Version 1.0

TECHNICAL INSTRUCTIONS

PRIUS (for RHD)

BRAKE BOOSTER PUMP ASSEMBLY (ACCUMULATOR) REPLACEMENT (3530E)

These instructions are to be read and signed by ALL Technicians PRIOR to carrying out repair process

Technician Name	Signature	License	Date

Service/After Sales Manager Name:……Signature:……..…….. Date:……...

《Safety Precautions》

◆ **Be sure to observe the following precautions to prevent accidents and injuries.**

- Park the vehicle and chock the wheels.
- If it is necessary to start the engine, perform the operation in a well ventilated area.
- Before removing and reinstalling heavy parts such as the engine, transmission and differential using specified tools, check that there are no problems with the tools.
- When working in a group of 2 or more, each person must work to ensure the safety of all team members.
- To prevent burns and other injuries, use extra caution when handling parts that are subject to high temperatures, as well as rotating, sliding, or vibrating parts.
- When lifting the vehicle using a jack, support it in the specified location using a safety stand.
- When lifting the vehicle using a lift, lock the lift for safety.

◆ **Also perform the following operation with care.**

Use of auto lift

- Make absolutely certain that there are no other workers and no tools, parts, or other objects within the movable range of the lift. Also, be sure to announce all lift operations out loud (such as “Raising the lift!” and “Lowering the lift!”) to alert other workers.
- When raising or lowering the lift, pay attention to the positions of your arms, legs, and other body parts, and be extremely careful to prevent them from being caught in the lift.

Use of brake cleaner

- Use brake cleaner for appropriate purposes in accordance with instructions in the manual.
- Do not use brake cleaner to remove dirt or stains from the engineer clothes and so forth, as it can catch on fire and cause causing serious burns.

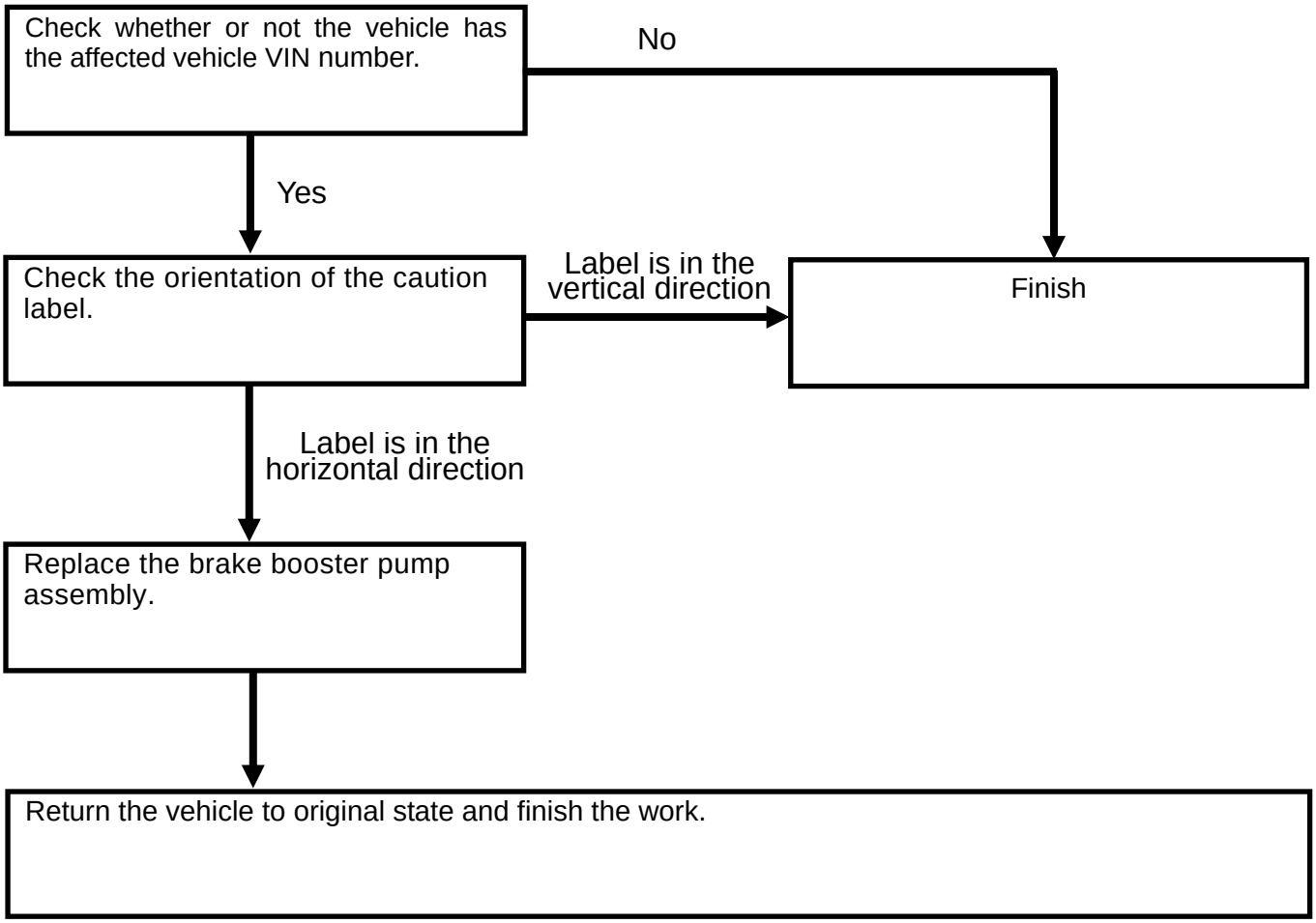
< Precautions >

- Do not use brake cleaner near flames or fire.
- Do not use large amounts of brake cleaner in a room where a fire is burning.
- Do not keep brake cleaner in a place subject to high temperatures exceeding 40°C, such as a place subject to direct sunlight or near fire.
- Do not put brake cleaner in fire.

Edges

- When handling the edges of parts and panels, wear protective gloves or apply protective tape to the edges to prevent injuries to your hands and fingers.

1. OPERATION FLOW CHART



2. IDENTIFICATION OF AFFECTED VEHICLES

2.1. VEHICLE IDENTIFICATION NUMBER RANGE

Model Name	Model Code	VIN Range			Production Period
		WMI	VDS	VIS	
PRIUS	ZVW30	JTD	KN36U#	#1000010 - #1092028	10/10/2008 Through 02/10/2009
				#5000001 - #5076068	24/12/2008 Through 07/10/2009

Note: # indicates that various characters may occupy that position.

Although the involved vehicles are within the above VIN ranges, not all vehicles in these ranges were sold in your country.

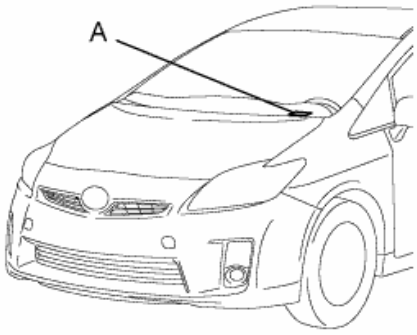
IMPORTANT:

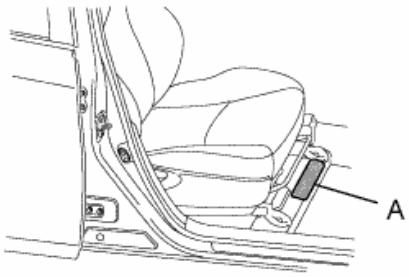
Not all vehicles in the VIN range are affected. As always, confirm VIN eligibility and to assure the campaign is applicable. This will verify the vehicle is affected and has not already been completed prior to dealer shipment or by another dealer. Warranty will not reimburse dealers for repairs conducted on vehicles that are not affected or were completed by another dealer.

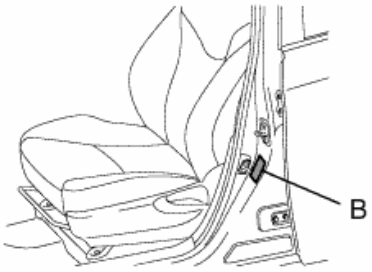
2.2. VEHICLE IDENTIFICATION NUMBER LOCATION

VIN is stamped on the cowl panel. It is also stamped on the certification label as shown in the illustration**.**

A: Vehicle Identification Number Plate
B: Certification Label







c

3. PREPARATION

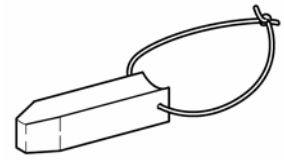
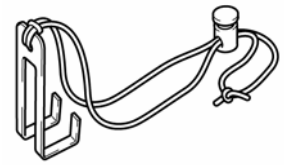
3.1. Replacement components

Parts:

Part Name	Part No.	Qty	Remarks
PUMP ASSY, BRAKE BOOSTER W/ACCUMULATOR	04002-20247	1	—
PUMP ASSY, BRAKE BOOSTER W/ACCUMULATOR	47070-47060	1	—

3.2. Brake booster pump assembly replacement

Tools:

Illustration	Part Name	Part No.	Qty	Remarks
-	Global Techstream	-	1	For DTC checks and for bleeding the brake system
-	Toyota Electrical Tester Set	09080-1C110	1	For voltage measurement
	Union Nut Wrench 10mm	09017-1C100	1	For brake tube removal/installation
-	Torque Wrench	-	-	For checking tightening torque
-	Brake Pump Tool Set (for RHD)	09750-99010	1	-
	Cap	-	3	Used to prevent brake fluid from coming out the brake booster pump (two of them are spare)
	Tube Remover	-	1	Used to unfasten brake and fuel tube clamps
	Bushing Holder	-	1	For holding bushing and collar

Supplies:

Illustration	Part Name	Qty	Type	Remarks
-	Brake Fluid	2.0L	DOT3 or equivalent (DOT4, DOT5.1)	For refill

Equipment:

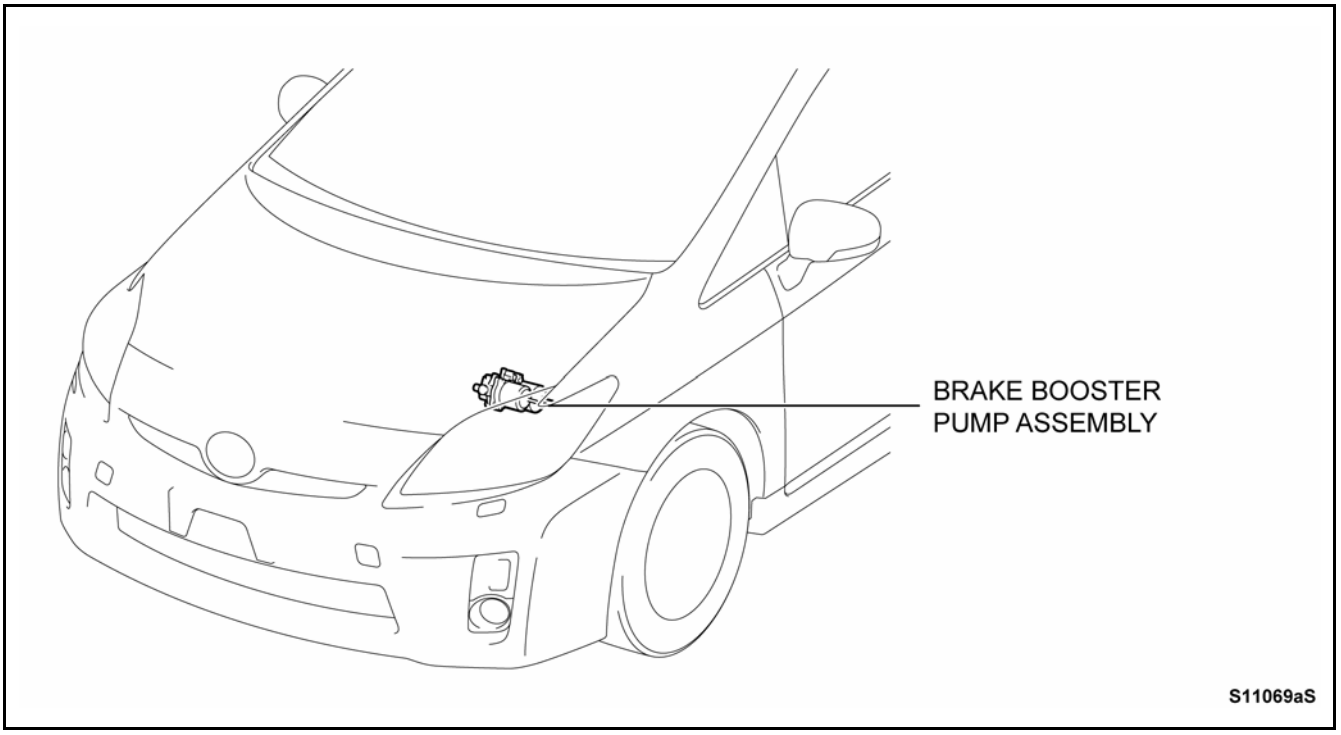
Part Name	Part No.	Qty	Remarks
Protective Tape	-	Appropriate quantity	For component protection
Fluid Extractor	-	1	For brake fluid removal
Marker Pen	-	1	For putting matchmarks
Plastic Bag	-	Appropriate quantity	For component protection
Inspection Mirror	-	1	For checking the installation of a brake booster pump
Battery Charger	-	1	For adjusting the battery voltage
Vinyl Tube	-	Appropriate quantity	For brake bleeding
Wire Brush	-	1	For cleaning wiper pivot serrations
Vise	-	1	For clamping a brake booster pump
Protective Glasses	-	1	-
Tape Measure	-	1	Used to locate an area for discharging residual gas from the removed brake booster pump
Hacksaw	-	1	Used to make a cut in the removed brake booster pump
Hose Plug	09053-1C220	1	Used to prevent brake fluid from coming out

4. WORK PROCEDURE

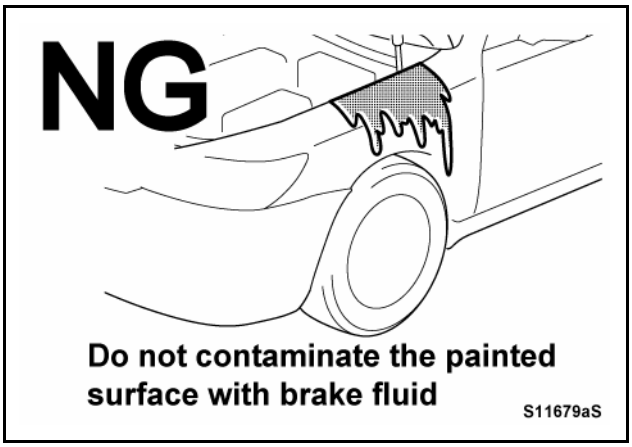
A. TABLE OF CONTENTS

B. WORK OUTLINE

- **Check the caution label on the brake booster pump to determine if the pump needs to be replaced with a new one.**
- **If the brake booster pump needs to be changed, remove the pump from the vehicle upper side and install a new one.**
- **The instructions described in this document vary from those described in the respective repair manual.**

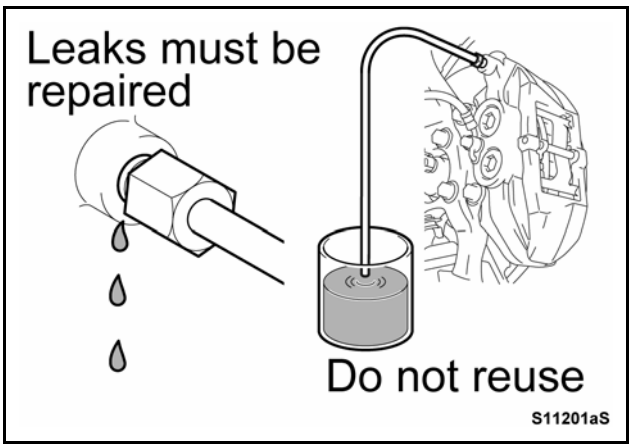


C. PRECAUTIONS FOR BRAKE BOOSTER PUMP REMOVAL/INSTALLATION



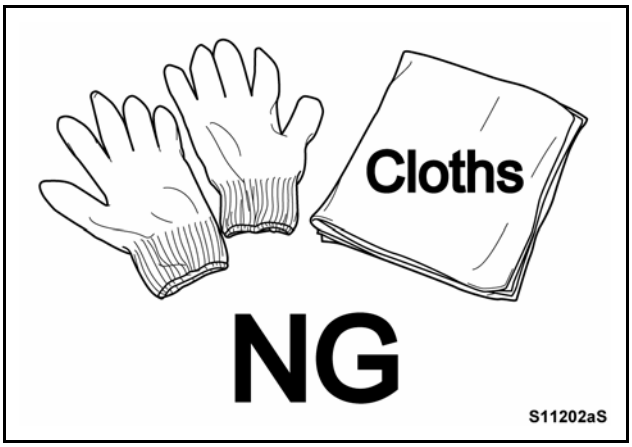
1. HANDLING OF BRAKE FLUID

(a) Do not allow brake fluid to come into contact with any painted body surface. Failure to do so could cause damage to the painted surface. If contact occurs, immediately rinse it off.



(b) Do not reuse brake fluid. Brake fluid which has absorbed moisture or mineral oil may suffer significant degradation in quality or the condition of rubber seals, resulting in a potentially serious failure which may cause an accident.

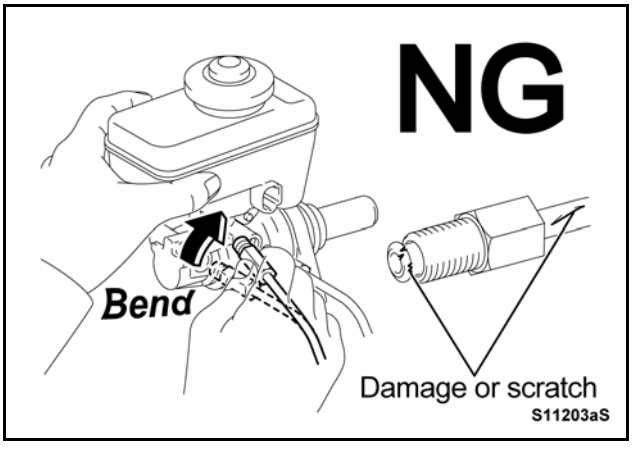
(c) If any brake fluid leakage is found, it must be repaired.



2. DO NOT USE CLOTH RAGS OR GLOVES

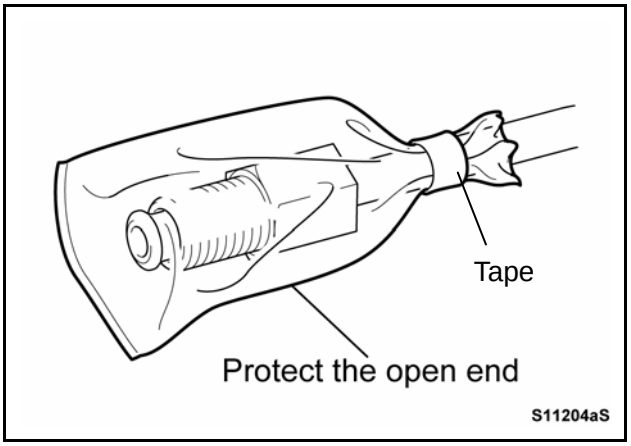
(a) Do not use any cloths or fabric gloves so as to prevent threads and fibers from entering the brake system.

(b) Keep your hands clean during work to prevent the entry of foreign objects into the components.



3. HANDLING OF BRAKE TUBES

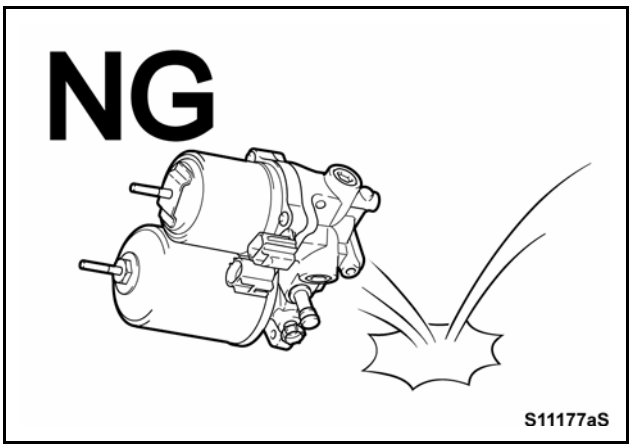
(a) Be careful not to damage or deform the brake tubes during removal and reinstallation.



4. BRAKE SYSTEM PROTECTION

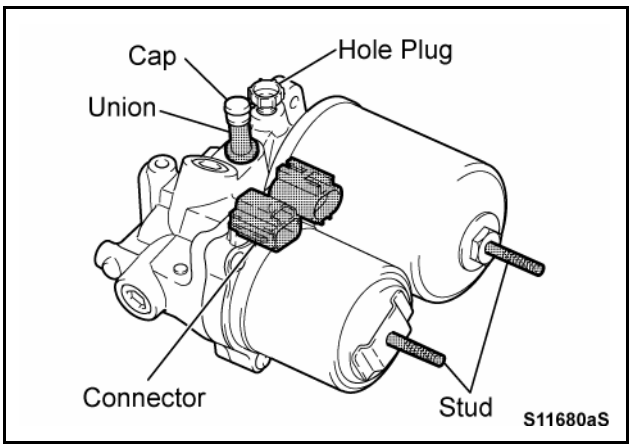
(a) Clean any brake system parts that are to be removed as well as other parts around them before removal.

(b) When removing any brake system parts, prevent foreign objects from entering the brake system by covering them.



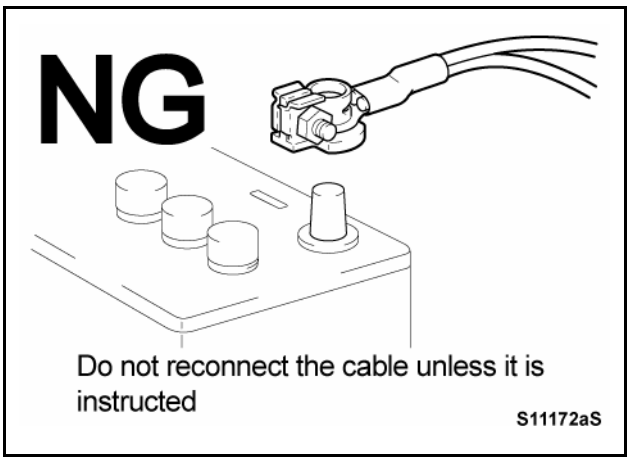
5. PRECAUTIONS FOR BRAKE BOOSTER PUMP INSTALLATION

(a) Be careful not to drop the new brake booster pump. If it is dropped onto the floor, ***do not use it.***



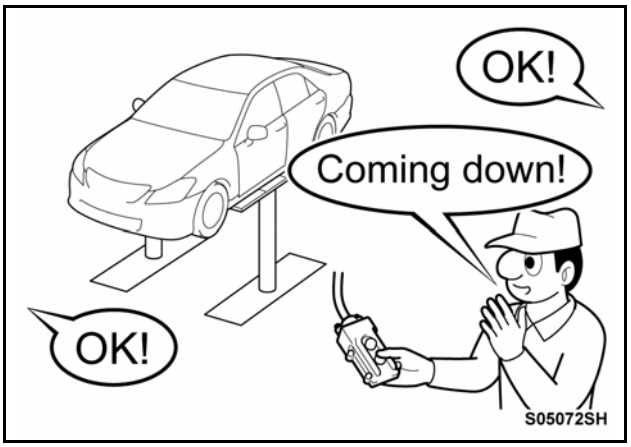
(b) In order to prevent damage or deformation to the new brake booster pump, do not hold its union, connectors or studs when it is carried.

(c) Since a new brake booster pump is filled with brake fluid, do not remove the plug or cap unless instructed.



(d) Do not reconnect the negative (-) battery cable until instructed. Otherwise, air may enter the brake booster pump, and this could cause the pump to burn out and fail.

D. PRECAUTIONS FOR ALL OPERATIONS



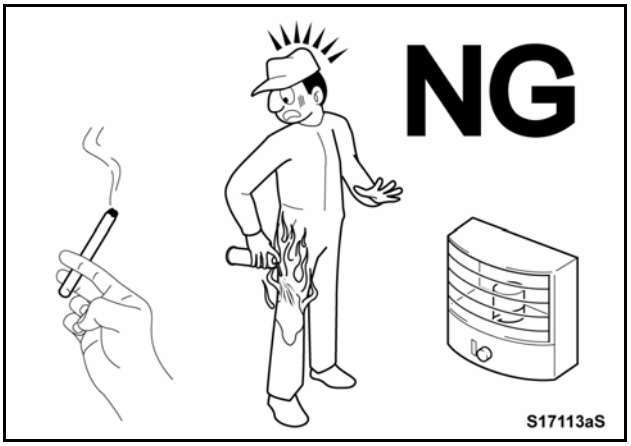
1. PRECAUTIONS WHEN RAISING VEHICLE USING A LIFT OR JACK

(a) Refer to the respective repair manual and follow the instructions within the Introduction section to ensure safety when working.

(b) Ensure the safety of all personnel near the lift or jack, including yourself, before beginning work. Also announce all lift and jack operations out loud to prevent any personnel from being caught or harmed in any way.

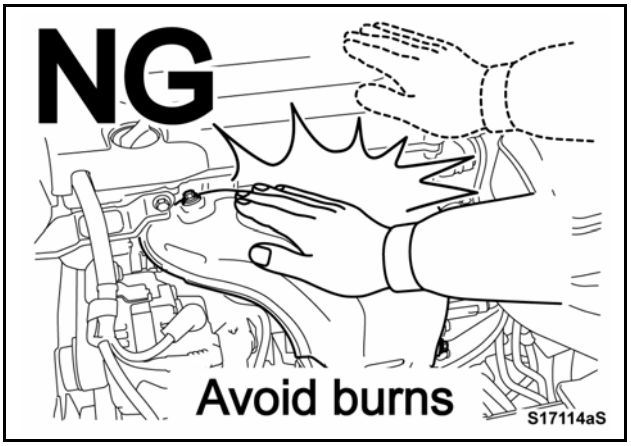
2. WEAR PROTECTIVE GLASSES

(a) Wear protective glasses when working under vehicle or where there is any risk of flying parts or debris.



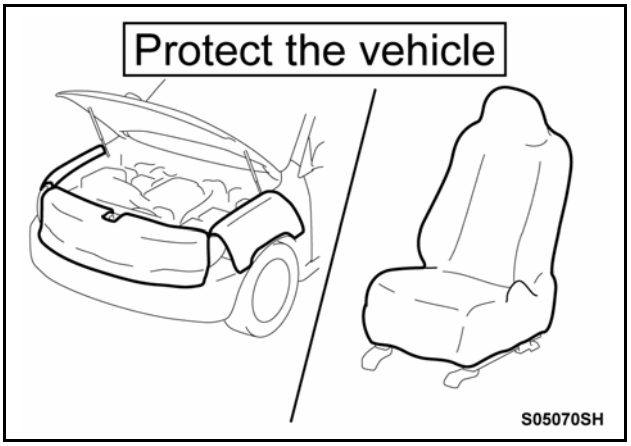
3. DO NOT USE BRAKE CLEANER AS STAIN REMOVER

(a) Do not spray brake cleaner onto any clothes since it is a flammable solvent that vaporizes easily. Do not use it near cigarettes or stoves as this can cause serious burns and injuries.



4. AVOID BURNS

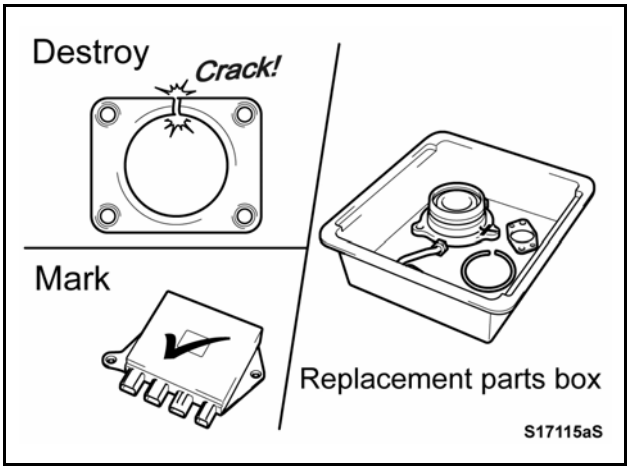
(a) If the engine is hot, wear protective gloves to prevent burns.



5. VEHICLE PROTECTION

(a) A fender cover, a grill cover, seat covers and protective tape etc. must be used to protect the vehicle from dirt or scratches.

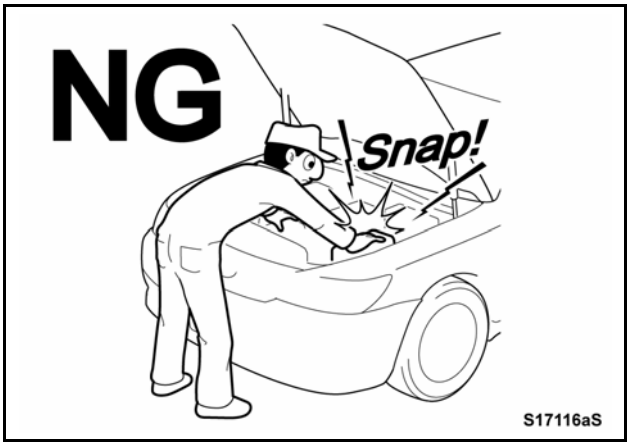
NOTE:
The protective measures listed above may not be shown in some illustrations to allow easy identification of the work location and to make the illustrations simple and easy to read.



6. HANDLING OF REMOVED PARTS

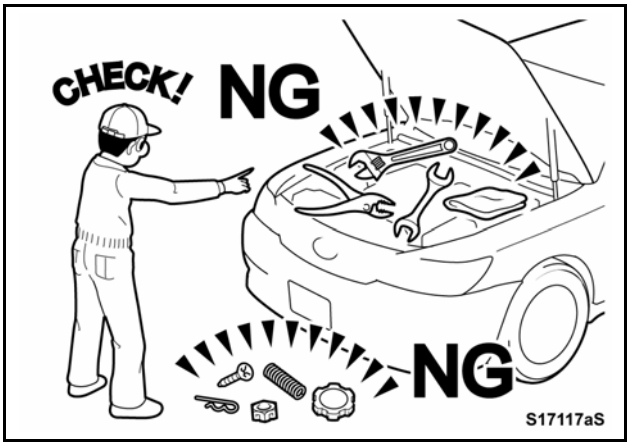
(a) Destroy or mark and store removed parts in a separate container so as to not be assembled again in error.
(b) Check the removed parts when performing the completion inspection.

NOTE:
The parts shown in the illustration to the left are examples only and differ from the actual replacement parts.



7. DO NOT BREAK PARTS WHEN WORKING INSIDE ENGINE COMPARTMENT

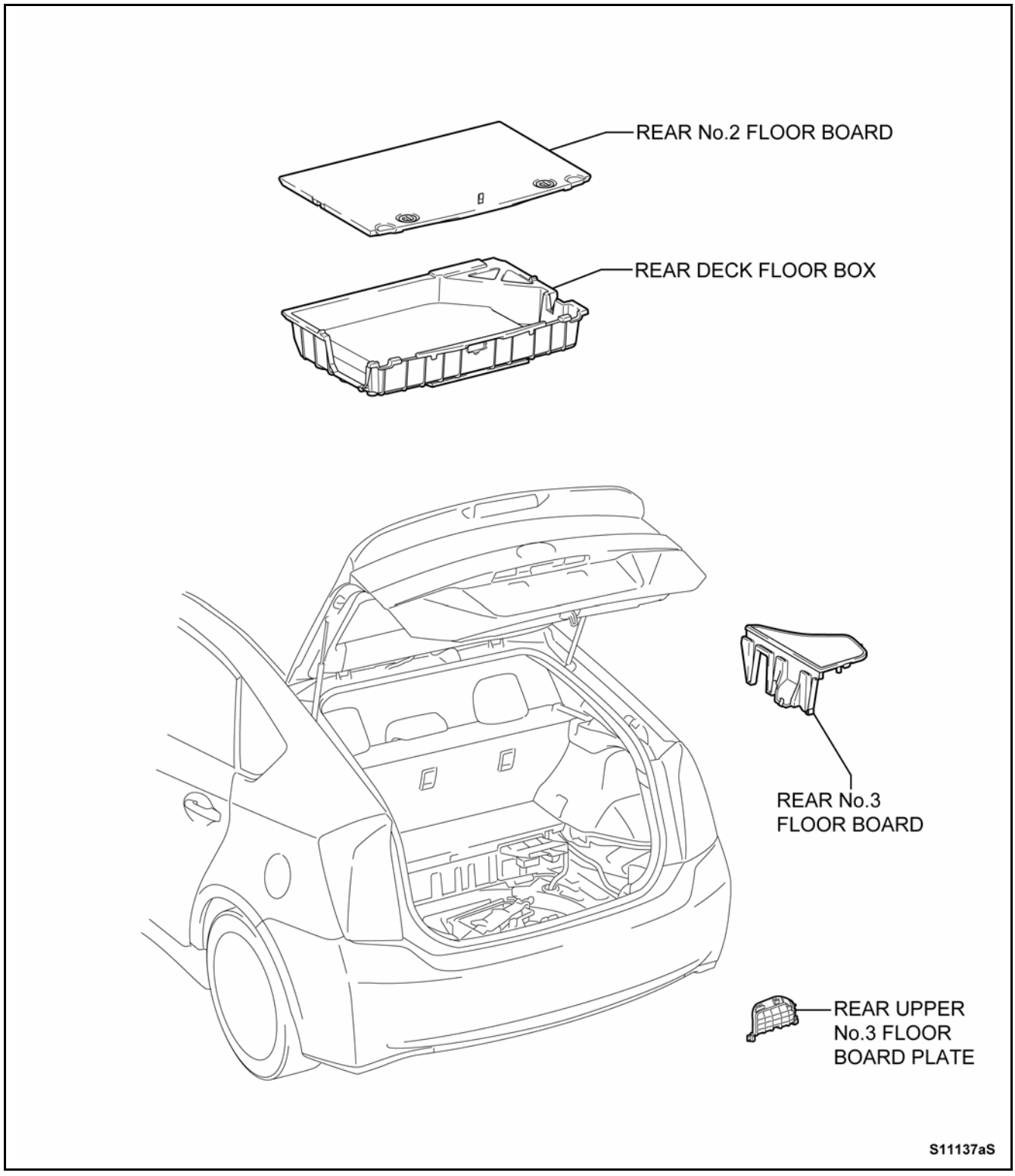
(a) Do not break parts by carelessly placing hands inside and leaning on the engine compartment while being preoccupied by work.

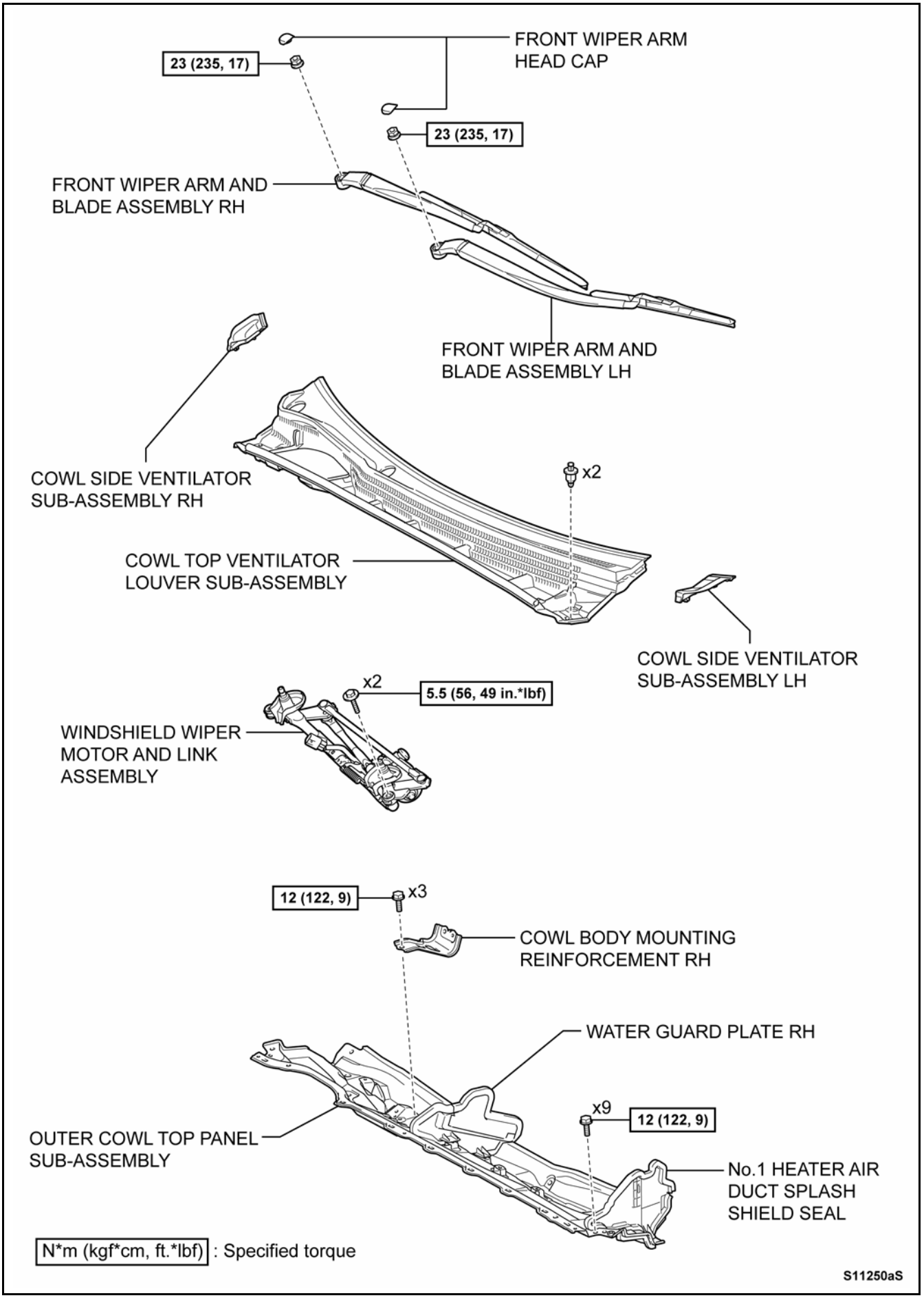


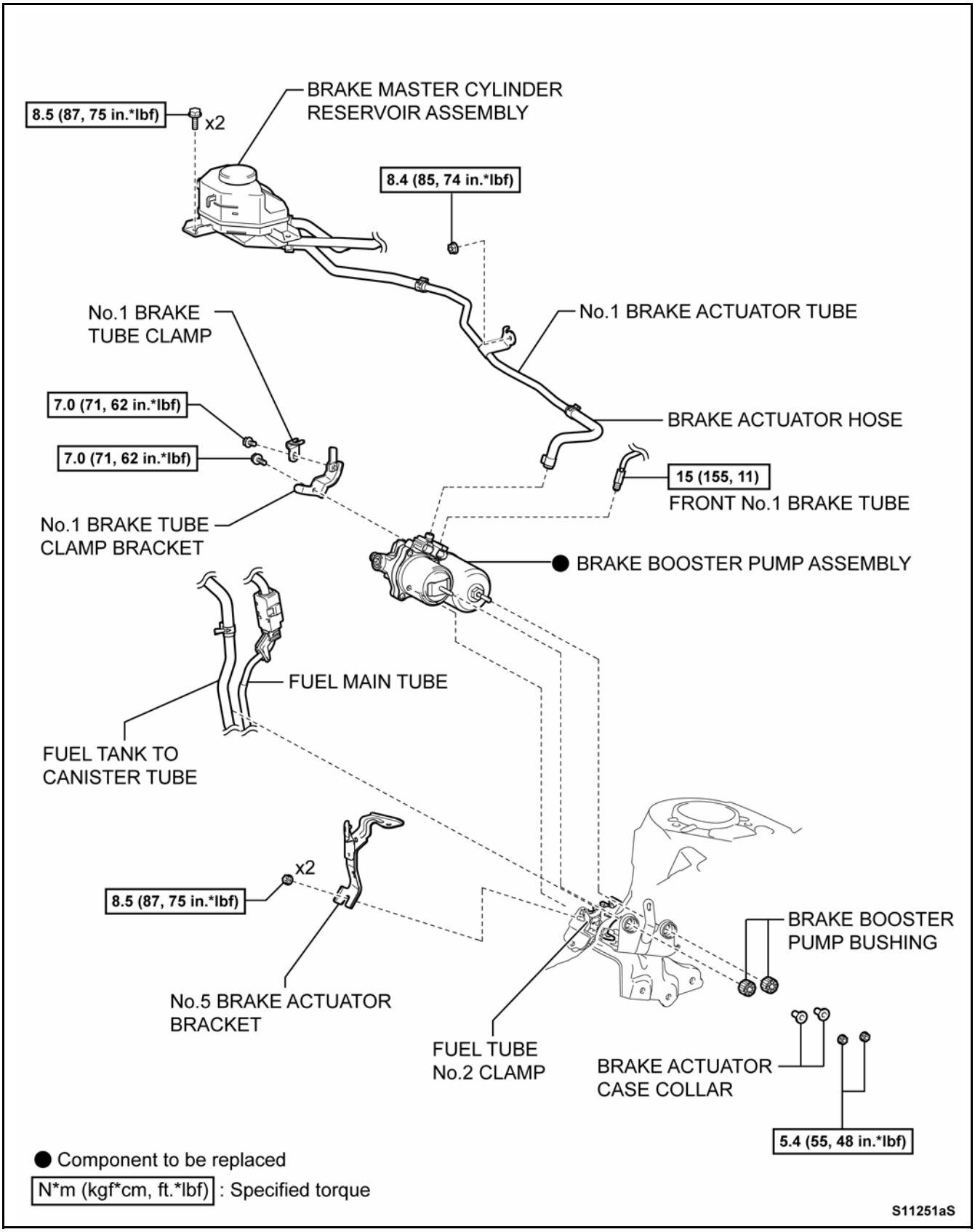
8. CHECK INSIDE ENGINE COMPARTMENT BEFORE ENGINE START-UP

(a) Check that all necessary parts are installed.
(b) Check that no tools or pieces of cloth are left inside the engine compartment.

E. COMPONENTS



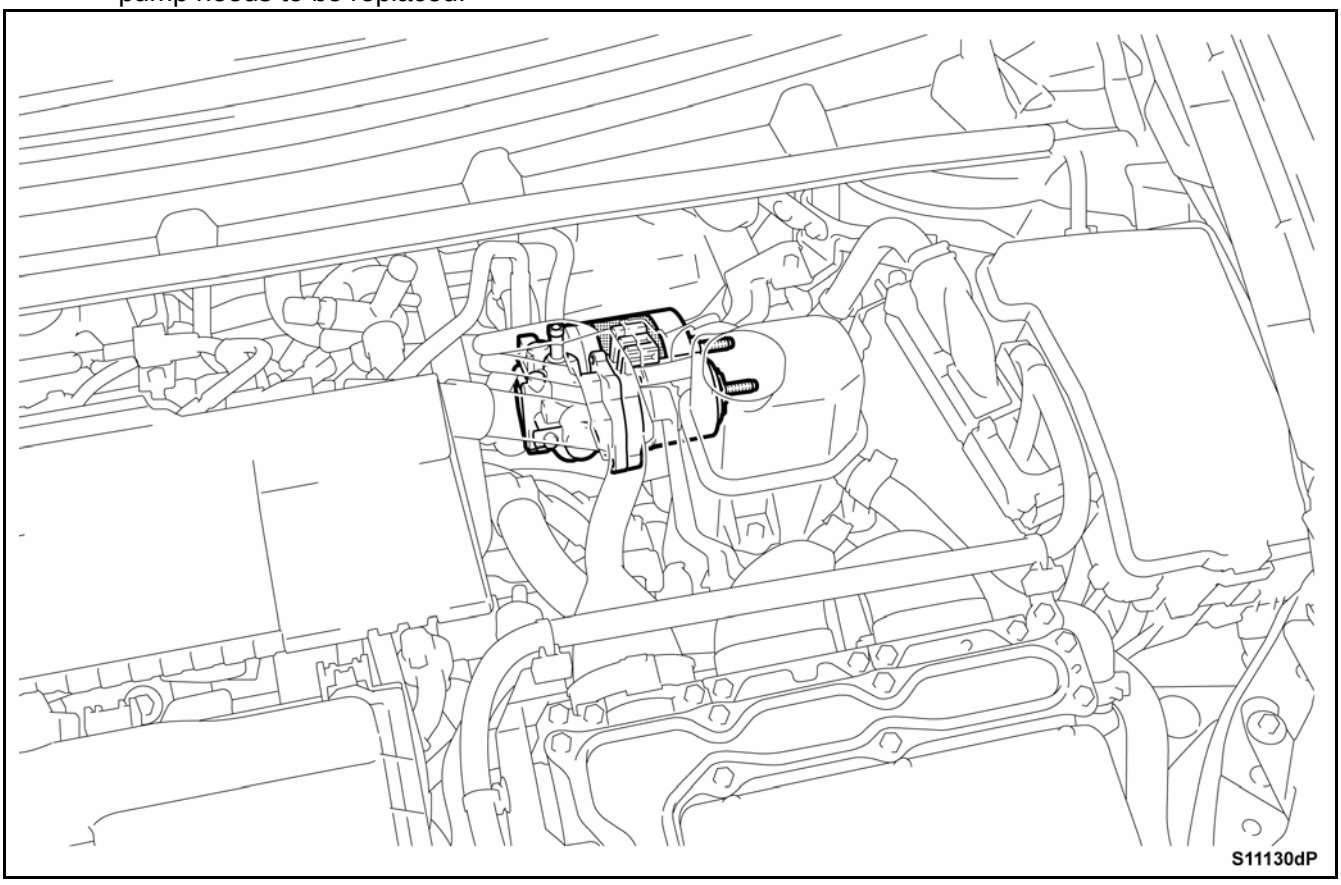

FRONT WIPER ARM HEAD CAP
23 (235, 17)
23 (235, 17)
FRONT WIPER ARM AND BLADE ASSEMBLY RH
FRONT WIPER ARM AND BLADE ASSEMBLY LH
COWL SIDE VENTILATOR SUB-ASSEMBLY RH
x2
COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY
COWL SIDE VENTILATOR SUB-ASSEMBLY LH
x2
5.5 (56, 49 in.*lbf)
WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY
12 (122, 9)
x3
COWL BODY MOUNTING REINFORCEMENT RH
WATER GUARD PLATE RH
x9
12 (122, 9)
OUTER COWL TOP PANEL SUB-ASSEMBLY
No.1 HEATER AIR DUCT SPLASH SHIELD SEAL
N*m (kgf*cm, ft.*lbf) : Specified torque
S11250aS

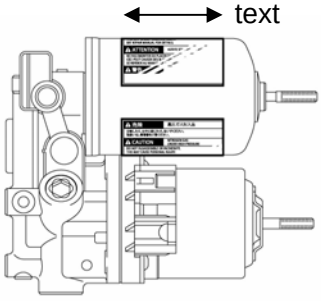
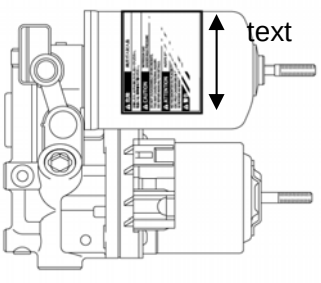

8.5 (87, 75 in.*lbf)
x2
BRAKE MASTER CYLINDER RESERVOIR ASSEMBLY
8.4 (85, 74 in.*lbf)
No.1 BRAKE TUBE CLAMP
No.1 BRAKE ACTUATOR TUBE
7.0 (71, 62 in.*lbf)
7.0 (71, 62 in.*lbf)
BRAKE ACTUATOR HOSE
15 (155, 11)
FRONT No.1 BRAKE TUBE
No.1 BRAKE TUBE CLAMP BRACKET
● BRAKE BOOSTER PUMP ASSEMBLY
FUEL MAIN TUBE
FUEL TANK TO CANISTER TUBE
x2
8.5 (87, 75 in.*lbf)
BRAKE BOOSTER PUMP BUSHING
No.5 BRAKE ACTUATOR BRACKET
FUEL TUBE No.2 CLAMP
BRAKE ACTUATOR CASE COLLAR
5.4 (55, 48 in.*lbf)
● Component to be replaced
N*m (kgf*cm, ft.*lbf) : Specified torque
S11251aS

F. CHECK CAUTION LABEL ON BRAKE BOOSTER PUMP

1. CHECK ORIENTATION OF CAUTION LABEL

(a) Check the orientation of the caution label that is on the brake booster pump to determine if the pump needs to be replaced.



Orientation of the caution label	Go to
Label text is in the horizontal direction NG  	**Brake booster pump needs to be replaced** G. REMOVE BRAKE BOOSTER PUMP ASSEMBLY (Page 18)
Label text is in the vertical direction OK  	**Brake booster pump does NOT need to be replaced**

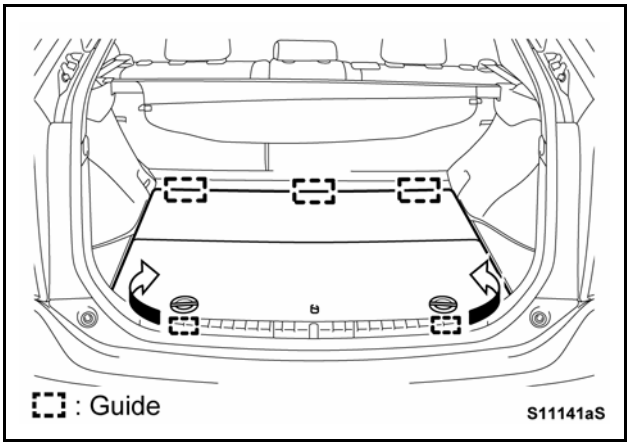
G. REMOVE BRAKE BOOSTER PUMP ASSEMBLY

1. CHECK FOR DTCS

(a) If any DTCs have been set, repair the vehicle using the procedures for the DTC(s) and freeze frame data, and then clear the DTC(s).

2. RECORD AUDIO AND AIR CONDITIONING SETTINGS

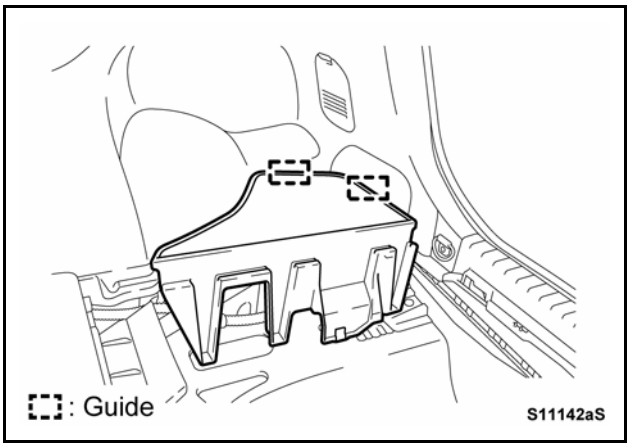
(a) When the auxiliary battery cable is disconnected, audio, air conditioning etc. settings may be reset. Therefore, before disconnecting the cable from the negative (-) battery terminal, make a note of the settings.



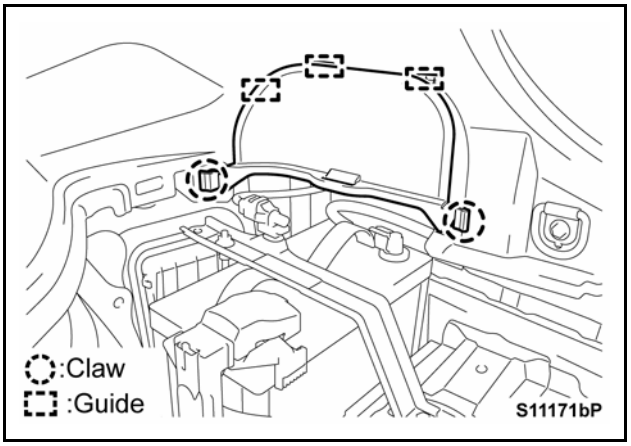
3. REMOVE REAR No.2 FLOOR BOARD

(a) Rotate the 2 knobs in the directions indicated by the arrows, and detach the floor board.

4. REMOVE REAR DECK FLOOR BOX



5. REMOVE REAR No.3 FLOOR BOARD

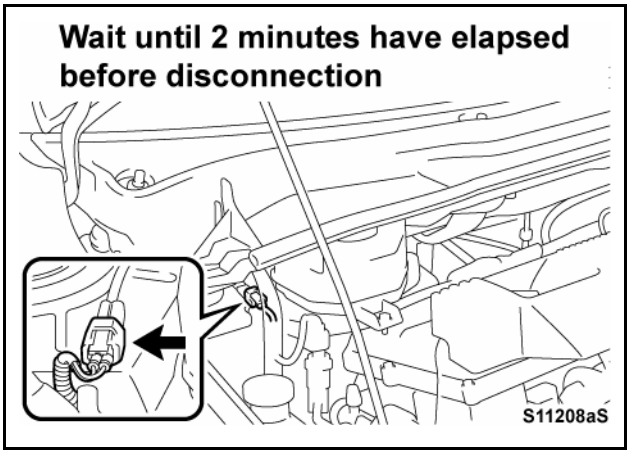


6. REMOVE REAR UPPER No.3 FLOOR BOARD PLATE

(a) Disengage the 2 claws and detach the board plate.

7. DISCONNECT CABLE FROM NEGATIVE BATTERY TERMINAL

CAUTION:
In order to prevent air from entering the brake system after battery reconnection, disable the brake control system before disconnecting the battery cable.



(a) Disable the brake control system.

(1) Turn the power switch off (IG OFF), apply the parking brake, step out of the vehicle and close all of the doors.

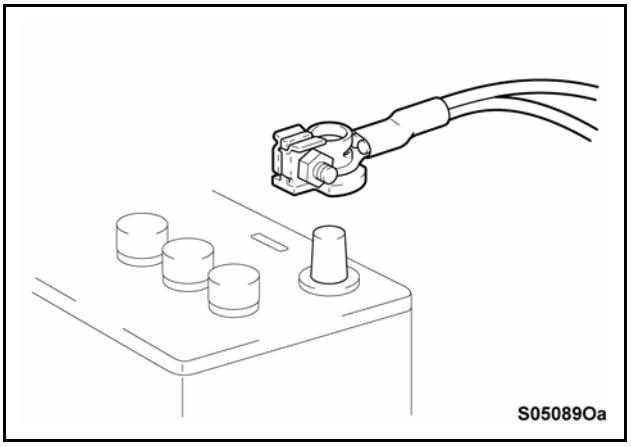
(2) Wait 2 minutes.

CAUTION:
It takes 2 minutes for the brake control. To become disabled. Do not proceed to the next step until 2 minutes have elapsed. Failure to do so could cause air to enter the brake system after battery reconnection.

(3) Disconnect the reservoir level switch connector.

CAUTIONS:

- **Do not open any doors or apply the brake pedal until the reservoir level switch connector is disconnected.**
- **If any door or the brake pedal is operated before the 2 minutes have elapsed, wait another 2 minutes.**

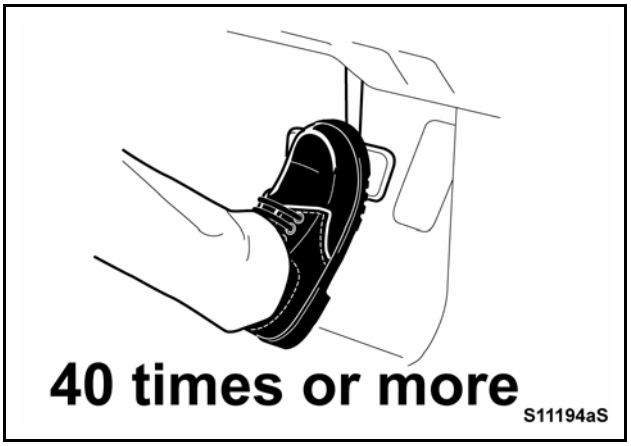


(b) Disconnect the negative (-) terminal cable from the auxiliary battery.

CAUTIONS:

- **Do not reconnect the cable until instructed. Otherwise, air could enter the accumulator of the brake booster pump, and critical damage to the pump may result.**
- **HDD navigation systems take approximately 60 seconds to save the memory data and function settings after the power switch is turned off (IG OFF). For that reason, before disconnecting the negative terminal cable from the auxiliary battery, wait for at least 60 seconds after the power switch is turned off (IG OFF).**

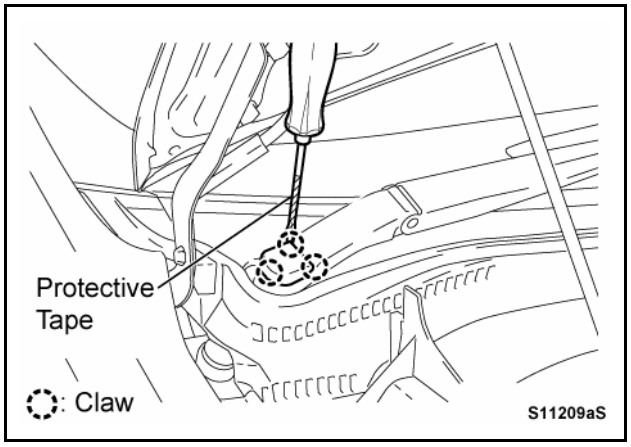
NOTE:
Disconnection of the battery negative terminal cable will cause the back door to become locked. Put a cloth or similar cover over the back door striker to prevent it from locking.



8. RELEASE PRESSURE FROM ACCUMULATOR

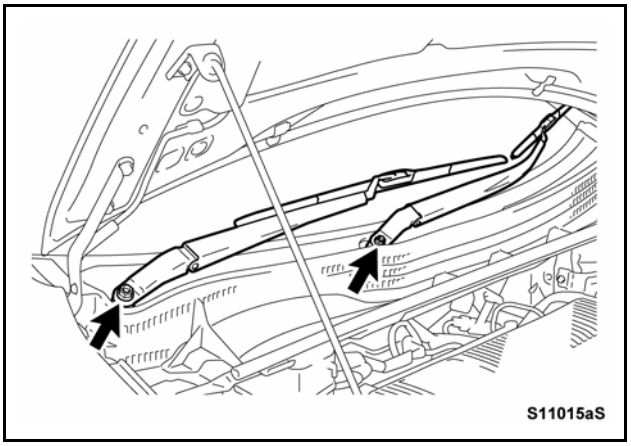
(a) Depress the brake pedal 40 times or more to discharge the internal pressure from the accumulator.

CAUTION:
Check that the brake pedal is becoming stiff.

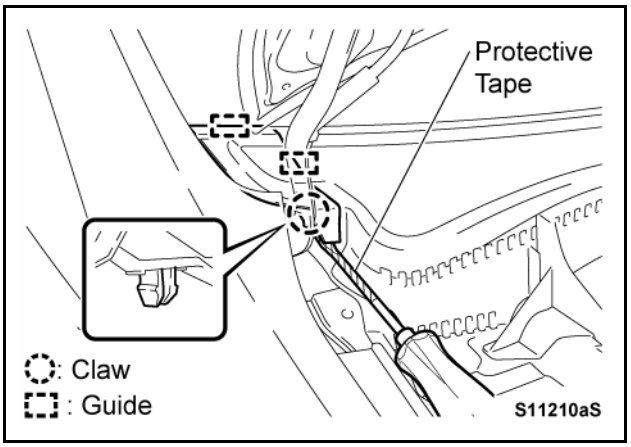


9. REMOVE FRONT WIPER ARM AND BLADE ASSEMBLY LH AND RH

(a) Using a thin slotted screw driver with its tip wrapped in protective tape, remove both left and right caps.



(b) Remove the 2 nuts, and then detach the left and right wiper arm and blade assemblies.



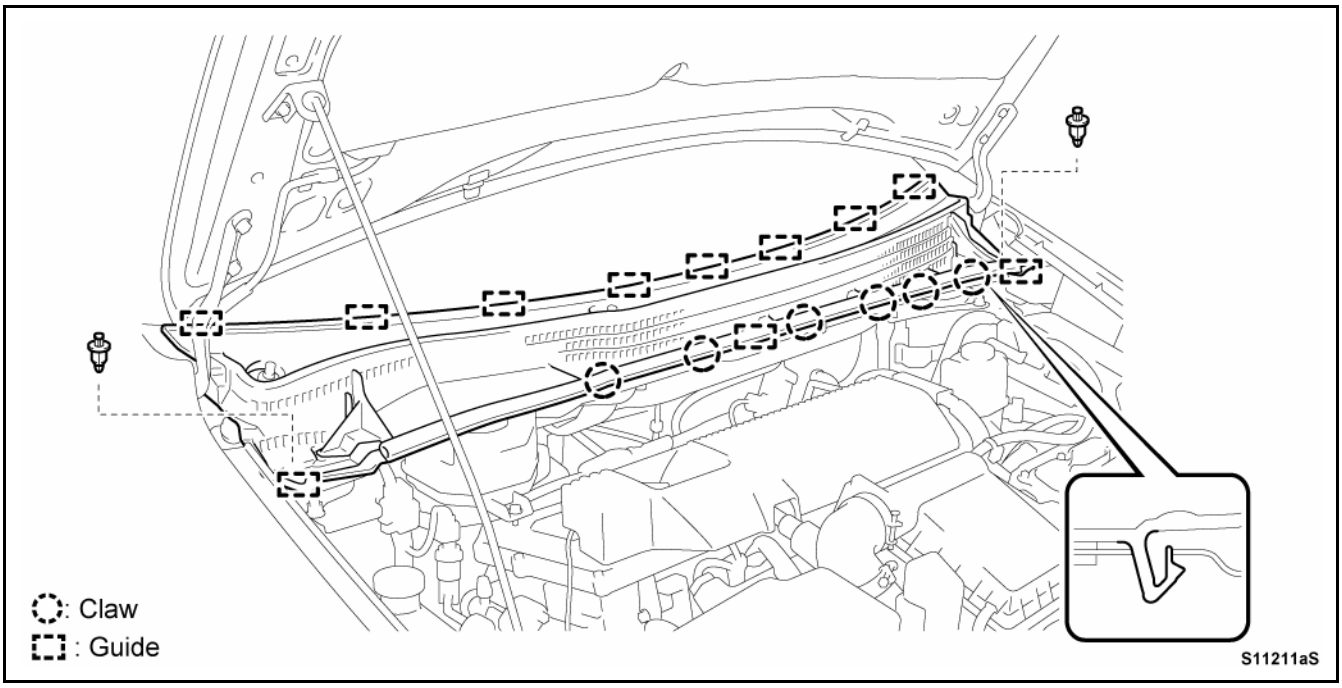
10. REMOVE COWL SIDE VENTILATOR SUB-ASSEMBLY LH AND RH

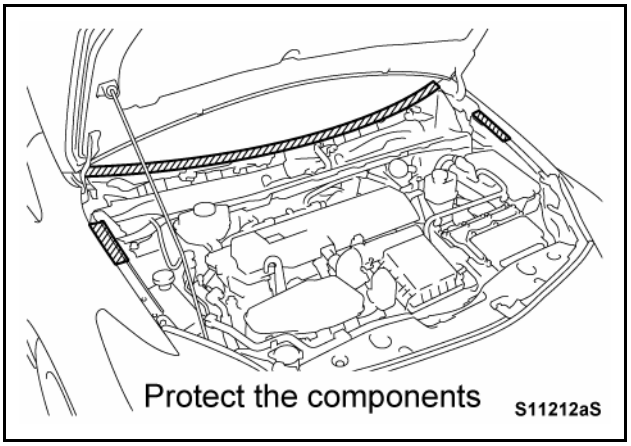
(a) Using a thin slotted screw driver with its tip wrapped in protective tape, disengage the claws and guides to detach the left and right cowl side ventilators respectively.

11. REMOVE COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY

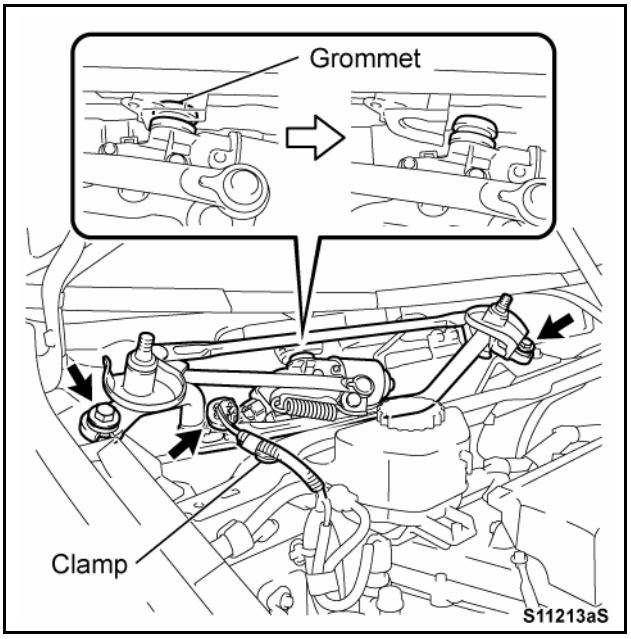
(a) Remove the 2 clips.

(b) Disengage the 6 claws, and pull the cowl top ventilator louver toward the front of the vehicle to detach it.





(c) In order to avoid scratches and damage to the vehicle, protect the perimeters of the windshield and fenders with protective tape.

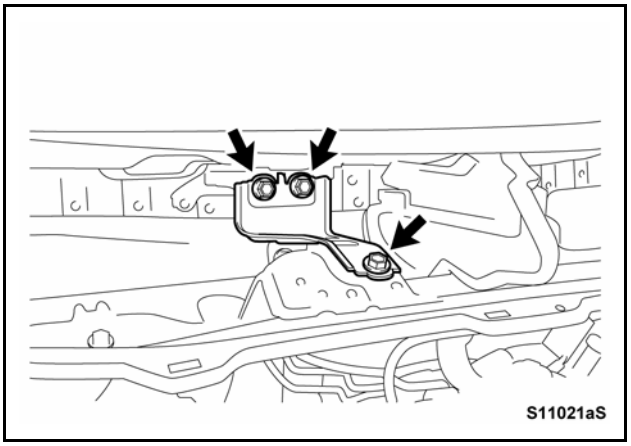


12. REMOVE WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY

(a) Disengage the wire harness clamp and then disconnect the connector.

(b) Remove the 2 bolts.

(c) Disengage the grommet, and then detach the wiper motor and link assembly.



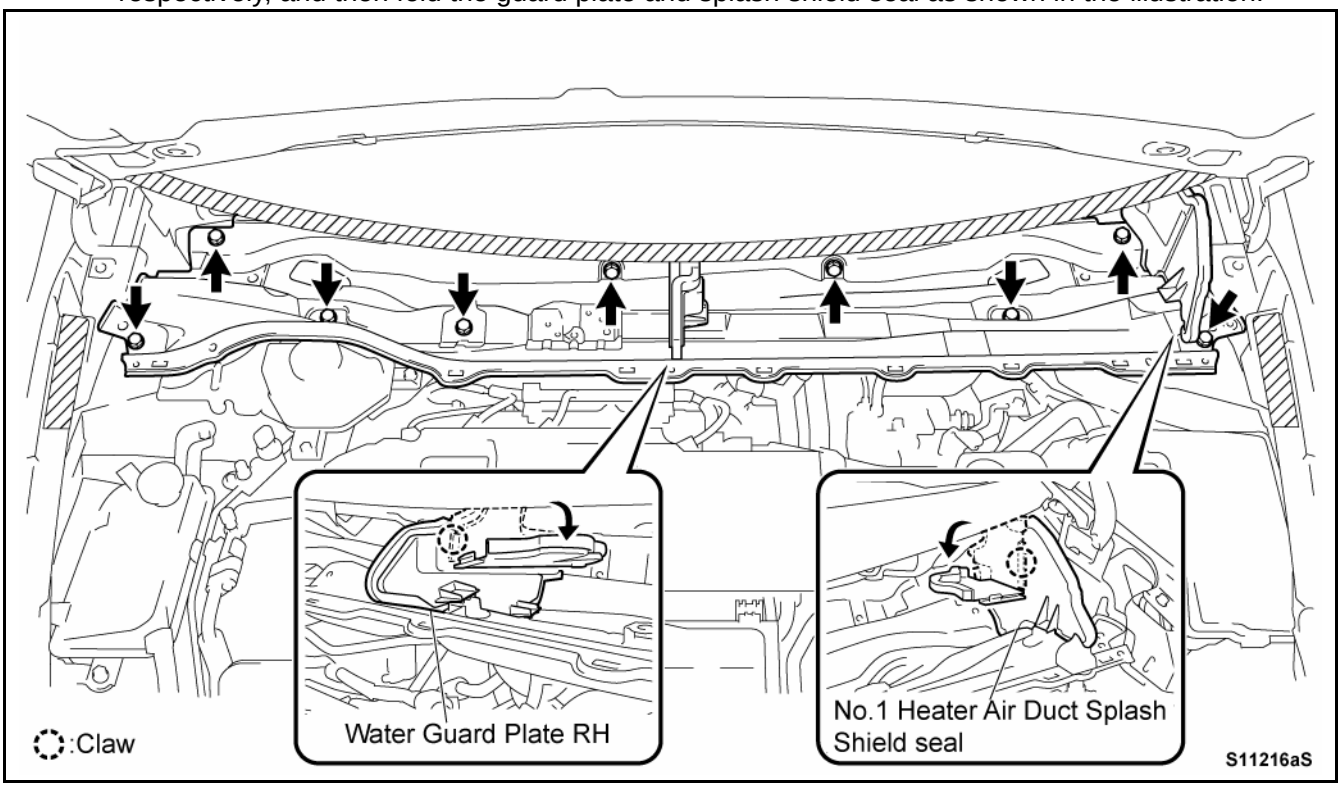
13. REMOVE COWL BODY MOUNTING REINFORCEMENT RH

(a) Remove the 3 bolts, and detach the reinforcement.

14. REMOVE OUTER COWL TOP PANEL SUB-ASSEMBLY

(a) Remove the 9 bolts.

(b) Disengage the claws on the water guard plate RH and No.1 heater air duct splash shield seal respectively, and then fold the guard plate and splash shield seal as shown in the illustration.



(c) Remove the cowl top panel.

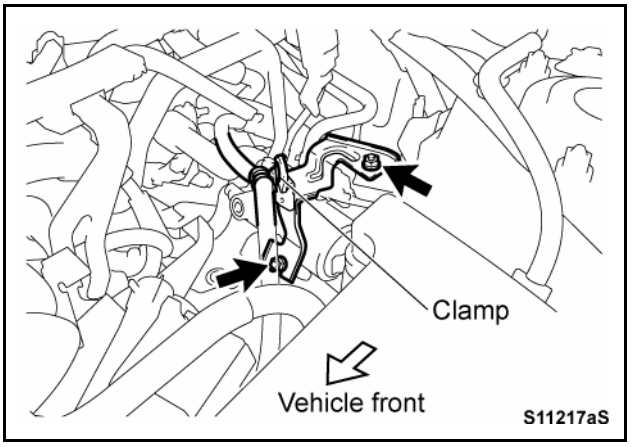
CAUTION:
Be careful not to damage the windshield as well as fenders.

15. REMOVE BRAKE FLUID

(a) Remove the brake fluid inside the reservoir.

CAUTIONS:

- **Do not use a fluid extractor that was used to remove mineral oil or water. Doing so may result in brake fluid leakage or poor braking performance.**
- **Do not allow brake fluid to come into contact with the painted body surface. If contact occurs, immediately wash it off.**

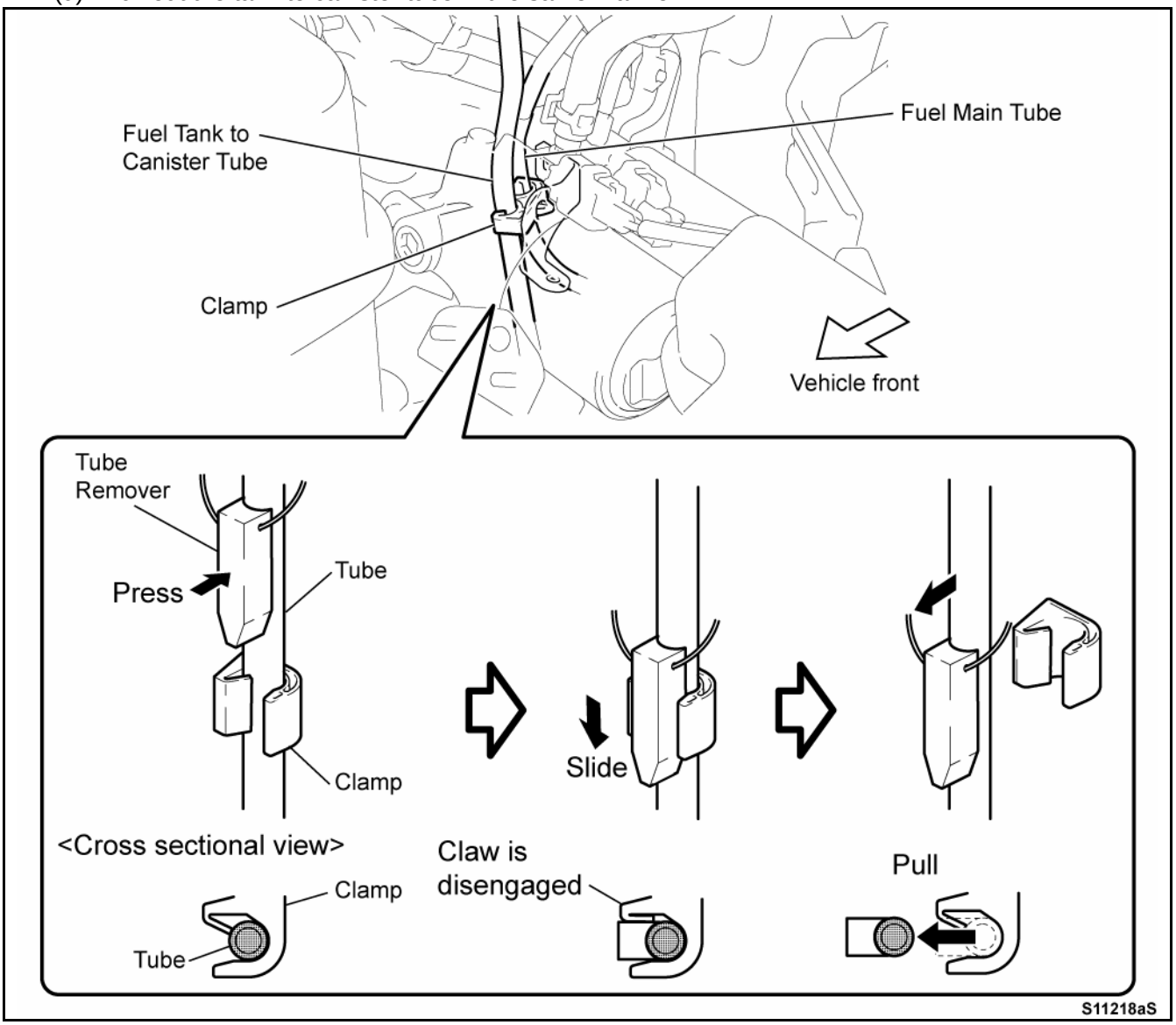


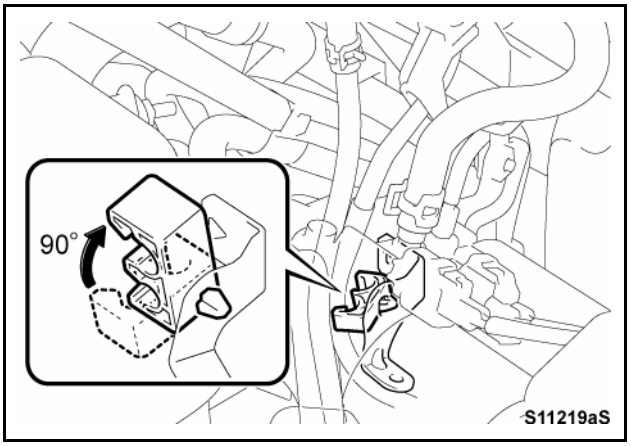
16. REMOVE No.5 BRAKE ACTUATOR BRACKET

(a) Disengage the clamp.
(b) Remove the 2 nuts and detach the bracket.

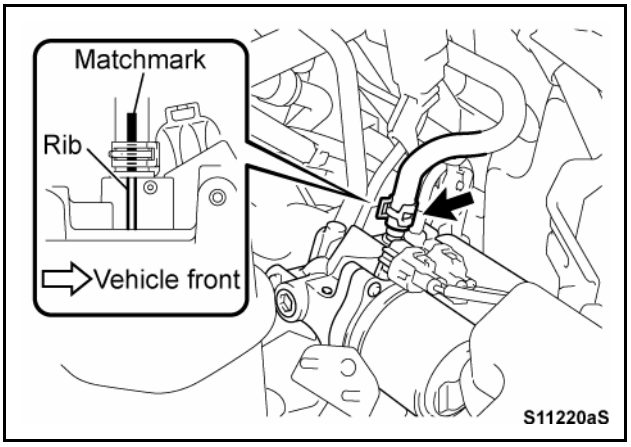
17. SEPARATE FUEL MAIN TUBE AND FUEL TANK TO CANISTOR TUBE

(a) Press the tube remover (supplied) against the main tube.
(b) Slide the remover into the clamp to disengage the clamp claw.
(c) While holding the remover, pull the main tube out of the clamp.
(d) Pull out the tank to canister tube in the same manner.





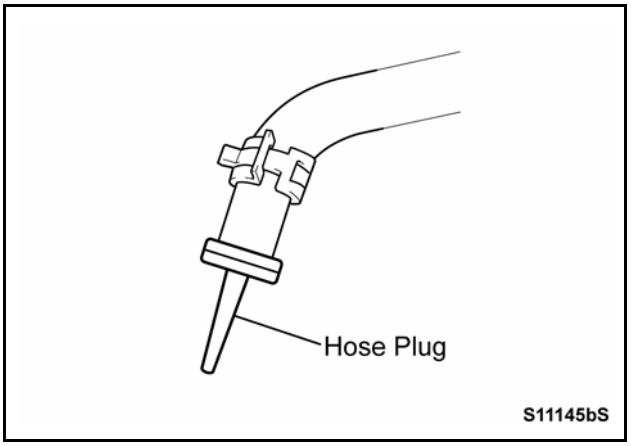
(e) Rotate the clamp 90 degrees to prevent the fuel tubes from unintentionally being engaged in the clamp.



18. DISCONNECT BRAKE ACTUATOR HOSE

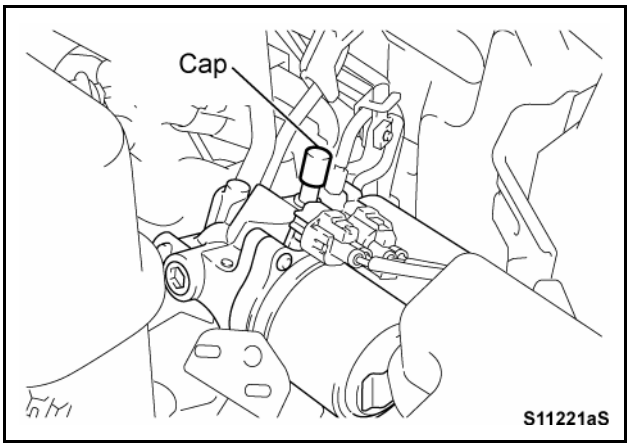
(a) Put a matchmark on the hose so that it is aligned with the rib on the brake booster pump.

(b) Put paper towels over the area where the hose is connected.



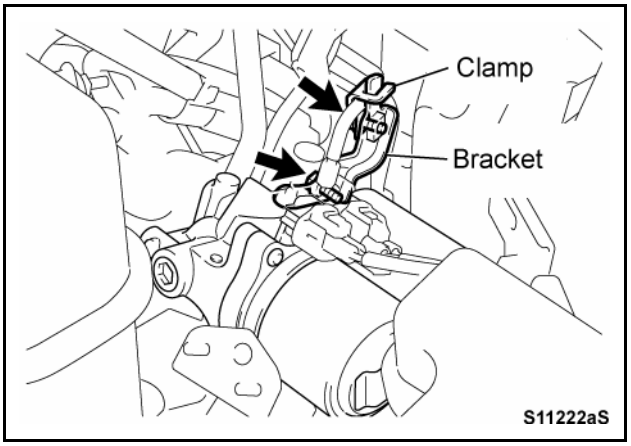
(c) Disconnect the hose from the pump, and attach a hose plug to the end of the hose. (Clamps can be used instead of a hose plug.)

CAUTION:
Immediately attach the hose plug in order to prevent the residual brake fluid from coming out of the reservoir.



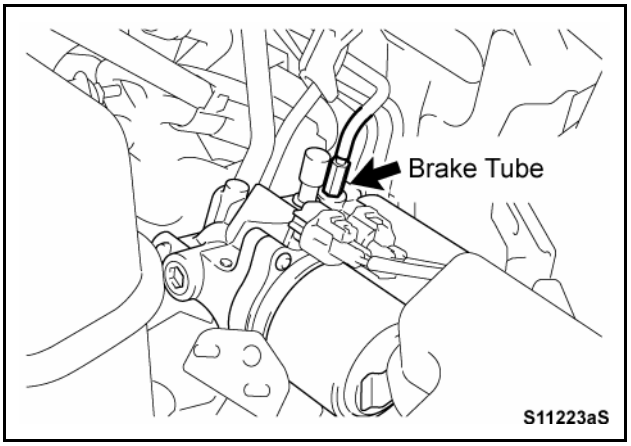
(d) In order to prevent the brake fluid from coming out of the pump, attach a cap (supplied) to the opening of the pump.

(e) Remove the paper towels.

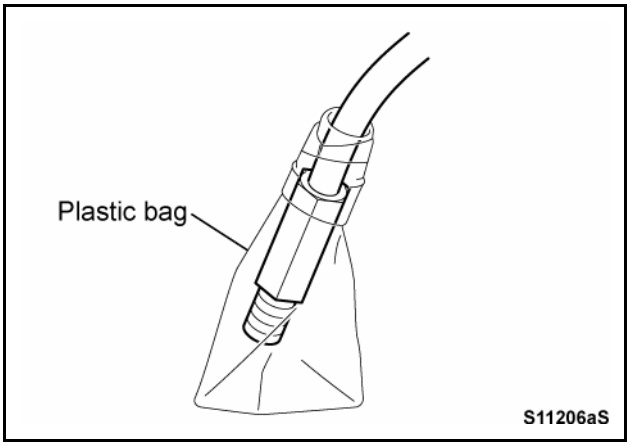


19. SEPARATE FRONT No.1 BRAKE TUBE

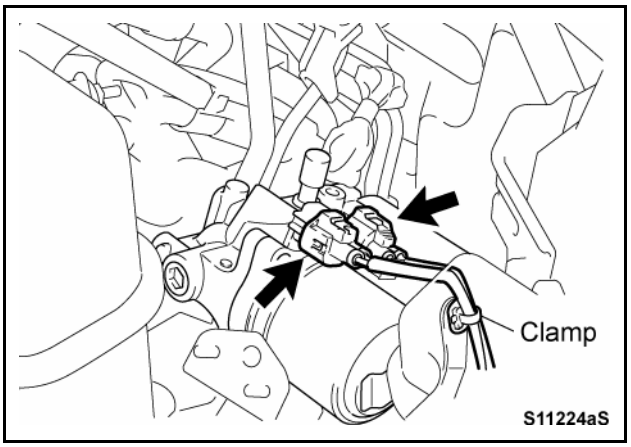
(a) Remove the bolt to detach the clamp.
(b) Remove the other bolt to detach the bracket.



(c) Put paper towels over the area where the brake tube is connected.
(d) Using a 10mm union nut wrench, disconnect the brake tube from the brake booster pump.

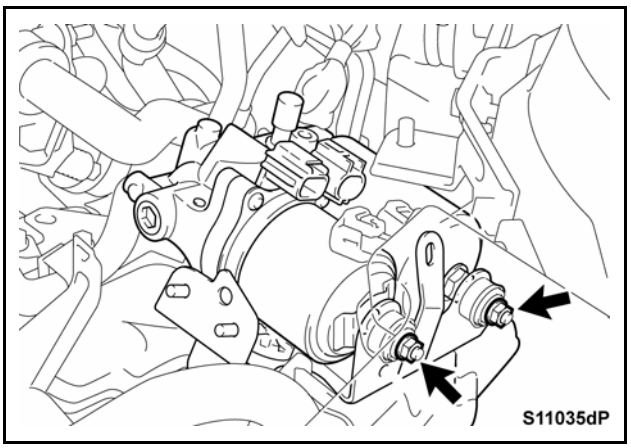


(e) In order to prevent foreign objects from entering the brake tube, protect it with a plastic bag.
(f) Remove the paper towels.



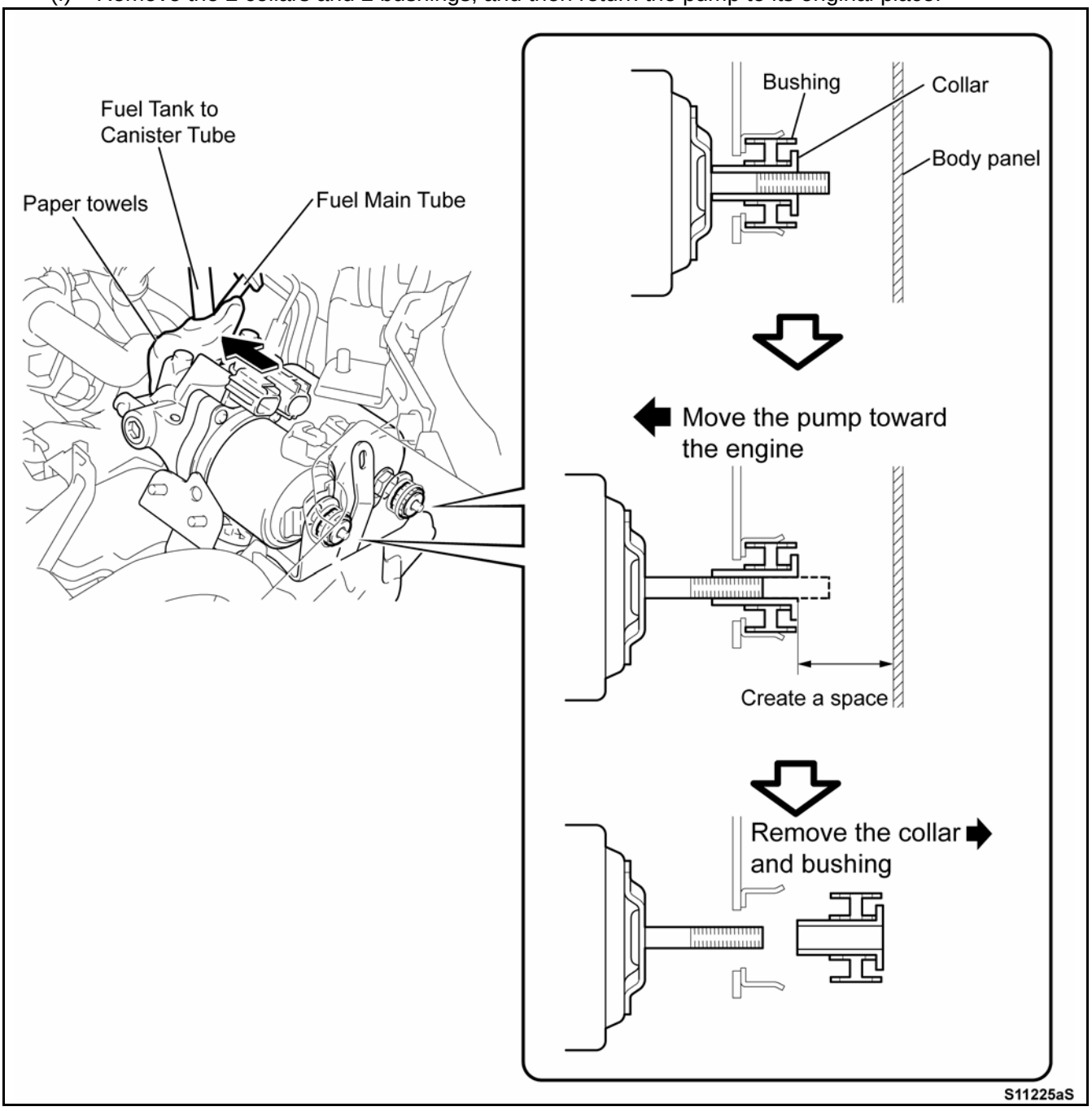
20. REMOVE BRAKE BOOSTER PUMP ASSEMBLY

(a) Disconnect the 2 connectors.
(b) Disengage the clamp.



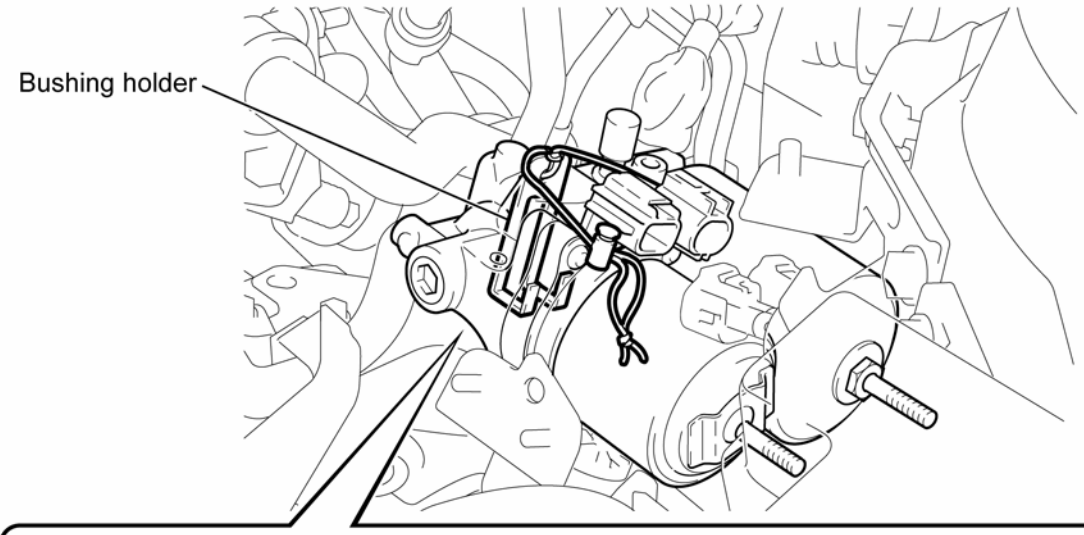
(c) Remove the 2 nuts.

(d) In order to avoid damage, protect the 2 fuel tubes with paper towels.
(e) Move the pump toward the engine to allow for removal of the collars and bushings.
(f) Remove the 2 collars and 2 bushings, and then return the pump to its original place.

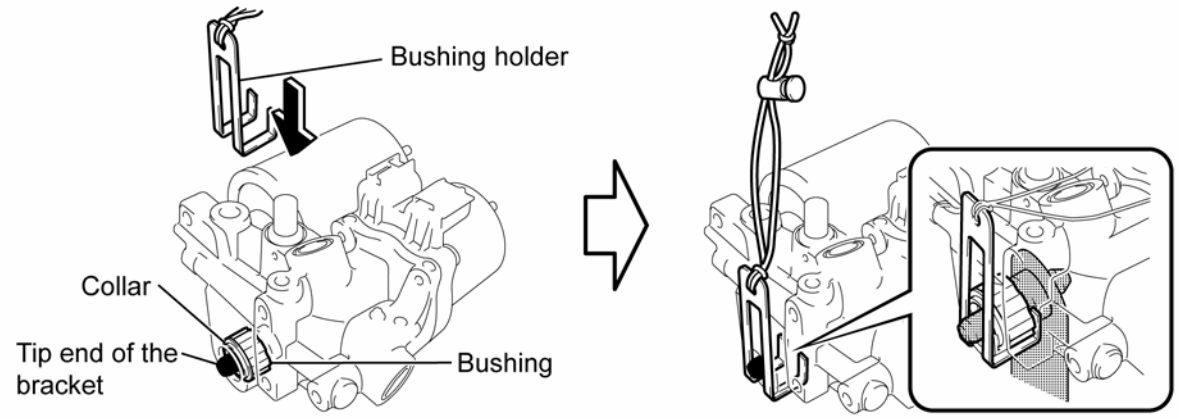


(g) Set the bushing holder (supplied) into place.

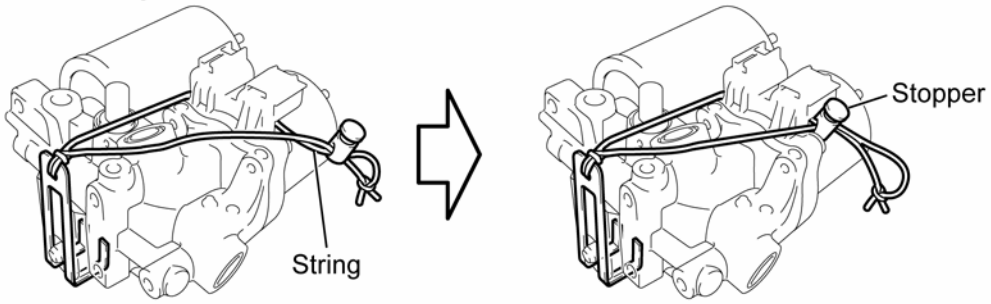
CAUTION:
If the bushing holder is not set correctly, the bushing will come off and the collar will drop while the pump is being detached.



①Set a bushing holder as shown in the illustration.



②Hook the loop of string at the connectors on the pump, and fix the holder with the stopper of the string.



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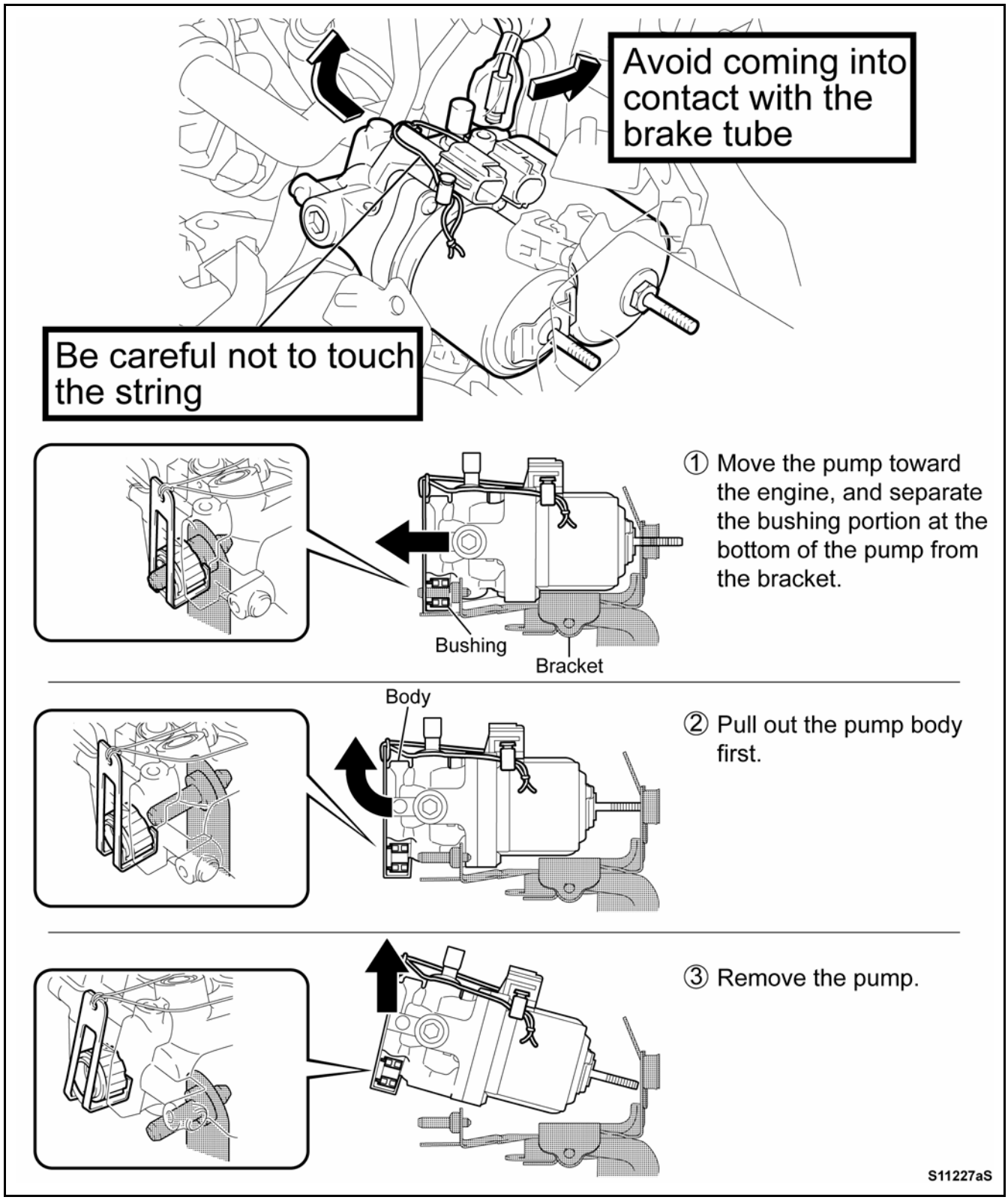
(h) While avoiding the pump from coming into contact with the brake tube, remove the pump from the bracket.

CAUTIONS:

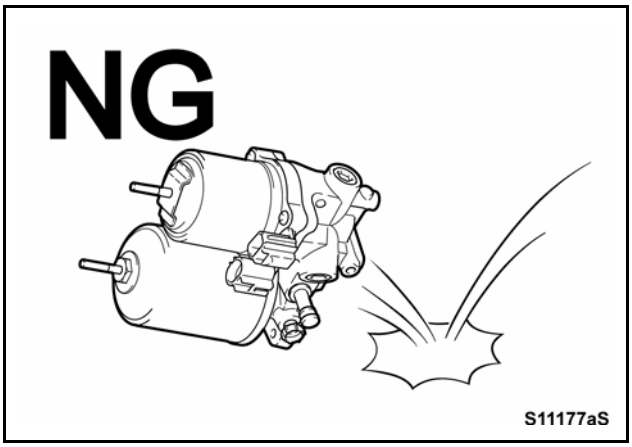
- **Do not touch the string. Doing so could cause the bushing holder to become detached.**
- **Be careful not to damage the brake tube and fuel tubes as well as the wire harness.**



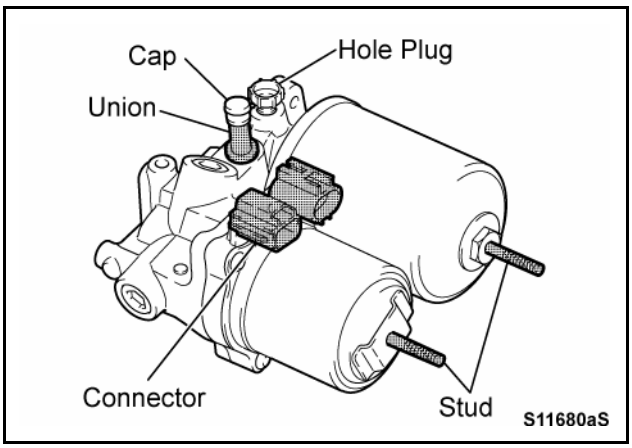
(i) Remove the bushing holder.

(j) Mark the removed pump and store it in a separate container so as to not accidentally reinstall it.

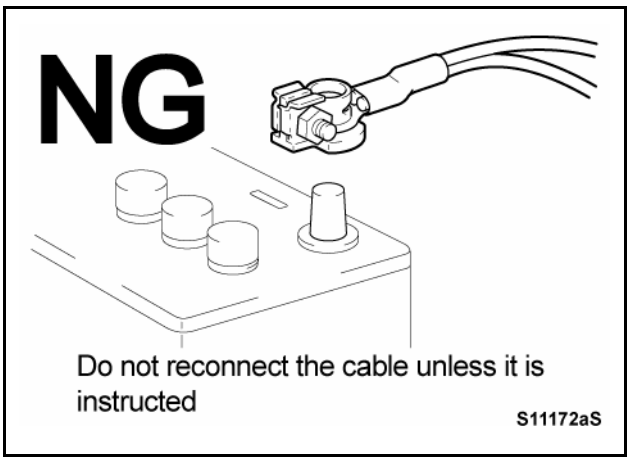
H. INSTALL NEW BRAKE BOOSTER PUMP ASSEMBLY



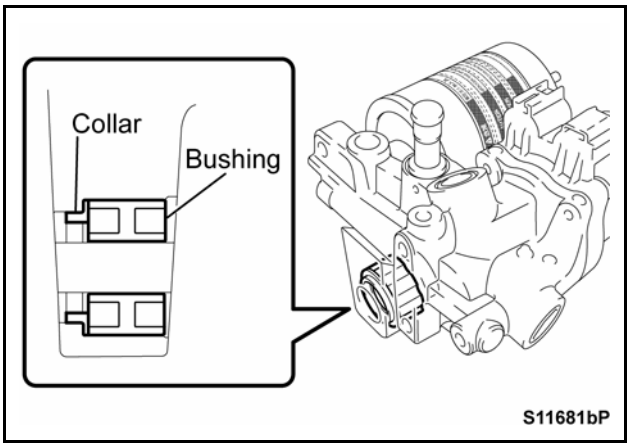
CAUTION:
Be careful not to drop the new brake booster pump. If it is dropped onto the floor, do not use it.



CAUTIONS:
- **In order to prevent damage or deformation to the new brake booster pump, do not hold its union, connectors or studs when it is being carried.**
- **Since the new brake booster pump is filled with brake fluid, do not remove the plug or cap unless instructed.**



CAUTION:
Do not reconnect the cable until instructed. Otherwise, air may enter the brake booster pump, and this could cause the pump to burn out.



1. INSTALL NEW BRAKE BOOSTER PUMP ASSEMBLY

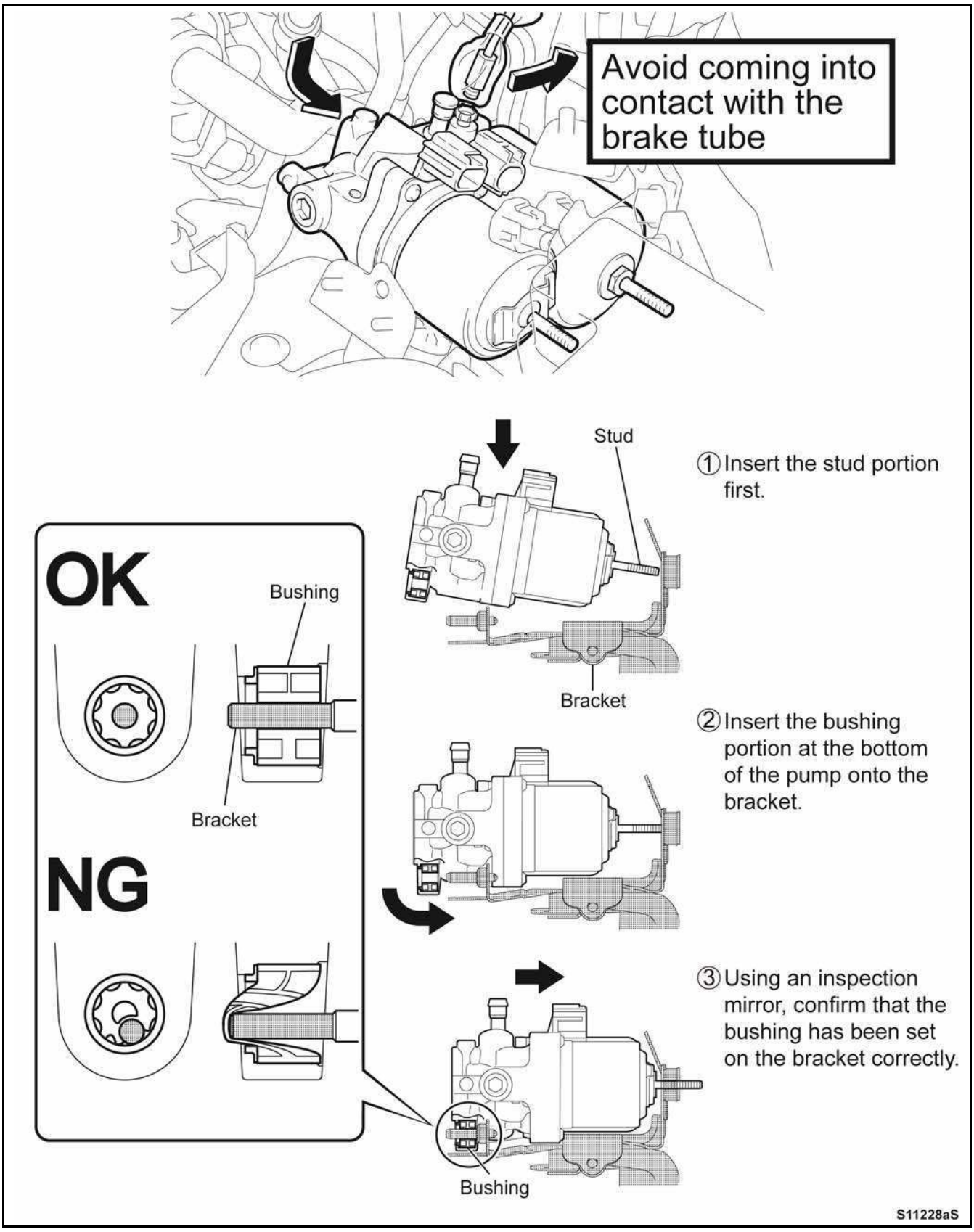
(a) Check that the bushing and collar are installed securely.

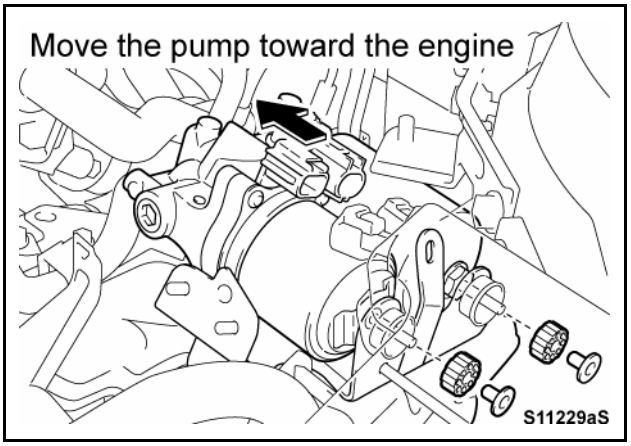
NOTE:
If the bushing and collar are detached, confirm the direction of the collar and then reattach them.

(b) Install the new pump onto the bracket. Do not allow the brake booster pump to come in contact with the brake tube.

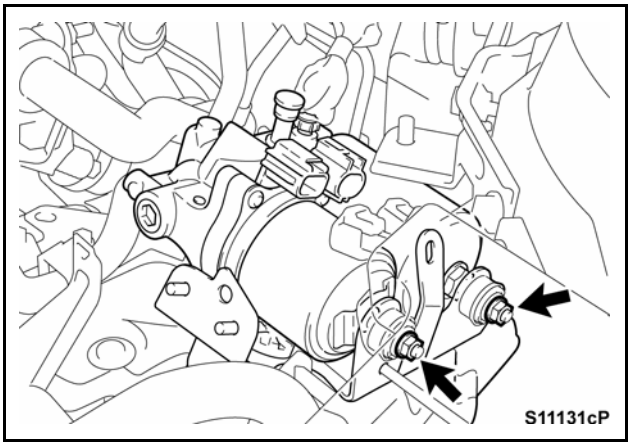
CAUTIONS:

- **Be careful not to damage the brake tubes, fuel tubes and the wire harness.**
- **If the new pump is not installed correctly, it will damage the bushing. If you feel resistance while the new pump is installed, immediately stop installation and remove the pump, and then try installation again.**





(c) Move the new pump toward the engine for installation of the bushings and collars.
(d) Install the 2 bushings and 2 collars.
(e) Remove the paper towels that have protected the fuel tubes.



(f) Install the 2 nuts.
(1) Tighten the nut located toward the vehicle rear side.

Specified torque:

T = 5.4 N*m (55 kgf*cm, 48 in.*lbf)

(2) Using a 10mm unit nut wrench, tighten the other nut, which is located toward the vehicle front side.

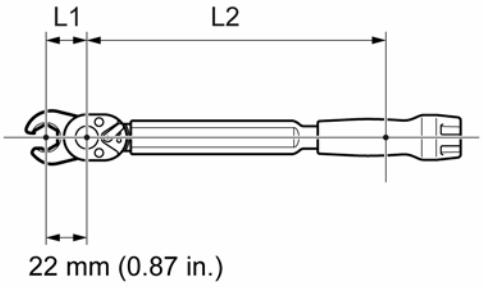
Specified torque:

T = 5.4 N*m (55 kgf*cm, 48 in.*lbf)

T’ = 4.6 N*m (47 kgf*cm, 41 in.*lbf)

Use a torque wrench with a fulcrum length of 135 mm (5.31 in.)

CAUTION:
Use the formula shown below to calculate reading values when an extension tool is used.



Formula T’= (L2 / (L1 + L2))*T

T’	Reading of torque wrench {N*m (kgf*cm, ft.*lbf)}
T	Torque {N*m (kgf*cm, ft.*lbf)}
L1	Length of SST or extension tool {mm (in.)}
L2	Lenfth of torque wrench {mm (in.)}

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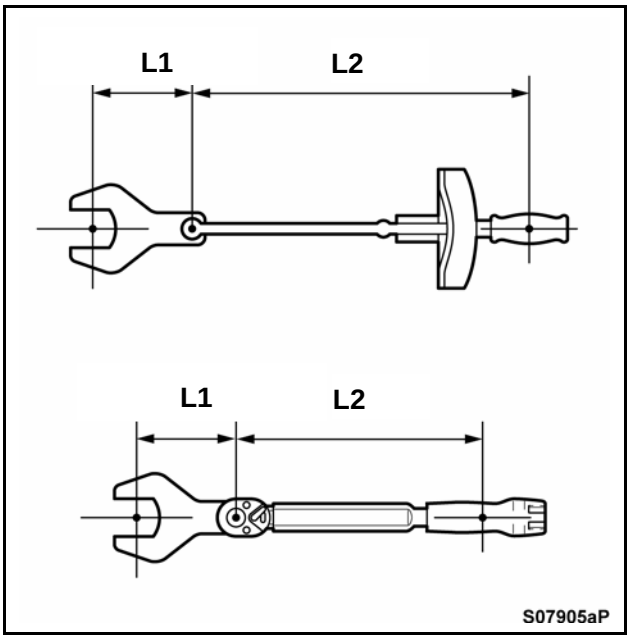
PRECAUTIONS FOR TORQUE WRENCH WITH EXTENSION TOOLS



Torque wrench reading calculation

(g) If a torque wrench is used together with an SST or extra tools that extend the handle length, the actual torque will be greater than the set torque on a torque wrench.

(h) This document specifies the required torques and the torque readings that will be set on general tools. If tools that are different from those described in this document will be used, calculate torque readings in accordance with the formula described in step (c) below.

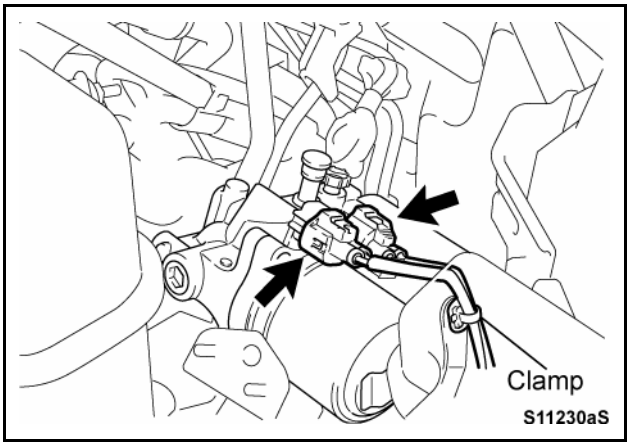
NOTICE:
For torque wrenches that have special instructions about turning directions, follow those instructions.

(i) Calculation formula: [Reading of Torque wrench] = {L2 / (L1 + L2)] x [Specified torque]

Example : If you are using the Toyota SST (Part Number 09017-1C100) dimension L1 is 22 mm. If you are using a torque wrench with a fulcrum length of 135 mm, according to the above formula, you need to set your torque wrench to 17.0 Nm. This can be calculated as follows:
Reading of Torque wrench = {135mm/ (22mm + 135mm)] x [5.4 N.m] = 4.6 N.m

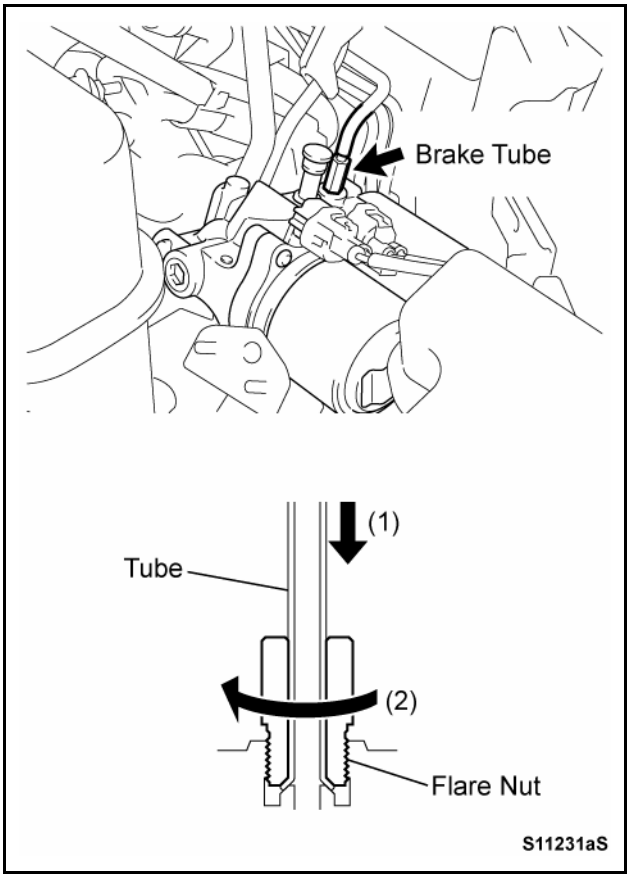
TGB have developed a tool in order to help you calculate the correct torque value.
This tool can be found on Toyota Central, under: **Service/Service and Technical/Torque Calculation Tool**.

If you are using an extension tool (either the Toyota SST or a crowfoot wrench from a different supplier) please enter the measurements into the Torque Calculation Tool to calculate the correct torque value.



(j) Check that the connectors are not contaminated with brake fluid or dirt.

(k) Engage the clamp, and reconnect the 2 connectors.



2. REINSTALL FRONT No.1 BRAKE TUBE

(a) Put paper towels over the area where the brake tube will be reconnected.

(b) Remove the hole plug from the new brake booster pump.

(c) Remove the plastic bag from the brake tube.

(d) Temporarily install the brake tube.

(1) Insert the brake tube into the pump perpendicular until it seats.

(2) While holding the brake tube, tighten the flare nut by hand.

(e) Using a 10mm union nut wrench, securely tighten the flare nut.

Specified torque:

T = 15 N*m (155 kgf*cm, 11 ft.*lbf)

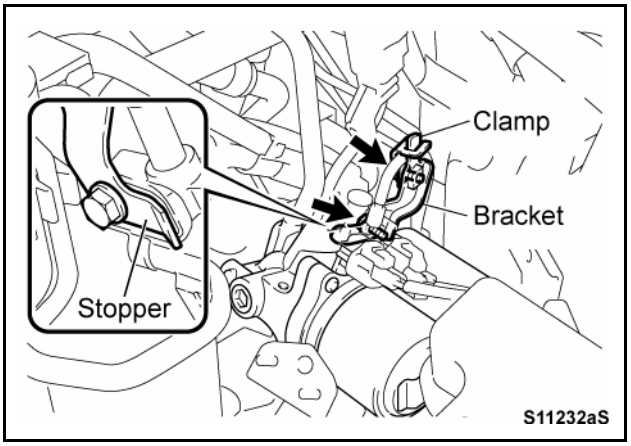
T’ = 13 N*m (133 kgf*cm, 10 ft.*lbf)

Use a torque wrench with a fulcrum length of 155 mm (6.10 in.)

(f) Remove the paper towels.

Please use the **Torque Calculation Tool** in order to calculate the correct torque value.

This tool can be found on Toyota Central, under: **Service/Service and Technical/Torque Calculation Tool**.



(g) Using a 10mm union nut wrench, tighten the bracket with the bolt.

Specified torque:

T = 7.0 N*m (71 kgf*cm, 62 in.*lbf)

T' = 6.1 N*m (62 kgf*cm, 54 in.*lbf)

Use a torque wrench with a fulcrum length of 155 mm (6.10 in.)

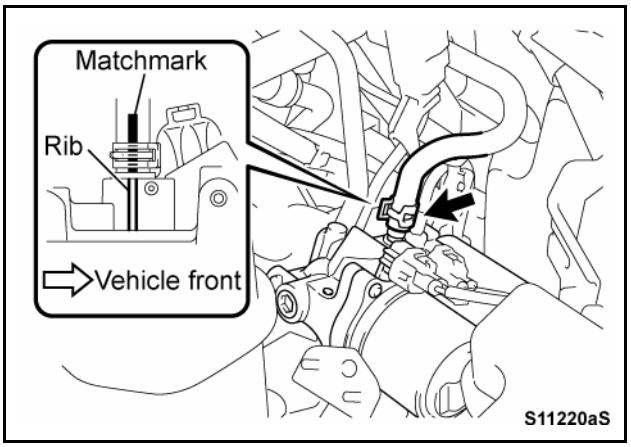
CAUTION:
Ensure that the stopper of the bracket is touching the brake booster pump securely.

(h) Tighten the clamp with the other bolt.

Specified torque:

T = 7.0 N*m (71 kgf*cm, 62 in.*lbf)

Please use the **Torque Calculation Tool** in order to calculate the correct torque value.
This tool can be found on Toyota Central, under: **Service/Service and Technical/Torque Calculation Tool**.



3. RECONNECT BRAKE ACTUATOR HOSE

(a) Put paper towels over the area where the hose will be reconnected.

(b) Remove the cap from the new brake booster pump.

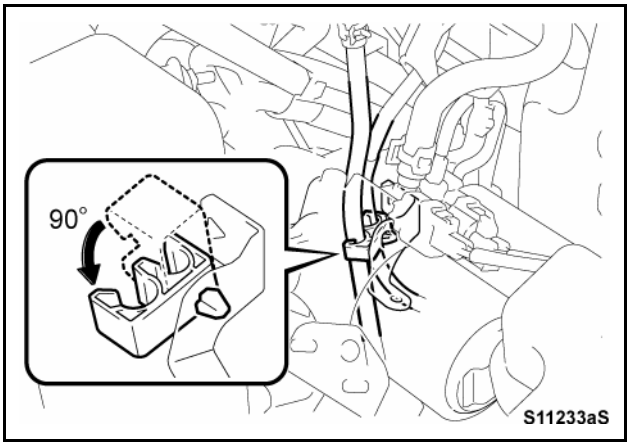
(c) Remove the hose plug from the hose, and then connect the hose to the pump.

CAUTION:
Immediately connect the hose in order to prevent the residual brake fluid from coming out of the reservoir.

(d) Align the matchmark on the hose with the rib on the brake booster pump, and then fixed the hose with the clip.

CAUTION:
Install the clip into its original position.

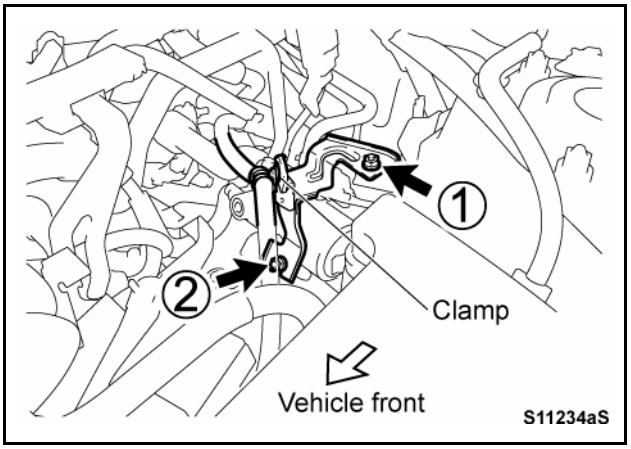
(e) Remove the paper towels.



4. REINSTALL FUEL MAIN TUBE AND FUEL TANK TO CANISTER TUBE

(a) Return the clamp to the original position (horizontal), and insert the 2 fuel tubes into the clamp.

CAUTION:
Ensure that the clamp is returned to the correct position.



5. REINSTALL No.5 BRAKE ACTUATOR BRACKET

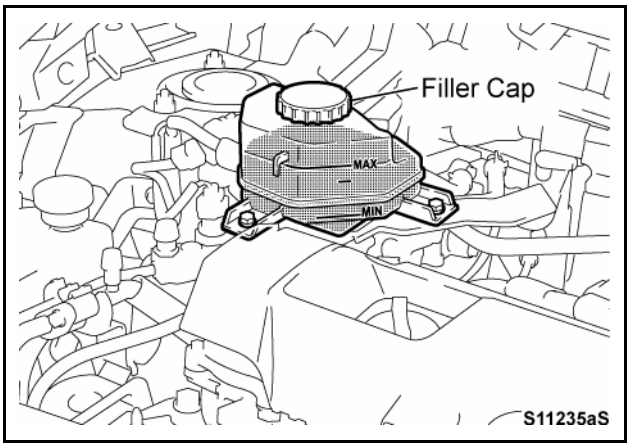
(a) Tighten the nuts in the order shown in the illustration to fasten the bracket.

Specified torque:

T = 8.5 N*m (87 kgf*cm, 75 in.*lbf)

(b) Engage the clamp.

I. BLEED No.1 BRAKE ACTUATOR TUBE



1. FILL RESERVOIR WITH BRAKE FLUID

(a) Fill the reservoir with brake fluid until the fluid level reaches the middle level between the MIN and MAX indicators.

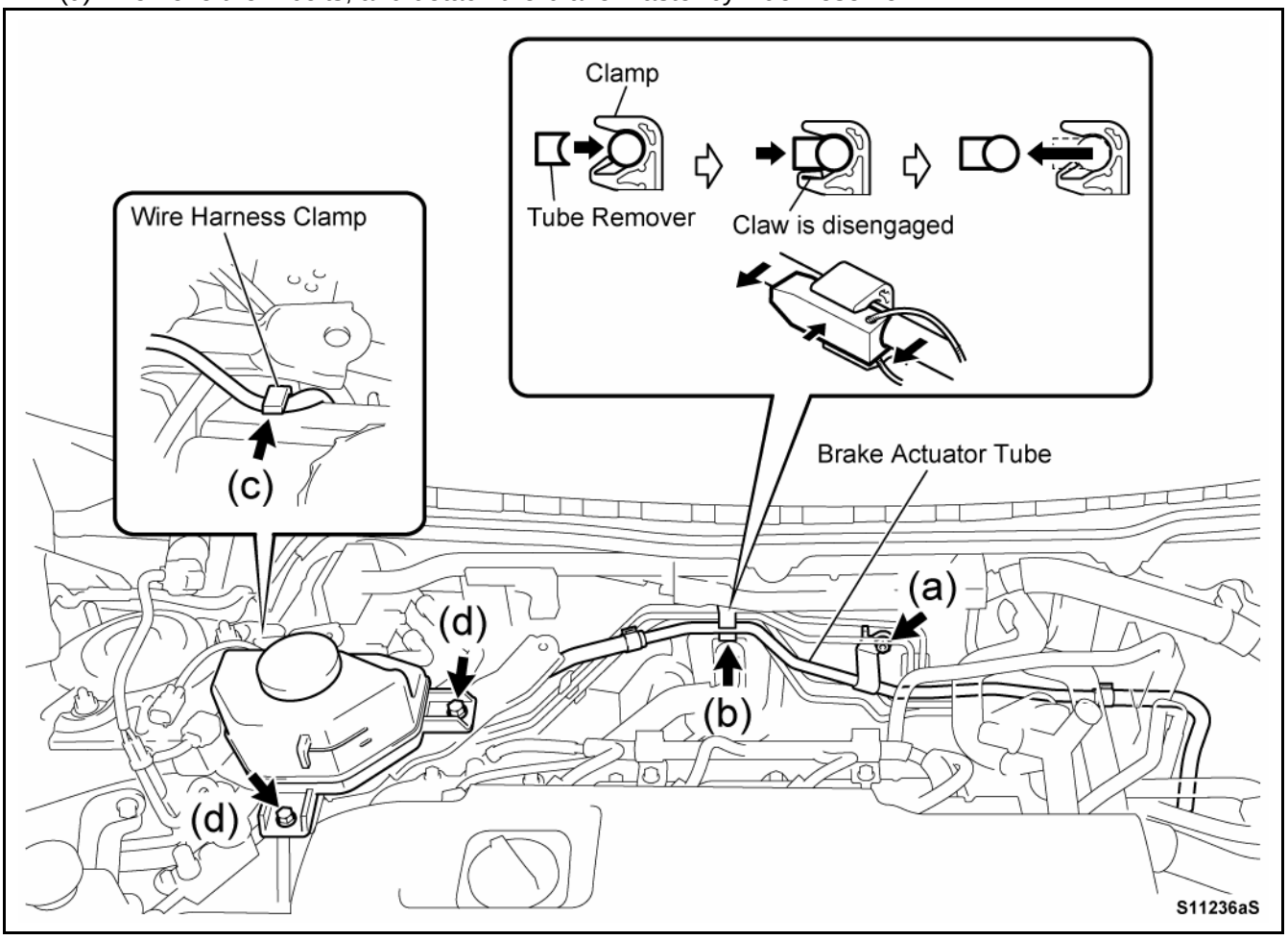
Brake fluid:

SAE J1703 or FMVSS No.116 DOT3

(b) Reinstall the filler cap.

2. SEPARATE BRAKE MASTER CYLINDER RESERVOIR AND No.1 BRAKE ACTUATOR TUBE

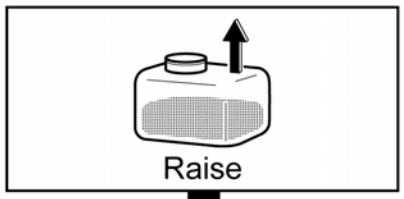
(a) Remove the nut.
(b) Using a tube remover, pull out the actuator tube from the clamp.
(c) Pull out the wire harness from the clamp.
(d) Remove the 2 bolts, and detach the brake master cylinder reservoir.



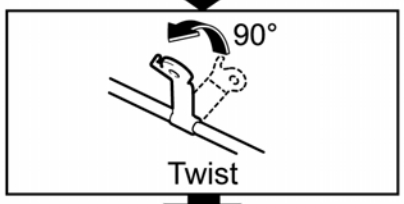
3. BLEED No.1 BRAKE ACTUATOR TUBE

Workflow of bleeding (for details, refer to the following pages)

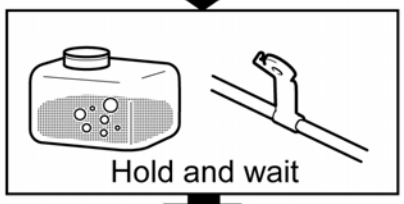
Completely bleed air from the brake actuator tube, otherwise, air will enter the new brake booster pump, and it will lead you to bleed the new pump.
If a large amount of air enters the new pump, this could cause the pump to be burned out in the worst case scenario.



① Raise the reservoir as high as possible.

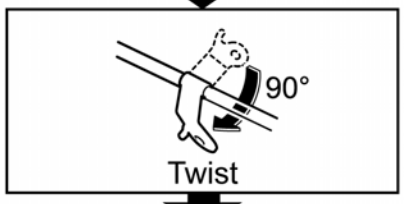


② Twist and hold the actuator tube 90 degrees toward the vehicle front.

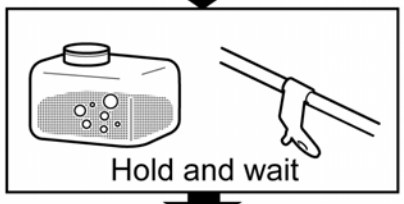


③ Hold and wait about 5 sec.

④ Return the tube.



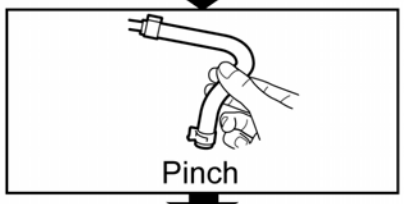
⑤ Twist and hold the actuator tube 90 degrees toward the vehicle rear.



⑥ Hold and wait about 5 sec.

⑦ Return the tube.

Repeat the steps from ② to ⑦ five times.



⑧ Pinch the actuator hose on the brake booster pump 10 times with your fingers.

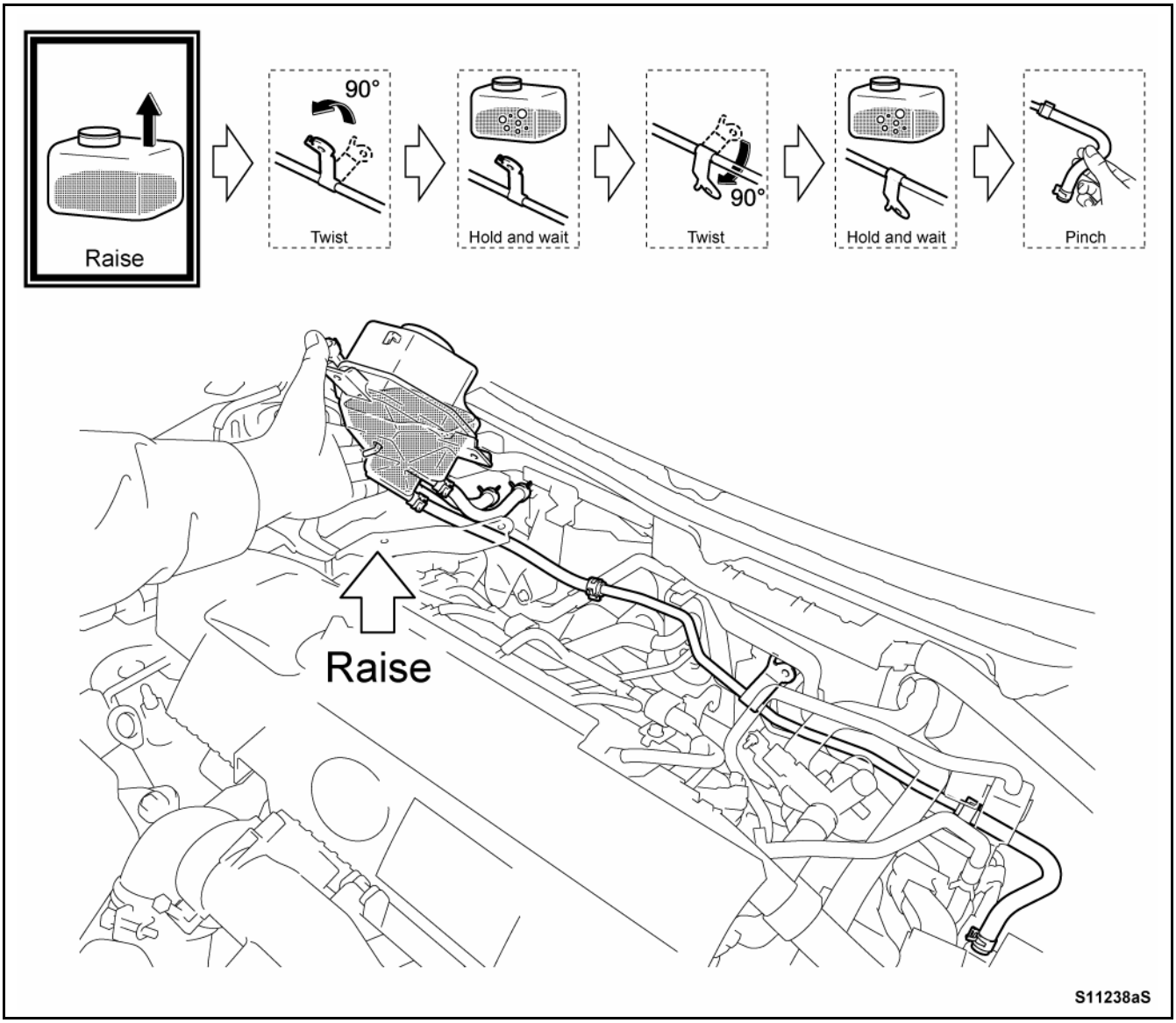
Repeat the steps from ② to ⑦ five times again.

Bleeding is completed

S11237aS

CAUTION:
Completely bleed air from the brake actuator tube, otherwise, air will enter the new brake booster pump, and it will lead you to bleed the new pump. If a large amount of air enters the new pump, this could cause the pump to be burned out in the worst case scenario.

(a) Raise the reservoir as high as possible.

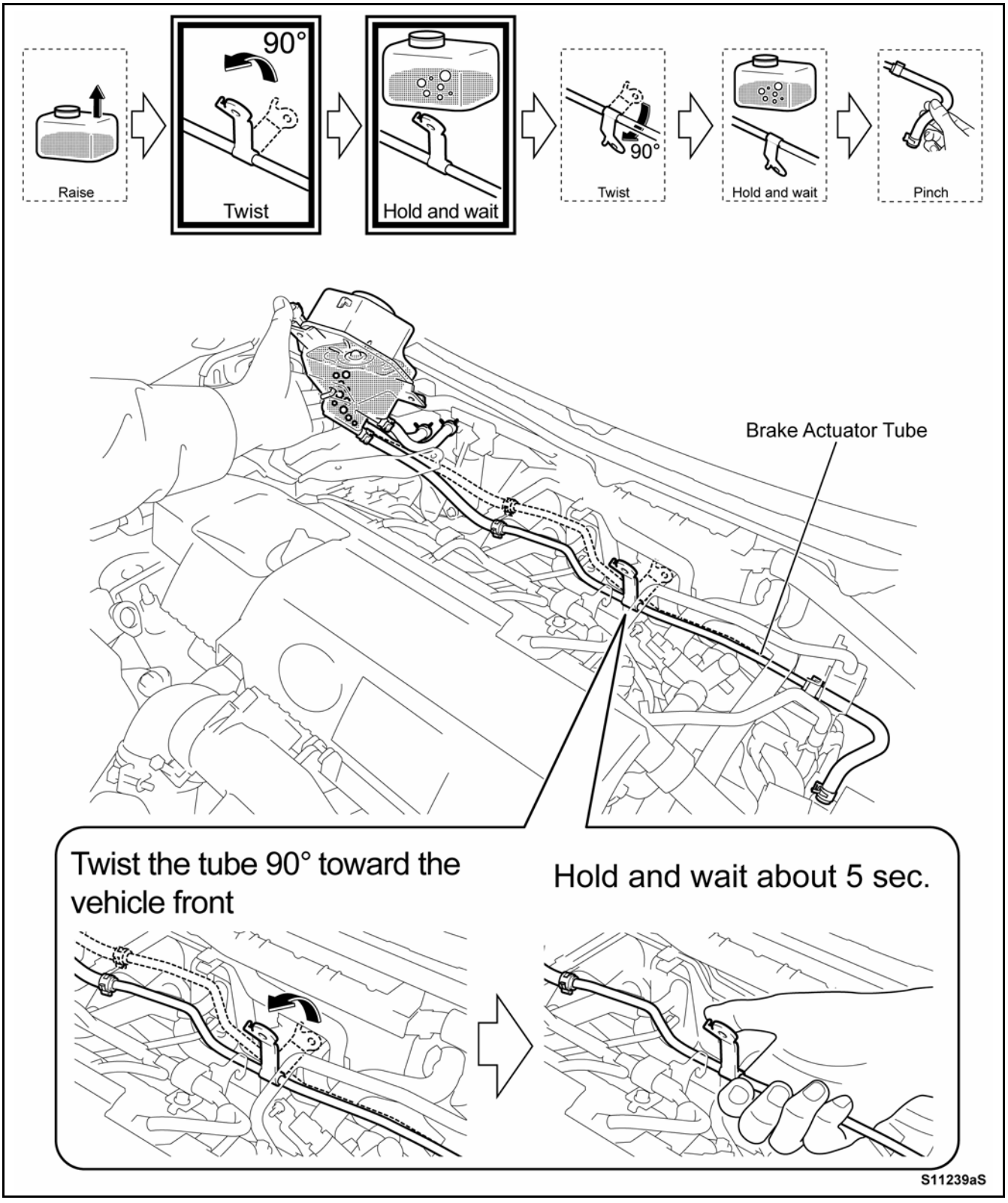


(b) While holding the reservoir in the air, twist and hold the actuator tube 90 degrees toward the vehicle front and wait about 5 seconds.

NOTE:

Holding the tube causes the residual air inside the tube to go into the reservoir. The amount of bubbles varies depending on the amount of the air that has remained inside.

(c) Return the tube to its original state.

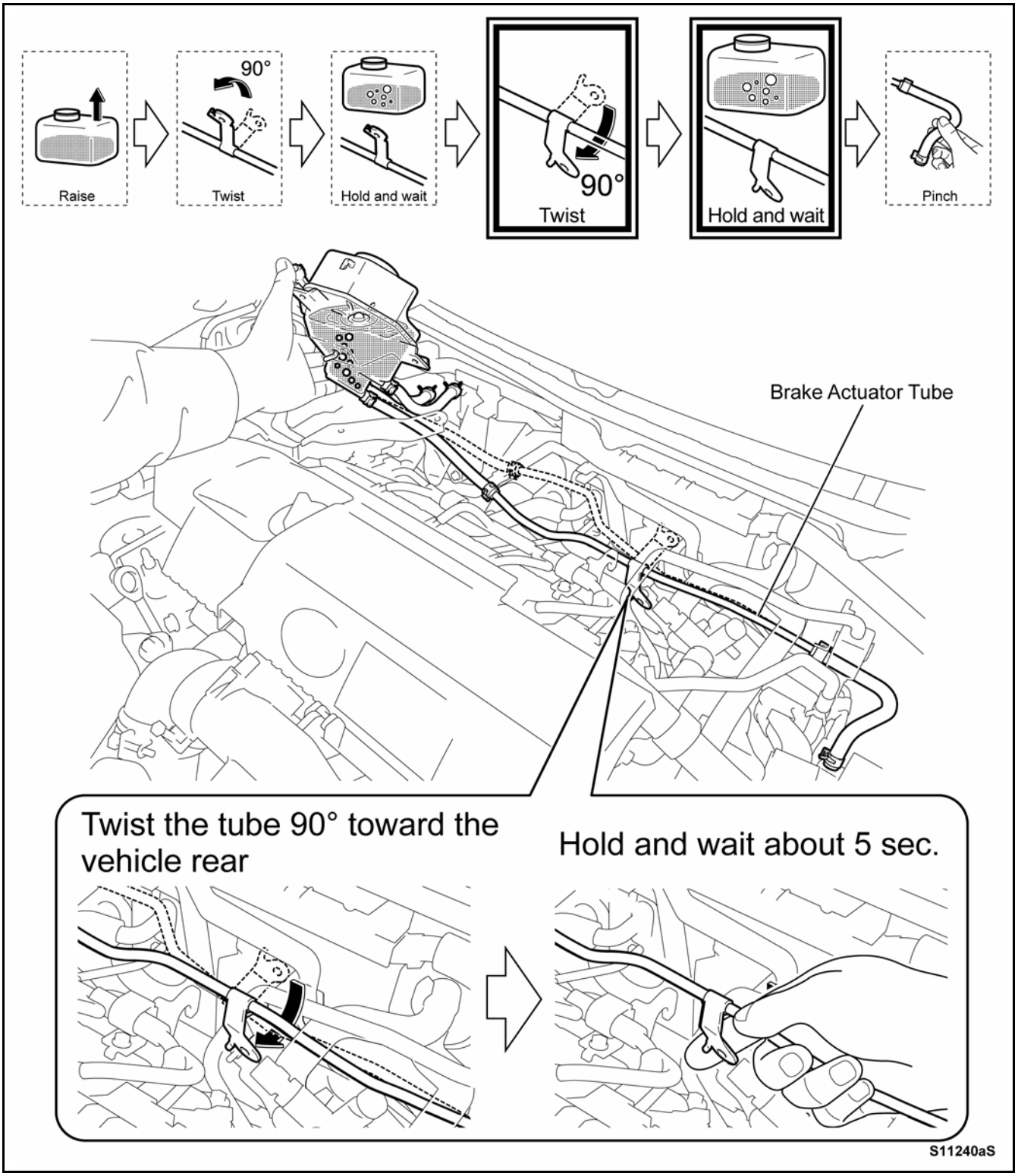


(d) Twist and hold the tube 90 degrees toward the vehicle rear and wait about 5 seconds.

NOTE:

Holding the tube causes the residual air inside the tube to go into the reservoir. The amount of bubbles varies depending on the amount of the air that has remained inside.

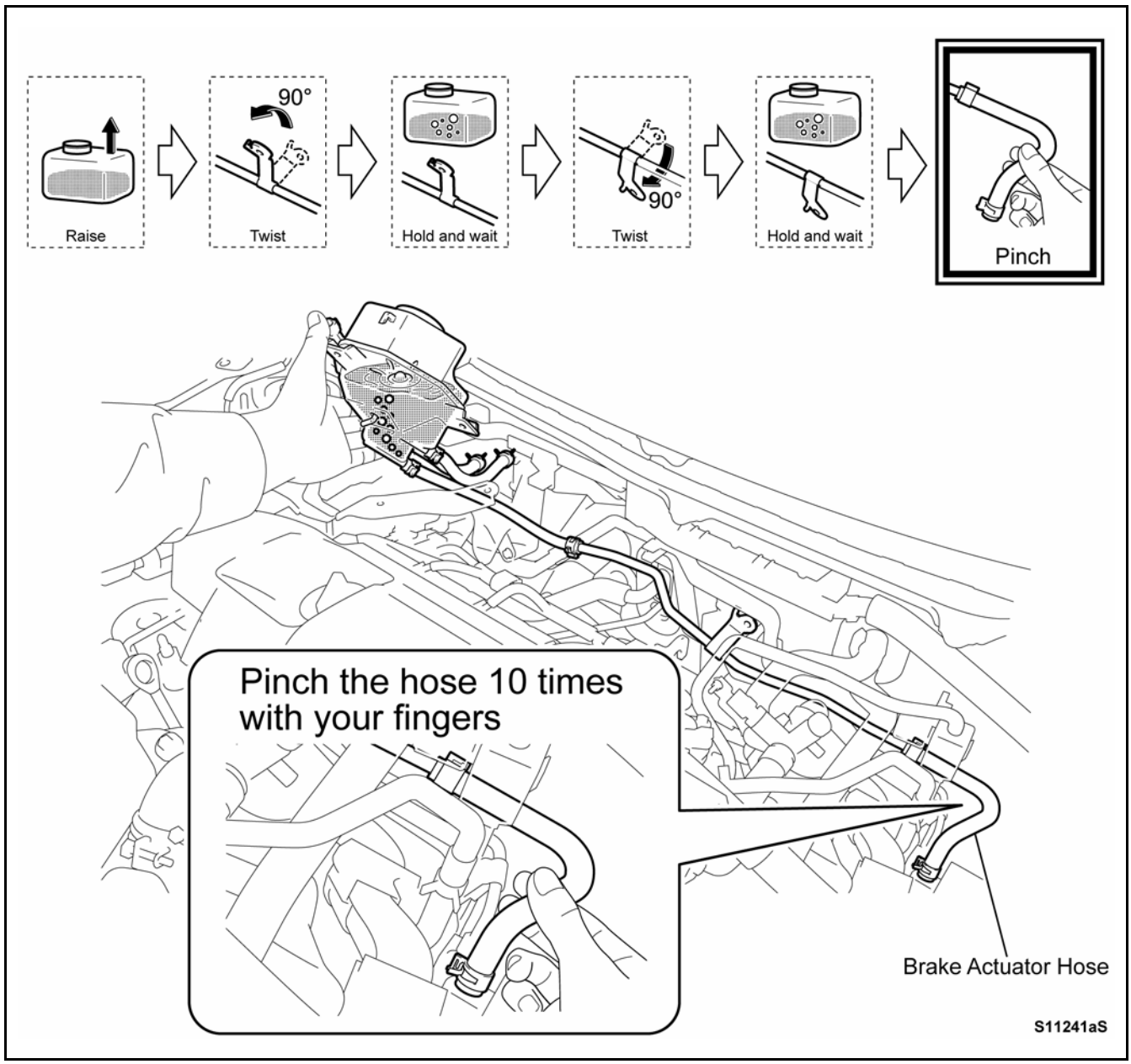
(e) Return the tube to its original state.



Repeat the steps from (b) to (e) 5 times.

(f) Pinch the actuator hose on the brake booster pump 10 times with your fingers.

CAUTION:
Do not use pliers or similar to pinch the hose. Doing so could cause damage to the hose. Use your fingers.



Repeat the steps from (b) to (e) 5 times again.

Check that no residual air goes into the reservoir, and then finish the bleeding.

4. REINSTALL BRAKE MASTER CYLINDER RESERVOIR AND No.1 BRAKE ACTUATOR TUBE

(a) Put back the actuator tube into the clamp.

(b) Fasten the actuator tube with the nut.

Specified torque:

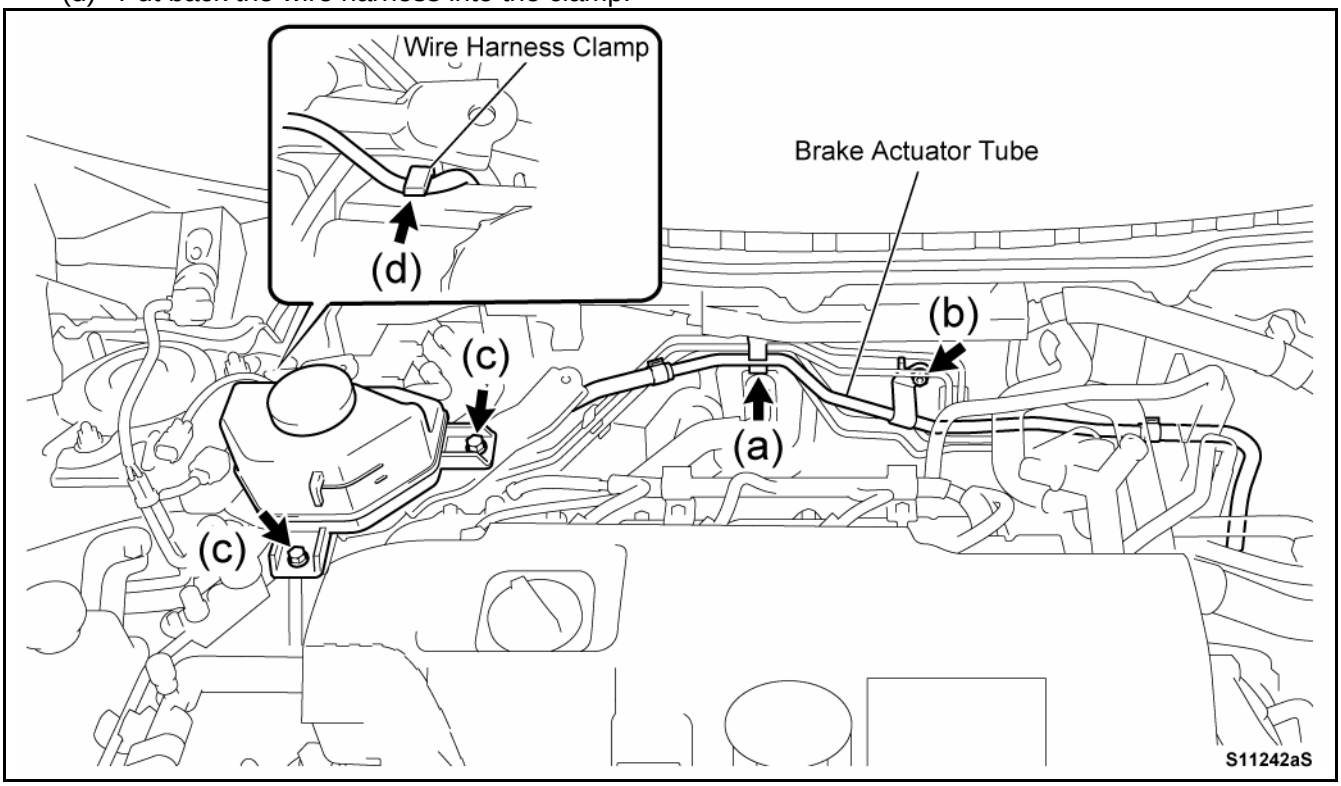
T = 8.4 N*m (85 kgf*cm, 74 in.*lbf)

(c) Fasten the brake master cylinder reservoir with the 2 bolts.

Specified torque:

T = 8.5 N*m (87 kgf*cm, 75 in.*lbf)

(d) Put back the wire harness into the clamp.



5. RECONNECT CABLE TO NEGATIVE BATTERY TERMINAL

NOTE:

READY ON may remain inactive in some cases after auxiliary battery reconnection. If this happens, open and close the driver’s door once with the power switch off (IG OFF) to reset the system.

6. CHECK THAT NO BUZZER SOUNDS

(a) With the power switch off (IG OFF), open and close the driver's door.

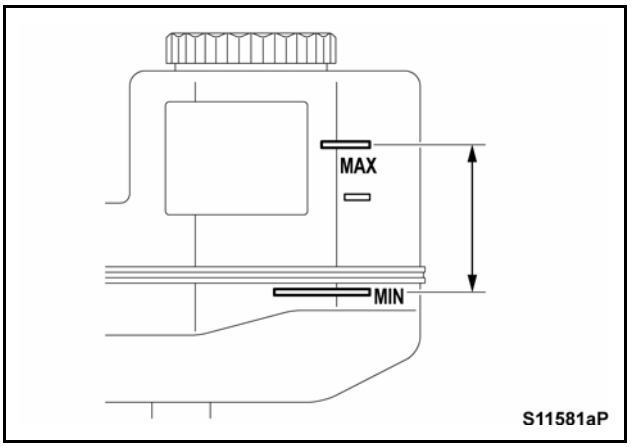
(b) Turn the power switch on (IG ON) and wait 1 minute. Confirm that no buzzer (beep) sounds.

Buzzer	Proceed to
Does not sound	J. PRECAUTIONS FOR BLEEDING BRAKE SYSTEM (page 44)
Sounds	[Case 1] Buzzer Sounds (page 56)

NOTE:
If a buzzer sounds, it is assumed that the accumulator internal pressure is low due to air that has entered the brake booster bump.

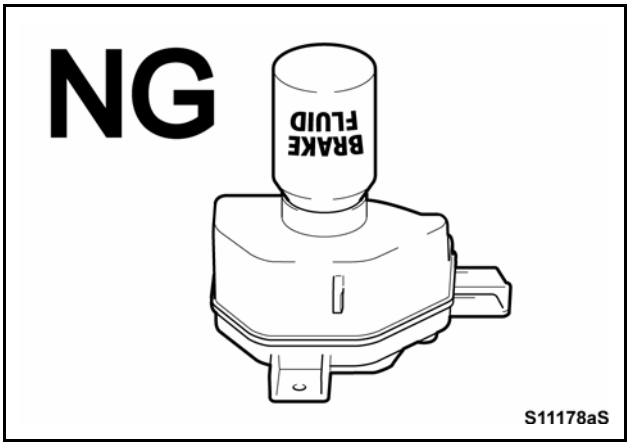
(c) Turn the power switch off (IG OFF).

J. PRECAUTIONS FOR BLEEDING BRAKE SYSTEM

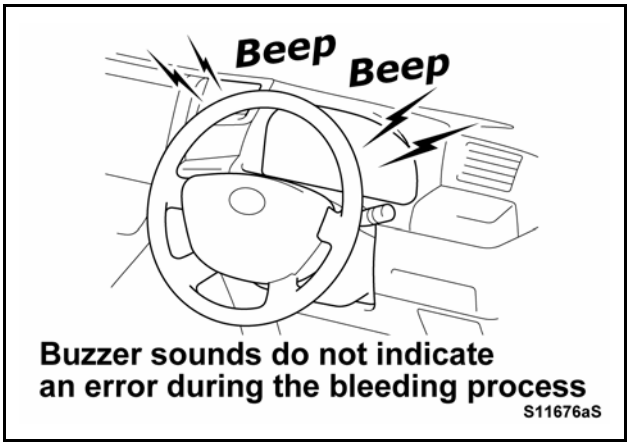


CAUTION:
During brake bleeding, in order to prevent air from entering the brake booster pump, add brake fluid to maintain the fluid level between the MIN and MAX of the reservoir.

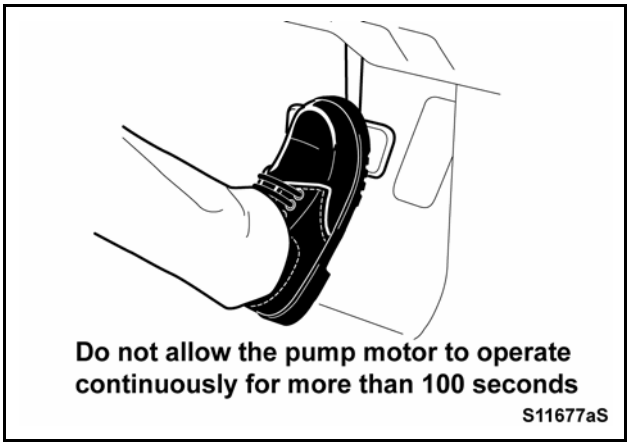
CAUTION:
Prevent brake fluid from coming into contact with any painted surface. If contact occurs, wash it off immediately.



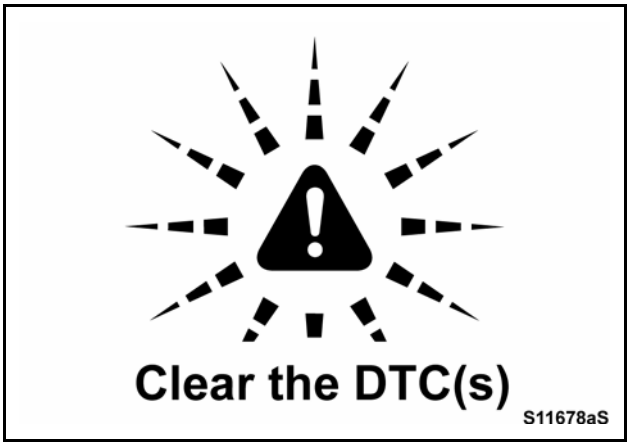
CAUTION:
Brake fluid may overflow as fluid returns from the accumulator. Do not leave the brake fluid can on the reservoir during brake bleeding.



CAUTION:
During brake bleeding, a buzzer may sound due to pressure decrease of the accumulator. However, this is not an error.



CAUTION:
During brake bleeding, in order to avoid damage to the pump motor, do not allow the motor to operate continuously for 100 seconds or more. To stop the motor from operating, release the brake pedal.



CAUTION:
Brake bleeding causes DTCs to be set, which indicate abnormalities such as pressure sensor failure. After completion of brake bleeding or as instructed to do so in the procedures, clear the DTC(s).

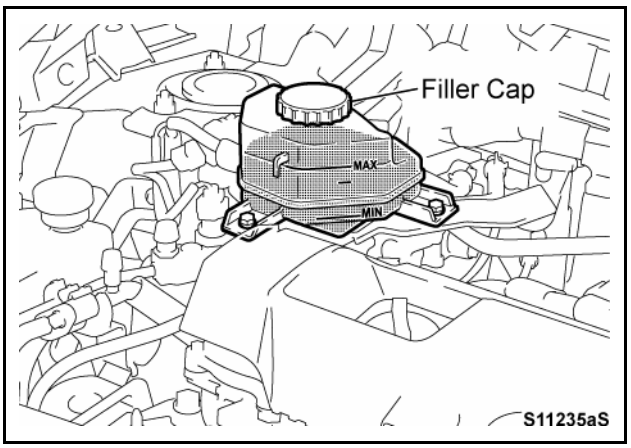
K. BLEED BRAKE SYSTEM

1. REMOVE ALL WHEELS

2. BLEED BRAKE SYSTEM

(a) Connect a battery charger to the auxiliary battery.

CAUTION:
In order to prevent the auxiliary battery from being depleted during brake bleeding, connect a battery charger to the auxiliary battery before bleeding.



(b) Remove the filler cap.

(c) Fill the reservoir with brake fluid until the fluid level reaches the middle level between the MIN and MAX indicators.

Brake fluid:

SAE J1703 or FMVSS No.116 DOT3

(d) Turn the power switch off (IG OFF), and connect a GTS (Global Techstream) to the DLC3.

(e) Turn the power switch on (IG ON), and turn the GTS on.

(f) Enter the following menu items on the GTS.
: Chassis / ABS/VSC/TRC / Utility / Air Bleeding

(g) Follow the instructions on the GTS, and select the “ABS actuator has been replaced”, and then press “NEXT.”

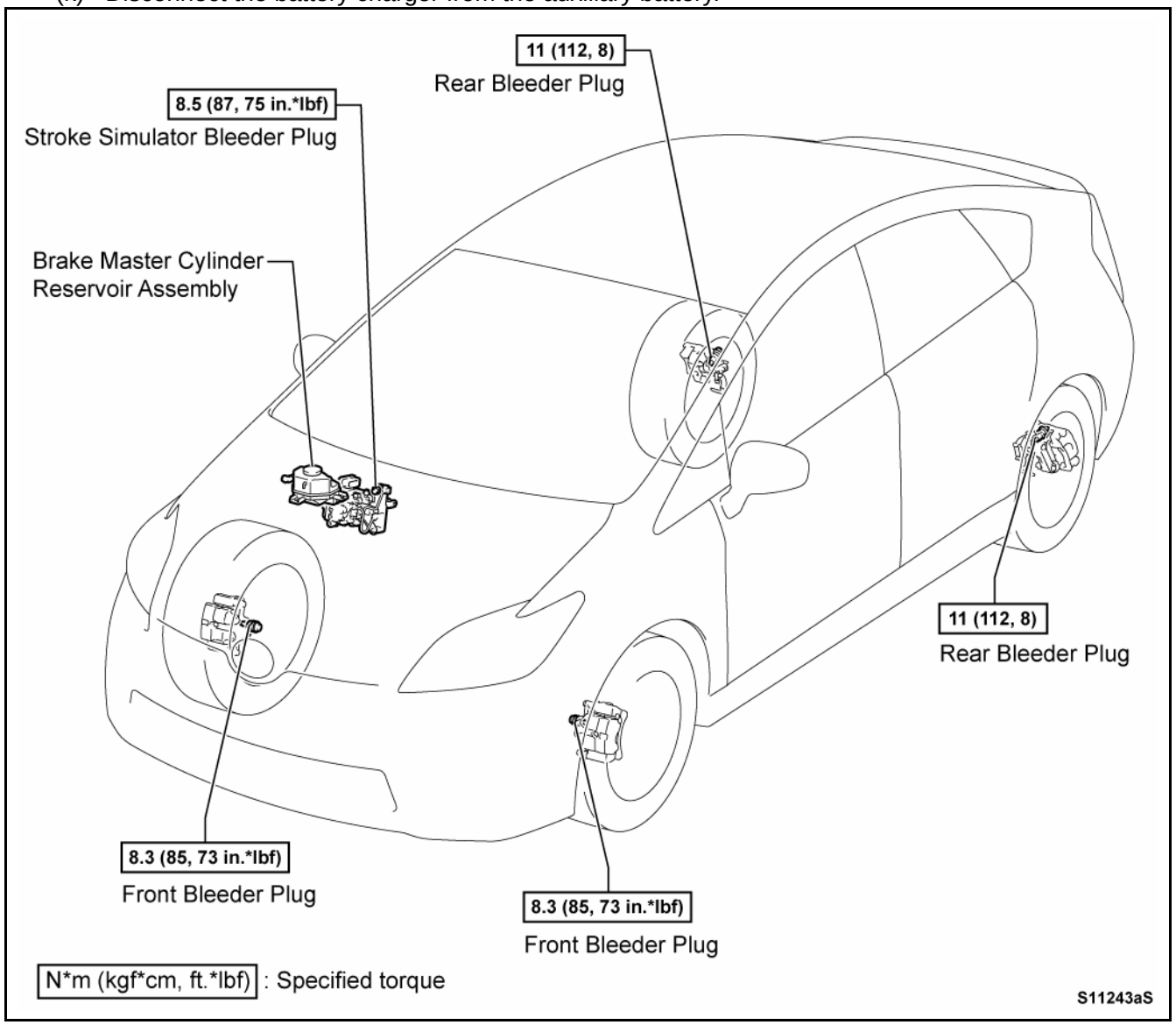
CAUTION:
Carefully read the instructions shown on the GTS while doing this procedure. If you fail to follow the instructions and brake bleeding stops before the procedure completes, conduct the “ABS actuator has been replaced” again.

(h) Bleed the brake system by referring to the instructions on the GTS.

CAUTIONS:

- **If the brake booster pump is operated when the brake fluid reservoir is empty, the pump could burn out. In order to avoid damage to the pump, add brake fluid to the reservoir so that the fluid level is maintained between the MIN and MAX levels during brake bleeding.**
- **During brake bleeding, a buzzer may sound due to pressure decrease of the accumulator. However, this is not an error.**

(i) After bleeding is complete, tighten each bleeder plug to the specified torque.
(j) Reinstall the filler cap.
(k) Disconnect the battery charger from the auxiliary battery.



3. CHECK FOR BRAKE FLUID LEAKAGE

CAUTION:
In order to avoid serious accident, conduct brake fluid leakage checks.

(a) Check that there is no brake fluid leakage on the brake tubes or hoses.
(b) Check that there is no brake fluid leakage on the brake calipers or stroke simulator bleeder plug.

4. REINSTALL ALL WHEELS

Specified torque:

T = 103 N*m (1050 kgf*cm, 76 ft.*lbf)

L. RESTORE VEHICLE

1. REINSTALL OUTER COWL TOP PANEL SUB-ASSEMBLY

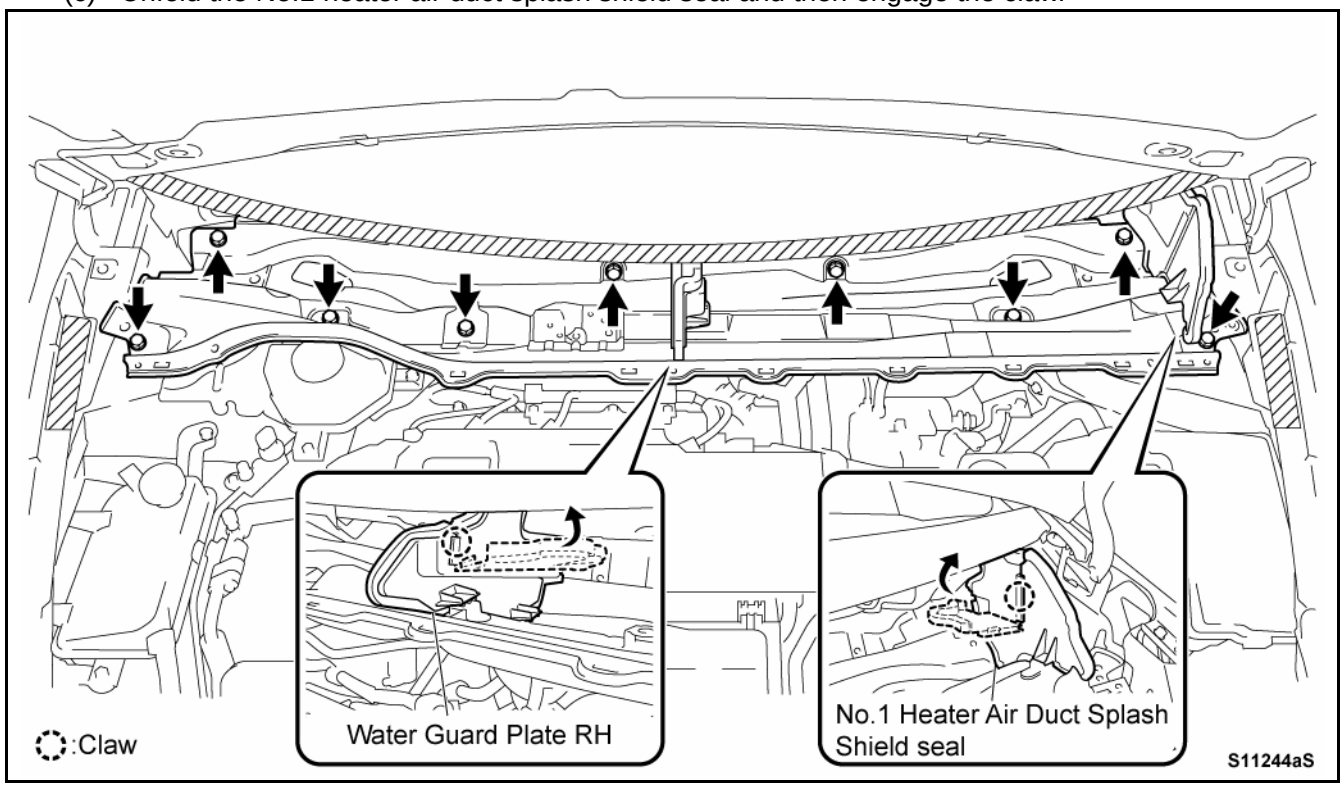
(a) Fasten the cowl top panel with the 9 bolts.

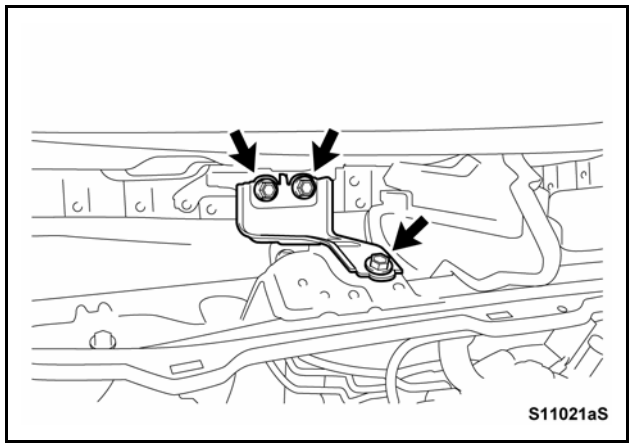
Specified torque:

T = 12 N*m (122 kgf*cm, 9 ft.*lbf)

(b) Unfold the water guard plate RH and then engage the claw.

(c) Unfold the No.1 heater air duct splash shield seal and then engage the claw.



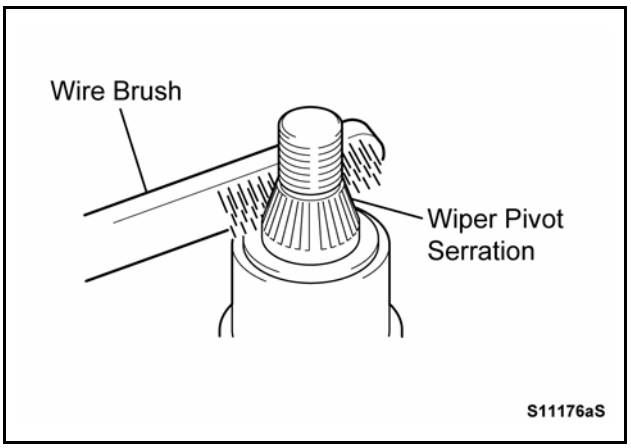


2. REINSTALL COWL BODY MOUNTING REINFORCEMENT RH

(a) Fasten the reinforcement with the 3 bolts.

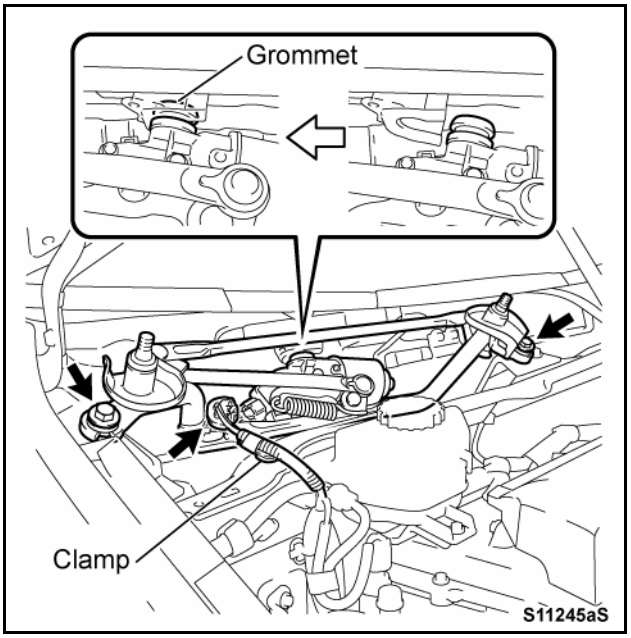
Specified torque:

T = 12 N*m (122 kgf*cm, 9 ft.*lbf)



3. REINSTALL WINDSHIELD WIPER MOTOR AND LINK ASSEMBLY

(a) Clean the wiper pivot serration with a wire brush.



(b) Engage the grommet to reinstall the wiper motor and link assembly.

(c) Tighten the 2 bolts.

Specified torque:

T = 5.5 N*m (56 kgf*cm, 49 in.*lbf)

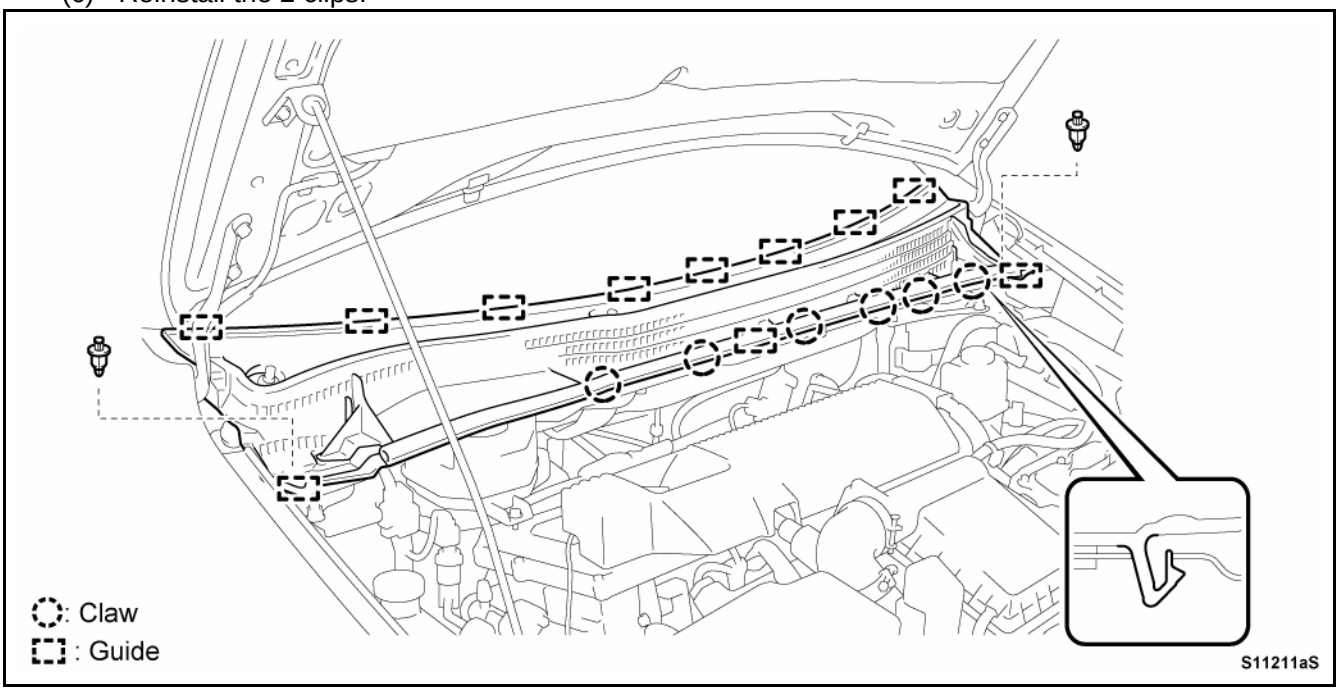
(d) Reconnect the connector and engage the clamp.

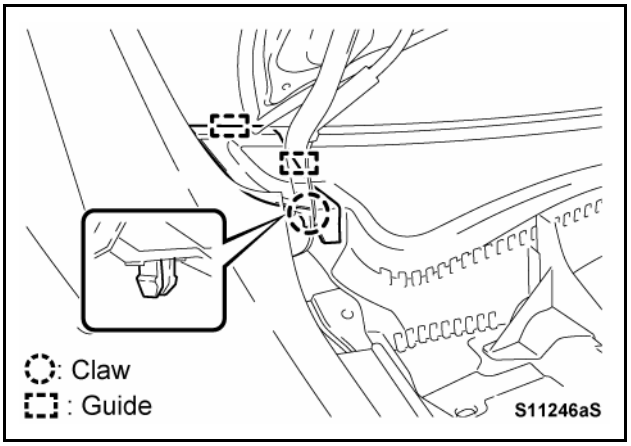
4. REINSTALL COWL TOP VENTILATOR LOUVER SUB-ASSEMBLY

(a) Remove the protective tape from the perimeters of the windshield and fenders.

(b) While inserting the cowl top ventilator louver, engage the 6 claws to fasten it.

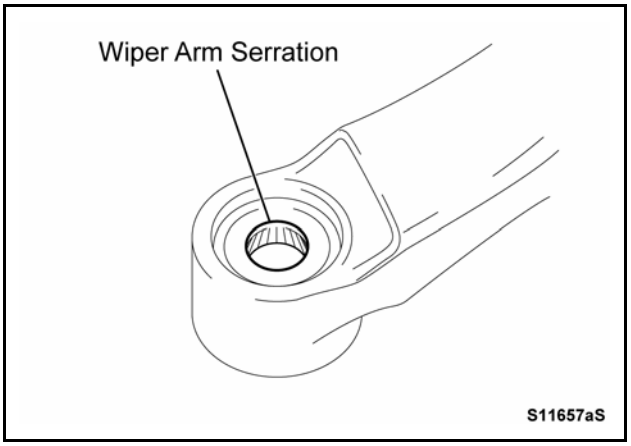
(c) Reinstall the 2 clips.





5. REINSTALL COWL SIDE VENTILATOR SUB-ASSEMBLY LH AND RH

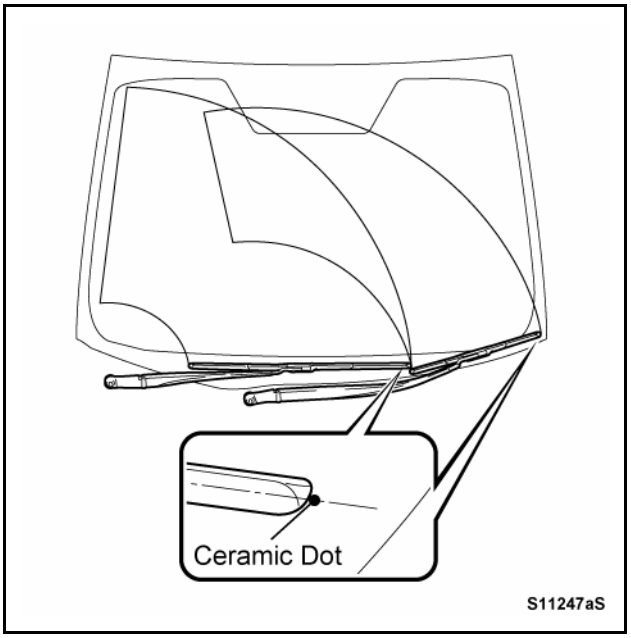
(a) While inserting a cowl side ventilator, engage the claw to fasten it. Do the same for the other cowl side ventilator.



6. REINSTALL FRONT WIPER ARM AND BLADE ASSEMBLY LH AND RH

(a) Stop the wiper motor at the automatic stop position.

(b) Clean the wiper arm serration.



(c) Position the tip of the wiper blade to the ceramic dot as shown in the illustration, and then fasten the front wiper arm and blade assembly with the nut. Do the same for the other one.

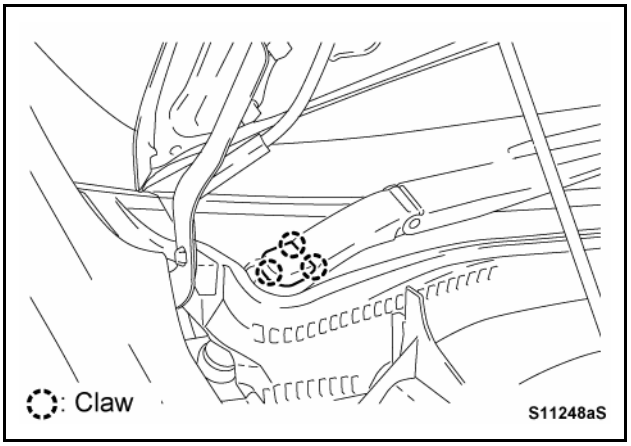
Specified torque:

T = 23 N*m (235 kgf*cm, 17 ft.*lbf)

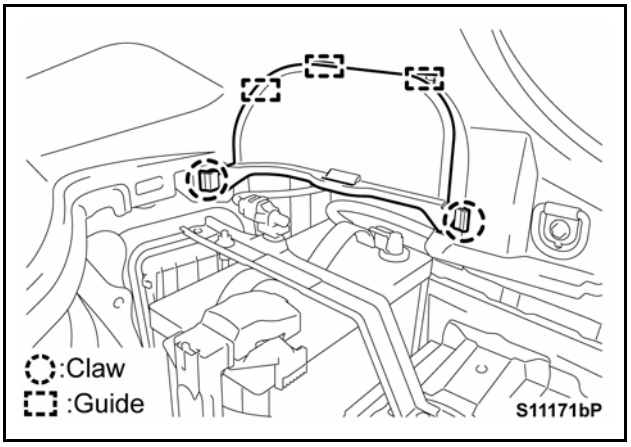
NOTE:

Holding the arm hinge portion by hand, tighten the nut.

7. CHECK WIPER OPERATIONS

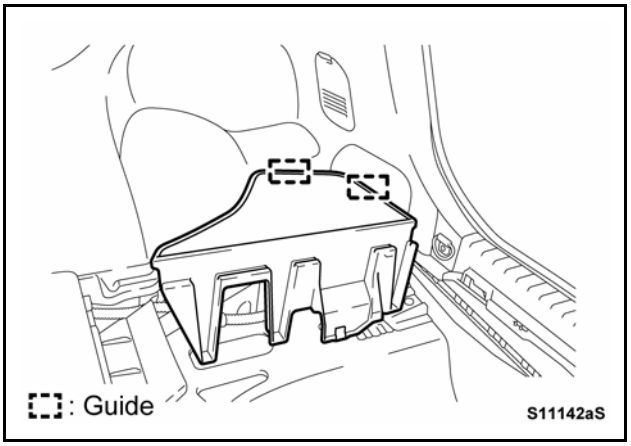


8. REINSTALL FRONT WIPER ARM HEAD CAP LH AND RH



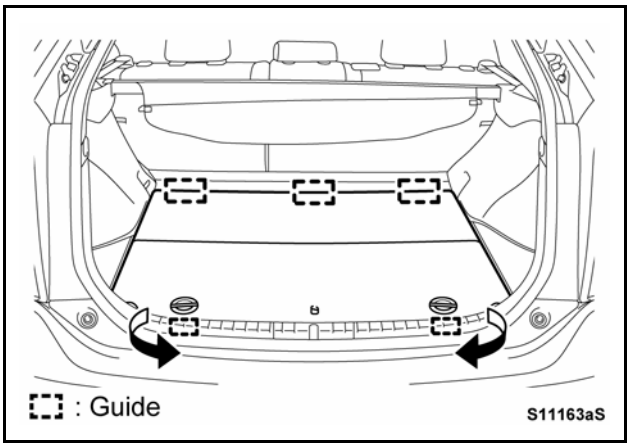
9. REINSTALL REAR UPPER No.3 FLOOR BOARD PLATE

(a) Engage the 2 claws to attach the board plate.



10. REINSTALL REAR No.3 FLOOR BOARD

11. REINSTALL REAR DECK FLOOR BOX



12. REINSTALL REAR No.2 FLOOR BOARD

(a) Attach the floor board, and rotate the 2 knobs in the directions indicated by the arrows.

13. INITIALIZE STEERING ANGLE NEUTRAL POINT

(a) Turn the power switch on (READY ON), and turn the steering wheel left and right as far as it can go to store the steering angle neutral point in the memory. This must be done a level ground.

CAUTIONS:

- **In order to prevent the vehicle from rolling, ensure that the parking brake is applied and the shift lever is in the P position, while firmly depressing the brake pedal.**
- **If the steering angle neutral point is not initialized, "System initializing" will be displayed on the navigation receiver assembly, and the intelligent parking assist system will not work correctly.**

14. CHECK AND CLEAR DTCS

CAUTION:

If DTC C1345 (Linear Solenoid Valve Offset Learning Undone) is detected again after all the DTCs are cleared, the brake bleeding has not been completed properly. Conduct the "Linear Solenoid Valve Offset Learning" by referring to the procedures instructed on page 58.

15. ISC INITIALIZATION (ISC LEARNING)

CAUTION:
If the ISC Initialization is skipped, rattling sounds may be emitted from the transaxle.

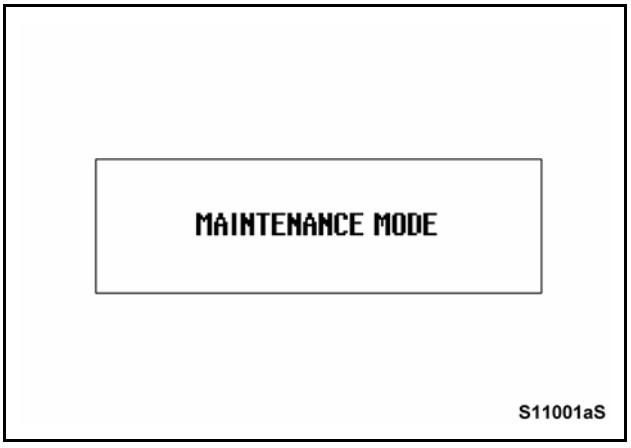
(a) Follow the procedure instructed below to enter maintenance mode and warm up the engine.

NOTE:

The accelerator pedal operation method can be used to enter maintenance mode.
Refer to repair manual for PRIUS for instructions on INTRODUCTION / REPAIR INSTRUCTION / INSPECTION MODE PROCEDURE.

CAUTION:
If the warning lamp comes on in maintenance mode, exit from the mode, check and clear DTCs.

(1) Enter the following menu items on a GTS.
: Powertrain / Hybrid Control / Utility / Inspection Mode
(2) Follow the instructions on the GTS, select the “2WD for measuring Exhaust Gas”, and then press the “NEXT.”



(3) When in maintenance mode, “MAINTENANCE MODE” appears on the multi information display.
(4) Depress the brake pedal, and turn the power switch on (READY ON).
(5) The READY indicator comes on, and the engine starts running.

(b) While the engine running, select the following menu items on the GTS.
: Powertrain / Engine and ECT / Data List / Coolant Temp and ISC Leaning
(c) Warm up the engine until the engine coolant temperature reading in the Data List exceeds 70°C (158°F) with the vehicle in READY ON mode.
(d) Turn the power switch off (IG OFF) and then turn it on (READY ON) again.
(e) Confirm that the engine coolant temperature reading in the Data List is above 70°C (158°F).
(f) Keep the shift position in P, and slightly depress the accelerator pedal to start the engine.
(g) Wait until the engine stops, and check that the ISC Learning value in the Data List is “compl”.

NOTE:

Normally, the engine stops within 1 minute. However, if the SOC (State Of Charge) is low, it may take several minutes until the engine stops.

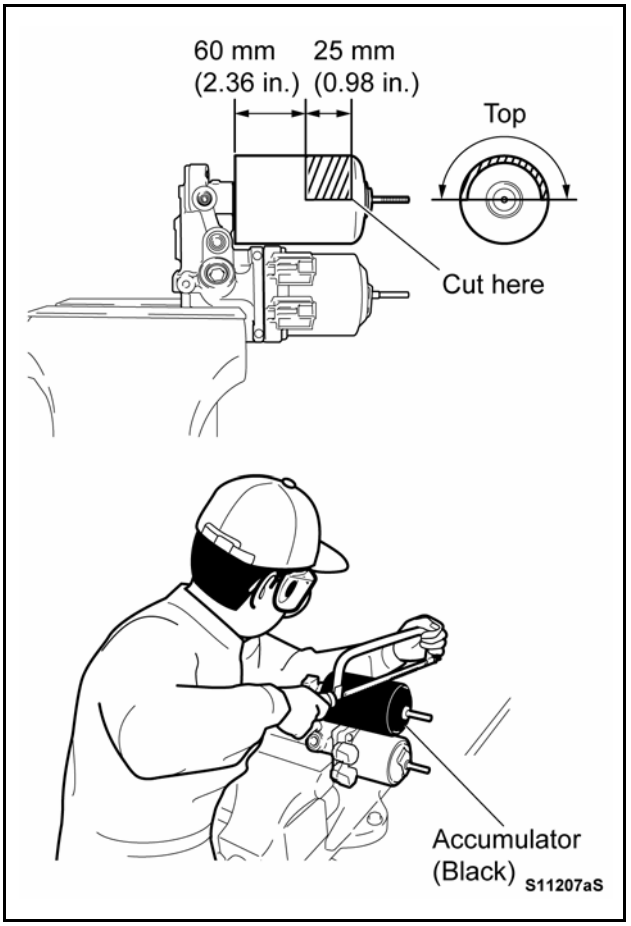
16. RESTORE SETTINGS AFTER AUXILIARY BATTERY CABLE RECONNECTION

(a) Refer to the settings recorded before the cable was disconnected from the negative (-) battery terminal. If the audio, air conditioning etc. settings have been cleared, input the recorded settings again.

M. DISPOSE OF REMOVED BRAKE BOOSTER PUMP ASSEMBLY

1. DISCHARGE RESIDUAL GAS FROM REMOVED BRAKE BOOSTER PUMP

(a) Wear protective glasses.



(b) Clamp the removed brake booster pump in a vise as shown in the illustration.

(c) Using a hacksaw, make a cut somewhere on the accumulator (black) within the shaded area, as shown in the illustration, to discharge the gas.

CAUTIONS:

- **Cut the accumulator slowly.**
- **Do not cut on the underside, otherwise a small amount of the enclosed fluid will spray out.**
- **Do not use any power or pneumatic tools.**

NOTE:
The enclosed gas is colorless, odorless and non toxic nitrogen.

2. DISPOSE OF REMOVED BRAKE BOOSTER PUMP ASSEMBLY

OPERATION COMPLETED

If the following errors occur, conduct the procedures instructed on the following pages.

[Case 1] Buzzer Sounds:

- **Bleed the Brake Booster Pump (referred from page 43)**

[Case 2] DTC C1345 (Linear Solenoid Valve Offset Learning Undone) is Detected:

- **Linear Solenoid Valve Offset Learning (referred from page 52)**

[Case 1] Buzzer Sounds:
Bleed the Brake Booster Pump (referred from page 43)

1. MEASURE PUMP MOTOR OPERATING TIME

(a) After the power switch is turned on (IG ON), measure the operating time of the pump motor, and then determine the necessary procedures by referring to the table below.

NOTE:

The pump motor starts operating just after the power switch is turned on (IG ON).

Operating time	Required procedures
Less than 100 seconds	Bleed the brake booster pump (go to "2. BLEED BRAKE BOOSTER PUMP" shown below).
100 seconds or longer	**Replace the new brake booster pump with another new one because air bleeding will not completely eliminate the residual air from the pump** Go to "G. REMOVE BRAKE BOOSTER PUMP ASSEMBLY" (page 18).

2. BLEED BRAKE BOOSTER PUMP

(a) Turn the power switch off (IG OFF), and connect a GTS (Global Techstream) to the DLC3.

(b) Turn the power switch on (IG ON), and turn the GTS on.

(c) Enter the following menu items on the GTS.
: Chassis / ABS/VSC/TRC / Utility / ECB Utility / Zero Down

(d) Follow the instructions on the GTS, select Zero Down, and then turn the power switch off (IG OFF).

CAUTION:
When DTC C1252 (Brake Booster Pump Motor on Time Abnormally Long) has been set, Zero Down cannot be conducted. So, before conducting it, check for that DTC and clear the DTC if it is detected.

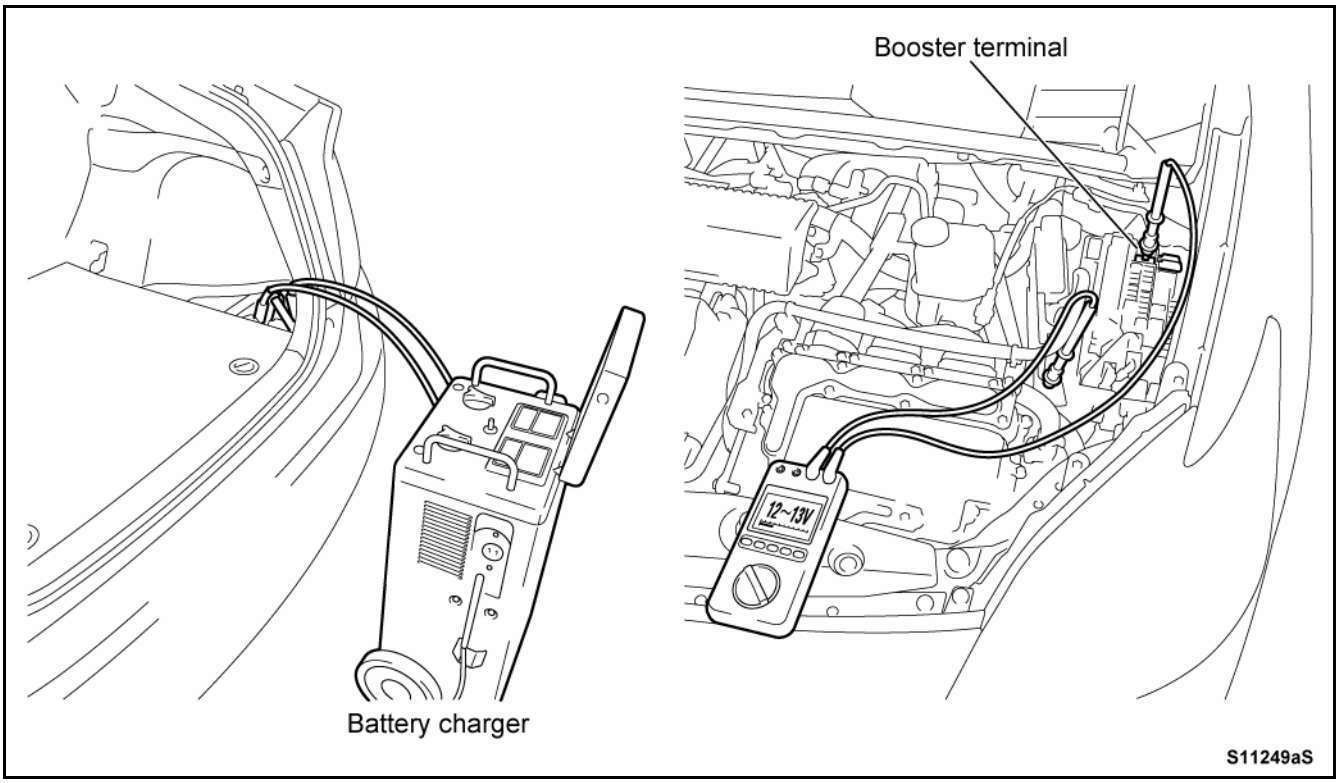
(e) Turn the power switch on (IG ON), and wait until the pump motor stops.

Repeat the steps from (d) to (e) 10 times.

(f) Turn the power switch off (IG OFF).

(g) Connect a battery charger to the auxiliary battery and adjust the battery voltage so that it will be maintained between 12 to 13 V while the power switch is on (IG ON).

CAUTION:
In order to conduct the following inspection properly, adjust the battery voltage.



(h) Enter the following menu items on the GTS.
: Chassis / ABS/VSC/TRC / Utility / ECB Utility / Zero Down

(i) Follow the instructions on the GTS, select Zero Down, and then turn the power switch off (IG OFF).

(j) Turn the power switch on (IG ON), and measure the time until when the pump motor stops operating.
Standard: The motor stops within 13 seconds.

Time to stop after the power switch is turned on (IG ON)	Required procedures
Pump motor stops within 13 seconds	**Brake booster pump bleeding has been completed successfully.** Go to "J. PRECAUTIONS FOR BLEEDING BRAKE SYSTEM" (page 44)
Pump motor takes 13 seconds or longer to stop	**The brake booster pump could be burned out, so it needs to be replaced with a new one.** Go to "G. REMOVE BRAKE BOOSTER PUMP ASSEMBLY" (page 18).

[Case 2] DTC C1345 (Linear Solenoid Valve Offset Learning Undone) is Detected:

Linear Solenoid Valve Offset Learning (referred from page 52)

1. PREPARE FOR LINEAR SOLENOID VALVE OFFSET LEARNING

(a) Check that the power switch is off (IG OFF), and then connect a battery charger to the auxiliary battery.

CAUTION:
If the battery voltage decreases below 10 V, the solenoid valve offset learning will be failed. For that reason, a battery charger needs to be connected to the auxiliary battery.

(b) Turn the power switch on (IG ON), and then check that the shift position is in P.

(c) Release the parking brake.

CAUTION:
While the parking brake is applied, the solenoid valve offset learning cannot be conducted.

2. CLEAR LINEAR SOLENOID VALVE OFFSET LEARNING VALUE FROM MEMORY

(a) Turn the power switch off (IG OFF), and connect a GTS (Global Techstream) to the DLC3.

(b) Turn the power switch on (IG ON), and turn the GTS on.

(c) Enter the following menu items on the GTS.
: Chassis / ABS/VSC/TRC / Utility / Reset Memory

(d) Turn the power switch off (IG OFF).

3. CONDUCT LINEAR SOLENOID VALVE OFFSET LEARNING

(a) Turn the power switch on (IG ON), and then enter the following menu items to enter test mode.
: Chassis / ABS/VSC/TRC / Utility / ECB Utility / Linear Valve Offset

(b) Maintain the vehicle in a stationary position without operating the brake pedal for about 2 minutes after the mode enters test mode.

(c) Check that the flashing interval of the brake warning indicator (yellow) changes to a faster one, from the 1 second interval to 0.25 second interval.

CAUTION:
While the linear solenoid valve offset learning is being conducted, do not drive the vehicle or operate the brake pedal.

(d) Confirm that the test mode code, C1346 (Stroke Sensor Zero Point Learning Malfunction), has not been detected.

(e) Turn the power switch off (IG OFF) to exit test mode.

4. CLEAR DTCS

15. PROCEED TO ISC INITIALIZATION (ISC LEARNING) (page 53)

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