Section 4

Brake

CONTENTS

Precautions

Precautions

Precautions for Brake System

B718H14000001

Refer to “General Precautions in Section 00 (Page 00-1)”.

Brake Fluid Information

B718H14000002

⚠ WARNING

- **This brake system is filled with an ethylene glycol-based DOT 4 brake fluid. Do not use or mix different types of fluid, such as silicone-based or petroleum-based.**
- **Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or which has been stored for a long period of time.**
- **When storing brake fluid, seal the container completely and keep it away from children.**
- **When replenishing brake fluid, take care not to get dust into the fluid.**
- **When washing brake components, use new brake fluid. Never use cleaning solvent.**
- **A contaminated brake disc or brake pad reduces braking performance. Discard contaminated pads and clean the disc with high quality brake cleaner or neutral detergent.**

⚠ CAUTION

Immediately and completely wipe off any brake fluid contacting any part of the motorcycle. The brake fluid reacts chemically with paint, plastics and rubber materials, etc., and will damage them severely.

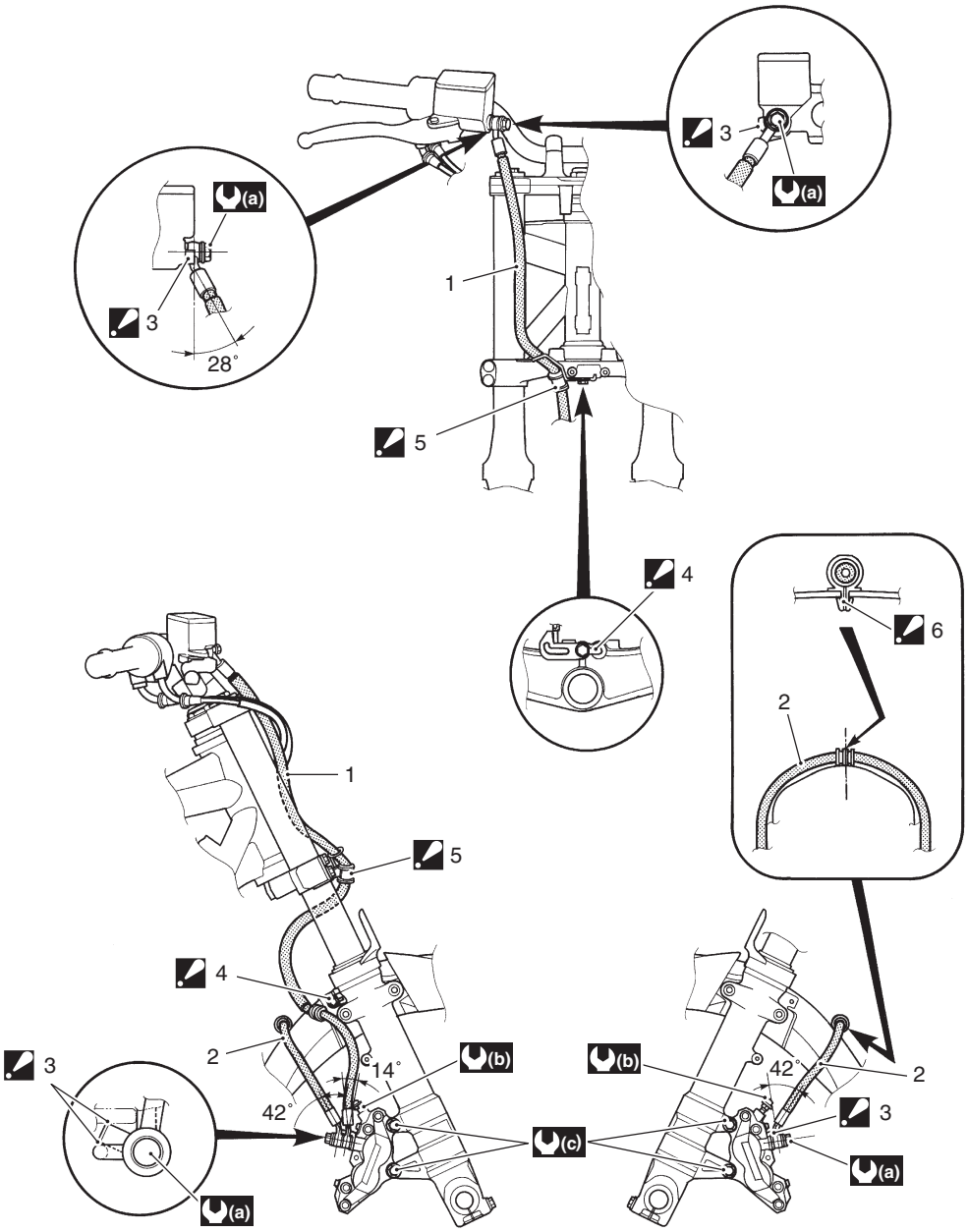
Brake Control System and Diagnosis

Schematic and Routing Diagram

Front Brake Hose Routing Diagram

B718H14102001

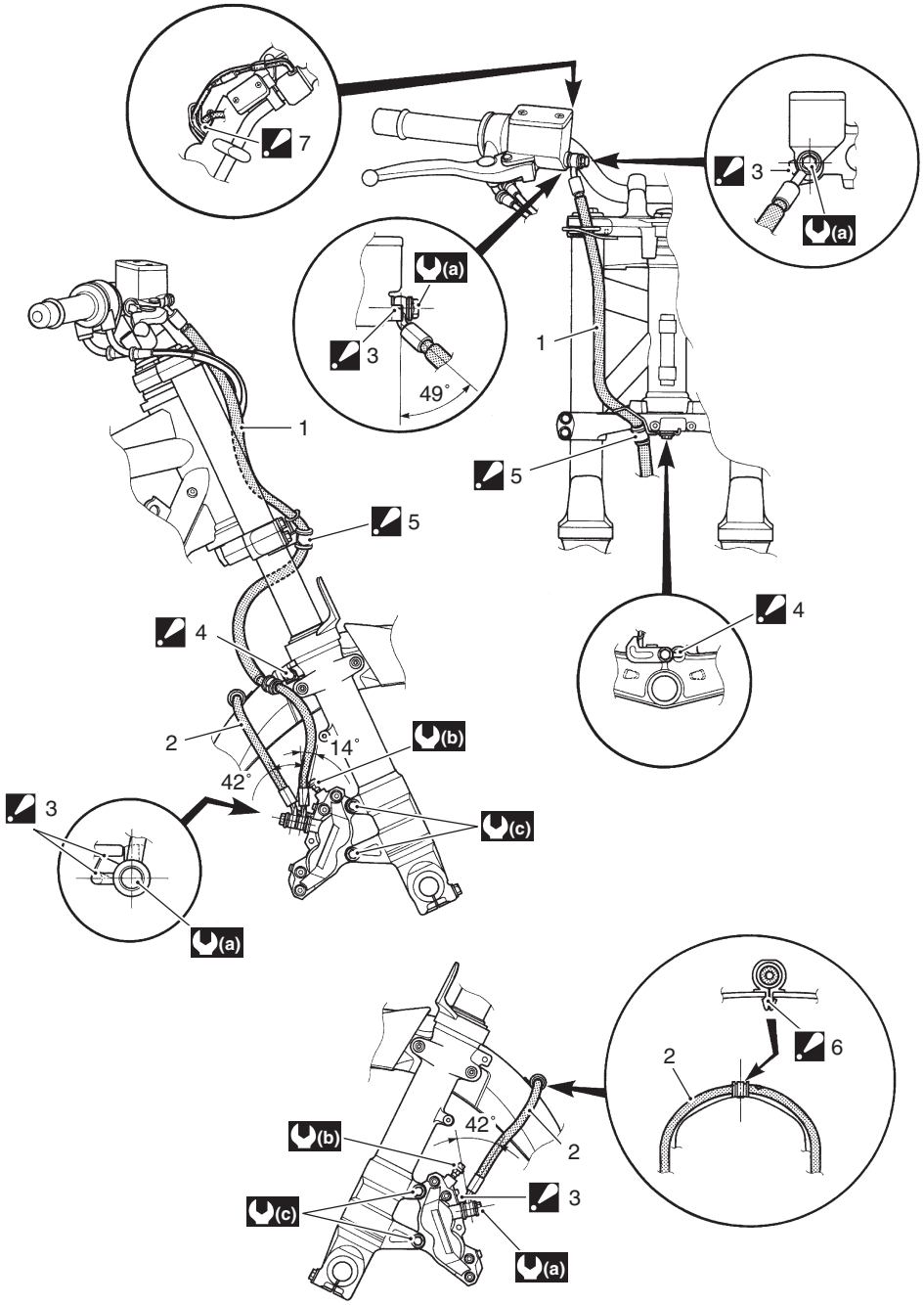
GSF1250



I718H1410001-04

1. Front brake hose No.1	6: Clamp : Insert the clamp to the hole of the front fender fully.
2. Front brake hose No.2	(a) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)
3: Stopper : After the brake hose union has contacted the stopper, tighten the union bolt.	(b) : 7.5 N·m (0.75 kgf-m, 5.5 lb-ft)
4: Clamp : After positioning the clamp with the stopper, tighten the clamp bolt.	(c) : 26 N·m (2.6 kgf-m, 19.0 lb-ft)
5: Brake hose : Clamp the brake hose firmly.	

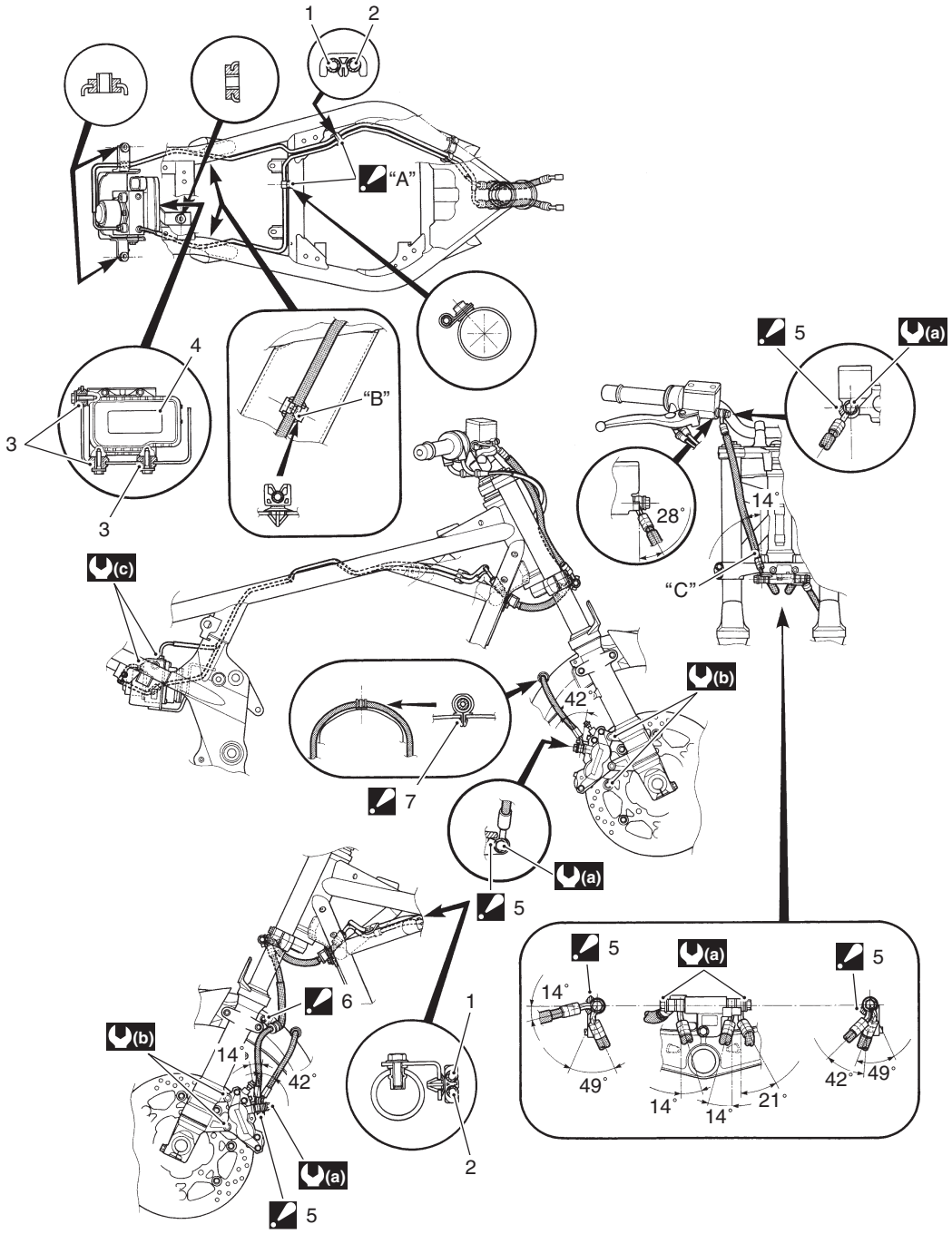
GSF1250S



I718H1410002-05

1. Front brake hose No.1	6: Clamp : Insert the clamp to the hole of the front fender fully.
2. Front brake hose No.2	7: Front brake hose No.1 : Pass the front brake hose No.1 to the brake hose guide.
3: Stopper : After the brake hose union has contacted the stopper, tighten the union bolt.	(a) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)
4: Clamp : After positioning the clamp with the stopper, tighten the clamp bolt.	(b) : 7.5 N·m (0.75 kgf-m, 5.5 lb-ft)
5: Brake hose : Clamp the brake hose firmly.	(c) : 26 N·m (2.6 kgf-m, 19.0 lb-ft)

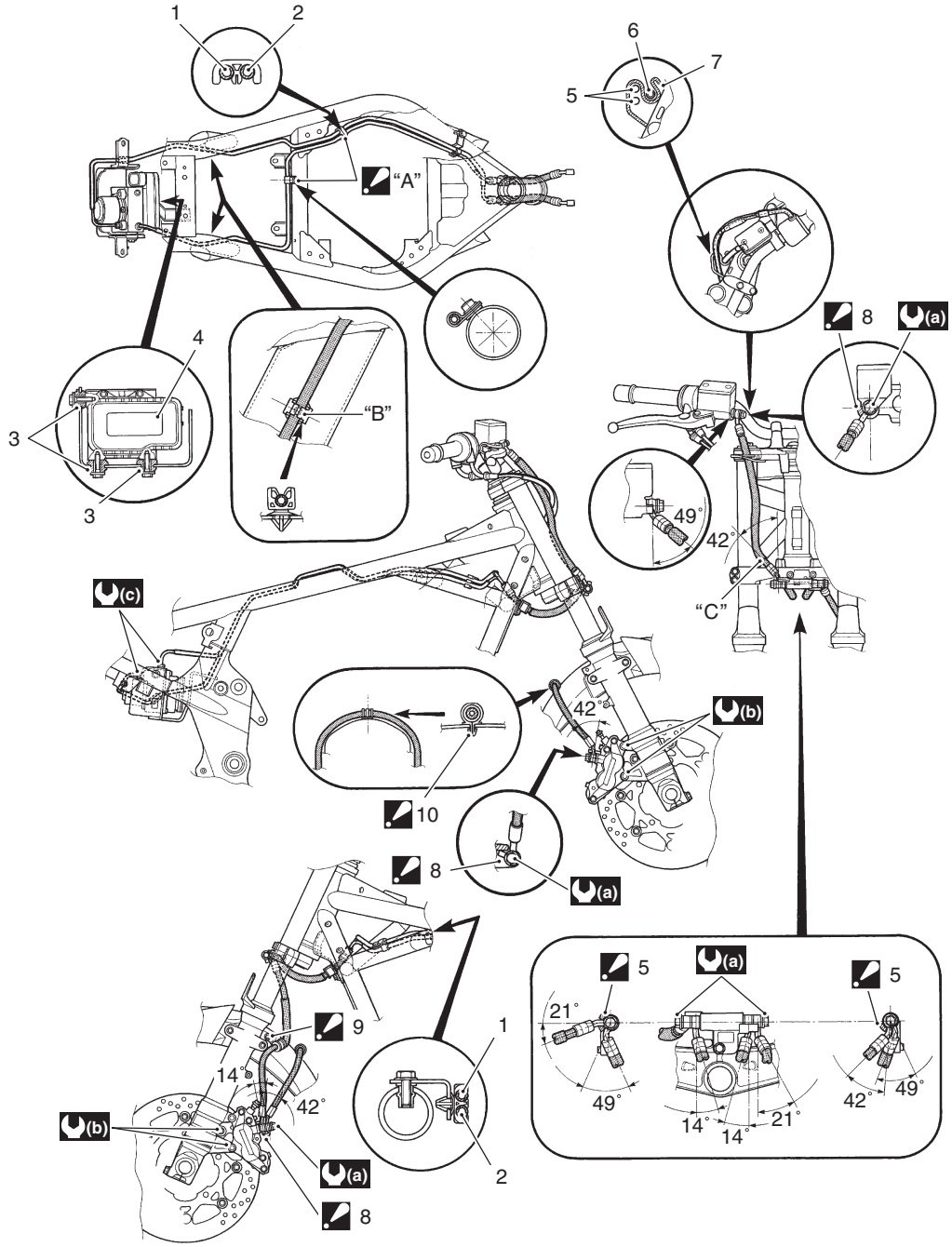
GSF1250A



I718H1410003-07

1. Brake hose No.1 (ABS)	"A": Clamp white paint part of brake hose.
2. Brake hose No.2 (ABS)	"B": White paint
3. Rubber cushion	"C": Yellow paint
4. ABS control unit/HU	(a) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)
5. Stopper :After the brake hose union has contacted the stopper, tighten the union bolt.	(b) : 26 N·m (2.6 kgf-m, 19.0 lb-ft)
6. Clamp :After positioning the clamp with the stopper, tighten the clamp bolt.	(c) : 16 N·m (1.6 kgf-m, 11.5 lb-ft)
7. Clamp :Insert the clamp to the hole of the fender fully.	

GSF1250SA



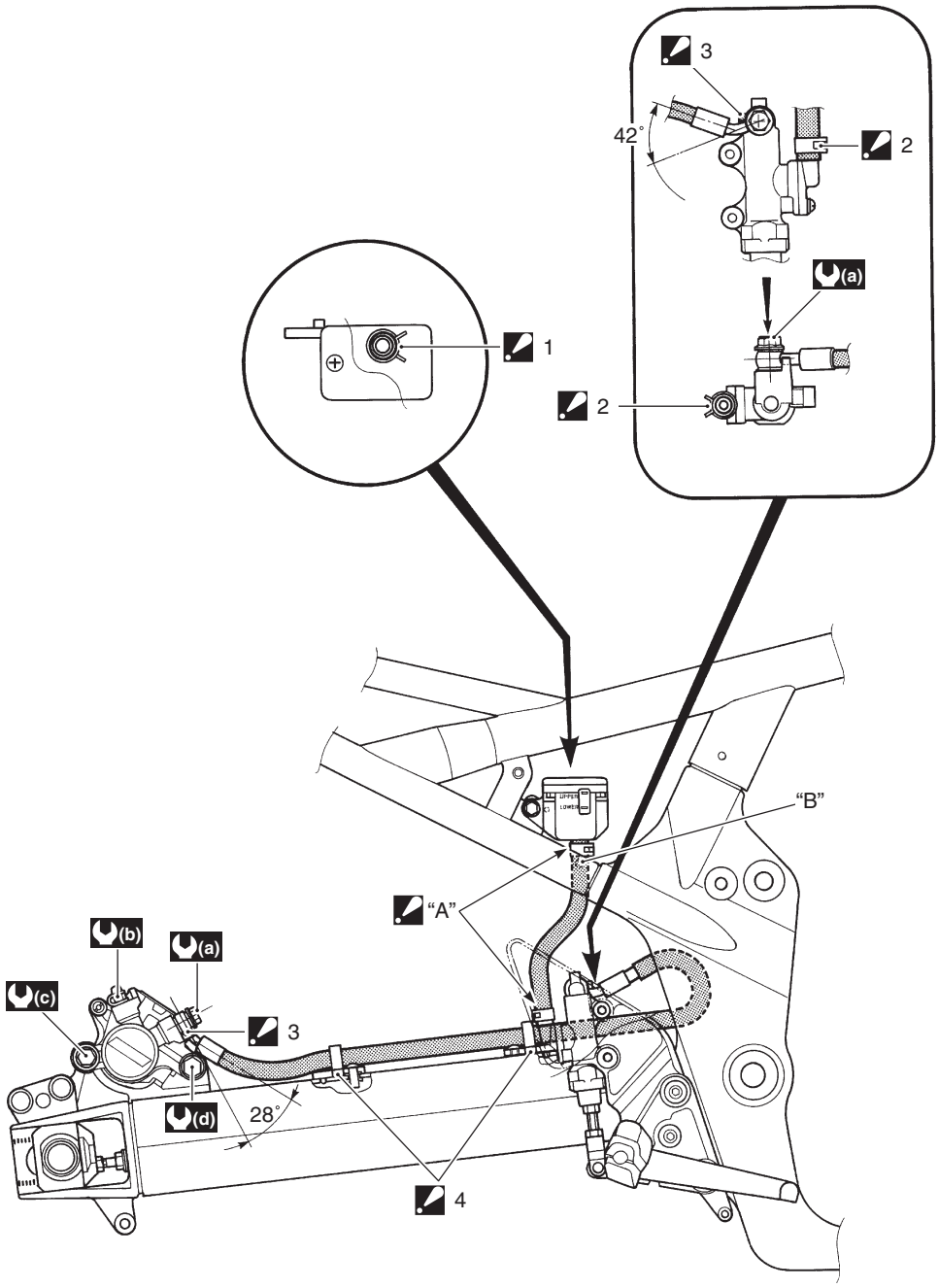
I718H1410004-05

1. Brake hose No.1 (ABS)	9. Clamp :After positioning the clamp with the stopper, tighten the clamp bolt.
2. Brake hose No.2 (ABS)	10. Clamp :Insert the clamp to the hole of the fender fully.
3. Rubber cushion	"A": Clamp white paint part of brake hose.
4. ABS control unit/HU	"B": White paint
5. Throttle cable	"C": Blue paint
6. Brake hose No.1	(a) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)
7. Throttle cable guide :Set the brake hose into the guide firmly.	(b) : 26 N·m (2.6 kgf-m, 19.0 lb-ft)
8. Stopper :After the brake hose union has contacted the stopper, tighten the union bolt.	(c) : 16 N·m (1.6 kgf-m, 11.5 lb-ft)

Rear Brake Hose Routing Diagram

B718H14102002

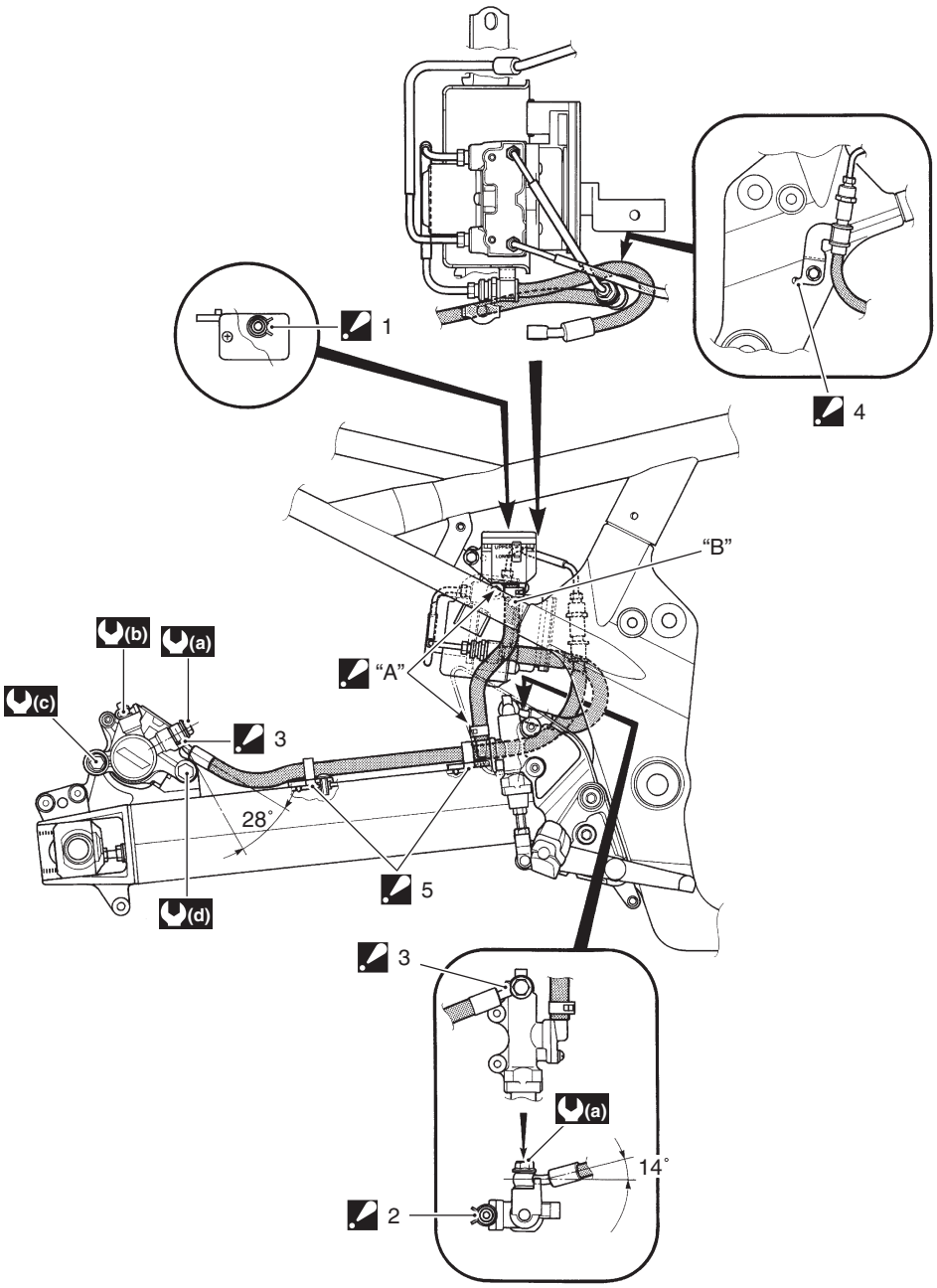
GSF1250/S



I718H1410062-03

1. Brake hose clamp : Brake hose clamp ends should face forward.	"B": White paint
2. Brake hose clamp : Brake hose clamp ends should face backward.	(a) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)
3: Stopper : After the brake hose union has contacted the stopper, tighten the union bolt.	(b) : 6 N·m (0.6 kgf-m, 4.5 lb-ft)
4: Guide : Position the guide with hole of swinging arm before tightening.	(c) : 22 N·m (2.2 kgf-m, 16.0 lb-ft)
"A": Insert the brake hose firmly.	(d) : 27 N·m (2.7 kgf-m, 19.5 lb-ft)

GSF1250A/SA



I718H1410005-03

1. Brake hose clamp : Brake hose clamp ends should face forward.	"B" : White paint
2. Brake hose clamp : Brake hose clamp ends should face backward.	(a) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)
3: Stopper : After the brake hose union has contacted the stopper, tighten the union bolt.	(b) : 6 N·m (0.6 kgf-m, 4.5 lb-ft)
4: Clamp : After positioning the clamp with hole of frame before tightening.	(c) : 22 N·m (2.2 kgf-m, 16.0 lb-ft)
5: Guide : Position the guide with hole of swinging arm before tightening.	(d) : 27 N·m (2.7 kgf-m, 19.5 lb-ft)
"A": Insert the brake hose firmly.	

Diagnostic Information and Procedures

Brake Symptom Diagnosis

B718H14104001

Condition	Possible cause	Correction / Reference Item
Insufficient brake power	Leakage of brake fluid from hydraulic system.	*Repair or replace.*
	Worn pads and disc.	*Replace.*
	Oil adhesion on friction surface of pads.	*Clean disc and pads.*
	Air in hydraulic system.	*Bleed air.*
	Not enough brake fluid in the reservoir.	*Replenish.*
Brake squeaking	Carbon adhesion on pad surface.	*Repair surface with sandpaper.*
	Tilted pad.	*Correct pad fitting or replace.*
	Damaged wheel bearing.	*Replace.*
	Loose front-wheel axle or rear-wheel axle.	*Tighten to specified torque.*
	Worn pads and disc.	*Replace.*
	Foreign material in brake fluid.	*Replace brake fluid.*
	Clogged return port of master cylinder.	*Disassemble and clean master cylinder.*
Excessive brake lever stroke	Air in hydraulic system.	*Bleed air.*
	Insufficient brake fluid.	*Replenish fluid to specified level; bleed air.*
	Improper quality of brake fluid.	*Replace with correct fluid.*
Leakage of brake fluid	Insufficient tightening of connection joints.	*Tighten to specified torque.*
	Cracked hose.	*Replace.*
	Worn piston and/or cup.	*Replace piston and/or cup.*
	Worn piston seal and dust seal.	*Replace piston seal and dust seal.*
Brake drags	Rusty part.	*Clean and lubricate.*
	Insufficient brake lever or brake pedal pivot lubrication.	*Lubricate.*
Brake locked (GSF1250A/SA)	Malfunctioning ABS, if equipped.	*Inspect ABS.*

Repair Instructions

Brake Pedal Height Inspection and Adjustment

B718H14106001

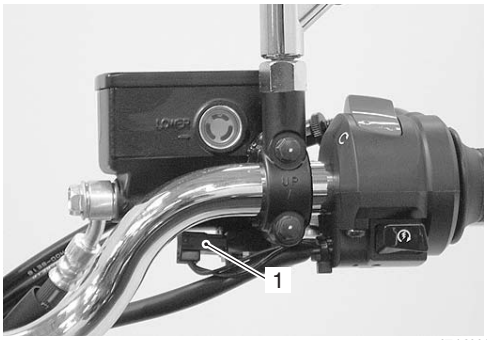
Refer to “Brake System Inspection in Section 0B (Page 0B-17)”.

Front Brake Light Switch Inspection

B718H14106002

Inspect the front brake light switch in the following procedures:

1) Disconnect the front brake light switch lead coupler (1).



I718H1410038-02

2) Inspect the switch for continuity with a tester.
If any abnormality is found, replace the front brake light switch with a new one. Refer to “Front Brake Master Cylinder / Brake Lever Disassembly and Assembly (Page 4A-15)”.

Special tool
TOOL : 09900–25008 (Multi-circuit tester set)

Tester knob indication
Continuity (•)))

Color / Position	Terminal (B/G)	Terminal (B)
OFF		
ON	○	○

I649G1410004-02

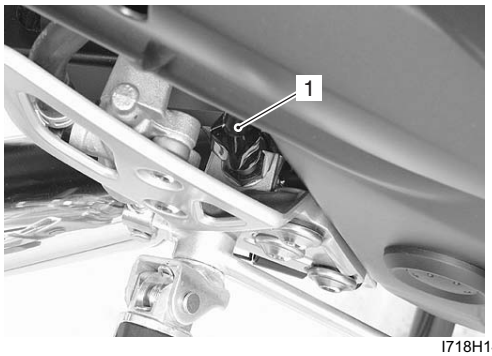
3) Connect the front brake light switch lead coupler.

Rear Brake Light Switch Inspection

B718H14106003

Inspect the rear brake light switch in the following procedures:

1) Disconnect the rear brake light switch lead coupler (1).



I718H1410039-02

2) Inspect the switch for continuity with a tester.
If any abnormality is found, replace the rear brake light switch with a new one.

Special tool
TOOL : 09900–25008 (Multi-circuit tester set)

Tester knob indication
Continuity (•)))

Rear brake light switch

Color / Position	Terminal (O/G)	Terminal (W/B)
ON	○	○
OFF		

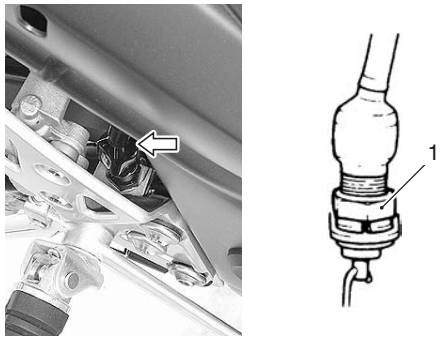
I649G1410006-02

3) Connect the rear brake light switch lead coupler.

Rear Brake Light Switch Inspection and Adjustment

B718H14106004

Check the rear brake light switch so that the brake light will come on just before pressure is felt when the brake pedal is depressed. If the brake light switch adjustment is necessary, turn the adjuster nut (1) in or out while holding the brake pedal.



I718H1410008-02

Brake Fluid Level Check

B718H14106005

Refer to “Brake System Inspection in Section 0B (Page 0B-17)”.

Brake Hose Inspection

B718H14106006

Refer to “Brake System Inspection in Section 0B (Page 0B-17)”.

Air Bleeding from Brake Fluid Circuit

B718H14106007

Air trapped in the brake fluid circuit acts like a cushion to absorb a large proportion of the pressure developed by the master cylinder and thus interferes with the full braking performance of the brake caliper. The presence of air is indicated by “sponginess” of the brake lever and also by lack of braking force. Considering the danger to which such trapped air exposes the machine and rider, it is essential that after remounting the brake and restoring the brake system to the normal condition, the brake fluid circuit be purged of air in the following manner:

⚠ CAUTION

Handle brake fluid with care: the fluid reacts chemically with paint, plastic, rubber materials, etc.

Front Brake

1) Fill the master cylinder reservoir to the top of the inspection window. Place the reservoir cap to prevent dirt from entering.

I718H1410063-03

2) Attach a hose to the air bleeder valve, and insert the free end of the hose into a receptacle.
3) Squeeze and release the brake lever several times in rapid succession and squeeze the lever fully without releasing it.

I718H1410010-01

4) Loosen the air bleeder valve by turning it a quarter of a turn so that the brake fluid runs into the receptacle, this will remove the tension of the brake lever causing it to touch the handlebar grip.

I718H1410040-01

5) Close the air bleeder valve, pump and squeeze the lever, and open the valve.
6) Repeat this process until the fluid flowing into the receptacle no longer contains air bubbles.

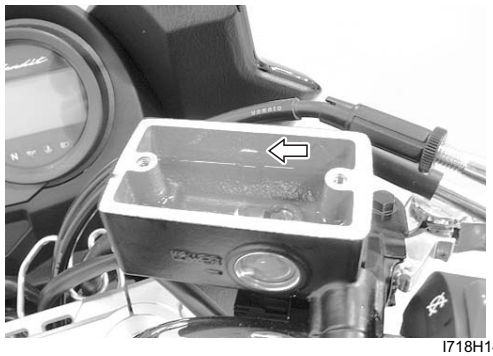
NOTE

While bleeding the brake system, replenish the brake fluid in the reservoir as necessary. Make sure that there is always some fluid visible in the reservoir.

7) Close the air bleeder valve and disconnect the hose.

Tightening torque
Air bleeder valve (Front brake): 7.5 N·m (0.75 kgf-m, 5.5 lb-ft)

8) Fill the reservoir with brake fluid to the upper mark of the reservoir.



I718H1410064-01

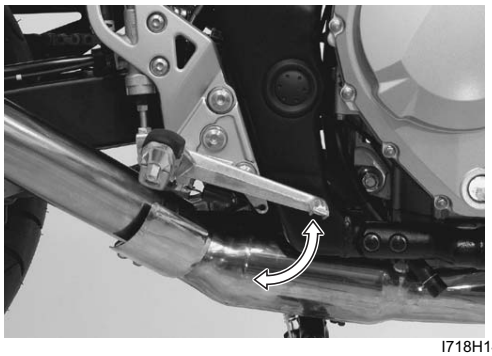
9) Install the reservoir cap.

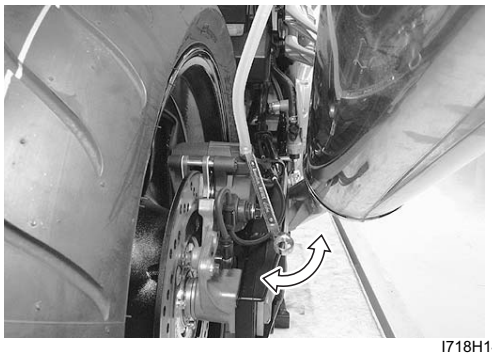
Rear Brake
Bleed air from the rear brake system as the same manner of front brake.

NOTE

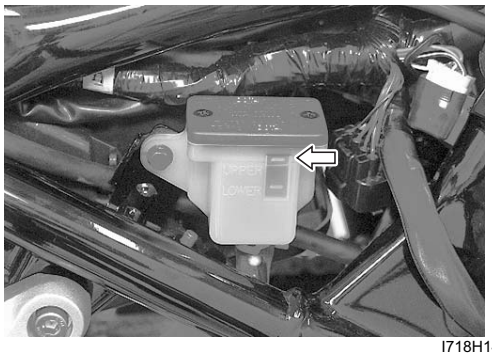
The only difference of bleeding operation from the front brake is that the rear master cylinder is actuated by a pedal.

Tightening torque
Air bleeder valve (Rear brake): 6.0 N·m (0.6 kgf-m, 4.5 lb-ft)


I718H1410068-02


I718H1410041-01

- Fill the reservoir with brake fluid to the upper mark of the reservoir.


I718H1410065-02

- Install the right frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.

Brake Fluid Replacement

B718H14106008

⚠ CAUTION

Handle brake fluid with care: the fluid reacts chemically with paint, plastic, rubber materials, etc.

Front Brake

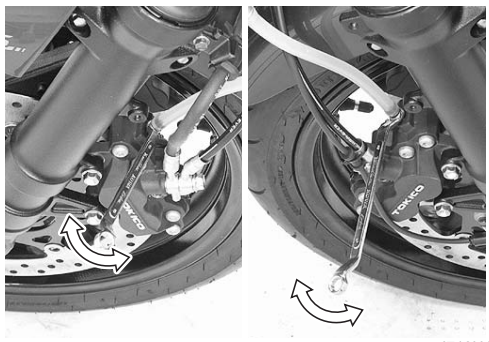
1) Place the motorcycle on a level surface and keep the handlebars straight.
2) Remove the brake fluid reservoir cap and diaphragm.
3) Suck up the old brake fluid as much as possible.


I718H1410042-02

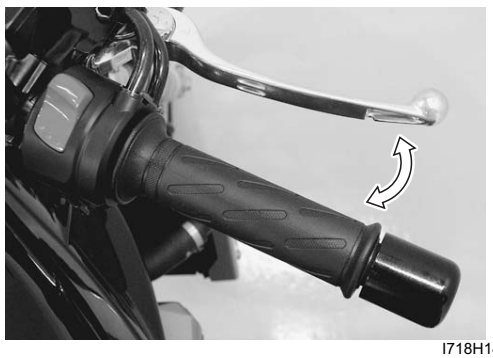
4) Fill the reservoir with new brake fluid.

BF: Brake fluid (DOT 4)

5) Connect a clear hose to the air bleeder valve and insert the other end of the hose into a receptacle.

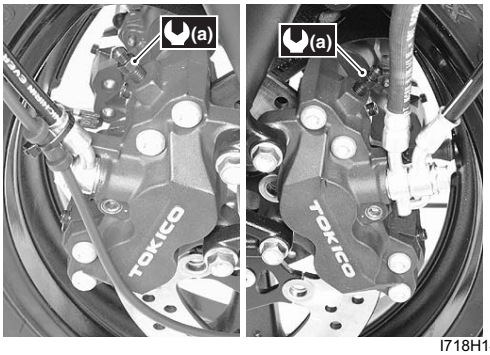

I718H1410043-01

6) Loosen the air bleeder valve and pump the brake lever until the old brake fluid flows out of the brake system.


I718H1410010-01

7) Close the air bleeder valve and disconnect the clear hose.

Tightening torque
Air bleeder valve (Front brake) (a): 7.5 N·m (0.75 kgf-m, 5.5 lb-ft)



I718H1410044-01

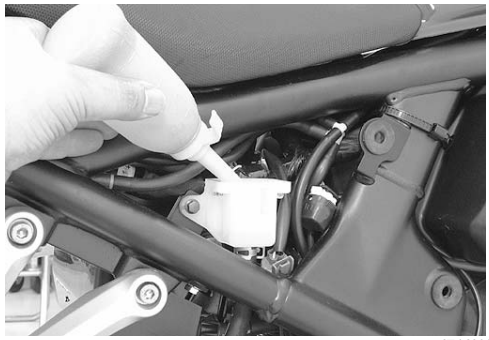
8) Fill the reservoir with brake fluid to the upper mark of the reservoir.

I718H1410066-01

9) Install the reservoir cap.

Rear Brake

1) Place the motorcycle on a level surface.
2) Remove the right frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
3) Remove the brake fluid reservoir cap and diaphragm.
4) Suck up the old brake fluid as much as possible.

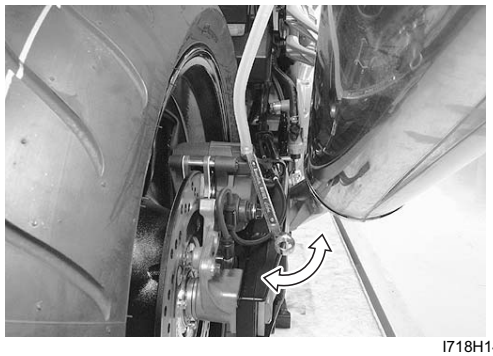


I718H1410045-01

5) Fill the reservoir with new brake fluid.

BF: Brake fluid (DOT 4)

6) Connect a clear hose to the air bleeder valve and insert the other end of the hose into a receptacle.
7) Loosen the air bleeder valve and pump the brake pedal until the old brake fluid flows out of the brake system.



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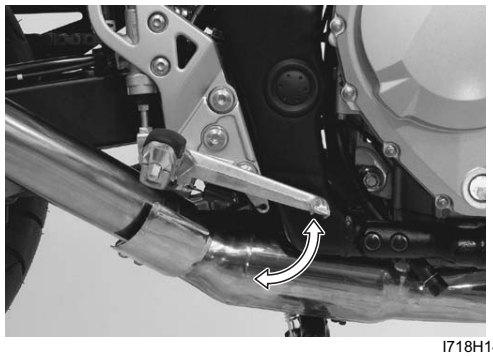
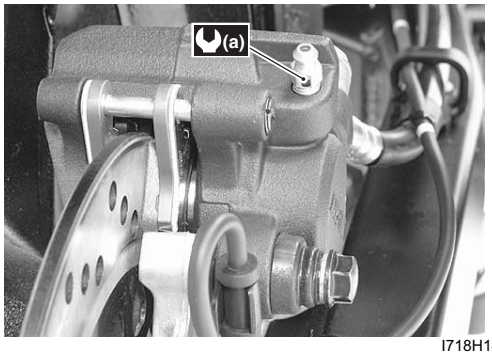


I718H1410068-02

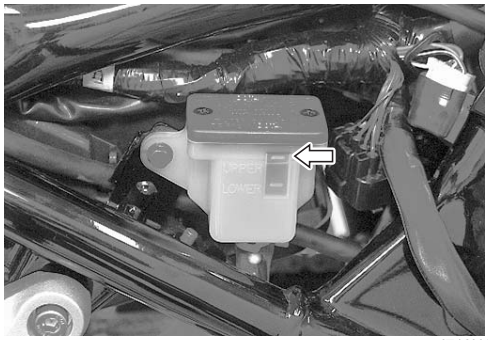
8) Close the air bleeder valve and disconnect the clear hose.

Tightening torque
Air bleeder valve (Rear brake) (a): 6.0 N·m (0.6 kgf-m, 4.5 lb-ft)



I718H1410047-01

9) Fill the reservoir with brake fluid to the upper mark of the reservoir.



I718H1410067-02

Front Brake Hose Removal and Installation

B718H14106009

GSF1250/S

Removal

1) Drain brake fluid. Refer to “Brake Fluid Replacement (Page 4A-10)”.
2) Remove the front brake hoses as shown in the front brake hose routing diagram. Refer to “Front Brake Hose Routing Diagram (Page 4A-1)”.

Installation

⚠ CAUTION

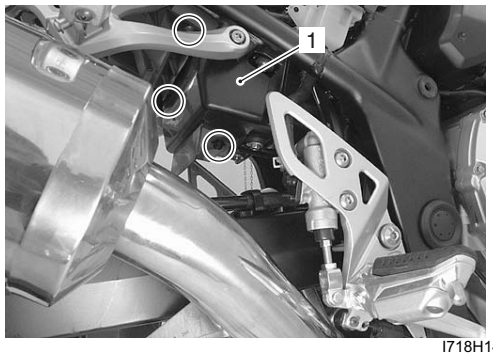
The seal washers should be replaced with the new ones to prevent fluid leakage.

1) Install the front brake hose as shown in the front brake hose routing diagram. Refer to “Front Brake Hose Routing Diagram (Page 4A-1)”.
2) Bleed air from the front brake system. Refer to “Air Bleeding from Brake Fluid Circuit (Page 4A-8)”.

GSF1250A/SA

Removal

1) Remove the seat and left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
2) Remove the fuel tank. Refer to “Fuel Tank Removal and Installation in Section 1G (Page 1G-9)”.
3) Drain brake fluid. Refer to “Brake Fluid Replacement (Page 4A-10)”.
4) Remove the battery and battery case. Refer to “ABS Control Unit/HU Removal and Installation in Section 4E (Page 4E-74)”.
5) Remove the fender lower cover (1).



I718H1410019-03

6) Remove the front brake hose as shown in the front brake hose routing diagram. Refer to “Front Brake Hose Routing Diagram (Page 4A-1)”.

Installation

⚠ CAUTION

The seal washers should be replaced with the new ones to prevent fluid leakage.

1) Install the front brake hose as shown in the front brake hose routing diagram. Refer to “Front Brake Hose Routing Diagram (Page 4A-1)”.
2) Bleed air from the front brake system. Refer to “Air Bleeding from Brake Fluid Circuit (Page 4A-8)”.
3) Reinstall the removed parts.

Rear Brake Hose Removal and Installation

B718H14106019

GSF1250/S

Removal

1) Remove the right frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
2) Drain brake fluid. Refer to “Brake Fluid Replacement (Page 4A-10)”.
3) Remove the rear brake hoses as shown in the rear brake hose routing diagram. Refer to “Rear Brake Hose Routing Diagram (Page 4A-5)”.

Installation

⚠ CAUTION

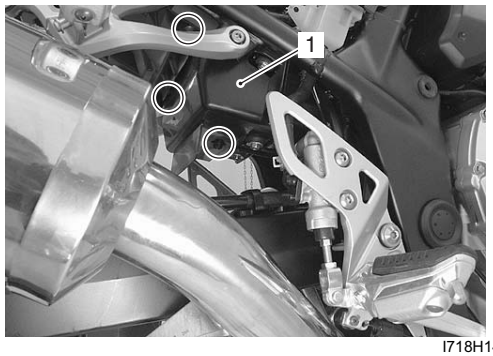
The seal washers should be replaced with the new ones to prevent fluid leakage.

1) Install the front brake hose as shown in the rear brake hose routing diagram. Refer to “Rear Brake Hose Routing Diagram (Page 4A-5)”.
2) Bleed air from the rear brake system. Refer to “Air Bleeding from Brake Fluid Circuit (Page 4A-8)”.
3) Reinstall the removed parts.

GSF1250A/SA

Removal

1) Remove the right frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
2) Remove the seat, battery and battery case. Refer to “ABS Control Unit/HU Removal and Installation in Section 4E (Page 4E-74)”.
3) Drain brake fluid. Refer to “Brake Fluid Replacement (Page 4A-10)”.
4) Remove the fender lower cover (1).



I718H1410020-01

5) Remove the rear brake hose as shown in the rear brake hose routing diagram. Refer to “Rear Brake Hose Routing Diagram (Page 4A-5)”.

Installation

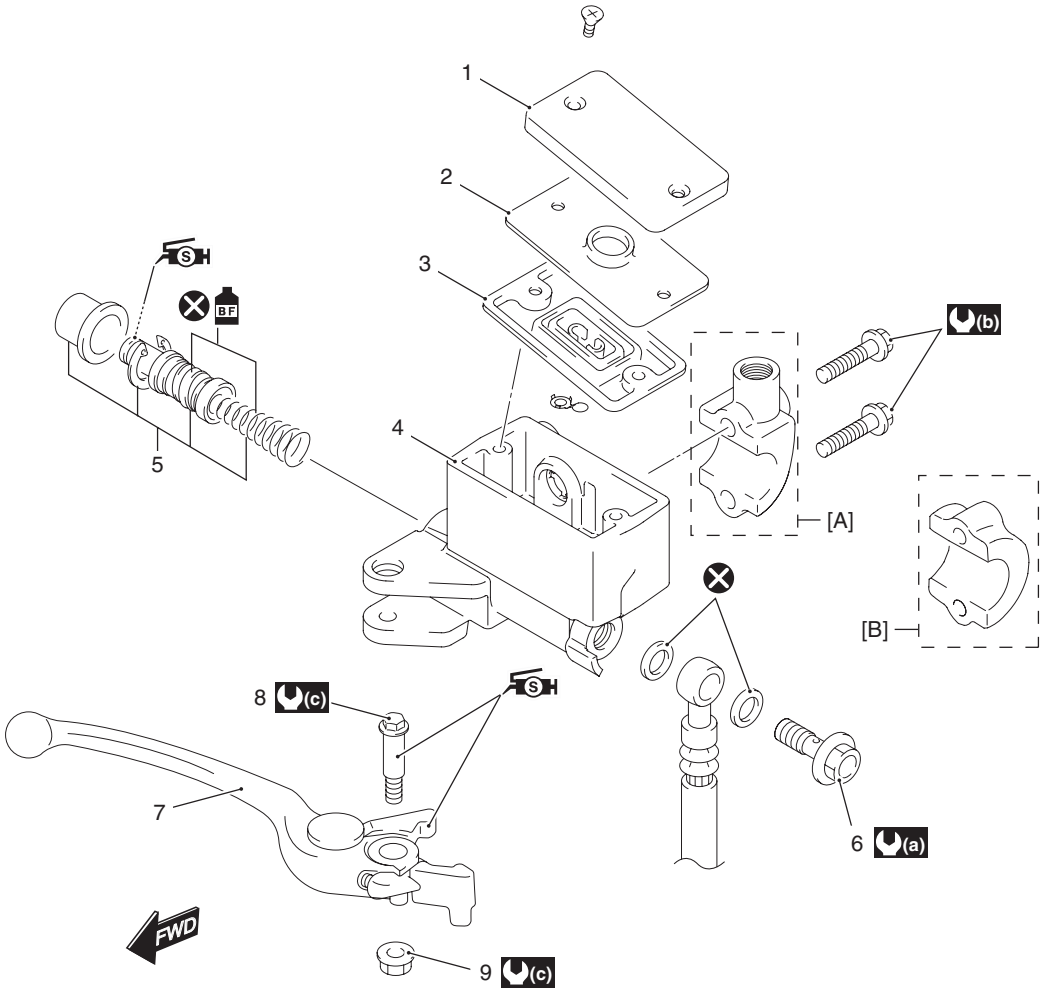
⚠ CAUTION

The seal washers should be replaced with the new ones to prevent fluid leakage.

1) Install the rear brake hose as shown in the rear brake hose routing diagram. Refer to “Rear Brake Hose Routing Diagram (Page 4A-5)”.
2) Bleed air from the rear brake system. Refer to “Air Bleeding from Brake Fluid Circuit (Page 4A-8)”.
3) Reinstall the removed parts.

Front Brake Master Cylinder Components

B718H14106011



I718H1410070-01

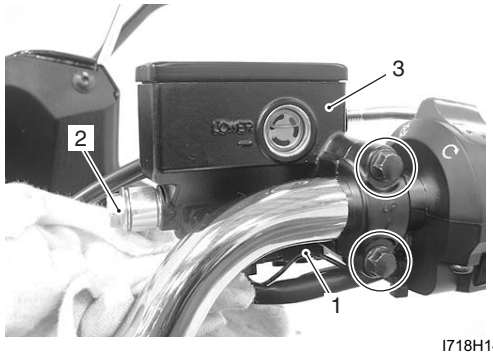
1. Reservoir cap	7. Brake lever	(b) : 10 N·m (1.0 kgf-m, 7.0 lb-ft)
2. Plate	8. Brake lever pivot bolt	(c) : 6.0 N·m (0.6 kgf-m, 4.5 lb-ft)
3. Diaphragm	9. Brake lever pivot bolt lock-nut	BF : Apply brake fluid.
4. Master cylinder	[A]: For GSF1250/A	S : Apply silicone grease.
5. Piston/Cup set	[B]: For GSF1250S/SA	: Do not reuse.
6. Brake hose union bolt	(a) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)	

Front Brake Master Cylinder Assembly Removal and Installation

B718H14106012

Removal

1) Drain brake fluid. Refer to “Brake Fluid Replacement (Page 4A-10)”.
2) Disconnect the front brake light switch lead coupler (1).
3) Place a rag underneath the brake hose union bolt (2) on the master cylinder to catch any spilt brake fluid.
4) Remove the brake hose union bolt (2) and disconnect the brake hose.
5) Remove the right rear view mirror. (GSF1250/A)
6) Remove the master cylinder assembly (3).



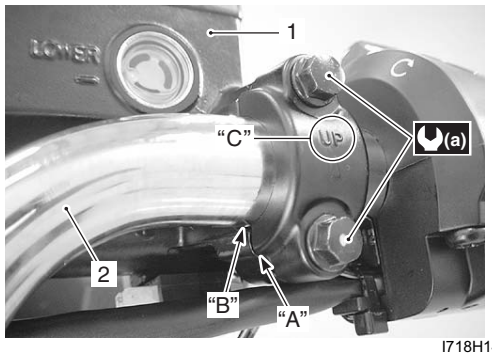
I718H1410048-04

Installation

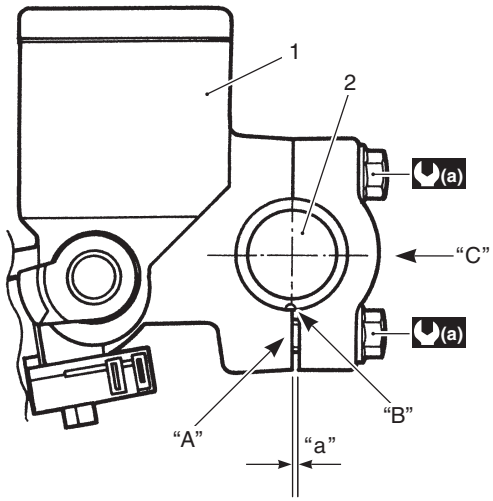
Install the front brake master cylinder in the reverse order of removal. Pay attention to the following points:

- When installing the master cylinder (1) onto the handlebars (2), align the master cylinder holder's mating surface "A" with the punch mark "B" on the handlebars (2) and tighten the upper holder bolt first. Refer to "Handlebar Construction in Section 6B (Page 6B-2)".

  Tightening torque
  Master cylinder holder bolt (Upper and Lower) (a): 10 N·m (1.0 kgf-m, 7.0 lb-ft)



I718H1410051-04



I718H1410072-01

"C": Up mark	"a": Clearance

- After setting the brake hose union to the stopper, tighten the union bolt to the specified torque.

  ⚠ CAUTION

  The seal washers should be replaced with the new ones to prevent fluid leakage.

  Tightening torque
  Brake hose union bolt (b): 23 N·m (2.3 kgf-m, 16.5 lb-ft)

I718H1410050-03

- Bleed air from the brake system. Refer to "Air Bleeding from Brake Fluid Circuit (Page 4A-8)".

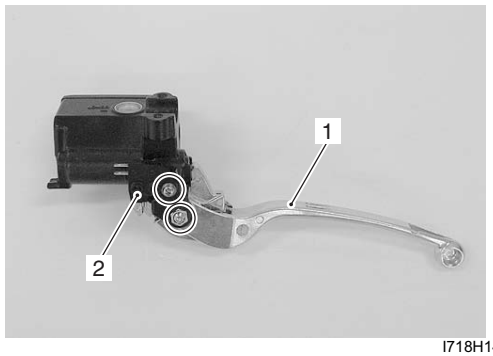
Front Brake Master Cylinder / Brake Lever Disassembly and Assembly

B718H14106013

Refer to "Front Brake Master Cylinder Assembly Removal and Installation (Page 4A-14)".

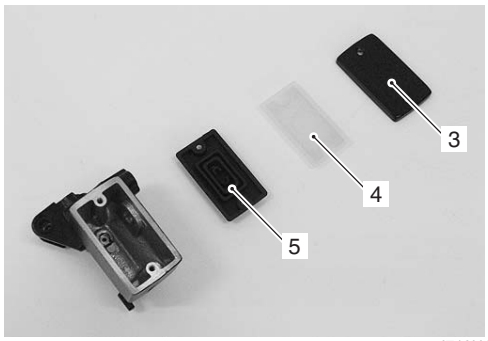
Disassembly

1) Remove the brake lever (1) and brake light switch (2).



I718H1410052-01

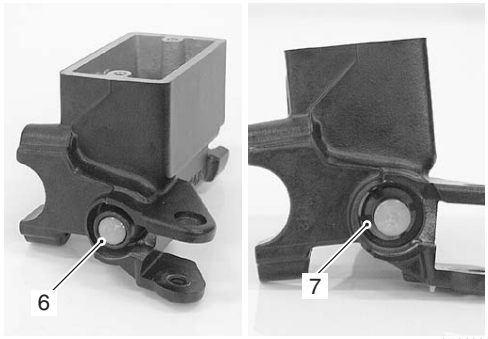
2) Remove the reservoir cap (3), plate (4) and diaphragm (5).



I718H1410053-01

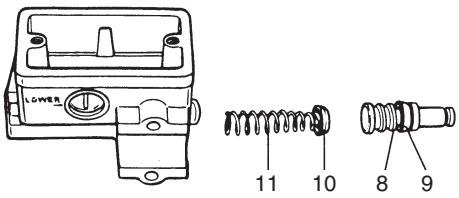
3) Pull out the dust boot (6) and remove the snap ring (7).

Special tool
TOOL : 09900–06108 (Snap ring pliers)



I718H1410054-02

4) Remove the following parts from the master cylinder.
- Piston (8)
- Secondary cup (9)
- Primary cup (10)
- Spring (11)



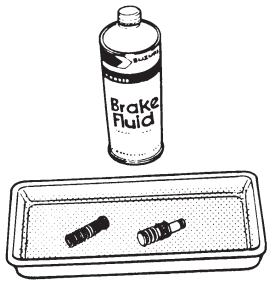
I649G1410023-01

Assembly
Assemble the master cylinder in the reverse order of disassembly. Pay attention to the following points:

⚠ CAUTION

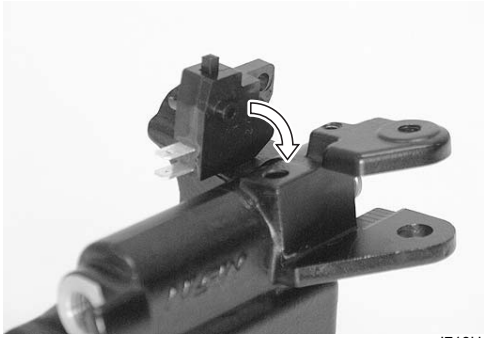
- **Wash the master cylinder components with new brake fluid before reassembly.**
- **Do not wipe the brake fluid off after washing the components.**
- **When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvents such as gasoline, kerosine, etc.**
- **Apply brake fluid to the master cylinder bore and all of the master cylinder component to be inserted into the bore.**

BF: Brake fluid (DOT 4)



I649G1410024-01

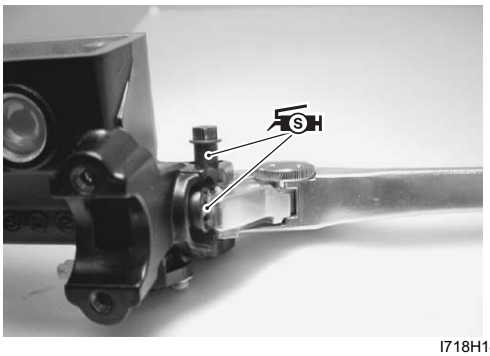
- When installing the brake light switch, align the projection on the switch with the hole in the master cylinder.



I718H1410055-01

- Apply grease to the brake lever pivot bolt.
- Apply grease to the contact point between piston and brake lever.

: Grease 99000–25100 (SUZUKI Silicone Grease or equivalent)



I718H1410071-01

- Tighten the pivot bolt and lock-nut to the specified torque.

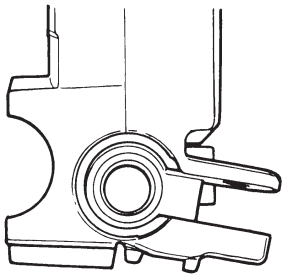
Tightening torque
Brake lever pivot bolt: 6.0 N·m (0.6 kgf-m, 4.5 lb-ft)
Brake lever pivot bolt lock-nut: 6.0 N·m (0.6 kgf-m, 4.5 lb-ft)

Front Brake Master Cylinder Parts Inspection

B718H14106014

Refer to “Front Brake Master Cylinder / Brake Lever Disassembly and Assembly (Page 4A-15)”.

Master Cylinder
Inspect the master cylinder bore for any scratches or other damage.



I649G1410027-01

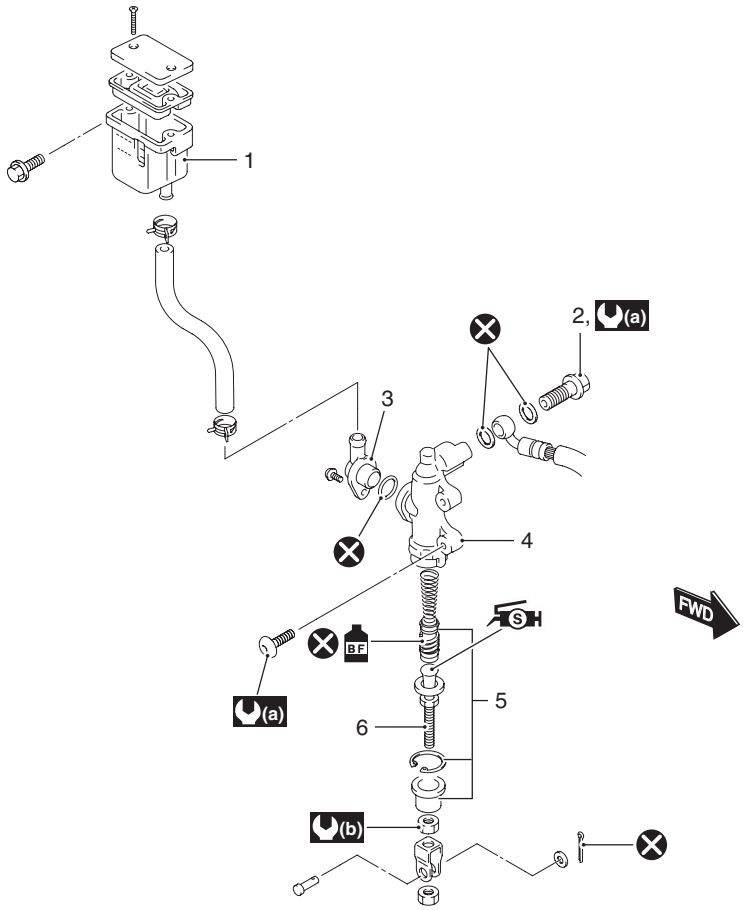
Piston
Inspect the piston surface for any scratches or other damage.

Rubber Parts
Inspect the primary cup, secondary cup and dust boot for wear or damage.

I649G1410028-01

Rear Brake Master Cylinder Components

B718H14106015



I649G1410029-05

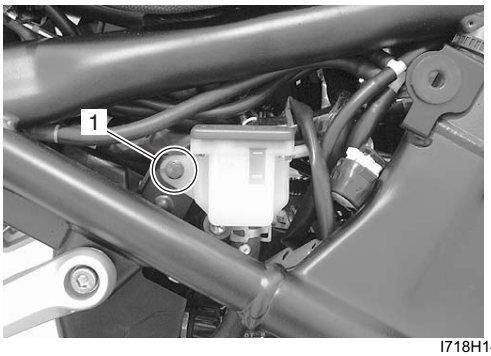
1. Reservoir tank	4. Master cylinder	(a) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)	BF : Apply brake fluid.
2. Brake hose union bolt	5. Piston/Cup set	(b) : 18 N·m (1.8 kgf-m, 13.0 lb-ft)	: Do not reuse.
3. Brake hose connector	6. Push rod	(S) H : Apply silicone grease.	

Rear Brake Master Cylinder Assembly Removal and Installation

B718H14106016

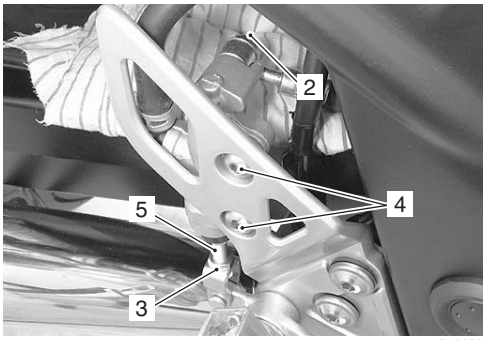
Removal

1) Remove the right frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
2) Drain brake fluid. Refer to “Brake Fluid Replacement (Page 4A-10)”.
3) Remove the reservoir mounting bolt (1).



I718H1410056-01

4) Place a rag underneath the brake hose union bolt (2) on the master cylinder to catch any spilt brake fluid.
5) Remove the brake hose union bolt (2) and disconnect the brake hose.
6) Loosen the lock-nut (3).
7) Remove the master cylinder mounting bolts (4).
8) Remove the master cylinder along with the reservoir by turning the push rod (5).



I718H1410057-01

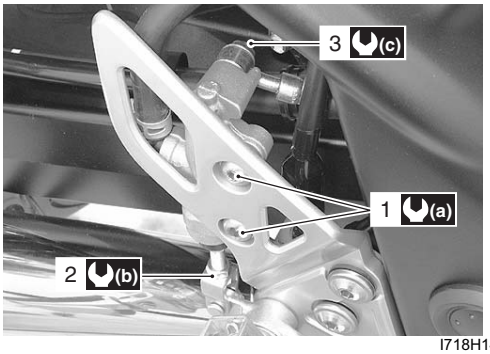
Installation
Install the rear brake master cylinder in the reverse order of removal. Pay attention to the following points:

⚠ CAUTION

The seal washers should be replaced with the new ones to prevent fluid leakage.

- Tighten the master cylinder mounting bolts (1) to the specified torque.
- Tighten the lock-nut (2) to the specified torque.
- After setting the brake hose union to the stopper, tighten the union bolt (3) to the specified torque.

Tightening torque
Rear master cylinder mounting bolt (a): 23 N·m (2.3 kgf-m, 16.5 lb-ft)
Rear master cylinder rod lock-nut (b): 18 N·m (1.8 kgf-m, 13.0 lb-ft)
Brake hose union bolt (c): 23 N·m (2.3 kgf-m, 16.5 lb-ft)



I718H1410058-01

- Bleed air from the system after reassembling the master cylinder. Refer to “Air Bleeding from Brake Fluid Circuit (Page 4A-8)”.
- Adjust the brake pedal height. Refer to “Brake System Inspection in Section 0B (Page 0B-17)”.

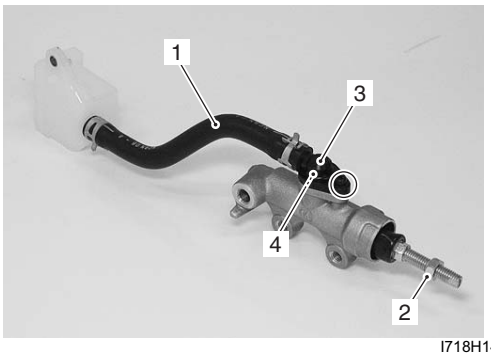
Rear Brake Master Cylinder Disassembly and Assembly

B718H14106017

Refer to “Front Brake Master Cylinder Assembly Removal and Installation (Page 4A-14)”.

Disassembly

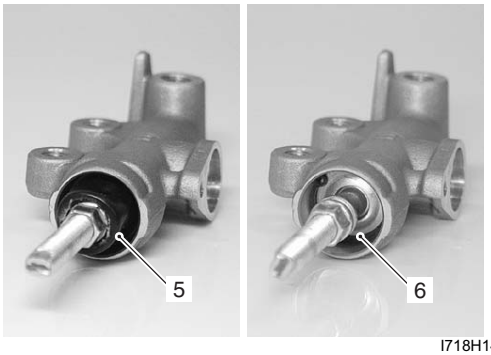
1) Disconnect the reservoir hose (1).
2) Remove the lock-nut (2).
3) Remove the brake hose connector (3) and O-ring (4).



I718H1410059-04

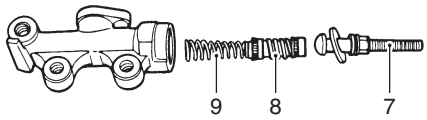
4) Pull out the dust boot (5) and remove the snap ring (6).

Special tool
TOOL : 09900–06108 (Snap ring pliers)



I718H1410060-01

5) Remove the push rod (7), piston/cup set (8) and spring (9).



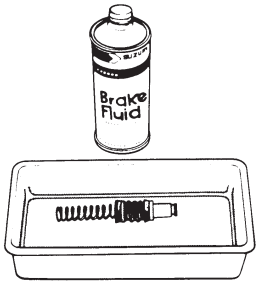
I649G1410035-01

Assembly
Assemble the master cylinder in the reverse order of disassembly. Pay attention to the following points:

⚠ CAUTION

- **Wash the master cylinder components with new brake fluid before reassembly.**
- **Do not wipe the brake fluid off after washing the components.**
- **When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvents such as gasoline, kerosine, etc.**
- **Apply brake fluid to the master cylinder bore and all of the master cylinder component to be inserted into the bore.**

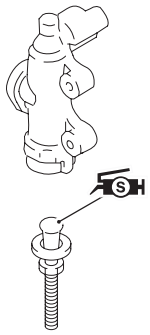
BF: Brake fluid (DOT 4)



I649G1410036-01

- Apply grease to the push rod end.

: Grease 99000–25100 (SUZUKI Silicone Grease or equivalent)

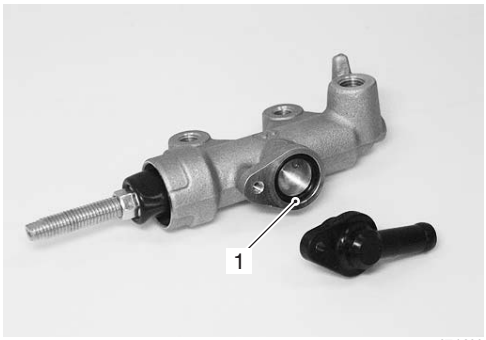


I649G1410041-02

- Install the O-ring (1).

⚠ CAUTION

Replace the O-ring (1) with a new one.



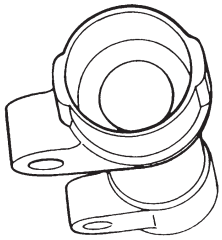
I718H1410061-01

Rear Brake Master Cylinder Parts Inspection

B718H14106018

Refer to “Rear Brake Master Cylinder Disassembly and Assembly (Page 4A-19)”.

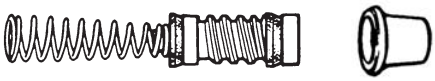
Master Cylinder
Inspect the master cylinder bore for any scratches or other damage.



I649G1410038-01

Piston
Inspect the piston surface for any scratches or other damage.

Rubber Parts
Inspect the primary cup, secondary cup and dust boot for wear or damage.



I649G1410039-01

Specifications

Service Data

B718H14107001

Brake

Unit: mm (in)

Item	Standard		Limit
Rear brake pedal height	50 – 60 (2.0 – 2.4)		—
Master cylinder bore	Front	14.000 – 14.043 (0.5512 – 0.5529)	—
	Rear	14.000 – 14.043 (0.5512 – 0.5529)	—
Master cylinder piston diam.	Front	13.957 – 13.984 (0.5495 – 0.5506)	—
	Rear	13.957 – 13.984 (0.5495 – 0.5506)	—

Oil

Item	Specification	Note
Brake fluid type	DOT 4	

Tightening Torque Specifications

B718H14107002

Fastening part	Tightening torque			Note
	N·m	kgf-m	lb-ft	
Air bleeder valve (Front brake)	7.5	0.75	5.5	☞(Page 4A-9) / ☞(Page 4A-11)
Air bleeder valve (Rear brake)	6.0	0.6	4.5	☞(Page 4A-10) / ☞(Page 4A-12)
Master cylinder holder bolt (Upper and Lower)	10	1.0	7.0	☞(Page 4A-15)
Brake hose union bolt	23	2.3	16.5	☞(Page 4A-15) / ☞(Page 4A-19)
Brake lever pivot bolt	6.0	0.6	4.5	☞(Page 4A-17)
Brake lever pivot bolt lock-nut	6.0	0.6	4.5	☞(Page 4A-17)
Rear master cylinder mounting bolt	23	2.3	16.5	☞(Page 4A-19)
Rear master cylinder rod lock-nut	18	1.8	13.0	☞(Page 4A-19)

NOTE

The specified tightening torque is also described in the following.
“Front Brake Hose Routing Diagram (Page 4A-1)”
“Rear Brake Hose Routing Diagram (Page 4A-5)”
“Front Brake Master Cylinder Components (Page 4A-14)”
“Rear Brake Master Cylinder Components (Page 4A-18)”

Reference:
For the tightening torque of fastener not specified in this section, refer to “Tightening Torque Specifications in Section 0C (Page 0C-7)”.

Special Tools and Equipment

Recommended Service Material

B718H14108001

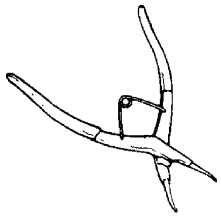
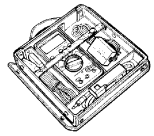
Material	SUZUKI recommended product or Specification		Note
Brake fluid	DOT 4	—	☞(Page 4A-10) / ☞(Page 4A-11) / ☞(Page 4A-16) / ☞(Page 4A-20)
Grease	SUZUKI Silicone Grease or equivalent	P/No.: 99000–25100	☞(Page 4A-17) / ☞(Page 4A-20)

NOTE

Required service material is also described in the following.
"Front Brake Master Cylinder Components (Page 4A-14)"
"Rear Brake Master Cylinder Components (Page 4A-18)"

Special Tool

B718H14108002

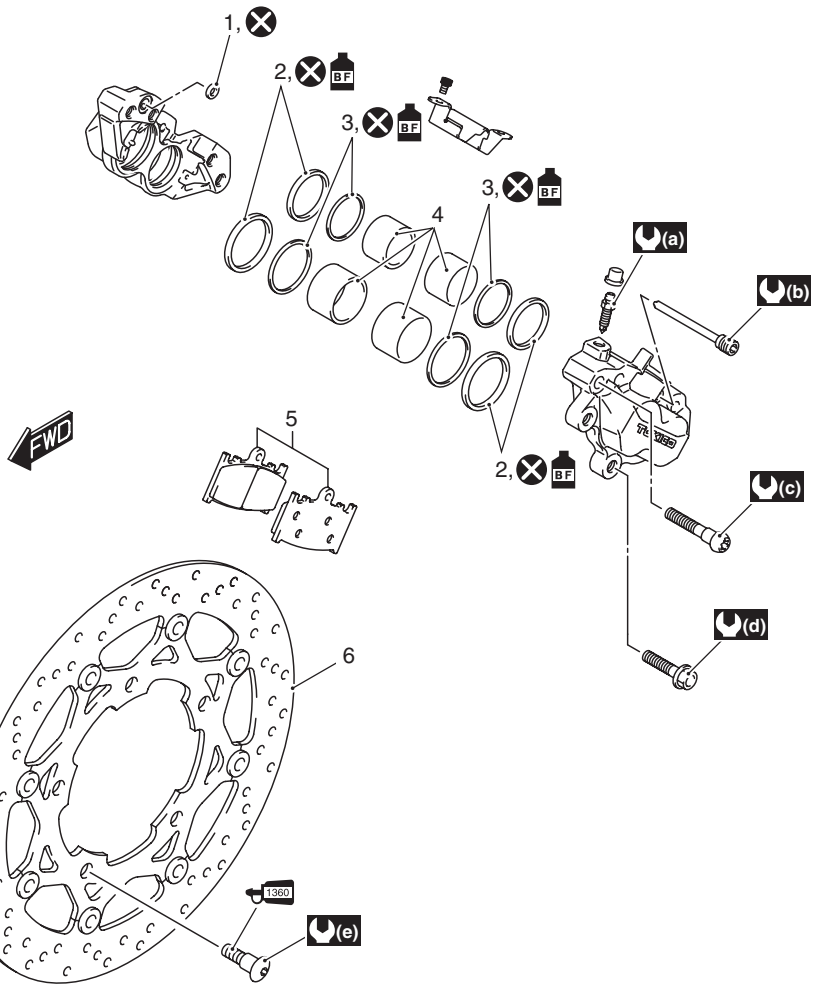
09900–06108 Snap ring pliers ☞(Page 4A-16) / ☞(Page 4A-19)		09900–25008 Multi-circuit tester set ☞(Page 4A-8) / ☞(Page 4A-8)	

Front Brakes

Repair Instructions

Front Brake Components

B718H14206001



I649G1420001-04

1. O-ring	6. Front brake disc	(e) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)
2. Piston seal	(a) : 7.5 N·m (0.75 kgf-m, 5.5 lb-ft)	1360 : Apply thread lock to thread part.
3. Dust seal	(b) : 16 N·m (1.6 kgf-m, 11.5 lb-ft)	BF : Apply brake fluid.
4. Piston	(c) : 22 N·m (2.2 kgf-m, 16.0 lb-ft)	: Do not reuse.
5. Front brake pad set	(d) : 26 N·m (2.6 kgf-m, 19.0 lb-ft)	

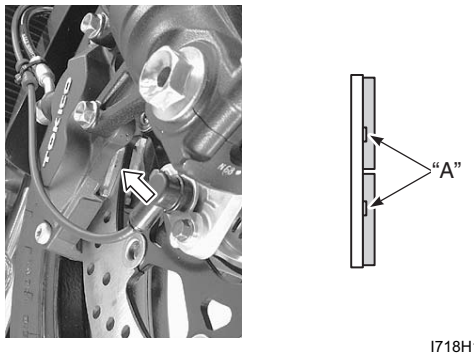
Front Brake Pad Inspection

B718H14206002

The extent of brake pads wear can be checked by observing the grooved limit line “A” on the pads. When the wear exceeds the grooved limit line, replace the pads with new ones. Refer to “Front Brake Pad Replacement (Page 4B-2)”.

⚠ CAUTION

Replace the brake pad as a set, otherwise braking performance will be adversely affected.

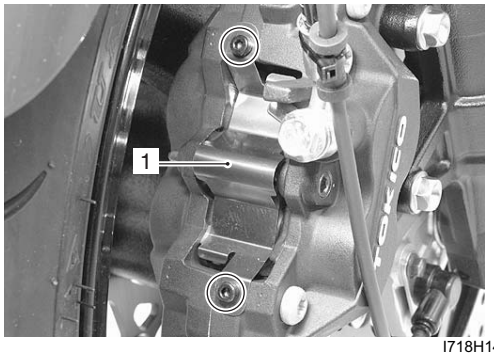


I718H1420001-03

Front Brake Pad Replacement

B718H14206003

1) Remove the spring (1).

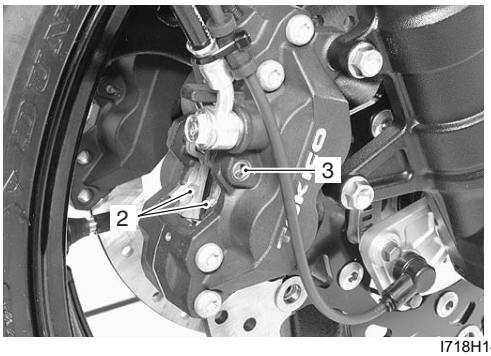


I718H1420011-01

2) Remove the brake pads (2) by removing the pad mounting pin (3).

NOTE

When removing the pads, push the piston all the way into the brake caliper.



I718H1420012-03

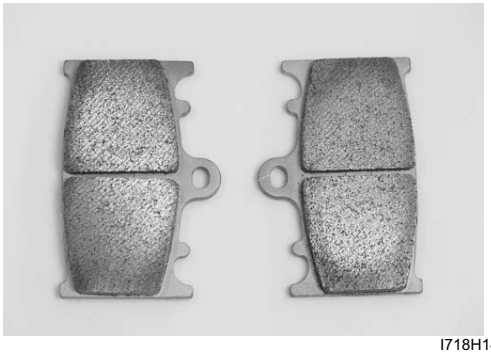
⚠ CAUTION

Do not operate the brake lever while dismounting the pads.

3) Clean up the caliper especially around the caliper piston.
4) Install the new brake pads.

⚠ CAUTION

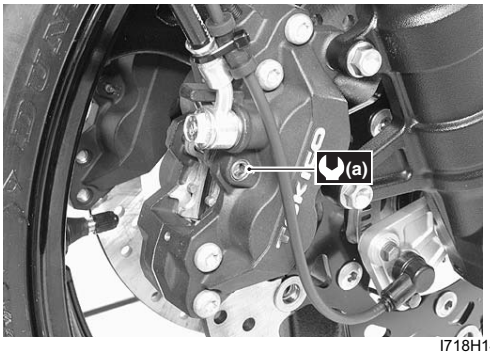
Replace the brake pads as a set, otherwise braking performance will be adversely affected.



I718H1420003-01

5) Tighten the pad mounting pin to the specified torque.

Tightening torque
Front brake pad mounting pin (a): 16 N·m (1.6 kgf-m, 11.5 lb-ft)



I718H1420013-01

NOTE

After replacing the brake pads, pump the brake lever several times to check for proper brake operation and then check the brake fluid level.

Front Brake Caliper Removal and Installation

B718H14206004

NOTE

The right and left calipers are installed symmetrically and therefore the removal procedure for one side is the same as that for the other side.

Removal

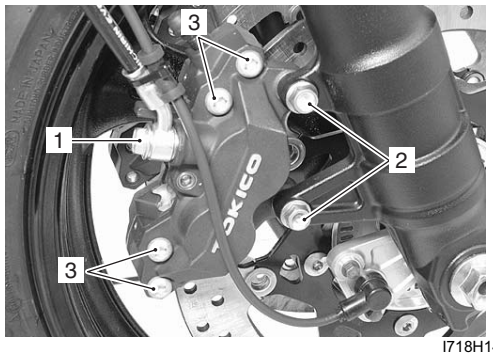
1) Drain brake fluid. Refer to “Brake Fluid Replacement in Section 4A (Page 4A-10)”.
2) Remove the brake hose from the caliper by removing the union bolt (1) and catch the brake fluid in a suitable receptacle.

NOTE

- **Place a rag underneath the union bolt on the brake caliper to catch any spilt brake fluid.**
- **Slightly loosen the brake caliper housing bolts (3) to facilitate later disassembly, if necessary.**

Special tool
TOOL : 09930–11920 (Torx bit (JT 40H))
TOOL : 09930–11940 (Bit holder)

3) Remove the brake caliper by removing the caliper mounting bolts (2).



I718H1420014-01

Installation

Install the brake caliper in the reverse order of removal. Pay attention to the following points:

- Tighten each bolt to the specified torque.

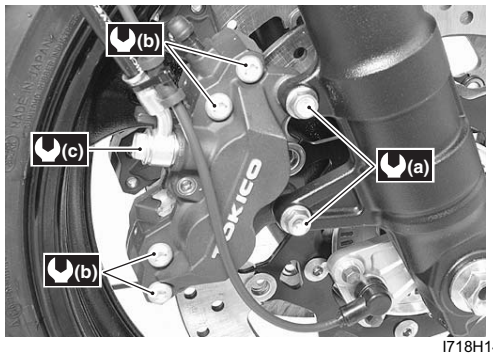
Tightening torque
Front brake caliper mounting bolt (a): 26 N·m (2.6 kgf-m, 19.0 lb-ft)
Front brake caliper housing bolt (b): 22 N·m (2.2 kgf-m, 16.0 lb-ft)

- After setting the brake hose union to the stopper, tighten the union bolt to the specified torque.

⚠ CAUTION

The seal washers should be replaced with the new ones to prevent fluid leakage.

Tightening torque
Front brake hose union bolt (c): 23 N·m (2.3 kgf-m, 16.5 lb-ft)



I718H1420015-01

- Bleed air from the brake system after installing the caliper. Refer to “Air Bleeding from Brake Fluid Circuit in Section 4A (Page 4A-8)”.

- Check the brake fluid leakage and brake operation.

⚠ WARNING

Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joints for cracks and fluid leakage.

Front Brake Caliper Disassembly and Assembly

B718H14206005

Refer to “Front Brake Caliper Removal and Installation (Page 4B-3)”.

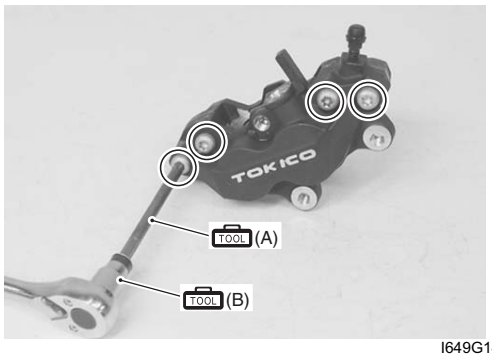
NOTE

The right and left calipers are installed symmetrically and therefore the disassembly procedure for one side is the same as that for the other side.

Disassembly

1) Remove the brake pads. Refer to “Front Brake Pad Replacement (Page 4B-2)”.
2) Separate the caliper halves by removing the caliper housing bolts with special tools.

Special tool
TOOL (A): 09930–11920 (Torx bit (JT 40H))
TOOL (B): 09930–11940 (Bit holder)



I649G1420021-01

3) Remove the O-ring.

I649G1420009-01

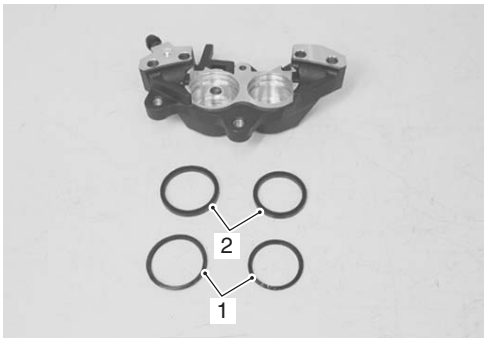
4) Place a rag over the pistons to prevent it from popping out and then force out the pistons using compressed air.

⚠ CAUTION

Do not use high pressure air to prevent piston damage.

I649G1420010-01

5) Remove the dust seals (1) and piston seals (2).



I718H1420008-01

Assembly

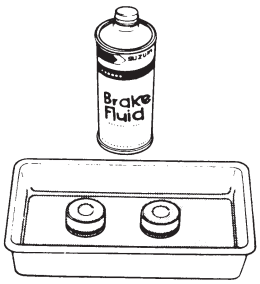
Assemble the caliper in the reverse order of disassembly. Pay attention to the following points:

- Wash the caliper bores and pistons with specified brake fluid. Particularly wash the dust seal grooves and piston seal grooves.

  BF: Brake fluid (DOT 4)

  ⚠ CAUTION

  - **Wash the caliper components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.**
  - **Do not wipe the brake fluid off after washing the components.**
  - **When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvent such as gasoline, kerosine or the others.**



I649G1420012-01

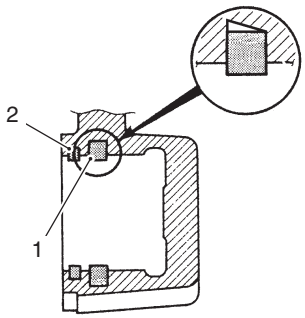
- Apply the brake fluid to piston seals (1) and dust seals (2).

  ⚠ CAUTION

  Replace the piston seals (1) and dust seals (2) with new ones

  BF: Brake fluid (DOT 4)

- Install the piston seals as shown.

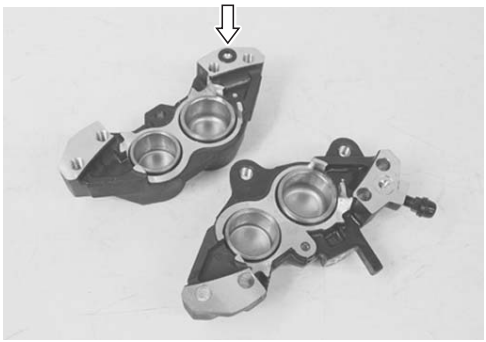


I649G1420013-01

- Install a new O-ring and reassemble caliper halves.

  ⚠ CAUTION

  Replace the O-ring with a new one.



I649G1420014-01

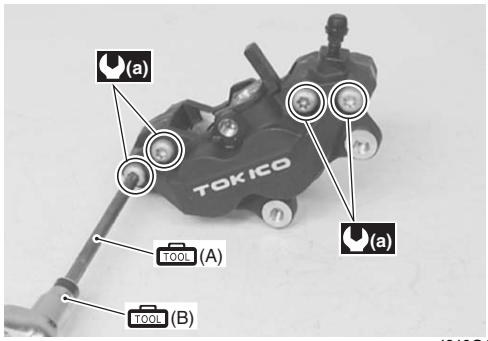
- Temporarily tighten the brake caliper housing bolts.

⚠ CAUTION

After installing the brake caliper to the front fork, tighten the brake caliper housing bolts to the specified torque. Refer to "Front Brake Caliper Removal and Installation (Page 4B-3)".

Special tool
TOOL (A): 09930–11920 (Torx bit (JT 40H))
TOOL (B): 09930–11940 (Bit holder)

Tightening torque
Front brake caliper housing bolt (a): 22 N·m (2.2 kgf-m, 16.0 lb-ft)



I649G1420008-03

- Install the brake pads. Refer to "Front Brake Pad Replacement (Page 4B-2)".

Front Brake Caliper Parts Inspection

B718H14206006

Refer to "Front Brake Caliper Disassembly and Assembly (Page 4B-4)".

Brake Caliper Cylinder
Inspect the brake caliper cylinder wall for nicks, scratches or other damage. If any damage is found, replace the caliper with a new one.

I649G1420015-01

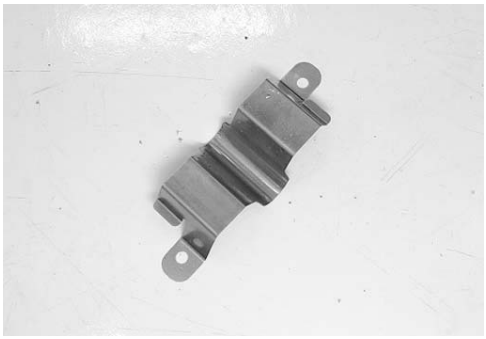
Brake Caliper Piston
Inspect the brake caliper piston surface for any scratches or other damage. If any damage is found, replace the piston with a new one.

I649G1420016-01

Brake Pad Mounting Pin
Inspect the brake Pad mounting pin for wear and other damage. If any damage is found, replace the mounting pin with a new one.

I718H1420018-03

Brake Pad Spring
Inspect the brake pad springs for damage and excessive bend. If any defects are found, replace them with new ones.



I718H1420019-03

Front Brake Disc Removal and Installation

B718H14206007

Removal

1) Remove the front wheel assembly. Refer to “Front Wheel Assembly Removal and Installation in Section 2D (Page 2D-6)”.
2) Remove the front brake disc.

I718H1420016-01

Installation

Install the front brake disc in the reverse order of removal. Pay attention to the following points:

- Make sure that the brake discs are clean and free of any grease.
- Apply thread lock to the brake disc bolts and tighten them to the specified torque.

1360 : Thread lock cement 99000–32130 (Thread Lock Cement Super 1360 or equivalent)

Tightening torque
Brake disc bolt (a): 23 N·m (2.3 kgf-m, 16.5 lb-ft)

I718H1420017-01

Front Brake Disc Inspection

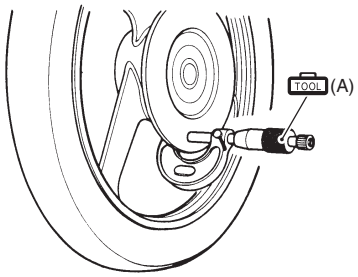
B718H14206008

Brake Disc Thickness

Check the brake disc for damage or cracks and measure the thickness using the micrometer.
Replace the brake disc if the thickness is less than the service limit or if defect is found.

Special tool
TOOL (A): 09900–20205 (Micrometer (0 – 25 mm))

Brake disc thickness
Service limit (Front): 4.5 mm (0.18 in)



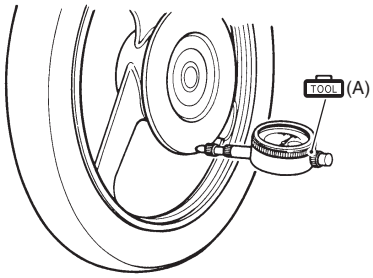
I649G1420019-02

Brake Disc Runout

1) Dismount the front brake caliper. Refer to “Front Brake Caliper Removal and Installation (Page 4B-3)”.
2) Measure the runout using the dial gauge. Replace the disc if the runout exceeds the service limit.

Special tool
TOOL (A): 09900–20607 (Dial gauge (1/100 mm, 10 mm))
TOOL : 09900–20701 (Magnetic stand)

Brake disc runout
Service limit: 0.30 mm (0.012 in)



I649G1420020-02

3) Remount the front brake caliper. Refer to “Front Brake Caliper Removal and Installation (Page 4B-3)”.

Specifications

Service Data

B718H14207001

Brake

Unit: mm (in)

Item	Standard			Limit
Brake disc thickness	Front	4.8 – 5.2 (0.189 – 0.205)		4.5 (0.18)
Brake disc runout	—			0.30 (0.012)
Brake caliper cylinder bore	Front	Leading	27.050 – 27.126 (1.0650 – 1.0680)	—
		Trailing	30.280 – 30.356 (1.1921 – 1.1951)	—
Brake caliper piston diam.	Front	Leading	26.920 – 26.970 (1.0598 – 1.0618)	—
		Trailing	30.150 – 30.200 (1.1870 – 1.1890)	—

Oil

Item	Specification	Note
Brake fluid type	DOT 4	

Tightening Torque Specifications

B718H14207002

Fastening part	Tightening torque			Note
	N·m	kgf-m	lb-ft	
Front brake pad mounting pin	16	1.6	11.5	☞(Page 4B-3)
Front brake caliper mounting bolt	26	2.6	19.0	☞(Page 4B-3)
Front brake caliper housing bolt	22	2.2	16.0	☞(Page 4B-3) / ☞(Page 4B-6)
Front brake hose union bolt	23	2.3	16.5	☞(Page 4B-3)
Brake disc bolt	23	2.3	16.5	☞(Page 4B-7)

NOTE

The specified tightening torque is also described in the following.
“Front Brake Components (Page 4B-1)”

Reference:
For the tightening torque of fastener not specified in this section, refer to “Tightening Torque Specifications in Section 0C (Page 0C-7)”.

Special Tools and Equipment

Recommended Service Material

B718H14208001

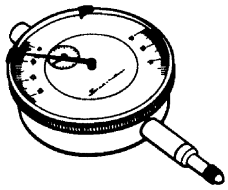
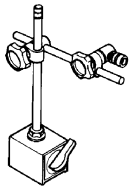
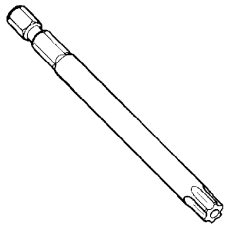
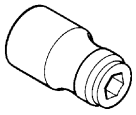
Material	SUZUKI recommended product or Specification		Note
Brake fluid	DOT 4	—	☞(Page 4B-5) / ☞(Page 4B-5)
Thread lock cement	Thread Lock Cement Super 1360 or equivalent	P/No.: 99000–32130	☞(Page 4B-7)

NOTE

Required service material is also described in the following.
“Front Brake Components (Page 4B-1)”

Special Tool

B718H14208002

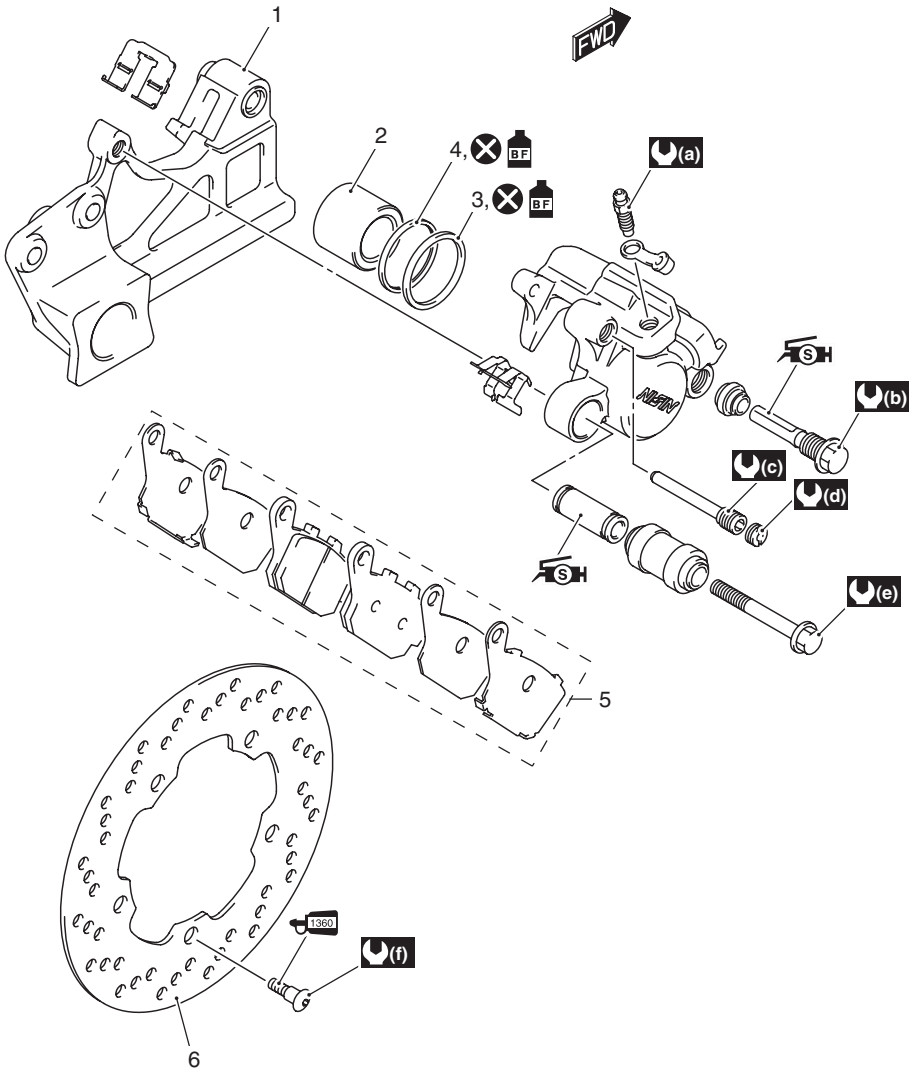
09900–20205 Micrometer (0 – 25 mm) ☞(Page 4B-7) 	09900–20607 Dial gauge (1/100 mm, 10 mm) ☞(Page 4B-7) 
09900–20701 Magnetic stand ☞(Page 4B-7) 	09930–11920 Torx bit (JT40H) ☞(Page 4B-3) / ☞(Page 4B-4) / ☞(Page 4B-6) 
09930–11940 Bit holder ☞(Page 4B-3) / ☞(Page 4B-4) / ☞(Page 4B-6) 	

Rear Brakes

Repair Instructions

Rear Brake Components

B718H14306001



I649G1430001-04

1. Rear caliper bracket	(a) : 6.0 N·m (0.6 kgf-m, 4.5 lb-ft)	: Apply silicone grease to sliding surface.
2. Piston	(b) : 27 N·m (2.7 kgf-m, 19.5 lb-ft)	1360 : Apply thread lock to thread part.
3. Piston seal	(c) : 18 N·m (1.8 kgf-m, 13.0 lb-ft)	BF : Apply brake fluid.
4. Dust seal	(d) : 2.5 N·m (0.25 kgf-m, 1.8 lb-ft)	: Do not reuse.
5. Rear brake pad/Shim set	(e) : 22 N·m (2.2 kgf-m, 16.0 lb-ft)	
6. Rear brake disc	(f) : 23 N·m (2.3 kgf-m, 16.5 lb-ft)	

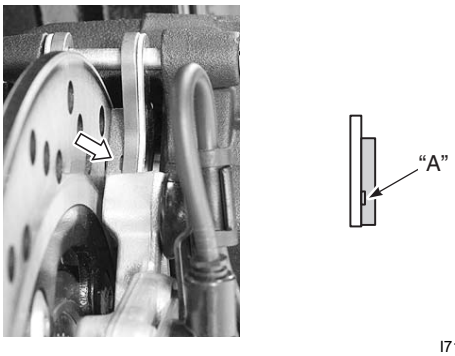
Rear Brake Pad Inspection

B718H14306002

The extent of brake pads wear can be checked by observing the grooved limit line “A” on the pads. When the wear exceeds the grooved limit line, replace the pads with new ones. Refer to “Rear Brake Pad Replacement (Page 4C-2)”.

⚠ CAUTION

Replace the brake pad as a set, otherwise braking performance will be adversely affected.

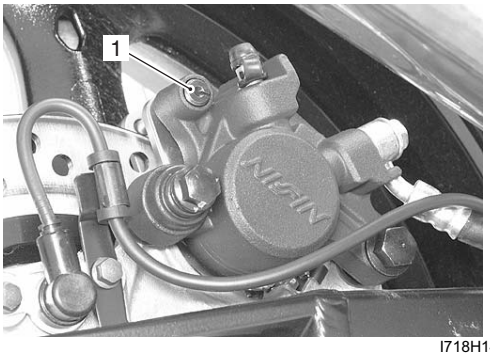


I718H1430001-02

Rear Brake Pad Replacement

B718H14306003

1) Remove the plug (1).

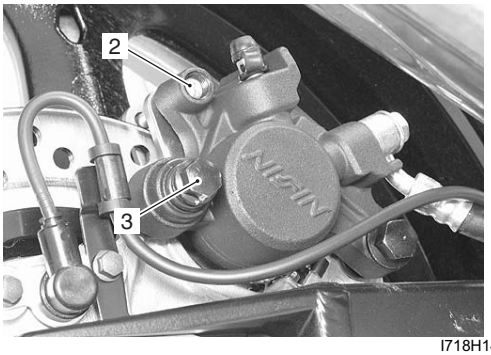


I718H1430016-01

2) Loosen the pad mounting pin (2).
3) Remove the caliper mounting bolt (3).

⚠ CAUTION

Do not operate the brake pedal while dismounting the pads.

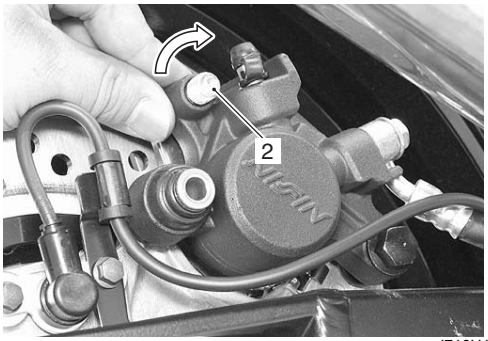


I718H1430018-02

4) Remove the pad mounting pin (2) and brake pads with the rear caliper pivoted up.

NOTE

When removing the pads, push the piston all the way into brake caliper.

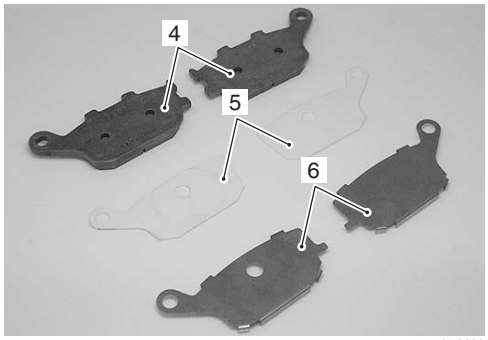


I718H1430017-02

5) Clean up the caliper, especially around the caliper piston.
6) Assemble the new brake pad (4), insulator (5) and shim (6).

⚠ CAUTION

Replace the brake pads as a set, otherwise braking performance will be adversely affected.

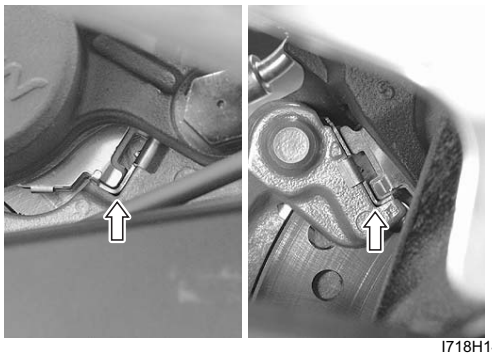


I718H1430019-02

7) Install the new brake pads.

NOTE

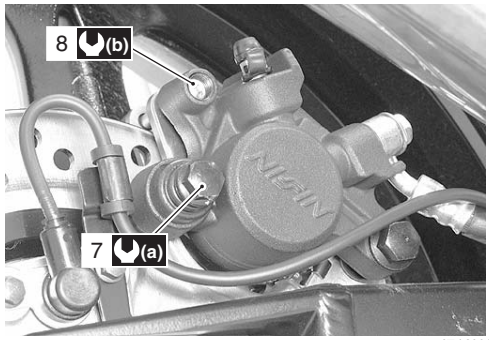
Make sure that the detent of the pad is seated onto the retainer on the caliper bracket.



I718H1430020-01

8) Tighten the caliper mounting bolt (7) and pad mounting pin (8) to the specified torque.

Tightening torque
Rear brake caliper mounting bolt (a): 22 N·m (2.2 kgf-m, 16.0 lb-ft)
Rear brake pad mounting pin (b): 18 N·m (1.8 kgf-m, 13.0 lb-ft)



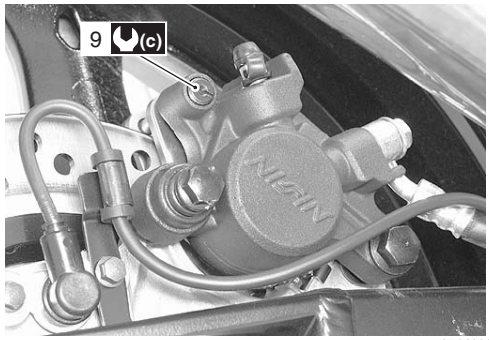
I718H1430021-02

9) Install the plug (9) to the specified torque.

Tightening torque
Pad pin plug (c): 2.5 N·m (0.25 kgf-m, 1.8 lb-ft)

NOTE

After replacing the brake pads, pump the brake pedal several times to check for proper brake operation and then check the brake fluid level.



I718H1430022-01

Rear Brake Caliper Removal and Installation

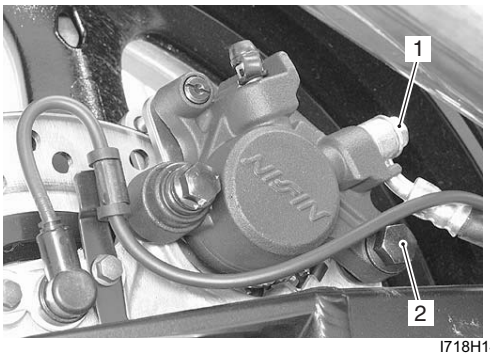
B718H14306004

Removal

1) Drain brake fluid. Refer to “Brake Fluid Replacement in Section 4A (Page 4A-10)”.
2) Remove the brake hose from the caliper by removing the union bolt (1) and catch the brake fluid in a suitable receptacle.

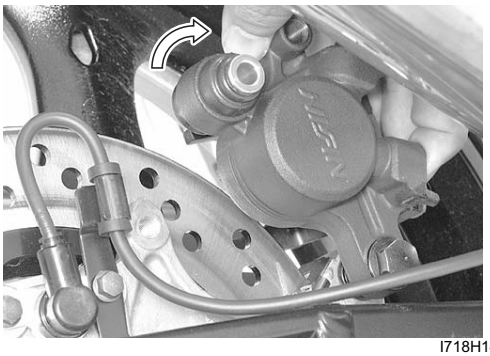
NOTE

- **Place a rag underneath the union bolt on the brake caliper to catch any spilt brake fluid.**
- **Slightly loosen the sliding pin (2) to facilitate later disassembly, if necessary.**



I718H1430023-01

3) Remove the brake pads. Refer to “Rear Brake Pad Replacement (Page 4C-2)”.
4) Pivot the caliper up and remove the caliper from the caliper bracket.



I718H1430024-01

Installation

Install the brake caliper in the reverse order of removal. Pay attention to the following points:

- Install the brake pad and remount the brake caliper. Refer to “Rear Brake Pad Replacement (Page 4C-2)”.
- Tighten the sliding pin (1) to the specified torque.

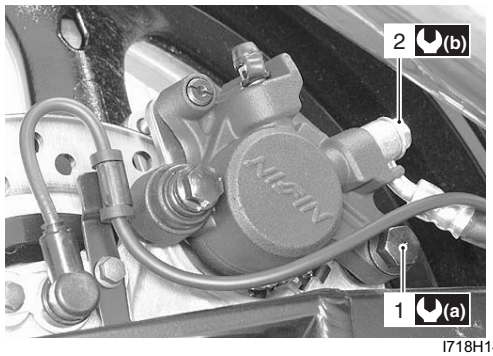
Tightening torque
Rear brake caliper sliding pin (a): 27 N·m (2.7 kgf-m, 19.5 lb-ft)

- After setting the brake hose union to the stopper, tighten the union bolt (2) to the specified torque.

⚠ CAUTION

The seal washers should be replaced with the new ones to prevent fluid leakage.

Tightening torque
Brake hose union bolt (b): 23 N·m (2.3 kgf-m, 16.5 lb-ft)



I718H1430026-01

- Bleed air from the brake system after installing the caliper. Refer to “Air Bleeding from Brake Fluid Circuit in Section 4A (Page 4A-8)”.
- Check the brake fluid leakage and brake operation.

⚠ WARNING

Brake fluid, if it leaks, will interfere with safe running and discolor painted surfaces. Check the brake hose and hose joints for cracks and fluid leakage.

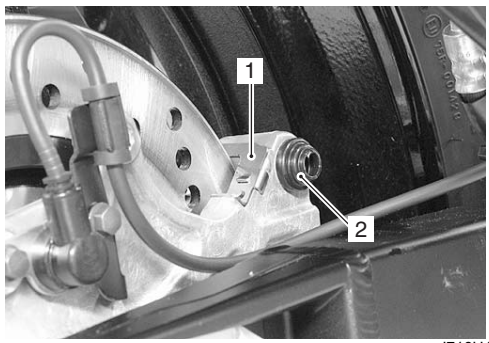
Rear Brake Caliper Disassembly and Assembly

B718H14306005

Refer to “Rear Brake Caliper Removal and Installation (Page 4C-4)”.

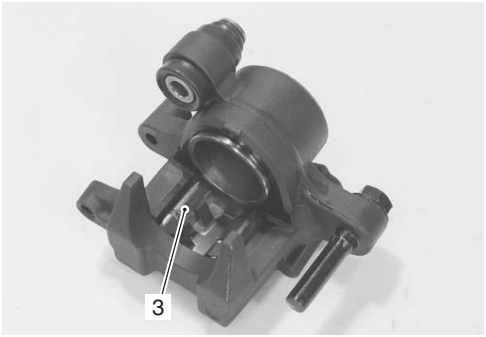
Disassembly

1) Remove the pad spring (1) and rubber boot (2).



I718H1430027-01

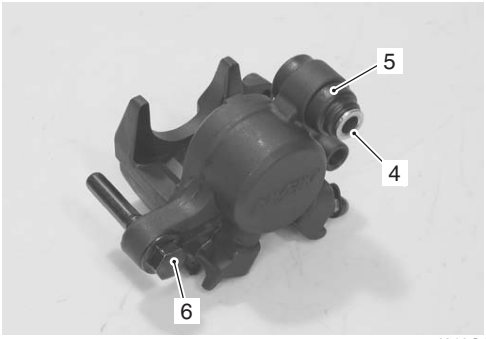
2) Remove the pad spring (3).



I649G1430014-01

3) Remove the spacer (4) and rubber boot (5) from the caliper.

4) Remove the slide pin (6).



I649G1430015-02

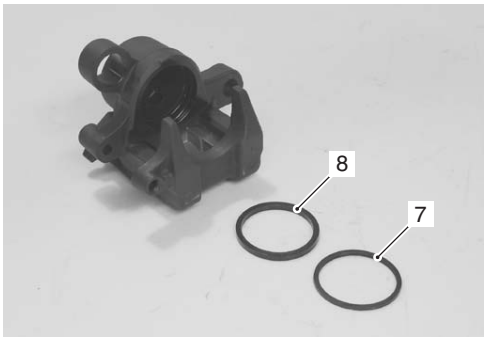
5) Place a rag over the piston to prevent it from popping out and then force out the piston using compressed air.

⚠ CAUTION

Do not use high pressure air to prevent piston damage.

I649G1430016-01

6) Remove the dust seal (7) and piston seal (8).



I649G1430017-01

Assembly

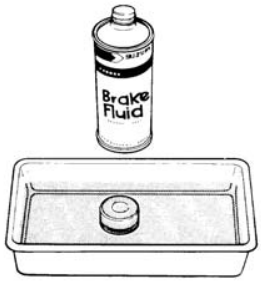
Assemble the caliper in the reverse order of disassembly. Pay attention to the following points:

- Wash the caliper bore and piston with specified brake fluid. Particularly wash the dust seal groove and piston seal groove.

  BF: Brake fluid (DOT 4)

⚠ CAUTION

- **Wash the caliper components with fresh brake fluid before reassembly. Never use cleaning solvent or gasoline to wash them.**
- **Do not wipe the brake fluid off after washing the components.**
- **When washing the components, use the specified brake fluid. Never use different types of fluid or cleaning solvent such as gasoline, kerosine or the others.**



I649G1430018-01

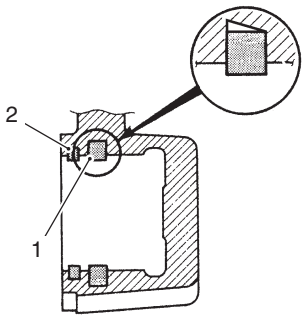
- Apply the brake fluid to piston seal (1) and dust seal (2).

⚠ CAUTION

Replace the piston seal (1) and dust seal (2) with new ones.

BF: Brake fluid (DOT 4)

- Install the piston seals as shown.



I649G1420013-01

- Apply grease to the inside of the boot.

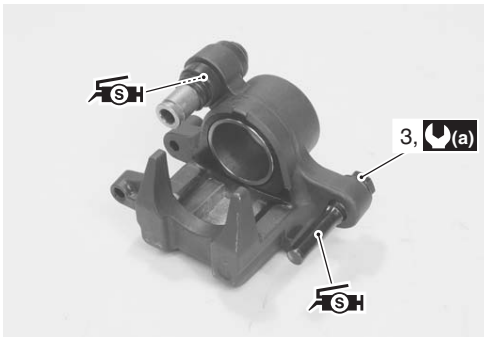
: Grease 99000–25100 (SUZUKI Silicone Grease or equivalent)

- Temporarily tighten the sliding pin (3) and apply grease to the sliding pin.

: Grease 99000–25100 (SUZUKI Silicone Grease or equivalent)

- After mounting the caliper, tighten the sliding pin (3) to the specified torque. Refer to “Rear Brake Caliper Removal and Installation (Page 4C-4)”.

Tightening torque
Rear brake caliper sliding pin (a): 27 N·m (2.7 kgf-m, 19.5 lb-ft)



I649G1430019-02

Rear Brake Caliper Parts Inspection

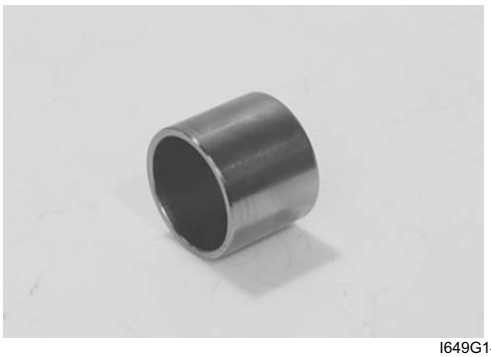
B718H14306006

Refer to “Rear Brake Caliper Disassembly and Assembly (Page 4C-4)”.

Brake Caliper Cylinder
Inspect the brake caliper cylinder wall for nicks, scratches or other damage. If any damage is found, replace the caliper with a new one.

I649G1430020-01

Brake Caliper Piston
Inspect the brake caliper piston surface for any scratches or other damage. If any damage is found, replace the piston with a new one.



I649G1430021-01

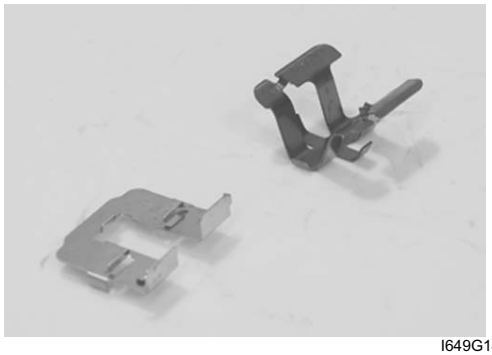
Brake Caliper Sliding Pin
Inspect the brake caliper sliding pin for wear and other damage. If any damage is found, replace the sliding pin with a new one.

I649G1430022-01

Boot and Spacer
Inspect the boots and spacer for damage and wear. If any defects are found, replace them with new ones.

I649G1430023-01

Brake Pad Spring
Inspect the brake pad springs for damage and excessive bend. If any defects are found, replace them with new ones.



I649G1430024-01

Rear Brake Disc Removal and Installation

B718H14306007

Removal

1) Remove the rear wheel assembly. Refer to “Rear Wheel Assembly Removal and Installation in Section 2D (Page 2D-16)”.
2) Remove the rear brake disc.

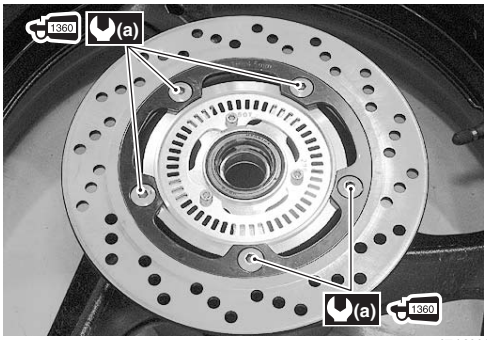
I718H1430028-01

Installation
Install the rear brake disc in the reverse order of removal. Pay attention to the following points:

- Make sure that the brake discs are clean and free of any grease.
- Apply thread lock to the brake disc bolts and tighten them to the specified torque.

1360 : Thread lock cement 99000–32130 (Thread Lock Cement Super 1360 or equivalent)

Tightening torque
Brake disc bolt (a): 23 N·m (2.3 kgf-m, 16.5 lb-ft)



I718H1430029-02

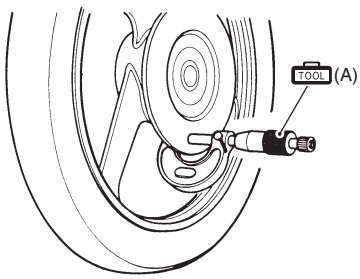
Rear Brake Disc Inspection

B718H14306008

Brake Disc Thickness
Check the brake disc for damage or cracks and measure the thickness using the micrometer.
Replace the brake disc if the thickness is less than the service limit or if defect is found.

Special tool
TOOL (A): 09900–20205 (Micrometer (0 – 25 mm))

Brake disc thickness
Service limit (Rear): 4.5 mm (0.18 in)



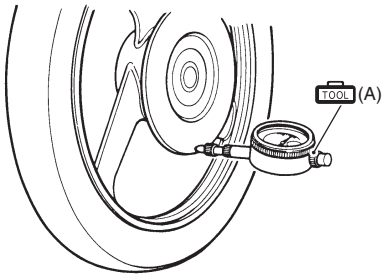
I649G1430027-02

Brake Disc Runout

1) Dismount the rear brake caliper. Refer to “Rear Brake Caliper Removal and Installation (Page 4C-4)”.
2) Measure the runout using the dial gauge. Replace the disc if the runout exceeds the service limit.

Special tool
TOOL (A): 09900–20607 (Dial gauge (1/100 mm, 10 mm))
TOOL (B): 09900–20701 (Magnetic stand)

Brake disc runout
Service limit: 0.30 mm (0.012 in)



I649G1430028-02

3) Remount the rear brake caliper. Refer to “Rear Brake Caliper Removal and Installation (Page 4C-4)”.

Specifications

Service Data

B718H14307001

Brake
Unit: mm (in)

Item	Standard		Limit
Brake disc thickness	Rear	4.8 – 5.2 (0.189 – 0.205)	4.5 (0.18)
Brake disc runout	—		0.30 (0.012)
Brake caliper cylinder bore	Rear	38.180 – 38.230 (1.5031 – 1.5051)	—
Brake caliper piston diam.	Rear	38.080 – 38.130 (1.4992 – 1.5012)	—

Oil

Item	Specification	Note
Brake fluid type	DOT 4	

Tightening Torque Specifications

B718H14307002

Fastening part	Tightening torque			Note
	N·m	kgf-m	lb-ft	
Rear brake caliper mounting bolt	22	2.2	16.0	☞(Page 4C-3)
Rear brake pad mounting pin	18	1.8	13.0	☞(Page 4C-3)
Pad pin plug	2.5	0.25	1.8	☞(Page 4C-3)
Rear brake caliper sliding pin	27	2.7	19.5	☞(Page 4C-4) / ☞(Page 4C-6)
Brake hose union bolt	23	2.3	16.5	☞(Page 4C-4)
Brake disc bolt	23	2.3	16.5	☞(Page 4C-7)

NOTE

The specified tightening torque is also described in the following.
“Rear Brake Components (Page 4C-1)”

Reference:
For the tightening torque of fastener not specified in this section, refer to “Tightening Torque Specifications in Section 0C (Page 0C-7)”.

Special Tools and Equipment

Recommended Service Material

B718H14308001

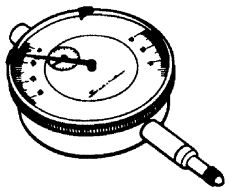
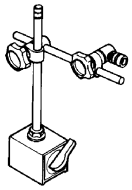
Material	SUZUKI recommended product or Specification		Note
Brake fluid	DOT 4	—	☞(Page 4C-5) / ☞(Page 4C-6)
Grease	SUZUKI Silicone Grease or equivalent	P/No.: 99000–25100	☞(Page 4C-6) / ☞(Page 4C-6)
Thread lock cement	Thread Lock Cement Super 1360 or equivalent	P/No.: 99000–32130	☞(Page 4C-7)

NOTE

Required service material is also described in the following.
"Rear Brake Components (Page 4C-1)"

Special Tool

B718H14308002

09900–20205 Micrometer (0 – 25 mm) ☞(Page 4C-7)		09900–20607 Dial gauge (1/100 mm, 10 mm) ☞(Page 4C-8)	
09900–20701 Magnetic stand ☞(Page 4C-8)			

ABS

Precautions

Precautions for ABS

B718H14500001

Refer to “Precautions for Electrical Circuit Service in Section 00 (Page 00-2)”.

ABS Information

B718H14500002

⚠ WARNING

- **Be sure to bleed air from the brake fluid circuit when the brake is felt spongy or when a brake relating part is replaced.**
- **Never ride the motorcycle before bleeding the air.**

- Be sure to route the brake hoses correctly.
- The ABS does not shorten the motorcycle’s braking distance. When riding down slopes or on wet or bumpy roads the braking distance is lengthened as compared to a motorcycle without ABS. In addition, braking distance increases more, when the road is slippery.
- The ABS does not control slides which may occur when braking while turning. As with a motorcycle that does not have ABS, it is best not apply the brakes while turning.
- The brake levers may move by themselves when they are applied. This is not a malfunction.
- Only use the specified tires.

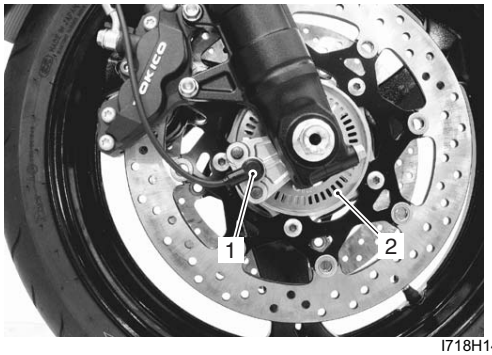
General Description

Wheel Speed Sensor Description

B718H14501001

Wheel speed sensor consists of wheel speed sensor (1) and sensor rotor (2).

Front



I718H1450005-01

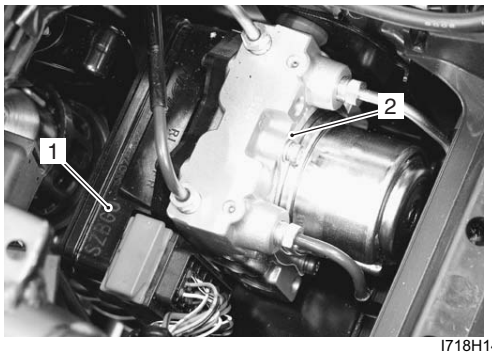
Rear

I718H1450006-01

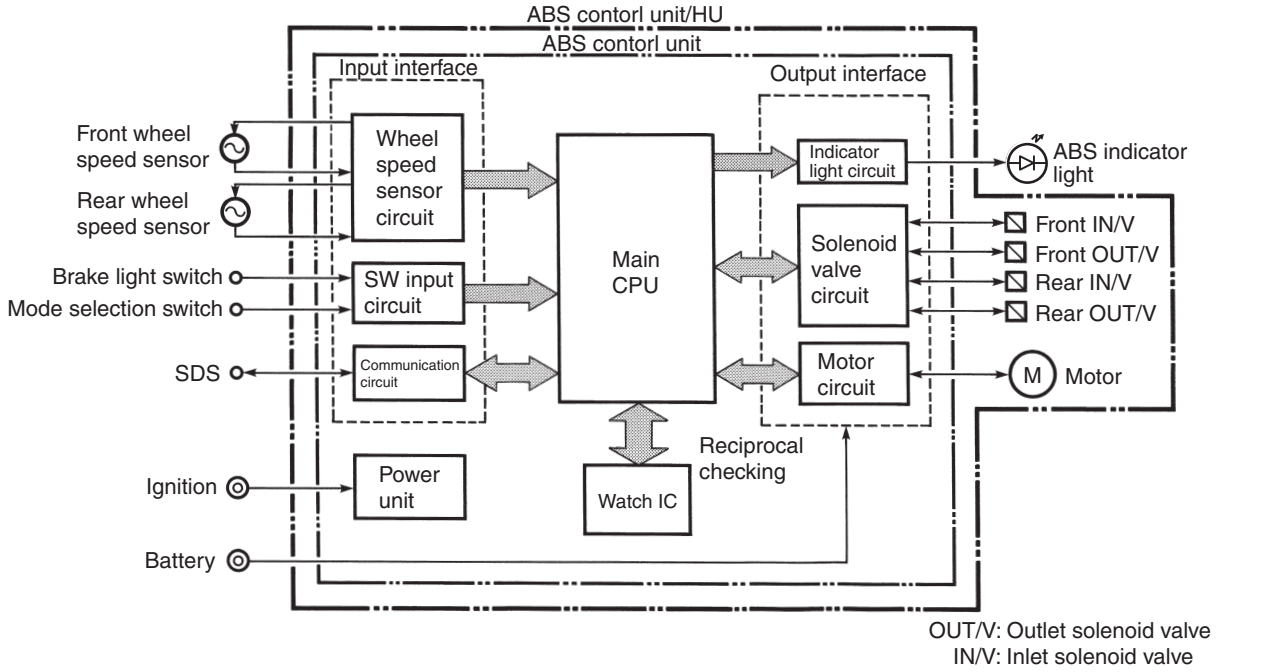
ABS Control Unit Description

B718H14501002

ABS control unit (1) calculates signals input from each one of front and rear wheel speed sensors, monitors the slipping conditions of the wheels and, at the same time, sends control signal to Hydraulic Unit (HU) (2).
This ABS control unit/HU can not be disassembled.



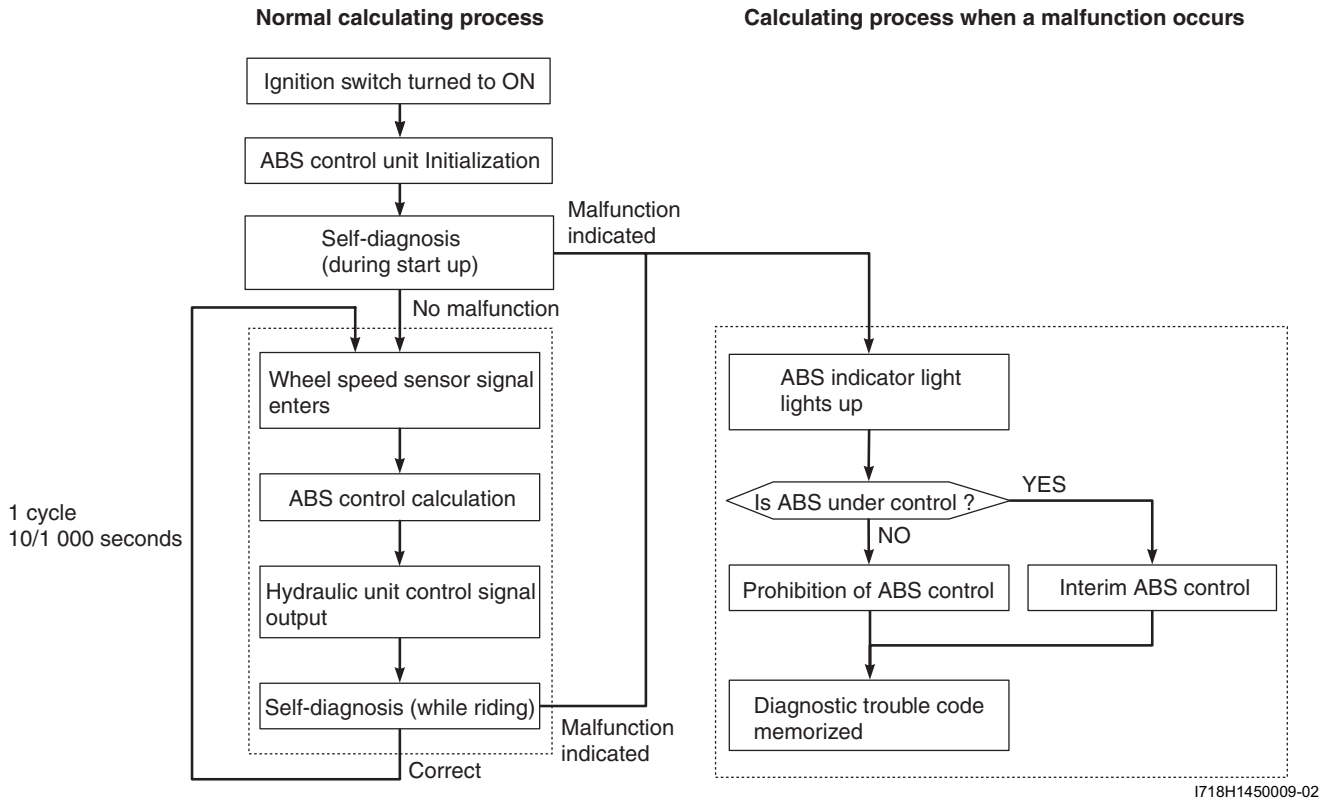
I718H1450007-03



I718H1450008-01

ABS Control Unit Calculating Process

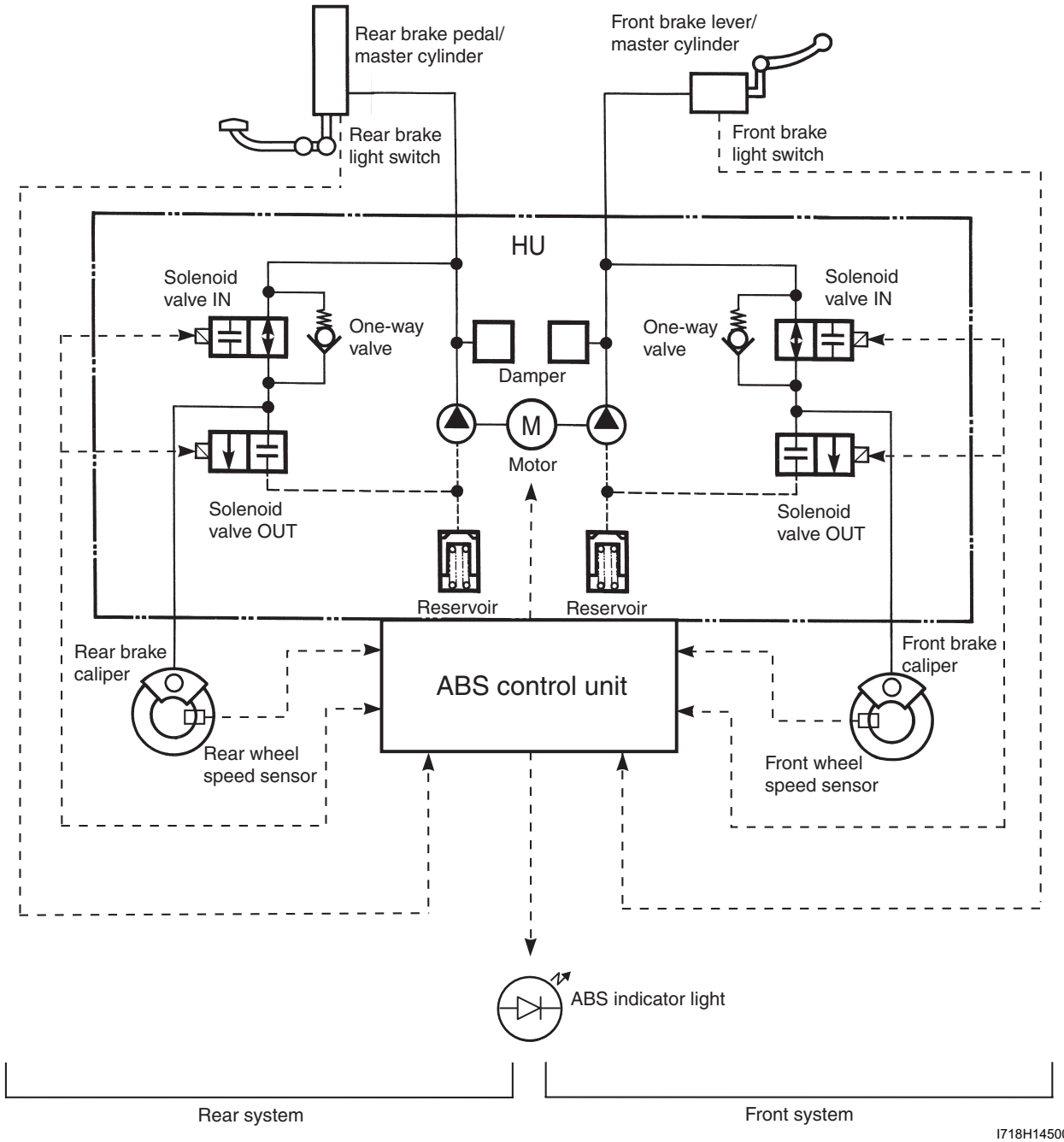
The ABS controls and its calculations, in addition to the self-diagnosing and the fail-safe processes, occur during the ABS control unit calculating process. ABS control is performed in one cycle every 10/1 000 seconds. In addition, if a malfunction is detected by the self-diagnosis function, the brake stops being controlled by the ABS and a diagnostic trouble code is stored.



Hydraulic Unit (HU) Description

B718H14501003

The hydraulic unit operates the solenoid valves based upon the signal which is output from the ABS control unit. The brake fluid pressure is then adjusted accordingly. The hydraulic unit controls the front and rear brake systems individually by operating separate components for the front and the rear, except for the pump drive motor, which is shared by both systems.



I718H1450010-01

Self-diagnosis Function and ABS Indicator Light Description

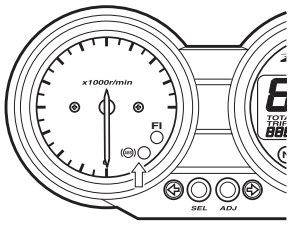
B718H14501006

The ABS control unit performs the self-diagnosis and can store any electronically detected malfunctions as diagnostic trouble codes. If a malfunction has occurred, the indicator light lights up to inform the rider of the malfunction. The special tool, when connected to the mode select coupler, enables the ABS indicator light to display the diagnostic trouble codes.

ABS Indicator Light

The ABS indicator light informs the rider of any ABS malfunctions. If a malfunction occurred, the ABS indicator light flashes, during the self-diagnosis, to indicate the diagnostic trouble code so that the correct part can be repaired.

- When the ignition switch is turned to ON, the ABS indicator light lights up even if no malfunction has occurred, to indicate that the bulb is not burnt out. It will go off after the motorcycle is ridden at more than 10 km/h (6.2 mile/h).
- If an ABS malfunction has occurred, the ABS indicator light keeps lighting up.



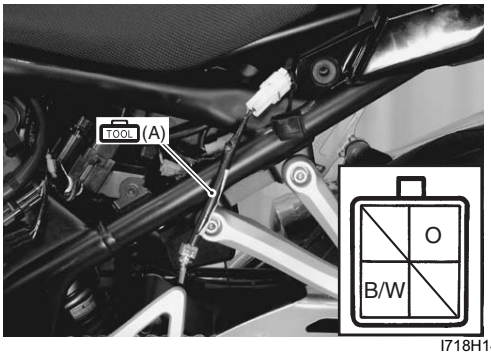
I718H1450122-04

NOTE

When a malfunction has occurred in the ABS, connect the special tool to the mode select coupler to display the diagnostic trouble code on the ABS indicator light. Refer to "DTC (Diagnostic Trouble Code) Output (Page 4E-23)".

Special tool

TOOL (A): 09930–82710 (Mode select switch)

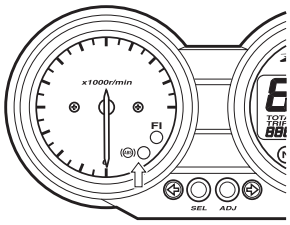


I718H1450042-03

ABS Operation and ABS Indicator Light

The ABS indicator light shows the ABS operating condition. During normal operation, the ABS indicator light lights up when the ignition switch is turned to ON and goes off after the motorcycle is ridden at more than 10 km/h (6.2 mile/h). If a malfunction has occurred, the ABS indicator light keeps lighting up.

The ABS indicator light goes off when the motorcycle is ridden at more than 10 km/h.	The ABS is normally activated.
The ABS indicator light keeps lighting up even though the motorcycle is ridden at more than 10 km/h (6.2 mile/h).	One or more malfunction has been found and ABS activation been hanged up.
The ABS indicator light does not light up when turning the ignition switch ON.	Check the wire harness and combination meter. Refer to "ABS Indicator Light Inspection (Page 4E-17)".



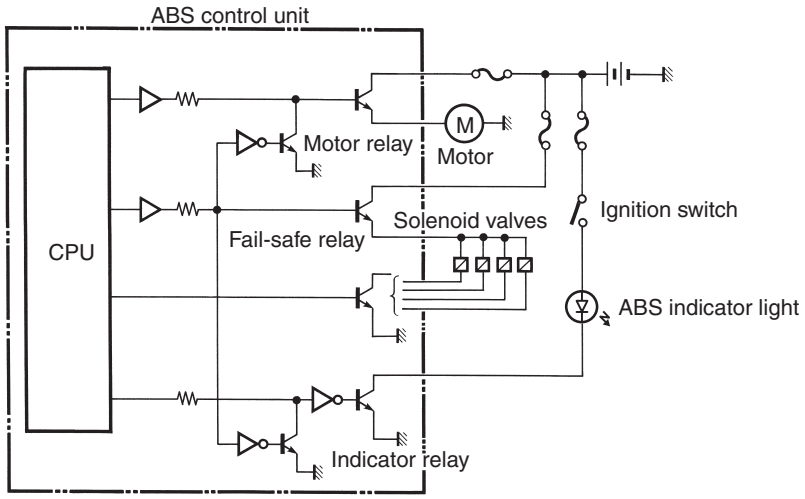
I718H1450122-04

Stored DTCs (Diagnostic Trouble Codes)
As for the diagnostic trouble code, the code of the first malfunction occurred during one ignition ON period will be stored. Pay attention to the fact that even though there may occur several malfunctions in one ON-period, only one code will be stored. Codes of malfunction that occurred in the past are all stored, but the same diagnostic trouble code will not be redundant.
Check and see if any diagnostic trouble code remains, by actually running the machine to activate ABS and by carrying out the self-diagnosis after deleting the diagnostic trouble code once the malfunctioned part is repaired.

Fail-safe Function Description

B718H14501007

If malfunction occurs in the ABS electric system, this sets fail-safe relay OFF. Consequently, motor relay will be set OFF and the indicator light ON, and no current will be applied to motor solenoid valve inactivating ABS and turning ABS indicator light ON. In this case, it functions as the normal brake. However, if malfunctions occurs while ABS is being activated, when ABS control unit diagnoses that the operation can continue, it will effectuate ABS provisional control (turning the ABS indicator light ON). Upon the moment when ABS provisional control is over, the fail-safe relay will be set OFF.



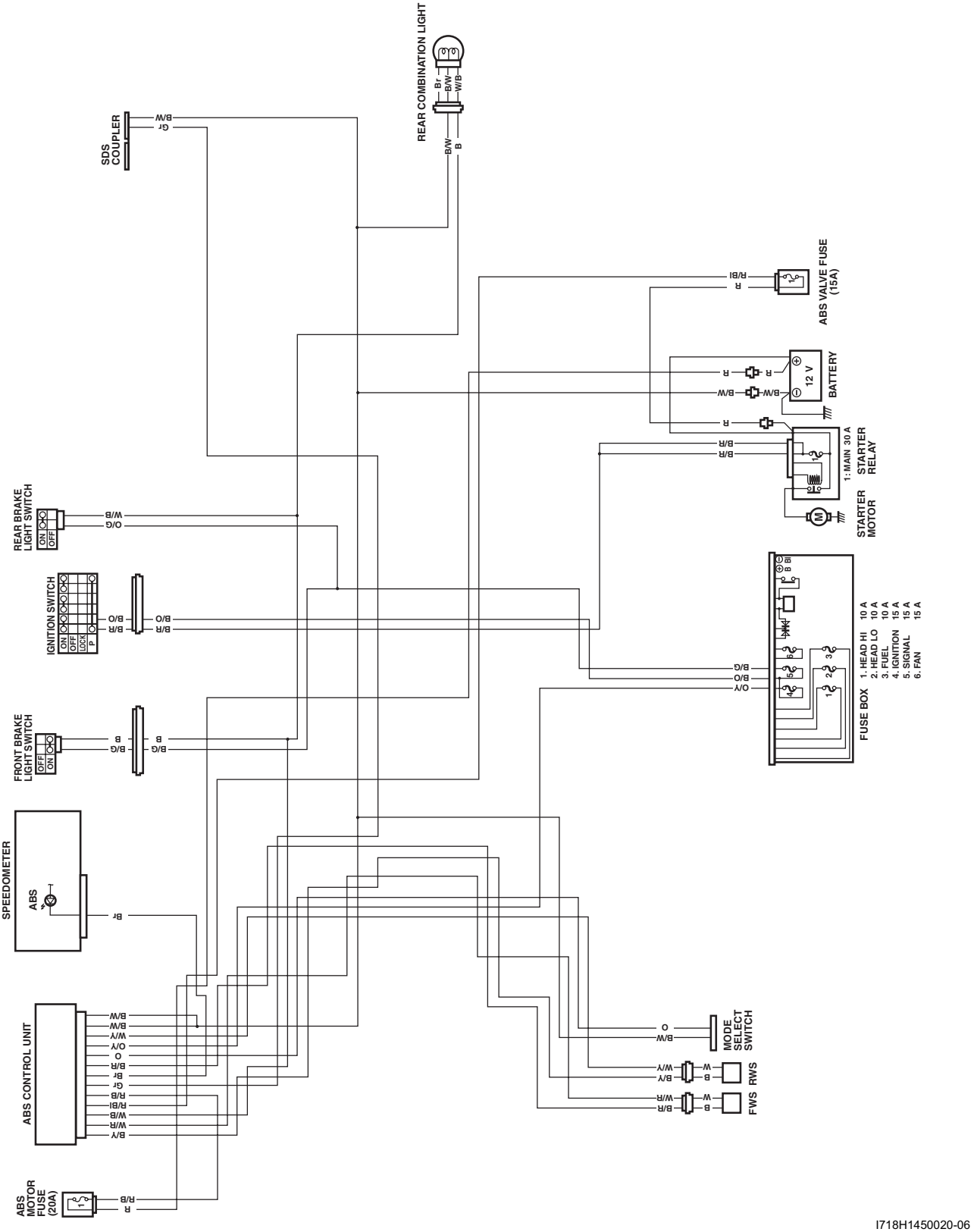
I718H1450019-01

Schematic and Routing Diagram

ABS Wiring Diagram

B718H14502001

Refer to “Wire Color Symbols in Section 0A (Page 0A-6)”.

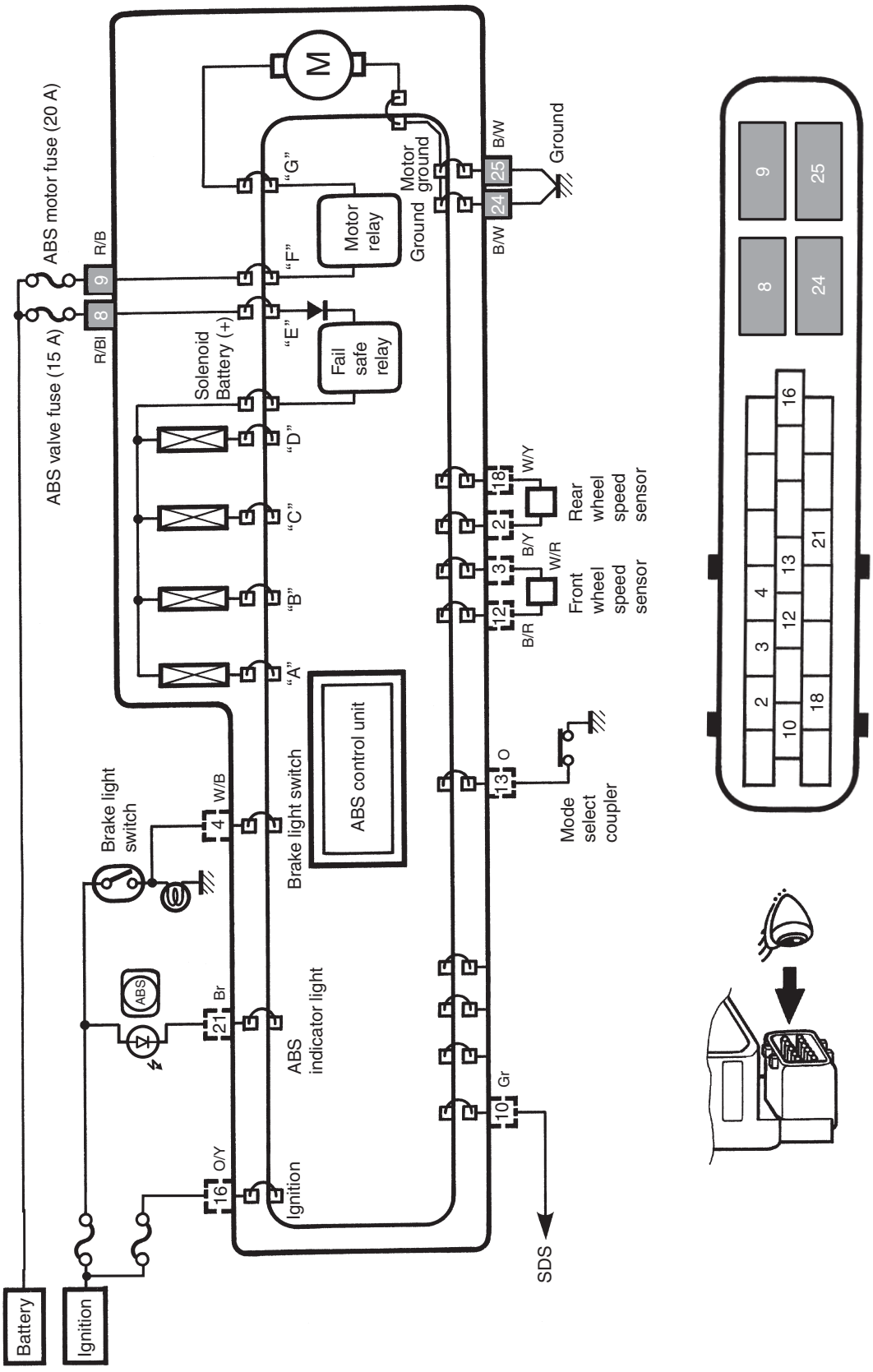


I718H1450020-06

ABS Unit Diagram

B718H14502002

Refer to “Wire Color Symbols in Section 0A (Page 0A-6)”.



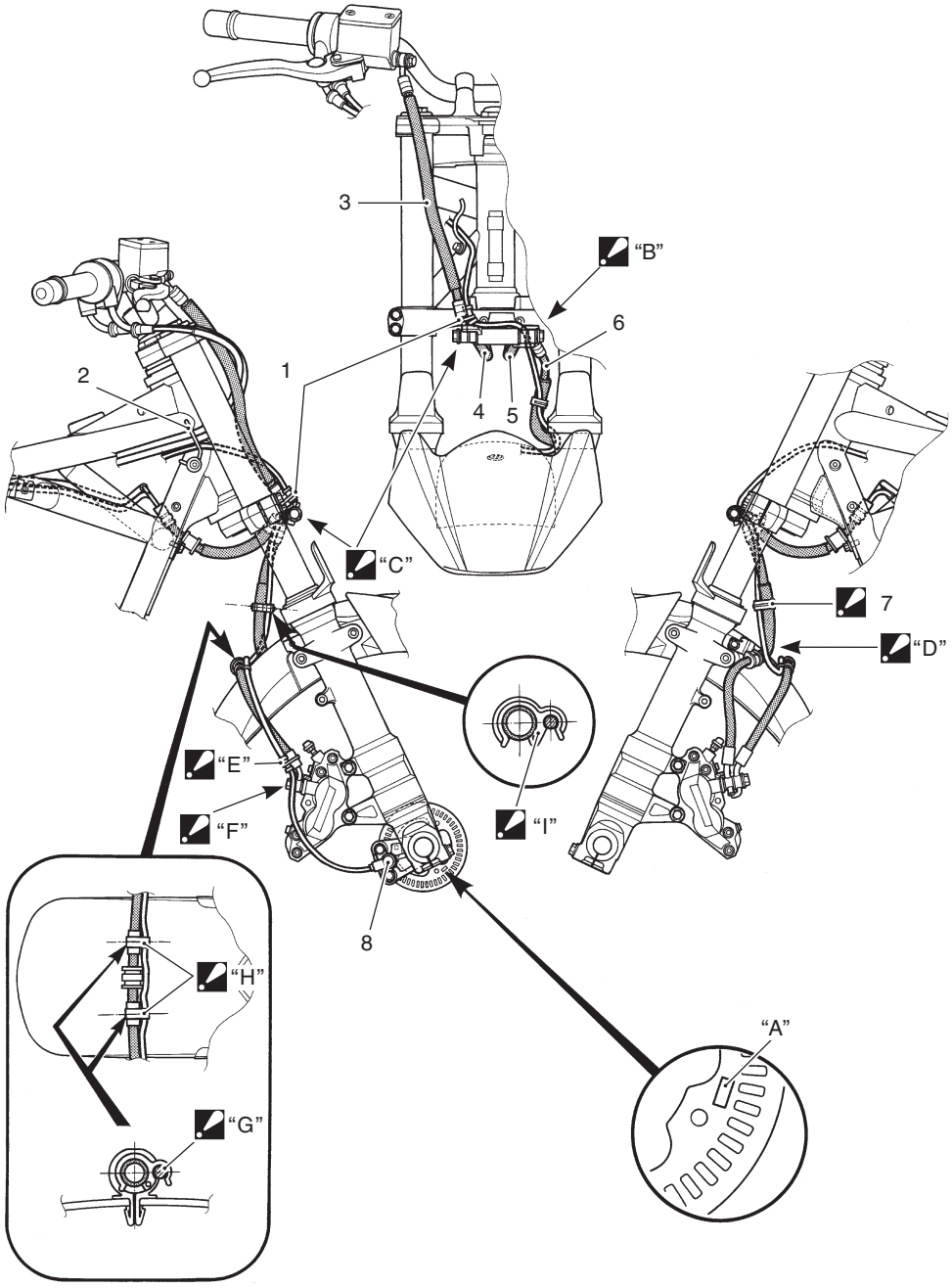
I718H1450021-04

“A”: Rear brake solenoid OUT	“C”: Front brake solenoid OUT	“E”: Fail safe (+) B	“G”: Motor (+) B
“B”: Rear brake solenoid IN	“D”: Front brake solenoid IN	“F”: Motor relay (+) B	

Front Wheel Speed Sensor Routing Diagram

B718H14502003

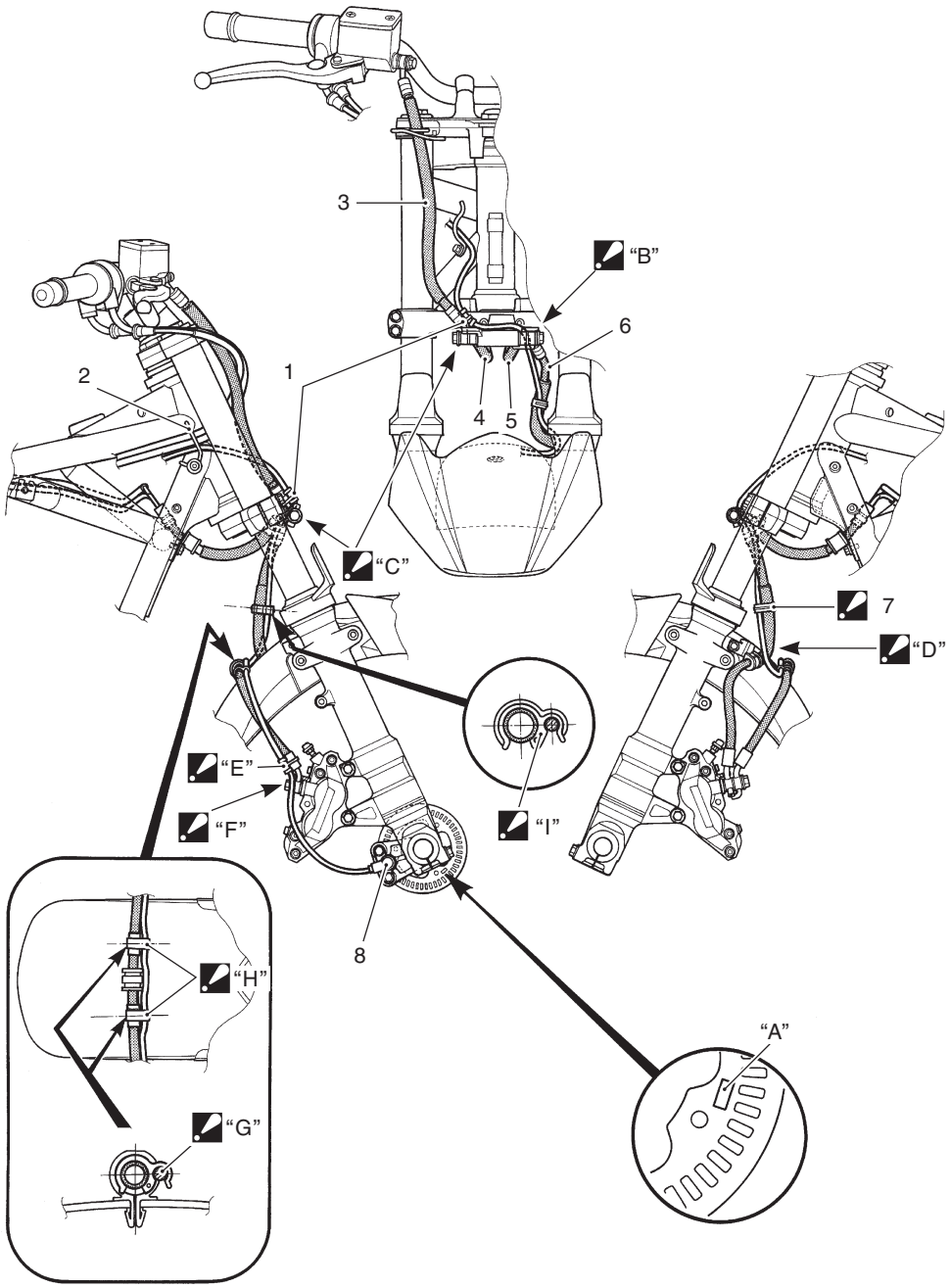
GSF1250A



I718H1450022-03

1. Clamp	7: Clamp : Clamp the sensor lead wire at the white marking.	"E": Clamp the sensor lead wire sleeve with the brake hose.
2. Guide	8. Front wheel speed sensor	"F": Pass through the sensor lead wire outside of the brake hose union bolt.
3. Front brake hose No.1	"A": Outside mark	"G": Clamp the sensor lead wire at front side of the brake hose. Make clearance from the front fender.
4. Front brake hose No.1 (L)	"B": Pass through the sensor lead wire between brake hose No.2 and brake hose No.2 (L).	"H": Clamp the sensor lead wire on the protector of brake hose.
5. Front brake hose No.2	"C": Pass through the sensor lead wire in front of the brake hose.	"I": Clamp the sensor lead wire at front side of the brake hose.
6. Front brake hose No.2 (L)	"D": Pass through the sensor lead wire outside of the brake hose.	

GSF1250SA

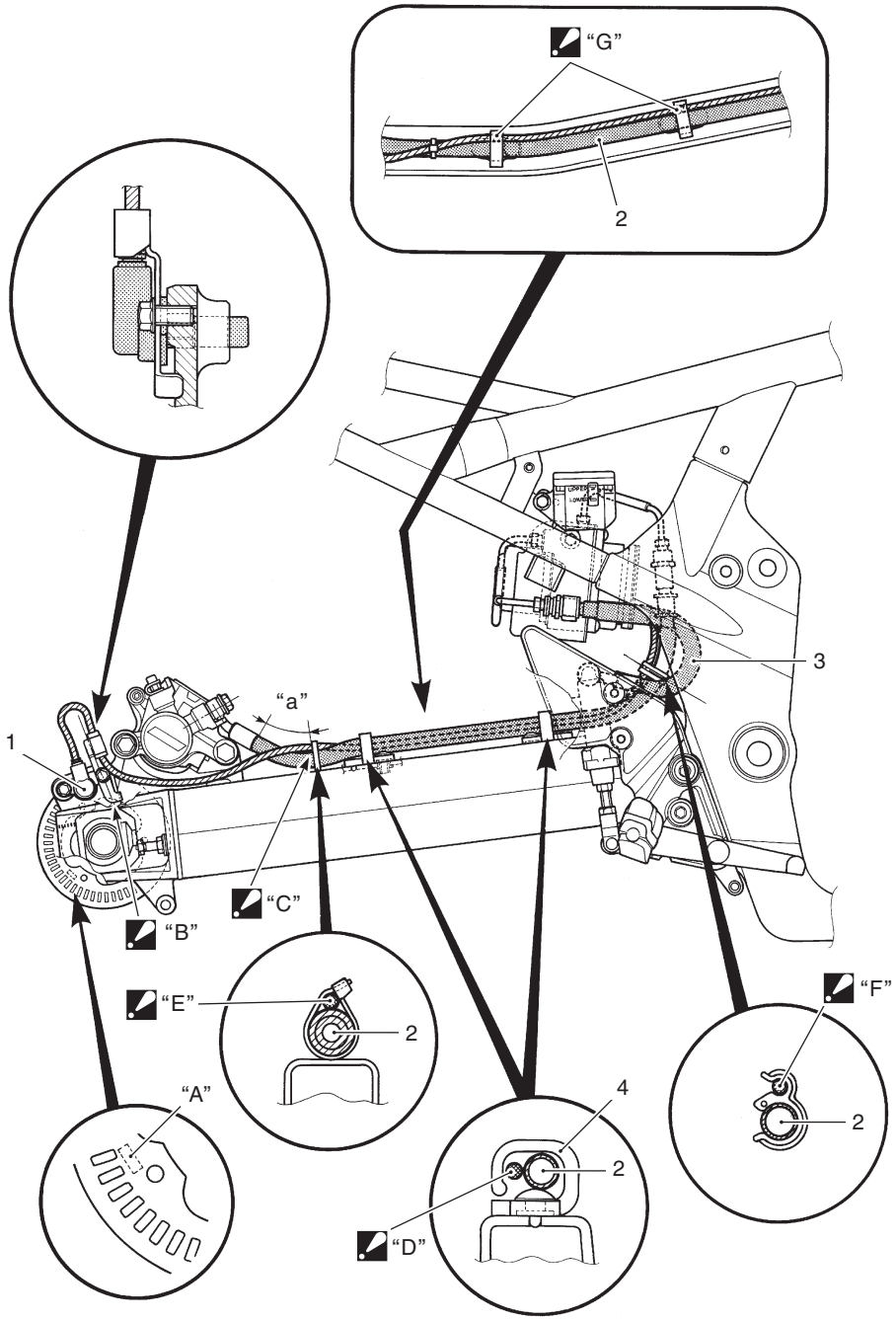


I718H1450023-03

1. Clamp	7: Clamp : Clamp the sensor lead wire at the white marking.	"E": Clamp the sensor lead wire sleeve with the brake hose.
2. Guide	8. Front wheel speed sensor	"F": Pass through the sensor lead wire outside of the brake hose union bolt.
3. Front brake hose No.1	"A": Outside mark	"G": Clamp the sensor lead wire at front side of the brake hose. Make clearance from the front fender.
4. Front brake hose No.1 (L)	"B": Pass through the sensor lead wire between brake hose No.2 and brake hose No.2 (L).	"H": Clamp the sensor lead wire on the protector of brake hose.
5. Front brake hose No.2	"C": Pass through the sensor lead wire in front of the brake hose.	"I": Clamp the sensor lead wire at front side of the brake hose.
6. Front brake hose No.2 (L)	"D": Pass through the sensor lead wire outside of the brake hose.	

Rear Wheel Speed Sensor Routing Diagram

B718H14502004



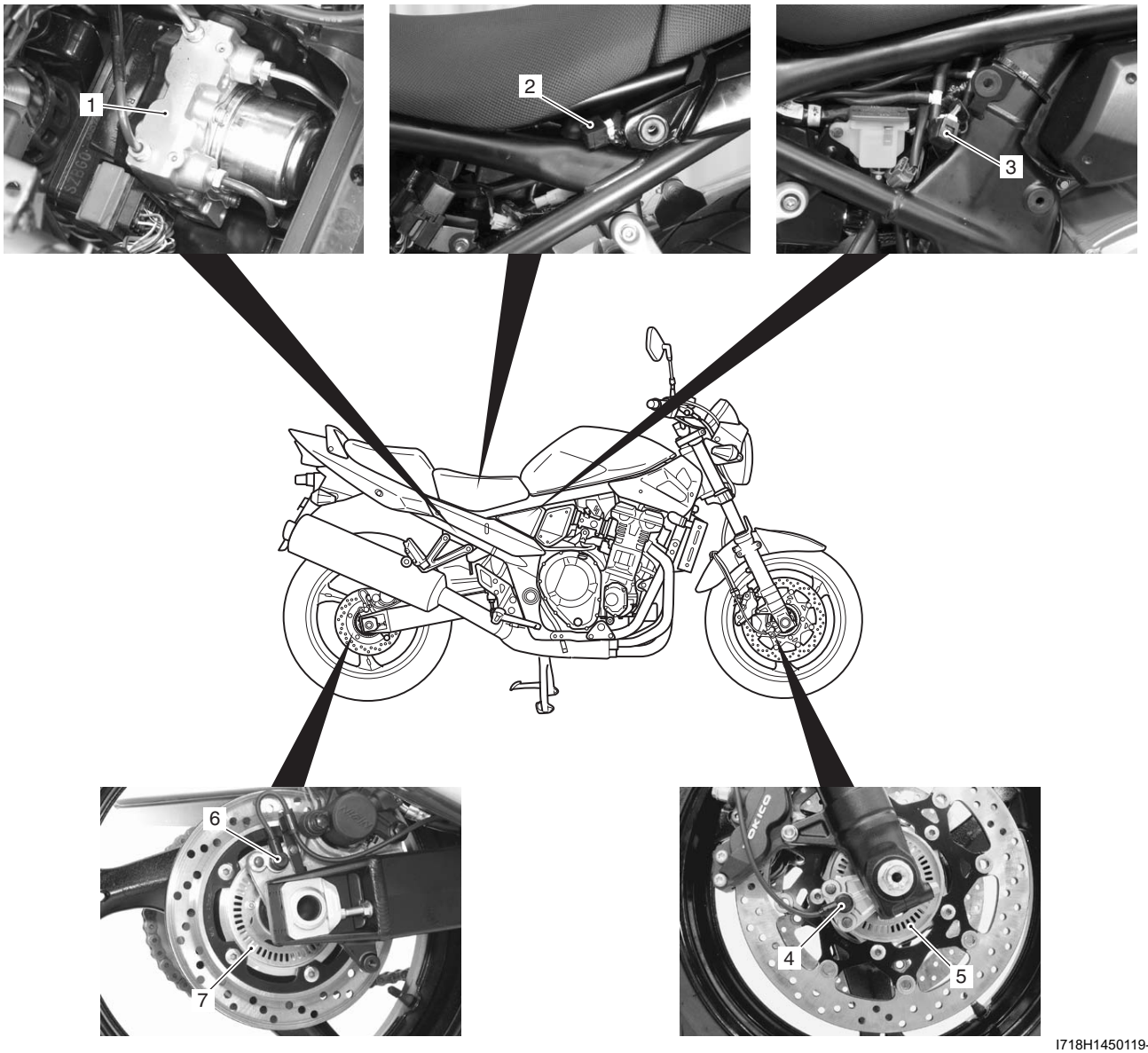
I718H1450118-03

1. Rear wheel speed sensor	"A": Outside mark	"E": Pass through the sensor lead wire on the brake hose.
2. Brake hose No.2	"B": After the clamp has contacted to the stopper, tighten the bolt.	"F": Clamp the sensor lead wire upper side of brake hose.
3. Brake hose No.1	"C": Clamp sensor lead wire with white tape matched green paint of brake hose.	"G": Pass through the sensor lead wire inside of the brake hose.
4. Brake hose guide	"D": Pass through the sensor lead wire inside of the brake hose guide.	"a": 35 mm (1.4 in)

Component Location

ABS Components Location

B718H14503001



I718H1450119-02

1. ABS control unit/HU	4. Front wheel speed sensor	7. Rear wheel speed sensor rotor
2. Mode selection coupler	5. Front wheel speed sensor rotor	
3. SDS coupler	6. Rear wheel speed sensor	

Diagnostic Information and Procedures

ABS Troubleshooting

B718H14504001

Many of the ABS malfunction diagnosing operations are performed by checking the wiring continuity. Quick and accurate detection of malfunctions within the complex circuitry assures the proper operation of the ABS. Before beginning any repairs, thoroughly read and understand this Supplementary Service Manual.
The ABS is equipped with a self-diagnosis function. The detected malfunction is stored as a diagnostic trouble code which causes the ABS indicator light to light up or flash in set patterns to indicate the malfunction. Diagnostic trouble codes are stored even when the ignition switch is turned to OFF and they can only be erased manually. In order to repair the ABS correctly, ask the customer for the exact circumstances under which the malfunction occurred, then check the ABS indicator light and the output diagnostic trouble codes. Explain to the customer that depending on how the motorcycle is operated (e.g., if the front wheel is off the ground), the ABS indicator light may light up even though the ABS is operating correctly.

Troubleshooting Procedure

Troubleshooting should be proceed as follows. If the order is performed incorrectly or any part is omitted, an error in misdiagnosis may result.

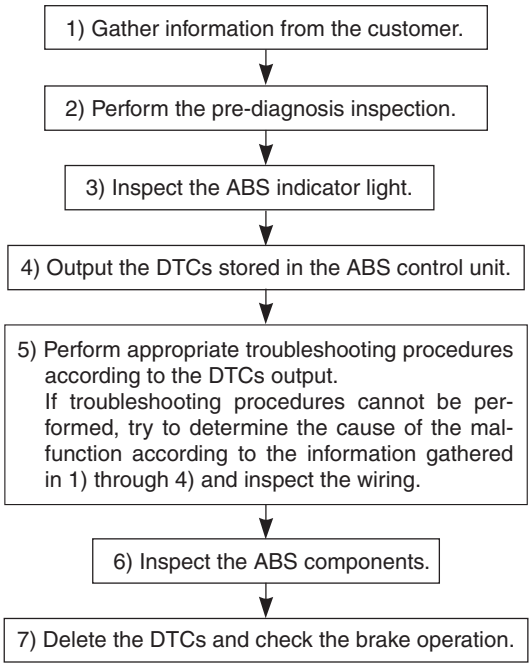
1) Gather information from the customer.
2) Perform the pre-diagnosis inspection. Refer to “Pre-diagnosis Inspection (Page 4E-15)”.
3) Inspect the ABS indicator light. Refer to “ABS Indicator Light Inspection (Page 4E-17)”.
4) Output the DTCs stored in the ABS control unit. Refer to “DTC (Diagnostic Trouble Code) Output (Page 4E-23)”.
5) Perform appropriate troubleshooting procedures according to the DTCs output. Refer to “DTC Table (Page 4E-34)”.
   If troubleshooting procedures cannot be performed, try to determine the cause of the malfunction according to the information gathered in 1) through 4) and inspect the wiring. Refer to “ABS Wiring Diagram (Page 4E-7)” and “ABS Unit Diagram (Page 4E-8)”.

⚠ CAUTION

- **When disconnecting couplers and turning the ignition switch ON, disconnect the ABS control unit coupler in order to prevent a DTC from being stored.**
- **Each time a resistance is measured, the ignition switch should be set to OFF.**

6) Inspect the ABS components. Refer to “Wheel Speed Sensor and Sensor Rotor Inspection (Page 4E-74)”.
7) Delete the DTCs and check the brake operation. Refer to “DTC (Diagnostic Trouble Code) Deleting (Page 4E-25)”.

Basic Troubleshooting Diagram



I718H1450120-01

Information Gathering

To properly diagnose a malfunction, one must not make guesses or assumptions about the circumstances that caused it. Proper diagnosis and repair require duplicating the situation in which the malfunction occurred. If a diagnosis is made without duplicating the malfunction, even an experienced service technician may make a misdiagnosis and not perform the servicing procedure correctly, resulting in the malfunction not being repaired. For example, a malfunction that occurs only while braking on slippery surfaces will not occur if the motorcycle is ridden on a non-slippery surface. Therefore, in order to properly diagnose and repair the motorcycle, the customer must be questioned about the conditions at the time that the malfunction occurred making “Information gathering” very important. In order that the information obtained from the customer to be used as a reference during troubleshooting, it is necessary to ask certain important questions concerning the malfunction. Therefore, a questionnaire has been created to improve the information-gathering procedure.

EXAMPLE: CUSTOMER PROBLEM INSPECTION FORM

User name:	Model:	VIN:	Date of issue:
Date Reg.	Date of problem:	Mileage:	

PROBLEM SYMPTOMS	
ABS operation	Past malfunctions and repairs
ABS does not work	
ABS works so often with	
Too long stopping distance	
Other	

CONDITION WHEN MALFUNCTION OCCURED	
ABS indicator light	Riding conditions
Does not light up	While stopping
Lights up	Over 10 km/h
Goes off after running over 10 km/h: Yes / No	When turning
Flashes	Others
Tires	Brake operating conditions
Abnormal air pressure	Usual braking
Less thread depth	Quick/hard braking
No specified tires installed	
	Interface
Road surface	Too big pulsations at brake levers
Paved road:	Too large brake lever strokes
Dry / Wet / Others	Others
Unpaved road:	
Gravel / Muddy / Uneven / Others	Others
	Abnormal noise from the ABS control unit/HU
	Skid noise from the calipers
	Vibration at the brake levers
NOTE:	

NOTE

This form is a standard sample. The form should be modified according to conditions and characteristic of each market.

Pre-diagnosis Inspection

B718H14504019

The mechanical and hydraulic components of the brake system should be inspected prior to performing any electrical checks. These inspections may find problems that the ABS could not detect; thus, shortening repair time.

Brake

Brake fluid level check
Refer to “Brake System Inspection in Section 0B (Page 0B-17)”.

Brake pad inspection
Refer to “Brake System Inspection in Section 0B (Page 0B-17)”.

Brake fluid circuit air bleeding
Refer to “Air Bleeding from Brake Fluid Circuit in Section 4A (Page 4A-8)”.

Tire

Tire type

Tire type
Front: DUNLOP D218FT
Rear: DUNLOP D218N

Tire pressure
Refer to “Tire Inspection in Section 0B (Page 0B-19)”.

⚠ CAUTION

- **The standard tire fitted on this motorcycle is 120/70ZR17M/C (58W) for front and 180/55ZR17M/C (73W) for rear. The use of tires other than those specified may cause instability. It is highly recommended to use a SUZUKI Genuine Tire.**
- **Replace the tire as a set, otherwise the DTC “25” (C1625) may be stored.**

Wheel
Refer to “Front Wheel Related Parts Inspection in Section 2D (Page 2D-8)” and “Rear Wheel Related Parts Inspection in Section 2D (Page 2D-17)”.

Battery

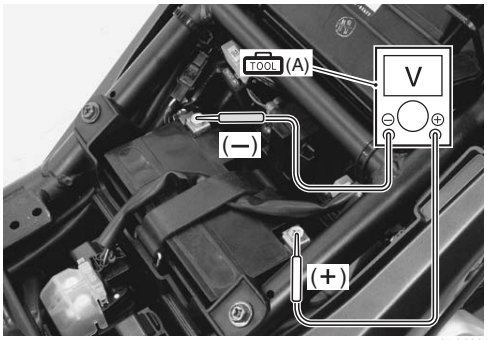
Battery voltage inspection

1) Turn the ignition switch OFF.
2) Remove the seat. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
3) Measure the voltage between the (+) and (–) battery terminals using the multi-circuit tester.
   If the voltage is less than 12.0 V, charge or replace the battery and inspect the charging system. Refer to “Battery Runs Down Quickly in Section 1J (Page 1J-2)”.

   Special tool
   TOOL (A): 09900–25008 (Multi-circuit tester set)

   Tester knob indication
   Voltage (⎓)

   Battery voltage
   12.0 V and more



I718H1450123-01

4) Reinstall the seat.

ABS Component

Wheel speed sensor – sensor rotor clearance inspection

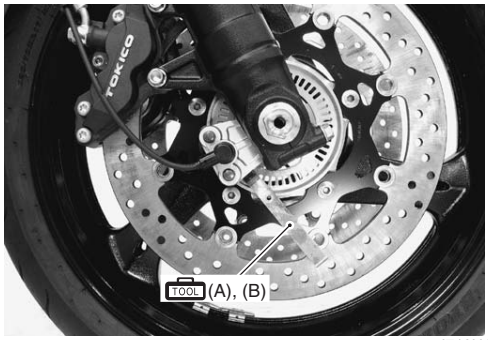
Inspect the clearance between the wheel speed sensor and sensor rotor for each wheel using the thickness gauge.

Special tool

(A): 09900–20803 (Thickness gauge)
(B): 09900–20806 (Thickness gauge)

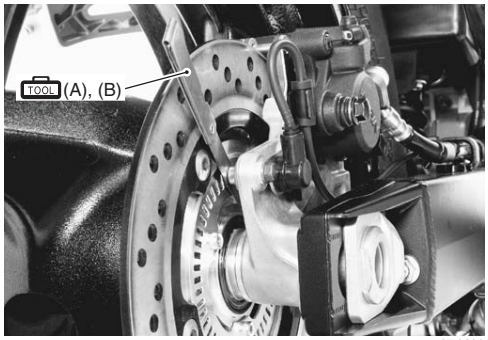
Wheel speed sensor – Sensor rotor clearance
0.3 – 1.5 mm (0.012 – 0.059 in)

Front



I718H1450025-01

Rear



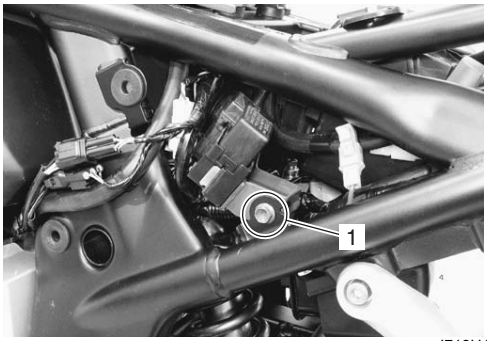
I718H1450026-01

ABS control unit/HU ground wire inspection

1) Turn the ignition switch OFF.
2) Remove the seat. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
3) Disconnect the battery (–) lead wire.

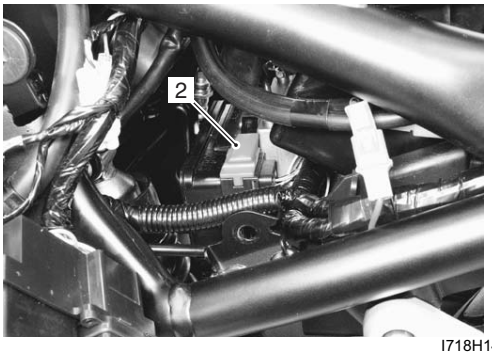
I718H1450124-01

4) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
5) Remove the fuse box mounting bolt (1).



I718H1450028-01

6) Disconnect the ABS control unit coupler (2).



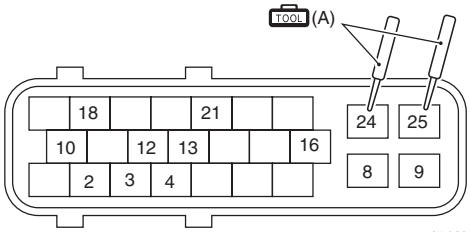
I718H1450115-01

7) Check for continuity between “24” (B/W) at the coupler and the battery (–) terminal, also “25” (B/W) at the coupler and the battery (–) terminal.

Special tool
(A): 09900–25008 (Multi-circuit tester set)

Tester knob indication
Continuity (•)))

ABS control unit coupler (Harness end)



I718H1450030-03

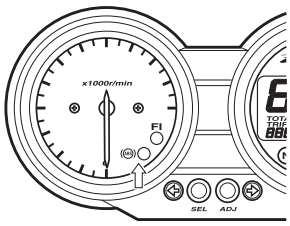
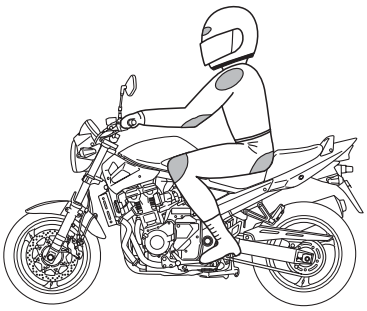
I718H1450125-01

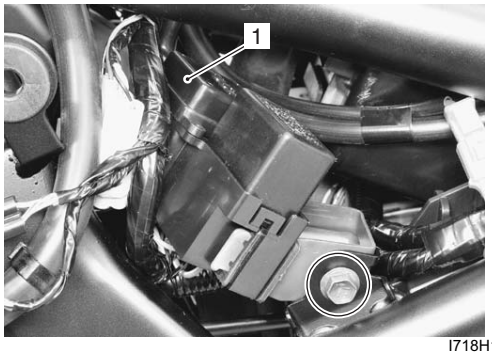
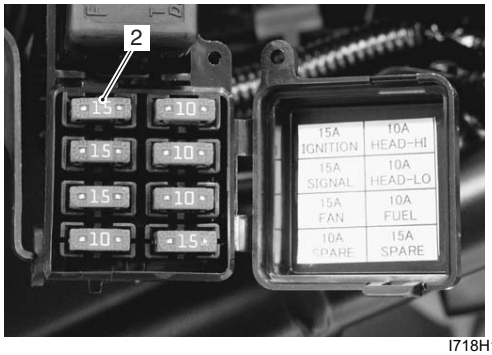
ABS Indicator Light Inspection

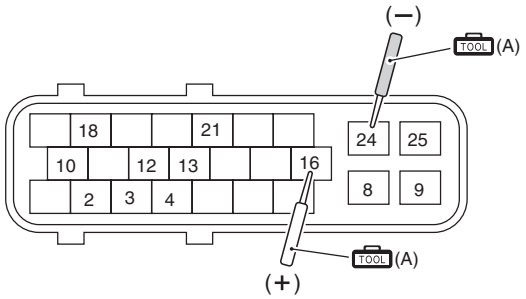
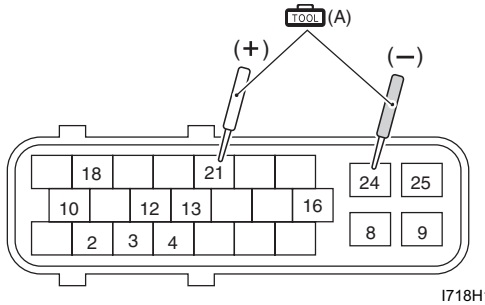
B718H14504020

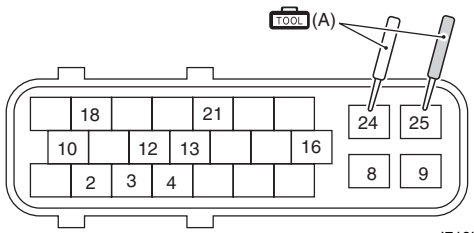
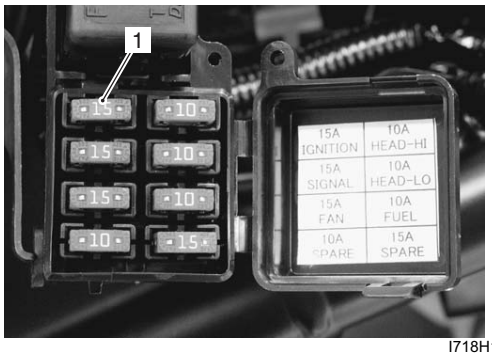
Wiring Diagram
Refer to “ABS Unit Diagram (Page 4E-8)”.

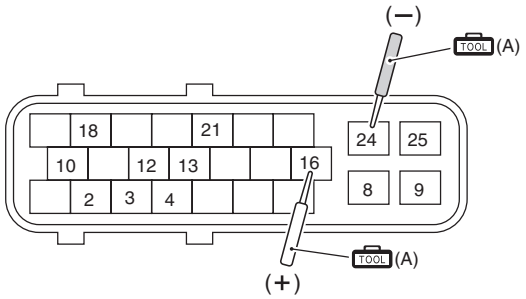
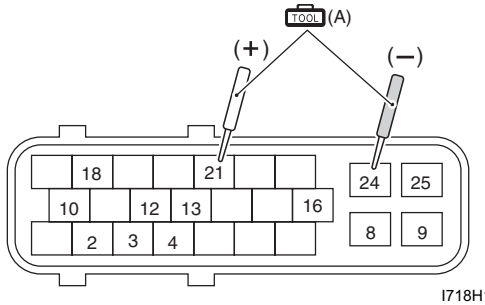
Troubleshooting

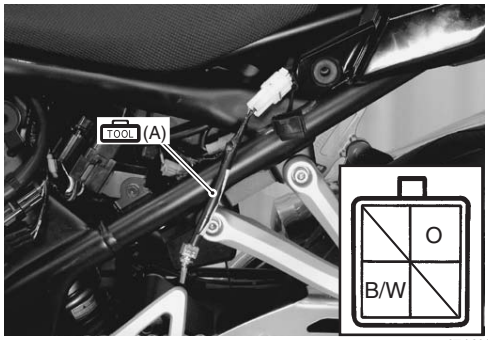
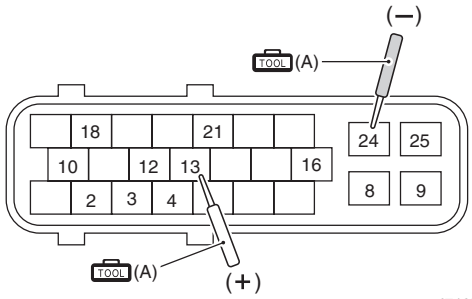
Step	Action	Yes	No
1	1) Check if the ABS indicator light lights up when turning the ignition switch ON.  I718H1450122-04 *Does the ABS indicator light up?*	Go to Step 2.	Go to Step 3.
2	**(The ABS indicator light lights up)** 1) Ride the motorcycle at more than 10 km/h (6.2 mile/h).  I718H1450033-02 *Does the ABS indicator light go off?*	Normal (No DTC exists)	• DTC output (Refer to “DTC (Diagnostic Trouble Code) Output (Page 4E-23)”) • If DTC can not be output (the ABS indicator light does not flash), go to Step 7.

Step	Action	Yes	No
3	**(The ABS indicator light does not light up)** 1) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 2) Remove the fuse box (1) by removing the mounting bolt.  I718H1450034-01 3) Open the fuse box and inspect the ignition fuse (2). **⚠ CAUTION** **If a fuse is blown, find the cause of the problem and correct it before replacing the fuse.** **Ignition fuse** **15 A**  I718H1450035-01 *Is the ignition fuse OK?*	Go to Step 4.	Replace the ignition fuse.

Step	Action	Yes	No
4	1) Turn the ignition switch OFF. 2) Disconnect the ABS control unit coupler. Refer to “ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)”. 3) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between “16” (O/Y) and “24” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Normal value (“16” – “24”)** **Battery voltage (12.0 V and more)** **ABS control unit coupler (Harness end)**  I718H1450036-04 *Is the voltage between “16” and “24” normal?*	Go to Step 5.	Inspect the wire harness. (Faulty ignition or ground wire)
5	1) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between “21” (Brown) and “24” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Normal value (“21” – “24”)** **7.0 V and more** **ABS control unit coupler (Harness end)**  I718H1450037-02 *Is the voltage between “21” and “24” normal?*	Go to Step 6.	• Inspect the wire harness. (Faulty indicator light wire) • Signal fuse or indicator light is blown.

Step	Action	Yes	No
6	1) Turn the ignition switch OFF. 2) Check for continuity between “24” (B/W) at the coupler and body ground, also “25” (B/W) at the coupler and body ground. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Continuity (•))))** **ABS control unit coupler (Harness end)**  I718H1450038-02 *Are there continuity between “24”, “25” and body ground?*	Replace the ABS control unit/HU.	Inspect the wire harness. (Faulty ground wire)
7	**(The ABS indicator light does not go off)** 1) Turn the ignition switch OFF. 2) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Remove the fuse box mounting bolt. Refer to “ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)”. 4) Open the fuse box and inspect the ignition fuse (1). **⚠ CAUTION** **If a fuse is blown, find the cause of the problem and correct it before replacing the fuse.** **Ignition fuse** **15 A**  I718H1450039-01 *Is the ignition fuse OK?*	Go to Step 8.	Replace the ignition fuse.

Step	Action	Yes	No
8	1) Turn the ignition switch OFF. 2) Disconnect the ABS control unit coupler. Refer to "ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)" 3) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between "16" (O/Y) and "24" (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Normal value ("16" – "24")** **Battery voltage (12.0 V and more)** **ABS control unit coupler (Harness end)**  I718H1450036-04 *Is the voltage between "16" and "24" normal?*	Go to Step 9.	Inspect the wire harness. (Faulty ignition or ground wire)
9	1) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between "21" (Brown) and "24" (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Normal value ("21" – "24")** **7.0 V and more** **ABS control unit coupler (Harness end)**  I718H1450037-02 *Is the voltage between "21" and "24" normal?*	Go to Step 10.	Inspect the wire harness. (Faulty indicator light wire)

Step	Action	Yes	No
10	1) Turn the ignition switch OFF. 2) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Short the mode select coupler terminals (O – B/W) using the special tool. **Special tool** **TOOL (A): 09930–82710 (Mode select switch)**  I718H1450042-03 4) Check for continuity between “13” (O) and “24” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Continuity (•))))** **ABS control unit coupler (Harness end)**  I718H1450043-02 *Is there continuity between “13” and “24”?*	Replace the ABS control unit/HU.	Inspect the wire harness. (Faulty mode select switch wire)

DTC (Diagnostic Trouble Code) Output

B718H14504021

NOTE

- **Even through the ABS is operating correctly, a DTC is memorized in any of the following conditions.**
  - **– If the motorcycle is put on its centerstand, the engine is started and only the rear wheel is rotated.**
  - **– Previous malfunctions were repaired, but the DTCs were not deleted.**
- **After carrying out DTC deleting and ABS operation check, explain to the customer that the ABS is operating correctly. Refer to "DTC (Diagnostic Trouble Code) Deleting (Page 4E-25)".**

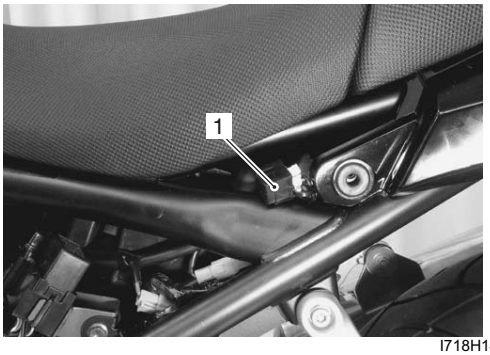
Use of Mode Select Switch

Connect the special tool to the mode select coupler to output the memorized DTCs on the ABS indicator light.

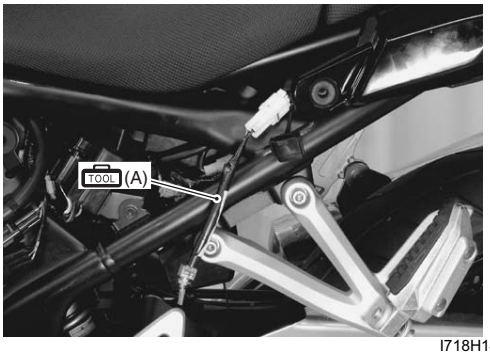
1) Turn the ignition switch OFF.
2) Remove the left frame cover. Refer to "Exterior Parts Removal and Installation in Section 9D (Page 9D-6)".
3) Connect the special tool to the mode select coupler (1) (O – B/W).

Special tool

TOOL (A): 09930–82710 (Mode select switch)



I718H1450044-02



I718H1450045-02

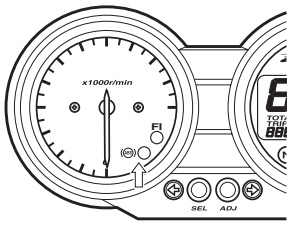
4) Switch the special tool to ON.

I718H1450040-02

5) Turn the ignition switch ON.
The ABS indicator light starts flashing to indicate the DTC. Refer to "DTC Table (Page 4E-34)".

NOTE

- **If there is a DTC, the ABS indicator light keeps flashing cyclically and repeatedly.**
- **If there is no DTC, the ABS indicator light keeps lighting on.**
- **If the DTCs are to be output for a long time, remove the HEAD-LO fuse in order to prevent the battery from discharging.**



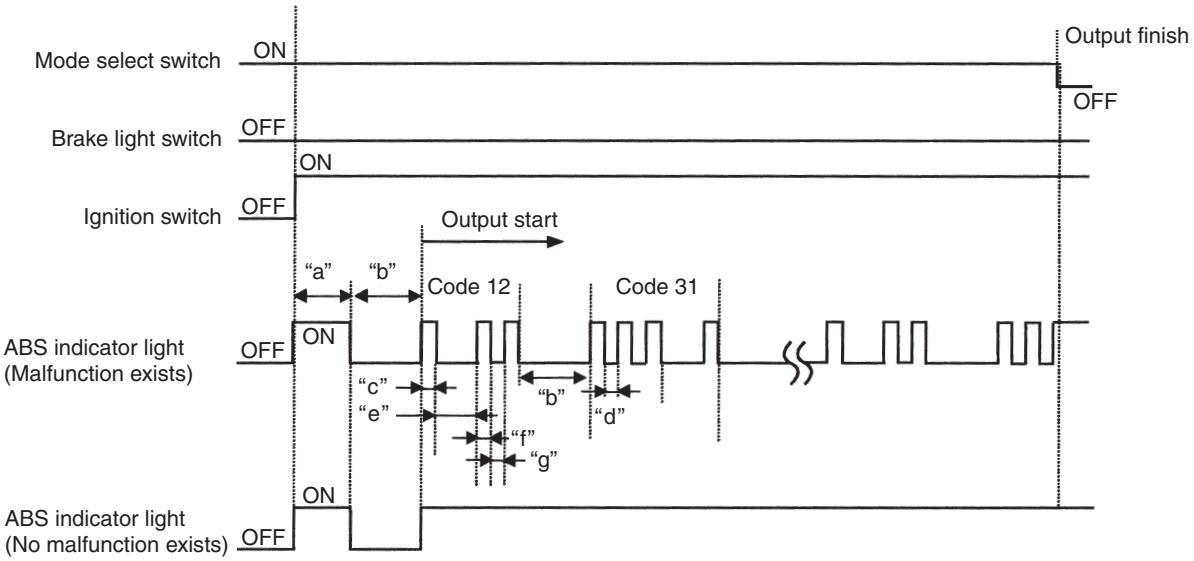
I718H1450122-04

6) Turn the ignition switch OFF and disconnect the special tool.

Understanding the DTC (Diagnostic Trouble Code)

A two-digit DTC is shown through the flashing pattern of the ABS indicator light. A number between 1 and 9 is represented by the number of times that the ABS indicator light lights up in interval of 0.4 seconds and the separation between the tens and ones are indicated by the light staying off for 1.6 seconds. In addition, the separation between the start code and the DTC is indicated by the light being off for 3.6 seconds. After the start code is displayed, DTCs appear from the smallest number code.

If no DTCs are memorized, the ABS indicator light keeps lighting up.



I718H1450046-03

"a": Initial minimum light ON time (About 2 seconds)	"e": Main-sub code interval (1.6 seconds)
"b": Error code interval (About 3.6 seconds)	"f": Sub code light ON time (0.4 seconds)
"c": Main code light ON time (0.4 seconds)	"g": Sub code light OFF time (0.4 seconds)
"d": Main code light OFF time (0.4 seconds)	

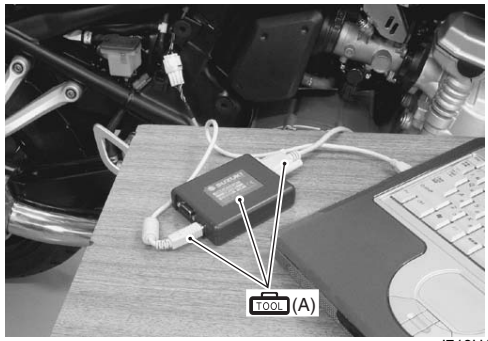
Use of SDS

NOTE

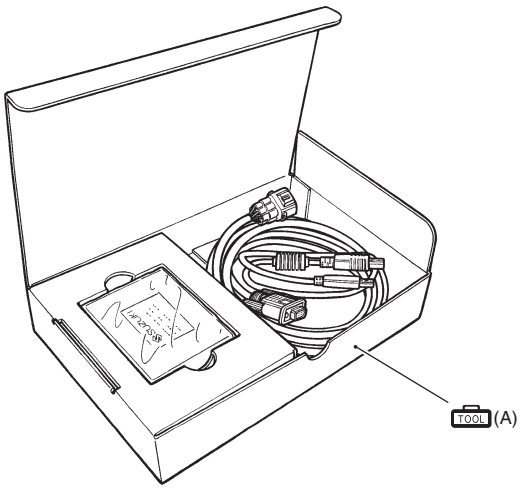
- **Don't disconnect couplers from ABS HU, the battery cable from the battery, ABS HU ground wire harness from the engine or main fuse before confirming the malfunction code (self-diagnostic trouble code) stored in memory. Such disconnection will erase the memorized information in ABS HU memory.**
- **DTC stored in ABS HU memory can be checked by the SDS.**

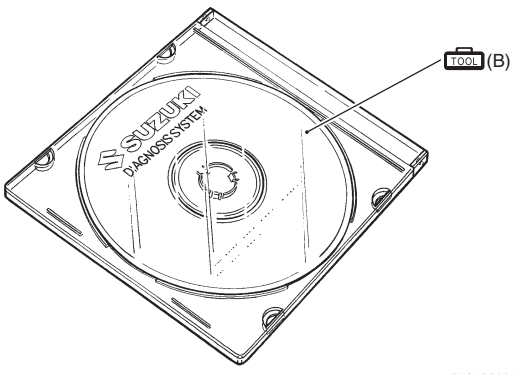
1) Remove the right frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
2) Set up the SDS tool. (Refer to the SDS operation manual for further details.)

Special tool
TOOL (A): 09904–41010 (SDS set)
TOOL (B): 99565–01010–010 (CD-ROM Ver.10)



I718H1450047-01





I705H1110116-03

3) Read the DTC (Diagnostic Trouble Code) and show data when trouble (displaying data at the time of DTC) according to instructions displayed on SDS.

NOTE

- **Not only is SDS used for detecting Diagnostic Trouble Codes but also for reproducing and checking on screen the failure condition as described by customers using the trigger.**
- **How to use trigger. (Refer to the SDS operation manual for further details.)**

4) Close the SDS tool and turn the ignition switch OFF.

DTC (Diagnostic Trouble Code) Deleting

B718H14504022

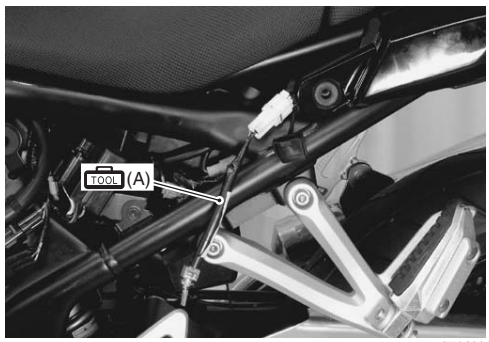
Use of Mode Select Switch

1) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.

I718H1450049-02

2) Connect the special tool to the mode select coupler (O – B/W) and output the DTCs.

Special tool
TOOL (A): 09930–82710 (Mode select switch)



I718H1450045-02

3) While the DTCs are being output, set the special tool to OFF.

⚠ CAUTION

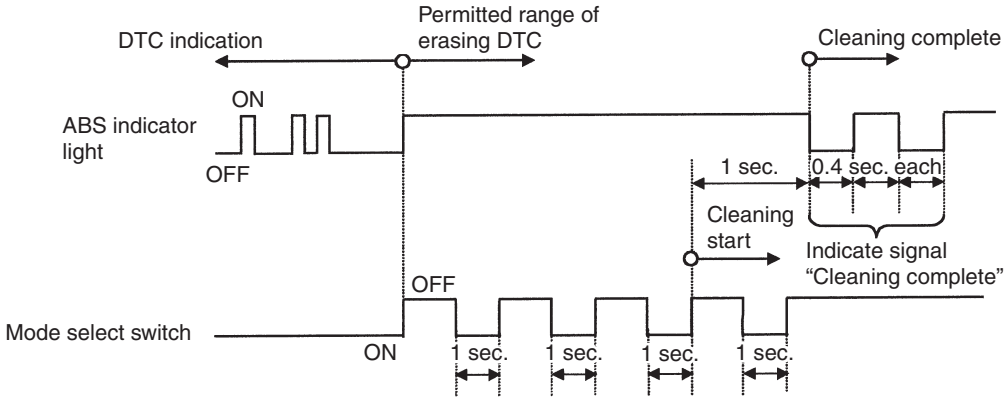
The DTC deletion mode starts 12.5 seconds after the switch is set to OFF.

I718H1450050-01

4) In the DTC deletion mode, switch the ABS test switch from OFF to ON three times, each time leaving it at ON for more than 1 second.

I718H1450051-01

DTC Deleting Diagram



I718H1450052-01

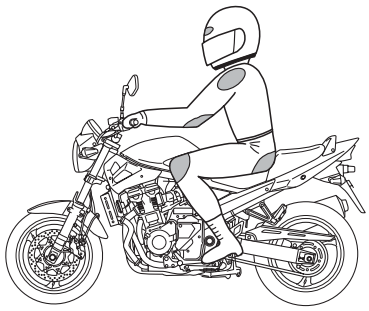
5) After deleting the DTCs, repeat the code output procedure and make sure that no DTCs remain (the ABS indicator light no longer flashes).

NOTE

If any DTCs remain, perform the appropriate procedures, then delete the codes. If DTCs are left stored, confusion may occur and unnecessary repairs may be made.

6) Disconnect the mode select switch and install the left frame cover.

7) Afterwards, ride the motorcycle at more than 30 km/h (18.6 mile/h) and quickly apply the brakes to check that the ABS activates correctly.



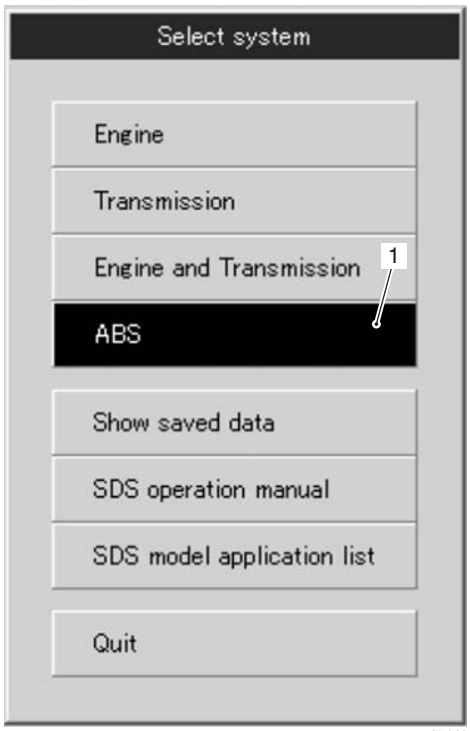
I718H1450053-01

Use of SDS

1) Remove the right frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
2) After repairing the trouble, turn OFF the ignition switch and turn ON again.
3) Set up the SDS tool. (Refer to the SDS operation manual for further details.)

   Special tool
   TOOL : 09904–41010 (SDS set)
   TOOL : 99565–01010–010 (CD-ROM Ver.10)

4) Click the ABS button (1).



I718H1450054-01

5) Click the “DTC inspection” button (2).

I718H1450055-01

6) Check the DTC.

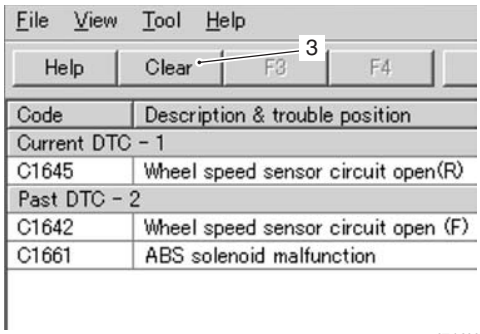
NOTE

The previous malfunction history code (Past DTC) still remains stored in the ABS HU. Therefore, erase the history code memorized in the ABS HU using SDS tool.

7) Click “Clear” (3) to delete history code (Past DTC).

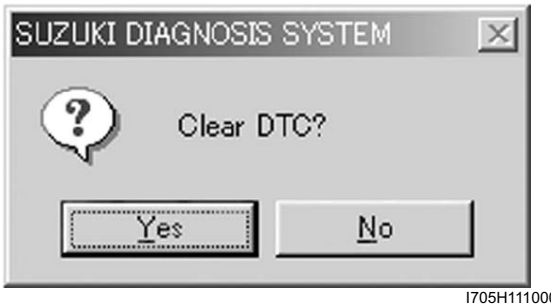
NOTE

The DTC is memorized in the ABS HU also when the wire coupler of any sensor is disconnected. Therefore, when a wire coupler has been disconnected at the time of diagnosis, erase the stored malfunction history code using SDS.



I718H1450056-01

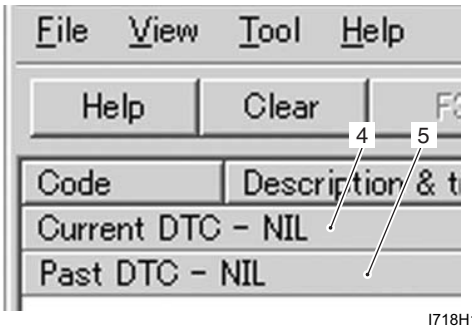
8) Follow the displayed instructions.



I705H1110006-01

I705H1110009-01

9) Check that both “Current DTC” (4) and “Past DTC” (5) are deleted (NIL).

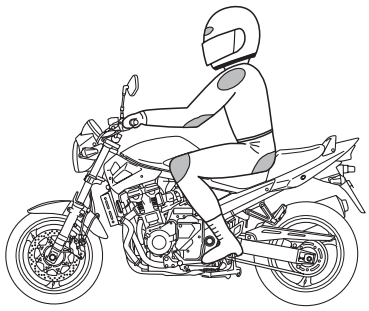


I718H1450057-01

10) Close the SDS tool and turn the ignition switch OFF.

11) Disconnect the SDS tool and install the left frame cover.

12) Ride the motorcycle at more than 30 km/h (18.6 mile/h) and quickly apply the brakes to check that the ABS activates correctly.



I718H1450053-01

SDS Check

B718H14504023

Using SDS, take the sample of data from the new motorcycle and at the time of periodic maintenance at your dealer. Save the data in the computer or by printing and filing the hard copies. The saved or filed data are useful for troubleshooting as they can be compared periodically with changes over time or failure conditions of the motorcycle. For example, when a motorcycle is brought in for service but the troubleshooting is difficult, comparison with the normal data that have been saved or filed can allow the specific ABS failure to be determined.

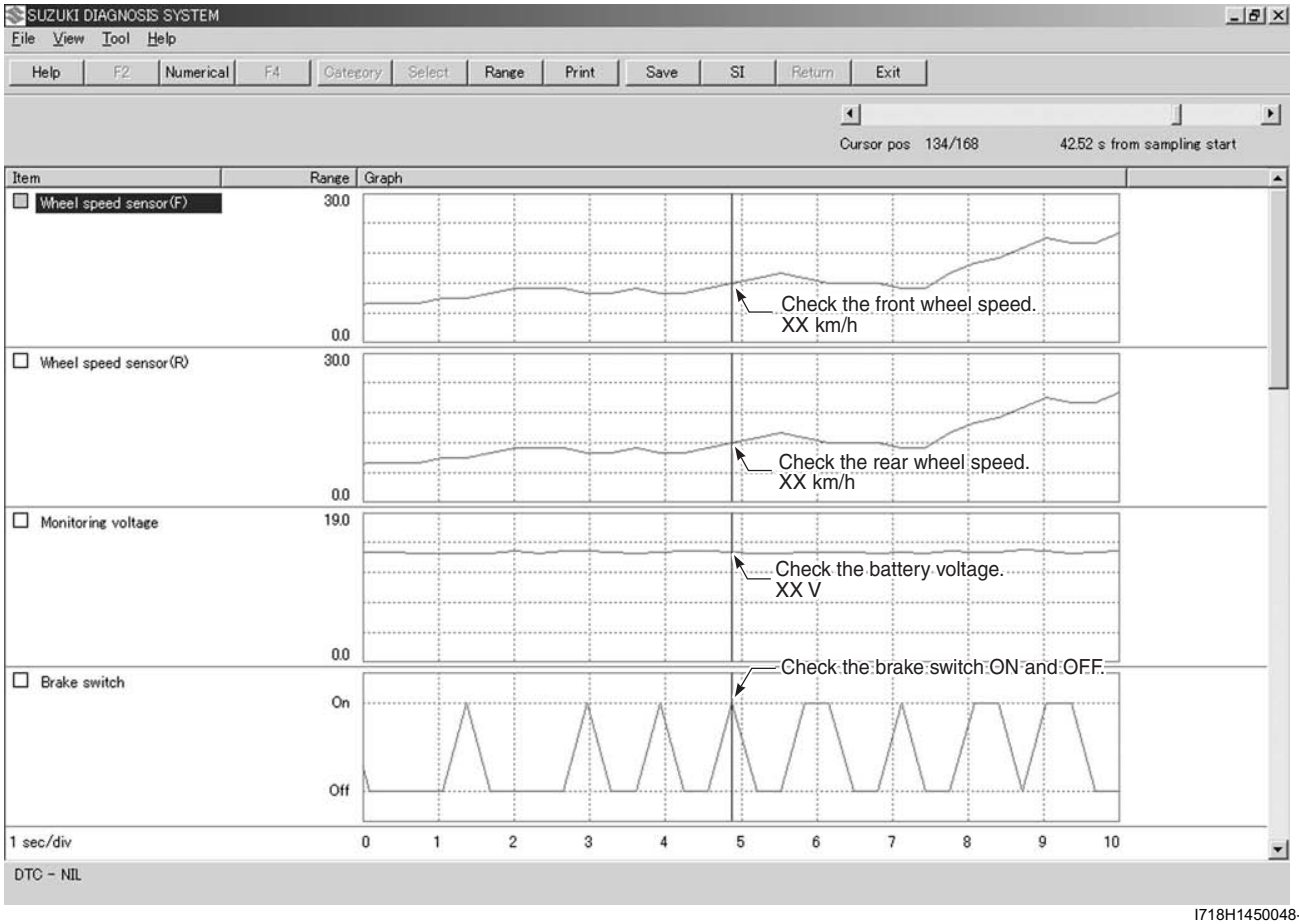
1) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
2) Set up the SDS tool. (Refer to “SDS operation manual for further details.)

NOTE

- **Before taking the sample of data, check and clear the Past DTC. Refer to “DTC (Diagnostic Trouble Code) Deleting (Page 4E-25)”.**
- **A number of different data under a fixed condition as shown should be saved or filed as sample.**

Special tool
TOOL : 09904–41010 (SDS set)
TOOL : 99565–01010–010 (CD-ROM Ver.10)

DATA sampled from ABS HU system

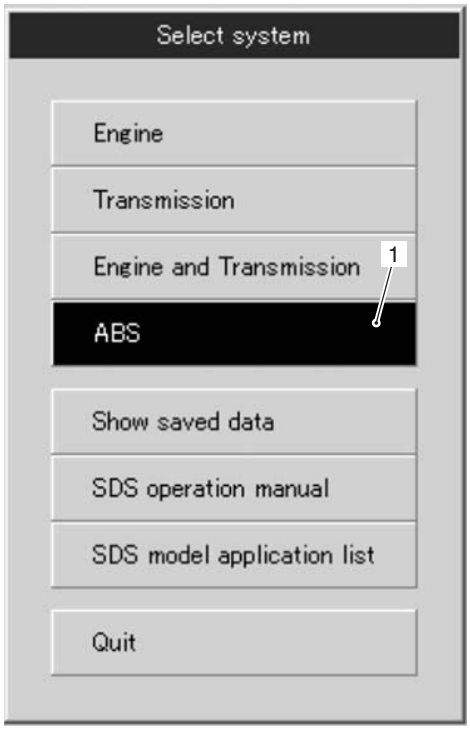


I718H1450048-03

Active Control Inspection

B718H14504024

1) Remove the right frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
2) Set up the SDS tool. (Refer to the SDS operation manual for further details.)
3) Click “ABS” (1).

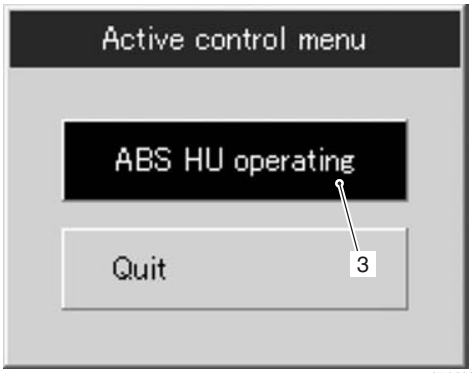


I718H1450054-01

4) Click “Active control” (2).

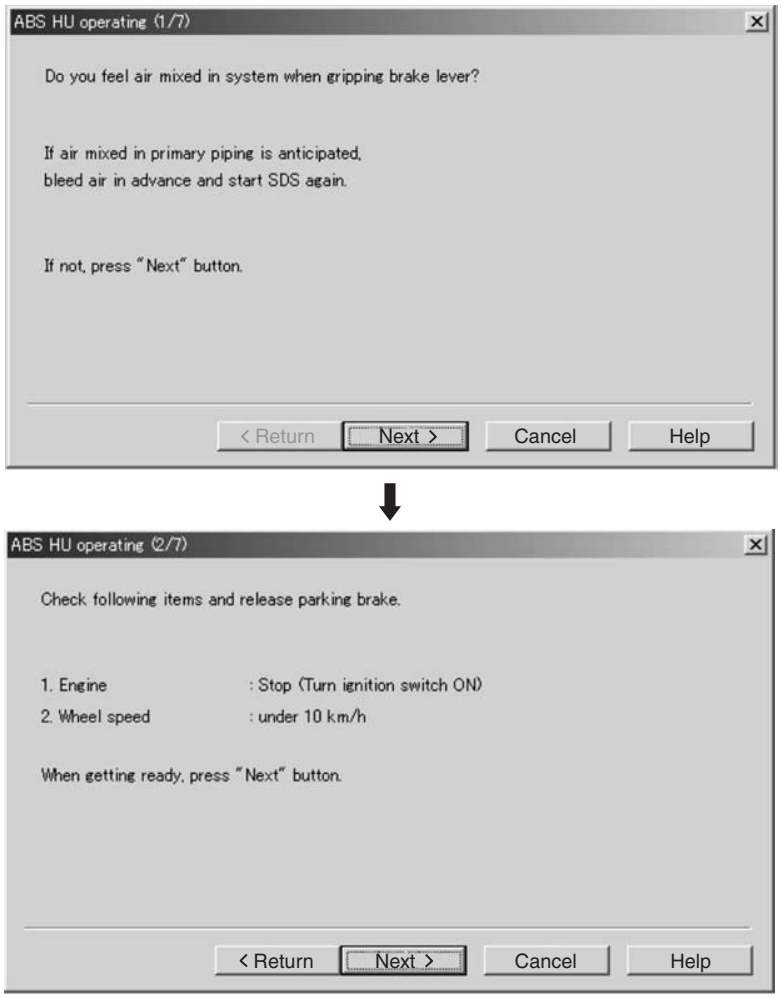
I718H1450058-01

5) Click “ABS HU operating” (3).



I718H1450059-01

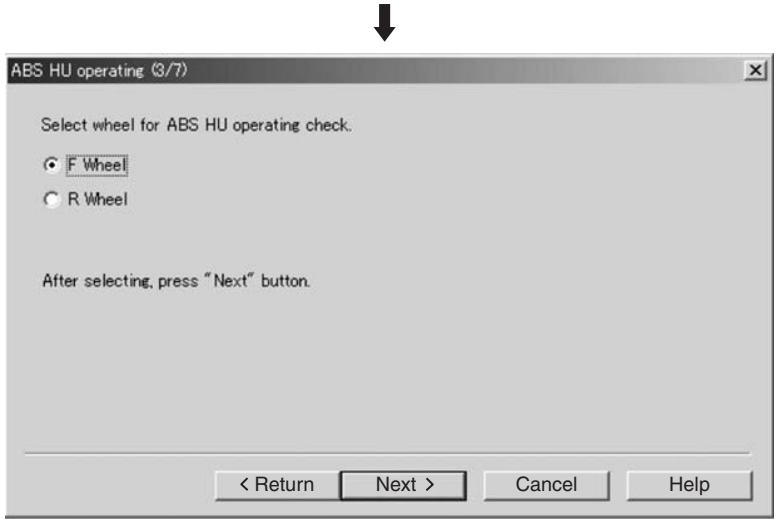
6) Click “Next” according to the screen indication.



I718H1450060-02

NOTE

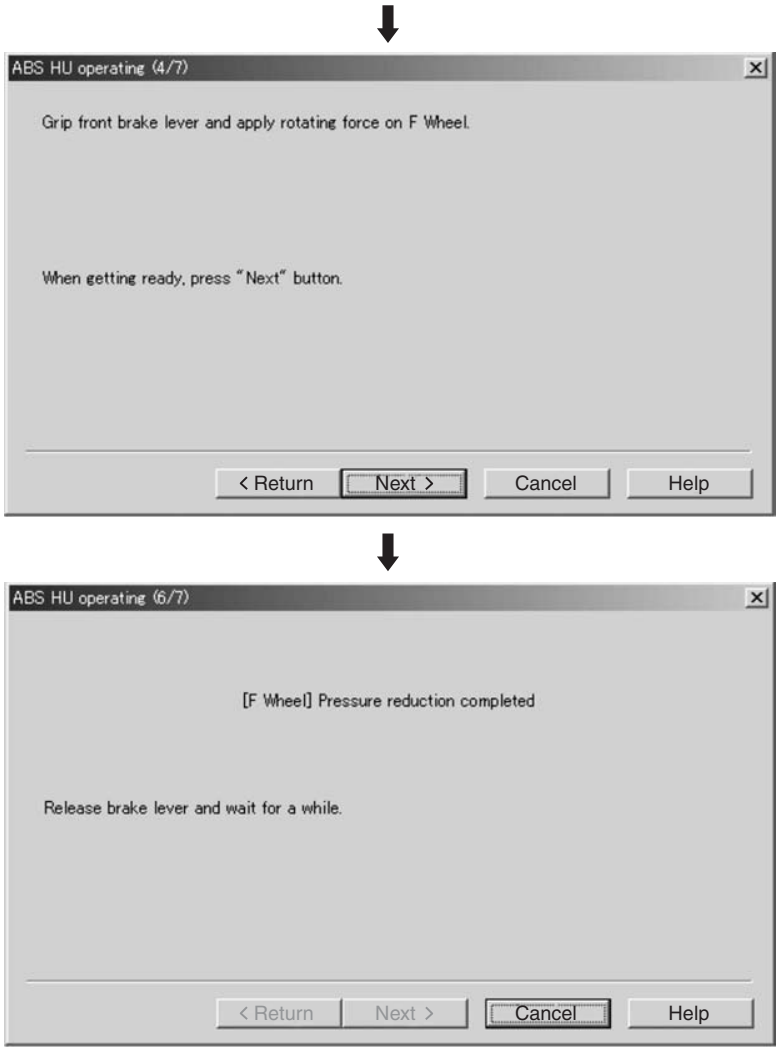
Skip this screen as this vehicle is not equipped with parking brake.



I718H1450121-01

NOTE

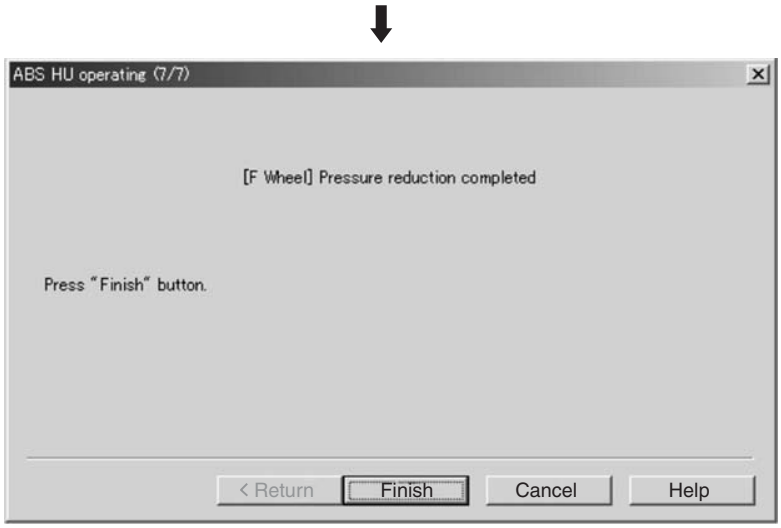
- **If the front wheel is selected, place the motorcycle on the center stand and lift the front wheel off the ground using a jack.**
- **Two operators are needed in this work; One should apply a rotational force to the front wheel.**



I718H1450061-01

NOTE

- **In normal cases, the front brake lever feels a reaction force and the front wheel turns discontinuously. At the same time, the ABS HU operating sound will be heard.**
- **The ABS HU motor operates for 6 seconds and then stops automatically.**



I718H1450062-01

NOTE

- **Inspect the rear brake in the same manner of front brake.**
- **If the ABS does not function, the cause may lie in the ABS control unit/HU.**
- **In checking the rear brake at the time of pressure reduction drive (4/7), "brake lever" appears on the screen. This is because the present screen shares with other model having front brake only. Therefore, in the case of rear brake pedal equipped vehicle, ignore this instruction and operate the rear brake pedal.**

7) Close the SDS tool and turn the ignition switch OFF.
8) Disconnect the SDS tool and install the right frame cover.

DTC Table

B718H14504002

DTC	Malfunction cause	Indicator status	Reference
None	Normal	ON *1	—
13 (C1613)	Wheel speed sensor rotor malfunction (F)	ON	Refer to “DTC “13” (C1613): Wheel Speed Sensor Rotor Malfunction (F) (Page 4E-35)”.
14 (C1614)	Wheel speed sensor rotor malfunction (R)	ON	Refer to “DTC “14” (C1614): Wheel Speed Sensor Rotor Malfunction (R) (Page 4E-37)”.
22 (C1622)	ABS actuator circuit malfunction (F)	ON	Refer to “DTC “22” (C1622): ABS Actuator Circuit Malfunction (F) (Page 4E-39)”.
23 (C1623)	ABS actuator circuit malfunction (R)	ON	Refer to “DTC “23” (C1623): ABS Actuator Circuit Malfunction (R) (Page 4E-41)”.
25 (C1625)	Wheel speed sensor related malfunction	ON	Refer to “DTC “25” (C1625): Wheel Speed Sensor Related Malfunction (Page 4E-43)”.
35 (C1635)	ABS motor malfunction	ON	Refer to “DTC “35” (C1635): ABS Motor Malfunction (Page 4E-45)”.
41 (C1641)	Wheel speed sensor signal malfunction (F) *2	ON	Refer to “DTC “41” (C1641): Wheel Speed Sensor Signal Malfunction (F) (Page 4E-47)”.
42 (C1642)	Wheel speed sensor circuit open (F) *2	ON	Refer to “DTC “42” (C1642): Wheel Speed Sensor Circuit Open (F) (Page 4E-49)”.
43 (C1643)	Wheel speed sensor circuit short (F) *2	ON	Refer to “DTC “43” (C1643): Wheel Speed Sensor Circuit Short (F) (Page 4E-53)”.
44 (C1644)	Wheel speed sensor signal malfunction (R) *2	ON	Refer to “DTC “44” (C1644): Wheel Speed Sensor Signal Malfunction (R) (Page 4E-55)”.
45 (C1645)	Wheel speed sensor circuit open (R) *2	ON	Refer to “DTC “45” (C1645): Wheel Speed Sensor Circuit Open (R) (Page 4E-57)”.
46 (C1646)	Wheel speed sensor circuit short (R) *2	ON	Refer to “DTC “46” (C1646): Wheel Speed Sensor Circuit Short (R) (Page 4E-61)”.
47 (C1647)	Supply voltage (Increased)	ON	Refer to “DTC “47” (C1647): Supply Voltage (Increased) (Page 4E-63)”.
48 (C1648)	Supply voltage (Decreased)	ON	Refer to “DTC “48” (C1648): Supply Voltage (Decreased) (Page 4E-65)”.
55 (C1655)	ABS control unit malfunction	ON	Refer to “DTC “55” (C1655): ABS Control Unit Malfunction (Page 4E-67)”.
61 (C1661)	ABS solenoid malfunction	ON	Refer to “DTC “61” (C1661): ABS Solenoid Malfunction (Page 4E-69)”.

*1: It goes off after running at more than 10 km/h (6.2 mile/h).
*2: The wheel speed sensor lead wire is connected to the ABS control unit, but a short-circuit or faulty continuity inside the ABS control unit caused this DTC to appear, therefore, the ABS control unit/HU assembly must be replaced. An insufficient wheel speed sensor output voltage is the cause of a malfunction in which the ABS is activated even if the brakes are not suddenly applied. If this occurs frequently even though the wheel speed sensor is operating correctly, the ABS control unit/HU assembly should be replaced.

⚠ CAUTION

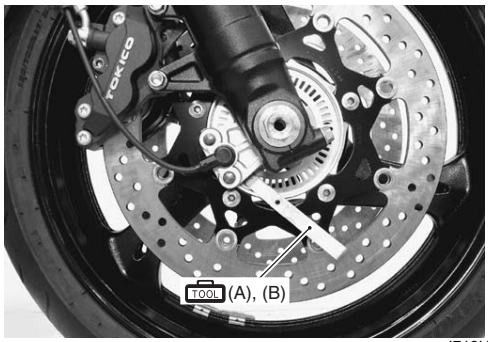
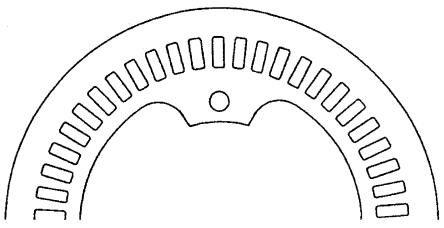
When disconnecting couplers and turning the ignition switch ON, disconnect the ABS control unit coupler in order to prevent a DTC from being stored. Each time a resistance is measured, the ignition switch should be set to OFF.

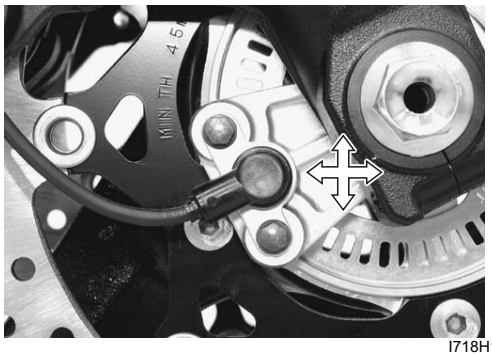
DTC "13" (C1613): Wheel Speed Sensor Rotor Malfunction (F)

B718H14504003

Possible Cause
• Front wheel speed sensor rotor distortion
• Faulty front wheel speed sensor or wiring discontinuity, etc.

Troubleshooting

Step	Action	Yes	No
1	1) Inspect the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge. **Special tool** **TOOL (A): 09900–20803 (Thickness gauge)** **TOOL (B): 09900–20806 (Thickness gauge)** **Wheel speed sensor – sensor rotor clearance** **0.3 – 1.5 mm (0.012 – 0.059 in)**  I718H1450063-01 *Is the clearance OK?*	Go to Step 2.	Adjust the clearance.
2	1) Inspect the front wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Is the sensor rotor OK?*	Go to Step 3.	Clean or replace the sensor rotor.

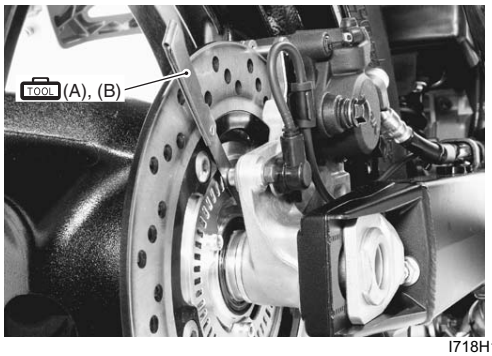
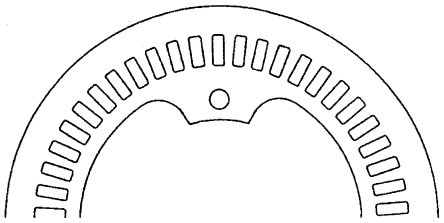
Step	Action	Yes	No
3	1) Check that the front wheel speed sensor is mounted securely.  I718H1450066-01 *Is the sensor mounted securely?*	Go to Step 4.	Tighten the mounting bolts or replace the bracket if necessary.
4	1) Inspect the front tire and wheel. **Tire type and size** **DUNLOP D218FT 120/70ZR17M/C (58W)** **Cold inflation tire pressure (Solo riding)** **250 kPa (2.50 kgf/cm^2, 36 psi)** **Cold inflation tire pressure (Dual riding)** **250 kPa (2.50 kgf/cm^2, 36 psi)** **Wheel runout** **Service limit (axial and radial): 2.0 mm (0.08 in)**  I718H1450067-01 *Are the front tire type, tire pressure and wheel runout OK?*	Replace the ABS control unit/HU.	Adjust or replace the front tire and wheel.

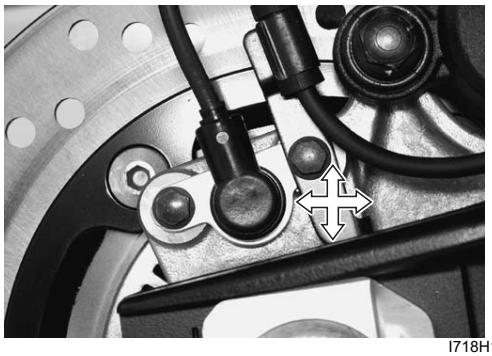
DTC “14” (C1614): Wheel Speed Sensor Rotor Malfunction (R)

B718H14504004

Possible Cause
• Rear wheel speed sensor rotor distortion
• Faulty rear wheel speed sensor or wiring discontinuity, etc.

Troubleshooting

Step	Action	Yes	No
1	1) Inspect the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge. **Special tool** **(A): 09900–20803 (Thickness gauge)** **(B): 09900–20806 (Thickness gauge)** **Wheel speed sensor – sensor rotor clearance** **0.3 – 1.5 mm (0.012 – 0.059 in)**  I718H1450026-01 *Is the clearance OK?*	Go to Step 2.	Adjust the clearance.
2	1) Inspect the rear wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Is the sensor rotor OK?*	Go to Step 3.	Clean or replace the sensor rotor.

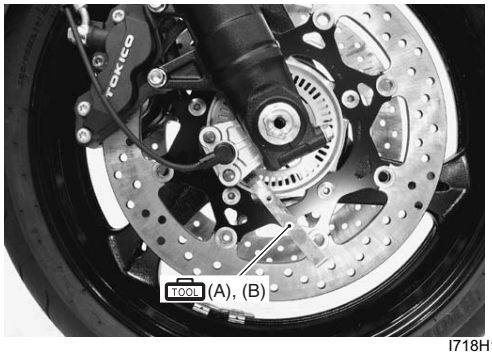
Step	Action	Yes	No
3	1) Check that the rear wheel speed sensor is mounted securely.  I718H1450068-01 *Is the sensor mounted securely?*	Go to Step 4.	Tighten the mounting bolts or replace the bracket if necessary.
4	1) Inspect the rear tire and wheel. **Tire type and size** **DUNLOP D218N 180/55ZR17M/C (73W)** **Cold inflation tire pressure (Solo riding)** **290 kPa (2.90 kgf/cm^2, 42 psi)** **Cold inflation tire pressure (Dual riding)** **290 kPa (2.90 kgf/cm^2, 42 psi)** **Wheel runout** **Service limit (axial and radial): 2.0 mm (0.08 in)**  I718H1450069-01 *Are the rear tire type, tire pressure and wheel runout OK?*	Replace the ABS control unit/HU.	Adjust or replace the rear tire and wheel.

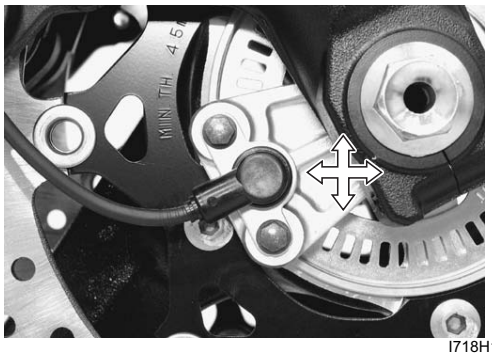
DTC “22” (C1622): ABS Actuator Circuit Malfunction (F)

B718H14504005

Possible Cause
• Wire harness discontinuity
• Front wheel locking, etc.

Troubleshooting

Step	Action	Yes	No
1	1) Raise the front wheel off the ground and support the motorcycle with a jack or wooden block. 2) Inspect the dragging of the front brake.  I718H1450067-01 *Is there any dragging in the front brake?*	Inspect the front brake master cylinder and the calipers.	Go to step 2.
2	1) Inspect the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge. **Special tool** **TOOL (A): 09900–20803 (Thickness gauge)** **TOOL (B): 09900–20806 (Thickness gauge)** **Wheel speed sensor – sensor rotor clearance** **0.3 – 1.5 mm (0.012 – 0.059 in)**  I718H1450025-01 *Is the clearance OK?*	Go to Step 3.	Adjust the clearance.

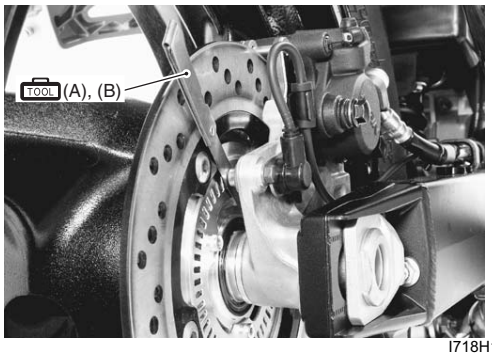
Step	Action	Yes	No
3	1) Check that the front wheel speed sensor is mounted securely.  I718H1450066-01 *Is the sensor mounted securely?*	Replace the ABS control unit/HU.	Tighten the mounting bolts or replace the bracket if necessary.

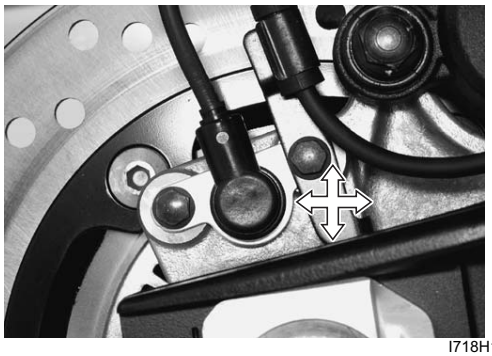
DTC “23” (C1623): ABS Actuator Circuit Malfunction (R)

B718H14504006

Possible Cause
• Wire harness discontinuity
• Rear wheel locking, etc.

Troubleshooting

Step	Action	Yes	No
1	1) Support the motorcycle with its center stand. 2) Inspect the dragging of the rear brake.  I718H1450069-01 *Is there any dragging in the rear brake?*	Inspect the rear brake master cylinder and the caliper.	Go to step 2.
2	1) Inspect the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge. **Special tool** **TOOL (A): 09900–20803 (Thickness gauge)** **TOOL (B): 09900–20806 (Thickness gauge)** **Wheel speed sensor – sensor rotor clearance** **0.3 – 1.5 mm (0.012 – 0.059 in)**  I718H1450026-01 *Is the clearance OK?*	Go to Step 3.	Adjust the clearance.

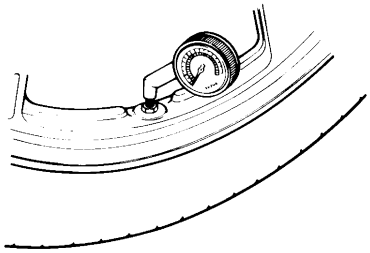
Step	Action	Yes	No
3	1) Check that the rear wheel speed sensor is mounted securely.  I718H1450068-01 *Is the sensor mounted securely?*	Replace the ABS control unit/HU.	Tighten the mounting bolts or replace the bracket if necessary.

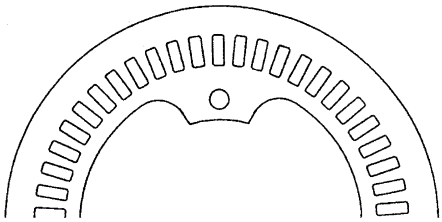
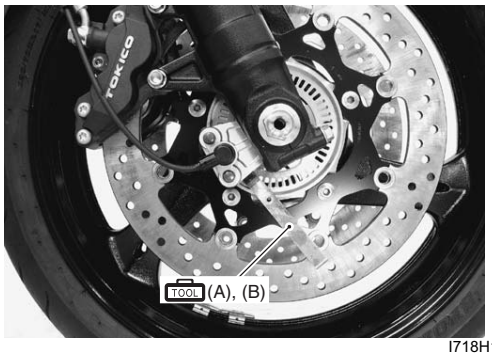
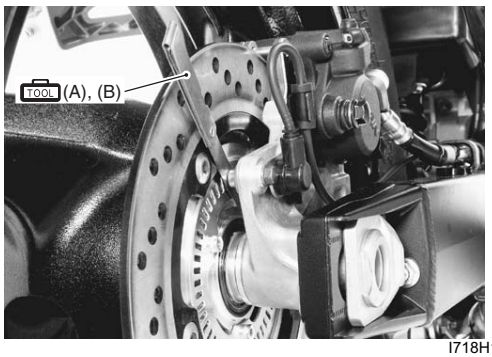
DTC “25” (C1625): Wheel Speed Sensor Related Malfunction

B718H14504007

Possible Cause
• Incorrect tire size, poor tire pressure
• Deformed wheel, etc.

Troubleshooting

Step	Action	Yes	No
1	1) Check that the specified tires are installed. **Tire type and size** **Front: DUNLOP D218FT 120/70ZR17M/C (58W)** **Rear: DUNLOP D218N 180/55ZR17M/C (73W)**  I718H1450070-01 *Are the tires OK?*	Go to Step 2.	Use the specified tires.
2	1) Make sure the tire pressure for each tire. Refer to “Tire Inspection in Section 0B (Page 0B-19)”. **Cold inflation tire pressure (Solo riding)** **Front: 250 kPa (2.50 kgf/cm^2, 36 psi)** **Rear: 290 kPa (2.90 kgf/cm^2, 42 psi)** **Cold inflation tire pressure (Dual riding)** **Front: 250 kPa (2.50 kgf/cm^2, 36 psi)** **Rear: 290 kPa (2.90 kgf/cm^2, 42 psi)**  I718H1450071-01 *Is the tire pressure for each tire correct?*	Go to Step 3.	Adjust the tire pressure.

Step	Action	Yes	No
3	1) Inspect both wheel speed sensor rotors for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Are the rotors OK?*	Go to Step 4.	Clean or replace the rotor.
4	1) Inspect the clearances of the front and rear wheel speed sensor – sensor rotor using the thickness gauge. **Special tool** **(A): 09900–20803 (Thickness gauge)** **(B): 09900–20806 (Thickness gauge)** **Wheel speed sensor – sensor rotor clearance** **0.3 – 1.5 mm (0.012 – 0.059 in)** **Front**  I718H1450025-01 **Rear**  I718H1450026-01 *Are the clearances OK?*	Replace the ABS control unit/HU.	Adjust the clearance.

DTC “35” (C1635): ABS Motor Malfunction

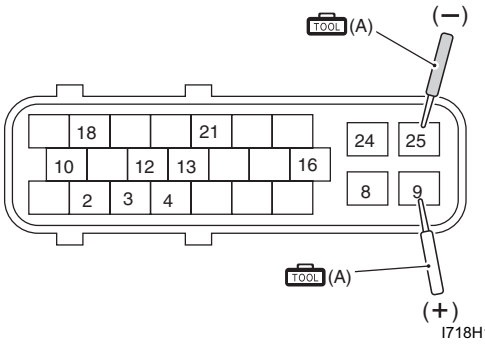
B718H14504008

Possible Cause
• Faulty HU motor
• Faulty wiring, etc.

Wiring Diagram
Refer to “ABS Unit Diagram (Page 4E-8)”.

Troubleshooting

Step	Action	Yes	No
1	1) Inspect if the pump motor makes turning noise by setting the ignition switch to ON from OFF when the vehicle stands still.  I718H1450074-01 *Does the pump motor make any turning noise?*	• Faulty HU motor • Replace the ABS control unit/HU.	Go to Step 2.
2	1) Remove the seat. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 2) Inspect the ABS motor fuse. **⚠ CAUTION** **If a fuse is blown, find the cause of the problem and correct it before replacing the fuse.** **ABS motor fuse** **20 A**  I718H1450126-02 *Is the ABS motor fuse OK?*	Go to Step 3.	Replace the ABS motor fuse.

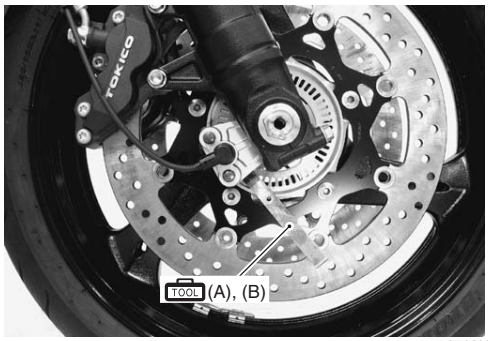
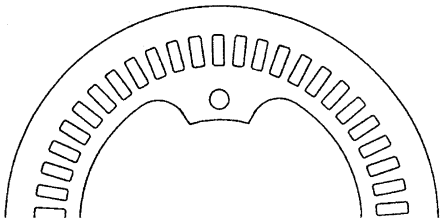
Step	Action	Yes	No
3	1) Turn the ignition switch OFF. 2) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Remove the fuse box mounting bolt. Refer to “ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)”. 4) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. 5) Measure the voltage between “9” (R/B) and “25” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Normal value (“9” – “25”)** **Battery voltage (12.0 V and more)** **ABS control unit coupler (Harness end)**  I718H1450076-02 *Is the voltage between “9” and “25” normal?*	Replace the ABS control unit/HU.	Inspect the wire harness. (Faulty motor power supply or ground wire)

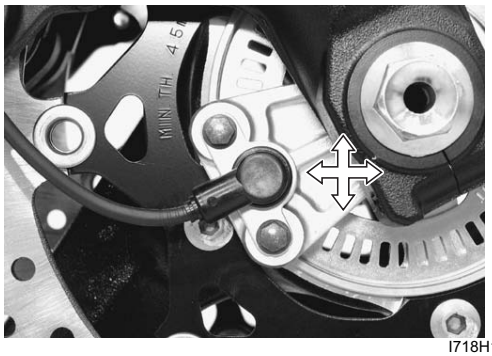
DTC “41” (C1641): Wheel Speed Sensor Signal Malfunction (F)

B718H14504009

Possible Cause
• Poor contact in the front wheel speed sensor coupler
• Faulty front wheel speed sensor, etc.

Troubleshooting

Step	Action	Yes	No
1	1) Inspect the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge. **Special tool** **TOOL (A): 09900–20803 (Thickness gauge)** **TOOL (B): 09900–20806 (Thickness gauge)** **Wheel speed sensor – sensor rotor clearance** **0.3 – 1.5 mm (0.012 – 0.059 in)**  I718H1450025-01 *Is the clearance OK?*	Go to Step 2.	Adjust the clearance.
2	1) Inspect the front wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Is the sensor rotor OK?*	Go to Step 3.	Clean or replace the sensor rotor.

Step	Action	Yes	No
3	1) Check that the front wheel speed sensor is mounted securely.  I718H1450066-01 *Is the sensor mounted securely?*	Go to DTC “42” (C1642). (Refer to “DTC “42” (C1642): Wheel Speed Sensor Circuit Open (F) (Page 4E-49)”.)	Tighten the mounting bolts or replace the bracket if necessary.

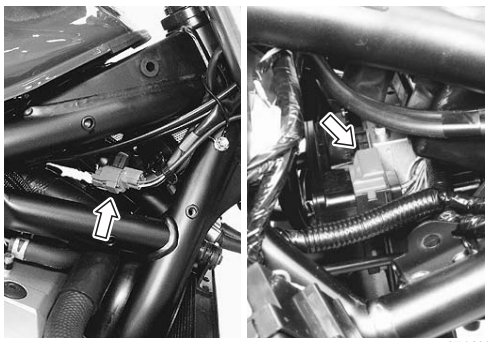
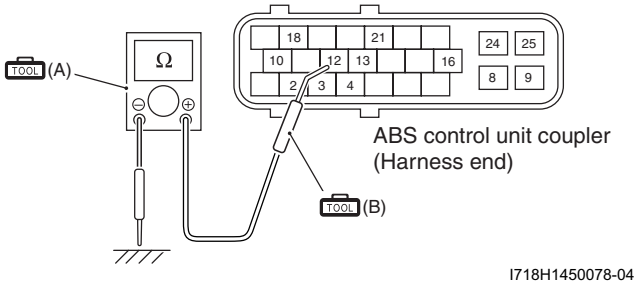
DTC “42” (C1642): Wheel Speed Sensor Circuit Open (F)

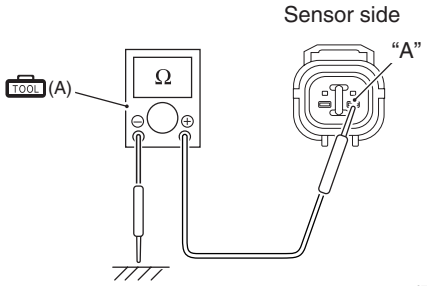
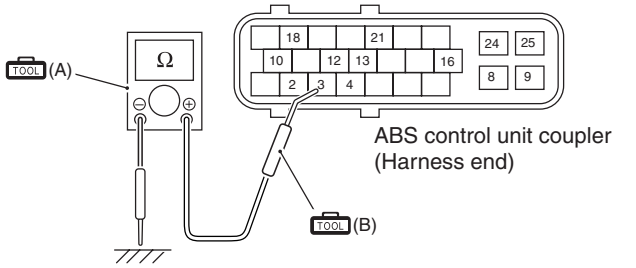
B718H14504010

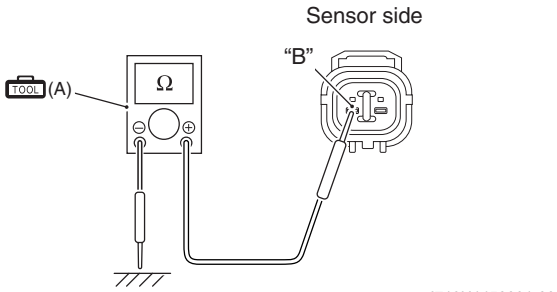
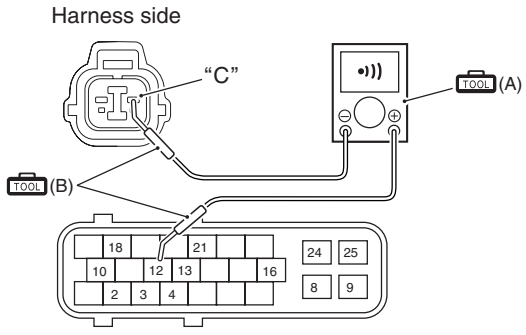
Possible Cause
• Poor contact in the front wheel speed sensor coupler
• Faulty front wheel speed sensor, etc.

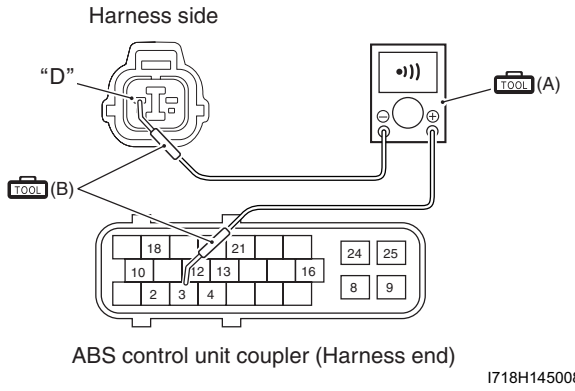
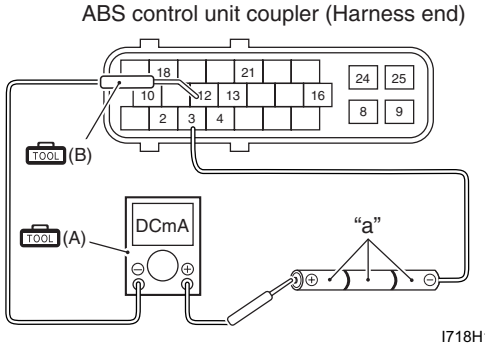
Wiring Diagram
Refer to “ABS Unit Diagram (Page 4E-8)”.

Troubleshooting

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Remove the right frame head cover. (GSF1250A) Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 4) Remove the fuse box mounting bolt. Refer to “ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)”. 5) Check the ABS control unit coupler and front wheel speed sensor coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler.  I718H1450077-01 6) Measure the resistance between “12” (B/R) and ground at the ABS control unit coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **TOOL (B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Resistance (Ω)** **Normal value (“12” – Ground)** **∞ Ω (Infinity)**  I718H1450078-04 *Is the resistance between “12” and ground OK?*	Go to Step 3.	Go to Step 2.

Step	Action	Yes	No
2	1) Disconnect the front wheel speed sensor coupler. 2) Measure the resistance between “A” (Black) and ground at the front wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Resistance (Ω)** **Normal value (“A” – Ground)** **∞ Ω (Infinity)**  I718H1450079-03 *Is the resistance between “A” and ground OK?*	Inspect the wire harness. (Faulty B/R wire)	Faulty front wheel speed sensor
3	1) Measure the resistance between “3” (W/R) and ground at the ABS control unit coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **TOOL (B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Resistance (Ω)** **Normal value (“3” – Ground)** **∞ Ω (Infinity)**  I718H1450080-04 *Is the resistance between “3” and ground OK?*	Go to Step 5.	Go to Step 4.

Step	Action	Yes	No
4	1) Measure the resistance between “B” (White) and ground at the front wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Resistance (Ω)** **Normal value (“B” – Ground)** **∞ Ω (Infinity)**  I718H1450081-03 *Is the resistance between “B” and ground OK?*	Inspect the wire harness. (Faulty W/R wire)	Faulty front wheel speed sensor
5	1) Check for continuity between “12” (B/R) on the ABS control unit coupler and “C” (B/R) on the front wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **TOOL (B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Continuity test (•)))** **Normal value (“12” – “C”)** **Continuity (•)))**  ABS control unit coupler (Harness end) I718H1450082-04 *Is there continuity between “12” and “C”?*	Go to Step 6.	Inspect the wire harness. (Faulty B/R wire)

Step	Action	Yes	No
6	1) Check for continuity between “3” (W/R) on the ABS control unit coupler and “D” (W/R) on the front wheel speed sensor coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **(B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Continuity test (•)))** **Normal value (“3” – “D”)** **Continuity (•)))**  ABS control unit coupler (Harness end) I718H1450083-04 *Is there continuity between “3” and “D”?*	Go to Step 7.	Inspect the wire harness. (Faulty W/R wire)
7	1) Connect the front wheel speed sensor coupler. 2) Connect three 1.5 V dry cells “a” in series as shown and make sure that their total voltage is more than 4.5 V. Measure the current between (+) dry cell terminal and “12” (B/R) on the ABS control unit coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **(B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Current (⎓ , 20 mA)** **Normal value** **3 – 14 mA**  I718H1450084-03 *Is the current OK?*	Replace the ABS control unit/HU.	Faulty front wheel speed sensor.

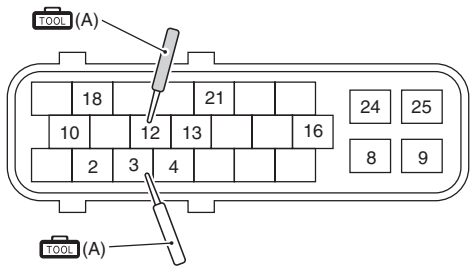
DTC “43” (C1643): Wheel Speed Sensor Circuit Short (F)

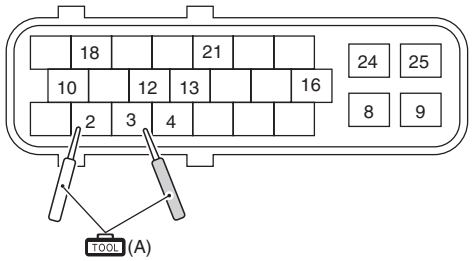
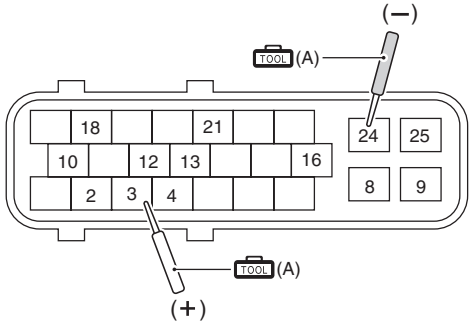
B718H14504011

Possible Cause
• Poor contact in the front wheel speed sensor coupler
• Faulty front wheel speed sensor, etc.

Wiring Diagram
Refer to “ABS Unit Diagram (Page 4E-8)”.

Troubleshooting

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Remove the fuse box mounting bolt. Refer to “ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)”. 4) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. 5) Check for continuity between “3” (W/R) and “12” (B/R) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Continuity (•)))** **ABS control unit coupler (Harness end)**  I718H1450085-02 *Is there continuity between “3” and “12”?*	• Inspect the wire harness. (Faulty sensor wire) • Faulty front wheel speed sensor	Go to Step 2.

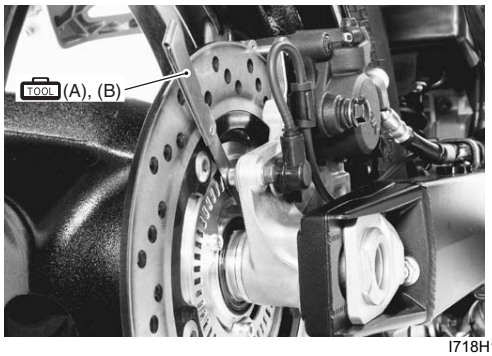
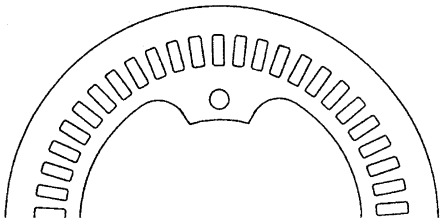
Step	Action	Yes	No
2	1) Check for continuity between “2” (B/Y) and “3” (W/R) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Continuity (•))))** **ABS control unit coupler (Harness end)**  I718H1450086-02 *Is there continuity between “2” and “3”?*	• Inspect the wire harness. (Faulty sensor wire) • Faulty front wheel speed sensor	Go to Step 3.
3	1) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between “3” (W/R) and “24” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Normal value (“3” – “24”)** **0 V** **ABS control unit coupler (Harness end)**  I718H1450087-02 *Is the voltage between “3” and “24” normal value?*	Replace the ABS control unit/HU.	Inspect the wire harness. (Faulty sensor signal or power supply wire)

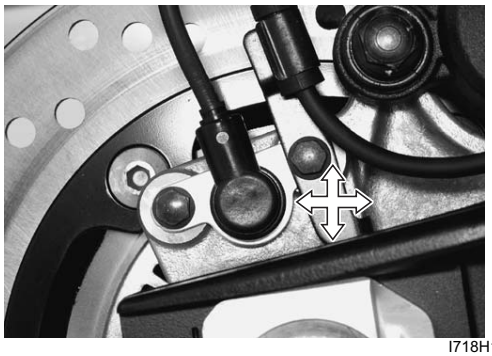
DTC “44” (C1644): Wheel Speed Sensor Signal Malfunction (R)

B718H14504012

Possible Cause
• Poor contact in the rear wheel speed sensor coupler
• Faulty rear wheel speed sensor, etc.

Troubleshooting

Step	Action	Yes	No
1	1) Inspect the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge. **Special tool** **(A): 09900–20803 (Thickness gauge)** **(B): 09900–20806 (Thickness gauge)** **Wheel speed sensor – sensor rotor clearance** **0.3 – 1.5 mm (0.012 – 0.059 in)**  I718H1450026-01 *Is the clearance OK?*	Go to Step 2.	Adjust the clearance.
2	1) Inspect the rear wheel speed sensor rotor for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Is the sensor rotor OK?*	Go to Step 3.	Clean or replace the sensor rotor.

Step	Action	Yes	No
3	1) Check that the rear wheel speed sensor is mounted securely.  I718H1450068-01 *Is the sensor mounted securely?*	Go to DTC “45” (C1645). (Refer to “DTC “45” (C1645): Wheel Speed Sensor Circuit Open (R) (Page 4E-57)”.)	Tighten the mounting bolts or replace the bracket if necessary.

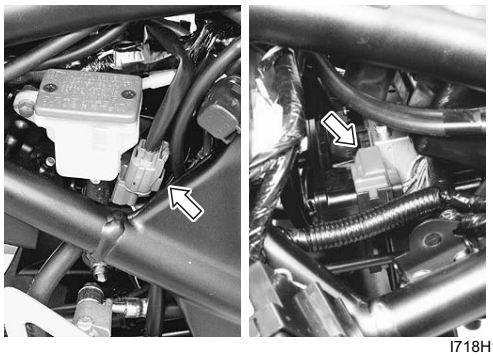
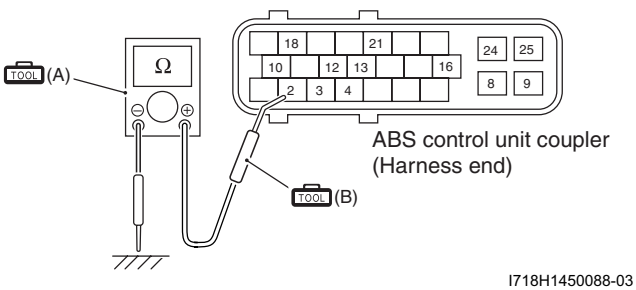
DTC “45” (C1645): Wheel Speed Sensor Circuit Open (R)

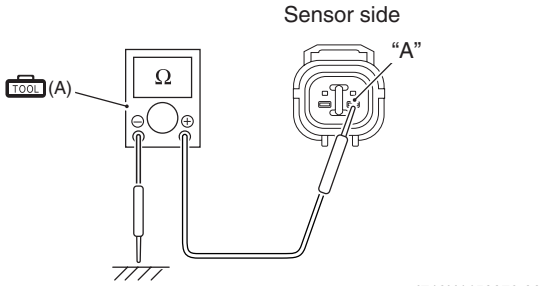
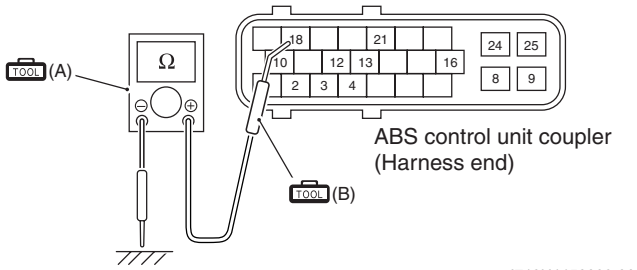
B718H14504013

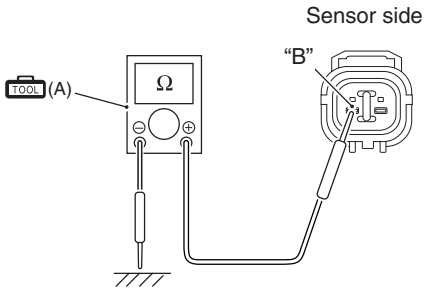
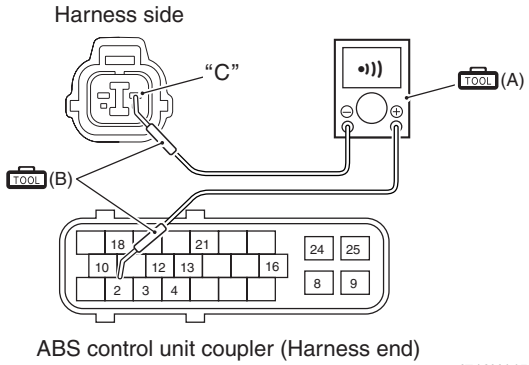
Possible Cause
• Poor contact in the rear wheel speed sensor coupler
• Faulty rear wheel speed sensor, etc.

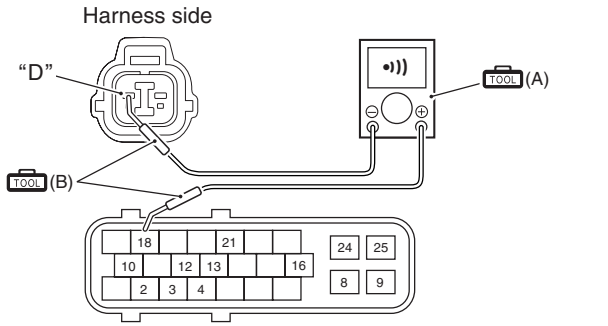
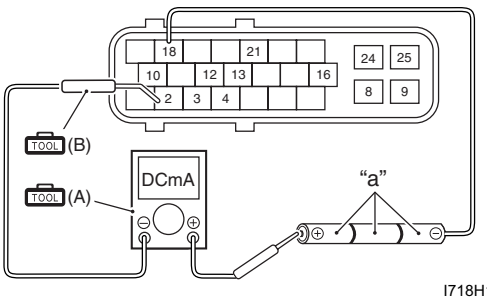
Wiring Diagram
Refer to “ABS Unit Diagram (Page 4E-8)”.

Troubleshooting

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Remove the frame covers, left and right. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Remove the fuse box mounting bolt. Refer to “ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)”. 4) Check the ABS control unit coupler and rear wheel speed sensor coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler.  I718H1450116-01 5) Measure the resistance between “2” (B/Y) and ground at the ABS control unit coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **(B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Resistance (Ω)** **Normal value (“2” – Ground)** ∞ Ω **(Infinity)**  I718H1450088-03 *Is the resistance between (2) and ground OK?*	Go to Step 3.	Go to Step 2.

Step	Action	Yes	No
2	1) Disconnect the rear wheel speed sensor coupler. 2) Measure the resistance between “A” (Black) and ground at the rear wheel speed sensor coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Resistance (Ω)** **Normal value (“A” – Ground)** **∞ Ω (Infinity)**  *Is the resistance between “A” and ground OK?*	Inspect the wire harness. (Faulty B/Y wire)	Replace the rear wheel speed sensor.
3	1) Measure the resistance between “18” (W/Y) and ground at the ABS control unit coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **TOOL (B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Resistance (Ω)** **Normal value (“18” – Ground)** **∞ Ω (Infinity)**  *Is the resistance between “18” and ground OK?*	Go to Step 5.	Go to Step 4.

Step	Action	Yes	No
4	1) Measure the resistance between “B” (White) and ground at the rear wheel speed sensor coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Resistance (Ω)** **Normal value (“B” – Ground)** **∞ Ω (Infinity)**  I718H1450081-03 *Is the resistance between “B” and ground OK?*	Inspect the wire harness. (Faulty W/Y wire)	Replace the rear wheel speed sensor.
5	1) Check for continuity between “2” (B/Y) on the ABS control unit coupler and “C” (B/Y) on the rear wheel speed sensor coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **(B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Continuity test (•)))** **Normal value (“2” – “C”)** **Continuity (•)))**  ABS control unit coupler (Harness end) I718H1450090-03 *Is there continuity between “2” and “C”?*	Go to Step 6.	Inspect the wire harness. (Faulty B/Y wire)

Step	Action	Yes	No
6	1) Check the continuity between “18” (W/Y) on the ABS control unit coupler and “D” (W/Y) on the rear wheel speed sensor coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **(B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Continuity test (•)))** **Normal value (“18” – “D”)** **Continuity (•)))**  ABS control unit coupler (Harness end) I718H1450092-03 *Is the resistance between “18” and “D”?*	Go to Step 7.	Inspect the wire harness. (Faulty W/Y wire)
7	1) Connect the rear wheel speed sensor coupler. 2) Connect three 1.5 V dry cells “a” in series as shown and make sure that their total voltage is more than 4.5 V. Measure the current between (+) dry cell terminal and “2” (B/Y) on the ABS control unit coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **(B): 09900–25009 (Needle pointed probe set)** **Tester knob indication** **Current (⎓ , 20 mA)** **Normal value** **3 – 14 mA** ABS control unit coupler (Harness end)  I718H1450091-04 *Is the current OK?*	Replace the ABS control unit/HU.	Replace the rear wheel speed sensor.

DTC “46” (C1646): Wheel Speed Sensor Circuit Short (R)

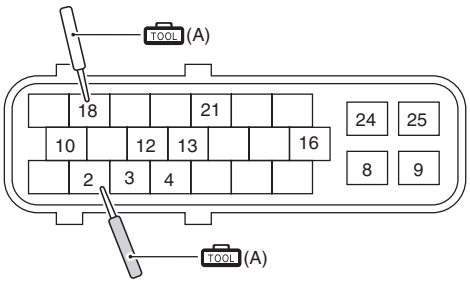
B718H14504014

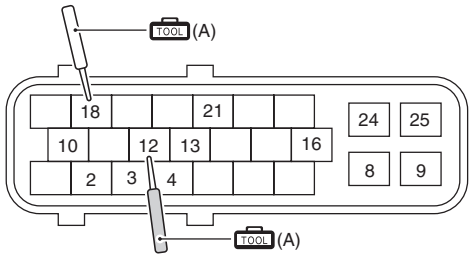
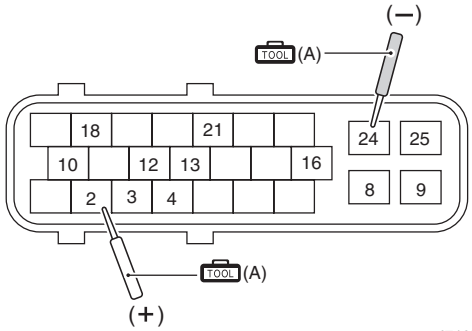
Possible Cause
• Poor contact in the rear wheel speed sensor coupler
• Faulty rear wheel speed sensor, etc.

Wiring Diagram

Refer to “ABS Unit Diagram (Page 4E-8)”.

Troubleshooting

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Remove the fuse box mounting bolt. Refer to “ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)”. 4) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. 5) Check for continuity between “2” (B/Y) and “18” (W/Y) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Continuity (•)))** **ABS control unit coupler (Harness end)**  I718H1450093-02 *Is there continuity between “2” and “18”?*	• Inspect the wire harness. (Faulty sensor wire) • Faulty rear wheel speed sensor	Go to Step 2.

Step	Action	Yes	No
2	1) Check for continuity between “12” (B/R) and “18” (W/Y) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Continuity (•))))** **ABS control unit coupler (Harness end)**  I718H1450094-03 *Is there continuity between “12” and “18”?*	• Inspect the wire harness. (Faulty sensor wire) • Faulty wheel speed sensor	Go to Step 3.
3	1) Turn the ignition switch ON with the ABS control unit coupler disconnected, measure the voltage between “2” (B/Y) and “24” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Normal value (“2” – “24”)** **0 V** **ABS control unit coupler (Harness end)**  I718H1450095-02 *Is the voltage between “2” and “24” 0 V?*	Replace the ABS control unit/HU.	Inspect the wire harness. (Faulty sensor signal or power supply wire)

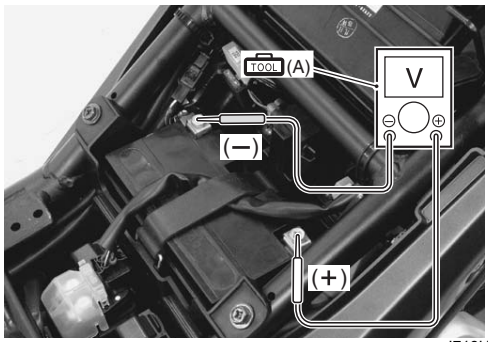
DTC “47” (C1647): Supply Voltage (Increased)

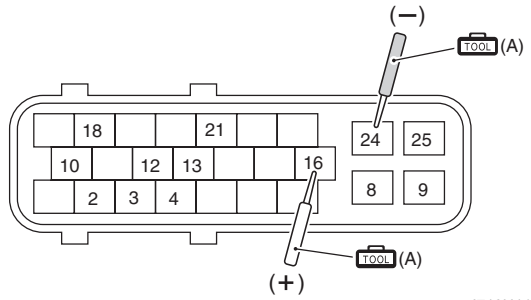
B718H14504015

Possible Cause
• Faulty regulator/rectifier
• Faulty ABS control unit
• Faulty wire harness, etc.

Wiring Diagram
Refer to “ABS Unit Diagram (Page 4E-8)”.

Troubleshooting

Step	Action	Yes	No
1	1) Remove the seat. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 2) Measure the voltage between the (+) and (–) battery terminals using the multi-circuit tester. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Battery voltage** **12.0 V and more**  I718H1450123-01 *Is the voltage over 12 V?*	Go to Step 2.	Charge or replace the battery.
2	1) Start the engine at 5 000 r/min with the dimmer switch set to HI. 2) Measure the voltage between the (+) and (–) battery terminals. **Special tool** **TOOL : 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Regulated voltage** **14.0 – 15.5 V at 5 000 r/min** *Is the voltage 14.0 – 15.5 V?*	Go to Step 3.	Inspect the regulator/rectifier. Refer to “Regulator / Rectifier Inspection in Section 1J (Page 1J-8)”.

Step	Action	Yes	No
3	1) Turn the ignition switch OFF. 2) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Remove the fuse box mounting bolt. Refer to “ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)”. 4) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. 5) Start the engine at 5 000 r/min with the dimmer switch set to HI. 6) Measure the voltage between “16” (O/Y) and “24” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)**  I718H1450036-04 *Is the voltage same as Step 2?*	Replace the ABS control unit/HU.	Inspect the wire harness. (Faulty ignition or ground wire)

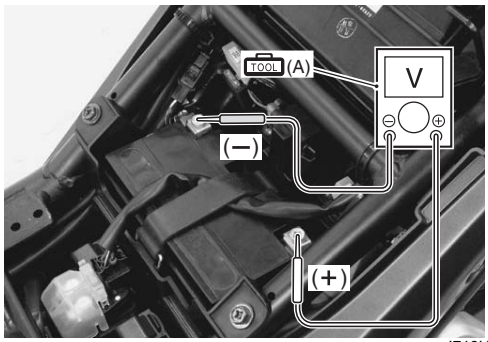
DTC “48” (C1648): Supply Voltage (Decreased)

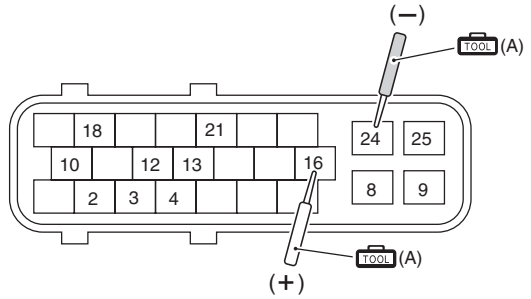
B718H14504016

Possible Cause
• Faulty generator or regulator/rectifier
• Faulty ABS control unit
• Faulty wire harness, etc.

Wiring Diagram
Refer to “ABS Unit Diagram (Page 4E-8)”.

Troubleshooting

Step	Action	Yes	No
1	1) Remove the seat. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 2) Measure the voltage between the (+) and (–) battery terminals using the multi-circuit tester. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Battery voltage** **12.0 V and more**  I718H1450123-01 *Is the voltage over 12 V?*	Go to Step 2.	Charge or replace the battery.
2	1) Start the engine at 5 000 r/min with the dimmer switch set to HI. 2) Measure the voltage between the (+) and (–) battery terminals. **Special tool** **TOOL : 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Regulated voltage** **14.0 – 15.5 V at 5 000 r/min** *Is the voltage 14.0 – 15.5 V?*	Go to Step 3.	Inspect the generator and regulator/rectifier. Refer to “Generator Inspection in Section 1J (Page 1J-3)” and “Regulator / Rectifier Inspection in Section 1J (Page 1J-8)”.

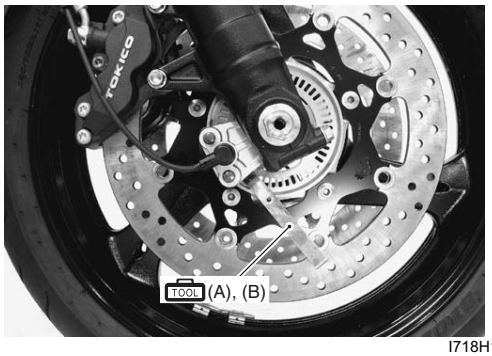
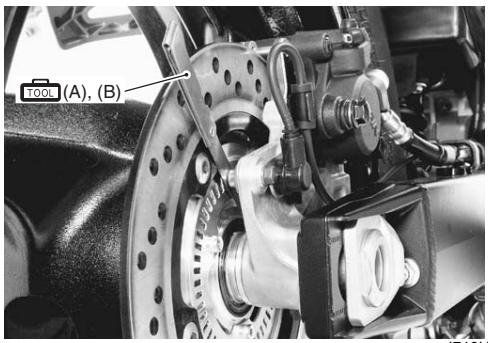
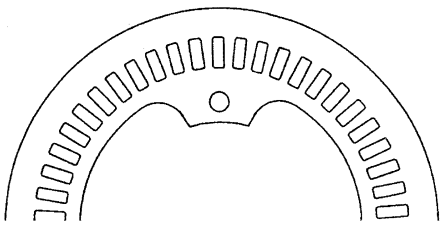
Step	Action	Yes	No
3	1) Turn the ignition switch OFF. 2) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Remove the fuse box mounting bolt. Refer to “ABS Control Unit Coupler Disconnect and Connect (Page 4E-70)”. 4) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. 5) Start the engine at 5 000 r/min with the dimmer switch set to HI. 6) Measure the voltage between “16” (O/Y) and “24” (B/W) at the coupler. **Special tool** **TOOL (A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **ABS control unit coupler (Harness end)**  I718H1450036-04 *Is the voltage same as Step 2?*	Replace the ABS control unit/HU.	Inspect the wire harness. (Faulty ignition or ground wire)

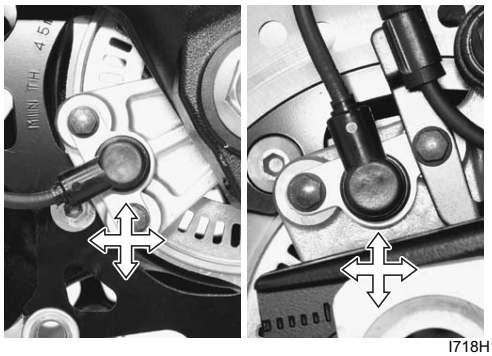
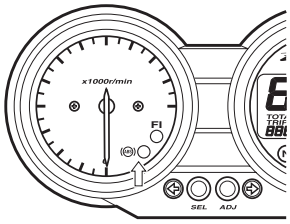
DTC “55” (C1655): ABS Control Unit Malfunction

B718H14504017

Possible Cause
Faulty ABS control unit

Troubleshooting

Step	Action	Yes	No
1	1) Inspect the clearances of the front and rear wheel speed sensor – sensor rotor using the thickness gauge. **Special tool** **(A): 09900–20803 (Thickness gauge)** **(B): 09900–20806 (Thickness gauge)** **Wheel speed sensor – sensor rotor clearance** **0.3 – 1.5 mm (0.012 – 0.059 in)** **Front**  I718H1450025-01 **Rear**  I718H1450026-01 *Are the clearances OK?*	Go to Step 2.	Adjust the clearance.
2	1) Inspect both of the wheel speed sensor rotors for damage and check that no foreign objects are caught in the rotor openings.  I718H1450064-01 *Are the rotors OK?*	Go to Step 3.	Clean or replace the rotor.

Step	Action	Yes	No
3	1) Check that the front and rear wheel speed sensors are mounted securely.  I718H1450097-01 *Are the sensors mounted securely?*	Go to Step 4.	Tighten the mounting bolts or replace the bracket if necessary.
4	1) Delete DTCs and repeat the code output procedure. Refer to “DTC (Diagnostic Trouble Code) Deleting (Page 4E-25)” and “DTC (Diagnostic Trouble Code) Output (Page 4E-23)”.  I718H1450122-04 *Is the DTC “55” (C1655) output again?*	Replace the ABS control unit/HU.	Intermittent trouble.

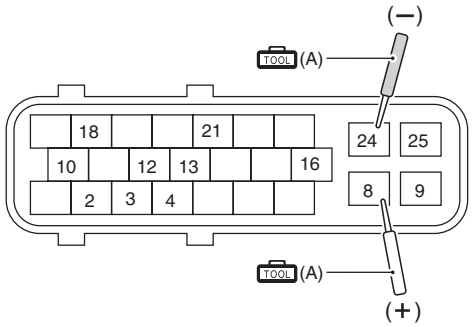
DTC “61” (C1661): ABS Solenoid Malfunction

B718H14504018

Possible Cause
Faulty solenoid valve or relay

Troubleshooting

Step	Action	Yes	No
1	1) Turn the ignition switch OFF. 2) Remove the seat. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”. 3) Inspect the ABS solenoid valve fuse. **⚠ CAUTION** **If a fuse is blown, find the cause of the problem and correct it before replacing the fuse.** **ABS solenoid valve fuse** **15 A**  I718H1450127-01 *Is the ABS solenoid valve fuse OK?*	Go to Step 2.	Replace the ABS solenoid valve fuse.

Step	Action	Yes	No
2	1) Check the ABS control unit coupler for loose or poor contacts. If OK, then disconnect the ABS control unit coupler. 2) Measure the voltage between “8” (R/Bl) and “24” (B/W) at the coupler. **Special tool** **(A): 09900–25008 (Multi-circuit tester set)** **Tester knob indication** **Voltage (⎓)** **Normal value (“8” – “24”)** **Battery voltage (12.0 V and more)** **ABS control unit coupler (Harness end)**  I718H1450096-02 *Is the voltage between “8” and “24” normal?*	Replace the ABS control unit/HU.	Inspect the wire harness. (Faulty solenoid or ground wire)

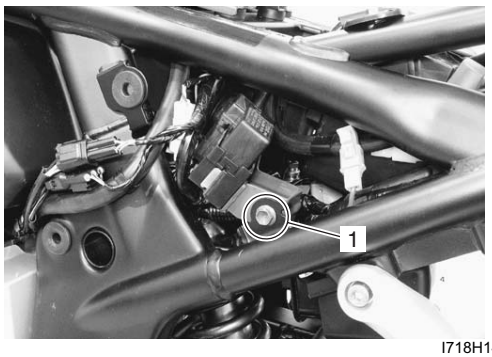
Repair Instructions

ABS Control Unit Coupler Disconnect and Connect

B718H14506003

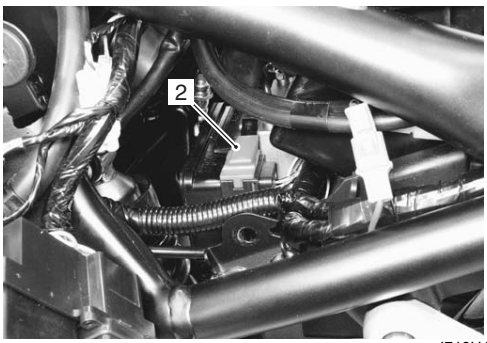
Disconnect

1) Turn the ignition switch OFF.
2) Remove the left frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
3) Remove the fuse box mounting bolt (1).



I718H1450028-01

4) Disconnect the ABS control unit coupler (2).



I718H1450029-01

Connect

Connect the ABS control unit coupler in the reverse order of disconnect.

Front Wheel Speed Sensor Removal and Installation

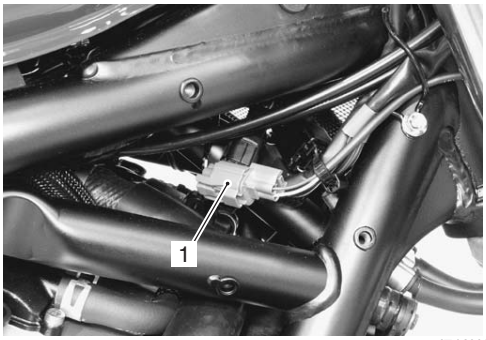
B718H14506004

⚠ CAUTION

- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **The wheel speed sensor cannot be disassembled.**

Removal

1) Turn the ignition switch OFF.
2) Remove the right frame head cover. (GSF1250A) Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.
3) Disconnect the front wheel speed sensor coupler (1).



I718H1450100-01

4) Remove the front wheel speed sensor mounting bolts.

I718H1450103-02

5) Remove the front wheel speed sensor as shown in the front wheel speed sensor routing diagram. Refer to “Front Wheel Speed Sensor Routing Diagram (Page 4E-9)”.

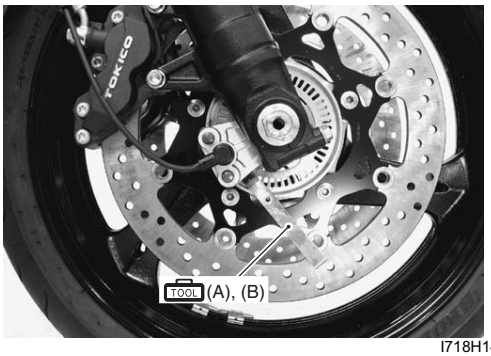
Installation

Refer to “Wheel Speed Sensor and Sensor Rotor Inspection (Page 4E-74)”.
Install the front wheel speed sensor in the reverse order of removal. Pay attention to the following points:

- Install the front wheel speed sensor as shown in the front wheel speed sensor routing diagram. Refer to “Front Wheel Speed Sensor Routing Diagram (Page 4E-9)”.
- Check the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge.

Special tool
TOOL (A): 09900–20803 (Thickness gauge)
TOOL (B): 09900–20806 (Thickness gauge)

Wheel speed sensor – sensor rotor clearance
0.3 – 1.5 mm (0.012 – 0.059 in)



I718H1450025-01

Rear Wheel Speed Sensor Removal and Installation

B718H14506005

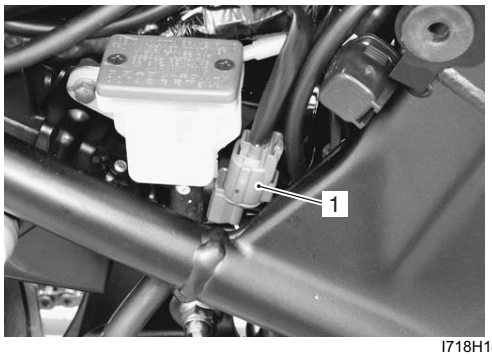
⚠ CAUTION

- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **The wheel speed sensor cannot be disassembled.**

Removal

1) Turn the ignition switch OFF.
2) Remove the right frame cover. Refer to “Exterior Parts Removal and Installation in Section 9D (Page 9D-6)”.

3) Disconnect the rear wheel speed sensor coupler (1).



I718H1450102-01

4) Remove the rear wheel speed sensor mounting bolts.

I718H1450101-02

5) Remove the rear wheel speed sensor as shown in the rear wheel speed sensor routing diagram. Refer to “Rear Wheel Speed Sensor Routing Diagram (Page 4E-11)”.

Installation

Refer to “Wheel Speed Sensor and Sensor Rotor Inspection (Page 4E-74)”.

Install the rear wheel speed sensor in the reverse order of removal. Pay attention to the following points:

- Install the rear wheel speed sensor as shown in the rear wheel speed sensor routing diagram. Refer to “Rear Wheel Speed Sensor Routing Diagram (Page 4E-11)”.
- Check the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge

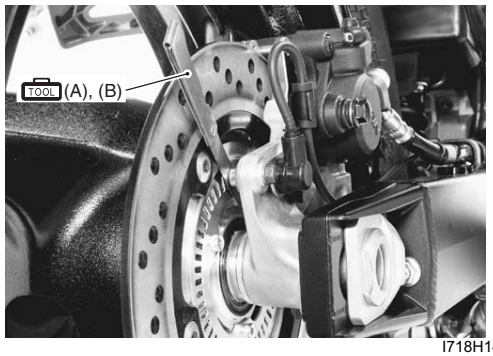
Special tool

TOOL (A): 09900–20803 (Thickness gauge)

TOOL (B): 09900–20806 (Thickness gauge)

Wheel speed sensor – sensor rotor clearance

0.3 – 1.5 mm (0.012 – 0.059 in)



I718H1450026-01

Front Wheel Speed Sensor Rotor Removal and Installation

B718H14506006

⚠ CAUTION

- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **Do not hit the front wheel speed sensor rotor when dismounting the front wheel.**

Removal

1) Remove the front wheel assembly. Refer to “Front Wheel Assembly Removal and Installation in Section 2D (Page 2D-6)”.
2) Remove the front wheel speed sensor rotor (1).

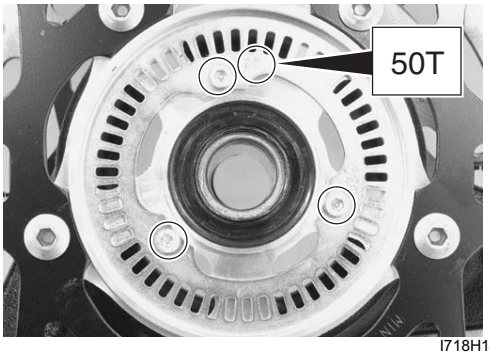
⚠ CAUTION

When replacing the tire, make sure not to damage the sensor rotor.

I718H1450104-01

Installation
Refer to “Wheel Speed Sensor and Sensor Rotor Inspection (Page 4E-74)”.
Install the front wheel speed sensor rotor in the reverse order of removal. Pay attention to the following points:

- Install the wheel speed sensor rotor as the letters “50T” face outside.

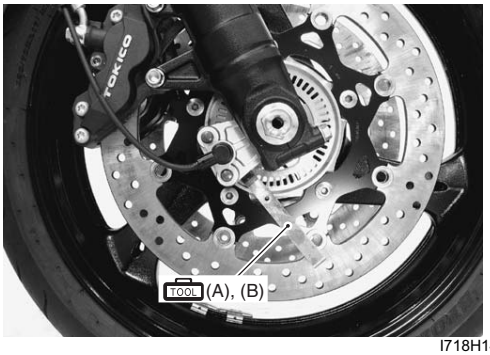


I718H1450105-02

- Install the front wheel assembly. Refer to “Front Wheel Assembly Removal and Installation in Section 2D (Page 2D-6)”.
- Check the clearance between the front wheel speed sensor and sensor rotor using the thickness gauge.

Special tool
(A): 09900–20803 (Thickness gauge)
(B): 09900–20806 (Thickness gauge)

Wheel speed sensor – sensor rotor clearance
0.3 – 1.5 mm (0.012 – 0.059 in)



I718H1450025-01

Rear Wheel Speed Sensor Rotor Removal and Installation

B718H14506007

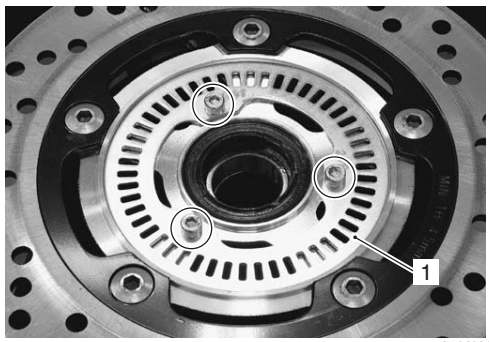
⚠ CAUTION

- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **Do not hit the rear wheel speed sensor rotor when dismounting the rear wheel.**

Removal
1) Remove the rear wheel assembly. Refer to “Rear Wheel Assembly Removal and Installation in Section 2D (Page 2D-16)”.
2) Remove the rear wheel speed sensor rotor (1).

⚠ CAUTION

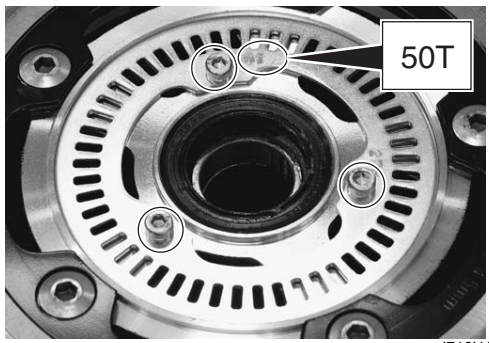
When replacing the tire, make sure not to damage the sensor rotor.



I718H1450106-02

Installation
Refer to “Wheel Speed Sensor and Sensor Rotor Inspection (Page 4E-74)”.
Install the rear wheel speed sensor rotor in the reverse order of removal. Pay attention to the following points:

- Install the wheel speed sensor rotor as the letters “50T” face outside.

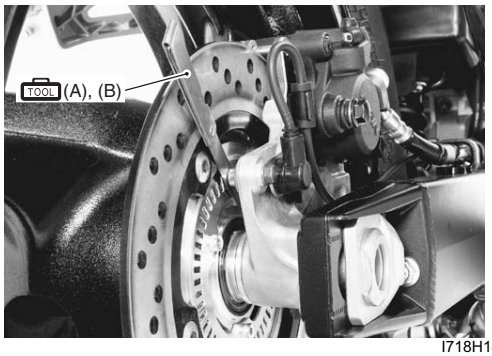


I718H1450107-02

- Install the rear wheel assembly. Refer to “Rear Wheel Assembly Removal and Installation in Section 2D (Page 2D-16)”.
- Check the clearance between the rear wheel speed sensor and sensor rotor using the thickness gauge.

Special tool
(A): 09900–20803 (Thickness gauge)
(B): 09900–20806 (Thickness gauge)

Wheel speed sensor – sensor rotor clearance
0.3 – 1.5 mm (0.012 – 0.059 in)



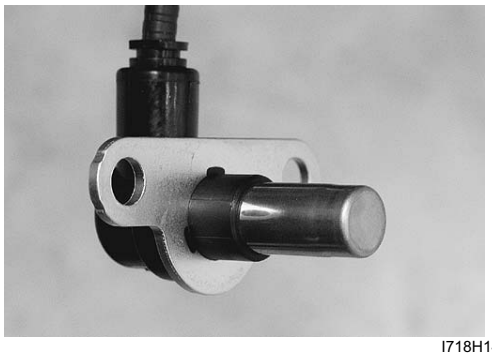
I718H1450026-01

Wheel Speed Sensor and Sensor Rotor Inspection

B718H14506008

Wheel Speed Sensor

1) Remove the wheel speed sensor. Refer to “Front Wheel Speed Sensor Removal and Installation (Page 4E-71)” and “Rear Wheel Speed Sensor Removal and Installation (Page 4E-71)”.
2) Inspect the wheel speed sensor for damage. Clean the sensor if any metal particle or foreign material stuck on it.


I718H1450108-01

3) After finishing the speed sensor inspection, install the wheel speed sensor.

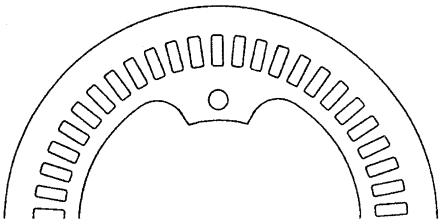
Wheel Speed Sensor Rotor

1) Raise the wheel off the ground and support the motorcycle with a jack or wooden block.

⚠ CAUTION

Make sure that the motorcycle is supported securely.

2) Check that no wheel speed sensor rotor teeth are broken and that no foreign objects are caught in the wheel speed sensor.


I718H1450064-01

ABS Control Unit/HU Removal and Installation

B718H14506009

Removal

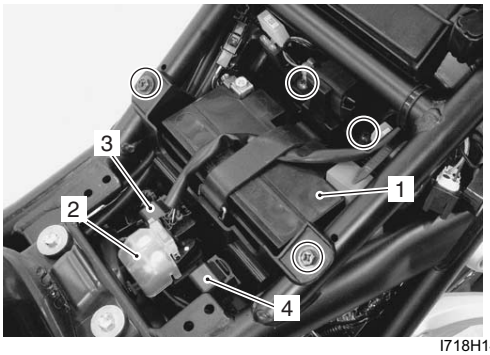
⚠ WARNING

When storing the brake fluid, seal the container completely and keep away from children.

⚠ CAUTION

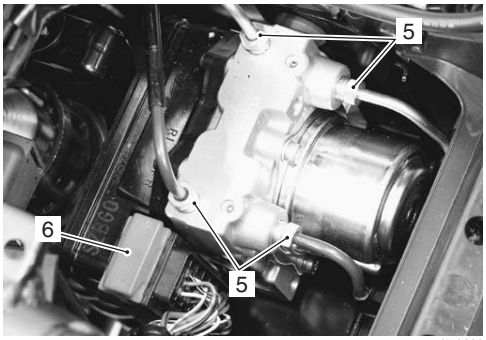
- **This brake system is filled with an ethylene glycol-based DOT 4 brake fluid. Do not mix different types of fluid such as silicone-based or petroleum-based.**
- **Do not use any brake fluid taken from old, used or unsealed containers. Never reuse brake fluid left over from the last servicing or stored for long periods.**
- **Handle brake fluid with care: the fluid reacts chemically with paint, plastics, rubber materials etc. and will damage then severely.**
- **The ABS is made up of many precision parts; never subject it to strong impacts or allow it to become dirty or dusty.**
- **The ABS control unit/HU cannot be disassembled.**

1) Remove the seat and frame covers. Refer to "Exterior Parts Removal and Installation in Section 9D (Page 9D-6)".
2) Remove the battery (1). Refer to "Battery Removal and Installation in Section 1J (Page 1J-12)".
3) Remove the starter relay (2) from the battery case.
4) Remove the cooling fan relay (3) and fuel pump relay (4) from the battery case.
5) Remove the battery case.



I718H1450128-01

6) Drain the brake fluid. Refer to "Brake Fluid Replacement in Section 4A (Page 4A-10)".
7) Loosen the flare nuts (5) and disconnect the brake pipes.
8) Disconnect the ABS control unit coupler (6).



I718H1450110-02

9) Remove the reservoir mounting bolt. Refer to "Rear Brake Master Cylinder Assembly Removal and Installation in Section 4A (Page 4A-18)".
10) Remove the ABS control unit/HU by removing the mounting bolts.


I718H1450111-01


I718H1450112-01

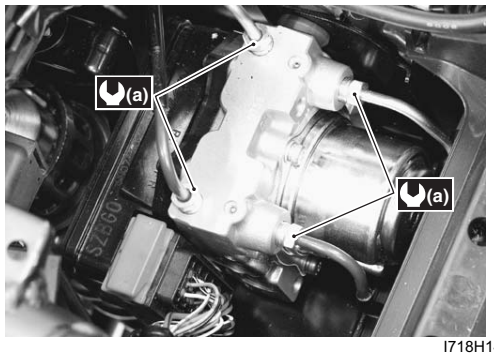
Installation
Installation is in the reverse order of removal. Pay attention to the following points:

⚠ CAUTION

- **Route the brake hoses and pipes correctly. Refer to "Front Brake Hose Routing Diagram in Section 4A (Page 4A-1)" or "Rear Brake Hose Routing Diagram in Section 4A (Page 4A-5)".**
- **Make sure to hold the brake pipe when tightening the flare nut, or it may be misaligned.**

- Tighten the brake pipe flare nuts to the specified torque.

Tightening torque
Brake pipe flare nut (a): 16 N·m (1.6 kgf-m, 11.5 lb-ft)



I718H1450113-03

- Bleed air from the brake fluid circuit. Refer to "Air Bleeding from Brake Fluid Circuit in Section 4A (Page 4A-8)".

Specifications

Tightening Torque Specifications

B718H14507001

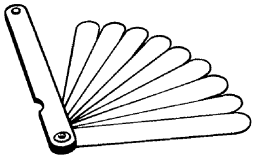
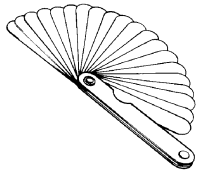
Fastening part	Tightening torque			Note
	N·m	kgf-m	lb-ft	
Brake pipe flare nut	16	1.6	11.5	☞(Page 4E-75)

Reference:
For the tightening torque of fastener not specified in this section, refer to “Tightening Torque Specifications in Section 0B (Page 0B-23)”.

Special Tools and Equipment

Special Tool

B718H14508001

09900–20803 Thickness gauge ☞(Page 4E-16) / ☞(Page 4E-35) / ☞(Page 4E-37) / ☞(Page 4E-39) / ☞(Page 4E-41) / ☞(Page 4E-44) / ☞(Page 4E-47) / ☞(Page 4E-55) / ☞(Page 4E-67) / ☞(Page 4E-71) / ☞(Page 4E-72) / ☞(Page 4E-73) / ☞(Page 4E-74)	
09900–20806 Thickness gauge ☞(Page 4E-16) / ☞(Page 4E-35) / ☞(Page 4E-37) / ☞(Page 4E-39) / ☞(Page 4E-41) / ☞(Page 4E-44) / ☞(Page 4E-47) / ☞(Page 4E-55) / ☞(Page 4E-67) / ☞(Page 4E-71) / ☞(Page 4E-72) / ☞(Page 4E-73) / ☞(Page 4E-74)	

09900–25008 Multi-circuit tester set ☞(Page 4E-15) / ☞(Page 4E-17) / ☞(Page 4E-19) / ☞(Page 4E-19) / ☞(Page 4E-20) / ☞(Page 4E-21) / ☞(Page 4E-21) / ☞(Page 4E-22) / ☞(Page 4E-46) / ☞(Page 4E-49) / ☞(Page 4E-50) / ☞(Page 4E-50) / ☞(Page 4E-51) / ☞(Page 4E-51) / ☞(Page 4E-52) / ☞(Page 4E-52) / ☞(Page 4E-53) / ☞(Page 4E-54) / ☞(Page 4E-54) / ☞(Page 4E-57) / ☞(Page 4E-58) / ☞(Page 4E-58) / ☞(Page 4E-59) / ☞(Page 4E-59) / ☞(Page 4E-60) / ☞(Page 4E-60) / ☞(Page 4E-61) / ☞(Page 4E-62) / ☞(Page 4E-62) / ☞(Page 4E-63) / ☞(Page 4E-63) / ☞(Page 4E-64) / ☞(Page 4E-65) / ☞(Page 4E-65) / ☞(Page 4E-66) / ☞(Page 4E-70)	09900–25009 Needle pointed probe set ☞(Page 4E-49) / ☞(Page 4E-50) / ☞(Page 4E-51) / ☞(Page 4E-52) / ☞(Page 4E-52) / ☞(Page 4E-57) / ☞(Page 4E-58) / ☞(Page 4E-59) / ☞(Page 4E-60) / ☞(Page 4E-60)
09904–41010 SDS set ☞(Page 4E-25) / ☞(Page 4E-27) / ☞(Page 4E-29)	09930–82710 Mode select switch ☞(Page 4E-5) / ☞(Page 4E-22) / ☞(Page 4E-23) / ☞(Page 4E-25)
99565–01010–010 CD-ROM Ver.10 ☞(Page 4E-25) / ☞(Page 4E-27) / ☞(Page 4E-29)	