KX450F

Motorcycle

OWNER'S MANUAL

⚠ Read this manual carefully. It contains safety information.

Kawasaki

Quick Reference Guide

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

A Table of Contents is included after the Foreword.

IMPORTANT INFORMATION
● This vehicle is designed for the operator only, no passengers. ● This vehicle is a competition model only and was not manufactured for use on public streets, roads or highways. ● The use of this vehicle should be limited to participation in sanctioned competition events upon a closed course. ● This vehicle should not be used for general off-road recreational riding. ● Read owner's manual.

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

⚠ DANGER

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

⚠ WARNING

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

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 NOTICE

THIS VEHICLE IS A COMPETITION MODEL ONLY AND WAS NOT MANUFACTURED FOR, NOR SHOULD IT BE USED ON, PUBLIC STREETS, ROADS, OR HIGHWAYS. THE USE OF THIS VEHICLE SHOULD BE LIMITED TO PARTICIPATION IN SANCTIONED COMPETITION EVENTS UPON A CLOSED COURSE. THIS VEHICLE SHOULD NOT BE USED FOR GENERAL OFF-ROAD RECREATIONAL RIDING. READ OWNER'S MANUAL.

⚠ WARNING

THIS VEHICLE SHOULD NOT BE USED FOR GENERAL OFF-ROAD RECREATIONAL RIDING.

DISCLAIMER OF WARRANTY

This motorcycle is sold AS IS, with all faults, obvious or concealed and there are NO WARRANTIES, expressed or implied. Including warranties of MERCHANTABILITY or FITNESS FOR PURPOSE.

The purchaser accepts all responsibilities concerning quality, performance, cost of service and/or necessary repairs.

NOTICE

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 MOTORCYCLE LEGALLY, SHOW CONCERN FOR THE ENVIRONMENT, AND RESPECT THE RIGHTS OF OTHER PEOPLE.

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

FOREWORD

Congratulations on your choosing this Kawasaki motorcycle. Your new motorcycle is the product of Kawasaki's advanced engineering, exhaustive testing, and continuous striving for a superior lightweight, high-performance machine with superb handling and stability for racing and sporting use.

Your new KX is a highly tuned competition machine for participation in racing events. As with any mechanical device, proper care and maintenance are important for trouble-free operation and top performance. This manual is written to enable you to keep your KX properly tuned and adjusted.

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

Mar. 17, 2014. (3)

TABLE OF CONTENTS

SPECIFICATIONS

DIMENSIONS	
Overall Length	2 195 mm (86.42 in.)
Overall Width	820 mm (32.3 in.)
Overall Height	1 275 mm (50.20 in.)
Wheelbase	1 495 mm (58.86 in.)
Road Clearance	340 mm (13.4 in.)
Curb Mass	112.1 kg (247 lb)
Fuel Tank Capacity	6.2 L (1.6 US gal)
ENGINE	
Type	4-stroke, DOHC, single-cylinder, liquid-cooled
Bore × Stroke	96.0 × 62.1 mm (3.78 × 2.44 in.)
Displacement	449 cm^3 (27.4 cu in.)
Compression Ratio	12.8:1
Fuel System	FI (Fuel Injection)
Starting System	Primary kick
Ignition System	Digital DC-CDI
Ignition Timing	10° BTDC @2 000 r/min (rpm)
Lubrication System	Forced lubrication (semi-dry sump)
Spark Plug	NGK CPR8EB-9
Spark Plug Terminal	Solid-post

TRANSMISSION	
Transmission Type	5-speed, constant-mesh, return shift
Clutch Type	Wet, multi disc
Driving System	Chain drive
Gear Ratio:	
1st	1.750 (28/16)
2nd	1.412 (24/17)
3rd	1.188 (19/16)
4th	1.000 (19/19)
5th	0.875 (21/24)
Primary Reduction Ratio	2.727 (60/22)
Final Reduction Ratio	3.846 (50/13)
Overall Drive Ratio	9.178 @Top gear
Engine Oil:	
Type	API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2
Viscosity	SAE 10W-40
Capacity	1.2 L (1.3 US qt)
FRAME	
Type	Tubular, semi-double cradle
Steering Angle	42° to either side
Caster	27.9°
Trail	120 mm (4.72 in.)

Tire Size/Type:	
Front	80/100-21 51M/BRIDGESTONE M403
Rear	120/80-19 63M/BRIDGESTONE M404
Rim Size:	
Front	21 × 1.60
Rear	19 × 2.15
Suspension:	
Front	Telescopic fork (upside-down)
Rear	New Uni-trak® swingarm
Front Suspension Travel	314 mm (12.4 in.)
Rear Wheel Travel	315 mm (12.4 in.)
Front Fork Oil:	
Type	Kawasaki Fork Oil SS19
Amount:	
Left Front Fork:	
Cylinder Unit	310 mL (10.5 US oz.)
Outer Tube	340 mL (11.5 US oz.)
Right Front Fork:	
Cylinder Unit	100 mL (3.38 US oz.)
Outer Tube	300 mL (10.1 US oz.)
Balance Chamber	10 mL (0.34 US oz.)

BRAKES

Type:	
Front	Single disc
Rear	Single disc

Specifications are subject to change without notice.

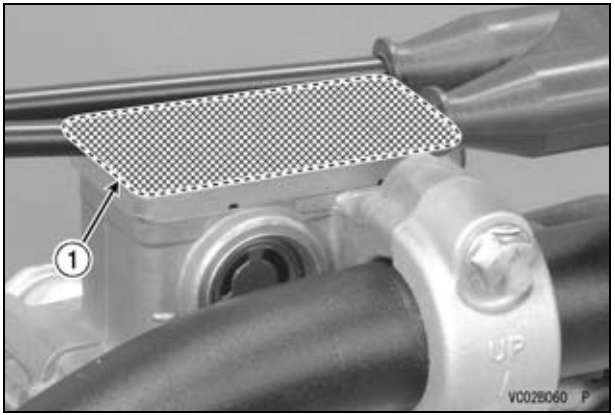
GENERAL INFORMATION

Location of Labels

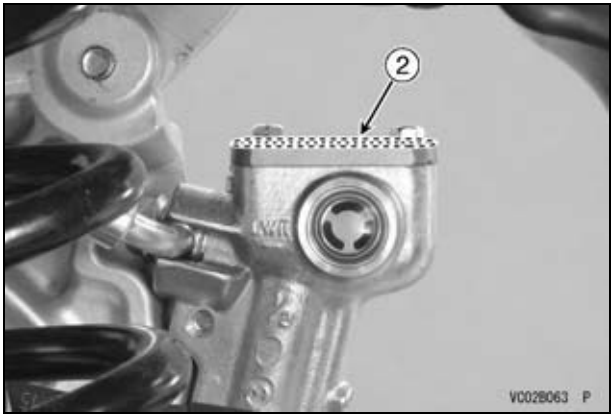
All warning labels which are on your vehicle are repeated here. Read labels on your vehicle and understand them thoroughly. They contain information which is important for your safety and the safety of anyone else who may operate your vehicle. Therefore, it is very important that all warning labels be 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.

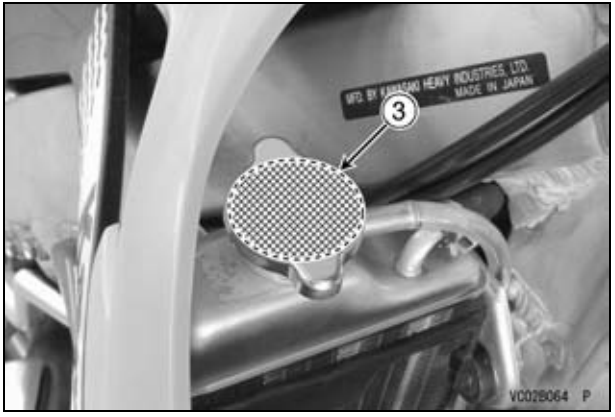
NOTE

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

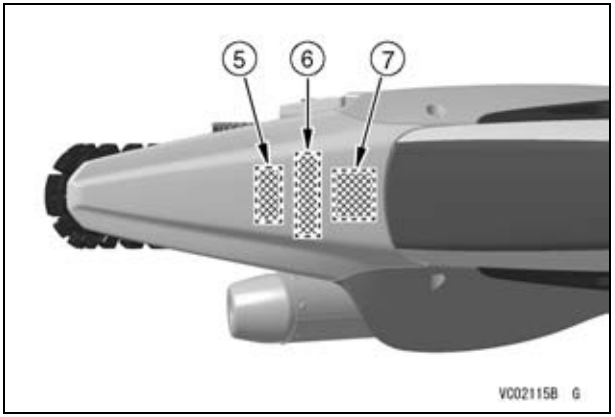


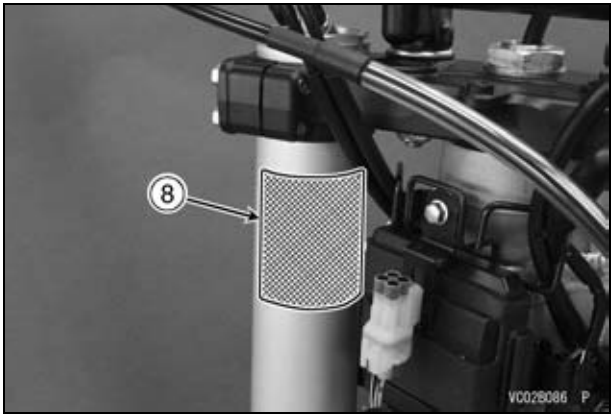
1. Brake Fluid (Front)





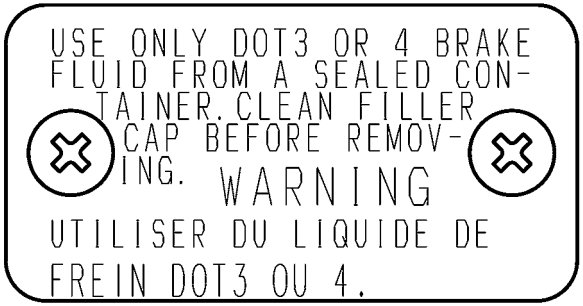
2. Brake Fluid (Rear)
3. Radiator Cap Danger
4. Rear Shock Absorber Warning





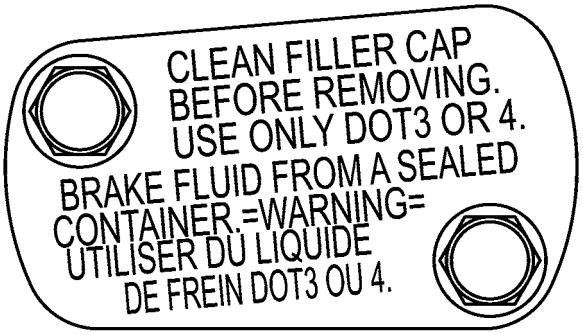
5. Noise Emission Control Information
6. Important Information
7. Disclaimer of Warranty
8. Front Fork Warning

1)



VC02074B S

2)

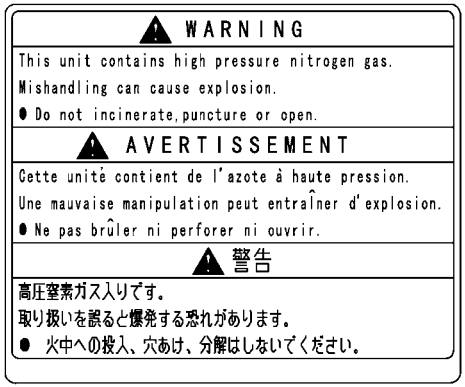


VC02096B S

3)

BD03299C S

4)



BD03238CM2 C

5)

Motorcycle Noise Emission Control Information

This motorcycle is designed for closed course competition use only. It does not conform to U.S. EPA motorcycle noise standards.

56030-1231

VC02094B S

6)

IMPORTANT INFORMATION

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- Read owner's manual.

56071-0028

VC02076B S

7)

DISCLAIMER OF WARRANTY

This motorcycle is sold AS IS, with all faults, obvious or concealed and there are NO WARRANTIES expressed or implied. Including warranties of MERCHANTABILITY or FITNESS FOR PURPOSE.

The purchaser accepts all responsibilities concerning quality, performance, cost of service and/or necessary repairs.

56030-1229

VC02092B S

8)

⚠ WARNING

This unit contains high pressure air.
Mishandling can cause explosion.
● Do not incinerate, puncture or open.
● Read owner's manual before servicing or adjusting.

⚠ AVERTISSEMENT

Cette unité contient de l'air à haute pression.
Une mauvaise manipulation peut entraîner d'explosion.
● Ne pas brûler ni perforer ni ouvrir.
● Lire le manuel de l'utilisateur avant de réparer ou ajuster.

⚠ 警告

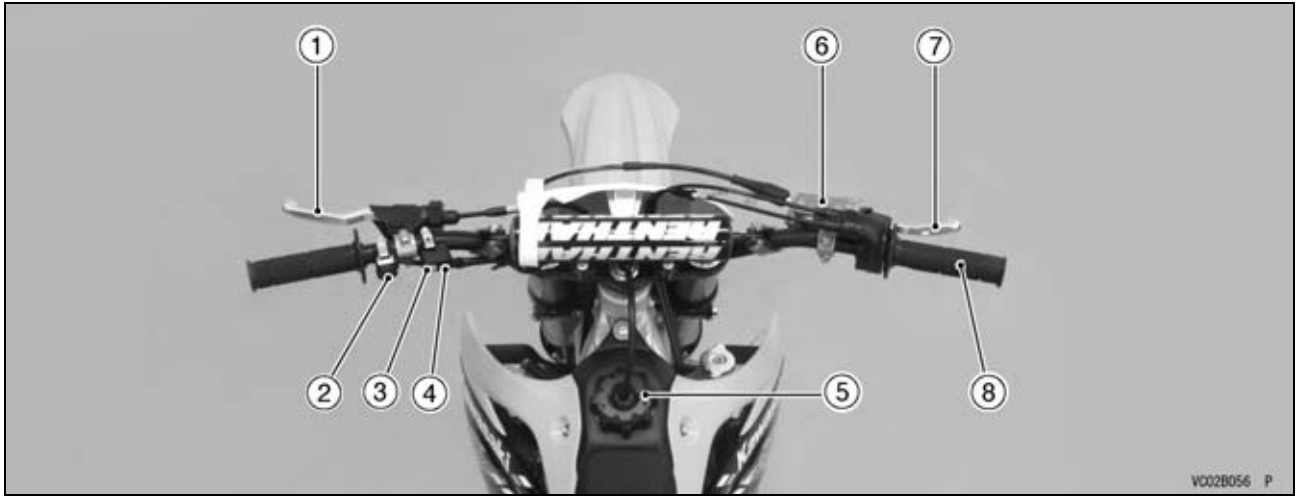
高圧空気入りくす。
取り扱いを誤ると爆発する恐れがあります。
● 火中への投入、穴あけ、分解はしないでください。
● 整備・調整する時は、取扱説明書に従ってください。

SHOWA

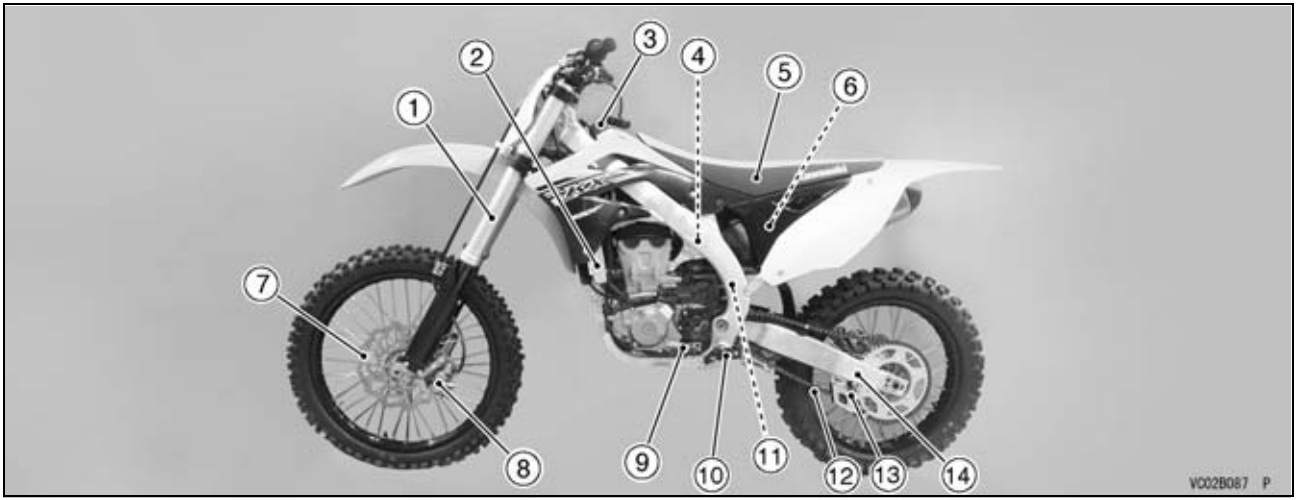
56071-0496

VC02224B S

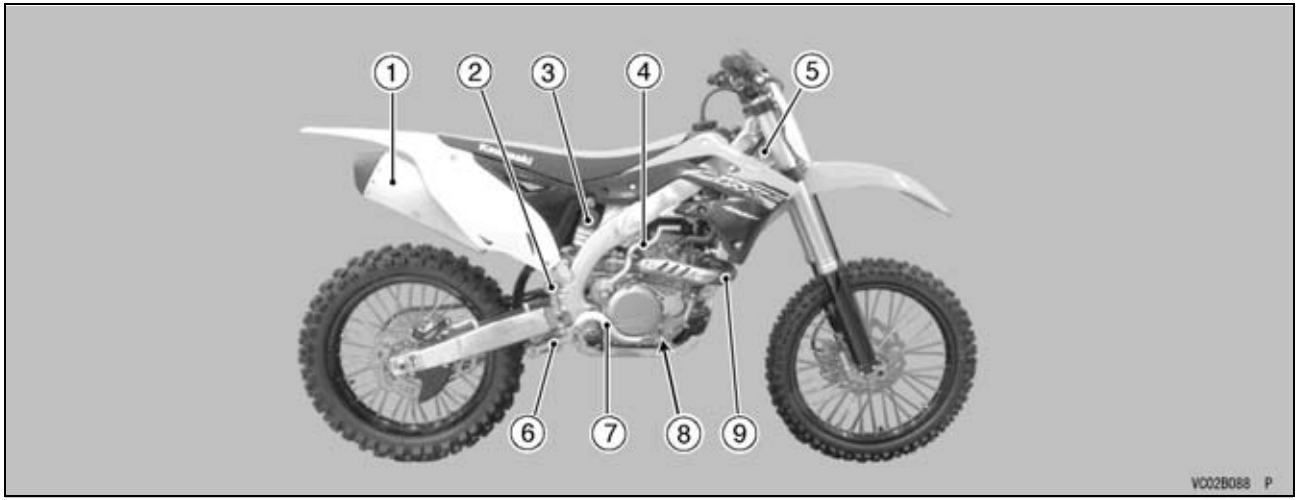
Location of Parts



1. Clutch Lever
2. Engine Stop Button
3. Launch Control Mode Button
4. Orange Launch Control Mode/FI Warning Indicator Light
5. Fuel Tank Cap
6. Front Brake Fluid Reservoir
7. Front Brake Lever
8. Throttle Grip



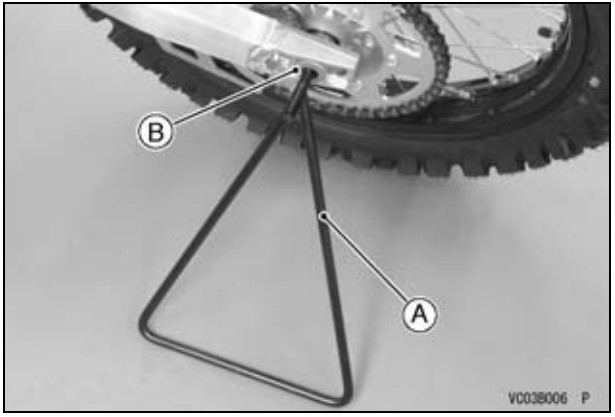
1. Front Fork
2. Radiator
3. Fuel Tank
4. Throttle Body Assy
5. Seat
6. Air Cleaner Element
7. Brake Disc
8. Brake Caliper
9. Shift Pedal
10. Footpeg
11. Rear Shock Absorber
12. Drive Chain
13. Chain Guide
14. Swingarm



1. Muffler
2. Rear Brake Fluid Reservoir
3. Rear Shock Absorber Gas Reservoir
4. Kick Pedal
5. DFI Setting Data Selection Connector
6. Uni-Trak® Tie-Rod and Rocker Arm
7. Rear Brake Pedal
8. Oil Level Inspection Window
9. Exhaust Pipe

Side Stand

To install the side stand, insert its flat end into the rear axle as shown in the figure.



A. Side Stand
B. Rear Axle

⚠ WARNING

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

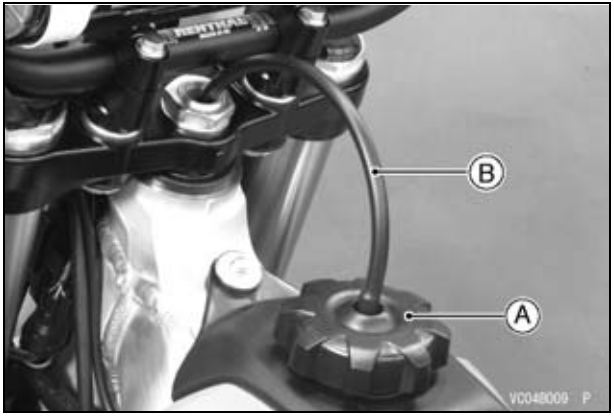
NOTE

○ *Support the motorcycle with a suitable stand to perform maintenance or adjustment procedures.*

Fuel

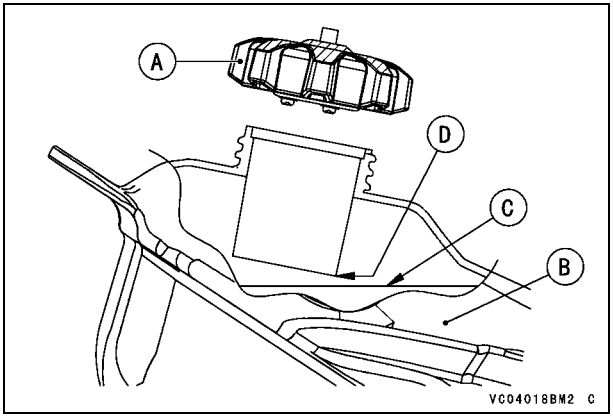
This Kawasaki KX has a 4-stroke engine that requires a gasoline.

The capacity of the fuel tank is 6.2 L (1.6 US gal). To open the fuel tank cap, pull out the breather hose from the hole in the steering stem, and turn the tank cap counterclockwise.



A. Fuel Tank Cap
B. Breather Hose

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.

Fuel Requirement:

Fuel Type

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 in Canada and the U.S.A. The octane rating of a gasoline is a measure of its resistance to detonation or "knocking". The Antiknock Index is an average of the Research Octane Number (RON) and the Motor Octane Number (MON) as shown in the table below.

Octane Rating Method		Minimum Rating
Antiknock Index	$\frac{(RON + MON)}{2}$	90

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. Operating problems that result from the use of poor quality or nonrecommended fuel may not be covered under your warranty.

Fuels Containing Oxygenates

Gasoline frequently contains oxygenates (alcohols and ethers) especially in areas of Canada and the U.S. which are required to sell such reformulated fuels as part of a strategy to reduce exhaust emissions.

The types and volume of fuel oxygenates approved for use in unleaded gasoline by the Canadian Environmental Protection Agency include a broad range of alcohols and ethers, but only two components have seen any significant level of commercial use.

Gasoline/Alcohol Blends - Gasoline containing up to 10% ethanol (alcohol produced from agricultural products such as corn), also known as “gasohol” is approved for use.

NOTICE

Avoid using blends of unleaded gasoline and methanol (wood alcohol) whenever possible, and never use “gasohol” containing more than 5% methanol. Fuel system damage and performance problems may result.

Gasoline/Ether Blends - The most common ether is methyl tertiary butyl ether (MTBE). You may use gasoline containing up to 15% MTBE.

NOTE

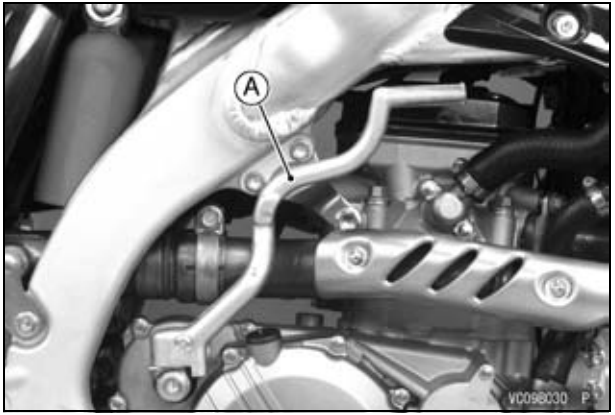
○ *Other oxygenates approved for use in unleaded gasoline include TAME (up to 16.7%) and ETBE (up to 17.2%). Fuel containing these oxygenates can also be used in your Kawasaki.*

NOTICE

Never use gasoline with an octane rating lower than the minimum specified by Kawasaki.
Never use “gasohol” with more than 10% ethanol, or more than 5% methanol. Gasoline containing methanol must also be blended with cosolvents and corrosion inhibitors.
Certain ingredients of gasoline may cause paint fading or damage. Be extra careful not to spill gasoline or gasoline oxygenate blends during refueling.
When not operating your Kawasaki for 30 to 60 days, mix a fuel stabilizer (such as STA-BIL) with the gasoline in the fuel tank. Fuel stabilizer additives inhibit oxidation of the fuel which minimizes gummy deposits.
Never store this product with “gasohol” in the fuel system. Before storage it is recommended that you drain all fuel from the fuel system. See the Storage section in this manual.

Kick Pedal

This motorcycle is equipped with a primary kick starting system. When the clutch lever is pulled, the motorcycle can be started with the transmission in any gear.



A. Kick Pedal

Starting the Engine

- Shift the transmission into neutral.

⚠ WARNING

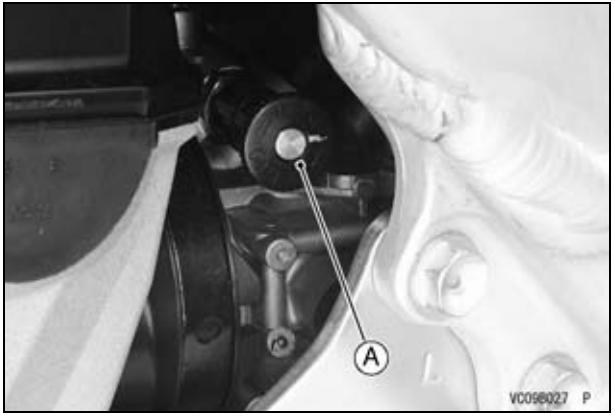
Riding with the side stand can cause a crash resulting in injury. Do not start the engine or attempt to ride the motorcycle when the side stand is installed.

NOTICE

This motorcycle is designed for competition use only. Therefore, the radiator does not incorporate a coolant reserve tank or 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.

When engine is cold

● Pull out the idle adjusting screw/choke knob.



A. Idle Adjusting Screw/Choke Knob

● 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.
● Kick the engine over, leaving the throttle closed.

NOTE

○ *When the clutch lever is pulled, the motorcycle can be started with the transmission in any gear.*

● Even after the engine has started, do not push back immediately the idle adjusting screw/choke knob until the engine is thoroughly warmed up.

When engine is already warm or restarts

● Kick the engine over, leaving the throttle closed without using the idle adjusting screw/choke knob.

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, leaving the throttle closed.*

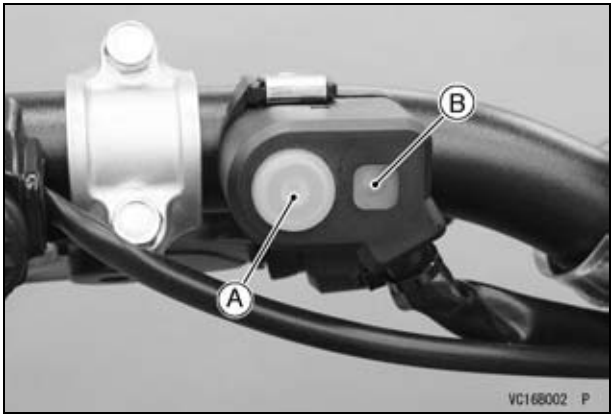
Launch Control Mode

The launch control mode can be used to adjust ignition timing to help riders get better starts on slippery terrain.

The system's effectiveness is dependent on rider skill, technique and terrain conditions.

Launch Control Mode Setting

- The launch control mode can be set when the engine is running and in neutral, 1st or 2nd gear. When activated, it only functions in 1st and 2nd gear.
- When pushing the launch control mode button for over two seconds, the orange launch control mode indicator light will blink to indicate the system is operating.
- When shifting into 3rd, the system is deactivated automatically.



A. Launch Control Mode Button
B. Orange Launch Control Mode/FI Warning Indicator Light

DFI Setting Data Selection

Three DFI settings are available to suit various track conditions. They are easily activated by changing the wiring connector on the side of the frame when the engine is stopped.

Track Condition	Connector Color
Soft	White
Standard	Green
Hard	Black

- Change the connector on the right front of the frame to suit the track condition with the engine stopped.

A. Connector

NOTE

- *If the connector is changed while the engine is running, the DFI setting does not change.*
- *The ECU is set to the standard track condition when operated without a connector. However, always have one of the three connectors attached when riding to prevent dust and mud from accumulating in the connector harness.*
- *The KX FI calibration kit (Part/No.: 99999-0394) can be used for changing the DFI setting.*

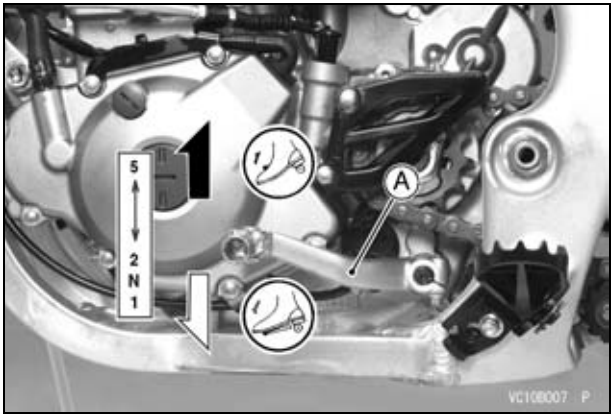
Shifting Gears

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.



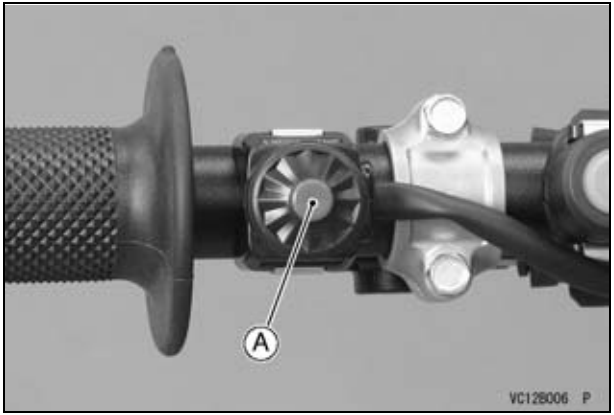
A. Shift Pedal

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.

Stopping the Engine

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



A. Engine Stop Button

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 mile) 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, 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, coolant 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 mile):
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.

⚠ WARNING

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

⚠ 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
Air Cleaner	Clean
	Apply oil to air cleaner element
	Properly installed
Muffler	No damage

	Properly installed
Engine Sprocket	No wear or damage

Frame

Tires	Overall condition good
	No wear or damage
	Pressure correct
	Air valve cap installed
Spokes	No looseness
Drive Chain	Overall condition good
	Chain slack correct
	Oil if necessary
Front and Rear Brakes	Function properly
	Lever and pedal play correct
	No fluid leakage
Throttle	Functions properly
	Throttle grip returns smoothly
Steering	Smooth but not loose from lock to lock
	No binding due to control cables
Front Fork	Functions properly
	No oil leakage
	Air pressure correct
Rear Shock Absorber	Functions properly
	No oil leakage
Fuel Tank	Mounted securely
	No fuel leakage
Rear Sprocket	No wear or damage
Engine Stop Button	Functions properly
Launch Control Mode Button	Functions properly
Nuts, Bolts, Fasteners	Properly tightened

After-Race Checks

After racing, first clean the motorcycle, then inspect the entire motorcycle with special attention to the air cleaner, brakes, etc.

Carry out the general lubrication and make necessary adjustments.

MAINTENANCE AND ADJUSTMENT

Periodic Maintenance Chart

The maintenance 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 / OPERATION	After each race (or 2.5 hours)	Every 3 races (or 7.5 hours)	Every 6 races (or 15 hours)	Every 12 races (or 30 hours)	As required	See Page
Throttle cable - inspect and adjust	●					61
Valve clearance - inspect †			●			82
Clutch plates - inspect †	●					76
Spark plug - clean and inspect †	●					48
Clutch - inspect	●					72
Air cleaner element - clean †	●					57
Throttle body assy - inspect and adjust	●					62
K Cylinder head, cylinder - inspect			●			–
K Crankshaft - inspect			●			–
Muffler - clean and inspect †	●					88
Kick pedal and shift pedal - clean	●					–
Engine sprocket - inspect †	●					97

FREQUENCY OPERATION	After each race (or 2.5 hours)	Every 3 races (or 7.5 hours)	Every 6 races (or 15 hours)	Every 12 races (or 30 hours)	As required	See Page
Coolant level - inspect	●					44
Breather hose - inspect	●					–
Water hoses and connections - inspect †	●					44

2. Periodic Inspection (Chassis Related Item)

FREQUENCY / OPERATION	After each race (or 2.5 hours)	Every 3 races (or 7.5 hours)	Every 6 races (or 15 hours)	Every 12 races (or 30 hours)	As required	See Page
Brake - adjust †	●					102
Brake pad wear - inspect †	●					105
Brake fluid level - inspect †	●					103
Spoke tightness and rim runout - inspect †	●					161
Rear axle nut - inspect †	●					92
Drive chain - inspect and adjust	●					92
Drive chain - lubricate	●					97
Drive chain wear - inspect †	●					94
Front fork - clean and inspect	●					108
Nuts, bolts, fasteners - inspect †	●					165
K Fuel system - clean		●				–
Fuel hose, connections - inspect †	●					164
Brake hoses, connections - inspect †	●					164
Steering play - inspect †	●					106
K Steering stem bearing - lubricate			●			–
Rear sprocket - inspect †	●					97
General lubrication - perform	●					171

FREQUENCY OPERATION	After each race (or 2.5 hours)	Every 3 races (or 7.5 hours)	Every 6 races (or 15 hours)	Every 12 races (or 30 hours)	As required	See Page
K Wheel bearing - inspect †	●					–
K Swingarm and UNI-TRAK linkage pivots - inspect †		●				–
K Swingarm and UNI-TRAK linkage pivots - lubricate		●				–
Frame - inspect	●					–
Wheels/tires - inspect	●					161
Rear shock absorber - inspect	●					155
Cable - inspect	●					–

3. Periodic Replacement (Engine and Chassis Related Item)

FREQUENCY / OPERATION	After each race (or 2.5 hours)	Every 3 races (or 7.5 hours)	Every 6 races (or 15 hours)	Every 12 races (or 30 hours)	See Page
Engine oil - change			●		40
Oil filter - replace			●		40
K Piston and piston ring - replace			●		–
K Piston pin - replace				●	–
Silencer wool - replace		●			88
Spark plug - replace		●			48
K Brake fluid - change	Every 2 years				–
K Brake master cylinder cup and dust cover - replace	Every 2 years				–
K Brake caliper fluid seal and dust seal - replace	Every 2 years				–
K Brake hoses - replace	Every 4 years				–
Front fork oil - change			●		114
K Fuel hose - replace	Every 5 years				–
K Rear shock absorber oil - change			●		–

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

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.

⚠ 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

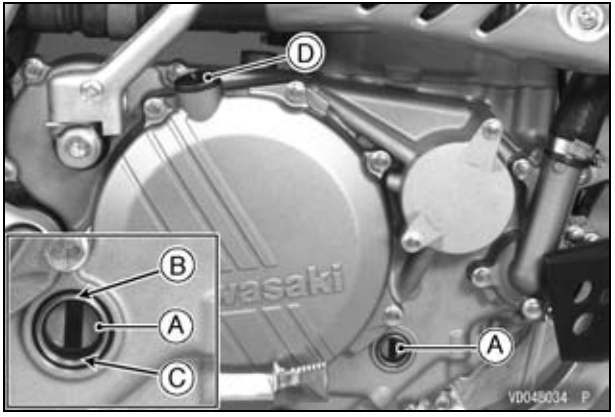
- If the oil has just been changed, let the motorcycle sit a few minutes allowing the oil to settle.
- Start the engine and run it for several minutes **at idle speed. Do not run the engine at high engine speed.**
- Stop the engine and wait several minutes for the oil to settle.
- Check the engine oil 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 oil level inspection window.

NOTE

- *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 the drain bolts to empty any oil that may be in the transmission and crankcase, reinstall the drain bolts and refill with the specified amount of oil.*

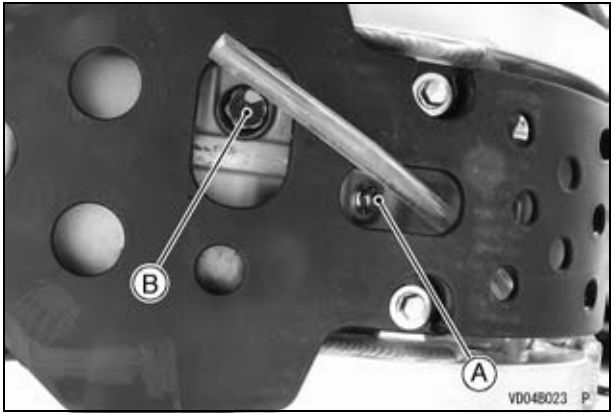


A. Oil Level Inspection Window
B. High Level Line
C. Low Level Line
D. Oil Filler Plug

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 plug.
- Remove the oil drain bolts and position the vehicle perpendicular to the ground to allow all the oil to drain.

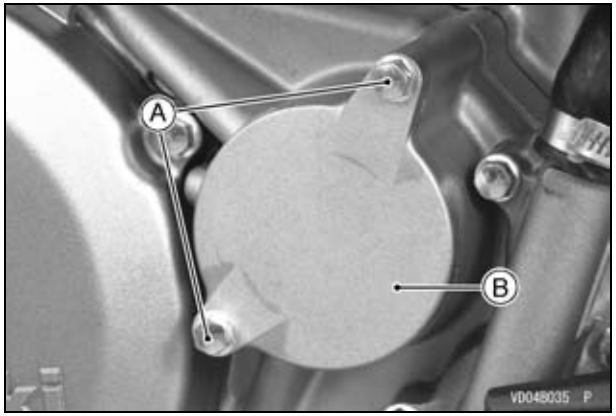


A. Drain Bolt (M6)
B. Drain Bolt (M10)

⚠ WARNING

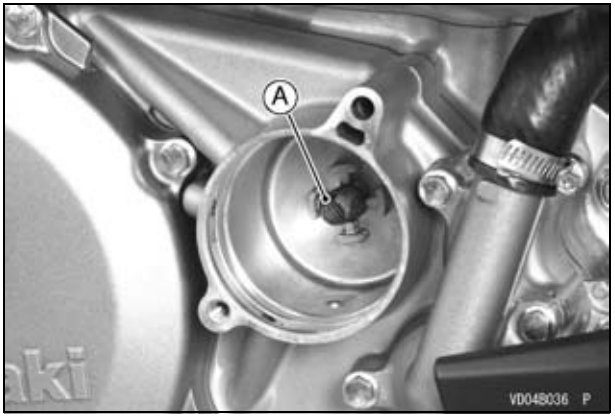
Engine oil is a toxic substance. Dispose of used oil properly. Contact your local authorities for approved disposal methods or possible recycling.

- When the oil filter is replaced, remove the oil filter cap bolts and take off the cap with O-rings.



A. Oil Filter Cap Bolts
B. Oil Filter Cap

- Be sure to install the spring on the original position.



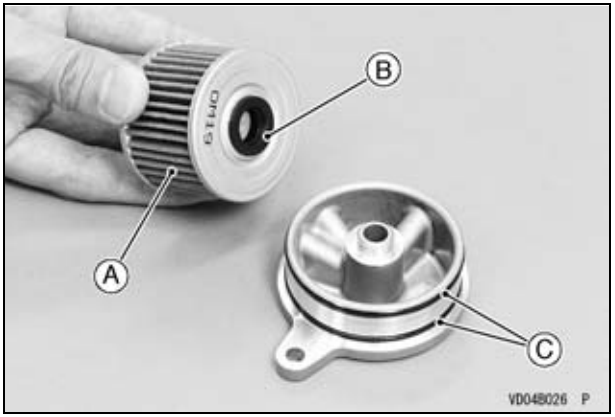
A. Spring

- Replace the oil filter element with a new one.
- Replace the O-rings with new ones.
- Apply grease to the grommet.
- Install the oil filter element with the grommet toward the oil filter cap.

NOTICE

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

● Install the oil filter cap with the grease applied to the new O-rings and tighten its bolts to the specified torque.



A. Oil Filter Element
B. Grommet
C. O-rings

Tightening Torque

Oil Filter Cap Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

● After the oil has completely drained out, install the drain bolts with their new gaskets. Proper torque for they are shown in the table.

Tightening Torque

Engine Oil Drain Bolt (M10): 20 N·m (2.0 kgf·m, 15 ft·lb) Engine Oil Drain Bolt (M6): 7.0 N·m (0.71 kgf·m, 62 in·lb)

NOTE

○ *Replace the gasket and O-rings with 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 or “Kawasaki Performance 4-Stroke Full Synthetic Oil*” 10W-40 or “Kawasaki Performance 4-Stroke Semi-Synthetic Oil*” 10W-40 or “Kawasaki Performance 4-Stroke Motorcycle Oil*” 10W-40

*Kawasaki Performance Oils and Lubricants have been specifically engineered for your vehicle. Consistent use of these products meets or exceeds warranty and service requirements and can help to extend the life of your Kawasaki.

Engine Oil Capacity

Capacity: 0.96 L (1.01 US qt) (When filter is not removed) 0.98 L (1.04 US qt) (When filter is removed) 1.20 L (1.27 US qt) (When engine is completely dry)

NOTE

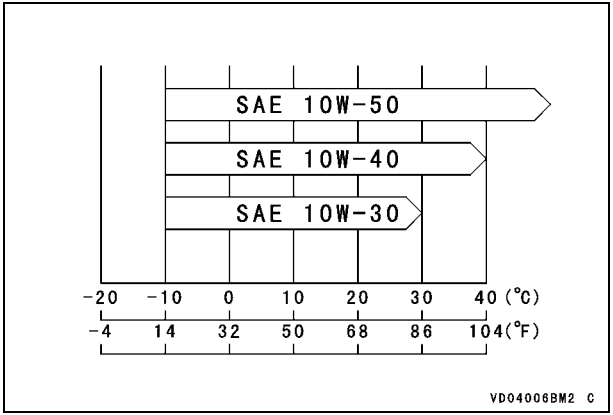
○ *If unavailable, use equivalent engine oil in accordance with the following table.*

Type: API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2 Viscosity: SAE 10W-30, 10W-40, 10W-50

NOTE

○ *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.



● Tighten the oil filler plug.

Tightening Torque

Oil Filler Plug: 3.5 N·m (0.36 kgf·m, 31 in·lb)

● Start the engine.
● Check the oil level and oil leakage.

Cooling System

Water Hoses

Check the water 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.

⚠ WARNING

The cooling system can get extremely hot during normal operation and cause serious burns. Do not touch the radiator when it is hot, nor open the radiator cap. Hot coolant inside will cause severe burns.

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

- Situate the motorcycle perpendicular to the ground until the radiator cap is level to the ground, so that the radiator cap is located uppermost in order to exhaust the air accumulated in the radiator.
- Remove the radiator cap in two steps.
- First, turn the cap counterclockwise to the first stop and wait there for a few seconds.

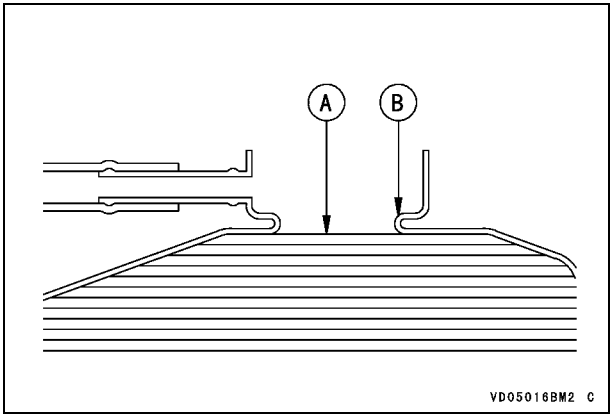
● Then, push and turn the cap further in the same direction and remove it.

A. Radiator Cap

● Check the coolant level in the radiator. The coolant should come up to the bottom of the radiator filler neck.

NOTE

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



A. Coolant Level
B. Filler Neck

● If the coolant level is low, add coolant through the radiator filler opening to the bottom of the filler neck.

Water and Antifreeze Mixing Ratio

1:1 (water:antifreeze)

Recommended Antifreeze

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

Coolant Total Amount

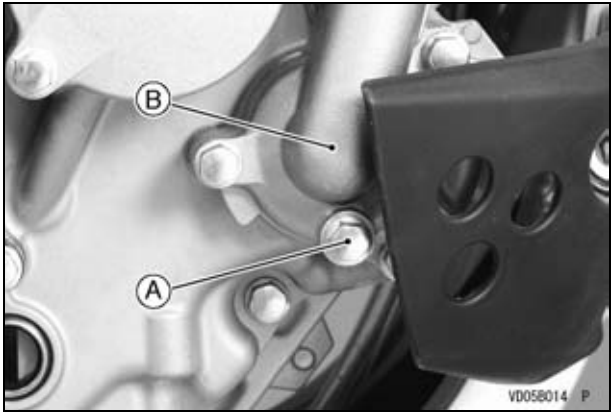
1.1 L (1.2 US qt)

● Install the radiator cap.

Coolant Change

The coolant should be changed to ensure long engine life, if necessary.

● Wait for the engine to cool completely.
● Situate the motorcycle perpendicular to the ground until the radiator cap is level to the ground.
● Remove the radiator cap in two steps.
● Drain the coolant from the engine and radiator in the following way.
● Place a container under the coolant drain bolt on the water pump cover and remove the drain bolt.



A. Coolant Drain Bolt
B. Water Pump Cover

NOTICE

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

⚠ WARNING

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.

● 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 bolt with its new gasket at the water pump cover and apply the specified torque.

NOTE

○ *Always replace a gasket with a new one.*

Tightening Torque

Coolant Drain Bolt: 7.0 N·m (0.71 kgf·m, 62 in·lb)

- Fill the radiator up to the bottom of the radiator filler neck with coolant.
- Lean the motorcycle slightly 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.*

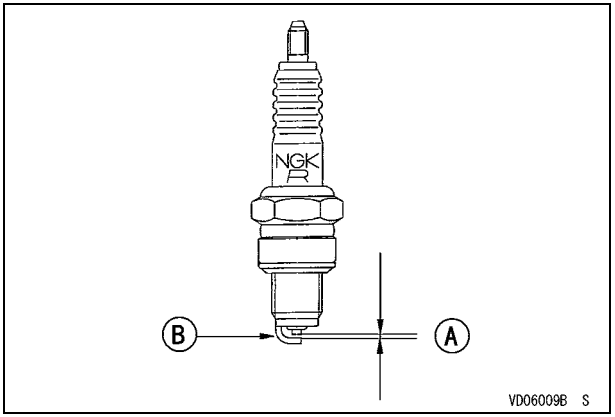
- Install the radiator cap.
- Check the cooling system for leaks.
- Start the engine and warm up thoroughly, then stop it.
- Check the coolant level after the engine has cooled down. The coolant should come up to the bottom of the radiator filler neck.
- If the coolant level is low, add coolant up to the bottom of the radiator filler neck.
- Install the radiator cap.
- Check the cooling system for leaks.

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

CPR8EB-9 CPR9EB-9	0.8 ~ 0.9 mm (0.03 ~ 0.04 in.)



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

NGK CPR8EB-9

To find out whether the plug's heat range is correct, remove the plug and examine the ceramic insulator around the center electrode. If the ceramic is light brown, the spark plug correctly matches the engine temperature.

If the ceramic is burned white, the plug should be replaced with a colder plug.

Optional Spark Plug

Colder	NGK CPR9EB-9

NOTE

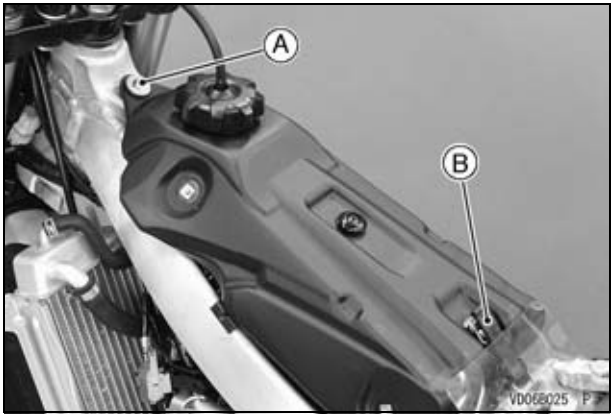
○ *If the engine performance drops, try replacing the spark plug to regain performance.*

Spark Plug Removal and Installation

- Remove the seat (see Air Cleaner section).
- Remove the bolts and take off the radiator shroud on both sides.

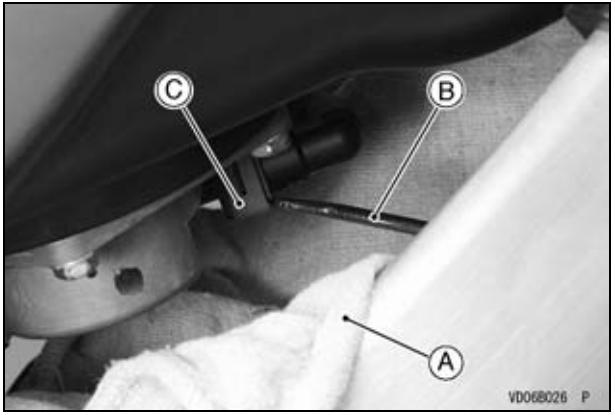
A. Bolts
B. Radiator Shroud

- Remove the fuel tank mounting bolt and band.



A. Fuel Tank Mounting Bolt
B. Band

- Be sure to place a piece of cloth around the fuel hose joint.
- Wipe off the dirt of the surface around the connection using a cloth or a soft brush.
- Insert a thin blade screwdriver into the slit on the joint lock.

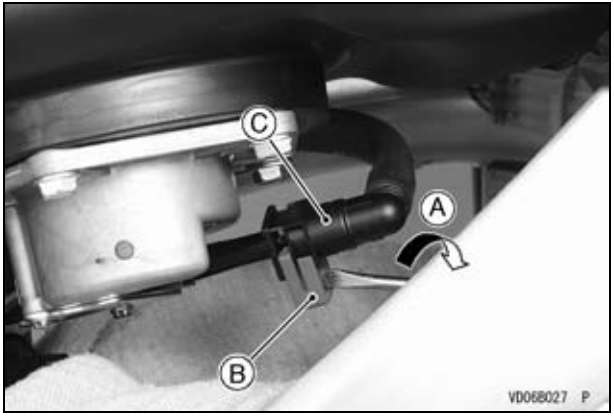


A. Cloth
B. Thin Blade Screwdriver
C. Joint Lock

⚠ WARNING

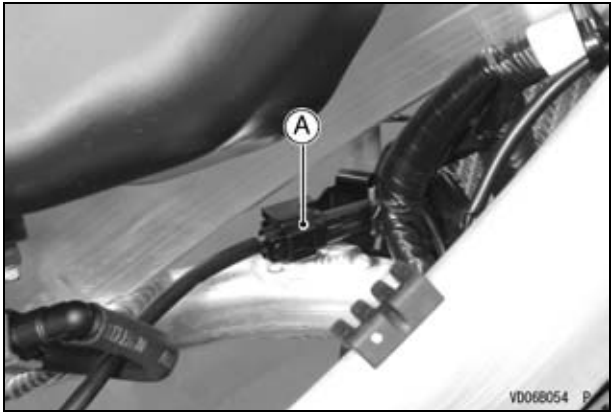
Fuel is flammable and explosive under certain conditions and can cause severe burns. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately. When the fuel hose is disconnected, fuel spills out from the hose and the pipe because of residual pressure. Cover the hose connection with a piece of clean cloth to prevent fuel spillage.

- Turn the driver to disconnect the joint lock.
- Disconnect the fuel hose joint from the outlet pipe.



A. Turn
B. Joint Lock
C. Fuel Hose Joint

- Cover the pipe and the fuel hose joint with the vinyl bags to keep them clean.
- Disconnect the fuel pump lead connector.
- Remove the fuel tank.

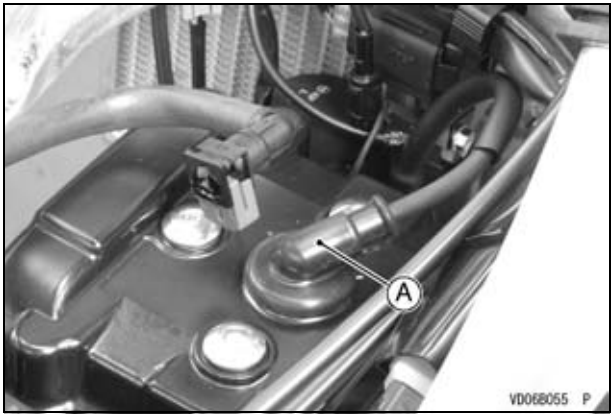


A. Fuel Pump Lead Connector

⚠ 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.

- 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.



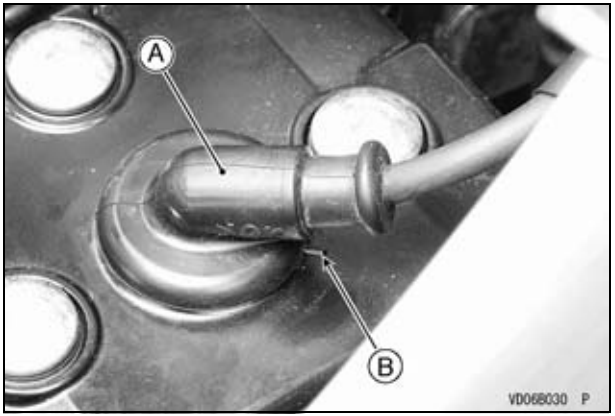
A. Spark Plug Cap

- Loosen and remove the spark plug with a suitable wrench (16 mm, 0.63 in.).
- When reinstalling the spark plug, torque it to specification.

Tightening Torque

Spark Plug: 13 N·m (1.3 kgf·m, 115 in·lb)

- Install the spark plug cap so that it is aligned with the line on the cylinder head cover.
- Pull up the plug cap lightly to make sure of the installation of the spark plug cap.



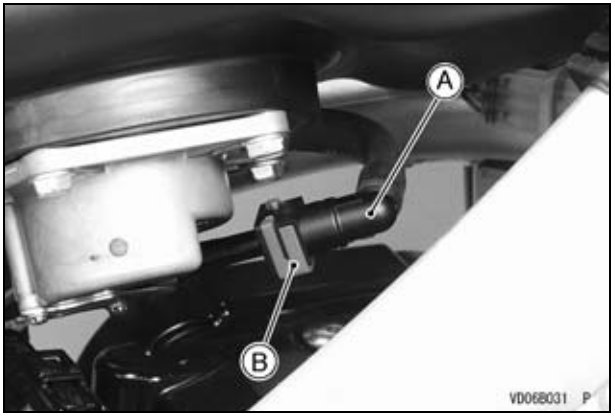
A. Spark Plug Cap
B. Line

- Make sure that the dampers are in place on the frame and are not damaged. If the dampers are not fixed completely, reattach them with an adhesive. If the dampers are damaged, replace them with new ones.

A. Dampers

- Check the joint lock for deformation and wear.
- If the joint lock is deformed, replace the fuel hose with a new one.
- Apply engine oil to the fuel outlet pipe lightly.

- Insert the fuel hose joint straight onto the fuel outlet pipe until the hose joint clicks.
- Push the joint lock until the hose joint clicks.

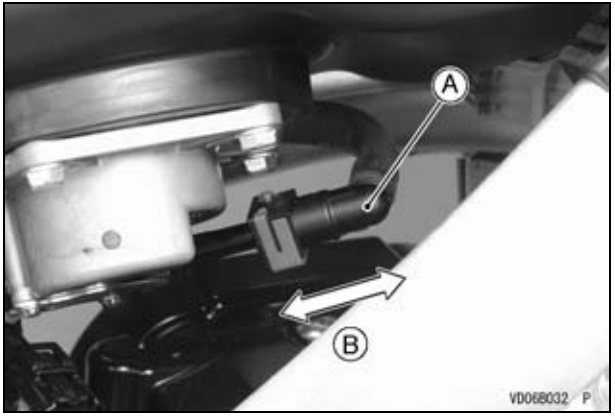


A. Fuel Hose Joint
B. Joint Lock

NOTICE

When installing the fuel hose joint, do not apply strong force to the outlet pipe on the fuel pump. The pipe made from resin could be damaged.

- Push and pull the fuel hose joint back and forth more than two times, and make sure it is locked and does not come off.



A. Fuel Hose Joint
B. Push and Pull

⚠ WARNING

Leaking fuel can cause a fire or explosion resulting in serious burns. Make sure the hose joint is installed correctly on the delivery pipe by sliding the joint.

NOTE

○ *If it comes off, reinstall the fuel hose joint.*

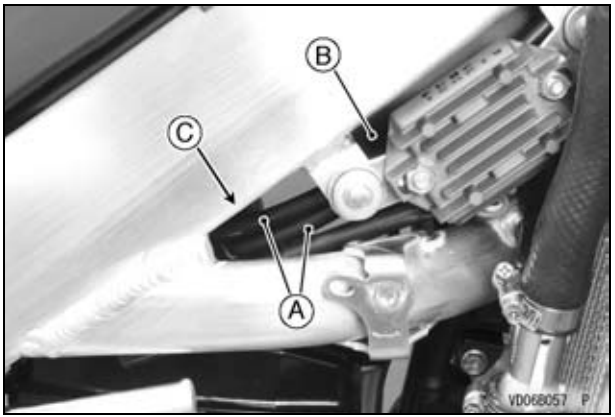
- Run the fuel pump lead over the fuel hose.

- Before installing the fuel tank, check that both throttle cables run over the main harness.

NOTE

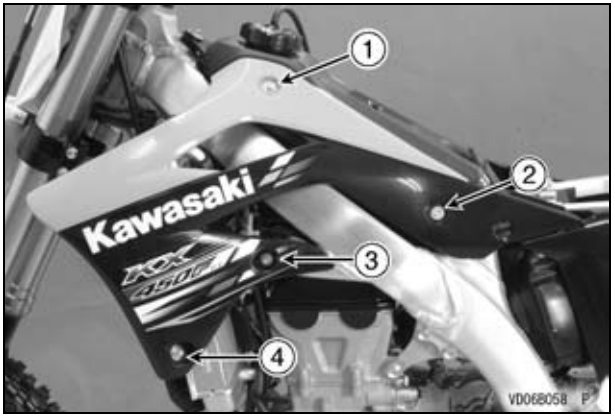
○ *To prevent the bottom of the fuel tank from pushing the throttle cables, run the throttle cables over the main harness correctly.*

- Hook the band to the fuel tank.
- Tighten the fuel tank mounting bolt.
- After installing the fuel tank, make sure that both throttle cables (outer) move slightly by pulling them back and forth in the upper space of the right side of the fuel tank. Check that both throttle cables run under the frame (right side) as shown in the figure.



A. Throttle Cables
B. Fuel Tank
C. Bottom of the Frame (Right Side)

- Temporarily tighten the radiator shroud bolts following the tightening sequence.



- Tighten the radiator shroud bolts.

Tightening Torque

Radiator Shroud Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Install the removed parts.

NOTE

○ *Insert the fuel tank breather hose outlet end into the steering stem hole.*

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 throttle body assy, and the duct clamps and throttle body assy, before each race or practice session.

⚠ WARNING

If dirt or dust is allowed to pass through into the throttle body assembly, the throttle may become stuck, possibly causing accident. Be sure to keep the dust from entering during cleaning.

NOTICE

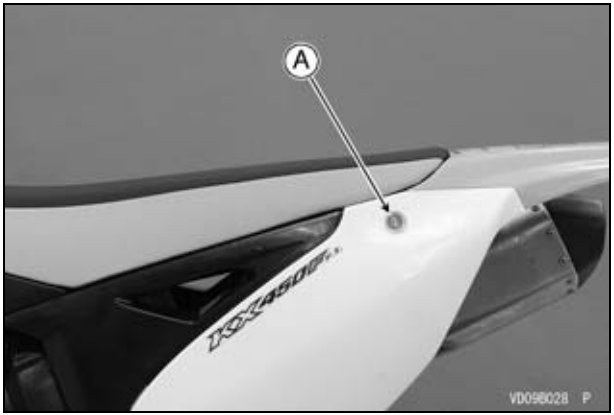
A clogged air cleaner will affect fuel mixture to the engine and reduce engine power and cause spark plug fouling.

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.*

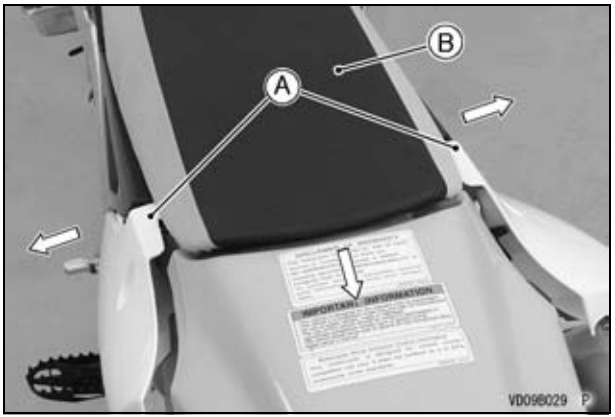
Element Removal and Inspection

- Remove the bolts on the both sides.



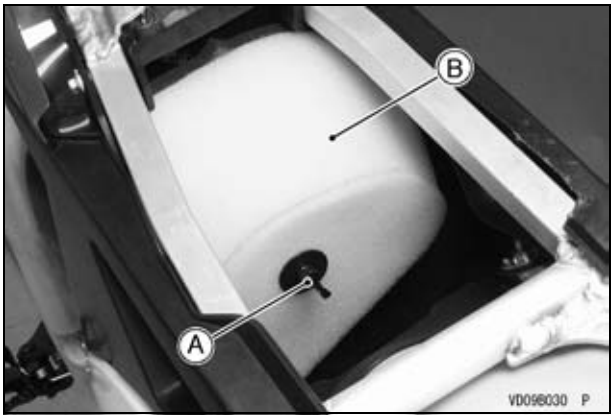
A. Bolt

- Open the both side covers slightly outward and slide the seat rearward.



A. Side Covers
B. Seat

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



A. Wing Bolt
B. Air Cleaner Element

- Check inside of the intake tract and throttle body assy for dirt. If dirty, clean the intake tract and throttle body assy thoroughly.
- Stuff a clean, lint-free towel into the throttle body assy to keep dirt from entering the throttle body assy.
- 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.

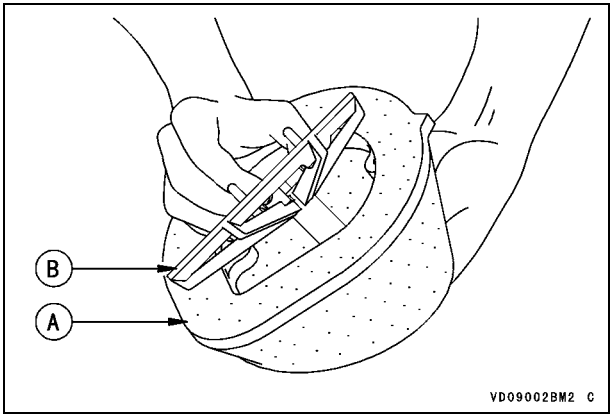
- Inspect the element. If it is dirty, clean it. Also check if the element is in good condition (no tears, hardening or shrinkage). If damaged, replace the element or it will allow dirt into the throttle body assy.

⚠ WARNING

A clogged air cleaner may allow dirt and dust to enter the throttle body assembly and the throttle may stick resulting in a hazardous operating condition. Clean the air cleaner according to the periodic maintenance chart; more often if the motorcycle 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.



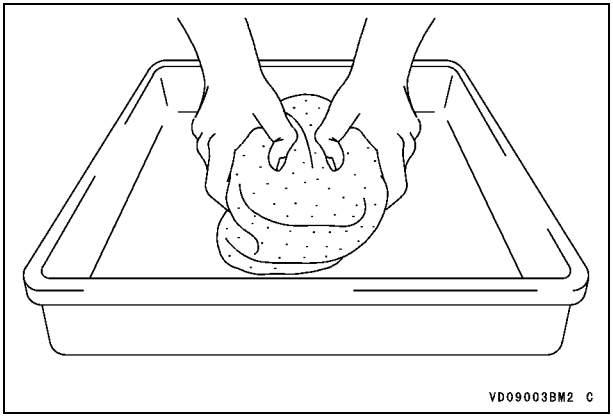
A. Air Cleaner Element
B. Element Frame

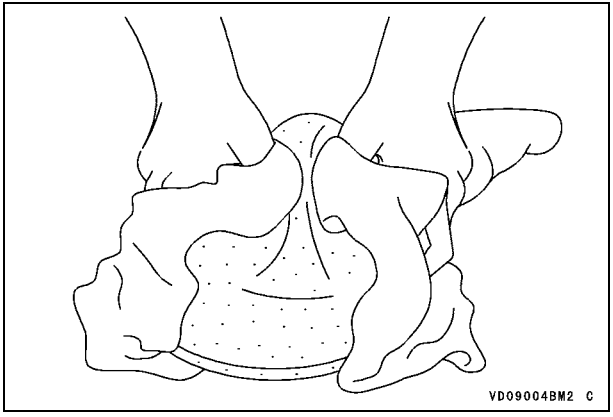
Element Cleaning and Installation

- 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.

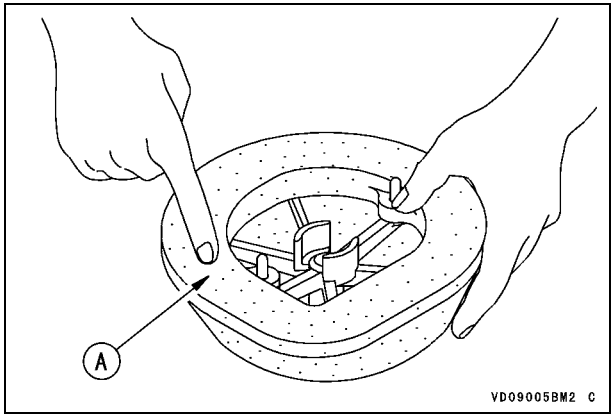




⚠ WARNING

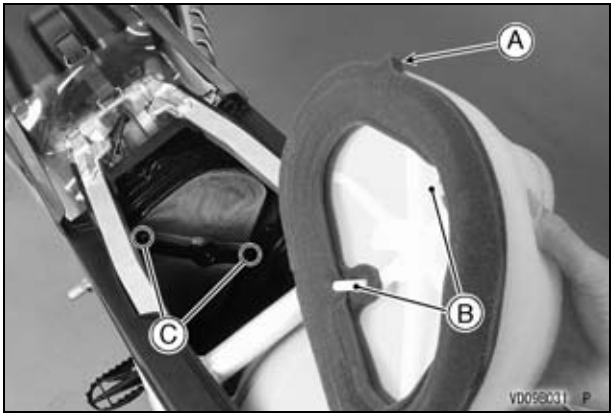
Gasoline and low flash-point solvents can be flammable and/or explosive and cause severe burns. Clean the element in a well-ventilated area, and take care that there is no spark or flame anywhere near the working areas. Do not use gasoline or low flash-point solvents to clean the element.

- 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 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 throttle body assy.
- 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.

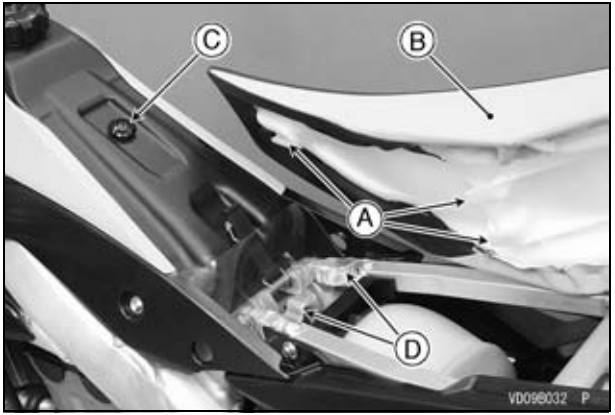
- Install the air cleaner element so that its tab faces upward and its projections align with the holes in the housing.



A. Tab
B. Projections
C. Holes

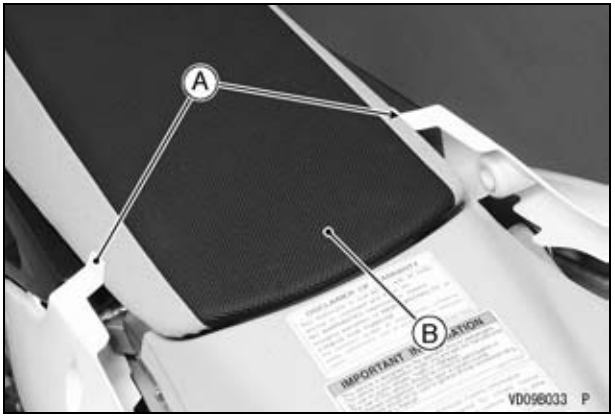
- Tighten the wing bolt.

- Insert the hooks of the seat under the flange collar and brackets.



A. Hooks
B. Seat
C. Flange Collar
D. Brackets

- Install the tabs of the side covers into the inside of the seat, and tighten the bolts.



A. Tabs
B. Seat

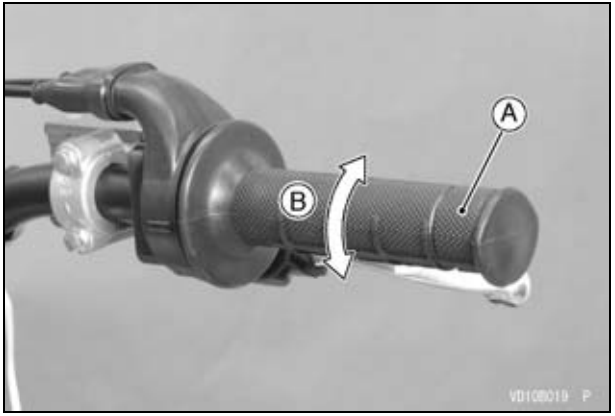
- Pull up the rear end of the seat to make sure it is securely installed.

Throttle Cable

Throttle Cable Adjustment

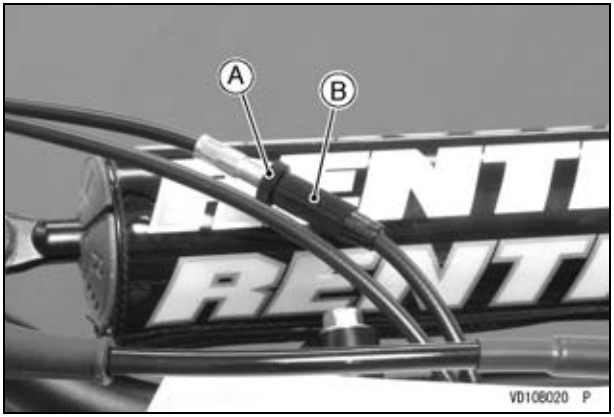
Inspect the throttle grip for smooth operation in all steering positions. Check and adjust the throttle cable in accordance with the Periodic Maintenance Chart.

- Check that the throttle grip has 2 ~ 3 mm (0.08 ~ 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. Locknut
B. Adjuster

- With the engine idling, turn the handlebar both ways and check if handlebar movement changes the idle 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.

⚠ WARNING

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.

Throttle Body Assy

Idle Speed Adjustment

- Remove the left radiator shroud (see Spark Plug section).
- Thoroughly warm up the engine.
- Turn the idle adjusting screw/choke knob to adjust the idle speed 1 950 ~ 2 050 r/min (rpm) by using the engine revolution tester (The tester should be followed by the method described by the manufacture.).

A. Idle Adjusting Screw/Choke Knob
B. Tester

- Open and close the throttle a few times to make sure the idle speed does not change, and readjust if necessary.
- With the engine idling, turn the handlebar both ways and check if handlebar movement changes the idle speed. If so, the throttle cable may be improperly adjusted, incorrectly routed, or damaged. Be sure to correct any of these conditions before riding.

⚠ WARNING

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

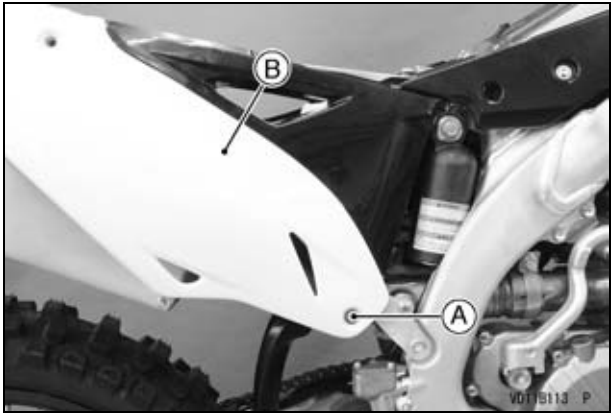
NOTICE

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.

Cleaning the Throttle Body Assy

- Remove the seat (see Air Cleaner section).

- Remove the fuel tank (see Spark Plug section).
- Remove the bolt and take off the side cover on both sides.



A. Bolt
B. Side Cover

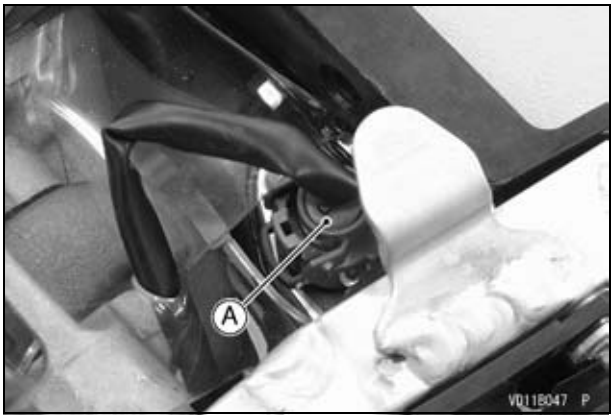
- Loosen the muffler clamp bolt.
- Remove the muffler mounting bolts, and pull out the muffler body backward.

A. Muffler Clamp Bolt
B. Muffler Mounting Bolts
C. Muffler Body

● Loosen the air cleaner duct clamp screw.

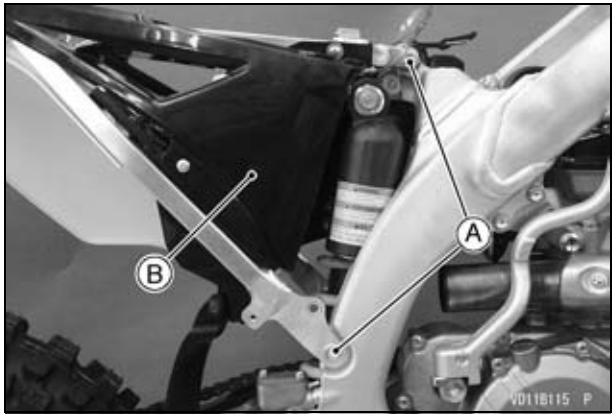
A. Air Cleaner Duct Clamp Screw

● Disconnect the intake air temperature sensor connector.



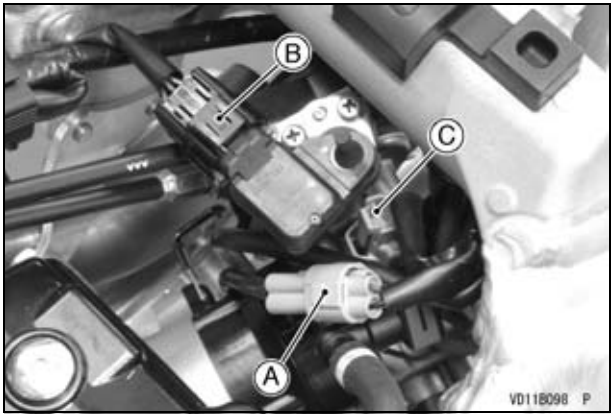
A. Intake Air Temperature Sensor Connector

- Remove the rear frame mounting bolts on the both sides.
- Pull the rear frame rearward with the air cleaner housing.



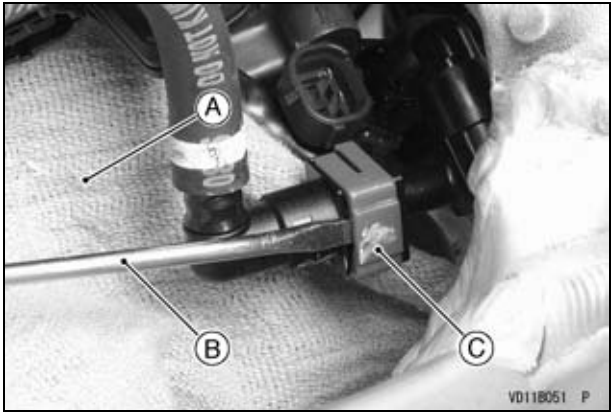
A. Rear Frame Mounting Bolts
B. Air Cleaner Housing

- Disconnect the throttle sensor connector.
- Disconnect the intake air pressure sensor connector.
- Disconnect the fuel injector connector.



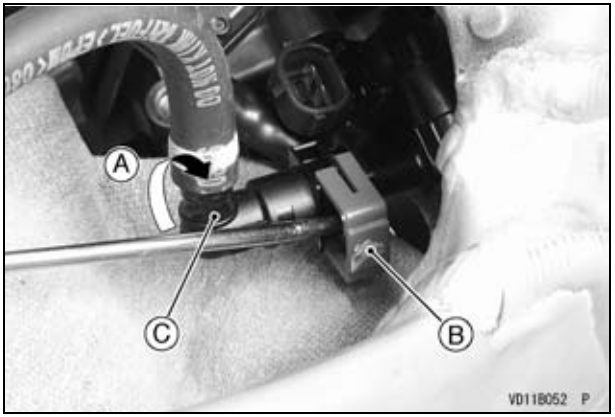
A. Throttle Sensor Connector
B. Intake Air Pressure Sensor Connector
C. Fuel Injector Connector

- Be sure to place a piece of cloth around the fuel hose joint.
- Wipe off the dirt of the surface around the connection using a cloth or a soft brush.
- Insert a thin blade screwdriver into the slit on the joint lock.



A. Cloth
B. Thin Blade Screwdriver
C. Joint Lock

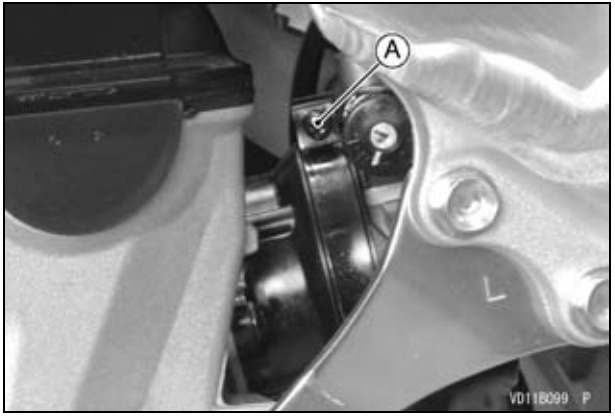
- Turn the driver to disconnect the joint lock.
- Disconnect the fuel hose joint from the delivery pipe.



A. Turn
B. Joint Lock
C. Fuel Hose Joint

- Cover the pipe and the fuel hose joint with the vinyl bags to keep them clean.

- Loosen the throttle body assy holder clamp screw.
- Pull the throttle body assy from the holder.

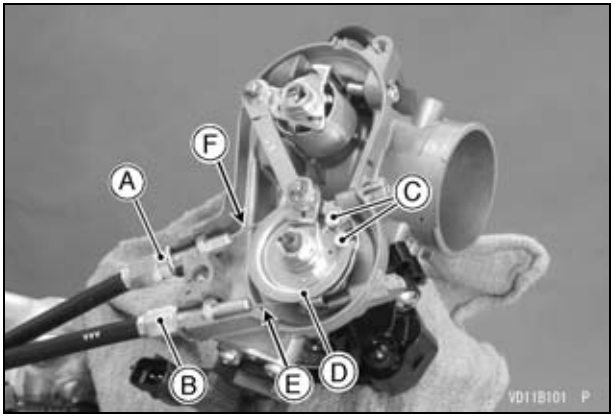


A. Throttle Body Assy Holder Clamp Screw

- Remove the bolts, and take off the throttle pulley cover.

A. Throttle Pulley Cover Bolts
B. Throttle Pulley Cover

- Loosen the decelerator cable bolt locknut, and free the tip of cable lower end.
- Loosen the accelerator cable bolt, and free the tip of cable lower end.

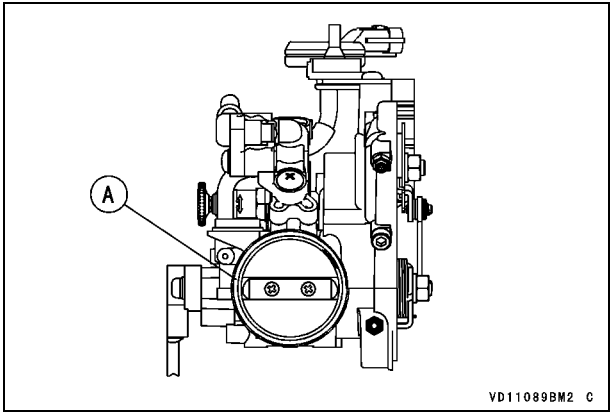


A. Decelerator Cable Bolt Locknut
B. Accelerator Cable Bolt
C. Tips of Throttle Cable Lower Ends
D. Throttle Pulley
E. Accelerator Cable
F. Decelerator Cable

NOTICE

Never drop the throttle body assy especially on a hard surface. Such a shock to the body assy can damage it.

- After removing the throttle body assy, cover the throttle body assy holder and air cleaner duct with a clean cloth to protect them from dirt.
- Clean the throttle body assy.
- Check the throttle bore at the throttle valve for carbon deposits by opening the throttle valve.
- If any carbon accumulates, wipe the carbon off the throttle bore and the throttle valve, using a lint-free cloth penerated with a high flash-point solvent.



A. Throttle Bore

NOTICE

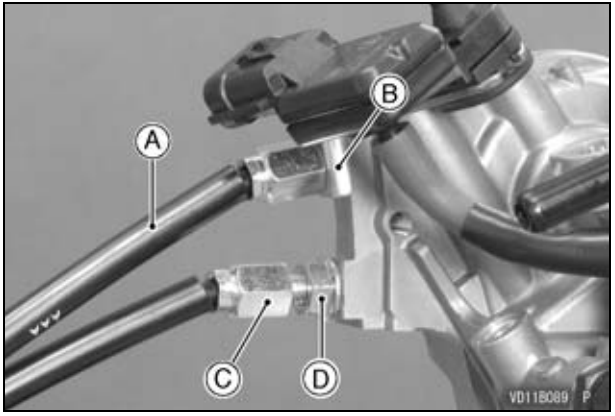
If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.

- Lubricate the lower ends of the throttle cables.
- Install the tip of accelerator cable lower end to the throttle pulley.
- Install the accelerator cable so that the position of the claw of the washer is as shown.
- Install the tip of decelerator cable lower end to the throttle pulley.

- While holding the decelerator cable bolt, tighten the cable bolt locknut.

Tightening Torque

Throttle Cable Mounting Bolts: 3.0 N·m (0.31 kgf·m, 27 in·lb) Throttle Pulley Cover Bolts: 3.4 N·m (0.35 kgf·m, 30 in·lb)

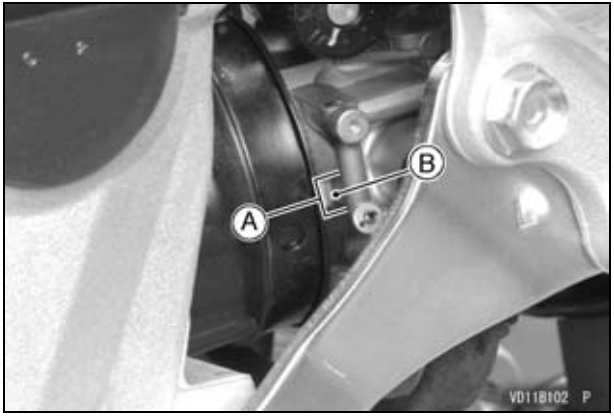


A. Accelerator Cable
B. Claw
C. Decelerator Cable Bolt
D. Decelerator Cable Bolt Locknut

⚠ WARNING

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.

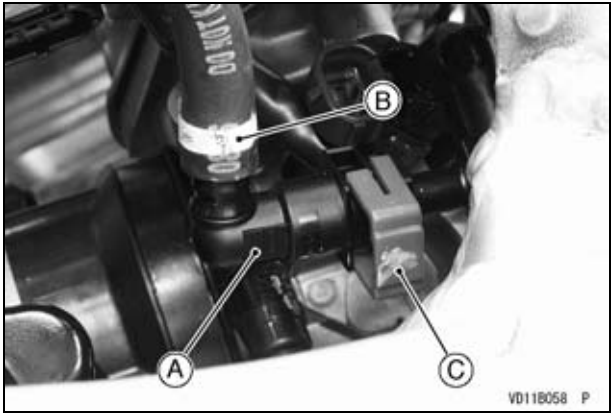
- Install the throttle body assy to the throttle body assy holder. Align the projection with the groove.
- Check the throttle body assy is installed securely.



A. Groove
B. Projection

- Check the joint lock for deformation and wear.
- If the joint lock is deformed, replace the fuel hose with a new one.
- Apply engine oil to the fuel delivery pipe lightly.

- Insert the fuel hose joint straight onto the delivery pipe.
- Check the white paint of the hose in the throttle body assy side.
- Push the joint lock until the hose joint clicks.

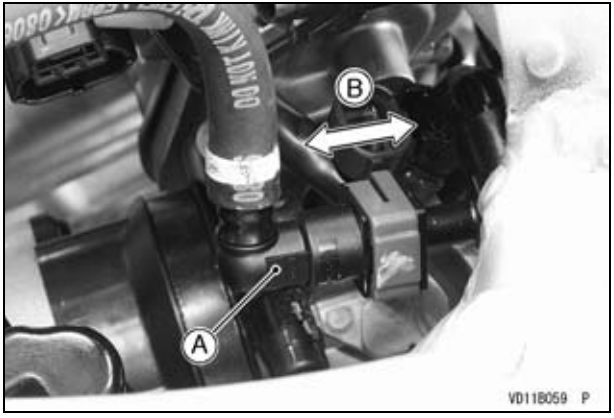


A. Fuel Hose Joint
B. White Paint
C. Joint Lock

NOTICE

When installing the fuel hose joint, do not apply strong force to the delivery pipe on the throttle body assy. The pipe made from resin could be damaged.

- Push and pull the fuel hose joint back and forth more than two times, and make sure it is locked and does not come off.



A. Fuel Hose Joint
B. Push and Pull

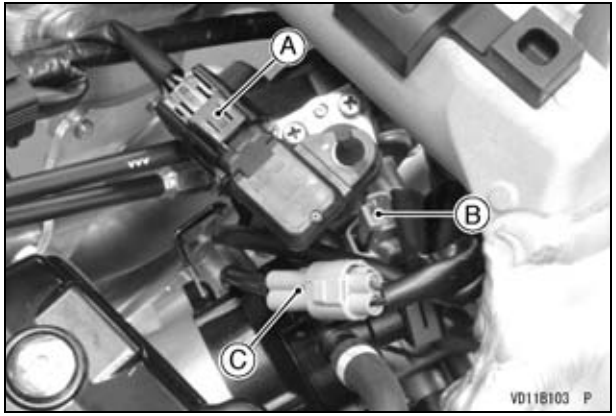
⚠ WARNING

Leaking fuel can cause a fire or explosion resulting in serious burns. Make sure the hose joint is installed correctly on the delivery pipe by sliding the joint.

NOTE

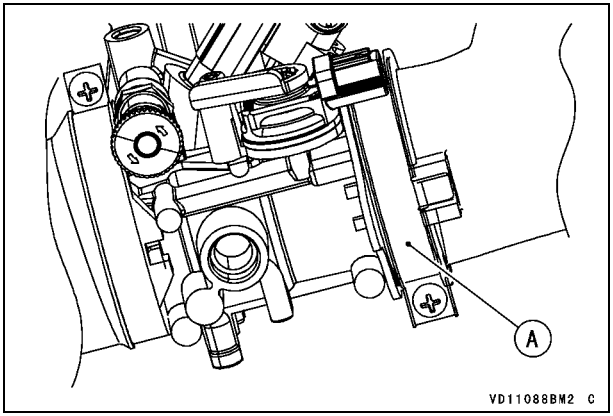
○ *If it comes off, reinstall the fuel hose joint.*

- Connect the intake air pressure sensor connector, fuel injector connector and throttle sensor connector.



A. Intake Air Pressure Sensor Connector
B. Fuel Injector Connector
C. Throttle Sensor Connector

- Install the rear frame with the air cleaner housing to the throttle body assy.
- Check the duct is installed securely.
- Check the clamp position as shown in the figure.



A. Clamp

- Tighten the air cleaner duct clamp screw securely.
- Tighten the throttle body assy holder clamp screw to the specified torque.

Tightening Torque

Throttle Body Assy Holder Clamp Screw: 2.0 N·m (0.20 kgf·m, 18 in·lb)

- Tighten the rear frame mounting bolts to the specified torque.

Tightening Torque

Rear Frame Mounting Bolts: 34 N·m (3.5 kgf·m, 25 ft·lb)

- Install the fuel tank (see Spark Plug section).
- Install the muffler (see Exhaust System section).
- Install the removed parts.
- Open and close the throttle a few times to make sure the grip operates correctly.
- Check the throttle cable play and idle speed adjustment.

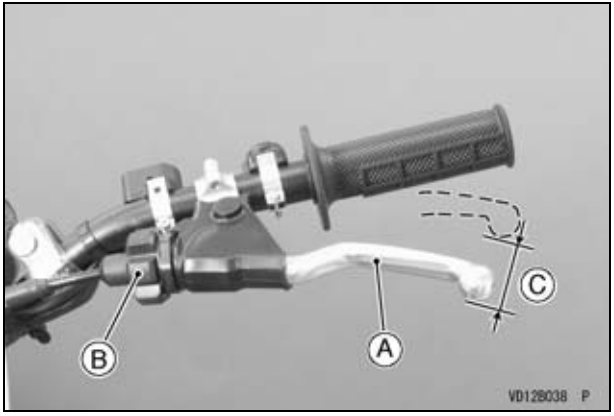
Clutch

Clutch Lever Adjustment

Proper clutch lever free play is 8 ~ 13 mm (0.3 ~ 0.5 in.). Lever play increases with cable stretch and friction plate wear, requiring periodic adjustment.

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

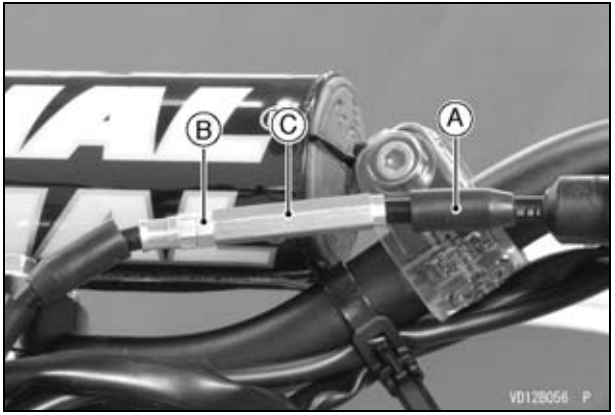
- Turn the adjuster to obtain the proper amount of clutch lever free play.



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

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

- Remove the number plate (see Steering section).
- Turn the adjuster in all the way.
- Slide the dust cover back.
- Loosen the locknut in the middle of the clutch cable, and turn the adjusting nut so that the clutch lever free play is 8 ~ 13 mm (0.3 ~ 0.5 in.).



A. Dust Cover
B. Locknut
C. Adjusting Nut

- Tighten the locknut.

⚠ WARNING

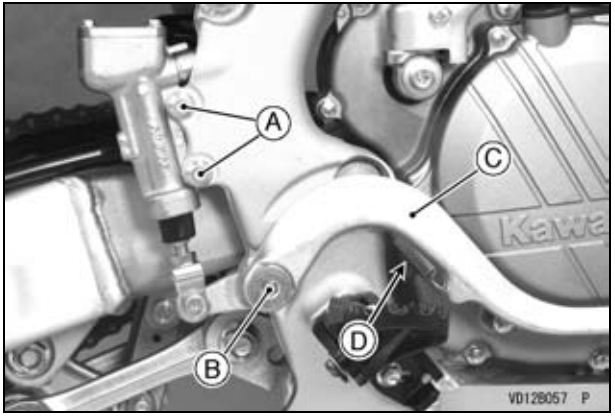
Too much cable play can prevent clutch disengagement and cause an accident resulting in serious injury or death. When adjusting the clutch or replacing the cable, be sure the upper end of the clutch outer cable is fully seated in its fitting, or it could slip into place later, creating enough cable play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

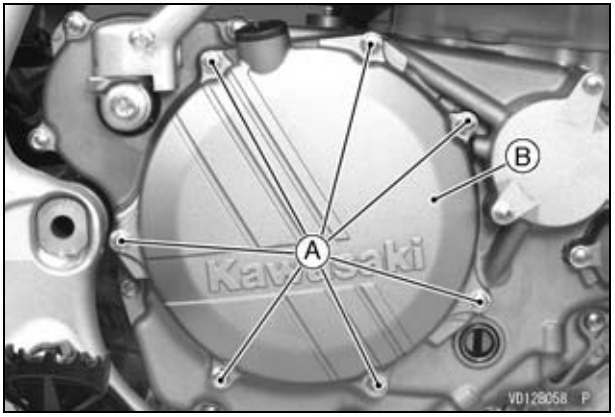
Friction and Steel Plates Removal

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



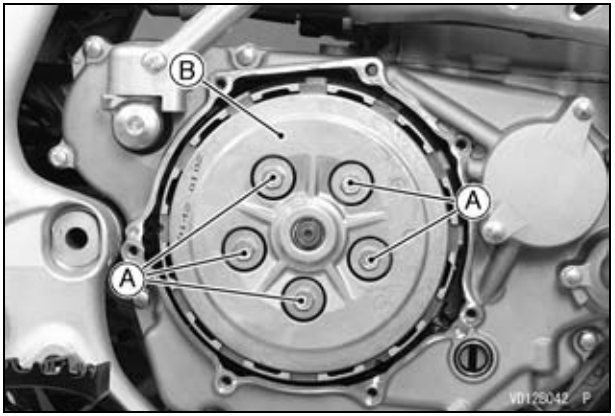
A. Rear Master Cylinder Mounting Bolts
B. Brake Pedal Bolt
C. Brake Pedal
D. Return Spring

- Remove the clutch cover bolts.



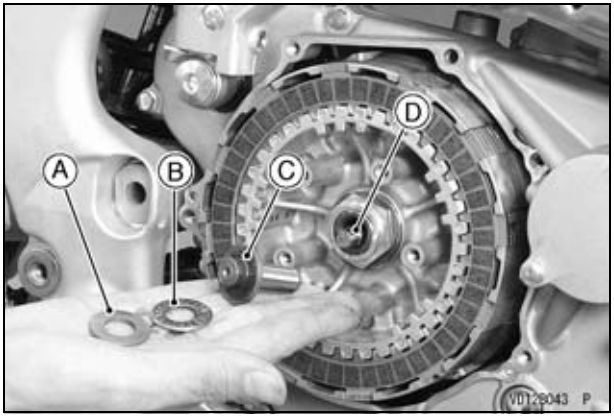
A. Clutch Cover Bolts
B. Clutch Cover

- Remove the clutch cover and gasket.
- Remove the clutch spring bolts, clutch pressure plate and springs.



A. Clutch Spring Bolts
B. Clutch Pressure Plate

- Remove the adjusting washer, needle bearing, push rod holder and push rod.



A. Adjusting Washer
B. Needle Bearing
C. Push Rod Holder
D. Push Rod

- Remove the friction and steel plates.

NOTE

- *The friction plates at each end are different from the plates installed between these plates. However, it is impossible to identify the difference by external view.*
- *When servicing the clutch, use a permanent marker to identify the two end friction plates before removing them so that they can be reinstalled in the correct positions.*

○ *When replacing the friction plates with new ones, mark the two end friction plates just after opening the package so that you can distinguish and install them in the correct location.*

- Remove the clutch hub nut with using the clutch holder (special tool: 57001-1243) to prevent the clutch hub from rotating.
- Remove the clutch hub.

A. Clutch Hub Nut
B. Clutch Holder (Special Tool: 57001-1243)
C. Clutch Hub

Friction and Steel Plates 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.

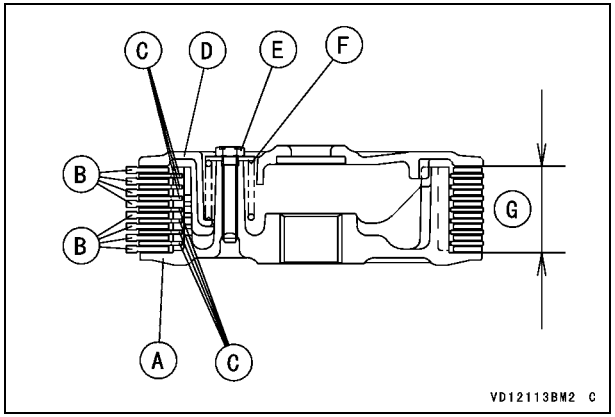
Friction Plate Thickness Measurement

Standard	2.92 ~ 3.08 mm (0.115 ~ 0.121 in.)
Service Limit	2.7 mm (0.11 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).

Tightening Torque

Clutch Spring Bolts: 8.8 N·m (0.90 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

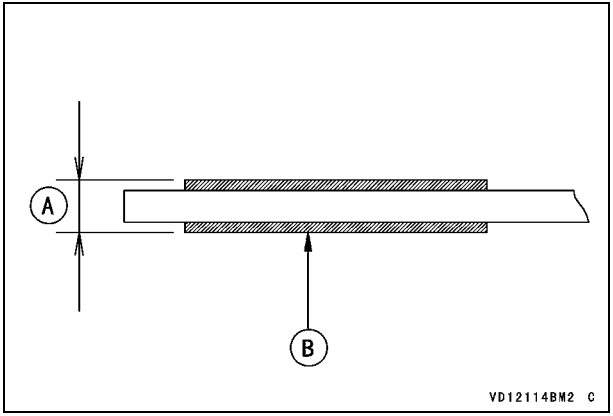
Clutch Plate Assembly Measurement Standard Length:

34.9 ~ 35.5 mm (1.37 ~ 1.40 in.)

Steel Plate (Part/No.)	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.*



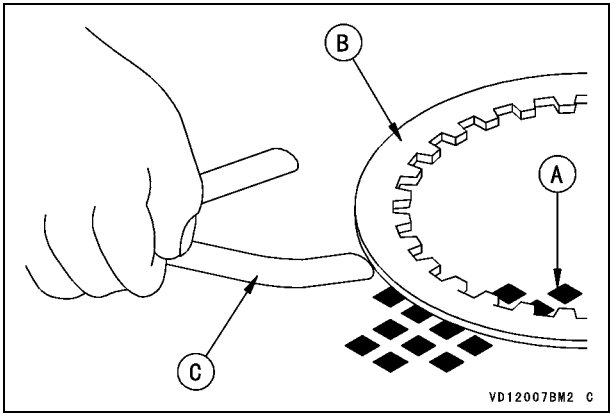
A. Thickness
B. Friction Plate

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

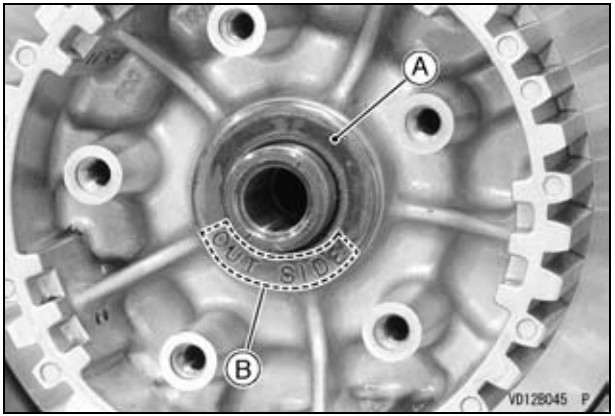
Friction Plate	Standard	Maximum 0.15 mm (0.0059 in.) or less
	Service Limit	0.3 mm (0.012 in.)
Steel Plate	Standard	Maximum 0.2 mm (0.008 in.) or less
	Service Limit	0.3 mm (0.012 in.)



A. Surface Plate
B. Friction or Steel Plate
C. Thickness Gauge

Clutch Hub Installation

- Install all parts in the reverse order of removal.
- Replace the clutch hub nut with a new one.
- Install the clutch hub.
- Install the spacer while “OUTSIDE” is faced to the nut.



A. Spacer
B. “OUTSIDE”

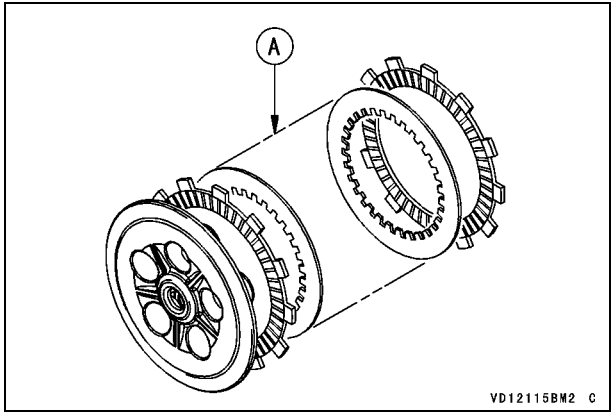
- Tighten the clutch hub nut with using the clutch holder (special tool: 57001-1243) to the specified torque.

Tightening Torque

Clutch Hub Nut: 98 N·m (10 kgf·m, 72 ft·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.

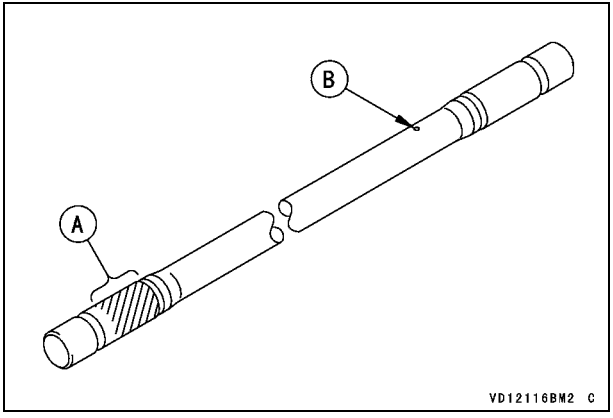


A. Friction and Steel Plates

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 push rod as shown in the figure.
- Install the push rod so that the oil passage hole faces engine right side.

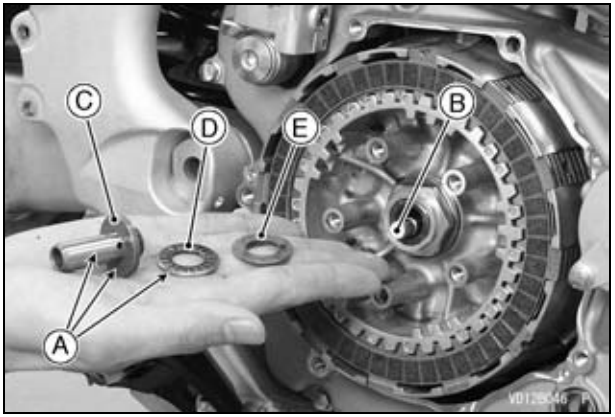


A. Apply molybdenum disulfide grease.
B. Oil Passage Hole

- Apply molybdenum disulfide grease to the contact area of the push rod holder, both surface of the needle bearing and adjusting washer.
- Install the push rod, push rod holder, needle bearing and adjusting washer.

NOTE

○ *Do not close the oil passage hole on the push rod with the molybdenum disulfide grease.*



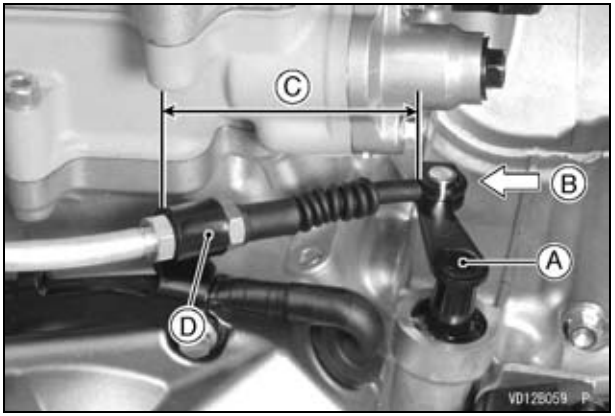
A. Apply molybdenum disulfide grease.
B. Push Rod
C. Push Rod Holder
D. Needle Bearing
E. Adjusting Washer

- Install the clutch pressure plate and springs.
- Tighten the clutch spring bolts to the specified torque.

Tightening Torque

Clutch Spring Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Check the release shaft lever position by measuring the position distance between the lever and the cable bracket while pushing the release shaft lever lightly forward.

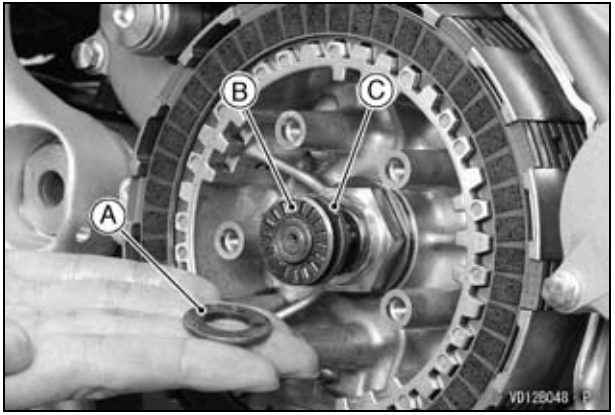


A. Release Shaft Lever
B. Push forward
C. Position Distance
D. Cable Bracket

Position Distance

Standard	68.6 ~ 76.4 mm (2.70 ~ 3.01 in.)

- If the lever position is not within the standard, select the correct thickness of adjusting washer according to the following table.
- Remove the clutch pressure plate as necessary and reinstall the clutch and install the selected adjusting washer.



A. Adjusting Washer
B. Needle Bearing
C. Push Rod Holder

Adjusting Washer

Thickness	Part No.
1.5 mm (0.06 in.)	92200-1548
1.0 mm (0.04 in.)	92200-0045

Release Shaft Lever Position and Adjusting Washer Selection

Position Distance	Judgment	Washers Thickness	Quantity
68.6 ~ 76.4 mm (2.70 ~ 3.01 in.)	Standard	1.5 mm (0.06 in.)	1
More than 76.4 mm (3.01 in.)	Too big	1.0 mm (0.04 in.)	1
Less than 68.6 mm (2.70 in.)	Too small	1.0 mm (0.04 in.)	2

- Place a new clutch cover gasket in position with a thin layer of grease and tighten the bolts.

Tightening Torque

Clutch Cover Bolts:
9.8 N·m (1.0 kgf·m, 87 in·lb)

- Replace the O-rings on the brake pedal bolt with new ones and install them.
- When installing the brake pedal, apply the grease to the contact area of the brake pedal pivot and apply a non-permanent locking agent to the threads of the brake pedal bolt.

Tightening Torque

Brake Pedal Bolts:
25 N·m (2.5 kgf·m, 18 ft·lb)

● While pushing down the brake pedal, tighten the rear master cylinder mounting bolts.

Tightening Torque

Rear Master Cylinder Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

● Check the engine oil level.

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.

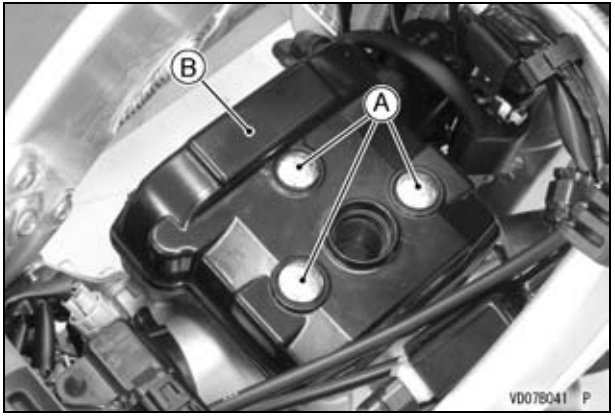
Valve clearance for each valve should be checked and adjusted in accordance with the Periodic Maintenance Chart.

NOTE

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

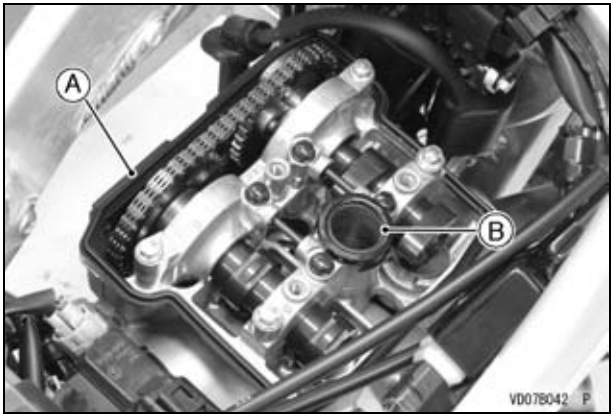
Valve Clearance Inspection

- Remove the spark plug cap (see Spark Plug section).
- Remove the cylinder head cover bolts and cylinder head cover.



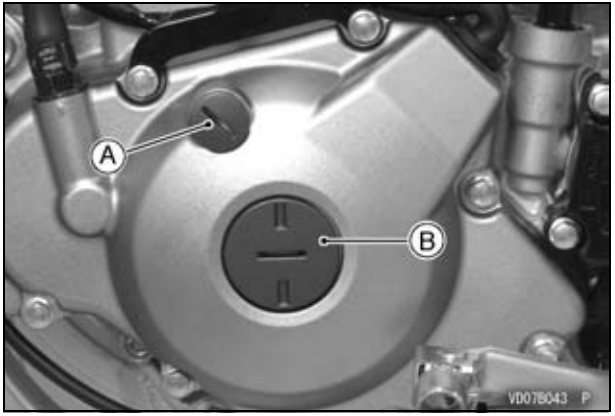
A. Cylinder Head Cover Bolts and Washers
B. Cylinder Head Cover

- Remove the head cover gasket and spark plug hole gasket.



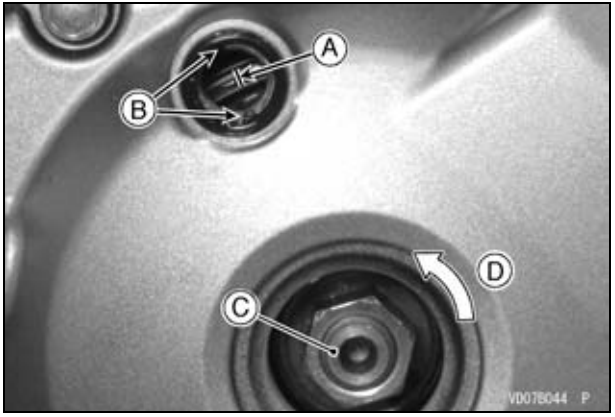
A. Head Cover Gasket
B. Spark Plug Hole Gasket

● Remove the two caps from the magneto cover.



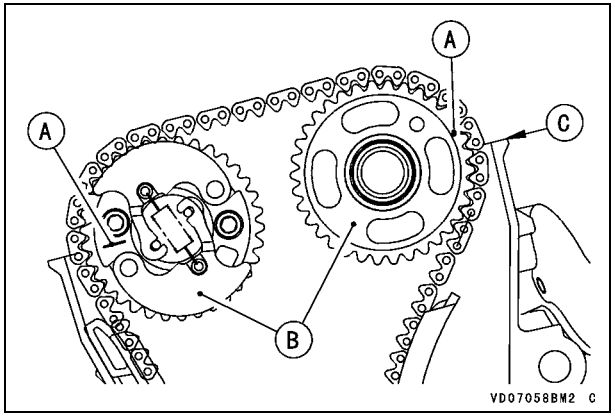
A. Timing Inspection Cap
B. Flywheel Nut Cap

● 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 magneto cover while turning the crankshaft counterclockwise.



A. Top Mark
B. Groove on Magneto Cover
C. Crankshaft
D. 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 Marks
B. Camshaft Sprockets
C. Cylinder Head Upper Surface

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

NOTE

○ *Record the measured valves clearance.*

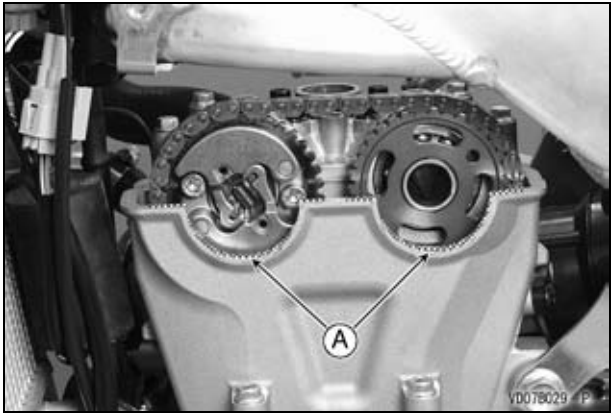
A. Thickness Gauge

Standard Valve Clearance

Exhaust	0.17 ~ 0.22 mm (0.0067 ~ 0.0087 in.)
Intake	0.10 ~ 0.15 mm (0.0039 ~ 0.0059 in.)

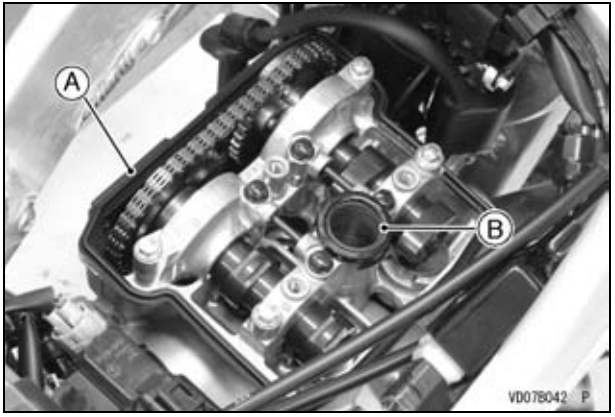
● If the valve clearance is not within the specified range, adjust by an authorized Kawasaki dealer or a competent mechanic following the instructions in the Service Manual.

- 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 silicone sealant to the cylinder head as shown in the figure.



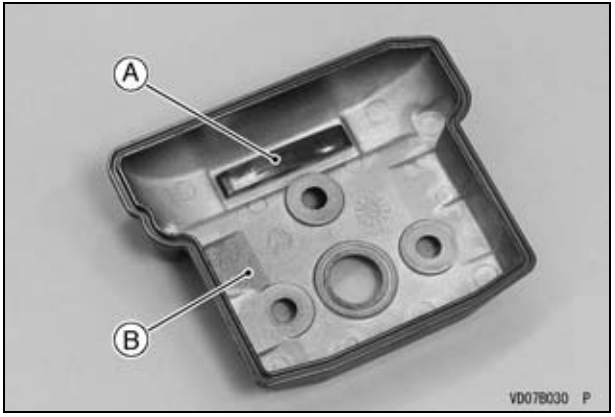
A. Silicone Sealant

- Replace the head cover gasket with a new one.
- Install the head cover gasket on the cylinder head.
- Replace the spark plug hole gasket with a new one, and install it.



A. Head Cover Gasket
B. Spark Plug Hole Gasket

- 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.

Tightening Torque

Cylinder Head Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Install the two caps to the magneto cover.

Tightening Torque

Timing Inspection Cap: 3.5 N·m (0.36 kgf·m, 31 in·lb) Flywheel Nut Cap: 3.5 N·m (0.36 kgf·m, 31 in·lb)

- Install the removed parts.

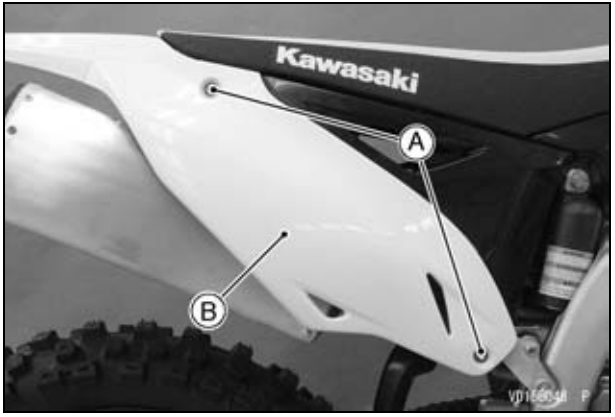
Exhaust System

The exhaust system, in particular the muffler body, is designed to reduce exhaust noise and conduct the exhaust gases away from the rider while minimizing power loss. If carbon has built up inside the muffler body, exhaust efficiency is reduced, causing engine performance to drop.

If the muffler body is badly damaged, dented, cracked or rusted, replace it. Replace the silencer wool if the exhaust noise becomes too loud or engine performance drops.

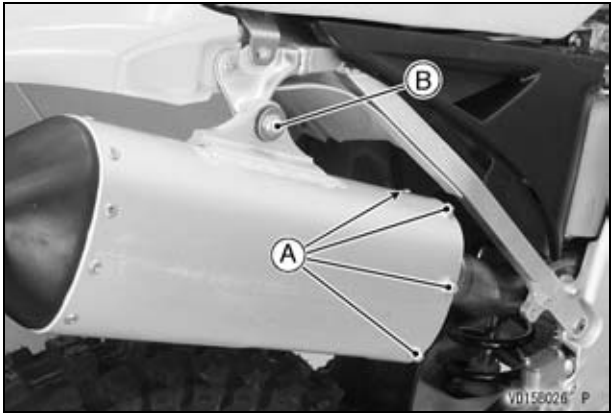
Silencer Wool Replacement

- Remove the bolts and right side cover.



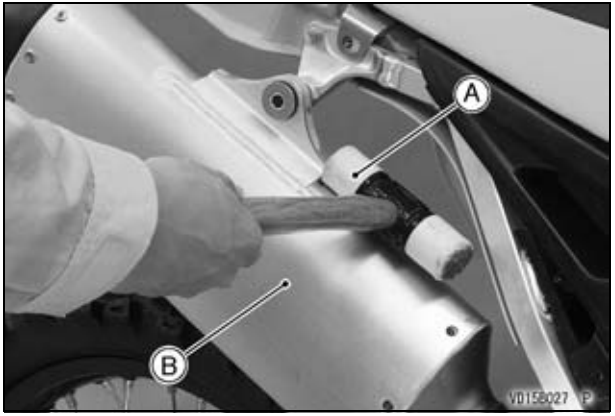
A. Bolts
B. Right Side Cover

- Remove the muffler cover bolts.
- Remove the muffler mounting bolt.



A. Muffler Cover Bolts
B. Muffler Mounting Bolt

- Remove the muffler cover with the plastic mallet.

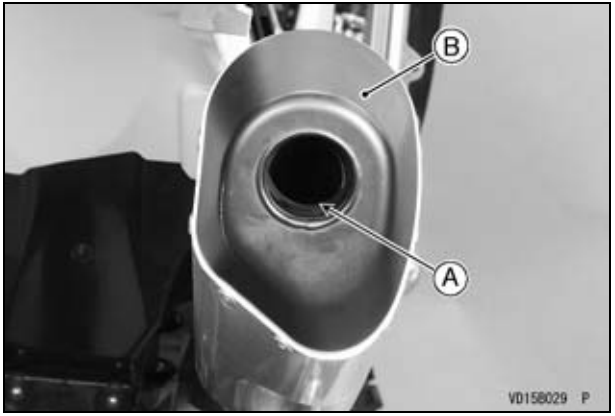


A. Plastic Mallet
B. Muffler Cover

- Replace the silencer wool with a new one.
- Remove the silicone sealant attaching on the muffler cover and muffler body.
- 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.
- Arrange the shape of the silencer wool and install the muffler cover to the muffler body.

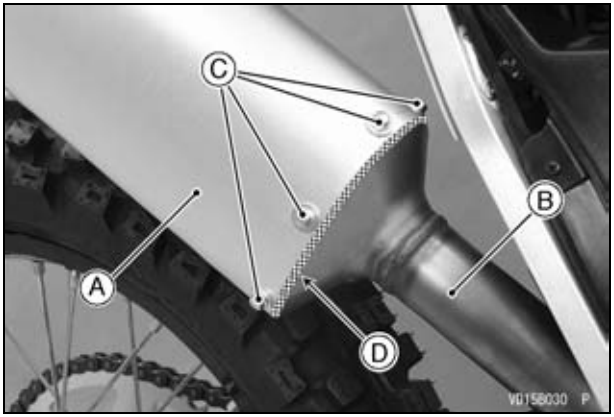
A. Silencer Wool
B. Muffler Body
C. Muffler Cover

- Check that the exhaust port of the muffler cover align with the muffler body.



A. Muffler Body End
B. Baffle

- Apply a non-permanent locking agent to the muffler body cover bolts.
- Tighten the muffler cover bolts and apply the silicone sealant to the joint part of the muffler cover and muffler body.

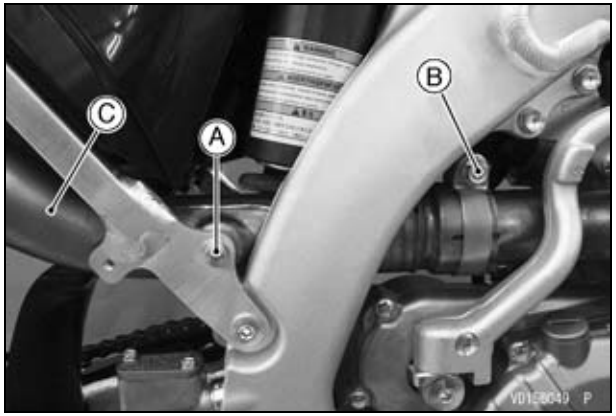


A. Muffler Cover
B. Muffler Body
C. Muffler Cover Bolts
D. Silicone Sealant

NOTE

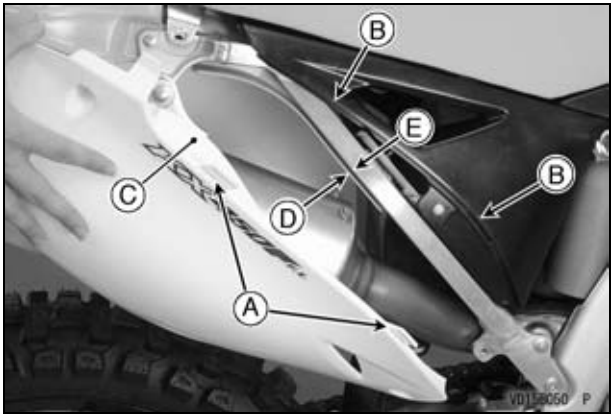
○ *If the threaded holes of the muffler cover and muffler body do not align, remove the muffler clamp bolt and muffler mounting bolts.*

- Firstly, tighten the muffler mounting bolt (front).
- Secondly, tighten the muffler mounting bolt (rear).
- Thirdly, tighten the muffler clamp bolt.



A. Muffler Mounting Bolt (Front)
B. Muffler Clamp Bolt
C. Muffler Body

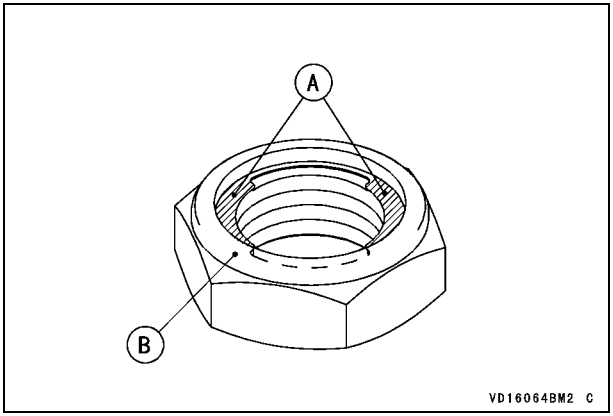
- Insert the tabs of the side cover into the slots of the air cleaner housing.
- Insert the side cover rib between the rear fender and the rear frame.
- Tighten the bolt.



A. Tabs
B. Slots
C. Rib
D. Rear Fender
E. Rear Frame

Rear Axle Nut

- Visually inspect the rear axle nut for deformation or damage at the friction ring and caulking. If it is deformed or damaged, replace the axle nut with a new one.



A. Friction Ring
B. Caulking

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.

⚠ WARNING

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 bottom of 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 (2.0 ~ 2.3 in.)

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

A. Chain Slack

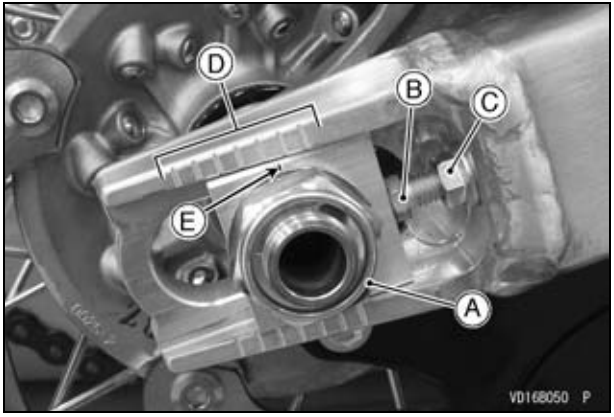
- In addition to checking the slack, rotate the rear wheel to inspect the drive chain for damaged rollers, loose pins and links and the sprockets for unevenly or excessively worn and damaged teeth.
- If there are any such defects, replace the drive chain and/or the sprockets.

Chain Slack Adjustment

- 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. Rear Axle Nut
B. Adjusting Bolt
C. Locknut
D. Marks
E. Notch

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.

- Inspect the rear axle nut (see Rear Axle Nut section).
- Tighten both chain adjuster locknuts.
- Tighten the axle nut to the specified torque.

Tightening Torque

Rear Axle Nut:
108 N·m (11.0 kgf·m, 79.7 ft·lb)

- Rotate the wheel, measure the chain slack again at the tightest position, and readjust it if necessary.

⚠ WARNING

A loose axle nut can lead to an accident resulting in serious injury or death. Tighten the axle nut to the proper torque.

- Check the rear brake effectiveness.

NOTE

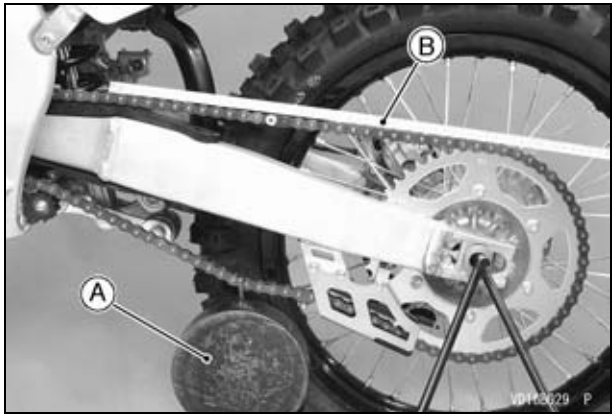
○ *When riding in wet and muddy conditions, mud sticks to the chain and sprockets, resulting in an overly tight chain, which can cause it to break. To prevent this, adjust the chain slack (measured between the chain and the swingarm) to 62 ~ 68 mm (2.4 ~ 2.7 in.).*

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 length 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

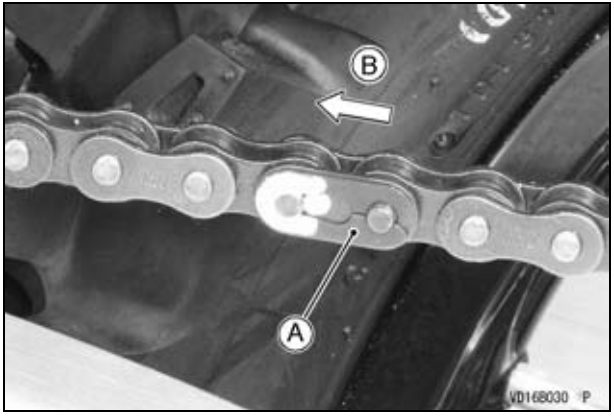
Drive Chain 20-Link Length

Standard	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)
Service Limit	323 mm (12.7 in.)

NOTE

○ *The drive system was designed for use with a DAIDO DID 520DMA4 114-links chain. For maximum stretch resistance and safety, a genuine part must be used for replacement.*

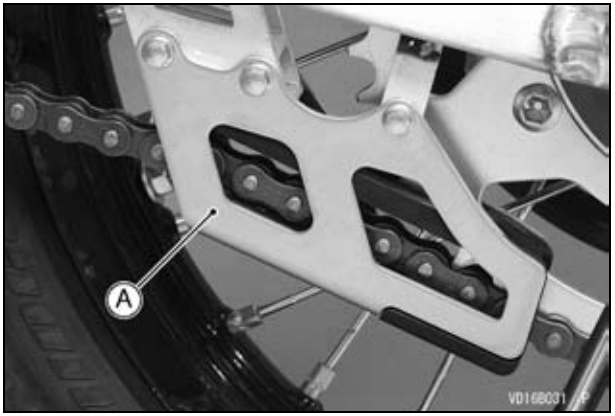
○ *To minimize any chance of the master link coming apart, the master link clip must be installed with the closed end of the "U" pointing in the direction of chain rotation.*



A. Master Link Clip
B. Direction of Chain Rotation

Chain Guide Wear Inspection

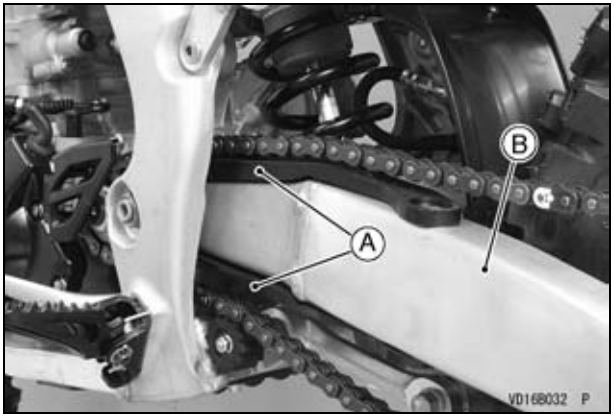
● Visually inspect the drive chain guide and replace it if excessively worn or damaged.



A. Chain Guide

Chain Slipper Wear Inspection

● Visually inspect the upper and lower of the chain slipper on the swingarm and replace them if worn or damaged.

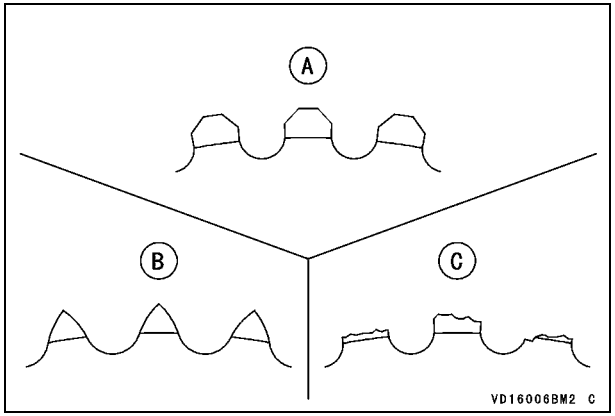


A. Upper and Lower of the Chain Slipper
B. Swingarm

Sprocket Wear Inspection

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

Sprocket Teeth Wear



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

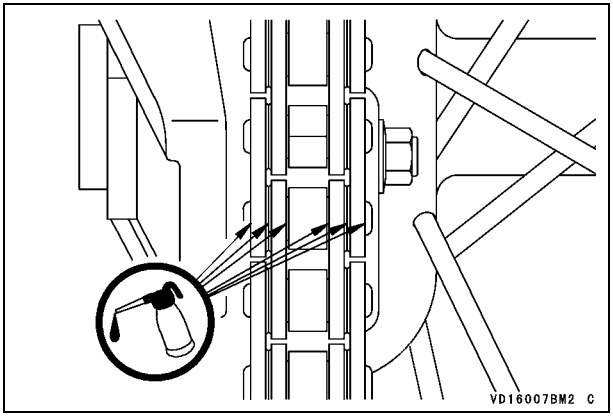
NOTE

○ *Sprocket wear is exaggerated in the illustration.*

Chain Lubrication

Lubrication of the drive chain is necessary after riding in the rain or mud, or any time the chain appears dry with a high quality lubricant for drive chains.

● Apply lubricant to the side of the rollers so that it will penetrate to the rollers and bushings.
● Wipe off any excess lubricant.



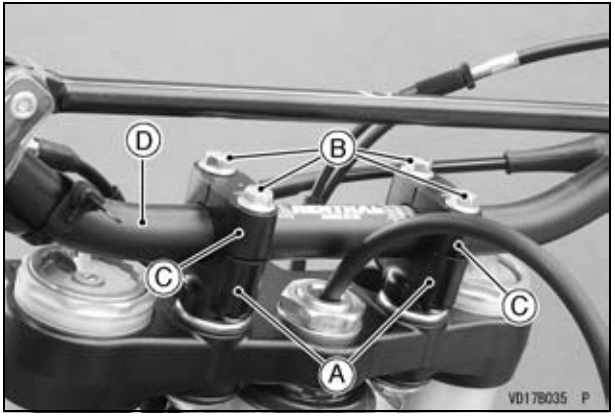
Adjustable Ergonomics

To suit various riding positions, the handlebar holder position can be changed and the handlebar can be adjusted by turning the handlebar holders around (180°).

The footpeg position can also be changed to suit the rider's preference.

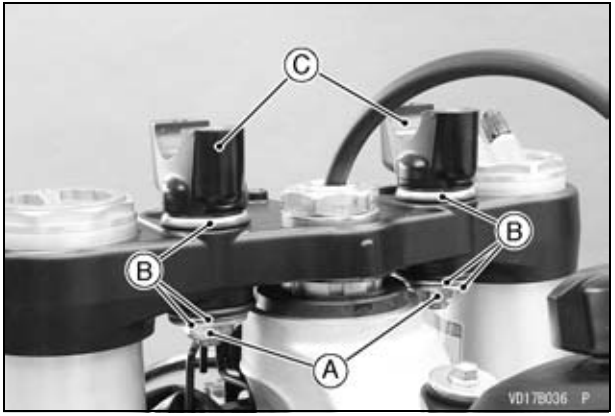
Handlebar Position Adjustment

- Remove the handlebar pad.
- Check the handlebar for damage or cracks.
- Remove the handlebar clamp bolts, the clamps and the handlebar.



A. Handlebar Holder
B. Handlebar Clamp Bolts
C. Handlebar Clamps
D. Handlebar

- Remove the handlebar holder nuts, washers and handlebar holders.

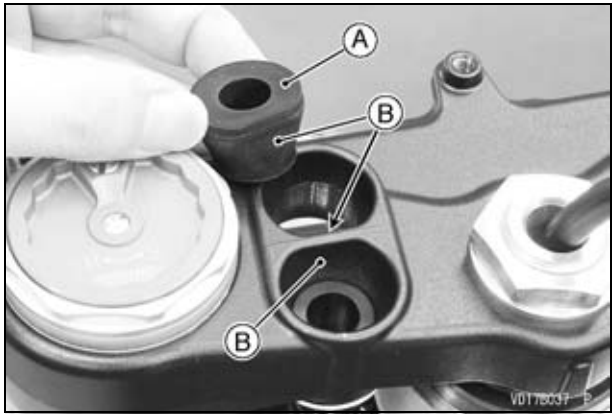


A. Handlebar Holder Nuts
B. Washers
C. Handlebar Holder

- Select the handlebar position and install the dampers into the holes of the steering stem head so that the flat surface of dampers fit the surface of the steering stem head holes.
- Replace the handlebar holder nuts with new ones.
- Install the handlebar holder in the suitable direction.
- Put the handlebar on the handlebar holder.
- Temporarily install the handlebar clamps.
- Hand tighten the handlebar clamp bolts.
- Tighten the handlebar holder nuts.

Tightening Torque

Handlebar Holder Nuts: 34 N·m (3.5 kgf·m, 25 ft·lb)



A. Dampers
B. Flat Surfaces

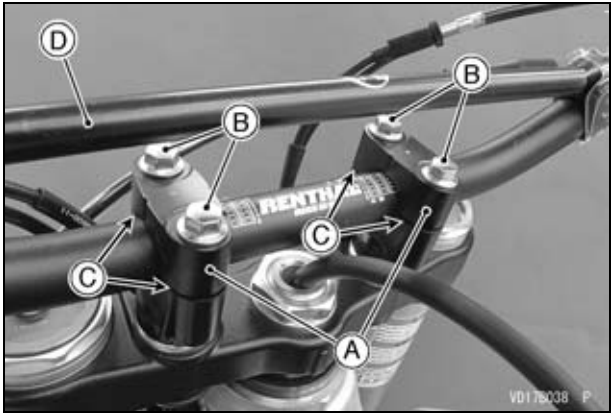
- Position the handlebar and use the gauge marks to check its alignment in the clamps. There should be equal marks showing on each side of the clamps.
- Tighten the front and rear handlebar clamp bolts equally. If the handlebar clamps are correctly installed, there will be even gaps on the front and rear sides of the clamp after the bolts are torqued.

Tightening Torque

Handlebar Clamp Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

NOTE

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



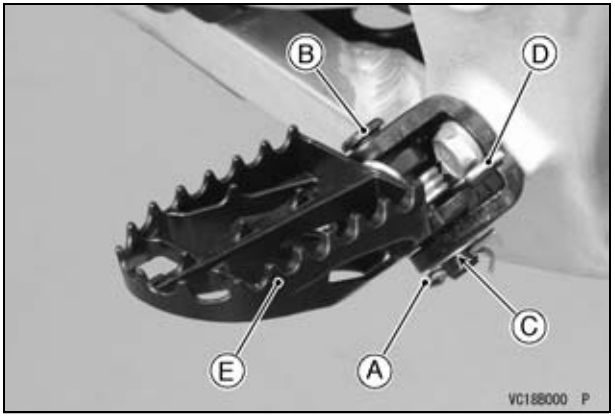
A. Handlebar Clamps
B. Clamp Bolts
C. Gap
D. Supporting Bar

- Do not disassemble the supporting bar on the handlebar.
- Check the front brake for the proper brake effect, or no brake drag.

Footpeg

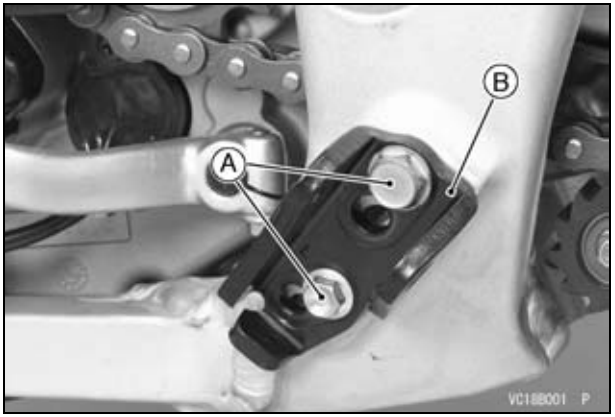
The right and left footpegs can be mounted in one of two positions.

- Remove the cotter pin, pivot pin, washer, spring and footpeg.



A. Cotter Pin
B. Pivot Pin
C. Washer
D. Spring
E. Footpeg

- Remove the footpeg bracket bolts and bracket. (This position is standard.)



A. Footpeg Bracket Bolts
B. Footpeg Bracket

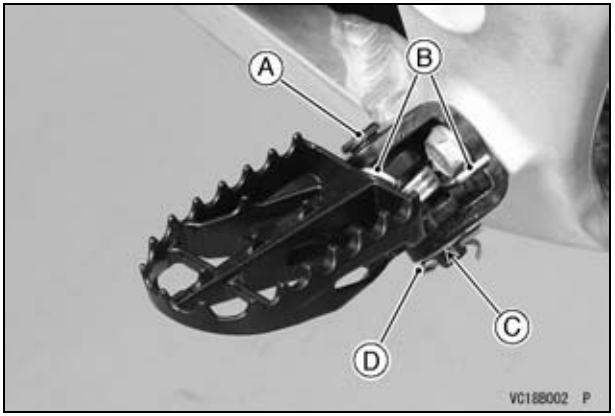
- Apply a non-permanent locking agent to the bracket bolts.
- Select either footpeg position and tighten the bracket with the two bolts.

Tightening Torque

Footpeg Bracket Bolts (Upper): 34 N·m (3.5 kgf·m, 25 ft·lb) Footpeg Bracket Bolts (Lower): 16.5 N·m (1.68 kgf·m, 12.2 ft·lb)

- Apply grease to the pivot pin.
- Install the footpeg, spring and pivot pin. Insert the pivot pin from the front.

- Position the spring ends as shown in the figure.
- Install the washer and new cotter pin.
- Bend the longer end of the cotter pin.



A. Pivot Pin
B. Spring Ends
C. Washer
D. Cotter Pin

NOTE

○ *Install the footpegs with same height on both sides. Do not ride the motorcycle with footpegs installed unevenly.*
○ *Adjust the positions of the shift pedal and the brake pedal to suit the rider's preference.*
○ *Installing the footpegs in the lower position will reduce the amount of ground clearance and lean angle.*

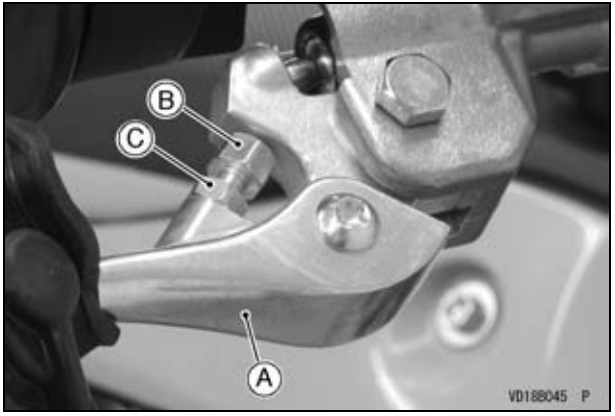
Brakes

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, slide the front brake lever dust cover back, and 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.

⚠ 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 brake 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/Rear Brake Fluid : DOT3 or DOT4

NOTE

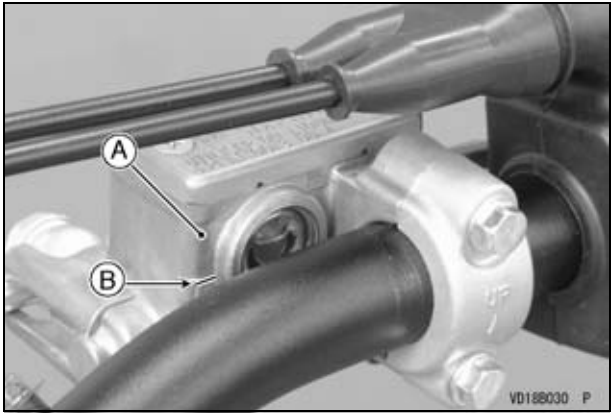
○ *The motorcycle is shipped with brake fluid DOT4 in the brake system.*

NOTICE

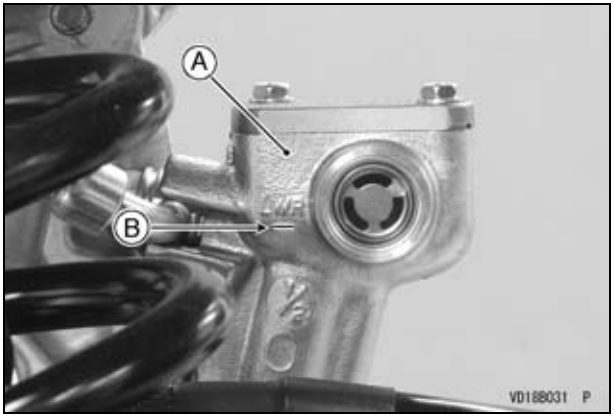
Do not spill brake fluid onto any painted surface.
Do not use fluid from a container that has been left open or that has been unsealed for a long time.
Check for fluid leakage around the brake system fittings.
Check for brake hose damage.

Brake Fluid Level Inspection (Front and Rear Brake Reservoirs)

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

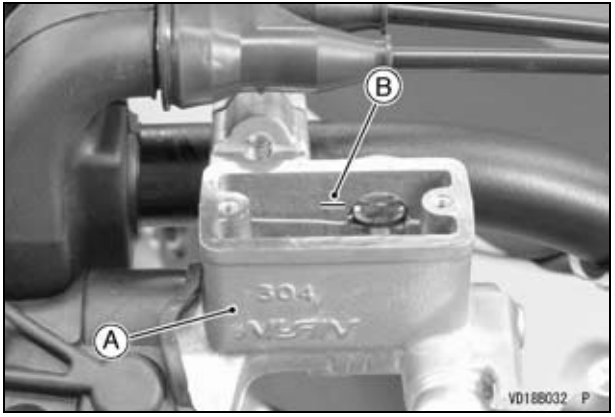


A. Front Brake Reservoir
B. Lower Level Line

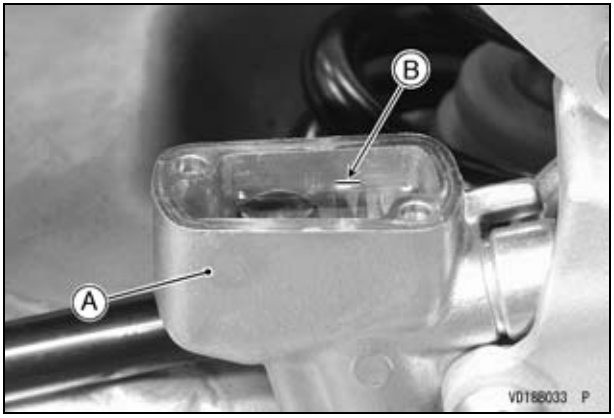


A. Rear Brake Reservoir
B. Lower Level Line

- If the brake fluid in the front or rear brake 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 brake reservoirs indicate the upper level.).



A. Front Brake Reservoir
B. Upper Level Line



A. Rear Brake Reservoir
B. Upper Level Line

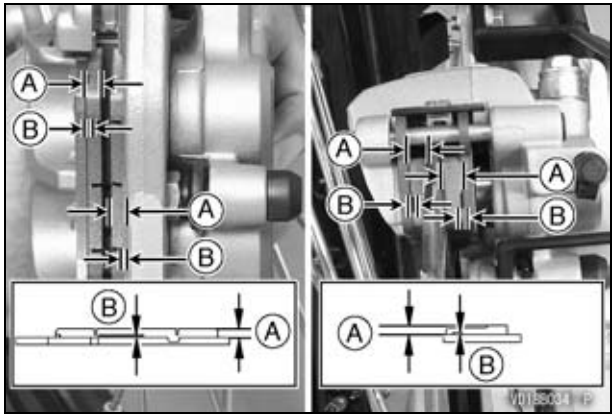
⚠ WARNING

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.

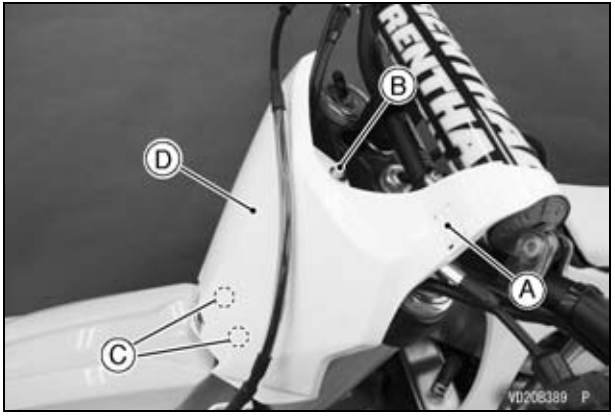
Steering Inspection

- To check the steering adjustment, raise the front wheel off the ground using a jack (special tool: 57001-1238) and attachment (special tool: 57001 -1608).
- 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 in the figure. If play is felt, the steering is too loose and needs to be adjusted.

A. Push and Rock

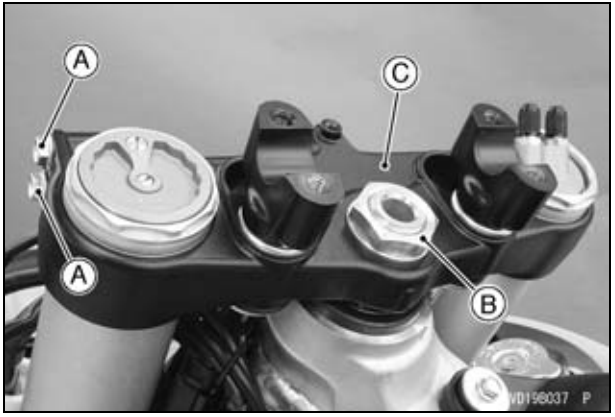
Steering Adjustment

- Raise the front wheel off the ground using a jack (special tool: 57001-1238) and attachment (special tool: 57001-1608).
- Unlock the clamp of the number plate.
- Remove the bolt.
- Clear the projections and remove the number plate.



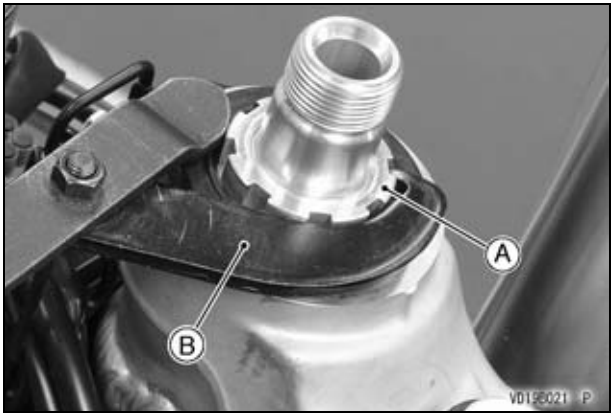
A. Clamp
B. Bolt
C. Projections
D. Number Plate

- Remove the handlebar (see Handlebar section).
- Loosen the left and right front fork clamp bolts (upper).
- Remove the steering stem head nut, and raise the steering stem head.



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

- Turn the steering stem nut with a stem nut wrench (special tool: 57001-1100) to obtain the proper adjustment.



A. Steering Stem Nut
B. Stem Nut Wrench (Special Tool: 57001-1100)

- Install the steering stem head to the original position.
- Apply the specified torques to the steering stem head nut and front fork clamp bolts (upper).

Tightening Torque

Steering Stem Head Nut: 98 N·m (10 kgf·m, 72 ft·lb) Front Fork Clamp Bolts (Upper): 20 N·m (2.0 kgf·m, 15 ft·lb)

NOTE

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

- Install the handlebar (see Handlebar section), and check the steering again and readjust it if necessary.
- Check the front brake for the proper brake effect, or no brake drag.
- Install the removed parts.

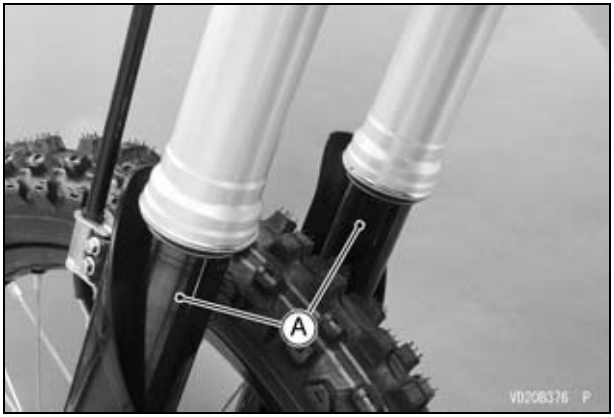
Front Suspension

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

⚠ WARNING

Oil leakage from the dust seal decreases the air pressure in the front fork, which can cause loss of control and an accident resulting in serious injury or death. If the seal begins to leak, replace it and any other worn or damaged parts to prevent air loss.

NOTICE

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

Front Fork Adjustment

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

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

● Air Pressure (Right Front Fork)

Air pressure adjustment changes the Fork Spring Characteristic.

Adjustable Range

Inner Chamber	600 ~ 1300 kPa (6.11 ~ 13.26 kgf/cm², 87.0 ~ 188.5 psi)
Outer Chamber	0 ~ 130 kPa (0 ~ 1.33 kgf/cm², 0 ~ 18.9 psi)
Balance Chamber	530 ~ 1400 kPa (5.40 ~ 14.28 kgf/cm², 76.9 ~ 203 psi)

Recommended Soft Setting

Inner Chamber	900 kPa (9.18 kgf/cm², 131 psi)
Outer Chamber	50 kPa (0.51 kgf/cm², 7.25 psi)
Balance Chamber	800 kPa (8.16 kgf/cm², 116 psi)

Standard Setting

Inner Chamber	1 000 kPa (10.20 kgf/cm², 145 psi)
Outer Chamber	50 kPa (0.51 kgf/cm², 7.25 psi)
Balance Chamber	900 kPa (9.18 kgf/cm², 131 psi)

Recommended Hard Setting

Inner Chamber	1 100 kPa (11.22 kgf/cm², 160 psi)
Outer Chamber	50 kPa (0.51 kgf/cm², 7.25 psi)
Balance Chamber	1 000 kPa (10.20 kgf/cm², 145 psi)

● Rebound Damping Adjustment (Left Front Fork)

This adjustment affects how quickly the fork rebounds. Depending on the model, the fork rebound damping adjuster has at least 20 positions. The fully seated position (adjuster turned fully clockwise) is the hardest setting. Turning the adjuster 13 clicks counterclockwise from the fully seated position is the standard setting, turning it counterclockwise 20 or more clicks (depending on the model) is the softest setting.

● Compression Damping Adjustment (Left Front Fork)

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 5 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 Height

Steering is greatly affected by the fork height (how much the outer fork tubes protrude above the steering stem head). 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.

⚠ WARNING

Improper fork leg adjustment can cause poor handling and loss of stability, which could lead to an accident. Always adjust the fork legs height on the left and right side to the same setting.

Air Pressure Adjustment

Before riding, adjust the air pressure to the specific value.

- Remove the number plate (see Steering section).
- Place the motorcycle on a stand so that the front wheel is off the ground the forks are fully extended.
- Remove the air valve caps.
- Bleed air by pushing down the balance chamber air valve.
- Adjust the air pressure in right fork leg within the specified range in the order of inner chamber, outer chamber and balance chamber.

Inner Chamber Air Pressure

Air Pressure (Standard setting)	1 000 kPa (10.20 kgf/cm², 145 psi)
Adjustable Range	600 ~ 1300 kPa (6.11 ~ 13.26 kgf/cm², 87.0 ~ 188.5 psi)

Outer Chamber Air Pressure

Air Pressure (Standard setting)	50 kPa (0.51 kgf/cm², 7.25 psi)
Adjustable Range	0 ~ 130 kPa (0 ~ 1.33 kgf/cm², 0 ~ 18.9 psi)

Balance Chamber Air Pressure

Air Pressure (Standard setting)	900 kPa (9.18 kgf/cm², 131 psi)
Adjustable Range	530 ~ 1400 kPa (5.40 ~ 14.28 kgf/cm², 76.9 ~ 203 psi)

NOTE

○ *Do not use the side stand during air pressure adjustment.*

⚠ WARNING

When riding and transporting the motorcycle, make sure that the air pressure is within the adjustable range. If used outside the adjustable range, running stability can decrease and cause an accident resulting in serious injury or death.

NOTICE

Do not pressurize the fork to more than the adjustable range or the fork may be damaged.

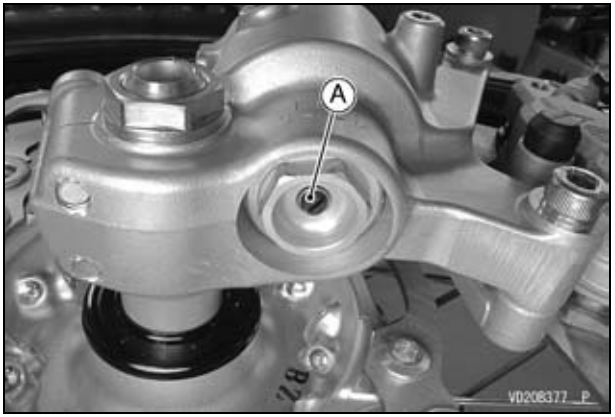
- Even if the air pressure of the front fork is adjusted, the performance of the front fork does not change, have the front fork checked by an authorized Kawasaki dealer.

Rebound Damping Adjustment

- Clean the bottom of the fork tubes.
- To adjust the rebound damping, turn the adjuster on each cylinder valve with a standard tip screwdriver. Adjust the rebound damping to suit your preference under certain conditions.

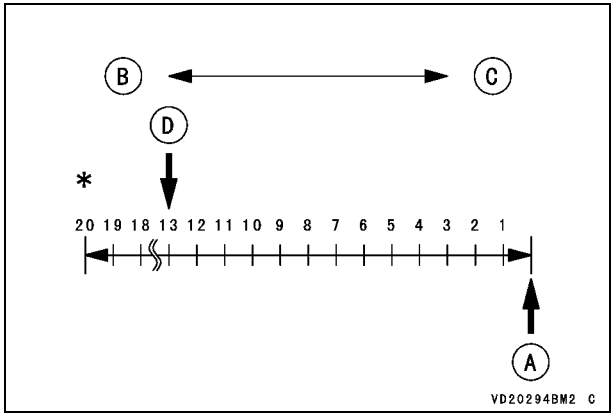
NOTICE

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



A. Rebound Damping Adjuster

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 -20 clicks or more.

Standard Rebound Damping Adjuster Setting

13 clicks *

* Counterclockwise from the fully seated position

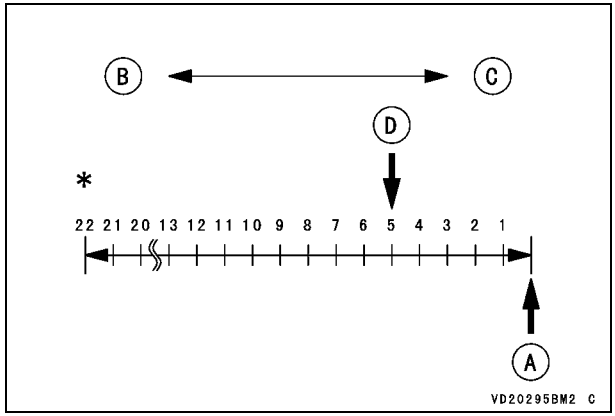
Compression Damping Adjustment

- To adjust the compression damping, turn the adjuster on each front fork cylinder valve with a standard tip screwdriver. Adjust the compression damping to suit your preference and riding conditions.

NOTICE
Do not force the compression damping adjuster beyond the fully seated position, or the adjusting mechanism may be damaged.

A. Compression Damping Adjuster

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

5 clicks *

* Counterclockwise from the fully seated position

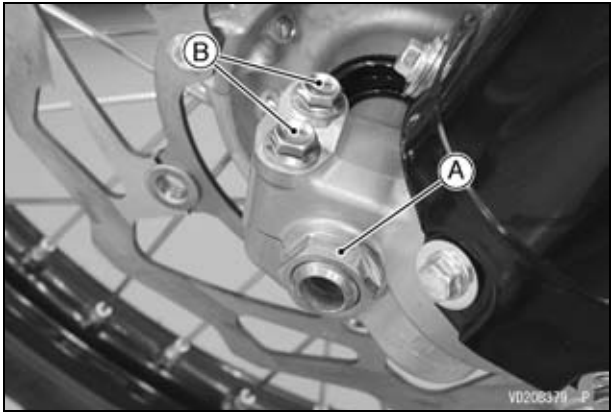
Front Fork Oil Change

● Thoroughly clean the fork before disassembly.

NOTICE

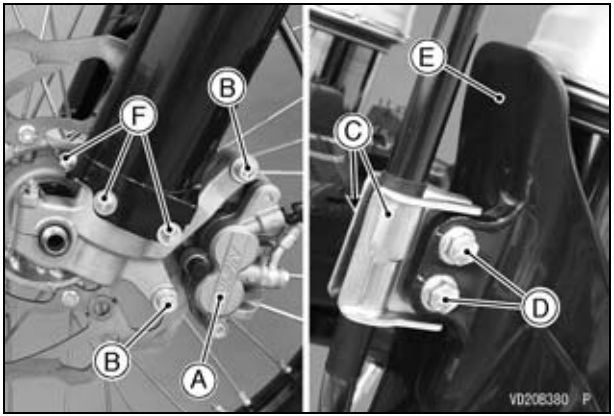
Be careful not to scratch the inner tube and not to damage the dust seal.
Avoid scratching or damaging the inner tube or the dust seal. Use a mild detergent and sponge out dirt with plenty of water.

● Place the motorcycle on a stand so that front wheel is in the air.
● Unscrew the front axle nut, and then loosen the left front axle clamp bolts.



A. Front Axle Nut
B. Left Front Axle Clamp Bolts (Loosen)

- Remove the brake caliper from the fork leg, and rest the caliper on some kind of stand so that it does not dangle.
- Insert a 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 clamps and both fork protectors.

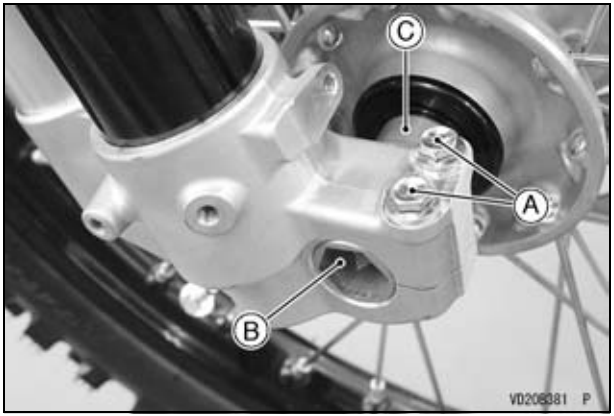


A. Brake Caliper
B. Brake Caliper Mounting Bolts
C. Brake Hose Clamps
D. Brake Hose Clamp Mounting Bolts
E. Fork Protector
F. Fork Protector Mounting Bolts

- Loosen the right front axle clamp bolts.
- Remove the axle, and pull out the wheel. Take off the collar from each side of the front hub.

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 (Loosen)
B. Front Axle
C. Collar

- Remove the number plate (see Steering section).
- Loosen the front fork clamp bolts (upper).

A. Front Fork Clamp Bolts (Upper)

NOTE

○ *Set the rebound and compression damping to the softest settings before disassembly to minimize damping forces that can hinder disassembly. Record the setting before turning the adjuster.*

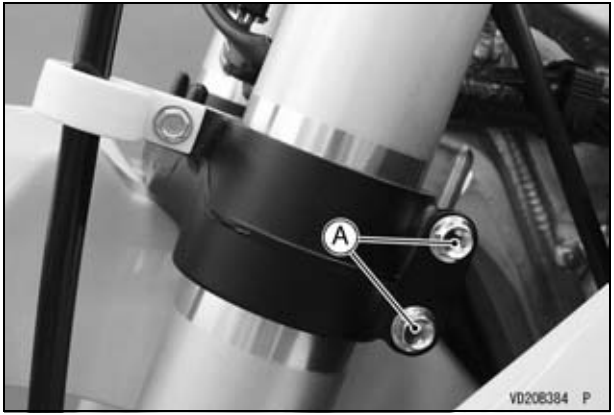
● Loosen the cylinder unit with the top plug wrench, 50 mm (special tool: 57001-1645).

NOTE

○ *Do not remove the cylinder unit.*

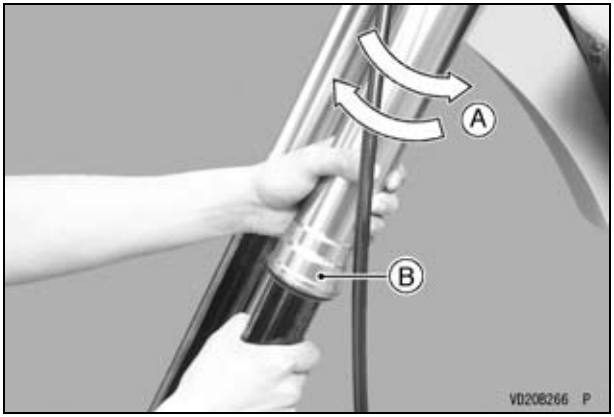
A. Cylinder Unit
B. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)

- Loosen the front fork clamp bolts (lower).



A. Front Fork Clamp Bolts (Lower)

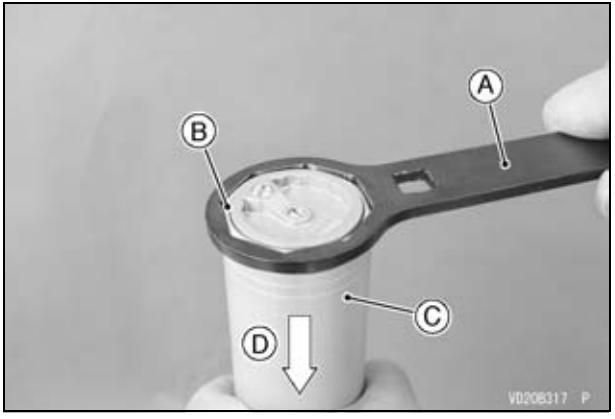
- Remove the front fork by pulling down while twisting it.



A. Pull down by twisting.
B. Front Fork

Left Front Fork

● Using the top plug wrench, 50 mm (special tool: 57001-1645), remove the cylinder unit from the outer tube and slowly slide down the outer tube.



A. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)
B. Cylinder Unit
C. Outer Tube
D. Slide Down

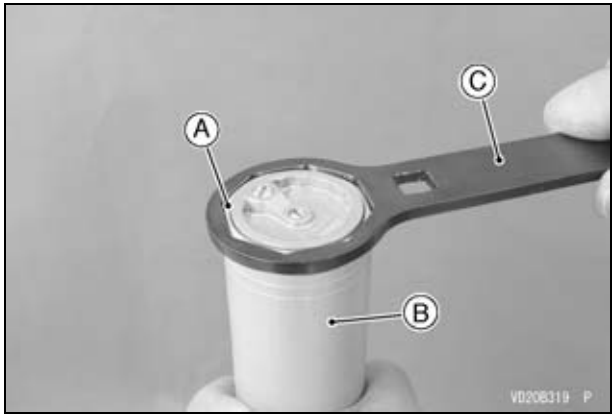
● Place a drain pan under the front fork and drain fork oil.

NOTE

○ *Pump the outer tube several times to drain the fork oil.*

A. Fork Oil

● Temporarily install the cylinder unit to the outer tube using the top plug wrench, 50 mm (special tool: 57001-1645).



A. Cylinder Unit
B. Outer Tube
C. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)

- Hold the axle holder with a vise.

⚠ WARNING

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

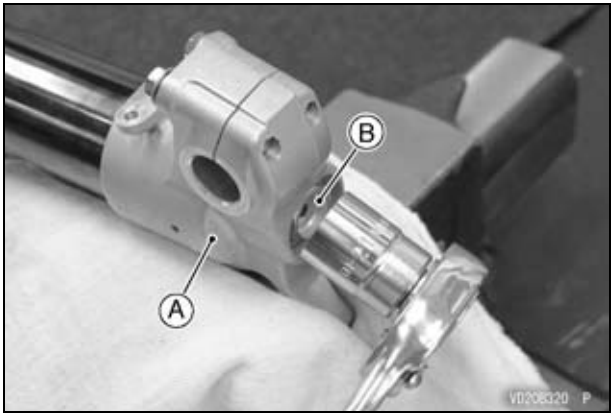
NOTE

○ *Protect the axle holder with a heavy cloth when using a vise.*

- Loosen the adjuster assembly completely.

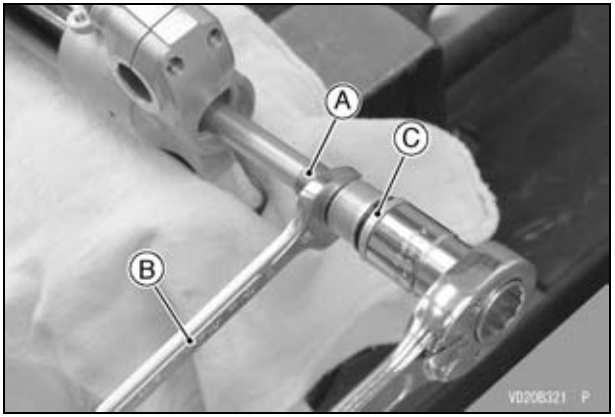
NOTE

○ *When 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 remove the adjuster assembly from the axle holder part so that the locknut appear about 20 ~ 30 mm (0.79 ~ 1.2 in.).
- Hold the locknut with a wrench and remove the adjuster assembly.

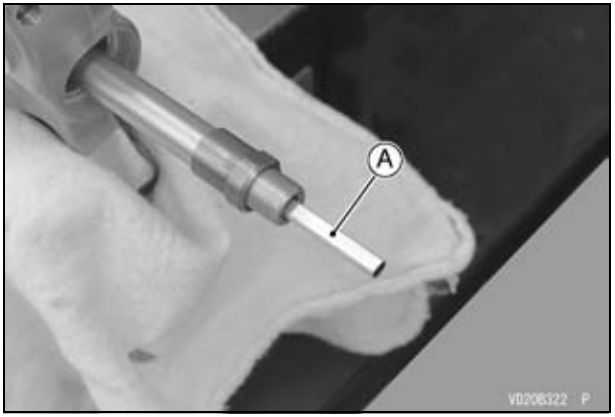


A. Locknut
B. Wrench
C. Adjuster Assembly

NOTICE

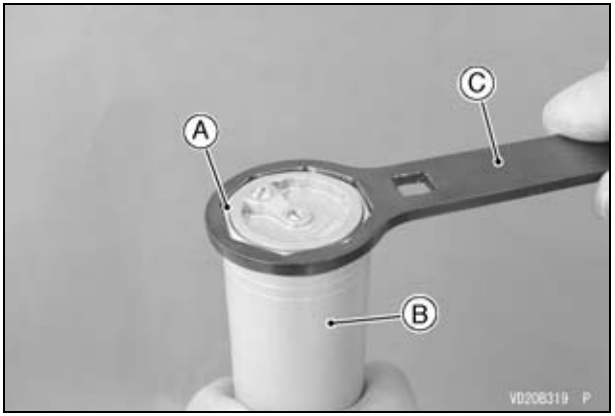
Removing the locknut and pushing the piston rod thread into the cylinder unit will damage the oil seal. Do not remove the locknut from the piston rod.

- Remove the push rod.



A. Push Rod

- Remove the fork leg from the vise.
- Remove the cylinder unit with the top plug wrench, 50 mm (special tool: 57001-1645).

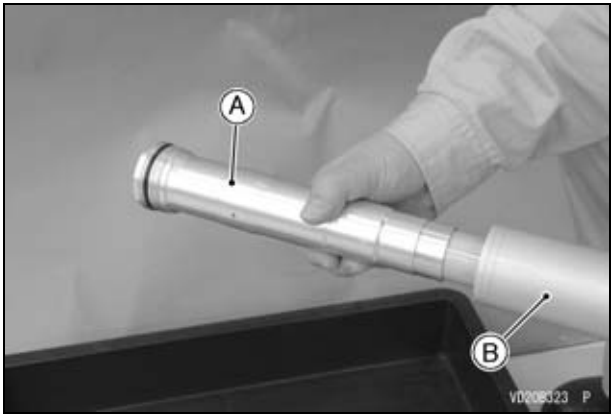


A. Cylinder Unit
B. Outer Tube
C. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)

- Remove the cylinder unit from the outer tube.

NOTICE

Do not touch the piston rod to the outer tube. The piston rod could be damage.

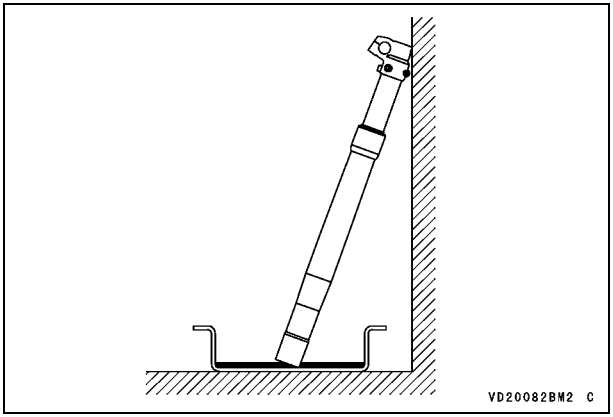


A. Cylinder
B. Outer Tube

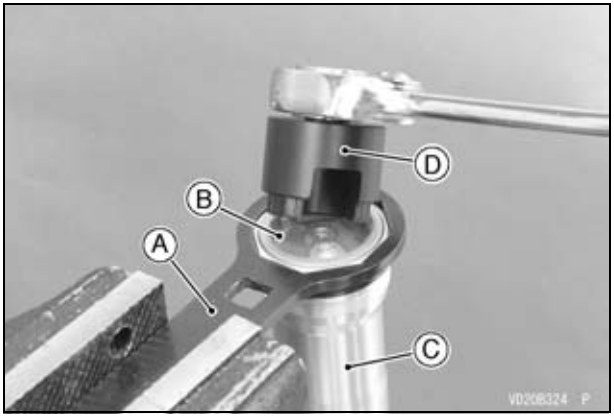
NOTICE

Disassembling the cylinder unit can cause internal damage. Do not disassemble the cylinder unit.

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



- Holding the top plug wrench, 50 mm (special tool: 57001-1645) with a vise, loosen the base valve assembly on the cylinder unit with a top plug wrench, 36 mm (special tool: 57001-1810).



A. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)
B. Base Valve Assembly
C. Cylinder Unit
D. Top Plug Wrench, 36 mm (Special Tool: 57001-1810)

- Remove the base valve assembly from the cylinder unit.

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

A. Base Valve Assembly
B. Cylinder Unit

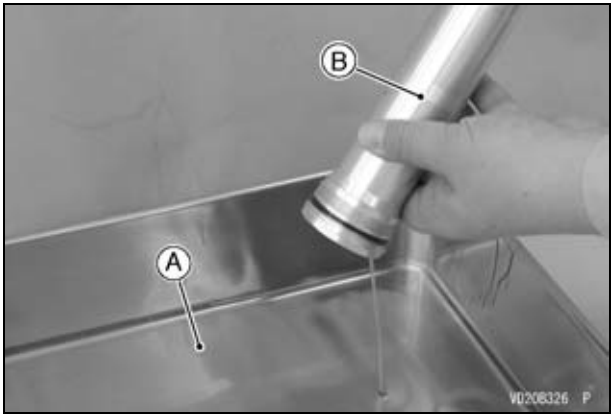
NOTE

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

NOTICE

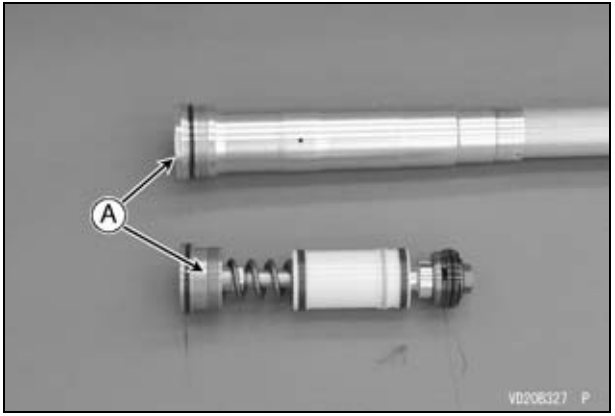
Disassembling the base valve assembly can lead to trouble. Do not disassemble the base valve assembly.

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



A. Fork Oil
B. Cylinder Unit

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

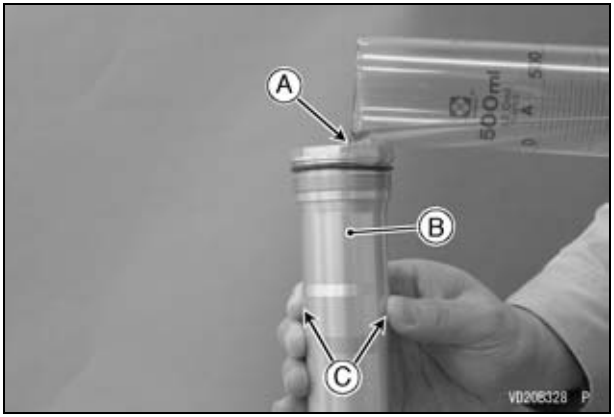


A. Threads

● With the piston rod fully stretched, pour 310 mL (10.5 US oz.) of fork oil.

NOTE

○ *Plug the oil hole on the cylinder unit with finger.*

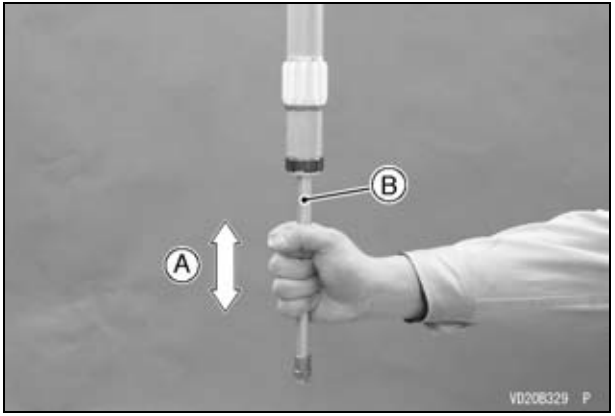


A. Fork Oil
B. Cylinder Unit
C. Oil Holes

Suspension Oil

SS-19 (1 L): P/No. 44091-0009

- Pump the piston rod slowly several times to expel air with plugged the oil hole by finger.



A. Pump
B. Piston Rod

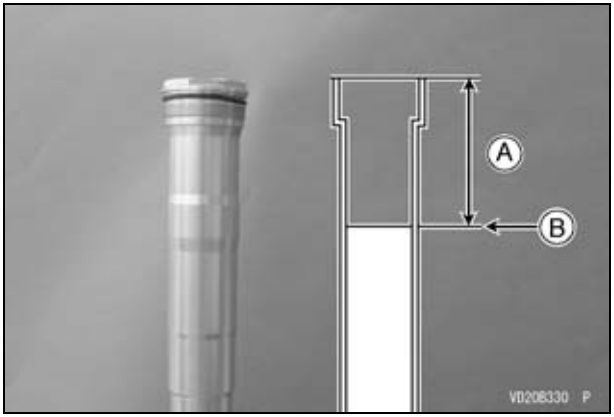
- With the piston rod fully stretched, check the oil level in the cylinder unit.

Oil Level

132 ~ 140 mm (5.20 ~ 5.51 in.)

NOTE

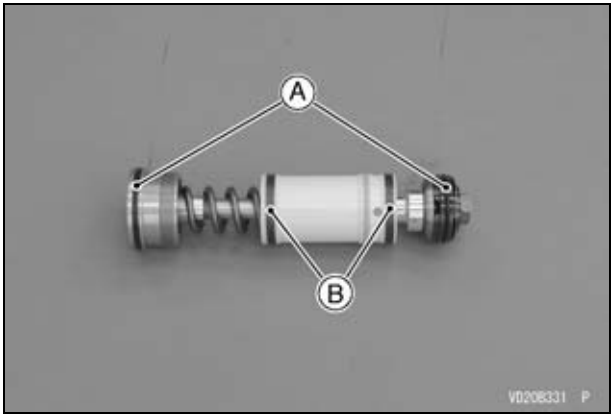
○ *Measure the oil level from the top surface in the cylinder unit using a gauge.*



A. 132 ~ 140 mm (5.20 ~ 5.51 in.)
B. Oil Level

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

NOTICE
Do not damage the bushings when assembling the base valve.

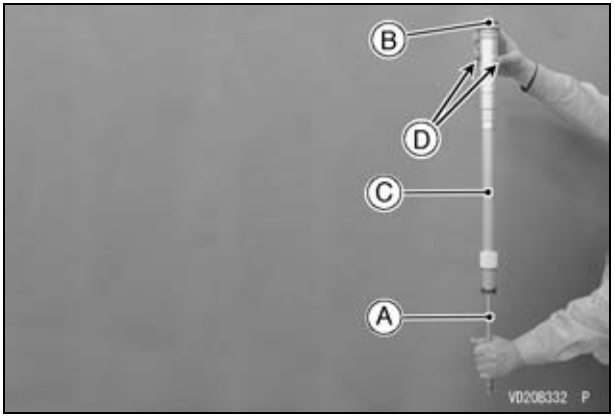


A. O-rings
B. Bushings

- With the piston rod appear about 20 mm (0.79 in.) from fully compressed, gently install the base valve assembly slowly to the cylinder unit.

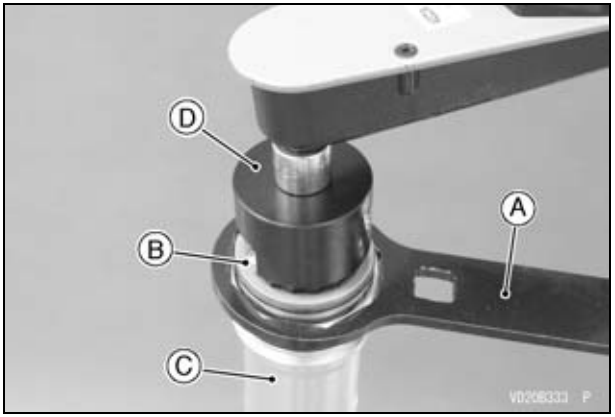
NOTE

○ *Plug the oil hole on the cylinder unit with finger.*
○ *While pulling the piston rod, install the base valve assembly slowly and pushing down it fully.*



A. Piston Rod
B. Base Valve Assembly
C. Cylinder Unit
D. Oil Holes

- Hold the top plug wrench, 50 mm (special tool: 57001-1645) with a vise.
- Holding the cylinder unit with the top plug wrench, 50 mm (special tool: 57001-1645), torque the base valve assembly with a top plug wrench, 36 mm (special tool: 57001-1810).



A. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)
B. Base Valve Assembly
C. Cylinder Unit
D. Top Plug Wrench, 36 mm (Special Tool: 57001-1810)

Tightening Torque

Base Valve Assembly: 30 N·m (3.1 kgf·m, 22 ft·lb)

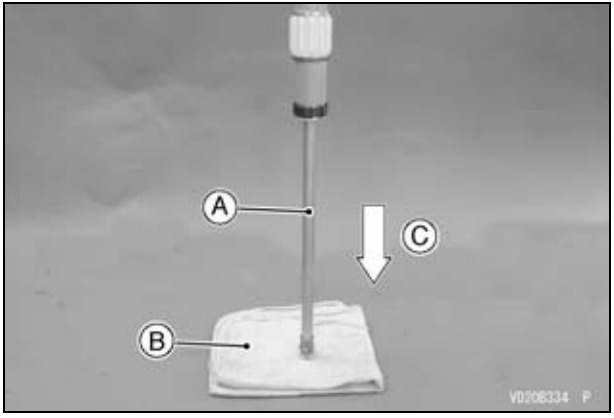
NOTE

○ *Check if the locknut is completely screwed onto the piston rod.*

- Protect the piston rod end with a heavy cloth to prevent piston rod thread damage.
- Hold the cylinder unit at the upright position and slowly pump the piston rod several times about 100 mm (3.94 in.).
- Drain 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 holes of the cylinder unit.



A. Piston Rod
B. Heavy Cloth
C. Pump the piston.

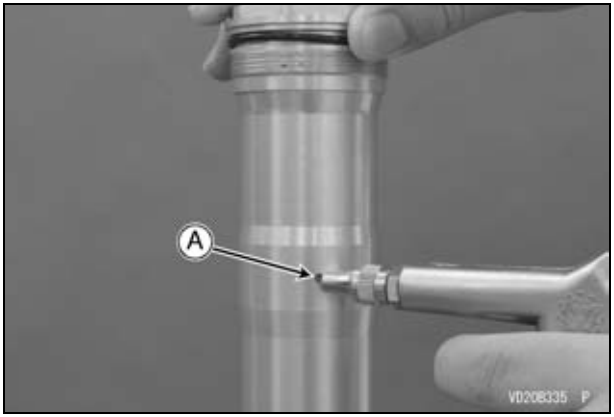
NOTE

○ *Set the compression damping force setting to the softest. Check the piston rod sliding surface for damage. Apply specified fork oil to the piston rod sliding surface.*

- Drain the extra oil from the cylinder unit oil hole.
- Blow out the extra oil from the oil hole of the cylinder unit with the compressed air blow to the oil hole.
- Wipe the oil off completely from the cylinder unit.
- If you cannot use compressed air, remove the air pressure relief screw of the base valve assembly. Up side down the fork damper for more than 10 minutes and drain the oil from the cylinder unit. Reinstall and tighten the air pressure relief screw.

Tightening Torque

Air Pressure Relief Screw: 1.3 N·m (0.13 kgf·m, 12 in·lb)

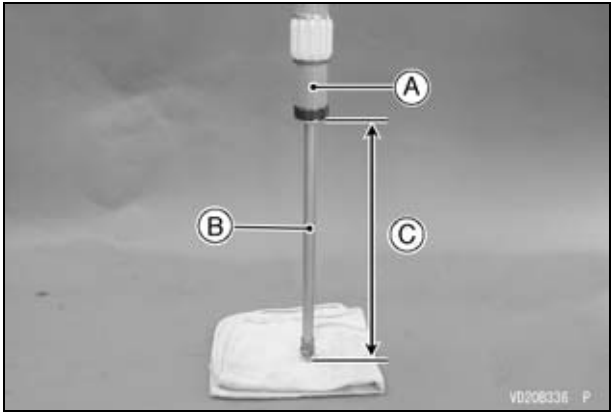


A. Oil Hole

- Protect the piston rod end with a heavy cloth to prevent damage.
- Pump the piston rod to full stroke by pushing down the cylinder unit.
- Check the piston rod for smooth operation.
- If the piston rod operation is not smooth, check the piston rod for bend or damage.
- Hold the cylinder unit on level ground while piston rod is full stroked by your hand.
- Release the piston rod then check the piston rod extend to maximum.
- If the piston rod does not extend to maximum, bleed the air in the cylinder unit again.

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

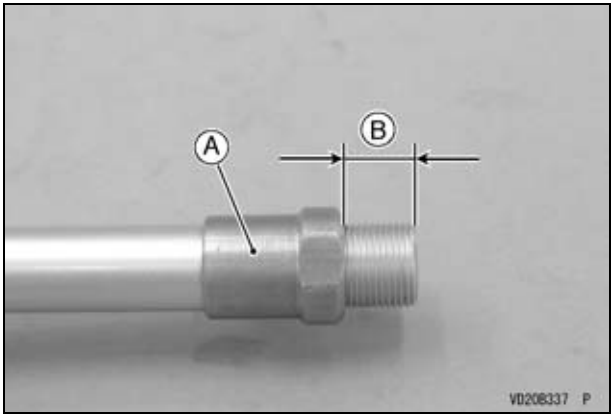
- Wipe the oil off completely from the cylinder unit.
- Compress the piston rod to 200 ~ 250 mm (7.87 ~ 9.84 in.) and hold the cylinder unit upright position for 10 minutes.



A. Cylinder Unit
B. Piston Rod
C. 200 ~ 250 mm (7.87 ~ 9.84 in.)

- There should be no oil leak from the cylinder unit.
- If oil leaks from the cylinder unit, replace the cylinder unit assembly.

- Hold the cylinder unit on level ground and release the piston rod then check the piston rod extend to maximum.
- Tighten the locknut fully and measure 10 ~ 12 mm (0.39 ~ 0.47 in.).

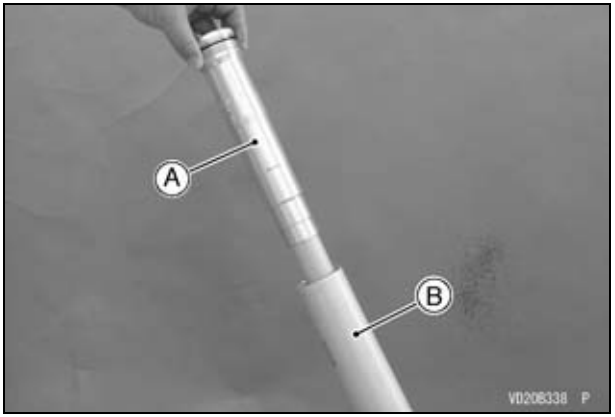


A. Locknut
B. 10 ~ 12 mm (0.39 ~ 0.47 in.)

- Completely wipe off the fork oil from the cylinder unit.
- Insert the cylinder unit into the fork.

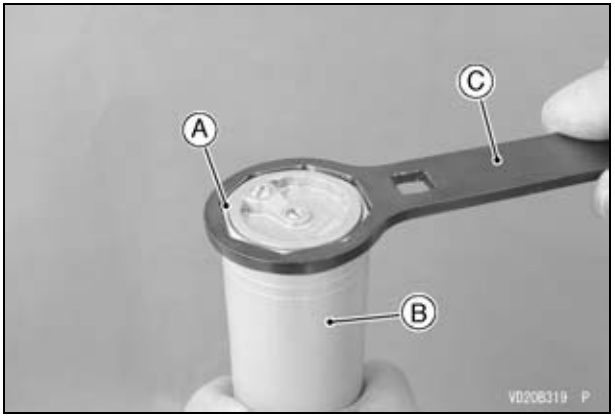
NOTICE

Do not touch the piston rod to the outer tube. The piston rod could be damage.



A. Cylinder Unit
B. Outer Tube

- Temporarily tighten the cylinder unit fully with the top plug wrench, 50 mm (special tool: 57001-1645).



A. Cylinder Unit
B. Outer Tube
C. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)

- Hold the axle holder with a vise.

NOTE

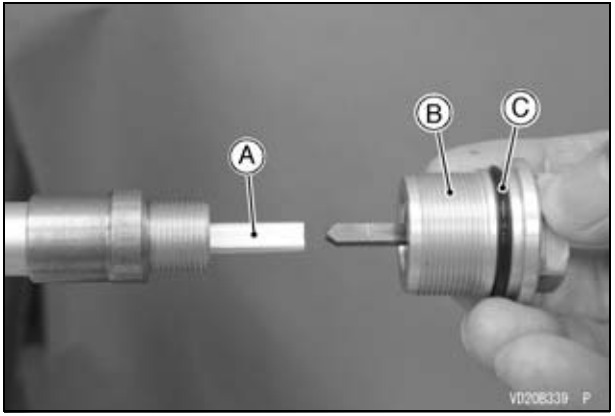
○ *Protect the axle holder with a heavy cloth when using a vise.*

⚠ WARNING

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

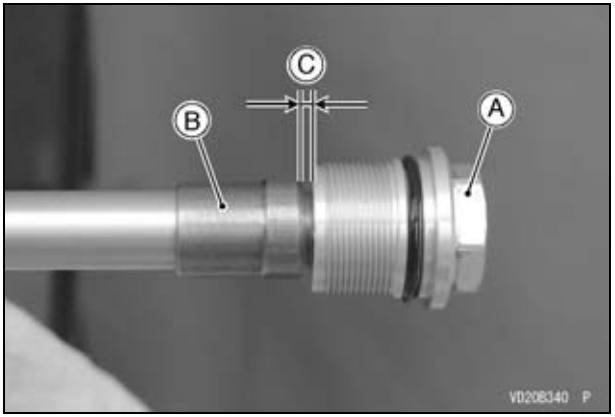
- Insert the push rod into the piston rod.
- Replace the O-ring on the adjuster assembly with a new one and apply teflon grease to the O-ring.

- Install the adjuster assembly to the push rod.



A. Push Rod
B. Adjuster Assembly
C. O-ring

- Slowly turn the adjuster assembly clockwise until resistance is felt and check the clearance between the locknut and adjuster assembly for more than 1 mm (0.04 in.).



A. Adjuster Assembly
B. Locknut
C. More Than 1 mm (0.04 in.)

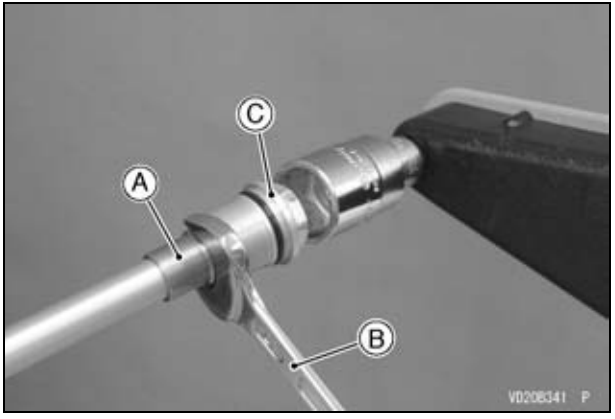
- Turn the locknut counterclockwise until it contacts with the adjuster assembly.
- With the locknut held immovable using a wrench, tighten the adjuster assembly to the specified torque.

Tightening Torque

Adjuster Assembly (to Piston Rod): 22 N·m (2.2 kgf·m, 16 ft·lb)

NOTICE

When tightening the locknut, the threads of the axle holder do not touch the piston rod. If the piston rod is scratched, it is possible to the damage in the cylinder unit.

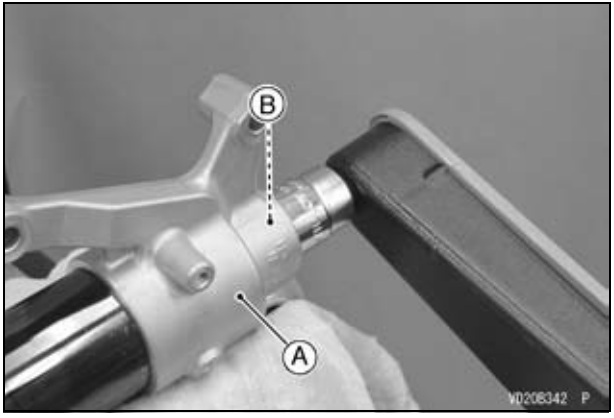


A. Locknut
B. Wrench
C. Adjuster Assembly

- Apply a non-permanent locking agent to the threads of the adjuster assembly and tighten the adjuster assembly into the front fork.

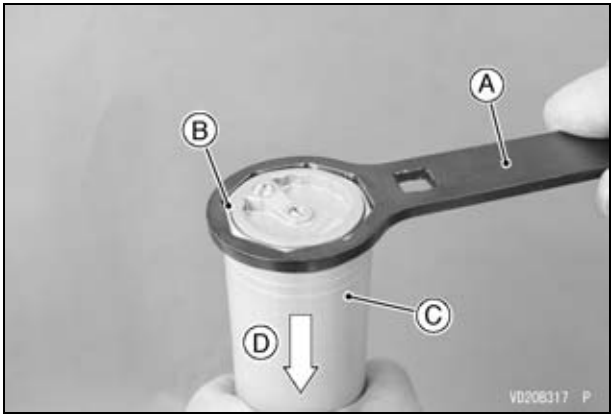
Tightening Torque

Adjuster Assembly (to Axle Holder): 69 N·m (7.0 kgf·m, 51 ft·lb)



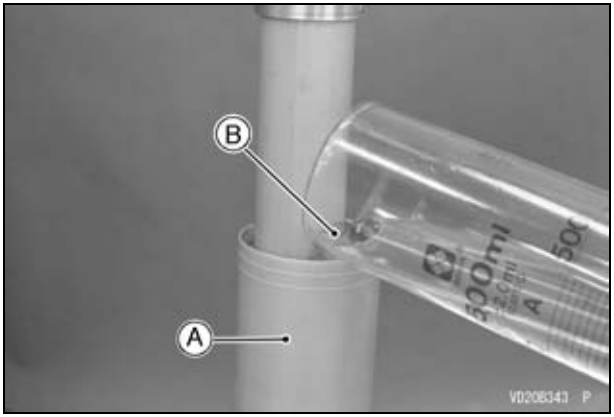
A. Axle Holder Part
B. Adjuster Assembly

- Using the top plug wrench, 50 mm (special tool: 57001-1645), remove the cylinder unit from the outer tube and slowly slide down the outer tube.



A. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)
B. Cylinder Unit
C. Outer Tube
D. Slide Down

- Pour the specified amount of fork oil into the outer tube.



A. Outer Tube
B. Fork Oil

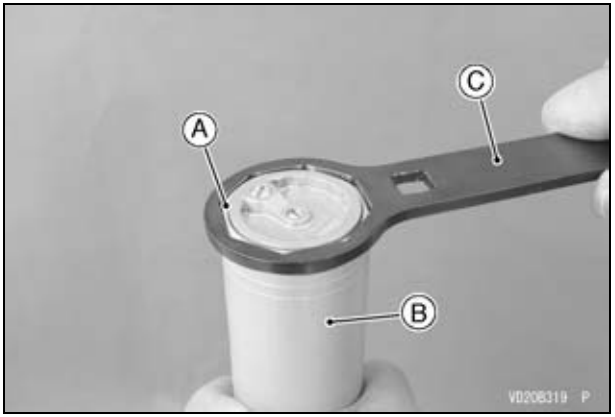
Suspension Oil

SS-19 (1 L): P/No. 44091-0009

Standard Fork Oil Amount

Fork Oil Amount	340 mL (11.5 US oz.)
Adjustable Range	300 ~ 398 mL (10.1 ~ 13.5 US oz.)

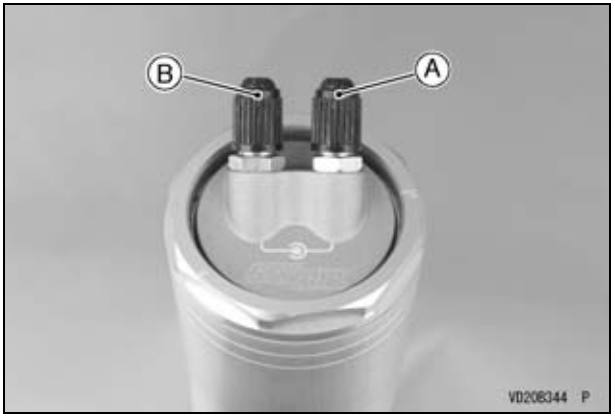
- Replace the O-ring on the cylinder unit with a new one and apply teflon grease oil to the O-ring.
- Raise the outer tube and temporarily install the left front fork cylinder unit to the outer tube using the top plug wrench, 50 mm (special tool: 57001 -1645).



A. Cylinder Unit
B. Outer Tube
C. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)

Right Front Fork

● Remove the air valve caps.



A. Air Valve Cap (Outer)
B. Air Valve Cap (Inner)

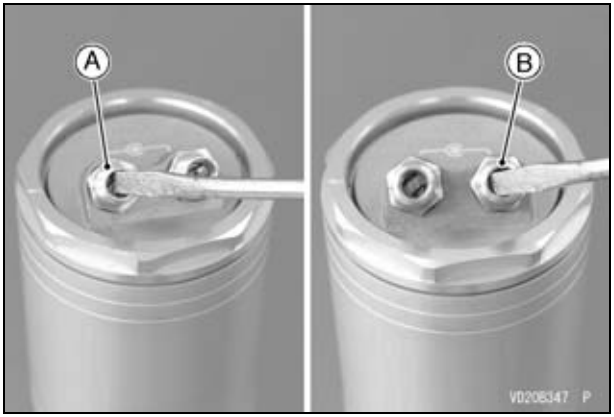
A. Air Valve Cap (Balance)

- Set the front fork upright state.
- Bleed air by pushing down the air valves in the order of balance chamber, outer chamber and inner chamber.

NOTE

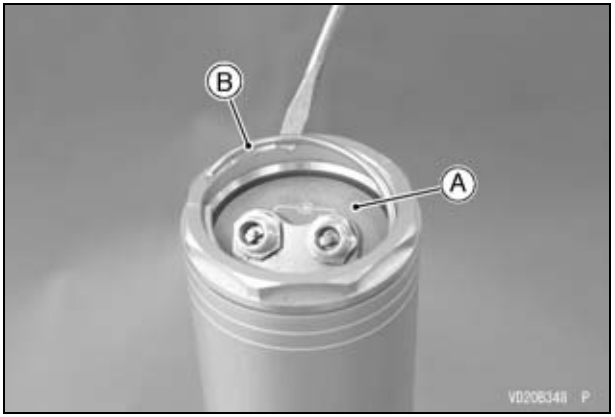
○ *First, bleed air in a balance chamber.*
○ *The oil may spout from the air valve.*

A. Air Valve (Balance)



A. Air Valve (Outer)
B. Air Valve (Inner)

- Press the chamber cap and remove the circlip.

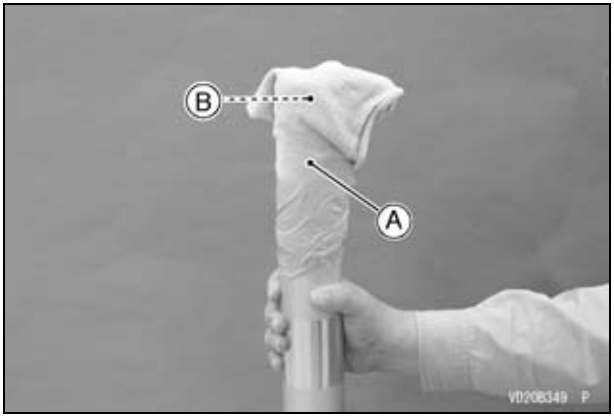


A. Chamber Cap
B. Circlip

- Cover the chamber cap with the clean cloth, and then hold the clean cloth to the outer tube with the tape.
- Pumping the outer tube several times to remove the chamber cap.

⚠ WARNING

Pressure within the chamber can push the chamber cap out with great force, creating the potential for injury. To avoid injury, point the chamber cap away from your body when pumping the outer tube and cover it with a cloth as shown.

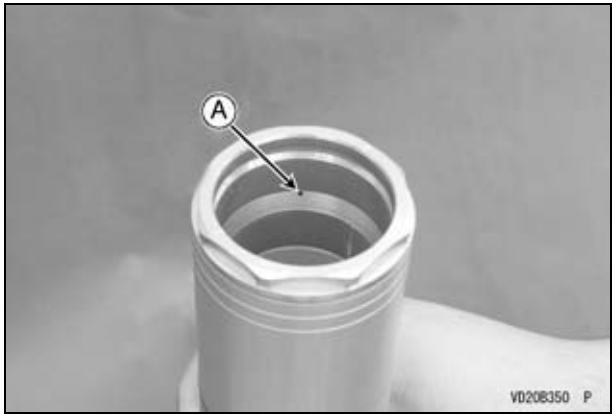


A. Clean Cloth
B. Chamber Cap

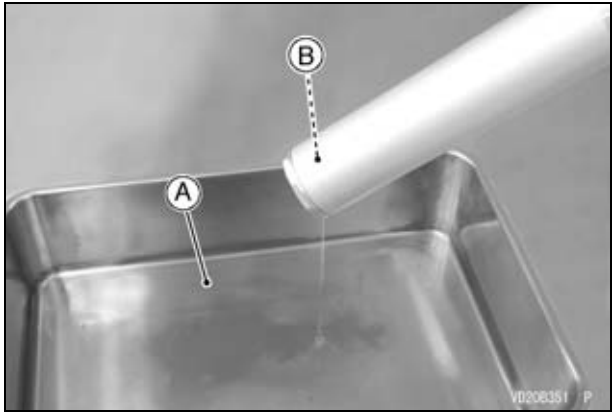
- Place the a drain pan under the front fork and drain fork oil so that the oil hole positions upward for the oil spout from the oil hole.

NOTE

○ *Pump the outer tube several times to drain the fork oil.*

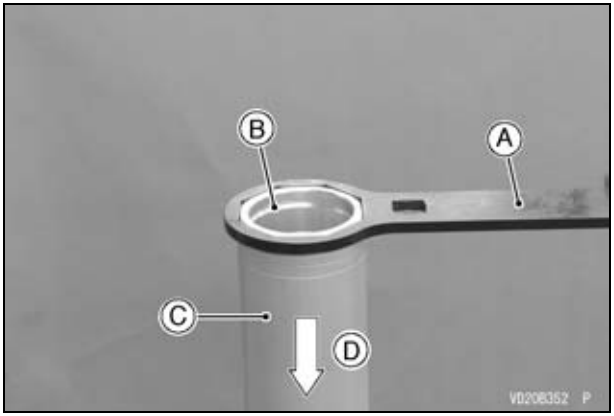


A. Oil Hole



A. Fork Oil
B. Oil Hole

- Using the top plug wrench, 50 mm (Special tool: 57001-1645), remove the cylinder unit from the outer tube and slowly slide down the outer tube.

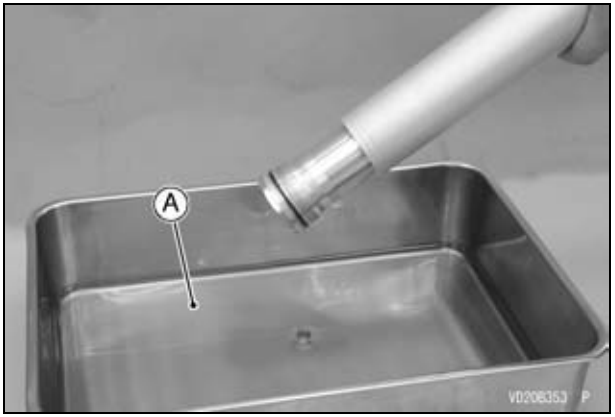


A. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)
B. Cylinder Unit
C. Outer Tube
D. Slide Down

- Place the drain pan under the front fork and drain fork oil.

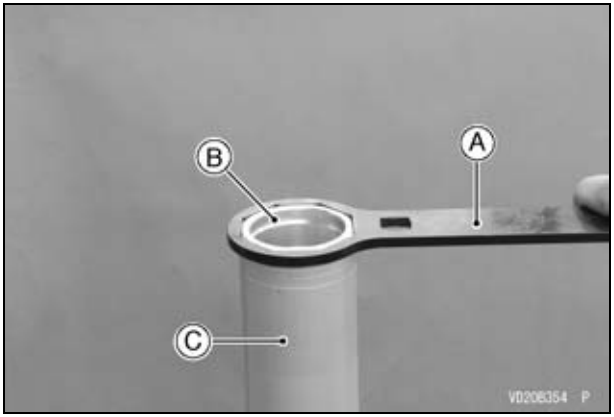
NOTE

○ *Pump the outer tube several times to drain the fork oil.*



A. Fork Oil

- Temporarily install the cylinder unit to the outer tube using the top plug wrench, 50 mm (Special tool: 57001-1645).



A. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)
B. Cylinder Unit
C. Outer Tube

- Hold the axle holder with a vise, remove the plug bolt.

⚠ WARNING

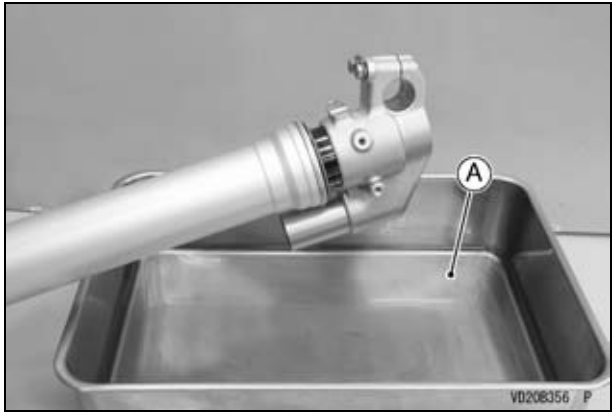
Clamping the axle holder too tight can damage it which will affect riding stability. Do not clamp the axle holder too tight.

NOTE

○ *Protect the axle holder with a heavy cloth when using a vice.*

A. Plug Bolt

- Place the drain pan under the front fork and drain fork oil.



A. Fork Oil

- Hold the axle holder with a vise.

⚠ WARNING

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 heavy cloth when using a vice.*

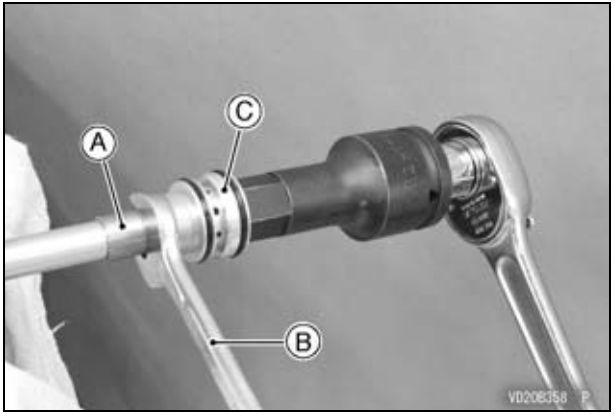
- Loosen the sealing bolt completely.

NOTE

○ *When removing the sealing bolt, do not force to loosen it at once using an impact wrench.*

A. Sealing Bolt

- Compress the outer tube by hand and remove the sealing bolt from the axle holder part so that the locknut appears about 20 ~ 30 mm (0.79 ~ 0.12 in.).
- Hold the locknut with a wrench and remove the sealing bolt.

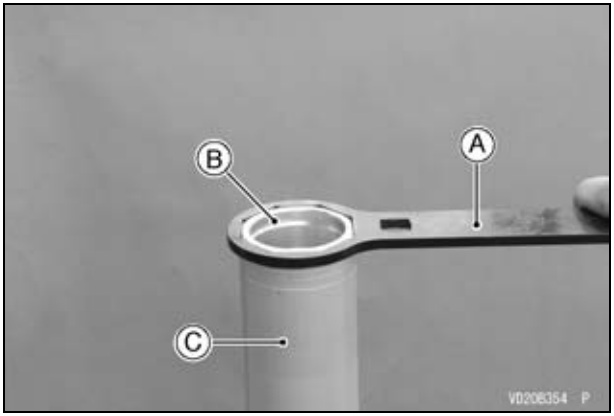


A. Locknut
B. Wrench
C. Sealing Bolt

NOTICE

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

- Remove the fork leg with a vise.
- Remove the cylinder unit with the top plug wrench, 50 mm (special tool: 57001-1645).



A. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)
B. Cylinder Unit
C. Outer Tube

- Remove the cylinder unit from the outer tube.

NOTICE

Do not touch the piston rod to the outer tube. The piston rod could be damage.

A. Cylinder Unit
B. Outer Tube

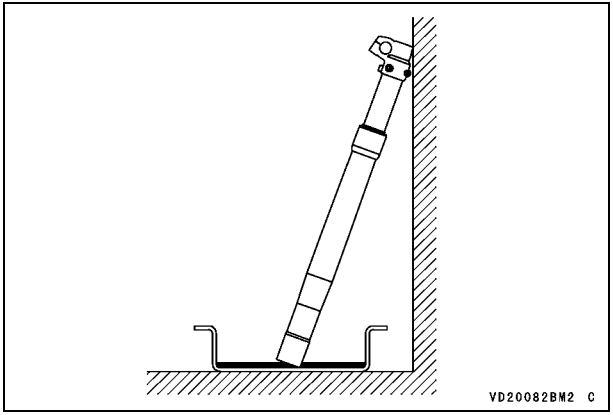
NOTICE
Disassembling the cylinder unit can cause internal damage. Do not disassemble the cylinder unit.

- Drain the fork oil from the cylinder unit by pumping the piston rod more than 10 times.

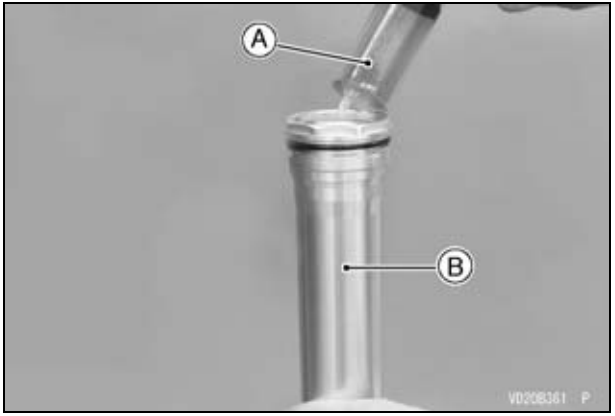
NOTICE
Service carefully because oil flies out from the oil hole of the cylinder unit.

A. Fork Oil

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



- With the piston rod fully stretched, pour the fork oil of 100 mL (3.38 US oz.).

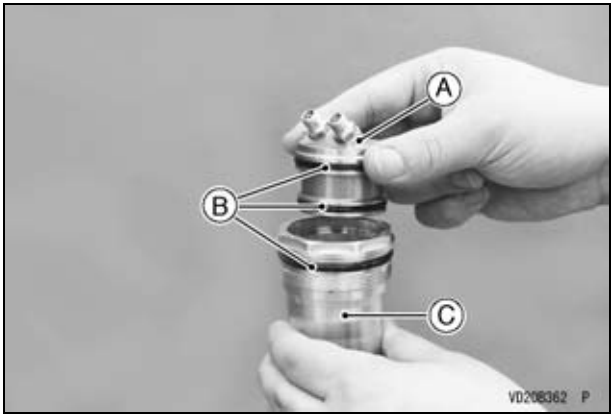


A. Fork Oil
B. Cylinder Unit

Recommended Fork Oil

SS-19 (1 L): P/No. 44091-0009

- Replace the O-rings on the chamber cap and cylinder unit with new ones.
- Apply teflon grease to the O-rings on the chamber cap.
- Install the chamber cap to the cylinder unit.

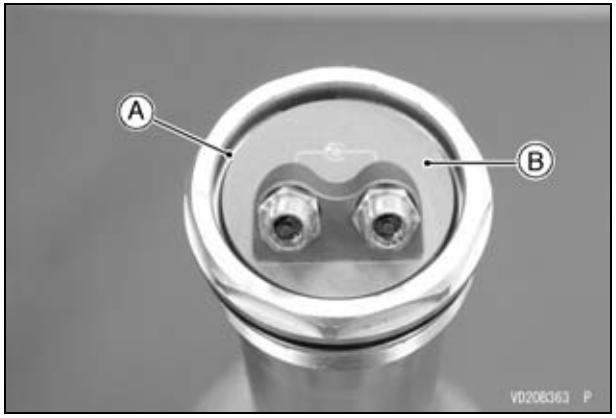


A. Chamber Cap
B. O-rings
C. Cylinder Unit

- Replace the circlip with a new one and install the circlip in the groove in the cylinder unit.

NOTICE
If the circlip is not a certain fit in the groove in the cylinder unit, the chamber cap may come out of the front fork when injecting the air pressure or riding the motorcycle.

- Pumping the cylinder unit and fit the chamber cap to the circlip.

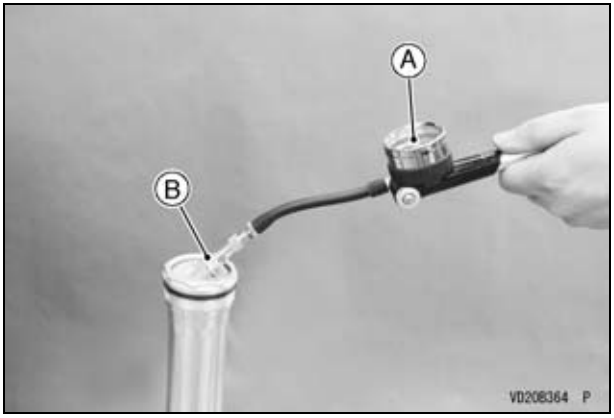


A. Circlip
B. Chamber Cap

- With the piston rod fully stretched, inject the air of specified pressure to the inner chamber by using the suitable air pump.

⚠ WARNING

Rapid pressurization of the cylinder unit can damage it and eject the piston rod with great force, creating the potential for injury. To avoid injury and damaging the piston rod, do not pressurize the cylinder unit quickly with compressed air; use a manually operated air pump.



A. Air Pump
B. Air Valve (Inner)

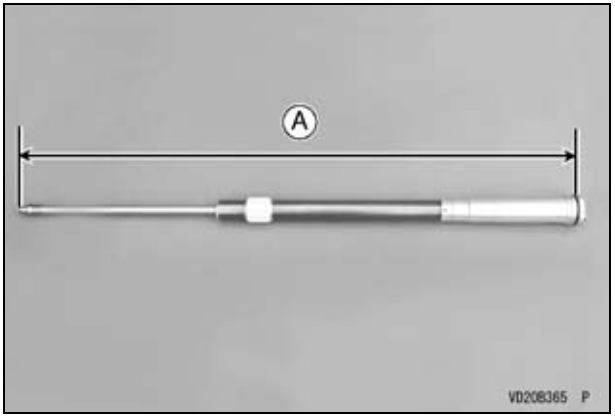
Inner Chamber Air Pressure

Air Pressure (Standard Setting)	1 000 kPa (10.20 kgf/cm², 145 psi)
Adjustable Range	600 ~ 1 300 kPa (6.11 ~ 13.26 kgf/cm², 87.0 ~ 188.5 psi)

- Measure the cylinder unit length.

Standard Length	950.5 ~ 952.5 mm (37.42 ~ 37.50 in.)

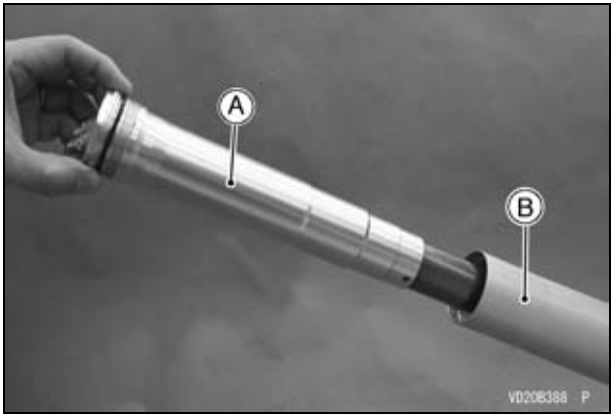
- If it is not within the standard, replace the cylinder unit.



A. Length

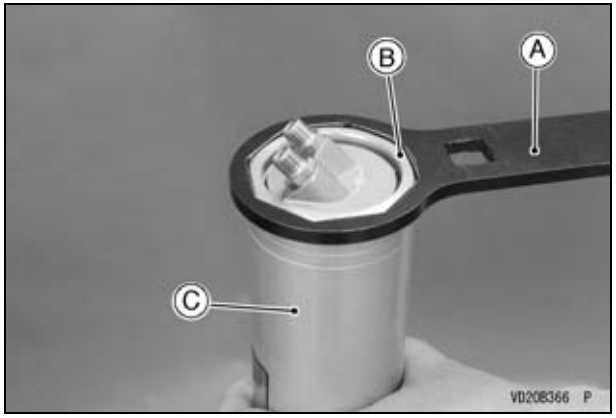
- Insert the cylinder unit to the outer tube.

NOTICE
Do not touch the piston rod to the outer tube. The piston rod could be damage.



A. Cylinder Unit
B. Outer Tube

- Temporarily install the cylinder unit to the outer tube using the top plug wrench, 50 mm (Special tool: 57001-1645).



A. Top Plug Wrench
B. Cylinder Unit
C. Outer Tube

- Hold the axle holder with a vise.

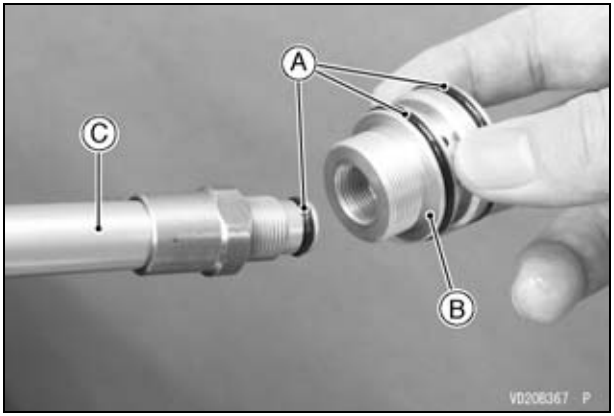
⚠ WARNING

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

NOTE

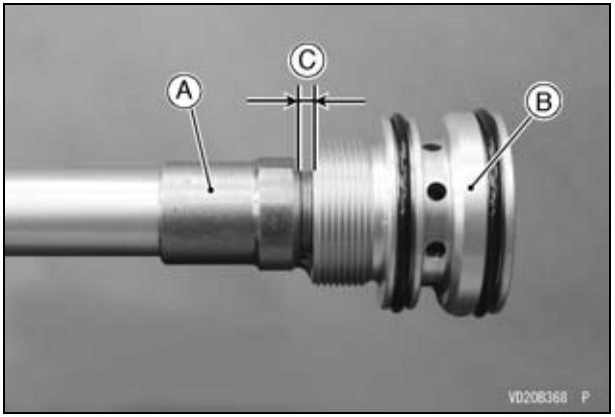
○ *Protect the axle holder with a heavy cloth when using a vice.*

- Replace the O-rings on the sealing bolt and piston rod with new ones and apply teflon grease to the O-rings.



A. O-rings
B. Sealing Bolt
C. Piston Rod

- Tighten the lock nut fully.
- Slowly turn the sealing bolt clockwise until resistance is felt and check the clearance between the locknut and sealing bolt for more than 1.5 mm (0.059 in.).



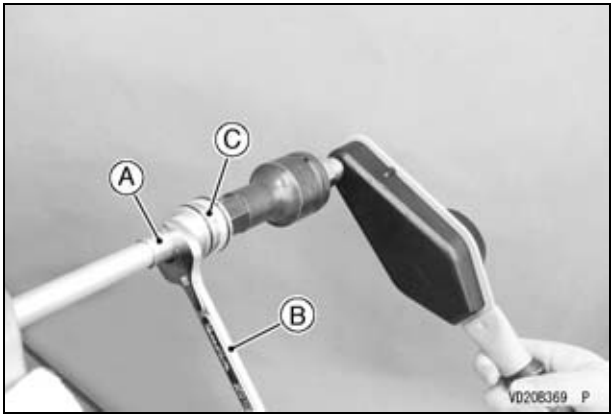
A. Locknut
B. Sealing Bolt
C. More than 1.5 mm (0.059 in.)

- Turn the locknut counterclockwise until it contacts with the sealing bolt.
- With the locknut held immovable using a wrench, tighten the sealing bolt to the specified torque.

Tightening Torque

Sealing Bolt (to Piston Rod): 28 N·m (2.9 kgf·m, 21 ft·lb)

NOTICE
When tightening the locknut, the threads of the axle holder do not touch the piston rod. If the piston rod is scratched, it is possible to the damage in the cylinder unit.

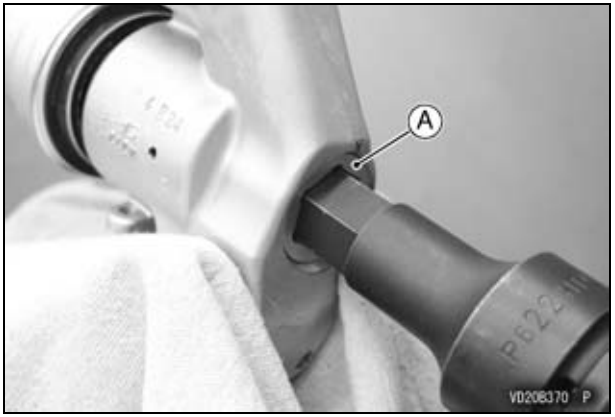


A. Locknut
B. Wrench
C. Sealing Bolt

- Apply a non-permanent locking agent to the threads of the sealing bolt and tighten the sealing bolt into the front fork.

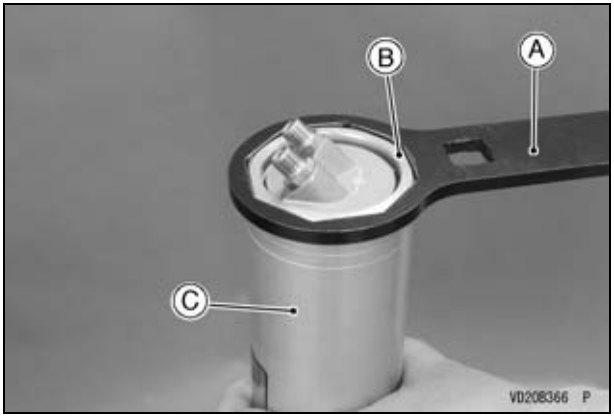
Tightening Torque

Sealing Bolt (to Axle Holder): 69 N·m (7.0 kgf·m, 51 ft·lb)



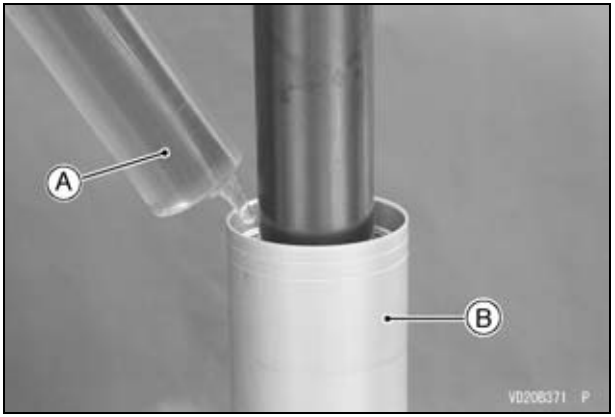
A. Sealing Bolt

- Remove the cylinder unit with the top plug wrench, 50 mm (special tool: 57001-1645).



A. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)
B. Cylinder Unit
C. Outer Tube

- Pour the fork oil of 300 mL (10.1 US oz.) into the outer tube.

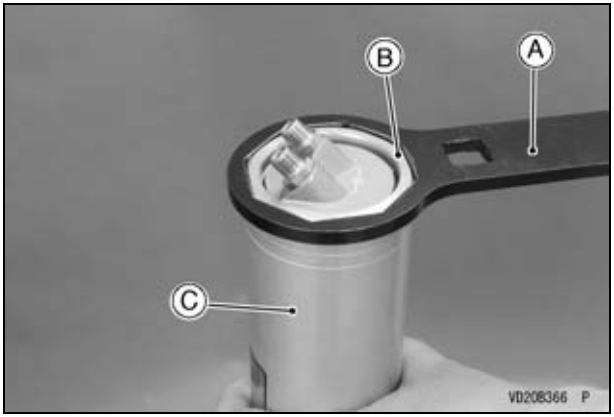


A. Fork Oil
B. Outer Tube

Suspension Oil

SS-19 (1 L): P/No. 44091-0009

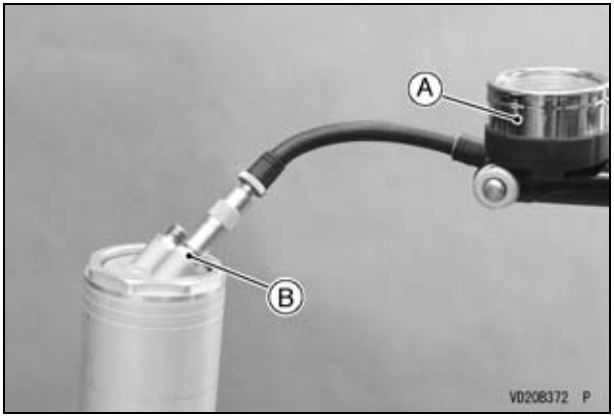
- Temporarily install the cylinder unit to the outer tube using the top plug wrench, 50 mm (Special tool: 57001-1645).



A. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)
B. Cylinder Unit
C. Outer Tube

- Inject the air of specified pressure to the outer chamber by using a suitable air pump.

NOTICE
Rapid pressurization of the front fork can damage it. To avoid damaging the front fork, do not pressurize the front fork quickly with compressed air; use a manually operated air pump.

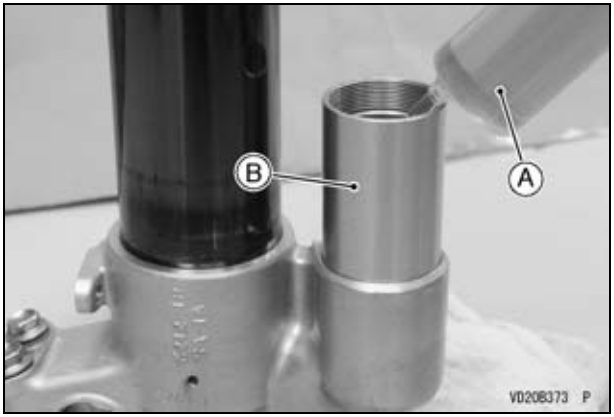


A. Air Pump
B. Air Valve (Outer)

Outer Chamber Air Pressure

Air Pressure (Standard Setting)	50 kPa (0.51 kgf/cm², 7.3 psi)
Adjustable Range	0 ~ 130 kPa (0 ~ 1.33 kgf/cm², 0 ~ 18.9 psi)

- Pour the fork oil of 10 mL (0.34 US oz.) into the balance chamber.



A. Fork Oil
B. Balance Chamber

Suspension Oil

SS-19 (1 L): P/No. 44091-0009

- Hold the axle holder with a vise, remove the plug bolt.

⚠ WARNING

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

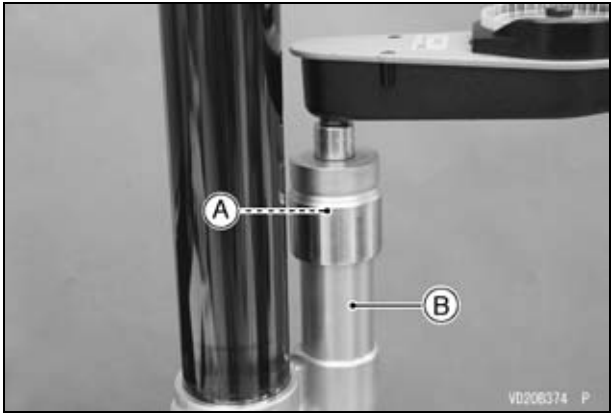
NOTE

○ *Protect the axle holder with a heavy cloth when using a vice.*

● Tighten the plug bolt to the specified torque.

Tightening Torque

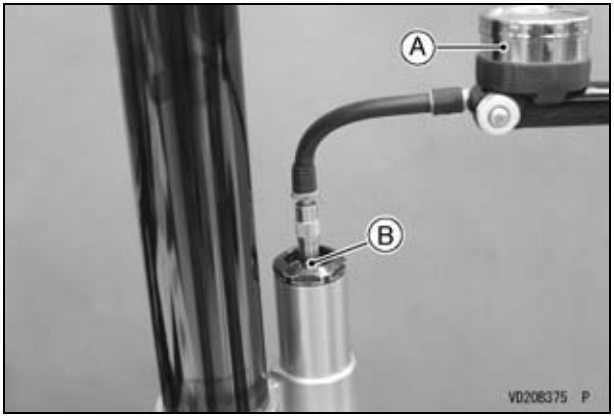
Plug Bolt: 45 N·m (4.6 kgf·m, 33 ft·lb)



A. Plug Bolt
B. Balance Chamber

● Inject the air of specified pressure to the balance chamber by using the suitable air pump.

NOTICE
Rapid pressurization of the front fork can damage it. To avoid damaging the front fork, do not pressurize the front fork quickly with compressed air; use a manually operated air pump.



A. Air Pump
B. Air Valve (Balance)

Balance Chamber Air Pressure

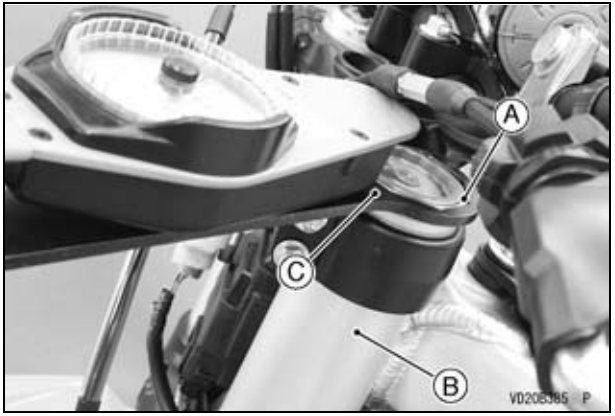
Air Pressure (Standard Setting)	800 kPa (8.16 kgf/cm², 116 psi)
Adjustable Range	530 ~ 1 400 kPa (5.40 ~ 14.28 kgf/cm², 76.9 ~ 203 psi)

● Install the Air valve cap.
● Confirm the stroke of the front fork.
● Install the front forks to the motorcycle.
● Tighten the front fork clamp bolts (lower) to the specified torque.

Tightening Torque

Front Fork Clamp Bolts (Lower): 20 N·m (2.0 kgf·m, 15 ft·lb)

● Tighten the front fork top plug using the top plug wrench, 50 mm (special tool: 57001-1645) to the specified torque.



A. Cylinder Unit
B. Outer Tube
C. Top Plug Wrench, 50 mm (Special Tool: 57001-1645)

Tightening Torque

Cylinder Unit: 76 N·m (7.7 kgf·m, 56 ft·lb)

NOTE

○ *The cylinder unit torque is specified to 76 N·m (7.7 kgf·m, 56 ft·lb) however, when you use the top plug wrench, 50 mm (special tool: 57001-1645), reduce the torque to 90% of the specified value [67 N·m (6.8 kgf·m, 49 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 [67 N·m (6.8 kgf·m, 49 ft·lb)] is applicable when you use a torque wrench whose length gives leverage of approximately 310 mm (12.2 in.) between the grip point to the center of the coupling square.*

○ *To obtain the correct tightening torque with your torque wrench, you need to calculate as follows.*

Formula:
a × b ÷ (b + c) = d

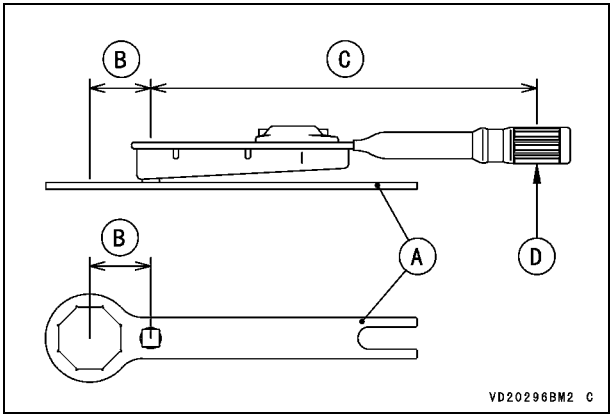
[a] Specified torque
[b] Length from center of square hole to grip point
[c] Offset = 44 mm
[d] Tightening torque

For an example:
76 N·m × 310 ÷ (310 + 44) = 67 N·m

● Tighten the front fork clamp (upper) bolts to the specified torque.

Tightening Torque

Front Fork Clamp Bolts (Upper): 20 N·m (2.0 kgf·m, 15 ft·lb)



A. Top Plug Wrench
B. Distance
C. Torque Wrench Length
D. Grip Point

- Install the brake caliper to the fork leg, and tighten the brake caliper bolts to the specified torque.

Tightening Torque

Brake Caliper Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Take out wood wedge between the disc brake pads.
- Apply high-temperature grease to the oil seals of the wheel.
- Install the collars on the left and right side of the hub.
- Put the front wheel assembly between the fork legs, and insert the front brake disc into the front brake pads.
- Insert the front axle from the right side of the motorcycle.
- Tighten the front axle nut to the specified torque.

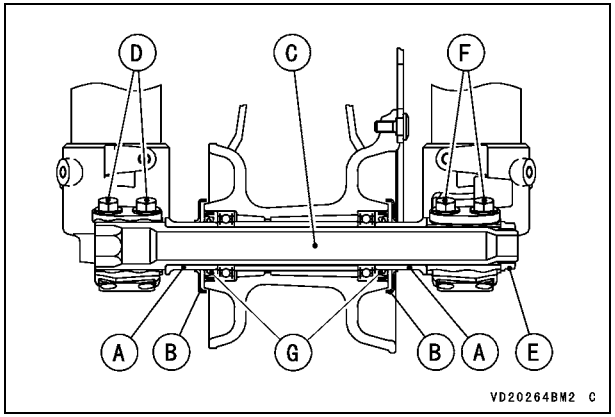
Tightening Torque

Front Axle Nut: 78 N·m (8.0 kgf·m, 58 ft·lb)

- Tighten the left front axle clamp bolts to the specified torque.

Tightening Torque

Left Front Axle Clamp Bolts: 23 N·m (2.3 kgf·m, 17 ft·lb)



A. Collars
B. Caps
C. Axle
D. Right Front Axle Clamp Bolts
E. Axle Nut
F. Left Front Axle Clamp Bolts
G. Oil Seal

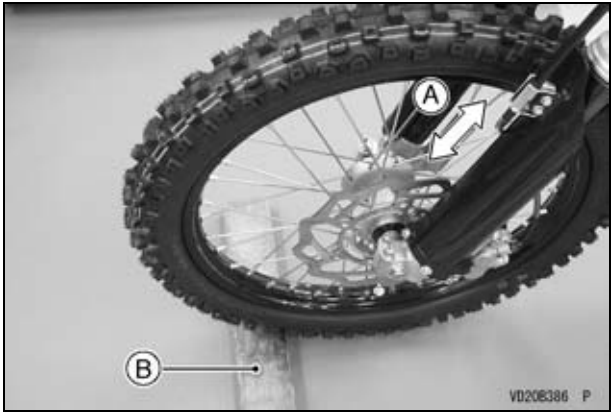
NOTE

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

- Remove the jack and attachment.
- 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

○ *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.

Tightening Torque

Right Front Axle Clamp Bolts: 23 N·m (2.3 kgf·m, 17 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.

⚠ WARNING

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.

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 (0.39 in.) steps.

NOTICE

The right and left fork tubes must be adjusted evenly.

A. Standard Fork Height

Standard Fork Height

5 mm (0.2 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.

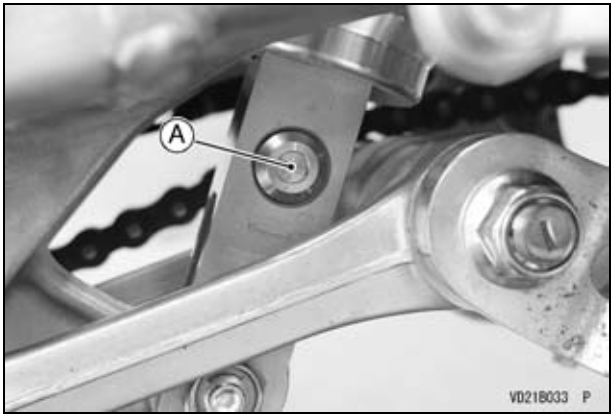
- Pump the seat down and up by 4 or 5 times, and inspect the smooth stroke.
- If it does not smoothly or noise is found, inspect the oil leak and rear shock absorber mounting.
- Visually inspect the rear shock absorber for oil leakage.
- If necessary, repair or replace by an authorized Kawasaki dealer.

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

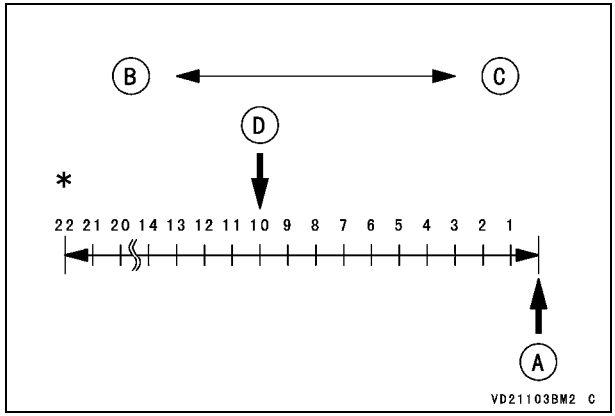
To adjust the rear shock absorber rebound damping, turn the rebound damping adjuster at the bottom of the rear shock absorber with a standard tip screwdriver.



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

10 clicks*

*: Counterclockwise from the fully seated position

NOTICE

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

NOTE

○ *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.*

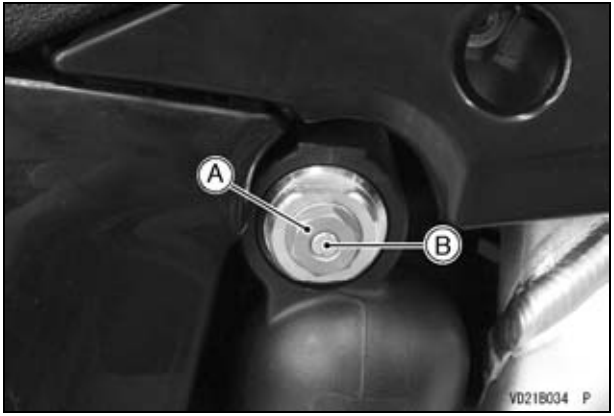
Compression Damping Adjustment (Gas Reservoir)

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 standard tip screwdriver.

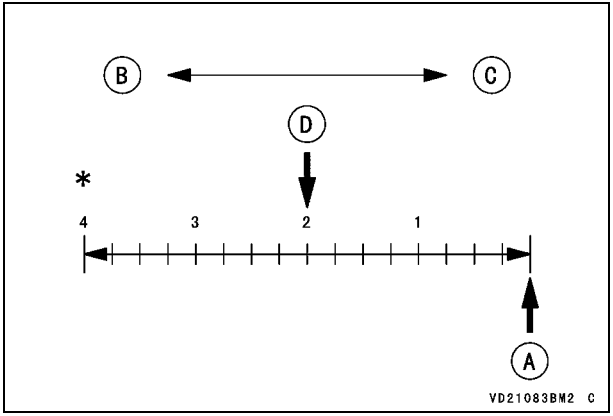
If the damping feels too soft or too stiff, adjust it in accordance with the following table.



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

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

High Speed Compression Damping Adjuster Settings



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

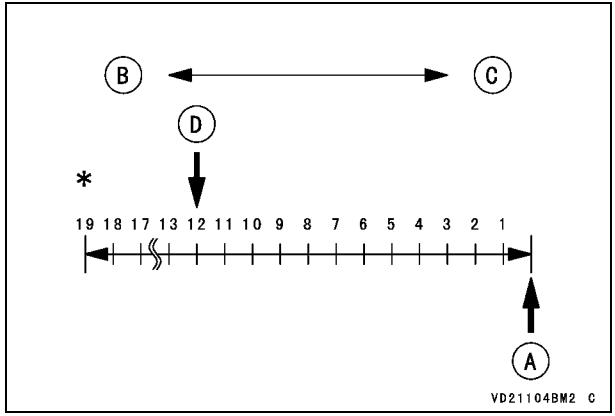
*: Number of turns counterclockwise usable range 4 turns or more.

Standard High Speed Compression Damping Adjuster Setting

2 turns out*

*: Counterclockwise from the fully seated position

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 19 clicks or more.

Standard Low Speed Compression Damping Adjuster Setting

12 clicks*

*: Counterclockwise from the fully seated position

NOTICE
Do not force the compression damping force adjuster beyond the fully seated position, or the adjusting mechanism may be damaged.

NOTE

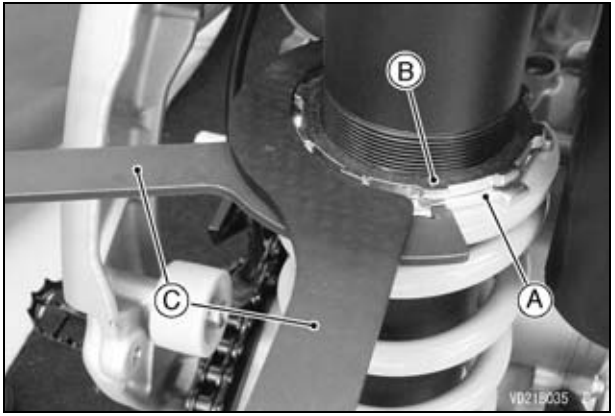
○ *Adjustment of the compression damping adjuster for the rear suspension will slightly affect the rebound damping force. Always make any damping adjustments in small steps and test their effects before using them in competition.*

Spring Preload Adjustment

● Remove the rear frame with air cleaner housing (see Throttle Body Assy section).

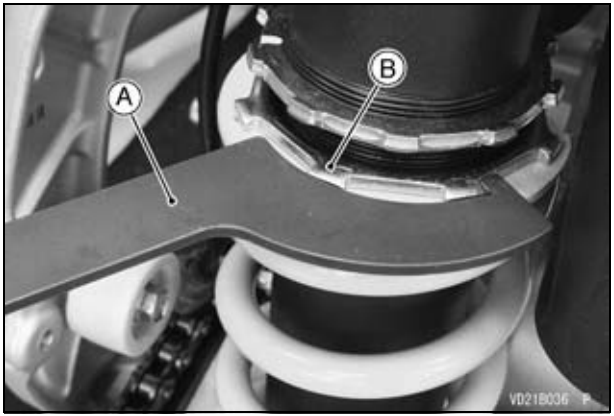
NOTICE
If the clamp is not removed from the air cleaner housing, the rear shock absorber spring may be damaged.

- Raise the rear wheel off the ground using a jack (special tool: 57001-1238) and attachment (special tool: 57001-1608).
- Using the hook wrenches (special tools: 57001 -1101, 1539), loosen the locknut on the rear shock absorber.



A. Spring Preload Adjusting Nut
B. Locknut
C. Hook Wrenches (Special Tools: 57001-1101, 1539)

- Using the hook wrench (special tool: 57001 -1539), turn the spring preload adjusting nut as required. Turning the adjusting nut down increases the spring preload.

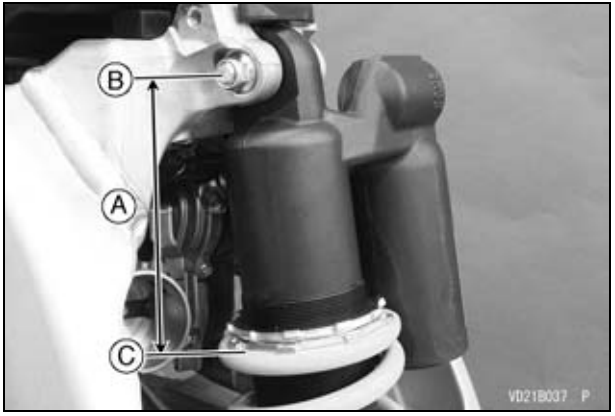


A. Hook Wrench (Special Tool: 57001-1539)
B. Spring Preload Adjusting Nut

- The standard adjusting nut position from the center of the upper rear shock absorber pivot point is 125.4 mm (4.937 in.).
- The adjustable range is as shown in the table below.

Rear Shock Absorber Spring	Adjustable Range
K = 49 N/mm (K = 5.0 kgf/mm)	125.8 ~ 135.8 mm (4.953 ~ 5.346 in.)
K = 51 N/mm (K = 5.2 kgf/mm)	125.8 ~ 133.8 mm (4.953 ~ 5.268 in.)
K = 53 N/mm* (K = 5.4 kgf/mm)	124.8 ~ 139.5 mm (4.913 ~ 5.492 in.)
K = 55 N/mm (K = 5.6 kgf/mm)	125.8 ~ 139.6 mm (4.953 ~ 5.496 in.)

*: Standard



A. Adjusting Nut Position
B. Center of Upper Rear Shock Absorber Pivot
C. Spring End

- Tighten the locknut securely.
- After making the adjustment, move the spring up and down to make sure that it is properly seated.
- Install the rear frame with air cleaner housing (see Throttle Body Assy section).
- Install the muffler (see Exhaust System section).
- Install the removed parts.

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

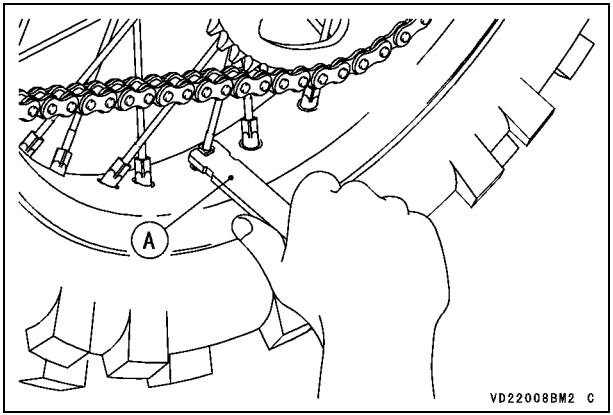
80 ~ 100 kPa (0.8 ~ 1.0 kgf/cm², 12 ~ 14 psi)

NOTE

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

Spokes and Rims

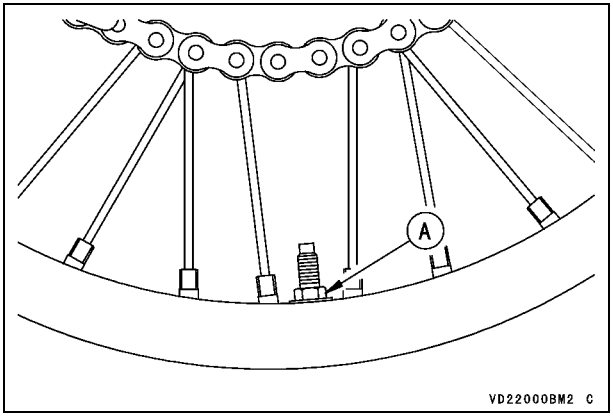
The spokes on both wheels must all be securely and evenly tightened and not be allowed to loosen. Unevenly tightened or loose spokes will cause the rim to warp, the nipples and spokes to fatigue more quickly, and the spokes to break.



A. Spoke Wrench

Bead Protector

There is a bead protector nut on the both wheels. The bead protector nut 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 nut before riding and tighten it if necessary. Tighten the valve stem nut finger tight only.



A. Bead Protector Nut

Rim Runout

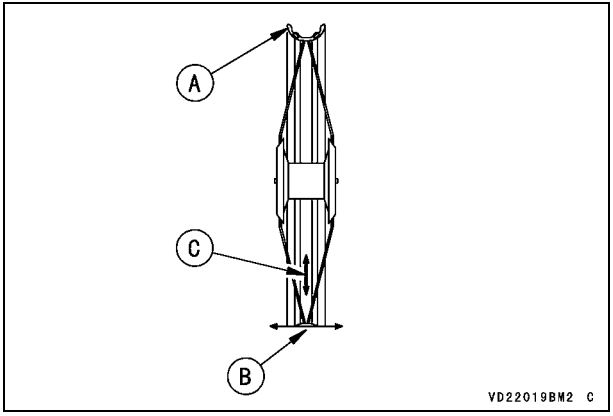
Set up a dial gauge on the side of the rim and rotate the wheel to measure its axial runout. The difference between the highest and lowest readings is the amount of runout.

- 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

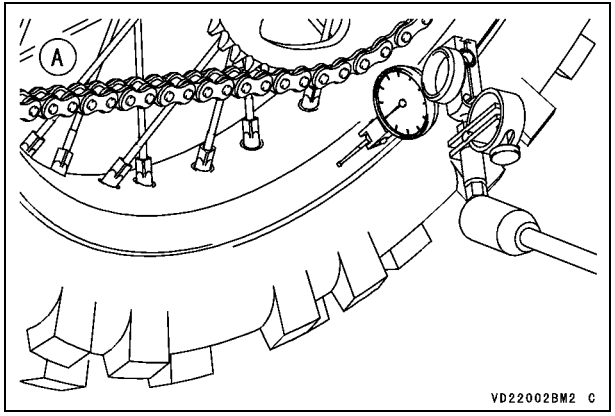


A. Rim
B. Axial Runout
C. Radial Runout

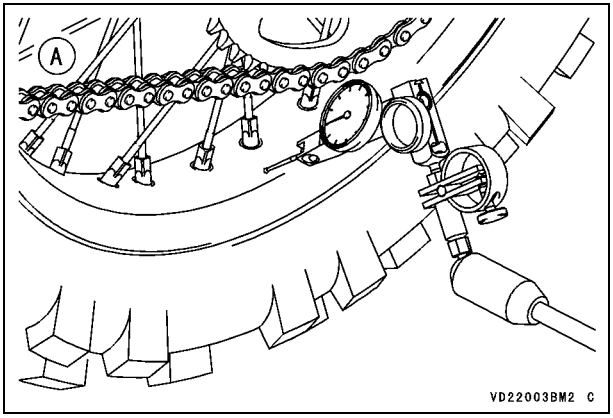
Rim Runout Maximum Limit

Axial	*TIR 2.0 mm (0.08 in.)
Radial	

*: Total Indicator Reading



A. Axial Rim Runout Measurement

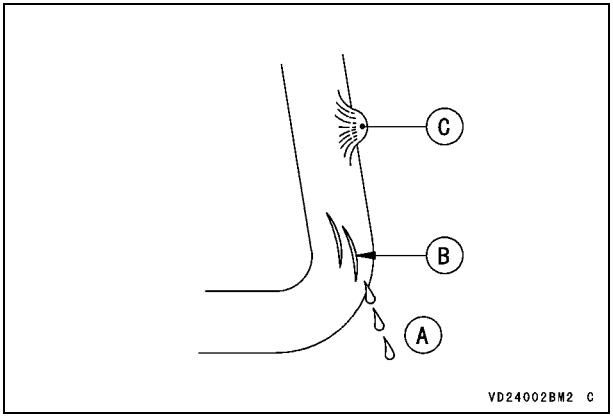


A. Radial Rim Runout Measurement

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.



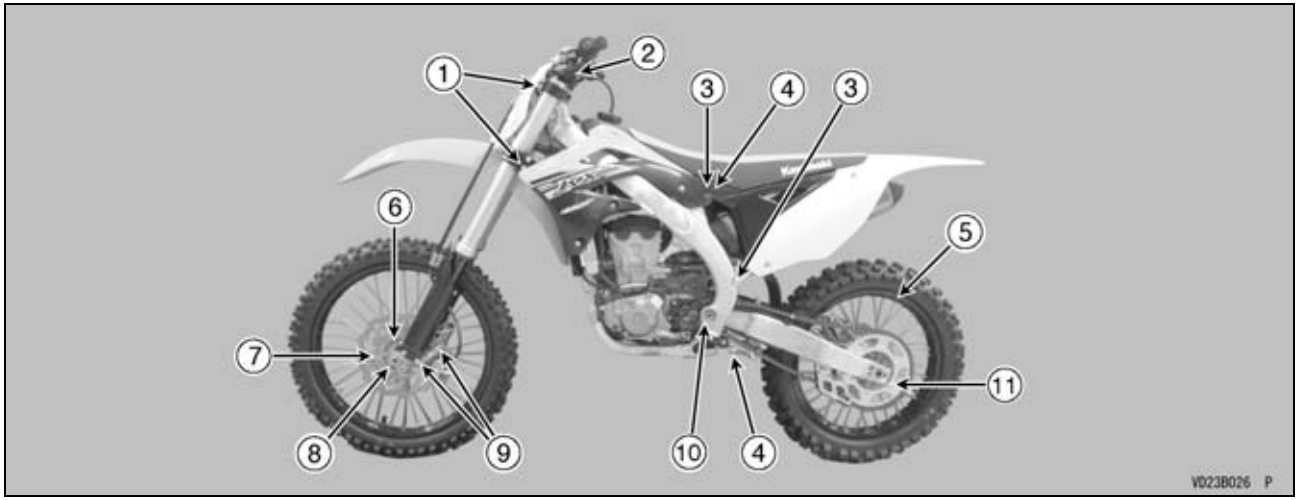
A. Leak
B. Cracks
C. Bulges

- Check that the hose are securely connected and bolts are tightened correctly.

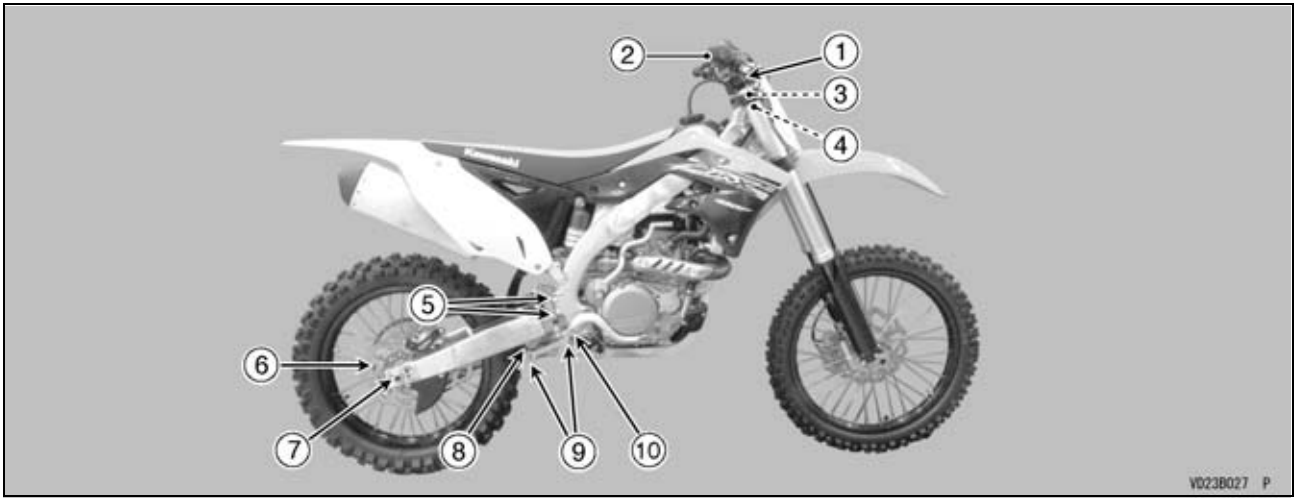
Tightening Torques of Nuts and Bolts

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. Rear Frame Mounting Bolts
4. Rear Shock Absorber Nuts
5. Spoke Nipples
6. Front Axle Clamp Bolts
7. Front Brake Disc Mounting Bolts
8. Front Axle Nut
9. Front Caliper Mounting Bolts
10. Swingarm Pivot Shaft Nut
11. Rear Sprocket Nuts



1. Steering Stem Head Nut
2. Front Master Cylinder Clamp Bolts
3. Steering Stem Nut
4. Handlebar Holder Nuts
5. Rear Master Cylinder Mounting Bolts
6. Rear Brake Disc Mounting Bolts
7. Rear Axle Nut
8. Rocker Arm Pivot Nut
9. Tie-Rod Mounting Nuts
10. Brake Pedal Bolt

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.

Fastener	N·m	kgf·m	ft·lb	Remarks
Front Axle Clamp Bolts	23	2.3	17	AL
Front Axle Nut	78	8.0	58	
Rear Axle Nut	108	11.0	79.7	R
Spoke Nipples	2.2	0.22	19 in·lb	
Rear Sprocket Nuts	34	3.5	25	R
Brake Pedal Bolt	25	2.5	18	G, L
Front Brake Disc Mounting Bolts	9.8	1.0	87 in·lb	L
Front Caliper Mounting Bolts	25	2.5	18	
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
Rear Brake Disc Mounting Bolts	23	2.3	17	L
Rear Master Cylinder Mounting Bolts	9.8	1.0	87 in·lb	
Front Fork Clamp Bolts (Lower)	20	2.0	15	AL
Front Fork Clamp Bolts (Upper)	20	2.0	15	AL
Rear Shock Absorber Nut (Lower)	34	3.5	25	R
Rear Shock Absorber Nut (Upper)	39	4.0	29	R
Rocker Arm Pivot Nut	59	6.0	44	R
Swingarm Pivot Shaft Nut	98	10	72	R
Tie-Rod Mounting Nuts	59	6.0	44	R
Handlebar Clamp Bolts	25	2.5	18	AL

Fastener	N·m	kgf·m	ft·lb	Remarks
Handlebar Holder Nuts	34	3.5	25	R
Steering Stem Head Nut	98	10	72	
Steering Stem Nut	4.9	0.50	43 in·lb	
Rear Frame Mounting Bolts	34	3.5	25	

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.
G: Apply grease.
L: Apply a non-permanent locking agent.
R: Replacement Parts
S: Follow the specified tightening sequence.

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.

⚠ WARNING

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.
- 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, throttle body assy, 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 a bucket. Use a soft cloth or sponge to wash your motorcycle. If needed, use a mild degreaser to remove any oil or grease which 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 the brakes dry and restores its normal operating performance.
- Lubricate the drive chain to prevent rusting.

NOTE

○ *After riding in an area where the roads are salted or near the ocean, immediately wash your motorcycle with cold water. 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 it 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 non-abrasive 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.

⚠ 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.

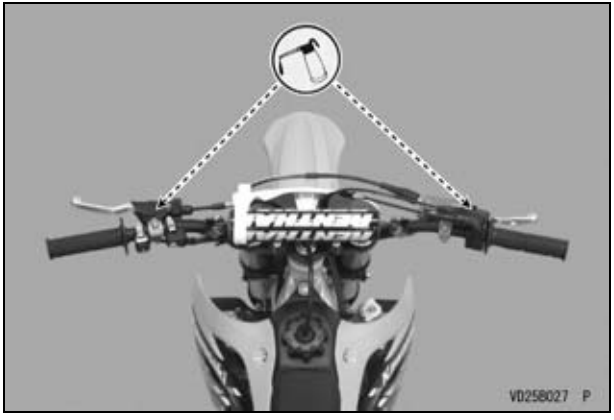
Lubrication

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.

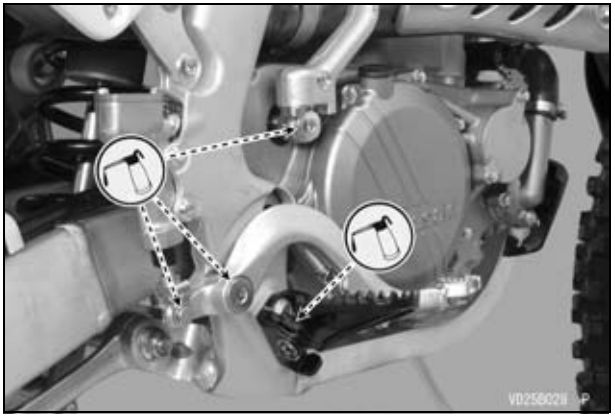
General Lubrication

Apply motor oil to the following pivots:

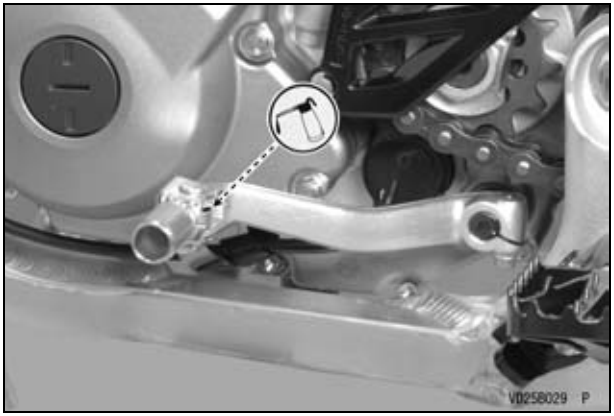
- Clutch Lever
- Front Brake Lever



- Rear Brake Pedal
- Rear Master Cylinder Joint Pin
- Kick Pedal
- Footpeg

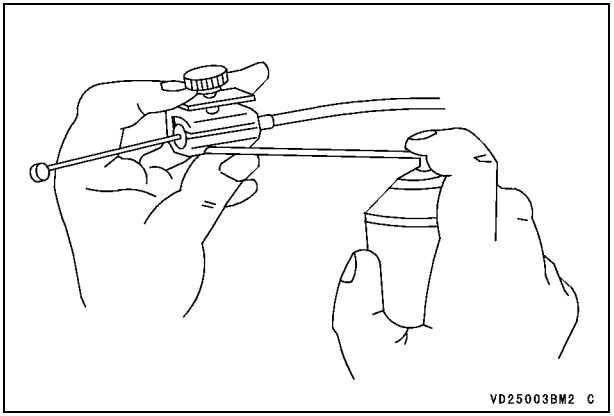


- Shift Pedal

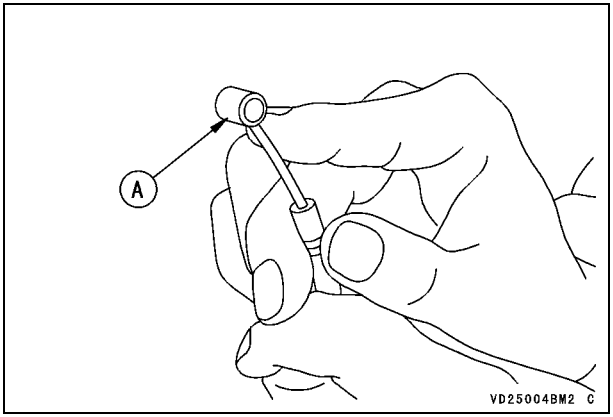


Apply an aerosol cable lubricant with a pressure lubricator on all cables:
- Clutch Cable
- Throttle Cable

Cable Lubrication



Apply grease to the following points:
- Clutch Inner Cable Upper End
- Throttle Inner Cable Upper End

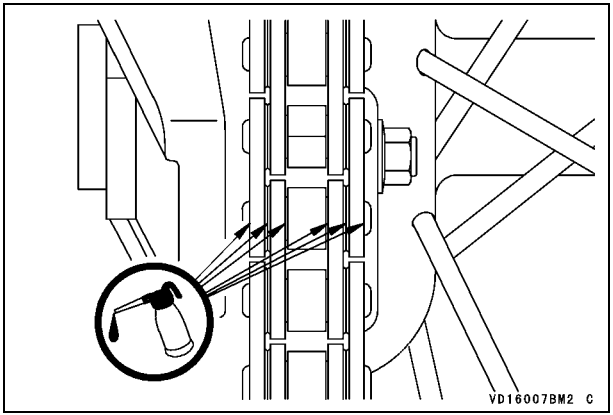


A. Upper End

Drive Chain Lubrication

Lubricate the drive chain after riding through rain or on wet track, or any time that the chain appears dry with a high quality lubricant for drive chains.

- Apply lubricant to the sides of the rollers so that it will penetrate to the rollers and bushings.
- Wipe off any excess lubricant.



DFI Self-Diagnosis

This motorcycle equips the DFI trouble self -diagnosis system. Trouble diagnosis can be conducted as the following procedures.

Self-diagnosis Outline

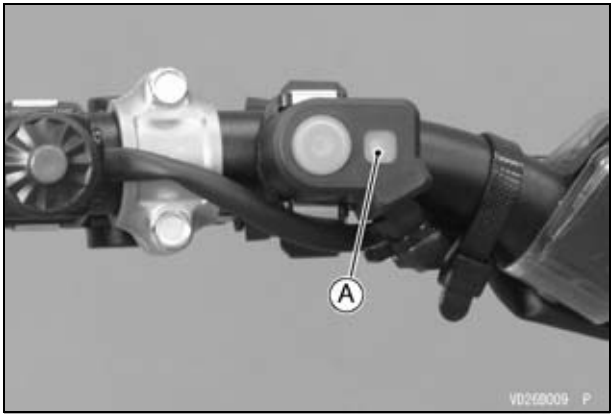
The self-diagnosis has two modes and can be switched to another mode by grounding the self-diagnosis terminal.

User Mode

The ECU connected orange FI warning indicator light goes on when DFI system and ignition system and ignition system parts are faulty. In case of serious troubles, the ECU stops the injection/ignition operation.

Dealer Mode

The orange FI warning indicator light emits service code(s) to show the problem(s) which the DFI system, and ignition system has at the moment of diagnosis.



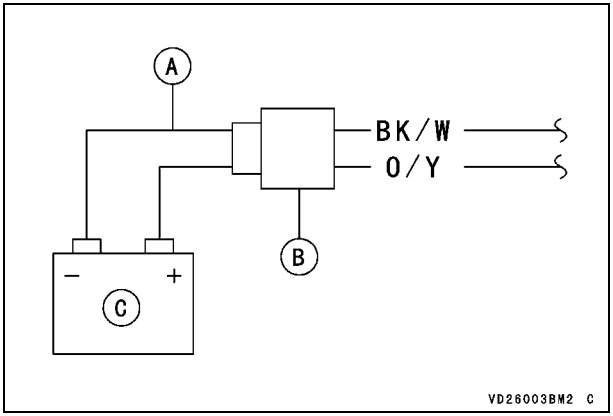
A. Orange Launch Control Mode/FI Warning Indicator Light

Self-diagnosis Procedures

- Disconnect the capacitor lead connector.

A. Capacitor Lead Connector

- Connect the power supply harness (optional part: 26011-0246) to the capacitor lead connector of the main harness.
- Connect the power supply harness (optional part: 26011-0246) to the 12 V battery as shown in the figure.
- Connect the O/Y lead (red cap) to the positive (+) terminal first.

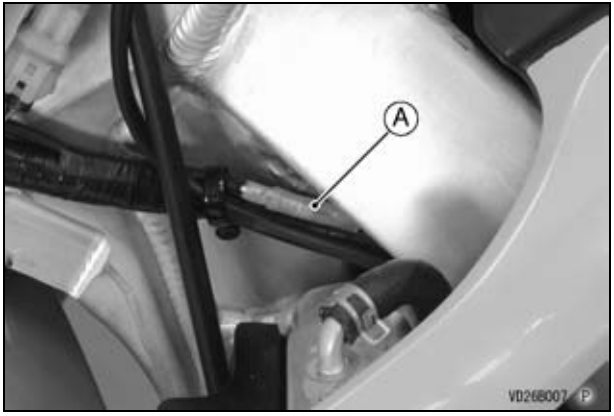


A. Power Supply Harness (Optional Part: 26011-0246)
B. Capacitor Lead Connector
C. 12 V Battery

NOTE

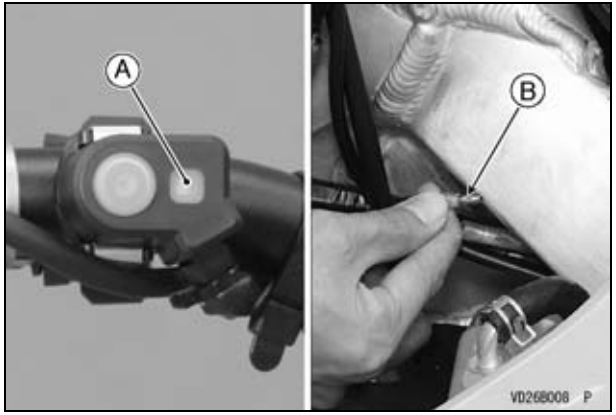
○ *Use a fully charged battery when conducting self -diagnosis. Otherwise, the light blinks very slowly or doesn't blink.*
○ *Keep the self-diagnosis terminal grounded during self-diagnosis.*

- Disconnect the self-diagnosis connector (Y lead).



A. Self-diagnosis Connector (Y Lead)

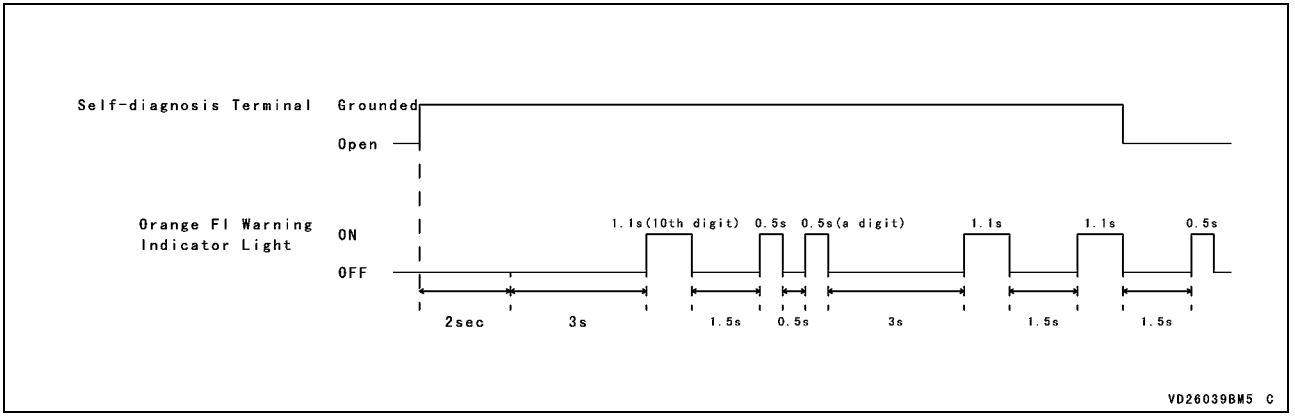
- To enter the self-diagnosis dealer mode, ground the self-diagnosis terminal for more than 2 seconds, and then keep it grounded continuously.
- Count the blinks of the orange light to read the service code. Keep the lead ground until you finish reading the service code.



A. Orange Launch Control Mode/FI Warning Indicator Light
B. Self-diagnosis Terminal

How to Read Service Codes

- Service codes are shown by a series of long and short blinks of the orange FI warning indicator light as shown below.
- Read 10th digit and unit digit as the orange FI warning indicator light blinks.
- When there are a number of problems, all the service codes can be stored and the display will begin starting from the lowest number service codes in the numerical order. Then after completing all codes, the display is repeated until the self-diagnosis terminal is open.
- If there is no problem, no code and unlight.
- For example, if two problems occurred in the order of 21, 12, the service codes are displayed from the lowest number in the order listed.
  (12 → 21) → (12 → 21) → ··· (repeated)



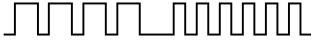
- If the problem is with the following parts, the ECU cannot memorize these problems, the orange FI warning indicator light doesn't go on, and no service codes can be displayed.
  ECU Power Source Wiring and Ground Wiring (see Service Manual)

NOTE

○ *Even if the battery or the ECU is disconnected, or the problem is solved, all service codes remain in the ECU.*

Service Code Table

Service Code	Orange FI Warning Indicator Light	Problems
11		Throttle sensor malfunction, wiring open or short
12		Intake air pressure sensor malfunction, wiring open or short
13		Intake air temperature sensor malfunction, wiring open or short
14		Water temperature sensor malfunction, wiring open or short
21		Crankshaft sensor malfunction, wiring open or short
25		Gear position switch malfunction, wiring open or short
31		Vehicle-down sensor malfunction, wiring open or short
41		Fuel injector malfunction, wiring open or short

Service Code	Orange FI Warning Indicator Light	Problems
46		Fuel pump malfunction, wiring open or short
51		Ignition coil malfunction, wiring open or short

NOTE

- *The ECU may be involved in these problems. If all the parts and circuits checked out good, be sure to check the ECU for ground and power supply. If the ground and power supply are checked good, replace the ECU (see Service Manual).*
- *When no service code is displayed, the electrical parts of the DFI system has no fault, and the mechanical parts of the DFI system and the engine are suspect.*

TROUBLESHOOTING GUIDE

NOTE

○ *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
- Improper installation of vehicle-down sensor

Fuel does not flow:
- No fuel in tank
- Fuel tank cap air vent obstructed
- Fuel line clogged
- Break down of a fuel pump
- Break down of a fuel injector

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
- ECU defective
- Ignition coil defective
- Engine stop button wiring defective
- Flywheel magneto damaged
- Wiring shorted or interrupted

Fuel/air mixture incorrect:
- Air cleaner element clogged, poorly sealed, or not installed

Compression low:
- Spark plug loose
- Cylinder head insufficiently tightened
- Cylinder bolt 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
- Decompression trouble

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
- Crankshaft sensor defective
- ECU defective
- Ignition coil defective
- Flywheel magneto defective
- Wiring connector not in good contact

Fuel/air mixture incorrect:
- Air cleaner element clogged, poorly sealed, or not installed
- Fuel tank cap air vent obstructed
- Throttle body assy holder loose
- Air cleaner duct loose
- Fuel pump defective

Compression low:
- Spark plug loose
- Cylinder head insufficiently tightened
- Cylinder bolt loose
- Cylinder or piston worn
- No valve clearance
- 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
- Decompression trouble

Other:
- ECU defective
- Brake dragging
- Clutch slipping
- Engine overheating
- Engine oil level too high
- Engine oil viscosity too high
- Drive chain trouble

Poor or no high-speed performance -

Firing incorrect:
- 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
- ECU defective
- Ignition coil defective
- Crankshaft sensor defective
- Flywheel magneto defective
- Wiring connector not in good contact

Fuel/air mixture incorrect:
- Air cleaner element clogged, poorly sealed, or not installed
- Fuel contaminated with water or foreign matter
- Fuel tank cap air vent obstructed
- Throttle body assy holder loose
- Air cleaner duct loose
- Fuel line clogged
- Fuel pump defective

Compression low:
- Spark plug loose
- Cylinder head insufficiently tightened
- Cylinder bolt loose
- Cylinder or piston worn
- No valve clearance
- 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
- Decompression trouble

Improper acceleration:
- Throttle valve does not fully open
- Air cleaner element 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
- Drive chain trouble

Knocking:
- Carbon built up in combustion chamber
- Fuel quality poor or type incorrect
- Spark plug type incorrect
- ECU defective

Engine overheating -

Firing incorrect:
- Spark plug dirty, broken, or gap improperly adjusted
- Spark plug type incorrect
- ECU defective

Fuel/air mixture incorrect:
- Throttle body assy holder loose
- Air cleaner element clogged, poorly sealed, or not installed
- Air cleaner duct poorly sealed

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 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 broken or weak
- Shift return spring pin loose
- Shift pawl broken
- Shift pawl spring weak
- Shift drum broken
- Gear positioning lever operation defective

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 broken or weak
- Shift fork guide pin worn
- Drive shaft, output shaft, and/or gear splines worn

Transmission skips gears:
- Gear positioning lever spring broken or weak
- Pawl guide plate worn

Engine noise abnormal -

Knocking:
- Carbon built up in combustion chamber

- Fuel quality poor or type incorrect
- Spark plug type incorrect
- Engine overheating
- ECU defective

Piston slap:
- Piston clearance excessive
- Cylinder or piston worn
- Connecting rod bent
- Piston pin or piston pin holes worn

Valve noise:
- Valve clearance incorrect
- Valve spring broken or weak
- Camshaft bearing or cam face 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 defective
- 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
- Kick 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 lubricated
- Rear wheel misaligned

Frame noise abnormal -

Front fork noise:
- Oil level or viscosity too low
- Front fork air pressure incorrect

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

Brownish:
- Air cleaner duct loose
- Air cleaner poorly sealed or missing

Poor handling and/or stability -

Handlebar hard to turn:
- Cable, hose, wiring incorrectly routed
- Steering stem nut too tight
- Steering stem bearing damaged
- Steering stem bearing 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 stem head nut loose
- Spoke loose

Handlebar pulls to one side:
- Frame bent
- Rear wheel misaligned
- Swingarm bent or twisted
- Swingarm pivot shaft runout excessive
- Steering maladjusted
- Steering stem bent
- Front fork bent

Shock absorption unsatisfactory (suspension too hard):
- Front fork oil excessive
- Front fork oil viscosity too high
- Front fork bent
- Front fork air pressure too 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 air pressure weak
- Rear shock absorber spring weak
- Rear shock absorber leaking oil or gas
- Rear shock absorber improperly adjusted
- Tire air pressure too low

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)

TUNING

Suspension

Introduction

No area of machine adjustment is more critical than proper suspension tuning. An improperly tuned suspension will keep even the best rider from attaining the full benefit of his machine's ability. Match the suspension to the rider and the course conditions.

WHILE TUNING THE SUSPENSION, KEEP THE FOLLOWING IMPORTANT POINTS IN MIND:

- If the machine is new, "break-in" the suspension with at least one hour of riding before making any setting evaluations or changes.
- The three major factors which must be considered in suspension tuning are RIDER WEIGHT, RIDER ABILITY, and TRACK CONDITIONS. Additional influences include the RIDER'S STYLE and POSITIONING on the machine.
- Before changing the suspension settings, test changing your riding posture or position to check whether it is the cause of the problem or not.
- It is a wise practice to adjust the suspension to suit the rider's strong points. If you are fast in the corners, adjust the suspension to allow fast cornering.
- Make setting changes in small increments. A little bit goes a long way, and a setting is easily over adjusted.
- The front and rear suspension should always be balanced; when the one is changed, the other one might need to be changed similarly.
- When evaluating suspension performance, the rider must make every effort to ride consistently and to recognize the effects of his input. Such things as changes in rider position and increasing fatigue may lead to incorrect judgments about necessary adjustments.
- When the proper settings have been determined for a particular track, they should be written down for reference when returning to the same track.
- Lubricate the bearings in the swingarm and UNI-TRAK® linkage after break-in and after every 3 races to prevent friction from affecting suspension performance.

Front Fork

Right Front Fork Air Pressure -

- Adjust the front fork air pressure (see Front Suspension section).

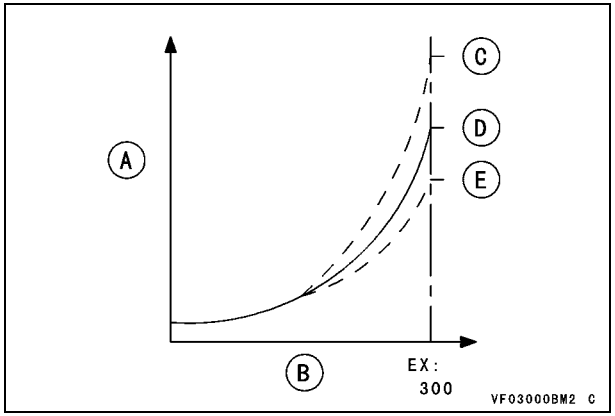
Left Front Fork Oil Amount -

The fork oil amount in the outer tube is adjustable. A change in the fork oil amount will not affect the air spring force much at the top of fork travel, but it will have a great effect at the bottom of it.

- When the oil amount is raised, the air spring becomes more progressive, and the front fork action feels "harder" in the later stage of fork travel, near the bottom.

- When the oil amount is lowered, the air spring becomes less progressive, and the front fork action does not feel as “hard” in the later stage of fork travel.

Fork Oil Amount Effect on Fork Stroke



A. Weight
B. Fork Stroke
C. Increase Amount
D. Standard Oil Amount
E. Decrease Amount

Changing the fork oil amount works effectively at the end of fork travel. If fork bottoming is experienced, raise the fork oil amount by 5 mL (0.2 US oz.) each.

Left Front Fork Oil Amount Adjustment -
- Adjust the left front fork oil amount (see Front Suspension section).

Troubleshooting Improper Settings

Listed below are some symptoms of improper suspension settings and the most likely means of correcting them. The proper settings can be achieved by applying the information given in this chapter in a scientific, methodical manner. This does not mean, however, that you must be a scientist or trained technician to succeed. Simply take time to think about the changes you believe are necessary, check them against the symptoms and cures described here, make the changes in small increments, and take note of the changes and their effects.

Front Fork Improper Adjustment Symptoms -
Too Hard
Spring too stiff:
- Rebound or compression damping improperly adjusted.
- Fork air pressure high
- Fork oil amount too high

Suspension stiffens at the end of the fork stroke:
- Fork oil amount too high
- Fork air pressure high

Spring OK, but suspension too hard:
- Fork oil deteriorated
- Fork air pressure high

Too Soft

The front fork dives excessively during braking and deceleration:

- Fork oil amount too low
- Fork air pressure low
- Fork oil deteriorated
- Rebound and/or compression damping improperly adjusted.

Rear Shock Absorber Improper Adjustment Symptoms -

Too Hard

Suspension too stiff:

- Compression damping too high
- Spring too hard

Spring OK but suspension too hard:

- Unbalance between the spring and the rebound damping (rebound damping too hard)
- Spring preload too hard

Too Soft

Bottoming occurs on landing after a high jump (otherwise OK):

- Spring preload too soft or compression damping too soft
- Spring too soft
- Shock absorber oil deteriorated

Determining the Proper Settings

Standard Settings

From the factory, the machine is set up for a medium-weight rider with intermediate riding ability. Hence, if the actual rider weighs considerably more or less, or if his riding experience and ability are much above or below the intermediate level, it is likely that a few basic suspension adjustments will be necessary.

Basic Readjustment of the Suspension

Suspension Tuning According to Riding Experience

Beginner	Front	Lower air pressure with (right front fork) weak rebound damping
	Rear	Softer spring with weak rebound damping
Experienced Rider	Front	Higher air pressure (right front fork)
	Rear	Harder spring

Suspension Tuning According to Rider Weight

Heavy Rider	Front	Higher air pressure (right front fork)
	Rear	Harder spring
Light Rider	Front	Lower air pressure (right front fork)
	Rear	Softer spring

Suspension Tuning According the Type of Course

Many Corners	Lower the front end slightly (Increase the amount of fork tube protrusion above the steering stem head by 5 mm (0.20 in.).). This accelerates steering and enhances turning ability.
Fast Course	Raise the front end slightly (Decrease the amount of fork tube protrusion above the steering stem head by 5 mm (0.20 in.).). This slows down steering and enhances stability at high speed.
Deep Dips or Sandy Ground	Raise the front end slightly to gain stability.

Begin the actual on-track testing and evaluation after making these preliminary adjustments.

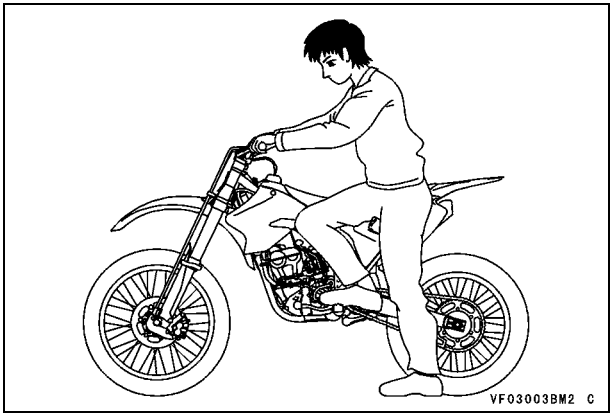
Bear in mind the following points when readjusting the suspension.

- Always make changes in small steps.
- The rider must be consistent in evaluating suspension performance.
- A change in the front suspension might require one in the rear suspension, and vise versa.

Front and Rear Suspension Compatibility Inspection

Use this procedure to determine if the suspension is balanced reasonably well.

- Hold the motorcycle upright (remove the side stand.).
- While standing next to the machine, lightly pull the brake lever, place one foot on the footpeg closest to you, and push down hard. If the motorcycle stays level as the suspension is compressed, the spring rates are well balanced.
- Sit astride the motorcycle, take a riding posture and check that the machine is in a horizontal position. If one end drops noticeably more than the other, the front and rear are not compatible and must be readjusted to achieve a better balance.



Although this is one of the most effective adjustment procedures, suspension settings may vary depending on the conditions at the track and the rider's preferences.

Front and Rear Suspension Troubleshooting

Front End Surges Downhill or During Acceleration Out of Corner -

The front suspension is too soft.

- Increase the compression damping or rebound damping.
- Increase the air pressure (right front fork inner chamber).
- Increase the fork oil amount (left front fork).

Front End "Knifes" or Oversteers in Turns (Tends to Turn Inward) -

The front suspension is too soft.

- Increase the compression damping or rebound damping.
- Increase the fork oil amount (left front fork).

NOTE

○ *Heavier or expert riders may heighten the air pressure.*

Front End Pushes or "Washes Out" in Turns (Front Wheel Tends to Push Outward Rather than "Bite" in a Turn) -

The front suspension is too stiff.

- Decrease the compression damping or rebound damping.
- Decrease the air pressure (right front fork inner chamber).
- Decrease the fork oil amount (left front fork).

NOTE

○ *Lighter or less experienced riders may lower the air pressure.*

Front End Does Not Respond to Small Bumps in Sweeping Turns -

The front suspension is too hard.

- Decrease the compression damping or rebound damping.
- Decrease the air pressure (right front fork).
- Decrease the fork oil amount (left front fork).

Rear End "Kicks" When Braking on Bumps -

The rear shock absorber rebound damping may be too low.

- Increase the rebound damping.

Rear Tire Does Not "Hook Up" Out of Corners (Lack of Traction Coming Out of Turns) -

The rear shock absorber may be too stiff.

- Decrease the rear shock absorber spring preload.
- Decrease the high speed/low speed compression damping.
- Use a softer spring (lightweight rider only).

Fork Bottoms Off After a High-speed Jump (may be due to improper riding posture) -

The rebound damping is too soft or the spring is too hard.

- Increase the rebound damping.
- Decrease the rear shock absorber spring preload.
- Decrease the compression damping.

Front and Rear Ends Bottom Off After a High-speed Jump (harsh bottoming occurs once or twice per lap) -

The front suspension is too soft.

- Increase the air pressure (right front fork inner chamber).
- Increase the fork oil amount (left front fork).

The rear suspension is too soft.

- Increase the rear shock absorber spring preload or use a harder spring.
- Increase the rear shock absorber high speed compression damping or use a harder spring.

NOTE

○ *Check the front and rear suspension compatibility after making any adjustment.*

Rear End Feels Soft at Small Jump -

- Increase the spring preload up to maximum.
- Increase the rear shock absorber low speed compression damping.

Rear End Feels Soft at Large Jump -

- Increase the spring preload up to maximum.
- Increase the rear shock absorber high speed compression damping.

Rear End Bottoms After 3 or 4 Successive Jumps -

- Decrease the rebound damping.

NOTE

○ *The rear shock absorber behavior on this machine may mislead some riders.*
○ *The rear shock absorber bottoms (due to full stroke) when the spring and damping are overcome by the total weight of the machine and rider.*
○ *A bottoming sensation (even though the machine is actually not bottoming) may be caused by machine weight and the inability of the rider to overcome an overly stiff spring or excessive damping.*
○ *Observe the rear end jumps and try lowering the spring preload and damping if it does not approach bottoming.*

Gearing

Selection of the Secondary Reduction Ratio (Rear Sprocket)

Rear Sprocket Selection According to Course Conditions

Fast Course	Small sprocket
Many Curves or Hills	Large sprocket
Sandy or Soft Ground	

- If the course has long straight portions, the secondary reduction ratio should be reduced so that the machine speed can be increased.
- If then the course has many corners or uphills or is wet, the secondary reduction ratio should be increased so that gear shifting and acceleration are smooth.
- Since the speed must be changed depending on the ground condition on the day of the race, be sure to run through the circuit prior to a race and tune the machine accordingly.
- If there is a long straight portion of the course on which the machine can be run at maximum speed, the machine should be set so that the maximum speed is developed toward the end of the straight course, but care should be taken not to over-rev the engine.
- Since it is difficult to set the machine so it is best suited for all portions of the circuit, determine which circuit portions will have the greatest effect on lap time, and tune the machine to these portions. Confirm your settings by recording lap times after each change. In this way the machine will deliver best performance for the entire circuit.

Special Care According to Track Conditions

- In dry, dusty conditions (such a volcanic ash or fine powdery dust), special care must be given to keeping the air cleaner element clean.
- When riding on wet, heavy clay, mud adheres to the tires and other parts of the vehicle. The mud can add significantly to the weight of the vehicle and therefore reduce performance. Take care to remove built-up mud from the tires and chassis after each ride, before drying occurs.
- The engine works hardest in muddy conditions and the radiator can become clogged with mud. Take care not to overheat the engine in these conditions. The engine also works very hard when riding in deep sand.
- In muddy or sandy conditions, increase chain slack as the chain and sprockets will be packed with mud or sand, which reduces chain slack.
- Check chain and sprocket wear frequently when riding in mud or sand, since wear is increased in these conditions.
- Sticking muds or dusts on the front fork inner tube and rear shock absorber rod could damage to the oil seal, leading to an oil leak. Clean the sticking muds or dusts from the front fork inner tube and rear shock absorber rod after each ride.

OPTIONAL PARTS

Rear Sprocket		
Aluminum	48T 49T 50T (Standard) 51T 52T	
Steel	48T 49T 50T 51T 52T	
Handlebar Holder and Clamp		
Clamp (Upper)	Size	ϕ28.6
Holder (Lower)	Size	ϕ28.6 ϕ22.2
Tie-rod		
Size	L = 136	

Suspension Spring (N/mm)	
Rear	K = 49 K = 51 K = 53 (Standard) K = 55
Aluminum Nipple Wheel (Without Tire)	
Front	21 × 1.60
Rear	19 × 2.15
Spoke Nipple	
Front and Rear	Steel

NOTE

○ *Installing the optional tie-rod will reduce the amount of groud clearance.*

KX FI Calibration Kit

The KX FI Calibration Kit can change the ECU data setting, and save and analyze the engine operation data in a personal computer (PC).

KX FI Calibration Kit: Part No. – 99999-0394

For details, refer to the KX FI Calibration Kit manual.

PRE-RACE CHECKS AND AFTER-RACE MAINTENANCE

Pre-Race Checks -
- Front axle nut, or axle clamp bolt torque
- Front fork clamp bolt torque
- Handlebar clamp bolt torque
- Throttle grip screw tightness
- Throttle grip operation
- Front and rear brake hose installation
- Front and rear brake fluid level
- Front and rear brake disc and caliper installation
- Front and rear brake function
- Fuel tank installation
- All control cable routings
- Engine mounting bolt torque
- Engine sprocket installation
- Shift pedal bolt torque
- Engine oil level
- UNI-TRAK® lever rod nut torque
- UNI-TRAK® lever nut torque
- Rear shock absorber nut torque
- Swingarm pivot shaft nut torque
- Rear axle nut torque
- Rear sprocket nut torque
- Rear brake pedal operation
- Seat installation
- Front and rear wheel spoke torque
- Front and rear tire air pressure
- Front fork air pressure
- Drive chain slack
- Coolant level
- Oil applied to air cleaner element

Maintenance After the First Race -
- Clean the air cleaner element.
- Adjust the drive chain slack.
- Torque the rear sprocket nuts.
- Torque the spokes.
- Check the front and rear tire air pressure.
- Torque the front and rear axle nuts.
- Torque the swingarm pivot shaft nut.
- Torque the muffler and exhaust pipe bolts and nuts.
- Tighten the front and rear fender bolts.
- Tighten the fuel tank and seat bolts.
- Check the front and rear brake function.
- Check the steering play.
- Fill the fuel tank with fuel.
- Check the coolant level.

Maintenance After Riding on a Dusty Course -
- If dirt or dust gets into the engine, cylinder, piston and crankshaft bearings will be damaged. After riding, inspect the crankshaft big end. If the crankshaft big end is worn past the service limit, replace the crankshaft with a new one.
- Clean the sliding surface of the front fork and rear shock absorber.

Maintenance After Riding in the Rain or on a Muddy Course -
- Clean the sliding surface of the front fork and rear shock absorber.

- Apply grease to swingarm and rear suspension pivots.
- Inspect the drive chain and rear sprocket for wear.
- Clean the air cleaner element.
- Check the cylinder and crankshaft big end.
- Grease the throttle grip and control cables.

Suggested Spare Parts -

- Front and rear wheels
- Shift pedal and brake pedal
- Brake lever, clutch lever, and holders
- Throttle and clutch cables
- Handlebar
- Front and rear fenders, side covers, and number plate
- Radiator, radiator shroud, and water hoses
- Throttle grip assembly
- Air cleaner element
- Muffler, and related parts
- Chain case
- Rear shock absorber springs (for suspension adjustment)
- Rear and engine sprockets with bolts/nuts and circlips
- Electrical parts
- Spark plugs
- Clutch assembly and friction plates
- Gaskets
- Front and rear tires (various compounds and tread patterns for different conditions)
- Front fork assembly
- Piston and piston rings
- Tire wraps, bolts, nuts, screws, O-rings, washers, snap rings, wire, adhesive tape, vinyl tape (or duct tape), and #400 to #600 emery cloth

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.

⚠ WARNING

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 bolts and fill in fresh engine oil.
- Empty the fuel tank (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.

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 lubrication procedure in the Lubrication section.

ENVIRONMENTAL PROTECTION

Kawasaki subscribes to the guidelines of Tread Lightly! a program dedicated to protecting the great outdoors through education and fostering responsible enjoyment of public lands. When using your Kawasaki motorcycle, please follow these Tread Lightly! guidelines:

Tread Lightly!

Travel responsibly on designated roads and trails or in permitted areas.

Respect the rights of others including private property owners and all recreational trail users, campers and others to allow them to enjoy their recreational activities undisturbed.

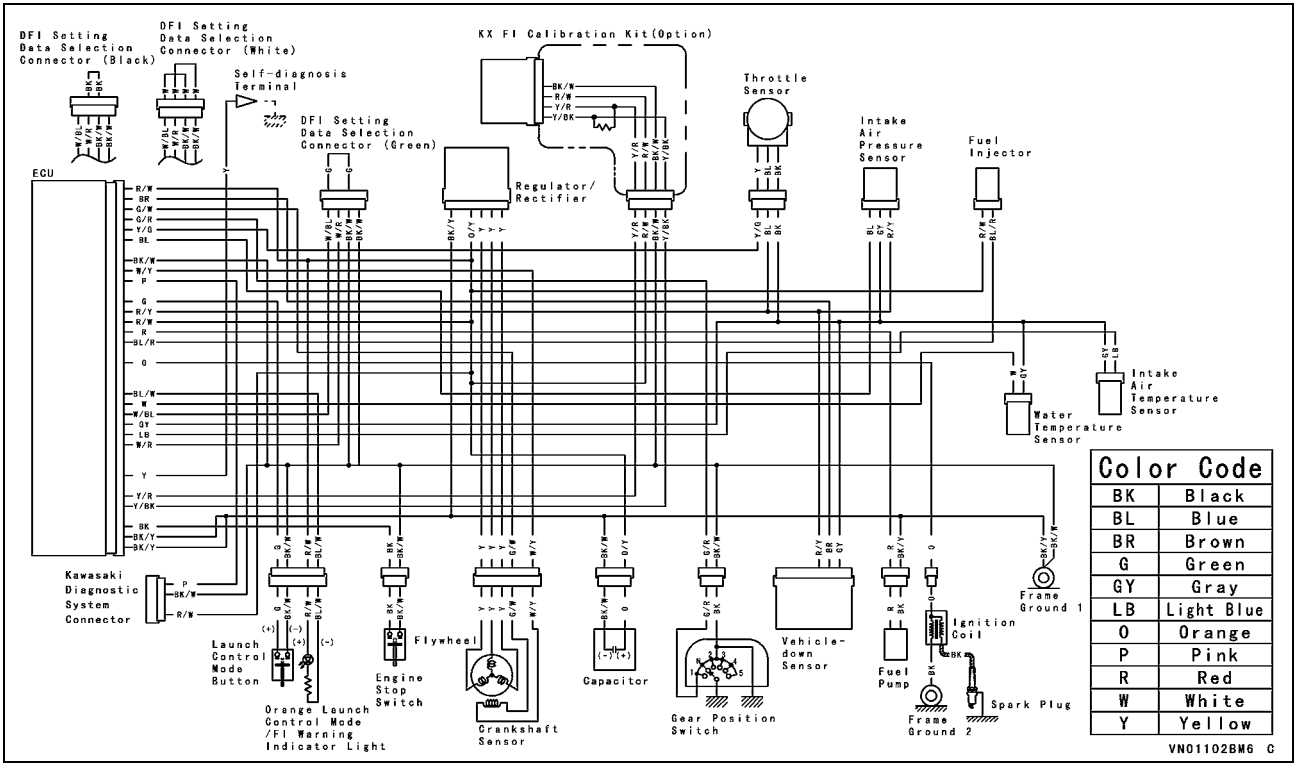
Educate yourself by obtaining travel maps and regulations from public agencies, planning for your trip, taking recreation skills classes, and knowing how to use and operate your equipment safely.

Avoid sensitive areas such as meadows, lakeshores, wetlands and streams, unless on designated routes. This protects wildlife habitat and sensitive soils from damage.

Do your part by leaving the area better than you found it, properly disposing of waste, minimizing the use of fire, avoiding the spread of invasive species, restoring degraded areas, and joining a local enthusiast organization.

Properly discard used tires, engine oil, other vehicle components, or the entire vehicle that you might dispose of in the future. Consult your authorized Kawasaki dealer or local environmental waste agency for their proper disposal procedure.

WIRING DIAGRAM



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