

BRAKES

Brake System (Hydraulic) (Service Information) - Sienna

BRAKE LINE

PRECAUTION

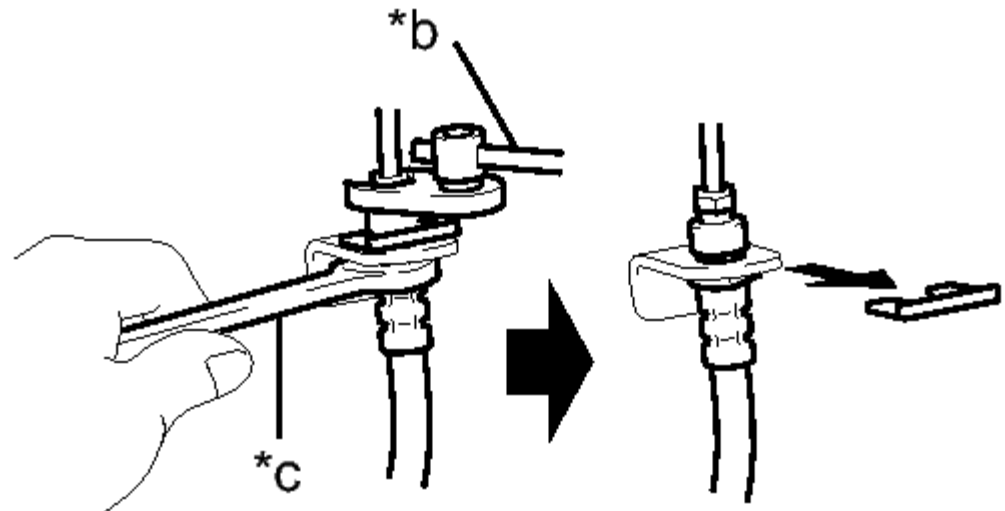
PRECAUTION

1. TROUBLESHOOTING PRECAUTION

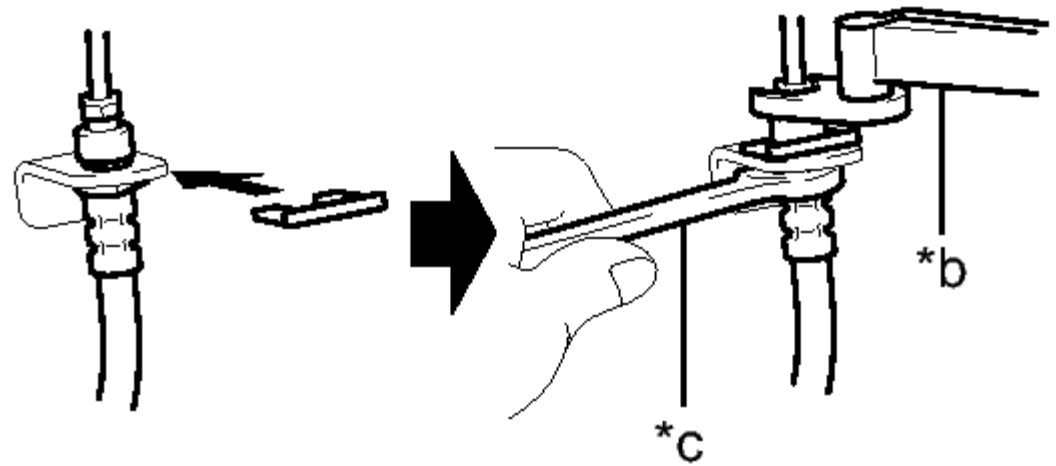
NOTE:

- 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 during the removal and installation procedures.
- When installing a grommet to the body, ensure that the brake line passes through the center of the grommet.
- When installing a brake line or flexible hose, ensure that they are free from twists or bends.
- Do not deform the bracket and the body when connecting a brake line and flexible hose.
- If the cap of a flexible hose does not match the groove on the bracket, twist the hose slightly(180°Max.) to insert it.
- Flexible hoses must be free from shock absorber oil, grease, etc.
- When installing a brake line to a plastic clamp, ensure that the brake line is not loose or pinched.
- Do not reuse any clips or plastic clamps removed from a flexible hose.
- After installing a brake line or flexible hose, ensure that they do not interfere with any other components.
- When disconnecting and connecting a flexible hose and brake line:

*a



*d



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Fig. 1: Remove/Install Flexible Hose & Brake Line
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a Disconnecting

*b	Turn
*c	Hold
*d	Connecting

1. Hold the flexible hose with a wrench and disconnect the brake line with a union nut wrench without deforming the line.
2. Remove the clip.
3. Install a new clip.
4. Connect the brake line with a union nut wrench without deforming the line.

- When connecting a brake line and way:

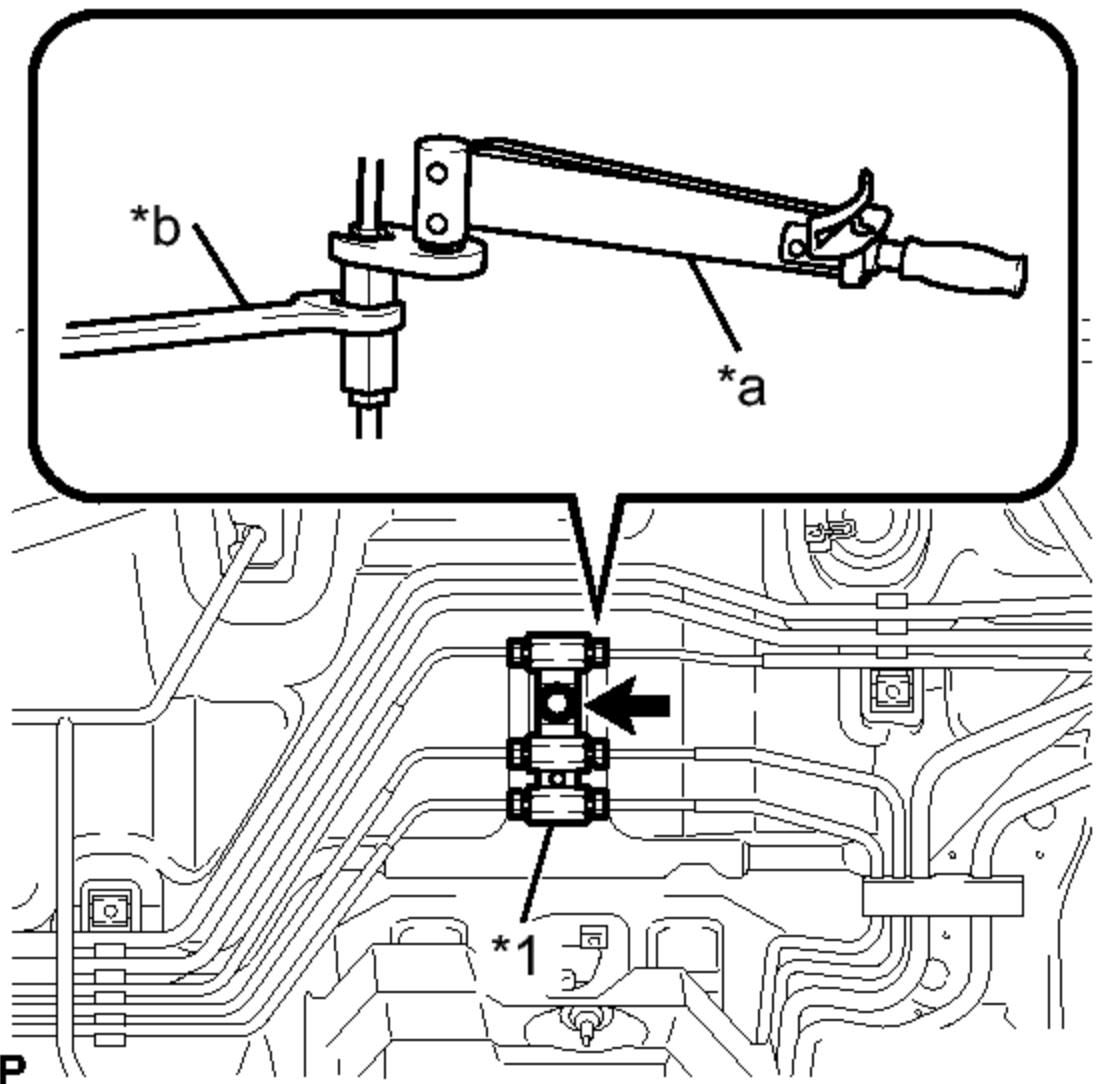


Fig. 2: Identifying Brake Line & Way

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

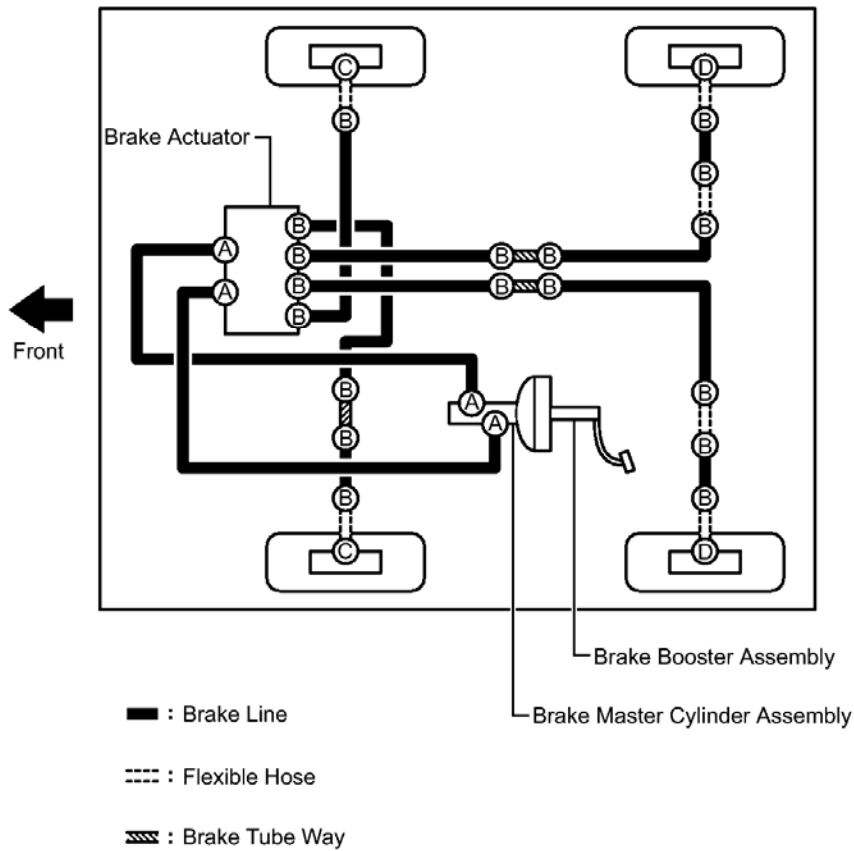
TEXT IN ILLUSTRATION

*1	Way
*a	Turn
*b	Hold

1. Support the way to prevent deformation of the brake line and connect the brake line to the way with a union nut wrench.
2. Support the way to prevent deformation of the brake line and install the bolt to secure the way to the body.

SYSTEM DIAGRAM

SYSTEM DIAGRAM



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Fig. 3: Brake Line System Diagram With Torque Specifications
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

BRAKE FLUID

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT FLUID LEVEL IN RESERVOIR

- a. Check the fluid level.

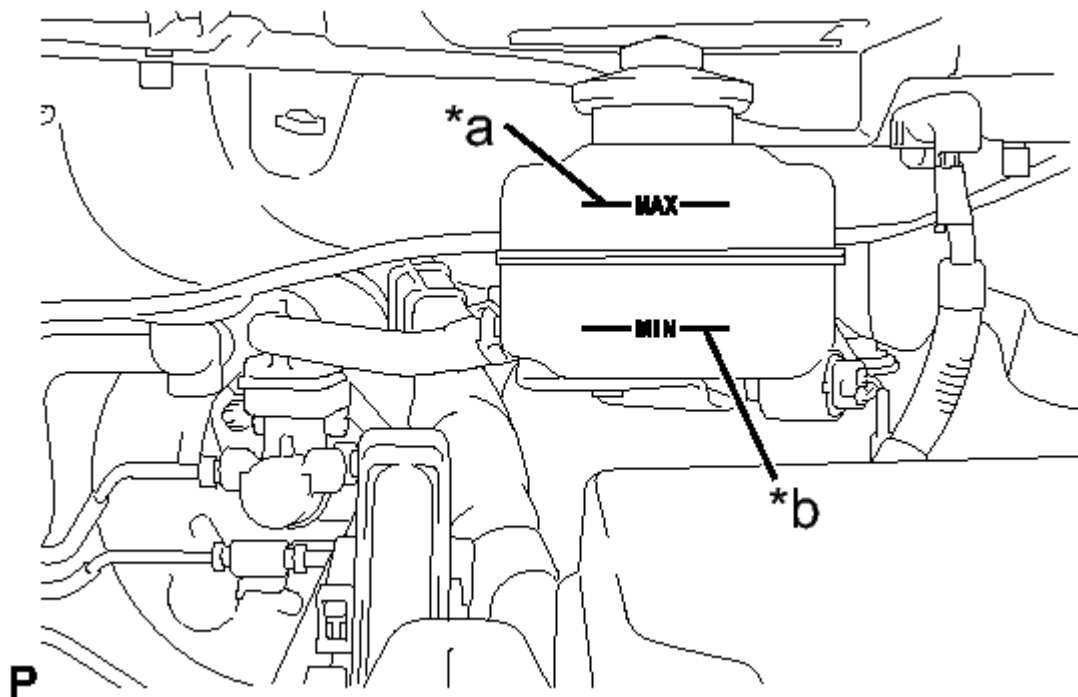


Fig. 4: Inspecting Brake Fluid Level In Reservoir

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	MAX Line
*b	MIN Line

If the 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

REPLACEMENT

REPLACEMENT

HINT:

If any work is performed on the brake system or if air in the brake lines is suspected, bleed the brake system.

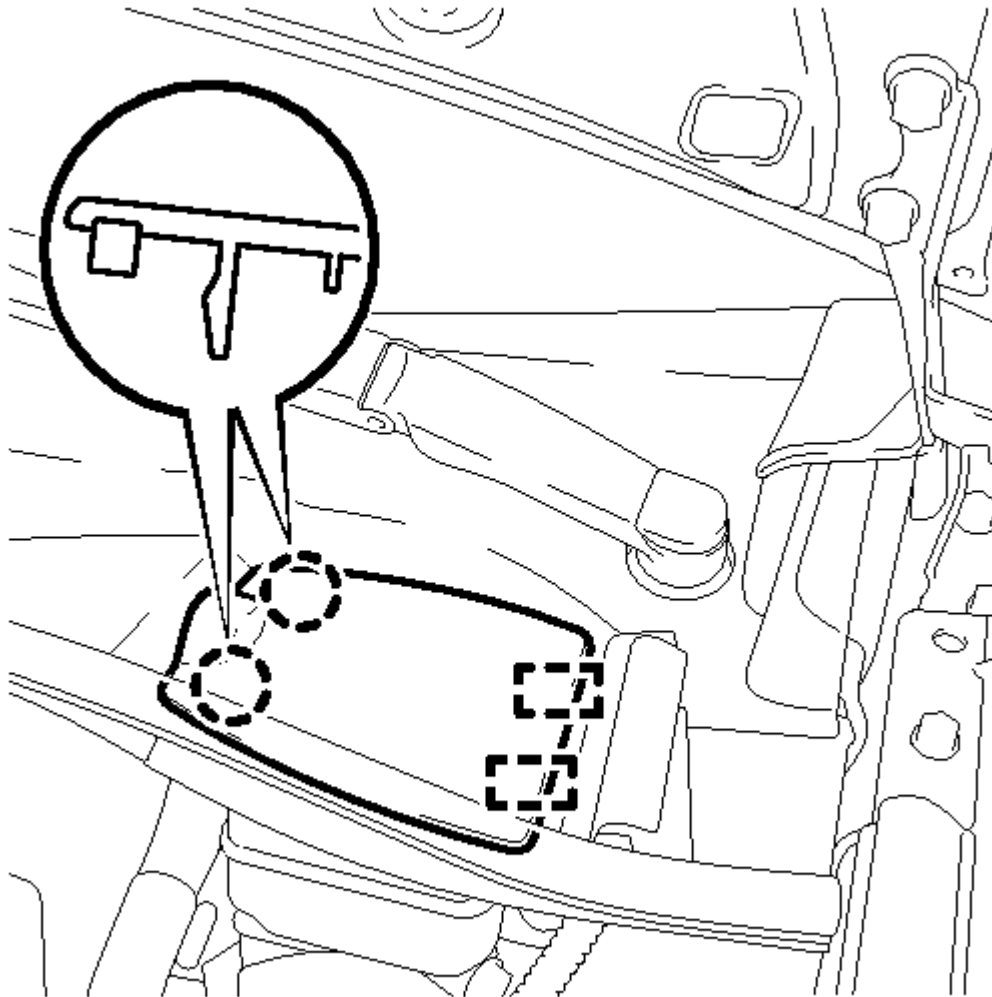
NOTE:

- Move the shift lever to P and apply the parking brake before bleeding the brakes.
- 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.

REPLACEMENT

1. REMOVE COWL TOP VENTILATOR LOUVER BRACKET RH

- a. Disengage the 2 claws and 2 guides and remove the cowl top ventilator louver bracket RH.

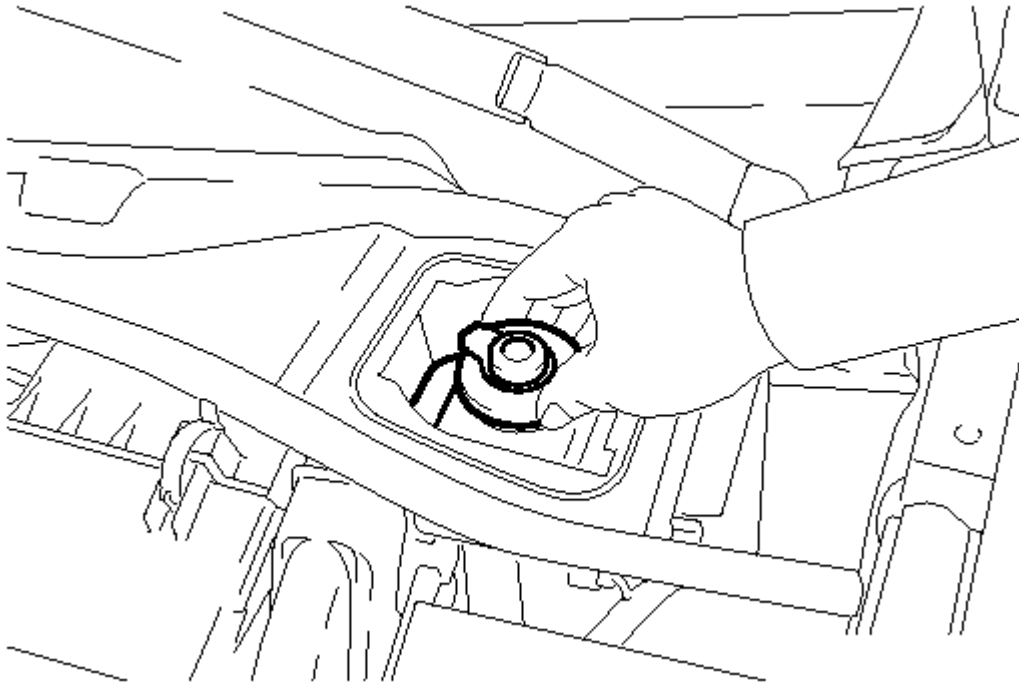


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Fig. 5: Identifying Cowl Top Ventilator Louver Bracket RH & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. FILL RESERVOIR WITH BRAKE FLUID

- a. Remove the brake master cylinder reservoir filler cap assembly.



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Fig. 6: Identifying Brake Fluid Reservoir

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Fill the reservoir with brake fluid.

Brake Fluid

SAE J1703 or FMVSS No. 116 DOT 3

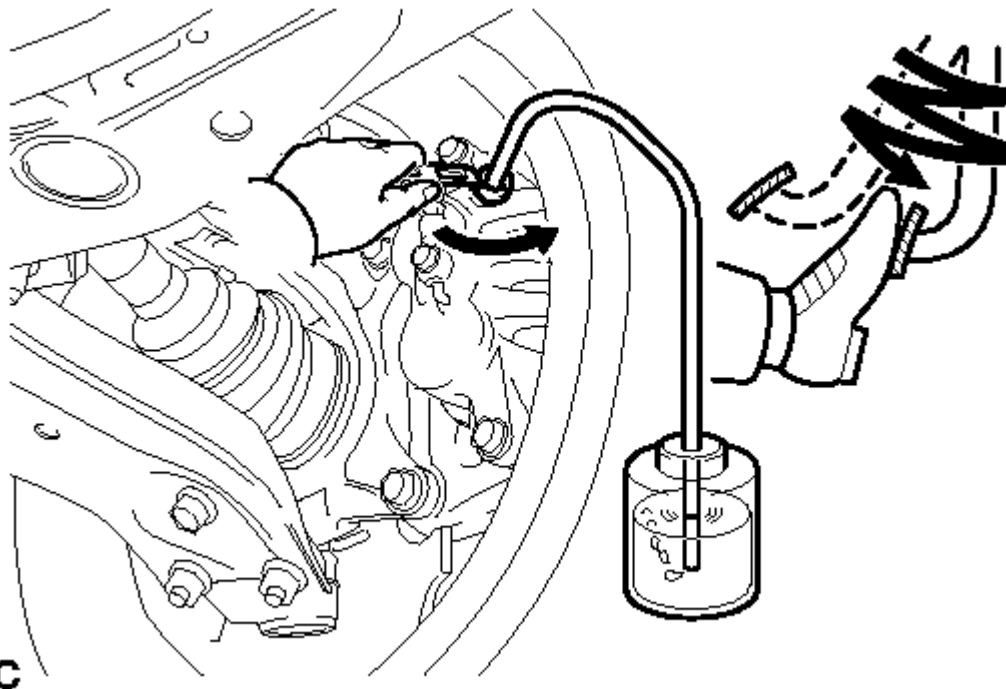
NOTE: **Make sure that there is sufficient brake fluid in the reservoir.**

3. REPLACE BRAKE LINE

NOTE:

- 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.

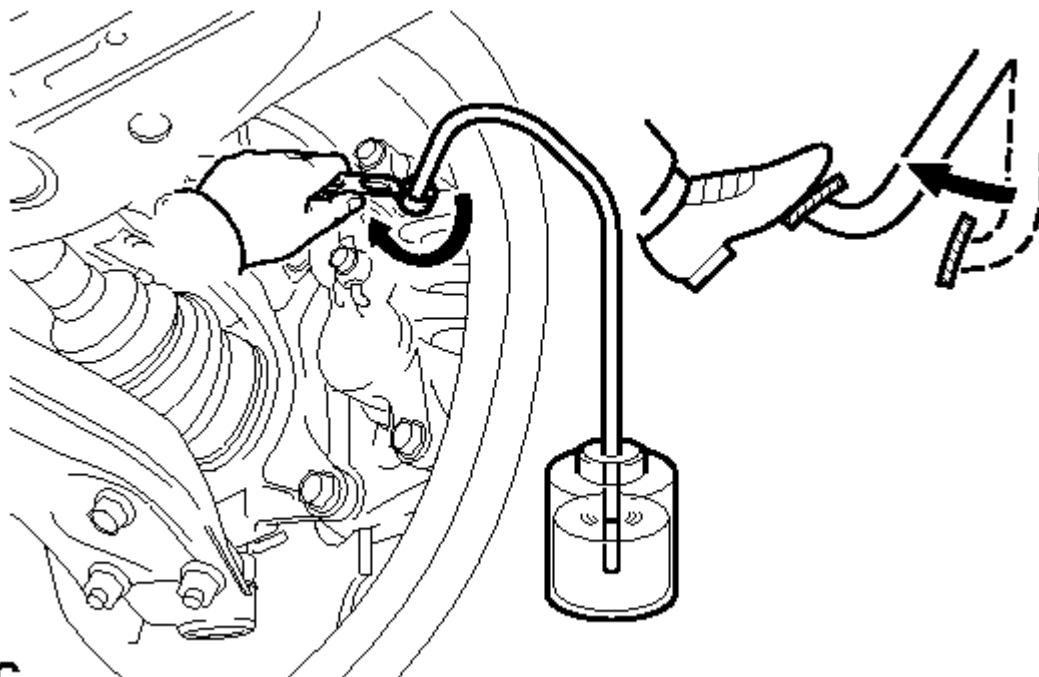
- a. Connect a vinyl tube to the bleeder plug.
- b. Depress the brake pedal several times, and then loosen the bleeder plug with the pedal depressed*1.



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Fig. 7: Connecting Vinyl Tube To Bleeder Plug
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. When fluid stops coming out, tighten the bleeder plug, and then release the brake pedal*2.



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Fig. 8: Tightening Bleeder Plug & Releasing Brake Pedal
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Repeat *1 and *2 until all the air in the fluid is completely bled out.
- e. Tighten the bleeder plug completely.

Front bleeder plug

Torque: 8.3 N*m (85 kgf*cm, 73 in.*lbf)

Rear bleeder plug

Torque: 11 N*m (110 kgf*cm, 8 ft.*lbf)

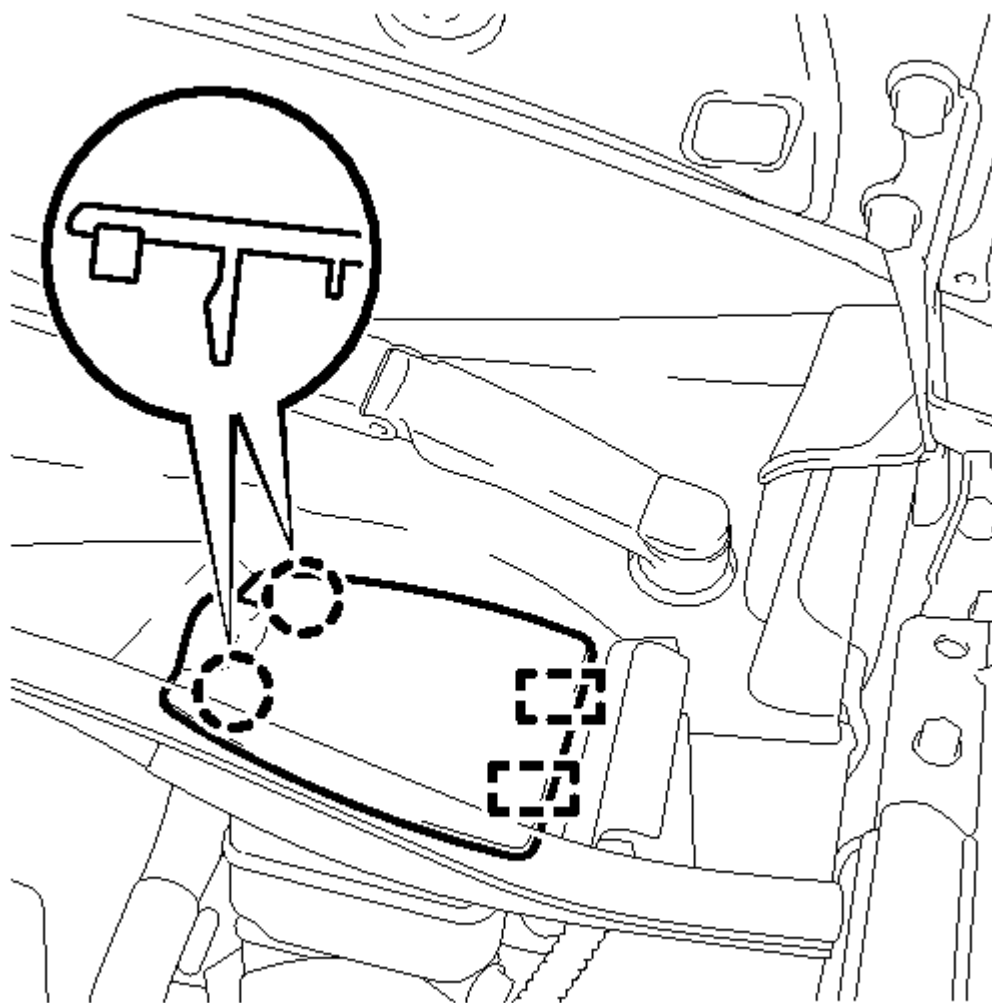
- f. Repeat the above procedure for each wheel to bleed the brake line.

4. INSPECT FOR BRAKE FLUID LEAK

5. INSPECT FLUID LEVEL IN RESERVOIR See step 1

6. INSTALL COWL TOP VENTILATOR LOUVER BRACKET RH

- a. Engage the 2 guides and 2 claws and install the cowl top ventilator louver bracket RH.



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Fig. 9: Identifying Cowl Top Ventilator Louver Bracket RH & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

BLEEDING

BLEEDING

HINT:

If any work is performed on the brake system or if air in the brake lines is suspected, bleed the air from the brake system.

NOTE:

- Move the shift lever to P and apply the parking brake before bleeding the brakes.
- Add brake fluid to keep the level between MIN and MAX lines of the

reservoir while bleeding the brakes.

- If brake fluid leaks onto any painted surface, wash off and remove the brake fluid completely.

BLEEDING

1. **REMOVE COWL TOP VENTILATOR LOUVER BRACKET RH** See step 1
2. **FILL RESERVOIR WITH BRAKE FLUID** See step 2
3. **BLEED BRAKE MASTER CYLINDER**

NOTE:

- If the master cylinder is reinstalled or runs out of brake fluid, bleed the master cylinder.
 - To prevent brake fluid from damaging painted surfaces, cover any surrounding parts with a piece of cloth.
- a. Using a union nut wrench (12 mm), disconnect the 2 brake lines from the master cylinder sub-assembly.

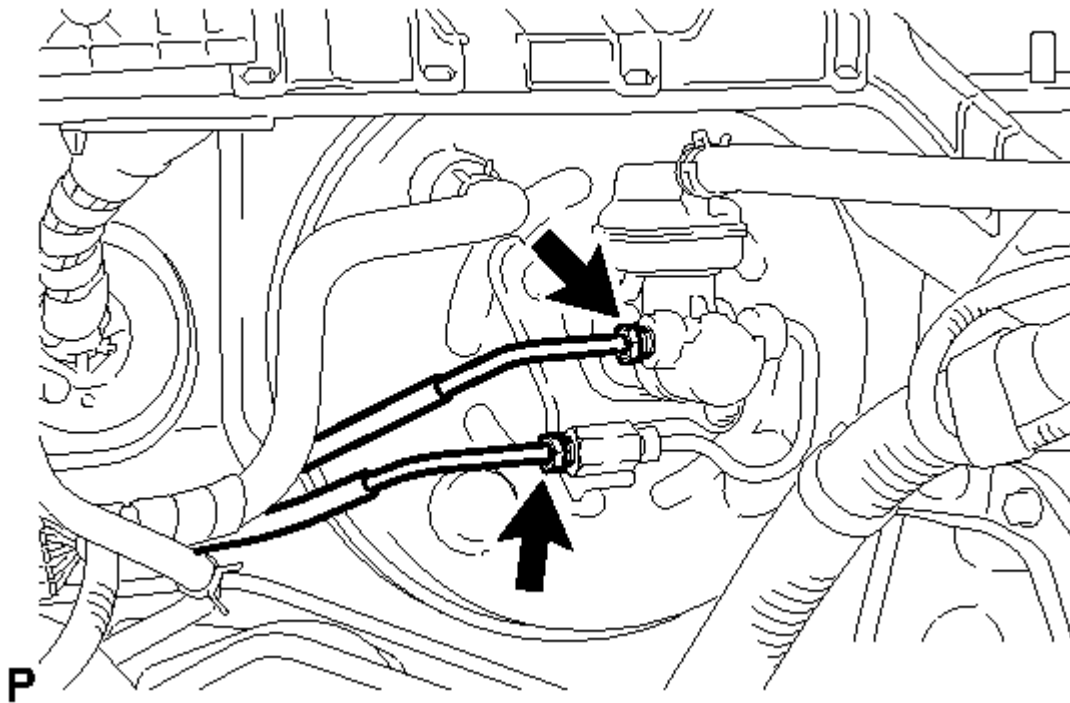
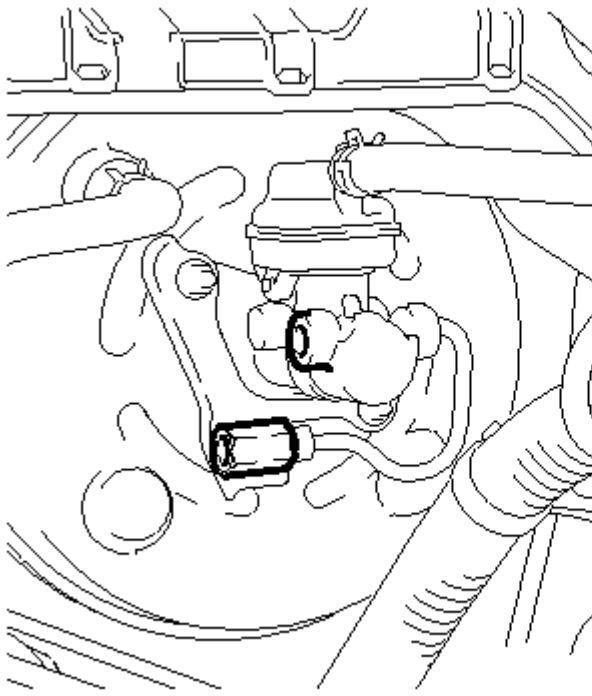


Fig. 10: Remove/Install Master Cylinder Sub-Assembly Brake Lines At Master Cylinder Sub-Assembly

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Slowly depress the brake pedal and hold it*1.

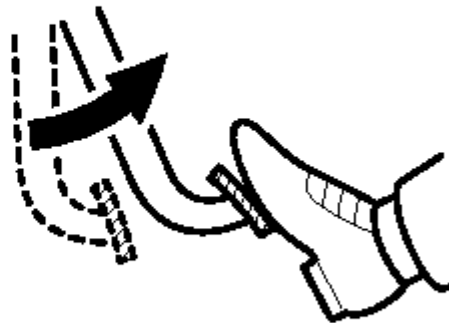
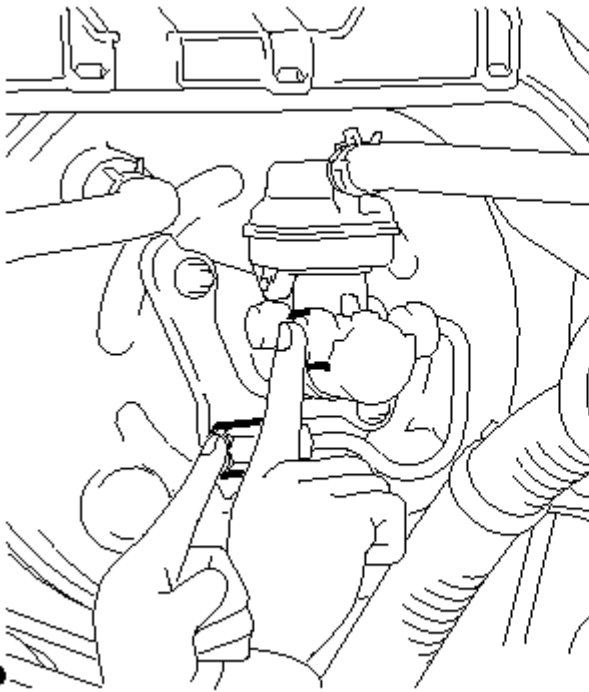


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Fig. 11: Depressing Brake Pedal & Hold

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Cover the 2 outer holes with fingers, and release the brake pedal*2.

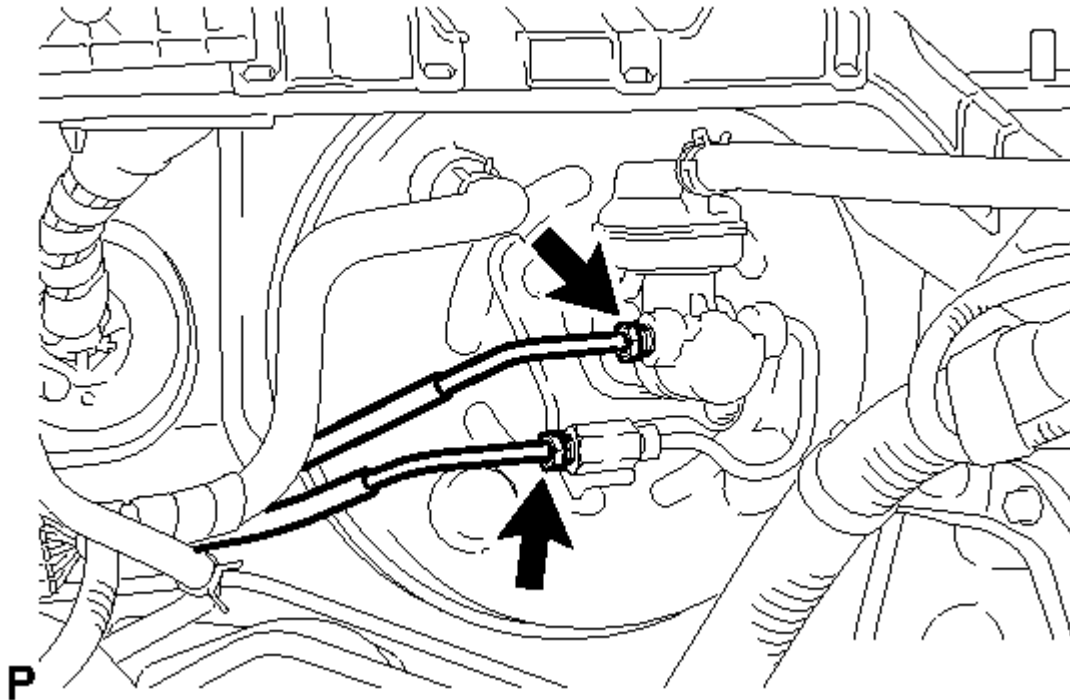


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Fig. 12: Releasing Brake Pedal With 2 Outer Holes Covered With Fingers

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Repeat steps *1 and *2, 3 or 4 times.
- e. Using a union nut wrench (12 mm), connect the 2 brake lines to the master cylinder.



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Fig. 13: Remove/Install Master Cylinder Sub-Assembly Brake Lines At Master Cylinder Sub-Assembly

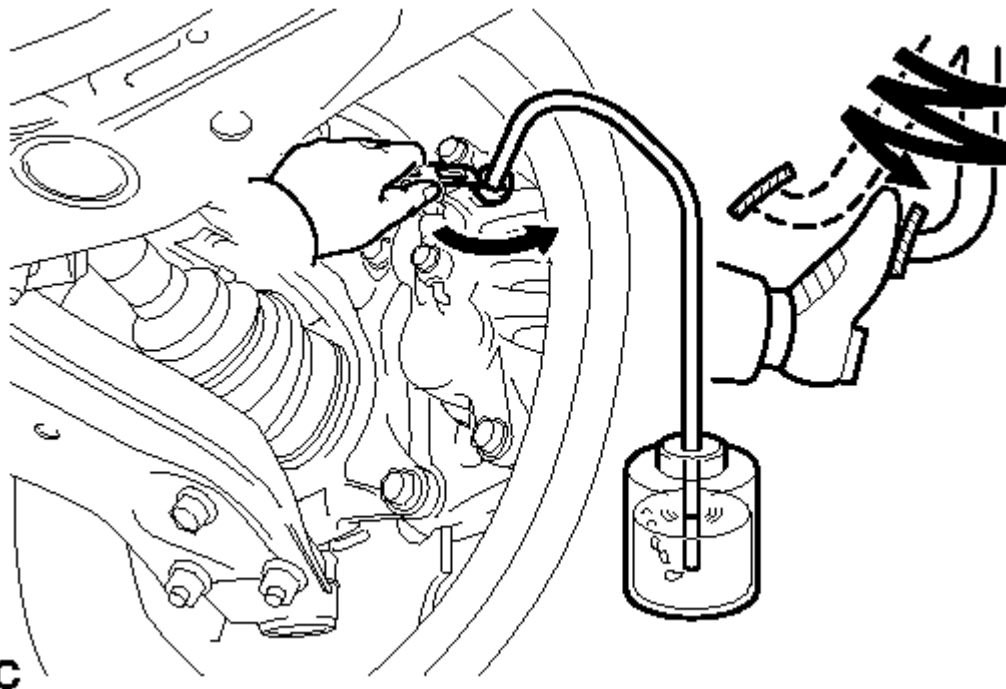
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 20 N*m (199 kgf*cm, 14 ft.*lbf)

NOTE: Use the formula to calculate special torque values for situations where the union nut wrench is combined with a torque wrench. Refer to PRECAUTION .

4. BLEED BRAKE LINE

- NOTE:**
- 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 brakes.
 - If brake fluid leaks onto any painted surface, immediately wash it off.
- 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.

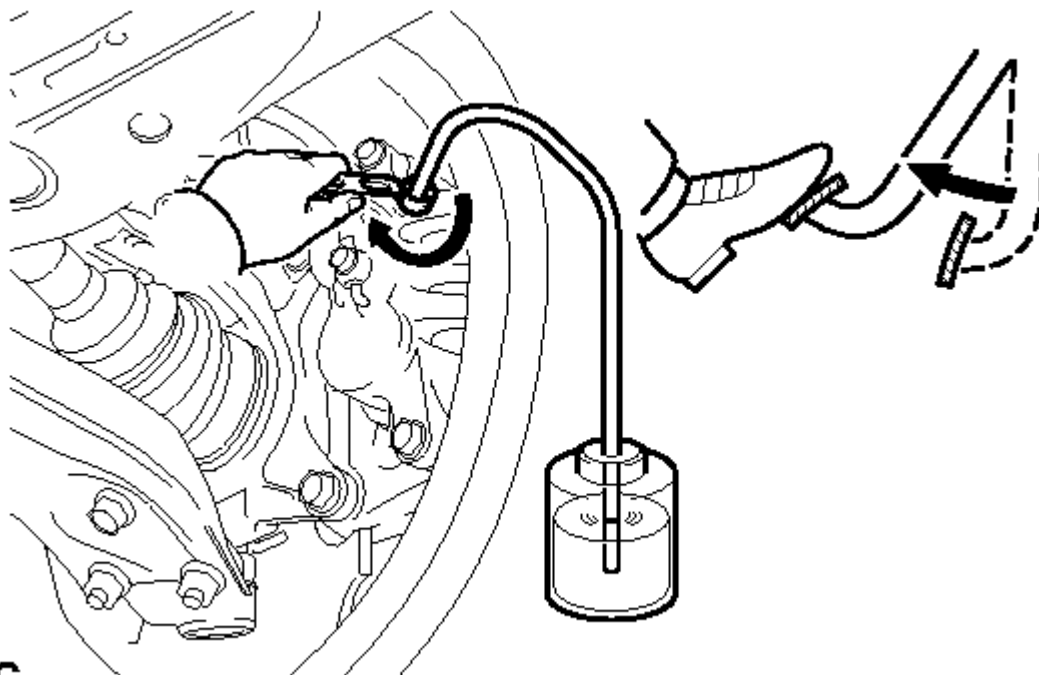


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Fig. 14: Connecting Vinyl Tube To Bleeder Plug

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. When fluid stops coming out, tighten the bleeder plug, and then release the brake pedal*2.



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Fig. 15: Tightening Bleeder Plug & Releasing Brake Pedal

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- d. Repeat *1 and *2 until all the air in the fluid is completely bled out.
- e. Tighten the bleeder plug completely.

Front bleeder plug

Torque: 8.3 N*m (85 kgf*cm, 73 in.*lbf)

Rear bleeder plug

Torque: 11 N*m (110 kgf*cm, 8 ft.*lbf)

- f. Repeat the above procedure for each wheel to bleed the brake line.

5. BLEED BRAKE ACTUATOR

NOTE: After bleeding the air from the brake system, if the correct height or feel of the brake pedal cannot be obtained, bleed the air from the brake actuator assembly using the Techstream by following the procedure below.

- a. Depress the brake pedal more than 20 times with the ignition switch off.
- b. Connect the Techstream to the DLC3, then turn the ignition switch to ON.

NOTE: Do not start the engine.

- c. Turn the Techstream on and enter the following menus: Chassis / ABS/VSC/TRAC / Utility / Air Bleeding.
- d. Bleed brake actuator following the instructions on the Techstream.
- e. After air bleeding, tighten each bleeder plug.

Front bleeder plug

Torque: 8.3 N*m (85 kgf*cm, 73 in.*lbf)

Rear bleeder plug

Torque: 11 N*m (110 kgf*cm, 8 ft.*lbf)

- f. Turn the Techstream off and disconnect the Techstream from the DLC3.
- g. Turn the ignition switch off.

6. INSPECT FOR BRAKE FLUID LEAK

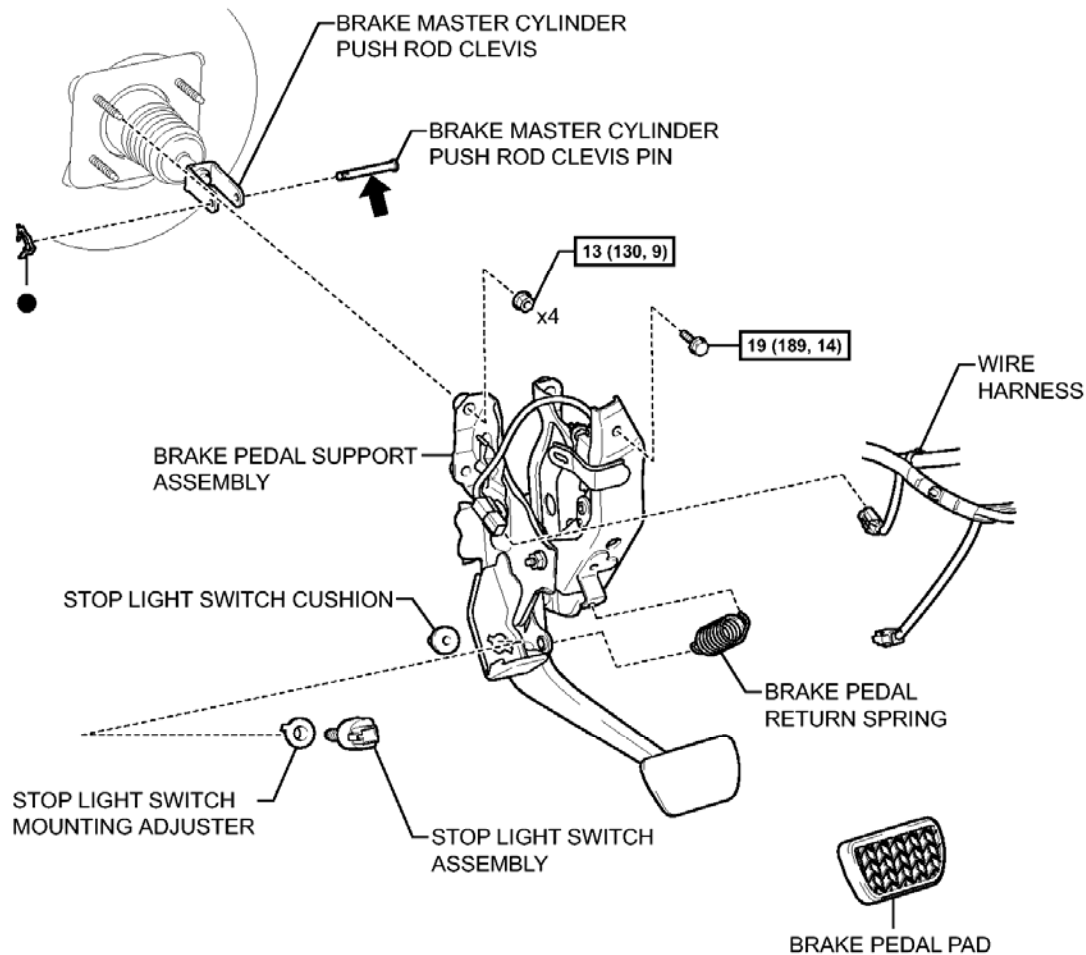
7. INSPECT FLUID LEVEL IN RESERVOIR See step 1

8. INSTALL COWL TOP VENTILATOR LOUVER BRACKET RH See step 6

BRAKE PEDAL

COMPONENTS

ILLUSTRATION



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

● Non-reusable part

◀ Lithium soap base glycol grease

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Fig. 16: Exploded View Of Brake Pedal Replacement Components With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. REMOVE KNEE AIRBAG ASSEMBLY

Refer to **REMOVAL**

2. SEPARATE BRAKE MASTER CYLINDER PUSH ROD CLEVIS

- a. Remove the clip and brake master cylinder push rod clevis pin and separate the brake master cylinder push rod clevis from the brake pedal support assembly.

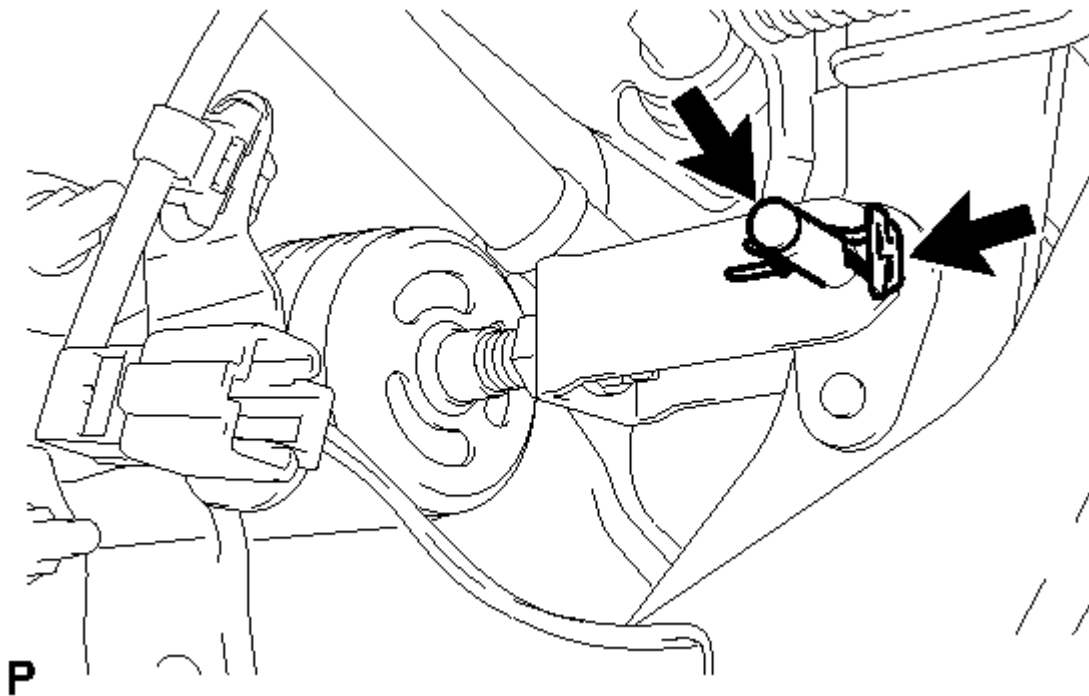


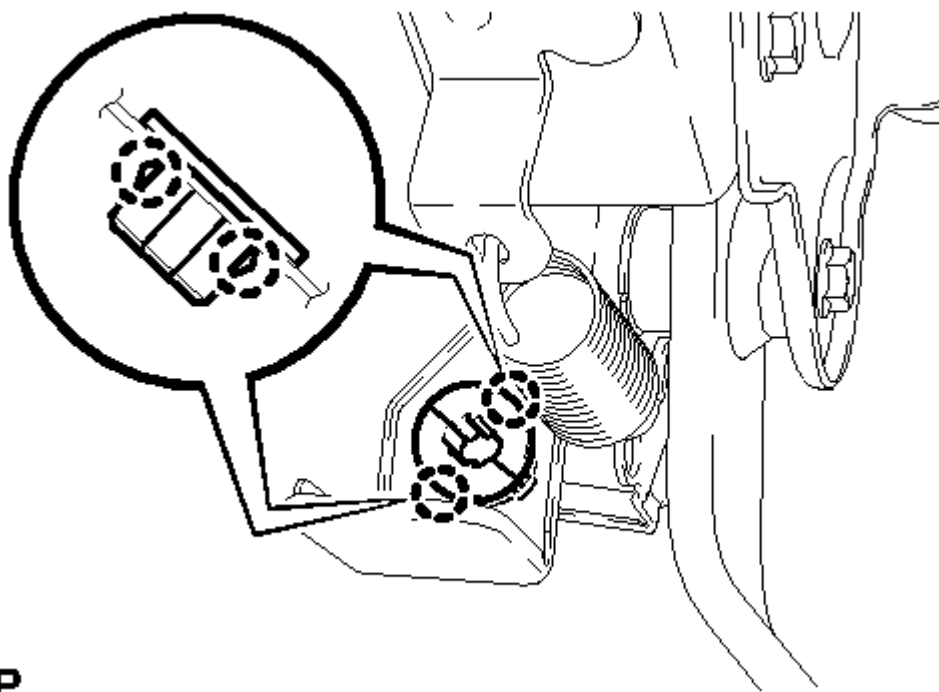
Fig. 17: Identifying Brake Master Cylinder Push Rod Clevis Pin & Clip At Brake Pedal Support Assembly

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. REMOVE STOP LIGHT SWITCH ASSEMBLY . Refer to **REMOVAL - Step 1**

4. REMOVE STOP LIGHT SWITCH MOUNTING ADJUSTER

- a. Disengage the 2 claws and remove the stop light switch mounting adjuster.

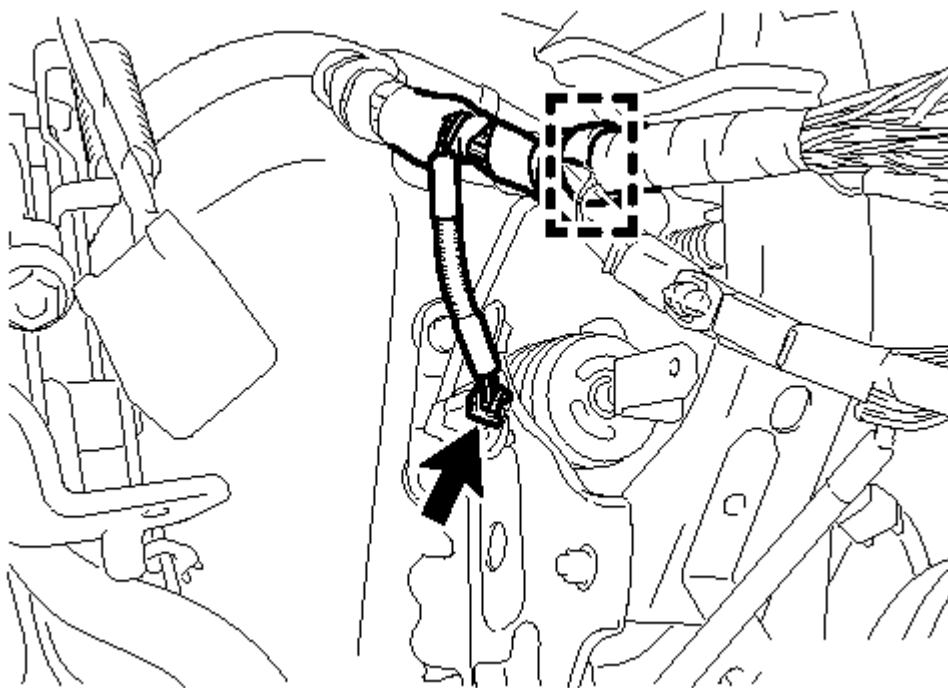


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Fig. 18: Identifying Stop Light Switch Mounting Adjuster & Claws
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

5. REMOVE BRAKE PEDAL SUPPORT ASSEMBLY

- a. Disconnect the connector and separate the harness clamp.



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Fig. 19: Identifying Brake Pedal Support Assembly Connector & Clamp

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the bolt and separate the brake pedal support assembly from the instrument panel reinforcement.

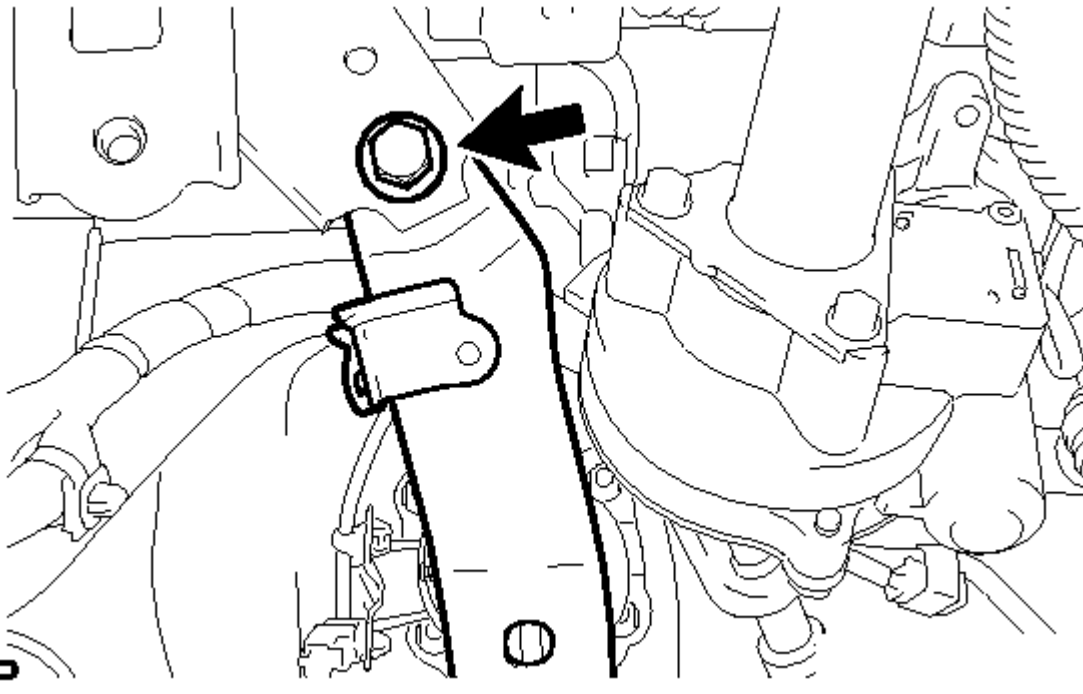
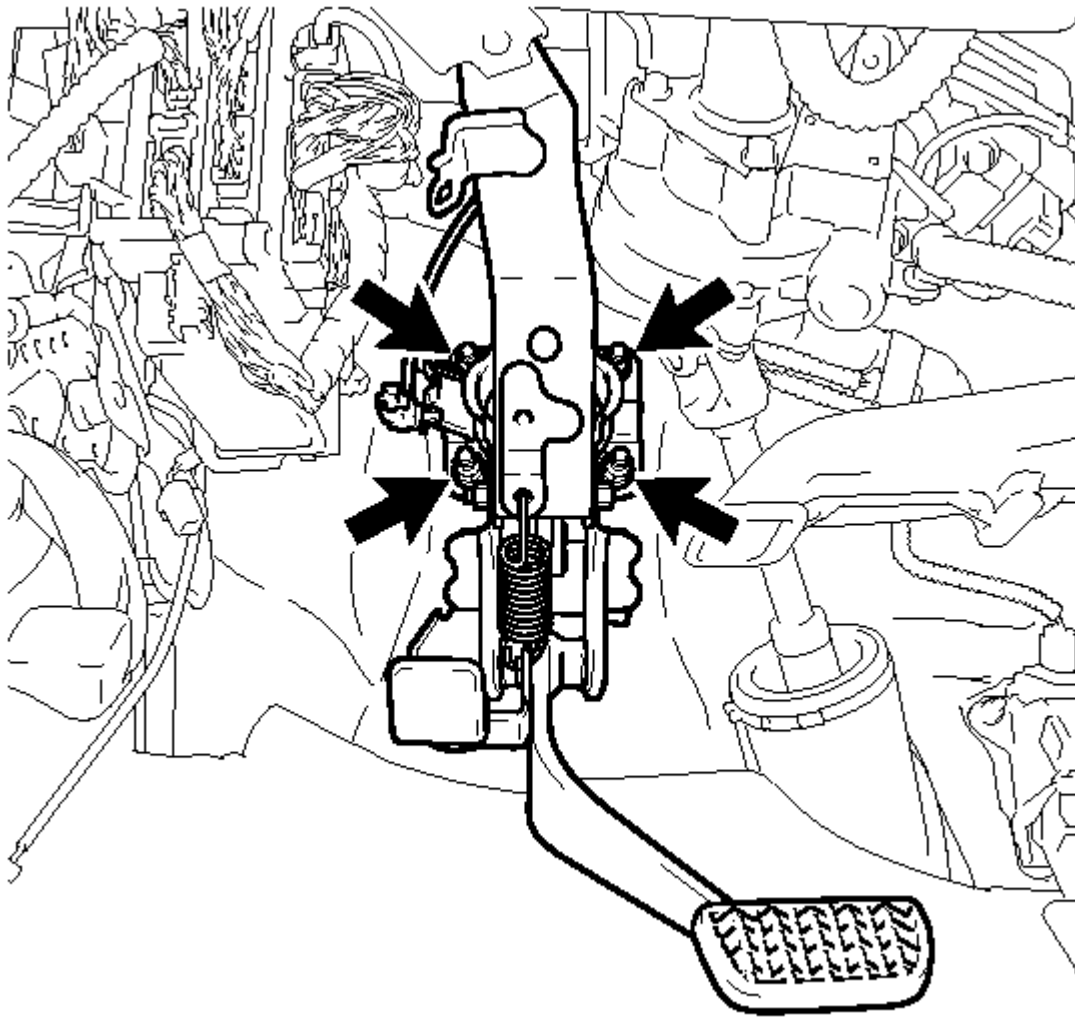


Fig. 20: Identifying Brake Pedal Support Assembly & Fastener At Instrument Panel Reinforcement

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- c. Remove the 4 nuts and brake pedal support assembly.



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Fig. 21: Identifying Brake Pedal Support Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

Push out the brake booster assembly toward the engine compartment if necessary.

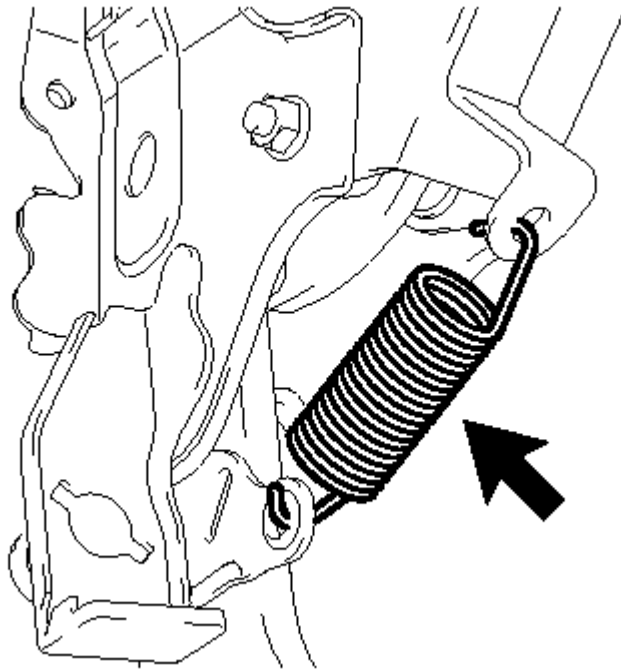
NOTE: **Do not apply excessive force to the brake lines.**

DISASSEMBLY

DISASSEMBLY

1. REMOVE BRAKE PEDAL RETURN SPRING

- a. Remove the brake pedal return spring from the brake pedal support assembly.



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Fig. 22: Remove/Install Brake Pedal Return Spring At Brake Pedal Support Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE BRAKE PEDAL PAD

- a. Remove the brake pedal pad from the brake pedal support assembly.

3. REMOVE STOP LIGHT SWITCH CUSHION

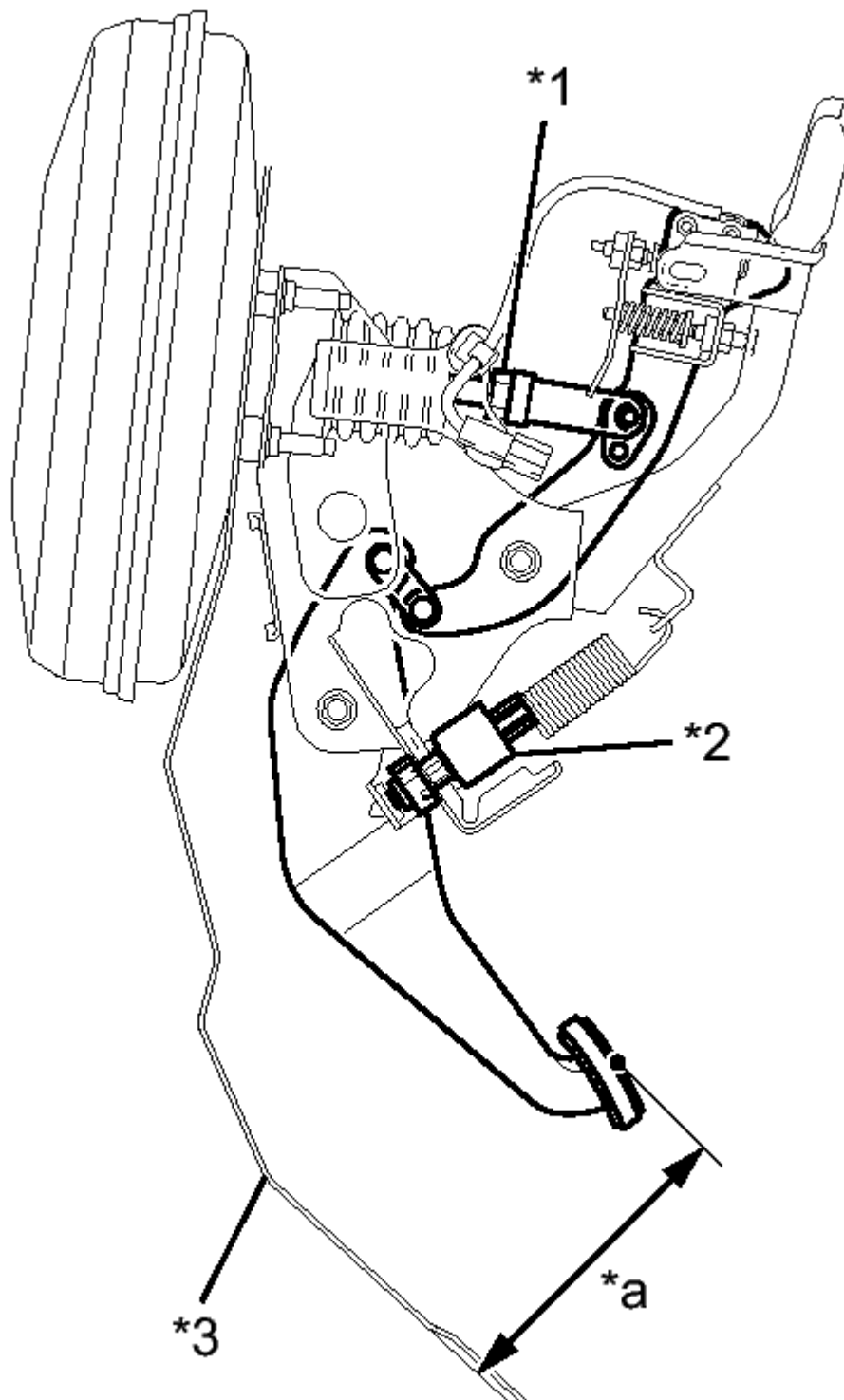
- a. Remove the stop light switch cushion from the brake pedal support assembly.

ADJUSTMENT

ADJUSTMENT

1. INSPECT BRAKE PEDAL HEIGHT

- a. Check the brake pedal height.
 1. Turn back the carpet.
 2. Measure the brake pedal height from the dash panel to the bottom edge of the brake pedal pad.



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Fig. 23: Inspecting Brake Pedal Height
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

Push Rod

*1	Clevis Lock Nut
*2	Stop Light Switch Assembly
*3	Dash Panel
*a	Brake Pedal Height

Standard pedal height

143.5 to 153.5 mm (5.65 to 6.04 in.)

NOTE: **Do not adjust the pedal height. Doing so by changing the push rod length will structurally change the pedal ratio.**

If the pedal height is incorrect, check that there is no damage in the brake pedal, brake pedal lever, brake pedal bracket and dash panel.

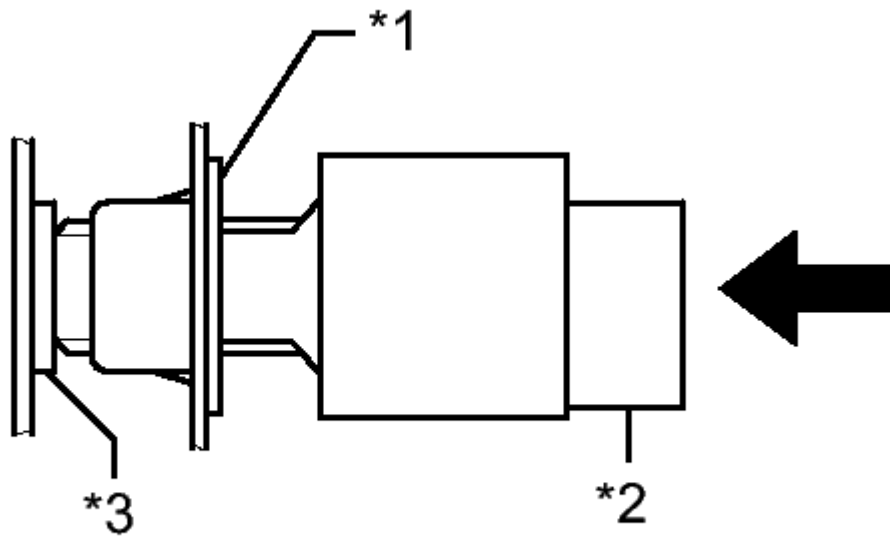
Even if there is damage, there is no problem if the reserve distance is within the standard value. If necessary, replace these parts.

2. INSPECT AND ADJUST STOP LIGHT SWITCH ASSEMBLY

HINT:

If the pedal height is incorrect, inspect and adjust the stop light switch clearance.

- a. Disconnect the connector from the stop light switch.
- b. Turn the stop light switch counterclockwise and remove the stop light switch.
- c. Insert the stop light switch into the adjuster until it just touches the cushion.



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Fig. 24: Inspecting Stop Light Switch Assembly Clearance
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Adjuster
*2	Stop Light Switch Assembly
*3	Cushion

HINT:

Do not depress the brake pedal.

- d. Make a quarter turn clockwise to install the stop light switch.

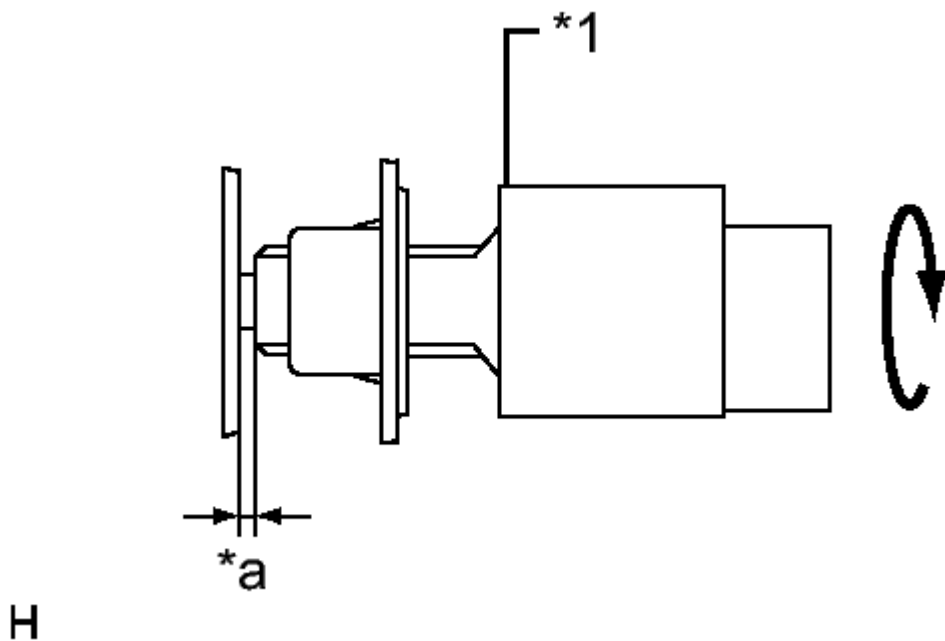


Fig. 25: Turning Stop Light Switch Clockwise
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Stop Light Switch Assembly
*a	Stop Light Switch Clearance

HINT:

- Do not depress the brake pedal.
- The turning torque for installing the stop light switch is as below.

Torque: 1.5 N*m (15 kgf*cm, 13 in.*lbf)

or less

- e. Inspect the stop light switch clearance.

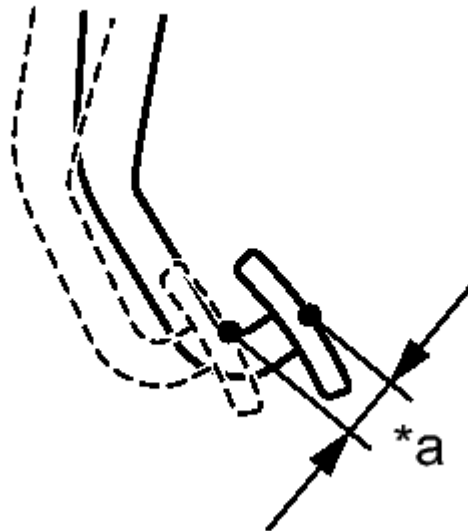
Stop light switch clearance

0.5 to 2.6 mm (0.020 to 0.102 in.)

f. Connect the connector to the stop light switch.

3. INSPECT BRAKE PEDAL FREE PLAY

- a. Stop the engine and firmly depress the brake pedal several times until no vacuum is left in the booster.
- b. Measure the free play of the brake pedal.



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Fig. 26: Identifying Brake Pedal Free Play

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Brake Pedal Free Play
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Standard pedal free play

1.0 to 6.0 mm (0.0394 to 0.236 in.)

If the pedal free play is not as specified, inspect the stop light switch clearance. If the pedal free play is as specified, proceed to the Inspect Brake Pedal Reserve Distance procedure.

4. INSPECT BRAKE PEDAL RESERVE DISTANCE

HINT:

Measure the distance at the same point used for the brake pedal height inspection.

- a. Start the engine.
- b. Depress the brake pedal and check the pedal reserve distance.
 1. Depress the brake pedal with a force of 500 N (51 kgf, 112.4 lbf).
 2. Measure the distance between the brake pedal and dash panel.

Standard pedal reserve distance

More than 60 mm (2.36 in.)

If the distance is not as specified, troubleshoot the brake system. Refer to **PROBLEM SYMPTOMS TABLE** .

REASSEMBLY

REASSEMBLY

1. INSTALL STOP LIGHT SWITCH CUSHION

- a. Install the stop light switch cushion to the brake pedal support assembly.

2. INSTALL BRAKE PEDAL PAD

- a. Install the brake pedal pad to the brake pedal support assembly.

3. INSTALL BRAKE PEDAL RETURN SPRING

- a. Install the brake pedal return spring to the brake pedal support assembly.

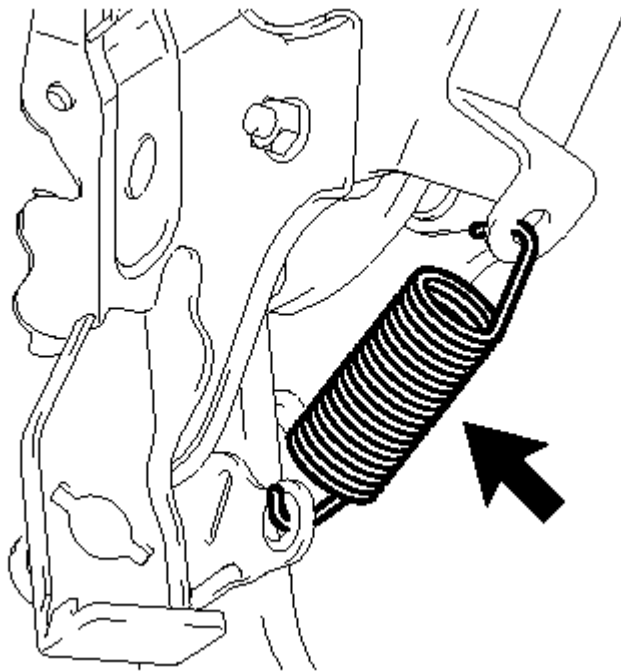


Fig. 27: Remove/Install Brake Pedal Return Spring At Brake Pedal Support Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSTALLATION

INSTALLATION

1. INSTALL BRAKE PEDAL SUPPORT ASSEMBLY

- a. Install the brake pedal support assembly with the 4 nuts.

Torque: 13 N*m (130 kgf*cm, 9 ft.*lbf)

HINT:

Push out the brake booster assembly toward the engine compartment if necessary.

NOTE: Do not apply excessive force to the brake lines.

- b. Install the brake pedal support assembly to the instrument panel reinforcement with the bolt.

Torque: 19 N*m (189 kgf*cm, 14 ft.*lbf)

- c. Connect the connector and install the harness clamp.

2. INSTALL STOP LIGHT SWITCH MOUNTING ADJUSTER

- a. Engage the 2 claws to install the stop light switch mounting adjuster.

3. INSTALL STOP LIGHT SWITCH ASSEMBLY . Refer to INSTALLATION - Step 1

4. INSTALL BRAKE MASTER CYLINDER PUSH ROD CLEVIS

- a. Apply lithium soap base glycol grease to the contact surface of the brake master cylinder push rod clevis pin.
- b. Connect the brake master cylinder push rod clevis to the brake pedal support assembly with the brake master cylinder push rod clevis pin and a new clip.

5. INSPECT BRAKE PEDAL HEIGHT See step 1

6. INSPECT BRAKE PEDAL FREE PLAY See step 3

7. INSPECT BRAKE PEDAL RESERVE DISTANCE See step 4

8. INSTALL KNEE AIRBAG ASSEMBLY

Refer to INSTALLATION

BRAKE MASTER CYLINDER

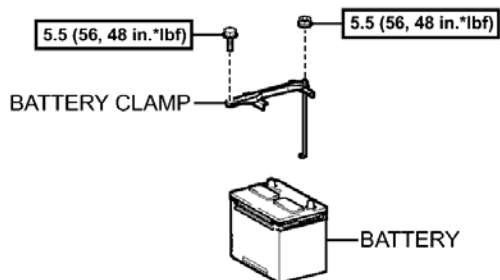
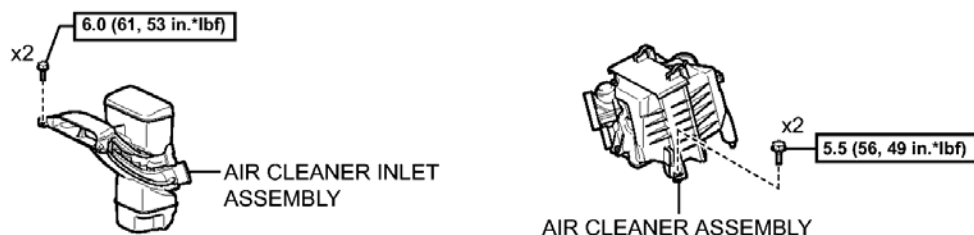
COMPONENTS

ILLUSTRATION

for 2GR-FE:



for 1AR-FE:

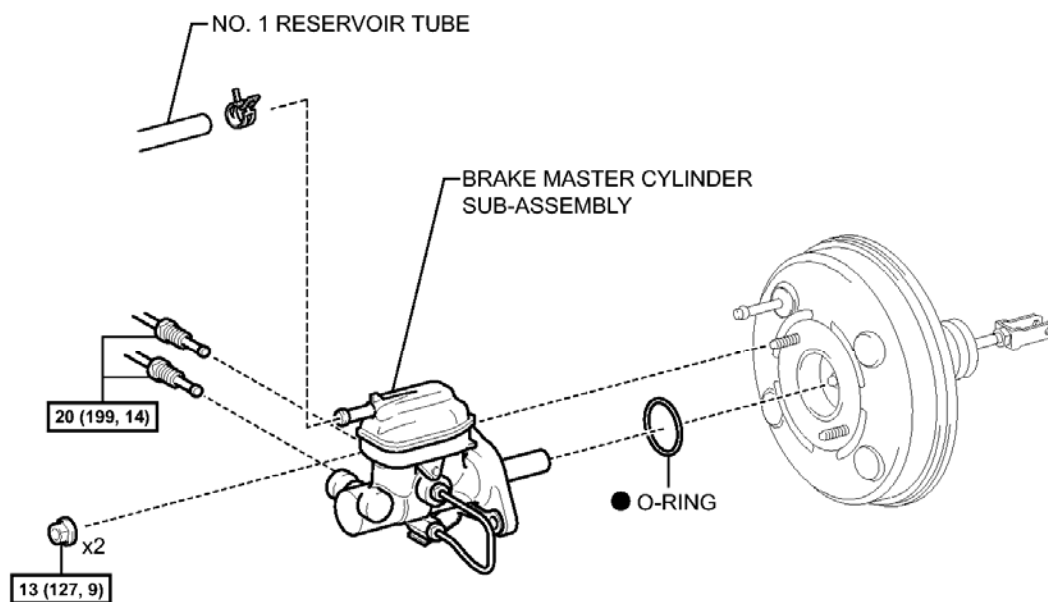


N*m (kgf*cm, ft.*lbf): Specified torque

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Fig. 28: Brake Master Cylinder Replacement Components With Torque Specifications (1 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



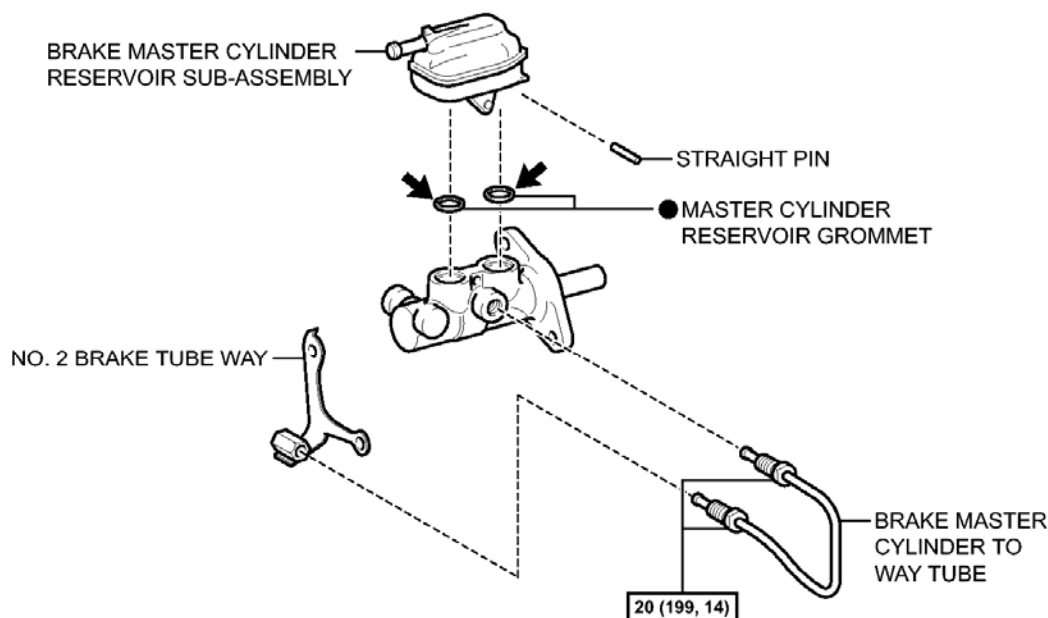
N*m (kgf*cm, ft.*lbf) : Specified torque

● Non-reusable part

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Fig. 29: Brake Master Cylinder Replacement Components With Torque Specifications (2 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



$\boxed{\text{N}^*\text{m (kgf}^*\text{cm, ft.}^*\text{lbf)}}$: Specified torque

● Non-reusable part

← Lithium soap base glycol grease

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Fig. 30: Brake Master Cylinder Replacement Components With Torque Specifications (3 of 3)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

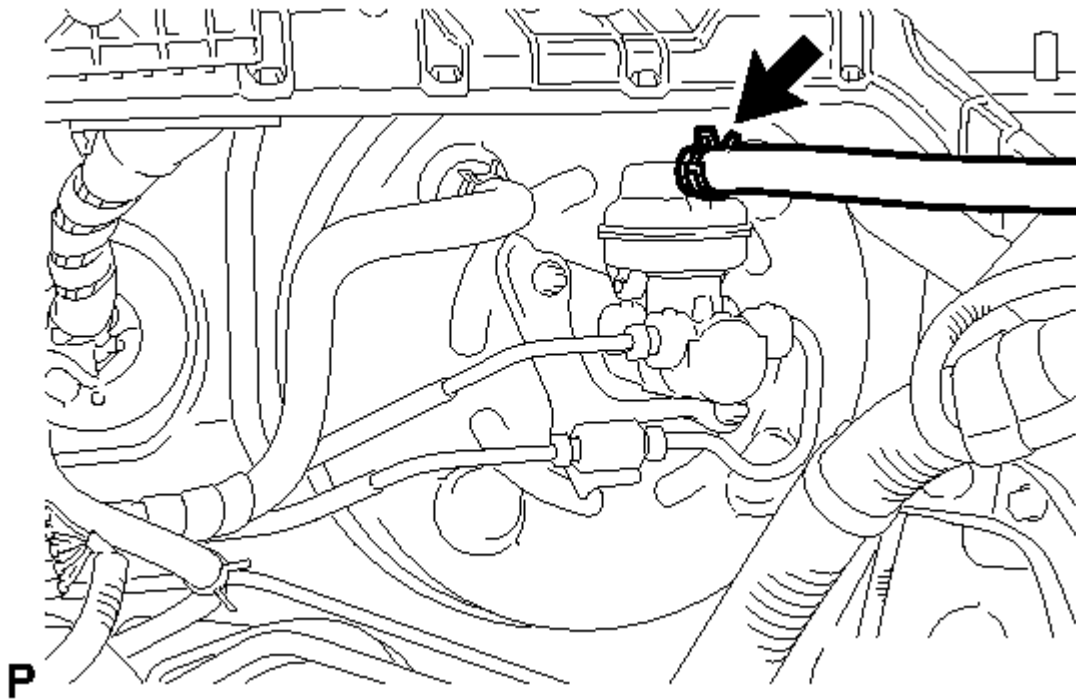
NOTE: Release the vacuum from booster by depressing the brake pedal several times. Then remove the brake master cylinder from brake booster.

1. **REMOVE AIR CLEANER INLET COVER ASSEMBLY SEAL (for 2GR-FE)** . Refer to **REMOVAL - Step 25**
2. **REMOVE AIR CLEANER INLET ASSEMBLY (for 1AR-FE)** . Refer to **REMOVAL - Step 22**
3. **REMOVE BATTERY (for 2GR-FE)** . Refer to **REMOVAL - Step 26**
4. **REMOVE BATTERY (for 1AR-FE)** . Refer to **REMOVAL - Step 23**
5. **REMOVE AIR CLEANER AND HOSE (for 2GR-FE)** . Refer to **REMOVAL - Step 7**
6. **REMOVE AIR CLEANER ASSEMBLY (for 1AR-FE)** . Refer to **REMOVAL - Step 7**
7. **DRAIN BRAKE FLUID**

NOTE: If brake fluid leaks onto any painted surface, immediately wash it off.

8. DISCONNECT NO. 1 RESERVOIR TUBE

- a. Slide the clip and disconnect the No. 1 reservoir tube from the brake master cylinder reservoir sub-assembly.

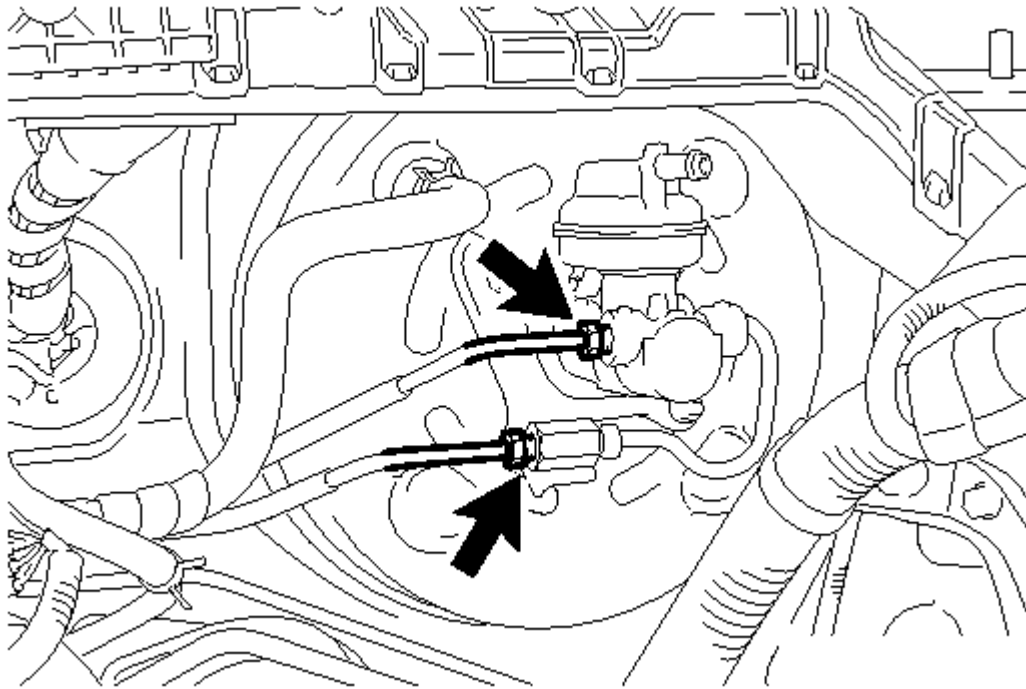


P

Fig. 31: Identifying No. 1 Reservoir Tube At Brake Master Cylinder Reservoir Sub-Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

9. REMOVE BRAKE MASTER CYLINDER SUB-ASSEMBLY

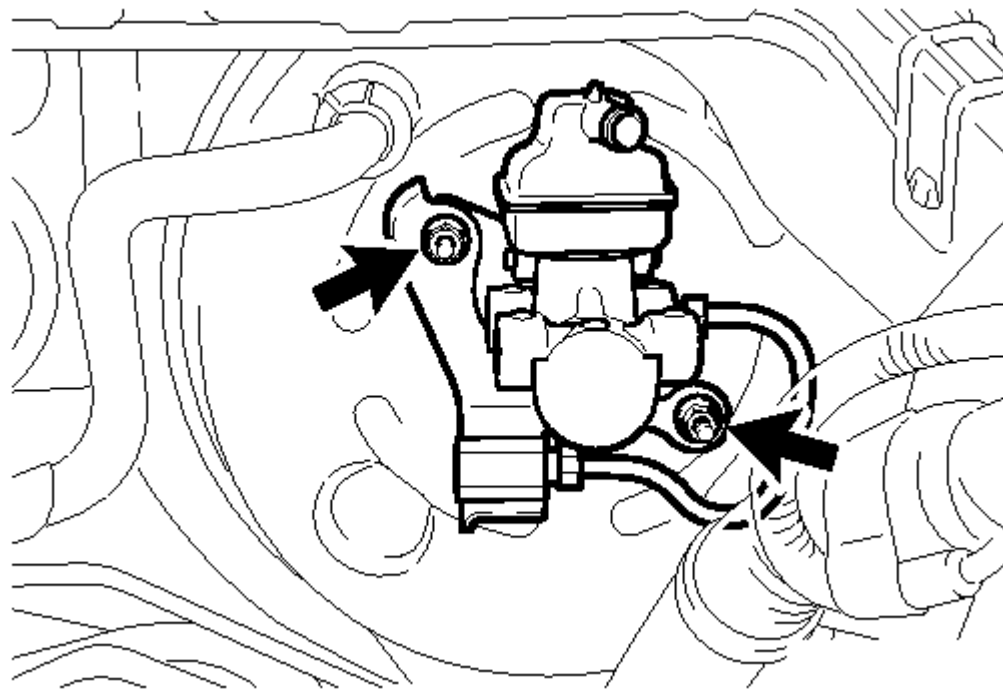
- a. Using a union nut wrench (12 mm), disconnect the 2 brake lines from the brake master cylinder sub-assembly.



P

Fig. 32: Identifying Brake Lines At Brake Master Cylinder Sub-Assembly
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the 2 nuts and brake master cylinder sub-assembly.



P

Fig. 33: Identifying Brake Master Cylinder Sub-Assembly & Fasteners
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- The master cylinder requires careful handling. Do not allow the master cylinder to receive any impact, such as 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.
- Release the vacuum from booster by depressing the brake pedal several times. Then remove the brake master cylinder from brake booster.
- When installing the master cylinder to the brake booster, or when removing the master cylinder from the brake booster, make sure that the master cylinder is kept horizontal or its tip faces downward (the piston faces upward) to prevent the master cylinder piston from falling out.
- Do not allow any foreign matter to contaminate the master cylinder piston. If foreign matter 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.

c. Remove the O-ring from the brake master cylinder sub-assembly.

DISASSEMBLY

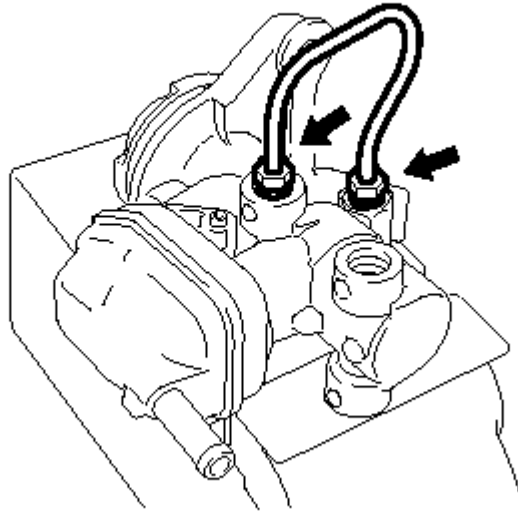
DISASSEMBLY

1. REMOVE BRAKE MASTER CYLINDER TO WAY TUBE

a. Mount the brake master cylinder sub-assembly in a vise.

NOTE: Place aluminum plates on the vise to prevent damage to the brake master cylinder sub-assembly.

b. Using a union nut wrench (12 mm), remove the brake master cylinder to way tube from the No. 2 brake tube way and brake master cylinder body.



C

Fig. 34: Remove/Install No. 2 Brake Tube Way At Brake Master Cylinder Body
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. REMOVE NO. 2 BRAKE TUBE WAY

- a. Remove the No. 2 brake tube way from the brake master cylinder body.

3. REMOVE BRAKE MASTER CYLINDER RESERVOIR SUB-ASSEMBLY

- a. Mount the brake master cylinder sub-assembly in a vise.

NOTE: **Place aluminum plates on the vise to prevent damage to the brake master cylinder sub-assembly.**

- b. Using a pin punch (5 mm) and a hammer, tap out the straight pin, and remove the brake master cylinder reservoir sub-assembly.

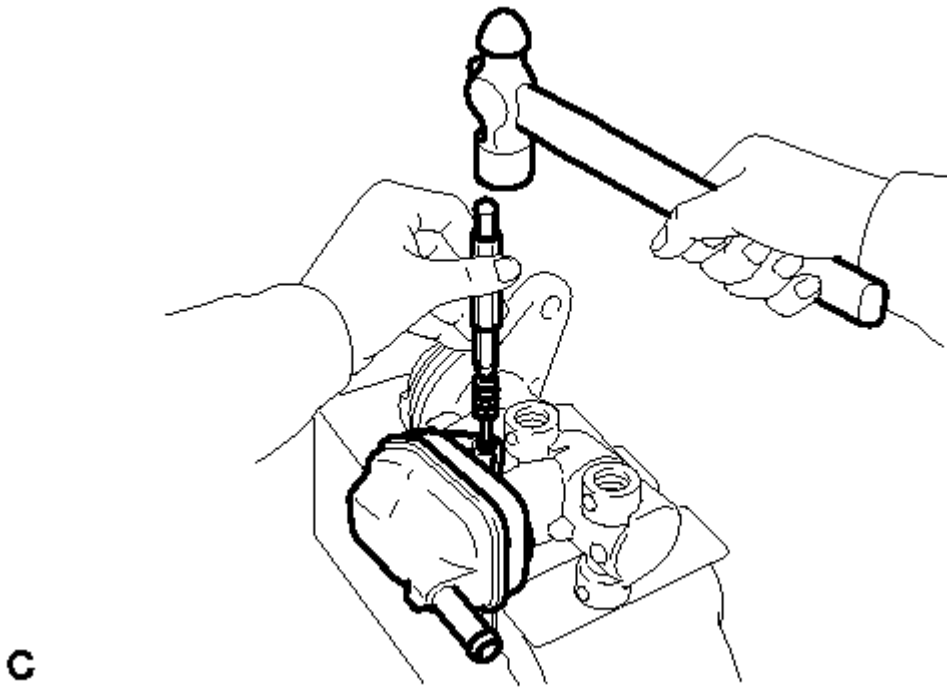


Fig. 35: Tapping Straight Pin
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

4. REMOVE MASTER CYLINDER RESERVOIR GROMMET

- a. Remove the 2 master cylinder reservoir grommets from the brake master cylinder reservoir assembly.

INSPECTION

INSPECTION

1. INSPECT AND ADJUST BRAKE BOOSTER PUSH ROD

NOTE: **Make an adjustment with no vacuum in the brake booster assembly.**
 (Depress the brake pedal several times with the engine stopped.)

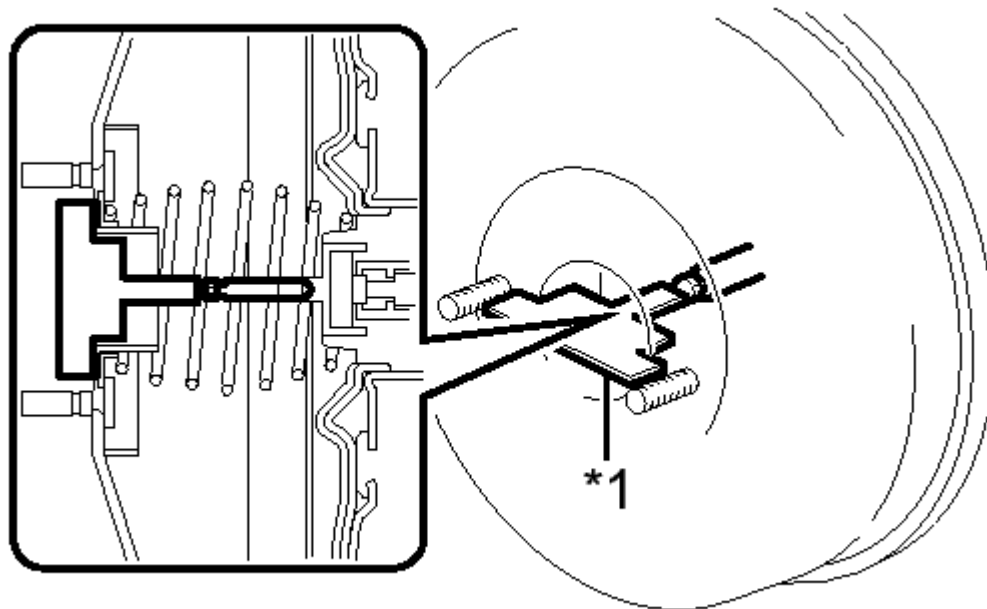
HINT:

- Adjustment of the brake booster push rod is required when the brake master cylinder sub-assembly is replaced with a new one.
 - Adjustment is not necessary when the removed brake master cylinder sub-assembly is reused and the brake booster assembly is replaced with a new one.
- a. Apply chalk to the tip of an accessory tool.

HINT:

The accessory tool is enclosed with a new brake master cylinder sub-assembly.

- b. Place the accessory tool on the brake booster assembly.



T

Fig. 36: Identifying Brake Booster Assembly & Accessory Tool
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Accessory Tool
----	----------------

- c. Measure the clearance between the brake booster push rod and accessory tool.

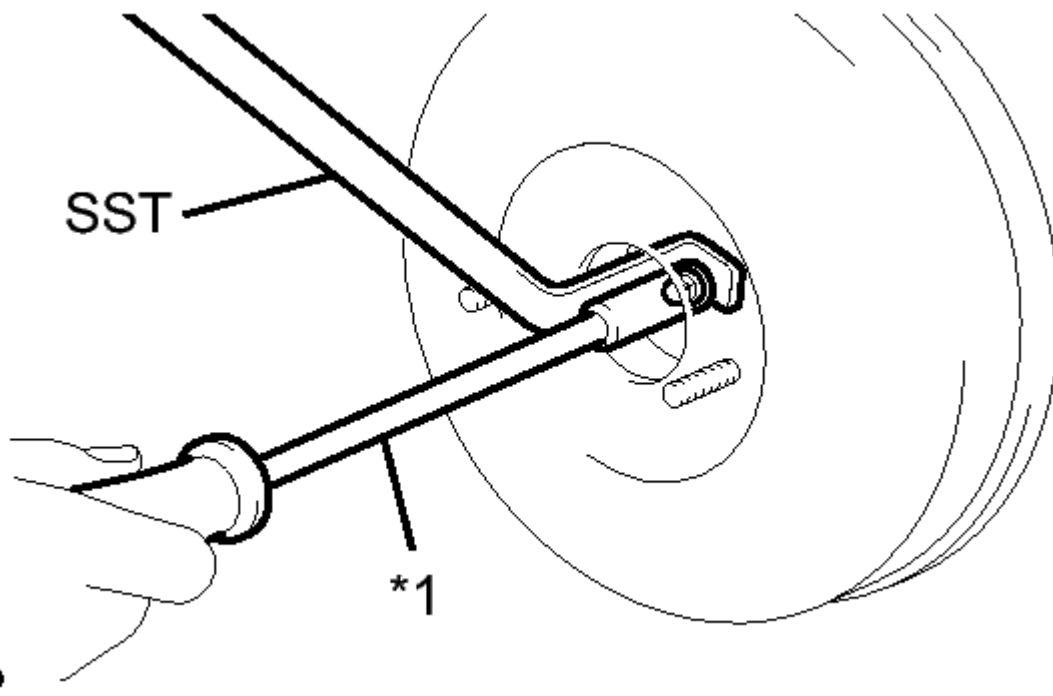
Standard clearance

0 mm (0 in.)

HINT:

Adjust the clearance in the following cases:

- If there is a clearance between the accessory tool and the shell of the brake booster (floating accessory tool), the push rod is protruding too far.
 - If the chalk does not stick on the tip of the brake booster push rod, the push rod protrusion is insufficient.
- d. If the clearance is not as specified, adjust the push rod length by holding the rod using SST and turning the tip of the rod using a socket driver (7 mm).



P

Fig. 37: Adjusting Push Rod Length Using SST & Socket Driver
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*1	Socket Driver (7 mm)
----	-------------------------------

- SST: 09737-00020

HINT:

Check the push rod clearance again after adjustment.

REASSEMBLY

REASSEMBLY

1. INSTALL MASTER CYLINDER RESERVOIR GROMMET

- Apply lithium soap base glycol grease to 2 new master cylinder reservoir grommets.
- Install the 2 master cylinder reservoir grommets to the brake master cylinder reservoir sub-assembly.

2. INSTALL BRAKE MASTER CYLINDER RESERVOIR SUB-ASSEMBLY

- Install the brake master cylinder reservoir sub-assembly to the master cylinder body.
- Mount the brake master cylinder sub-assembly in a vise.

NOTE: Place aluminum plates on the vise to prevent damage to the brake master cylinder sub-assembly.

- c. Using a pin punch (5 mm) and a hammer, tap in the straight pin.

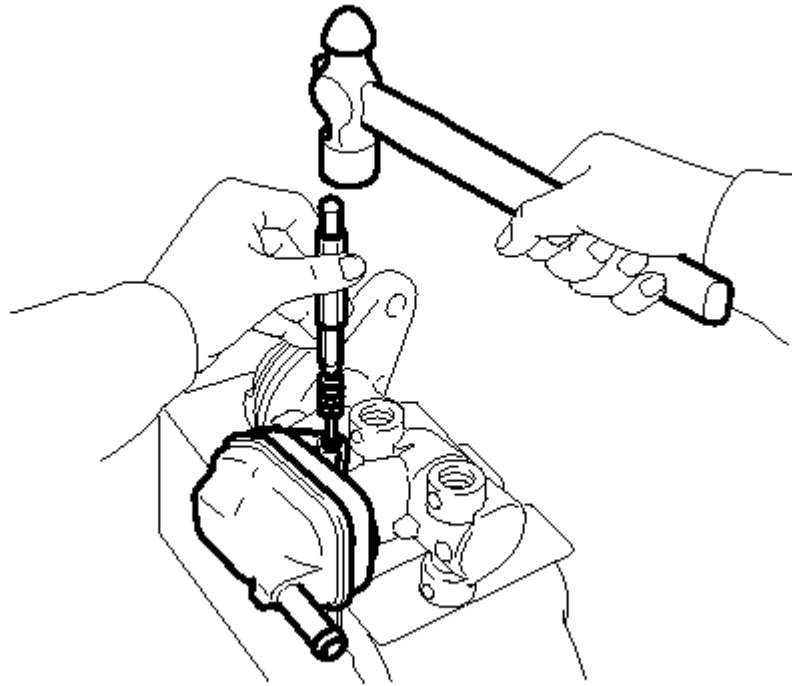


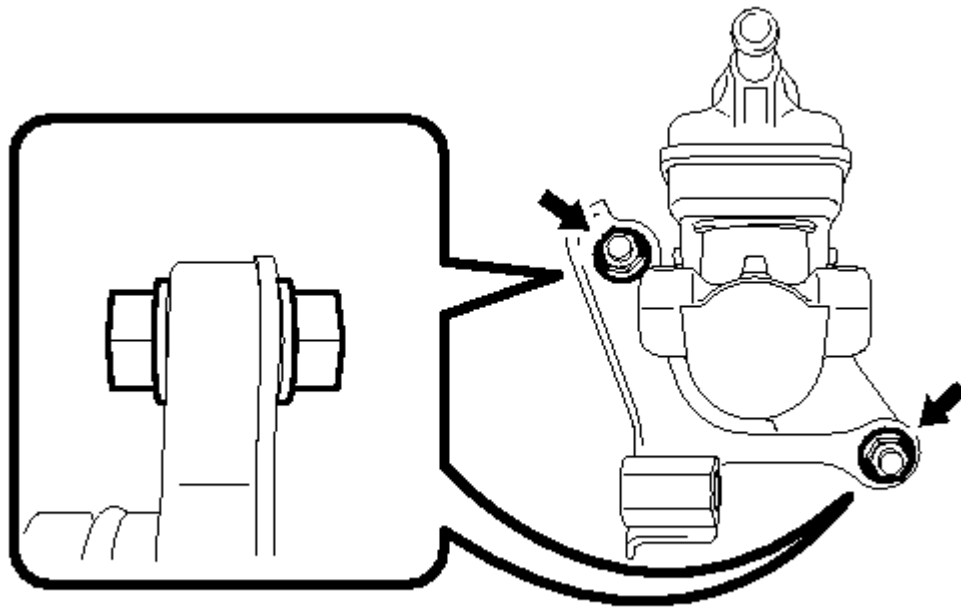
Fig. 38: Tapping Straight Pin
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. INSTALL NO. 2 BRAKE TUBE WAY

- a. Install the No. 2 brake tube way to the brake master cylinder body.

4. INSTALL BRAKE MASTER CYLINDER TO WAY TUBE

- a. Secure the No. 2 brake tube way to the brake master cylinder body with the 2 bolts, 2 nuts and 4 washers as shown in the illustration.



C

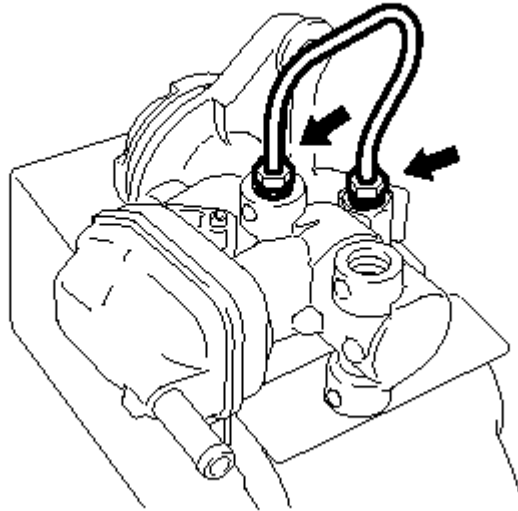
Fig. 39: Identifying No. 2 Brake Tube Way To Brake Master Cylinder Body Bolts
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 13 N*m (127 kgf*cm, 9 ft.*lbf)

- b. Mount the brake master cylinder sub-assembly in a vise.

NOTE: Place aluminum plates on the vise to prevent damage to the brake master cylinder sub-assembly.

- c. Using a union nut wrench (12 mm), install the brake master cylinder to way tube to the brake master cylinder body and No. 2 brake tube way.



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Fig. 40: Remove/Install No. 2 Brake Tube Way At Brake Master Cylinder Body
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 20 N*m (199 kgf*cm, 14 ft.*lbf)

NOTE: Use the formula to calculate special torque values for situations where the union nut wrench is combined with a torque wrench. Refer to PRECAUTION .

- d. Remove the 2 bolts, 2 nuts and 4 washers.

INSTALLATION

INSTALLATION

1. **INSPECT AND ADJUST BRAKE BOOSTER PUSH ROD** See step 1
2. **INSTALL BRAKE MASTER CYLINDER SUB-ASSEMBLY**
 - a. Install a new O-ring to the brake master cylinder sub-assembly.
 - b. Install the brake master cylinder sub-assembly to the brake booster assembly with the 2 nuts.

Torque: 13 N*m (127 kgf*cm, 9 ft.*lbf)

NOTE:

- The master cylinder requires careful handling. Do not allow the master cylinder to receive any impact, such as 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 when removing the master cylinder from the brake booster, make sure that the master cylinder is kept horizontal or its tip faces downward (the piston faces upward) to prevent the master cylinder piston from falling out.
 - Do not allow any foreign matter to contaminate the master cylinder piston. If foreign matter gets on the piston, remove it by using a piece of cloth and then apply an even layer of lithium soap based glycol grease around the circumference (sliding part) of the piston.
 - Do not use any other type of grease or fluid.
- c. Using a union nut wrench (12 mm), connect the 2 brake lines to the brake master cylinder sub-assembly.

Torque: 20 N*m (199 kgf*cm, 14 ft.*lbf)

NOTE: Use the formula to calculate special torque values for situations where the union nut wrench is combined with a torque wrench. Refer to PRECAUTION .

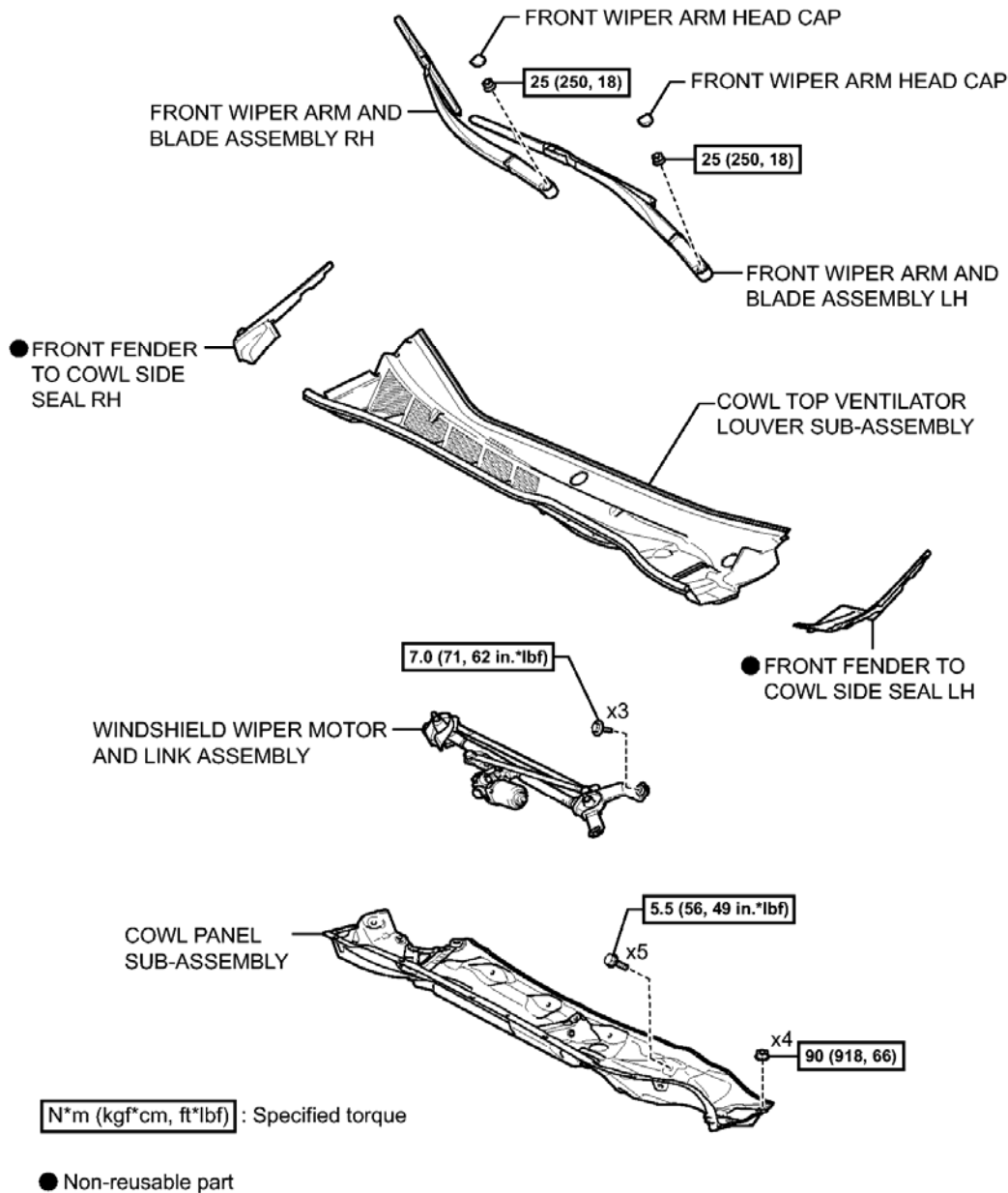
3. CONNECT NO. 1 RESERVOIR TUBE

- a. Connect the No. 1 reservoir tube to the brake master cylinder reservoir sub-assembly.
4. **INSTALL AIR CLEANER AND HOSE (for 2GR-FE)** . Refer to INSTALLATION - Step 4
5. **INSTALL AIR CLEANER ASSEMBLY (for 1AR-FE)** . Refer to INSTALLATION - Step 5
6. **INSTALL BATTERY (for 2GR-FE)** . Refer to INSTALLATION - Step 61
7. **INSTALL BATTERY (for 1AR-FE)** . Refer to INSTALLATION - Step 46
8. **INSTALL AIR CLEANER INLET COVER ASSEMBLY SEAL (for 2GR-FE)** . Refer to INSTALLATION - Step 62
9. **INSTALL AIR CLEANER INLET ASSEMBLY (for 1AR-FE)** . Refer to INSTALLATION - Step 47
10. **FILL RESERVOIR WITH BRAKE FLUID** See step 2
11. **BLEED BRAKE MASTER CYLINDER** See step 3
12. **BLEED BRAKE LINE** See step 4
13. **BLEED BRAKE ACTUATOR** See step 5
14. **INSPECT FOR BRAKE FLUID LEAK**
15. **INSPECT FLUID LEVEL IN RESERVOIR** See step 1

BRAKE BOOSTER

COMPONENTS

ILLUSTRATION

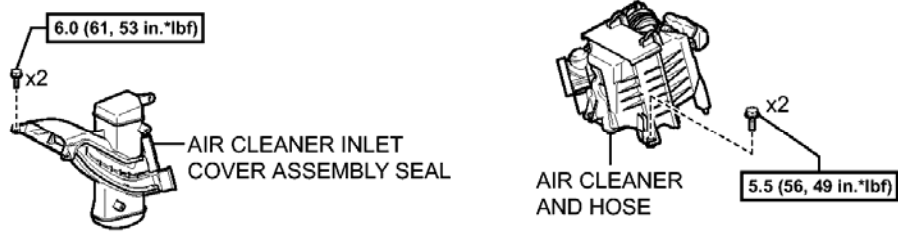


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Fig. 41: Brake Booster Replacement Components With Torque Specifications (1 of 6)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

for 2GR-FE:

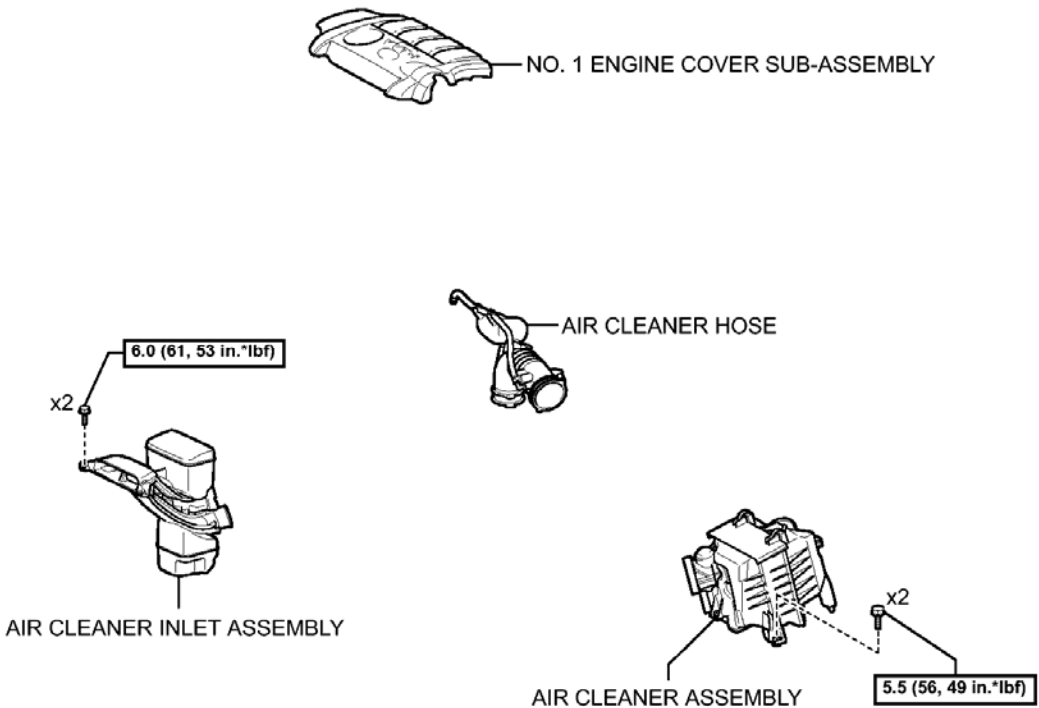


[N*m (kgf*cm, ft.*lbf)]: Specified torque

Fig. 42: Brake Booster Replacement Components With Torque Specifications (2 of 6)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

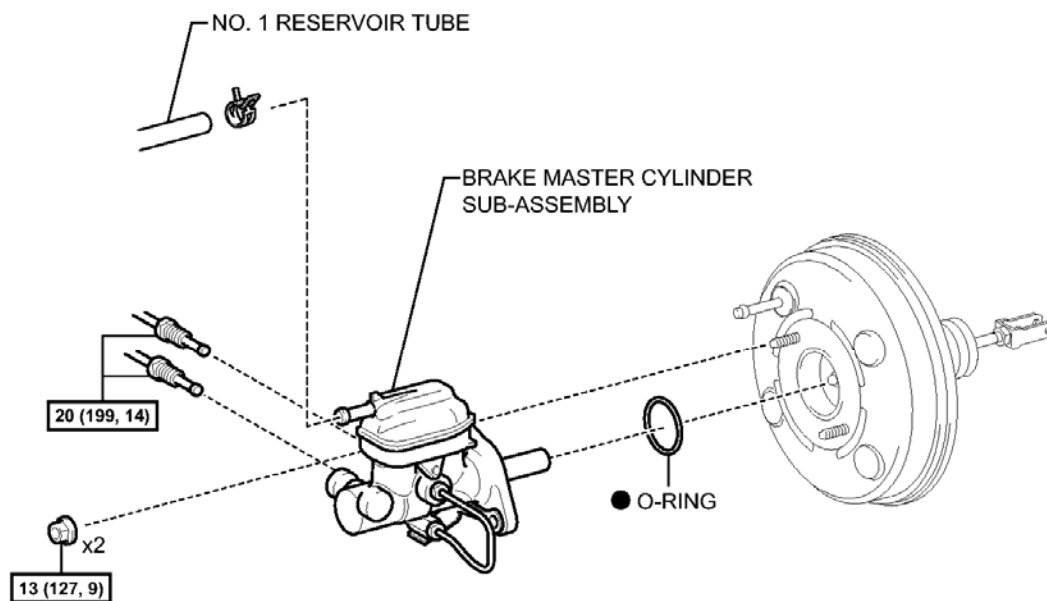
for 1AR-FE:



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

Fig. 43: Brake Booster Replacement Components With Torque Specifications (3 of 6)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



$\boxed{\text{N}\cdot\text{m (kgf}\cdot\text{cm, ft.}\cdot\text{lbf)}}$: Specified torque

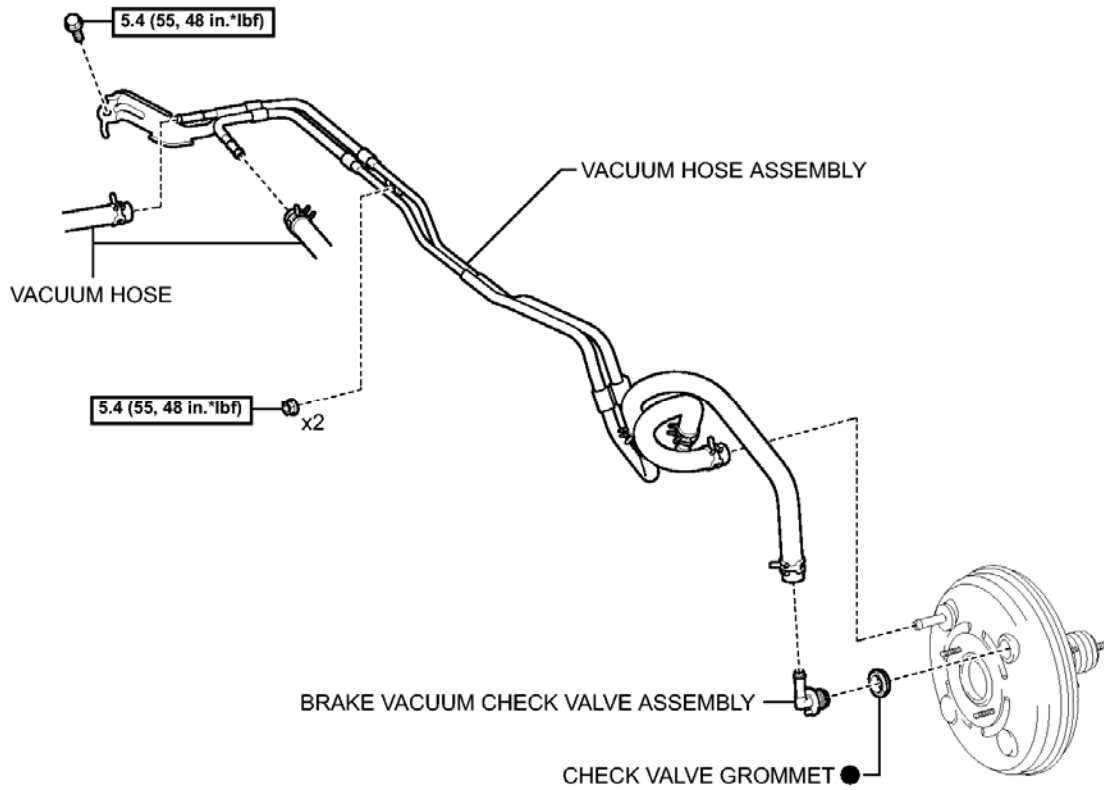
● Non-reusable part

T

Fig. 44: Brake Booster Replacement Components With Torque Specifications (4 of 6)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION

for 1AR-FE:



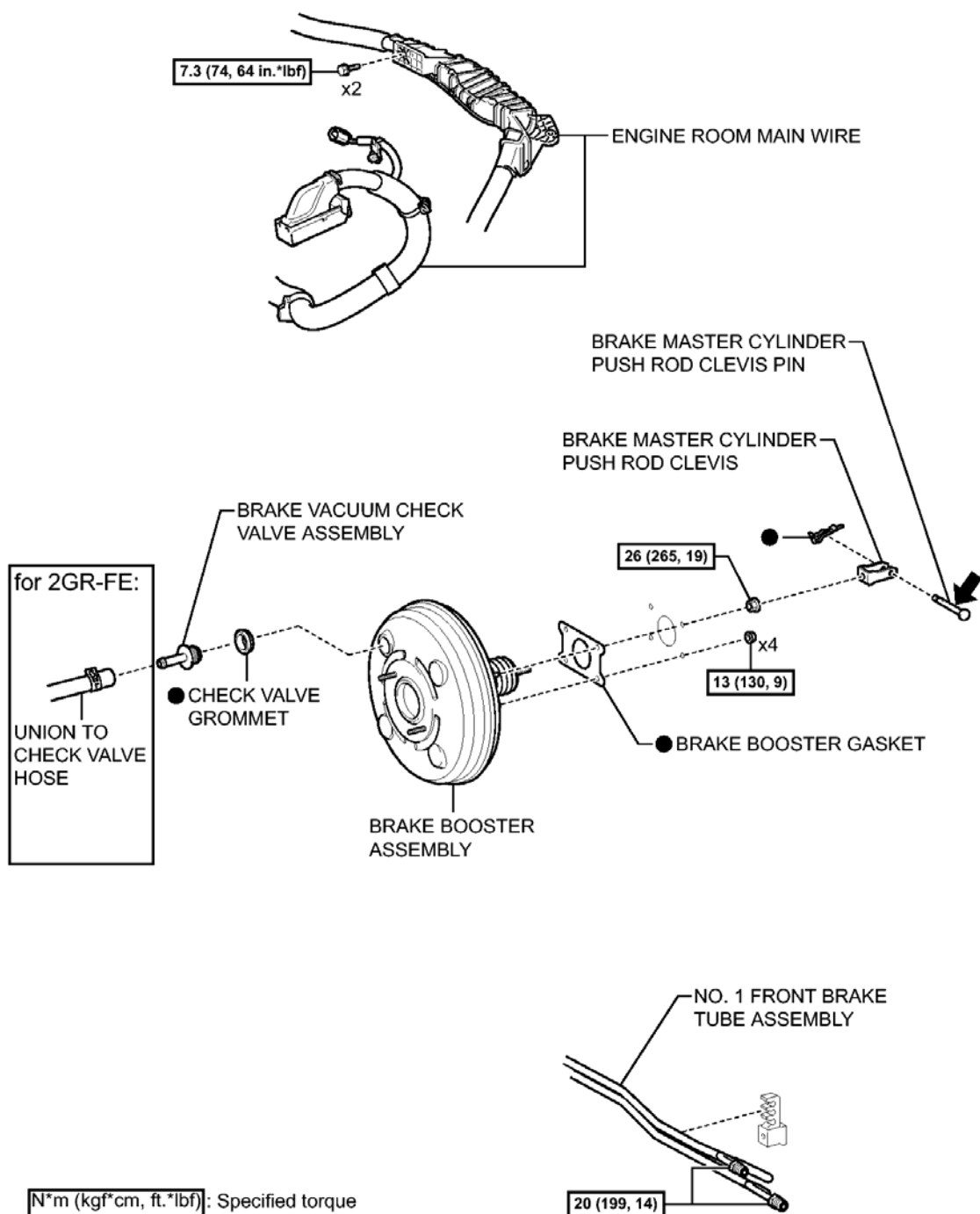
$\boxed{\text{N}\cdot\text{m (kgf}\cdot\text{cm, ft.}\cdot\text{lbf)}}\text{: Specified torque}$

● Non-reusable part

P

Fig. 45: Brake Booster Replacement Components With Torque Specifications (5 of 6)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



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

● Non-reusable part

← Lithium soap base glycol grease

P

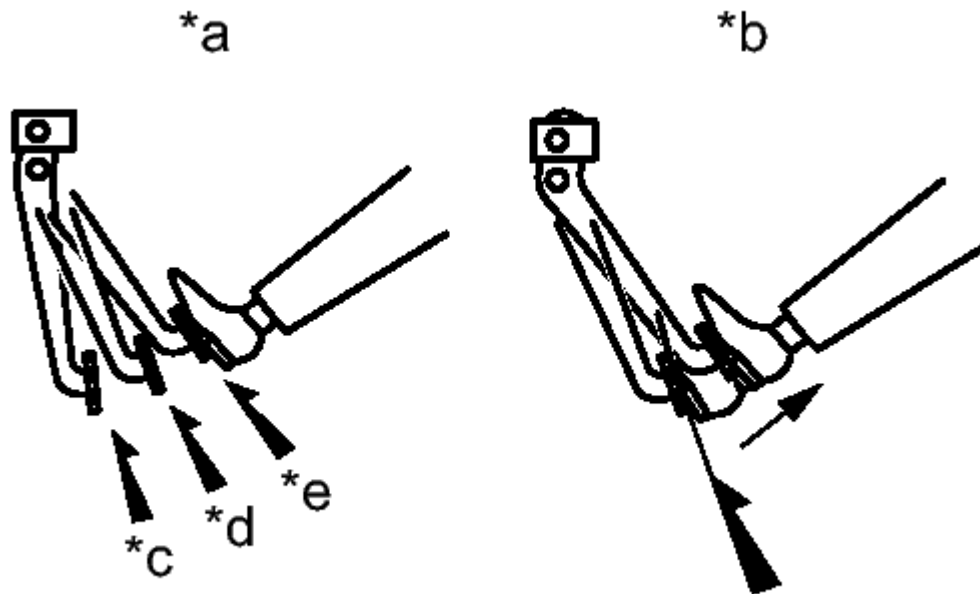
Fig. 46: Brake Booster Replacement Components With Torque Specifications (6 of 6)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

ON-VEHICLE INSPECTION

1. INSPECT BRAKE BOOSTER ASSEMBLY

- a. Airtightness check



T

Fig. 47: Inspecting Brake Booster Assembly Airtightness
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	CORRECT
*b	INCORRECT
*c	1st
*d	2nd
*e	3rd

1. Start the engine and stop it after 1 or 2 minutes. Slowly depress the brake pedal several times.

HINT:

If the pedal can be depressed to the floor the first time, but on the 2nd and 3rd times cannot be depressed as far, the booster is airtight.

2. Depress the brake pedal while the engine is running, and stop the engine with the brake pedal depressed.

HINT:

If there is no change in the pedal reserve distance while holding the pedal for 30 seconds, the booster is airtight.

b. Operation check

1. Depress the brake pedal several times with the ignition switch off and check that there is no change in the pedal reserve distance when the pedal is depressed.

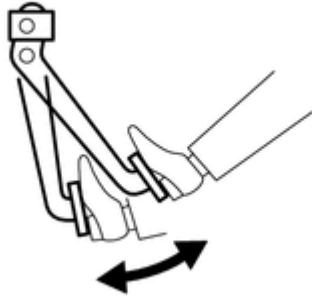


Fig. 48: Depressing Pedal Several Times

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

2. Depress and hold down the pedal, and start the engine.

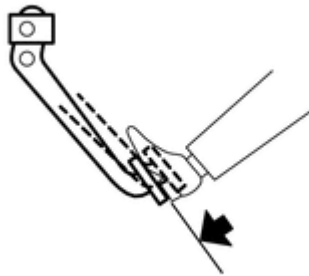


Fig. 49: Depressing And Holding Down Pedal

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

HINT:

If the pedal goes down slightly, operation is normal.

REMOVAL

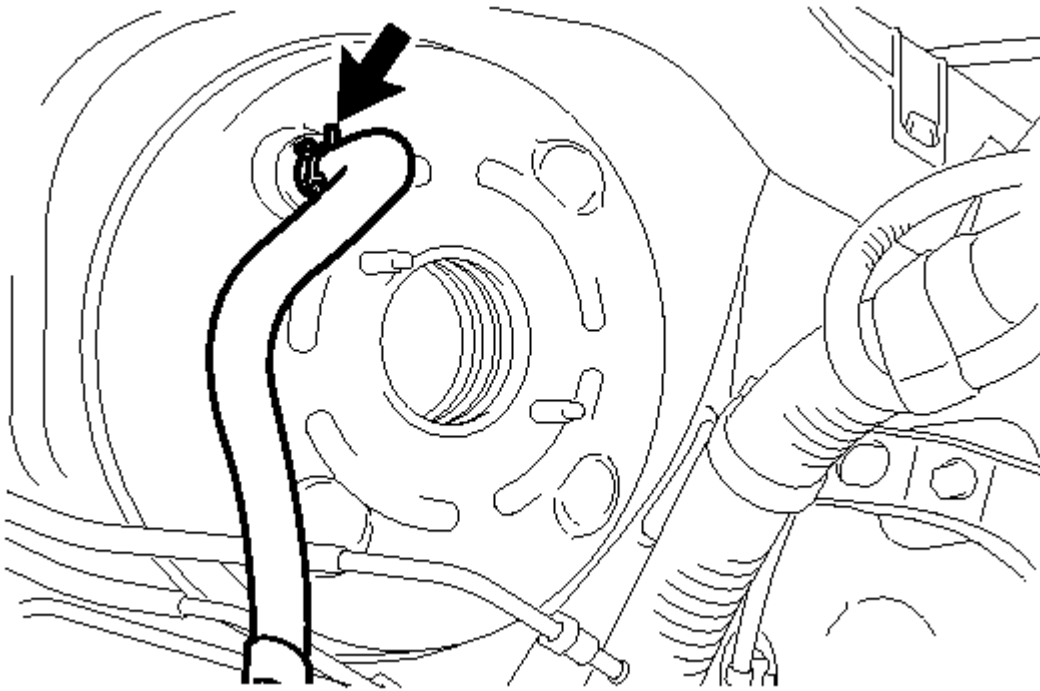
REMOVAL

NOTE: Release the vacuum from booster by depressing the brake pedal several times. Then remove the brake master cylinder from brake booster.

1. **REMOVE FRONT WIPER ARM HEAD CAP** . Refer to **REMOVAL - Step 1**
2. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH** . Refer to **REMOVAL - Step 2**
3. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH** . Refer to **REMOVAL - Step 3**
4. **REMOVE FRONT FENDER TO COWL SIDE SEAL LH** . Refer to **REMOVAL - Step 4**
5. **REMOVE FRONT FENDER TO COWL SIDE SEAL RH** . Refer to **REMOVAL - Step 5**
6. **REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 6**
7. **REMOVE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY** . Refer to **REMOVAL - Step 7**
8. **REMOVE COWL PANEL SUB-ASSEMBLY** . Refer to **REMOVAL - Step 10**
9. **REMOVE AIR CLEANER INLET COVER ASSEMBLY SEAL (for 2GR-FE)** . Refer to **REMOVAL - Step 25**
10. **REMOVE AIR CLEANER INLET ASSEMBLY (for 1AR-FE)** . Refer to **REMOVAL - Step 22**
11. **REMOVE AIR CLEANER AND HOSE (for 2GR-FE)** . Refer to **REMOVAL - Step 7**
12. **REMOVE AIR CLEANER ASSEMBLY (for 1AR-FE)** . Refer to **REMOVAL - Step 7**
13. **REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY (for 1AR-FE)** . Refer to **REMOVAL - Step 21**
14. **REMOVE AIR CLEANER HOSE (for 1AR-FE)** . Refer to **REMOVAL - Step 3**
15. **DRAIN BRAKE FLUID**

NOTE: If brake fluid leaks onto any painted surface, immediately wash it off.

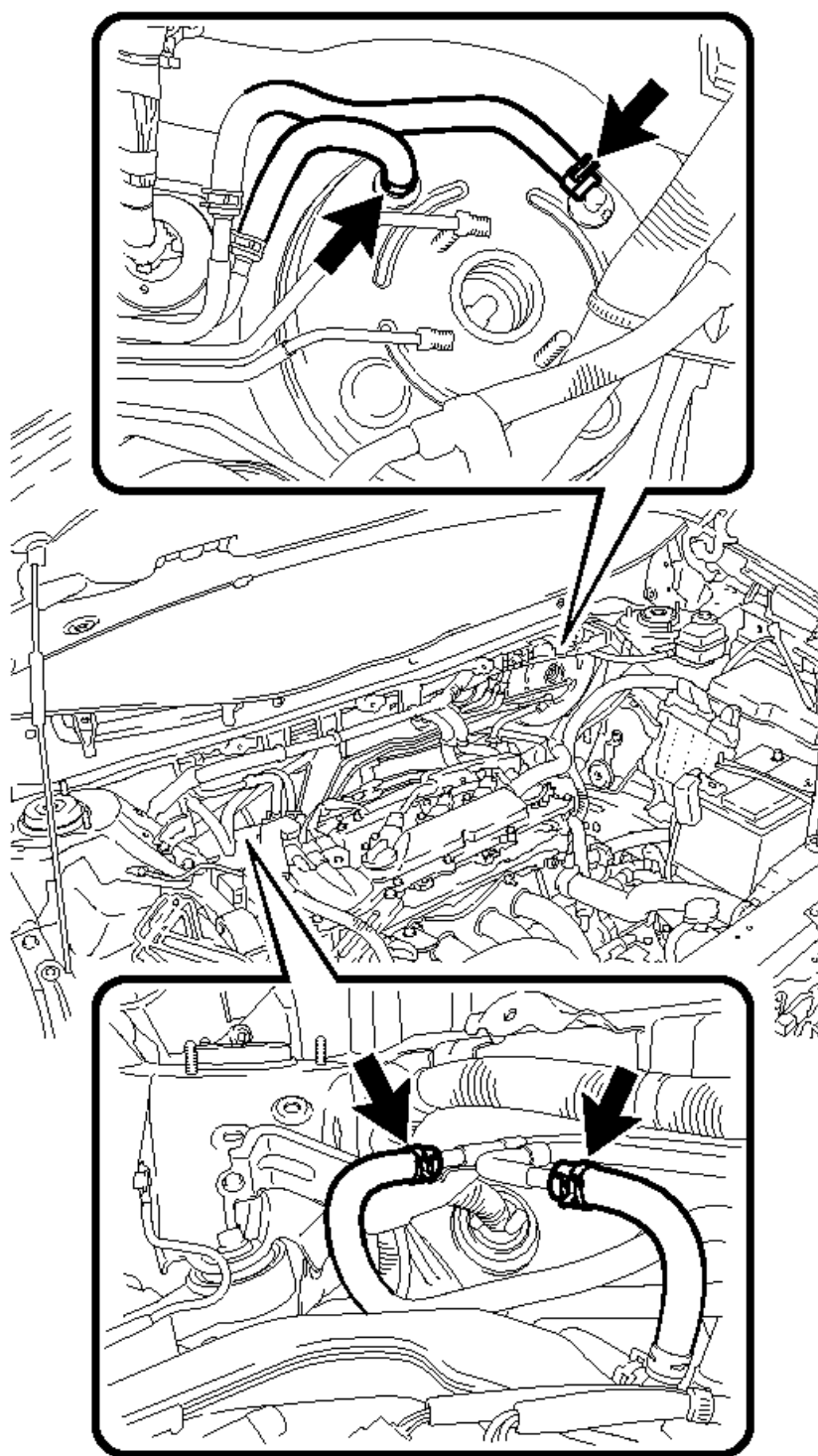
16. **DISCONNECT NO. 1 RESERVOIR TUBE** See step 8
17. **REMOVE BRAKE MASTER CYLINDER SUB-ASSEMBLY** See step 9
18. **DISCONNECT UNION TO CHECK VALVE HOSE (for 2GR-FE)**
 - a. Slide the clip and disconnect the union to check valve hose.



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Fig. 50: Identifying Union To Check Valve Hose & Clip (For 2GR-FE)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

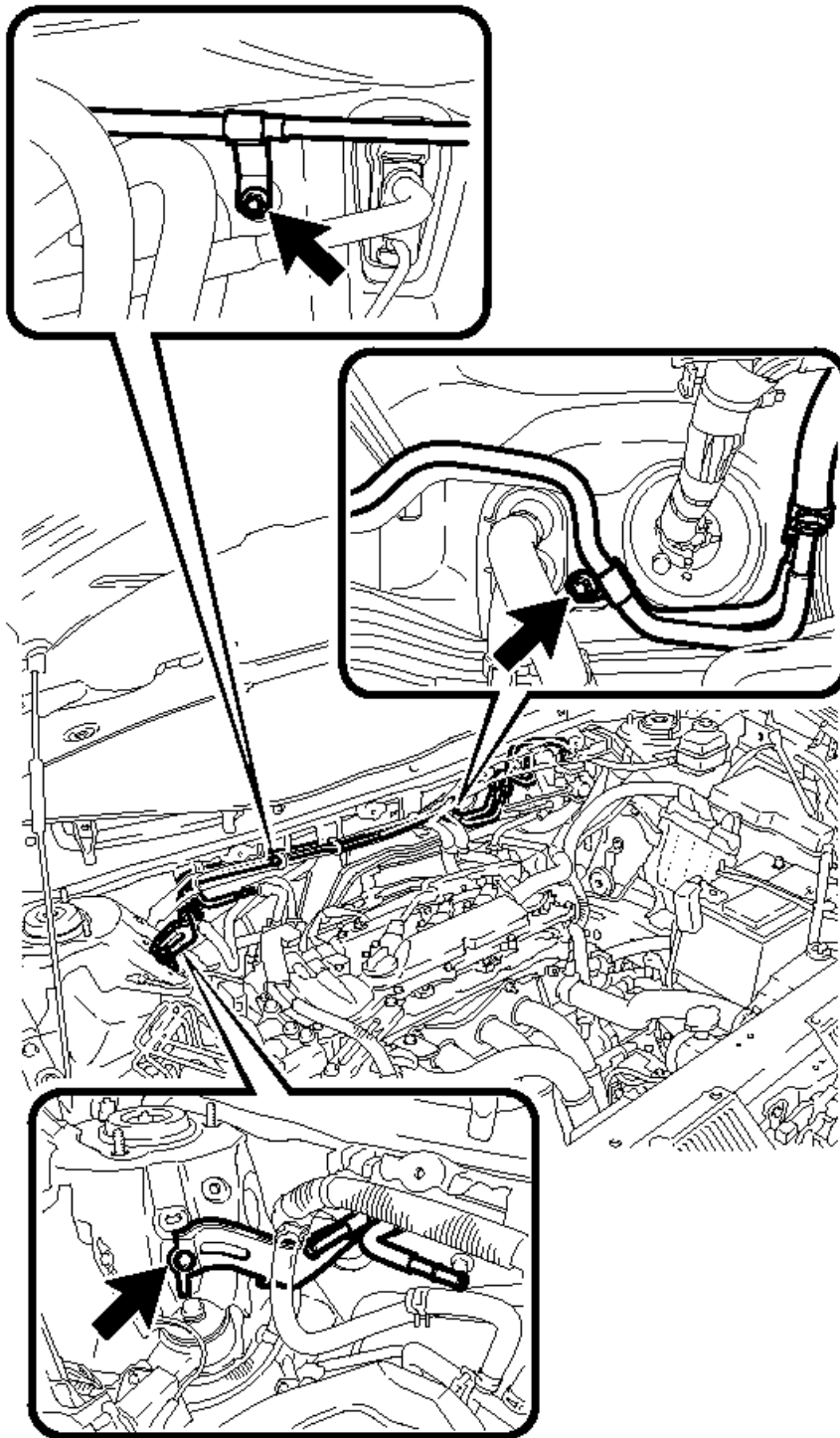
19. **REMOVE VACUUM HOSE ASSEMBLY (for 1AR-FE)**
 - a. Slide the 4 clips and disconnect the 4 vacuum hoses.



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Fig. 51: Identifying Vacuum Hoses & Clips (For 1AR-FE)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

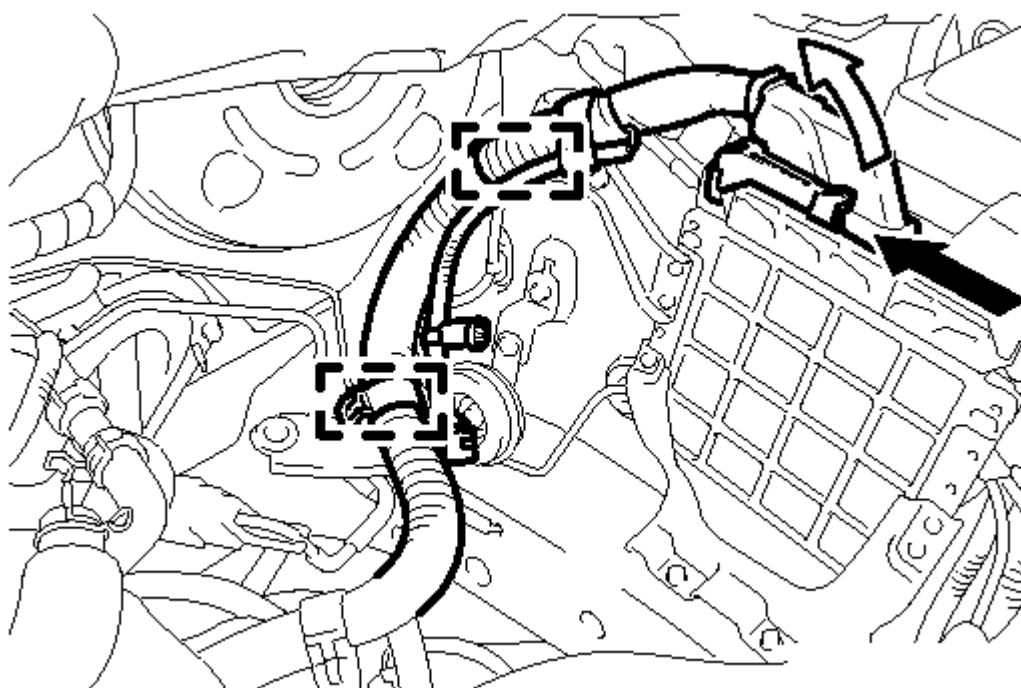
- b. Remove the 2 nuts, bolt and vacuum hose assembly.



P

Fig. 52: Identifying Vacuum Hose Assembly & Fasteners (For 1AR-FE)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

20. SEPARATE ENGINE ROOM MAIN WIRE
 - a. Disengage the 2 clamps.

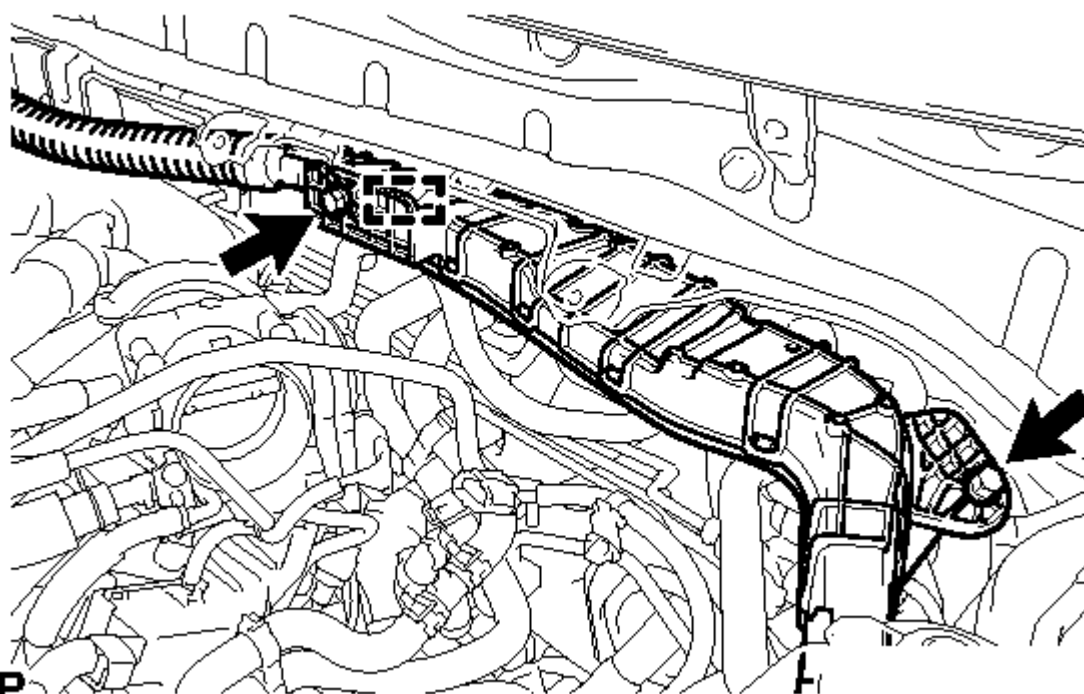


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Fig. 53: Removing Engine Room Main Wire ECM Connector & Clamps

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Raise the lever while pushing the lock on the lever, and disconnect the ECM connector.
- c. Remove the 2 bolts and clamp and separate the engine room main wire.



P

Fig. 54: Identifying Engine Room Main Wire & Fasteners

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

21. SEPARATE NO. 1 FRONT BRAKE TUBE ASSEMBLY

- a. Disengage the clamp and separate the No. 1 front brake tube assembly.

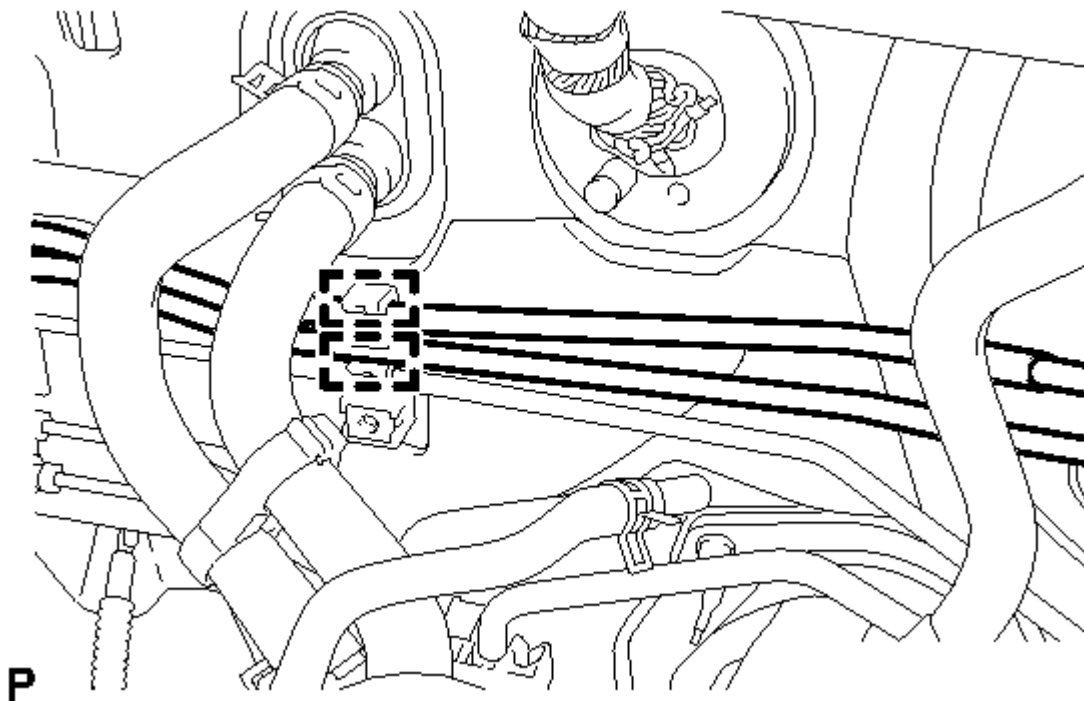


Fig. 55: Identifying No. 1 Front Brake Tube Assembly & Clamp

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

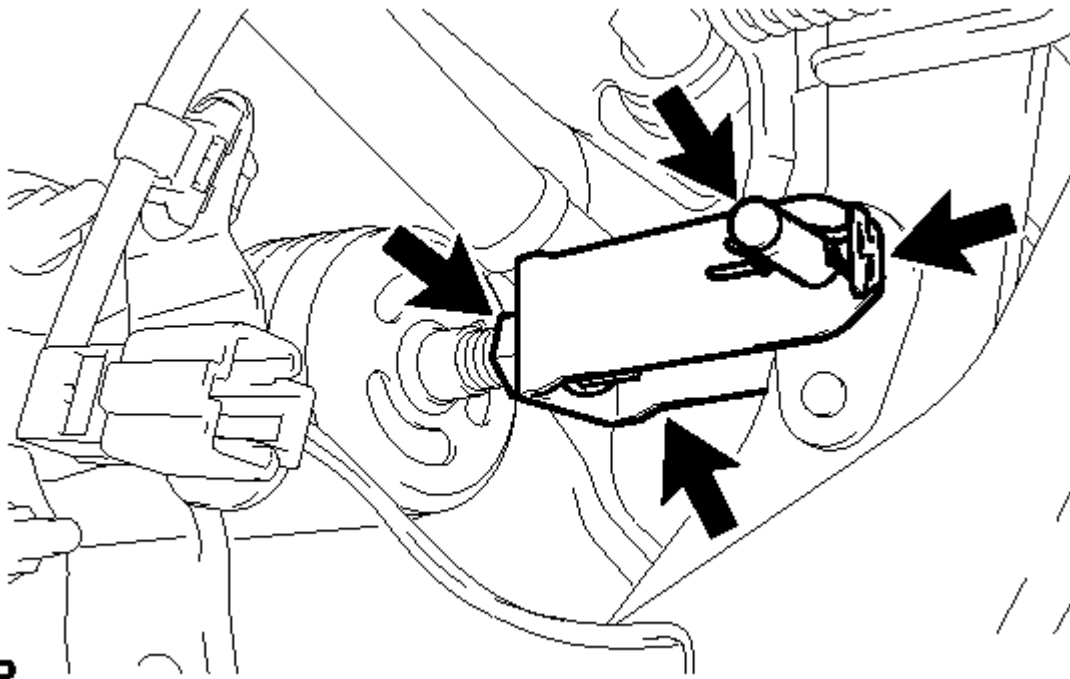
NOTE: Be careful not to damage the brake lines or clamps. If any parts are damaged, replace them with new ones.

22. REMOVE KNEE AIRBAG ASSEMBLY

Refer to **REMOVAL**

23. REMOVE BRAKE MASTER CYLINDER PUSH ROD CLEVIS

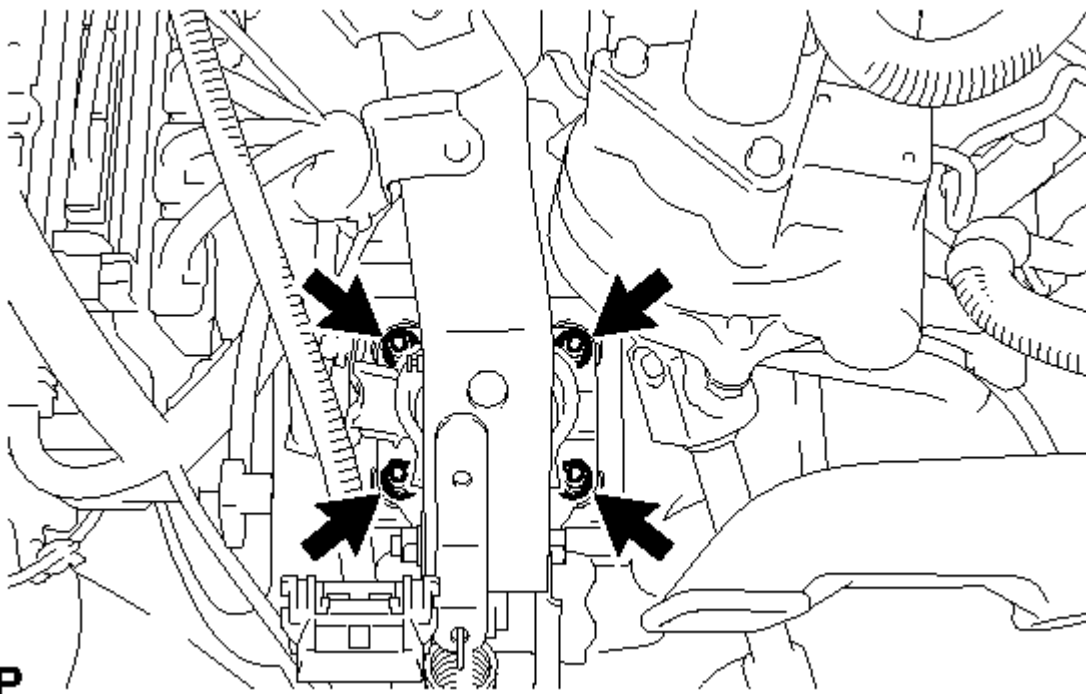
- a. Loosen the lock nut.



P

Fig. 56: Identifying Push Rod Pin & Clip At Brake Pedal Support Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the clip and the push rod pin and separate the push rod clevis from the brake pedal support assembly.
 - c. Remove the brake master cylinder push rod clevis and lock nut from the brake booster assembly.
24. **REMOVE BRAKE BOOSTER ASSEMBLY**
- a. Remove the 4 nuts and brake booster assembly.

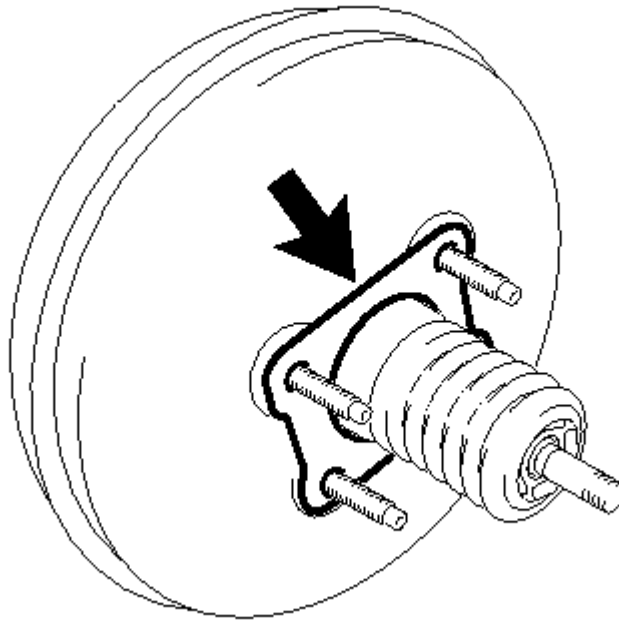


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Fig. 57: Identifying Brake Booster Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE: **Do not damage the brake lines.**

25. REMOVE BRAKE BOOSTER GASKET

- a. Remove the brake booster gasket from the brake booster assembly.



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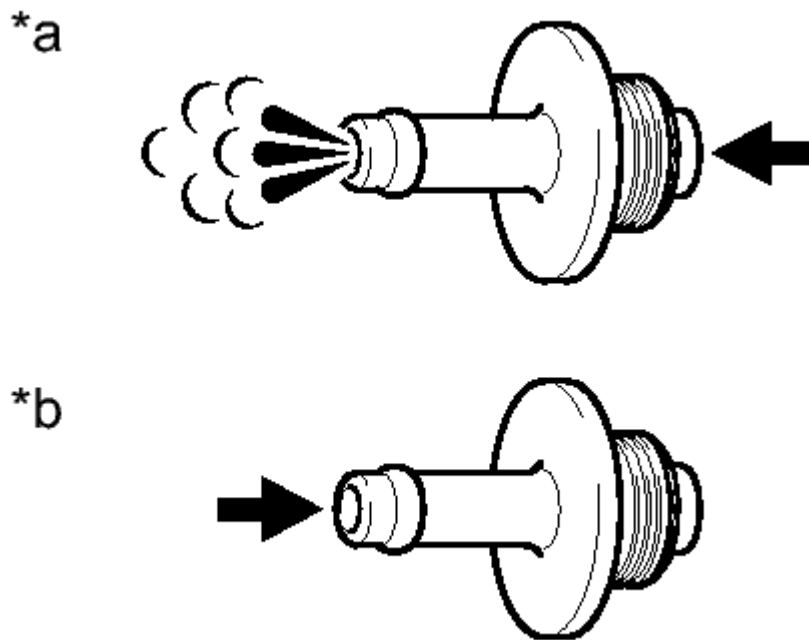
Fig. 58: Identifying Brake Booster Gasket At Brake Booster Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

26. **REMOVE BRAKE VACUUM CHECK VALVE ASSEMBLY (for 2GR-FE)**
 - a. Remove the vacuum check valve assembly from the brake booster assembly.
27. **REMOVE BRAKE VACUUM CHECK VALVE ASSEMBLY (for 1AR-FE)**
 - a. Remove the 2 vacuum check valve assemblies from the brake booster assembly.
28. **REMOVE CHECK VALVE GROMMET (for 2GR-FE)**
 - a. Remove the check valve grommet from the brake booster assembly.
29. **REMOVE CHECK VALVE GROMMET (for 1AR-FE)**
 - a. Remove the 2 check valve grommets from the brake booster assembly.

INSPECTION

INSPECTION

1. **INSPECT BRAKE VACUUM CHECK VALVE ASSEMBLY**
 - a. Check that there is ventilation from the booster to the engine, and no ventilation from the engine to the booster.



P

Fig. 59: Inspecting Brake Vacuum Check Valve Assembly Ventilation
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

*a	Ventilation
*b	No Ventilation

If the results are not as specified, replace the brake vacuum check valve assembly.

INSTALLATION

INSTALLATION

1. **INSTALL CHECK VALVE GROMMET (for 2GR-FE)**
 - a. Install a new check valve grommet to the brake booster assembly.
2. **INSTALL CHECK VALVE GROMMET (for 1AR-FE)**
 - a. Install 2 new check valve grommets to the brake booster assembly.
3. **INSTALL BRAKE VACUUM CHECK VALVE ASSEMBLY (for 2GR-FE)**
 - a. Install the vacuum check valve assembly to the brake booster assembly.
4. **INSTALL BRAKE VACUUM CHECK VALVE ASSEMBLY (for 1AR-FE)**
 - a. Install the 2 vacuum check valve assemblies to the brake booster assembly.
5. **INSTALL BRAKE BOOSTER GASKET**
 - a. Install a new brake booster gasket to the brake booster assembly.

6. INSTALL BRAKE BOOSTER ASSEMBLY

- a. Install the brake booster assembly with the 4 nuts.

Torque: 13 N*m (130 kgf*cm, 9 ft.*lbf)

NOTE: Be careful not to damage the brake lines or clamps. If any parts are damaged, replace them with new ones.

7. INSTALL BRAKE MASTER CYLINDER PUSH ROD CLEVIS

- a. Install the lock nut and brake master cylinder push rod clevis to the brake booster assembly.
- b. Tighten the lock nut.

Torque: 26 N*m (265 kgf*cm, 19 ft.*lbf)

- c. Apply lithium soap base glycol grease to the push rod pin.
- d. Install the push rod clevis onto the brake pedal support assembly with the push rod pin and new clip.

8. INSTALL KNEE AIRBAG ASSEMBLY

Refer to **INSTALLATION**

9. INSTALL NO. 1 FRONT BRAKE TUBE ASSEMBLY

- a. Engage the clamp to install the No. 1 front brake tube assembly.

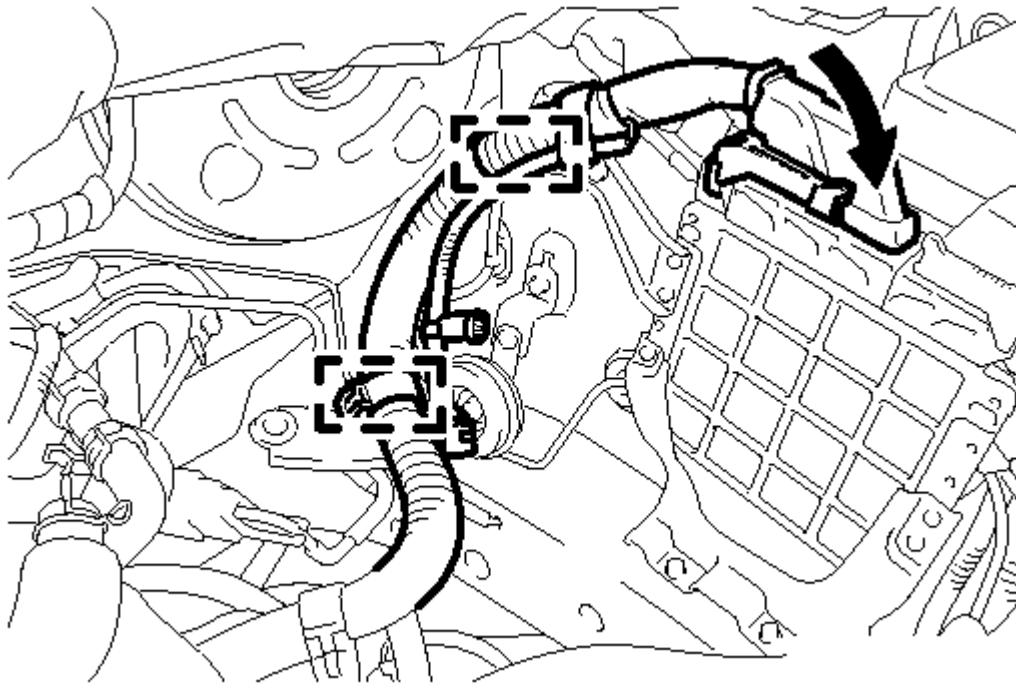
NOTE: Be careful not to damage the brake lines or clamps. If any parts are damaged, replace them with new ones.

10. INSTALL ENGINE ROOM MAIN WIRE

- a. Engage the clamp and 2 bolts and install the engine room main wire.

Torque: 7.3 N*m (74 kgf*cm, 64 in.*lbf)

- b. Connect the ECM connector and lower the lever.



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Fig. 60: Installing Engine Room Main Wire ECM Connector & Clamps
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

NOTE:

- When connecting the connectors, make sure that dirt, water or other foreign matter does not become stuck between the connectors and other parts.
- Make sure that the lever is securely locked.

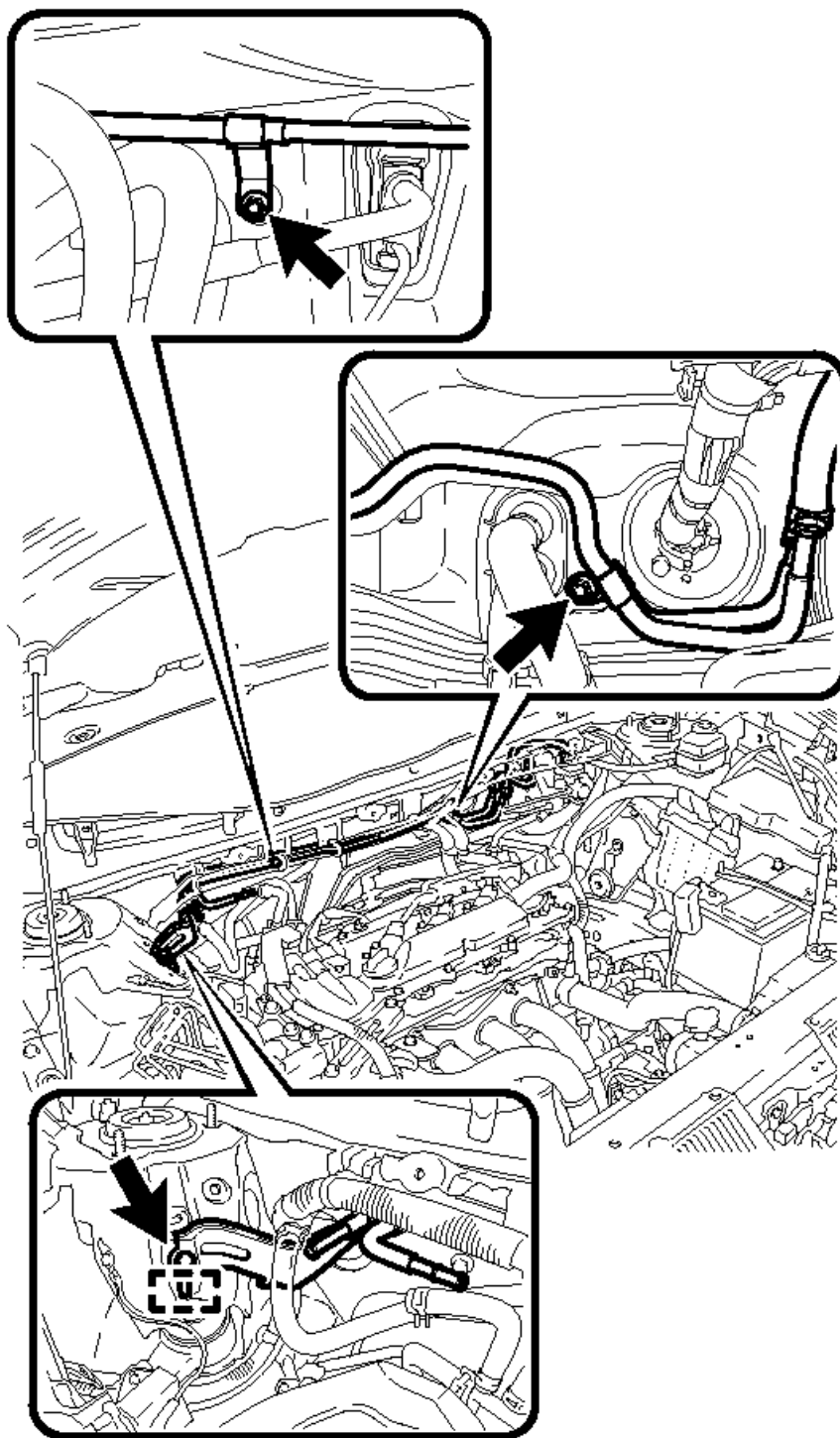
c. Engage the 2 clamps.

11. CONNECT UNION TO CHECK VALVE HOSE (for 2GR-FE)

a. Connect the union to check valve hose to the vacuum check valve and slide the clip.

12. INSTALL VACUUM HOSE ASSEMBLY (for 1AR-FE)

a. Install the vacuum hose assembly with the bolt and 2 nuts.



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Fig. 61: Installing Vacuum Hose Assembly & Fasteners
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Torque: 5.4 N*m (55 kgf*cm, 48 in.*lbf)

NOTE: Be sure to insert the vacuum hose assembly into the stopper hole while installing the vacuum hose assembly.

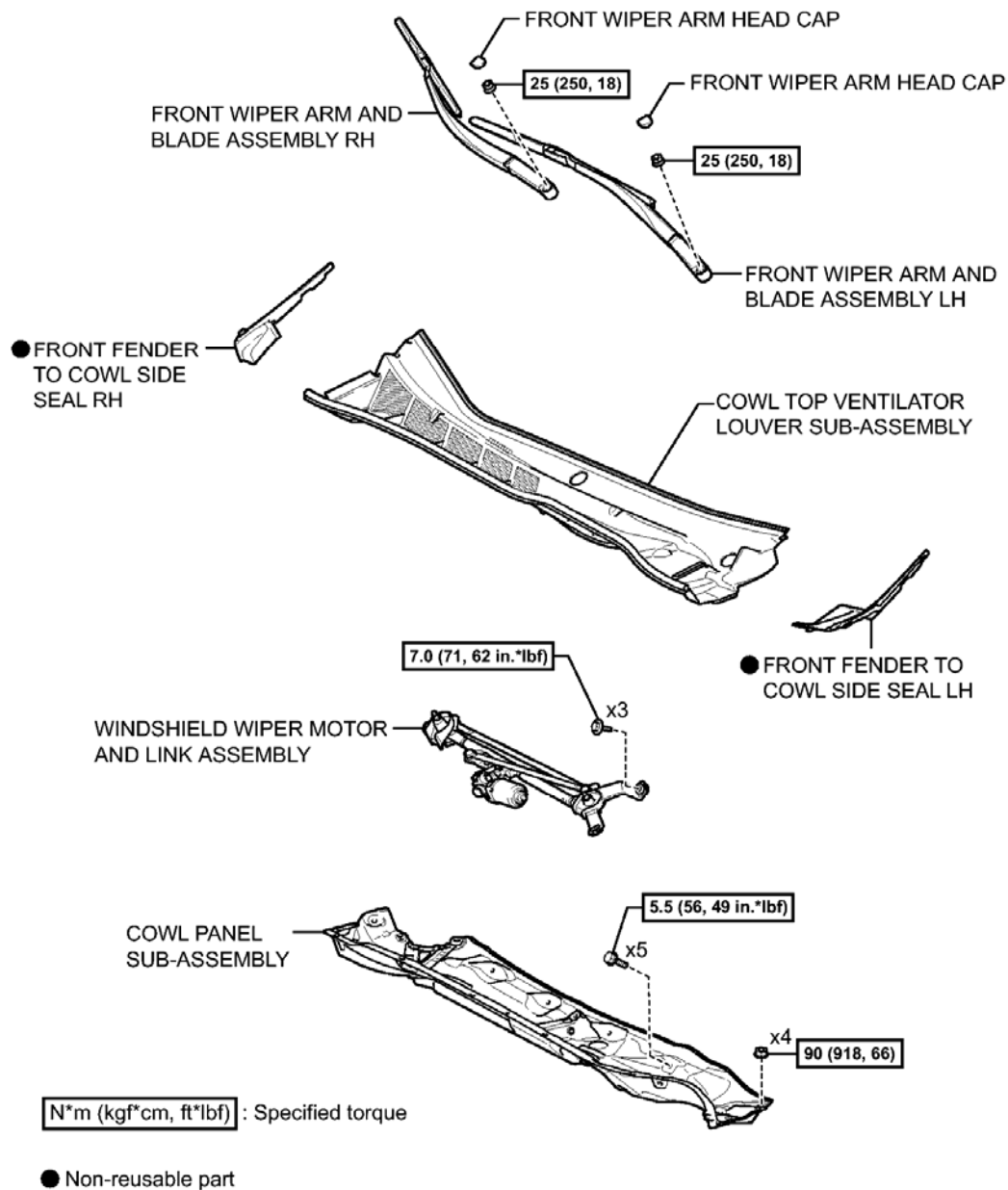
- b. Connect the 4 vacuum hoses to the vacuum check valve assemblies, vacuum tube and slide the 4 clips.

13. **INSTALL BRAKE MASTER CYLINDER SUB-ASSEMBLY** See step 2
14. **CONNECT NO. 1 RESERVOIR TUBE** See step 3
15. **INSTALL AIR CLEANER AND HOSE (for 2GR-FE)** . Refer to INSTALLATION - Step 4
16. **INSTALL AIR CLEANER HOSE (for 1AR-FE)** . Refer to INSTALLATION - Step 18
17. **INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY (for 1AR-FE)** . Refer to INSTALLATION - Step 75
18. **INSTALL AIR CLEANER ASSEMBLY (for 1AR-FE)** . Refer to INSTALLATION - Step 5
19. **INSTALL AIR CLEANER INLET COVER ASSEMBLY SEAL (for 2GR-FE)** . Refer to INSTALLATION - Step 62
20. **INSTALL AIR CLEANER INLET ASSEMBLY (for 1AR-FE)** . Refer to INSTALLATION - Step 47
21. **FILL RESERVOIR WITH BRAKE FLUID** See step 2
22. **BLEED BRAKE MASTER CYLINDER** See step 3
23. **BLEED BRAKE LINE** See step 4
24. **BLEED BRAKE ACTUATOR** See step 5
25. **INSPECT FOR BRAKE FLUID LEAK**
26. **INSPECT FLUID LEVEL IN RESERVOIR** See step 1
27. **INSTALL COWL PANEL SUB-ASSEMBLY** . Refer to INSTALLATION - Step 12
28. **INSTALL WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY** . Refer to INSTALLATION - Step 2
29. **INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** . Refer to INSTALLATION - Step 3
30. **INSTALL FRONT FENDER TO COWL SIDE SEAL LH** . Refer to INSTALLATION - Step 4
31. **INSTALL FRONT FENDER TO COWL SIDE SEAL RH** . Refer to INSTALLATION - Step 5
32. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH** . Refer to INSTALLATION - Step 6
33. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH** . Refer to INSTALLATION - Step 7
34. **INSTALL FRONT WIPER ARM HEAD CAP** . Refer to INSTALLATION - Step 8
35. **INSPECT BRAKE PEDAL HEIGHT** See step 1
36. **INSPECT BRAKE PEDAL FREE PLAY** See step 3
37. **INSPECT BRAKE PEDAL RESERVE DISTANCE** See step 4

EJECTOR TUBE

COMPONENTS

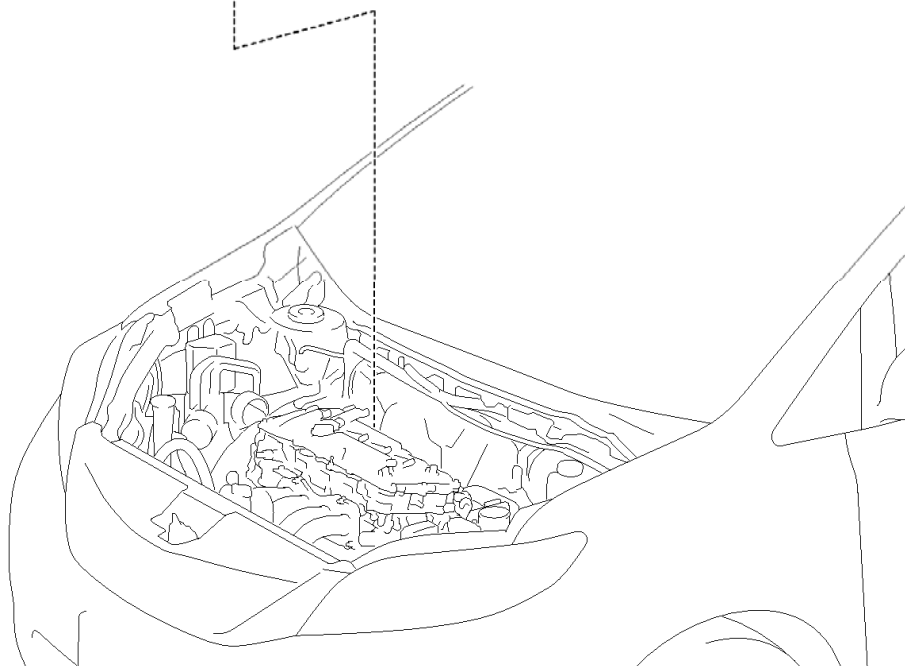
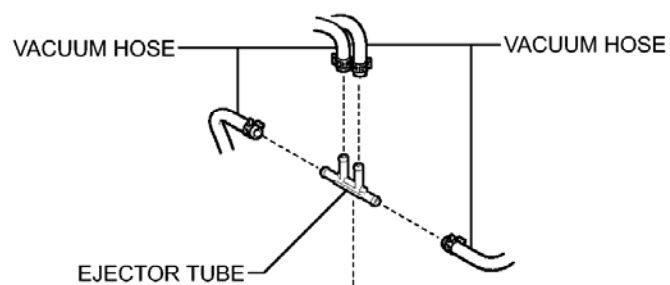
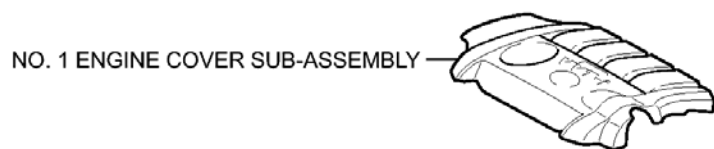
ILLUSTRATION



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Fig. 62: Ejector Tube Replacement Components With Torque Specifications
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



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Fig. 63: Ejector Tube Replacement Components
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

REMOVAL

REMOVAL

1. **REMOVE FRONT WIPER ARM HEAD CAP** . Refer to **REMOVAL - Step 1**
2. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH** . Refer to **REMOVAL - Step 2**
3. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH** . Refer to **REMOVAL - Step 3**
4. **REMOVE FRONT FENDER TO COWL SIDE SEAL LH** . Refer to **REMOVAL - Step 4**
5. **REMOVE FRONT FENDER TO COWL SIDE SEAL RH** . Refer to **REMOVAL - Step 5**
6. **REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 6**
7. **REMOVE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY** . Refer to **REMOVAL - Step 7**
8. **REMOVE COWL PANEL SUB-ASSEMBLY** . Refer to **REMOVAL - Step 10**
9. **REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 21**
10. **REMOVE EJECTOR TUBE**
 - a. Disconnect the 4 vacuum hoses to remove the ejector tube.

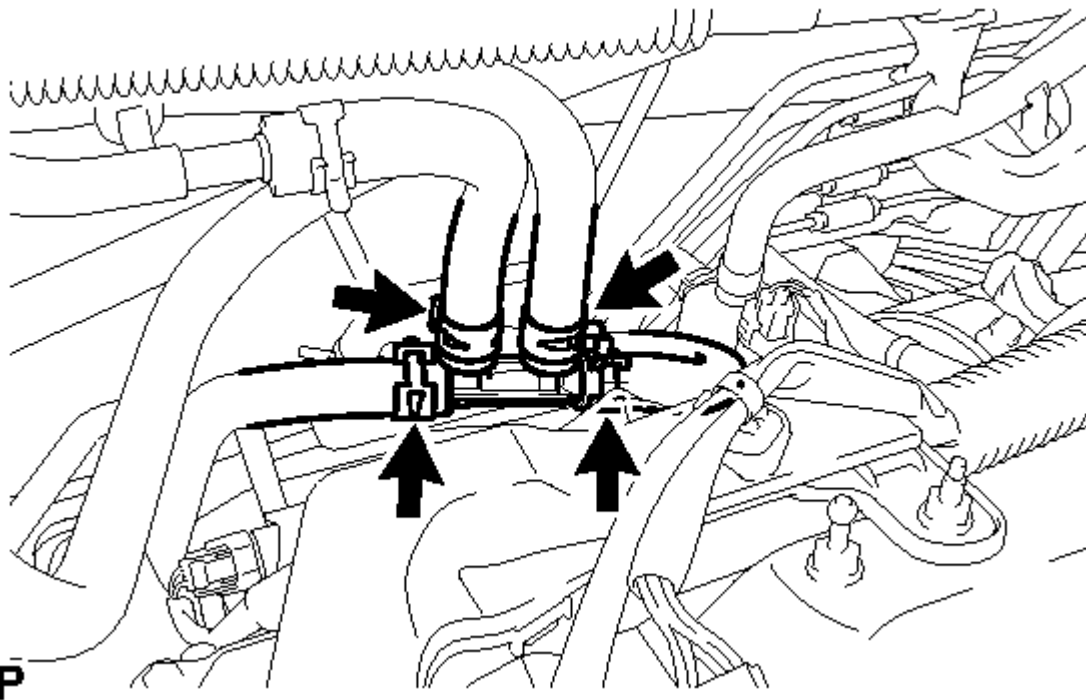


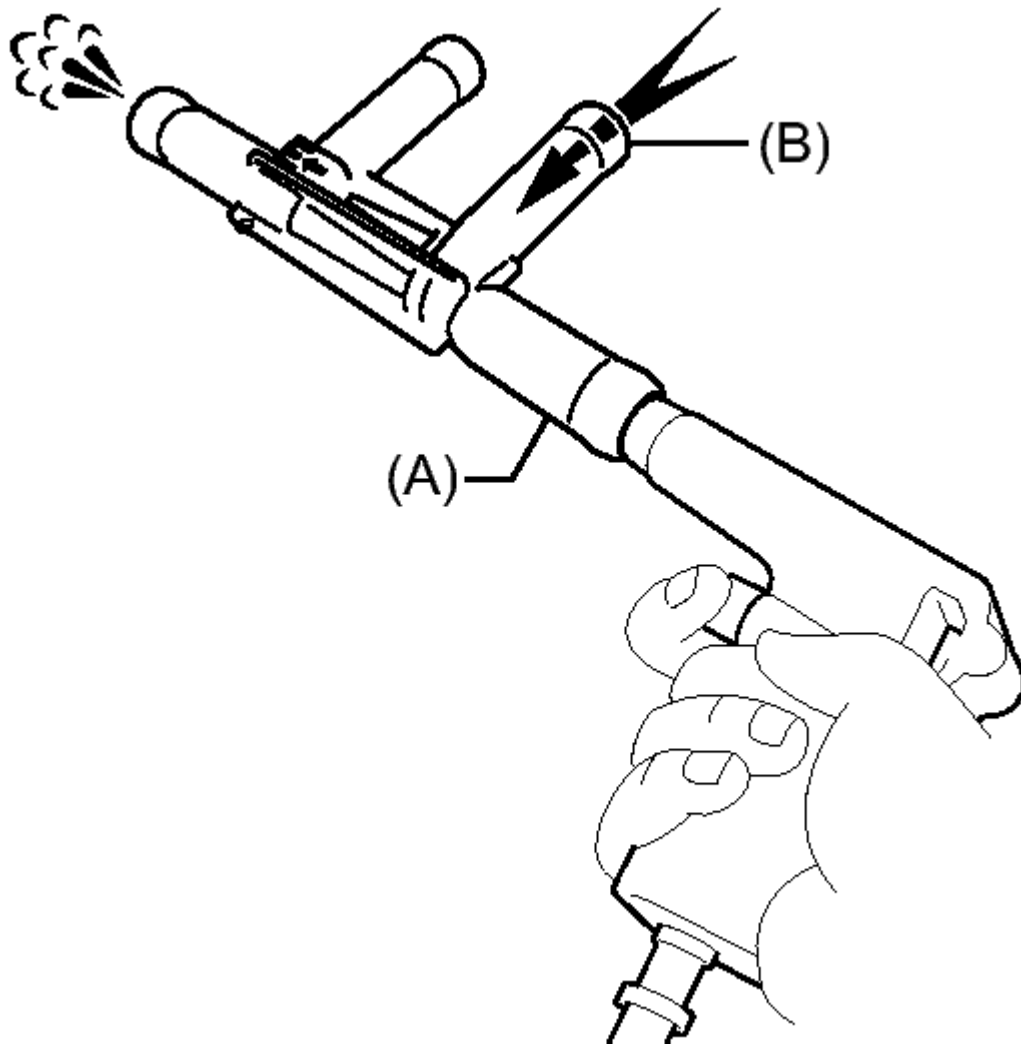
Fig. 64: Identifying Ejector Tube & Vacuum Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

INSPECTION

1. **INSPECT EJECTOR TUBE**
 - a. Inspect that the ejector tube has no deformation or cracks.

- b. Check that suction occurs at the port (B) when applying compressed air into the port (A).



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Fig. 65: Checking For Suction At Port B
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

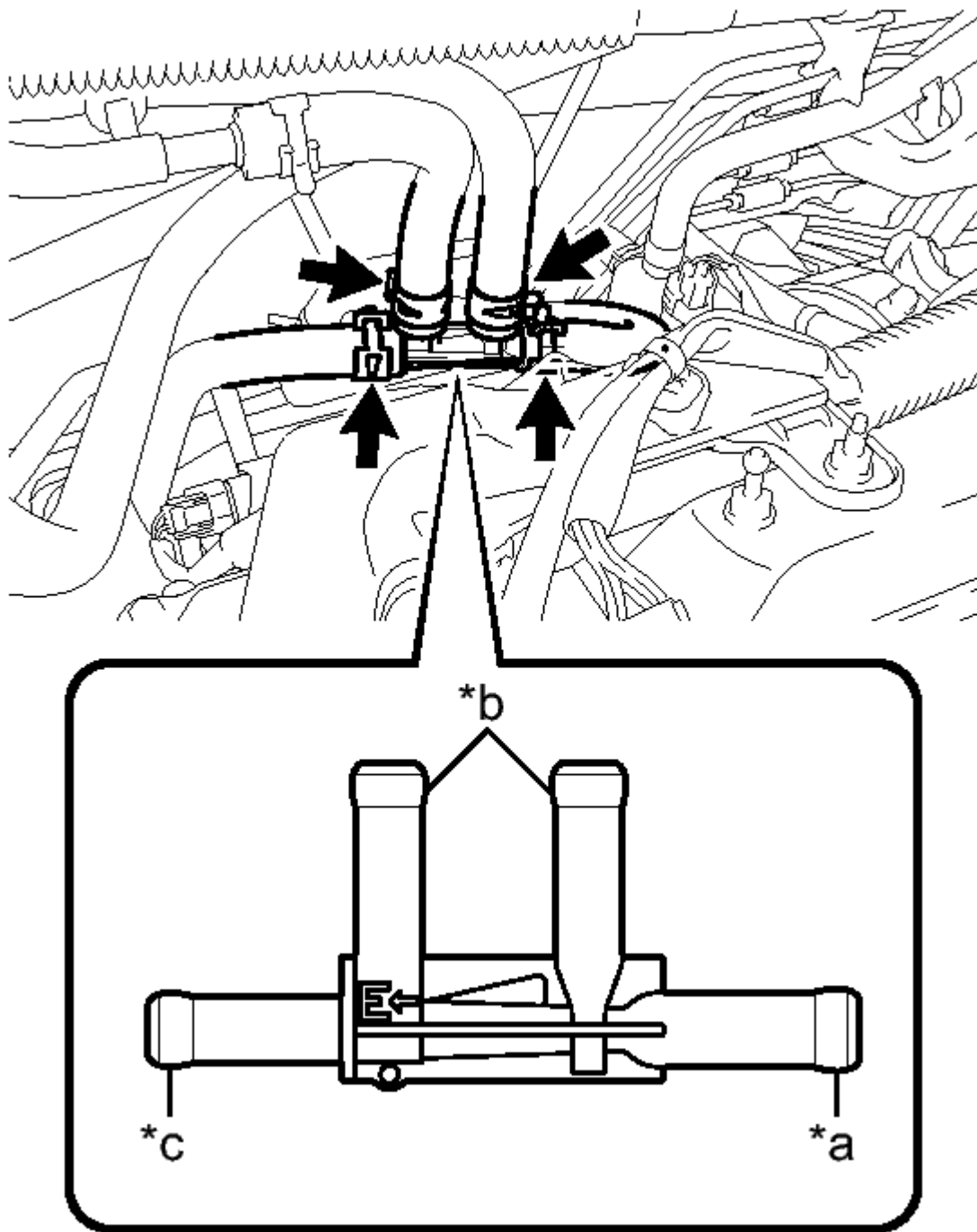
If any defect is found, replace the ejector tube with a new one.

INSTALLATION

INSTALLATION

1. INSTALL EJECTOR TUBE

- a. Connect the 4 vacuum hoses to the ejector tube to install it.



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Fig. 66: Identifying Ejector Tube & Vacuum Hoses
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

From

*a	Air Cleaner
*b	From Brake Booster
*c	To Intake Manifold

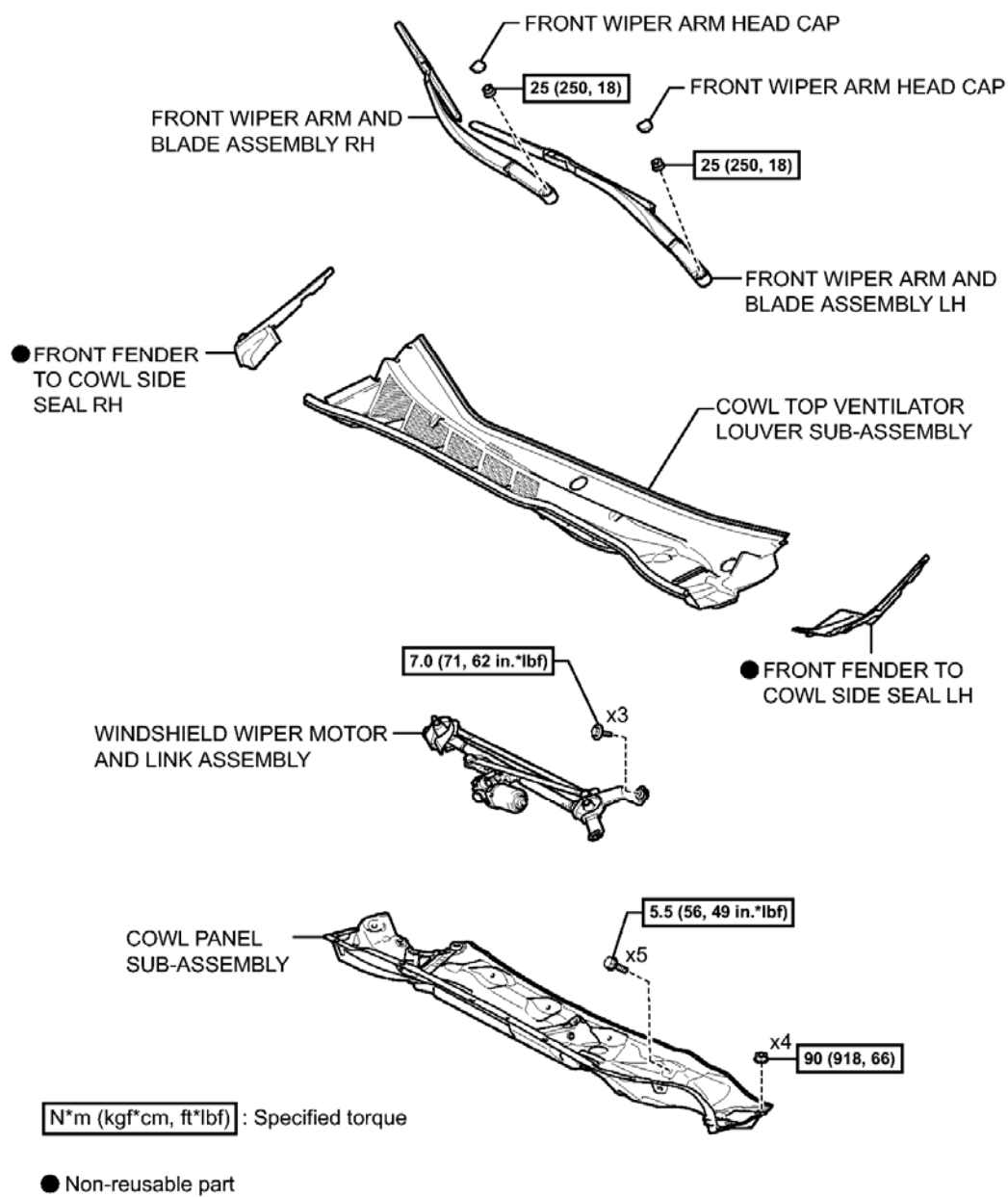
NOTE: Install the ejector tube in the correct direction.

2. **INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 75**
3. **INSTALL COWL PANEL SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 12**
4. **INSTALL WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY** . Refer to **INSTALLATION - Step 2**
5. **INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 3**
6. **INSTALL FRONT FENDER TO COWL SIDE SEAL LH** . Refer to **INSTALLATION - Step 4**
7. **INSTALL FRONT FENDER TO COWL SIDE SEAL RH** . Refer to **INSTALLATION - Step 5**
8. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH** . Refer to **INSTALLATION - Step 6**
9. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH** . Refer to **INSTALLATION - Step 7**
10. **INSTALL FRONT WIPER ARM HEAD CAP** . Refer to **INSTALLATION - Step 8**

VACUUM SWITCHING VALVE

COMPONENTS

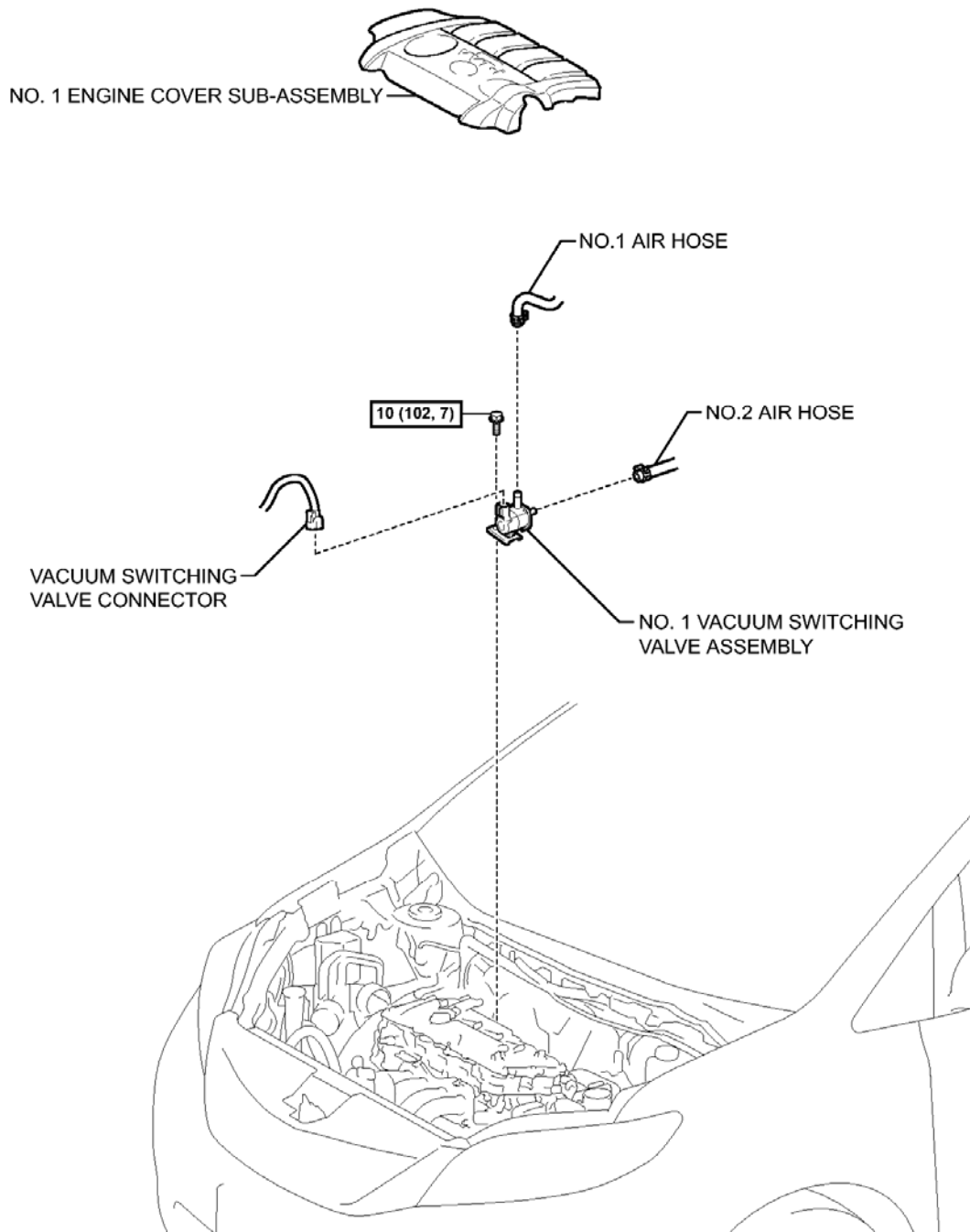
ILLUSTRATION



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Fig. 67: Vacuum Switching Valve Replacement Components With Torque Specifications (1 of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ILLUSTRATION



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

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Fig. 68: Vacuum Switching Valve Replacement Components With Torque Specifications (2 of 2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

ON-VEHICLE INSPECTION

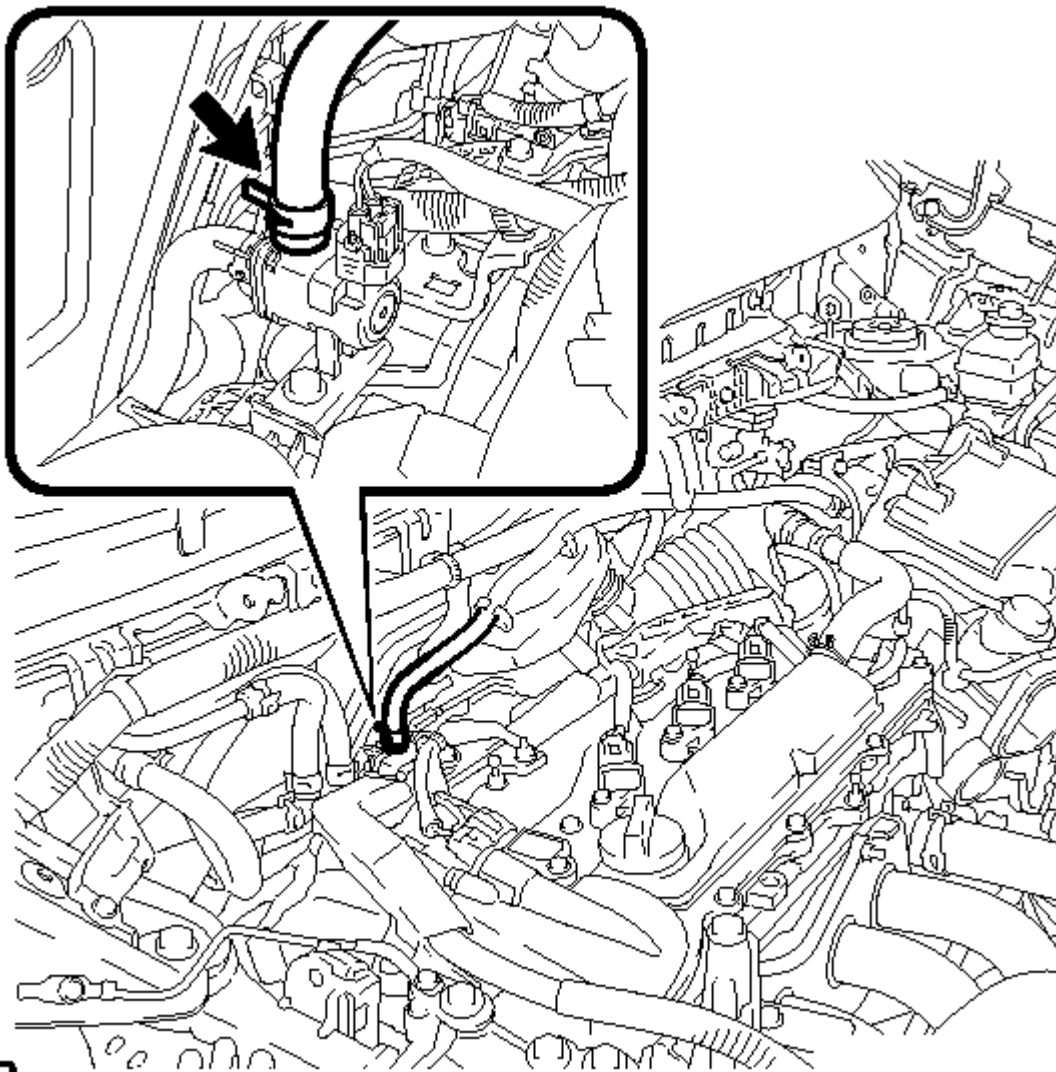
ON-VEHICLE INSPECTION

1. REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY

Refer to **REMOVAL**

2. INSPECT NO. 1 VACUUM SWITCHING VALVE ASSEMBLY

- a. Disconnect the No. 1 air hose (connected to the air cleaner) from the No. 1 vacuum switching valve assembly.



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Fig. 69: Identifying No. 1 Air Hose At No. 1 Vacuum Switching Valve Assembly
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Move the shift lever to P and apply the parking brake.
- c. Connect the Techstream to the DLC3, and then turn the ignition switch to ON.
- d. Enter the following menus: Powertrain / Engine / Active Test / Activate the Brake Ejector VSV.

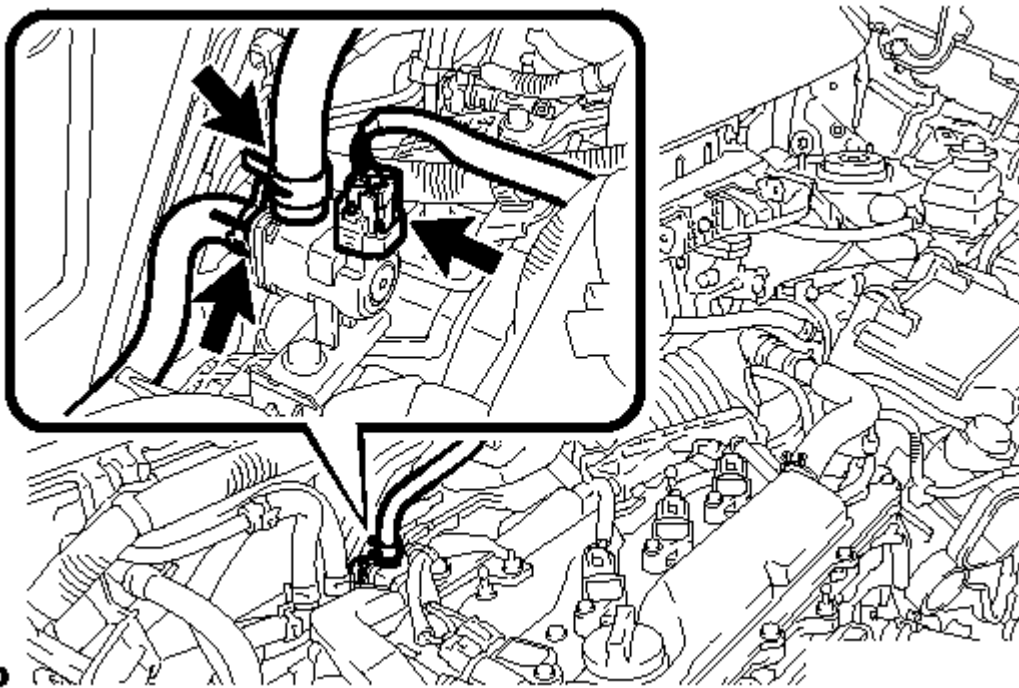
- e. Start the engine.
 - f. Using the Techstream, turn off the No. 1 vacuum switching valve assembly (Brake Ejector VSV: CLOSE).
 - g. Use your finger to confirm that the No. 1 vacuum switching valve assembly has no suction.
 - h. Using the Techstream, turn on the No. 1 vacuum switching valve assembly (Brake Ejector VSV: OPEN).
 - i. Use your finger to confirm that the No. 1 vacuum switching valve assembly has suction.
 - j. Connect the No. 1 air hose to the No. 1 vacuum switching valve assembly.
3. **INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY**

Refer to **INSTALLATION**

REMOVAL

REMOVAL

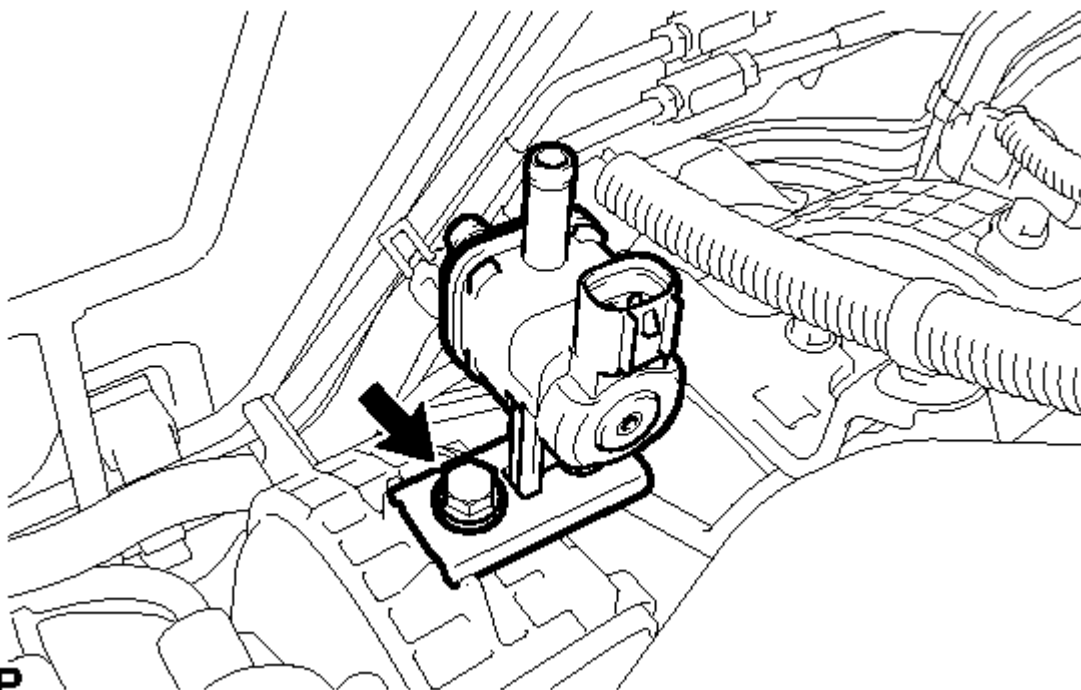
- 1. **REMOVE FRONT WIPER ARM HEAD CAP** . Refer to **REMOVAL - Step 1**
- 2. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH** . Refer to **REMOVAL - Step 2**
- 3. **REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY RH** . Refer to **REMOVAL - Step 3**
- 4. **REMOVE FRONT FENDER TO COWL SIDE SEAL LH** . Refer to **REMOVAL - Step 4**
- 5. **REMOVE FRONT FENDER TO COWL SIDE SEAL RH** . Refer to **REMOVAL - Step 5**
- 6. **REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 6**
- 7. **REMOVE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY** . Refer to **REMOVAL - Step 7**
- 8. **REMOVE COWL PANEL SUB-ASSEMBLY** . Refer to **REMOVAL - Step 10**
- 9. **REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY** . Refer to **REMOVAL - Step 21**
- 10. **REMOVE NO. 1 VACUUM SWITCHING VALVE ASSEMBLY**
 - a. Slide the 2 clips and disconnect the No. 1 air hose, No. 2 air hose and connector.



P

Fig. 70: Identifying No. 1/No. 2 Air Hose, Clips & Connector
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

- b. Remove the bolt and No. 1 vacuum switching valve assembly.



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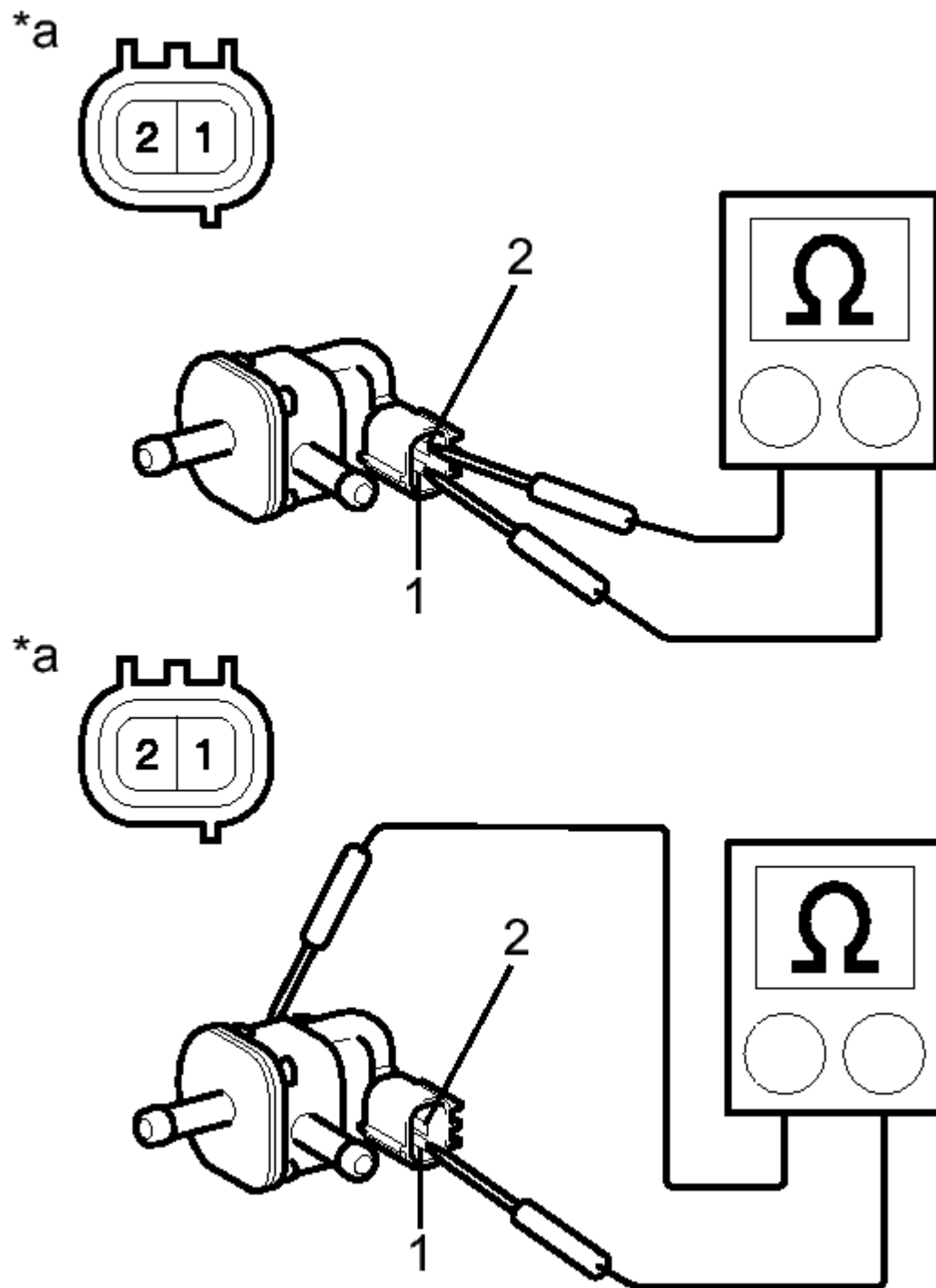
Fig. 71: Identifying No. 1 Vacuum Switching Valve Assembly & Fastener
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

INSPECTION

INSPECTION

1. INSPECT NO. 1 VACUUM SWITCHING VALVE ASSEMBLY

- a. Check the No. 1 vacuum switching valve assembly for an open circuit.
 1. Measure the resistance according to the value(s) in the table below.



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Fig. 72: Measuring No. 1 Vacuum Switching Valve Assembly Resistance
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

TEXT IN ILLUSTRATION

	Component
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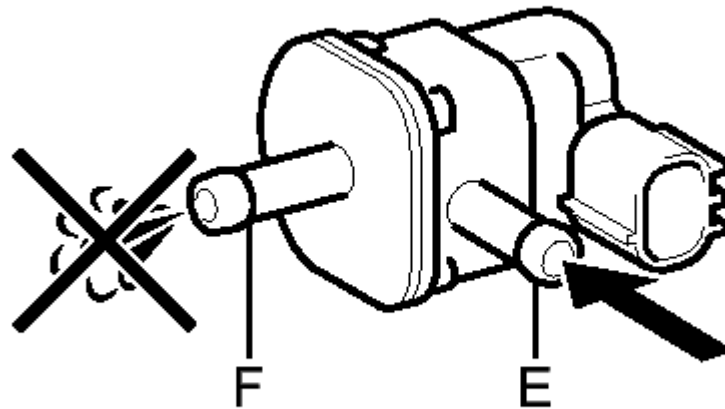
*a	without harness connected (No. 1 Vacuum Switching Valve Assembly)
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Standard Resistance

Tester Connection	Condition	Specified Condition
1 - 2	20°C (68° F)	23 to 26 ohms
1 - Body ground	always	10 Mohms or higher
2 - Body ground	always	10 Mohms or higher

If the result is not as specified, replace the No. 1 vacuum switching valve assembly.

- b. Check the operation of the No. 1 vacuum switching valve assembly.
 1. Check that air does not flow from port E to port F as shown in the illustration.

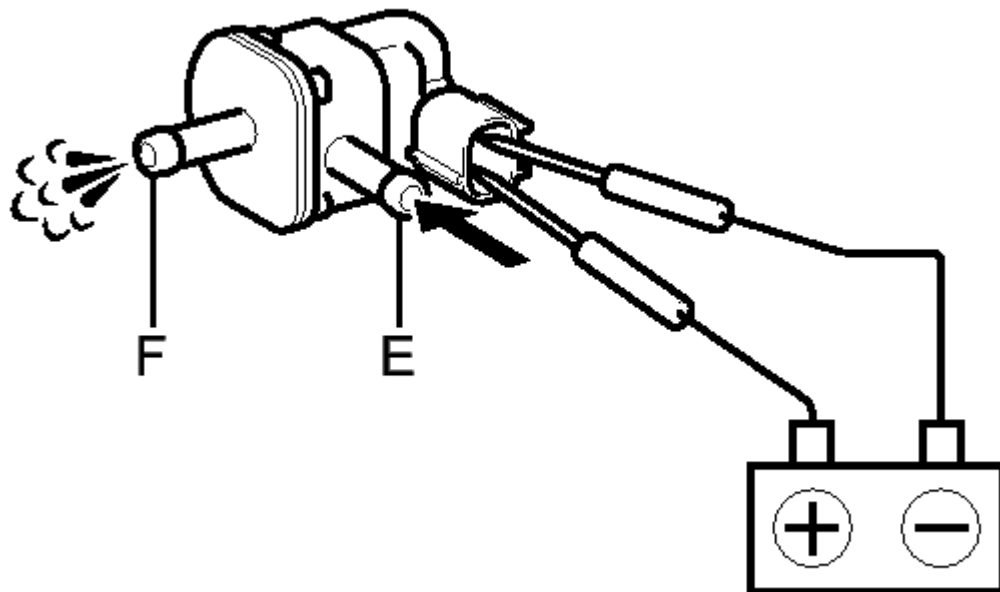


C

Fig. 73: Checking Air Does Not Flow From Port E To Port F
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

If the result is not as specified, replace the No. 1 vacuum switching valve assembly.

2. Apply battery positive voltage across the terminals.



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Fig. 74: Applying Battery Positive Voltage Across Terminals
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

3. Check that air flows from port E to port F as shown in the illustration.

If the result is not as specified, replace the No. 1 vacuum switching valve assembly.

INSTALLATION

INSTALLATION

1. INSTALL NO. 1 VACUUM SWITCHING VALVE ASSEMBLY

- a. Install the No. 1 vacuum switching valve assembly with the bolt.

Torque: 10 N*m (102 kgf*cm, 7 ft.*lbf)

- b. Connect the connector, No. 1 air hose and No 2 air hose and slide the 2 clips.

2. **INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 75**
3. **INSTALL COWL PANEL SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 12**
4. **INSTALL WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY** . Refer to **INSTALLATION - Step 2**
5. **INSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY** . Refer to **INSTALLATION - Step 3**
6. **INSTALL FRONT FENDER TO COWL SIDE SEAL LH** . Refer to **INSTALLATION - Step 4**
7. **INSTALL FRONT FENDER TO COWL SIDE SEAL RH** . Refer to **INSTALLATION - Step 5**
8. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH** . Refer to **INSTALLATION - Step 6**
9. **INSTALL FRONT WIPER ARM AND BLADE ASSEMBLY RH** . Refer to **INSTALLATION - Step 7**
10. **INSTALL FRONT WIPER ARM HEAD CAP** . Refer to **INSTALLATION - Step 8**