cover upward, leading to an oil leak.

- Install the cylinder head cover.
- Install the washer with the metal side upwards to the cylinder head cover, and tighten the bolts to the specified torque.

Cylinder Head Cover Bolt Tightening Torque

9.8 N·m (1.0 kgf·m, 87 in·lb)

- Install the two caps to the generator cover.
- Install the spark plug cap and the parts removed.

Spark Arrester (Brazil model only)

This vehicle is equipped with a spark arrester. It must be properly maintained to ensure its efficiency. In accordance with the Periodic Maintenance Chart, clean the spark arrester.

NOTICE

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

Spark Arrester Cleaning

Hot exhaust system parts can cause serious burns. The exhaust system becomes very hot soon after the engine is started. To avoid burns, be sure the exhaust system is cold before cleaning the spark arrester.

• Remove the muffler end mounting bolts.



A. Muffler End Mounting Bolts B. Muffler End • Take off the spark arrester mounting bolts.



A. Spark Arrester Mounting Bolts

• Remove the spark arrester.



A. Spark Arrester B. Gasket

- With a wire brush, remove the carbon off the inside of the spark arrester and muffler.
- Replace the gasket to the new one.
- Install the spark arrester into the rear end of the muffler.
- Install the muffler end.

Drive Chain

For safety and to prevent excessive wear, the drive chain must be checked, adjusted, and lubricated before riding. If the chain becomes badly worn or maladjusted - either too loose or too tight - it could jump off the sprockets or break.

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. Inspect the chain for damage and proper adjustment before each ride.

Chain Slack Inspection

- Raise the rear wheel off the ground, then rotate the rear wheel to find the place where the chain is tightest (because it wears unevenly).
- Push up the drive chain in the middle of the upper chain run to measure the chain slack. The distance between the chain and the swingarm (at the end of the chain slipper) should be within the standard value.

Drive Chain Slack

Standard 52 ~ 58 mm

52 ~ 58 mm (2.0 ~ 2.3 in.)

• Adjust the drive chain if its slack is out of specification.



A. Chain Slack

- In addition to checking the slack, rotate the rear wheel to inspect the drive chain for damaged rollers, loose pins and links and the sprockets for unevenly or excessively worn and damaged teeth.
- If there are any such defects, replace the drive chain and/or the sprockets.

Chain Slack Adjustment

- Remove the cotter pin from the rear axle nut.
- Loosen the rear axle nut and both chain adjuster locknuts.
- Turn both chain adjusting bolts evenly until the drive chain slack (measured between the chain and the swingarm) is within the standard value. For the rear wheel to be properly aligned, the notch of the left chain adjuster should align with the same swingarm mark that the notch of the right chain adjuster aligns with.

Drive Chain Slack

52 ~ 58 mm (2.0 ~ 2.3 in.)



- A. Axle Nut
- **B. Adjusting Bolt**
- C. Locknut
- D. Marks
- E. Notch
- F. Cotter pin

NOTE

○ Wheel alignment can also be checked using the straightedge or string method.

WARNING

Misalignment of the wheel will result in abnormal wear, and may result in an unsafe riding condition. Align the rear wheel using the marks on the swingarm or measuring the distance between the center of the axle and swingarm pivot.

- Tighten both chain adjuster locknuts.
- Torque the axle nut to the specified torque.

Rear Axle Nut Tightening Torque

110 N·m (11.0 kgf·m, 81 ft·lb)

- Rotate the wheel, measure the chain slack again at the tightest position, and readjust it if necessary.
- Install a new cotter pin through the axle nut and axle, and spread its ends.



A. Cotter Pin

NOTE

- When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle shaft, tighten the nut clockwise up to the next alignment.
- It should be within 30 degrees.
- Loosen once and tighten again when the slot goes past the nearest hole.



A. Turning Clockwise

A loose axle nut can lead to an accident resulting in serious injury or death. Tighten the axle nut to the proper torque and install a new cotter pin.

• Check the rear brake effect.

NOTE

 \odot When riding in wet and muddy conditions, mud sticks to the chain and sprockets, resulting in an overly tight chain, which can cause it to break. To prevent this, adjust the chain slack (measured between the chain and the swingarm) to 62 ~ 68 mm (2.4 ~ 2.7 in.).

Chain Wear Inspection

When the chain has reached its wear limit (i.e., when it has stretched by 1.7% of its original length), it is no longer safe for use and should be replaced. Since it is impractical to measure the entire length of the chain, determine the degree of wear by measuring a 20-link section of the chain.

• Tighten the chain either by using the chain adjusters or by hanging a 10 kg (22 lb) weight on the chain.

• Measure the 20-link section on a straight part of the chain from the center of the 1st pin to the center of the 21st pin. If the length exceeds the service limit, the chain should be replaced. Since overworn sprockets will cause a new chain to wear faster, inspect both the engine and rear sprockets whenever the chain is replaced, and replace them if necessary.



A. Weight B. Tape Measure

Drive Chain 20-Link Section

Standard length	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)
Wear limit	323 mm (12.7 in.)

NOTE

O The drive system was designed for use with a DAIDO D.I.D 520MVX 114-link chain. For maximum stretch resistance and safety, a genuine part must be used for replacement.

Chain Guide Wear Inspection

• Visually inspect the drive chain guide and replace it if excessively worn or damaged.



A. Chain Guide

Chain Slipper Wear Inspection

• Visually inspect the front end of the chain slippers on the swingarm and replace them if worn or damaged.



- A. Chain Slippers
- B. Swingarm

Sprocket Wear Inspection

• Visually inspect the sprocket teeth and replace the sprocket if its teeth are worn or damaged.

Sprocket Tooth Wear



- A. Good Teeth
- B. Worn Teeth
- C. Damaged Teeth

NOTE

○ Sprocket wear is exaggerated in the illustration.

Chain Lubrication

Lubrication is necessary after riding through rain or on wet roads, or any time that the chain appears dry.

Use a lubricant for sealed chains to prevent deterioration of chain seals. If the chain is especially dirty, clean it using a cleaner for sealed chains following the instructions supplied by the chain cleaner manufacturer.

• Apply lubricant to the sides of the rollers so that it will penetrate to the rollers and bushings. Apply lubricant to the seals so that the seals will be coated with lubricant. Wipe off any excess lubricant.



• Wipe off any lubricant that gets on the tire surface.

Handlebar

To suit various riding positions, the handlebar can be adjusted by turning the handlebar holders around.

- Remove the handlebar pad.
- Check the handlebar for bent or crack.
- Remove the handlebar clamp bolts, the clamps and the handlebar.



A. Handlebar Clamp B. Bolts C. Handlebar

• Loosen the handlebar holder nuts, turn the handlebar holders 180°, and securely tighten the nuts.



A. Handlebar Holders

B. Handlebar Holder Nuts

- Put the handlebar on the handlebar holders.
- Mount the handlebar clamps.
- Check that the gauge on the handlebar is out of the left and right handlebar clamps equally.



- A. Handlebar Clamps
- **B. Clamp Bolts**
- C. Gap
- D. Supporting Bar
- Tighten the front and rear bolts of the handlebar clamps equally. If the handlebar clamps are correctly installed, there will be even gap on the front and rear side of the clamp after the bolts torqued.
- Do not disassemble the supporting bar on the handlebar.

Handlebar Clamp Bolts Tightening Torque

25 N·m (2.5 kgf·m, 18 ft·lb)

• Check the front brake for the proper brake effect, or no brake drag.

NOTE

• Tighten the two clamp bolts alternately two times to ensure even tightening torque.

Brakes

Disc and disc pad wear is automatically compensated for and has no effect on the brake lever or pedal action. There are no parts on the brakes that require adjustment except brake lever position.

Brake Lever Position

The brake lever position can be adjusted to suit the rider's preference.

- To adjust the brake lever position, loosen the locknut, and turn the adjuster to either side with a wrench.
- After adjustment, tighten the locknut securely.



A. Brake Lever B. Adjuster C. Locknut

• Test the braking power and check that there is no brake drag.

A WARNING

Air in the brake lines diminish braking performance and can cause an accident resulting in injury or death. If the brake lever or pedal feels mushy when it is applied, there might be air in the brake lines or the brake may be defective. Have the brake checked immediately by an authorized Kawasaki dealer.

Disc Brake Fluid

Inspect the brake fluid level in the front and rear reservoirs and change the brake fluid in accordance with the Periodic Maintenance Chart. The brake fluid should also be changed when contaminated with dirt or water.

Use only heavy-duty brake fluid as follows.

Front brake fluid :	DOT 3 or DOT 4
Rear brake fluid :	DOT 3 or DOT 4

NOTE

• The motorcycle is shipped with brake fluid DOT4 in the brake system.

NOTICE

Do not spill brake fluid onto any painted surface.

Do not use fluid from a container that has been left open or that has been unsealed for a long time.

Check for fluid leakage around the brake system fittings.

Check for brake hose damage.

Brake Fluid Level Inspection (Front and Rear Reservoirs)

With the front or rear reservoir positioned horizontally, the brake fluid must always be above the lower level line.



A. Front Reservoir B. Lower Level Line



A. Rear Reservoir B. Lower Level Line

MAINTENANCE AND ADJUSTMENT 87

• If the brake fluid in the front or rear reservoir is below the lower level line, check for fluid leaks in the brake line and fill the reservoir to the upper level line. (The step inside the front and rear reservoirs indicate the upper level.)



A. Front Reservoir B. Upper Level Line



A. Rear Reservoir B. Upper Level Line

AWARNING

Mixing brands and types of brake fluid can reduce the brake system's effectiveness and cause an accident resulting in injury or death. Do not mix two brands of brake 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.

Brake Pad Wear Inspection

Inspect the brake pads for wear in accordance with the Periodic Maintenance chart. If the thickness of any pad in any (front or rear) brake caliper is less than 1 mm (0.04 in.), have both pads in the caliper replaced as a set. Pad replacement should be done by an authorized Kawasaki dealer.

Usable Brake Pad Range



A. Lining Thickness B. 1 mm (0.04 in.)

Steering

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

Steering Inspection

- To check the steering adjustment, raise the front wheel off the ground using a jack (special tool).
- Push the handlebar lightly to either side. If the handlebar continues moving under its own momentum, the steering is not too tight.
- Squatting in front of the motorcycle, grasp the lower ends of the front fork at the axle, and push and rock the front fork back and forth as shown. If play is felt, the steering is too loose and needs to be adjusted.



Steering Adjustment

- Raise the front wheel off the ground using a jack (special tool).
- Remove the handlebar.
- Loosen the left and right front fork upper clamp bolts.
- Remove the steering head nut, and raise the front fork upper clamp.



A. Front Fork Upper Clamp B. Steering Head Nut C. Front Fork Upper Clamp Bolts

• Turn the steering stem locknut with a stem nut wrench (special tool) to obtain the proper adjustment.



- A. Steering Stem Locknut B. Stem Nut Wrench (P.N. 57001-1100)
- Install the front fork upper clamp to the original position.
- Apply the specified torques to the steering head nut and front fork upper clamp bolts.

Steering Head Nut Tightening Torque

98 N·m (10.0 kgf·m, 72 ft·lb)

Front Fork Upper Clamp Bolt Tightening Torque

20 N·m (2.0 kgf·m, 15 ft·lb)

• Install the handlebar.

NOTE

- Tighten the two clamp bolts alternately two times to ensure even tightening torque.
- Install the handlebar and apply the specified torque, check the steering again and readjust it if necessary.

Handlebar Clamp Bolts Tightening Torque

25 N·m (2.5 kgf·m, 18 ft·lb)

NOTE

- Tighten the two clamp bolts alternately two times to ensure even tightening torque.
- Check the front brake for the proper brake effect, or no brake drag.

Front Suspension

Front Fork Inspection

NOTICE

Sticking muds or dusts on the sliding surface of the front fork could damage to the oil seal, leading to an oil leak. Clean the sliding surface after each ride.

- Holding the brake lever, pump the front fork back and forth manually to check for smooth operation.
- Visually inspect the front fork for oil leakage, scoring or scratches on the outer surface of the inner tube.
- If necessary, repair or replace by an authorized Kawasaki dealer.



A. Inner Tube

NOTICE

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

Front Fork Adjustment

Any of the following front fork adjustments should be made to tune the front suspension to the rider's weight and the condition of the track.

Basically, there are six adjustments you can make to the front fork.

• Air Pressure

Air pressure acts as a progressive spring over the entire fork travel range. Since the air pressure in the fork legs increases with normal use, the fork action on your KLX will get stiffer as the race progresses. Therefore, it is not recommended to increase the air pressure for additional springing. The KLX forks are designed to function without added air.

• Rebound Damping Adjustment

This adjustment affects how quickly the fork rebounds. Depending on the model, the fork rebound damping adjuster has at least 18 positions. The fully seated position (adjuster turned fully clockwise) is the hardest setting. Turning the adjuster 9 clicks counterclockwise from the fully seated position is the standard setting, turning it counterclockwise 18 or more clicks (depending on the model) is the softest setting.

Compression Damping Adjustment

This adjustment affects how quickly the fork compresses. Depending on the model, the fork compression damping adjuster has at least 22 positions. The fully seated position (adjuster turned fully clockwise) is the hardest setting. Turning the adjuster 11 clicks counterclockwise from the fully seated position is the standard setting, turning it counterclockwise 22 or more clicks (depending on the model) is the softest setting. Fork Oil Amount Adjustment

The fork oil amount affects only the final 100 mm (4 in.) of fork travel. A higher oil amount will make the fork rebound more quickly. A lower oil amount will make the fork rebound more slowly.

• Fork Springs

Optional springs, softer and stiffer than standard, are available.

• Fork Height

Steering is greatly affected by the fork height (how much the outer fork tubes protrude above the upper fork clamp). The less the fork tube protrudes, the lighter the front end becomes and the greater the tendency for understeering and washout due to weight biasing. Increasing the amount of fork tube protrusion has opposite effects. Be sure that the front tire does not touch the fender when the fork is fully compressed. Make this adjustment in 10 mm (0.4 in.) steps.

NOTICE

The right and left fork tubes must be adjusted evenly.

Air Pressure Adjustment

The standard air pressure in the front fork legs is atmospheric (0 kPa, 0 kgf/cm², 0 psi). Air pressure in the fork legs increase with normal use, so the fork action stiffens during operation. Release air pressure from the fork legs prior to each race through the pressure relief screw located in each front fork cap. Make sure the front forks are fully extended with the front wheel off the ground when releasing the pressure.

- Raise the front wheel off the ground using a jack (special tool).
- Remove the screw on each front fork top plug to let the air pressure equalize. Then, reinstall the screws.



Rebound Damping Adjustment

- Clean the bottom of the fork tubes.
- Remove the caps on the bottom of the fork tubes.
- To adjust the rebound damping, turn the adjuster on each front fork top plug with a flat-head screwdriver. Adjust the rebound damping to suit your preference under certain conditions.

NOTICE

Do not force the rebound and compression damping force adjusters beyond the fully seated position, or the adjusting mechanism may be damaged.



A. Rebound Damping Adjuster

A. Screw

$B \longrightarrow C$ $* \longrightarrow C$ 18 17 16 13 12 11 10 9 8 7 6 5 4 3 2 1 $4 \longrightarrow C$ 18 17 16 13 12 11 10 9 8 7 6 5 4 3 2 1 $4 \longrightarrow C$ A VD20169BM2 C

- A. Seated Position (Adjuster Turned Fully Clockwise)
- B. Softer (Counterclockwise)
- C. Harder (Clockwise)
- D. Standard Setting

*: Number of turns counterclockwise usable range -18 clicks or more.

Standard Rebound Damping Adjuster Setting

9 clicks *

* Counterclockwise from the fully seated position

NOTICE

The right and left fork tubes must be adjusted evenly.

• Install the caps on the bottom of the fork tubes.

Compression Damping Adjustment

• To adjust the compression damping, turn the adjuster on the each front fork cylinder valve with a flat-head screwdriver. Adjust the compression damping to suit your preference under certain conditions.

NOTICE

Do not force the rebound and compression damping force adjusters beyond the fully seated position, or the adjusting mechanism may be damaged.



A. Compression Damping Adjuster

Rebound Damping Adjuster Settings

Compression Damping Adjuster Settings



- A. Seated Position (Adjuster Turned Fully Clockwise)
- B. Softer (Counterclockwise)
- C. Harder (Clockwise)
- D. Standard Setting

*: Number of turns counterclockwise usable range -22 clicks or more.

Standard Compression Damping Adjuster Setting

11 clicks *

* Counterclockwise from the fully seated position

NOTICE

The right and left fork tubes must be adjusted evenly.

- Front Fork Oil Change
- Thoroughly clean the fork before disassembly.

NOTICE

Be careful not to scratch the inner tube and not to damage the dust seal. Avoid scratching or damaging the inner tube or the dust seal. Use a mild detergent and sponge out dirt with plenty of water.

• Loosen the front fork upper clamp bolts.

NOTE

 Set the rebound and compression damping setting to the softest settings before disassembly to prevent the needle of adjusters from damping. Record the setting before turning the adjuster.

• Loosen the front fork top plug with the top plug wrench, 49 mm (special tool).

NOTE

○ Do not take off the top plug.



A. Front Fork Top Plug B. Top Plug Wrench, 49 mm (P.N. 57001-1653)

- Support the motorcycle using a jack (special tool).
- Unscrew the front axle nut, and then loosen the left front axle clamp bolts.
- Remove the brake caliper from the fork leg to be removed, and rest the caliper on some kind of stand so that it does not dangle.
- Insert the wood wedge between the disc brake pads. This prevents them from being moved out of their proper position, if the brake lever is squeezed accidentally.
- Remove the brake hose holder and fork protector.



- A. Front Axle Nut
- B. Left Front Axle Clamp Bolts (Loosen)
- C. Brake Caliper
- D. Brake Hose Holder
- E. Fork Protector
- F. Bolts

- Loosen the right front axle clamp bolts.
- Place a suitable stand under the engine to raise the front wheel off the ground.
- Remove the axle, and pull out the wheel. Take off the speedometer gear case assy from right side of the front hub and collar and cap from the left side.

NOTICE

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 the disc does not touch the ground.



- A. Right Front Axle Clamp Bolts
- B. Axle
- C. Speedometer Gear Case Assy

• Loosen the front fork lower clamp bolts.



A. Front Fork Lower Clamp Bolts

• Remove the front fork by pulling down while twisting it.



A. Pull down by twisting. B. Front Fork • Using the top plug wrench, 49 mm (special tool), remove the fork top plug from the outer tube and slowly slide down the outer tube.



- A. Top Plug Wrench, 49 mm (P.N. 57001-1653) B. Front Fork Top Plug
- C. Outer Tube
- D. Slide Down

• Place a drain pan under the front fork and drain fork oil.

NOTE

 Pump the fork tube several times to discharge the fork oil.



A. Fork Oil

• Raise the outer tube and temporarily install the fork top plug to the outer tube using the top plug wrench, 49 mm (special tool).



- A. Front Fork Top Plug B. Outer Tube C. Top Plug Wrench, 49 mm (P.N. 57001-1653)
- Hold the axle holder with a vise.

AWARNING

Clamping the axle holder too tight can damage it which will affect riding stability. Do not clamp the axle holder too tight.

NOTE

Protect the axle holder with a rag when using a vise.

• Loosen the adjuster assembly completely.

NOTE

OWhen removing the adjuster assembly, do not force to loosen it at once using an impact wrench.



A. Axle Holder Part B. Adjuster Assembly • Compress the outer tube by hands and install the top plug wrench, 49 mm (special tool) between the axle holder bottom and lock nut.

The fork spring applies pressure to the adjuster assembly and can eject the special tool with substantial force if the tool is not properly and securely placed. Be sure the tool is fully in place as shown in the photo, and keep fingers away to avoid getting them pinched between the tool, adjuster assembly and axle holder.



A. Top Plug Wrench, 49 mm (P.N 57001-1653) B. Axle Holder Bottom C. Lock Nut

• Hold the locknut with a wrench and remove the adjuster assembly.



- A. Top Plug Wrench, 49 mm (P.N. 57001–1653) B. Axle Holder Bottom
- C. Locknut
- D. Wrench
- E. Adjuster Assembly

• Remove the push rod.



A. Push Rod

• With the outer tube compressed by hand, remove the top plug wrench, 49 mm (special tool).

NOTICE

Removing the lock nut and pushing the piston rod thread into the cylinder unit will damage the oil seal. Do not remove the lock nut from the piston rod.

Be careful of reaction force from the fork spring when removing the top plug wrench. Hold the cylinder unit tight enough so that the locknut does not damage the fork leg.



A. Top Plug Wrench, 49 mm (P.N. 57001-1653)

- Remove the fork leg from vise.
- Loosen the front fork top plug with the top plug wrench (special tool).



- A. Front Fork Top Plug
- B. Outer Tube
- C. Top Plug Wrench, 49 mm (P.N. 57001-1653)

• Remove the cylinder unit and fork spring from the outer tube.

NOTICE

Disassembling the cylinder unit can lead to trouble. Do not disassemble the cylinder unit.



- A. Cylinder Unit
- **B. Fork Spring**
- C. Outer Tube
- D. Piston Rod

• Holding the top plug wrench, 49 mm (special tool) with a vise, loosen the base valve assembly on the cylinder unit.



A. Top Plug Wrench, 49 mm (P.N. 57001-1653) B. Base Valve Assembly C. Cylinder Unit

• Remove the base valve assembly from the cylinder unit.

NOTICE

Be careful not to damage the bushing of the base valve.



A. Base Valve Assembly B. Cylinder Unit

NOTE

 Slowly compress the piston rod until it stops so that the base valve assembly can be removed easily.

NOTICE

Disassembling the base valve assembly can lead to trouble. Do not disassemble the base valve assembly.

• Drain the fork oil from the cylinder unit by pumping the piston rod several times.



A. Fork Oil B. Cylinder Unit

• Hold the front fork at the inverted position for more than 20 minutes to allow the fork oil to fully drain.



• Clean the threads of cylinder unit and base valve assembly.



A. Threads

- Replace the O-ring on the base valve assembly and cylinder unit with new ones.
- Apply specified fork oil to the O-rings and bushings on the base valve assembly.



A. O-ring B. Bushing

• With the piston rod fully compressed, pour the specified amount of fork oil.

NOTE

○ Plug the two oil holes on the cylinder unit with fingers.



A. Fork Oil B. Oil Holes C. Cylinder Unit

Recommended Fork Oil

KHL 15-10 (1 L): P/No. 44091-0004 KHL 15-10 (4 L): P/No. 44091-0013

Standard Fork Oil Amount (Cylinder Unit)

189 mL (6.4 US oz.)

- Pump the piston rod slowly several times to expel air.
- Hold the piston rod immovable with the fully compressed position.



A. Compressed Position

Gently install the base valve assembly to the cylinder unit.

NOTICE

Do not damage the bushings when assembling the base valve.



- A. Base Valve Assembly B. Cylinder Unit
- Screw in the base valve assembly in the cylinder unit when the piston rod extends.

NOTE

- When it is hard to screw in the base valve assembly, pull down the piston rod a little.
- Hold the top plug wrench, 49 mm (special tool) with a vise.
• Holding the cylinder unit with the top plug wrench, 49 mm (special tool), torque the base valve assembly to the specified torque.



- A. Top Plug Wrench, 49 mm (P.N. 57001-1653)
- **B.** Cylinder Unit
- C. Base Valve Assembly

Base Valve Assembly Tightening Torque

27.5 N·m (2.8 kgf·m, 20 ft·lb)

NOTE

• Check if the locknut is completely screwed on to the piston rod.

- Protect the piston rod end with a rag to prevent fork damage.
- Discharge the extra oil off the cylinder unit by pumping the piston rod to full stroke.

NOTICE

Be careful not to bend or damage the piston rod when the piston rod is stroked. Service carefully because oil flies out from the oil hole of the cylinder unit.



- A. Piston Rod End
- B. Rag
- C. Pump the Piston

NOTE

○ Check the piston rod sliding surface for damage.
 ○ Apply fork oil to the piston rod sliding surface.

• Drain the extra oil from the cylinder unit oil hole.



A. Oil Hole

- With the cylinder unit in horizontal position, slide the piston rod by hand to inspect it if operating smoothly.
- If the piston rod is not extend, remove the base valve assembly and perform the air bleeding (pour the specified amount fork oil and discharge an excess of oil).



A. Slide Piston Rod. B. Piston Rod

NOTICE

Be careful not to bend or damage the piston rod when the piston rod is stroked.

• Make sure about 16 mm of push rod thread is exposed from the lock nut.





- Completely wipe off the fork oil from the spring and cylinder unit.
- Insert the spring and cylinder unit to the outer tube.



- A. Cylinder Unit B. Fork Spring
- C. Outer Tube
- **D. Piston Rod**

• Temporarily tighten the fork top plug by using the top plug wrench, 49 mm (special tool).



- A. Front Fork Top Plug
- **B.** Outer Tube
- C. Top Plug Wrench, 49 mm (P.N. 57001-1653)
- Clamp the axle holder with a vise.

NOTE

Protect the axle holder with a rag when using a vise.

Clamping the axle holder too tight can damage it which will affect riding stability. Do not clamp the axle holder too tight. • Compress the outer tube by hands and install the top plug wrench, 49 mm (special tool) between the axle holder bottom and lock nut.

The fork spring applies pressure to the adjuster assembly and can eject the special tool with substantial force if the tool is not properly and securely placed. Be sure the tool is fully in place as shown in the photo, and keep fingers away to avoid getting them pinched between the tool, adjuster assembly and axle holder.



A. Top Plug Wrench, 49 mm (P.N. 57001-1653)

• Insert the push rod into the piston rod.

NOTE

 Check the push rod installation by turning the push rod right and left.



A. Push Rod

- Replace the O-ring on the adjuster assembly with new ones and apply specified fork oil to the O-ring.
- Slowly turn the adjuster assembly clockwise until resistance is felt and check the clearance between the lock nut and adjuster assembly for more than 1 mm (0.04 in).



- A. Adjuster Assembly
- B. Lock Nut
- C. More Than 1 mm
- Turn the lock nut counterclockwise until it contacts with the adjuster assembly.
- With the lock nut held immovable using a wrench, tighten the adjuster assembly to the specified torque.

Lock Nut/Adjuster Assembly Tightening Torque

29 N·m (3.0 kgf·m, 21 ft·lb)

- With the outer tube compressed by hands, remove the top plug wrench, 49 mm (special tool).
- Apply a non-permanent locking agent to the threads of a adjuster assembly.
- Torque the adjuster assembly to the specified torque.



A. Adjuster Assembly

Adjuster Assembly Tightening Torque

55 N·m (5.6 kgf·m, 40 ft·lb)

- Using the top plug wrench, 49 mm (special tool), remove the fork top plug from the outer tube and slowly slide down the outer tube.
- Pour the specified amount of fork oil into the outer tube.



A. Outer Tube B. Fork Oil

NOTICE

Be sure the oil amount is the same in both fork legs.

Recommended Fork Oil

KHL 15-10 (1 L): P/No. 44091-0004 KHL 15-10 (4 L): P/No. 44091-0013

Standard Fork Oil Amount

Fork spring	4.3 N/mm (0.44 kgf/mm)
Fork oil amount	335 mL (11.3 US oz.)
Adjustable Range	300 ~ 380 mL (10.1 ~ 12.8 US oz.)

• When changing the fork spring, the oil amount is as shown in the table.

HARD: 4.4	Standard Oil Amount	330 cc (11.2 US oz.)
(K = 0.45 kgf/mm)	Adjustable Range	300 ~ 380 cc (10.1 ~ 12.8 US oz.)
MOREHARD:	Standard Oil Amount	330 cc (12.0 US oz.)
(K = 0.46 kgf/mm)	Adjustable Range	300 ~ 380 cc (10.1 ~ 12.8 US oz.)

- Raise the outer tube and temporarily install the fork top plug to the outer tube using the top plug wrench, 49 mm (special tool).
- Install the front forks to the motorcycle.
- Tighten the front fork lower clamp bolts to the specified torque.

Front Fork Lower Clamp Bolts Tightening Torque

20 N·m (2.0 kgf·m, 14 ft·lb)

• Tighten the front fork top plug with using the top plug wrench, 49 mm (special tool) to the specified torque.



A. Front Fork Top Plug B. Outer Tube

C. Top Plug Wrench, 49 mm (P.N. 57001-1653)

Front Fork Top Plug Tightening Torque

30 N·m (3.1 kgf·m, 22 ft·lb)

NOTE

○ The torque of fork top plug is specified to 30 N·m (3.1 kgf·m, 22 ft·lb) however, when you use the top plug wrench, 49 mm (special tool), reduce the torque to 90% of the specified value [27 N·m (2.8 kgf·m, 20 ft·lb)] due to the distance between the center of the square hole, where the torque

wrench is fitted, and that of the octagonal hole of the wrench.

- This torque value [27 N·m (2.8 kgf·m, 20 ft·lb)] is applicable when you use a torque wrench whose length gives leverage of approximately 310 mm between the grip point to the center of the coupling square.
- Tighten the front fork upper clamp bolts to the specified torque.

Front Fork Upper Clamp Bolts Tightening Torque

20 N·m (2.0 kgf·m, 14 ft·lb)



- A. Top Plug Wrench, 49 mm (P.N. 57001-1653) B. Distance
- Install the brake caliper to the fork leg, and tighten the brake caliper bolts to the specified torque.

Brake Caliper Bolts Tightening Torque

25 N·m (2.5 kgf·m, 18 ft·lb)

- Take out wood wedge between the disc brake pads.
- Apply grease to the oil seals of the wheel.
- Install the caps and collars on the left side of the hub.
- Put the speedometer gear case assy on the right side of the hub as follows.
- Install the projections so that it fits in the notches
- Put the front wheel assembly between the fork legs, and insert the front brake disc into the front brake pads.



- A. Projections
- B. Notches
- C. Machined Surface

NOTE

 If the projections fit in the notches correctly, the machined surface is not seen after putting the front wheel between the fork legs.



- A. Correct
- **B. Incorrect**
- C. Machined Surface
- Make sure that the stopper is installed on the top of speedometer gear case assy.



- A. Stopper B. Speedometer Gear Case Assy
- Insert the front axle from the right side of the motorcycle.
- Tighten the front axle nut to the specified torque.

Front Axle Nut Tightening Torque

79 N·m (8.1 kgf·m, 58 ft·lb)

• Tighten the left front axle clamp bolt to the specified torque.

Left Front Axle Clamp Bolt Tightening Torque

20 N·m (2.0 kgf·m, 14.5 ft·lb)



- A. Collars
- B. Caps
- C. Axle
- D. Right Side
- E. Axle Nut
- F. Left Side
- G. Oil Seal
- H. Speedometer Gear Case Assy

NOTE

 Tighten the two clamp bolts alternately two times to ensure even tightening torque.

- Remove the jack and stand supporting the motorcycle.
- Install the parts removed.
- Before tightening the clamp bolts on the right fork leg, pump the forks up and down 4 or 5 times to allow the right fork leg to find a neutral position on the front axle.

NOTE

O Do not apply the front brake during this process to stop the motorcycle from rolling forward. Put a block in front of the wheel to stop it from moving.



- A. Pump up and down B. Block
- Tighten the right axle clamp bolts to the specified torque.

Right Front Axle Clamp Bolt Tightening Torque

20 N·m (2.0 kgf·m, 14.5 ft·lb)

NOTE

- Tighten the two clamp bolts alternately two times to ensure even tightening torque.
- Check the front brake for good braking power and no brake drag.

After servicing, it takes several applications of the brake lever before the brake pads contact the disc, which could result in increased stopping distance and cause an accident resulting in injury or death. Do not attempt to ride the motorcycle until a firm brake lever is obtained by pumping the lever until the pads are against the disc.

• Adjust the compression and rebound damping force adjusters.

Optional Fork Springs

Various fork springs are available to achieve suitable front fork action in accordance with the rider's weight and track condition.

Harder springs stiffen the fork action and accelerate the rebound damping.

Softer springs soften the fork action and slow down the rebound damping.

Fork Height Adjustment

Steering is greatly affected by the fork height (how much the outer fork tubes protrude above the upper fork clamp). The less the fork tube protrudes, the lighter the front end becomes and the greater the tendency for understeering and washout due to weight biasing. Increasing the amount of fork tube protrusion has opposite effects.

Be sure that the front tire does not touch the fender when the fork is fully compressed. Make this adjustment in 10 mm (0.4 in.) steps.

NOTICE

The right and left fork tubes must be adjusted evenly.



A. Standard Fork Height

Standard Fork Height

8 mm (0.31 in.)*

* below the surface of the top plug

NOTE

 Tighten the two clamp bolts alternately two times to ensure even tightening torque.

Rear Suspension (UNI-TRAK®)

This motorcycle's rear suspension system is called "UNI-TRAK[®]" and consists of a rear shock absorber unit, a swingarm, two lever rods and a lever.

The operating characteristics of the UNI-TRAK[®] suspension are similar to those of the front fork. However, a linkage system is used to achieve progressive springing characteristics.

Rear Shock Absorber Inspection

NOTICE

Sticking muds or dusts on the sliding surface of the rear shock absorber could damage to the oil seal, leading to an oil leak. Clean the sliding surface after each ride.

- Pump the seat down and up by 4 or 5 times, and inspect the smooth stroke.
- If it does not smoothly or noise is found, inspect the oil leak and rear shock absorber mounting.
- Visually inspect the rear shock absorber for oil leakage.
- If necessary, repair or replace by an authorized Kawasaki dealer.

Rear Shock Absorber Adjustment

The spring preload of the shock absorber can be adjusted or the spring can be replaced with an optional one to suit various riding conditions. In addition, the damping force can be adjusted easily, making it unnecessary to change the oil viscosity.

Rebound Damping Adjustment

To adjust the rear shock absorber rebound damping, turn the rebound damping adjuster at the bottom of the rear shock absorber with a flat-head screwdriver.



A. Rebound Damping Adjuster

If the damping feels too soft or too stiff, adjust it in accordance with the following table.

Rebound Damping Adjuster Settings



- A. Seated Position (Adjuster Turned Fully Clockwise)
- B. Softer (Counterclockwise)
- C. Harder (Clockwise)
- D. Standard Setting

* Number of turns counterclockwise usable range-22 clicks or more

Standard Rebound Damping Adjuster Setting

9 th position*

*Counterclockwise from the fully seated position

NOTICE

Do not force the rebound and compression damping force adjusters beyond the fully seated position, or the adjusting mechanism may be damaged.

NOTE

O Adjustment of the rebound damping adjuster for the rear suspension will slightly affect the compression damping force. Always make any damping adjustments in small steps and test their effects before using them in competition.

Compression Damping Adjustment (Gas Reservoir)

There are two adjustments you can make to the rear shock absorber gas reservoir.

To adjust the high speed compression damping, turn the high speed compression damping adjuster.

To adjust the low speed compression damping, turn the low speed compression damping adjuster with a flat head screwdriver.

If the damping feels too soft or too stiff, adjust it in accordance with the following table.



A. Compression Damping Adjuster for High Speed B. Compression Damping Adjuster for Low Speed

High Speed Compression Damping Adjuster Setting

 $0 \sim 2 \text{ turns out}$

If the damper setting feels too soft or too stiff, adjust it in accordance with the following table. Low Speed Compression Damping Adjuster Settings



- A. Seated Position (Adjuster Turned Fully Clockwise)
- B. Softer (Counterclockwise)
- C. Harder (Clockwise)
- **D. Standard Setting**

* Number of turns counterclockwise usable range-22 clicks or more

Standard Compression Damping Adjuster Setting

High speed	Low speed
1-1/4 turns out*	11th clicks*

* Counterclockwise from the fully seated position

NOTICE

Do not force the rebound and compression damping force adjusters beyond the fully seated position, or the adjusting mechanism may be damaged.

NOTE

O Adjustment of the rebound damping adjuster for the rear suspension will slightly affect the compression damping force. Always make any damping adjustments in small steps and test their effects before using them in competition.

Spring Preload Adjustment

The rear shock absorber can be adjusted by changing the spring preload for various riding and loading conditions. If the spring action feels too soft or too stiff, have it adjusted by an authorized Kawasaki dealer.

Optional Rear Shock Absorber Springs

Various rear shock absorber springs are available to achieve suitable rear shock absorber action in accordance with the rider's weight and track condition.

A harder spring stiffens the shock absorber action and accelerates the rebound damping.

A softer spring softens the shock absorber action and slows down the rebound damping.

WARNING

Improper removal or installation of the rear shock absorber spring may cause the spring and/or related parts to be ejected at high velocity. Always wear eye and face protection when working on the rear shock absorber. Removal and installation of the rear shock absorber spring should be performed by an authorized Kawasaki dealer.

Wheels

Tire Air Pressure

Tire air pressure affects traction, handling, and tire life. Adjust the tire air pressure to suit track conditions and rider preference, but keep it close within the recommended range.

- To check the tire air pressure, remove the air valve cap, and make sure to tighten the cap securely after checking the tire pressure.
- Reduce the tire air pressure to increase the tire tread surface on the ground when riding on a wet, muddy, sandy or slippery track.
- Increase the tire air pressure to prevent damage or punctures (though the tires will skid more easily) when riding on a pebbly or hard track.

Tire Air Pressure Adjustable Range

80 kPa (0.8 kgf/cm², 11 psi) ~ 100 kPa (1.0 kgf/cm², 14 psi)

NOTE

○ Tire air pressure should be checked when the tires are cold, before you ride the motorcycle.

Spokes and Rims

The spokes on both wheels must all be securely and evenly tightened and not be allowed to loosen. Unevenly tightened or loose spokes will cause the rim to warp, the nipples and spokes to fatigue more quickly, and the spokes to break.



A. Spoke Wrench

Bead Protector

There is a bead protector on the both wheels. The bead protector prevents the tire and tube from slipping on the rim and damaging the valve stem. Valve stem damage may cause the tube to leak, necessitating tube replacement. In order to keep the tire and tube in position on the rim, inspect the bead protector before riding and tighten it if necessary. Tighten the valve stem nut finger tight only.





Rim Runout

Set up a dial gauge on the side of the rim and rotate the wheel to measure its axial runout. The difference between the highest and lowest readings is the amount of runout.

- Set up the dial gauge on the inner circumference of the rim and rotate the wheel to measure its radial runout. The difference between the highest and lowest readings is the amount of runout.
- A certain amount of rim warpage (runout) can be corrected by recentering the rim, that is, by loosening some spokes and tightening other to change the position of certain portions of the rim. If the rim is badly bent, however, it should be replaced.

NOTE

• The welding spot of the rim may show excessive runout. Disregard this when measuring rim runout.

Rim Runout



Rim Runout Maximum Limit





A. Axial Rim Runout Measurement

Front Wheel Installation

Refer to pages 115 \sim 118 for detail front wheel installation procedure.

- A. Rim
- **B. Radial Runout**
- C. Axial Runout



A. Radial Rim Runout Measurement

Hoses Inspection

Check the brake and fuel hoses for cracks or deterioration, and the connections for looseness in accordance with the Periodic Maintenance Chart.

- Inspect the brake hose and fittings for deterioration, cracks and signs of leakage by bending or twisting the hoses.
- If damaged, replace the hoses.



- A. Leakage
- B. Cracks
- C. Bulges
- D. Ozone Cracks
- Check the hose are securely connected and clamps are tightened correctly.

Headlight

Adjust the headlight so that it points slightly below horizontal. Turning the adjusting screw clockwise makes the headlight beam point upward.



A. Headlight B. Adjusting Screw

NOTICE

When handling the quartz-halogen bulbs, 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.

Battery

The battery installed in this motorcycle is a sealed type, so it is not necessary to check the battery electrolyte level or add distilled water.

However, in order to maximize battery life and ensure that it will provide the power needed to start the motorcycle you must properly maintain the battery's charge. When used regularly, the charging system in the motorcycle helps keep the battery fully charged. If your motorcycle is only used occasionally or for short periods of time, the battery is more likely to discharge.

Due to their internal composition, batteries continually self discharge. The discharge rate depends on the type of battery and ambient temperature. As temperatures rise, so does the discharge rate. Every 15°C (59°F) doubles the rate.

Electrical accessories, such as digital clocks and computer memory, also draw current from the battery even when the engine stops. Combine such "engine-stop" draws with hot temperature, and a battery can go from fully charged to completely discharged in a matter of days.

Self-discharge			
Temperature	Approx. Number of Days From 100% Charged to 100% discharged		
	Lead-Antimony	Lead-Calcium	
	Battery	Battery	
40°C (104°F)	40°C (104°F) 100 Days		
25°C (77°F)	200 Days	600 Days	
0°C (32°F) 550 Days 950 Days			

Current Drain			
Discharging Ampere	Days from 100% charged to 50% Discharged	Days from 100% charged to 100% Discharged	
7 mA	60 Days	119 Days	
10 mA	42 Days	83 Days	
15 mA	28 Days	56 Days	
20 mA	21 Days	42 Days	
30 mA	14 Days	28 Days	

In extremely cold weather the fluid in an inadequately charged battery can easily freeze, which can crack the case and buckle the plates. A fully charged battery can withstand sub-freezing temperatures with no damage.

Battery Sulfation

A common cause of battery failure is sulfation.

Sulfation occurs when the battery is left in a discharged condition for an extended time. Sulfate is a normal by product of the chemical reactions within a battery. But when continuous discharge allows the sulfate to crystallize in the cells, the battery plates become permanently damaged and will not hold a charge. Battery failure due to sulfation is not warrantable.

Battery Maintenance

It is the owner's responsibility to keep the battery fully charged. Failure to do so can lead to battery failure and leave you stranded.

If you are riding your vehicle infrequently, inspect the battery voltage weekly using a voltmeter. If it drops below 12.8 volts, the battery should be charged using an appropriate charger (check with your Kawasaki dealer). If you will not be using the motorcycle for longer than two weeks, the battery should be charged using an appropriate charger. Do not use an automotive-type quick charger that may overcharge the battery and damage it.

NOTE

○ Leaving the battery connected causes the electrical components (clock etc) to make the battery discharged, resulting the over discharge of the battery. In this case, the repair or replacement of the battery is not included in the warranty. If you do not drive for four weeks or more, disconnect the battery from the vehicle.

Kawasaki-recommended chargers are:

Battery Mate 150-9

OptiMate 4

Yuasa MB-2040/2060

Christie C10122S

If the above chargers are not available, use equivalent one.

For more details, ask your Kawasaki dealer.

Battery Charging

- Remove the battery from the motorcycle (see Battery Removal).
- Attach the leads from the charger and charge the battery at a rate (amperage × hours) that is indicated on the battery. If it is not possible to read the rate, charge the battery at an amperage that is about 1/10th of the battery capacity.
- The charger will keep the battery fully charged until you are ready to reinstall the battery in the motorcycle (see Battery Installation).

NOTICE

Do not install a conventional battery in this motorcycle, or the electrical system cannot work properly.

Make	Yuasa Battery
Туре	YTZ7S(F)

NOTE

O If you charge the sealed battery, never fail to observe the instructions shown in the label on the battery.

Battery Removal

- Remove the seat.
- Disconnect the cables from the battery, first from the (-) terminal and then the (+) terminal.



- A. (+) Terminal
- B. (-) Terminal
- C. Battery Holder
- D. Bolts
- Take out battery holder by removing the bolt.
- Take the battery out of the case.
- Clean the battery using a solution of baking soda and water. Be sure that the cable connections are clean.

Battery Installation

- Place the battery in the battery case.
- Install the battery holder and tighten the bolts.
- Connect the red cable to the (+) terminal, and then connect the black cable to the (–) terminal.

NOTE

 Install the battery in the reverse order of the Battery Removal.

NOTICE

Installing the (–) cable to the (+) terminal of the battery or the (+) cable to the (–) terminal of the battery can seriously damaged the electrical system.

- Put a light coat of grease on the terminals to prevent corrosion.
- Reinstall the parts removed.

Fuse

The main fuse is mounted on the starter relay under the seat. 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.



A. Main Fuse B. Spare Fuse

A WARNING

Substituting fuses can cause wiring to overheat, catch fire and/or fail. Do not use any substitute for the standard fuse. Replace the blown fuse with a new one of the correct capacity, as specified on the junction box and main fuse.



Tightening Torques of Nuts and Bolts

Location of nuts and bolts

Before the first ride of each day of operation, check the tightness of the nuts and bolts shown below. Check also that all cotter pins are in place and in good condition.



- 1. Front Fork Clamp Bolts
- 2. Handlebar Clamp Bolts
- 3. Clutch Lever Holder Bolt
- 4. Spark Plug
- 5. Cylinder Head Cover Bolts
- 6. Cylinder Head Bolts
- 7. Cylinder Bolts
- 8. Rear Frame Bolts
- 9. Spokes

- 10. Brake Disc Mounting Bolts
- 11. Front Axle Nut
- 12. Front Axle Clamp Bolts
- 13. Brake Caliper Bolts
- 14. Engine Mounting Bolts and Nuts
- 15. Camshaft Chain Tensioner Bolts
- 16. Side Stand Bolt and Nut

- 17. Swingarm Pivot Shaft Nut
- 18. Rear Sprocket Nut
- 19. Seat Bolt



- 20. Muffler End Mounting Bolts 21. Spark Arrester Mounting
- Bolts
- 22. Rear Master Cylinder Mounting Bolts
- 23. Steering Head Nut

- 24. Front Master Cylinder Mounting Bolts
- 25. Rear Axle Nut
- 26. UNI-TRAK[®] Lever Rod Bolt
- 27. Rear Brake Pedal Pivot Bolt
- 28. Rear Shock Absorber Bolt and Nut

V0238007 P

- 29. UNI-TRAK Arm Bolt
- 30. Kick Pedal Pivot Bolt
- 31. Clutch Cover Bolts
- 32. Engine Oil Drain Plugs 33. Water Pump Cover Bolts

Torque table

Tighten all nuts and bolts to the proper torque using an accurate torque wrench. An insufficiently tightened nut or bolt may become damaged or fall out, possibly resulting in damage to the motorcycle and injury to the rider. An overtightened nut or bolt may become damaged, broken, or fall out.

* : Apply the oil to the threads and seating surface, if removed.

	Part Name		N∙m	kgf∙m	ft·lb
	Cylinder Head Cover Bolts		9.8	1.0	(87 in·lb)
	Cylinder Head Bolts	(M10)	59	6.0	44
		(M6)	12	1.2	(106 in·lb)
	Camshaft Chain Tensioner Bolts		9.8	1.0	(87 in·lb)
	Cylinder Bolts	(M6)	12	1.2	(106 in·lb)
	Camshaft Cap Bolts		9.8	1.0	(87 in·lb)
ш	Engine Oil Drain Plug	(M6)	7.0	0.7	5.2
ND ND	Engine Oil Drain Plug	(M10)	20	2.0	15
ENC	Oil Filter Cover Bolts		9.8	1.0	(87 in·lb)
	Kick Pedal Pivot Bolt		25	2.5	18
	Spark Plug		13	1.3	9.6
	Coolant Drain Plug		7.0	0.7	(61 in·lb)
	Clutch Cover Bolts		9.8	1.0	(87 in·lb)
	Clutch Spring Bolts		8.8	0.9	(78 in·lb)
	Generator Cover Bolts		9.8	1.0	(87 in·lb)

	Part Name		N∙m	kgf∙m	ft·lb
	Brake Caliper Bolts	(Front)	25	2.5	18
	Brake Disc Mounting Bolts	(Front)	10.0	1.0	(88 in·lb)
		(Rear)	23	2.3	17
	Engine Bracket Nut/Bolt	M8	29	3.0	21
		M10	49	5.0	36
	Engine Mounting Bolts		49	5.0	36
	Front Axle Nut		79	8.1	58
SIS	Front Axle Clamp Bolts		20	2.0	14
1S:	Front Fork Clamp Bolts		20	2.0	14
E	Front Fork Top Nut		98	10	72
	Handlebar Clamp Bolts		25	2.5	18
	Side Stand Bolt/Nut		29	3.0	21
	Swingarm Pivot Shaft Nut		98	10.0	72
	Rear Axle Nut		110	11.0	81
	Rear Brake Pedal Pivot Bolt		25	2.5	18
	Rear Frame Bolts		34	3.5	25
	Rear Shock Absorber Upper Bolt		39	4.0	29

	Part Name	N∙m	kgf∙m	ft·lb
	Rear Shock Absorber Lower Nut	34	3.5	25
	Spokes	2.0	0.2	(18 in·lb)
	Steering Head Nut	98	10.0	72
SISS	Steering Stem Locknut	4.9	0.5	(43 in·lb)
	UNI-TRAK [®] Arm Bolt*	59	6.0	44
Ή	UNI-TRAK [®] Rod Bolts*	59	6.0	44
0	Rear Sprocket Nuts	34	3.5	25
	Front Brake Master Cylinder Clamp Bolts	8.8	0.9	(78 in·lb)
	Rear Brake Master Cylinder Mounting Bolts	10.0	1.0	(88 in·lb)

*: Apply the oil to blot threads or nut seat side.

Cleaning Your Motorcycle

General Precautions

Frequent and proper care of your Kawasaki motorcycle will enhance its appearance, optimize overall performance, and extend its useful life. Covering your motorcycle with a high quality, breathable motorcycle cover will help protect its finish from harmful UV rays, pollutants, and reduce the amount of dust reaching its surfaces.

Build-up of debris or flammable material in and around the vehicle chassis, engine, and exhaust can cause mechanical problems and increase the risk of fire.

When operating the vehicle in conditions that allow debris or flammable material to collect in and around the vehicle, inspect the engine, electrical component and exhaust areas frequently. If debris or flammable materials have collected, park the vehicle outside and stop the engine. Allow the engine to cool, then remove any collected debris. Do not park or store the vehicle in an enclosed space prior to inspecting for build-up of debris or flammable materials.

• Be sure the engine and exhaust are cool before washing.

- Avoid applying degreaser to seals, brake pads, and tires.
- Always use non-abrasive wax and cleaner/polisher.
- Avoid all harsh chemicals, solvents, detergents, and household cleaning products such as ammonia-based window cleaners.
- Gasoline, brake fluid, and coolant will damage the finish of painted and plastic surfaces: wash them off immediately.
- Avoid wire brushes, steel wool, and all other abrasive pads or brushes.
- Use care when washing the plastic parts as they can easily be scratched.
- Avoid using pressure washers; water can penetrate seals and electrical components and damage your motorcycle.
- Avoid spraying water in delicate areas such as in air intakes, carburetors, brake components, electrical components, muffler outlets, and fuel tank openings.

Washing Your Motorcycle

- Rinse your bike with cold water from a garden hose to remove any loose dirt.
- Mix a mild neutral detergent (designed for motorcycles or automobiles) and water in bucket. Use a soft cloth or sponge to wash your motorcycle. If needed, use a mild degreaser to remove any oil or grease build up.
- After washing, rinse your motorcycle thoroughly with clean water to remove any residue (residue

from the detergent can damage parts of your motorcycle).

- Use a soft cloth to dry your motorcycle. As you dry, inspect your motorcycle for chips and scratches. Do not let the water air dry as this can damage the painted surfaces.
- Start the engine and let it idle for several minutes. The heat from the engine will help dry moist areas.
- Carefully ride your motorcycle at a slow speed and apply the brakes several times. This helps dry the brakes and restores them to normal operating performance.
- Lubricate the drive chain to prevent rusting.

NOTE

○ The front fork may have a scrach by the spattered stones, etc. but it is no effect for the performance of the front fork. After riding in an area where the roads are salted or near the ocean, immediately wash your motorcycle with <u>cold water</u>. Do not use warm water as it accelerates the chemical reaction of the salt. After drying, apply a corrosion protection spray on all metal and chrome surfaces to prevent corrosion.

Semi-gloss Finish

To clean the semi-gloss finish;

- When washing the motorcycle, always use a mild neutral detergent and water.
- The semi-gloss finish effect may be lost when the finish is excessively rubbed.
- If any doubt, consult an authorized Kawasaki dealer.

Painted Surfaces

After washing your motorcycle, coat painted surfaces, both metal and plastic, with a commercially available motorcycle/automotive wax. Wax should be applied once every three months or as conditions require. Avoid surfaces with "satin" or "flat" finishes. Always use nonabrasive products and apply them according to the instructions on the container.

Plastic Parts

After washing use a soft cloth to gently dry plastic parts. When dry, treat the non-painted plastic parts with an approved plastic cleaner/polisher product.

NOTICE

Plastic parts may deteriorate and break if they come in contact with chemical substances or household cleaning products such as gasoline, brake fluid, window cleaners, thread-locking agents, or other harsh chemicals. If a plastic part comes in contact with any harsh chemical substance, wash it off immediately with water and a mild neutral detergent, and then inspect for damage. Avoid using abrasive pads or brushes to clean plastic parts, as they will damage the part's finish.

Chrome and Aluminum

Chrome and uncoated aluminum parts can be treated with a chrome/aluminum polish. Coated

aluminum should be washed with a mild neutral detergent and finished with a spray polish. Aluminum wheels, both painted and unpainted can be cleaned with special non-acid based wheel spray cleaners.

Leather, Vinyl, and Rubber

If your motorcycle has leather accessories, special care must be taken. Use a leather cleaner/treatment to clean and care for leather accessories. Washing leather parts with detergent and water will damage them, shortening their life.

Vinyl parts should be washed with the rest of the motorcycle, then treated with a vinyl treatment.

The sidewalls of tires and other rubber components should be treated with a rubber protectant to help prolong their useful life.

A WARNING

Rubber protectants can be slippery and, if used on the tread area, cause loss of traction resulting in accident causing injury or death. Do not apply rubber protectant to any tread area.

Lubrication

Lubricate the areas shown in the illustrations of this section with either motor oil or regular grease, after each race and whenever the vehicle has been operated under wet or rainy conditions, especially after using a high-pressure spray washer. Before lubricating a part, clean off any rust with rust remover and wipe off any grease, oil, dirt, or grime.

General Lubrication

Apply motor oil to the following pivots:

- Clutch lever
- Front brake lever
- Hot Starter Lever



- Rear brake pedal
 Rear brake rod joints
 Kick pedal
 Foot peg



Shift pedal



Apply an aerosol cable lubricant with a pressure lubricator on all cables:

- Clutch cable
- Throttle cable
- Hot starter cable

Cable Lubrication



Apply grease to the following points:

- Upper end of clutch cable
- Upper end of throttle cable
- Upper end of hot starter cable



A. Grease.

Drive Chain Lubrication

Lubrication is necessary after riding through rain or on wet roads, or any time that the chain appears dry.

Use a lubricant for sealed chains to prevent deterioration of chain seals. If the chain is especially dirty, clean it using a cleaner for sealed chains following the instructions supplied by the chain cleaner manufacturer.

• Apply lubricant to the sides of the rollers so that it will penetrate to the rollers and bushings. Apply lubricant to the seals so that the seals will be coated with lubricant. Wipe off any excess lubricant.



• Wipe off any lubricant that gets on the tire surface.

TROUBLESHOOTING GUIDE

NOTE

O This troubleshooting guide is not exhaustive and does not give every possible cause for each problem listed. It is meant simply as a quick guide to assist you in troubleshooting for some of the more common difficulties.

Starting failure or difficulties -

Engine does not turn over

- Valve seized
- Valve lifter seized
- Cylinder or piston seized
- Crankshaft seized
- Connecting rod small end seized
- Connecting rod big end seized
- Camshaft seized
- Transmission gear or bearing seized
- Kick shaft return spring broken
- Kick ratchet gear not engaging

Fuel does not flow

- No fuel in tank
- Fuel tap turned off
- Tank cap air vent obstructed
- Fuel tap clogged
- Fuel line clogged
- Float valve clogged

Engine flooded

- Fuel level too high
- Float valve worn or stuck open
- Wrong starting technique (when the engine is flooded, kick with the throttle fully closed by pulling the hot starter lever in.)

Spark missing or weak

- Spark plug dirty, broken, or gap improperly adjusted
- Spark plug cap or high-tension wiring defective
- Spark plug cap not contacting properly
- Spark plug type incorrect
- Crankshaft sensor defective
- CDI unit defective
- Ignition coil defective
- Engine stop switch wiring defective
- Ignition coil resistor defective/disconnected
- Flywheel magneto damaged
- Neutral switch defective
- Wiring shorted or interrupted

Fuel-air mixture incorrect

- Idling adjusting improperly adjusted
- Slow jet or air passage clogged
- Air cleaner element clogged, poorly sealed, or not installed
- Starter jet clogged
Compression low

- Spark plug loose
- Cylinder head insufficiently tightened
- Cylinder nut loose
- Cylinder or piston worn
- No valve clearance
- Crankshaft oil seal leak
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)
- Piston ring worn, weak, broken, or sticking
- Piston ring side clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Cylinder gasket damaged

Poor low-speed performance -

Spark weak

- Spark plug dirty, broken, or gap improperly adjusted
- Spark plug cap or high-tension wiring defective
- Spark plug cap shorted or not contacting properly
- Spark plug type incorrect
- CDI unit defective
- Ignition coil defective
- Crankshaft sensor defective
- Flywheel magneto defective
- Wiring connector not in good contact

Fuel-air mixture incorrect

- Idling adjusting screw improperly adjusted
- Slow jet, Needle jet or air passage clogged
- Air cleaner element clogged, poorly sealed, or not installed
- Starter plunger stuck open
- Carburetor fuel level too high or too low
- Fuel tank air vent obstructed
- Carburetor holder loose
- Air intake duct loose
- Hot starter stuck open
- Fuel tap clogged

Compression low

- Spark plug loose
- Cylinder head insufficiently tightened
- Cylinder nut loose
- Cylinder or piston worn
- Piston ring worn, weak, broken, or sticking
- Piston ring side clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Cylinder gasket damaged
- No valve clearance
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface).
- Decompression trouble

Other

- Engine oil viscosity too high
- Brake dragging
- Ignition timing incorrect
- Engine oil level too high
- CDI unit defective
- Drive chain trouble
- Engine over heating
- Clutch slipping

Poor or no high-speed performance -

Firing incorrect

- Spark plug dirty, damaged, or gap improperly adjusted
- Spark plug cap or high-tension wiring defective
- Spark plug cap shorted or not contacting properly
- Spark plug type incorrect
- CDI unit defective
- Ignition coil defective
- Crankshaft sensor defective
- Flywheel magneto defective
- Wiring connector not in good contact

Fuel-air mixture incorrect

- Main jet clogged or wrong size
- Jet needle or needle jet worn
- Jet needle clip in wrong position
- Carburetor fuel level too high or too low
- Air jet or air passage clogged
- Air cleaner element clogged, poorly sealed or not installed
- Starter plunger stuck open
- Fuel supply to carburetor insufficient

- Fuel contaminated with water or foreign matter
- Fuel tank air vent obstructed
- Carburetor holder loose
- Air intake duct loose
- Fuel tap clogged
- Fuel line clogged
- Hot starter stuck open
- Needle Jet or air passage clogged

Compression low

- Spark plug loose
- Cylinder head insufficiently tightened
- Cylinder nut loose
- Cylinder or piston worn
- Piston ring worn, weak, broken, or sticking
- Piston ring side clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- No valve clearance
- Valve spring broken or weak
- Valve not seating properly (valve bent, worn, or carbon accumulation on seating surface).
- Cylinder gasket damaged
- Decompression trouble

Improper acceleration

- Starter plunger stuck open
- Carburetor fuel level too high or too low
- Main jet clogged
- Throttle valve does not fully open
- Air cleaner element clogged
- Muffler clogged
- Fuel contaminated with water or foreign matter
- Brake dragging

- Clutch slipping
- Engine overheating
- Engine oil level too high
- Engine oil viscosity too high
- Crankshaft bearing worn or damaged
- Ignition timing incorrect
- Crankshaft sensor defective
- Hot starter stuck open

Knocking

- Carbon built up in combustion chamber
- Fuel quality poor or type incorrect
- Spark plug type incorrect
- CDI unit defective

Engine overheating -

Firing incorrect

- Spark plug dirty, broken, or gap improperly adjusted
- Spark plug type incorrect
- CDI unit defective

Fuel-air mixture incorrect

- Main jet clogged or wrong size
- Carburetor fuel level too low
- Carburetor holder loose
- Air cleaner element clogged, poorly sealed, or not installed
- Air intake duct poorly sealed
- Hot starter stuck open

Compression high

Carbon built up in combustion chamber

Engine overloaded

- Brake dragging
- Clutch slipping
- Engine oil level too high
- Engine oil viscosity too high
- Drive chain trouble

Lubrication inadequate

- Engine oil level too low
- Engine oil quality poor or type incorrect

Coolant inadequate

- Coolant level too low
- Coolant deteriorated

Cooling system component defective

- Radiator clogged
- Radiator cap defective
- Water pump not rotating

Clutch operation faulty -

Clutch slipping

- No clutch lever play
- Clutch cable improperly adjusted
- Clutch cable defective
- Clutch plate worn or warped
- Clutch spring broken or weak
- Clutch release mechanism defective
- Clutch hub or housing unevenly worn

Clutch not disengaging properly

- Clutch lever play excessive
- Clutch plate warped or too rough
- Clutch spring tension uneven
- Engine oil deteriorated
- Engine oil viscosity too high
- Engine oil level too high
- Clutch housing frozen on drive shaft
- Clutch release mechanism defective
- Clutch hub nut loose
- Clutch plate warped or rough
- Clutch hub spline damaged

Gear shifting faulty -

Transmission does not go into gear; shift pedal does not return

- Clutch not disengaging
- Shift fork bent or seized
- Gear stuck on the shaft
- Shift lever broken
- Pawl guide plate broken
- Shift return spring weak or broken
- Shift return spring pin loose
- Shift pawl broken
- Shift pawl spring tension lose
- Shift drum broken

Transmission jumps out of gear

- Shift fork worn
- Gear groove worn

- Gear dogs and/or dog grooves 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

Transmission skips gears

- Gear positioning lever spring weak or broken
- Pawl guide plate worn

Engine noise abnormal -

Knocking

- CDI unit defective
- Carbon built up in combustion chamber
- Fuel quality poor or type incorrect
- Spark plug type incorrect
- Engine overheating

Piston slap

- Piston clearance excessive
- Cylinder or piston worn
- Connecting rod bent
- Piston pin or piston pin bores worn

Valve noise

- Valve clearance incorrect
- Valve spring broken or weak
- Camshaft bearing or camface 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 seized or damaged
- Cylinder head gasket leaking
- Exhaust pipe leaking at cylinder head
- Crankshaft runout excessive
- Engine mounts loose
- Crankshaft bearing worn
- Primary gear worn or chipped
- Camshaft chain tensioner trouble
- Camshaft chain, sprocket, chain guide worn
- Decompression spring broken
- Flywheel magneto loose

Abnormal drive train noise -

Clutch noise

- Clutch housing/friction plate clearance excessive
- Clutch housing gear excessive
- Metal chip jammed in clutch housing gear teeth

Transmission noise

- Crankcase bearing worn or damaged
- Transmission gear worn or chipped
- Metal chip jammed in gear teeth
- Engine oil level or viscosity too low
- Kick ratchet gear not properly disengaging from kick gear

• Output shaft idle gear worn or chipped

Drive chain noise

- Drive chain slack improperly adjusted
- Drive chain worn
- Rear and/or engine sprocket(s) worn
- Drive chain inefficiently lubrified
- Rear wheel misaligned

Frame noise abnormal -

Front fork noise

- Oil level or viscosity too low
- Spring weak or broken
- Front fork air pressure high

Rear shock absorber noise

Shock absorber damaged

Disc brake noise

- Pad installed incorrectly
- Pad surface glazed
- Brake disc warped
- Brake caliper defective
- Brake cylinder damaged

Other noise

• Bracket, nut, bolt, etc. improperly mounted or tightened

Exhaust smoke -

Excessively white

- Piston oil ring worn
- Cylinder worn
- Valve oil seal damaged
- Valve guide worn
- Engine oil level too high

Black smoke

- Air cleaner element clogged
- Main jet too large or fallen out
- Starter plunger stuck open
- Fuel level in carburetor float bowl too high

Brownish

- Main jet too small
- Fuel level in carburetor float bowl too low
- Air cleaner duct loose
- Air cleaner O-ring damaged
- Air cleaner poorly sealed or missing.

Poor handling and/or stability -

Handlebar hard to turn

- Control cable incorrectly routed
- Wiring incorrect routed
- Steering stem locknut too tight
- Roller bearing damaged
- Steering stem inadequately lubricated
- Steering stem bent

• Tire air pressure too low

Handlebar shakes or vibrates excessively

- Tire worn
- Swingarm sleeve or needle bearing damaged
- Rim warped or out of balance
- Front and/or rear axle runout excessive
- Wheel bearing worn
- Handlebar clamp loose
- Steering head nut loose

Handlebar pulls to one side

- Frame bent
- Wheel misaligned
- Swingarm bent or twisted
- Swingarm pivot shaft runout excessive
- Steering maladjusted
- Steering stem bent
- Front fork leg bent
- Right/left front fork oil level uneven

Shock absorption unsatisfactory (suspension too hard)

- Front fork oil excessive
- Front fork oil viscosity too high
- Front fork leg bent
- Front fork air pressure high
- Tire air pressure too high
- Rear shock absorber improperly adjusted

Shock absorption unsatisfactory (suspension too soft)

- Front fork oil level insufficient and/or front fork leaking oil
- Front fork oil viscosity too low
- Front fork and/or rear shock absorber spring weak
- Rear shock absorber leaking gas
- Rear shock absorber improperly adjusted

Poor braking performance -

- Air in the brake line
- Brake pad or disc worn
- Brake fluid leaking
- Brake disc warped
- Brake pads contaminated
- Brake fluid deteriorated
- Primary and/or secondary master cylinder cup(s) damaged
- Master cylinder scratched
- Brake maladjusted (lever or pedal play excessive)

STORAGE

Before Storage

When the motorcycle is to be stored for any length of time, it should be prepared for storage as follows.

- Clean the entire vehicle thoroughly.
- Run the engine for about five minutes to warm the oil, then stop it and drain the engine oil.

Engine oil is a toxic substance. Dispose of used oil properly. Contact your local authorities for approved disposal methods or possible recycling.

- Install the oil drain plugs and fill in fresh engine oil.
- Empty the fuel tank and the carburetor float bowl. (Fuel will deteriorate if left for a long time.)

WARNING

Gasoline is extremely flammable and can be explosive under certain conditions, creating the potential for serious burns. Always stop the engine and never smoke while handling fuel. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light. Make sure the engine is cold before working. Wipe any fuel off the engine before starting it. Gasoline is a toxic substance. Dispose of gasoline properly. Contact your local authorities for approved disposal methods.

- Remove the spark plug and spray fogging oil, directly into the cylinder. Kick the engine over slowly a few times to coat the cylinder wall. Install the spark plug.
- Lubricate the drive chain and all the cables.
- Spray oil on all unpainted metal surfaces to prevent rusting. Avoid getting oil on rubber parts and on the brakes.
- Lift the motorcycle on a box or stand so that both wheels are raised off the ground. (If this cannot be done, put boards under the front and rear wheels to keep dampness away from the tire rubber.)
- Tie a plastic bag over the muffler to prevent moisture from entering.
- Cover the motorcycle to keep dust and dirt away from it.

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After Storage

- Remove the plastic bag from the muffler.
- Make sure the spark plug is tight.

NOTE

- Fit the plug cap securely onto the spark plug, and pull the cap lightly to make sure that it is properly installed.
- Fill the fuel tank with fuel.
- Check all the points listed in the Daily pre-ride checks section.
- Perform a General Lubrication Procedure.

ENVIRONMENTAL PROTECTION

Off-road motorcycling is a wonderful sport, and we hope you will enjoy it to the fullest. However, if improperly conducted, this sport has the potential to cause environmental problems as well as conflicts with other people. Responsible use of your vehicle will ensure that these problems and conflicts do not occur. TO PROTECT THE FUTURE OF YOUR SPORT, MAKE SURE YOU USE YOUR VEHICLE LEGALLY, SHOW CONCERN FOR THE ENVIRONMENT, AND RESPECT THE RIGHTS OF OTHER PEOPLE.

To help preserve the environment, properly discard used batteries, tires, oils and fluids, or other vehicle components that you might dispose of in the future. Consult your authorized Kawasaki dealer or local environmental waste agency for their proper disposal procedure. This also applies to disposal of the entire vehicle at the end of its life.

Also take special care not to spill fuel, oil or other fluids onto the ground.

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WIRING DIAGRAM





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Kawasaki Heavy Industries, Ltd. Motorcycle & Engine Company

Printed in Japan

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