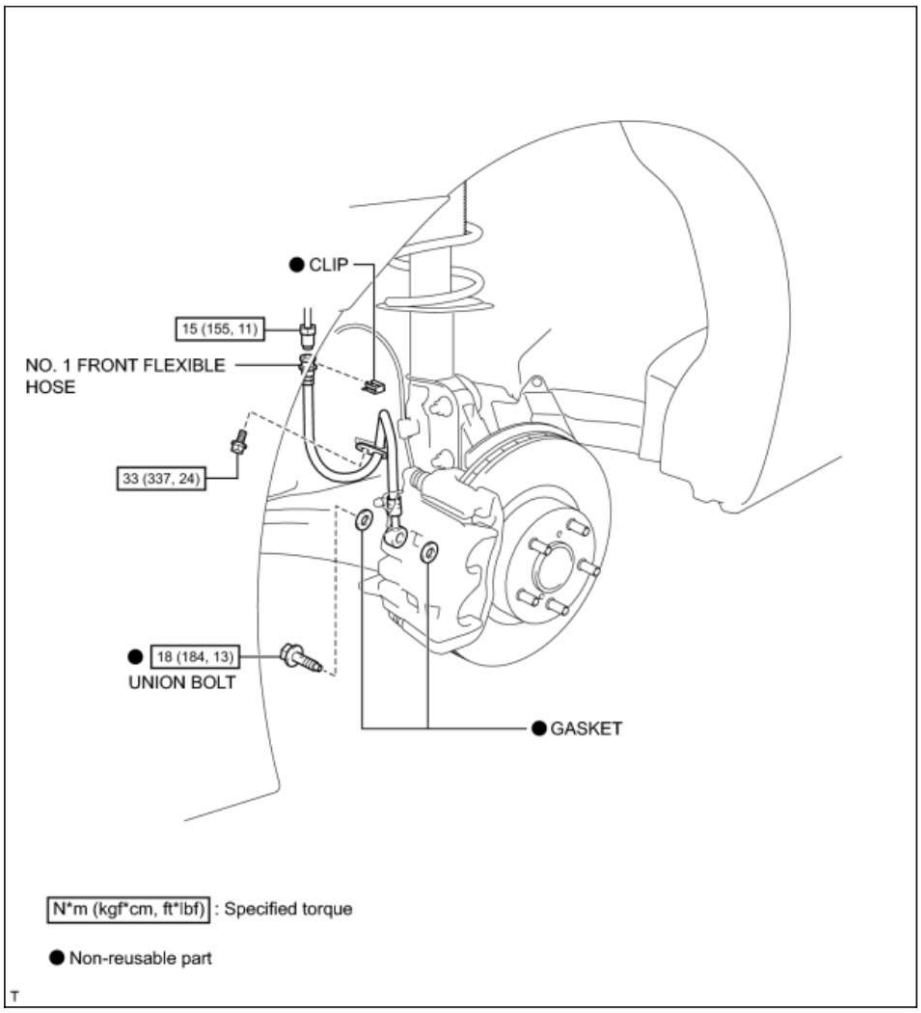
Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIT023X
Title: BRAKE (FRONT): FRONT BRAKE FLEXIBLE HOSE: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION



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-IA challenge.

Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIS021X
Title: BRAKE (FRONT): FRONT BRAKE FLEXIBLE HOSE: INSTALLATION (2013 FR-S)		

INSTALLATION

HINT:

- Use the same procedure for RH and LH sides.
- The procedure listed below is for LH side.

1. INSTALL NO. 1 FRONT FLEXIBLE HOSE

(a) Temporarily install the NO. 1 front flexible hose with a new clip.

NOTICE:

Securely install the clip.

(b) Hold the NO. 1 front flexible hose with a wrench using a union nut wrench.

Torque: 15 N·m (155 kgf·cm, 11ft·lbf)

NOTICE:

- Do not bend or damage the brake tube.
- Do not allow any foreign matter such as dirt and dust to enter the brake tube from the connecting point.
- Use the formula to calculate special torque values for situations where a union nut wrench is combined with a torque wrench INFO .

(c) Connect the No. 1 front flexible hose to the front shock absorber assembly with the bolt.

Torque: 33 N·m (337 kgf·cm, 24ft·lbf)

(d) Install the No. 1 flexible hose to the disc brake cylinder assembly with 2 new gaskets and the new union bolt.

Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

2. ADD BRAKE FLUID INFO

3. BLEED BRAKE LINE INFO

4. INSPECT BRAKE FLUID LEAK

5. INSPECT FLUID LEVEL INFO

6. INSTALL FRONT WHEEL

Torque: 120 N·m (1224 kgf·cm, 89ft·lbf)

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIU01XX
Title: BRAKE (FRONT): FRONT BRAKE FLEXIBLE HOSE: REMOVAL (2013 FR-S)		

REMOVAL

HINT:

- Use the same procedure for RH and LH sides.
- The procedure listed below is for LH side.

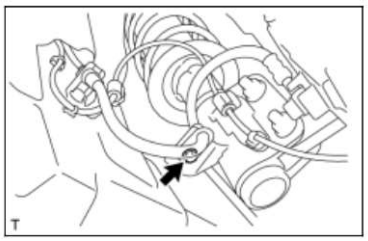
1. REMOVE FRONT WHEEL

2. DRAIN BRAKE FLUID

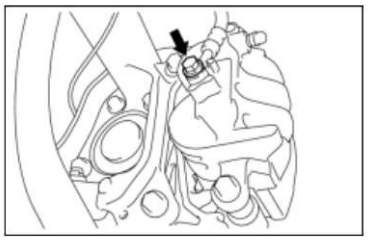
NOTICE:

Immediately wash off any brake fluid that comes into contact with any painted surfaces.

3. REMOVE NO. 1 FRONT FLEXIBLE HOSE



(a) Remove the bolt and separate the No. 1 front flexible hose from the front shock absorber assembly.



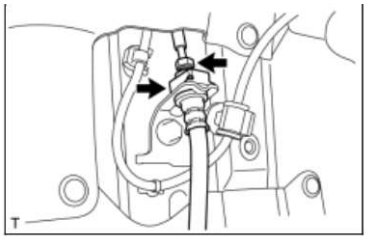
(b) Remove the union bolt, 2 gaskets and No. 1 front flexible hose.

(c) Hold the No. 1 flexible hose with a wrench and disconnect the brake tube using a union nut wrench.

NOTICE:

- Do not bend or damage the brake tube.
- Do not allow any foreign matter such as dirt and dust

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to enter the brake tube from the connecting position.

(d) Remove the clip.

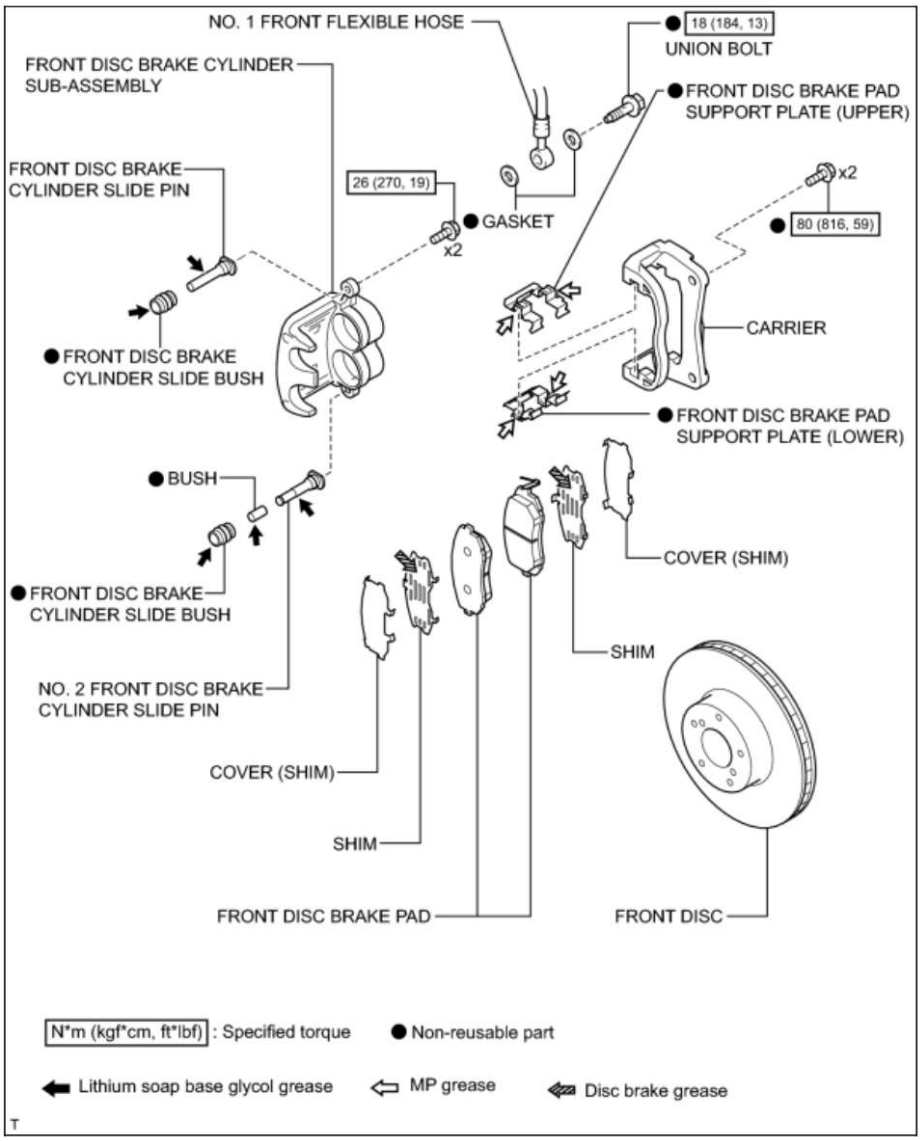
(e) Remove the No. 1 front flexible hose.

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIF02EX
Title: BRAKE (FRONT): FRONT BRAKE: COMPONENTS (2013 FR-S)		

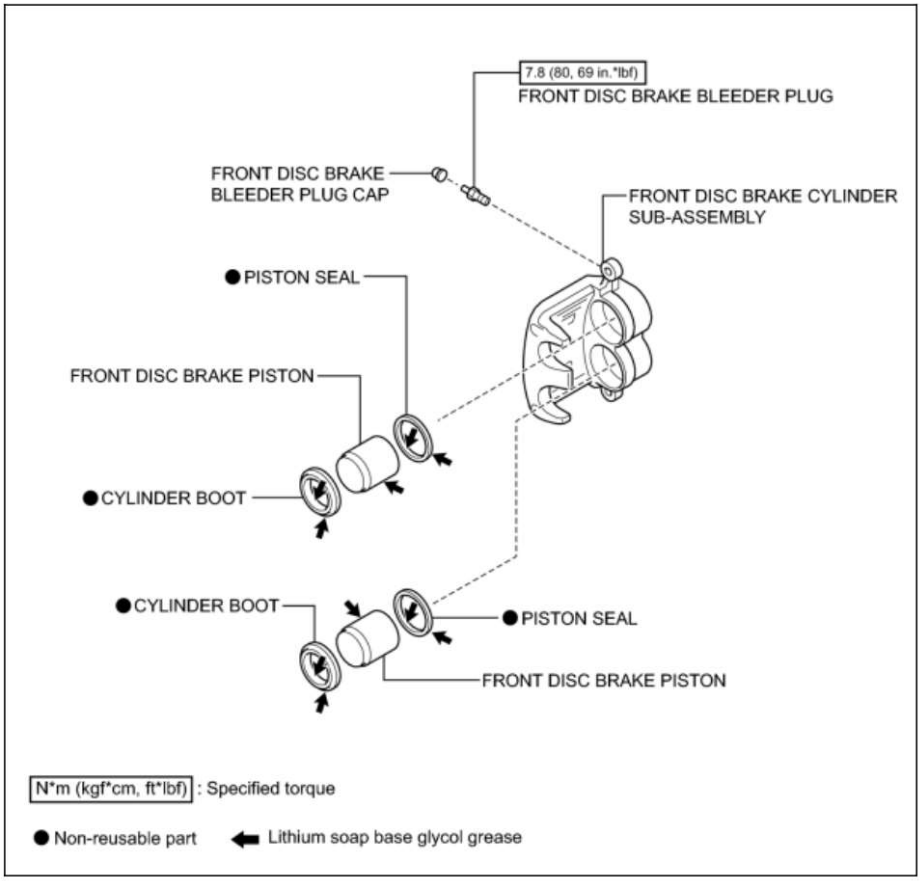
COMPONENTS

ILLUSTRATION



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ILLUSTRATION

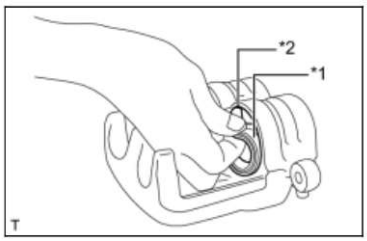


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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIH02BX
Title: BRAKE (FRONT): FRONT BRAKE: DISASSEMBLY (2013 FR-S)		

DISASSEMBLY

1. REMOVE CYLINDER BOOT



(a) Remove the 2 cylinder boots.

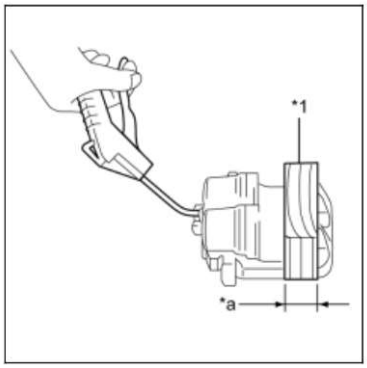
NOTICE:

To prevent damage to the front disc brake piston, remove the boot by hand, and not using a screwdriver or the like.

Text in Illustration

*1	Cylinder Boot
*2	Front Disc Brake Piston

2. REMOVE FRONT DISC BRAKE PISTON



(a) Place a wooden block between the front disc brake piston and disc cylinder.

Text in Illustration

*1	Wooden Block
*a	30 mm (1.811 in.)

(b) Slowly apply compressed air to remove the 2 front disc brake pistons from the cylinder.

CAUTION:

Do not place your fingers in front of the front disc brake piston when applying compressed air.

NOTICE:

Do not spatter the brake fluid.

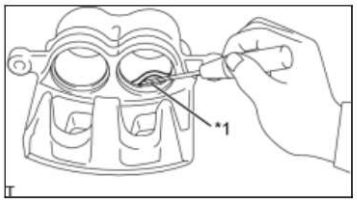
HINT:

If the front disc brake piston has been damaged, replace it with a new one.

(c) Remove the wooden block.

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3. REMOVE PISTON SEAL



(a) Using a screwdriver with its tip wrapped in protective tape, remove the 2 piston seals from the disc brake cylinder.

Text in Illustration

*1	Protective Tape

NOTICE:

Do not damage the inner surface or piston seal groove of the cylinder.

4. REMOVE FRONT DISC BRAKE BLEEDER PLUG CAP

(a) Remove the front disc brake bleeder plug cap from the front disc brake bleeder plug.

5. REMOVE FRONT DISC BRAKE BLEEDER PLUG

(a) Remove the front disc brake bleeder plug.

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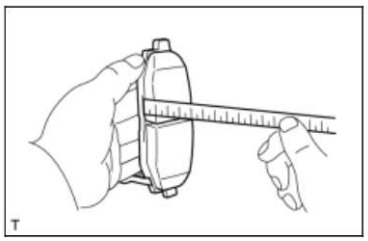
Last Modified: 3-27-2012	6.4 G	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM0000010KR014X
Title: BRAKE (FRONT): FRONT BRAKE: INSPECTION (2013 FR-S)		

INSPECTION

1. CHECK BRAKE CYLINDER AND PISTON

(a) Check the cylinder bore and piston for rust and scoring. If necessary, replace the disc brake cylinder and piston.

2. CHECK PAD LINING THICKNESS

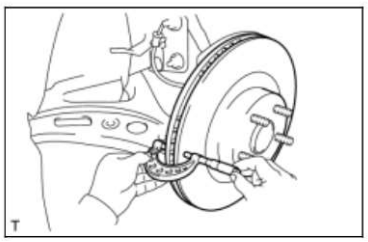


(a) Using a ruler, measure the pad lining thickness.

Standard thickness:
1.5 mm (0.0591 in.)
Minimum thickness:
11.0 mm (0.4331 in.)

If the pad lining thickness is lower/under the minimum, replace the pad.

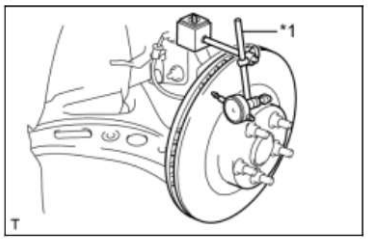
3. CHECK DISC THICKNESS



(a) Using a micrometer, measure the disc thickness.

Standard Thickness:
24.0 mm (0.945 in.)
Minimum Thickness:
22.0 mm (0.866 in.)

4. CHECK DISC RUNOUT



(a) Check the bearing play in the axial direction and check the axle hub runout INFO .

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(b) Tighten the disc with the 5 nuts.

Torque: 120 N·m (1224 kgf·cm, 89ft·lbf)

(c) Using a dial indicator, measure the disc runout 10 mm (0.394 in.) away from the outer edge of the front disc.

Text in Illustration

*1	Dial Indicator

Maximum disc runout:
0.05 mm (0.0020 in.)

NOTICE:

- Do not bring the magnetic base near the axle hub and speed sensor.
- Set the magnetic base on the shock absorber.
- If the runout exceeds the maximum value, change the installation positions of the disc and axle to make the minimum runout. If the runout exceeds the maximum even when the installation positions are changed, replace the front disc.

(d) Remove the 5 hub nuts and front disc.

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIE02MX
Title: BRAKE (FRONT): FRONT BRAKE: INSTALLATION (2013 FR-S)		

INSTALLATION

HINT:

- Use the same procedure for RH and LH sides.
- The procedure listed below is for LH side.

1. INSTALL FRONT DISC

(a) When reusing the disc

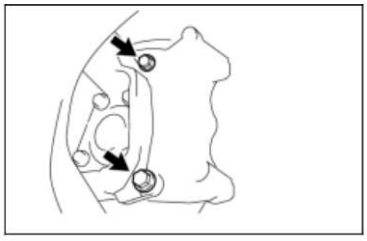
(1) Align the matchmarks placed when removing, and install the front disc to the axle hub.

(b) When replacing the front disc

(1) Install a new front disc to the axle hub and measure the disc runout INFO .

(c) Temporarily tighten the hub nut and fix the front disc to the axle hub.

2. INSTALL CARRIER

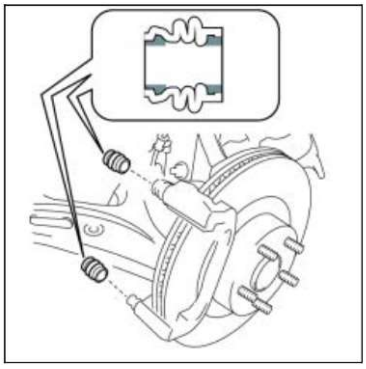


(a) Install the carrier with the 2 new bolts.

Torque: 80 N·m (816 kgf·cm, 59ft·lbf)

3. INSTALL FRONT DISC BRAKE CYLINDER SLIDE BUSH

(a) Apply a light layer of lithium soap base glycol grease to the inner face of the 2 new front disc brake cylinder slide bushes as shown in the illustration.



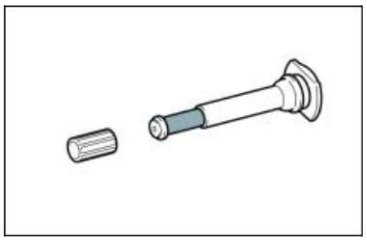
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Text in Illustration

	Lithium Soap Base Glycol Grease

4. INSTALL BUSH

(a) Apply a light layer of lithium soap base glycol grease to the contact surface of the No. 2 front disc brake cylinder slide pin with a new bush.



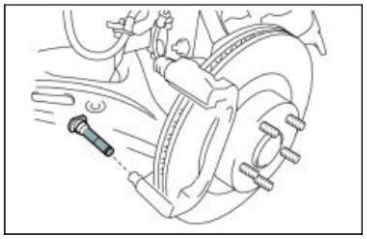
Text in Illustration

	Lithium Soap Base Glycol Grease

(b) Install the bush to the No. 2 front disc brake cylinder slide pin.

5. INSTALL NO. 2 FRONT DISC BRAKE CYLINDER SLIDE PIN

(a) Apply a light layer of lithium soap base glycol grease to the entire circumference of the No. 2 front disc brake cylinder slide pin, as shown in the illustration.



Text in Illustration

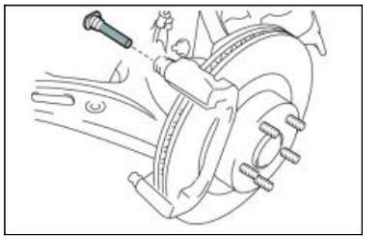
	Lithium Soap Base Glycol Grease

(b) Install the No. 2 front disc brake cylinder slide pin to the carrier.

6. INSTALL FRONT DISC BRAKE CYLINDER SLIDE PIN

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(a) Apply a light layer of lithium soap base glycol grease to the entire circumference of the front disc brake cylinder slide pin, as shown in the illustration.



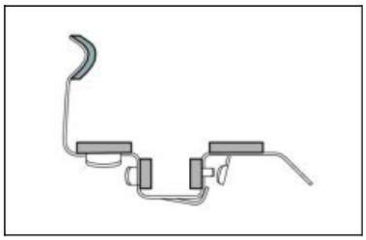
Text in Illustration

▭	Lithium Soap Base Glycol Grease

(b) Install the front disc brake cylinder slide pin to the carrier.

7. INSTALL FRONT DISC BRAKE PAD SUPPORT PLATE (LOWER)

(a) Apply MP grease to the front disc brake pad support plate (lower) as shown in the illustration.



Text in Illustration

▭	MP grease

8. INSTALL FRONT DISC BRAKE PAD SUPPORT PLATE (UPPER)

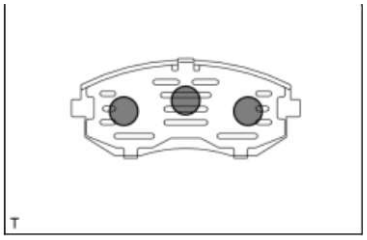
HINT:

Use the same procedure as for the front disc brake pad support plate (lower).

9. INSTALL FRONT DISC BRAKE CYLINDER SUB-ASSEMBLY

(a) Apply disc brake grease to both sides of the shim.

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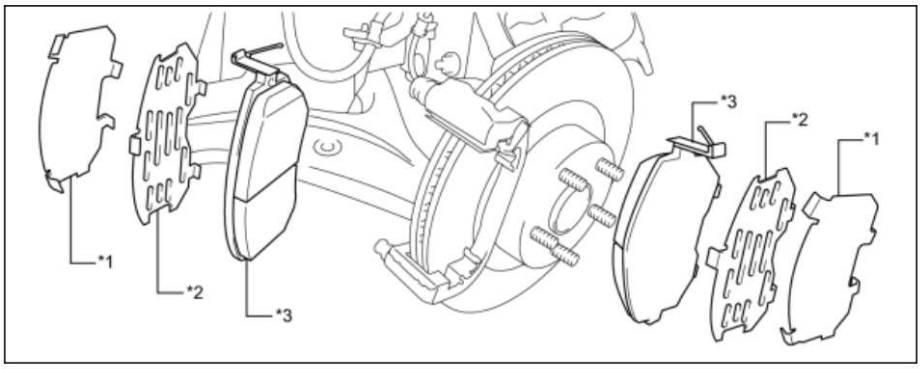


Text in Illustration

	Disc Brake Grease

(b) Install the covers (shim) to each front disc brake pad.

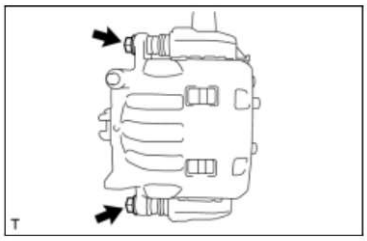
(c) Install the disc brake pads, covers (shim) and shims to the carrier.



Text in Illustration

*1	Cover (Shim)	*2	Shim
*3	Disc Brake Pad	-	-

10. INSTALL FRONT DISC BRAKE CYLINDER SUB-ASSEMBLY



(a) Install the front disc brake cylinder assembly LH to the carrier with the 2 bolts.

Torque: 26 N·m (270 kgf·cm, 19ft·lbf)

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11. CONNECT NO. 1 FRONT FLEXIBLE HOSE

(a) Install the No. 1 front flexible hose to the disc brake cylinder assembly with 2 new gaskets and the new union bolt.

Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

12. ADD BRAKE FLUID INFO

13. BLEED BRAKE LINE INFO

14. INSPECT FLUID LEAK

15. INSPECT FLUID LEVEL INFO

16. INSTALL FRONT WHEEL

Torque: 120 N·m (1224 kgf·cm, 89ft·lbf)



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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIJ02DX
Title: BRAKE (FRONT): FRONT BRAKE: REASSEMBLY (2013 FR-S)		

REASSEMBLY

1. TEMPORARILY INSTALL FRONT DISC BRAKE BLEEDER PLUG

(a) Temporarily install the front disc brake bleeder plug to the front disc brake cylinder assembly LH.

2. INSTALL FRONT DISC BRAKE BLEEDER PLUG CAP

(a) Install the front disc brake bleeder plug cap on the front disc brake bleeder plug.

3. INSTALL PISTON SEAL

(a) Apply a light layer of lithium soap base glycol grease to the entire circumference of 2 new piston seals.



Text in Illustration

	Lithium Soap Base Glycol Grease

(b) Securely install the 2 piston seals into the grooves of the disc brake cylinder.

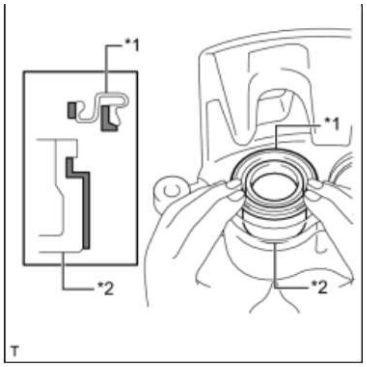
NOTICE:

Securely install the piston seal into the groove of the disc brake cylinder.

4. INSTALL FRONT DISC BRAKE PISTON

(a) Apply a light layer of lithium soap base glycol grease to the entire circumference of a new cylinder boot as shown in the illustration.

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Text in Illustration

*1	Cylinder Boot
*2	Front Disc Brake Piston
	Lithium Soap Base Glycol Grease

(b) Securely install the cylinder boot into the grooves of the front disc brake piston.

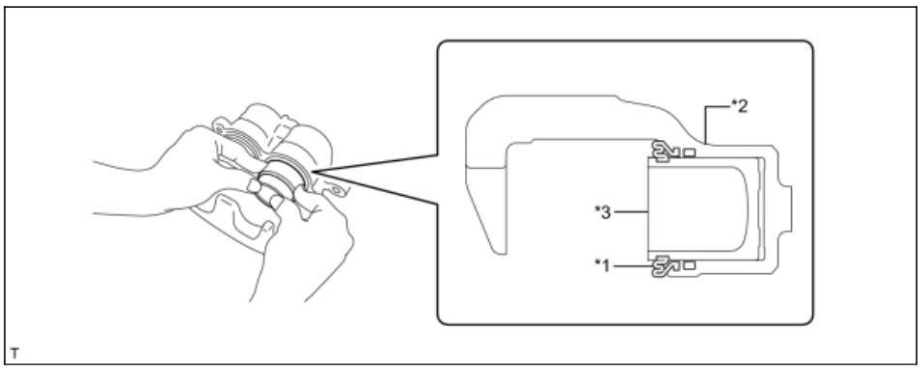
(c) Apply a light of lithium soap base glycol grease to the entire circumference of the 2 front disc brake pistons and install them to the front disc brake cylinder LH.

NOTICE:

Do not install the piston forcibly in the disc brake cylinder.

5. INSTALL CYLINDER BOOT

(a) Securely install the cylinder boot into the groove of the front disc brake cylinder LH.



Text in Illustration

*1	Cylinder Boot	*2	Front Disc Brake Cylinder Assembly LH
*3	Front Disc Brake Piston	-	-

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIG02JX
Title: BRAKE (FRONT): FRONT BRAKE: REMOVAL (2013 FR-S)		

REMOVAL

HINT:

- Use the same procedure for the RH and LH sides.
- The procedure listed below is for the LH side.

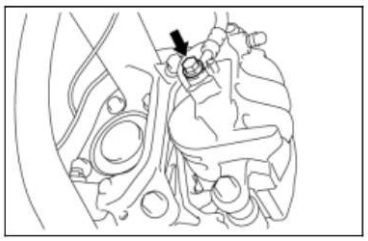
1. REMOVE FRONT WHEEL

2. DRAIN BRAKE FLUID

NOTICE:

Immediately wash off any brake fluid that comes into contact with any painted surfaces.

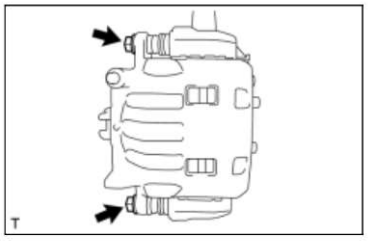
3. DISCONNECT NO. 1 FRONT FLEXIBLE HOSE



(a) Remove the union bolt, 2 gaskets and disconnect the No. 1 front flexible hose from the disc brake cylinder assembly LH.

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4. REMOVE FRONT DISC BRAKE CYLINDER SUB-ASSEMBLY

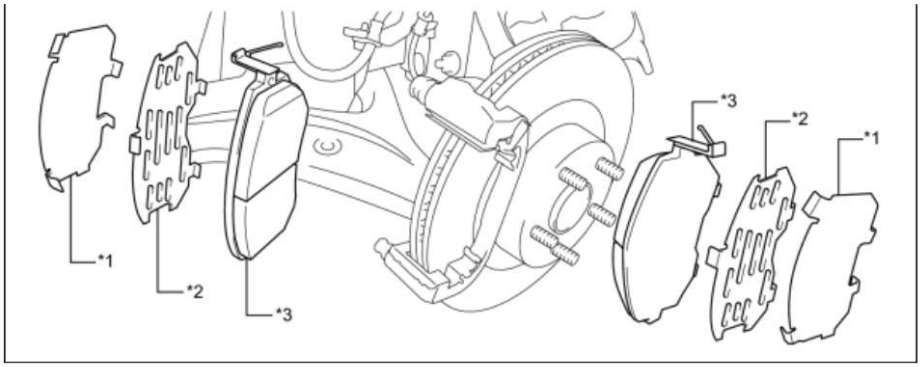


(a) Remove the 2 bolts and front disc brake cylinder sub-assembly.

5. REMOVE FRONT DISC BRAKE PAD

(a) Remove the disc brake pads from the carrier.

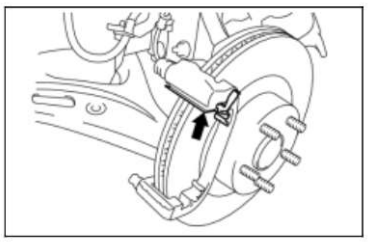
(b) Remove the covers (shims) and shims from each pad.



Text in Illustration

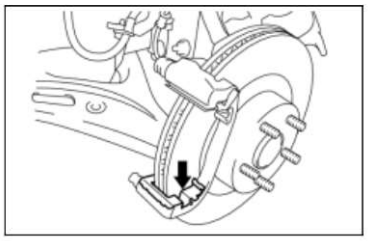
*1	Cover (shim)	*2	Shim
*3	Disc Brake Pad	-	-

6. REMOVE FRONT DISC BRAKE PAD SUPPORT PLATE (UPPER)



(a) Remove the front disc brake pad support plate (upper) from the carrier.

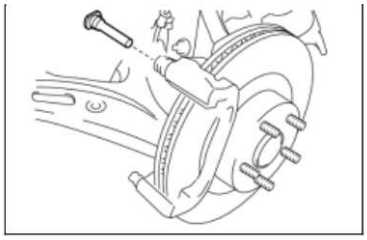
7. REMOVE FRONT DISC BRAKE PAD SUPPORT PLATE (LOWER)



(a) Remove the front disc brake pad support plate (lower) from the carrier.

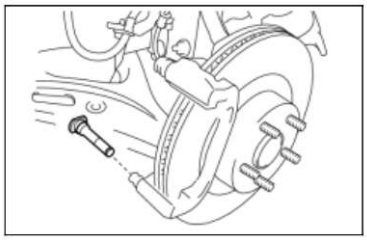
8. REMOVE FRONT DISC BRAKE CYLINDER SLIDE PIN

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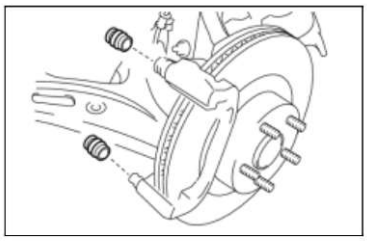
(a) Remove the front disc brake cylinder slide pin from the carrier.

9. REMOVE NO. 2 FRONT DISC BRAKE CYLINDER SLIDE PIN



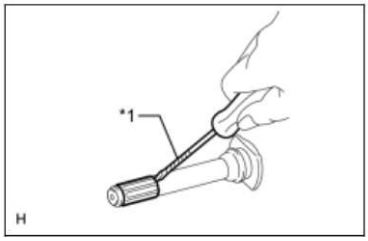
(a) Remove the No. 2 front disc brake cylinder slide pin from the carrier.

10. REMOVE FRONT DISC BRAKE CYLINDER SLIDE BUSH



(a) Remove the 2 front disc brake cylinder slide bushes from the carrier.

11. REMOVE BUSH



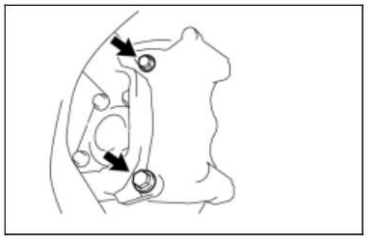
(a) Using a screwdriver with its tip wrapped in protective tape, remove the bush from the pin (B).

Text in Illustration

*1	Protective Tape

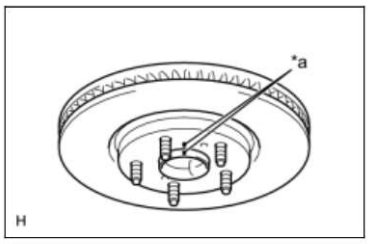
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12. REMOVE CARRIER



(a) Remove the 2 bolts and carrier.

13. REMOVE FRONT DISC



(a) Place matchmarks on the front disc and front axle hub.

HINT:

It is not necessary when replacing the disc.

Text in Illustration

*a	Matchmark

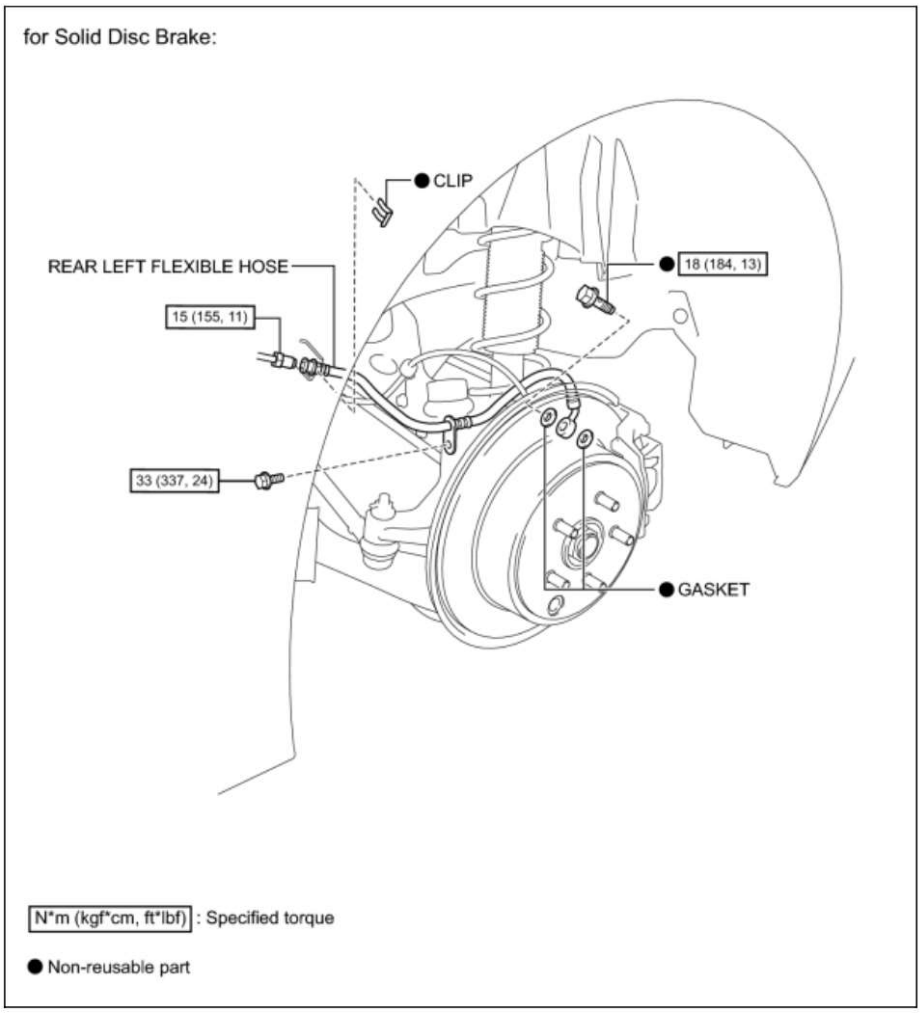
(b) Remove the front disc.

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIW01CX
Title: BRAKE (REAR): REAR BRAKE FLEXIBLE HOSE: COMPONENTS (2013 FR-S)		

COMPONENTS

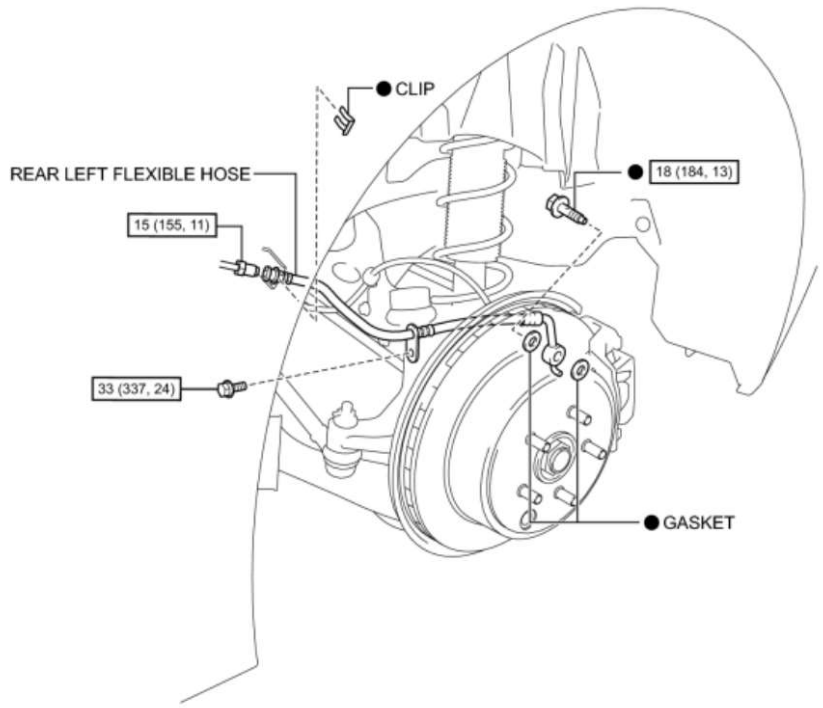
ILLUSTRATION



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ILLUSTRATION

for Ventilated Disc Brake:



N*m (kgf*cm, ft*lbf) : Specified torque

● Non-reusable part

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIV017X
Title: BRAKE (REAR): REAR BRAKE FLEXIBLE HOSE: INSTALLATION (2013 FR-S)		

INSTALLATION

HINT:

- Use the same procedure for RH and LH sides.
- The procedure listed below is for LH side.

1. INSTALL REAR LEFT FLEXIBLE HOSE

(a) Connect the rear left flexible hose with a new clip.

NOTICE:

Securely install the clip.

(b) Hold the rear left flexible hose with a wrench and connect the brake tube to the rear left flexible hose using a union nut wrench.

Torque: 15 N·m (155 kgf·cm, 11ft·lbf)

NOTICE:

- Do not bend or damage the brake tube.
- Do not allow any foreign matter such as dirt and dust to enter the brake tube from the connecting position.
- Use the formula to calculate special torque wrench is combined with a torque wrench INFO .

(c) Connect the rear left flexible hose to the rear carrier LH with the bolt.

Torque: 33 N·m (337 kgf·cm, 24ft·lbf)

(d) Connect the rear left flexible hose to the rear disc brake cylinder assembly LH with a new 2 gaskets and the new union bolt.

Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

2. ADD BRAKE FLUID INFO

3. BLEED BRAKE LINE INFO

4. INSPECT BRAKE FLUID LEAK

5. INSPECT FLUID LEVEL INFO

6. INSTALL REAR WHEEL

Torque: 120 N·m (1224 kgf·cm, 88ft·lbf)

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIX015X
Title: BRAKE (REAR): REAR BRAKE FLEXIBLE HOSE: REMOVAL (2013 FR-S)		

REMOVAL

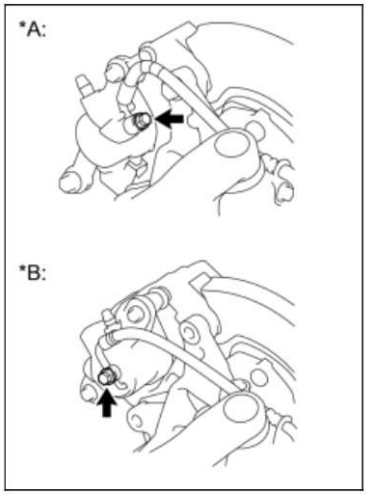
HINT:

- Use the same procedure for RH and LH sides.
- The procedure listed below is for LH side.

1. REMOVE REAR WHEEL

2. DRAIN BRAKE FLUID

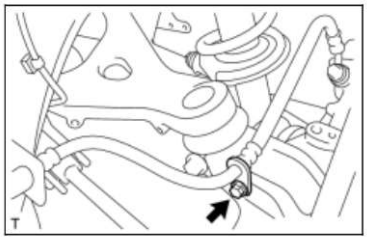
3. REMOVE REAR LEFT FLEXIBLE HOSE



(a) Remove the union bolt and 2 gaskets, and disconnect the rear left flexible hose from the rear disc brake cylinder LH.

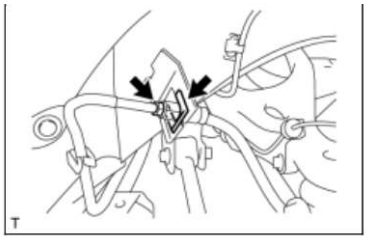
Text in Illustration

*A	Solid Disc Brake
*B	Ventilated Disc Brake



(b) Remove the bolt and separate the rear left flexible hose from the rear carrier LH.

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(c) Hold the rear left flexible hose with a wrench and disconnect the brake tube using a union nut wrench.

NOTICE:

- Do not bend or damage the brake tube.
- Do not allow any foreign matter such as dirt and dust to enter the brake tube from the connecting position.

(d) Remove the clip.

(e) Remove the rear left flexible hose.

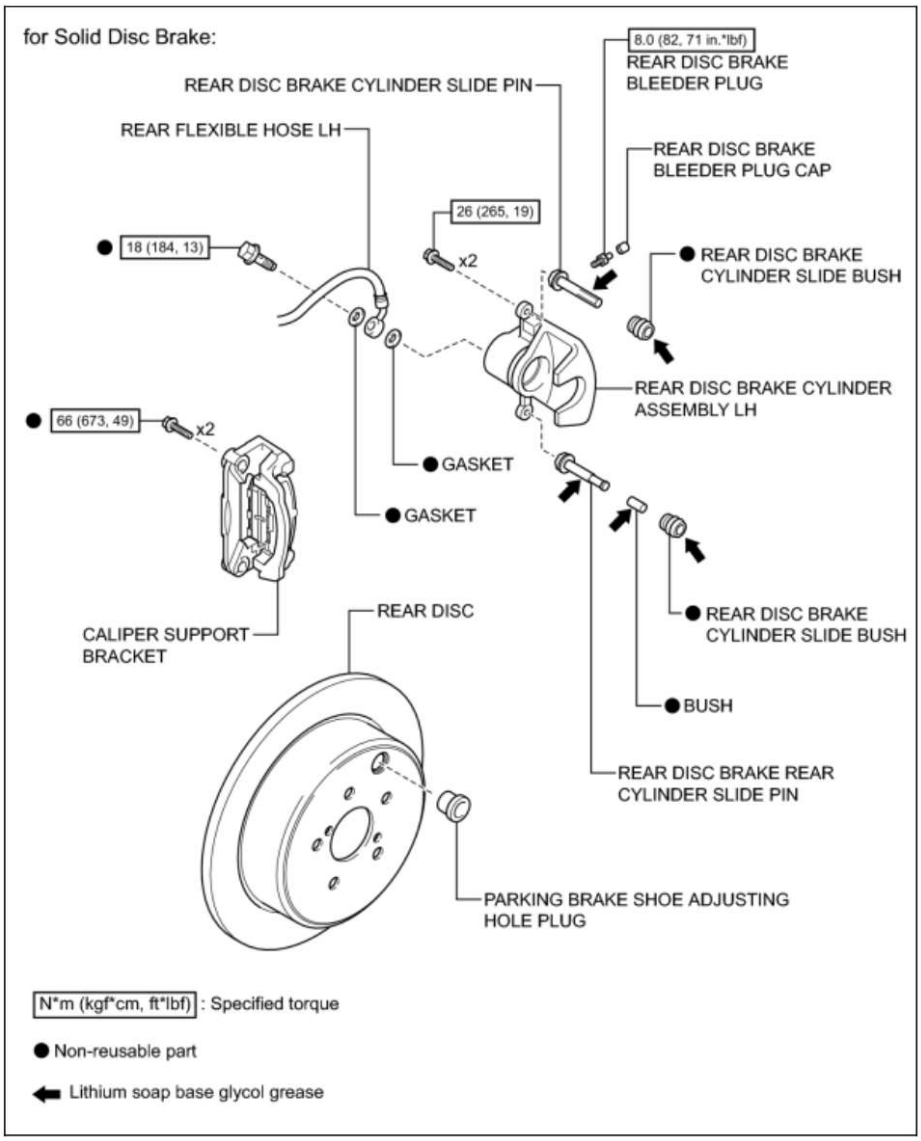
TOYOTA

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIL015X
Title: BRAKE (REAR): REAR BRAKE: COMPONENTS (2013 FR-S)		

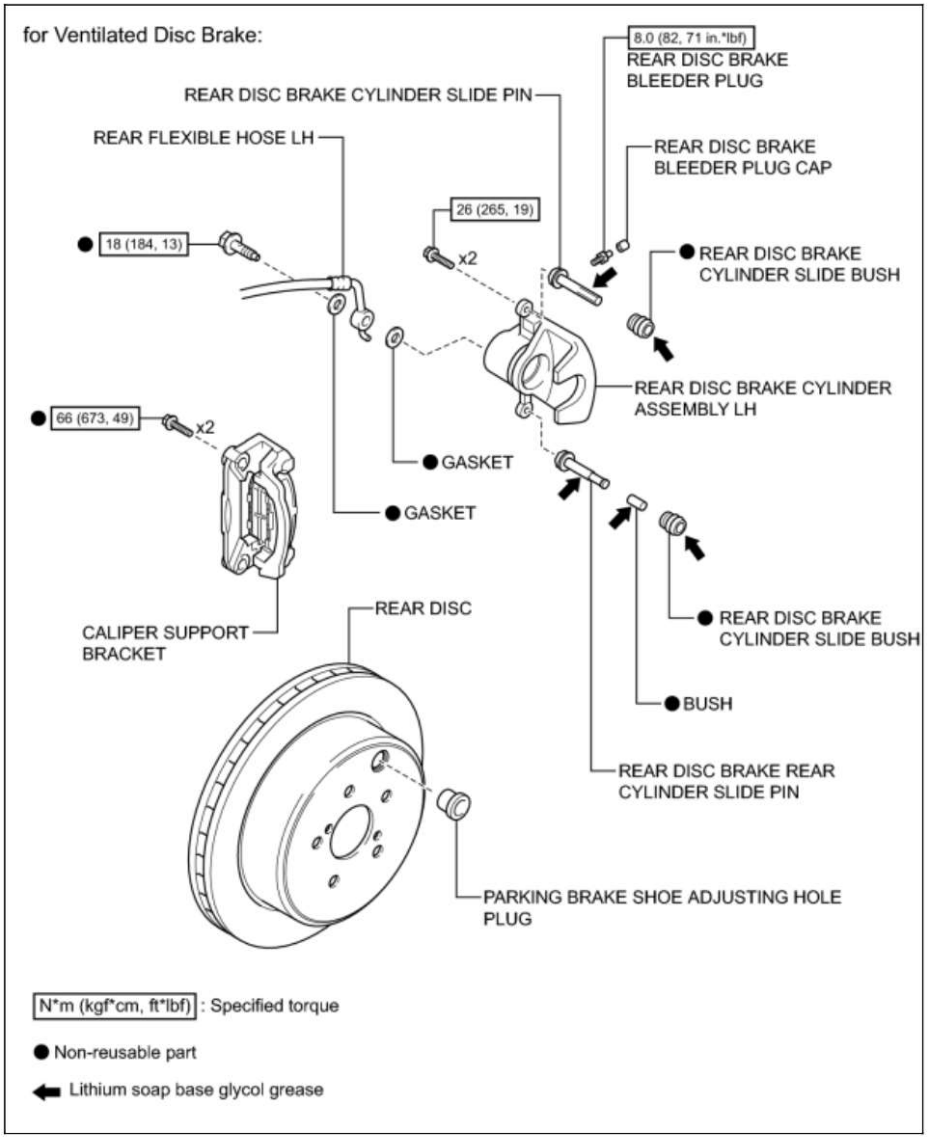
COMPONENTS

ILLUSTRATION



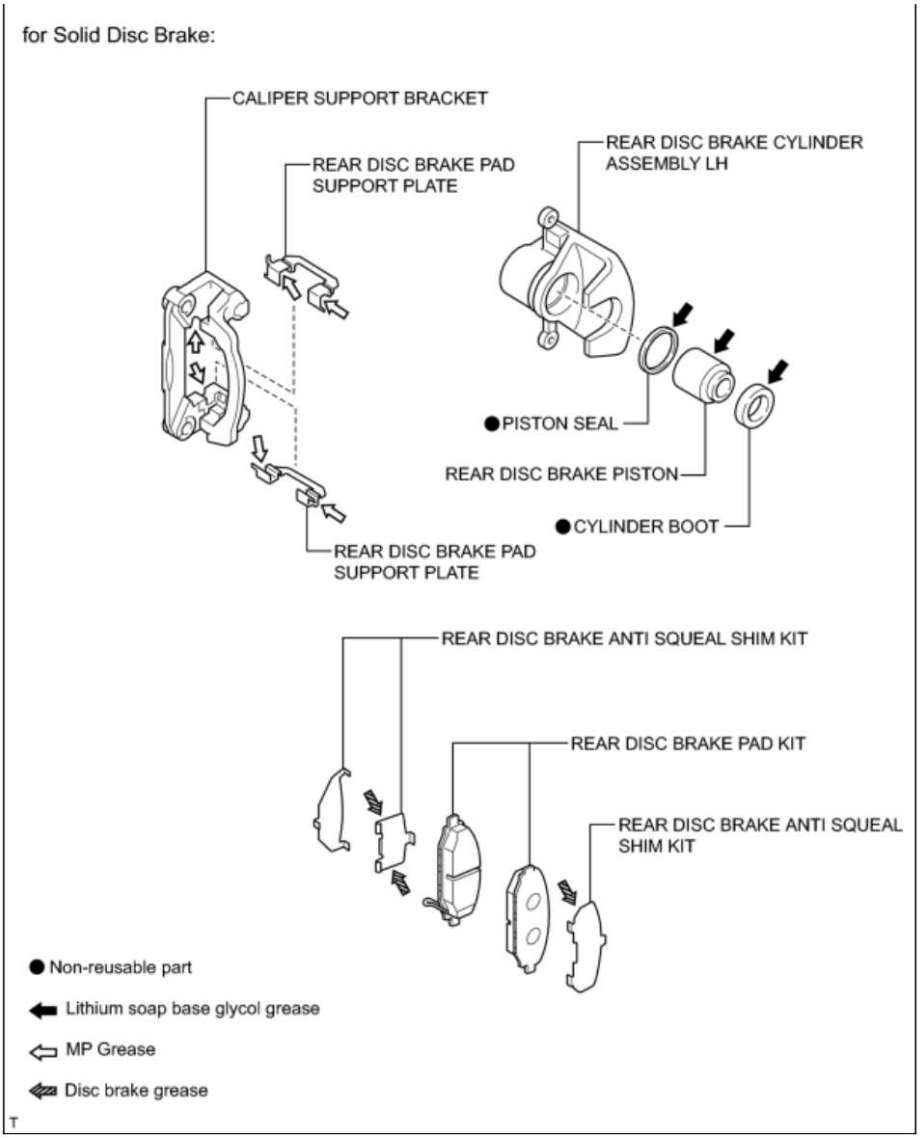
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ILLUSTRATION



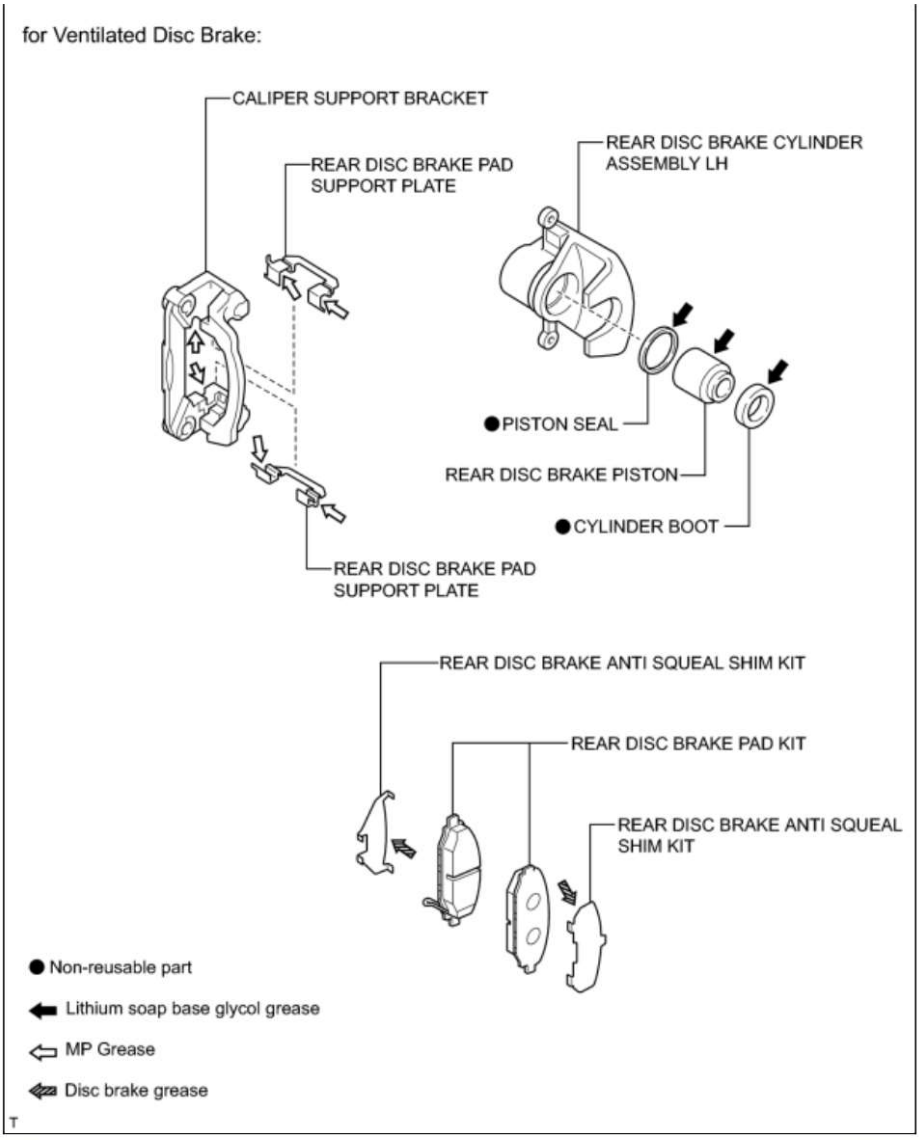
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ILLUSTRATION



ILLUSTRATION

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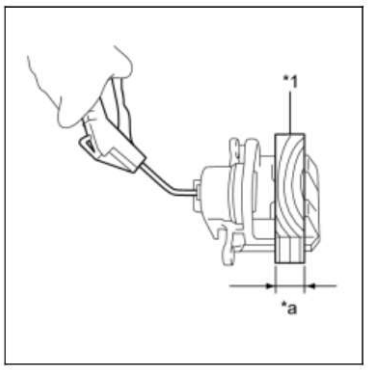


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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIN00YX
Title: BRAKE (REAR): REAR BRAKE: DISASSEMBLY (2013 FR-S)		

DISASSEMBLY

1. REMOVE REAR DISC BRAKE PISTON



(a) Place a wooden block between the rear disc brake piston and disc brake cylinder.

Text in Illustration

*1	Wooden Block
*a	30 mm (1.1811 in.)

(b) Slowly apply compressed air to remove the disc brake piston.

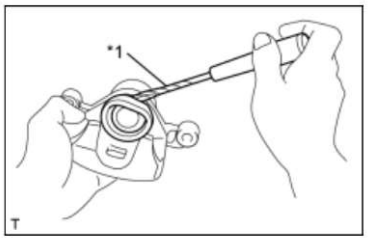
CAUTION:

Do not place your fingers in front of the piston when using compressed air.

NOTICE:

Do not spatter brake fluid.

2. REMOVE CYLINDER BOOT



(a) Using a screwdriver with its tip wrapped in protective tape, remove the cylinder boot from the disc brake cylinder.

NOTICE:

Do not damage the inner surface or groove of the cylinder.

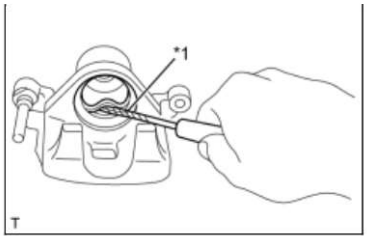
Text in Illustration

*1	Protective Tape

3. REMOVE PISTON SEAL

(a) Using a screwdriver with its tip wrapped in protective tape, remove the piston seal.

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Text in Illustration

*1	Protective Tape

NOTICE:

Do not damage the inner surface or piston seal groove of the cylinder.

4. REMOVE REAR DISC BRAKE BLEEDER PLUG CAP

(a) Remove the rear disc brake bleeder plug cap from the rear disc brake bleeder plug.

5. REMOVE REAR DISC BRAKE BLEEDER PLUG

(a) Remove the rear disc brake bleeder plug from the rear disc brake cylinder assembly LH.

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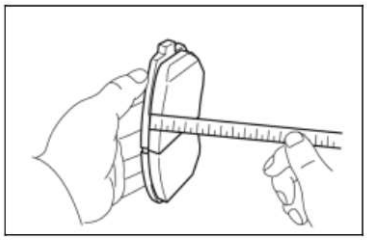
Last Modified: 3-27-2012	6.4 G	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001ED100LX
Title: BRAKE (REAR): REAR BRAKE: INSPECTION (2013 FR-S)		

INSPECTION

1. CHECK BRAKE CYLINDER AND PISTON

(a) Check the cylinder bore and piston for rust and scoring.

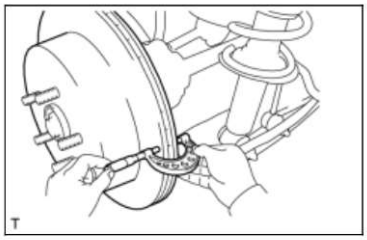
2. INSPECT PAD LINING THICKNESS



(a) Using a ruler, measure the pad lining thickness.

SPECIFICATION	MINIMUM THICKNESS	STANDARD THICKNESS
Solid Type	1.5 mm (0.059 in.)	9.0 mm (0.354 in.)
Ventilated Type	1.5 mm (0.059 in.)	11.0 mm (0.433 in.)

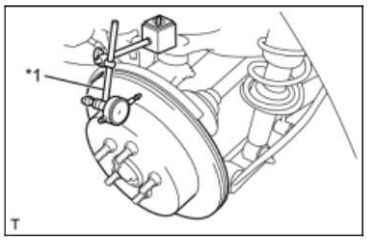
3. INSPECT DISC THICKNESS



(a) Using a micrometer, measure the disc thickness.

SPECIFICATION	MINIMUM THICKNESS	STANDARD THICKNESS
Solid Type	8.5 mm (0.3346 in.)	10.0 mm (0.3937 in.)
Ventilated Type	16.5 mm (0.6496 in.)	18.0 mm (0.7087 in.)

4. INSPECT DISC RUNOUT



(a) Check the bearing play in the axial direction and check for the axle hub runout INFO .

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(b) Tighten the disc with the 5 nuts.

Torque: 120 N·m (1224 kgf·cm, 89ft·lbf)

(c) Using a dial indicator, measure the disc runout 10 mm (0.394 in.) away from the outer edge of the rear disc.

Text in Illustration

*1	Dial Indicator

Maximum disc runout:
0.05 mm (0.0020 in.)

NOTICE:

- If the runout exceeds the maximum value, change the installation positions of the disc and axle to make the minimum runout. If the runout exceeds the maximum even when the installation positions are changed, replace the front disc.

(d) Remove the 5 hub nuts and rear disc.

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIK01IX
Title: BRAKE (REAR): REAR BRAKE: INSTALLATION (2013 FR-S)		

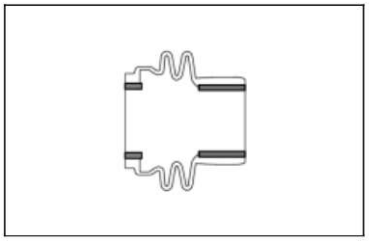
INSTALLATION

HINT:

- Use the same procedure for RH and LH sides.
- The procedure listed below is for LH side.

1. INSTALL REAR DISC BRAKE CYLINDER SLIDE BUSH

(a) Apply a light layer of lithium soap base glycol grease to the inner face of a new rear disc brake cylinder slide bush.



Text in Illustration

	Lithium Soap Base Glycol Grease

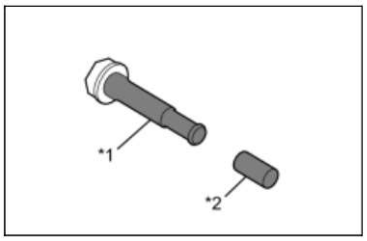
HINT:

Apply at least 0.3 g (0.01 oz.) of lithium soap base glycol grease to each rear disc brake cylinder slide bush.

(b) Install the 2 rear disc brake cylinder slide bushes to the caliper support bracket.

2. INSTALL REAR DISC BRAKE REAR CYLINDER SLIDE PIN

(a) Apply a light layer of lithium soap base glycol grease to the contact face between a new bush and rear disc brake rear cylinder rear disc brake cylinder slide pin.



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Text in Illustration

*1	rear disc brake rear cylinder rear disc brake cylinder slide pin
*2	Bush
	Lithium Soap Base Glycol Grease

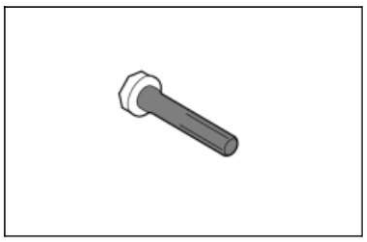
(b) Install the new bush to the rear disc brake rear cylinder rear disc brake cylinder slide pin.

(c) Apply a light layer of lithium soap base glycol grease to entire circumference of the rear disc brake rear cylinder rear disc brake cylinder slide pin and fitting part.

(d) Install the rear disc brake rear cylinder rear disc brake cylinder slide pin to the caliper support bracket.

3. INSTALL REAR DISC BRAKE CYLINDER SLIDE PIN

(a) Apply a light layer of lithium soap base glycol grease to entire circumference of the rear disc brake cylinder slide pin and fitting part.



Text in Illustration

	Lithium Soap Base Glycol Grease

(b) Install the rear disc brake cylinder slide pin to the caliper support bracket.

4. INSTALL REAR DISC

(a) Align the matchmarks placed when removing, install the rear disc to the axle hub.

HINT:

When using a new rear disc, install it so that rear disc runout is minimum.

5. ADJUST PARKING BRAKE

6. INSTALL PARKING BRAKE SHOE ADJUSTING HOLE PLUG

(a) Install the parking brake shoe adjusting hole plug to the rear disc.

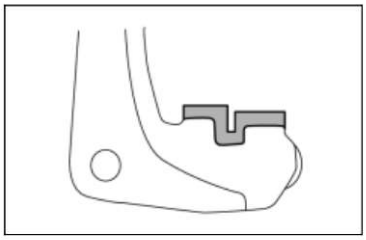
7. INSTALL CALIPER SUPPORT BRACKET

(a) Install the caliper support bracket with the 2 new bolts.

Torque: 66 N·m (673 kgf·cm, 49ft·lbf)

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(b) Apply a light of lithium soap base glycol grease to contact section of the rear disc brake pad support plate with the rear disc brake pad.

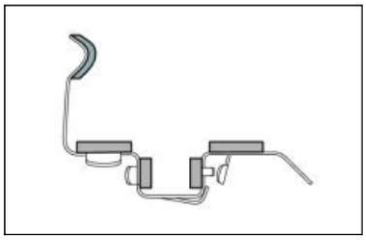


Text in Illustration

	Lithium Soap Base Glycol Grease

8. INSTALL REAR DISC BRAKE PAD SUPPORT PLATE

(a) Apply a light of lithium soap base glycol grease to contact section of the rear disc brake pad support plate with the rear disc brake pad.



Text in Illustration

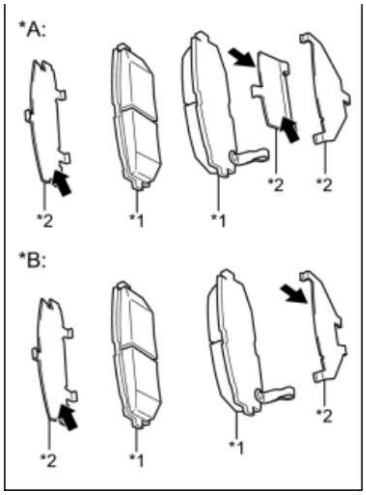
	Lithium Soap Base Glycol Grease

(b) Install the rear disc brake pad support plate to the caliper support bracket.

9. INSTALL REAR DISC BRAKE ANTI SQUEAL SHIM KIT

(a) Apply disc brake grease to the rear disc brake anti squeal shim kit.

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Text in Illustration

*A	Solid Disc Brake
*B	Ventilated Disc Brake
*1	Rear Disc Brake Pad Kit
*2	Rear Disc Brake Anti Squeal Shim Kit
➡	Disc Brake Grease

(b) Put the rear disc anti squeal shim kit to each rear disc brake pad.

10. INSTALL REAR DISC BRAKE PAD KIT

(a) Install the rear disc brake pad kit to the caliper support bracket.

11. INSTALL REAR DISC BRAKE CYLINDER ASSEMBLY LH

(a) Apply the rear disc brake cylinder assembly LH to the caliper support bracket.

Torque: 26 N·m (265 kgf·cm, 19ft·lbf)

12. CONNECT REAR FLEXIBLE HOSE LH

(a) Connect the rear left flexible hose with 2 new gaskets and the new union bolt.

Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

13. ADD BRAKE FLUID INFO

14. BLEED BRAKE LINE INFO

15. INSPECT BRAKE FLUID LEAK

16. INSPECT FLUID LEVEL INFO

17. INSTALL REAR WHEEL

Torque: 120 N·m (1224 kgf·cm, 89ft·lbf)

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIP00YX
Title: BRAKE (REAR): REAR BRAKE: REASSEMBLY (2013 FR-S)		

REASSEMBLY

1. TEMPORARILY INSTALL REAR DISC BRAKE BLEEDER PLUG

(a) Temporarily install the rear disc brake bleeder plug to the rear disc brake cylinder LH.

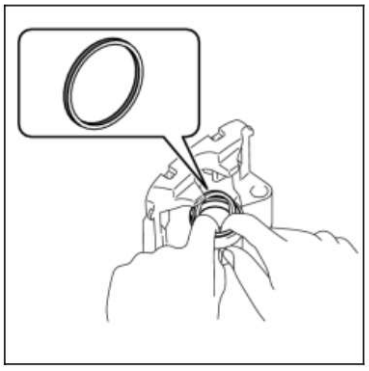
Torque: 8.0 N·m (82 kgf·cm, 71in·lbf)

2. INSTALL REAR DISC BRAKE BLEEDER PLUG CAP

(a) Install the rear disc brake bleeder plug cap to the rear disc brake bleeder plug.

3. INSTALL PISTON SEAL

(a) Apply a light layer of lithium soap base glycol grease to the entire circumference of a new piston seal and install it into the groove of the disc brake cylinder.



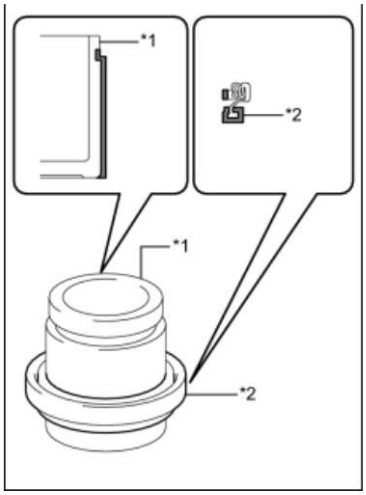
Text in Illustration

	Lithium Soap Base Glycol Grease

4. INSTALL CYLINDER BOOT

(a) Apply a light layer of lithium soap base glycol grease to a new cylinder boot, and put it on the disc brake piston as shown in the illustration.

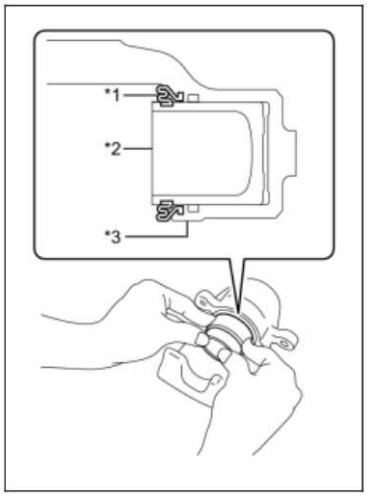
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Text in Illustration

*1	Piston
*2	Cylinder Boot
	Lithium soap base glycol grease

5. INSTALL REAR DISC BRAKE PISTON



(a) Fit the seal section of the cylinder boot into the groove of the rear disc brake cylinder assembly LH.

Text in Illustration

*1	Cylinder Boot
*2	Rear disc Brake Piston
*3	Rear disc Brake Cylinder Assembly LH

NOTICE:

Securely fit the seal section of the cylinder boot.

(b) Push in the piston by hand and fit the seal section of the boot into the groove of the rear disc brake piston.

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NOTICE:

Securely fit the seal section of the cylinder boot.



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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000CIM01AX
Title: BRAKE (REAR): REAR BRAKE: REMOVAL (2013 FR-S)		

REMOVAL

HINT:

- Use the same procedure for RH and LH sides.
- The procedure listed below is for LH side.

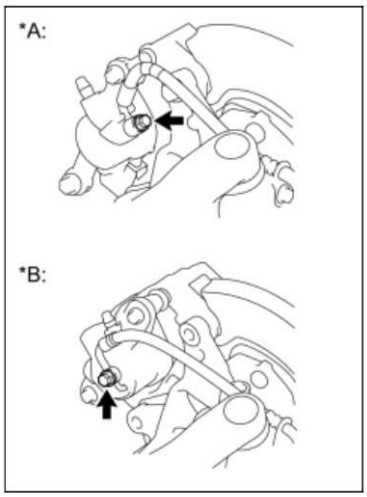
1. REMOVE REAR WHEEL

2. DRAIN BRAKE FLUID

NOTICE:

Immediately wash off any brake fluid that comes into contact with any painted surfaces.

3. DISCONNECT REAR FLEXIBLE HOSE LH



(a) Remove the union bolt and 2 gaskets and disconnect the rear left flexible hose from the rear disc brake cylinder assembly LH.

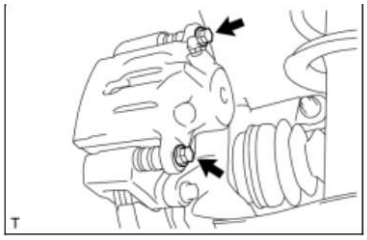
Text in Illustration

*A	Solid Disc Brake
*B	Ventilated Disc Brake

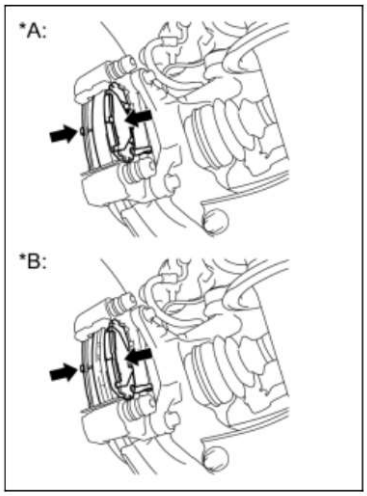
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4. REMOVE REAR DISC BRAKE CYLINDER ASSEMBLY LH

(a) Remove the 2 bolts and rear disc brake cylinder LH.



5. REMOVE REAR DISC BRAKE PAD KIT



(a) Remove the rear disc brake pad kit from the caliper support bracket.

Text in Illustration

*A	Solid Disc Brake
*B	Ventilated Disc Brake

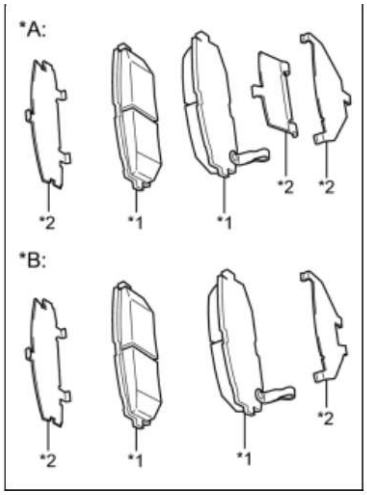
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6. REMOVE REAR DISC BRAKE ANTI SQUEAL SHIM KIT

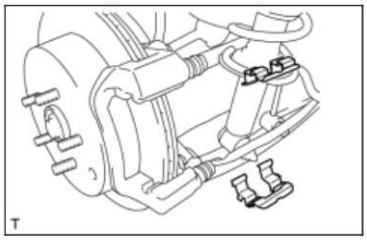
(a) Remove the rear disc brake anti squeal shim kit from each rear disc brake pad.

Text in Illustration

*A	Solid Disc Brake
*B	Ventilated Disc Brake
*1	Rear Disc Brake Pad
*2	Rear Disc Brake Anti Squeal Shim Kit

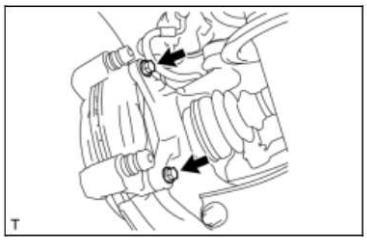


7. REMOVE REAR DISC BRAKE PAD SUPPORT PLATE



(a) Remove the 2 rear disc brake pad support plates.

8. REMOVE CALIPER SUPPORT BRACKET



(a) Remove the 2 bolts and caliper support bracket.

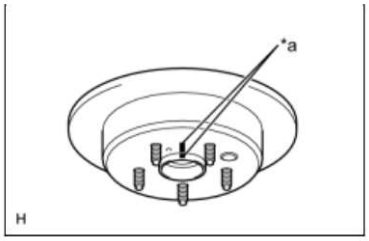
9. REMOVE REAR DISC

(a) Place matchmarks on the rear disc and rear axle hub.

Text in Illustration

*a	Matchmark

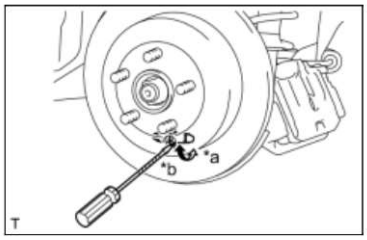
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HINT:

It is not necessary when replacing the rear disc.

(b) Release the parking brake and remove the rear disc.



HINT:

If it is difficult to remove the rear disc, insert a screwdriver through the hole of rear disc and turn the adjusting screw to contract it.

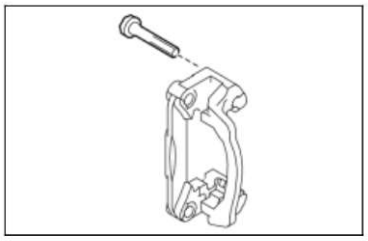
Text in Illustration

*a	Contract
*b	Expand

10. REMOVE PARKING BRAKE SHOE ADJUSTING HOLE PLUG

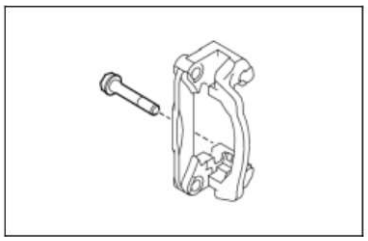
(a) Remove the parking brake shoe adjusting hole plug from the rear from the rear disc.

11. REMOVE REAR DISC BRAKE CYLINDER SLIDE PIN



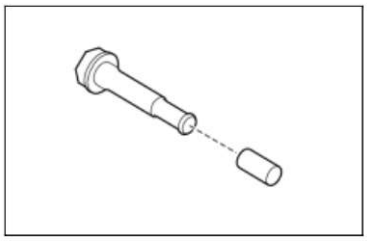
(a) Remove the rear disc brake cylinder slide pin from the caliper support bracket.

12. REMOVE REAR DISC BRAKE REAR CYLINDER SLIDE PIN



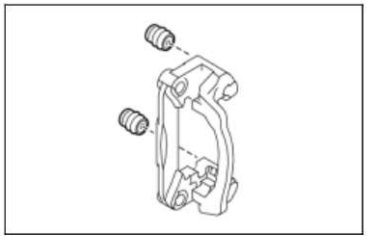
(a) Remove the rear disc brake rear cylinder slide pin from the caliper support bracket.

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(b) Remove the bush from the rear disc brake rear cylinder slide pin.

13. REMOVE REAR DISC BRAKE CYLINDER SLIDE BUSH



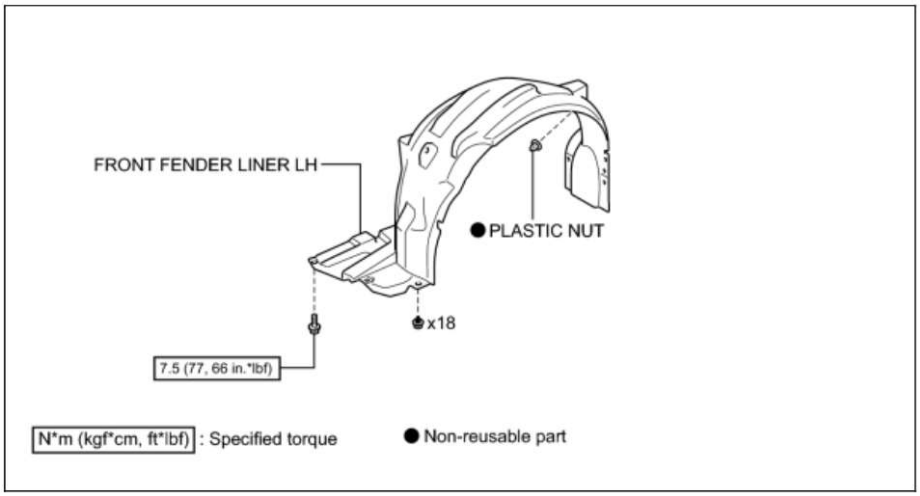
(a) Remove the 2 rear disc brake cylinder slide bushes from the caliper support bracket.

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM0000034UW00EX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: BRAKE ACTUATOR: COMPONENTS (2013 FR-S)		

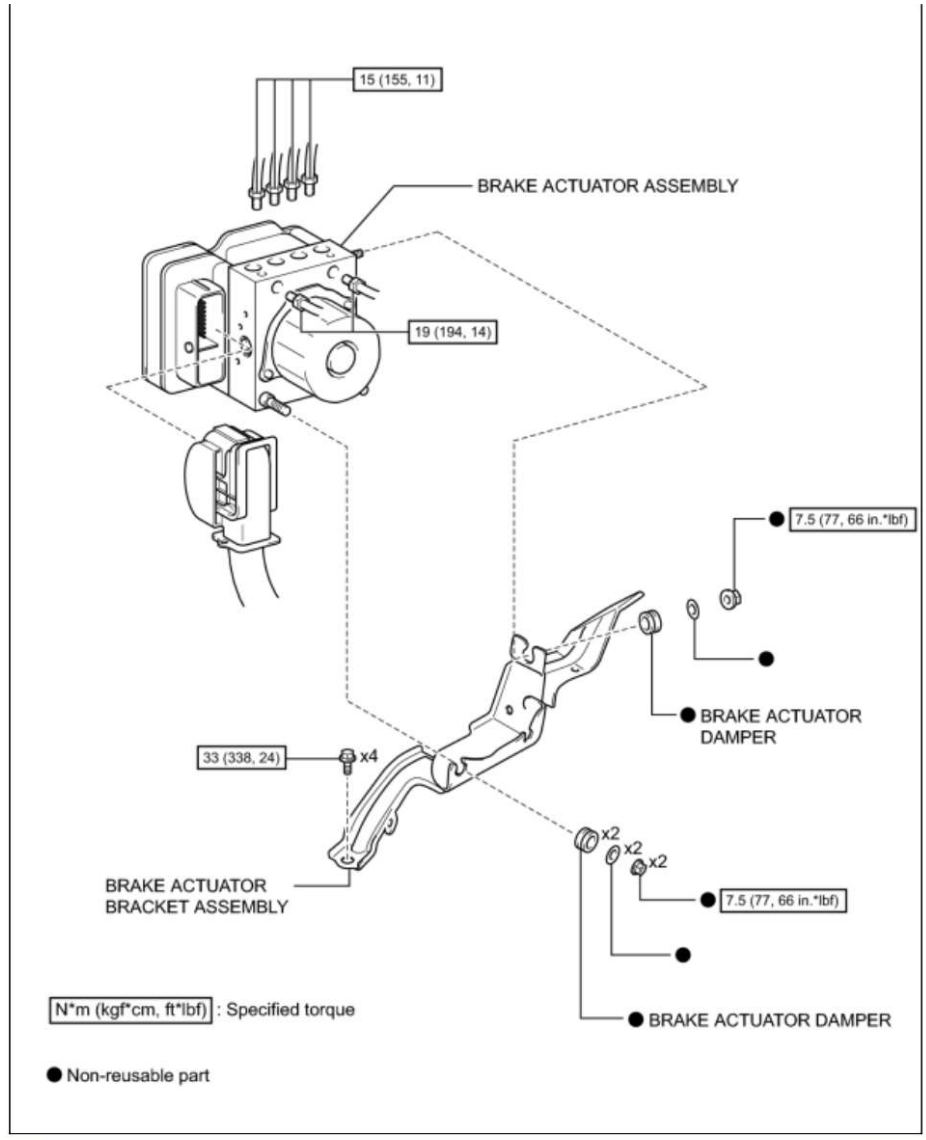
COMPONENTS

ILLUSTRATION



ILLUSTRATION

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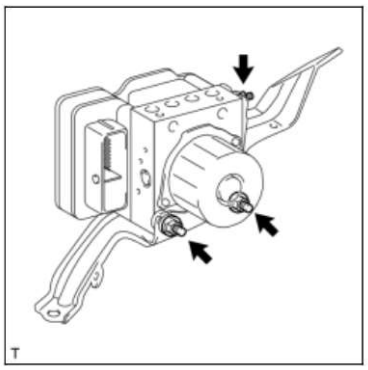


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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM0000058JE000X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: BRAKE ACTUATOR: DISASSEMBLY (2013 FR-S)		

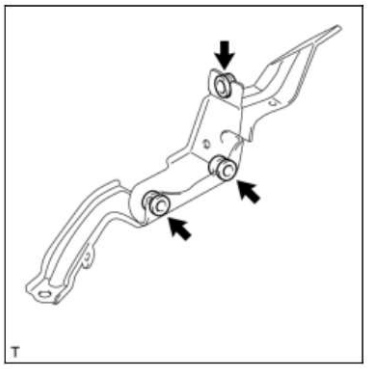
DISASSEMBLY

1. REMOVE BRAKE ACTUATOR BRACKET ASSEMBLY



(a) Remove the 3 nuts and remove the brake actuator assembly from the brake actuator bracket assembly.

2. REMOVE BRAKE ACTUATOR DAMPER



(a) Remove the 3 brake actuator actuator damper from the brake actuator bracket assembly.

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM0000034UV01BX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: BRAKE ACTUATOR: INSTALLATION (2013 FR-S)		

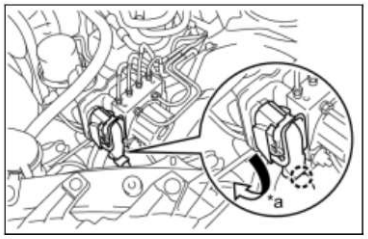
INSTALLATION

1. INSTALL BRAKE ACTUATOR ASSEMBLY WITH BRAKE ACTUATOR BRACKET

(a) Install the brake actuator assembly with brake actuator bracket using the 4 bolts.

Torque: 33 N·m (338 kgf·cm, 24ft·lbf)

(b) Connect the brake actuator connector to the brake actuator.



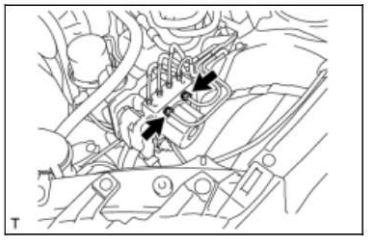
(c) Turn the locking lever downwards, and engage the wire harness connector locking claw to lock the connector.

Text in Illustration

*a	Turn

NOTICE:

- Make sure that the actuator connector can be connected smoothly. Do not allow water, oil or dirt to enter.
- Make sure that the connector is locked securely.

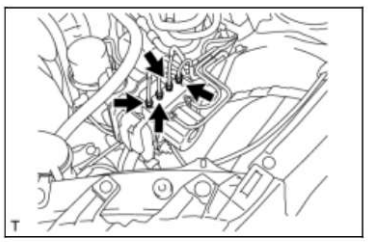


(d) Using a union nut wrench 12 mm, tighten 2 brake tubes.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

NOTICE:

Use the formula to calculate the special torque values for situations where the union nut wrench is combined with a torque wrench INFO **.**



(e) Using a union nut wrench 10 mm, tighten the 4 brake tubes.

Torque: 15 N·m (155 kgf·cm, 11ft·lbf)

NOTICE:

Use the formula to calculate the special torque values for situations where the union nut wrench is combined with a torque wrench INFO **.**

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(f) Connect the front speed sensor LH harness clamp to the brake actuator bracket assembly.

(g) Connect the cooler pipe to the clamp.

(h) Connect the 2 harness clamp to the brake actuator bracket.

2. ADD BRAKE FLUID INFO

3. BLEED BRAKE SYSTEM

INFO

4. INSPECT FLUID LEAK

5. INSPECT BRAKE FLUID LEVEL INFO

6. INSTALL FRONT FENDER LINER LH INFO

7. INSTALL FRONT WHEEL LH

Torque: 120 N·m (1224 kgf·cm, 89ft·lbf)

8. VSC SENSOR NEUTRAL MEMORIZATION

INFO

9. INSPECT SPEED SENSOR

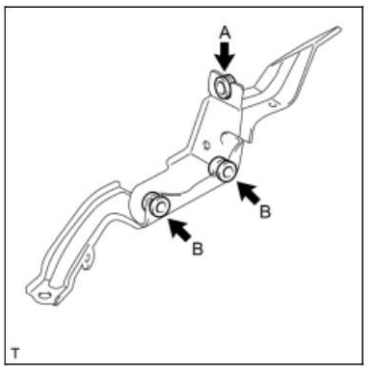
INFO

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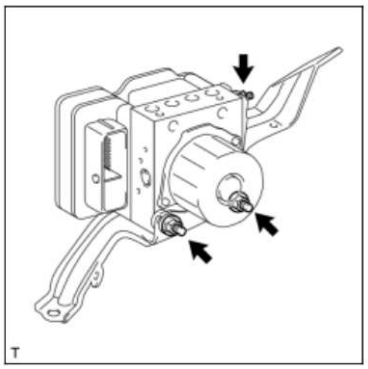
Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM0000058JF000X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: BRAKE ACTUATOR: REASSEMBLY (2013 FR-S)		

REASSEMBLY

1. INSTALL BRAKE ACTUATOR DAMPER



(a) Install the 3 new brake actuator dampers (A and B) to the brake actuator bracket assembly.



2. INSTALL BRAKE ACTUATOR BRACKET ASSEMBLY

(a) Install the brake actuator bracket assembly to the brake actuator assembly with the 3 new nuts and 3 new washers.

NOTICE:

Do not remove the hole plugs of a new brake actuator assembly before connecting the brake lines because the brake actuator assembly is filled with brake fluid.

Torque: 7.5 N·m (77 kgf·cm, 66in·lbf)

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM0000034UX01BX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: BRAKE ACTUATOR: REMOVAL (2013 FR-S)		

REMOVAL

NOTICE:

Before removing the brake actuator assembly, refer to the "Brake line precaution". INFO

1. REMOVE FRONT WHEEL LH

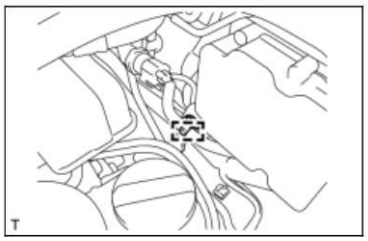
2. DRAIN BRAKE FLUID

NOTICE:

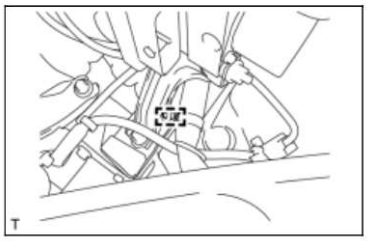
Wash off the brake fluid immediately if it comes into contact with a painted surface.

3. REMOVE FRONT FENDER LINER LH INFO

4. REMOVE BRAKE ACTUATOR ASSEMBLY WITH BRAKE ACTUATOR BRACKET



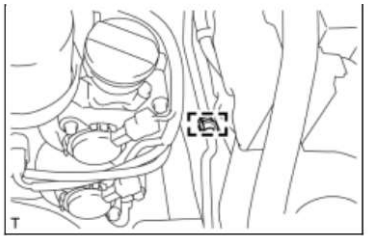
(a) Disconnect the harness clamp from the brake actuator bracket.



(b) Disconnect the harness clamp from the brake actuator bracket.

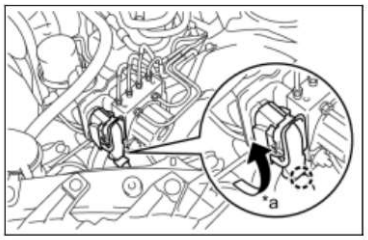
(c) Disconnect the cooler pipe from the clamp.

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(d) Disconnect the front speed sensor LH harness clamp from the brake actuator bracket.

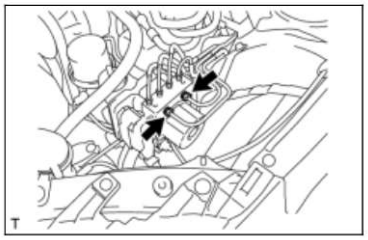


(e) Press the wire harness connector locking claw to disengage the locking lever, and turn the locking lever upwards to unlock the connector.

Text in Illustration

*a	Turn

(f) Disconnect the connector from the brake actuator assembly.



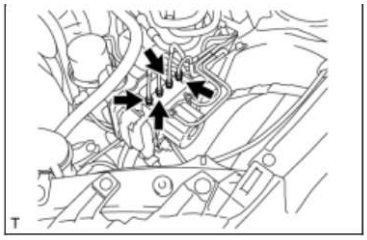
(g) Using a union nut wrench 12 mm, disconnect the 2 brake lines from the brake actuator assembly.

NOTICE:

Be careful not to allow the brake fluid to enter the removed connector.

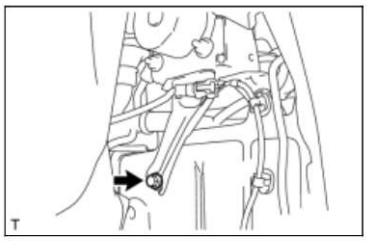
(h) Using a union nut wrench 10 mm, disconnect the 4 brake lines from the brake actuator assembly.

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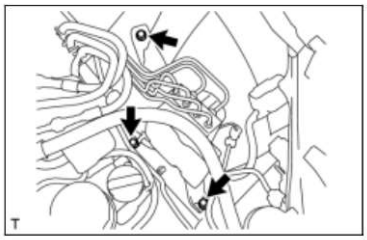


NOTICE:

Be careful not to allow the brake fluid to enter the removed connector.



(i) Remove the brake actuator bracket installation bolt.



(j) Remove the 3 bolts from the brake actuator with bracket.

(k) Remove the brake actuator with bracket from the vehicle body.

NOTICE:

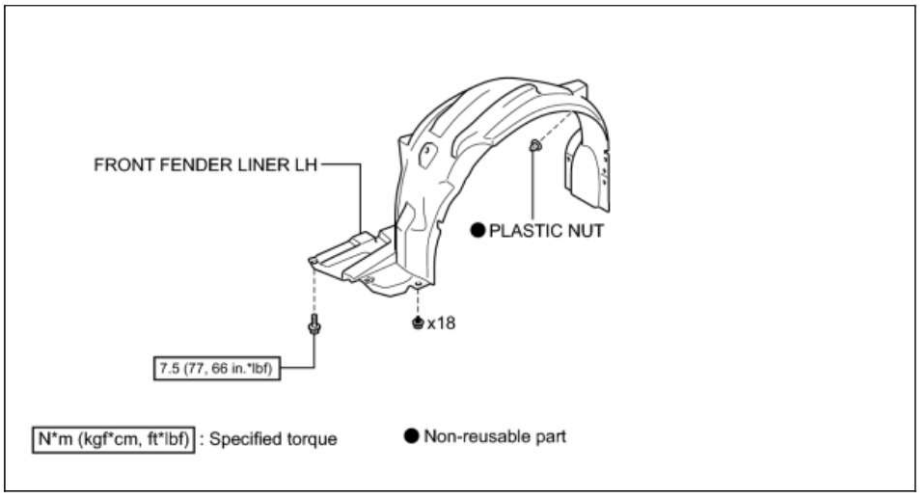
Do not damage the brake tubes.

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000VKW00YX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: FRONT SPEED SENSOR: COMPONENTS (2013 FR-S)		

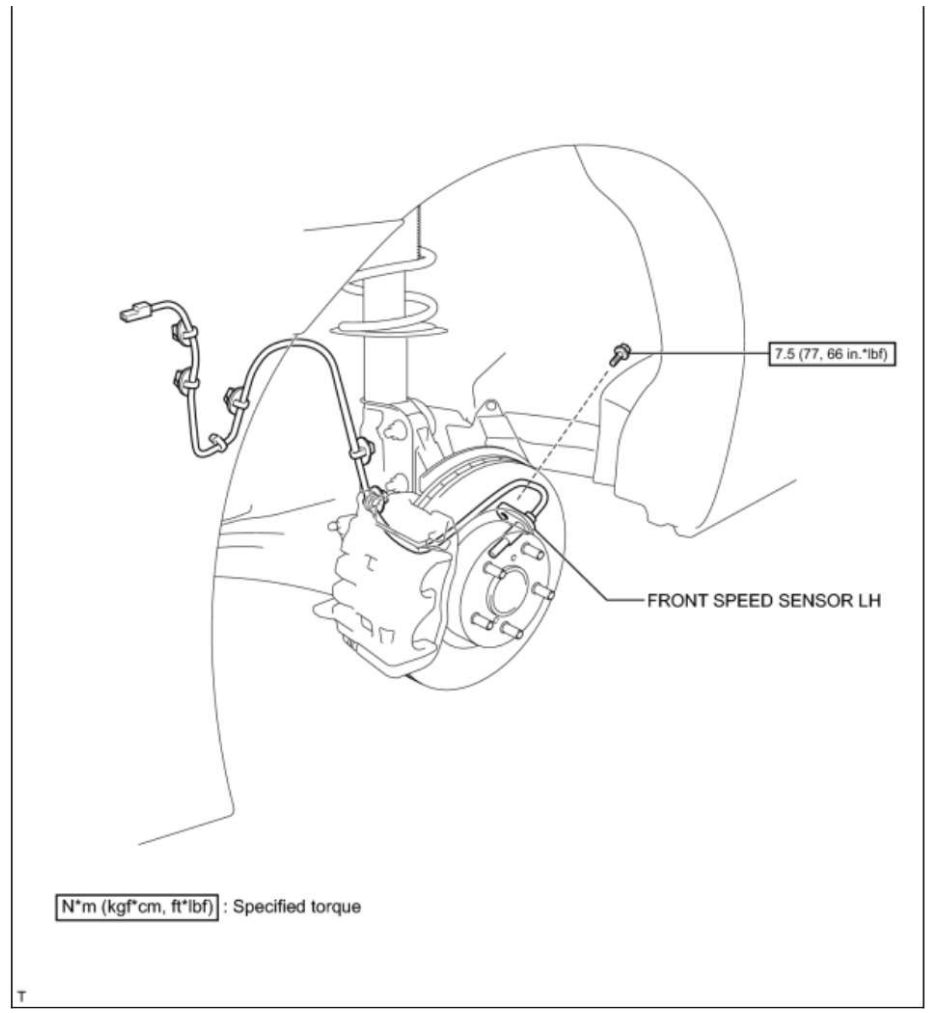
COMPONENTS

ILLUSTRATION



ILLUSTRATION

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000WET03BX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: FRONT SPEED SENSOR: INSTALLATION (2013 FR-S)		

INSTALLATION

HINT:

- The procedures listed below are for the LH side.
- Use the same procedures for the RH and LH sides.

1. INSTALL FRONT SPEED SENSOR LH

(a) Install the front speed sensor LH with the bolt.

Torque: 7.5 N·m (77 kgf·cm, 66in·lbf)

NOTICE:

Do not allow any foreign matter such as dirt or dust to enter between the steering knuckle and the front disc brake dust cover.

(b) Connect the 6 front speed sensor clamps.

NOTICE:

Securely connect the connector.

2. INSTALL FRONT FENDER LINER LH INFO

3. INSTALL FRONT WHEEL LH

Torque: 120 N·m (1224 kgf·cm, 89ft·lbf)

4. INSPECT SPEED SENSOR SIGNAL

INFO

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000WEU02RX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: FRONT SPEED SENSOR: REMOVAL (2013 FR-S)		

REMOVAL

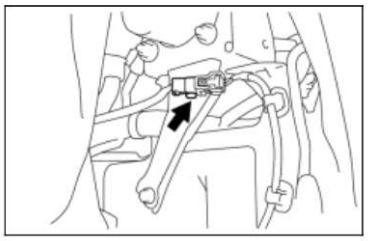
HINT:

- The procedures listed below are for the LH side.
- Use the same procedures for the RH and LH sides.

1. REMOVE FRONT WHEEL LH

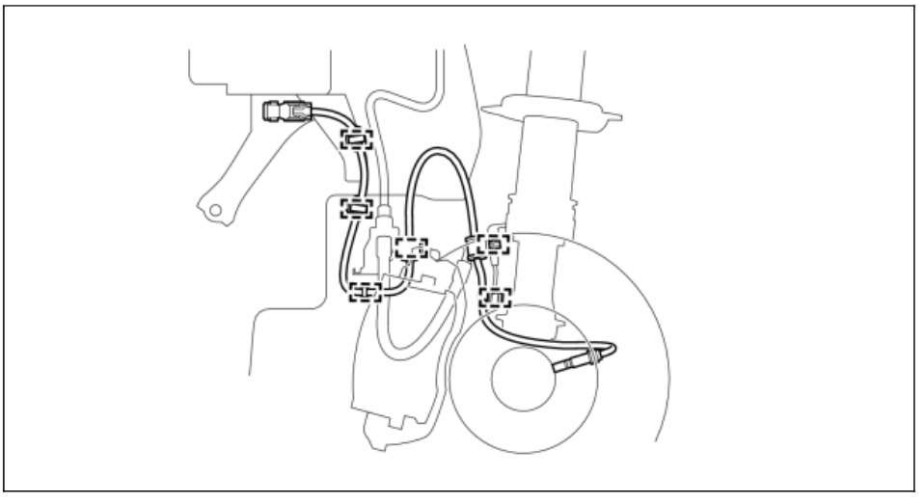
2. REMOVE FRONT FENDER LINER LH INFO

3. REMOVE FRONT SPEED SENSOR LH

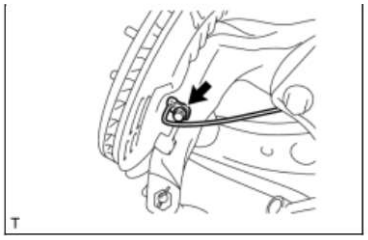


(a) Disconnect the front speed sensor connector.

(b) Disconnect the 6 clamps.



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(c) Remove the bolt and front speed sensor LH from the steering knuckle.

NOTICE:

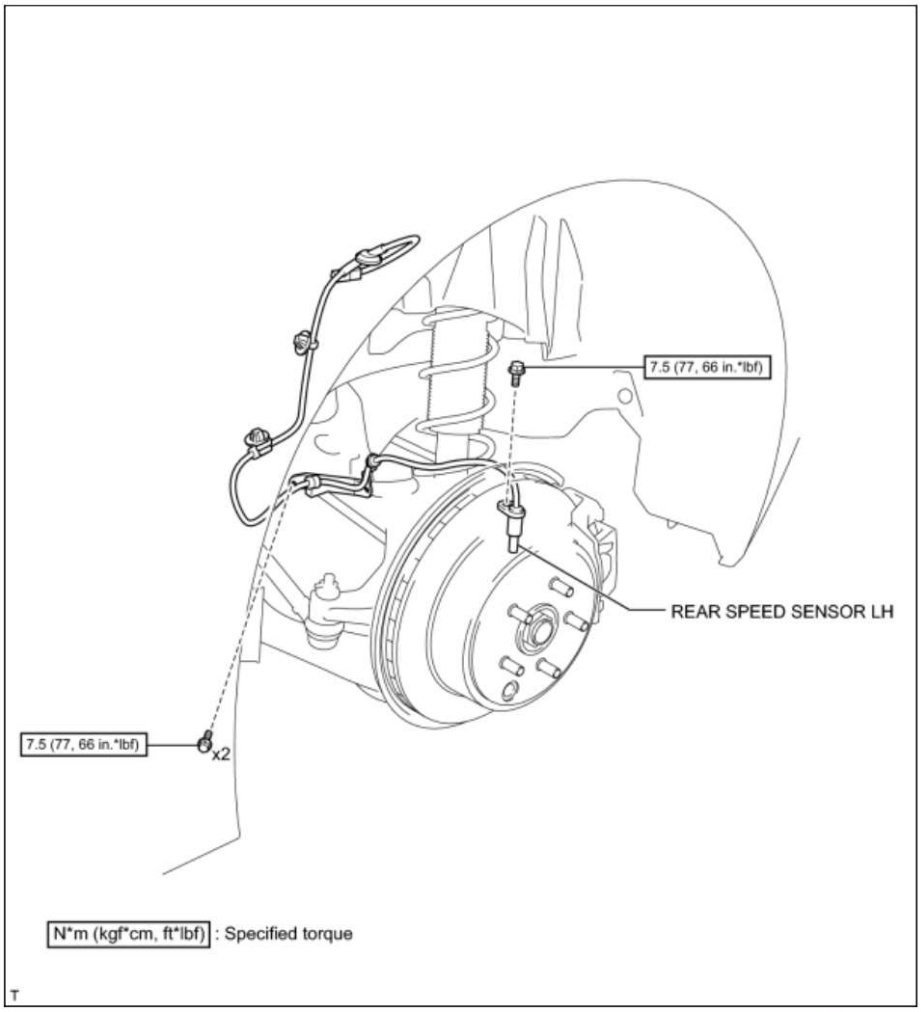
Clean the speed sensor installation hole and the contact surfaces every time the front speed sensor is removed.

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000SS0011X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: REAR SPEED SENSOR: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION



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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000SRY02NX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: REAR SPEED SENSOR: INSTALLATION (2013 FR-S)		

INSTALLATION

HINT:

- The procedures listed below are for the LH side.
- Use the same procedures for the RH and LH sides.

1. INSTALL REAR SPEED SENSOR LH

(a) Install the rear speed sensor LH with the 3 bolts.

Torque: 7.5 N·m (77 kgf·cm, 66in·lbf)

NOTICE:

Prevent foreign matter from attaching to the rear speed sensor LH tip, installation surface and sensor body.

(b) Connect the 2 clamps.

NOTICE:

Do not twist the wire harness for the rear speed sensor LH when installing it.

(c) Pull the rear speed sensor LH grommet out from vehicle interior.

NOTICE:

- Do not pull the rear speed sensor LH wire harness.
- Do not fix the pass-through grommet at an angle.

(d) Connect the rear speed sensor LH connector.

(e) Remove the luggage compartment floor mat.

2. INSTALL REAR WHEEL LH

Torque: 120 N·m (1224 kgf·cm, 89ft·lbf)

3. INSPECT SPEED SENSOR SIGNAL

INFO

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000SS1028X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: REAR SPEED SENSOR: REMOVAL (2013 FR-S)		

REMOVAL

HINT:

- Use the same procedures for the RH and LH sides.
- The procedures listed below are for the LH side.

1. REMOVE REAR WHEEL LH

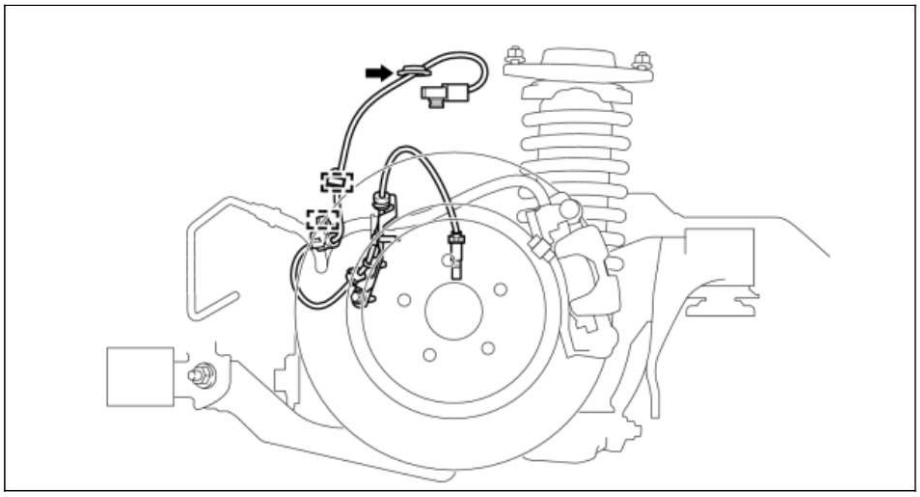
2. REMOVE REAR SPEED SENSOR LH

(a) Remove the luggage compartment floor mat.



(b) Disconnect the rear speed sensor LH connector.

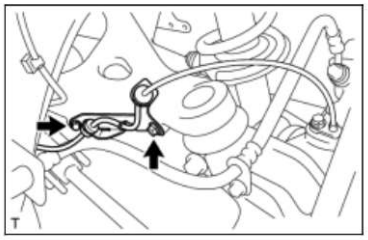
(c) Disconnect the rear speed sensor LH grommet and 2 harness clamps from the rear wheel house.



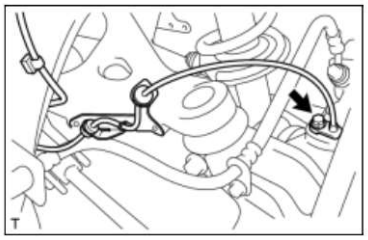
Text in illustration

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➡	Grommet	-	-



(d) Remove the 2 bolts from the bracket.



(e) Remove the bolt and the rear speed sensor LH.

NOTICE:

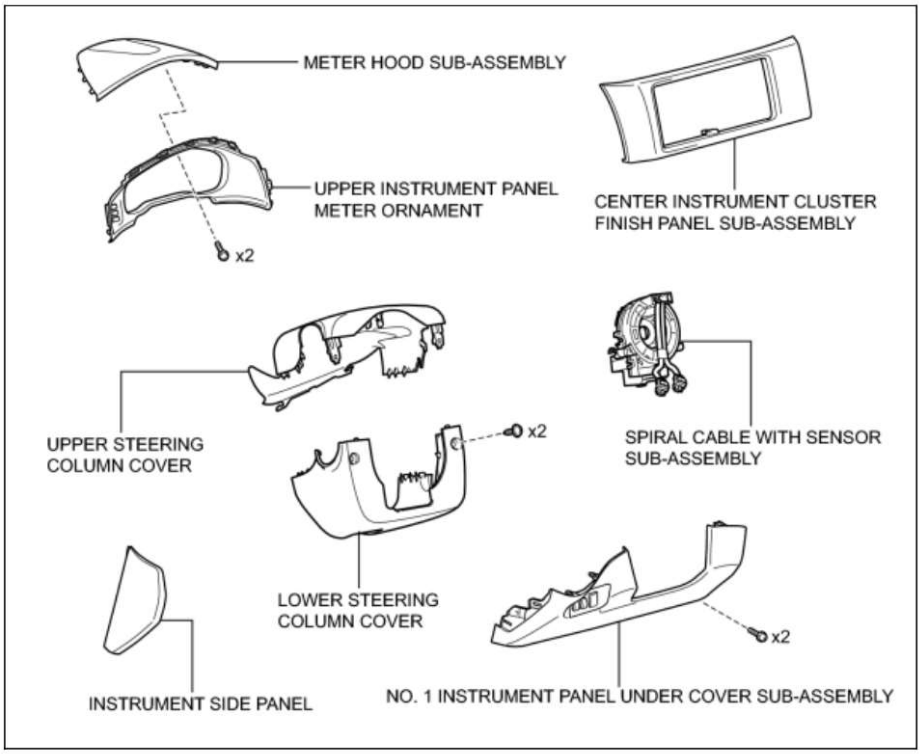
Clean the speed sensor installation hole and the contact surfaces every time the rear speed sensor is removed.

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000UWC064X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: STEERING ANGLE SENSOR: COMPONENTS (2013 FR-S)		

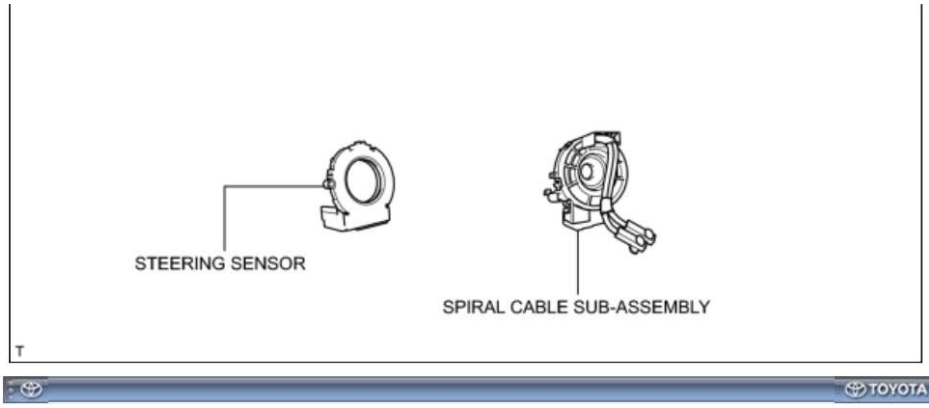
COMPONENTS

ILLUSTRATION



ILLUSTRATION

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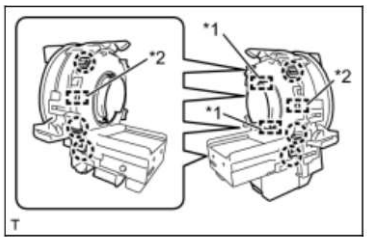


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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000UWA09MX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: STEERING ANGLE SENSOR: INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL STEERING SENSOR



(a) Align the 2 pins and 2 guides, and engage the 6 claws to install the steering sensor to the spiral cable sub-assembly.

Text in Illustration

*1	Guide
*2	Pin

NOTICE:

Do not rotate the spiral cable until the steering sensor has been attached to it.

2. ALIGN FRONT WHEELS TO FACEING STRAIGHT AHEAD

3. INSTALL SPIRAL CABLE WITH SENSOR SUB-ASSEMBLY

NOTICE:

- Do not replace the spiral cable sub-assembly with the battery connected and the ignition switch on (IG).
- Do not rotate the spiral cable sub-assembly without the steering wheel with the battery connected and the ignition switch on (IG).
- Ensure that the steering wheel is installed and aligned straight when inspecting the steering sensor.

(a) Check that the ignition switch is off.

(b) Check that the cable is disconnected from the negative (-) battery terminal.

CAUTION:

Wait at least for 90 seconds after disconnecting the cable from the negative (-) battery terminal to disable the SRS system.

(c) Check that the front wheels are facing straight ahead.

(d) Set the turn signal switch to the neutral position.

NOTICE:

If it is not in the neutral position, the turn signal switch pin may snap.

(e) Engage the 3 claws to install the spiral cable with sensor sub-assembly.

(f) Connect the each connector.

4. INSTALL UPPER STEERING COLUMN COVER INFO

5. INSTALL LOWER STEERING COLUMN COVER INFO

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6. INSPECT AND ADJUST SPIRAL CABLE WITH SENSOR SUB-ASSEMBLY INFO

7. INSTALL NO.1 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

8. INSTALL UPPER INSTRUMENT PANEL METER ORNAMENT INFO

9. INSTALL METER HOOD SUB-ASSEMBLY INFO

10. INSTALL CENTER INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY INFO

11. INSTALL INSTRUMENT SIDE PANEL LH INFO

12. INSTALL STEERING WHEEL ASSEMBLY

INFO

13. INSPECT SRS WARNING LIGHT

INFO

14. VSC SENSOR NEUTRAL MEMORIZATION

INFO



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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000UWD09LX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: STEERING ANGLE SENSOR: REMOVAL (2013 FR-S)		

REMOVAL

1. REMOVE STEERING WHEEL ASSEMBLY

INFO

2. ALIGN FRONT WHEELS FACING STRAIGHT AHEAD

3. REMOVE INSTRUMENT SIDE PANEL LH INFO

4. REMOVE CENTER INSTRUMENT CLUSTER FINISH PANEL SUB-ASSEMBLY INFO

5. REMOVE METER HOOD SUB-ASSEMBLY INFO

6. REMOVE UPPER INSTRUMENT PANEL METER ORNAMENT INFO

7. REMOVE NO.1 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

8. INSPECT SPIRAL CABLE SUB-ASSEMBLY INFO

9. REMOVE LOWER STEERING COLUMN COVER INFO

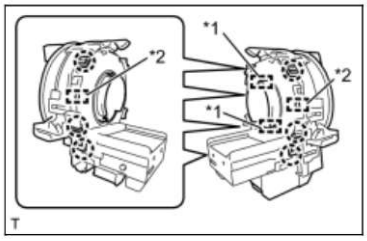
10. REMOVE UPPER STEERING COLUMN COVER INFO

11. REMOVE SPIRAL CABLE WITH SENSOR SUB-ASSEMBLY INFO

12. REMOVE STEERING SENSOR

NOTICE:

- Remove the steering sensor from the spiral cable sub-assembly only when replacing it or the steering sensor.
- Do not rotate the center section of the steering sensor, as it may deviate from the steering sensor neutral point.
- When replacing the spiral cable sub-assembly: INFO



(a) Disengage the 6 claws, 2 pins and 2 guides to remove the steering sensor from the spiral cable sub-assembly.

NOTICE:

Do not damage the guide and claw.

Text in Illustration

*1	Guide
*2	Pin

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XIQ0E2X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: ABS Warning Light does not Come ON (2013 FR-S)		

ABS Warning Light does not Come ON

DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A

▼

2.	**CHECK ABS WARNING LIGHT**

(a) Disconnect the skid control ECU (brake actuator assembly) connector.

(b) Turn the ignition switch to ON.

(c) Check that the ABS warning light comes on.

OK:

The ABS warning light comes on.

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HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ INSPECT COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

3.	INSPECT COMBINATION METER ASSEMBLY

(a) Turn the ignition switch off.

(b) Reconnect the skid control ECU (brake actuator assembly) connector.

(c) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(d) Check the combination meter assembly.

OK:

The ABS warning light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ REPLACE COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XIH0E3X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: ABS Warning Light Remains ON (2013 FR-S)		

ABS Warning Light Remains ON

DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

If any of the following is detected, the ABS warning light remains on:

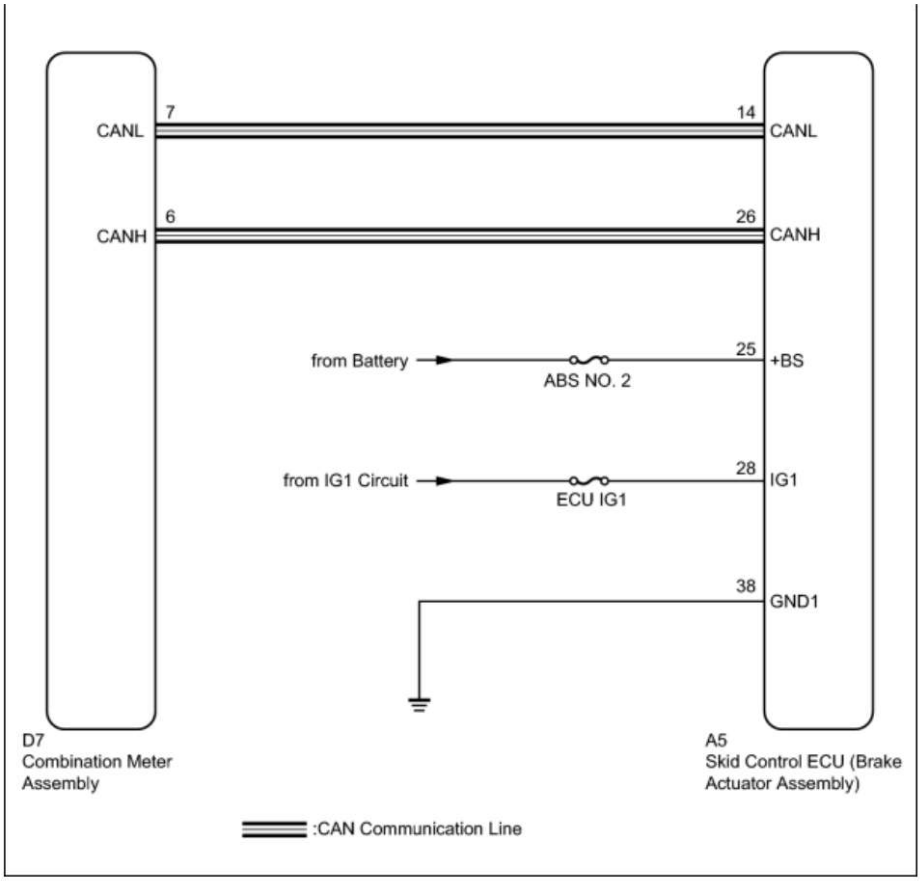
- The skid control ECU (brake actuator assembly) connector is disconnected from the skid control ECU (brake actuator assembly).
- There is a malfunction in the skid control ECU (brake actuator assembly) internal circuit.
- There is an open in the harness between the combination meter assembly and the skid control ECU (brake actuator assembly).
- The ABS control system is defective.

HINT:

In some cases, the Techstream cannot be used when the skid control ECU (brake actuator assembly) is abnormal.

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A

DTC is output.	B

B ▶ INSPECT CAN COMMUNICATION SYSTEM

A ▼

2.	CHECK IF BRAKE ACTUATOR ASSEMBLY CONNECTOR IS SECURELY CONNECTED

(a) Check if the skid control ECU (brake actuator assembly) connector is securely connected.

OK:
The connector is securely connected.

NG ▶ CONNECT CONNECTOR TO ECU CORRECTLY

OK ▼

3.	CHECK BATTERY

(a) Check the battery voltage.

Standard Voltage:
11 to 14 V

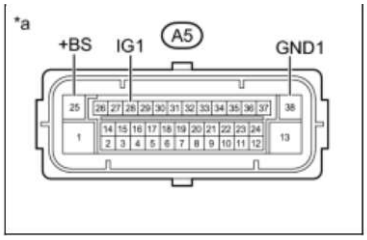
NG ▶ CHECK OR REPLACE CHARGING SYSTEM COMPONENT OR BATTERY

OK ▼

4.	CHECK HARNESS AND CONNECTOR (POWER SOURCE TERMINAL)

(a) Disconnect the skid control ECU (brake actuator assembly) connector.

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(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-25 (+BS) - Body ground	Always	11 to 14 V
A5-25 (+BS) - A5-38 (GND1)	Always	11 to 14 V
A5-28 (IG1) - Body ground	Ignition switch ON	11 to 14 V
A5-28 (IG1) - A5-38 (GND1)	Ignition switch ON	11 to 14 V

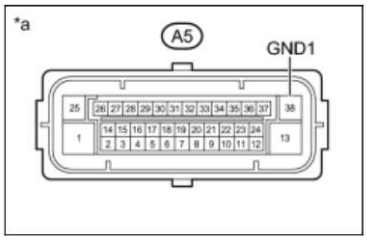
Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (GND1 TERMINAL)**



(a) Turn the ignition switch off.

(b) Measure the resistance according to the value(s) in the table below.

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Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-38 (GND1) - Body ground	Always	Below 1 Ω

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND1 CIRCUIT)**

OK ▼

6.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Reconnect the skid control ECU (brake actuator assembly) connector.

(b) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(c) Check the combination meter assembly.

OK:

The ABS warning light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO **.**

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000YHH0E5X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: Brake Warning Light does not Come ON (2013 FR-S)		

Brake Warning Light does not Come ON

DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A

▼

2.	**CHECK BRAKE WARNING LIGHT**

(a) Disconnect the skid control ECU (brake actuator assembly) connector.

(b) Turn the ignition switch to ON.

(c) Check that the brake warning light comes on.

OK:

The brake warning light comes on.

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HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ INSPECT COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

3.	INSPECT COMBINATION METER ASSEMBLY

(a) Turn the ignition switch off.

(b) Reconnect the skid control ECU (brake actuator assembly) connector.

(c) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(d) Check the combination meter assembly.

OK:
The brake warning light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ REPLACE COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000YHG0E5X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: Brake Warning Light Remains ON (2013 FR-S)		

Brake Warning Light Remains ON

DESCRIPTION

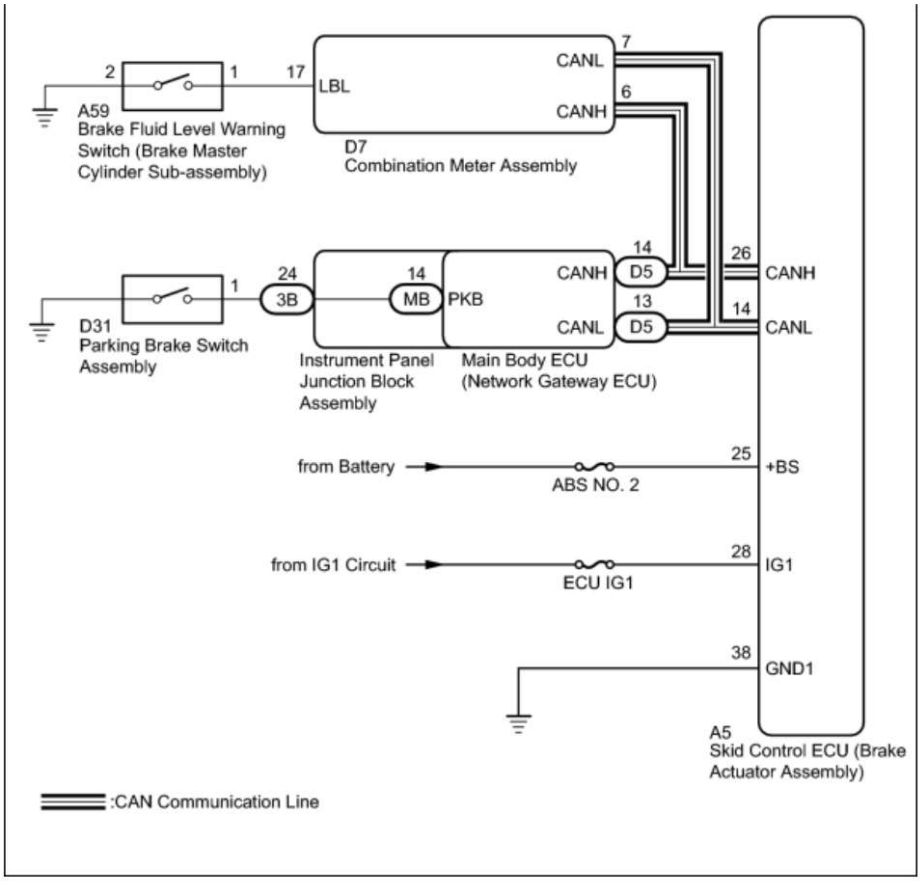
The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

If any of the following is detected, the brake warning light remains on:

- The skid control ECU (brake actuator assembly) connector is disconnected from the skid control ECU (brake actuator assembly).
- The brake fluid level is insufficient.
- The parking brake is applied.
- EBD operation is not possible.

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A

DTC is output.	B

B ▶ INSPECT CAN COMMUNICATION SYSTEM

A ▼

2.	CHECK IF BRAKE ACTUATOR ASSEMBLY CONNECTOR IS SECURELY CONNECTED

(a) Check if the skid control ECU (brake actuator assembly) connector is securely connected.

OK:
The connector is securely connected.

NG ▶ CONNECT CONNECTOR TO ECU CORRECTLY

OK ▼

3.	CHECK BATTERY

(a) Check the battery voltage.

Standard Voltage:
11 to 14 V

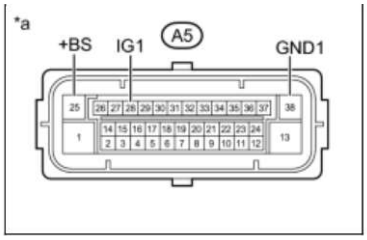
NG ▶ CHECK OR REPLACE CHARGING SYSTEM COMPONENT OR BATTERY

OK ▼

4.	CHECK HARNESS AND CONNECTOR (POWER SOURCE TERMINAL)

(a) Disconnect the skid control ECU (brake actuator assembly) connector.

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(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-25 (+BS) - Body ground	Always	11 to 14 V
A5-25 (+BS) - A5-38 (GND1)	Always	11 to 14 V
A5-28 (IG1) - Body ground	Ignition switch ON	11 to 14 V
A5-28 (IG1) - A5-38 (GND1)	Ignition switch ON	11 to 14 V

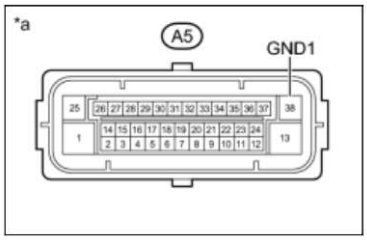
Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

OK ▼

5.	**CHECK HARNESS AND CONNECTOR (GND1 TERMINAL)**



(a) Turn the ignition switch off.

(b) Measure the resistance according to the value(s) in the table below.

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Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-38 (GND1) - Body ground	Always	Below 1 Ω

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND1 CIRCUIT)**

OK ▼

6.	**READ VALUE USING TECHSTREAM (PARKING BRAKE SWITCH)**

(a) Reconnect the skid control ECU (brake actuator assembly) connector.

(b) Connect the Techstream to the DLC3.

(c) Turn the ignition switch to ON.

(d) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Parking Brake SW	Parking brake switch / ON or OFF	ON: Parking brake applied OFF: Parking brake released	-

(e) Using the Techstream, check the switch operation signal received when the parking brake is operated.

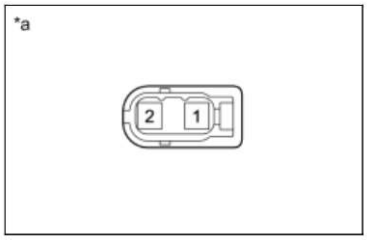
OK:
When the parking brake is operated, the display changes as shown above.

NG ▶ **INSPECT PARKING BRAKE SWITCH ASSEMBLY**

OK ▼

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7.	INSPECT BRAKE FLUID LEVEL WARNING SWITCH



(a) Turn the ignition switch off.

(b) Remove the reservoir filler cap and the strainer.

(c) Disconnect the brake fluid level warning switch connector.

(d) Measure the resistance according to the value(s) in the table below.

HINT:

A float is located inside the reservoir. Its position changes according to the brake fluid level.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - 2	Switch OFF (Float up)	1.9 to 2.1 kΩ
1 - 2	Switch ON (Float down)	Below 1 Ω

Text in Illustration

*a	Component without harness connected (Brake Fluid Level Warning Switch (Brake Master Cylinder Sub-assembly))

HINT:

If there is no problem after finishing the above check, adjust the brake fluid level to the MAX level.

NG ▶ **REPLACE BRAKE MASTER CYLINDER SUB-ASSEMBLY**

OK ▼

8.	CHECK HARNESS AND CONNECTOR (COMBINATION METER ASSEMBLY - BRAKE FLUID LEVEL WARNING SWITCH)

(a) Disconnect the combination meter assembly connector.

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(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
D7-17 (LBL) - A59-1	Always	Below 1 Ω
D7-17 (LBL) - Body ground	Always	10 kΩ or higher
A59-2 - Body ground	Always	Below 1 Ω

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

9.	**INSPECT COMBINATION METER ASSEMBLY**

(a) Reconnect the combination meter assembly connector and the brake fluid level warning switch connector.

(b) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(c) Check the combination meter assembly.

OK:

The brake warning light turns on or off in accordance with the Active Test operation.

HINT:

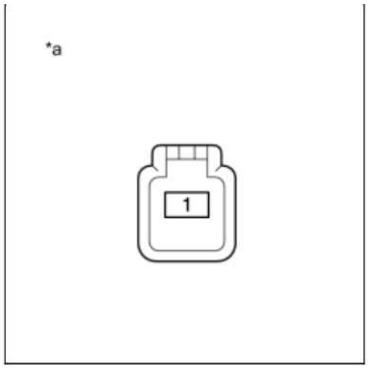
If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

10.	**INSPECT PARKING BRAKE SWITCH ASSEMBLY**

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(a) Turn the ignition switch off.

(b) Disconnect the parking brake switch assembly connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
1 - Body ground	Parking brake switch ON (Switch pin free)	Below 1 Ω
1 - Body ground	Parking brake switch OFF (Switch pin pushed in)	10 kΩ or higher

Text in Illustration

*a	Component without harness connected (Parking Brake Switch Assembly)

NG ▶ **REPLACE PARKING BRAKE SWITCH ASSEMBLY**

OK ▼

11.	**CHECK HARNESS AND CONNECTOR (INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY - PARKING BRAKE SWITCH ASSEMBLY)**

(a) Disconnect the instrument panel junction block assembly connector.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
3B-24 - D31-1	Always	Below 1 Ω

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3B-24 - Body ground	Always	10 kΩ or higher

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

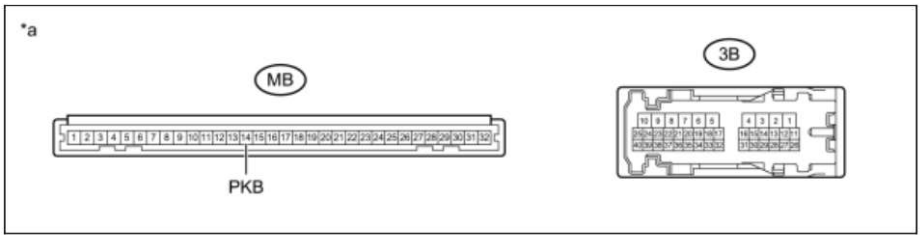
OK ▼

12.	INSPECT INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY

(a) Remove the instrument panel junction block assembly INFO .

(b) Remove the main body ECU (network gateway ECU) from the instrument panel junction block assembly INFO .

(c) Measure the resistance according to the value(s) in the table below.



Text in Illustration

*a	Component without harness connected (Instrument Panel Junction Block Assembly)	-	-

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
MB-14 (PKB) - 3B-24	Always	Below 1 Ω
MB-14 (PKB) - Body ground	Always	10 kΩ or higher

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **REPLACE INSTRUMENT PANEL JUNCTION BLOCK ASSEMBLY**

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OK ▶ REPLACE MAIN BODY ECU (NETWORK GATEWAY ECU)

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001JD60BOX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C146C: Open in ABS Motor Relay Circuit (2013 FR-S)		

DTC	**C146C**	**Open in ABS Motor Relay Circuit**

DESCRIPTION

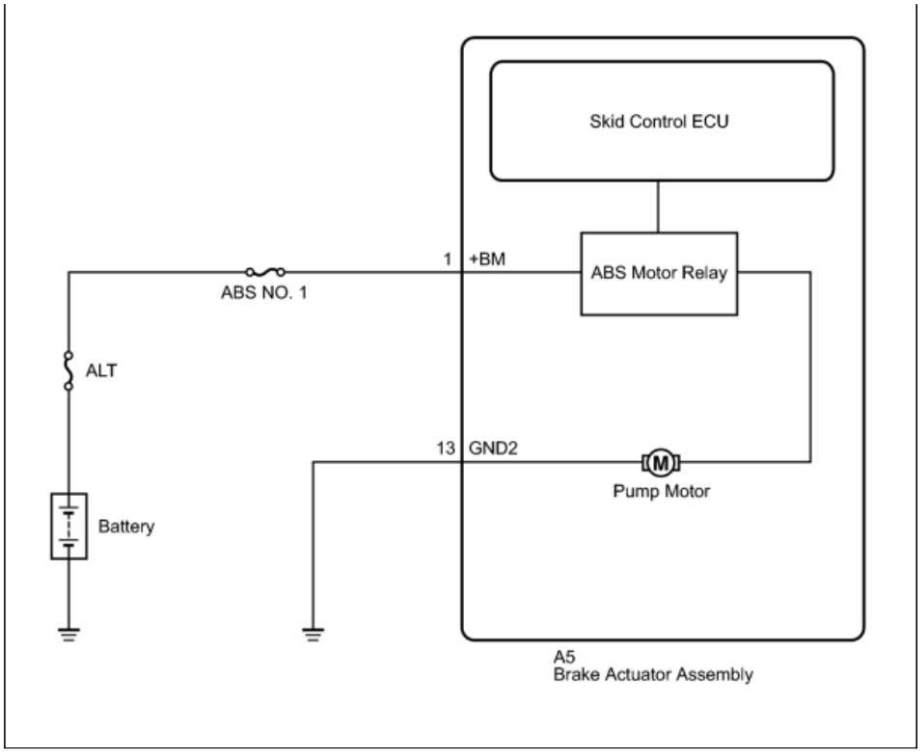
The ABS motor relay supplies power to the pump motor. While the ABS is activated, the skid control ECU turns the ABS motor relay on to operate the pump motor.

If the voltage supplied to the ABS motor relay (+BM) is too low due to low voltage from the battery or alternator, the DTC may be stored.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C146C	Any of the following is detected: 1. When the ABS motor relay is actuated, voltage is not supplied to the pump motor. 2. When the ABS motor relay is not actuated, voltage in the pump motor is high. 3. The skid control ECU judges that pump motor operation is abnormal.	• ABS NO. 1 fuse (Fusible link block assembly) • ABS motor relay circuit • ABS motor relay (Brake actuator assembly)

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

HINT:

When C1241 is output together with C146C, inspect and repair the trouble areas indicated by C1241 first INFO .

PROCEDURE

1.	**PERFORM ACTIVE TEST USING TECHSTREAM (ABS MOTOR RELAY)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test using the Techstream INFO .

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Motor Relay	ABS motor relay	Relay ON/OFF	Operating sound of motor can be heard

(d) Check the operating sound of the pump motor when operating it using the Techstream.

Result:

RESULT	PROCEED TO
Operating sound is heard.	A
Operating sound is not heard.	B

B ▶ **CHECK HARNESS AND CONNECTOR (+BM TERMINAL)**

A ▼

2.	**RECONFIRM DTC**

HINT:

This DTC is stored when a problem is identified in the brake actuator assembly.

The ABS motor relay is in the brake actuator assembly.

Therefore, motor relay inspection and motor relay unit inspection cannot be performed. Be sure to check if the DTC is output again before replacing the skid control ECU (brake actuator assembly).

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 40 km/h (25 mph) or more for 30 seconds or more.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC C146C is not output.	A
DTC C146C is output.	B

HINT:

- If a speed signal of 40 km/h (25 mph) or more is received by the skid control ECU (brake actuator assembly) with the ignition switch ON, the skid control ECU (brake actuator assembly) performs self diagnosis of the motor circuit.

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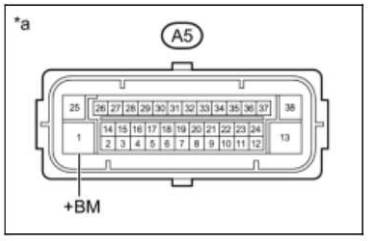
If the normal system code is output (No DTCs are output), slightly jiggle the connectors, wire harness, and fuses of the skid control ECU (brake actuator assembly).

- If any DTCs are output while jiggling a connector or wire harness of the skid control ECU (brake actuator assembly), inspect and repair the connector or wire harness.
- If no DTCs were output when reconfirming DTCs, checking for intermittent problems is necessary because it is suspected that the original DTCs were stored due to the poor connection of a connector terminal.

B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS**

3.	CHECK HARNESS AND CONNECTOR (+BM TERMINAL)



(a) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(b) Disconnect the skid control ECU (brake actuator assembly) connector.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-1 (+BM) - Body ground	Always	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (+BM CIRCUIT)**

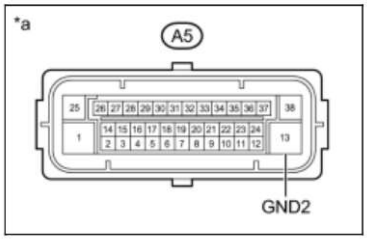
OK ▼

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4.	CHECK HARNESS AND CONNECTOR (GND2 TERMINAL)

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-13 (GND2) - Body ground	Always	Below 1 Ω

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND2 CIRCUIT)**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001NJY01TX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C146E: Open in ABS Solenoid Relay Circuit (2013 FR-S)		

DTC	**C146E**	**Open in ABS Solenoid Relay Circuit**

DESCRIPTION

The ABS solenoid relay is built into the skid control ECU in the brake actuator assembly.

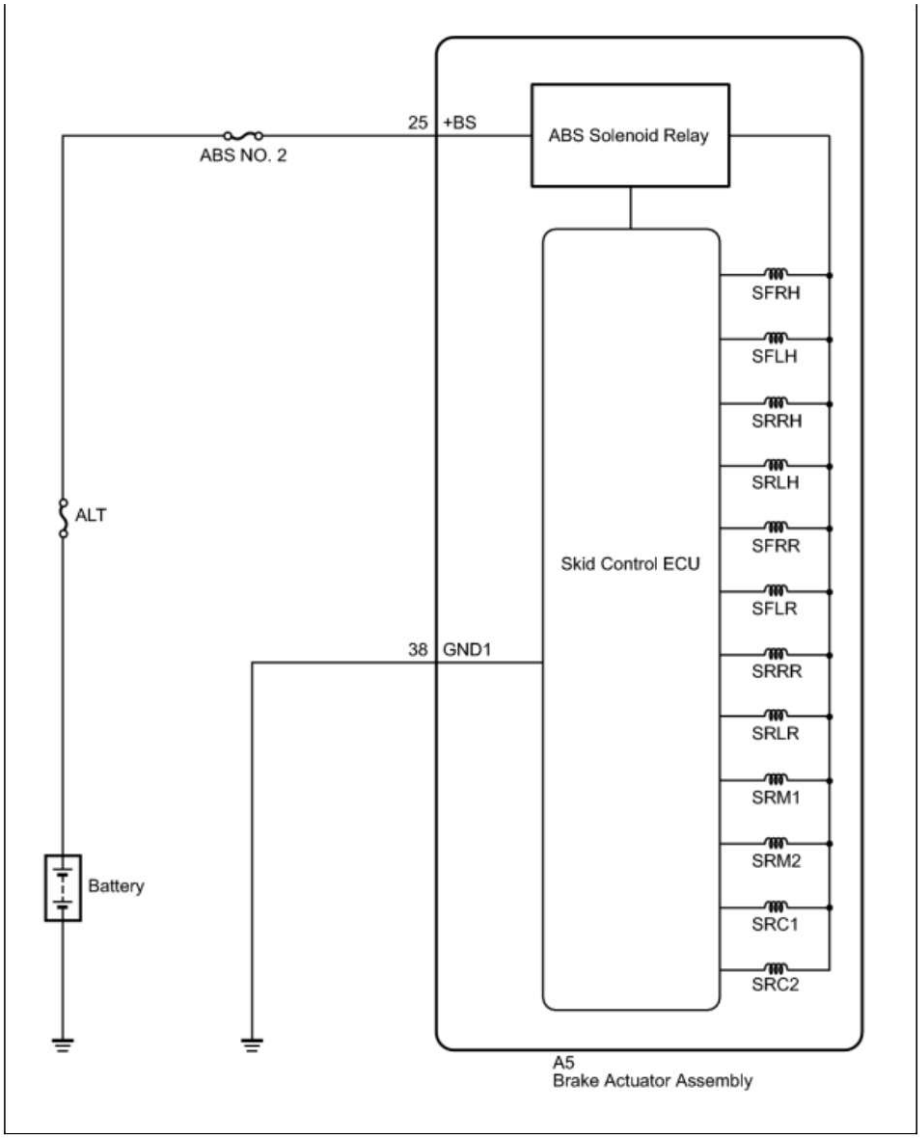
The ABS solenoid relay supplies power to the ABS and TR(A)C solenoids.

The skid control ECU detects a solenoid relay malfunction by performing a self check and relay operation check.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C146E	Either of the following is detected: 1. A solenoid relay drive circuit in the skid control ECU is malfunctioning. 2. The solenoid relay cannot be switched between on and off.	• ABS NO. 2 fuse (Fusible link block assembly) • ABS solenoid relay circuit • ABS solenoid relay (Brake actuator assembly)

WIRING DIAGRAM

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INSPECTION PROCEDURE

NOTICE:

- When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

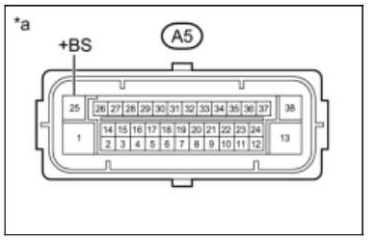
HINT:

When C1241 is output together with C146E, inspect and repair the trouble areas indicated by C1241

first INFO .

PROCEDURE

1.	**CHECK HARNESS AND CONNECTOR (+BS TERMINAL)**



(a) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(b) Disconnect the skid control ECU (brake actuator assembly) connector.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-25 (+BS) - Body ground	Always	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

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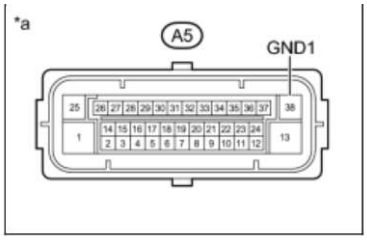
NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (+BS CIRCUIT)**

OK ▼

2.	**CHECK HARNESS AND CONNECTOR (GND1 TERMINAL)**

(a) Measure the resistance according to the value(s) in the table below.

Standard Resistance:



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-38 (GND1) - Body ground	Always	Below 1 Ω

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND1 CIRCUIT)**

OK ▼

3.	**RECONFIRM DTC**

HINT:

This DTC is stored when a problem is identified in the skid control ECU (brake actuator assembly).

The solenoid circuits are located in the brake actuator assembly.

Therefore, solenoid circuit inspection and solenoid unit inspection cannot be performed. Be sure to check if the DTC is output again before replacing the skid control ECU (brake actuator assembly).

(a) Reconnect the skid control ECU (brake actuator assembly) connector.

(b) Clear the DTCs INFO .

(c) Turn the ignition switch off.

(d) Start the engine.

(e) Drive the vehicle at a speed of 40 km/h (25 mph) or more for 30 seconds or more.

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC C146E is not output.	A
DTC C146E is output.	B

HINT:

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If a speed signal of 15 km/h (9 mph) or more is received by the skid control ECU (brake actuator assembly) with the ignition switch ON, the skid control ECU (brake actuator assembly) performs self diagnosis of the solenoid circuit.

- If the normal system code is output (No DTCs are output), slightly jiggle the connectors, wire harnesses, and fuses of the skid control ECU (brake actuator assembly).
- If any DTCs are output while jiggling a connector or wire harness of the skid control ECU (brake actuator assembly), inspect and repair the connector or wire harness.
- If no DTCs were output when reconfirming DTCs, checking for intermittent problems is necessary because it is suspected that the original DTCs were stored due to the poor connection of a connector terminal.

B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS**

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XII080X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1201: Engine Control System Malfunction (2013 FR-S)		

DTC	**C1201**	**Engine Control System Malfunction**

DESCRIPTION

If a malfunction in the SFI system is detected, the operation of VSC and TR(A)C is prohibited by the fail-safe function. When the signals from the engine are received normally, fail-safe control is canceled.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1201	Engine control system malfunction signal continues for 5 seconds while the vehicle is being driven.	SFI system

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK SFI SYSTEM**

(a) Check if an SFI system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

B ▶ **INSPECT SFI SYSTEM**

A ▶ **REPLACE ECM**

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XI80DAX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1225-C1228,C1468,C1469,C146A,C146B: SA1 Solenoid Circuit (2013 FR-S)		

DTC	**C1225**	**SA1 Solenoid Circuit**
DTC	**C1226**	**SA2 Solenoid Circuit**
DTC	**C1227**	**SA3 Solenoid Circuit**
DTC	**C1228**	**STR Solenoid Circuit**
DTC	**C1468**	**SFR Solenoid Circuit**
DTC	**C1469**	**SFL Solenoid Circuit**
DTC	**C146A**	**SRR Solenoid Circuit**
DTC	**C146B**	**SRL Solenoid Circuit**

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DESCRIPTION

These solenoids turn on when signals are received from the skid control ECU and they control the pressure acting on the wheel cylinders to control the braking force.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1225 C1226 C1227 C1228 C1468 C1469 C146A C146B	Solenoid valve signal does not match the check result.	• Solenoid circuit • Solenoid valve (Brake actuator assembly)

WIRING DIAGRAM

Refer to DTC C146E INFO .

INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**RECONFIRM DTC**

HINT:

These codes are detected when a problem is determined in the brake actuator assembly.

The solenoid circuits are in the brake actuator assembly.

Therefore, solenoid circuit inspection and solenoid unit inspection cannot be performed. Be sure to check if any DTC is output before replacing the brake actuator assembly.

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 20 km/h (12 mph) or more.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs C1225, C1226, C1227, C1228, C1468, C1469, C146A and C146B are not output.	A
DTCs C1225, C1226, C1227, C1228, C1468, C1469, C146A and/or C146B are output.	B

HINT:

- The skid control ECU performs self diagnosis of the solenoid circuit after the ignition switch turned to ON.
- If the normal system code is output (No DTCs are output), slightly jiggle the connectors, wire harness, and fuses of the brake actuator assembly.
- If any DTCs are output while jiggling a connector or wire harness of the skid control ECU (brake actuator assembly), inspect and repair the connector or wire harness.
- If no DTCs were output when reconfirming DTCs, checking for intermittent problems is necessary because it is suspected that the original DTCs were stored due to the poor connection of a connector terminal.

B ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

A ▶ CHECK FOR INTERMITTENT PROBLEMS

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XIM0L6X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1231: Steering Angle Sensor (2013 FR-S)		

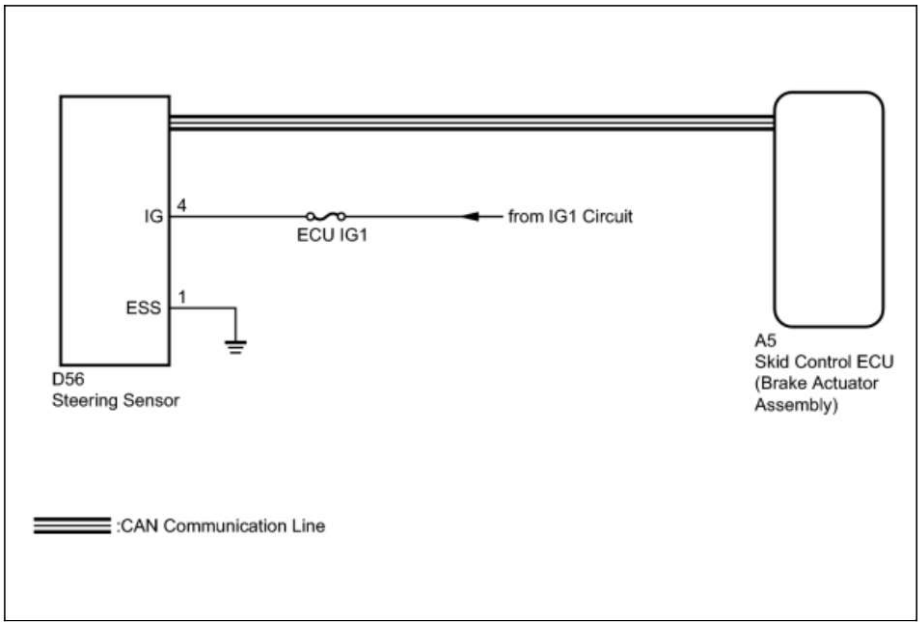
DTC	**C1231**	**Steering Angle Sensor**

DESCRIPTION

The steering sensor signal is sent to the skid control ECU (brake actuator assembly) via the CAN communication system. When there is a malfunction in the CAN communication system, it will be detected by the steering sensor zero point malfunction diagnostic function.

DTC CODE	DTC DETECTION CONDITION	TROUBLE AREA
C1231	When the +BS terminal voltage is between 9.6 and 16.5 V, the steering sensor malfunction signal is received.	• Steering sensor • Steering sensor circuit • Steering sensor power supply

WIRING DIAGRAM



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INSPECTION PROCEDURE

NOTICE:

- When replacing the steering sensor, perform VSC sensor neutral memorization INFO .
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

HINT:

- When DTC U0073 and/or U0126 is output together with DTC C1231, inspect and repair the trouble areas indicated by DTC U0073 and/or U0126 first INFO .
- When the speed sensor or the yaw rate sensor has trouble, DTCs for the steering sensor may be output even when the steering sensor is normal. When DTCs for the speed sensor or yaw rate sensor assembly are output together with this steering sensor DTC, inspect and repair the speed sensor and yaw rate sensor assembly first, and then inspect and repair the steering sensor.

PROCEDURE

1.	**CHECK DTC**

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Turn the ignition switch to ON again and check that no CAN communication system DTC is output.

(d) Drive the vehicle at a speed of 35 km/h (22 mph), turn the steering wheel to the right and left, and check that no speed sensor and yaw rate sensor DTCs are output INFO .

Result

RESULT	PROCEED TO
No CAN communication system, speed sensor or yaw rate sensor DTC is output.	A
CAN communication system DTC is output.	B
Speed sensor or yaw rate sensor DTC is output.	C

HINT:

- If there is a malfunction in the speed sensor or yaw rate sensor, an abnormal value may be output although the steering sensor is normal.
- If speed sensor and yaw rate sensor assembly DTCs are output together with this steering sensor DTC, inspect and repair the speed and yaw rate sensors first, and then inspect and repair the steering sensor.

B ▶ **GO TO CAN COMMUNICATION SYSTEM (HOW TO PROCEED WITH TROUBLESHOOTING)**

C ▶ **REPAIR CIRCUIT INDICATED BY OUTPUT DTC**

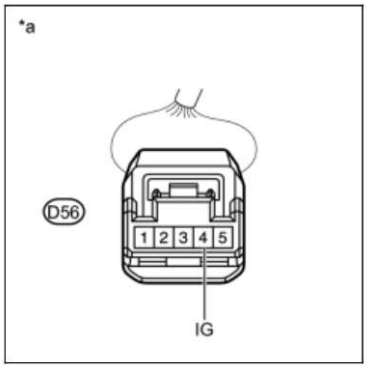
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A

2.	CHECK HARNESS AND CONNECTOR (POWER SOURCE TERMINAL)

(a) Turn the ignition switch off.

(b) Disconnect the steering sensor connector.



(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
D56-4 (IG) - Body ground	Ignition switch ON	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Steering Sensor)

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

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OK

3.	CHECK HARNESS AND CONNECTOR (GROUND TERMINAL)

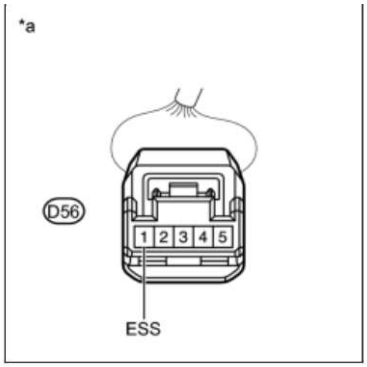
(a) Turn the ignition switch off.

(b) Disconnect the steering sensor connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION



D56-1 (ESS) - Body ground	Always	Below 1 Ω

Text in Illustration

*a	Front view of wire harness connector (to Steering Sensor)

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GROUND CIRCUIT)**

OK ▶ **REPLACE STEERING SENSOR**

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM0000025HJ01NX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1234,C1419,C1472,C1474: Yaw Rate Sensor (2013 FR-S)		

DTC	**C1234**	**Yaw Rate Sensor**

DTC	**C1419**	**Acceleration Sensor Internal Circuit**

DTC	**C1472**	**Acceleration Sensor**

DTC	**C1474**	**Forward and Rearward G Sensor**

DESCRIPTION

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1234	Internal failure of the skid control ECU (Yaw rate sensor).	Skid control ECU (Brake actuator assembly)
C1419	Internal failure of the skid control ECU (Acceleration sensor).	
C1472	Internal failure of the skid control ECU (Lateral G sensor).	
C1474	Internal failure of the skid control ECU (Forward and backward G sensor).	

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INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO **.**

PROCEDURE

1.	**CHECK BRAKE ACTUATOR ASSEMBLY INSTALLATION**

(a) Turn the ignition switch off.

(b) Check that the skid control ECU (brake actuator assembly) has been installed properly INFO .

OK:

The skid control ECU (brake actuator assembly) should be tightened to the specified torque.

The skid control ECU (brake actuator assembly) should not be tilted.

INSTALL BRAKE ACTUATOR ASSEMBLY

NG ▶ CORRECTLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY



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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000002N5F02QX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1237,C1275-C1278: Speed Sensor Rotor Faulty (2013 FR-S)		

DTC	**C1237**	**Speed Sensor Rotor Faulty**

DTC	**C1275**	**Abnormal Change in Output Signal of Front Speed Sensor RH (Test Mode DTC)**

DTC	**C1276**	**Abnormal Change in Output Signal of Front Speed Sensor LH (Test Mode DTC)**

DTC	**C1277**	**Abnormal Change in Output Signal of Rear Speed Sensor RH (Test Mode DTC)**

DTC	**C1278**	**Abnormal Change in Output Signal of Rear Speed Sensor LH (Test Mode DTC)**

DESCRIPTION

The skid control ECU (brake actuator assembly) measures the speed of each wheel by receiving signals from the speed sensor.

These signals are used for recognizing that all four wheels are operating properly.

Therefore, all wheel signals must be equal.

DTCs C1275 to C1278 are cleared when the speed sensor sends a vehicle speed signal or when Test Mode ends. DTCs C1275 to C1278 are output only in Test Mode.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1237	Any of the following is detected: 1. Discrepancy among four wheel speed sensor output. 2. Abnormal pulse signals from 3 or more sensors. 3. Continuous ABS control is performed for 60 seconds or more. 4. VSC control is performed for 5 seconds or more.	• Tire and wheel size • Tire deformation • Speed sensor rotor • Speed sensor • Speed sensor circuit • Skid control ECU (Brake actuator assembly)
C1275	Detected only during Test Mode.	Front speed sensor rotor RH/LH (Front axle

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C1276		hub sub-assembly RH/LH)
C1277 C1278	Detected only during Test Mode.	Rear speed sensor rotor RH/LH (Rear axle hub sub-assembly RH/LH)

HINT:

- DTC C1275 is for the front speed sensor RH.
- DTC C1276 is for the front speed sensor LH.
- DTC C1277 is for the rear speed sensor RH.
- DTC C1278 is for the rear speed sensor LH.

WIRING DIAGRAM

Refer to DTCs C1330, C1331, C1332, C1333, C1464, C1465, C1466 and C1467 INFO for front, and INFO for rear).

INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

HINT:

When C1330, C1331, C1332, C1333, C1464, C1465, C1466 and/or C1467 is output together with C1237, inspect and repair the trouble areas indicated by C1330, C1331, C1332, C1333, C1464, C1465, C1466 and/or C1467 first INFO for front, and/or INFO for rear).

PROCEDURE

1.	**CHECK TIRES**

(a) Check the size and condition of all four wheels INFO .

HINT:

The DTC is output when tire deformation or a difference in tire size is detected.

OK:
The diameter of all four tires and the tire pressure are the same.

NG ▶ **REPLACE TIRES SO THAT ALL FOUR TIRES ARE THE SAME SIZE**

OK ▼

2.	**READ VALUE USING TECHSTREAM (SPEED SENSOR)**

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(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Data List using the Techstream INFO .

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TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
FR Wheel Speed	Front wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
FL Wheel Speed	Front wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
RR Wheel Speed	Rear wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
RL Wheel Speed	Rear wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations

(d) Check the speed value output from the speed sensor displayed on the Techstream.

HINT:

Factors that affect the indicated vehicle speed include tire size, tire pressure, and tire wear. The speed indicated on the speedometer has an allowable margin of error. This can be tested using a speedometer tester (calibrated chassis dynamometer). For details about testing and the margin of error, see the reference chart INFO .

OK:
The speed value output from the speed sensor displayed on the Techstream is similar to the speed indicated on the speedometer.
Result:

RESULT	PROCEED TO
OK	A
NG (for front)	B
NG (for rear)	C

B ▶ CHECK FRONT SPEED SENSOR INSTALLATION

C ▶ CHECK REAR SPEED SENSOR INSTALLATION

A

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3.	PERFORM TEST MODE INSPECTION (SIGNAL CHECK)

(a) Turn the ignition switch off.

(b) Perform the sensor check using the Test Mode procedure INFO .

OK:
All Test Mode DTCs are not output.
Result:

RESULT	PROCEED TO
OK	A
NG (for front)	B
NG (for rear)	C

B ▶ CHECK FRONT SPEED SENSOR INSTALLATION

C ▶ CHECK REAR SPEED SENSOR INSTALLATION

A ▼

4.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC C1237 is not output.	A
DTC C1237 is output (for front).	B
DTC C1237 is output (for rear).	C

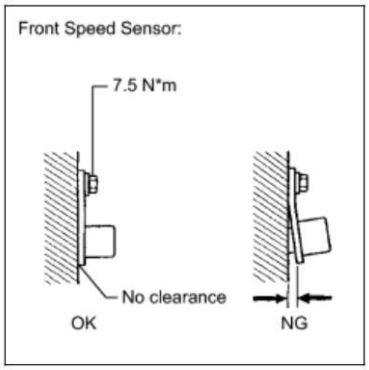
B ▶ REPLACE FRONT SPEED SENSOR

C ▶ REPLACE REAR SPEED SENSOR

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A ▶ CHECK FOR INTERMITTENT PROBLEMS

5.	CHECK FRONT SPEED SENSOR INSTALLATION



(a) Turn the ignition switch off.

(b) Check the speed sensor installation.

OK:

There is no clearance between the sensor and the front axle hub sub-assembly.
The installation bolt is tightened properly.

Torque

7.5 N*m (77 kgf*cm, 66 in.*lbf)

NG ▶ INSTALL FRONT SPEED SENSOR CORRECTLY

OK ▼

6.	CHECK FRONT SPEED SENSOR TIP

(a) Remove the front speed sensor INFO .

(b) Check the speed sensor tip.

OK:

No scratches or foreign matter on the sensor tip.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

NG ▶ CLEAN OR REPLACE FRONT SPEED SENSOR

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OK

7.	**CHECK HARNESS AND CONNECTOR (BRAKE ACTUATOR ASSEMBLY - FRONT SPEED SENSOR)**

(a) Install the front speed sensor INFO .

(b) Make sure that there is no looseness at the locking part and the connecting part of the connectors.

(c) Disconnect the skid control ECU (brake actuator assembly) connector and the front speed sensor connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for RH

for LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-16 (FR+) - A42-2 (FR+)	Always	Below 1 Ω
A5-16 (FR+) - Body ground	Always	10 kΩ or higher
A5-4 (FR-) - A42-1 (FR-)	Always	Below 1 Ω
A5-4 (FR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-19 (FL+) - A12-2 (FL+)	Always	Below 1 Ω
A5-19 (FL+) - Body ground	Always	10 kΩ or higher
A5-32 (FL-) - A12-1 (FL-)	Always	Below 1 Ω
A5-32 (FL-) - Body ground	Always	10 kΩ or higher

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NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

8.	**RECONFIRM DTC**

(a) Reconnect the skid control ECU (brake actuator assembly) connector and the front speed sensor connector.

(b) Clear the DTCs INFO .

(c) Turn the ignition switch off.

(d) Start the engine.

(e) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC C1237 is output.	A
DTC C1237 is not output.	B

B ▶ **CHECK FOR INTERMITTENT PROBLEMS**

A

9.	**REPLACE FRONT SPEED SENSOR**

(a) Turn the ignition switch off.

(b) Replace the front speed sensor INFO .

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT

10.	**RECONFIRM DTC**

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

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Result:

RESULT	PROCEED TO
DTC C1237 is output.	A
DTC C1237 is not output.	B

B ▶ END

A ▼

11.	REPLACE FRONT SPEED SENSOR ROTOR

(a) Turn the ignition switch off.

(b) Replace the front speed sensor rotor INFO .

HINT:

If the front speed sensor rotor needs to be replaced, replace the front axle hub sub-assembly.

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT ▼

12.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

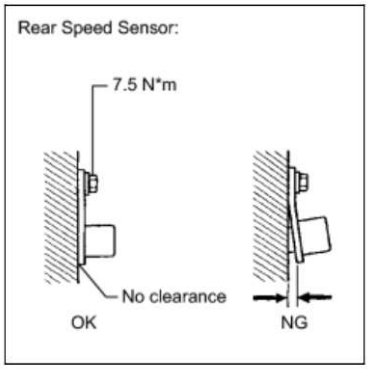
RESULT	PROCEED TO
DTC C1237 is output.	A
DTC C1237 is not output.	B

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B ▶ END

A ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

13.	CHECK REAR SPEED SENSOR INSTALLATION



(a) Turn the ignition switch off.

(b) Check the speed sensor installation.

OK:

There is no clearance between the sensor and the rear axle hub sub-assembly.

The installation bolt is tightened properly.

Torque

7.5 N*m (77 kgf*cm, 66 in.*lbf)

NG ▶ INSTALL REAR SPEED SENSOR CORRECTLY

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OK ▼

14.	CHECK REAR SPEED SENSOR TIP

(a) Remove the rear speed sensor INFO .

(b) Check the speed sensor tip.

OK:

No scratches or foreign matter on the sensor tip.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

NG ▶ **CLEAN OR REPLACE REAR SPEED SENSOR**

OK ▼

15.	**CHECK HARNESS AND CONNECTOR (BRAKE ACTUATOR ASSEMBLY - REAR SPEED SENSOR)**

(a) Install the rear speed sensor INFO .

(b) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(c) Disconnect the skid control ECU (brake actuator assembly) connector and the rear speed sensor connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for RH

for LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-17 (RR+) - G9-2 (RR+)	Always	Below 1 Ω
A5-17 (RR+) - Body ground	Always	10 kΩ or higher
A5-29 (RR-) - G9-1 (RR-)	Always	Below 1 Ω
A5-29 (RR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-31 (RL+) - H12-2 (RL+)	Always	Below 1 Ω
A5-31 (RL+) - Body ground	Always	10 kΩ or higher
A5-18 (RL-) - H12-1 (RL-)	Always	Below 1 Ω
A5-18 (RL-) - Body ground	Always	10 kΩ or higher

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NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▼

16.	RECONFIRM DTC

(a) Reconnect the skid control ECU (brake actuator assembly) connector and the rear speed sensor connector.

(b) Clear the DTCs INFO .

(c) Turn the ignition switch off.

(d) Start the engine.

(e) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC C1237 is output.	A
DTC C1237 is not output.	B

B ▶ CHECK FOR INTERMITTENT PROBLEMS

A ▼

17.	REPLACE REAR SPEED SENSOR

(a) Turn the ignition switch off.

(b) Replace the rear speed sensor INFO .

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT ▼

18.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

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(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC C1237 is output.	A
DTC C1237 is not output.	B

B ▶ END

A ▼

19.	REPLACE REAR SPEED SENSOR ROTOR

(a) Turn the ignition switch off.

(b) Replace the rear speed sensor rotor INFO .

HINT:

If the rear speed sensor rotor needs to be replaced, replace the rear axle hub and bearing assembly.

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT ▼

20.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO

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DTC C1237 is output.	A
DTC C1237 is not output.	B

B ▶ END

A ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XW60DXX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1241: Low or High Power Supply Voltage (2013 FR-S)		

DTC	**C1241**	**Low or High Power Supply Voltage**

DESCRIPTION

If a malfunction is detected in the power supply circuit, the skid control ECU (brake actuator assembly) stores this DTC and the fail-safe function prohibits ABS operation.

This DTC is stored when the +BS terminal voltage meets one of the DTC detection conditions due to a malfunction in the power supply or charging circuit such as the battery or alternator circuit, etc.

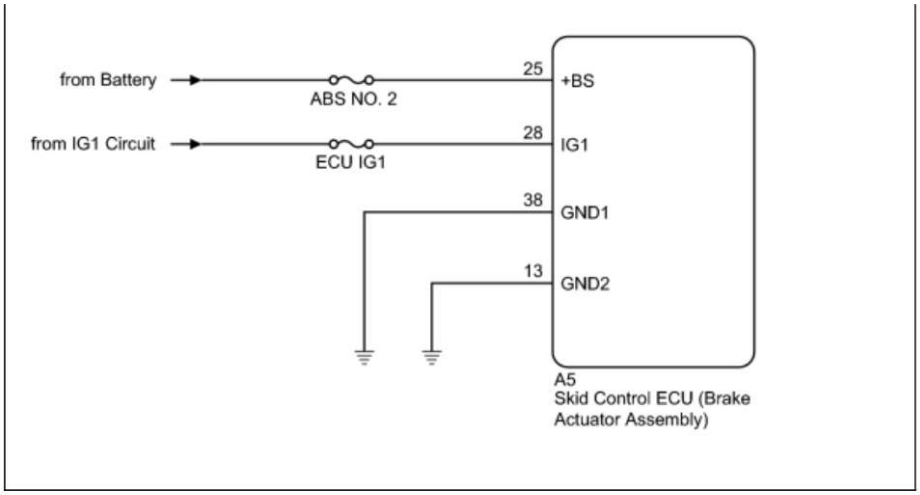
The DTC is canceled when the +BS terminal voltage returns to normal.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1241	Any of the following is detected: 1. The vehicle speed is 6 km/h (4 mph) or more and the +BS terminal voltage (soft low voltage) is 9.6 V or less for 1 second or more. 2. The vehicle speed is 6 km/h (4 mph) or more and the +BS terminal voltage (hard low voltage) is 6.9 V or less for 1 second or more. 3. The vehicle speed is 15 km/h (9 mph) or more, the +BS terminal voltage is 9.6 V or more, the skid control ECU (brake actuator assembly) turns on more than one valve at the same time within a short period of time and the valve relay supply voltage drop exceeds the threshold.*	• ABS NO. 2 fuse • ECU IG1 fuse • Battery • Charging system • Power source circuit • Ground circuit • Internal power supply circuit of the skid control ECU (brake actuator assembly)

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*: The skid control ECU (brake actuator assembly) monitors the resistance of the power source line at the +BS terminal. A malfunction is detected when an abnormality occurs in the +BS terminal wire harness or its connection and the skid control ECU (brake actuator assembly) determines that the wiring resistance at the +BS terminal exceeds the standard resistance.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	**CHECK BATTERY**

(a) Check the battery voltage.

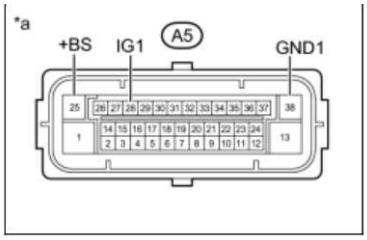
Standard Voltage:
11 to 14 V

NG ▶ **CHECK OR REPLACE CHARGING SYSTEM COMPONENT OR BATTERY**

OK
▼

2.	**CHECK HARNESS AND CONNECTOR (POWER SOURCE TERMINAL)**

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(a) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(b) Disconnect the skid control ECU (brake actuator assembly) connector.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-25 (+BS) - Body ground	Always	11 to 14 V
A5-25 (+BS) - A5-38 (GND1)	Always	11 to 14 V
A5-28 (IG1) - Body ground	Ignition switch ON	11 to 14 V
A5-28 (IG1) - A5-38 (GND1)	Ignition switch ON	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

Result:

RESULT	PROCEED TO
OK	A
NG (for +BS circuit)	B
NG (for IG1 circuit)	C

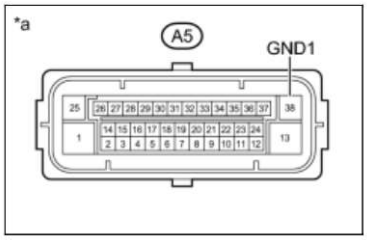
B ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (+BS CIRCUIT)**

C ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (IG1 CIRCUIT)**

A ▼

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3.	CHECK HARNESS AND CONNECTOR (GND1 TERMINAL)



(a) Turn the ignition switch off.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-38 (GND1) - Body ground	Always	Below 1 Ω

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (GND1 CIRCUIT)**

OK ▼

4.	RECONFIRM DTC

(a) Reconnect the skid control ECU (brake actuator assembly) connector.

(b) Clear the DTCs INFO .

(c) Turn the ignition switch off.

(d) Start the engine.

(e) Perform a road test.

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO

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DTC C1241 is not output.	A
DTC C1241 is output.	B

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

B ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

A ▶ CHECK FOR INTERMITTENT PROBLEMS

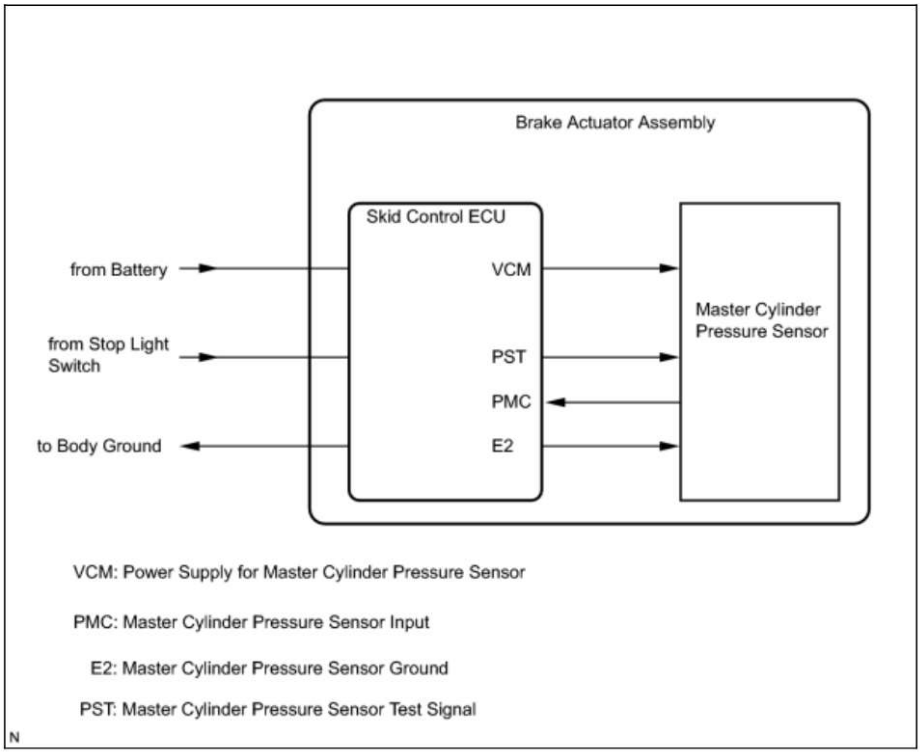
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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XIG0H7X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1246: Master Cylinder Pressure Sensor Malfunction (2013 FR-S)		

DTC	**C1246**	**Master Cylinder Pressure Sensor Malfunction**

DESCRIPTION

The master cylinder pressure sensor is connected to the skid control ECU in the brake actuator assembly.



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DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1246	Any of the following is detected: 1. The voltage of the sensor signal is out of range (below 0.129 V, above 3.29 V). 2. An abnormality is detected in the skid control ECU internal sensor test. 3. The sensor signal offset value is out of range.	• STOP fuse • Stop light switch circuit • Master cylinder pressure sensor circuit • Master cylinder pressure sensor (Brake actuator assembly)

WIRING DIAGRAM

Refer to DTCs C1249 INFO .

INSPECTION PROCEDURE

NOTICE:

- When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	**CHECK STOP LIGHT OPERATION**

(a) Check that the stop lights come on when the brake pedal is depressed, and go off when the brake pedal is released.

OK:

CONDITION	ILLUMINATION CONDITION
Brake pedal depressed.	ON
Brake pedal released.	OFF

NG ▶ **INSPECT LIGHTING SYSTEM (STOP LIGHT CIRCUIT)**

OK ▼

2.	**READ VALUE USING TECHSTREAM (MASTER CYLINDER PRESSURE SENSOR)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Master Cylinder	Master cylinder pressure sensor reading / Min.: 0.00 V, Max.: 5.00 V	Brake pedal released: 0.20 to	Reading increases when brake pedal is depressed

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Sensor		0.40 V	

(d) Check that the brake fluid pressure value of the master cylinder pressure sensor observed on the Techstream changes when the brake pedal is depressed.

OK:

When the pedal is depressed, the voltage displayed on the Techstream increases.

NG ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

OK ▼

3.	**READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH)**

(a) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

(b) Check that the stop light switch display observed on the Techstream change according to brake pedal operation.

OK:

The Techstream displays on or off according to brake pedal operation.

NG ▶ **CHECK HARNESS AND CONNECTOR (POWER SOURCE TERMINAL)**

OK ▼

4.	**RECONFIRM DTC**

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle and depress the brake pedal several times to test the stop light circuit.

(e) Check if the same DTC is output INFO .

Result:

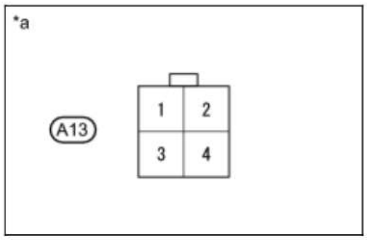
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RESULT	PROCEED TO
DTC C1246 is not output.	A
DTC C1246 is output.	B

B ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS**

5.	CHECK HARNESS AND CONNECTOR (POWER SOURCE TERMINAL)



(a) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(b) Disconnect the noise filter connector.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A13-3 - Body ground	Always	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Noise Filter)

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

OK ▼

6.	INSPECT NOISE FILTER

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(a) Remove the noise filter INFO .

(b) Inspect the noise filter INFO .

NG ▶ REPLACE NOISE FILTER

OK ▼

7.	CHECK HARNESS AND CONNECTOR (NOISE FILTER - STOP LIGHT SWITCH ASSEMBLY)

(a) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(b) Disconnect the stop light switch assembly connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A13-2 - A22-1	Always	Below 1 Ω
A13-1 - A22-2	Always	Below 1 Ω

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

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OK ▼

8.	INSPECT STOP LIGHT SWITCH ASSEMBLY

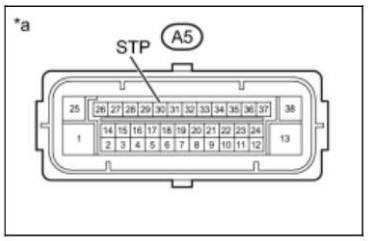
(a) Remove the stop light switch assembly INFO .

(b) Inspect the stop light switch assembly INFO .

NG ▶ REPLACE STOP LIGHT SWITCH ASSEMBLY

OK ▼

9.	CHECK HARNESS AND CONNECTOR (STP TERMINAL)



(a) Turn the ignition switch off.

(b) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(c) Disconnect the skid control ECU (brake actuator assembly) connector.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-30 (STP) - Body ground	Stop light switch ON (Brake pedal depressed)	11 to 14 V*
	Stop light switch OFF (Brake pedal released)	Below 1.5 V

HINT:

***: The standard voltage value varies depending on the +BS terminal voltage value. The standard voltage is 85% of the +BS terminal voltage.**

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STP CIRCUIT)**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XIE0K1X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1249: Open in Stop Light Switch Circuit (2013 FR-S)		

DTC	**C1249**	**Open in Stop Light Switch Circuit**

DESCRIPTION

The skid control ECU (brake actuator assembly) receives stop light switch signals and uses them to determine whether or not the brakes are applied.

DTCs may be stored if one of the following occurs:

- Stop light switch stuck on/off malfunction.
- Accelerator pedal and brake pedal depressed simultaneously.*

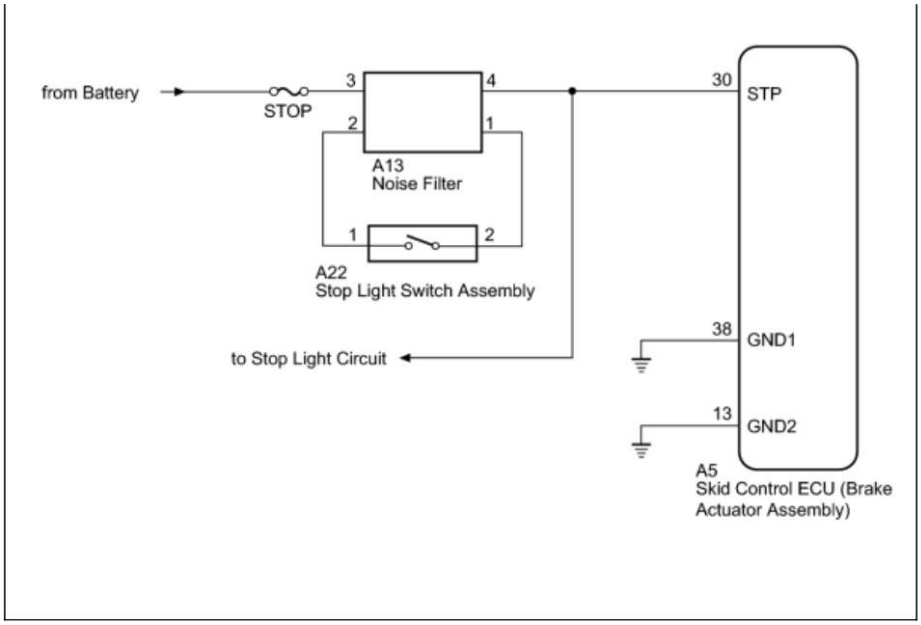
HINT:

***: The skid control ECU (brake actuator assembly) may store this DTC upon judging that a stuck on malfunction has occurred when the accelerator pedal and brake pedal are depressed simultaneously. However, this does not indicate a malfunction.**

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1249	Any of the following is detected: • The vehicle speed is 10 km/h (6 mph) or more, the accelerator pedal is depressed, the master cylinder pressure is 0.5 MPa (5.09 kgf/cm ^{2} , 72 psi) or less, and the stop light switch is on for 60 seconds or more. • When the stop light switch is OFF, the master cylinder pressure is increased.	• STOP fuse • Stop light switch assembly • Noise filter • Stop light switch circuit • Skid control ECU (Brake actuator assembly)

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WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

- When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .
- Inspect the fuses for circuits related to this system before performing the following inspection procedure.

PROCEDURE

1.	CHECK ACCELERATOR PEDAL AND BRAKE PEDAL OPERATION

(a) Interview the customer to check if the pedals were depressed simultaneously while driving or braking.

OK:

The pedals were not depressed simultaneously.

HINT:

The skid control ECU (brake actuator assembly) may store this DTC upon judging that a stuck on malfunction has occurred when the accelerator pedal and brake pedal are depressed simultaneously.

If the pedals were depressed simultaneously, clear the DTC because it is not a malfunction.

NG ▶ END

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OK

2.	CHECK STOP LIGHT OPERATION

(a) Check that the stop lights come on when the brake pedal is depressed, and go off when the brake pedal is released.

OK:

CONDITION	ILLUMINATION CONDITION
Brake pedal depressed.	ON
Brake pedal released.	OFF

NG ▶ **CHECK HARNESS AND CONNECTOR (POWER SOURCE TERMINAL)**

OK

3.	READ VALUE USING TECHSTREAM (STOP LIGHT SWITCH)

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

(d) Check that the stop light switch display observed on the Techstream changes according to brake pedal operation.

OK:

The Techstream displays on or off according to brake pedal operation.

NG ▶ **CHECK HARNESS AND CONNECTOR (STP TERMINAL)**

OK

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4.	RECONFIRM DTC

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Turn the ignition switch off.

(d) Start the engine.

(e) Drive the vehicle and depress the brake pedal several times to test the stop light circuit.

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC C1249 is not output.	A
DTC C1249 is output.	B

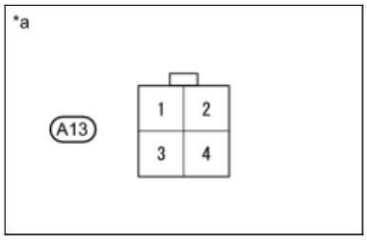
HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

B ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

A ▶ CHECK FOR INTERMITTENT PROBLEMS

5.	CHECK HARNESS AND CONNECTOR (POWER SOURCE TERMINAL)



(a) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(b) Disconnect the noise filter connector.

(c) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

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TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A13-3 - Body ground	Always	11 to 14 V

Text in Illustration

*a	Front view of wire harness connector (to Noise Filter)

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (POWER SOURCE CIRCUIT)**

OK ▼

6.	**INSPECT NOISE FILTER**

(a) Remove the noise filter INFO .

(b) Inspect the noise filter INFO .

NG ▶ **REPLACE NOISE FILTER**

OK ▼

7.	**CHECK HARNESS AND CONNECTOR (NOISE FILTER - STOP LIGHT SWITCH ASSEMBLY)**

(a) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(b) Disconnect the stop light switch assembly connector.

(c) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A13-2 - A22-1	Always	Below 1 Ω
A13-1 - A22-2	Always	Below 1 Ω

REPAIR OR REPLACE HARNESS OR

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NG ▶ CONNECTOR

OK ▼

8.	INSPECT STOP LIGHT SWITCH ASSEMBLY

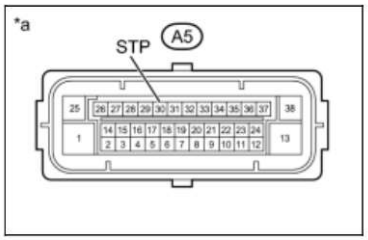
(a) Remove the stop light switch assembly INFO .

(b) Inspect the stop light switch assembly INFO .

NG ▶ REPLACE STOP LIGHT SWITCH ASSEMBLY

OK ▼

9.	CHECK HARNESS AND CONNECTOR (STP TERMINAL)



(a) Reconnect the stop light switch assembly connector.

(b) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(c) Disconnect the skid control ECU (brake actuator assembly) connector.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-30 (STP) - Body ground	Stop light switch ON (Brake pedal depressed)	11 to 14 V*
	Stop light switch OFF (Brake pedal released)	Below 1.5 V

HINT:

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***: The standard voltage value varies depending on the +BS terminal voltage value. The standard voltage is 85% of the +BS terminal voltage.**

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STP CIRCUIT)**

OK ▼

10.	**RECONFIRM DTC**

(a) Reconnect the skid control ECU (brake actuator assembly) connector.

(b) Clear the DTCs INFO .

(c) Turn the ignition switch off.

(d) Start the engine.

(e) Drive the vehicle and depress the brake pedal several times to test the stop light circuit.

(f) Check if the same DTC is output INFO .

Result:

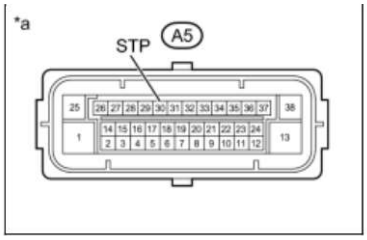
RESULT	PROCEED TO
DTC C1249 is not output.	A
DTC C1249 is output.	B

B ▶ **CHECK FOR INTERMITTENT PROBLEMS**

A ▶ **INSPECT LIGHTING SYSTEM (STOP LIGHT CIRCUIT)**

11.	**CHECK HARNESS AND CONNECTOR (STP TERMINAL)**

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(a) Turn the ignition switch off.

(b) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(c) Disconnect the skid control ECU (brake actuator assembly) connector.

(d) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-30 (STP) - Body ground	Stop light switch ON (Brake pedal depressed)	11 to 14 V*
	Stop light switch OFF (Brake pedal released)	Below 1.5 V

HINT:

***: The standard voltage value varies depending on the +BS terminal voltage value. The standard voltage is 85% of the +BS terminal voltage.**

Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO **.**

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR (STP CIRCUIT)**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XI90O4X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1271,C1272,C1330,C1331,C1464,C1465: Low Output Signal of Front Speed Sensor RH (Test Mode DTC) (2013 FR-S)		

DTC	**C1271**	**Low Output Signal of Front Speed Sensor RH (Test Mode DTC)**

DTC	**C1272**	**Low Output Signal of Front Speed Sensor LH (Test Mode DTC)**

DTC	**C1330**	**Open in Front Speed Sensor RH**

DTC	**C1331**	**Open in Front Speed Sensor LH**

DTC	**C1464**	**Front Speed Sensor RH**

DTC	**C1465**	**Front Speed Sensor LH**

DESCRIPTION

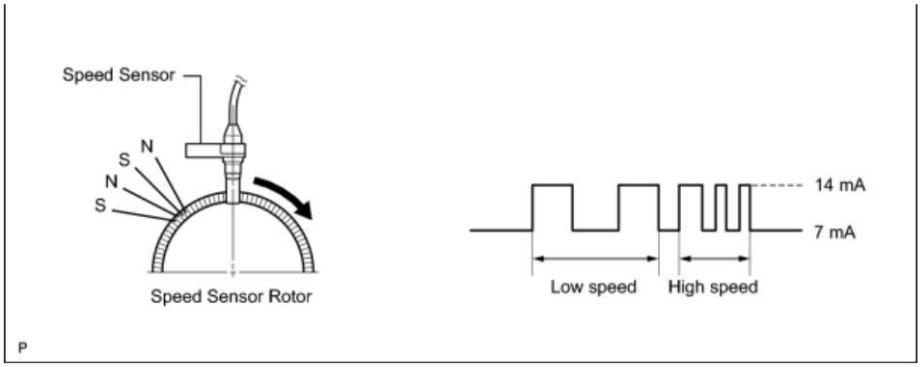
Each speed sensor detects wheel speed and sends the appropriate signals to the skid control ECU (brake actuator assembly). These signals are used by the brake control system.

Speed sensor rotors have row of alternating N and S magnetic poles, and their magnetic fields change when the rotors turn.

Each speed sensor detects that magnetic field change and sends a pulse signal to the skid control ECU (brake actuator assembly).

DTCs C1271 and C1272 are cleared when the speed sensor sends a vehicle speed signal or when Test Mode ends. DTCs C1271 and C1272 are output only in Test Mode.

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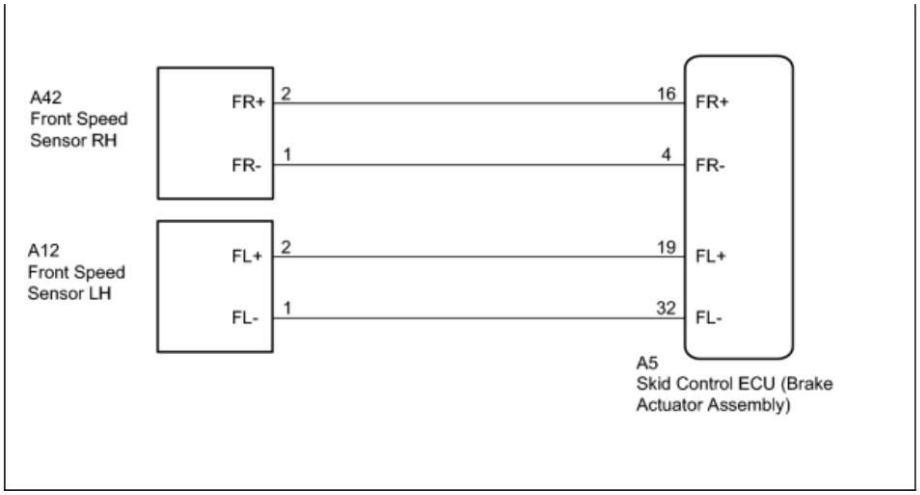
DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1330 C1331	An open or short in the speed sensor signal circuit.	• Front speed sensor RH/LH • Speed sensor circuit • Sensor installation • Skid control ECU (Brake actuator assembly)
C1464 C1465	An abnormal signal is received from a wheel speed sensor.	• Front speed sensor RH/LH • Speed sensor circuit • Front speed sensor rotor RH/LH (Front axle hub sub-assembly RH/LH) • Sensor installation • Skid control ECU (Brake actuator assembly)
C1271 C1272	Detected only during Test Mode.	• Front speed sensor RH/LH • Sensor installation • Front speed sensor rotor RH/LH (Front axle hub sub-assembly RH/LH)

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HINT:

- DTCs C1271, C1330 and C1464 are for the front speed sensor RH.
- DTCs C1272, C1331 and C1465 are for the front speed sensor LH.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**READ VALUE USING TECHSTREAM (FRONT SPEED SENSOR)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
FR Wheel Speed	Front wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
FL Wheel Speed	Front wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations

(d) Check the speed value output from the speed sensor displayed on the Techstream.

HINT:

Factors that affect the indicated vehicle speed include tire size, tire pressure, and tire wear. The speed indicated on the speedometer has an allowable margin of error. This can be tested using a speedometer tester (calibrated chassis dynamometer). For details about testing and the margin of

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error, see the reference chart INFO .

OK:
The speed value output from the speed sensor displayed on the Techstream is similar to the speed indicated on the speedometer.

NG ▶ CHECK FRONT SPEED SENSOR INSTALLATION

OK ▼

2.	PERFORM TEST MODE INSPECTION (SIGNAL CHECK)

(a) Turn the ignition switch off.

(b) Perform the sensor check using the Test Mode procedure INFO .

OK:
All Test Mode DTCs are not output.

NG ▶ CHECK FRONT SPEED SENSOR INSTALLATION

OK ▼

3.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

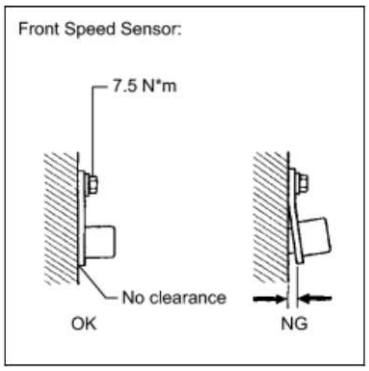
RESULT	PROCEED TO
DTCs C1330, C1331, C1464 and C1465 are not output.	A
DTCs C1330, C1331, C1464 and/or C1465 are output.	B

B ▶ REPLACE FRONT SPEED SENSOR

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A ▶ CHECK FOR INTERMITTENT PROBLEMS

4.	CHECK FRONT SPEED SENSOR INSTALLATION



(a) Turn the ignition switch off.

(b) Check the speed sensor installation.

OK:

There is no clearance between the sensor and the front axle hub sub-assembly.

The installation bolt is tightened properly.

Torque

7.5 N*m (77 kgf*cm, 66 in.*lbf)

NG ▶ INSTALL FRONT SPEED SENSOR CORRECTLY

OK ▼

5.	CHECK FRONT SPEED SENSOR TIP

(a) Remove the front speed sensor INFO .

(b) Check the speed sensor tip.

OK:

No scratches or foreign matter on the sensor tip.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

NG ▶ CLEAN OR REPLACE FRONT SPEED SENSOR

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OK

6.	**CHECK HARNESS AND CONNECTOR (BRAKE ACTUATOR ASSEMBLY - FRONT SPEED SENSOR)**

(a) Install the front speed sensor INFO .

(b) Make sure that there is no looseness at the locking part and the connecting part of the connectors.

(c) Disconnect the skid control ECU (brake actuator assembly) connector and the front speed sensor connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for RH

for LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-16 (FR+) - A42-2 (FR+)	Always	Below 1 Ω
A5-16 (FR+) - Body ground	Always	10 kΩ or higher
A5-4 (FR-) - A42-1 (FR-)	Always	Below 1 Ω
A5-4 (FR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-19 (FL+) - A12-2 (FL+)	Always	Below 1 Ω
A5-19 (FL+) - Body ground	Always	10 kΩ or higher
A5-32 (FL-) - A12-1 (FL-)	Always	Below 1 Ω
A5-32 (FL-) - Body ground	Always	10 kΩ or higher

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NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

7.	**INSPECT BRAKE ACTUATOR ASSEMBLY (FRONT SPEED SENSOR POWER SOURCE TERMINAL)**

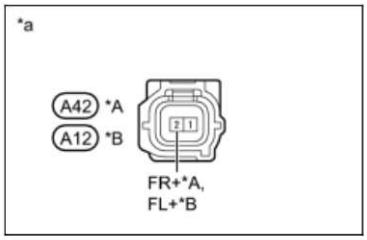
(a) Reconnect the skid control ECU (brake actuator assembly) connector.

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

for RH

for LH



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A42-2 (FR+) - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A12-2 (FL+) - Body ground	Ignition switch ON	8 to 14 V

Text in Illustration

*A	for RH
*B	for LH
*a	Front view of wire harness connector (to Front Speed Sensor)

NG ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

OK ▼

8.	**RECONFIRM DTC**

(a) Reconnect the front speed sensor connector.

(b) Clear the DTCs INFO .

(c) Turn the ignition switch off.

(d) Start the engine.

(e) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO

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DTCs C1330, C1331, C1464 and/or C1465 are output.	A
DTCs C1330, C1331, C1464 and C1465 are not output.	B

B ▶ CHECK FOR INTERMITTENT PROBLEMS

A ▼

9.	REPLACE FRONT SPEED SENSOR

(a) Turn the ignition switch off.

(b) Replace the front speed sensor INFO .

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT ▼

10.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs C1330, C1331, C1464 and/or C1465 are output.	A
DTCs C1330, C1331, C1464 and C1465 are not output.	B

B ▶ END

A ▼

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11.	REPLACE FRONT SPEED SENSOR ROTOR

(a) Turn the ignition switch off.

(b) Replace the front speed sensor rotor INFO .

HINT:

If the front speed sensor rotor needs to be replaced, replace the front axle hub sub-assembly.

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT

12.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs C1330, C1331, C1464 and/or C1465 are output.	A
DTCs C1330, C1331, C1464 and C1465 are not output.	B

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

B ▶ END

A ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XIA0HBX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1273,C1274,C1332,C1333,C1466,C1467: Low Output Signal of Rear Speed Sensor RH (Test Mode DTC) (2013 FR-S)		

DTC	**C1273**	**Low Output Signal of Rear Speed Sensor RH (Test Mode DTC)**

DTC	**C1274**	**Low Output Signal of Rear Speed Sensor LH (Test Mode DTC)**

DTC	**C1332**	**Open in Rear Speed Sensor RH**

DTC	**C1333**	**Open in Rear Speed Sensor LH**

DTC	**C1466**	**Rear Speed Sensor RH**

DTC	**C1467**	**Rear Speed Sensor LH**

DESCRIPTION

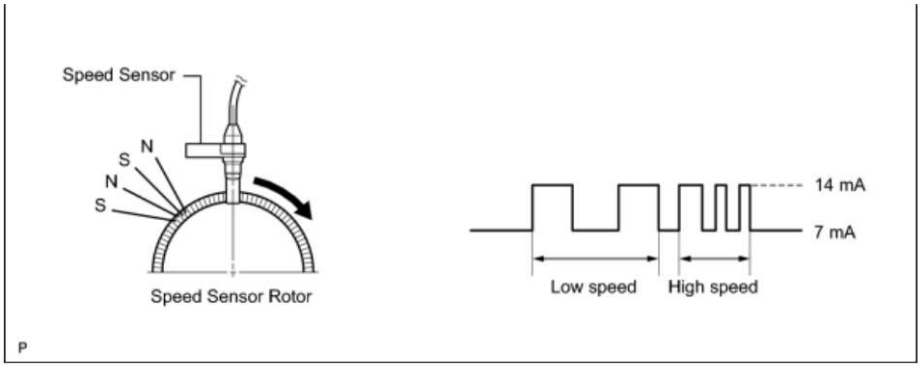
Each speed sensor detects the wheel speed and sends the appropriate signals to the skid control ECU (brake actuator assembly). These signals are used by the brake control system.

Speed sensor rotors have row of alternating N and S magnetic poles, and their magnetic fields change when the rotors turn.

Each speed sensor detects that magnetic field change and sends a pulse signal to the skid control ECU (brake actuator assembly).

DTCs C1273 and C1274 are cleared when the speed sensor sends a vehicle speed signal or when Test Mode ends. DTCs C1273 and C1274 are output only in Test Mode.

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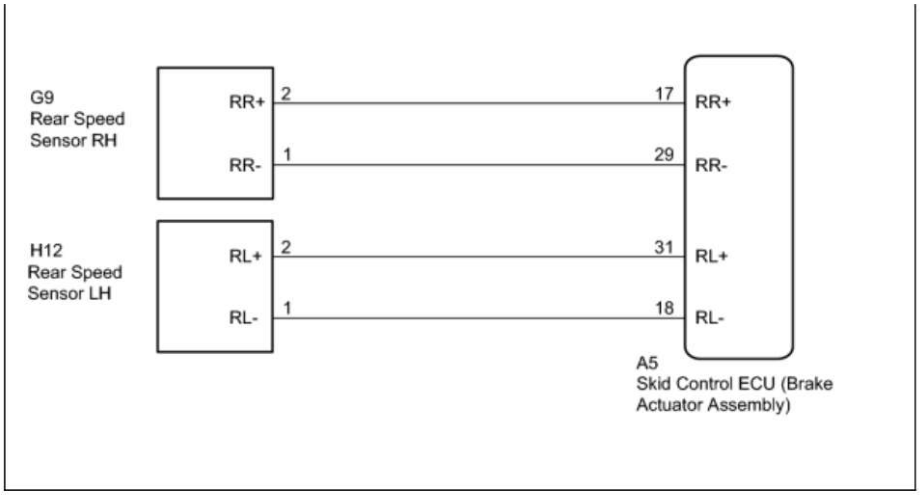
DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1332 C1333	An open or short in the speed sensor signal circuit.	• Rear speed sensor RH/LH • Speed sensor circuit • Sensor installation • Skid control ECU (Brake actuator assembly)
C1466 C1467	An abnormal signal is received from a wheel speed sensor.	• Rear speed sensor RH/LH • Speed sensor circuit • Rear speed sensor rotor RH/LH (Rear axle hub sub-assembly RH/LH) • Sensor installation • Skid control ECU (Brake actuator assembly)
C1273 C1274	Detected only during Test Mode.	• Rear speed sensor RH/LH • Sensor installation • Rear speed sensor rotor RH/LH (Rear axle hub sub-assembly RH/LH)

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HINT:

- DTCs C1273, C1332 and C1466 are for the rear speed sensor RH.
- DTCs C1274, C1333 and C1467 are for the rear speed sensor LH.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**READ VALUE USING TECHSTREAM (REAR SPEED SENSOR)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
RR Wheel Speed	Rear wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
RL Wheel Speed	Rear wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations

(d) Check the speed value output from the speed sensor displayed on the Techstream.

HINT:

Factors that affect the indicated vehicle speed include tire size, tire pressure, and tire wear. The speed indicated on the speedometer has an allowable margin of error. This can be tested using a speedometer tester (calibrated chassis dynamometer). For details about testing and the margin of

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error, see the reference chart INFO .

OK:
The speed value output from the speed sensor displayed on the Techstream is similar to the speed indicated on the speedometer.

NG ▶ **CHECK REAR SPEED SENSOR INSTALLATION**

OK ▼

2.	PERFORM TEST MODE INSPECTION (SIGNAL CHECK)

(a) Turn the ignition switch off.

(b) Perform the sensor check using the Test Mode procedure INFO .

OK:
All Test Mode DTCs are not output.

NG ▶ **CHECK REAR SPEED SENSOR INSTALLATION**

OK ▼

3.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

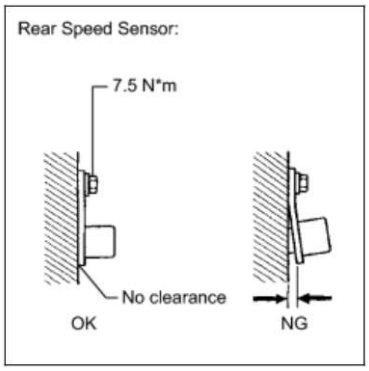
RESULT	PROCEED TO
DTCs C1332, C1333, C1466 and C1467 are not output.	A
DTCs C1332, C1333, C1466 and/or C1467 are output.	B

B ▶ **REPLACE REAR SPEED SENSOR**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS**

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4.	CHECK REAR SPEED SENSOR INSTALLATION



(a) Turn the ignition switch off.

(b) Check the speed sensor installation.

OK:

There is no clearance between the sensor and the rear axle hub sub-assembly.

The installation bolt is tightened properly.

Torque

7.5 N*m (77 kgf*cm, 66 in.*lbf)

NG ▶ **INSTALL REAR SPEED SENSOR CORRECTLY**

OK

▼

5.	CHECK REAR SPEED SENSOR TIP

(a) Remove the rear speed sensor INFO .

(b) Check the speed sensor tip.

OK:

No scratches or foreign matter on the sensor tip.

NOTICE:

Check the speed sensor signal after cleaning or replacement INFO .

NG ▶ **CLEAN OR REPLACE REAR SPEED SENSOR**

OK

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6.	**CHECK HARNESS AND CONNECTOR (BRAKE ACTUATOR ASSEMBLY - REAR SPEED SENSOR)**

(a) Install the rear speed sensor INFO .

(b) Make sure that there is no looseness at the locking part and the connecting part of the connector.

(c) Disconnect the skid control ECU (brake actuator assembly) connector and the rear speed sensor connector.

(d) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

for RH

for LH

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-17 (RR+) - G9-2 (RR+)	Always	Below 1 Ω
A5-17 (RR+) - Body ground	Always	10 kΩ or higher
A5-29 (RR-) - G9-1 (RR-)	Always	Below 1 Ω
A5-29 (RR-) - Body ground	Always	10 kΩ or higher

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-31 (RL+) - H12-2 (RL+)	Always	Below 1 Ω
A5-31 (RL+) - Body ground	Always	10 kΩ or higher
A5-18 (RL-) - H12-1 (RL-)	Always	Below 1 Ω
A5-18 (RL-) - Body ground	Always	10 kΩ or higher

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NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK

7.	**INSPECT BRAKE ACTUATOR ASSEMBLY (REAR SPEED SENSOR POWER SOURCE TERMINAL)**

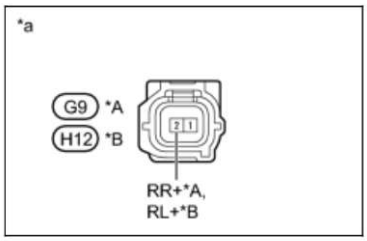
(a) Reconnect the skid control ECU (brake actuator assembly) connector.

(b) Measure the voltage according to the value(s) in the table below.

Standard Voltage:

for RH

for LH



TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
G9-2 (RR+) - Body ground	Ignition switch ON	8 to 14 V

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
H12-2 (RL+) - Body ground	Ignition switch ON	8 to 14 V

Text in Illustration

*A	for RH
*B	for LH
*a	Front view of wire harness connector (to Rear Speed Sensor)

NG ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

OK ▼

8.	**RECONFIRM DTC**

(a) Reconnect the rear speed sensor connector.

(b) Clear the DTCs INFO .

(c) Turn the ignition switch off.

(d) Start the engine.

(e) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(f) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs C1332, C1333, C1466 and/or C1467 are output.	A

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DTCs C1332, C1333, C1466 and C1467 are not output.	B

B ▶ CHECK FOR INTERMITTENT PROBLEMS

A ▼

9.	REPLACE REAR SPEED SENSOR

(a) Turn the ignition switch off.

(b) Replace the rear speed sensor INFO .

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT ▼

10.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs C1332, C1333, C1466 and/or C1467 are output.	A
DTCs C1332, C1333, C1466 and C1467 are not output.	B

B ▶ END

A ▼

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11.	REPLACE REAR SPEED SENSOR ROTOR

(a) Turn the ignition switch off.

(b) Replace the rear speed sensor rotor INFO .

HINT:

If the rear speed sensor rotor needs to be replaced, replace the rear axle hub and bearing assembly.

NOTICE:

Check the speed sensor signal after replacement INFO .

NEXT

12.	RECONFIRM DTC

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 45 km/h (28 mph) or more for at least 120 seconds.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTCs C1332, C1333, C1466 and/or C1467 are output.	A
DTCs C1332, C1333, C1466 and C1467 are not output.	B

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

B ▶ END

A ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM0000027RM01HX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1288: Error in Matching of ECUs (2013 FR-S)		

DTC	**C1288**	**Error in Matching of ECUs**

DESCRIPTION

The skid control ECU stores this DTC when the previously learned values in the VSC system and the engine information sent from the ECM are inconsistent, or when the learning has not completed after the skid control ECU (brake actuator assembly) is replaced with a new one.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1288	ECM does not match.	ECM

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A ▼

2.	**RECONFIRM DTC**

(a) Turn the ignition switch off.

(b) Clear the DTCs INFO .

(c) Turn the ignition switch off.

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(d) Start the engine.

(e) Check if the same DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC C1288 is not output.	A
DTC C1288 is output.	B

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

B ▶ **REPLACE ECM**

A ▶ **END**

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XII07ZX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1294: ECT System Malfunction (2013 FR-S)		

DTC	**C1294**	**ECT System Malfunction**

DESCRIPTION

If a malfunction in the automatic transmission system is detected, the operation of VSC and TR(A)C is prohibited by the fail-safe function. When the signals from the automatic transmission are received normally, fail-safe control is canceled.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1201	Automatic transmission system malfunction signal continues for 0.5 seconds.	Automatic transmission system

INSPECTION PROCEDURE

PROCEDURE

1.	**CHECK AUTOMATIC TRANSMISSION SYSTEM**

(a) Check if the automatic transmission system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

B ▶ INSPECT AUTOMATIC TRANSMISSION SYSTEM

A ▶ REPLACE TCM

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001JHK02TX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: C1300: Skid Control ECU Malfunction (2013 FR-S)		

DTC	**C1300**	**Skid Control ECU Malfunction**

DESCRIPTION

The skid control ECU stores this DTC if malfunctions are found in the circuit inside the ECU by self diagnosis.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
C1300	Internal failure of the skid control ECU.	Skid control ECU (Brake actuator assembly)

INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**REPLACE BRAKE ACTUATOR ASSEMBLY**

(a) Replace the skid control ECU (brake actuator assembly) INFO .

HINT:

This DTC is output when the skid control ECU (brake actuator assembly) detects a malfunction in the internal circuit.

(b) Perform the sensor check using the Test Mode procedure INFO .

NEXT END

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Last Modified: 3-27-2012	6.4 D	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000003U2400AX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: CALIBRATION (2013 FR-S)		

CALIBRATION

1. DESCRIPTION

(a) Refer to the table below and then perform the necessary operation according to the part to be replaced in order to perform calibration.

PARTS TO BE REPLACED	NECESSARY OPERATION
Skid control ECU (Brake actuator assembly)	1. Perform VSC sensor neutral memorization
Steering sensor	
Steering column assembly	
Rack and pinion power steering gear assembly	
Wheel alignment adjustment	

2. VSC SENSOR NEUTRAL MEMORIZATION

(a) Perform VSC Sensor Neutral Memorization.

NOTICE:

- While obtaining the zero point, keep the vehicle stationary and do not vibrate, tilt, move, or shake it. (Do not start the engine.)
- Be sure to perform this procedure on a level surface (with an inclination of less than 1 degree).

HINT:

When VSC sensor neutral memorization is performed, the yaw rate and acceleration sensor and the steering sensor zero point calibration are performed at the same time.

(1) Turn the ignition switch off.

(2) Check that the steering wheel is centered.

(3) Check that the shift lever is in neutral.

(4) Apply the parking brake by pulling up the parking brake lever.

(5) Connect the Techstream to the DLC3.

(6) Turn the ignition switch on.

(7) Turn the Techstream on.

(8) Enter the following menus: Chassis / ABS/VSC/TRAC / Utility / VSC Sensor Neutral Memorization.

(9) According to the display on the Techstream, perform VSC sensor neutral memorization.

(10) Turn the ignition switch off and disconnect the Techstream.

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Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XHS0C2X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: CHECK FOR INTERMITTENT PROBLEMS (2013 FR-S)		

CHECK FOR INTERMITTENT PROBLEMS

1. CHECK FOR INTERMITTENT PROBLEMS

HINT:

A momentary interruption (open circuit) in the connectors and/or wire harness can be detected using the Data List function of the Techstream.

(a) Turn the ignition switch off.

(b) Connect the Techstream to the DLC3.

(c) Turn the ignition switch to ON.

(d) Turn the Techstream on.

(e) Follow the directions on the Techstream to display the Data List and select areas where momentary interruption should be monitored.

HINT:

- A momentary interruption (open circuit) cannot be detected for 3 seconds after the ignition switch is turned to ON (initial check).
- If Error remains displayed for one of the items on the Techstream, check for continuity between the ECU and the item for which Error is displayed.
- If a momentary interruption occurs and Error is displayed on the Techstream, Error will remain displayed on the Techstream for 1 second after the circuit returns to normal.

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
IG Voltage Value Decreased	IG voltage value decrease detection / Error or Normal	Error: Voltage low Normal: Normal	-
IG Voltage Value Increased	IG voltage value increase detection / Error or Normal	Error: Voltage high Normal: Normal	-

(f) While observing the screen, gently jiggle the connector or wire harness.

OK:
Normal is displayed.

HINT:

If the display changes, this indicates that there has been a momentary interruption (open circuit) in the connector and/or wire harness. In this case, repair or replace the connectors and/or wire harnesses as one of them is faulty.

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Last Modified: 3-27-2012	6.4 U	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XHW0BIX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: DATA LIST / ACTIVE TEST (2013 FR-S)		

DATA LIST / ACTIVE TEST

1. DATA LIST

HINT:

Using the Techstream to read the Data List allows the values or states of switches, sensors, actuators and other items to read without removing any parts. This non-intrusive inspection can be very useful because intermittent conditions or signals may be discovered before parts or wiring is disturbed. Reading the Data List information early in troubleshooting is one way to save diagnostic time.

NOTICE:

In the table below, the values listed under "Normal Condition" are reference values. Do not depend solely on these reference values when deciding whether a part is faulty or not.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn the Techstream on.

(f) Enter the following menus: Chassis / ABS/VSC/TRAC / Data List.

(g) According to the display on the tester, read the Data List.

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
ABS Warning Light	ABS warning light / ON or OFF	ON: Warning light on OFF: Warning light off	-
Brake Warning Light	Brake warning light / ON or OFF	ON: Warning light on OFF: Warning light off	-
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-
Parking Brake SW	Parking brake switch / ON or OFF	ON: Parking brake applied OFF: Parking brake released	-
Gear Position*	Gear position information / "P,N", R, 1st-6th or Fail	Actual gear position	-

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Shift Lever Position*	Shift lever position information / "P,N", R, D/M or Fail	Actual shift lever position	-
Shift Information*	Shift information / ON or OFF	ON: During gear change	-
Inspection Mode	Inspection mode / Other or Inspect	Other: Normal mode Inspect: Inspection mode	-
Number of IG ON(Inspection)	Number of times ignition switch turned to ON after entering inspection mode / Min.: 0, Max.: 255	-	-
Master Cylinder Sensor	Master cylinder pressure sensor reading / Min.: 0.00 V, Max.: 5.00 V	Brake pedal released: 0.20 to 0.40 V	Reading increases when brake pedal is depressed
Deceleration Sensor	Acceleration sensor reading / Min.: -18.30 m/s^2 , Max.: 18.21 m/s^2	-	During deceleration/acceleration: Changes continuously
Deceleration Sensor2	Acceleration sensor 2 reading / Min.: -18.30 m/s^2 , Max.: 18.21 m/s^2	-	During deceleration/acceleration: Changes continuously
Yaw Rate Sensor	Yaw rate sensor / Min.: -128 °/s, Max.: 127 °/s	Vehicle stopped: 0 °/s Turning right: -128 to 0 °/s Turning left: 0 to 127 °/s	-
Steering Angle Sensor	Steering angle sensor / Min.: -3276.8°, Max.: 3276.7°	Turning left: Increases Turning right: Decreases	-
Lateral G	Lateral G / Min.: -25.10 m/s^2 , Max.: 24.90 m/s^2	-	During turning: Changes in proportion with acceleration
Forward and Rearward G	Forward and backward G / Min.: -25.10 m/s^2 , Max.: 24.90 m/s^2	-	During acceleration/deceleration: Changes in proportion with acceleration
Yaw Rate Value	Yaw rate value / Min.: -128 °/s, Max.: 127 °/s	-	During turning: Changes in proportion with yaw
Steering Angle Value	Steering angle value / Min.: -3276.8°, Max.: 3276.7°	-	During steering operation: Changes in proportion with steering wheel rotation
Slip Indicator Light	Slip indicator light / ON or OFF	ON: Indicator light on OFF: Indicator light off	-

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FR Wheel Speed	Front wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
FL Wheel Speed	Front wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
RR Wheel Speed	Rear wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
RL Wheel Speed	Rear wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
Vehicle Speed	Maximum wheel speed sensor reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
FR Wheel Acceleration	Front wheel RH acceleration / Min.: -200.84 m/s ^{2} , Max.: 199.27 m/s ^{2}	-	During deceleration/acceleration: Changes continuously
FL Wheel Acceleration	Front wheel LH acceleration / Min.: -200.84 m/s ^{2} , Max.: 199.27 m/s ^{2}	-	During deceleration/acceleration: Changes continuously
RR Wheel Acceleration	Rear wheel RH acceleration / Min.: -200.84 m/s ^{2} , Max.: 199.27 m/s ^{2}	-	During deceleration/acceleration: Changes continuously
RL Wheel Acceleration	Rear wheel LH acceleration / Min.: -200.84 m/s ^{2} , Max.: 199.27 m/s ^{2}	-	During deceleration/acceleration: Changes continuously
FR Wheel ABS Ctrl Status	Front wheel RH ABS control status / ON or OFF	ON: During control	-
FL Wheel ABS Ctrl Status	Front wheel LH ABS control status / ON or OFF	ON: During control	-
RR Wheel ABS Ctrl Status	Rear wheel RH ABS control status / ON or OFF	ON: During control	-
RL Wheel ABS Ctrl Status	Rear wheel LH ABS control status / ON or OFF	ON: During control	-
FR Wheel EBD Ctrl Status	Front wheel RH EBD control status / ON or OFF	ON: During control	-
FL Wheel EBD Ctrl Status	Front wheel LH EBD control status / ON or OFF	ON: During control	-
RR Wheel EBD Ctrl Status	Rear wheel RH EBD control status / ON or OFF	ON: During control	-
RL Wheel EBD Ctrl Status	Rear wheel LH EBD control status / ON or OFF	ON: During control	-
TRC(TRAC) Ctrl Status	TR(A)C control status / ON or OFF	ON: During control	-
TRC(TRAC)			

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Engine Ctrl Status	TR(A)C engine control status / ON or OFF	ON: During control	-
TRC(TRAC) Brake Ctrl Status	TR(A)C brake control status / ON or OFF	ON: During control	-
FR Wheel VSC Ctrl Status	Front wheel RH VSC control status / ON or OFF	ON: During control	-
FL Wheel VSC Ctrl Status	Front wheel LH VSC control status / ON or OFF	ON: During control	-
RR Wheel VSC Ctrl Status	Rear wheel RH VSC control status / ON or OFF	ON: During control	-
RL Wheel VSC Ctrl Status	Rear wheel LH VSC control status / ON or OFF	ON: During control	-
Engine Revolutions	Engine speed / Min.: 0 rpm, Max.: 65535 rpm	Engine stopped: 0 rpm	When engine speed is constant: No large fluctuations
Real Engine Torque	Real engine torque / Min.: -1024.0 Nm, Max.: 1023.0 Nm	-	-
Accelerator Opening Angle %	Percentage of accelerator pedal opening angle / Min.: 0.0%, Max.: 100.0%	When the accelerator pedal is released: 0.0%	During accelerator pedal operation: Changes in proportion with the pedal movement
Solenoid Relay	ABS solenoid relay / ON or OFF	ON: Solenoid relay on OFF: Solenoid relay off	-
ECB Motor Relay	ABS motor relay / ON or OFF	ON: Motor relay on OFF: Motor relay off	-
TRC(TRAC)/VSC Solenoid (SRM2)	Master cut solenoid (SRM2) / ON or OFF	ON: Operating	-
TRC(TRAC)/VSC Solenoid (SRM1)	Master cut solenoid (SRM1) / ON or OFF	ON: Operating	-
TRC(TRAC)/VSC Solenoid (SRC2)	Master cut solenoid (SRC2) / ON or OFF	ON: Operating	-
TRC(TRAC)/VSC Solenoid (SRC1)	Master cut solenoid (SRC1) / ON or OFF	ON: Operating	-
ABS Solenoid (SFRH)	ABS solenoid (SFRH) / ON or OFF	ON: Operating	-
ABS Solenoid (SFRR)	ABS solenoid (SFRR) / ON or OFF	ON: Operating	-
ABS Solenoid			

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(SFLH)	ABS solenoid (SFLH) / ON or OFF	ON: Operating	-
ABS Solenoid (SFLR)	ABS solenoid (SFLR) / ON or OFF	ON: Operating	-
ABS Solenoid (SRRH)	ABS solenoid (SRRH) / ON or OFF	ON: Operating	-
ABS Solenoid (SRRR)	ABS solenoid (SRRR) / ON or OFF	ON: Operating	-
ABS Solenoid (SRLH)	ABS solenoid (SRLH) / ON or OFF	ON: Operating	-
ABS Solenoid (SRLR)	ABS solenoid (SRLR) / ON or OFF	ON: Operating	-
IG1 Voltage Value	IG1 voltage value / Min.: 0.00 V, Max.: 20.00 V	-	Changes in proportion to battery voltage
MT Voltage Value	Motor voltage value / Min.: 0.00 V, Max.: 20.00 V	-	Changes in proportion to battery voltage
TRC(TRAC)/VSC Off Mode	TR(A)C/VSC OFF mode / Normal, TRC(TRAC) OFF or VSC OFF	Normal: Normal mode TRC(TRAC) OFF: TR(A)C OFF mode VSC OFF: VSC OFF mode	-
Sports Mode	VSC SPORT mode / Normal or Sports	Normal: Normal mode Sports: VSC SPORT mode	-
Number of DTC	Number of DTC recorded / Min.: 0, Max.: 255	-	-
IG Voltage Value Decreased	IG voltage value decrease detection / Error or Normal	Error: Voltage low Normal: Normal	-
IG Voltage Value Increased	IG voltage value increase detection / Error or Normal	Error: Voltage high Normal: Normal	-

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*: for Automatic Transmission

2. ACTIVE TEST

HINT:

Using the Techstream to perform Active Tests allows relays, VSVs, actuators and other items to be operated without removing any parts to operate without removing any parts. This non-intrusive functional inspection can be very useful because intermittent operation may be discovered before parts or wiring is disturbed. Performing Active Tests early in troubleshooting is one way to save diagnostic time. Data List information can be displayed while performing Active Tests.

(a) Warm up the engine.

(b) Turn the ignition switch off.

(c) Connect the Techstream to the DLC3.

(d) Turn the ignition switch to ON.

(e) Turn the Techstream on.

(f) Enter the following menus: Chassis / ABS/VSC/TRAC / Active Test.

(g) According to the display on the tester, perform the Active Test.

ABS/VSC/TRAC

TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
ABS Warning Light	ABS warning light	Warning light ON/OFF	Observe combination meter assembly
VSC OFF Indicator Light	VSC OFF indicator light	Indicator light ON/OFF	Observe combination meter assembly
TRC(TRAC) OFF Indicator Light	TR(A)C OFF indicator light	Indicator light ON/OFF	Observe combination meter assembly
Brake Warning Light	Brake warning light	Warning light ON/OFF	Observe combination meter assembly
Slip Indicator Light	Slip indicator light	Indicator light ON/OFF	Observe combination meter assembly
Sports Mode Indicator Light	VSC SPORT indicator light	Indicator light ON/OFF	Observe combination meter assembly
Motor Relay	ABS motor relay	Relay ON/OFF	Operating sound of motor can be heard
ABS Solenoid (SRLR)	ABS solenoid (SRLR)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
ABS Solenoid (SRLH)	ABS solenoid (SRLH)	Solenoid ON/OFF	Operating sound of solenoid (clicking

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			sound) can be heard
ABS Solenoid (SRRR)	ABS solenoid (SRRR)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
ABS Solenoid (SRRH)	ABS solenoid (SRRH)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
ABS Solenoid (SFLR)	ABS solenoid (SFLR)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
ABS Solenoid (SFLH)	ABS solenoid (SFLH)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
ABS Solenoid (SFRR)	ABS solenoid (SFRR)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
ABS Solenoid (SFRH)	ABS solenoid (SFRH)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
VSC/TRC(TRAC) Solenoid (SRMR)	Master cut solenoid (SRM2)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
VSC/TRC(TRAC) Solenoid (SRMF)	Master cut solenoid (SRM1)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard

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VSC/TRC(TRAC) Solenoid (SRCR)	Master cut solenoid (SRC2)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
VSC/TRC(TRAC) Solenoid (SRCF)	Master cut solenoid (SRC1)	Solenoid ON/OFF	Operating sound of solenoid (clicking sound) can be heard
ABS Solenoid	ABS solenoid (SRLR, SRLH, SRRR, SRRH, SFLR, SFLH, SFRR, SFRH)	Solenoid SRLR/SRLH/SRRR/SRRH/SFLR/SFLH/SFRR/SFRH	Operating sound of each solenoid (clicking sound) can be heard
VSC/TRC(TRAC) Solenoid	Master cut solenoid (SRMR, SRMF, SRCR, SRCF, SPFL, SPFR, SMR, SMF)	Solenoid SRMR/SRMF/SRCR/SRCF/SPFL/SPFR/SMR/SMF	Operating sound of each solenoid (clicking sound) can be heard

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Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XHP0DZX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: DIAGNOSIS SYSTEM (2013 FR-S)		

DIAGNOSIS SYSTEM

1. DESCRIPTION

When troubleshooting a vehicle with a diagnosis system, the only difference from the usual troubleshooting procedure is connecting the Techstream to the vehicle and reading various data output from the skid control ECU.

The skid control ECU records DTCs when it detects a malfunction in itself or in its circuits.

To check for DTCs, connect the Techstream to the DLC3 on the vehicle. The Techstream can be used to clear the DTCs, activate various actuators, and check the Freeze Frame Data and Data List.

(a) Check the battery voltage.

Standard Voltage:
11 to 14 V

If the voltage is below 11 V, recharge the battery before proceeding to the next step.

(b) Check the DLC3 INFO .

2. DIAGNOSIS

(a) If the skid control ECU detects a malfunction, the ABS warning, brake warning, and/or slip indicator lights will come on in order to warn the driver.

(b) The DTCs are simultaneously stored in memory.

The DTCs can be read by connecting the Techstream INFO .

(c) This system has a Test Mode (signal check) function.

The DTCs can be read by connecting the Techstream INFO .

3. WARNING LIGHT AND INDICATOR LIGHT INITIAL CHECK

(a) Release the parking brake.

NOTICE:

Before releasing the parking brake, move the shift lever to P (for automatic transmission) or set chocks to prevent the vehicle from rolling.

HINT:

When the parking brake is applied or the brake fluid level is low, the brake warning light comes on.

(b) When the ignition switch is turned to ON, check that the ABS warning, brake warning, TR(A)C OFF indicator, VSC OFF indicator, VSC SPORT indicator and slip indicator lights all come on.

HINT:

- If the warning light and indicator light check result is not normal, proceed to troubleshooting for the ABS warning, brake warning, TR(A)C OFF indicator, VSC OFF indicator, VSC SPORT indicator and slip indicator light circuits.
- If any of the indicators remains on or does not come on, proceed to troubleshooting for the light circuits listed below.

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TROUBLE AREA	SEE PROCEDURE
ABS warning light circuit (Remains on)	INFO
ABS warning light circuit (Does not come on)	INFO
Brake warning light circuit (Remains on)	INFO
Brake warning light circuit (Does not come on)	INFO
TR(A)C OFF indicator light circuit (Remains on)	INFO
TR(A)C OFF indicator light circuit (Does not come on)	INFO
VSC OFF indicator light circuit (Remains on)	INFO
VSC OFF indicator light circuit (Does not come on)	INFO
VSC SPORT indicator light circuit (Remains on)	INFO
VSC SPORT indicator light circuit (Does not come on)	INFO
Slip indicator light circuit (Remains on)	INFO
Slip indicator light circuit (Does not come on)	INFO

(1) When the ignition switch is turned to ON, check that the brake warning, TR(A)C OFF indicator, VSC OFF indicator and VSC SPORT indicator lights turn off after 3 seconds.

(2) When the engine is started, check that the ABS warning and slip indicator lights turn off after 3 seconds.

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Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001NJG01RX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: DIAGNOSTIC TROUBLE CODE CHART (2013 FR-S)		

DIAGNOSTIC TROUBLE CODE CHART

NOTICE:

Turn the ignition switch off before removing any parts.

HINT:

- If no malfunction is found when inspecting parts, inspect the skid control ECU and ground points for poor connections.
- If a trouble code is displayed during the DTC check, inspect the trouble areas listed for that code. For details, refer to the "See page" reference for the DTC.
- When 2 or more DTCs are detected, perform diagnosis for each DTC, one by one until the problem is identified.
- If DTCs were checked using the warning light or indicator light, refer to the tables in DTC Check/Clear to cross-reference them to the 5-digit DTCs shown in the following tables.
- Inspect the fuses and relays before inspecting the trouble areas shown in the following table.

VSC System

DTC CODE	DETECTION ITEM	SEE PAGE
C1201	Engine Control System Malfunction	INFO
C1225	SA1 Solenoid Circuit	INFO
C1226	SA2 Solenoid Circuit	INFO
C1227	SA3 Solenoid Circuit	INFO
C1228	STR Solenoid Circuit	INFO
C1231	Steering Angle Sensor	INFO
C1234	Yaw Rate Sensor	INFO
C1237	Speed Sensor Rotor Faulty	INFO
C1241	Low or High Power Supply Voltage	INFO
C1246*2	Master Cylinder Pressure Sensor Malfunction	INFO
C1249	Open in Stop Light Switch Circuit	INFO
C1288	Error in Matching of ECUs	INFO
C1294	ECT System Malfunction	INFO
C1300	Skid Control ECU Malfunction	INFO
C1330	Open in Front Speed Sensor RH	INFO
C1331	Open in Front Speed Sensor LH	INFO
C1332	Open in Rear Speed Sensor RH	INFO
C1333	Open in Rear Speed Sensor LH	INFO

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C1419	Acceleration Sensor Internal Circuit	INFO
C1464*1	Front Speed Sensor RH	INFO
C1465*1	Front Speed Sensor LH	INFO
C1466*1	Rear Speed Sensor RH	INFO
C1467*1	Rear Speed Sensor LH	INFO
C1468	SFR Solenoid Circuit	INFO
C1469	SFL Solenoid Circuit	INFO
C146A	SRR Solenoid Circuit	INFO
C146B	SRL Solenoid Circuit	INFO
C146C*1	Open in ABS Motor Relay Circuit	INFO
C146E	Open in ABS Solenoid Relay Circuit	INFO
C1472	Acceleration Sensor	INFO
C1474	Forward and Rearward G Sensor	INFO
U0073	Control Module Communication Bus "A" Off	INFO
U0100	Lost Communication with ECM / PCM "A"	INFO
U0101	Lost Communication with TCM	INFO
U0126	Lost Communication with Steering Angle Sensor Module	INFO

*1, *2:

Even after the trouble areas are repaired, the ABS warning light will not go off unless the following operations are performed:

- *1:
  a. Drive the vehicle at 20 km/h (12 mph) for 30 seconds or more and check that the ABS warning light goes off.
  b. Clear the DTC.
- *2:
  a. Keep the vehicle stationary for 5 seconds or more and depress the brake pedal lightly 2 or 3 times.
  b. Drive the vehicle at a vehicle speed of 50 km/h (31 mph) and keep depressing the brake pedal strongly for approximately 3 seconds.
  c. Repeat the above operation 3 times or more and check that the ABS warning light goes off.
  d. Clear the DTC.

ABS Test Mode DTC

DTC CODE	DETECTION ITEM	SEE PAGE
C1271	Low Output Signal of Front Speed Sensor RH (Test Mode DTC)	INFO
C1272	Low Output Signal of Front Speed Sensor LH (Test Mode DTC)	INFO
C1273	Low Output Signal of Rear Speed Sensor RH (Test Mode DTC)	INFO

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C1274	Low Output Signal of Rear Speed Sensor LH (Test Mode DTC)	INFO
C1275	Abnormal Change in Output Signal of Front Speed Sensor RH (Test Mode DTC)	INFO
C1276	Abnormal Change in Output Signal of Front Speed Sensor LH (Test Mode DTC)	INFO
C1277	Abnormal Change in Output Signal of Rear Speed Sensor RH (Test Mode DTC)	INFO
C1278	Abnormal Change in Output Signal of Rear Speed Sensor LH (Test Mode DTC)	INFO



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Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: DTC CHECK / CLEAR (2013 FR-S)		

DTC CHECK / CLEAR

1. DTC CHECK/CLEAR

(a) Check for DTCs.

(1) Turn the ignition switch off.

(2) Connect the Techstream to the DLC3.

(3) Turn the ignition switch to ON.

(4) Turn the Techstream on.

(5) Read the DTCs following the prompts on the Techstream. Enter the following menus: Chassis / ABS/VSC/TRAC / Trouble Codes.

(6) Check the details of the DTCs INFO .

(b) Clear the DTCs.

(1) Turn the ignition switch off.

(2) Connect the Techstream to the DLC3.

(3) Turn the ignition switch to ON.

(4) Turn the Techstream on.

(5) Operate the Techstream to clear the codes. Enter the following menus: Chassis / ABS/VSC/TRAC / Trouble Codes.

2. END OF DTC CHECK/CLEAR

(a) Turn the ignition switch to ON.

(b) Check that the ABS warning and slip indicator lights go off within approximately 3 seconds after turning the ignition switch to ON.

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Last Modified: 3-27-2012	6.4 U	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XHX0A7X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: FAIL-SAFE CHART (2013 FR-S)		

FAIL-SAFE CHART

1. FAIL-SAFE OPERATION

- If there is a problem with sensor signals or actuator systems, the skid control ECU prohibits power supply to the brake actuator assembly and informs the ECM of VSC system malfunction.

  The brake actuator turns off the solenoids and the ECM stops its VSC control according to signals from the skid control ECU. The vehicle will operate in a manner similar to a vehicle that is not equipped with ABS, TR(A)C and VSC systems.

  ABS control will be prohibited, but EBD control will continue to the extent that EBD control is possible. If EBD control is impossible, the brake warning light will come on to warn the driver INFO .
- If a VSC system component malfunctions before VSC control begins, VSC control will be prohibited. If a system component malfunctions during VSC control, the system will gradually stop performing control so as not to trigger a sudden change in vehicle operation.

  If it is impossible for control to continue, the indicator light comes on to inform the driver of system control termination INFO .

ABS, EBD and BA System

ITEM	OPERATION
Malfunction in the ABS system.	ABS, BA, TR(A)C and VSC control prohibited.
Malfunction in the BA system.	ABS, BA, TR(A)C and VSC control prohibited.
Malfunction in the EBD system.	ABS, EBD, BA, TR(A)C and VSC control prohibited.

TR(A)C and VSC System

ITEM	OPERATION
Malfunction in the engine control system (TR(A)C and VSC systems).	Before control: Disables control. During control: Uses only the brakes to perform control.
Malfunction in the automatic transmission control system (TR(A)C and VSC systems).	Disables control.
Malfunction in the brake control system (VSC system).	Disables control.
Malfunction in the brake control system (TR(A)C system).	Before control: Disables control. During control: Disables control (by gradually ending control).

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Last Modified: 3-27-2012	6.4 D	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XHY0FHX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: FREEZE FRAME DATA (2013 FR-S)		

FREEZE FRAME DATA

1. FREEZE FRAME DATA

(a) Whenever an ABS DTC is detected, the skid control ECU stores the current vehicle (ECU or sensor) state as Freeze Frame Data.

(b) The skid control ECU stores the number of times (maximum: 31) the ignition switch has been turned from off to ON since the last time the ABS was activated.

HINT:

- However, if the vehicle is stopped or driven at a low speed (7 km/h (4.3 mph) or less), or if a DTC is detected, the skid control ECU will stop counting the number.
- Freeze Frame Data at the time the ABS operates:

  The skid control ECU stores and updates data whenever the ABS system operates.

  When the ECU stores data at the time a DTC is detected, the data stored during ABS operation is cleared.
- Freeze Frame Data at the time a DTC is detected:

  When the skid control ECU stores data at the time a DTC is detected, no updates will be performed until the data is cleared.

2. CHECK FREEZE FRAME DATA

(a) Turn the ignition switch off.

(b) Connect the Techstream to the DLC3.

(c) Turn the ignition switch to ON.

(d) Turn the Techstream on.

(e) Enter the following menus: Chassis / ABS/VSC/ TRAC / Trouble Codes.

(f) Select a DTC to display its Freeze Frame Data.

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Elapsed Time after Freeze Trigger	Elapsed time after freeze trigger / Min.: 0 msec, Max.: 510 msec	-	-
Number of IG ON	Number of times ignition switch turned to ON after Freeze Frame Data stored / 0 to 31	-	-
Stop Light SW	Stop light switch / ON or OFF	ON: Brake pedal depressed OFF: Brake pedal released	-

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Parking Brake SW	Parking brake switch / ON or OFF	ON: Parking brake applied OFF: Parking brake released	-
Gear Position*	Gear position information / "P,N", R, 1st-6th or Fail	Actual gear position	-
Shift Lever Position*	Shift lever position information / "P,N", R, D/M or Fail	Actual shift lever position	-
Operated System	Operated system status / ABS, VSC, TRC(TRAC), BA or Fail	Actual operated system	ABS: ABS activated VSC: VSC activated TRC(TRAC): TR(A)C activated BA: BA activated Fail: Fail safe mode activated
Master Cylinder Sensor	Master cylinder pressure sensor reading / Min.: 0.00 V, Max.: 5.00 V	Brake pedal released: 0.20 to 0.40 V	Reading increases when brake pedal is depressed
M/C Sensor Grade	Master cylinder pressure sensor change / Min.: -30 MPa/s, Max.: 225 MPa/s	When brake pedal is released or pedal held at constant position: 0 MPa/s	When brake pedal is being operated: Changes in proportion with pedal movement speed
Yaw Rate Sensor	Yaw rate sensor / Min.: -128 °/s, Max.: 127 °/s	Vehicle stopped: 0 °/s Turning right: -128 to 0 °/s Turning left: 0 to 127 °/s	-
Lateral G	Lateral G / Min.: -25.10 m/s^2, Max.: 24.90 m/s^2	-	During turning: Changes in proportion with acceleration
Forward and Rearward G	Forward and backward G / Min.: - 25.10 m/s^2, Max.: 24.90 m/s^2	-	During acceleration/deceleration: Changes in proportion with acceleration
FR Wheel Speed	Front wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
FL Wheel Speed	Front wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
RR Wheel Speed	Rear wheel speed sensor RH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
RL Wheel Speed	Rear wheel speed sensor LH reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations

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Vehicle Speed	Maximum wheel speed sensor reading / Min.: 0 km/h (0 mph), Max.: 326.4 km/h (202 mph)	Vehicle stopped: 0 km/h (0 mph)	When driving at constant speed: No large fluctuations
Vehicle Speed Grade	Vehicle speed grade / Min.: -25.10 m/s ^{2} , Max.: 24.90 m/s ^{2}	Vehicle stopped: 0 m/s ^{2}	During driving: Changes in proportion with vehicle acceleration/deceleration
Real Engine Torque	Real engine torque / Min.: -1024.0 Nm, Max.: 1023.0 Nm	-	-
Accelerator Opening Angle %	The difference of a present accelerator / Min.: 0.0%, Max.: 100.0%	When the accelerator pedal is released: 0.0%	During accelerator pedal operation: Changes in proportion with the pedal movement
Inspection Mode	Inspection mode / Other or Inspect	Other: Normal mode Inspect: Inspection mode	-
Steering Angle Sensor	Steering angle sensor / Min.: -3276.8°, Max.: 3276.7°	Turning left: Increases Turning right: Decreases	-
TRC(TRAC)/VSC Off Mode	TR(A)C/VSC OFF mode / Normal, TRC(TRAC) OFF or VSC OFF	Normal: Normal mode TRC(TRAC) OFF: TR(A)C OFF mode VSC OFF: VSC OFF mode	-
Sports Mode	VSC SPORT mode / Normal or Sports	Normal: Normal mode Sports: VSC SPORT mode	-

*: for Automatic Transmission

3. CLEAR FREEZE FRAME DATA

NOTICE:

Clearing the DTC will also clear the Freeze Frame Data.

(a) Turn the ignition switch off.

(b) Connect the Techstream to the DLC3.

(c) Turn the ignition switch to ON.

(d) Clear the DTCs and Freeze Frame Data INFO .

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Last Modified: 3-27-2012	6.4 D	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XHK0F2X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: HOW TO PROCEED WITH TROUBLESHOOTING (2013 FR-S)		

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

***: Use the Techstream.**

1.	**VEHICLE BROUGHT TO WORKSHOP**

NEXT

2.	**CUSTOMER PROBLEM ANALYSIS**

(a) Interview the customer and confirm the trouble INFO .

NEXT

3.	**CHECK DTC AND FREEZE FRAME DATA***

(a) Check and record DTCs and Freeze Frame Data.

(b) Clear the DTCs and Freeze Frame Data INFO for DTC Check/Clear, and INFO for Freeze Frame Data).

(c) Reconfirm the DTCs.

(1) Reconfirm the DTCs based on the recorded DTCs and Freeze Frame Data INFO for DTC Check/Clear, and INFO for Freeze Frame Data).

HINT:

- When DTCs indicating CAN communication system malfunctions are output, repair the CAN communication system first INFO .
- If the Techstream cannot communicate with the skid control ECU, inspect the CAN communication system INFO .
- If there is no response from the skid control ECU, inspect the power source circuit of the skid control ECU INFO .

Result:

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RESULT	PROCEED TO
DTC is output.	A
DTC is not output. (Problem symptom does not occur.)	B
DTC is not output. (Problem symptom occurs.)	C

B ▶ **Go to step 5**

C ▶ **Go to step 6**

A
▼

4.	DIAGNOSTIC TROUBLE CODE CHART

(a) Proceed to Diagnostic Trouble Code Chart INFO .

NEXT ▶ **Go to step 7**

5.	SYMPTOM SIMULATION

(a) Proceed to How to Proceed with Troubleshooting INFO .

NEXT
▼

6.	PROBLEM SYMPTOMS TABLE

(a) Proceed to Problem Symptoms Table INFO .

NEXT
▼

7.	CIRCUIT INSPECTION*

NEXT

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8.	IDENTIFICATION OF PROBLEM

NEXT

9.	REPAIR OR REPLACEMENT

NEXT

10.	CONFIRMATION TEST*

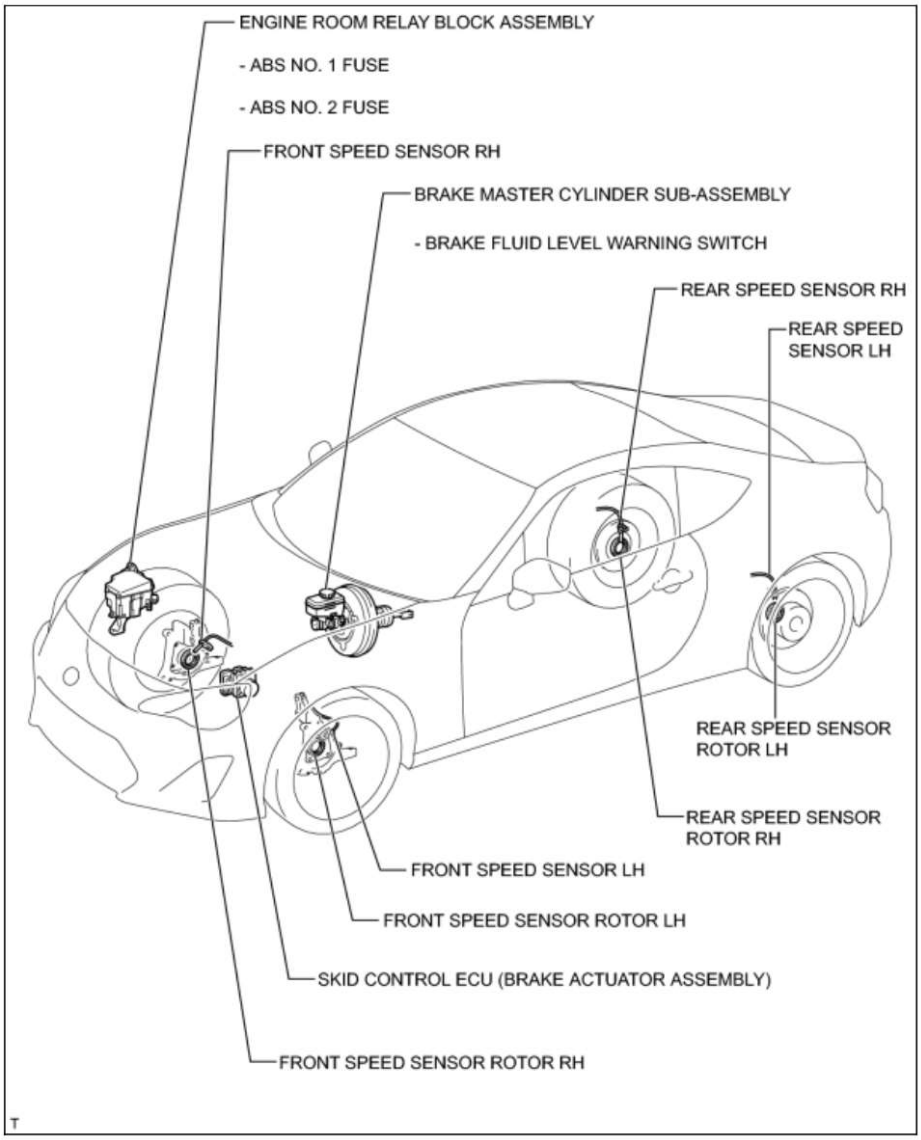
NEXT END

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Last Modified: 3-27-2012	6.4 R	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001JB305LX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: PARTS LOCATION (2013 FR-S)		

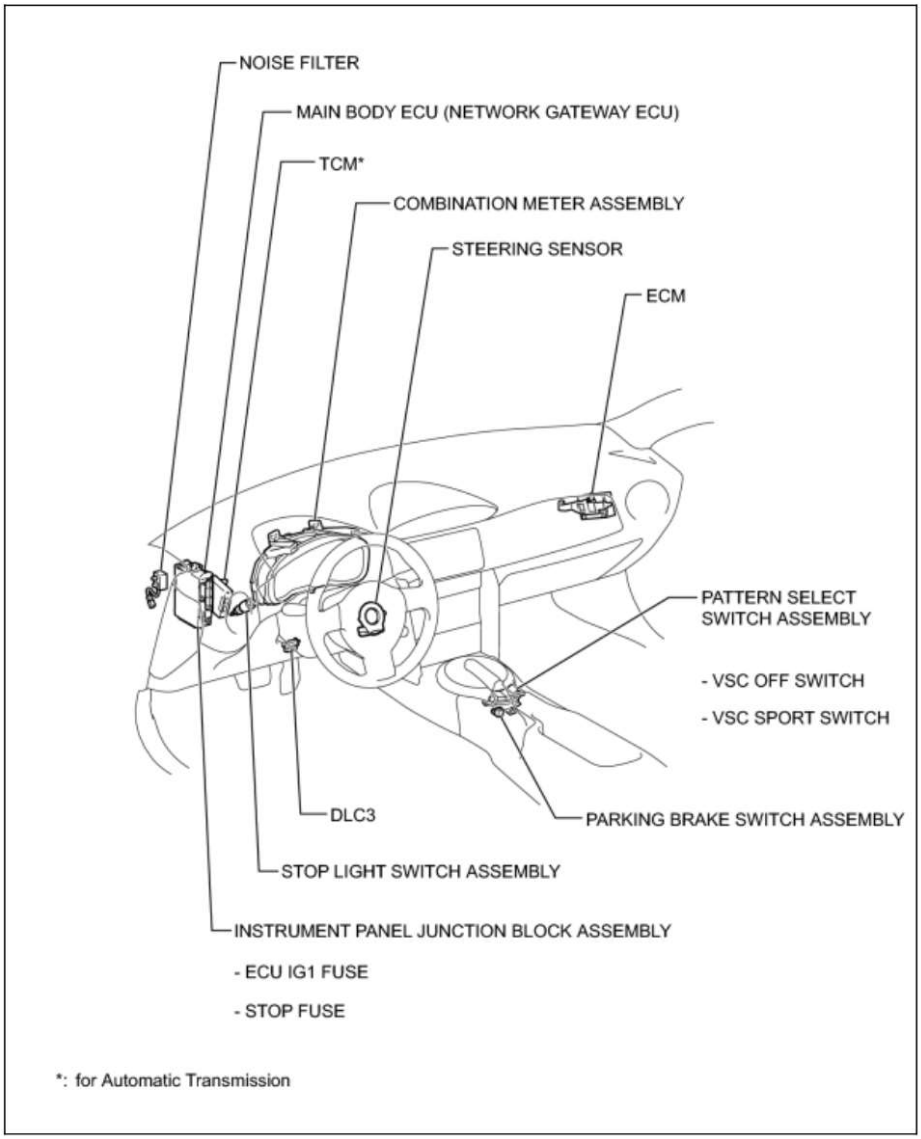
PARTS LOCATION

ILLUSTRATION



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ILLUSTRATION



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Last Modified: 3-27-2012	6.4 L	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XFT0CCX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: PRECAUTION (2013 FR-S)		

PRECAUTION

1. TROUBLESHOOTING PRECAUTIONS

(a) When there is a malfunction with terminal contact points or part installation problems, removal and installation of the suspected parts may return the system to normal either completely or temporarily.

(b) In order to determine the malfunctioning area, be sure to check the conditions at the time the malfunction occurred, such as DTC output and the Freeze Frame Data, and record it before disconnecting any connector or removing and installing parts.

(c) Since the system may be influenced by malfunctions in systems other than the VSC system, be sure to check for DTCs in other systems.

2. HANDLING PRECAUTIONS

(a) Do not remove or install VSC parts such as the steering sensor except when required, as they need to be adjusted correctly after removal and installation.

(b) Be sure to perform preparation before work and confirmation after work is completed by following the directions in the repair manual when working on the VSC system.

(c) Be sure to remove and install the ECU, brake actuator assembly, sensors, etc. with the ignition switch off unless it is otherwise specified in the inspection procedure.

(d) If the ECU, brake actuator assembly or a sensor has been removed and installed, it is necessary to check the system for problems after the parts have been reassembled. Check for DTCs using the Techstream, also check that system functions and signals received by the ECU are normal using Test Mode.

3. DTC PRECAUTION

(a) Warnings for some DTCs cannot be cleared only by repairing the malfunctioning parts. If the warning is displayed after repair work, the DTC should be cleared after turning the ignition switch off.

NOTICE:

If a DTC for a malfunctioning part reappears after it was cleared, then it has been stored again.

4. CHASSIS DYNAMOMETER PRECAUTION

When testing with a 2-wheel drum tester such as a speedometer tester, a combination tester for the speedometer and brakes, a chassis dynamometer, or when jacking up the front wheels and turning the wheels, perform the following procedure to enter Inspection Mode and stop the TR(A)C and VSC systems.

Enter Inspection Mode to disable TR(A)C and VSC operation when using a chassis dynamometer.

HINT:

- If Inspection Mode is not used, the vehicle may unexpectedly move off the dynamometer because of TR(A)C and VSC operation.
- The VSC OFF switch must not be used to disable TR(A)C and VSC operation when the vehicle is to be operated on a dynamometer. Pressing the VSC OFF switch does not disable TR(A)C and VSC operation completely.

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NOTICE:

Secure the vehicle with lock chains for safety.

(a) Activating Inspection Mode (When Using the Techstream)

(1) Ensure that the ignition switch is off and the engine is stopped.

(2) Make sure that the shift lever is in P.

(3) Connect the Techstream to the DLC3.

(4) Start the engine.

(5) Turn the Techstream on.

(6) Enter the following menus: Chassis / ABS/VSC/TRAC / Utility / Inspection Mode.

(7) Check that the VSC OFF indicator light will come on.

HINT:

- If the VSC OFF indicator light does not come on, repeat the steps.
- Turning the ignition switch off ends Inspection Mode.

(b) Activating Inspection Mode (When not Using the Techstream)

HINT:

Perform steps "C" to "H" within 30 seconds.

(1) Ensure that the ignition switch is off and the engine is stopped (Step "A").

(2) for Manual Transmission:

Check that the shift lever is in neutral (Step "B").

for Automatic Transmission:

Make sure that the shift lever is in P (Step "B").

(3) Start the engine (Step "C").

(4) Apply the parking brake by pulling up the parking brake lever (Step "D").

(5) Depress and release the brake pedal twice (Step "E").

(6) While holding the brake pedal down, release and apply the parking brake twice (Step "F").

(7) With the parking brake applied, depress and release the brake pedal twice (Step "G").

(8) Check if the slip indicator light will come on (Step "H").

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HINT:

- If the slip indicator light does not come on in step "H", repeat steps "A" to "H".
- Turning the ignition switch off ends Inspection Mode.

5. CAN COMMUNICATION SYSTEM PRECAUTIONS

(a) The CAN communication system is used for communication between the skid control ECU (brake actuator assembly), the steering sensor and other ECUs. If any CAN communication DTCs are detected, DTCs corresponding to the malfunction will be output.

(b) If any CAN communication DTCs are output, repair the malfunction and troubleshoot the VSC system while communication is normal.

(c) In order to enable CAN communication, a specific type of wiring is used for the CAN communication lines. The wiring used for each communication line is a twisted pair of wires that have an equal length. A bypass wire should not be used because the data being transmitted will be corrupted.

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Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XHN0D7X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: PROBLEM SYMPTOMS TABLE (2013 FR-S)		

PROBLEM SYMPTOMS TABLE

If there are no DTCs output and the problem still occurs, check the suspected areas for each problem symptom in the order given in the following table and proceed to the relevant troubleshooting page.

NOTICE:

When replacing the brake actuator assembly, sensors, etc., turn the ignition switch off.

HINT:

- Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

Vehicle Stability Control System

SYMPTOM	SUSPECTED AREA	SEE PAGE
ABS, BA and/or EBD does not operate.	Check for DTCs again and make sure that DTCs are not output.	INFO
	Power source circuit	INFO
	Front speed sensor circuit	INFO
	Rear speed sensor circuit	INFO
	Check the brake actuator assembly using the Techstream. (Check brake actuator assembly operation using the Active Test function.) If abnormal, check the hydraulic circuit for leaks.	INFO
	If the symptoms still occur even after the above suspected areas have been inspected and proved to be normal, replace the skid control ECU (brake actuator assembly).	INFO
ABS, BA and/or EBD does not operate efficiently.	Check for DTCs again and make sure that DTCs are not output.	INFO
	Front speed sensor circuit	INFO
	Rear speed sensor circuit	INFO
	Stop light switch circuit	INFO
	Check the brake actuator assembly using the Techstream. (Check brake actuator assembly operation using the Active Test function.) If abnormal, check the hydraulic circuit for leaks.	INFO
	If the symptoms still occur even after the above suspected areas have been inspected and proved to be normal, replace the skid control ECU (brake actuator assembly).	INFO
	Check for DTCs again and make sure that DTCs are not output.	INFO
	Check CAN communication system.	INFO

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ABS sensor DTC check cannot be done.		
	If the symptoms still occur even after the above suspected areas has been inspected and proved to be normal, replace the skid control ECU (brake actuator assembly).	INFO
ABS warning light abnormal (Remains on).	ABS warning light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
ABS warning light abnormal (Does not come on).	ABS warning light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
Brake warning light abnormal (Remains on).	Brake warning light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
Brake warning light abnormal (Does not come on).	Brake warning light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
VSC and/or TR(A)C does not operate.	Check for DTCs again and make sure that DTCs are not output.	INFO
	Check the engine control system.	INFO
	Check the automatic transmission control system.	INFO
	Power source circuit	INFO
	Check the hydraulic circuit for leaks.	-
	Front speed sensor circuit	INFO
	Rear speed sensor circuit	INFO
	Steering sensor circuit	INFO
	Replace the ECM.	INFO
	If the symptoms still occur even after the above suspected areas have been inspected and proved to be normal, replace the skid control ECU (brake actuator assembly).	INFO
VSC sensor DTC check cannot be done.	Check for DTCs again and make sure that DTCs are not output.	INFO
	Check CAN communication system.	INFO
	If the symptoms still occur even after the above suspected areas has been inspected and proved to be normal, replace the skid control ECU (brake actuator assembly).	INFO
TR(A)C OFF indicator light abnormal (Remains on).	TR(A)C OFF indicator light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
TR(A)C OFF indicator light abnormal (Does not come on).	TR(A)C OFF indicator light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
VSC OFF indicator light abnormal (Remains on).	VSC OFF indicator light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
VSC OFF indicator	VSC OFF indicator light circuit	INFO

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light abnormal (Does not come on).	Skid control ECU (Brake actuator assembly)	INFO
VSC SPORT indicator light abnormal (Remains on).	VSC SPORT indicator light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
VSC SPORT indicator light abnormal (Does not come on).	VSC SPORT indicator light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
Slip indicator light abnormal (Remains on).	Slip indicator light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
Slip indicator light abnormal (Does not come on).	Slip indicator light circuit	INFO
	Skid control ECU (Brake actuator assembly)	INFO
Sensor check cannot be done.	Check CAN communication system.	INFO
	Skid control ECU (Brake actuator assembly)	INFO



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Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000YHJ0AIX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: Slip Indicator Light does not Come ON (2013 FR-S)		

Slip Indicator Light does not Come ON

DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A

2.	**PERFORM ACTIVE TEST USING TECHSTREAM (SLIP INDICATOR LIGHT)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test using the Techstream INFO .

ABS/VSC/TRAC

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Slip Indicator Light	Slip indicator light	Indicator light ON/OFF	Observe combination meter assembly

(d) Check that the slip indicator light on the combination meter assembly turns on or off in accordance with the Techstream operation.

OK:
The slip indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **INSPECT COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

3.	INSPECT COMBINATION METER ASSEMBLY

(a) Turn the ignition switch off.

(b) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(c) Check the combination meter assembly.

OK:
The slip indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000YHI0AIX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: Slip Indicator Light Remains ON (2013 FR-S)		

Slip Indicator Light Remains ON

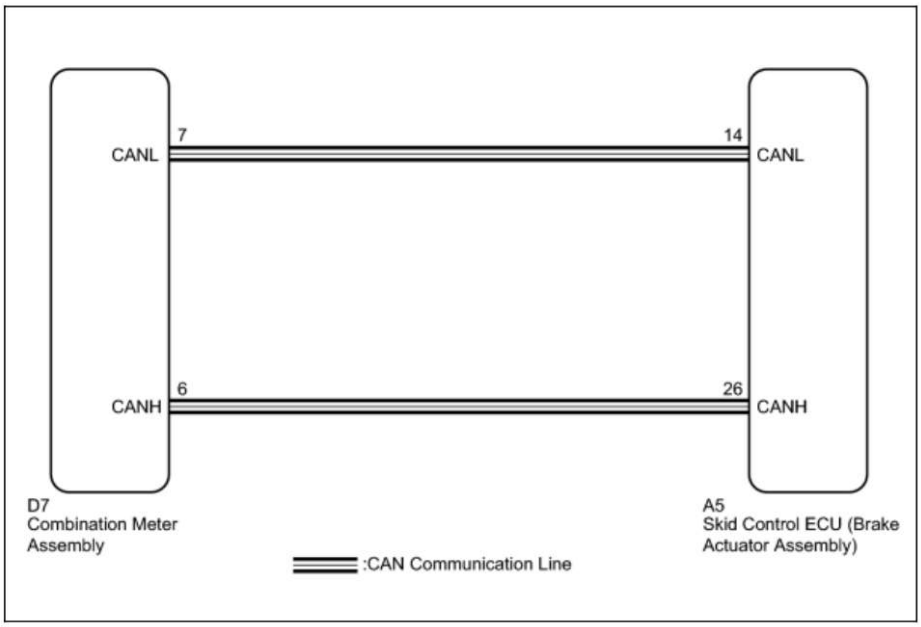
DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

The slip indicator light blinks during VSC and/or TR(A)C operation.

If a malfunction is detected, the slip indicator light comes on to warn the driver INFO .

WIRING DIAGRAM



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INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A ▼

2.	**CHECK IF BRAKE ACTUATOR ASSEMBLY CONNECTOR IS SECURELY CONNECTED**

(a) Check if the skid control ECU (brake actuator assembly) connector is securely connected.

OK:

The connector is securely connected.

NG ▶ **CONNECT CONNECTOR TO ECU CORRECTLY**

OK ▼

3.	**CHECK BATTERY**

(a) Check the battery voltage.

Standard Voltage:

11 to 14 V

NG ▶ **CHECK OR REPLACE CHARGING SYSTEM COMPONENT OR BATTERY**

OK ▼

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4.	INSPECT COMBINATION METER ASSEMBLY

(a) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(b) Check the combination meter assembly.

OK:

The slip indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ REPLACE COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 D	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XHO09FX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: SYSTEM DESCRIPTION (2013 FR-S)		

SYSTEM DESCRIPTION

1. FUNCTION DESCRIPTION

(a) Anti-lock Brake System (ABS)

(1) Helps prevent the wheels from locking when the brakes are applied firmly or when braking on a slippery surface.

(b) Electronic Brake force Distribution (EBD)

(1) EBD control utilizes ABS, realizing proper brake force distribution between the front and rear wheels in accordance with the driving conditions. In addition, during braking while cornering, it also controls the brake forces of the right and left wheels, helping maintain vehicle behavior.

(c) Brake Assist (BA)

(1) The primary purpose of brake assist is to provide supplementary brake force to assist a driver who cannot generate a large brake force during emergency braking, thus helping ensure the vehicle's braking performance.

(d) Traction Control (TR(A)C)

(1) Helps restrain the slippage of the drive wheels if the driver depresses the accelerator pedal excessively when starting off or accelerating on a slippery surface.

(e) Vehicle Stability Control (VSC)

(1) Helps restrain sideways slippage of the vehicle during a strong understeer tendency or strong oversteer tendency while cornering.

2. FUNCTION OF COMPONENTS

COMPONENT		FUNCTION
Brake Actuator Assembly	Skid Control ECU	Judges the vehicle driving condition based on the signals from each sensor and switch, and sends the brake control signals to the brake actuator assembly.
	Master Cylinder Pressure Sensor	Detects the master cylinder pressure.
	Pump Motor	Drives the pumps inside the brake actuator assembly.
	Solenoid Valves	• The hydraulic circuit has 2 master cylinder cut solenoid valves, 2 reservoir cut solenoid valves, 4 pressure holding solenoid valves and 4 pressure reduction solenoid valves. • Change the fluid path based on the signals from the skid control ECU during the operation of the brake control system functions, in order to control the fluid pressure applied to the wheel cylinders.
	Yaw Rate and Acceleration	• The yaw rate sensor detects the vehicle's yaw rate. • The acceleration sensor detects the vehicle's longitudinal and

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	Sensor	lateral acceleration.
Skid Control ECU	ABS Motor Relay	Supplies power to the pump motor.
	ABS Solenoid Relay	Supplies power to the solenoid valves.
Speed Sensor		Detect the wheel speed of each of the 4 wheels.
Pattern Select Switch Assembly	VSC OFF Switch	Enables the driver to select normal mode, TR(A)C OFF mode or VSC OFF mode.
	VSC SPORT Switch	Enables the driver to select normal mode or VSC SPORT mode.
Stop Light Switch Assembly		Detects the brake pedal depressing signal.
Main Body ECU (Network Gateway ECU)		Transmits the parking brake switch signal to the skid control ECU.
Parking Brake Switch Assembly		Detects the parking brake pedal status.
ECM		• Sends the accelerator pedal position signal, engine speed signal etc., to the skid control ECU. • Based on the signals from the skid control ECU, controls the engine output.
TCM*		Sends the gear position signal to the skid control ECU.
Steering Sensor		Detects the steering direction and angle of the steering wheel.
Combination Meter Assembly	ABS Warning Light	Illuminates to alert the driver when the skid control ECU detects a malfunction in the ABS.
	Brake Warning Light	• Illuminates to alert the driver when the skid control ECU detects a malfunction in the EBD or brake system. • Illuminates to alert the driver when the brake fluid level is low. • Illuminates to inform the driver when the parking brake is operated.
	TR(A)C OFF Indicator Light	Illuminates to inform the driver when TR(A)C OFF mode is selected.
	VSC OFF Indicator Light	Illuminates to inform the driver when VSC OFF mode or VSC SPORT mode is selected.
	VSC SPORT Indicator Light	Illuminates to inform the driver when VSC SPORT mode is selected.
	Slip Indicator Light	• Blinks to inform the driver when the TR(A)C or VSC is performing control. • Illuminates to alert the driver when the skid control ECU detects a

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		malfunction in the TR(A)C and/or VSC.

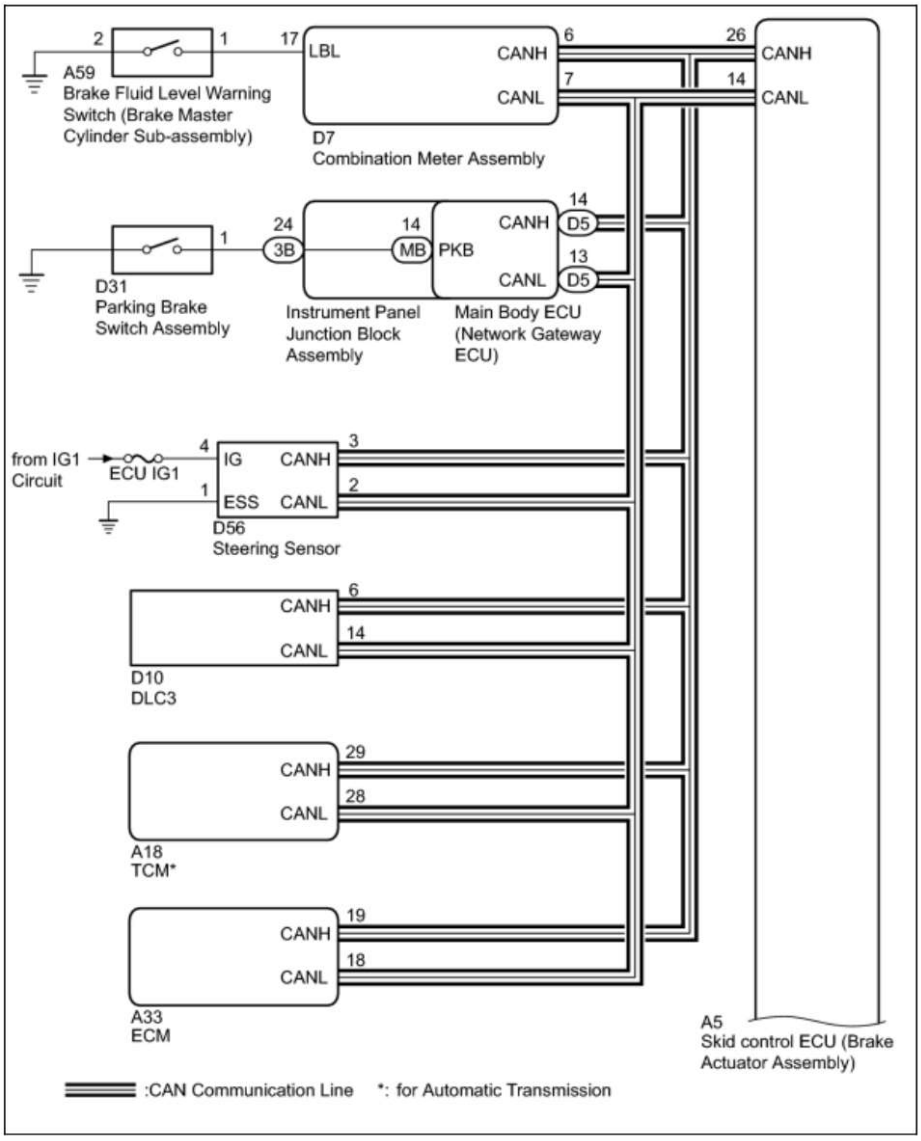
*: for Automatic Transmission



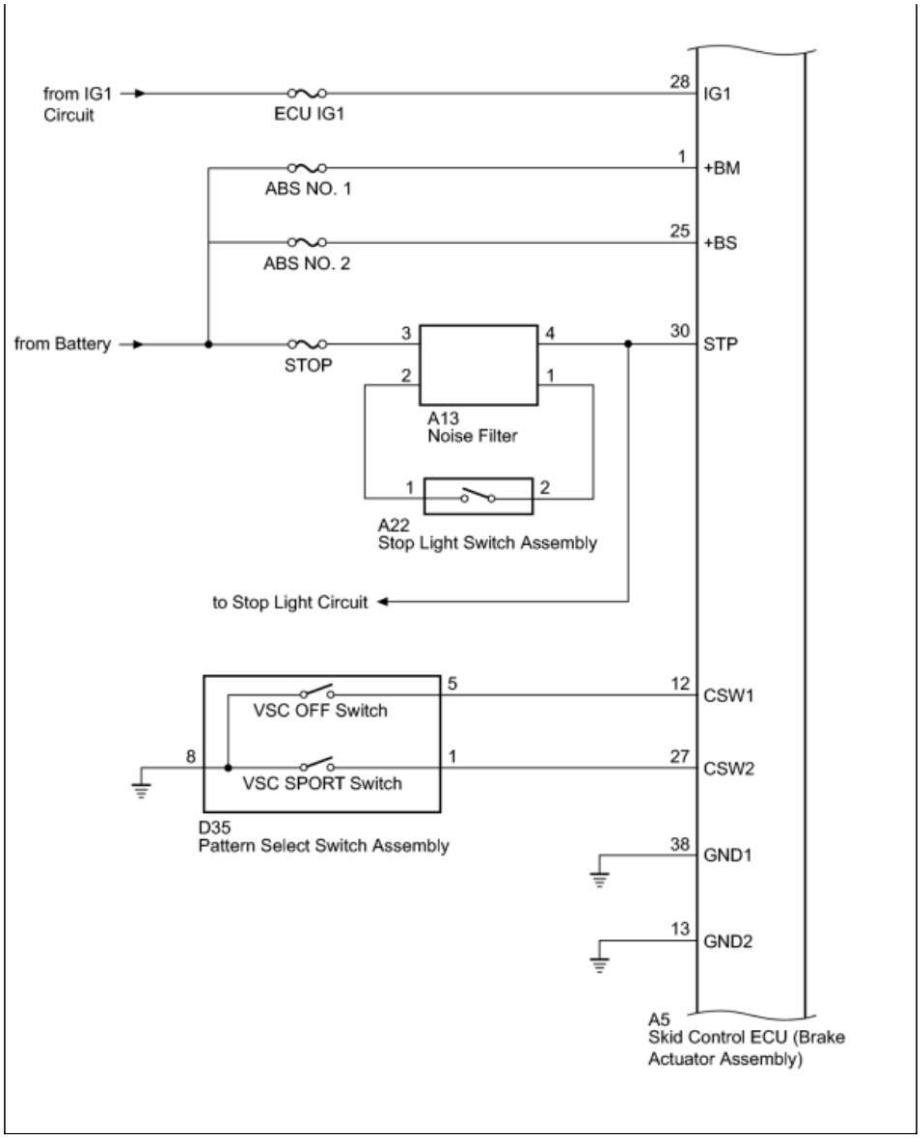
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Last Modified: 3-27-2012	6.4 U	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XHQ079X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: SYSTEM DIAGRAM (2013 FR-S)		

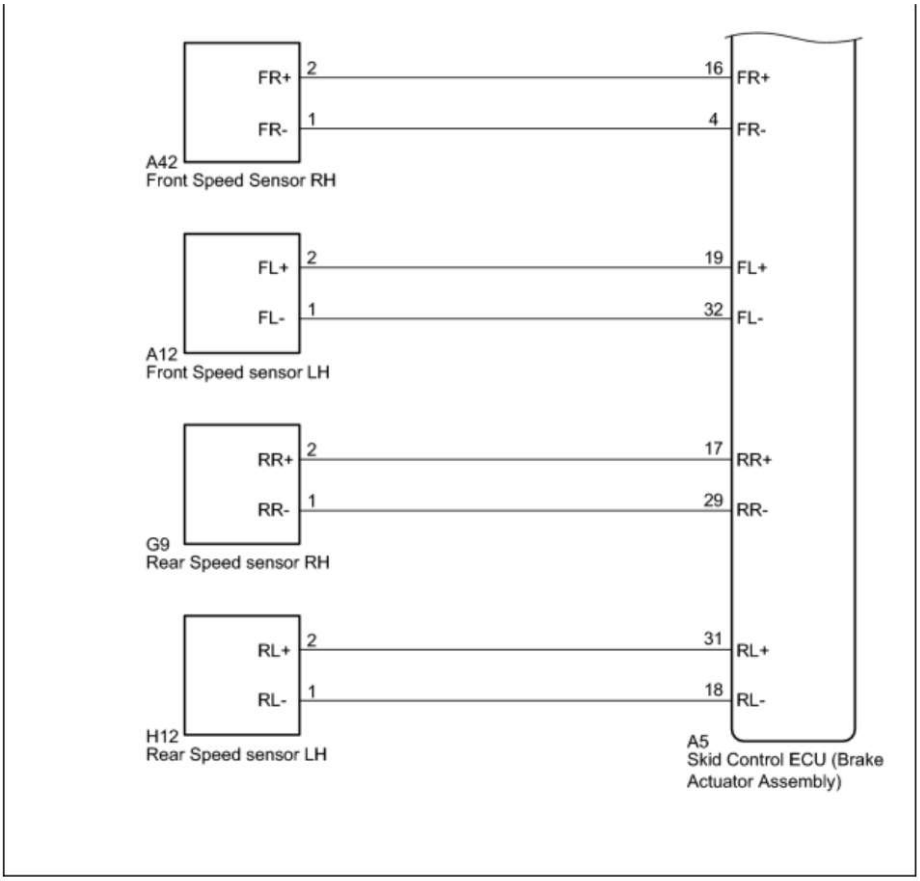
SYSTEM DIAGRAM



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TRANSMITTING ECU (TRANSMITTER)	RECEIVING ECU	SIGNAL	COMMUNICATION METHOD
Steering sensor	Skid control ECU	Steering sensor signal	CAN communication line
Skid control ECU	ECM	• Wheel speed signal • VSC data signal	CAN communication line
ECM	Skid control ECU	• Accelerator pedal position signal • Engine speed signal • Diagnosis signal	CAN communication line
TCM*	Skid control ECU	Gear position signal	CAN communication line
Skid control ECU	Power steering ECU assembly	VSC data signal	CAN communication line
Main body ECU	Skid control ECU	Parking brake switch signal	CAN communication

			line
Skid control ECU	Combination meter assembly	• ABS warning light signal • Brake warning light signal • TR(A)C OFF indicator light signal • VSC OFF indicator light signal • VSC SPORT indicator light signal • Slip indicator light signal • Wheel speed signal	CAN communication line

*: for Automatic Transmission

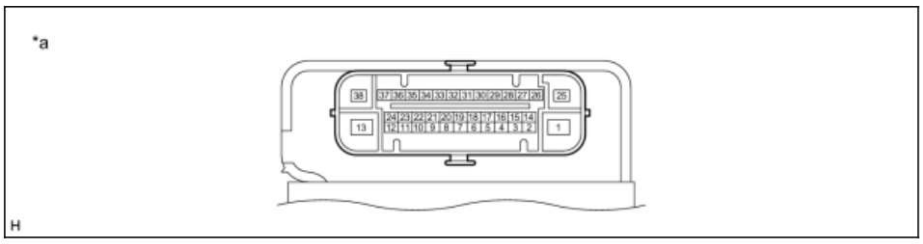


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Last Modified: 3-27-2012	6.4 U	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001NJI017X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: TERMINALS OF ECU (2013 FR-S)		

TERMINALS OF ECU

1. TERMINALS OF ECU



Text in Illustration

*a	Component without harness connected (Skid Control ECU (Brake Actuator Assembly))	-	-

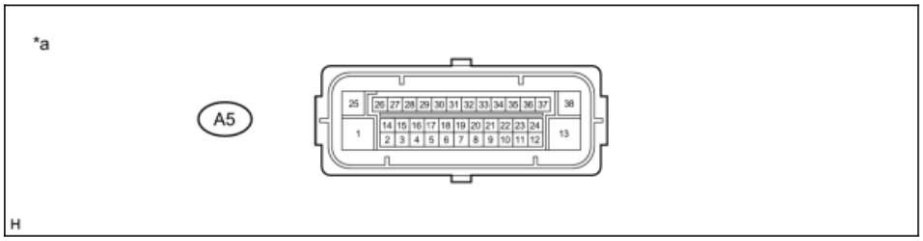
TERMINAL NO. (SYMBOL)	TERMINAL DESCRIPTION
1 (+BM)	ABS motor relay power supply
2 (SPD)	Speed signal output for speedometer
3	- (Not used)
4 (FR-)	Front wheel speed RH (-) signal input
5	- (Not used)
6	- (Not used)
7	- (Not used)
8	- (Not used)
9	- (Not used)
10	- (Not used)
11	- (Not used)
12 (CSW1)	VSC OFF switch input
13 (GND2)	Pump motor ground
14 (CANL)	CAN communication line L
15	- (Not used)
16 (FR+)	Front wheel speed RH (+) signal input
17 (RR+)	Rear wheel speed RH (+) signal input
18 (RL-)	Rear wheel speed LH (-) signal input
19 (FL+)	Front wheel speed LH (+) signal input

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20	- (Not used)
21	- (Not used)
22	- (Not used)
23	- (Not used)
24	- (Not used)
25 (+BS)	ABS solenoid relay power supply
26 (CANH)	CAN communication line H
27 (CSW2)	VSC SPORT switch input
28 (IG1)	IG1 power source input
29 (RR-)	Rear wheel speed RH (-) signal input
30 (STP)	Stop light switch input
31 (RL+)	Rear wheel speed LH (+) signal input
32 (FL-)	Front wheel speed LH (-) signal input
33	- (Not used)
34	- (Not used)
35	- (Not used)
36	- (Not used)
37	- (Not used)
38 (GND1)	Skid control ECU ground

2. TERMINAL INSPECTION

(a) Disconnect the connector and measure the voltage and resistance on the wire harness side.



Text in Illustration

*a	Front view of wire harness connector (to Skid Control ECU (Brake Actuator Assembly))	-	-

HINT:

The voltage cannot be measured with the connector connected to the skid control ECU (brake actuator assembly) because the connector is watertight.

Standard

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TERMINAL NO. (SYMBOL)	WIRING COLOR	TERMINAL DESCRIPTION	CONDITION	SPECIFIED CONDITION
A5-1 (+BM) - Body ground	W - Body ground	ABS motor relay power supply	Always	11 to 14 V
A5-12 (CSW1) - Body ground	O - Body ground	VSC OFF switch input	VSC OFF switch held ON → OFF (Not pressed)	Below 1 Ω → 10 kΩ or higher
A5-13 (GND2) - Body ground	B - Body ground	Pump motor ground	Always	Below 1 Ω
A5-25 (+BS) - Body ground	G - Body ground	ABS solenoid relay power supply	Always	11 to 14 V
A5-27 (CSW2) - Body ground	P - Body ground	VSC SPORT switch input	VSC SPORT switch held ON → OFF (Not pressed)	Below 1 Ω → 10 kΩ or higher
A5-28 (IG1) - Body ground	G-R - Body ground	IG1 power source input	Ignition switch ON	11 to 14 V
A5-30 (STP) - Body ground	R - Body ground	Stop light switch input	Stop light switch ON → OFF (Brake pedal depressed → released)	11 to 14 V* → Below 1.5 V
A5-38 (GND1) - Body ground	B - Body ground	Skid control ECU ground	Always	Below 1 Ω

HINT:

***: The standard voltage value varies depending on the +BS terminal voltage value. The standard voltage is 85% of the +BS terminal voltage.**

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Last Modified: 3-27-2012	6.4 D	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001JBD04SX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: TEST MODE PROCEDURE (2013 FR-S)		

TEST MODE PROCEDURE

1. WARNING LIGHT AND INDICATOR LIGHT INITIAL CHECK

(a) Release the parking brake.

NOTICE:

Before releasing the parking brake, move the shift lever to P (for automatic transmission) or set chocks to prevent the vehicle from rolling.

HINT:

When the parking brake is applied or the brake fluid level is low, the brake warning light comes on.

(b) When the ignition switch is turned to ON, check that the ABS warning, brake warning, TR(A)C OFF indicator, VSC OFF indicator, VSC SPORT indicator and slip indicator lights all come on.

HINT:

- If the skid control ECU stores a DTC, the ABS warning and slip indicator lights will come on.
- If any of the indicators remains on or does not come on, proceed to troubleshooting for the light circuits listed below.

TROUBLE AREA	SEE PROCEDURE
ABS warning light circuit (Remains on)	INFO
ABS warning light circuit (Does not come on)	INFO
Brake warning light circuit (Remains on)	INFO
Brake warning light circuit (Does not come on)	INFO
TR(A)C OFF indicator light circuit (Remains on)	INFO
TR(A)C OFF indicator light circuit (Does not come on)	INFO
VSC OFF indicator light circuit (Remains on)	INFO
VSC OFF indicator light circuit (Does not come on)	INFO
VSC SPORT indicator light circuit (Remains on)	INFO
VSC SPORT indicator light circuit (Does not come on)	INFO
Slip indicator light circuit (Remains on)	INFO
Slip indicator light circuit (Does not come on)	INFO

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(1) When the ignition switch is turned to ON, check that the brake warning, TR(A)C OFF indicator, VSC OFF indicator and VSC SPORT indicator lights turn off after 3 seconds.

(2) When the engine is started, check that the ABS warning and slip indicator lights turn off after 3 seconds.

2. SENSOR CHECK USING TEST MODE (SIGNAL CHECK)

HINT:

DTCs are stored if any malfunctions are detected during the check of each sensor.

(a) Procedure to enter Test Mode

(1) Turn the ignition switch off.

(2) Check that the steering wheel is centered.

(3) Check that the shift lever is in neutral.

(4) Connect the Techstream to the DLC3.

(5) Turn the ignition switch to ON.

(6) Turn the Techstream on.

(7) Switch the skid control ECU to Test Mode using the Techstream. Enter the following menus: Chassis / ABS/VSC/TRAC / Utility / Signal Check.

(8) Check that the ABS warning and slip indicator lights come on.

(b) Speed Sensor Check

(1) Drive the vehicle straight-ahead.

Accelerate the vehicle to a speed of 45 km/h (28 mph) or more for several seconds.

HINT:

- The sensor check may not complete if wheelspin occurs.
- The speed sensor check may not complete if the speed sensor check is started while turning the steering wheel or spinning the wheels.

NOTICE:

After the ABS warning light goes off, if the vehicle speed exceeds 80 km/h (50 mph), a sensor check code will be stored again.

Decelerate or stop the vehicle before the speed reaches 80 km/h (50 mph).

(2) Check that the ABS warning light goes off.

HINT:

- The ABS warning light goes off when the sensor check has completed.
- The ABS warning light comes on immediately after a malfunction has been detected during the speed sensor check.

(3) Stop the vehicle.

HINT:

When the sensor check has completed, the ABS warning light goes off.

NOTICE:

If the sensor check has not completed, the ABS warning light will come on and the ABS system will not operate.

(c) End of Sensor Check

(1) If the sensor checks have completed, the ABS warning light goes off.

NOTICE:

If the sensor checks have not completed, the ABS warning light come on and the ABS system will not operate.

(d) Reading Sensor Check DTCs

(1) Read the DTC(s) by following the Techstream screen.

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NOTICE:

- If only DTCs other than Test Mode sensor check DTCs are displayed, repair the malfunctions and clear the DTCs.
- If Test Mode sensor check DTCs and other DTCs are displayed or if only Test Mode sensor check DTCs are displayed, repair the malfunctions, clear the DTCs, and perform Test Mode inspection again.

HINT:

See "Sensor Check DTCs".

(2) Turn the ignition switch off and disconnect the Techstream.

(e) Sensor Check DTCs

ABS Sensor

DTC NO.	DETECTION ITEM	TROUBLE AREA
C1271	Low Output Signal of Front Speed Sensor RH	• Front speed sensor RH • Sensor installation • Front speed sensor rotor RH (Front axle hub and bearing assembly RH)
C1272	Low Output Signal of Front Speed Sensor LH	• Front speed sensor LH • Sensor installation • Front speed sensor rotor LH (Front axle hub and bearing assembly LH)
C1273	Low Output Signal of Rear Speed Sensor RH	• Rear speed sensor RH • Sensor installation • Rear speed sensor rotor RH (Rear axle hub and bearing assembly RH)
C1274	Low Output Signal of Rear Speed Sensor LH	• Rear speed sensor LH • Sensor installation • Rear speed sensor rotor LH (Rear axle hub and bearing assembly LH)
C1275	Abnormal Change in Output Signal of Front Speed Sensor RH	Front speed sensor rotor RH (Front axle hub and bearing assembly RH)
C1276	Abnormal Change in Output Signal of Front Speed Sensor LH	Front speed sensor rotor LH (Front axle hub and bearing assembly LH)
C1277	Abnormal Change in Output Signal of Rear Speed Sensor RH	Rear speed sensor rotor RH (Rear axle hub and bearing assembly RH)
C1278	Abnormal Change in Output Signal of Rear Speed Sensor LH	Rear speed sensor rotor LH (Rear axle hub and bearing assembly LH)

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HINT:

The codes in this table are output only in Test Mode (signal check).

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001FQP0DAX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: TRAC OFF Indicator Light does not Come ON (2013 FR-S)		

TRAC OFF Indicator Light does not Come ON

DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A

2.	**PERFORM ACTIVE TEST USING TECHSTREAM (TR(A)C OFF INDICATOR LIGHT)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test on the Techstream INFO .

ABS/VSC/TRAC

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
TRC(TRAC) OFF Indicator Light	TR(A)C OFF indicator light	Indicator light ON/OFF	Observe combination meter assembly

(d) Check that the TR(A)C OFF indicator light on the combination meter assembly turns on or off in accordance with the Techstream operation.

OK:
The TR(A)C OFF indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ INSPECT COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

3.	INSPECT COMBINATION METER ASSEMBLY

(a) Turn the ignition switch off.

(b) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(c) Check the combination meter assembly.

OK:
The TR(A)C OFF indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ REPLACE COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001FQO0DCX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: TRAC OFF Indicator Light Remains ON (2013 FR-S)		

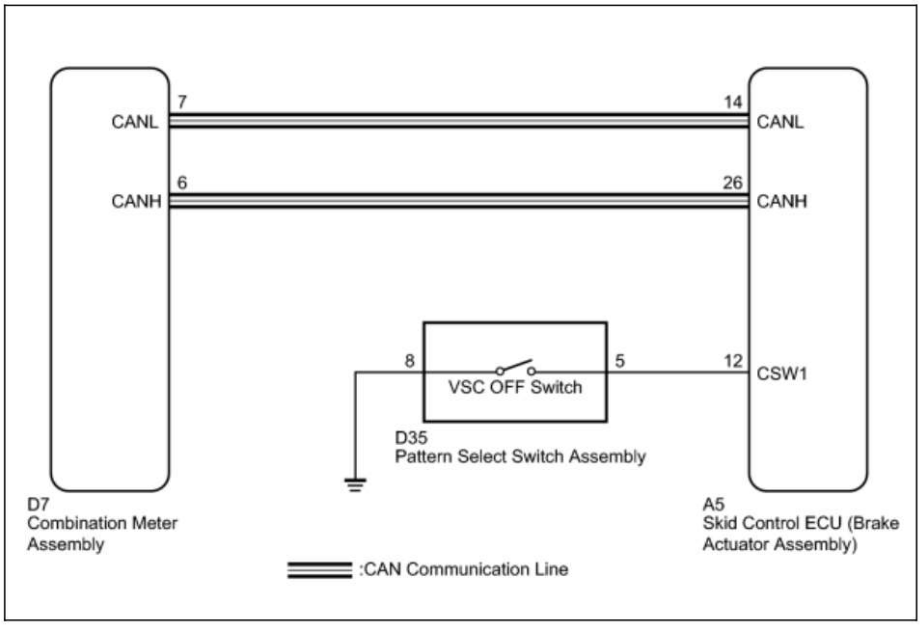
TRAC OFF Indicator Light Remains ON

DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

Pressing the VSC OFF switch turns off TR(A)C, and pressing and holding this switch turns off TR(A)C and VSC. If TR(A)C is turned off, the TR(A)C OFF indicator light will come on.

WIRING DIAGRAM



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INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO **.**

PROCEDURE

1.	CHECK CAN COMMUNICATION SYSTEM

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ INSPECT CAN COMMUNICATION SYSTEM

A ▼

2.	CHECK IF BRAKE ACTUATOR ASSEMBLY CONNECTOR IS SECURELY CONNECTED

(a) Check if the skid control ECU (brake actuator assembly) connector is securely connected.

OK:

The connector is securely connected.

NG ▶ CONNECT CONNECTOR TO ECU CORRECTLY

OK ▼

3.	CHECK BATTERY

(a) Check the battery voltage.

Standard Voltage:

11 to 14 V

NG ▶ CHECK OR REPLACE CHARGING SYSTEM COMPONENT OR BATTERY

OK ▼

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4.	READ VALUE USING TECHSTREAM (VSC OFF SWITCH)

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
TRC(TRAC)/VSC Off Mode	TR(A)C/VSC OFF mode / Normal, TRC(TRAC) OFF, Unknown or VSC OFF	Normal: Normal mode TRC(TRAC) OFF: TR(A)C OFF mode Unknown: Unspecified VSC OFF: VSC OFF mode	-

(d) Using the Techstream, check that the switch condition displayed on the Techstream changes according to VSC OFF switch operation.

OK:
The Techstream display changes according to VSC OFF switch operation.

NG ▶ **INSPECT VSC OFF SWITCH**

OK ▼

5.	INSPECT COMBINATION METER ASSEMBLY

(a) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(b) Check the combination meter assembly.

OK:
The TR(A)C OFF indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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6.	**INSPECT VSC OFF SWITCH**

(a) Remove the VSC OFF switch INFO .

(b) Inspect the VSC OFF switch INFO .

NG ▶ **REPLACE PATTERN SELECT SWITCH ASSEMBLY**

OK ▼

7.	**CHECK HARNESS AND CONNECTOR (BRAKE ACTUATOR ASSEMBLY - VSC OFF SWITCH)**

(a) Disconnect the skid control ECU (brake actuator assembly) connector.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-12 (CSW1) - D35-5	Always	Below 1 Ω
A5-12 (CSW1) - Body ground	Always	10 kΩ or higher
D35-8 - Body ground	Always	Below 1 Ω

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 3-27-2012	6.4 C	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000YUO0I8X
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: U0073,U0100,U0101,U0126: Control Module Communication Bus "A" Off (2013 FR-S)		

DTC	**U0073**	**Control Module Communication Bus "A" Off**

DTC	**U0100**	**Lost Communication with ECM / PCM "A"**

DTC	**U0101**	**Lost Communication with TCM**

DTC	**U0126**	**Lost Communication with Steering Angle Sensor Module**

DESCRIPTION

The skid control ECU (brake actuator assembly) receives signals from the ECM, steering sensor and TCM via the CAN communication system.

DTC NO.	DTC DETECTION CONDITION	TROUBLE AREA
U0073	The +BS terminal voltage is between 9.6 and 16.5 V and bus off is judged for 0.1 seconds or more.	CAN communication system
U0100	The +BS terminal voltage is between 9.6 and 16.5 V, the vehicle speed is 6 km/h (4 mph) or more, and signals cannot be sent to the ECM for 0.5 seconds or more.	• CAN communication system • Skid control ECU (Brake actuator assembly) • ECM
U0123	The +BS terminal voltage is between 9.6 and 16.5 V, the vehicle speed is 6 km/h (4 mph) or more, and signals cannot be sent to the TCM for 0.5 seconds or more.	• CAN communication system • Skid control ECU (Brake actuator assembly) • TCM
	The +BS terminal voltage is between 9.6 and 16.5 V, the vehicle	• CAN communication system

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U0126	speed is 6 km/h (4 mph) or more, and signals from the steering sensor cannot be received for 0.1 seconds or more.	• Skid control ECU (Brake actuator assembly) • steering sensor

INSPECTION PROCEDURE

PROCEDURE

1.	**RECONFIRM DTC**

(a) Clear the DTCs INFO .

(b) Turn the ignition switch off.

(c) Start the engine.

(d) Drive the vehicle at a speed of 15 km/h (9 mph) or more and turn the steering wheel to the right and left.

(e) Check that no CAN communication system DTC is output INFO .

(f) If VSC system DTCs are output, record them INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B
CAN communication system DTC is output.	C

HINT:

The CAN communication system must be normal when performing troubleshooting for sensor DTCs (for VSC system).

B ▶ **REPAIR CIRCUITS INDICATED BY OUTPUT DTCS**

C ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A ▶ **CHECK FOR INTERMITTENT PROBLEMS**

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BRAKE ACTUATOR
FRONT SPEED SENSOR
REAR SPEED SENSOR
STEERING ANGLE SENSOR
VEHICLE STABILITY CONTROL SYSTEM
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PARTS LOCATION (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
SYSTEM DIAGRAM (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
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DIAGNOSTIC TROUBLE CODE CHART (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C1201: Engine Control System Malfunction (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C1225-C1228,C1468,C1469,C146A,C146B: SA1 Solenoid Circuit (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
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C1234,C1419,C1472,C1474: Yaw Rate Sensor (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C1237,C1275-C1278: Speed Sensor Rotor Faulty (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C1241: Low or High Power Supply Voltage (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C1246: Master Cylinder Pressure Sensor Malfunction (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C1249: Open in Stop Light Switch Circuit (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C1271,C1272,C1330,C1331,C1464,C1465: Low Output Signal of Front Speed Sensor RH (Test Mode DTC) (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTE
C1273,C1274,C1332,C1333,C1466,C1467: Low Output Signal of Rear Speed Sensor RH (Test Mode DTC) (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTE
C1288: Error in Matching of ECUs (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C1294: ECT System Malfunction (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C1300: Skid Control ECU Malfunction (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C146C: Open in ABS Motor Relay Circuit (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
C146E: Open in ABS Solenoid Relay Circuit (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
U0073,U0100,U0101,U0126: Control Module Communication Bus "A" Off (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
ABS Warning Light Remains ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
ABS Warning Light does not Come ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
Brake Warning Light Remains ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
Brake Warning Light does not Come ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
TRAC OFF Indicator Light Remains ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
TRAC OFF Indicator Light does not Come ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
VSC OFF Indicator Light Remains ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
VSC OFF Indicator Light does not Come ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
VSC SPORT Indicator Light Remains ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
VSC SPORT Indicator Light does not Come ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
Slip Indicator Light Remains ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
Slip Indicator Light does not Come ON (2013 FR-S):BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM
VSC OFF SWITCH
BRAKE SYSTEM (OTHER)
PARKING BRAKE
Drivetrain
Engine / Hybrid / EV System

Last Modified: 3-27-2012	6.4 L	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000XFT0CCX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: PRECAUTION (2013 FR-S)		

PRECAUTION

1. TROUBLESHOOTING PRECAUTIONS

(a) When there is a malfunction with terminal contact points or part installation problems, removal and installation of the suspected parts may return the system to normal either completely or temporarily.

(b) In order to determine the malfunctioning area, be sure to check the conditions at the time the malfunction occurred, such as DTC output and the Freeze Frame Data, and record it before disconnecting any connector or removing and installing parts.

(c) Since the system may be influenced by malfunctions in systems other than the VSC system, be sure to check for DTCs in other systems.

2. HANDLING PRECAUTIONS

(a) Do not remove or install VSC parts such as the steering sensor except when required, as they need to be adjusted correctly after removal and installation.

(b) Be sure to perform preparation before work and confirmation after work is completed by following the directions in the repair manual when working on the VSC system.

(c) Be sure to remove and install the ECU, brake actuator assembly, sensors, etc. with the ignition switch off unless it is otherwise specified in the inspection procedure.

(d) If the ECU, brake actuator assembly or a sensor has been removed and installed, it is necessary to check the system for problems after the parts have been reassembled. Check for DTCs using the Techstream, also check that system functions and signals received by the ECU are normal using Test Mode.

3. DTC PRECAUTION

(a) Warnings for some DTCs cannot be cleared only by repairing the malfunctioning parts. If the warning is displayed after repair work, the DTC should be cleared after turning the ignition switch off.

NOTICE:

If a DTC for a malfunctioning part reappears after it was cleared, then it has been stored again.

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- General
- INTRODUCTION
- Power Source / Network
- Steering
- Suspension
- Vehicle Exterior
- Vehicle Interior

4. CHASSIS DYNAMOMETER PRECAUTION

When testing with a 2-wheel drum tester such as a speedometer tester, a combination tester for the speedometer and brakes, a chassis dynamometer, or when jacking up the front wheels and turning the wheels, perform the following procedure to enter Inspection Mode and stop the TR(A)C and VSC systems.

Enter Inspection Mode to disable TR(A)C and VSC operation when using a chassis dynamometer.

HINT:

- If Inspection Mode is not used, the vehicle may unexpectedly move off the dynamometer because of TR(A)C and VSC operation.
- The VSC OFF switch must not be used to disable TR(A)C and VSC operation when the vehicle is to be operated on a dynamometer. Pressing the VSC OFF switch does not disable TR(A)C and VSC operation completely.

NOTICE:

Secure the vehicle with lock chains for safety.

(a) Activating Inspection Mode (When Using the Techstream)

(1) Ensure that the ignition switch is off and the engine is stopped.

(2) Make sure that the shift lever is in P.

(3) Connect the Techstream to the DLC3.

(4) Start the engine.

(5) Turn the Techstream on.

(6) Enter the following menus: Chassis / ABS/VSC/TRAC / Utility / Inspection Mode.

(7) Check that the VSC OFF indicator light will come on.

HINT:

- If the VSC OFF indicator light does not come on, repeat the steps.
- Turning the ignition switch off ends Inspection Mode.

(b) Activating Inspection Mode (When not Using the Techstream)

HINT:

Perform steps "C" to "H" within 30 seconds.

(1) Ensure that the ignition switch is off and the engine is stopped (Step "A").

(2) for Manual Transmission:

Check that the shift lever is in neutral (Step "B").

for Automatic Transmission:

Make sure that the shift lever is in P (Step "B").

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(3) Start the engine (Step "C").

(4) Apply the parking brake by pulling up the parking brake lever (Step "D").

(5) Depress and release the brake pedal twice (Step "E").

(6) While holding the brake pedal down, release and apply the parking brake twice (Step "F").

(7) With the parking brake applied, depress and release the brake pedal twice (Step "G").

(8) Check if the slip indicator light will come on (Step "H").

HINT:

- If the slip indicator light does not come on in step "H", repeat steps "A" to "H".
- Turning the ignition switch off ends Inspection Mode.

5. CAN COMMUNICATION SYSTEM PRECAUTIONS

(a) The CAN communication system is used for communication between the skid control ECU (brake actuator assembly), the steering sensor and other ECUs. If any CAN communication DTCs are detected, DTCs corresponding to the malfunction will be output.

(b) If any CAN communication DTCs are output, repair the malfunction and troubleshoot the VSC system while communication is normal.

(c) In order to enable CAN communication, a specific type of wiring is used for the CAN communication lines. The wiring used for each communication line is a twisted pair of wires that have an equal length. A bypass wire should not be used because the data being transmitted will be corrupted.

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001FQP0DCX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: VSC OFF Indicator Light does not Come ON (2013 FR-S)		

VSC OFF Indicator Light does not Come ON

DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A

2.	**PERFORM ACTIVE TEST USING TECHSTREAM (VSC OFF INDICATOR LIGHT)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test using the Techstream INFO .

ABS/VSC/TRAC

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
VSC OFF Indicator Light	VSC OFF indicator light	Indicator light ON/OFF	Observe combination meter assembly

(d) Check that the VSC OFF indicator light on the combination meter assembly turns on or off in accordance with the Techstream operation.

OK:
The VSC OFF indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ INSPECT COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

3.	INSPECT COMBINATION METER ASSEMBLY

(a) Turn the ignition switch off.

(b) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(c) Check the combination meter assembly.

OK:
The VSC OFF indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ REPLACE COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001FQO0DEX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: VSC OFF Indicator Light Remains ON (2013 FR-S)		

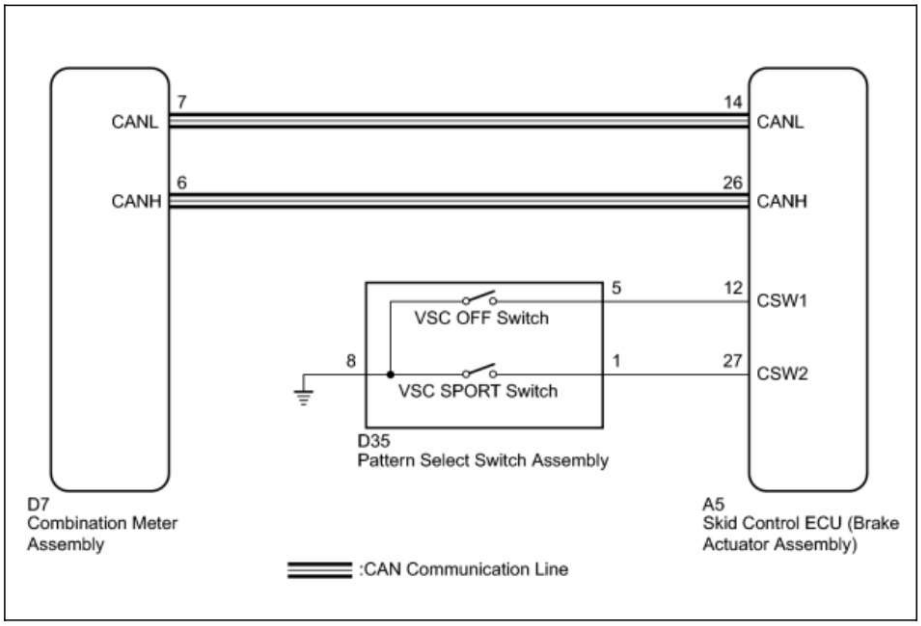
VSC OFF Indicator Light Remains ON

DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

Pressing the VSC OFF switch turns off TR(A)C and pressing and holding this switch turns off TR(A)C and VSC. If VSC is turned off, the VSC OFF indicator light will come on.

WIRING DIAGRAM



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INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO **.**

PROCEDURE

1.	CHECK CAN COMMUNICATION SYSTEM

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ INSPECT CAN COMMUNICATION SYSTEM

A ▼

2.	CHECK IF BRAKE ACTUATOR ASSEMBLY CONNECTOR IS SECURELY CONNECTED

(a) Check if the skid control ECU (brake actuator assembly) connector is securely connected.

OK:

The connector is securely connected.

NG ▶ CONNECT CONNECTOR TO ECU CORRECTLY

OK ▼

3.	CHECK BATTERY

(a) Check the battery voltage.

Standard Voltage:

11 to 14 V

NG ▶ CHECK OR REPLACE CHARGING SYSTEM COMPONENT OR BATTERY

OK ▼

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4.	READ VALUE USING TECHSTREAM (VSC OFF SWITCH)

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
TRC(TRAC)/VSC Off Mode	TR(A)C/VSC OFF mode / Normal, TRC(TRAC) OFF, Unknown or VSC OFF	Normal: Normal mode TRC(TRAC) OFF: TR(A)C OFF mode Unknown: Unspecified VSC OFF: VSC OFF mode	-

(d) Using the Techstream, check that the switch condition displayed on the Techstream changes according to VSC OFF switch operation.

OK:

The Techstream display changes according to VSC OFF switch operation.

NG ▶ **INSPECT VSC OFF SWITCH**

OK ▼

5.	READ VALUE USING TECHSTREAM (VSC SPORT SWITCH)

(a) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Sports Mode	VSC SPORT mode / Normal or Sports	Normal: Normal mode Sports: VSC SPORT mode	-

(b) Using the Techstream, check that the switch condition displayed on the Techstream changes according to VSC SPORT switch operation.

OK:

The Techstream display changes according to VSC SPORT switch operation.

NG ▶ **INSPECT VSC SPORT SWITCH**

OK

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▼

6.	INSPECT COMBINATION METER ASSEMBLY

(a) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(b) Check the combination meter assembly.

OK:
The VSC OFF indicator and VSC SPORT indicator lights turn on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ REPLACE COMBINATION METER ASSEMBLY

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

7.	INSPECT VSC OFF SWITCH

(a) Remove the VSC OFF switch INFO .

(b) Inspect the VSC OFF switch INFO .

NG ▶ REPLACE PATTERN SELECT SWITCH ASSEMBLY

OK
▼

8.	CHECK HARNESS AND CONNECTOR (BRAKE ACTUATOR ASSEMBLY - VSC OFF SWITCH)

(a) Disconnect the skid control ECU (brake actuator assembly) connector.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-12 (CSW1) - D35-5	Always	Below 1 Ω

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A5-12 (CSW1) - Body ground	Always	10 kΩ or higher
D35-8 - Body ground	Always	Below 1 Ω

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **REPAIR OR REPLACE HARNESS OR CONNECTOR**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

9.	**INSPECT VSC SPORT SWITCH**

(a) Remove the VSC SPORT switch INFO .

(b) Inspect the VSC SPORT switch INFO .

NG ▶ **REPLACE PATTERN SELECT SWITCH ASSEMBLY**

OK ▼

10.	**CHECK HARNESS AND CONNECTOR (BRAKE ACTUATOR ASSEMBLY - VSC SPORT SWITCH)**

(a) Disconnect the skid control ECU (brake actuator assembly) connector.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-27(CSW2) - D35-1	Always	Below 1 Ω
A5-27(CSW2) - Body ground	Always	10 kΩ or higher
D35-8 - Body ground	Always	Below 1 Ω

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

REPAIR OR REPLACE HARNESS OR

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NG ▶ CONNECTOR

OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001FQP0DBX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: VSC SPORT Indicator Light does not Come ON (2013 FR-S)		

VSC SPORT Indicator Light does not Come ON

DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO .

PROCEDURE

1.	**CHECK CAN COMMUNICATION SYSTEM**

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ **INSPECT CAN COMMUNICATION SYSTEM**

A

2.	**PERFORM ACTIVE TEST USING TECHSTREAM (VSC SPORT INDICATOR LIGHT)**

(a) Connect the Techstream to the DLC3.

(b) Start the engine.

(c) Select the Active Test using the Techstream INFO .

ABS/VSC/TRAC

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TESTER DISPLAY	TEST PART	CONTROL RANGE	DIAGNOSTIC NOTE
Sports Mode Indicator Light	VSC SPORT indicator light	Indicator light ON/OFF	Observe combination meter assembly

(d) Check that the VSC SPORT indicator light on the combination meter assembly turns on or off in accordance with the Techstream operation.

OK:
The VSC SPORT indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **INSPECT COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

3.	INSPECT COMBINATION METER ASSEMBLY

(a) Turn the ignition switch off.

(b) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(c) Check the combination meter assembly.

OK:
The VSC SPORT indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

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Last Modified: 3-27-2012	6.4 J	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001FQO0DDX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VEHICLE STABILITY CONTROL SYSTEM: VSC SPORT Indicator Light Remains ON (2013 FR-S)		

VSC SPORT Indicator Light Remains ON

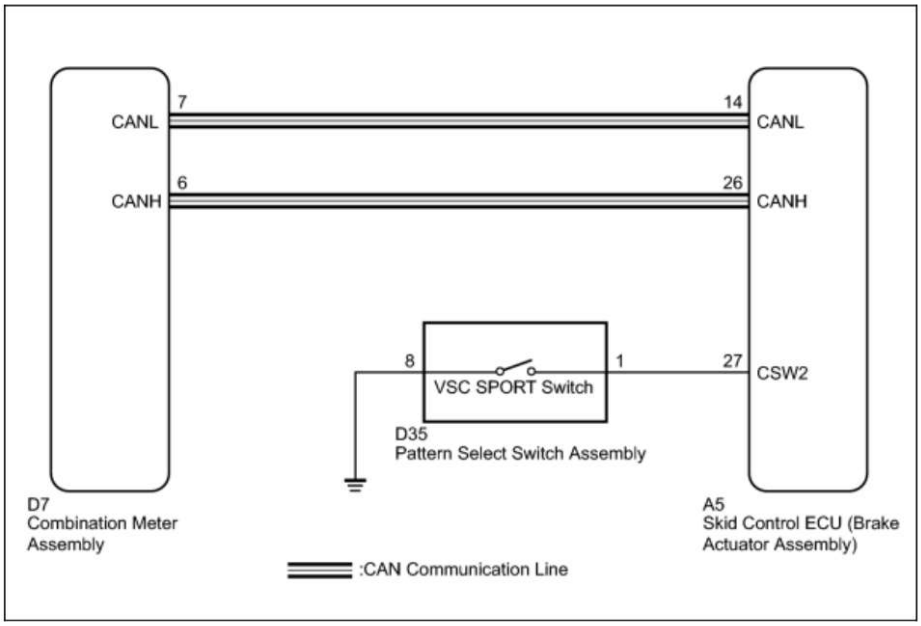
DESCRIPTION

The skid control ECU (brake actuator assembly) is connected to the combination meter assembly via CAN communication.

When the VSC SPORT switch is operated, the system switches between normal mode and sport mode.

If the VSC SPORT switch is pressed in normal mode, the system enters sport mode.

WIRING DIAGRAM



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INSPECTION PROCEDURE

NOTICE:

When replacing the skid control ECU (brake actuator assembly), perform VSC sensor neutral memorization INFO **.**

PROCEDURE

1.	CHECK CAN COMMUNICATION SYSTEM

(a) Check if a CAN communication system DTC is output INFO .

Result:

RESULT	PROCEED TO
DTC is not output.	A
DTC is output.	B

B ▶ INSPECT CAN COMMUNICATION SYSTEM

A ▼

2.	CHECK IF BRAKE ACTUATOR ASSEMBLY CONNECTOR IS SECURELY CONNECTED

(a) Check if the skid control ECU (brake actuator assembly) connector is securely connected.

OK:

The connector is securely connected.

NG ▶ CONNECT CONNECTOR TO ECU CORRECTLY

OK ▼

3.	CHECK BATTERY

(a) Check the battery voltage.

Standard Voltage:

11 to 14 V

NG ▶ CHECK OR REPLACE CHARGING SYSTEM COMPONENT OR BATTERY

OK ▼

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4.	READ VALUE USING TECHSTREAM (VSC SPORT SWITCH)

(a) Connect the Techstream to the DLC3.

(b) Turn the ignition switch to ON.

(c) Select the Data List using the Techstream INFO .

ABS/VSC/TRAC

TESTER DISPLAY	MEASUREMENT ITEM/RANGE	NORMAL CONDITION	DIAGNOSTIC NOTE
Sports Mode	VSC SPORT mode / Normal or Sports	Normal: Normal mode Sports: VSC SPORT mode	-

(d) Using the Techstream, check that the switch condition displayed on the Techstream changes according to VSC SPORT switch operation.

OK:

The Techstream display changes according to VSC SPORT switch operation.

NG ▶ **INSPECT VSC SPORT SWITCH**

OK ▼

5.	INSPECT COMBINATION METER ASSEMBLY

(a) Perform an Active Test of the combination meter assembly (meter CPU) using the Techstream INFO .

(b) Check the combination meter assembly.

OK:

The VSC SPORT indicator light turns on or off in accordance with the Active Test operation.

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ **REPLACE COMBINATION METER ASSEMBLY**

OK ▶ **REPLACE BRAKE ACTUATOR ASSEMBLY**

6.	INSPECT VSC SPORT SWITCH

(a) Remove the VSC SPORT switch INFO .

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(b) Inspect the VSC SPORT switch INFO .

NG ▶ REPLACE PATTERN SELECT SWITCH ASSEMBLY

OK ▼

7.	CHECK HARNESS AND CONNECTOR (BRAKE ACTUATOR ASSEMBLY - VSC SPORT SWITCH)

(a) Disconnect the skid control ECU (brake actuator assembly) connector.

(b) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CONDITION	SPECIFIED CONDITION
A5-27 (CSW2) - D35-1	Always	Below 1 Ω
A5-27 (CSW2) - Body ground	Always	10 kΩ or higher
D35-8 - Body ground	Always	Below 1 Ω

HINT:

If troubleshooting has been carried out according to Problem Symptoms Table, refer back to the table and proceed to the next step before replacing parts INFO .

NG ▶ REPAIR OR REPLACE HARNESS OR CONNECTOR

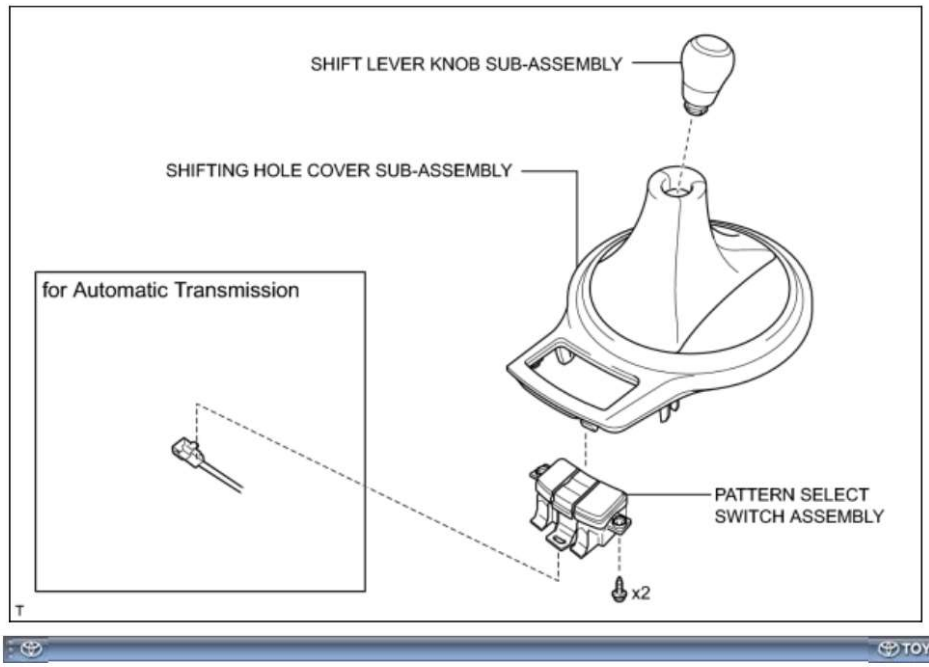
OK ▶ REPLACE BRAKE ACTUATOR ASSEMBLY

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001WZ102QX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VSC OFF SWITCH: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION



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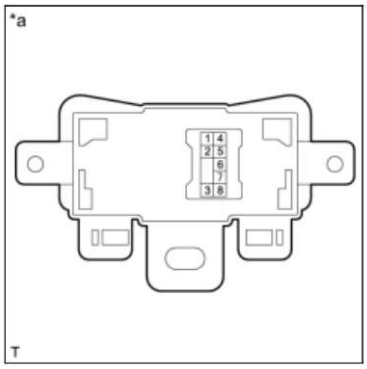
Last Modified: 3-27-2012	6.4 G	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM0000034VE00ZX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VSC OFF SWITCH: INSPECTION (2013 FR-S)		

INSPECTION

1. INSPECT PATTERN SELECT SWITCH ASSEMBLY

(a) Make sure that there is no looseness in the locking part and the connecting part of the VSC OFF switch.

(1) Measure the resistance according to the value(s) in the table below.



Text in Illustration

*a	Component without harness connected (Pattern Select Switch Assembly)

Standard Resistance:

TESTER CONNECTION	CHECK CONDITION	SPECIFIED CONDITION
5 - 8	Switch not pushed in	10 kΩ or higher
	Switch pushed in	Below 1 Ω

(b) Make sure that there is no looseness in the locking part and the connecting part of the VSC SPORT switch.

(1) Measure the resistance according to the value(s) in the table below.

Standard Resistance:

TESTER CONNECTION	CHECK CONDITION	SPECIFIED CONDITION
1 - 8	Switch not pushed in	10 kΩ or higher
	Switch pushed in	Below 1 Ω

(c) Check the illumination status

(1) Check the illumination when the battery voltage is applied between the connector terminals.

Standard:

CHECK CONDITION	SPECIFIED CONDITION
Battery positive → 2 Battery negative → 3	The illumination comes on

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001WYZ02WX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VSC OFF SWITCH: INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL PATTERN SELECT SWITCH ASSEMBLY

(a) Install the 2 screws and the pattern select switch assembly to the shifting hole cover sub-assembly.

(b) Connect the pattern select switch assembly connector clamp. (for Automatic Transmission)

(c) Connect the pattern select switch assembly connector.

2. INSTALL SHIFTING HOLE COVER SUB-ASSEMBLY (for Manual Transmission) INFO

3. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY (for Manual Transmission) INFO

4. INSTALL SHIFTING HOLE COVER SUB-ASSEMBLY (for Automatic Transmission) INFO

5. INSTALL SHIFT LEVER KNOB SUB-ASSEMBLY (for Automatic Transmission) INFO

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001WZ202WX
Title: BRAKE CONTROL / DYNAMIC CONTROL SYSTEMS: VSC OFF SWITCH: REMOVAL (2013 FR-S)		

REMOVAL

1. REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY (for Manual Transmission) INFO

2. REMOVE SHIFTING HOLE COVER SUB-ASSEMBLY (for Manual Transmission) INFO

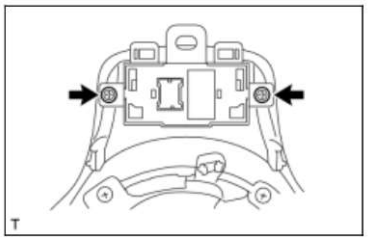
3. REMOVE SHIFT LEVER KNOB SUB-ASSEMBLY (for Automatic Transmission) INFO

4. REMOVE SHIFTING HOLE COVER SUB-ASSEMBLY (for Automatic Transmission) INFO

5. REMOVE PATTERN SELECT SWITCH ASSEMBLY

(a) Disconnect the pattern select switch assembly connector.

(b) Disconnect the pattern select switch assembly connector clamp. (for Automatic Transmission)



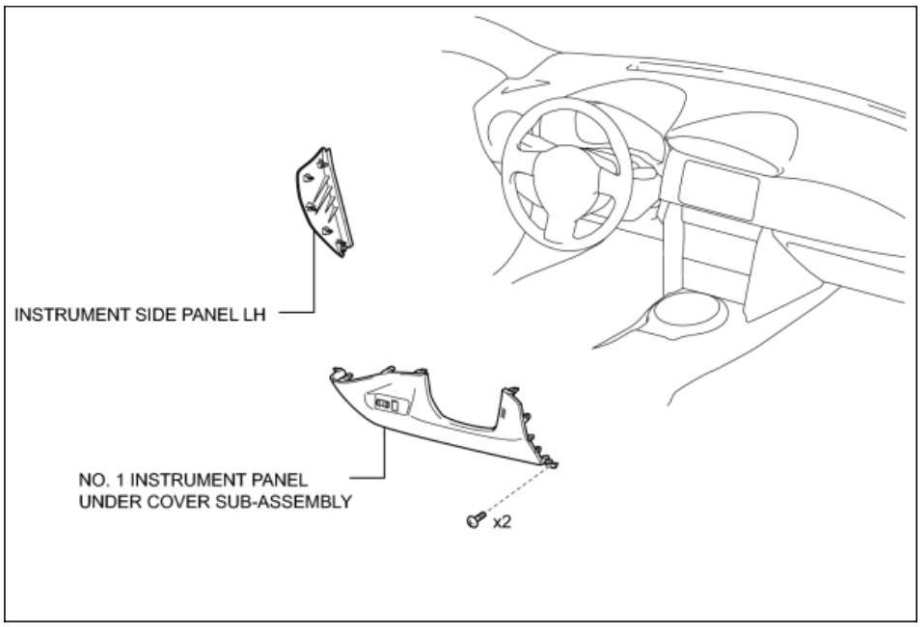
(c) Remove the 2 screws and the pattern select switch assembly from the shifting hole cover sub-assembly.

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJC00SX
Title: BRAKE SYSTEM (OTHER): BRAKE BOOSTER: COMPONENTS (2013 FR-S)		

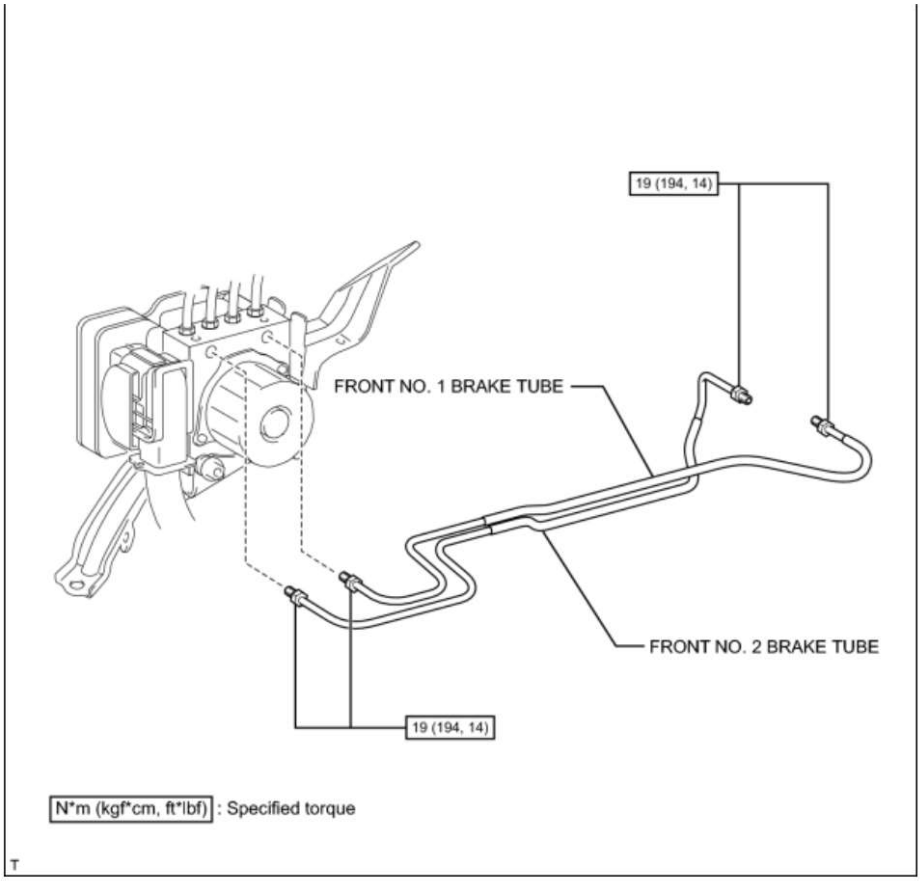
COMPONENTS

ILLUSTRATION



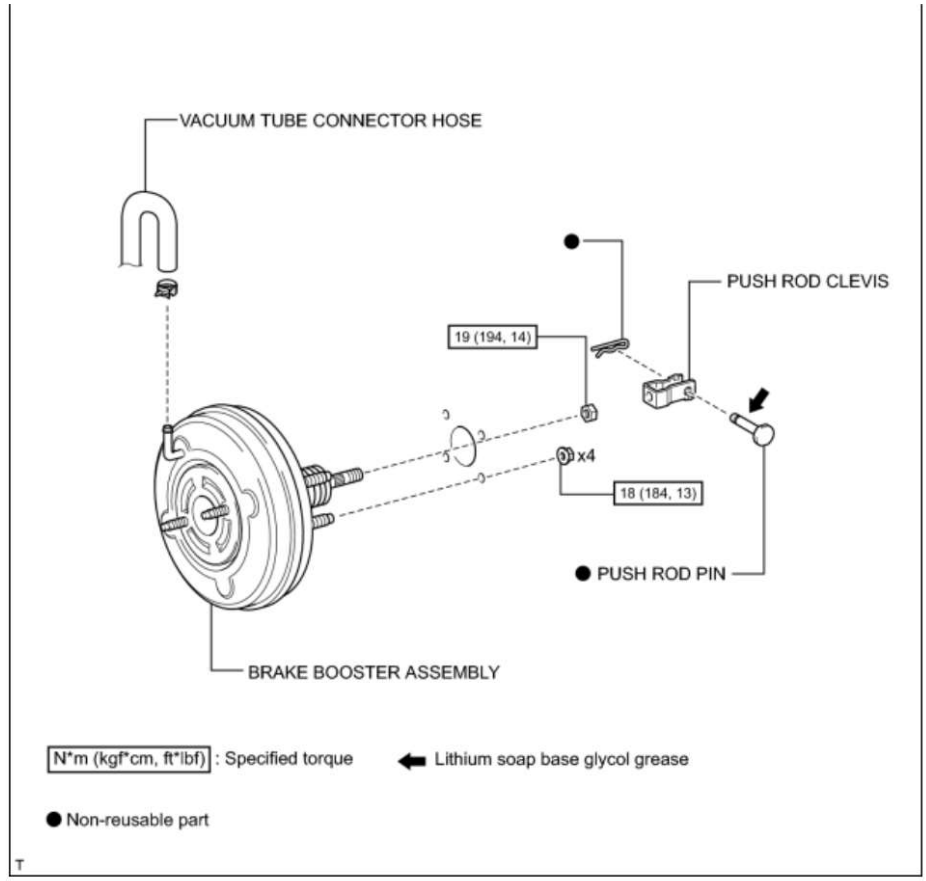
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ILLUSTRATION



ILLUSTRATION

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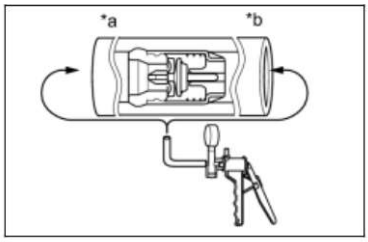
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Last Modified: 3-27-2012	6.4 G	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000004A0W005X
Title: BRAKE SYSTEM (OTHER): BRAKE BOOSTER: INSPECTION (2013 FR-S)		

INSPECTION

1. INSPECT VACUUM TUBE CONNECTOR HOSE

(a) Slide the 2 clamps and remove the vacuum tube connector hose.

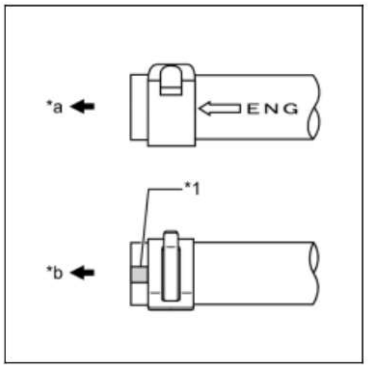


(b) Using a vacuum pump, check that there is ventilation from the booster to the engine, and no ventilation from the engine to the booster.

Text in Illustration

*a	Brake Booster Assembly Side
*b	Engine Assembly Side

If the result is not as specified, replace the vacuum tube connector hose.



(c) Connect the engine side of the vacuum hose with the engine stamp facing outside of the vehicle.

Text in Illustration

*1	Paint Mark
*a	Engine Assembly Side
*b	Brake Booster Assembly Side

(d) Connect the vacuum hose to the booster assembly with the paint mark facing front side of the vehicle.

HINT:

If the paint mark has been disappeared, check the ventilation and connect the hose so that there is ventilation from the booster to the engine, and no ventilation from the engine to the booster.

(e) Slide the 2 clamps and install the vacuum hose connector hose.

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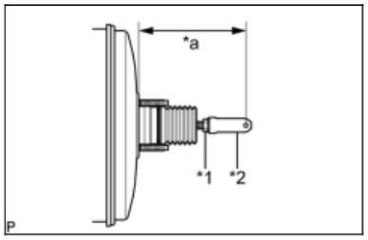
Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJB01YX
Title: BRAKE SYSTEM (OTHER): BRAKE BOOSTER: INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL BRAKE BOOSTER ASSEMBLY

(a) Temporarily install the lock nut and push rod clevis to the brake booster assembly.

(b) Set the push rod length as shown in the illustration.



Text in Illustration

*1	Lock Nut
*2	Push Rod Clevis
*a	Push Rod Length

Push rod length:
155.2 mm (6.11 in.)

(c) Tighten the lock nut.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

(d) Install the 4 nuts to the brake booster assembly.

Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

2. INSTALL FRONT NO. 2 BRAKE TUBE

(a) Connect 2 clips and install the front No. 2 brake tube.

(b) Using a union nut wrench 12 mm, connect the front No. 2 brake tube from the brake actuator.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

NOTICE:

- Do not bend or damage the brake lines.
- Do not allow brake lines to twist and interfere with other parts or vehicle body during tightening.
- Do not allow any foreign matter such as dirt or dust to enter the brake lines.
- Use the formula to calculate special torque values for situations where the union nut wrench is combined with a torque wrench INFO .

3. INSTALL FRONT NO. 1 BRAKE TUBE

(a) Connect 2 clips and install the front No. 1 brake tube.

(b) Using a union nut wrench 12 mm, connect the front No. 1 brake tube from the brake actuator.

NOTICE:

- Do not bend or damage the brake lines.
- Do not allow brake lines to twist and interfere with other parts or vehicle body during tightening.
- Do not allow any foreign matter such as dirt or dust to enter the brake lines.
- Use the formula to calculate special torque values for situations where the union nut wrench is combined with a torque wrench INFO .

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4. CONNECT VACUUM TUBE CONNECTOR HOSE INFO

5. INSTALL PUSH ROD PIN INFO

6. INSTALL BRAKE MASTER CYLINDER SUB-ASSEMBLY

INFO

7. CHECK AND ADJUST BRAKE PEDAL

INFO

8. INSTALL TCM (for Automatic Transmission)

INFO

9. INSTALL NO. 1 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

10. INSTALL INSTRUMENT SIDE PANEL LH

HINT:

Use the same procedure for the LH side as for the RH side INFO .



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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJD01QX
Title: BRAKE SYSTEM (OTHER): BRAKE BOOSTER: REMOVAL (2013 FR-S)		

REMOVAL

1. REMOVE INSTRUMENT SIDE PANEL LH

HINT:

Use the same procedure for the LH side as for the RH side INFO .

2. REMOVE NO. 1 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

3. REMOVE TCM (for Automatic Transmission)

INFO

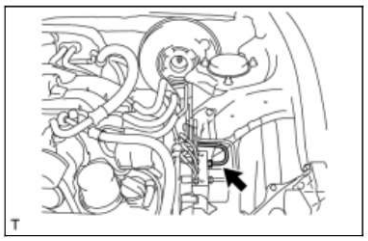
4. REMOVE BRAKE MASTER CYLINDER SUB-ASSEMBLY

INFO

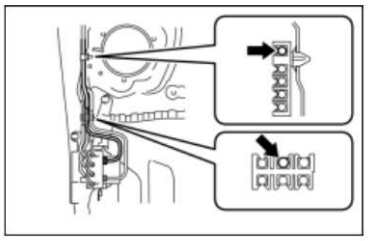
5. DISCONNECT VACUUM TUBE CONNECTOR HOSE

(a) Slide the clip and disconnect the vacuum tube connector hose from the brake booster assembly.

6. REMOVE FRONT NO. 1 BRAKE TUBE



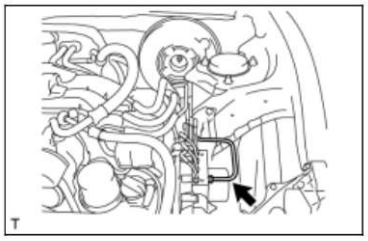
(a) Using a union nut wrench 12 mm, disconnect the front No. 1 brake tube from the brake actuator.



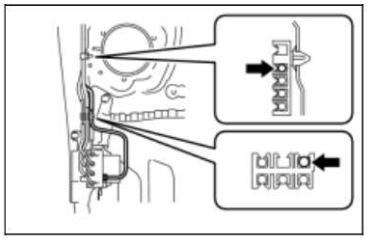
(b) Disconnect 2 clips and remove the front No. 1 brake tube.

7. REMOVE FRONT NO. 2 BRAKE TUBE

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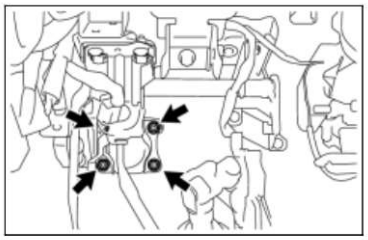
(a) Using a union nut wrench 12 mm, disconnect the front No. 2 brake tube from the brake actuator.



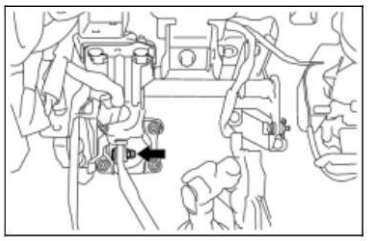
(b) Disconnect 2 clips and remove the front No. 2 brake tube.

8. REMOVE BRAKE BOOSTER ASSEMBLY

(a) Loosen the push rod clevis lock nut.



(b) Remove the 4 nuts.



(c) Remove the push rod clevis pin.

(d) Remove the brake booster assembly.

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Last Modified: 3-27-2012	6.4 N	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000003WYV00DX
Title: BRAKE SYSTEM (OTHER): BRAKE FLUID: BLEEDING (2013 FR-S)		

BLEEDING

NOTICE:

- Move the shift lever to P and apply the parking brake before bleeding the brakes (for automatic transmission).
- Apply the parking brake before bleeding the brakes (for manual transmission).
- Add brake fluid to keep the level between the MIN and MAX lines of the reservoir while bleeding the brakes.
- If brake fluid leaks onto any painted surface, immediately wash it off.
- Do not operate the brake actuator assembly while air is in the brake system or in the brake master cylinder sub-assembly. Doing so may cause air to enter the brake actuator assembly.
- If bleeding the brake actuator assembly is difficult due to air in the brake actuator assembly, replace it with a new one.

HINT:

If any work is done on the brake system or if air in the brake lines is suspected, bleed the air from the system.

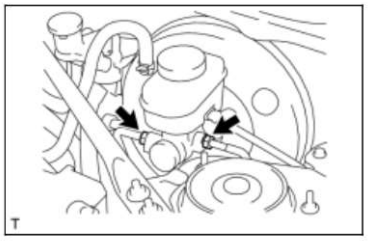
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1. FILL RESERVOIR WITH BRAKE FLUID INFO

2. BLEED BRAKE MASTER CYLINDER SUB-ASSEMBLY

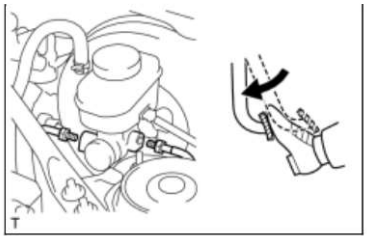
HINT:

If the master cylinder has been disassembled or if the reservoir becomes empty, bleed the air from the master cylinder.



(a) Using a union nut wrench 12 mm, separate the 2 brake tubes from the master cylinder.

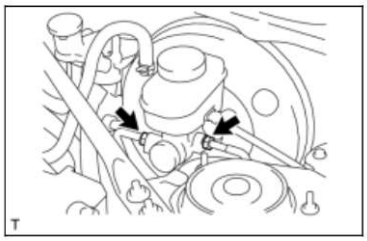
(b) Slowly depress the brake pedal and hold it there (Step A).





(c) Block the outer holes with your fingers, and release the brake pedal (Step B).

(d) Repeat Steps A and B 3 or 4 times.



(e) Using a union nut wrench 12 mm, install the 2 brake tubes into the master cylinder.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

NOTICE:

- Do not bend or damage the brake lines.
- Do not allow brake lines to twist and interfere with other parts or vehicle body during tightening.
- Do not allow any foreign matter such as dirt or dust to enter the brake lines.
- Use the formula to calculate special torque values for situations where a union nut wrench is combined with a torque wrench INFO .

3. BLEED BRAKE LINE INFO

4. INSPECT FOR BRAKE FLUID LEAK

5. INSPECT FLUID LEVEL INFO

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Last Modified: 3-27-2012	6.4 G	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000SRG03NX
Title: BRAKE SYSTEM (OTHER): BRAKE FLUID: ON-VEHICLE INSPECTION (2013 FR-S)		

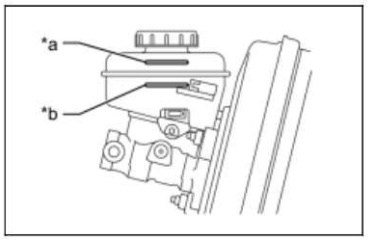
ON-VEHICLE INSPECTION

1. INSPECT BRAKE FLUID LEVEL IN RESERVOIR

(a) Check the fluid level.

Text in Illustration

*a	MAX Line
*b	MIN Line



If brake fluid level is lower than the MIN line, check for leaks and inspect the disc brake pads. If necessary, refill the reservoir with brake fluid to the MAX line after repair or replacement.

Brake Fluid:
SAE J1703 or FMVSS No. 116 DOT 3

NOTICE:

If using a dropper to adjust the fluid amount, make sure that the dropper has not been used with mineral oils, water or deteriorated brake fluid. Sealed areas may deteriorate and lead to fluid leaks, or the fluid may deteriorate and lead to decreased efficiency.

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000002XY202KX
Title: BRAKE SYSTEM (OTHER): BRAKE FLUID: REPLACEMENT (2013 FR-S)		

REPLACEMENT

NOTICE:

- Move the shift lever to P and apply the parking brake before replacing the brake fluid (for automatic transmission).
- Move the shift lever to P and apply the parking brake before replacing the brake fluid (for manual transmission).
- Add brake fluid to keep the level between the MIN and MAX lines of the reservoir while replacing the brake fluid.
- If brake fluid leaks onto any painted surface, immediately wash it off.

HINT:

If any work is performed on the brake system or if air in the brake lines is suspected, bleed the brake system.

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1. FILL RESERVOIR WITH BRAKE FLUID

(a) Remove the brake master cylinder reservoir filler cap.

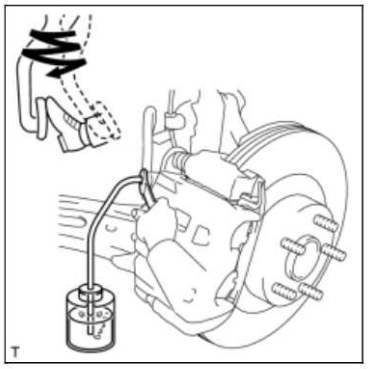
(b) Fill the reservoir with brake fluid.

Brake Fluid:
SAE J1703 or FMVSS No. 116 DOT 3

NOTICE:

Make sure that there is sufficient brake fluid in the reservoir.

2. BLEED BRAKE LINE



NOTICE:

- Bleed the brake line of the wheel farthest from the master cylinder first.
- Add brake fluid to keep the level between the MIN and MAX lines of the reservoir while bleeding the brake lines.

(a) Connect a vinyl tube to the bleeder plug.

(b) Depress the brake pedal several times, and then loosen the bleeder plug with the pedal depressed.*1

(c) When fluid stops coming out, tighten the bleeder plug and release the brake pedal.*2

(d) Repeat steps *1 and *2 until all the air in the brake fluid is completely bled out and a new brake fluid comes out.

(e) Tighten the bleeder plug completely.

Torque: 8.0 N·m (82 kgf·cm, 71in·lbf)

(f) Repeat the above steps to replace the brake fluid of the brake lines for each wheel.

3. INSPECT FOR BRAKE FLUID LEAK

4. INSPECT BRAKE FLUID LEVEL IN RESERVOIR INFO



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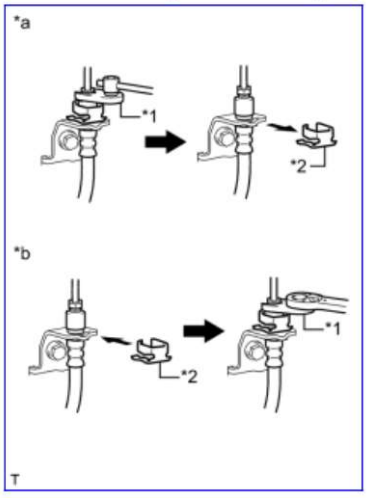
Last Modified: 3-27-2012	6.4 L	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000000SRD092X
Title: BRAKE SYSTEM (OTHER): BRAKE LINE: PRECAUTION (2013 FR-S)		

PRECAUTION

1. TROUBLESHOOTING PRECAUTION

NOTICE:

- Since the brake lines are classified as critical safety related parts, be sure to disassemble and inspect the components if a brake fluid leak is found. If any abnormality is found, replace the component with a new one.
- When removing brake components, cover the brake line connections to prevent foreign matter, such as dust or dirt, from entering the lines.
- Do not damage or deform the brake lines when removing or installing them.
- Do not deform the bracket and the body when connecting a brake line and flexible hose.
- When installing a brake tube grommet to the body, make sure that the brake line passes through the center of the grommet.
- When installing a brake line or flexible hose, make sure that it is free from twists or bends.
- If the cap of a flexible hose does not match the groove on the bracket, twist the hose slightly to insert it.
- Flexible hoses must be free from shock absorber oil, grease, etc.
- When installing a brake line to a plastic clamp, make sure that the brake line is not loose or pinched.
- Do not reuse any clips or plastic clamps removed from a flexible hose or brake line.
- After installing a brake line or flexible hose, make sure that it does not interfere with any other components.
- Do not allow brake fluid to adhere to any painted surface such as the vehicle body. If brake fluid leaks onto any painted surface, immediately wash it off.
- When disconnecting and connecting a flexible hose and brake line:



Text in Illustration

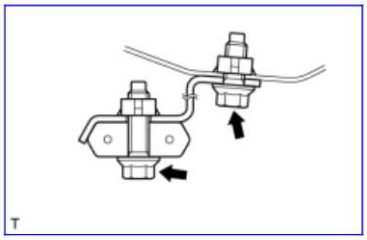
*1	Union Nut Wrench

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*2	Clip
*a	Disconnecting
*b	Connecting

a. Hold the flexible hose with a wrench and disconnect the brake line with a union nut wrench without deforming the line.
b. Remove the clip.
c. Install a new clip.
d. Hold the flexible hose with a wrench and connect the brake line with a union nut wrench without deforming the line.

- When connecting a brake line and way:

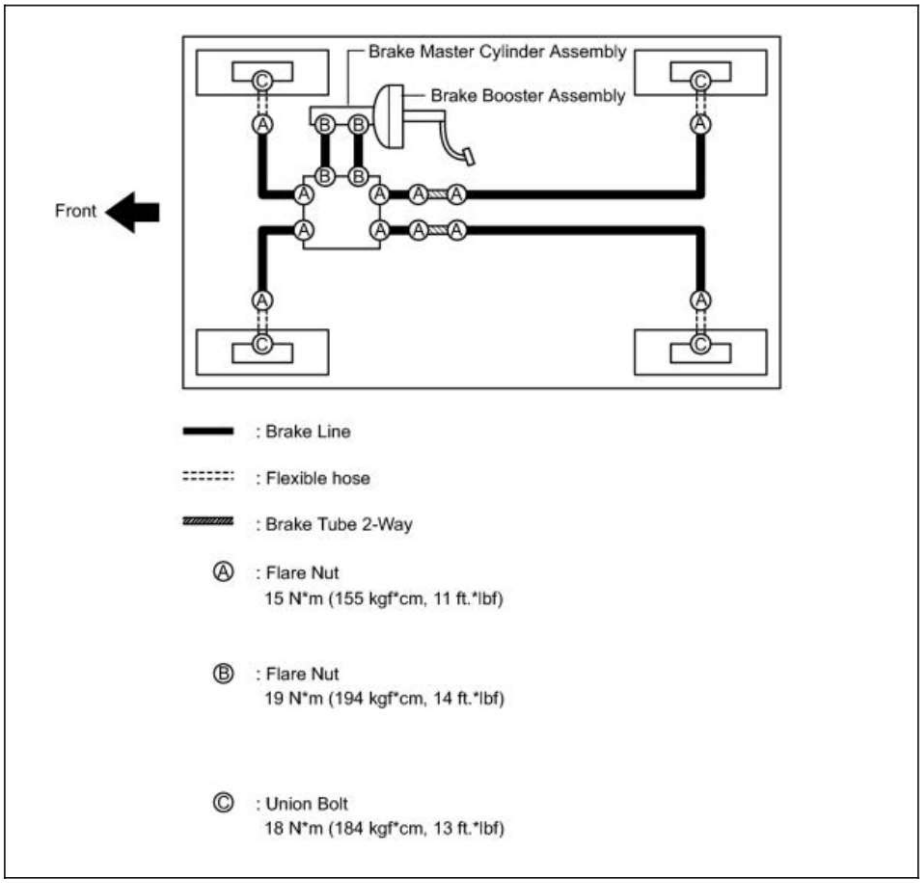


a. Support the way to prevent deformation of the brake tube and connect the brake tube to the way with a union nut wrench.
b. Support the way to prevent deformation of the brake tube and install the bolt to fix the way to the body.

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Last Modified: 3-27-2012	6.4 U	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000003D8B02EX
Title: BRAKE SYSTEM (OTHER): BRAKE LINE: SYSTEM DIAGRAM (2013 FR-S)		

SYSTEM DIAGRAM

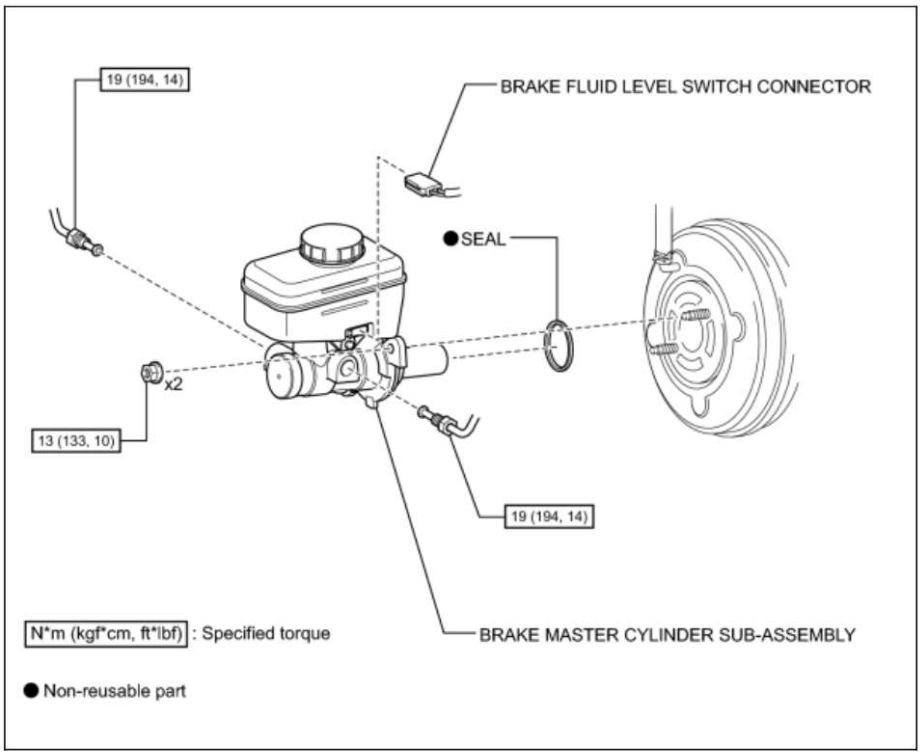


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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HK8013X
Title: BRAKE SYSTEM (OTHER): BRAKE MASTER CYLINDER: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION



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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HK602QX
Title: BRAKE SYSTEM (OTHER): BRAKE MASTER CYLINDER: INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL SEAL

(a) Install a new seal to the brake master cylinder sub-assembly.

2. INSTALL BRAKE MASTER CYLINDER SUB-ASSEMBLY

(a) Install the brake master cylinder sub-assembly to the brake booster assembly with the 2 nuts.

Torque: 13 N·m (133 kgf·cm, 10ft·lbf)

(b) Using a union nut wrench 12 mm, install the 2 brake tubes to the brake master cylinder sub-assembly.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

NOTICE:

Use the formula to calculate the special torque values for situations where a union nut wrench is combined with a torque wrench INFO **.**

(c) Connect the brake fluid level switch connector.

3. BLEED BRAKE SYSTEM

INFO

4. INSTALL FRONT SUSPENSION UPPER TO COWL BRACE SUB-ASSEMBLY LH

INFO

5. INSTALL FRONT WHEEL LH

Torque: 120 N·m (1224 kgf·cm, 86ft·lbf)

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HK902FX
Title: BRAKE SYSTEM (OTHER): BRAKE MASTER CYLINDER: REMOVAL (2013 FR-S)		

REMOVAL

NOTICE:

Make sure to release the vacuum from the brake booster assembly before removing the brake master cylinder sub-assembly from the brake booster assembly.

1. REMOVE FRONT WHEEL LH

2. DRAIN BRAKE FLUID

NOTICE:

If brake fluid leaks onto any painted surface, wash it off immediately.

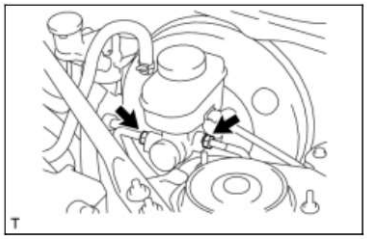
3. REMOVE FRONT SUSPENSION UPPER TO COWL BRACE SUB-ASSEMBLY LH

INFO

4. REMOVE BRAKE MASTER CYLINDER SUB-ASSEMBLY

(a) Release the vacuum from the booster by depressing the brake pedal several times.

(b) Disconnect the brake fluid level switch connector.



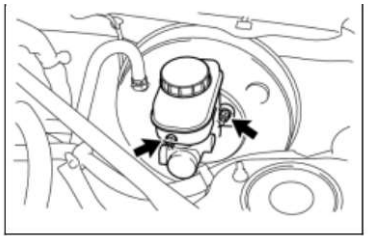
(c) Using a union nut wrench 12 mm, disconnect the 2 brake tubes from the brake master cylinder sub-assembly.

(d) Remove the 2 nuts and the brake master cylinder sub-assembly from the brake booster assembly.

NOTICE:

- Because of the way the master cylinder sub-assembly is designed, the piston can easily fall out, and so do not hold the master cylinder sub-assembly by the piston or pull the piston out. If the piston has been removed from the master cylinder sub-assembly by accident, there is a danger that the performance of the master cylinder sub-assembly will be degraded, and so it cannot be reused and must be replaced with a new master cylinder sub-assembly.
- The master cylinder requires careful handling. Do not allow the master cylinder to receive any impact, such as

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from being dropped. Do not reuse a master cylinder that has been dropped.

- Do not strike or pinch the master cylinder piston, and do not cause any damage to the master cylinder piston by any other means.
- When installing the master cylinder to the brake booster or removing the master cylinder from the brake booster, make sure that the master cylinder is kept horizontal or with its tip facing downward (the piston faces upward) to prevent the master cylinder piston from falling out.
- Do not allow any foreign objects to contaminate the master cylinder piston. If a foreign object gets on the piston, remove it by using a piece of cloth, and then apply an even layer of lithium soap base glycol grease around the circumference (sliding part) of the piston.
- Do not use any other type of grease or fluid.
- Be careful not to damage the brake tubes.

5. REMOVE SEAL

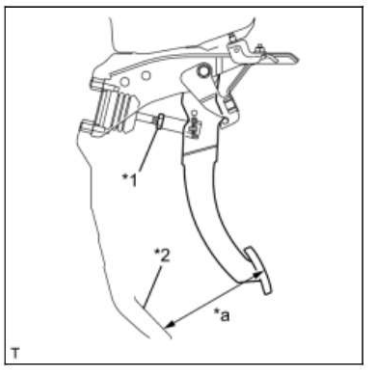
(a) Remove the seal.

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Last Modified: 3-27-2012	6.4 N	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJ3019X
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Automatic Transmission): ADJUSTMENT (2013 FR-S)		

ADJUSTMENT

1. CHECK AND ADJUST BRAKE PEDAL HEIGHT



(a) Check the pedal height.

Text in Illustration

*1	Push Rod Clevis Lock Nut
*2	Floor mat
*a	Pedal Height

Standard Pedal Height from floor mat:
150mm (5.906in.)

(b) Adjust the pedal height.

(1) Remove the instrument side panel LH.

(2) Remove the No. 1 instrument panel under cover sub-assembly.

(3) Disconnect the connector from the stop light switch assembly.

(4) Remove the stop light switch assembly.

(5) Loosen the push rod clevis lock nut.

(6) Adjust the pedal height by turning the push rod.

Standard Pedal Height from floor mat:
150mm (5.906in.)

(7) Tighten the push rod clevis lock nut.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

(8) Install the stop light switch INFO .

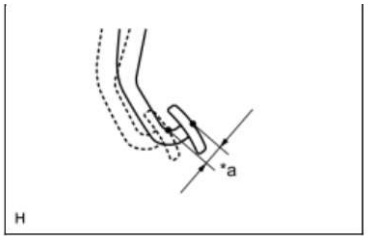
(9) Connect the connector to the stop light switch assembly.

(10) Check that the stop light does not illuminate when the brake pedal is not stepped.

2. CHECK BRAKE PEDAL FREE PLAY

(a) Stop the engine. Depress the pedal several times until

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there is no vacuum in the booster. Then release the pedal.

(b) Depress the pedal until resistance is felt.

(c) Check the pedal free play by measuring the distance between the position in the previous step and the pedal released position.

Standard pedal free play:
0.5 to 2.0mm (0.020 to 0.079in.)

Text in Illustration

*a	Pedal Free Play

HINT:

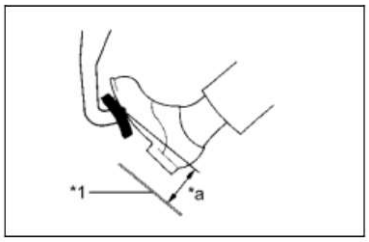
If the pedal free play distance 1mm (0.039in.) or less, adjust the stop light switch assembly.

3. CHECK BRAKE PEDAL RESERVE DISTANCE

(a) Release the brake pedal. Start the engine, and when the pressure in the brake booster reaches 66.7 kPa (500 mmHg, 19.6 in.Hg), proceed with the next step.

(b) Depress the pedal and check the pedal reserve distance.

Text in Illustration



*1	Floor mat
*a	Pedal Reserve Distance

Standard Pedal Reserve Distance from the floor mat at 490 N (50 kgf, 110.2 lbf):
More than 55 mm (2.165 in.)

If the distance is not as specified, troubleshoot the brake system.

HINT:

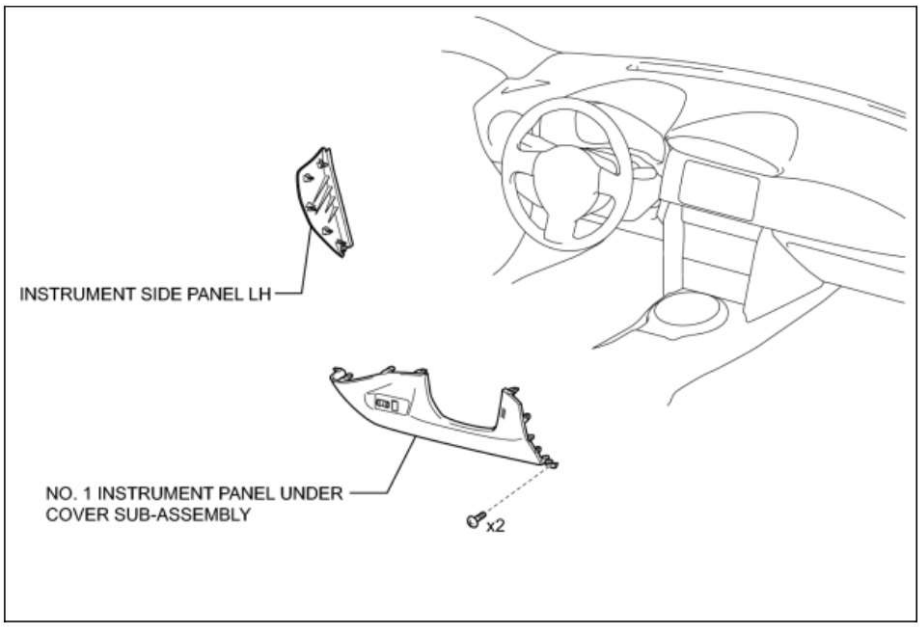
Check the brake pedal reserve distance at the same location as that used when checking the brake pedal height.

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000003D8800HX
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Automatic Transmission): COMPONENTS (2013 FR-S)		

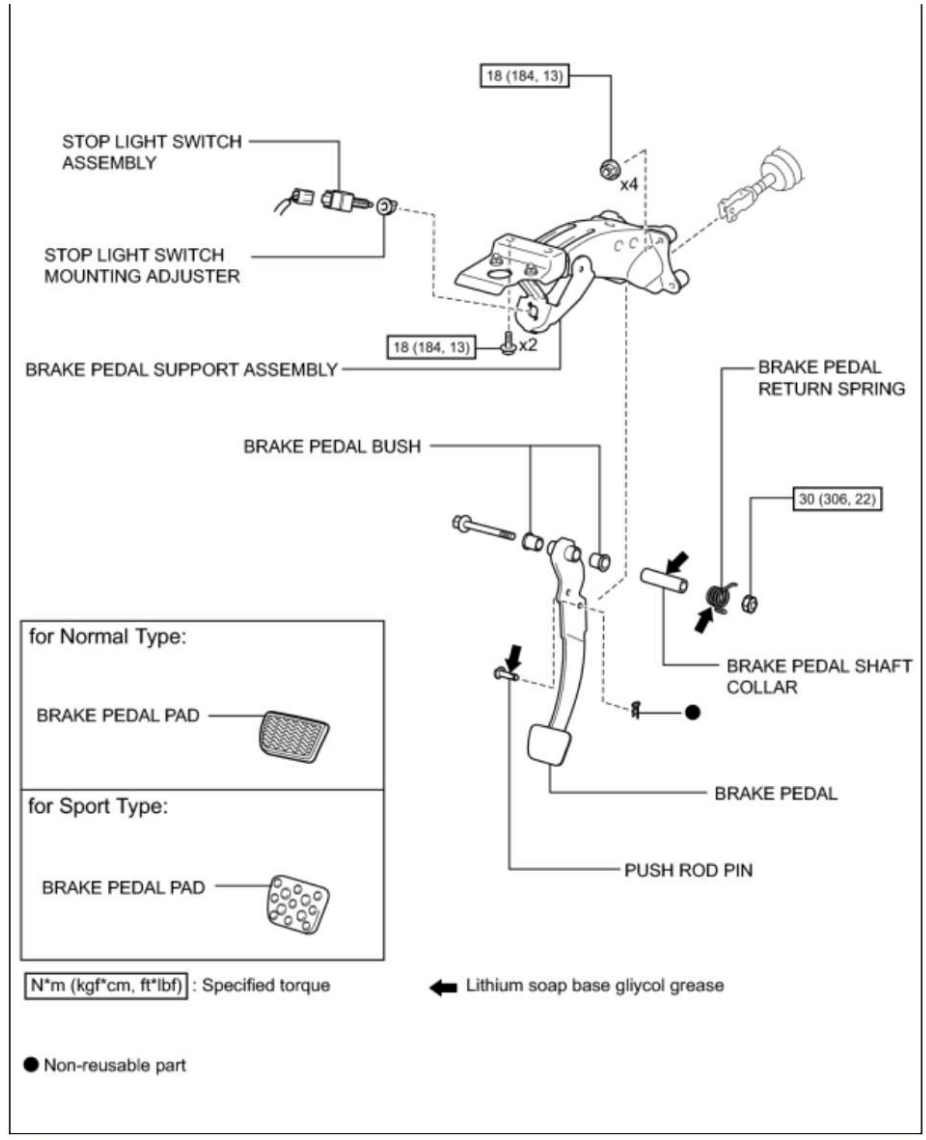
COMPONENTS

ILLUSTRATION



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ILLUSTRATION

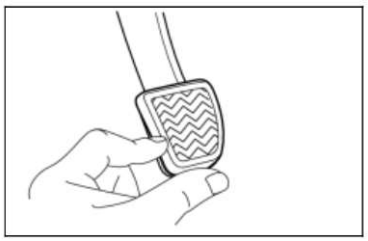


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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000002W9103JX
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Automatic Transmission): DISASSEMBLY (2013 FR-S)		

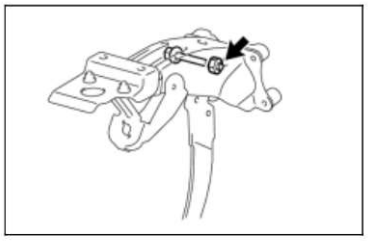
DISASSEMBLY

1. REMOVE BRAKE PEDAL PAD



(a) Remove the brake pedal pad from the brake pedal support assembly.

2. REMOVE BRAKE PEDAL



(a) Remove the bolt and nut from the brake pedal support assembly.

HINT:

Hold the bolt in place and loosen the nut.

3. REMOVE BRAKE PEDAL RETURN SPRING

(a) Remove the brake pedal return spring.

4. REMOVE BRAKE PEDAL SHAFT COLLAR

(a) Remove the brake pedal shaft collar.

5. REMOVE BRAKE PEDAL BUSH

(a) Remove the 2 brake pedal bushes.

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000002W8Y04VX
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Automatic Transmission): INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL BRAKE PEDAL SUPPORT ASSEMBLY

(a) Install the brake pedal support assembly with the 4 nuts.

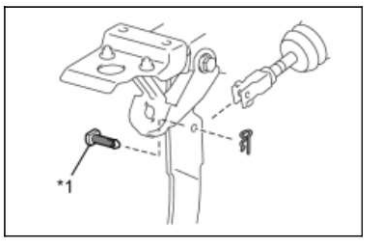
Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

(b) Install the brake pedal support assembly with the 2 bolts.

Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

2. INSTALL PUSH ROD PIN

(a) Apply lithium soap base glycol grease to the new push rod pin.



Text in Illustration

*1	Push Rod Pin
	Lithium Soap Base Glycol Grease

(b) Connect the brake master cylinder push rod clevis to the brake pedal with the new push rod pin, and install a new clip as shown in the illustration.

NOTICE:

After installation, check that the pedal operates smoothly.

3. INSTALL STOP LIGHT SWITCH MOUNTING ADJUSTER

(a) Engage the 2 claws and install the stop light switch mounting adjuster.

4. INSPECT AND ADJUST BRAKE PEDAL

INFO

5. INSPECT AND ADJUST BRAKE PEDAL HEIGHT

INFO

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6. INSPECT BRAKE PEDAL FREE PLAY

INFO

7. INSPECT BRAKE PEDAL RESERVE DISTANCE

INFO

8. INSTALL STOP LIGHT SWITCH ASSEMBLY INFO

9. INSTALL TCM

INFO

10. INSTALL NO. 1 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

11. INSTALL INSTRUMENT SIDE PANEL LH

HINT:

Use the same procedure for the LH side as for the RH side INFO .

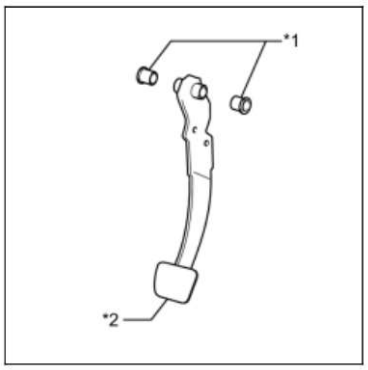


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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000002W9203WX
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Automatic Transmission): REASSEMBLY (2013 FR-S)		

REASSEMBLY

1. INSTALL BRAKE PEDAL BUSH



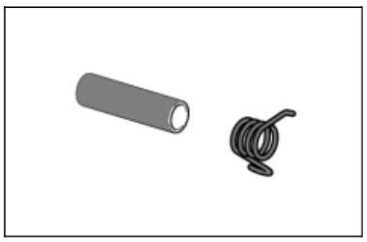
(a) Install the 2 brake pedal bushes to the brake pedal.

Text in Illustration

*1	Brake Pedal Bush
*2	Brake Pedal

2. INSTALL BRAKE PEDAL

(a) Apply a light layer of lithium soap base glycol grease to the entire circumference of the brake pedal return spring and brake pedal shaft collar.

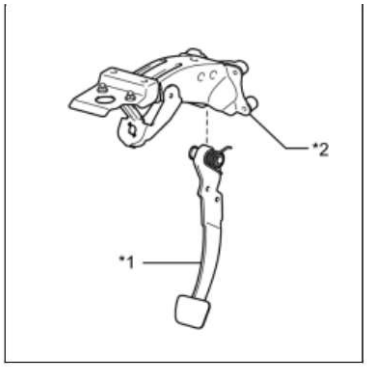


Text in Illustration

	Lithium soap base glycol grease

(b) Install the brake pedal return spring and brake pedal shaft collar to the brake pedal.

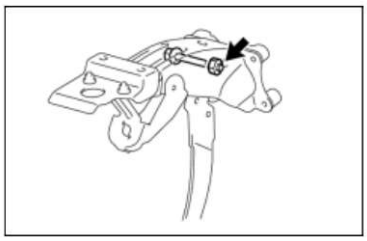
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(c) Install the brake pedal to the brake pedal bracket support assembly.

Text in Illustration

*1	Brake Pedal
*2	Brake Pedal Support Assembly



(d) Install the bolt and nut to the brake pedal support assembly.

HINT:

Hold the bolt in place and tighten the nut.

Torque: 30 N·m (306 kgf·cm, 22ft·lbf)

3. INSTALL BRAKE PEDAL PAD

(a) Install the brake pedal pad to the brake pedal.

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000002W9004UX
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Automatic Transmission): REMOVAL (2013 FR-S)		

REMOVAL

1. REMOVE INSTRUMENT SIDE PANEL LH

HINT:

Use the same procedure for the LH side as for the RH side INFO .

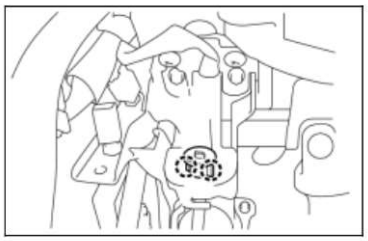
2. REMOVE NO. 1 INSTRUMENT PANEL UNDER COVER SUB-ASSEMBLY INFO

3. REMOVE TCM

INFO

4. REMOVE STOP LIGHT SWITCH ASSEMBLY INFO

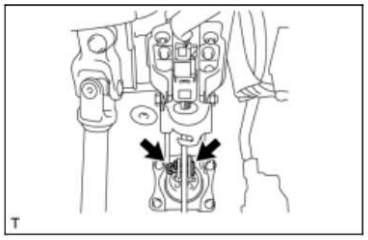
5. REMOVE STOP LIGHT SWITCH MOUNTING ADJUSTER



(a) Disengage the 2 clamps and remove the stop light switch mounting adjuster from the brake pedal support assembly.

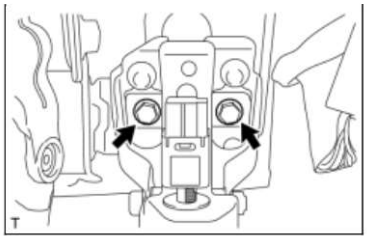
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6. REMOVE PUSH ROD PIN

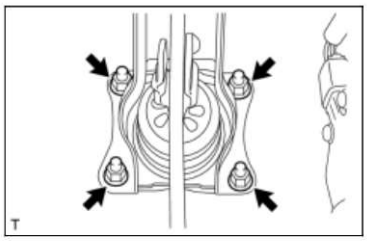


(a) Remove the clip and the push rod pin from the push rod clevis.

7. REMOVE BRAKE PEDAL SUPPORT ASSEMBLY



(a) Remove the 2 bolts from the brake pedal support assembly.



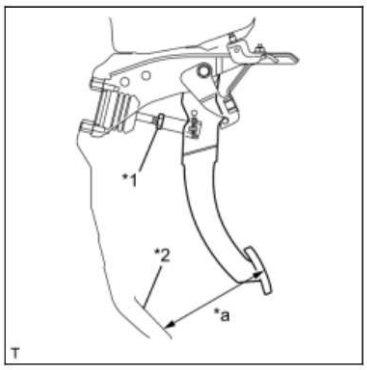
(b) Remove the 4 nuts and the brake pedal support assembly.

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Last Modified: 3-27-2012	6.4 N	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJ3018X
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Manual Transmission): ADJUSTMENT (2013 FR-S)		

ADJUSTMENT

1. CHECK AND ADJUST BRAKE PEDAL HEIGHT



(a) Check the pedal height.

Text in Illustration

*1	Push Rod Clevis Lock Nut
*2	Floor mat
*a	Pedal Height

Standard Pedal Height from floor mat:
145mm
(5.709in.)

(b) Adjust the pedal height.

(1) Remove the instrument side panel LH.

(2) Remove the No. 1 instrument panel under cover sub-assembly.

(3) Disconnect the connector from the stop light switch assembly.

(4) Remove the stop light switch assembly.

(5) Loosen the push rod clevis lock nut.

(6) Adjust the pedal height by turning the push rod.

Standard Pedal Height from floor mat:
145mm
(5.709in.)

(7) Tighten the push rod clevis lock nut.

Torque: 19 N·m (194 kgf·cm, 14ft·lbf)

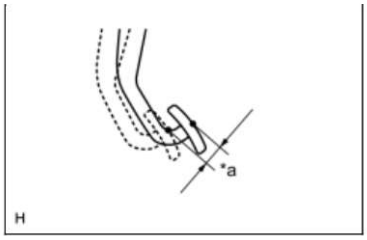
(8) Install the stop light switch assembly INFO .

(9) Connect the connector to the stop light switch assembly.

(10) Check that the stop light does not illuminate when the brake pedal is not stepped.

2. CHECK BRAKE PEDAL FREE PLAY

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(a) Stop the engine. Depress the pedal several times until there is no vacuum in the booster. Then release the pedal.

(b) Depress the pedal until resistance is felt.

(c) Check the pedal free play by measuring the distance between the position in the previous step and the pedal released position.

Standard pedal free play:
0.5 to 2.0mm
(0.020 to 0.079in.)

Text in Illustration

*a	Pedal Free Play

HINT:

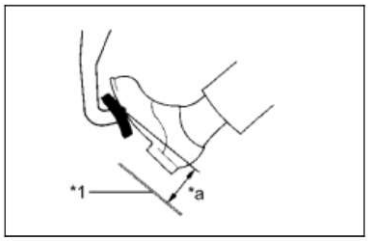
Check the brake pedal free play at the same location as that used when checking the brake pedal height.

3. CHECK BRAKE PEDAL RESERVE DISTANCE

(a) Release the brake pedal. Start the engine, and when the pressure in the brake booster reaches 66.7 kPa (500 mmHg, 19.6 in.Hg), proceed with the next step.

(b) Depress the pedal and check the pedal reserve distance.

Text in Illustration



*1	Floor mat
*a	Pedal Reserve Distance

Standard Pedal Reserve Distance from the floor mat at 490 N (50 kgf, 110.2 lbf):
More than 55 mm (2.165 in.)

If the distance is not as specified, troubleshoot the brake system.

HINT:

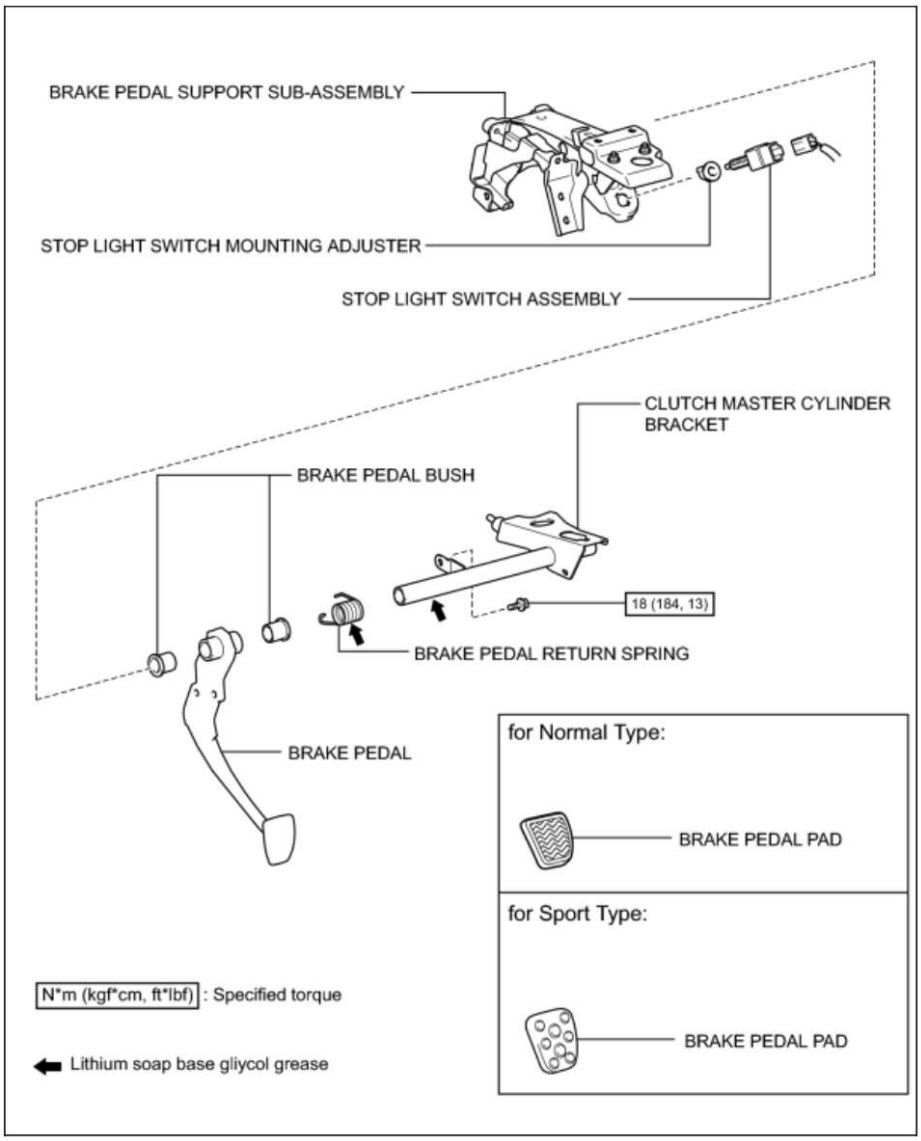
Check the brake pedal reserve distance at the same location as that used when checking the brake pedal height.

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJ500QX
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Manual Transmission): COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION

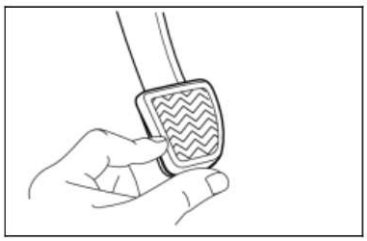


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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000002W9103KX
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Manual Transmission): DISASSEMBLY (2013 FR-S)		

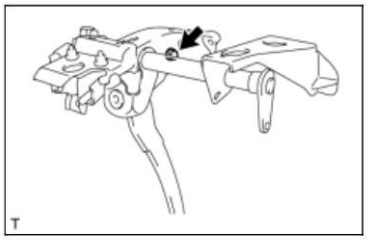
DISASSEMBLY

1. REMOVE BRAKE PEDAL PAD

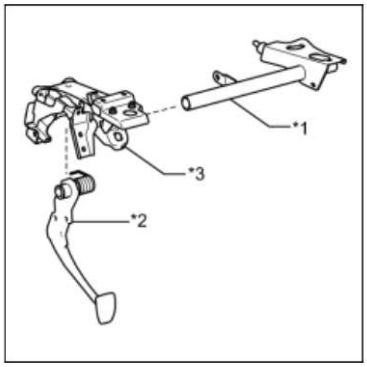


(a) Remove the brake pedal pad from the brake pedal support assembly.

2. REMOVE BRAKE PEDAL



(a) Remove the bolt.



(b) Remove the clutch master cylinder bracket and the brake pedal from the brake pedal support assembly.

Text in Illustration

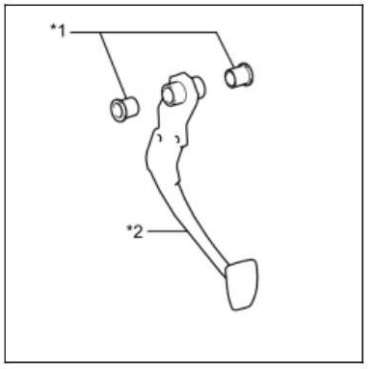
*1	Clutch Master Cylinder Bracket
*2	Brake Pedal
*3	Brake Pedal Support Assembly

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3. REMOVE BRAKE PEDAL RETURN SPRING

(a) Remove the brake pedal return spring from the clutch master cylinder bracket.

4. REMOVE BRAKE PEDAL BUSH



(a) Remove the 2 brake pedal bushes from the brake pedal.

Text in Illustration

*1	Brake Pedal Bush
*2	Brake Pedal

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJ401BX
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Manual Transmission): INSTALLATION (2013 FR-S)		

INSTALLATION

1. INSTALL STOP LIGHT SWITCH MOUNTING ADJUSTER

(a) Engage the 2 clamps and install the stop light switch mounting adjuster.

2. INSPECT AND ADJUST BRAKE PEDAL

INFO

3. INSTALL STOP LIGHT SWITCH ASSEMBLY INFO

4. INSTALL CLUTCH PEDAL SUB-ASSEMBLY

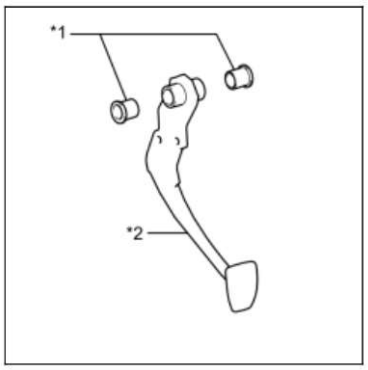
INFO

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000002W9203XX
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Manual Transmission): REASSEMBLY (2013 FR-S)		

REASSEMBLY

1. INSTALL BRAKE PEDAL BUSH



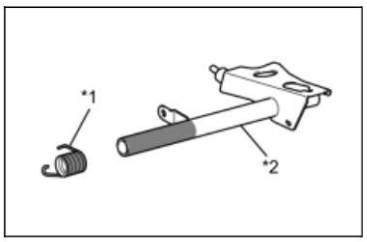
(a) Install the 2 brake pedal bushes to the brake pedal.

Text in Illustration

*1	Brake Pedal Bush
*2	Brake Pedal

2. INSTALL BRAKE PEDAL

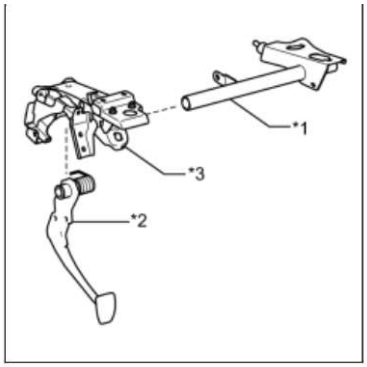
(a) Apply lithium soap base glycol grease to the brake pedal return spring and the clutch master cylinder bracket.



Text in Illustration

*1	Brake Pedal Return Spring
*2	Clutch Master Cylinder Bracket
	Lithium Soap Base Glycol Grease

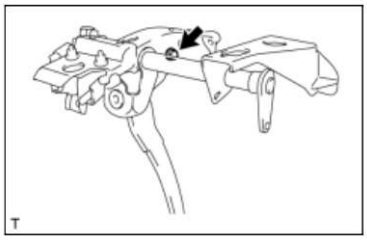
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(b) Install the clutch master cylinder bracket and the brake pedal to the brake pedal support sub-assembly.

Text in Illustration

*1	Clutch Master Cylinder Bracket
*2	Brake Pedal
*3	Brake Pedal Support Sub-assembly



(c) Install the bolt.

Torque: 18 N·m (184 kgf·cm, 13ft·lbf)

3. INSTALL BRAKE PEDAL PAD

(a) Install the brake pedal pad to the brake pedal.

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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJ6018X
Title: BRAKE SYSTEM (OTHER): BRAKE PEDAL (for Manual Transmission): REMOVAL (2013 FR-S)		

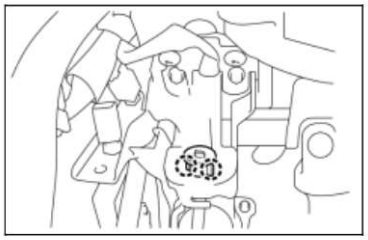
REMOVAL

1. REMOVE CLUTCH PEDAL SUB-ASSEMBLY

INFO

2. REMOVE STOP LIGHT SWITCH ASSEMBLY INFO

3. REMOVE STOP LIGHT SWITCH MOUNTING ADJUSTER



(a) Disengage the 2 clamps and remove the stop light switch mounting adjuster from the brake pedal support sub-assembly.

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Last Modified: 3-27-2012	6.4 L	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJ901XX
Title: BRAKE SYSTEM (OTHER): BRAKE SYSTEM: PRECAUTION (2013 FR-S)		

PRECAUTION

NOTICE:

- Take extra care to replace each part properly. Improper installation or repair could affect the performance of the brake system and cause a driving hazard.
- It is very important to keep the brake system parts and the work area clean when repairing the brake system.
- If the vehicle is equipped with a mobile communication system, refer to the Precautions in the Introduction section.
- Care must be taken when using magnets as they could affect the performance of the speed sensors.
- Since the brake line is one of the critical safety-related parts, be sure to disassemble the components if a brake fluid leak is found. If any abnormality is found, replace the component with a new one.
- When removing brake components, cover the brake tube connections to prevent foreign matter such as dust or dirt from entering the tubes.
- Do not damage or deform the brake tubes when removing or installing them.
- Do not deform the bracket and the body when connecting a brake line and flexible hose.
- When installing a brake tube grommet to the body, make sure that the brake tube passes through the center of the grommet.
- When installing a brake tube or flexible hose, make sure that it is not twisted or bent.
- If the fitting of the flexible hose does not match the groove on the bracket, twist the hose slightly to insert it.
- Flexible hoses must be free from absorber oil, grease, etc.
- When installing a brake tube to a plastic clamp, make sure that the brake tube is not loose or being pinched.
- Do not reuse a clip or plastic clamp removed from a flexible hose.
- After installing a brake tube and flexible hose, make sure that they do not interfere with any other components.
- Do not allow brake fluid to adhere to any painted surface such as the vehicle body. If brake fluid leaks onto any painted surface, immediately wash it off.

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Last Modified: 3-27-2012	6.4 T	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000001HJA01YX
Title: BRAKE SYSTEM (OTHER): BRAKE SYSTEM: PROBLEM SYMPTOMS TABLE (2013 FR-S)		

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help determine the cause of problem symptoms. If multiple suspected areas are listed, the potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

Brake System

SYMPTOM	SUSPECTED AREA	SEE PAGE
Low pedal or spongy pedal	Fluid leaks in brake system	-
	Air in brake system	INFO
	Front brake piston seals (worn or damaged)	INFO
	Rear brake piston seals (worn or damaged)	INFO
	Brake master cylinder (faulty)	INFO
	Booster push rod (adjustment necessary)	INFO
Brake drag	Brake pedal free play (minimum)	INFO
	Parking brake lever travel (adjustment necessary)	INFO
	Parking brake cable (sticking)	INFO
	Parking brake shoe clearance (adjustment necessary)	INFO
	Front brake pad (cracked or distorted)	INFO
	Rear brake pad (cracked or distorted)	INFO
	Parking brake lining (cracked or distorted)	INFO
	Front brake piston (stuck or seized)	INFO
	Rear brake piston (stuck or seized)	INFO
	Parking brake shoe return tension spring	INFO
	Vacuum leaks in booster system	INFO
	Brake master cylinder (faulty)	INFO
Brake pull	Front brake piston (stuck or seized)	INFO
	Rear brake piston (stuck or seized)	INFO
	Front brake pad (oily, cracked or distorted)	INFO
	Rear brake pad (oily, cracked or distorted)	INFO
	Parking brake lining (oily, cracked or distorted)	INFO

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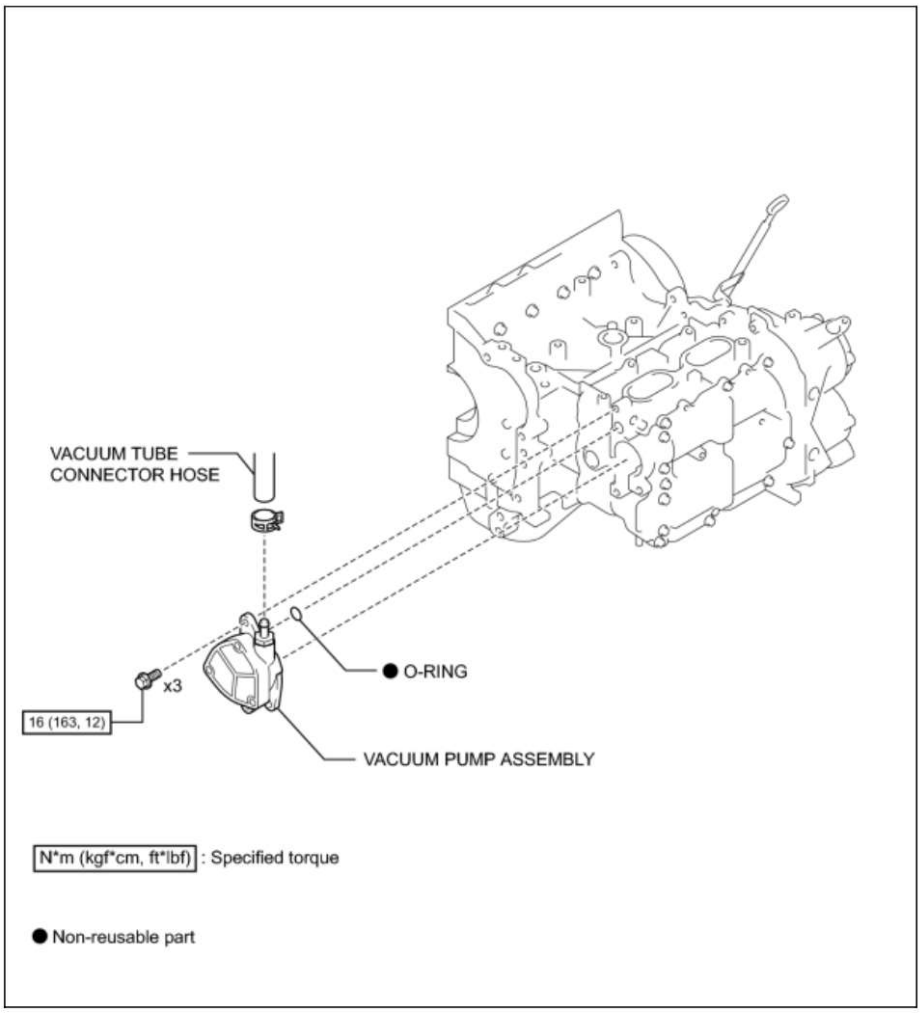
	Front brake disc (scored)	INFO
	Rear brake disc (scored)	INFO
Hard pedal but braking inefficient	Fluid leaks in brake system	-
	Air in brake system	INFO
	Front brake pad (worn, cracked, distorted, oily or glazed)	INFO
	Rear brake pad (worn, cracked, distorted, oily or glazed)	INFO
	Parking brake lining (worn, cracked, distorted, oily or glazed)	INFO
	Front brake disc (scored)	INFO
	Rear brake disc (scored)	INFO
	Vacuum leaks in booster system	INFO
Noise from brakes	Front brake pad (cracked, distorted, dirty or glazed)	INFO
	Rear brake pad (cracked, distorted, dirty or glazed)	INFO
	Front disc brake pad clip (worn)	INFO
	Rear disc brake pad clip (worn)	INFO
	Front brake installation bolt (loose)	INFO
	Rear brake installation bolt (loose)	INFO
	Front brake disc (scored)	INFO
	Rear brake disc (scored)	INFO
	Front brake anti-squeal shim (damaged)	INFO
	Rear brake anti-squeal shim (damaged)	INFO
	Parking brake shoe hold-down spring (damaged)	INFO

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Last Modified: 3-27-2012	6.4 K	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM000002I8900HX
Title: BRAKE SYSTEM (OTHER): VACUUM PUMP: COMPONENTS (2013 FR-S)		

COMPONENTS

ILLUSTRATION



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Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM00000159A017X
Title: BRAKE SYSTEM (OTHER): VACUUM PUMP: INSTALLATION (2013 FR-S)		

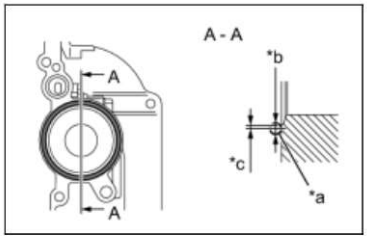
INSTALLATION

1. INSTALL VACUUM PUMP ASSEMBLY

(a) Coat a new O-ring with engine oil, and install it.

(b) Apply seal packing in a continuous line as shown in the illustration.

Text in Illustration



*a	Edge of groove
*b	2.0 to 4.0 mm (0.078 to 0.158 in.) in diameter
*c	1.0mm or less

NOTICE:

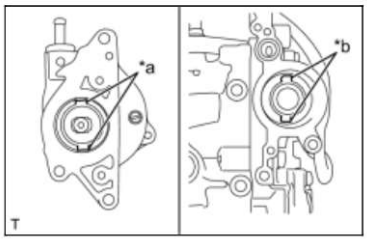
- Clean and degrease the contact surface.
- Install the vacuum pump assembly within 5 minutes of applying seal packing.

HINT:

When replace the vacuum pump assembly on the vehicle, apply seal packing to the vacuum pump assembly.

(c) Install the vacuum pump assembly while aligning the grooves of the vacuum pump assembly with the claws of the intake camshaft RH.

Text in Illustration



*a	Groove of the vacuum pump assembly
*b	Claw of the intake camshaft

NOTICE:

Make sure that the O-ring is not pinched.

(d) Install the 3 bolts.

Torque: 16 N·m (163 kgf·cm, 12ft·lbf)

2. INSTALL VACUUM TUBE CONNECTOR HOSE

(a) Install the vacuum tube connector hose.

3. INSTALL FRONT SUSPENSION UPPER TO COWL BRACE SUB-ASSEMBLY RH

INFO

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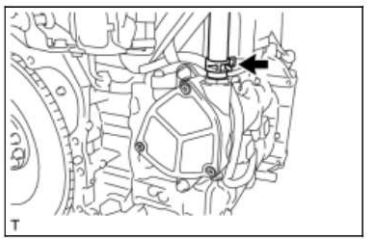


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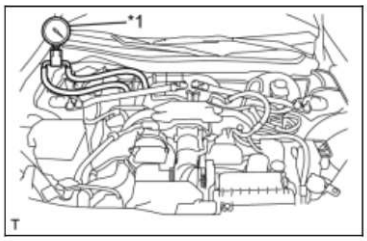
Last Modified: 3-27-2012	6.4 G	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM00000159D016X
Title: BRAKE SYSTEM (OTHER): VACUUM PUMP: ON-VEHICLE INSPECTION (2013 FR-S)		

ON-VEHICLE INSPECTION

1. INSPECT VACUUM PUMP ASSEMBLY OPERATION



(a) Move the clamp and disconnect the vacuum tube connector hose from the vacuum pump assembly.



(b) Connect the hose of a vacuum gauge to the vacuum pump assembly.

Text in Illustration

*1	Vacuum Gauge

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(c) Start the engine and warm it up for more than 2 minutes.

(d) With the engine idling, check the vacuum of the vacuum pump assembly.

Standard pressure:
More than 93 kPa (698 mmHg, 27 in.Hg) of vacuum

If the is not as specified, disassemble the vacuum pump assembly and inspect or replace it INFO .

HINT:

After disassembling and checking the vacuum pump assembly, check the vacuum pump assembly function.

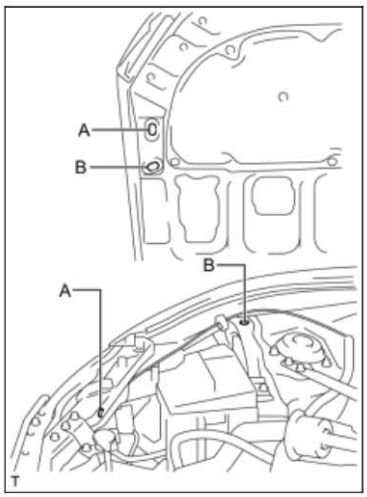
(e) Remove the vacuum gauge from the vacuum pump assembly.

(f) Connect the vacuum tube connector hose to the vacuum pump and move the clamp back into position.

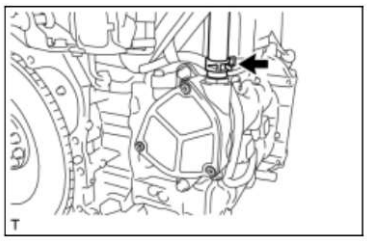
Last Modified: 3-27-2012	6.4 A	**From:** 201203
Model Year: 2013	**Model:** FR-S	**Doc ID:** RM00000159C017X
Title: BRAKE SYSTEM (OTHER): VACUUM PUMP: REMOVAL (2013 FR-S)		

REMOVAL

1. REMOVE VACUUM TUBE CONNECTOR HOSE



(a) Change the locations of the front hood stay from A to B, and support the hood sub-assembly with the location B.



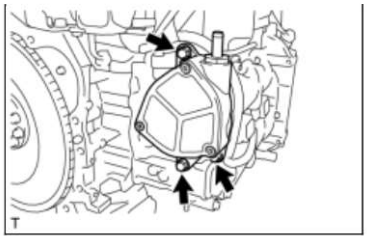
(b) Disconnect the vacuum tube connector hose from the vacuum pump assembly.

2. REMOVE FRONT SUSPENSION UPPER TO COWL BRACE SUB-ASSEMBLY RH

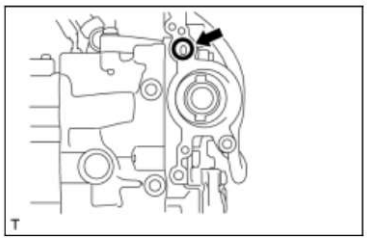
INFO

3. REMOVE VACUUM PUMP ASSEMBLY

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(a) Remove the 3 bolts and vacuum pump assembly.



(b) Remove the O-ring.

(c) Remove the seal packing from the vacuum pump assembly and the engine.

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