Brakes

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Exploded View

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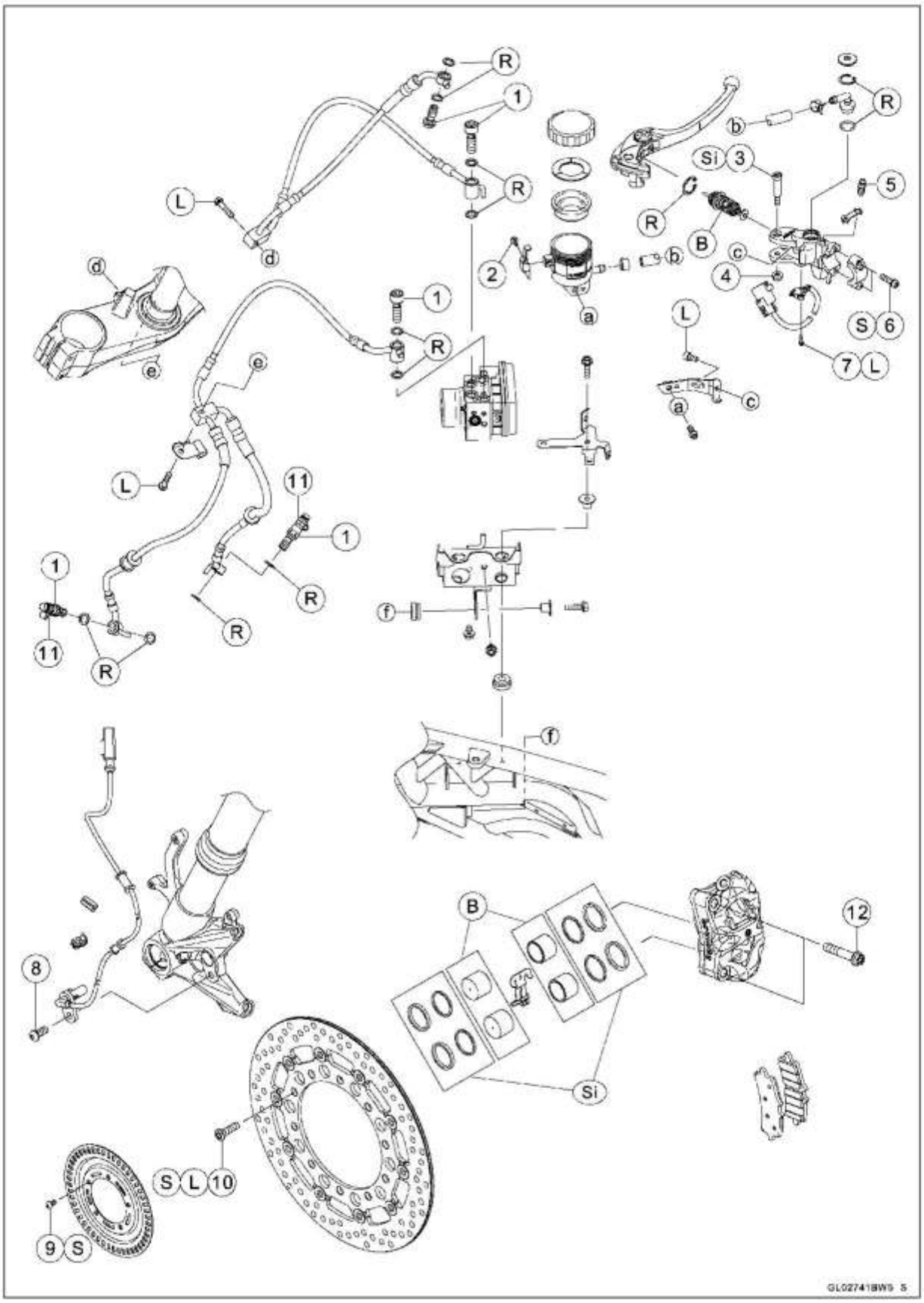
Exploded View



Exploded View

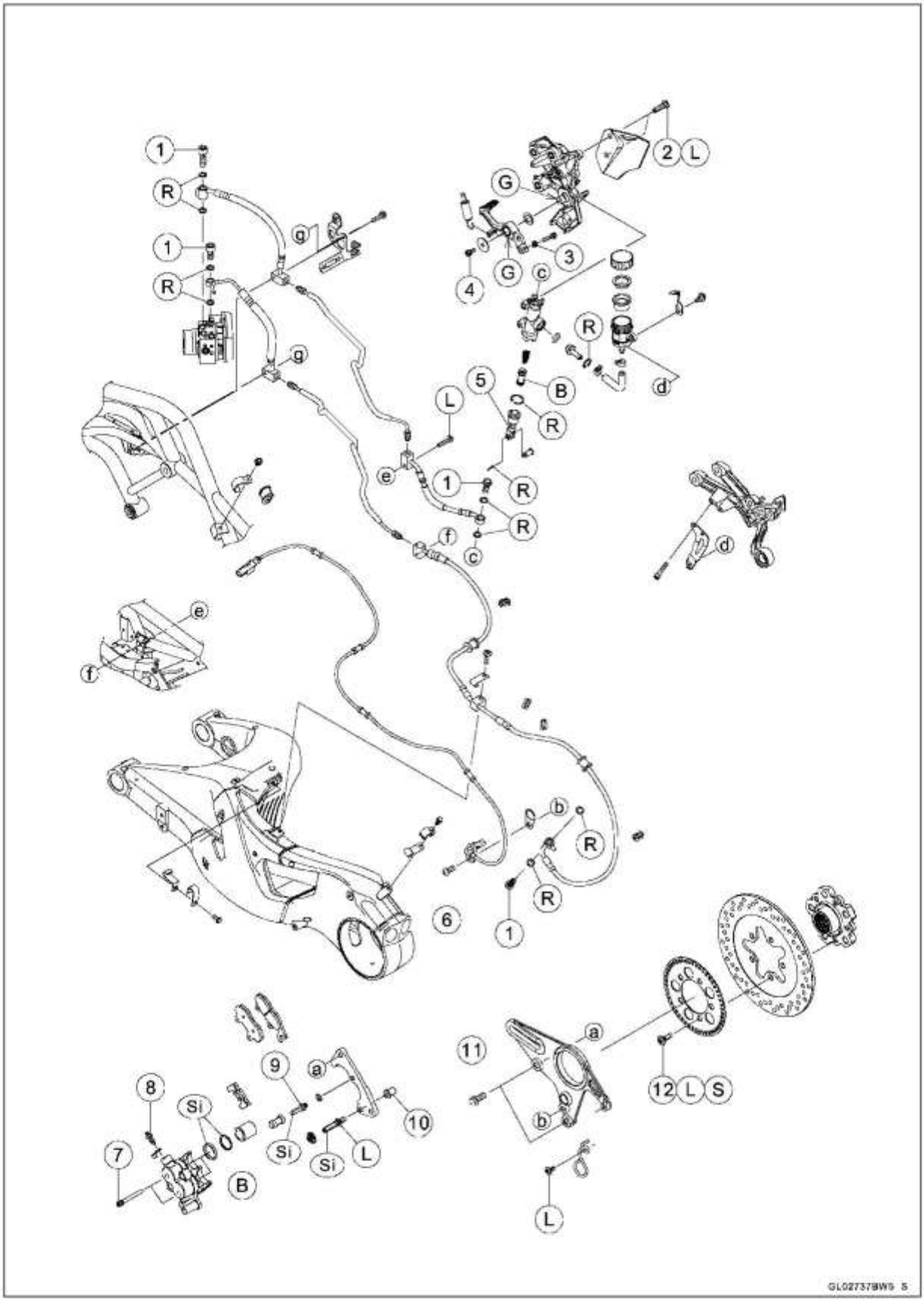
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Brake Hose Banjo Bolts	25	2.5	18	
2	Front Brake Reservoir Cap Stopper Screw	1.2	0.12	11 in·lb	
3	Brake Lever Pivot Bolt	1.0	0.10	8.9 in·lb	Si
4	Brake Lever Pivot Bolt Locknut	5.9	0.60	52 in·lb	
5	Front Master Cylinder Bleed Valve	5.4	0.55	48 in·lb	
6	Front Master Cylinder Clamp Bolts	11	1.1	97 in·lb	S
7	Brake/Electronic Cruise Control Cancel Switch Screw	0.30	0.03	2.7 in·lb	L
8	Front Wheel Rotation Sensor Bolts	25	2.5	18	
9	Front Wheel Rotation Sensor Rotor Bolts	4.0	0.41	35 in·lb	S
10	Front Brake Disc Mounting Bolts	28	2.9	21	L, S
11	Front Caliper Bleed Valves	10	1.0	89 in·lb	
12	Front Caliper Mounting Bolts	35	3.6	26	

B: Apply brake fluid.
L: Apply a non-permanent locking agent.
R: Replacement Parts
S: Follow the specified tightening sequence.
Si: Apply silicone grease.

NOTE

○*When disassembling the brake hose and pipe, disassemble them by the unit as shown in the exploded view.*

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Brake Hose Banjo Bolts	25	2.5	18	
2	Rear Master Cylinder Mounting Bolts	25	2.5	18	L
3	Electronic Cruise Control Cancel Switch Adjuster Locknut	7.0	0.71	62 in·lb	
4	Brake Pedal Bolt	9.0	0.92	80 in·lb	
5	Rear Master Cylinder Push Rod Locknut	17	1.7	13	
6	Rear Wheel Rotation Sensor Bolts	25	2.5	18	
7	Rear Brake Pad Pins	17	1.7	13	
8	Rear Caliper Bleed Valve	8.0	0.82	71 in·lb	
9	Rear Caliper Holder Pin	17	1.7	13	Si
10	Rear Caliper Holder Pin Nut	22	2.2	16	
11	Rear Caliper Mounting Bolts	35	3.6	26	
12	Rear Brake Disc Mounting Bolts	28	2.9	21	L, S

B: Apply brake fluid.
G: Apply grease.
L: Apply a non-permanent locking agent.
R: Replacement Parts
S: Follow the specified tightening sequence.
Si: Apply silicone grease.

NOTE

○*When disassembling the brake hose and pipe, disassemble them by the unit as shown in the exploded view.*

Specifications

Item	Standard	Service Limit
Brake Lever, Brake Pedal		
Brake Lever Position	6-way adjustable (to suit rider)	– – –
Brake Lever Free Play	Non-adjustable	– – –
Brake Pedal Free Play	Non-adjustable	– – –
Brake Pedal Position	About 63 mm (2.5 in.) below top of footpeg	– – –
Brake Pads		
Lining Thickness:		
Front	3.7 mm (0.15 in.)	1.0 mm (0.04 in.)
Rear	3.7 mm (0.15 in.)	1.5 mm (0.06 in.)
Brake Discs		
Thickness:		
Front	5.3 ~ 5.7 mm (0.21 ~ 0.22 in.)	5.0 mm (0.20 in.)
Rear	5.8 ~ 6.2 mm (0.23 ~ 0.24 in.)	5.5 mm (0.22 in.)
Runout	TIR 0.15 mm (0.0059 in.) or less	TIR 0.3 mm (0.013 in.)
Brake Fluid		
Grade	DOT4	– – –
ABS		
ABS Hydraulic Unit:		
Make	BOSCH	– – –
Wheel Rotation Sensor Air Gap:		
Front	About 1.3 mm (0.05 in.)	– – –
Rear	About 1.5 mm (0.06 in.)	– – –

Brake Lever, Brake Pedal

Brake Lever Position Adjustment

The brake lever adjuster has 6 positions so that the brake lever position can be adjusted to suit the operator's hand.

- Push the lever forward and turn the adjuster [A] to align the number with the arrow mark [B] on the lever.

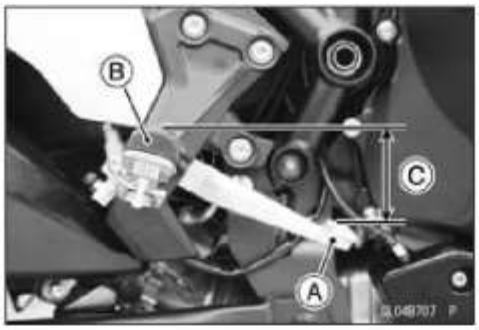
○The distance from the grip to the lever is minimum at number 6 and maximum at number 1.

Brake Pedal Position Inspection

- Check that the brake pedal [A] is in the correct position.
  Footpeg [B]

Brake Pedal Position
Standard: About 63 mm (2.5 in.) [C] below top of footpeg

★If it is incorrect, adjust the brake pedal position.



Brake Pedal Position Adjustment

NOTE

○*Usually it is not necessary to adjust the pedal position, but always adjust it when the push rod locknut has been loosened.*

- Loosen the locknut [A] and turn the push rod with the hex head [B] to achieve the correct pedal position.

★If the length [C] shown is **70 ±1 mm (2.76 ±0.04 in.)**, the pedal position will be within the standard range.

- Tighten:

Torque - Rear Master Cylinder Push Rod Locknut: 17 N·m (1.7 kgf·m, 13 ft·lb)

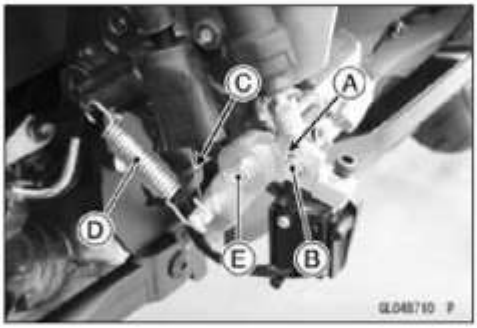
- Check the brake light switch operation (see Brake Light Switch Operation Inspection(2-59)).

Brake Pedal Removal

- Remove:
  Bolt [A] and Stopper
  Front Footpeg Bracket Bolts [B]

Brake Lever, Brake Pedal

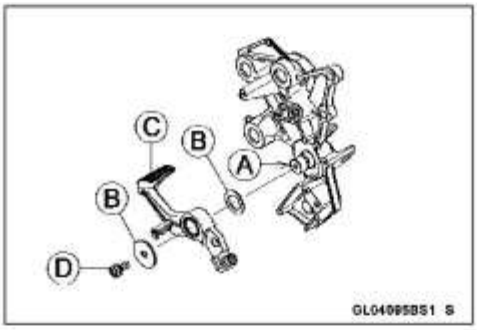
- Remove:
  Cotter Pin [A]
  Joint Pin [B]
  Rear Brake Light Switch Spring [C]
  Return Spring [D]
  Brake Pedal Bolt [E] and Washers
  Brake Pedal



Brake Pedal Installation

- Apply grease to the pivot shaft [A] of the footpeg and brake pedal side of washers [B].
- Install:
  Brake Pedal [C]
  Washers
- Tighten:

Torque - Brake Pedal Bolt [D]: 9.0 N·m (0.92 kgf·m, 80 in·lb)



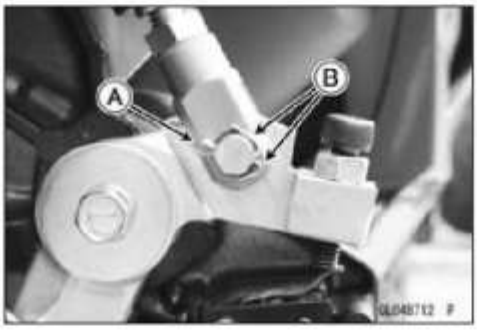
- Hook the longer end of the rear brake light switch spring [A] to the brake pedal.
- Hook the larger diameter end of the return spring [B] to the brake pedal.

○Face the both lower spring ends forward.

- Replace the cotter pin [A] with a new one.
- Insert the cotter pin and bend the pin ends [B].
- Install the front footpeg bracket.
- Apply a non-permanent locking agent to the front footpeg bracket bolts.
- Tighten:

Torque - Front Footpeg Bracket Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

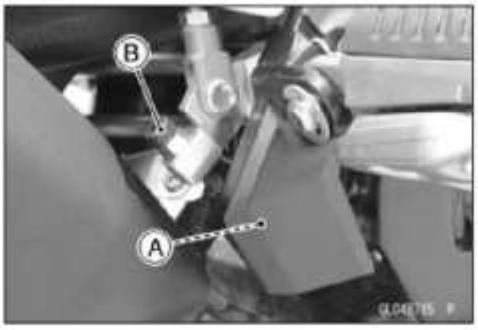
- Check the brake pedal position (see Brake Pedal Position Inspection(12-9)).



- Enter the electronic cruise control system switch diagnostic mode (see Electronic Cruise Control System Switches and Buttons Inspection(16-90)).
- Check that the electronic cruise control cancel switch (rear brake) [A] is switched when depressing the pedal 7 ±2 mm (0.3 ±0.08 in.).
- In addition, make sure the electronic cruise control cancel switch is operated before the rear brake light switch.

★If the timing is improper, adjust the electronic cruise control switch adjuster [B].

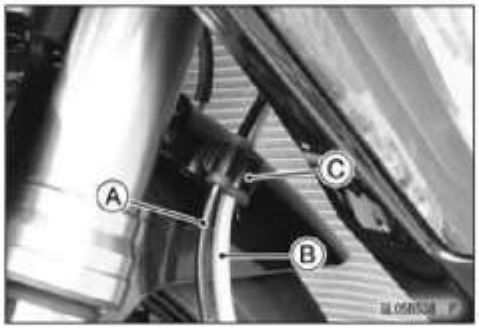
- Loosen the locknut and turn the adjuster.
- Tighten the locknut.



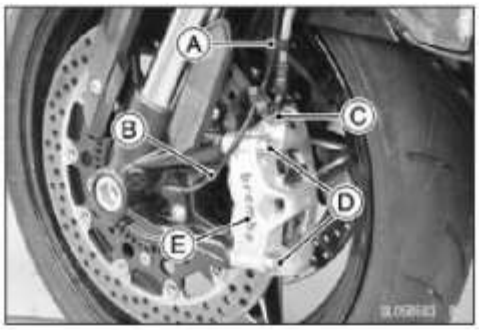
Calipers

Front Caliper Removal

- Free the front wheel rotation sensor lead [A] and front brake hose [B] from the clamp [C].



- Remove the clamp [A] to free the front wheel rotation sensor lead [B].
- Loosen the front brake hose banjo bolt [C] and tighten it loosely to prevent the fluid spillage.
- Remove the caliper mounting bolts [D], and detach the caliper [E] from the disc.
- Remove the banjo bolt and disconnect the brake hose from the caliper.



NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

○Take care not to spill the brake fluid on the painted or plastic parts.
○Temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
○Immediately wash away any brake fluid that spills.

Front Caliper Installation

- Replace the washers that are on each side of the hose fitting with new ones.
- Install the front caliper and the brake hose lower end.

Torque - Front Caliper Mounting Bolts: 35 N·m (3.6 kgf·m, 26 ft·lb)
Brake Hose Banjo Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

○Avoid sharp bending, kinking, flatting or twisting.
○Touch the stopper of the hose fitting to the caliper.

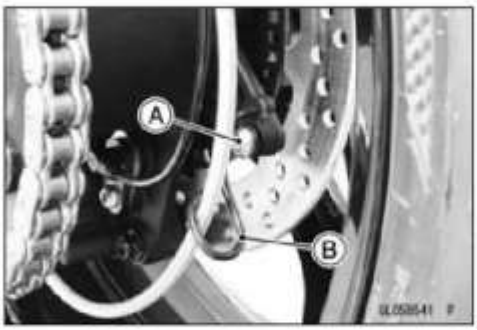
- Run the brake hoses and the front wheel rotation sensor lead correctly (see Cable, Wire, and Hose Routing section (18-2)).
- Check the fluid level in the brake fluid reservoir.
- Bleed the brake line (see Brake Line Bleeding(12-26)).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

⚠ WARNING

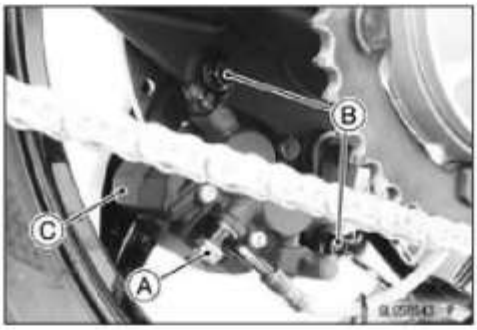
After servicing, it takes several applications of the brake lever before the brake pads contact the disc, which could result in increased stopping distance and cause an accident resulting in injury or death. Do not attempt to ride the motorcycle until a firm brake lever is obtained by pumping the lever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

Calipers

Rear Caliper Removal



- Remove:
  Rear Sprocket Guard (see Rear Sprocket Guard Removal(15-36))
- Remove the clamp bolt [A] and clamp [B] to free the rear brake hose.



- Loosen the banjo bolt [A] and tighten it loosely to prevent the fluid spillage.
- Remove the caliper mounting bolts [B], and detach the caliper [C] from the disc.
- Remove the banjo bolt and disconnect the brake hose from the caliper.

NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

○Take care not to spill the brake fluid on the painted or plastic parts.
○Temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
○Immediately wash away any brake fluid that spills.

Rear Caliper Installation

- Replace the washers that are on each side of the hose fitting with new ones.
- Install the caliper temporarily.
- Install the brake hose.
○Avoid sharp bending, kinking, flatting or twisting.
○Touch the stopper of the hose fitting to the caliper.
- Tighten:

Torque - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)
Rear Caliper Mounting Bolts: 35 N·m (3.6 kgf·m, 26 ft·lb)

- Run the brake hose and rear wheel rotation sensor lead correctly (see Cable, Wire, and Hose Routing section (18-2)).
- Check the fluid level in the brake fluid reservoir.
- Bleed the brake line (see Brake Line Bleeding(12-26)).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

⚠ WARNING

After servicing, it takes several applications of the brake pedal 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 pedal is obtained by pumping the pedal until the pads are against the disc.

- Install the removed parts.

Calipers

Front Caliper Disassembly

- Refer to the Caliper Rubber Parts Replacement (see Caliper Rubber Parts Replacement(2-55)).

Front Caliper Assembly

- Refer to the Caliper Rubber Parts Replacement (see Caliper Rubber Parts Replacement(2-55)).

Rear Caliper Disassembly

- Refer to the Caliper Rubber Parts Replacement (see Caliper Rubber Parts Replacement(2-55)).

Rear Caliper Assembly

- Refer to the Caliper Rubber Parts Replacement (see Caliper Rubber Parts Replacement(2-55)).

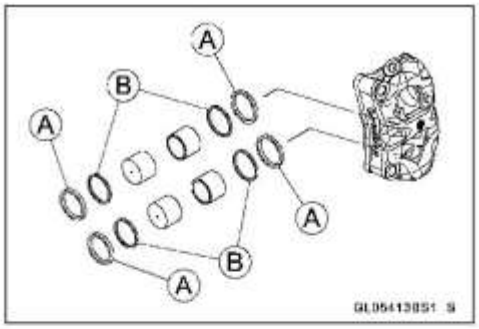
Caliper Fluid Seal Damage Inspection

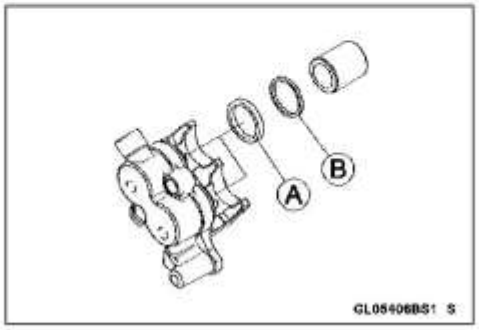
The fluid seals (piston seals) [A] are placed around the piston to maintain clearance between the pad and the disc. If the seal is in a poor condition, it could lead the pad to wear excessively or the brake to drag, which may cause the temperature of the discs or the brake fluid to increase.

- Replace the fluid seal if it exhibits any of the conditions listed below.

○Brake fluid leakage around the pad.
○Brakes overheat.
○Considerable difference in inner and outer pad wear.
○Seal and piston are stuck together.

★If the fluid seals are replaced, replace the dust seals [B] as well. Also, replace all seals every other time the pads are changed.





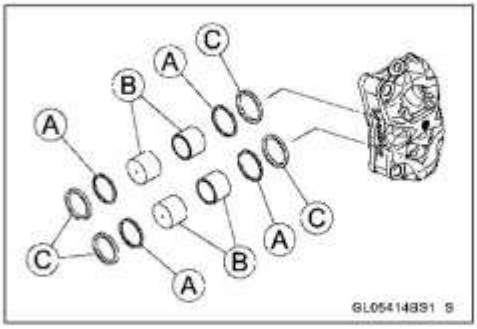
Calipers

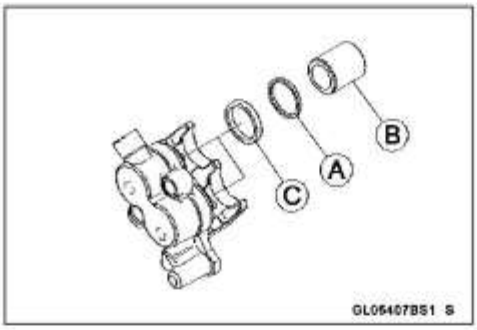
Caliper Dust Seal Damage Inspection

- Check that the dust seals [A] are not cracked, worn, swollen, or otherwise damaged.

★If they show any damage, replace the dust seals with new ones.

Pistons [B]
Fluid Seals [C]

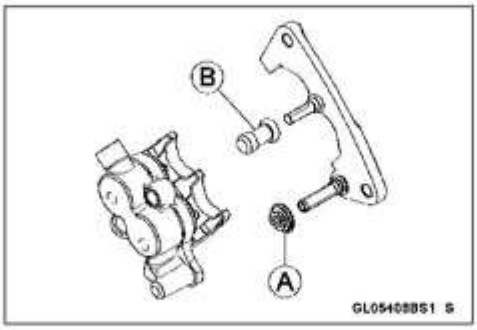




Rear Caliper Dust Boot and Friction Boot Damage Inspection

- Check that the dust boot [A] and friction boot [B] are not cracked, worn, swollen, or otherwise damaged.

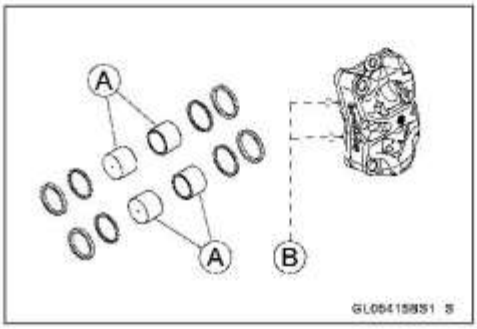
★If they show any damage, replace it.

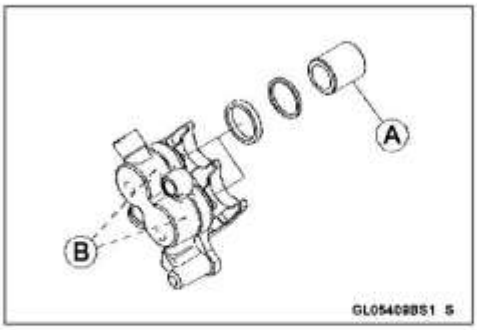


Caliper Piston and Cylinder Damage Inspection

- Visually inspect the pistons [A] and cylinder surfaces [B].

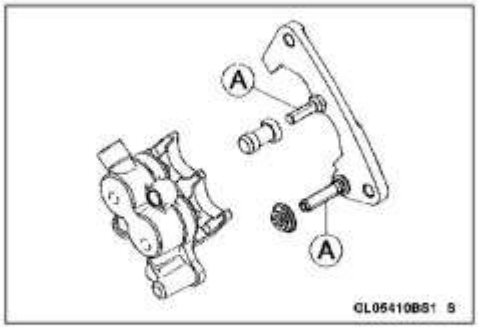
★Replace the caliper if the cylinder and piston are badly scores or rusty.





Calipers

Rear Caliper Holder Shaft Wear Inspection



The caliper body must slide smoothly on the caliper holder shafts [A]. If the body does not slide smoothly, one pad will wear more than the other, pad wear will increase, and constant drag on the disc will raise brake and brake fluid temperature.

- Check to see that the caliper holder shafts are not badly worn or stepped, and that the rubber friction boots are not damaged.

★If the rubber friction boot is damaged, replace the rubber friction boot. To replace the friction boot, remove the pads and the caliper bracket.

★If the caliper holder shaft is damaged, replace the caliper holder.

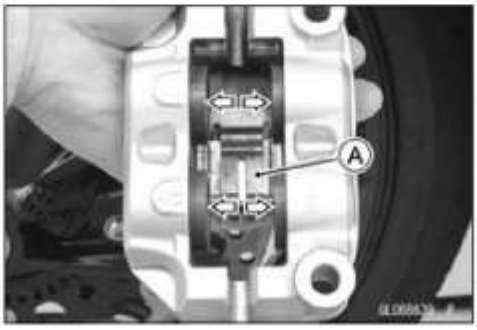
Brake Pads

Front Brake Pad Removal

- Remove the front caliper with the hose installed (see Front Caliper Removal(12-11)).
- Remove:
  Brake Pads

Front Brake Pad Installation

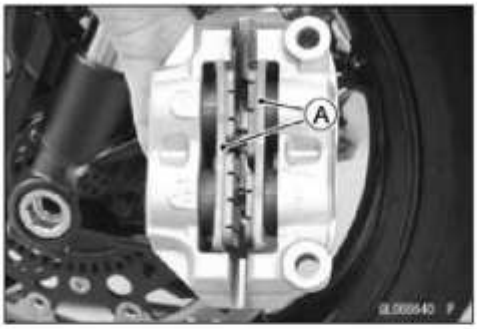
- Check that the pad spring [A] is in place on the caliper.
- Push the caliper pistons in by hand as far as they will go.



- Install the brake pads [A] on the pad spring correctly.

○Fit the pad into the groove of the caliper as shown.

- Install the front caliper (see Front Caliper Installation(12-11)).



⚠ WARNING

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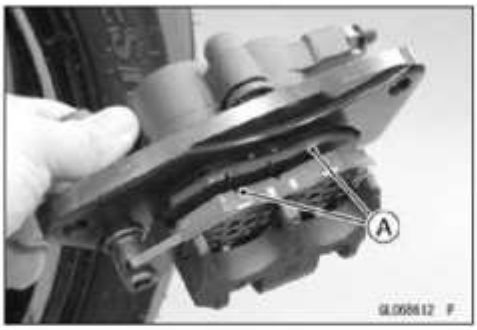
Rear Brake Pad Removal

- Loosen:
  Pad Pins [A]

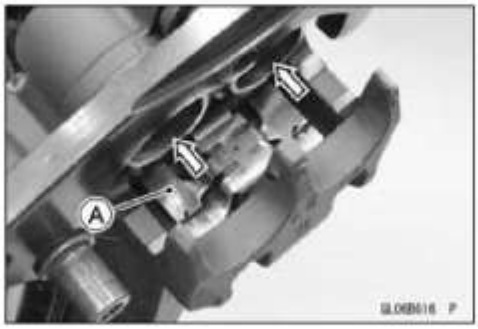
- Remove the rear caliper with the hose installed (see Rear Caliper Removal(12-12)).
- Remove:
  Pad Pins
  Brake Pads [A]



Brake Pads

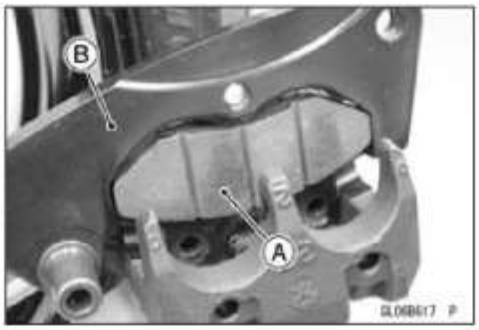
Rear Brake Pad Installation

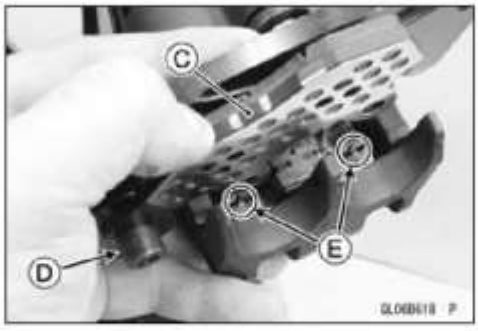
- Check that the pad spring [A] is in place on the caliper.
- Push the caliper pistons in by hand as far as it will go.



- Install the inner brake pad [A].
  - Set it under the caliper holder [B].
- Install the outer brake pad [C].
  - Hook it to the nut [D].
  - Set it to outside of the bent claws [E].
- Install the pad pins while pushing the brake pads lightly.
- Tighten the pad pins temporarily.
- Install the rear caliper (see Rear Caliper Installation(12-12)).
- Tighten:

Torque - Rear Brake Pad Pins: 17 N·m (1.7 kgf·m, 13 ft·lb)





⚠ WARNING

After servicing, it takes several applications of the brake pedal 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 pedal is obtained by pumping the pedal until the pads are against the disc.

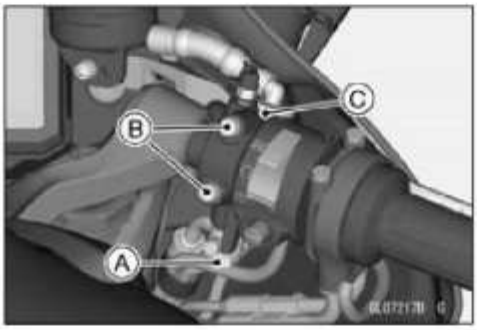
Brake Pad Wear Inspection

- Refer to the Brake Pad Wear Inspection (see Brake Pad Wear Inspection(2-58)).

Master Cylinder

Front Master Cylinder Removal

- Remove:
  Front Brake Light Switch Screw [A]
  Front Brake Light Switch [B]



- Remove the banjo bolt [A] to disconnect the brake hose from the master cylinder.

NOTICE

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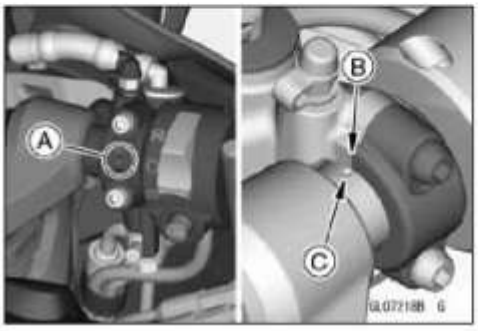
- Take care not to spill the brake fluid on the painted or plastic parts.
- Temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.

- Remove the clamp bolts [B], and take off the master cylinder [C] as an assembly with the reservoir and brake lever installed.

Front Master Cylinder Installation



- Install the master cylinder clamp so that the arrow mark [A] faces upward.
- Set the front master cylinder to match its mating surface [B] to the punch mark [C] of the handlebar.
- Tighten the upper clamp bolt first, and then the lower clamp bolt.

Torque - Front Master Cylinder Clamp Bolts: 11 N·m (1.1 kgf·m, 97 in·lb)

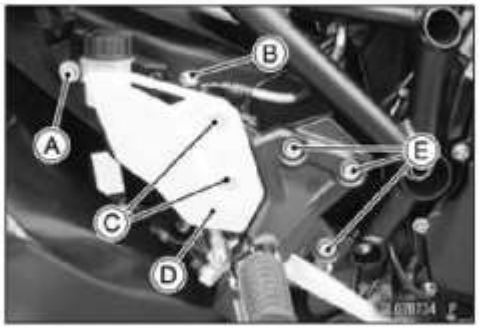
- Replace the washers that are on each side of the hose fitting with new ones.
- Install the brake hose (see Cable, Wire, and Hose Routing section (18-2)).
- Tighten:

Torque - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Install:
  Front Brake Light Switch [A]
  Front Brake Light Switch Screw [B]
- Bleed the brake line (see Brake Line Bleeding(12-26)).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

Master Cylinder

Rear Master Cylinder Removal



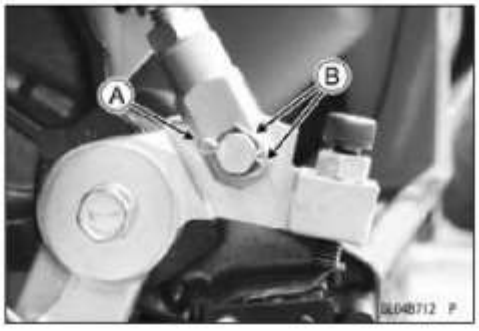
- Remove the bolt [A] and stopper.
- Remove the brake hose banjo bolt [B] and disconnect the brake hose.

NOTICE
Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

- ○Take care not to spill the brake fluid on the painted or plastic parts.
- ○Temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- ○Immediately wash away any brake fluid that spills.
- Remove:
  Rear Master Cylinder Mounting Bolts [C]
  Heel Guard [D]
  Front Footpeg Bracket Bolts [E]

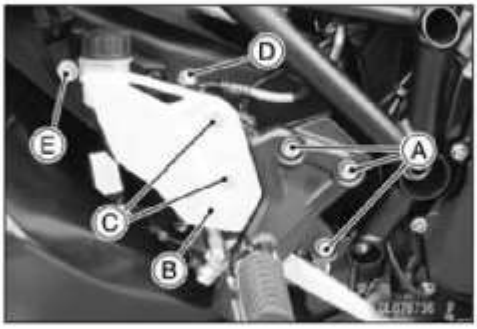
- Remove:
  Cotter Pin [A]
  Joint Pin [B]
- Drain the brake fluid from the rear brake fluid reservoir.

Rear Master Cylinder Installation



- Replace the cotter pin [A] with a new one.
- Insert the cotter pin and bend the pin ends [B].

Master Cylinder



- Tighten:

Torque - Front Footpeg Bracket Bolts [A]: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Install the heel guard [B].
- Apply a non-permanent locking agent to the rear master cylinder mounting bolts [C].
- Tighten:

Torque - Rear Master Cylinder Mounting Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Replace the washers that are on each side of hose fitting with new ones.
- Install the brake hose.

○Touch the brake hose to the stopper of the rear master cylinder.

- Tighten:

Torque - Brake Hose Banjo Bolt [D]: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Install:
  Stopper
  Brake Fluid Reservoir
- Tighten the bolt [E].
- Bleed the brake line (see Brake Line Bleeding(12-26)).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

Front Master Cylinder Disassembly

- Refer to the Master Cylinder Rubber Parts Replacement (see Master Cylinder Rubber Parts Replacement(2-54)).

Rear Master Cylinder Disassembly

- Refer to the Master Cylinder Rubber Parts Replacement (see Master Cylinder Rubber Parts Replacement(2-54)).

Master Cylinder Assembly

- Refer to the Master Cylinder Rubber Parts Replacement (see Master Cylinder Rubber Parts Replacement(2-54)).

Master Cylinder

Master Cylinder Inspection (Visual Inspection)

- Remove the front master cylinder (see Front Master Cylinder Removal(12-18)).
- Remove the rear master cylinder (see Rear Master Cylinder Removal(12-19)).
- Disassemble the front and rear master cylinders (see Master Cylinder Rubber Parts Replacement(2-54)).
- Check that there are no scratches, rust or pitting on the inner wall [A] of each master cylinder and on the outside of each piston [B].

★If a master cylinder or piston shows any damage, replace them.

- Inspect the primary cup [C] and secondary cup [D].

★If a cup is worn, damaged softened (rotted), or swollen, the piston assembly should be replaced to renew the cups.

★If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cups.

- Check the dust covers [E] for damage.

★If they are damaged, replace them.

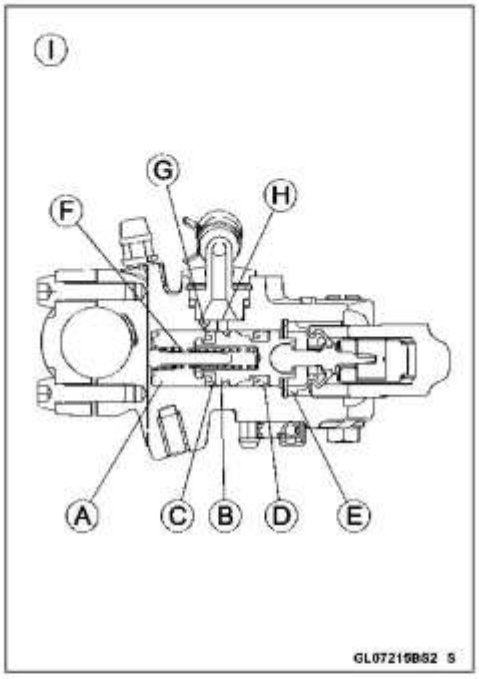
- Check the piston return springs [F] for any damage.

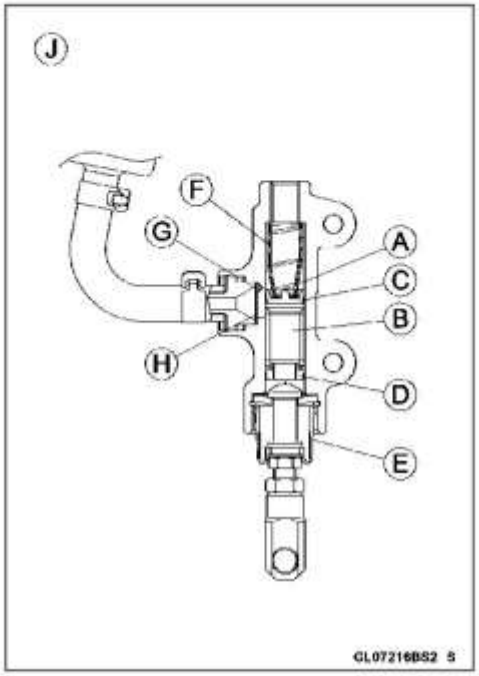
★If the springs are damaged, replace them.

- Check that relief port [G] and supply port [H] are not plugged.

★If the relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.

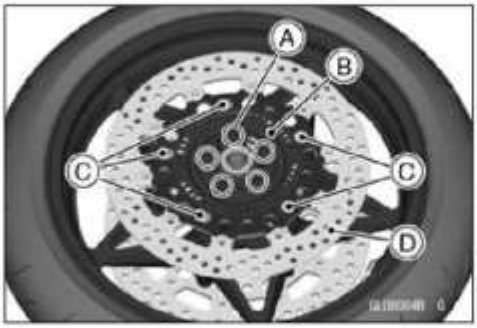
Front Master Cylinder [I]
Rear Master Cylinder [J]





Brake Disc

Front Brake Disc Removal

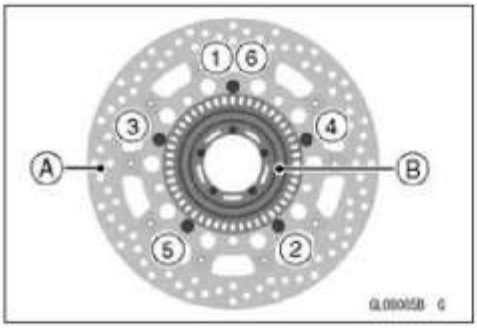


- Remove:
  Front Wheel (see Front Wheel Removal(10-6))
  Front Wheel Rotation Sensor Rotor Bolts [A] (Left Side)
  Front Wheel Rotation Sensor Rotor [B] (Left Side)
  Front Brake Disc Mounting Bolts [C]
  Front Brake Disc [D]

NOTE

○*Handle the wheel rotation sensor rotor carefully and do not apply the external force to deform it. There is a possibility that the sensor cannot read the signal correctly from the rotor.*

Front Brake Disc Installation



- Install the front brake disc [A] so that the marked side faces outward.
- Apply a non-permanent locking agent to the front brake disc mounting bolts.
- Tighten the front brake disc mounting bolts following the specified sequence [1 ~ 6].

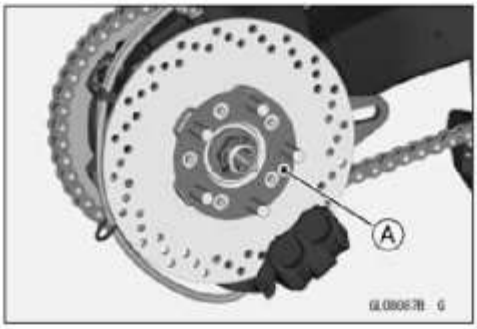
  Torque - Front Brake Disc Mounting Bolts: 28 N·m (2.9 kgf·m, 21 ft·lb)

- Install the front wheel rotation sensor rotor [B] so that the marked side faces outward.
- Tighten the front wheel rotation sensor rotor bolts following the specified sequence [1 ~ 6].

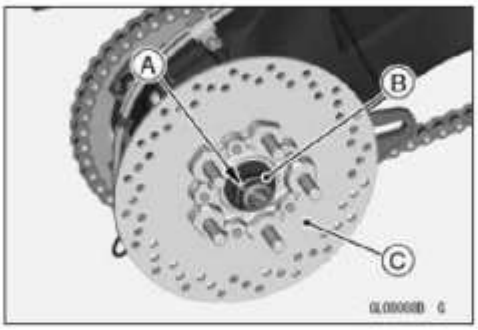
  Torque - Front Wheel Rotation Sensor Rotor Bolts: 4.0 N·m (0.41 kgf·m, 35 in·lb)

- Install the front wheel (see Front Wheel Installation(10-6)).

Rear Brake Disc Removal



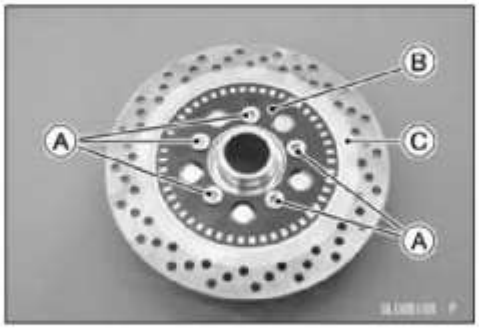
- Remove:
  Rear Wheel (see Rear Wheel Removal(10-8))
  Plate [A]
- Remove the rear caliper from the rear caliper holder (see Rear Caliper Removal(12-12)).



- Support the swingarm using a suitable stand.
- Remove:
  Cotter Pin [A]
  Rear Axle Nut [B] and Collar
  Rear Brake Disc Assembly [C]

Brake Disc

- Remove:
  Rear Brake Disc Mounting Bolts [A]
  Rear Wheel Rotation Sensor Rotor [B]
  Rear Brake Disc [C]



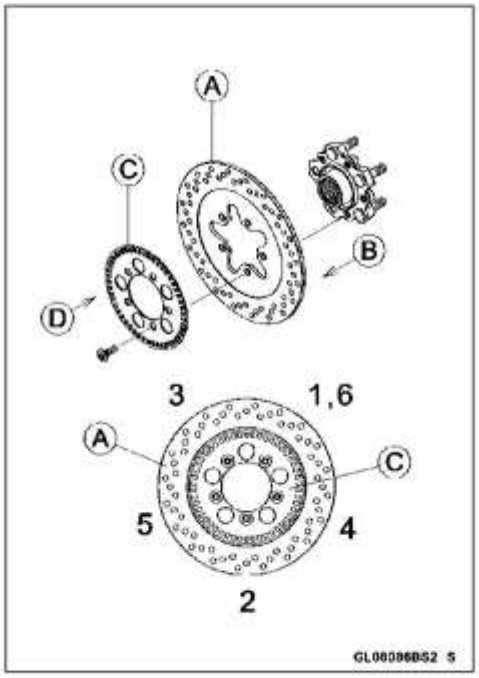
NOTE

○*Handle the wheel rotation sensor rotor carefully and do not apply the external force to deform it. There is a possibility that the sensor cannot read the signal correctly from the rotor.*

Rear Brake Disc Installation

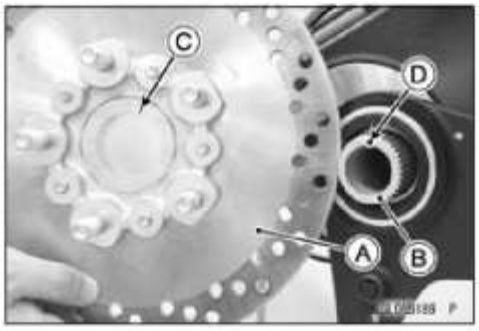
- Install the rear brake disc [A] so that the marked side [B] faces the wheel side.
- Install the rear wheel rotation sensor rotor [C] so that the marked side [D] faces out.
- Apply a non-permanent locking agent to the threads of the rear brake disc mounting bolts.
- Tighten the rear brake disc mounting bolts following the specified tightening sequence [1 ~ 6].

Torque - Rear Brake Disc Mounting Bolts: 28 N·m (2.9 kgf·m, 21 ft·lb)



- Install the rear brake disc assembly [A] to the outer rear axle [B].

○Align the line [C] and the paint mark [D].

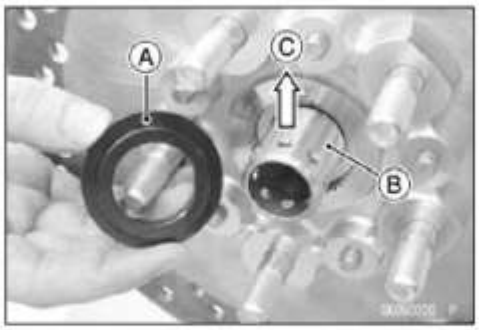


- Install:
  Collar [A]

○Face the stepped side inward.

- Insert the inner rear axle [B] from the coupling side.

○Face the one of the hole on the axle upward [C].



Brake Disc

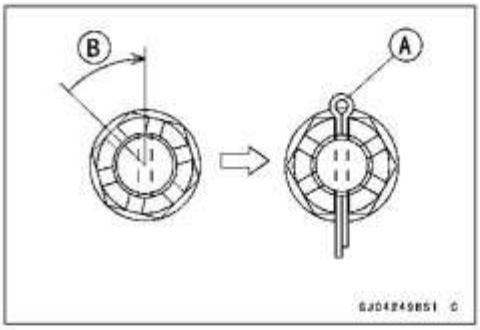
- Support the swingarm using a suitable stand.
- While holding the inner rear axle, tighten the rear axle nut [A].

Torque - Rear Axle Nut: 200 N·m (20.4 kgf·m, 148 ft·lb)

- Insert a new cotter pin [A] from the upper side.

NOTE

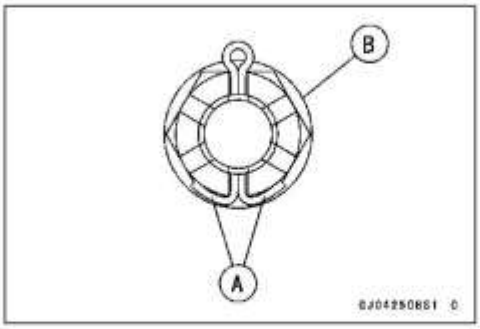
○*When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle, tighten the nut clockwise [B] up to next alignment.*
○*It should be within 60 degrees.*
○*Loosen once and tighten again when the slot goes past the nearest hole.*



- Bend the cotter pin [A] along the nut [B].

⚠ WARNING

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

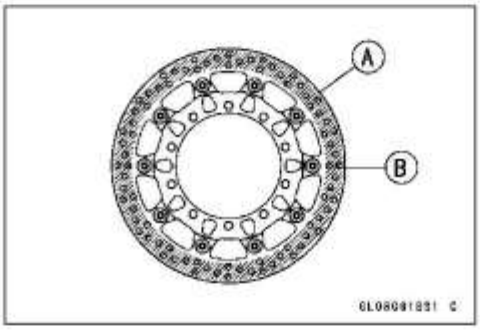


- Install the removed parts.

Brake Disc Wear Inspection

- Measure the thickness of each disc [A] at the point where it has worn the most.

★If the disc has worn past the service limit, replace it.
Measuring Area [B]

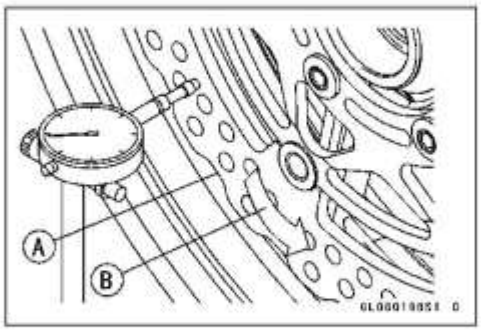


Brake Discs Thickness

Standard:	
Front	**5.3 ~ 5.7 mm (0.21 ~ 0.22 in.)**
Rear	**5.8 ~ 6.2 mm (0.23 ~ 0.24 in.)**
Service Limit:	
Front	**5.0 mm (0.20 in.)**
Rear	**5.5 mm (0.22 in.)**

Brake Disc

Brake Disc Warp Inspection



- Raise the front/rear wheel off the ground a suitable stand.

○For front disc inspection, turn the handlebars fully to one side.

- Set up a dial gauge against the disc [A] as shown and measure disc runout, while turning [B] the wheel by hand.

★If runout exceeds the service limit, replace the disc.

Disc Runout

Standard	**TIR 0.15 mm (0.0059 in.) or less**
Service Limit	**TIR 0.3 mm (0.013 in.)**

Brake Fluid

Brake Fluid Level Inspection

- Refer to the Brake Fluid Level Inspection (see Brake Fluid Level Inspection(2-48)).

Brake Fluid Change

- Refer to the Brake Fluid Change (see Brake Fluid Change(2-49)).

Brake Line Bleeding

The brake fluid has a very low compression coefficient so that almost all the movement of the brake lever or pedal is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake lines, brake lever or pedal movement will be partially used in compressing the air. This will make the lever or pedal feel spongy, and there will be a loss in braking power.

⚠ WARNING

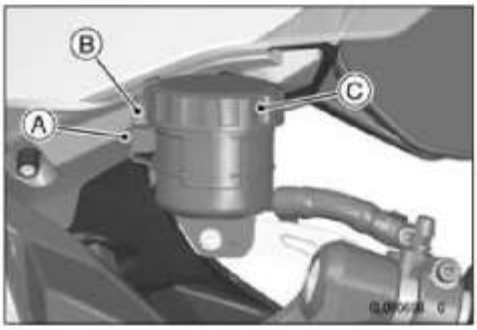
Air in the brake lines diminish braking performance and can cause an accident resulting in injury or death. If the brake lever or pedal has a soft or "spongy" feeling mushy when it is applied, there might be air in the brake lines or the brake may be defective. Do not operate the vehicle and service the brake system immediately.

NOTE

○ *The procedure to bleed the front brake line is as follows. Bleeding the rear brake line is the same as for the front brake.*

Recommended Brake Fluid
Grade: DOT4

- Remove:
  Front Brake Reservoir Cap Stopper Screw [A]
  Stopper [B]
  Front Brake Reservoir Cap [C]
  Diaphragm Plate
  Diaphragm
- Fill the reservoir with fresh brake fluid to the upper level line in the reservoir.
- 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.



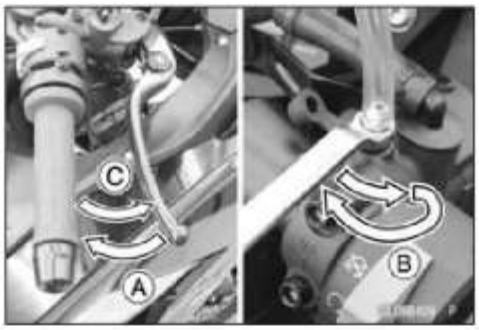
Brake Fluid

- Remove the rubber cap from the bleed valve on the front master cylinder.
- Attach a clear plastic hose [A] to the bleed valve, and run the other end of the hose into a container.

- Bleed the brake line and the master cylinder.

○Repeat this operation until no more air can be seen coming out into the plastic hose.

1. Pump the brake lever until it becomes hard, and apply the brake and hold it [A].
2. Quickly open and close [B] the bleed valve while holding the brake applied.
3. Release the brake [C].



NOTICE

After pumping the brake lever several times, releasing it without opening and closing of the bleed valve may cause brake fluid to be blown back from the master cylinder reservoir. Brake fluid spilt on painted surfaces and plastic parts will quickly damage them. Be sure to open and close the bleed valve.

NOTE

○*The fluid level must be checked often during the bleeding operation and replenished with fresh brake fluid as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.*

- Remove the clear plastic hose.
- Tighten the bleed valve, and install the rubber cap.

Torque - Front Master Cylinder Bleed Valve: 5.4 N·m (0.55 kgf·m, 48 in·lb)

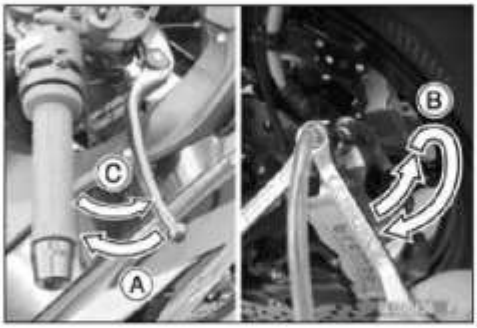
- Remove the rubber cap from the front caliper bleed valve.
- Attach a wrench and a clear plastic hose [A] to the bleed valve, and run the other end of the hose into a container.

Brake Fluid

- Bleed the brake line and the caliper.

○Repeat this operation until no more air can be seen coming out into the plastic hose.

1. Pump the brake lever until it becomes hard, and apply the brake lever and hold it [A].
2. Hold the banjo bolt, and quickly open and close [B] the bleed valve while holding the brake lever applied.
3. Release the brake lever [C].



NOTE

○*The fluid level must be checked often during the bleeding operation and replenished with fresh brake fluid as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.*

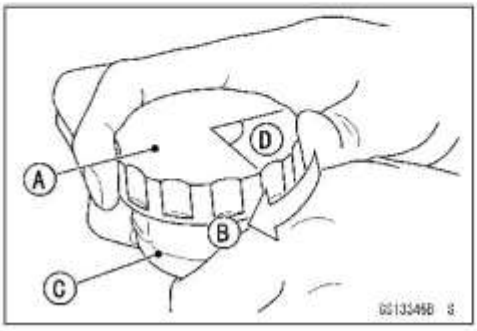
○*Tap the brake hose lightly from the caliper to the reservoir for more complete bleeding.*

○*Front Brake: Repeat the above steps for the other caliper.*

- Remove the clear plastic hose.
- Install:
  Diaphragm
  Diaphragm Plate
  Front Brake Reservoir Cap

- Follow the procedure below to install the front/rear brake fluid reservoir cap correctly.

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



- Install the front brake reservoir cap stopper.
- Tighten:

Torque - Front Brake Reservoir Cap Stopper Screw: 1.2 N·m (0.12 kgf·m, 11 in·lb)

- Tighten the bleed valve, and install the rubber cap.

Torque - Front Caliper Bleed Valves: 10 N·m (1.0 kgf·m, 89 in·lb)

- Check the fluid level (see Brake Fluid Level Inspection(2-48)).
- After bleeding is done, check the brake for good braking power, no brake drag, and no fluid leakage.

Brake Fluid

⚠ WARNING

When working with the disc brake, observe the precautions listed below.

- **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 and brands of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.**
- **Do not leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.**
- **Do not change the fluid in the rain or when a strong wind is blowing.**
- **Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning of the brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely and will eventually deteriorate the rubber used in the disc brake.**
- **When handling the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high flash-point solvent. Do not use one which will leave an oily residue. Replace the pads with new ones if they cannot be cleaned satisfactorily.**
- **Brake fluid quickly damages painted surfaces; any spilled fluid should be completely wiped up immediately.**
- **If any of the brake line fittings or the bleed valve is opened at any time, the AIR MUST BE BLED FROM THE BRAKE LINE.**

Brake Hose

Brake Hose Removal/Installation

- Refer to the Brake Hose and Pipe Replacement (see Brake Hose and Pipe Replacement(2-52)).

Brake Hose and Pipe Inspection

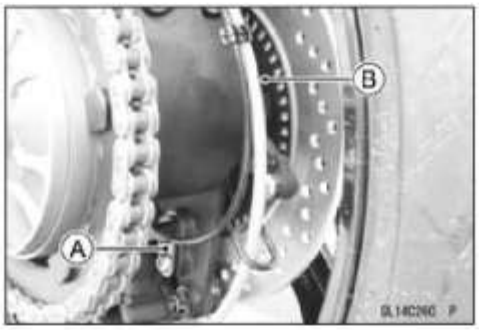
- Refer to the Brake System Inspection (see Brake System Inspection(2-47)).

Anti-Lock Brake System

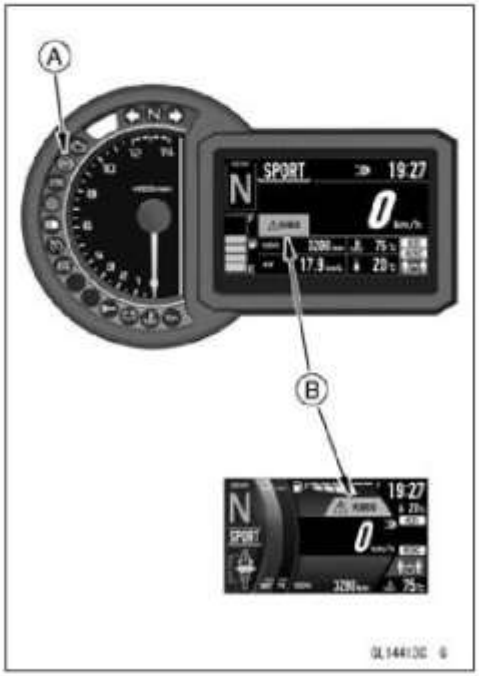
Parts Location

Front Wheel Rotation Sensor [A]
Front Wheel Rotation Sensor Rotor [B]

Rear Wheel Rotation Sensor [A]
Rear Wheel Rotation Sensor Rotor [B]



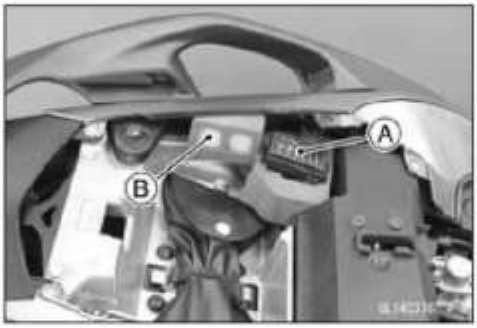
Yellow ABS Indicator Light (LED) [A]
KIBS Warning Message [B]



ABS Hydraulic Unit [A]

Anti-Lock Brake System

Fuse Box (2) [A]
ABS Kawasaki Diagnosis System Connector [B]



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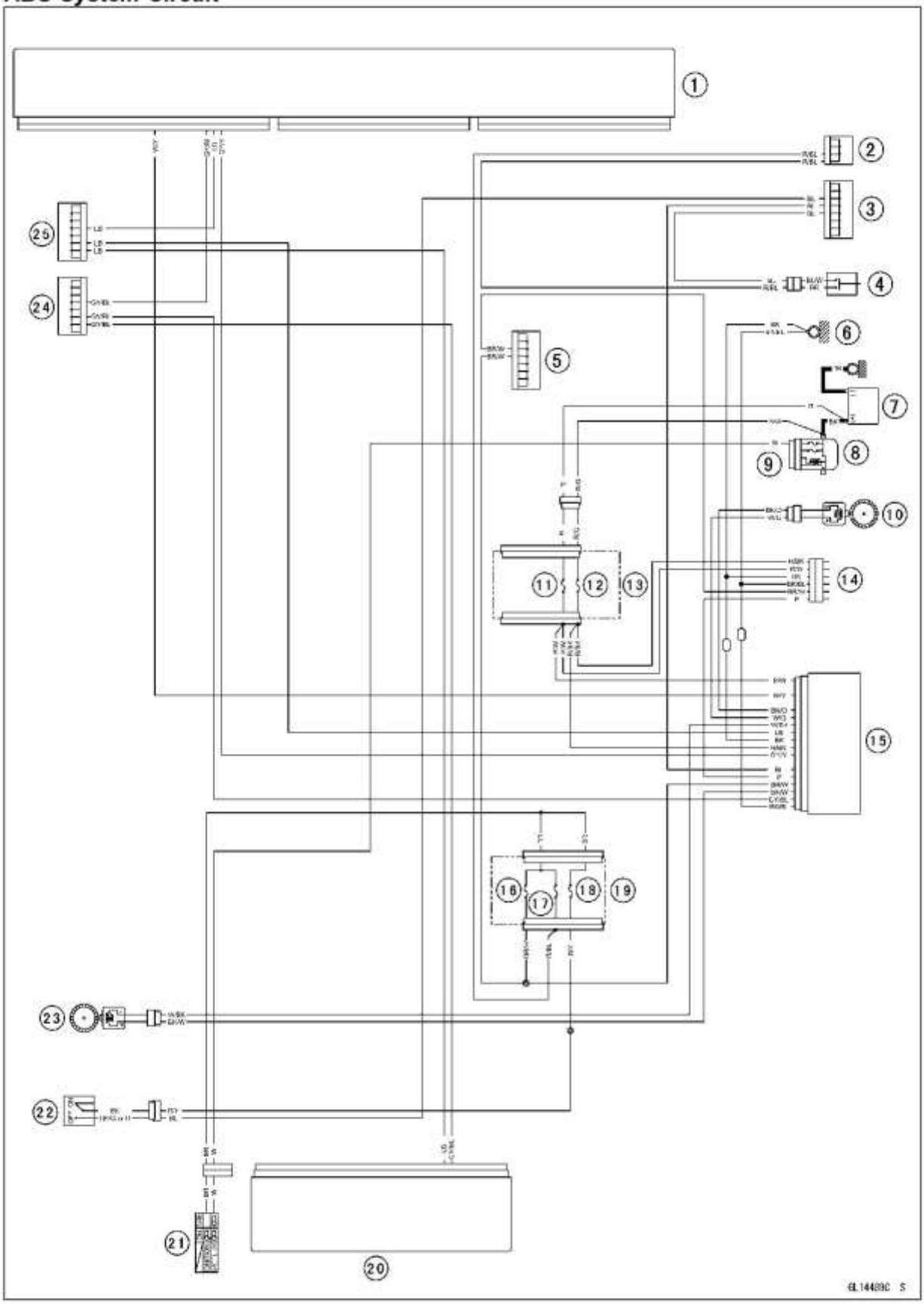
Anti-Lock Brake System

ABS System Circuit



Anti-Lock Brake System

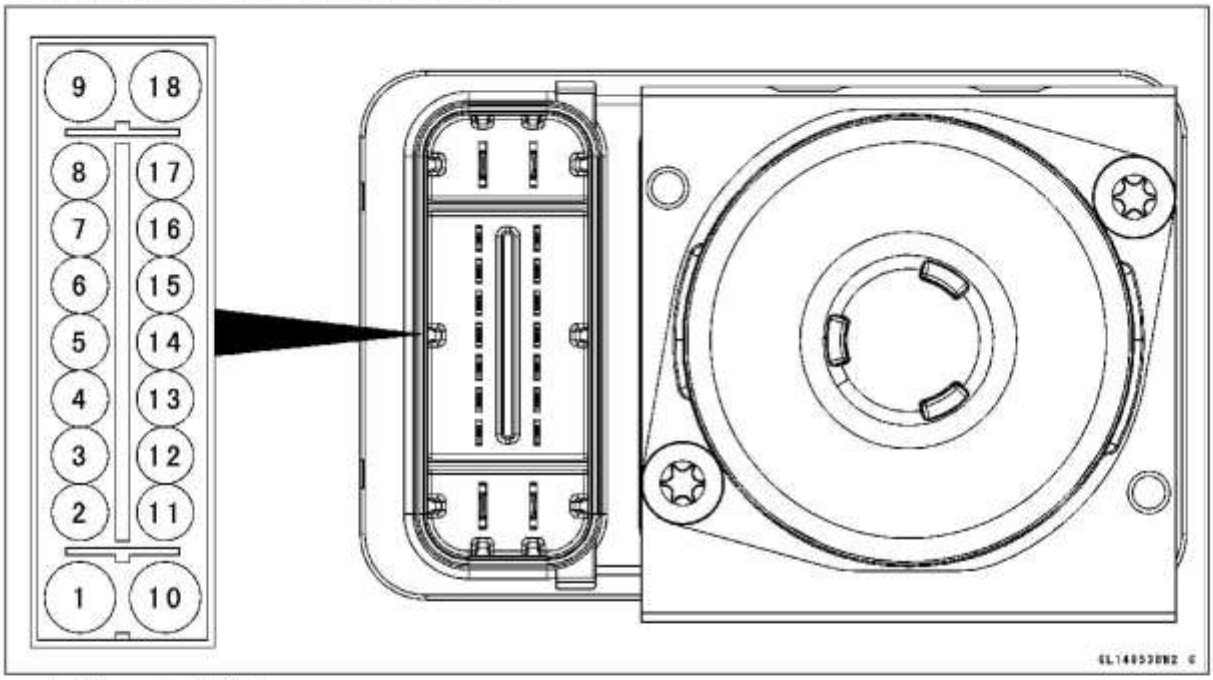
1. ECU
2. Joint Connector (5)
3. Joint Connector (6)
4. Rear Brake Light Switch
5. Joint Connector (3)
6. Frame Ground (5)
7. Battery
8. Starter Relay
9. Main Fuse 30 A
10. Rear Wheel Rotation Sensor
11. ABS Motor Relay Fuse 25 A
12. ABS Solenoid Valve Relay Fuse 15 A
13. Fuse Box (2)
14. ABS Kawasaki Diagnosis System Connector
15. ABS Hydraulic Unit
16. Ignition Fuse 15 A
17. Brake Light/Horn Fuse 10 A
18. Electronic Cruise Control Fuse 10 A
19. Fuse Box (1)
20. Meter Unit
21. Ignition Switch
22. Brake/Electronic Cruise Control Cancel Switch
23. Front Wheel Rotation Sensor
24. Joint Connector (CAN High)
25. Joint Connector (CAN Low)

○Color Codes:

BK: Black	GY: Gray	PU: Purple
BL: Blue	LB: Light Blue	R: Red
BR: Brown	LG: Light Green	V: Violet
CH: Chocolate	O: Orange	W: White
DG: Dark Green	P: Pink	Y: Yellow
G: Green		

Anti-Lock Brake System

ABS Hydraulic Unit Terminal Names



1. Ground: BK/BL
2. CAN Communication Line (High): GY/BL
3. Front Wheel Rotation Sensor Signal Input: BK/W
4. Power Supply: BR/W
5. ABS Kawasaki Diagnosis System Terminal: P
6. Front and Rear Brake Light Switch Signal: BL
7. Unused
8. Front Wheel Rotation Sensor Signal Output: GY/Y
9. Power Supply to ABS Solenoid Valve Relay: R/BK
10. Ground to Motor: BK
11. CAN Communication Line (Low): LB
12. Power Supply to Front Wheel Rotation Sensor: W/BK
13. Power Supply to Rear Wheel Rotation Sensor: W/G
14. Rear Wheel Rotation Sensor Signal Input: BK/O
15. Unused
16. Rear Wheel Rotation Sensor Signal Output: W/Y
17. Unused
18. Power Supply to ABS Motor Relay: R/W

Anti-Lock Brake System

ABS Servicing Precautions

There are a number of important precautions that should be followed servicing the ABS.

- This ABS is designed to be used with a 12 V sealed battery as its power source. Do not use any other battery except for a 12 V sealed battery as a power source.
- Do not reverse the battery cable connections. This will damage the ABS hydraulic unit.
- To prevent damage to the ABS parts, do not disconnect the battery cables or any other electrical connections when the ignition switch is on or while the engine is running.
- Take care not to short the leads that are directly connected to the battery positive (+) terminal to the chassis ground.
- Do not turn the ignition switch on while any of the ABS electrical connectors are disconnected. The ABS hydraulic unit memorizes service codes.
- Do not spray water on the electrical parts, ABS parts, connectors, leads and wiring.
- If a transceiver is installed on the motorcycle, make sure that the operation of the ABS is not influenced by electric wave radiated from the antenna. Locate the antenna as far as possible away from the ABS hydraulic unit.
- Whenever the ABS electrical connections are to be disconnected, first turn off the ignition switch.
- The ABS parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- The ABS parts cannot be disassembled. Even if a fault is found, do not try to disassemble and repair the ABS parts, replace it.
- The ABS has many brake lines, pipes, and leads. And the ABS cannot detect problems with the conventional braking system (brake disc wear, unevenly worn brake pad, and other mechanical faults). To prevent trouble, check the brake lines and pipes for correct routing and connection, the wiring for correct routing, and the brakes for proper braking power. Be sure to check for fluid leakage, and bleed the brake line thoroughly.

⚠ WARNING

Air in the brake lines diminish braking performance and can cause an accident resulting in injury or death. If any of the brake line fittings, including the ABS hydraulic unit joint nuts, or the bleed valve is opened at any time, the air must be bled completely from the brake line. If the brake lever has a soft or "spongy" feeling mushy when it is applied, there might be air in the brake lines or the brake may be defective. Do not operate the vehicle and service the brake system immediately.

NOTICE

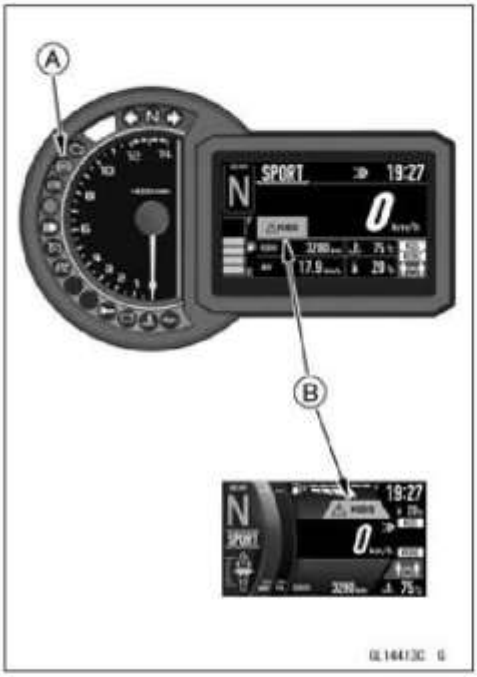
Do not ride the motorcycle with air in the brake line, or the ABS could malfunction.

Anti-Lock Brake System

○The yellow ABS indicator light (LED) [A] and KIBS warning message [B] may go on or blink if the tire pressure is incorrect, a non-recommended tire is installed, or the wheel is deformed. If the indicator light (LED) and warning message go on or blink, remedy the problem and clear the service code.

⚠ WARNING

Use of non-recommended tires may cause malfunctioning of ABS and can lead to extended braking distance resulting in an accident causing serious injury or death. Always use recommended standard tires for this motorcycle.



○The yellow ABS indicator light (LED) may come on if the engine is run with the motorcycle on a stand and the transmission in gear. If the indicator light comes on, just turn the ignition switch off, then clear service code B42, which indicates a "Faulty front wheel rotation sensor."

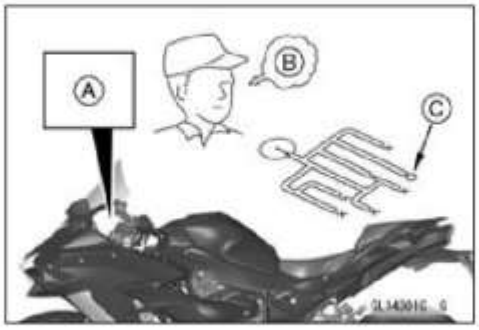
○When the ABS operates, the ABS makes noise and the rider feels the reaction force on the brake lever and brake pedal. This is a normal condition. It informs the rider that the ABS is operating normally.

○Service codes detected once by the ABS hydraulic unit will be memorized in the ABS hydraulic unit.

○A fully charged battery is a must for conducting reliable self-diagnosis. Test run the motorcycle at a speed of more than 20 km/h (12 mph) to see that the yellow ABS indicator light (LED) and yellow warning indicator light (LED)/white KIBS indicator light (LED) do not go on or blink. Finally, test run the motorcycle at a speed of more than 30 km/h (20 mph) and brake suddenly to see that the motorcycle stops without loss of steering control and the ABS operates normally (The reaction force generated is felt in the brake lever and pedal.). This completes the final inspection.

Anti-Lock Brake System

ABS Troubleshooting Outline



When an abnormality in the system occurs, the yellow ABS indicator light (LED) goes on and/or KIBS warning message appears to alert the rider. In addition, the nature of the fault is stored in the memory of the ABS hydraulic unit and FI ECU, and when in the self-diagnosis mode, the service code [A] is displayed on the LCD by the "B" and the number of two digits. When repair has been done, the indicator lights (LED) and KIBS warning message go off and service codes are not displayed. But the service codes stored in memory of the ABS hydraulic unit ECU and FI ECU are not erased to preserve the problem history.

When, due to a malfunction, the yellow ABS indicator light (LED) and KIBS warning message remain lit or blink, get a thorough understanding of the background before starting the repair work. Ask the rider about the conditions [B] under which the problem occurred and try to determine the cause [C]. Do not rely solely on the ABS and DFI self-diagnosis function, use common sense; check the brakes for proper braking power, and brake fluid level, search for leaks, etc.

Even when the ABS and DFI are operating normally, the yellow ABS indicator light (LED) goes on and/or KIBS warning message appears under the conditions listed below. Turn the ignition switch off to go off the indicator lights (LED) and KIBS warning message.

- ○After continuous riding on a rough road.
- ○When the engine is started with the stand raised and the transmission engaged, and the rear wheel turns.
- ○When accelerating so abruptly that the front wheel leaves the ground.
- ○When the ABS has been subjected to strong electrical interference.
- ○When tire pressure is abnormal. Adjust tire pressure.
- ○When a tire different in size from the standard size is being used. Replace with standard size.
- ○When the wheel is deformed. Replace the wheel.

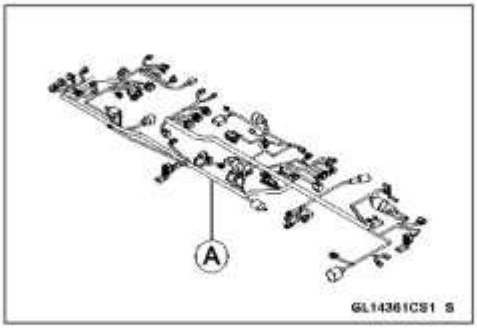
Much of the ABS troubleshooting work consists of confirming continuity of the wiring. The ABS parts are assembled and adjusted by the manufacturer, so there is no need to disassemble or repair them. Replace the ABS hydraulic unit.

The basic troubleshooting procedures are listed below.

- Carry out pre-diagnosis inspections as a preliminary inspection.
- Determine the fault using the self-diagnosis function.
- Check wiring and connections from the ABS hydraulic unit connector to the suspected faulty ABS part, using a digital meter.

Anti-Lock Brake System

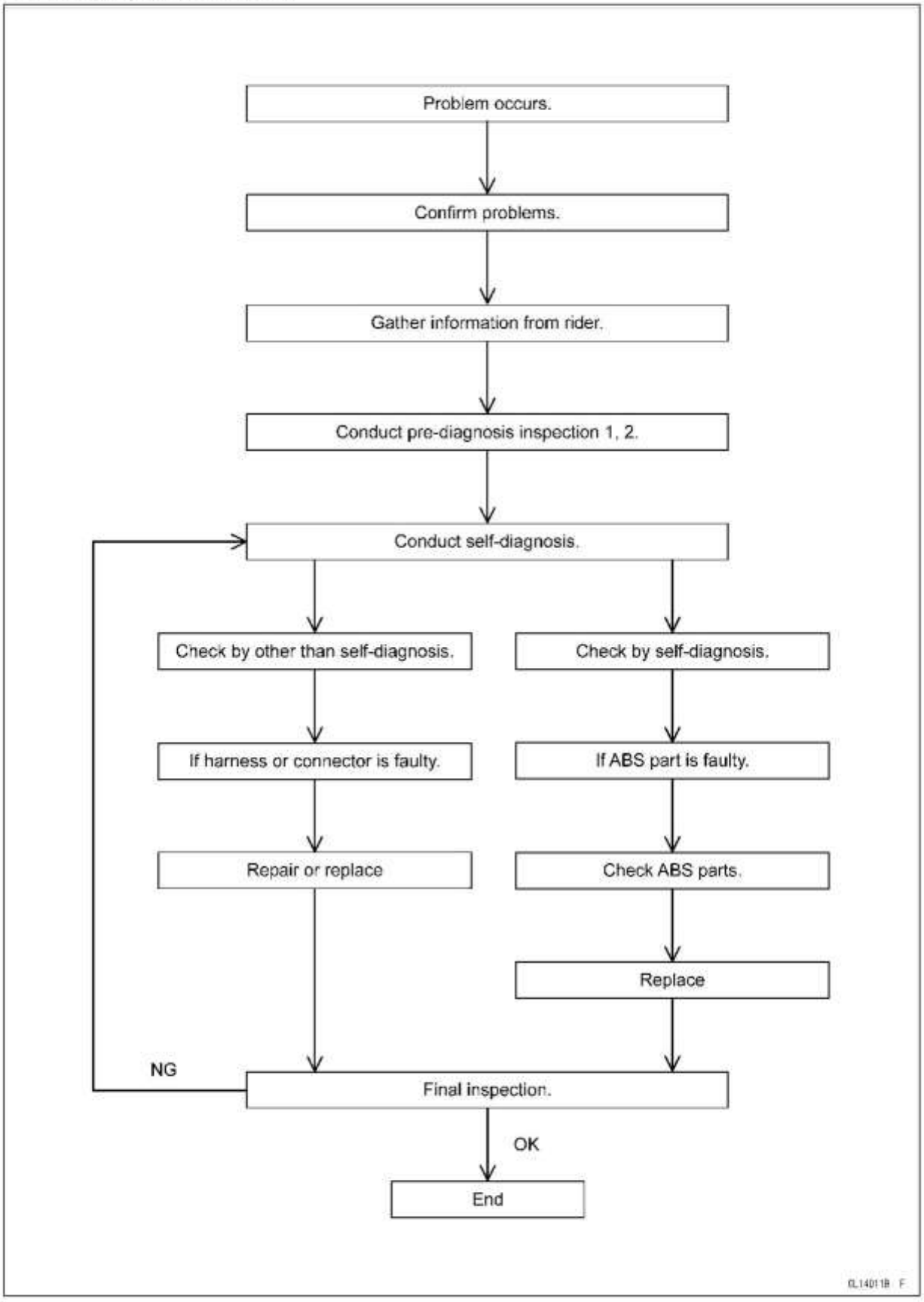
- Visually inspect the wiring for signs of burning or fraying.
★If any wiring is poor, replace the damaged wiring.
- Pull each connector apart and inspect it for corrosion, dirt and damage.
★If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.
- Check the wiring for continuity.
○Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
○Connect the digital meter between the ends of the leads.
★If the digital meter does not read about 0 Ω, the lead is defective. Replace the main harness [A] if necessary.



- Narrow down suspicious parts and close in on the faulty ABS part by repeating the continuity tests.
★If no abnormality is found in the wiring or connectors, the ABS parts are the next likely suspects. Check each part one by one.
★If an abnormality is found, replace the affected ABS part.

Anti-Lock Brake System

ABS Diagnosis Flow Chart



Inquiries to Rider

- Each rider reacts to problems in different ways, so it is important to confirm what kind of problem the rider is experiencing.
- Try to find out exactly what problem occurs under exactly what conditions by asking the rider; knowing this information may help you reproduce the problem in the workshop.
- The diagnosis sheet will help prevent you from overlooking any key information, so always use it.

Sample Diagnosis Sheet 1

Rider Name: ..... Registration No. (license plate No.): .....
Date of registration: ..... Model: .....
Vin No.: ..... Odometer reading: ..... km or miles
Engine No.: ..... Odometer reading when problem first occured: ..... km or miles

Question	Description			Answer	Advice to customer
Which statement/s best describes the fault with the ABS system?	*Yellow ABS indicator light (LED) illuminated?*	*Flashing*			A fault has been detected with the ABS system.
		Continuous			
		Not working			
	ABS not working				Further inspection by technician required.
	ABS operates too frequently				Continuous riding on rough or un-even surfaces can cause the ABS to operate more frequently.
	Stopping distance too long				
	Does the wheel lock when you apply the brakes				Further inspection by technician required.
	Brake can't be released				
	Other				
Do the front and rear brake levers feel normal during application?	*Normal*				Further inspection by technician required.
	Abnormal	*Long stroke (lever feels soft and moves back close to the handle bar)*			This indicates a probable fault with the braking system and should be inspected immediately.
		Limited stroke (lever feels hard and has little movement)			
		Pulsing/vibrating			
	Which lever? (front, rear or both)				
When does the fault occur?	*During start up / stationary*	*(Is a centre stand or service stand used)*			If the motorcycle engine is left running whilst on its centre or service stand, mechanical drag can cause the rear wheel to rotate. If the rear wheel rotates the ABS system may detect a fault. Turning off the ignition switch and restarting should reset the yellow ABS indicator light (LED) if no problems are detected. However the service code will be stored in the ABS ECU and should be reset by the dealer.
	Driving below 6 km/h (4mph) (Speeds vary depending on model)				The ABS system is not active at these speeds.
	Driving above 6 km/h (4mph) (Speeds vary depending on model)				This may be normal ABS operation if the road conditions are poor.
	When slowing or stopping (Rate of brake application)	*Gradual braking*	*front only*		
			rear only		
			both brakes		
		During abrupt braking	*front only*		Abrupt braking may cause the ABS to function early as the suspension may not have had enough time to react to the situation.
			rear only		
			both brakes		
		There is no specific pattern			
	Other				

Anti-Lock Brake System

Question	Description		Answer	Advice to customer
How often does the fault occur?	*Every time ignition is switched on*			Further inspection by technician required.
	Every time the brakes are used (Continually)			
	No regularity (Intermittent)			
	Other			
During which riding conditions does the fault occur?	*Highway riding*			Braking and handling characteristics can vary with vehicle speed, therefore ABS operation during braking at highway speed may be more frequent.
	City riding			Accelerating abruptly between traffic signals so that the front wheel leaves the ground can trigger the ABS warning indicator. Normal riding on good condition roads should allow the yellow ABS indicator light (LED) to reset automatically.
	Mild/country roads riding	*Any comment on riding style maybe applicable.*		Continuous riding on rough or uneven surfaces can cause the ABS to operate more frequently.
	Cross country riding			Continuous riding on loose or off road surfaces can trigger the ABS warning indicator. Normal riding on good condition roads should allow the yellow ABS indicator light (LED) to reset automatically.
	Track/closed circuit riding			Excessive use of the ABS system due to continuous fast riding can trigger the ABS warning indicator. Normal riding on good condition roads should allow the yellow ABS indicator light (LED) to reset automatically.
	All			Further inspection by technician required.
In what road conditions does the problem occur?	*Dry*			Further inspection by technician required.
	Wet			In wet conditions it is possible that the ABS is operating normally
	Snow/Ice			In snow/icy conditions it is possible that the ABS is operating normally
	Loose/rough surface (gravel)			On loose/rough surfaces it is possible that the ABS is operating normally
Motorcycle condition	*Has the machine been regularly serviced according to the periodic maintenance schedule?*			If the service history is incomplete it is possible that a fault may become apparent. For example, failure to replace the brake fluid during periodic maintenance can cause the hydraulic unit to become internally damaged.
	Have there been any previous braking problems?			Any previous braking problems may be related to the ABS complaint. It is important that the customer provides as much information as possible so that diagnosis can be made as quickly as possible.
	Have any aftermarket parts been fitted?	*OE Tires and brakes?*		Further inspection by technician required.
	Have the daily safety checks been carried out? (tire pressures / condition etc.)			Worn tires or tires with incorrect pressures can cause an ABS fault. It is important to regularly check both tire condition and pressure.

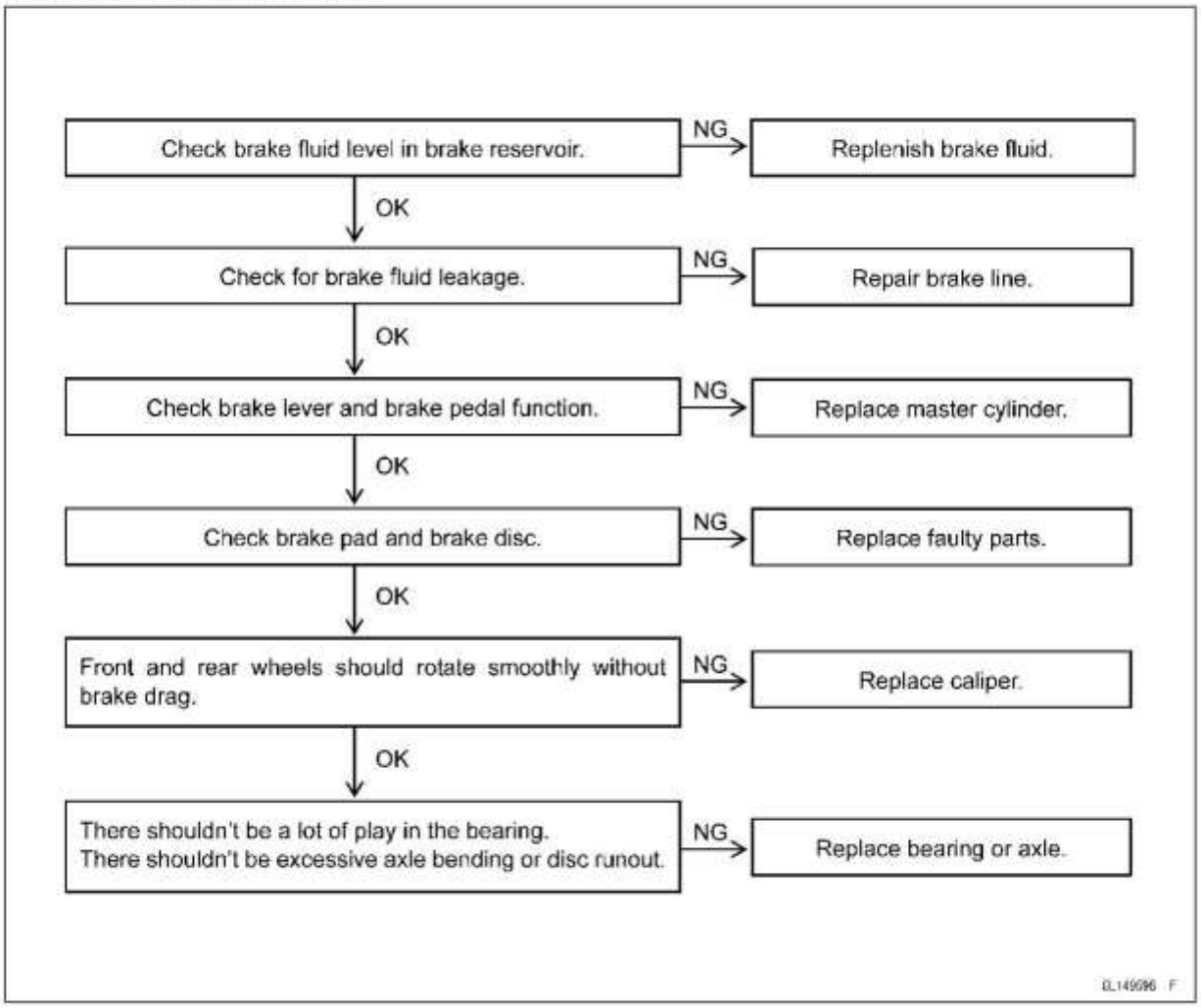
Dealer Findings

Sample Diagnosis Sheet 2

Question/Action	Description		Answer	Advice to technician
Review customer feedback information	*Carefully analyze the information that has been collected from the customer. Use this information to help you perform your initial diagnosis*			
Check to see if any diagnostic codes are present	*1*			If codes are present refer to service manual.
	2			
	3			
	4			
	5			
Inspect the following	*Battery voltage*			The ABS is designed to be used with a 12 V sealed battery as its power source. Only use the battery specified by the service manual as a power source. If low battery voltage is detected service codes: B52 or B53 will be displayed.
	Tires type/size		Front ..... Rear	Refer to service manual.
	Tire pressures		Front ..... Rear	
	Tire condition		Front ..... Rear	Excessive or abnormal wear can be recognized as an ABS fault.
	Wheel rotation sensor air gap		Front ..... Rear	Refer to service manual. Also check that the wheel orientation is correct.
	Wheel condition (damaged or deformed)		Front ..... Rear	Refer to service manual.
	Brake system general condition		Front ..... Rear	Pad wear/Front and rear operation/Condition of hoses etc.
	Brake disc run-out		Front ..... Rear	Refer to service manual.
Additional information on the yellow ABS indicator light (LED)	*Continuous*	*Stays on all the time while ignition on*		Check for diagnostic trouble codes.
		Turns off when first moving off but turns on again and stays on		
		Turns on when brake(s) are operated		
		Other:		
	Not working	*Turns off soon after moving off*		Test the operation of the light by turning on the ignition. If the light fails to illuminate ensure that the bike is equipped with ABS before inspecting the meter panel for faults as per the service manual.
		Turns off after riding for a while		
		Other:		
	How many times does it flash per 10 seconds?		5, 15, or 20	By flashing the ABS unit is indicating additional fault codes that may not be listed in the service manual. Please carefully count the number of flashes per 10 seconds before contacting Kawasaki. *(Kawasaki may request a video of the flashing sequence)*
			Other: ..... times	

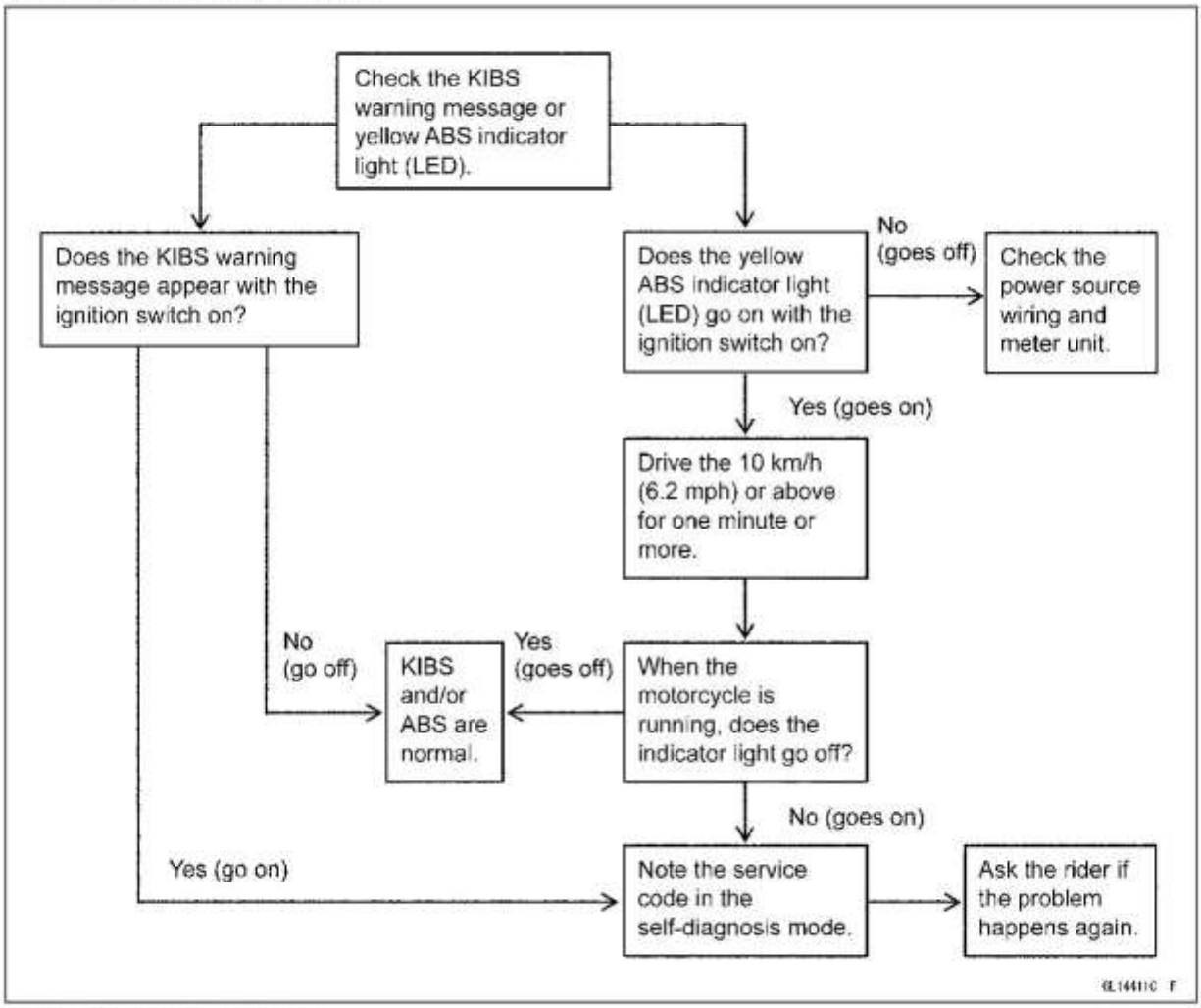
Anti-Lock Brake System

Pre-Diagnosis Inspection 1



Anti-Lock Brake System

Pre-Diagnosis Inspection 2

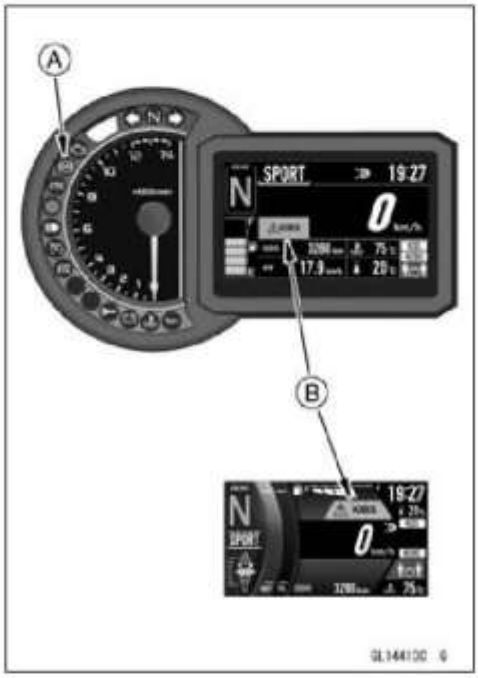


Self-diagnosis Outline

Refer to the Self-Diagnosis System chapter for the self-diagnosis or service code .

Anti-Lock Brake System

ABS and KIBS Indicator Lights (LED) Inspection



○In this model, the yellow ABS indicator light (LED) [A] and KIBS warning message [B] go on or blink by the data sent from the ABS hydraulic unit.

● Refer to the Meter Unit Inspection (see Meter Unit Inspection(16-83)).

Yellow ABS Indicator Light (LED) and KIBS Warning Message Function

Status	Brake Condition	(ABS)	⚠ KIBS
Normal	KIBS	Goes off	Non-display
Engine information communication error	ABS	Goes on	Displays
Battery voltage decreases	Low voltage ABS*	Blinks	Non-display
ABS error	Normal brake	Goes on	Non-display

*: The mode of "Low voltage ABS" controls ABS while reducing the load to the battery.

NOTE

○*When the yellow ABS indicator light (LED) is blinking, the ABS has been in the low voltage mode (insufficient battery voltage). When it is in the low voltage mode, the KIBS system does not function, but the ABS functions. To recover the KIBS system, charge the battery.* *(see Refreshing Charge(16-29))*.

ABS Hydraulic Unit Removal

NOTICE
The ABS hydraulic unit [A] has been adjusted and set with precision at the factory. Therefore, it should be handled carefully, never struck sharply, as with a hammer, or allowed to fall on a hard surface. **Be careful not to get water or mud on the ABS hydraulic unit.**

● Drain the brake fluid from the front and rear brake lines.

○Drain the brake fluid through the bleed valve by pumping the brake lever and pedal.

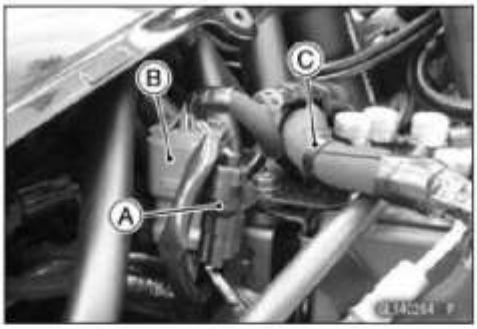
Anti-Lock Brake System

- Remove:
  Right Upper Inner Fairing (see Upper Inner Fairing Removal(15-18))
  Right Lower Fairing (see Lower Fairing Removal(15-14))

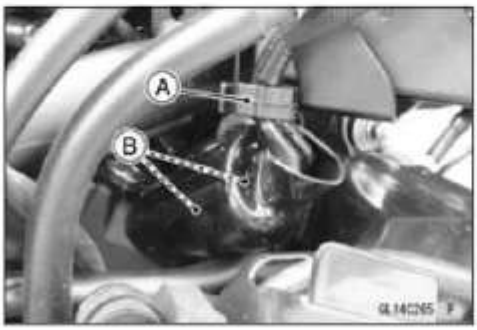
- Clean the ABS hydraulic unit.

NOTICE
Clean all fittings on the ABS hydraulic unit and the rear master cylinder because dirt around the banjo bolts could contaminate the brake fluid in the line during removal/installation. **Spread over a shop towel around the ABS hydraulic unit before removing the brake line so that brake fluid does not leak on the parts.**

- Remove the crankshaft sensor lead connector [A] and the engine sub harness connector [B] from the bracket.
- Open the clamp [C].



- Open the clamp [A].
- Disconnect:
  Radiator Fan Lead Connectors [B]



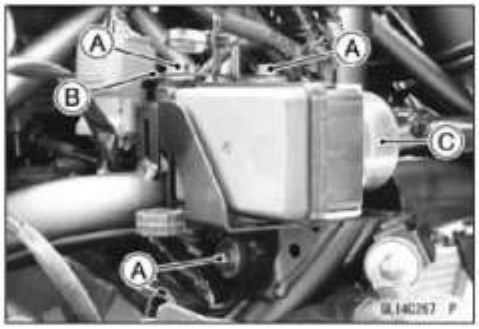
- Remove:
  Brake Hose Banjo Bolts [A] and Washers

NOTICE
Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

- Pull the lever [B] to disconnect the ABS hydraulic unit connector.

Anti-Lock Brake System

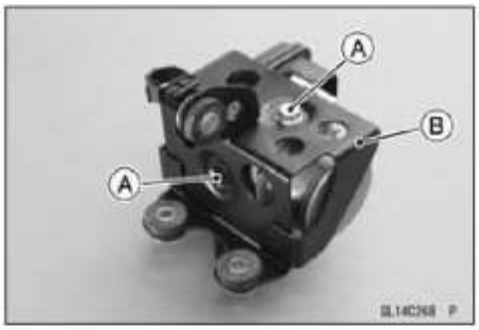
- Remove the bolts [A] and the bracket [B].
- Remove the ABS hydraulic unit [C] together with the bracket.



- Remove the bolts [A] and bracket [B].

NOTICE

The ABS hydraulic unit has been adjusted and set with precision at the factory. Do not try to disassemble and repair the ABS hydraulic unit.



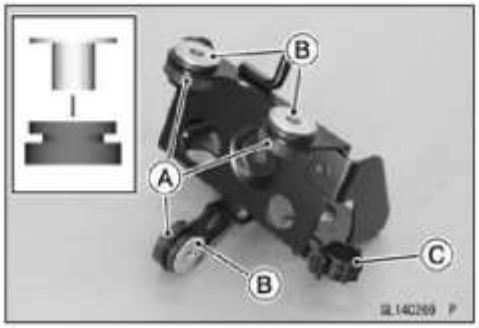
ABS Hydraulic Unit Installation

NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

- Be sure to install the following parts.
  Dampers [A]
  Collars [B]
  Clamp [C]

○Face the thinner side of the damper to the collar as shown.



- Install the ABS hydraulic unit.

○The procedure is the reverse of removal.

- Install the brake hoses (see Cable, Wire, and Hose Routing section (18-2)).
- Tighten:

Torque - Brake Hose Banjo Bolts [A]: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Pull the lever [B] to connect the ABS hydraulic unit connector.
- Bleed the brake line (see Brake Line Bleeding(12-26)).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

Anti-Lock Brake System

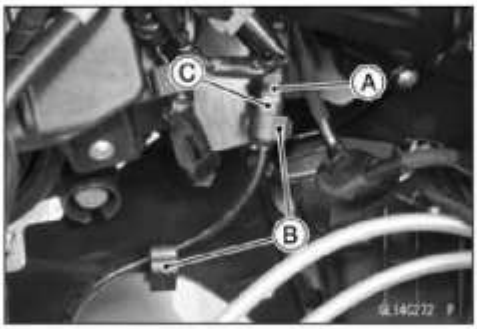
ABS Hydraulic Unit Inspection

- Remove the ABS hydraulic unit (see ABS Hydraulic Unit Removal(12-47))).
- Visually inspect the connector terminals [A].
- ★Replace the ABS hydraulic unit or main harness if either of the terminals are cracked, bent, or otherwise damaged.
- ★If the ABS hydraulic unit connector is clogged with mud or dust, blow it off with compressed air.
- Visually inspect the ABS hydraulic unit.
- ★Replace the ABS hydraulic unit if any of them are cracked, or otherwise damaged.

Front Wheel Rotation Sensor Removal

NOTICE

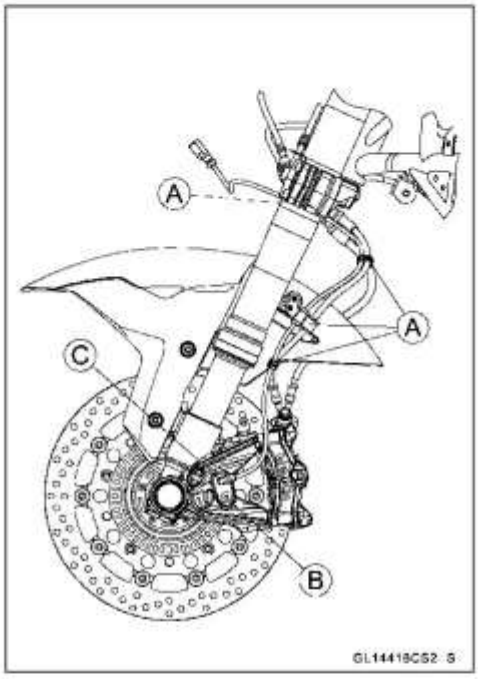
The wheel rotation sensor should be handled carefully, never struck sharply, as with a hammer, or allowed to fall on a hard surface since the wheel rotation sensor is precision made. Be careful not to get water or mud on the wheel rotation sensor.
Do not try to disassemble or repair the wheel rotation sensor.



- Remove:
  Right Upper Inner Fairing (see Upper Inner Fairing Removal(15-18))
- Cut the band [A].
- Open the clamp [B].
- Disconnect the front wheel rotation sensor lead connector [C].

Anti-Lock Brake System

- Clear the sensor lead from the clamps [A].
- Remove:
  Front Wheel Rotation Sensor Bolt [B]
  Front Wheel Rotation Sensor [C]



Front Wheel Rotation Sensor Installation

- Installation is the reverse of removal.
- Run the lead correctly (see Cable, Wire, and Hose Routing section (18-2)).
- Tighten:

Torque - Front Wheel Rotation Sensor Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)

Rear Wheel Rotation Sensor Removal

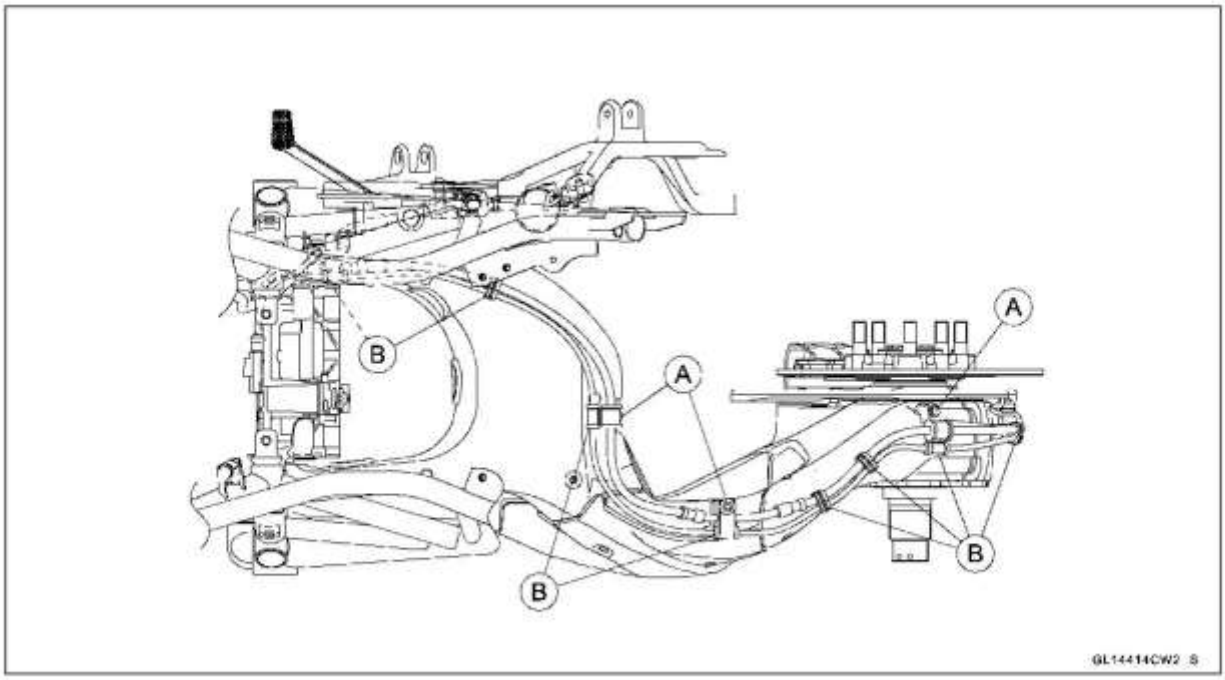
NOTICE
The wheel rotation sensor should be handled carefully, never struck sharply, as with a hammer, or allowed to fall on a hard surface since the wheel rotation sensor is precision made. Be careful not to get water or mud on the wheel rotation sensor. **Do not try to disassemble or repair the wheel rotation sensor.**

- Remove:
  Fuel Tank (see Fuel Tank Removal(3-75))
  Bolt [A]

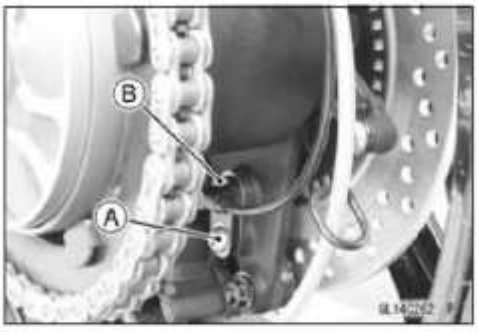
Anti-Lock Brake System

- Disconnect the rear wheel rotation sensor lead connector [A].

- Remove:
  Mud Guard (see Mud Guard Removal(15-35))
  Bolts [A]
- Clear the sensor lead from the clamps [B].



- Remove:
  Rear Wheel Rotation Sensor Bolt [A]
  Rear Wheel Rotation Sensor [B]
  Spacer



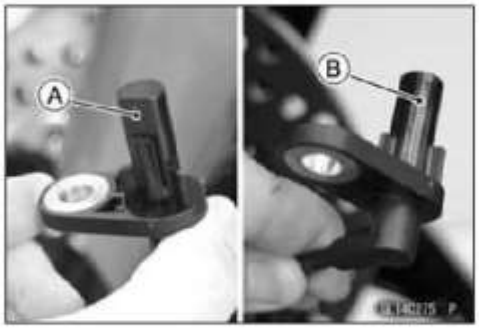
Rear Wheel Rotation Sensor Installation

- Installation is the reverse of removal.
- Run the lead correctly (see Cable, Wire, and Hose Routing section (18-2)).
- Tighten:

Torque - Rear Wheel Rotation Sensor Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)

Anti-Lock Brake System

Wheel Rotation Sensor Inspection



- Remove the front wheel rotation sensor [A] from the front fork.
- Remove the rear wheel rotation sensor [B] from the rear caliper holder.
- Visually inspect the wheel rotation sensors.

★Replace the wheel rotation sensor if it is cracked, bent, or otherwise damaged.

Wheel Rotation Sensor Air Gap Inspection

- Raise the front wheel off the ground (see Front Wheel Removal(10-6)).
- Raise the rear wheel off the ground (see Rear Wheel Removal(10-8)).
- Measure the air gap between the sensor and sensor rotor at several points by turning the wheel slowly.

Thickness Gauge [A]

Wheel Rotation Sensor Air Gap

Standard

Front	**About 1.3 mm (0.05 in.)**
Rear	**About 1.5 mm (0.06 in.)**

NOTE

○ *The front wheel rotation sensor air gap cannot be adjusted.*

★For front wheel rotation sensor, if the air gap is not within the specification, inspect the front hub bearing (see Front Hub Bearing Inspection(10-18)), sensor installation condition and sensor (see Wheel Rotation Sensor Inspection(12-53)).

★For rear wheel rotation sensor, if the air gap is not within the specification, adjust the air gap with the spacer.

Adjustment Spacers

Thickness	Part Number
0.5 mm (0.020 in.)	92026-0789
1.0 mm (0.039 in.) (STD)	92026-0790
1.5 mm (0.059 in.)	92026-0791

★For rear wheel rotation sensor, if the air gap can not be adjusted by spacer, inspect the bearing housing bearing (see Bearing Housing Bearing Installation(11-18)), sensor installation condition and sensor (see Wheel Rotation Sensor Inspection(12-53)).

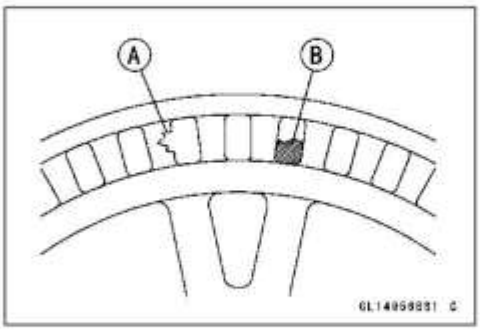
Anti-Lock Brake System

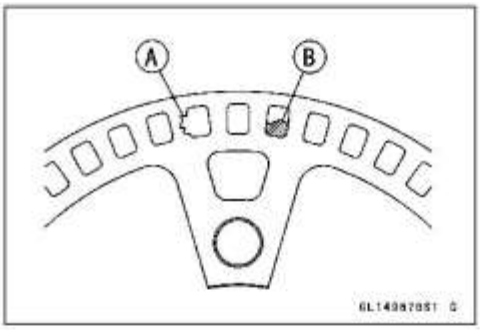
Wheel Rotation Sensor Rotor Inspection

- Visually inspect the wheel rotation sensor rotor.

★If the rotor is deformed or damaged (chipped teeth [A]), replace the sensor rotor with a new one.

★If there is iron or other magnetic deposits [B], remove the deposits.





ABS Solenoid Valve Relay Fuse (15 A) Removal

- Refer to the Fuse Box Fuse Removal (see Fuse Box Fuse Removal(16-129)).

ABS Motor Relay Fuse (25 A) Removal

- Refer to the Fuse Box Fuse Removal (see Fuse Box Fuse Removal(16-129)).

Fuse Installation

- If a fuse fails during operation, inspect the electrical system to determine the cause, and then replace it with a new fuse of proper amperage (see Fuse Installation(16-130)).

Fuse Inspection

- Remove the ABS solenoid valve relay fuse (15 A) (see ABS Solenoid Valve Relay Fuse (15 A) Removal(12-54)).
- Remove the ABS motor relay fuse (25 A) (see ABS Motor Relay Fuse (25 A) Removal(12-54)).
- Refer to the Fuse Inspection (see Fuse Inspection(16-131)).