



Ninja[®] 650R
ER-6f
ER-6f ABS



Motorcycle Assembly & Preparation Manual

Foreword

In order to ship Kawasaki vehicles as efficiently as possible, they are partially disassembled before crating. Since some of the most commonly removed parts have a direct bearing on a vehicle's reliability and safety, conscientious pre-sale assembly and preparation becomes extremely important. Good setup procedures can prevent needless warranty claims and give customers a greater sense of confidence in Kawasaki and their Kawasaki Dealers.

This Assembly and Preparation Manual explains step by step procedures of the following items for the Kawasaki Ninja 650R, ER-6f and ER-6f ABS.

1. Uncrating
2. Assembly
3. Preparation

The selling dealer assumes sole responsibility for any unauthorized modifications prior to sale. Refer to your Service Binder for any Service Bulletins specifying Factory Directed Modifications (Special Claims) which must be performed before the vehicle is ready for sale.

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

WARNING

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

CAUTION

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

NOTE

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

Kawasaki Heavy Industries, Ltd. accepts no liability for any inaccuracies or omissions in this publication, although every possible measure has been taken to make it as complete and accurate as possible. All procedures and specifications subject to change without notice.

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Uncrating

Opening Crate

⚠ WARNING

Always wear protective gloves, boots and eye protection when uncrating to prevent injury.



MC03003B S

⚠ WARNING

Be careful not to injure your body by the sharp edges of the steel crate panel plates and other sharp fasteners.



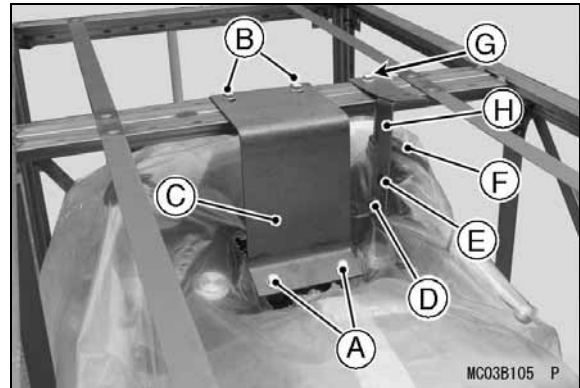
MC03004B S

- Clear a space about 6 m (20 ft) square to give yourself plenty of space to work.
- Place the crate upright on its base.
- Remove the cardboard cover.
- Remove the handlebar and the parts box.

CAUTION

When removing the crate bracket from the motorcycle, be careful not to drop any parts or the bracket onto the fuel tank and other components, and not to scratch the fuel tank or other components with the crate bracket.

- First, remove the lower bolts (D = 8, L = 16) at the steering stem and discard them.
- Remove the upper bolts (D = 8, L = 22) to take off the steering stem support bracket and discard them.
- Remove the lower bolts (D = 6, L = 12) and washer to take off the front master cylinder.
- Remove the upper bolt (D = 8, L = 16) to take off the front master cylinder support bracket and discard it.



MC03B105 P

- A. Lower Bolts (D = 8, L = 16)
- B. Upper Bolts (D = 8, L = 22)
- C. Steering Stem Support Bracket
- D. Lower Bolt (D = 6, L = 12) and Washer
- E. Lower Bolt (D = 6, L = 12)
- F. Front Master Cylinder
- G. Upper Bolt (D = 8, L = 16)
- H. Front Master Cylinder Support Bracket

- Take out all the bolts and screws and remove the top and sides of the crate.

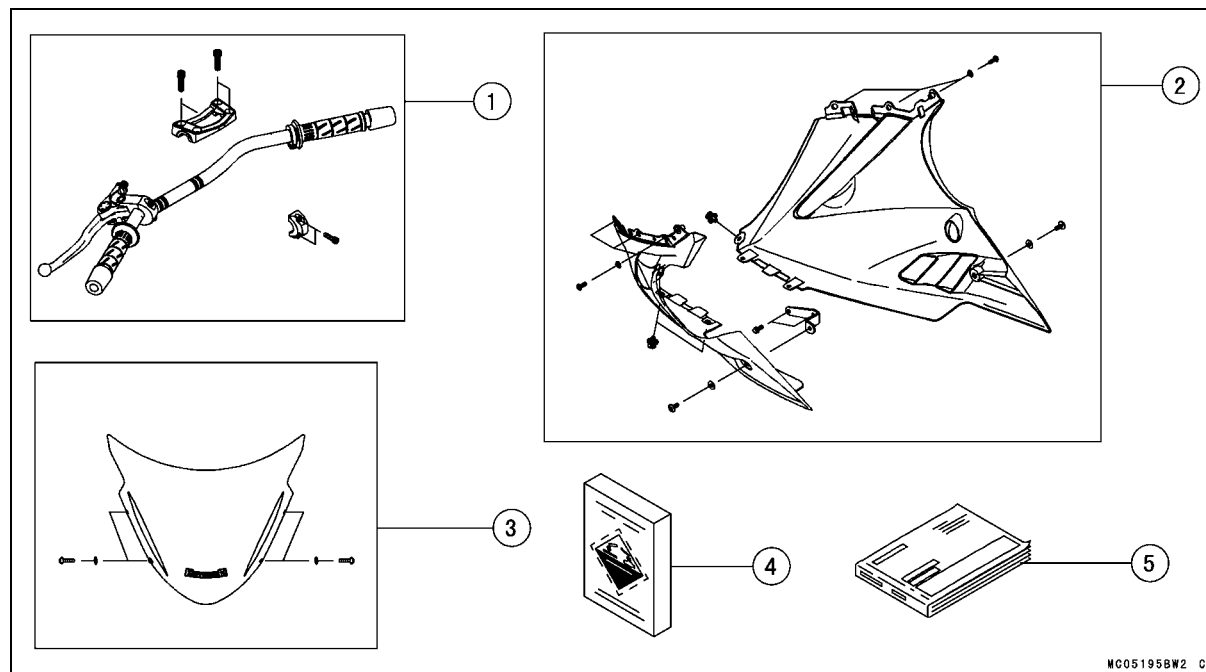
NOTE

- Roll the vehicle off the crate base after installing the handlebar and front master cylinder.

4 UNCRATING

Parts Check

- Open the parts box, and check the parts against the illustrations. There may be minor differences between these illustrations and the actual vehicle parts. In the following charts under Remarks, D = diameter in millimeters, and L = length in millimeters.



No.	Part Name	Qty	Remarks
1	Handlebar with Grips, Weights and Clutch Lever Assy	1	
	Clamp, Handlebar	1	
	Socket Bolt, Clamp, Handlebar	4	D = 8, L = 30
	Clamp, Front Master Cylinder	1	
	Socket Bolt, Clamp, Front Master Cylinder	2	D = 6, L = 22
	2	Left Bracket, Lower Fairing	1
	Flanged Bolt with Non-permanent Locking Agent, Left Bracket	2	D = 6, L = 14
	Lower Fairing, LH & RH	2	
	Socket Bolt, Lower Fairing	6	D = 5, L = 16
	Plastic Washer, Lower Fairing	6	D = 5.3
	Socket Bolt, Lower Fairing	2	D = 6, L = 14
	Plastic Washer, Lower Fairing	2	D = 6.5
	Plastic Rivet, Lower Fairing	3	
3	Windshield	1	
	Socket Bolt, Windshield	4	D = 5, L = 20
	Plastic Washer, Windshield	4	D = 5.3
4	Battery Electrolyte, FTX12-BS	1	12 V 10 Ah
5	Owner's Manual	1	

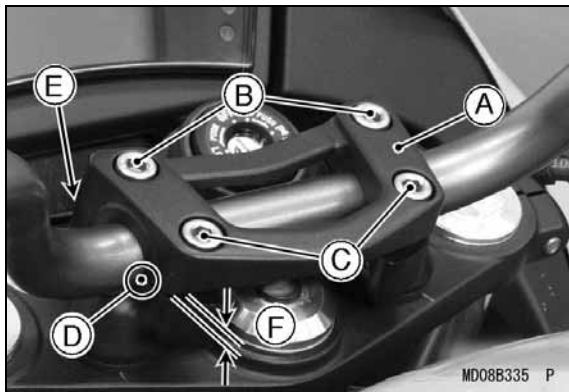
Assembly

Handlebar

Handlebar Installation

- Set the handlebar so that its punched mark is aligned with the upper rear edge of the lower handlebar clamp and install the upper handlebar clamp and bolts (D = 8, L = 30).
- Tighten the front clamp bolts first, and then the rear clamp bolts to the specified torque. There will be a gap at the rear part of the clamp after tightening.

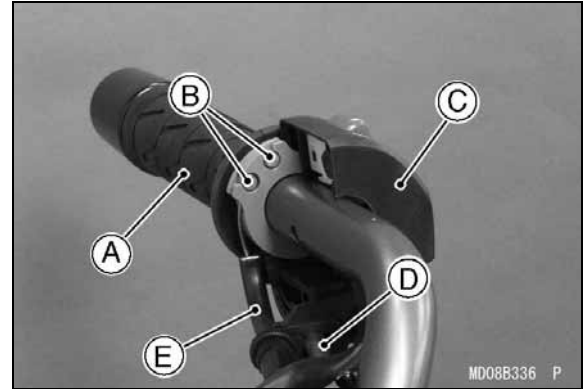
Torque: 25 N·m (2.5 kgf·m, 18 ft·lb)



- A. Handlebar Clamp (Upper)
- B. Front Bolts (D = 8, L = 30)
- C. Rear Bolts (D = 8, L = 30)
- D. Punched Mark
- E. No Gap
- F. Gap

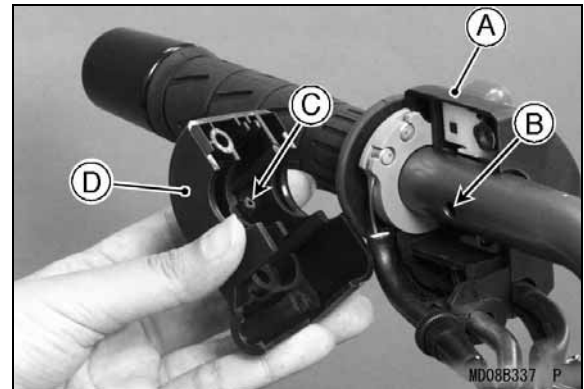
Throttle Grip and Right Switch Housing

- Apply a light coat of grease on the exposed portion of the throttle inner cables.
- Fit both throttle cable tips into the nearest socket in the throttle grip.



- A. Throttle Grip
- B. Cable Tips : Apply Grease.
- C. Rear Half
- D. Throttle Cable (Decelerator)
- E. Throttle Cable (Accelerator)

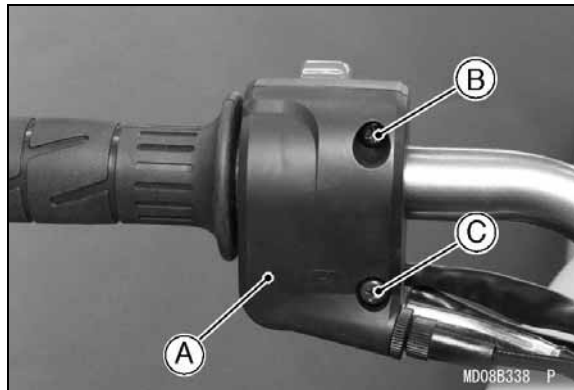
- Fit the two halves of the right switch housing so that the projection on the front half fits into the hole in the handlebar.



- A. Rear Half
- B. Hole
- C. Projection
- D. Front Half

- Insert the two screws (D = 5, L = 25) (D = 5, L = 40) and tighten them.

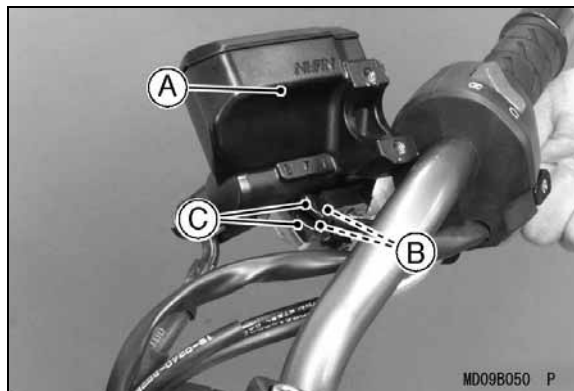
6 ASSEMBLY



- A. Right Switch Housing**
- B. Screw (D = 5, L = 25)**
- C. Screw (D = 5, L = 40)**

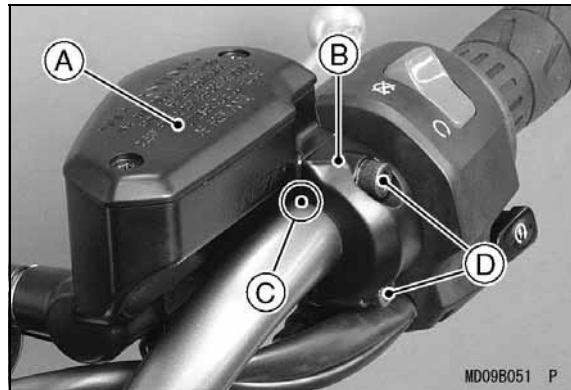
Front Brake Master Cylinder

- Connect the right switch housing lead connectors to the front brake light switch terminals on the front brake master cylinder.



- A. Front Master Cylinder**
- B. Brake Light Switch Terminals**
- C. Connectors and Dust Covers**

- Install the front master cylinder with its clamp and the two bolts (D = 6, L = 22).
- Position the master cylinder so that the mating surface of the front and rear master cylinder clamps align with the punched mark on the handlebar.



- A. Front Master Cylinder**
- B. Clamp**
- C. Punched Mark**
- D. Bolts (D = 6, L = 22)**

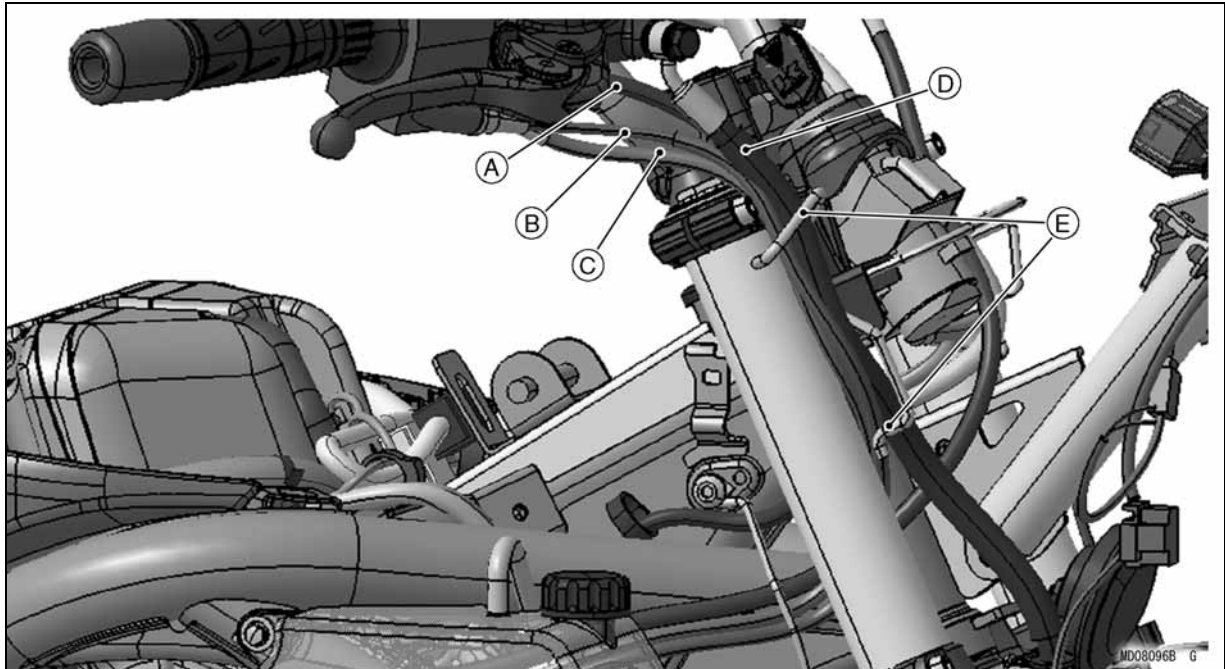
- Tighten the upper clamp bolt first and then the lower clamp bolt to the specified torque.

Torque: 11 N·m (1.1 kgf·m, 97 in·lb)

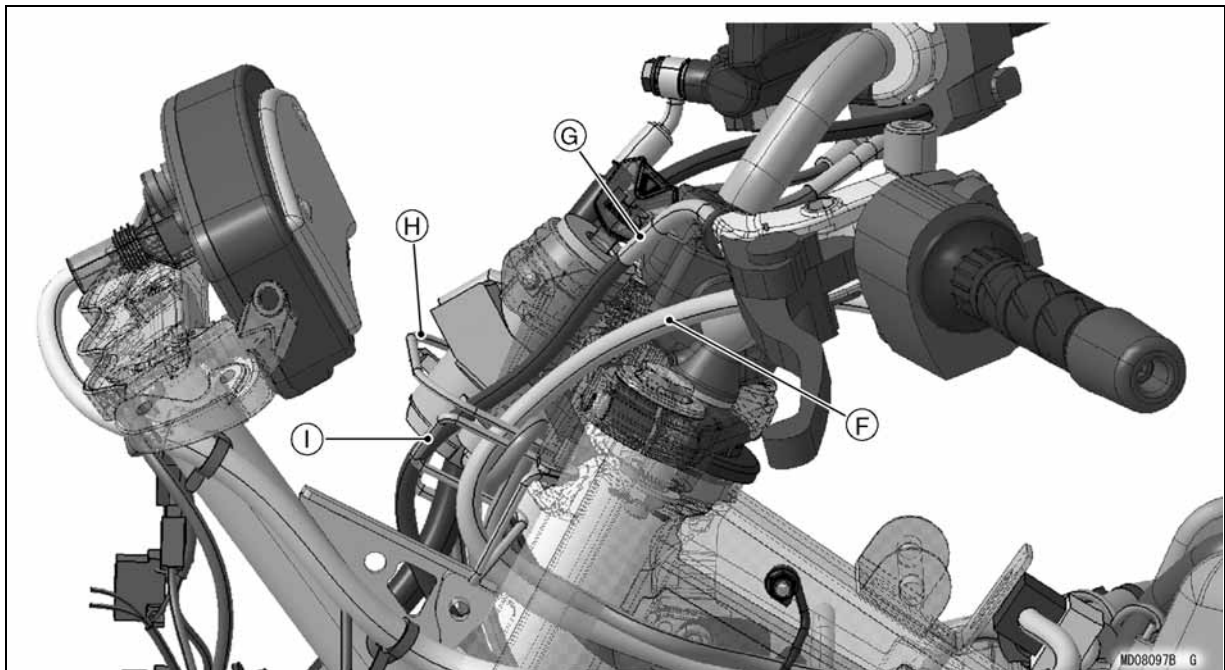
Cables, Harness and Hoses Routing

- Check that the cables, wiring leads and hoses are routed correctly.

Right Side View



Left Side View



A. Right Switch Housing Harness

B. Throttle Cable (Accelerator)

C. Throttle Cable (Decelerator)

D. Front Brake Hose

E. From the inside sequentially, run the right switch housing harness, front brake hose, throttle cable (decelerator) and throttle cable (accelerator) through the guides.

F. Left Switch Housing Harness

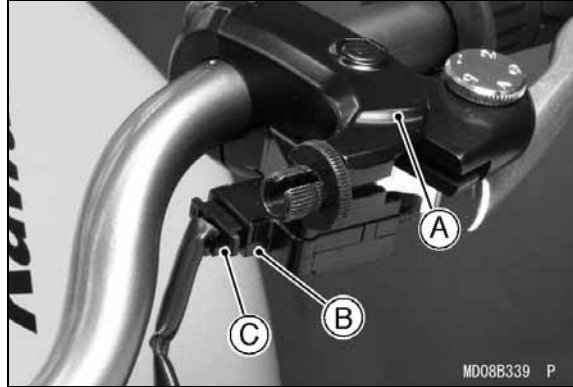
G. Clutch Cable

H. Run the clutch cable and left switch housing harness through the guide.

I. Run the left switch housing harness through the guide.

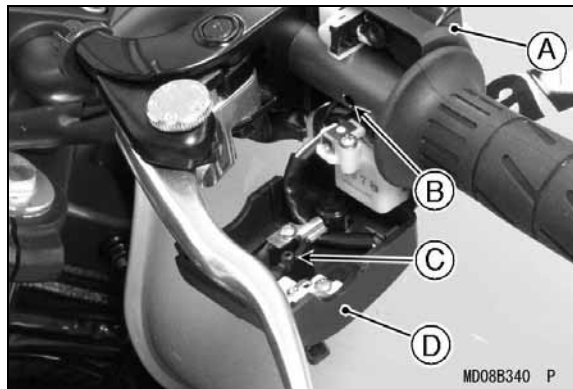
Left Switch Housing

- Connect the left switch housing connector to the starter lock-out switch on the clutch lever assembly.



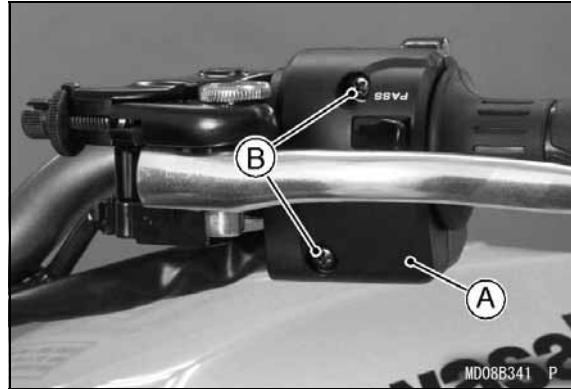
- A. Clutch Lever Assy
- B. Starter Lock-out Switch
- C. Connector

- Fit the two halves of the left switch housing together so that the small projection on the front half fits into the hole in the handlebar.



- A. Rear Half
- B. Hole
- C. Projection
- D. Front Half

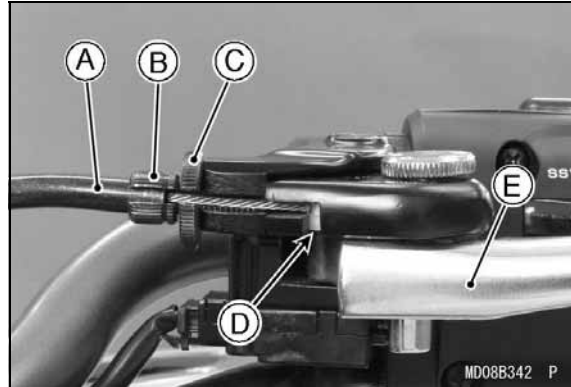
- Insert the two screws (D = 5, L = 25) and tighten them securely.



- A. Left Switch Housing
- B. Screws (D = 5, L = 25)

Clutch Cable

- Apply a light coat of grease on the clutch inner cable.
- Line up the slots on the clutch lever, locknut, and adjuster.
- Fit the tip of the clutch inner cable into the lever socket, slide the inner cable through the slots, and release the outer cable into the adjuster.



- A. Clutch Cable
- B. Adjuster
- C. Locknut
- D. Cable Tip
- E. Clutch Lever

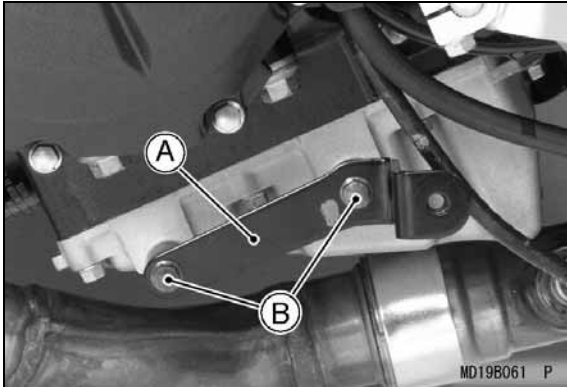
Lower Fairing

NOTE

○ It is recommended that the lower fairing should be installed after completing the steps in the "Coolant" section on page 20 in the PREPARATION chapter.

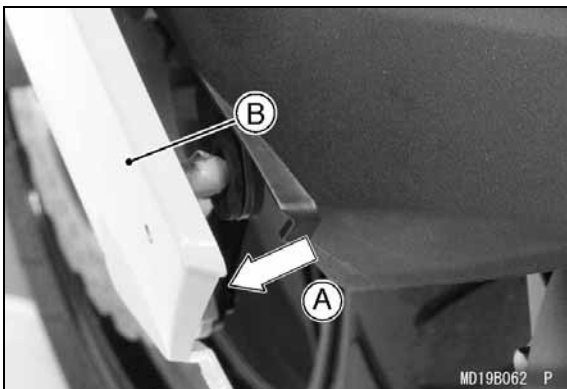
- Install the left bracket on the lower left side of the engine with the flanged bolts (D = 6, L = 14) (2) with non-permanent locking agent, and tighten the bolts to the specified torque.

Torque: 12 N·m (1.2 kgf·m, 106 in·lb)



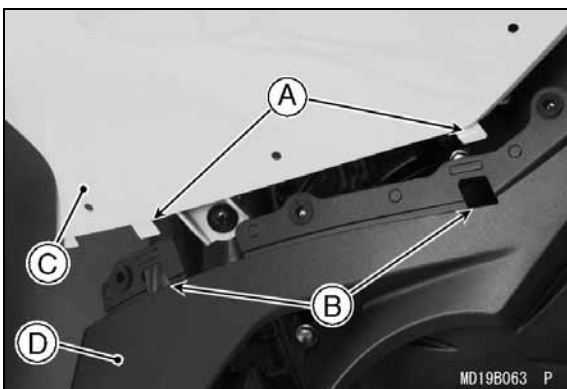
- A. Left Bracket**
- B. Flanged Bolts (D = 6, L = 14)**

- Pull the left upper fairing outward to clear the stopper.



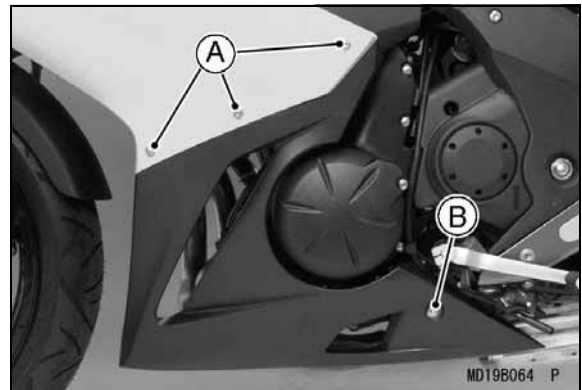
- A. Clear the stopper.**
- B. Left Upper Fairing**

- Insert the tabs into the slots to fit the left lower fairing on the inside of the left upper fairing.



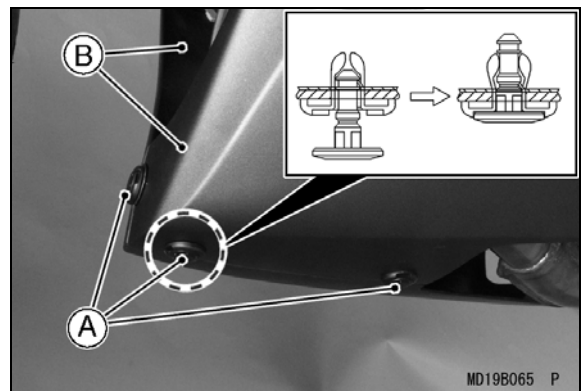
- A. Tabs**
- B. Slots**
- C. Left Upper Fairing**
- D. Left Lower Fairing**

- Install the socket bolts (D = 5, L = 16) (3) and plastic washers (D = 5.3) (3).
- Install the socket bolt (D = 6, L = 14) and plastic washer (D = 6.5).



- A. Socket Bolts (D = 5, L = 16) and Plastic Washers (D = 5.3)**
- B. Socket Bolt (D = 6, L = 14) and Plastic Washer (D = 6.5)**

- Install the right lower fairing in the same manner as the left lower fairing.
- Fasten the left and right lower fairings with three plastic rivets.



- A. Plastic Rivets**
- B. Left and Right Lower Fairings**

- Tighten the socket bolts (D = 5, L = 16).
- Tighten the socket bolts (D = 6, L = 14) to the specified torque.

Torque: 8.8 N·m (0.90 kgf·m, 78 in·lb)

Windshield

- Install the windshield on the upper center fairing with the socket bolts (D = 5, L = 20) (4) and plastic washers (D = 5.3) (4), and tighten the bolts.



- A. Socket Bolts (D = 5, L = 20) and Plastic Washers (D = 5.3)
- B. Upper Center Fairing
- C. Windshield

Brake Disc Cleaning

- Clean the front and rear brake discs using oilless solvent.

⚠ WARNING

If not removed, the anticorrosive treatment applied to the brake disc surface will interfere with brake action, and an unsafe riding condition could result.



Preparation

Battery Service

Battery Removal

The battery used in this motorcycle is a sealed type and never needs to be refilled. Follow the procedure for activating a new battery to ensure the best possible battery performance.

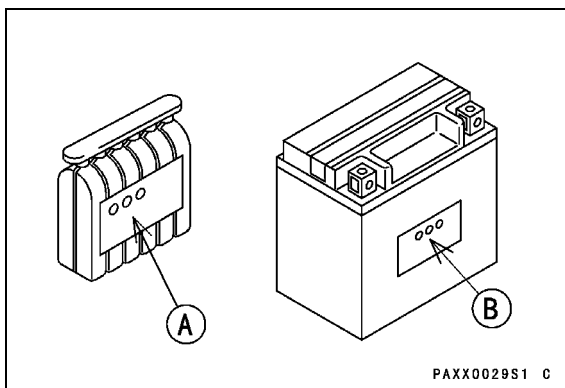
Activating the battery requires two steps, filling the battery with electrolyte, and charging. Read the electrolyte safety label and the following procedures carefully before battery activation.

CAUTION

Incorrect Battery Activation will reduce battery performance and service life. Be sure to strictly follow the Battery Service instructions in this Manual.

- Make sure to use the electrolyte packed in the crate with the unit.
- Make sure that the model name of the electrolyte container matches the model name of the battery. These names must be the same.

**Battery Model Name for
EX650C/D: FTX12-BS**

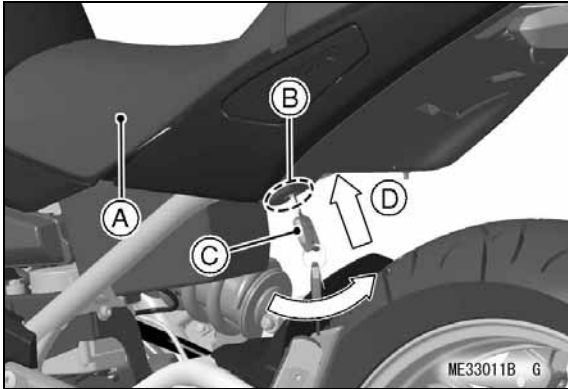


- A. Model Name of the Electrolyte
- B. Model Name of the Battery

CAUTION

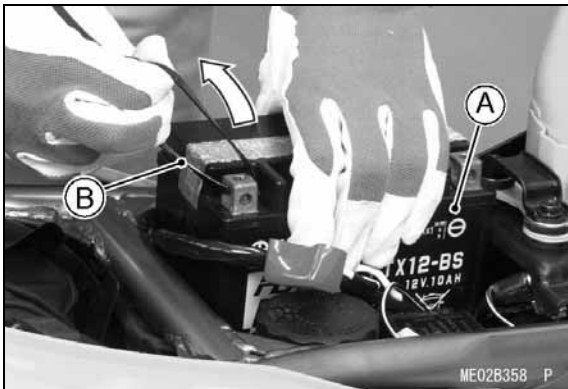
Sealed battery electrolyte has a higher concentration of sulfuric acid. Each container contains the proper amount of electrolyte for its specific battery. Insufficient or incorrect electrolyte will reduce battery performance and service life. Electrolyte over capacity can lead to battery cranking or leaking and result in corrosion damage to the vehicle.

- Insert the ignition key into the seat lock, located under the seat cover.



- A. Seat
- B. Seat Lock
- C. Ignition Key
- D. Insert

- Turn the key clockwise while pulling the rear end of the seat.
- Remove the seat backward.
- Run the suitable band into the positive terminal (+).
- Pull the battery out of the battery case with both hands.



- A. Battery
- B. Suitable Band

- Clean the terminals.

Battery Specifications

Make	Furukawa
Battery Type	FTX12-BS
Battery Capacity	12 V 10 Ah
Electrolyte Capacity	0.60 L
Battery/Electrolyte Set P/No.	26012-0109

Battery Activation

Filling the Battery with Electrolyte

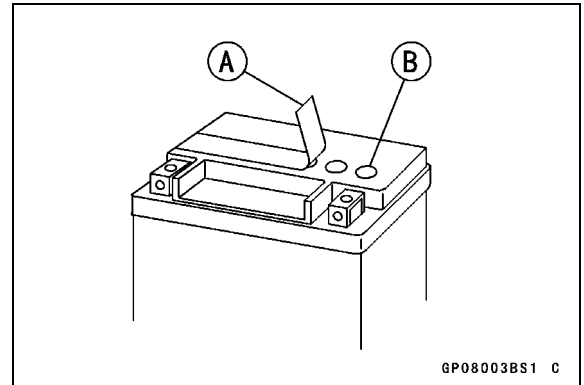
CAUTION

Do not remove the aluminum sealing sheet [A] from the filler ports [B] until just prior to use. Be sure to use the dedicated electrolyte container for correct electrolyte volume.

- Place the battery on a level surface.
- Check to see that the sealing sheet [A] has no peeling, tears, or holes in it.
- Remove the sealing sheet [A].

NOTE

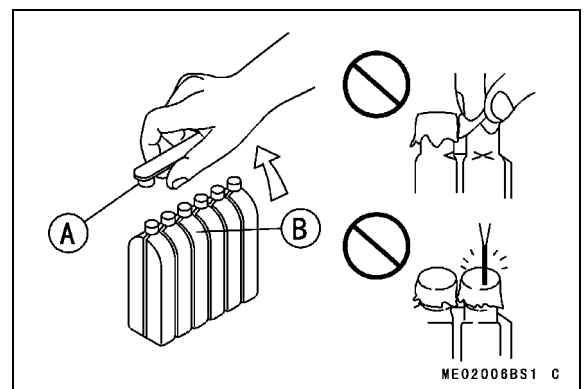
○The battery is vacuum sealed. If the sealing sheet has leaked air into the battery, it may require a longer initial charge.



- Remove the electrolyte container from the vinyl bag.
- Detach the strip of caps [A] from the container and set aside, these will be used later to seal the battery.

NOTE

○Do not pierce or otherwise open the sealed cells [B] of the electrolyte container. Do not attempt to separate individual cells.

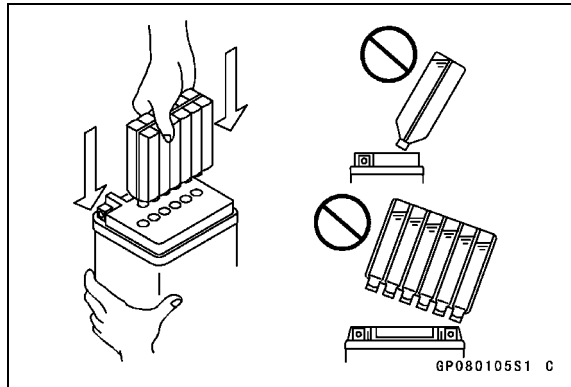


12 PREPARATION

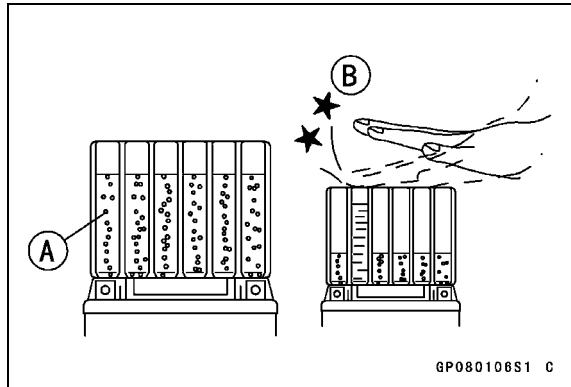
- Place the electrolyte container upside down with the six sealed cells into the filler ports of the battery. Hold the container level, push down to break the seals of all six cells. You will see air bubbles rising into each cell as the ports fill.

NOTE

- Do not tilt the electrolyte container.



- Check the electrolyte flow.
- If no air bubbles [A] are coming up from the filler ports, or if the container cells have not emptied completely, tap the container [B] a few times.



- Keep the container in place for **20 minutes** or more. Don't remove the container from the battery until it's empty, the battery requires all the electrolyte from the container for proper operation.

CAUTION

Removal of the container before it is completely empty can shorten the service life of the battery. Do not remove the electrolyte container until it is completely empty and 20 minutes have elapsed.

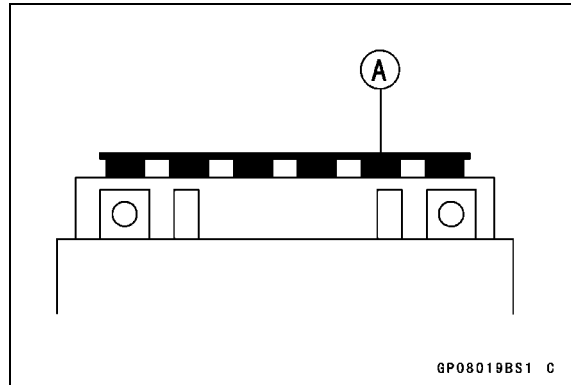
- Gently remove the container from the battery.
- Let the battery sit for **30 minutes** prior to charging to allow the electrolyte to permeate into the plates for optimum performance.

NOTE

- Charging the battery immediately after filling can shorten service life. Let the battery sit for at least **30 minutes** after filling.

Initial Charge

- Place the strip of caps [A] loosely over the filler ports.



- Newly activated sealed batteries require an initial charge.

Standard Charge: 1.2 A × 5 ~ 10 hours

- If using a recommended battery charger, follow the charger's instructions for newly activated sealed battery.

Kawasaki-recommended chargers:

Optimate III

Yuasa 1.5 Amp Automatic Charger

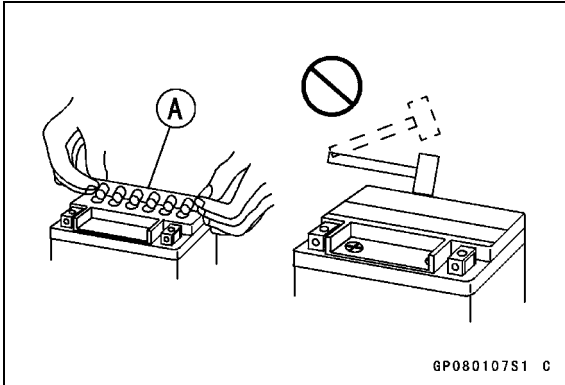
Battery Mate 150-9

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

NOTE

- Charging rates will vary depending on how long the battery has been stored, temperature, and the type of charger used. Let battery sit 30 minutes after initial charge, then check voltage using a voltmeter. If it is not at least 12.6 volts, repeat charging cycle.

- After charging is completed, press down firmly with both hands to seat the strip of caps [A] into the battery (don't pound or hammer). When properly installed, the strip of the caps will be level with the top of the battery.



CAUTION

Once the strip of the caps [A] is installed onto the battery, never remove the caps, nor add water or electrolyte to the battery.

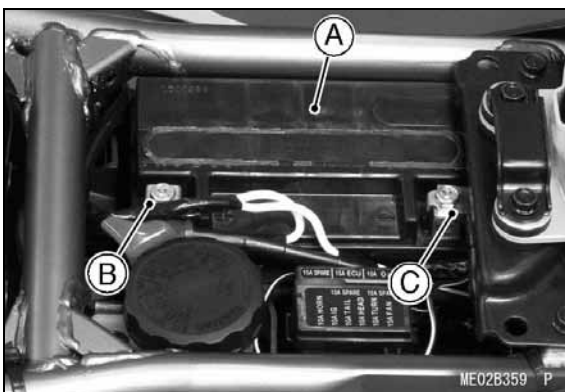
NOTE

○ To ensure maximum battery life and customer satisfaction, it is recommended the battery be load tested at three times its amp-hour rating for 15 seconds.

Re-check voltage and if less than 12.6 volts repeat the charging cycle and load test. If still below 12.6 volts the battery is defective.

Battery Installation

- Turn the ignition switch OFF.
- Place the battery into the battery case.
- Route the battery cables as shown, and first connect the red capped cable to the positive terminal (+), and then connect the negative cable to the negative terminal (-).
- Put a light coat of grease on the terminals to prevent corrosion.
- Cover the positive terminal (+) with its protective cap.

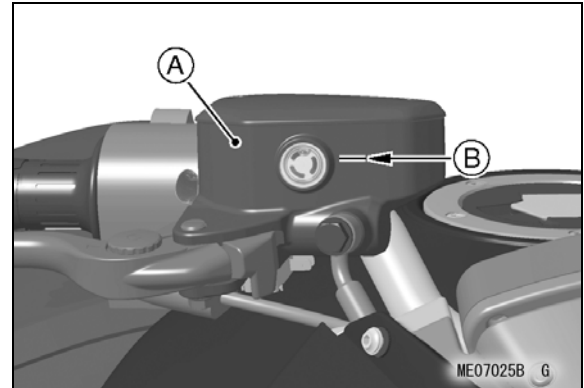


- A. Battery**
- B. Positive Cable (+)**
- C. Negative Cable (-)**

Front Brake Fluid

Front Brake Fluid Level Inspection

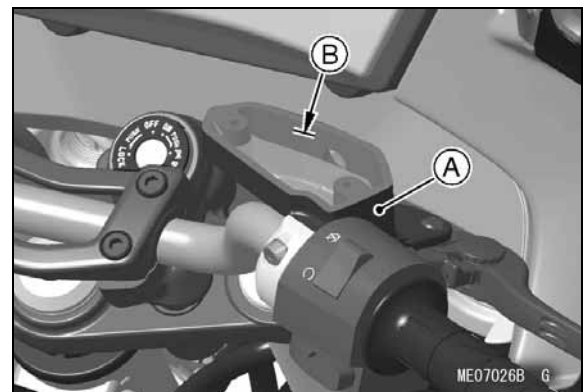
- With the front brake fluid reservoir held horizontal, check that the fluid level is above the lower level line.



A. Front Brake Fluid Reservoir

B. Lower Level Line

- If the fluid level in the reservoir is lower than the lower level line, check for fluid leaks in the front brake lines and fill the reservoir.
- Remove the screws to take off the front brake fluid reservoir cap and diaphragm.
- Fill the reservoir to the upper level line with DOT4 brake fluid. Inside the front brake reservoir is a stepped line showing the upper level line.



A. Front Brake Fluid Reservoir

B. Upper Level Line

⚠ WARNING

Never reuse old brake fluid.
Do not use fluid from a container that has been left unsealed or that has been open for a long time.
Do not mix two types of fluid for use in the brakes. This lowers the brake fluid boiling point and could reduce brake effectiveness. It may also cause the rubber brake parts to deteriorate.
Don't leave the reservoir cap off for any length of time to prevent moisture contamination of the fluid.
Don't add or change brake fluid in the rain or during conditions of blowing dust or debris.

CAUTION

Brake fluid quickly ruins painted surfaces. Wipe up any spilled fluid immediately.

- Operate the brake lever several times.
- If it feels spongy, there might be air in the brake line.
- If necessary, bleed the air in the front brake lines.
- Also check for fluid leakage around the fittings.

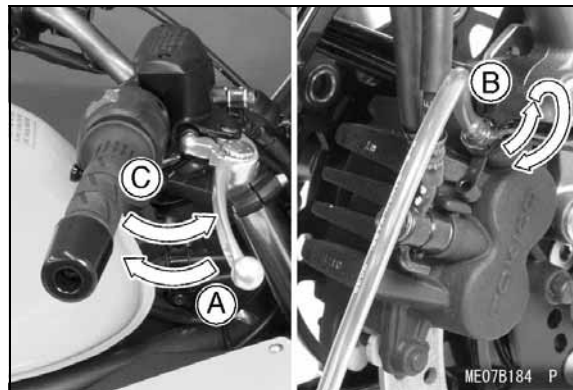
Front Brake Line Air Bleeding

- Remove the reservoir cap and diaphragm, and check that there is plenty of fluid in the reservoir.

NOTE

- *The fluid level must be checked several times, during the bleeding operation and replenished as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be repeated from the beginning since air will have entered the line.*

- Attach a clear plastic hose to the bleed valve on each front brake caliper and run the other end of the hose into a container.
- With the reservoir cap off, slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir. This bleeds the air from the brake master cylinder end of the line.
- Pump the brake lever a few times until it becomes hard and then, holding the lever squeezed, quickly open (turn counterclockwise) and close the bleed valve. Then release the lever. Repeat this operation until no more air can be seen coming out into the plastic hose.



- A. Hold the brake lever applied.**
- B. Quickly open and close the bleed valve.**
- C. Release the brake lever.**

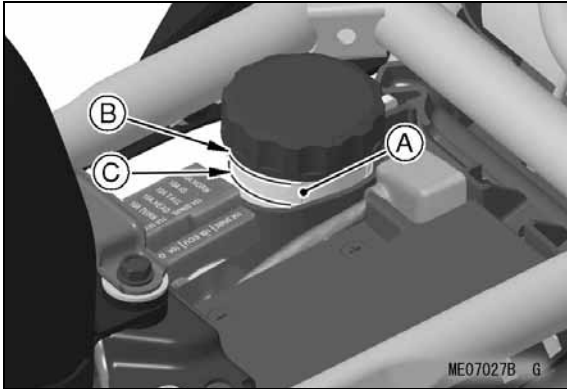
- Repeat the previous step one more time for the other front disc brake.
- When air bleeding is finished, check that the fluid level is between the upper and lower level lines.
- Install the diaphragm and reservoir cap.
- Tighten the bleed valves to the specified torque.

Torque: 7.8 N·m (0.80 kgf·m, 69 in·lb)

- Apply the brake forcefully for a few seconds, and check for fluid leakage around the fittings.

Rear Brake Fluid**Rear Brake Fluid Level Inspection**

- With the rear brake fluid reservoir held horizontal, check that the fluid level is between the upper and lower level lines.



- A. Rear Brake Fluid Reservoir**
- B. Upper Level Line**
- C. Lower Level Line**

- If the fluid level in the reservoir is lower than the lower level line, check for fluid leaks in the brake line, and fill the reservoir.
- Remove the reservoir cap and diaphragm, and fill the reservoir to the upper level line with DOT4 brake fluid.

⚠ WARNING

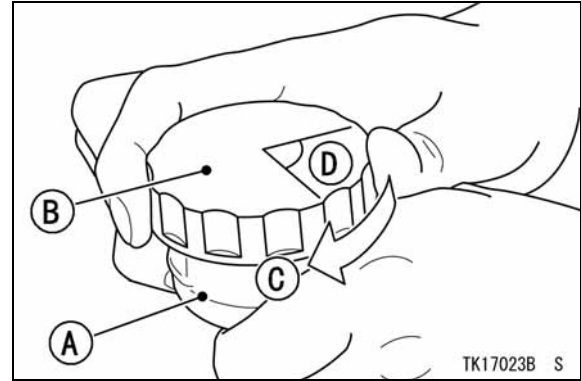
Be sure to hold the front brake during the bleeding operation, or the motorcycle may fall over. It could cause an accident and injury.

CAUTION

Brake fluid quickly ruins painted surfaces. Wipe up any spilled fluid immediately.

NOTE

- *First, tighten the rear brake fluid reservoir cap clockwise by hand until slight resistance is felt indicating that the cap is seated on the reservoir body, then tighten the cap an additional 1/6 turn while holding the brake fluid reservoir body.*



- A. Reservoir**
- B. Cap**
- C. Clockwise**
- D. 1/6 turn**

- Operate the brake pedal several times.
- If it feels spongy, there might be air in the brake line.
- If necessary, bleed the air in the rear brake line.
- Also check for fluid leakage around the fittings.

Rear Brake Line Air Bleeding

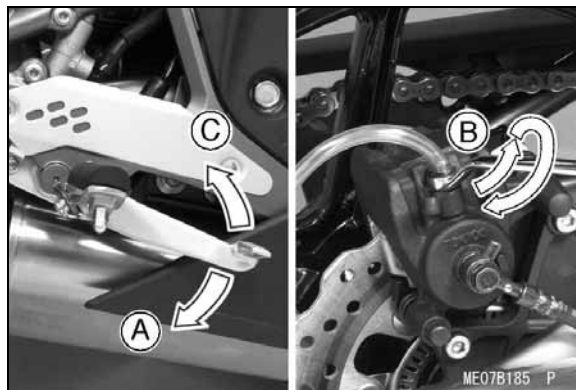
- Remove the rear brake reservoir cap and diaphragm, and check that there is plenty of fluid in the reservoir.

NOTE

- *The fluid level must be checked several time, during the bleeding operation and replenished as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be repeated from the beginning since air will have entered the line.*

- Attach a clear plastic hose to the bleed valve on the rear brake caliper and run the other end of the hose into a container.
- With the reservoir cap off, slowly pump the brake pedal several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir. This bleeds the air from the rear brake master cylinder end of the line.
- Pump the brake pedal a few times until it becomes hard and then, holding the pedal pushed down, quickly open (turn counter-clockwise) and close the bleed valve. Then release the pedal. Repeat this operation until no more air can be seen coming up into the plastic hose.

16 PREPARATION



- A. Hold the brake pedal applied.**
B. Quickly open and close the bleed valve.
C. Release the brake pedal.

- When air bleeding is finished, check that the fluid level is between the upper and lower level lines.
- Tighten the bleed valve to the specified torque.

Torque: 7.8 N·m (0.80 kgf·m, 69 in·lb)

- Install the diaphragm and reservoir cap.

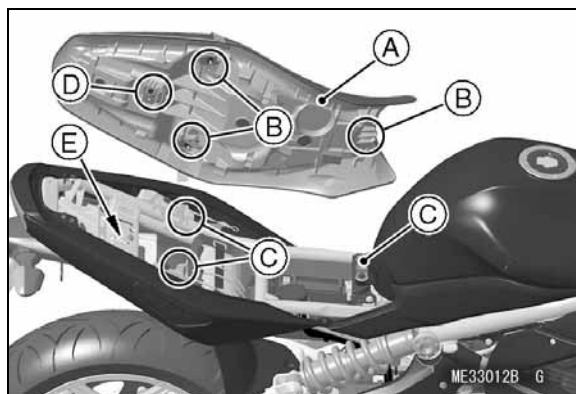
NOTE

○First, tighten the rear brake fluid reservoir cap clockwise by hand until slight resistance is felt indicating that the cap is seated on the reservoir body, then tighten the cap an additional 1/6 turn while holding the brake fluid reservoir body.

- Apply the brake forcefully for a few seconds, and check for fluid leakage around the fittings.

Seat Installation

- Insert the three tabs on the seat into the slots.



- A. Seat**
B. Tabs
C. Slots
D. Hook
E. Latch

- Insert the hook at the rear of the seat into the latch, and push down the rear part of seat until the lock clicks.
- Pull up the rear end of seat to make sure it is securely locked.

NOTE

○If there is difficulty removing the ignition key from the seat lock, turn it lightly counterclockwise while pulling it out.

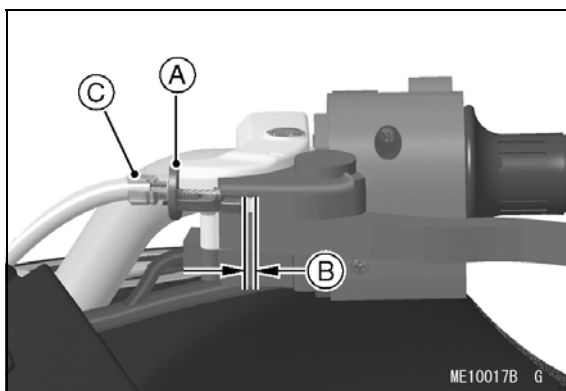
Clutch Lever and Cable

Clutch Lever Free Play Inspection

- Check that the clutch lever has the specified amount of free play as shown in the figure.

Clutch Lever Free Play:

2 ~ 3 mm (0.08 ~ 0.12 in.)

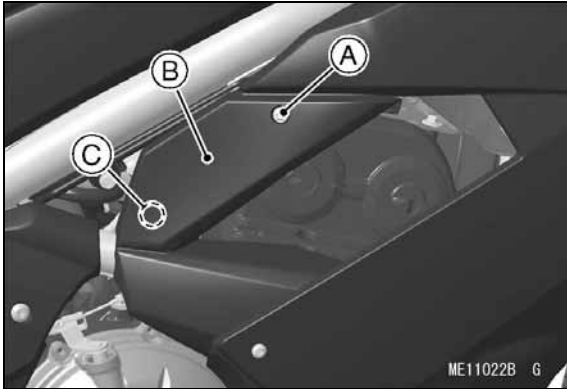


- A. Locknut**
B. 2 ~ 3 mm (0.08 ~ 0.12 in.)
C. Adjuster

- If the free play is incorrect, adjust the free play.

Clutch Lever Free Play Adjustment

- Turn the adjuster so that the clutch lever will have 2 ~ 3 mm (0.08 ~ 0.12 in.) of free play.
- If it cannot be done, use the adjuster at the middle of the clutch cable.
- Remove the socket bolt (D = 5, L = 16) and plastic washer (D = 5.3).
- Pull the right side cover outward to clear the stopper, and then remove the right side cover.

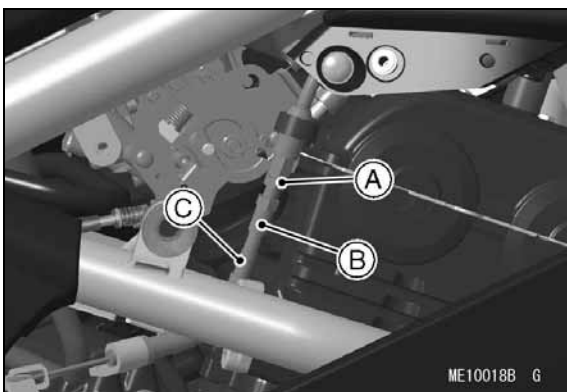


- A. Socket Bolt (D = 5, L = 16) and Plastic Washer (D = 5.3)
- B. Right Side Cover
- C. Stopper

- Loosen the locknut at the middle of the clutch cable.
- Turn the adjuster until the free play is correct.

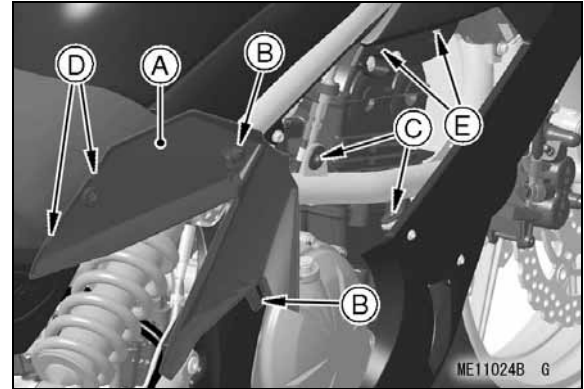
⚠ WARNING

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



- A. Locknut
- B. Adjuster
- C. Clutch Cable

- Tighten the locknut.
- Insert the projections of the right side cover into the grommets.
- Insert the tabs of the right side cover into the slots.



- A. Right Side Cover
- B. Projections
- C. Grommets
- D. Tabs
- E. Slots

- Reinstall the bolt and plastic washer, and tighten the bolt.

NOTE

- After the adjustment is made, start the engine and check that the clutch does not slip and that it releases properly.
- For minor corrections, use the adjuster at the clutch lever.

Drive Chain

Drive Chain Slack and Wheel Alignment Inspection

- Set the motorcycle up on its side stand.
- Make sure that the drive chain has the specified amount of play, and that the left and right notches (marks) on the swingarm points to the same marks on the left and right drive chain adjusters.

⚠ WARNING

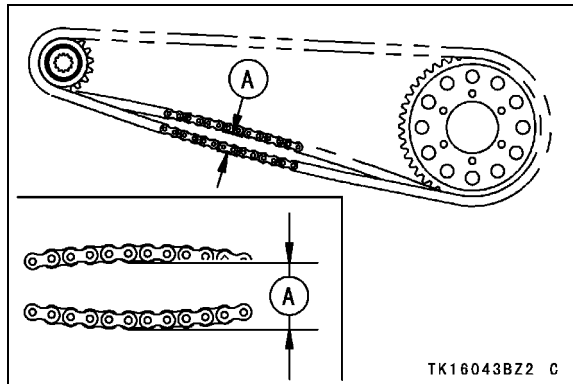
Misalignment of the wheel will result in abnormal wear, and may result in an unsafe riding condition.

- Rotate the rear wheel to find the position where the chain is tightest, and measure the maximum chain slack by pulling up and pushing down in the chain midway between the engine sprocket and rear wheel sprocket.

Drive Chain Slack:

25 ~ 35 mm (1.0 ~ 1.4 in.)

18 PREPARATION



A. 25 ~ 35 mm (1.0 ~ 1.4 in.)

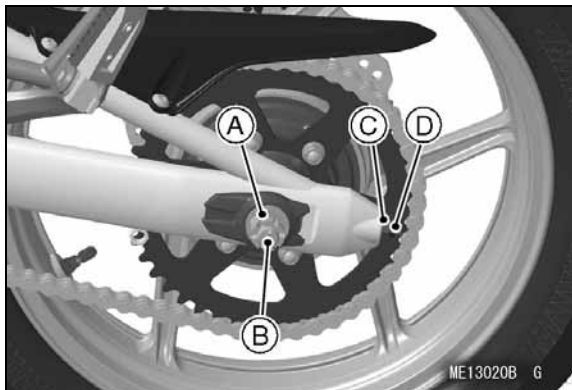
- If the drive chain is too tight or too loose, adjust it so that the chain slack will be within the standard value.

⚠ 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.

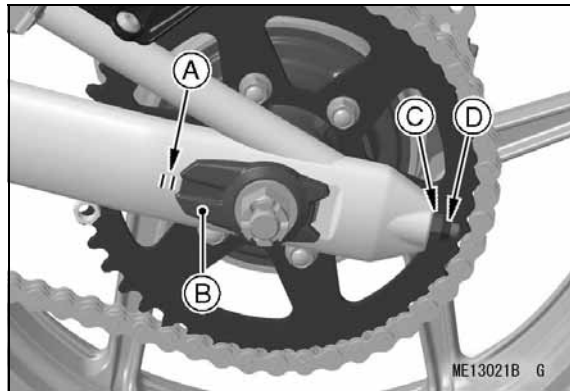
Drive Chain Slack Adjustment

- Loosen the left and right chain adjuster locknuts.
- Remove the cotter pin, and loosen the rear axle nut.



- A. Rear Axle Nut**
- B. Cotter Pin**
- C. Drive Chain Adjusting Nut**
- D. Drive Chain Adjuster Locknut**

- If the chain is too loose, turn in the left and right chain adjusting nuts evenly.
- If the chain is too tight, turn out the left and right chain adjusting nuts evenly.
- Turn both chain adjusting nuts evenly until the drive chain has the correct amount of slack. To keep the chain and wheel properly aligned, the left wheel alignment indicator should align with the same swingarm mark that the right indicator aligns with.



- A. Chain Adjuster Alignment Marks**
- B. Indicator**
- C. Drive Chain Adjusting Nut**
- D. Drive Chain Adjuster Locknut**

NOTE

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

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

Torque: 108 N·m (11.0 kgf·m, 80 ft·lb)

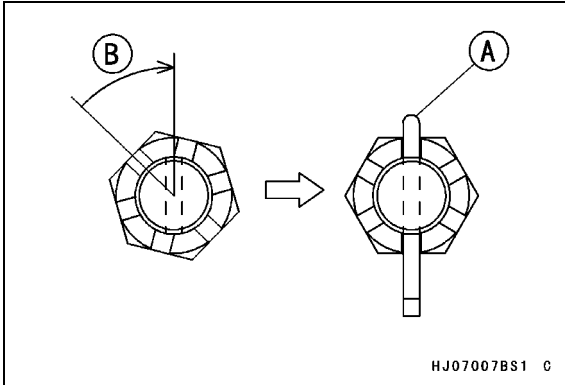
- Rotate the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Install a new cotter pin.

NOTE

○ When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle, tighten the nut clockwise up to the next alignment.

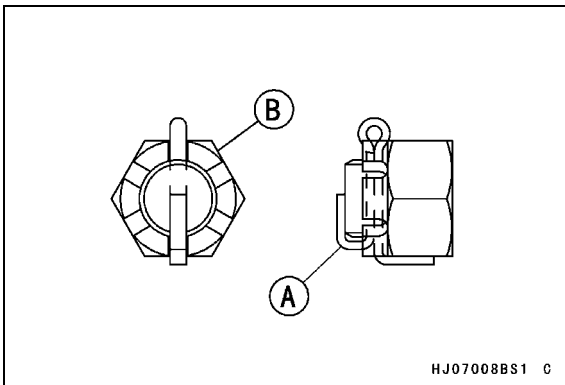
○ It should be within 30 degrees.

○ Loosen once and tighten again when the slot goes past the nearest hole.



- A. Cotter Pin
- B. Turning Clockwise

- Bend the cotter pin over the nut.



- A. Cotter Pin
- B. Nut

⚠ WARNING

If the rear axle nut is not securely tightened or the cotter pin is not installed, an unsafe riding condition may result.

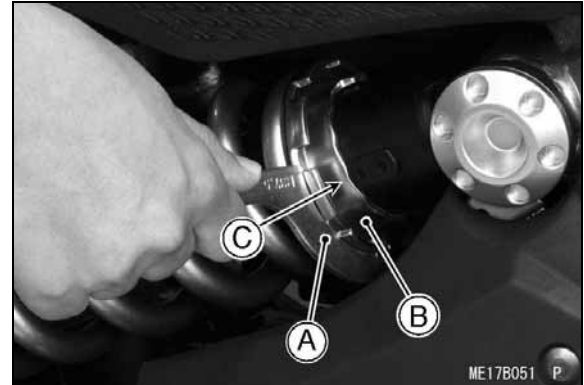
- Check the rear brake effectiveness.

Rear Shock Absorber

Spring Preload Adjustment

- Check the position of the spring preload adjuster on the rear shock absorber.

STD Spring Preload: No.4 position



- A. Wrench
- B. Spring Preload Adjuster
- C. No.4 Position

- Turn the preload adjuster to the No.4 position with the wrench in the tool kit.

Tire Air Pressures

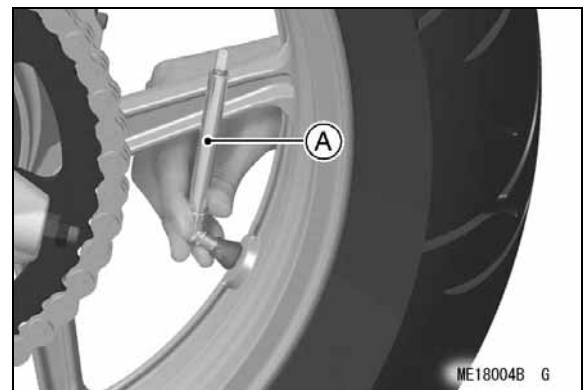
Tire Air Pressures

- To prevent flat-spotting during shipment, the tires are over-inflated before crating. Adjust the pressures to the specified values in the front and rear, and make sure to tighten the caps securely.

Tire Air Pressure [when cold]:

Front: 225 kPa (2.25 kgf/cm², 32 psi)

Rear: 250 kPa (2.50 kgf/cm², 36 psi)



- A. Tire Air Pressure Gauge

Fuel

⚠ WARNING

Fill the tank in a well-ventilated area, and take ample care that there are no sparks or open flames anywhere near the work area.

20 PREPARATION

- Open the fuel tank cap, and check for debris in the fuel tank.
- Fill the fuel tank with one gallon or four liters of unleaded gasoline. Use gasoline with a minimum antiknock index rating according to the recommendation of your country. Refer to the following table.

The antiknock index is an average of the Research Octane Number (RON) and the Motor Octane Number (MON), as shown in the table.

Octane Rating Method	Minimum Rating
Research Octane Number (RON)	91

- Close the fuel tank cap. Check for any leaks.

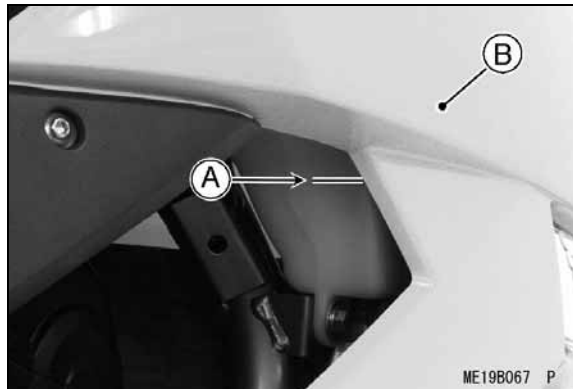
Coolant

Coolant Level Inspection

- Situate the motorcycle so that it is perpendicular to the ground.
- Check the coolant level through the coolant level gauge on the reserve tank located inside the right upper fairing. The coolant level should be above the L (Low) level line.

NOTE

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

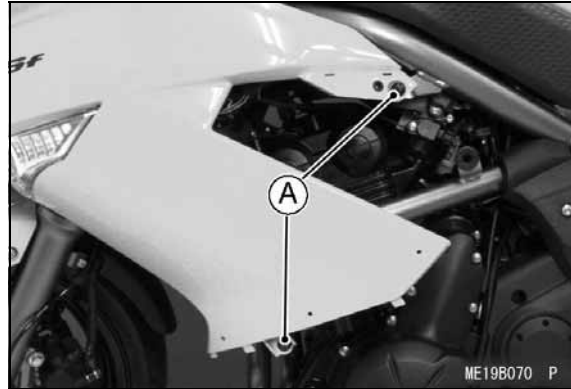


- A. L (Low) Level Line**
- B. Right Upper Fairing**

- If the amount of coolant is insufficient, add coolant into the reserve tank.

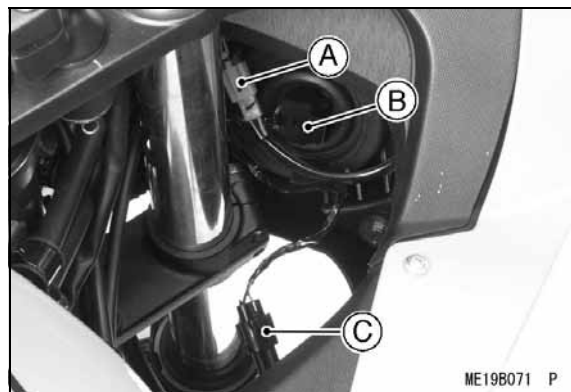
Coolant Filling

- Remove the right side cover (see the “Clutch Lever and Cable” section on page 16 in the Preparation chapter).
- Remove the left side cover in the same manner as the right side cover.
- Remove the socket bolts (D = 6, L = 14) (4) on both sides of the upper fairing.



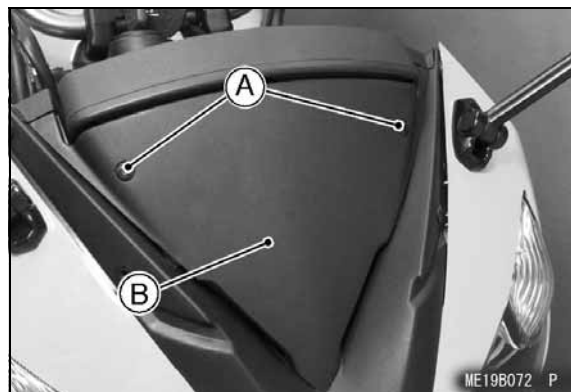
- A. Socket Bolts (D = 6, L = 14)**

- Free the turn signal light lead from the clamp.
- Disconnect the city light lead connector, head light lead connector and turn signal light lead connector.



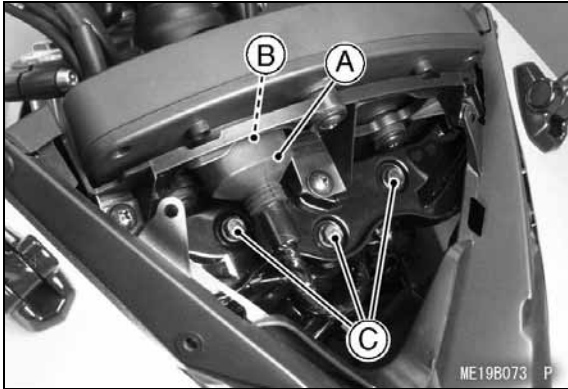
- A. City Light Lead Connector**
- B. Head Light Lead Connector**
- C. Turn Signal Light Lead Connector**

- Disconnect the connectors on the left side in the same manner.
- Remove the quick rivets to take off the meter cover.



- A. Quick Rivets**
- B. Meter Cover**

- Slide the dust cover and disconnect the meter unit connector.
- Remove the flanged bolts (D = 6, L = 12) (3).



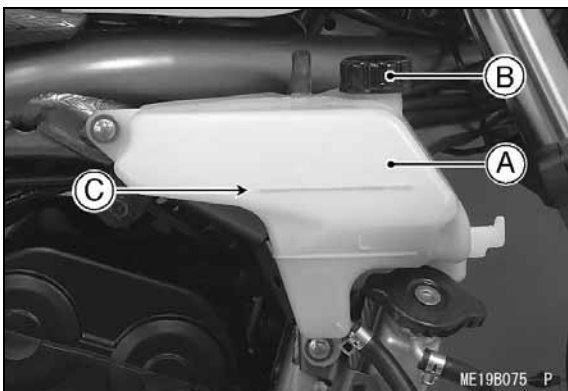
- A. Dust Cover
- B. Meter Unit Connector
- C. Flanged Bolts (D = 6, L = 12)

- Pull the upper fairing outward to clear the stoppers on both sides.
- Remove the upper fairing forward.



- A. Upper Fairing
- B. Stoppers
- C. Remove the Upper Fairing Forward.

- Remove the cap from the reserve tank and add coolant through the filler opening to the F (Full) level line.



- A. Reserve Tank
- B. Cap
- C. F (Full) Level Line

- Install the cap.
- Reinstall the upper fairing and meter cover in the reverse order of the removal procedure.
- Connect the city light lead connectors, head light lead connectors and turn signal light lead connectors on both sides.
- Reinstall the right side cover (see the “Clutch Lever and Cable” section on page 16 in the Preparation chapter).
- Reinstall the left side cover in the same manner as the right side cover.

NOTE

○ A permanent type of antifreeze is installed in the cooling system when shipped. It is colored green and contains ethylene glycol. It is mixed at 50% and has the freezing point of $-35\text{ }^{\circ}\text{C}$ ($-31\text{ }^{\circ}\text{F}$).

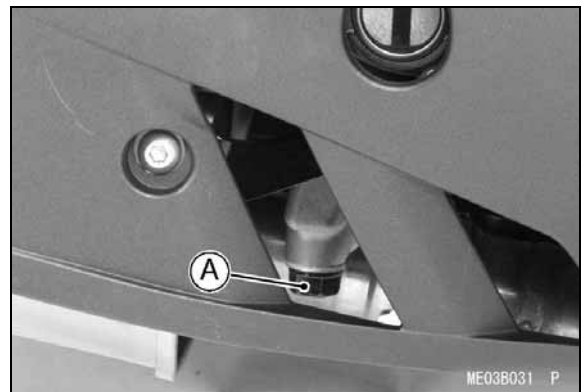
Engine Oil (4-stroke)

Engine Oil Level Inspection

NOTE

○ This vehicle's engine is filled with 20W-40 oil from the factory. **DO NOT DRAIN** and refill the crankcase before use. Check oil level and drain plug tightness.

Engine Oil Drain Plug Torque:
30 N·m (3.1 kgf·m, 22 ft·lb)



A. Oil Drain Plug

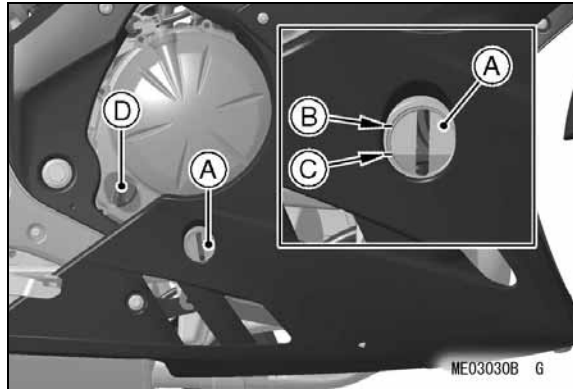
- Park the vehicle on level ground.
- Before starting the engine, check that the engine has oil.
- With the motorcycle held level, check that the engine has oil through the oil level sight gauge in the lower right side of the engine.

CAUTION

If the engine is run without oil, it will be severely damaged.

22 PREPARATION

- Start the engine and run it for several minutes at idle speed. Stop the engine, then wait several minutes until the oil settles.
- With the motorcycle held level, check the engine oil level through the oil level sight gauge. The oil level should come up between the upper and lower level lines next to the gauge.



- A. Oil Level Sight Gauge**
- B. Upper Level Line**
- C. Lower Level Line**
- D. Oil Filler Cap**

- If the oil level is too high, remove the excess oil through the oil filler opening, using a syringe or some other suitable device.
- If the oil level is too low, add oil to reach the correct level. Use the same type oil that is already in the engine.
- When replacing the cap, be sure the O-ring is in place, and tighten the cap in finger tight.

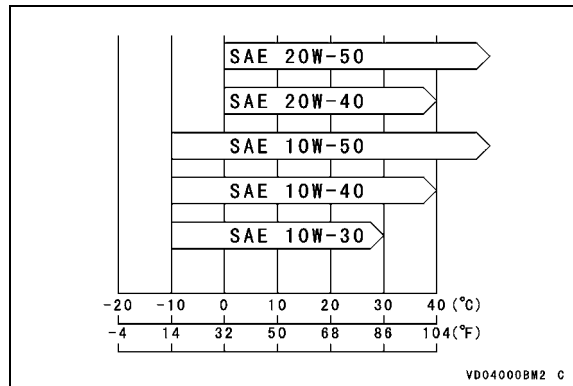
Recommended Engine Oil

- Type:** API SE, SF or SG
API SH, SJ, SL or SM with
JASO MA, MA1 or MA2
- Viscosity:** SAE 10W-40
- Capacity:** 1.7 L (1.8 US qt)
[when filter is not removed]
1.9 L (2.0 US qt)
[when filter is removed]
2.4 L (2.5 US qt)
[when engine is completely dry]

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.

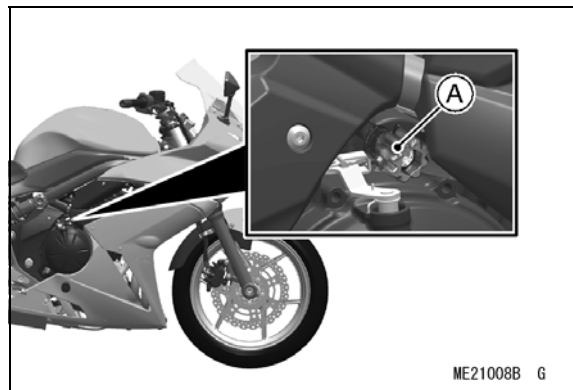
Although 10W-40 engine oil is the recommended oil for most conditions, the oil viscosity may need to be changed to accommodate atmospheric conditions in your riding area.



Idle Speed Adjustment

- Start the engine and warm it up thoroughly.
- Adjust the idle speed to 1 250 ~ 1 350 r/min (rpm) by turning the idle adjusting screw.

Idle Speed: 1 250 ~ 1 350 r/min (rpm)



A. Idle Adjusting Screw

- Open and close the throttle grip a few times to make sure that the idle speed does not change.
- With the engine idling, turn the handlebar to each side. If handlebar movement changes idle speed, check the throttle cable routing and free play.

⚠ WARNING

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

- Check for any exhaust leaks and correct if necessary.

Throttle Grip and Cable

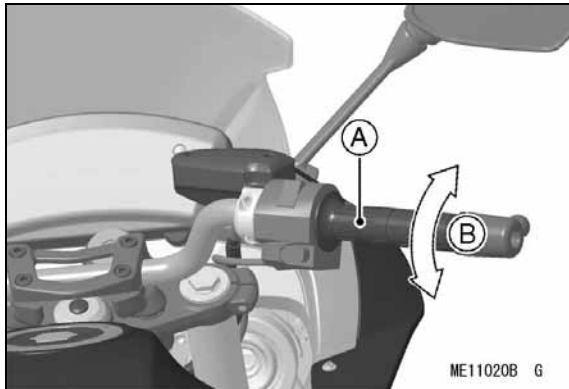
Throttle Grip Free Play Inspection

- Inspect the throttle grip free play. If the free play is incorrect, adjust the throttle cables.

Throttle Grip Free Play:

2 ~ 3 mm (0.08 ~ 0.12 in.)

- Check that the throttle grip moves smoothly from full open to close, and the throttle closes quickly and completely in all steering positions by the return spring. If the throttle grip does not return properly, check the throttle cable routing, grip free play, and for possible cable damage. Then lubricate the throttle cables.



A. Throttle Grip

B. 2 ~ 3 mm (0.08 ~ 0.12 in.)

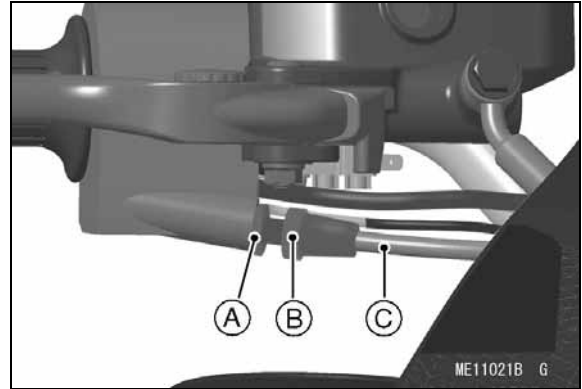
- Run the engine at idle speed, and turn the handlebar all the way to the right and left to ensure that the idle speed does not change. If the idle speed increases, check the throttle grip free play.

⚠ WARNING

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

Throttle Grip Free Play Adjustment

- Loosen the locknut at the throttle grip, and turn the cable adjuster until the specified amount of play is obtained.
- Tighten the locknut.

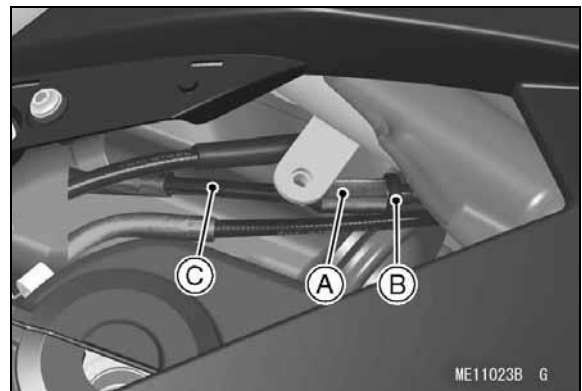


A. Locknut

B. Adjuster

C. Throttle Cable (Accelerator)

- If the throttle cable can not be adjusted by using the cable adjuster at the throttle grip, use the cable adjuster near the cylinder head.
- Remove the right side cover (see the “Clutch Lever and Cable” section on page 16 in the Preparation chapter).
- Loosen the locknut at the throttle grip and turn in the adjuster fully.
- Tighten the locknut.
- Turn out the decelerator cable adjuster until there is no play when the throttle grip is completely closed. Tighten the locknut.



A. Adjuster

B. Locknut

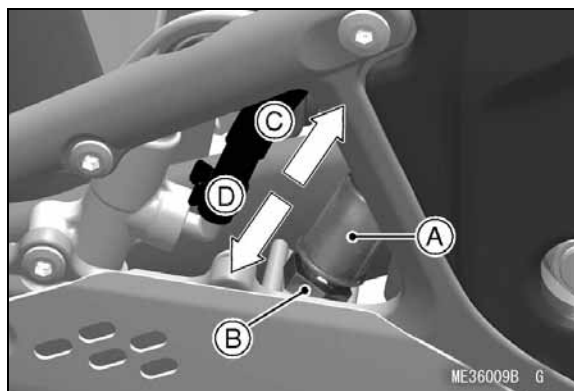
C. Decelerator Cable

- Turn out the accelerator cable adjuster until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained. Tighten the locknut.
- Reinstall the right side cover.

Rear Brake Light Switch

Rear Brake Light Switch Adjustment

- Turn on the ignition switch. The brake light should illuminate when the brake pedal is depressed about 10 mm (0.39 in.)
- If it does not, disconnect the rear brake light switch lead connector.
- Turn the rear brake light switch body as required.
- Connect the connector.



- A. Rear Brake Light Switch
- B. Adjusting Nut
- C. Lights sooner.
- D. Lights later.

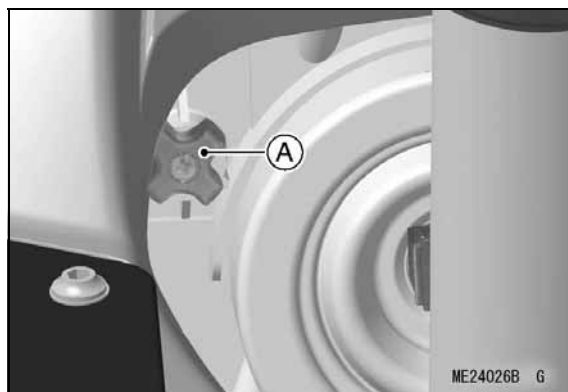
Headlight Aim

The headlight beam is adjustable both horizontally and vertically. Headlight aim must be correctly adjusted for safe riding as well as oncoming drivers. In most areas it is illegal to ride with an improperly adjusted headlight.

The left and right (high beam and low beam) headlight aim can be adjusted individually. The following explains the procedure for adjusting the left headlight aim, and the right headlight aim can be adjusted in the same manner.

Horizontal Adjustment

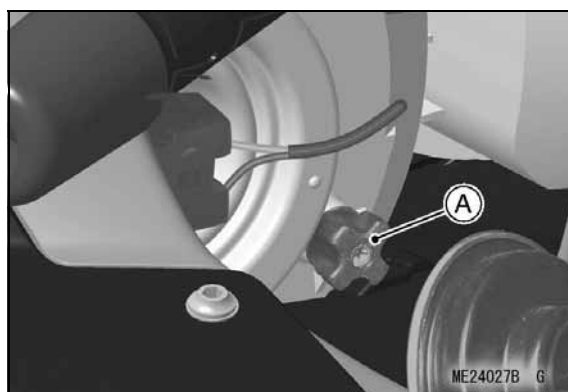
- Turn the horizontal adjuster in or out until the beam points straight ahead.



A. Horizontal Adjuster

Vertical Adjustment

- Turn the vertical adjuster in or out to adjust the headlight vertically.



A. Vertical Adjuster

For US and Canadian model

NOTE

- On high beam, the brightest point should be slightly below horizontal. The proper angle is 0.4 degrees below horizontal. This is a 50 mm (2 in.) drop at 7.6 m (25 ft) measured from the center of the headlight, with the motorcycle on its wheels and the rider seated.

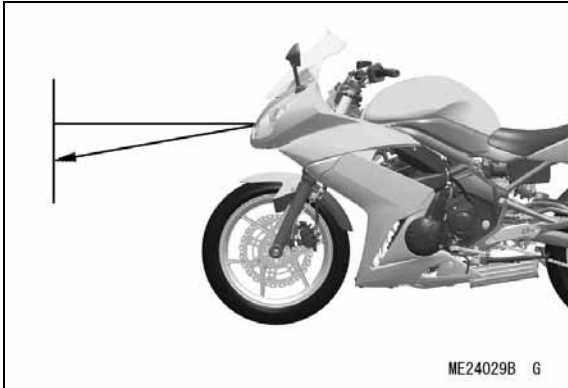
For other than US and Canadian models

NOTE

- On high beam, the brightest point should be slightly below horizontal with the motorcycle on its wheels and the rider seated. Adjust the headlight to the proper angle according to local regulation.

CAUTION

When handling the quartz-halogen bulbs, never touch the glass portion with bare hands. Always use a clean cloth. Oil contamination from hands or dirty rags can reduce bulb life or cause the bulb to explode.



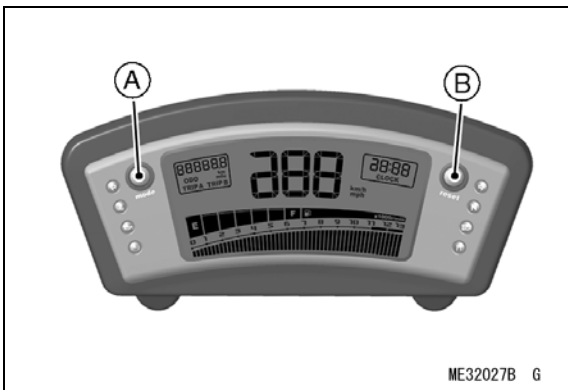
Digital Meter

Check the Km/Mile Display in the Digital Meter:

Km/Mile Display can alternate between English and metric modes (km and mile) in the digital meter. Make sure that km or mile according to local regulations is correctly displayed before sale.

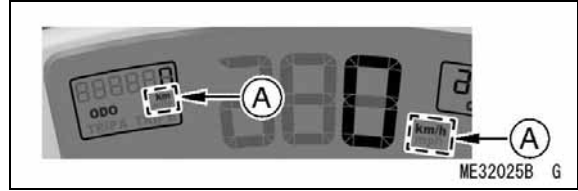
NOTE

Do not operate the vehicle with the digital meter displaying in the wrong unit (km or mile) of the digital meter. Shift the km/mile display in the digital meter as follows.



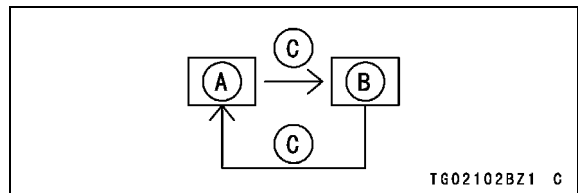
- A. MODE Button
- B. RESET Button

- Turn the ignition key to "ON".
- Push MODE button to display the odometer in the digital meter.
- The km/mile display shifts by pushing the RESET button while the MODE button pushed in.



A. Km/Mile Display

- The km/mile display shifts as follows.



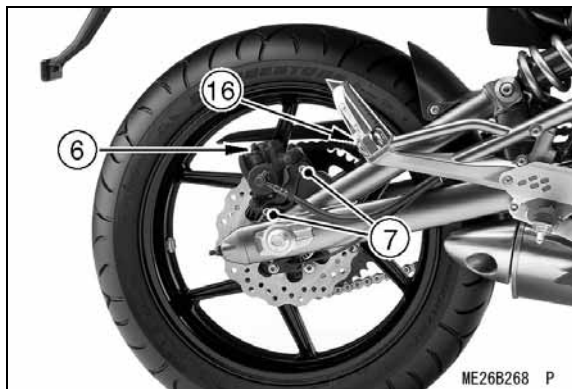
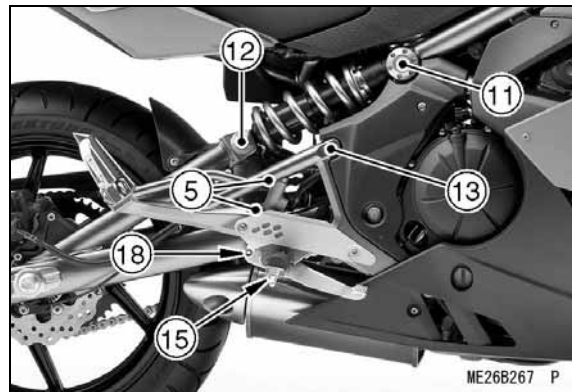
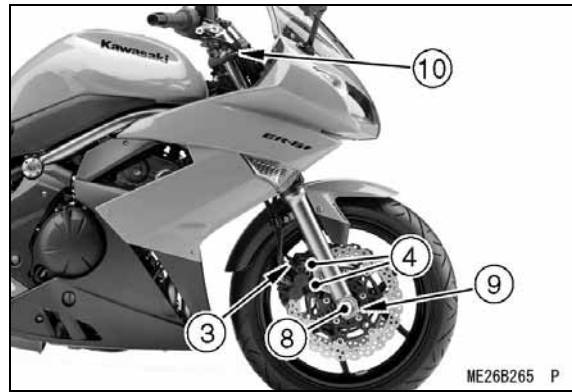
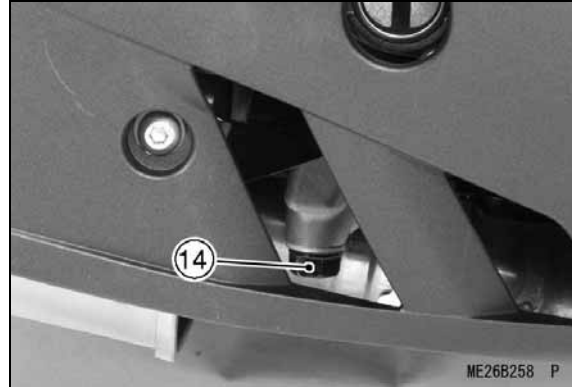
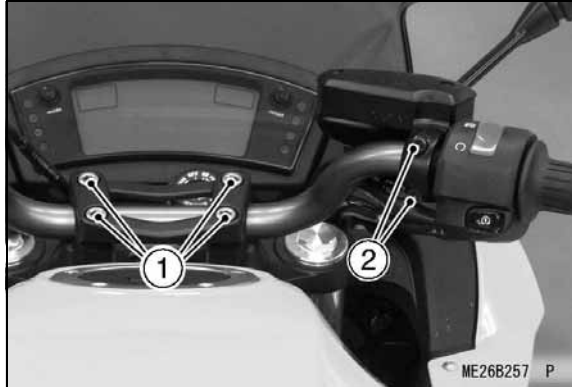
- A. Mile Display
- B. Km Display
- C. Push RESET Button with MODE Button in

NOTE

The data is maintained even if the battery is disconnected.

Fastener Check

- The torque values listed are for assembly and preparation items only, see the appropriate Service Manual for a more comprehensive list. Check tightness of all fasteners that are in the table before retail delivery. Also check to see that each cotter pin or circlip is in place.



No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
Steering					
1	Handlebar clamp bolt	25	2.5	18	S
Brake					
2	Front master cylinder clamp bolt	11	1.1	97 in·lb	S
3	Front brake bleed valve (Left and Right)	7.8	0.80	69 in·lb	
4	Front caliper mounting bolt (Left and Right)	34	3.5	25	
5	Rear master cylinder mounting bolt	25	2.5	18	
6	Rear brake bleed valve	7.8	0.80	69 in·lb	
7	Rear caliper mounting bolt	25	2.5	18	
Wheel					
8	Front axle	108	11	80	
9	Front axle clamp bolt (Right)	34	3.5	25	
Suspension					
10	Front fork clamp bolt (Upper) (Left and Right)	20	2.0	15	
11	Rear shock absorber mounting bolt (Upper)	59	6.0	44	
12	Rear shock absorber mounting bolt (Lower)	59	6.0	44	
Other					
13	Footpeg bracket bolt (Left and Right)	25	2.5	18	
Engine Oil Drain Plug					
14	Engine oil drain plug	30	3.1	22	
Cotter Pin or Circlip					
15	Front footpeg pin circlip (Left and Right)	–	–	–	
16	Rear footpeg pin circlip (Left and Right)	–	–	–	
17	Rear axle nut cotter pin	–	–	–	
18	Rear master cylinder rod cotter pin	–	–	–	

S: Follow the specific tightening sequence.

Standard Torque Table

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

General Fasteners:

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

Test Ride the Motorcycle

- Complete the test ride checklist.

Control Cables: Throttle cables must work without binding in any steering position.

Steering: Action is free from lock-to-lock.

Suspension: Check operation front and rear.

Engine: Electric starter works properly and engine starts promptly. Good throttle response and return.

Transmission and Clutch: Smooth operation.

Brakes: Adequate, smooth stopping power, No drag.

Speedometer and Tachometer: Check operation.

Electrical System:

Headlight - check high and low beams.

Taillight - check operation.

Brake Light - check operation.

Turn Signal Lights - check operation.

Horn - check operation.

Instrument Lights and Indicator Lights – check operation.

Engine Stop Switch Works:

Starter Interlock Switch Works:

No Unusual Noises:

No Fuel, Oil, Brake Fluid, or Coolant Leaks:

PREPARATION COMPLETE.

WARNING

New tires are slippery and may cause loss of control and injury. A break-in period of 160 km (100 miles) is necessary to establish normal tire traction. During break-in, avoid sudden and maximum braking and acceleration, and hard cornering.

A&P Check List

- Complete the A & P Check List.

MODEL APPLICATION

Year	Model	Name
2009	EX650C9F	Ninja 650R, ER-6f
2009	EX650D9F	ER-6f ABS



KAWASAKI HEAVY INDUSTRIES, LTD.
Consumer Products & Machinery Company

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