Technical Service Information Bulletin

Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Service Category Brake

Section Brake Control/Dynamic Control System **Market** USA

Toyota Supports ASE Certification

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2016 - 2021	RX450H	

Introduction

Some 2016 – 2021 model year RX 450h vehicles may exhibit a squawk/knock noise from the engine compartment when depressing and/or releasing the brake pedal. This may be due to small amounts of air within the brake actuator assembly. Follow the Repair Procedure in this bulletin to address this condition.

Warranty Information

OP CODE	DESCRIPTION	TIME	OFP	T1	T2
BR1919	Brake Actuator Replacement & Brake Bleed	3.8	44050-48320	91	99

APPLICABLE WARRANTY

- **This repair is covered under the Lexus Basic Warranty. This warranty is in effect for 48 months or 50,000 miles, whichever occurs first, from the vehicle's in-service date.**
- **Warranty application is limited to occurrence of the specified condition described in this bulletin.**

Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Required Tools & Equipment

SPECIAL SERVICE TOOLS (SST)	PART NUMBER	QTY
Battery Diagnostic Tool*	DCA-8000P T	1

*Essential SST.

NOTE

Additional SSTs may be ordered by calling 1-800-933-8335.

REQUIRED EQUIPMENT	SUPPLIER	PART NUMBER	QTY
Techstream ADVI*	ADE	TSADVUNIT	1
Techstream 2.0		TS2UNIT	
Techstream Lite		TSLITEPDLR01	
Techstream Lite (Green Cable)		TSLP2DLR01	

*Essential SST.

NOTE

- Only ONE of the Techstream units listed above is required.
- Software version 15.30.027 or later is required.
- Additional Techstream units may be ordered by calling Approved Dealer Equipment (ADE) at 1-800-368-6787.

Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure

Diagnosis

1. Confirm the condition exists.

   Is there a squawk/knock noise from the engine compartment when depressing and/or releasing the brake pedal?

   - **YES —** Continue to step 2.
   - **NO —** This bulletin does NOT apply. Continue diagnosis using the applicable Repair Manual.

2. Are ANY DTCs stored related to a noise present during brake application?

   - **YES —** This bulletin does NOT apply. Continue diagnosis using the applicable Repair Manual.
   - **NO —** Continue to step 3.

3. Replace the brake actuator.

   Refer to TIS, applicable model and model year Repair Manual:

   - 2016 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Brake Actuator: Removal / Installation"
   - 2017 – 2018 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Brake Actuator: Removal / Installation"
   - 2019 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Brake Actuator: Removal / Installation"
   - 2020 – 2021 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Brake Actuator: Removal / Installation"

4. AFTER the brake actuator is replaced, follow the modified brake bleed procedure in the next section.

> NOTE
>
> The modified bleed procedure in this Service Bulletin is to be used ONLY on vehicles with the brake squawk noise. ALL other repairs should follow the standard brake bleed procedure in the Repair Manual.

Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding

Table 1.

PARTS TO REPLACE/ATTACH/DETACH	PROCEDURE TO REFER TO
Flexible Hose (Front/Rear)	Brake Line Air Bleeding
Disk Brake Cylinder Assembly (Front/Rear)	
Brake Actuator Assembly	Bleed Brake System
Brake Master Cylinder Reservoir Assembly	
Brake Master Cylinder Sub-assembly	Bleed Brake Master Cylinder
Brake Stroke Simulator Cylinder Sub-assembly	

1. Perform the following air bleeding operation.

NOTICE

The Techstream must be used for air bleeding. If not used, the air bleeding will be incomplete, which is hazardous and may lead to an accident.

NOTICE

- **Adjust the brake fluid level so that the brake fluid level is at the MAX line with the power switch on (IG).**
- **Perform air bleeding with the shift lever in P and the parking brake applied.**
- **As brake fluid may overflow when bleeding, do not place the brake fluid can on the brake master cylinder reservoir assembly filler opening.**
- **Perform air bleeding while maintaining the brake fluid level between the MAX and MIN lines on the brake master cylinder reservoir assembly.**
- **Air bleeding will be difficult if the following occurs:**
  - **The No. 2 brake actuator hose (the hose between the brake booster pump assembly and brake master cylinder reservoir assembly) is higher than the brake fluid level and air enters the No. 2 brake actuator hose.**
  - **During the bleeding procedure, air enters the brake booster pump assembly while it is operating.**
- **With the auxiliary battery connected, the brake control system operates when a door courtesy switch or brake pedal is operated even with the power switch off. Therefore, if performing any work where it is possible for air to become trapped inside the brake actuator hose, disconnect the 2 brake booster pump connectors before work.**
- **While performing air bleeding, the accumulator pressure drop may cause a buzzer to sound. As there is no problem, continue with air bleeding.**
- **During air bleeding, DTCs for pressure sensor malfunctions, etc. may be stored. After air bleeding and if instructed in the procedures, clear the DTCs.**
- **Do not allow brake fluid on any painted vehicle body surface. If brake fluid leaks onto any painted surface, immediately wash it off.**
- **When bleeding air, select the suitable procedure according to the table below.**

Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

NOTE

*An ECB (Electronic Control Brake System) has a complicated oil passage. There is a risk that gas dissolved into the brake fluid may vaporize due to a pressure reduction and consequently generate air bubbles.

A. The brake actuator assembly is replaced. Initialize the correction value of the linear valve.
B. Delete the linear valve offset learning memory and brake pedal stroke sensor 0-point learning value memory.
C. Turn the ignition ON.
D. Shift to the “P” position.
E. Turn the parking brake ON.
F. Turn the ignition OFF.
G. Connect Techstream to the DLC3 and turn the ignition ON.
H. From the Techstream screen, select [chassis]→[ABS-VSC-TRC] →[UTILITY]→ [RESET MEMORY]
I. Select [delete the back-up memory] and perform.

Chassis – ABS-VSC-TRC – Utility – Reset Memory

CAUTION

- **Once “Delete the Back-Up Memory” is performed, the 0-point memory for the yaw-rate sensor and G sensor will also be deleted. Make sure to perform a 0-point acquisition for the yaw-rate sensor and G sensor.**
- **After the 0-point memory for the yaw-rate sensor and G sensor is deleted, and if 15 seconds passes while the shift position is at “P” and the ignition is ON, only the yaw-rate sensor 0-point will be stored. If a vehicle is operated under this condition, Non-Corrected G Sensor 0-point Malfunction will be stored, and its DTC will be output.**

Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

2. Brake System Air Bleeding.

NOTICE

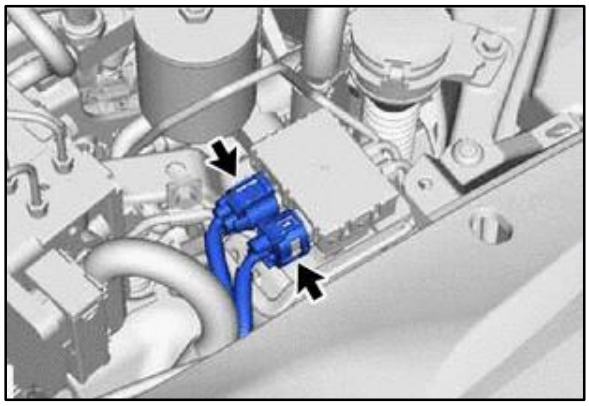
Techstream MUST be used for brake system air bleeding. If air bleeding is performed without Techstream, the operation will be incomplete and may lead to failures and accidents.

A. While the ignition is OFF, disconnect two brake booster pump connectors.

NOTE

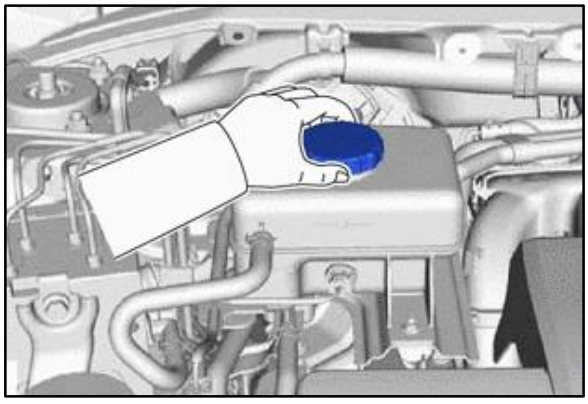
If the two brake booster pump connectors are already disconnected, this step is unnecessary.

Figure 1.



B. Remove the brake master cylinder reservoir filler cap assembly.

Figure 2.



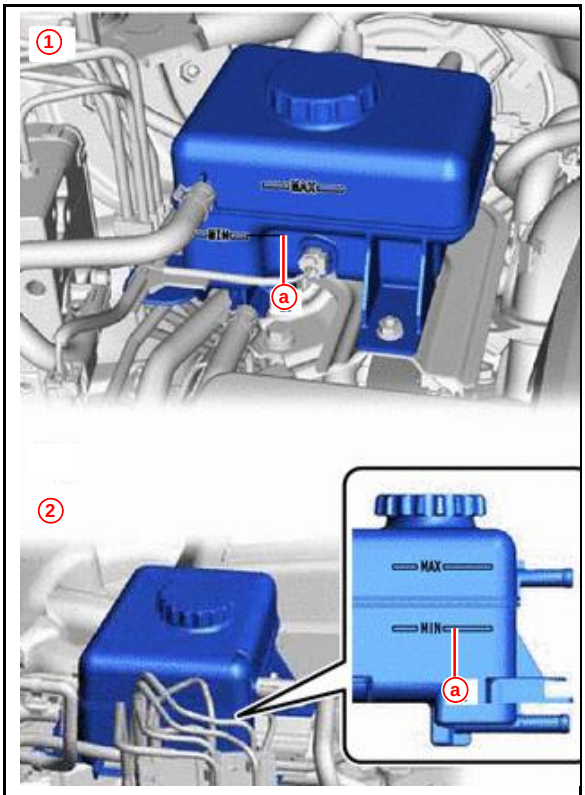
Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

C. Drain the brake fluid in the brake master cylinder reservoir assembly to near the MIN line.

Figure 3.



1	Type A
2	Type B
a	MIN Line

Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

D. Once the ignition is OFF, connect the Techstream to the DLC 3 Connector.

E. Turn the ignition ON.

F. Turn Techstream ON.

Enter the following menus:

Chassis – ABS-VSC-TRC – Utility – ECB (Electronically Controlled Brake System) Utility – Zero Down.

Chassis – ABS-VSC-TRAC – Utility.

TESTER DISPLAY
ECB Utility

NOTE

Using the Techstream to perform zero down causes the pressurized brake fluid in the accumulator to be returned to the brake master cylinder reservoir assembly.

G. Confirm the buzzer sound then turn the ignition OFF.

H. Add brake fluid to the brake master cylinder reservoir assembly until the brake fluid level is between the MAX and MIN lines on the brake master cylinder reservoir assembly.

I. Turn the power switch on (IG).

J. Enter the following menus:
Chassis – ABS-VSC-TRAC – Utility – Air Bleeding.

Chassis – ABS-VSC-TRAC – Utility.

TESTER DISPLAY
Air Bleeding

K. Select “Actuator has been removed” and bleed the brake system by following the instructions on the Techstream.

L. Perform the air-bleeding procedure by following the Techstream instructions.

CAUTION

Add the brake fluid so that the fluid level in the brake master cylinder reservoir assembly does NOT go below the MIN level.

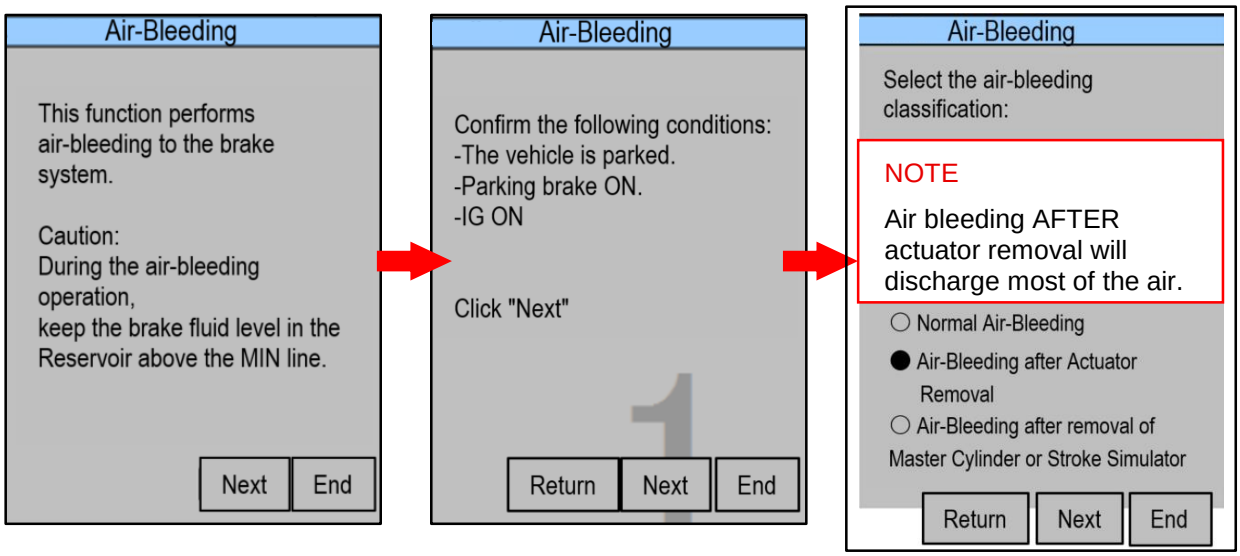
Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

3. Perform air bleeding AFTER actuator removal.
   Follow the Techstream instructions to complete this procedure.

Figure 4.



Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

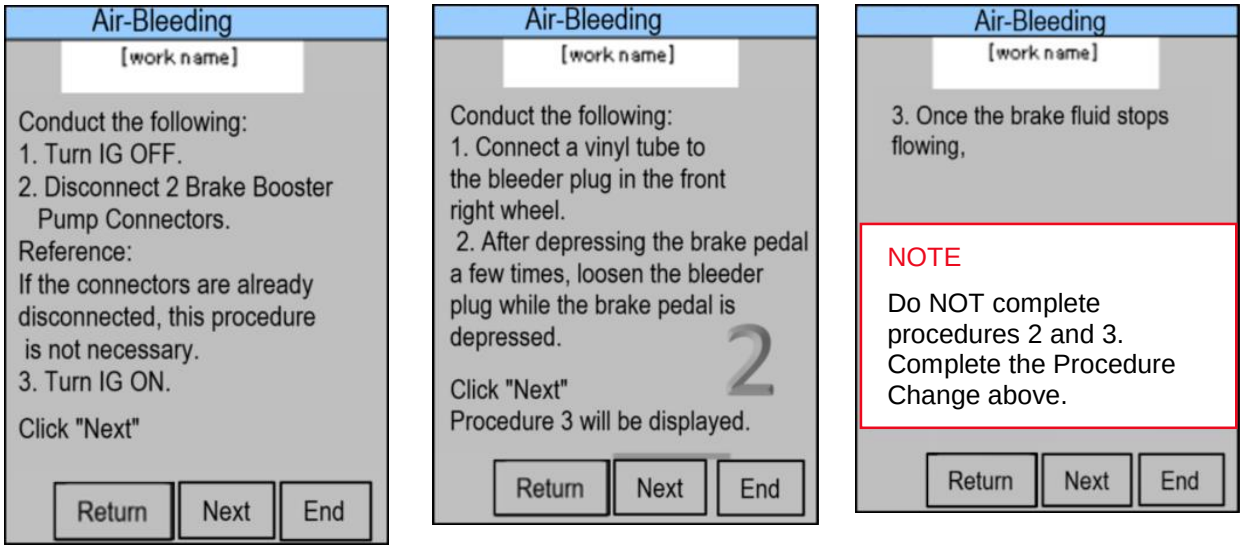
Procedure Change (Refer to Figure 5)

A. Drain the fluid until the fluid level in the reservoir tank reaches MIN level. (Press on the brake pedal while the bleeder plug is open.)

B. Fasten the bleeder plug and add the fluid until the fluid level in the reservoir tank reaches MAX level. Repeat substeps A and B twice.

C. Discharge the brake fluid by pumping the brake pedal (depress the pedal a few times) and loosen the bleeder plug with the brake pedal depressed and release the pedal after the plug is fastened. Repeat substep C 20 times.

Figure 5.



Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

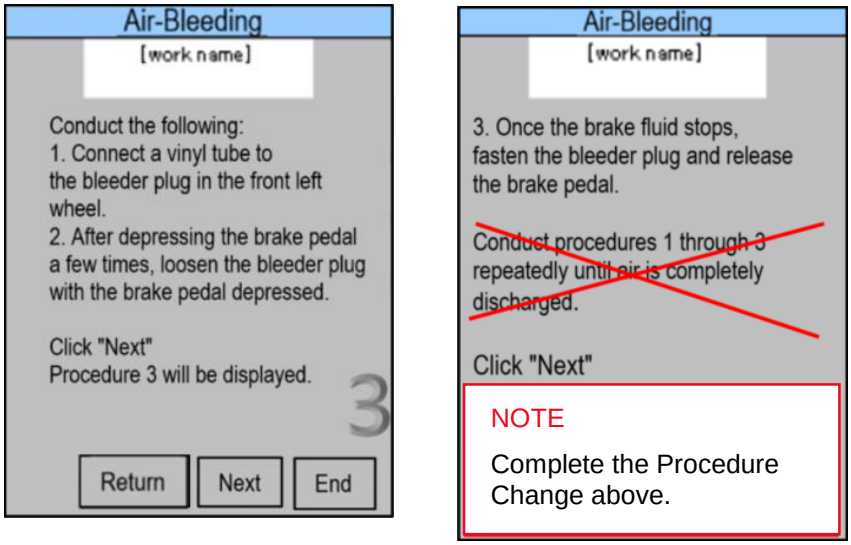
Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

Procedure Change (Refer to Figure 6)

Steps 1 – 3 MUST be repeated 20 times.

Figure 6.



Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

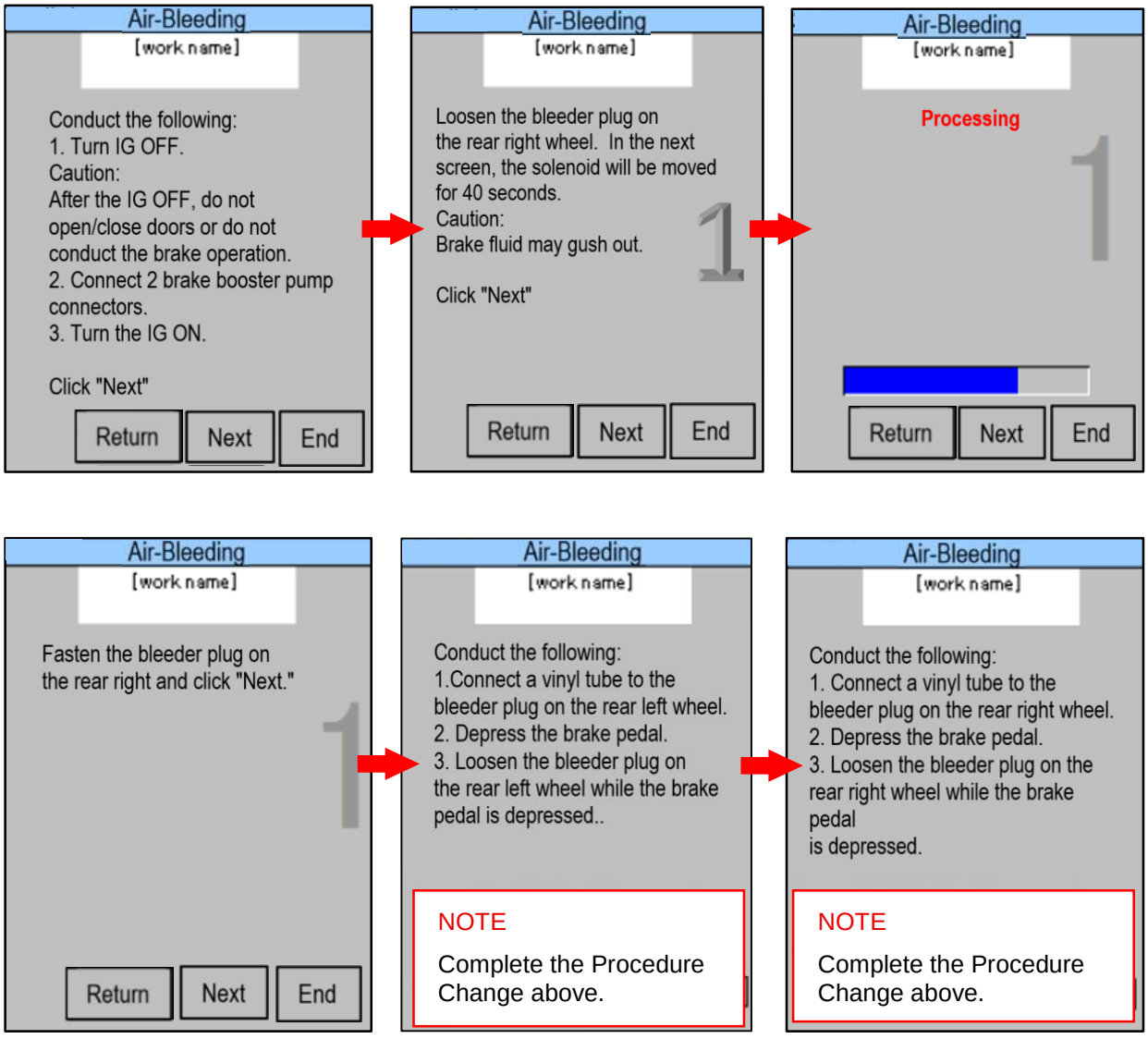
Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

Procedure Change (Refer to Figure 7)

AFTER discharging brake fluid for 30 seconds continuously, fasten the bleeder plug and release the brake pedal.

Figure 7.

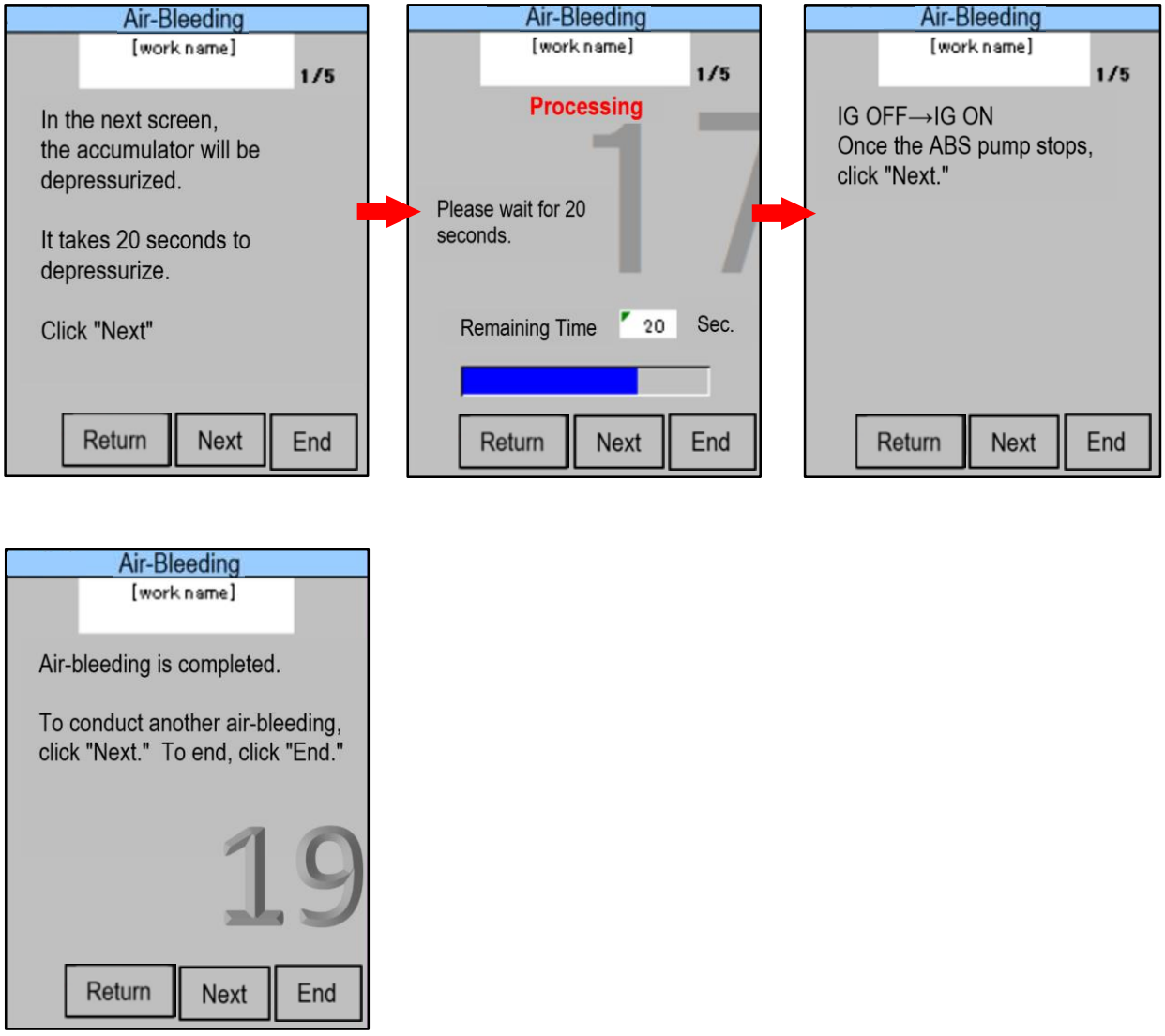


Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

Figure 7 (continued).



4. Tighten the bleeder plugs once the air-bleeding is completed.
   Torque: 8.3 N*m (85 kgf*cm, 73 in*lbf)

Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

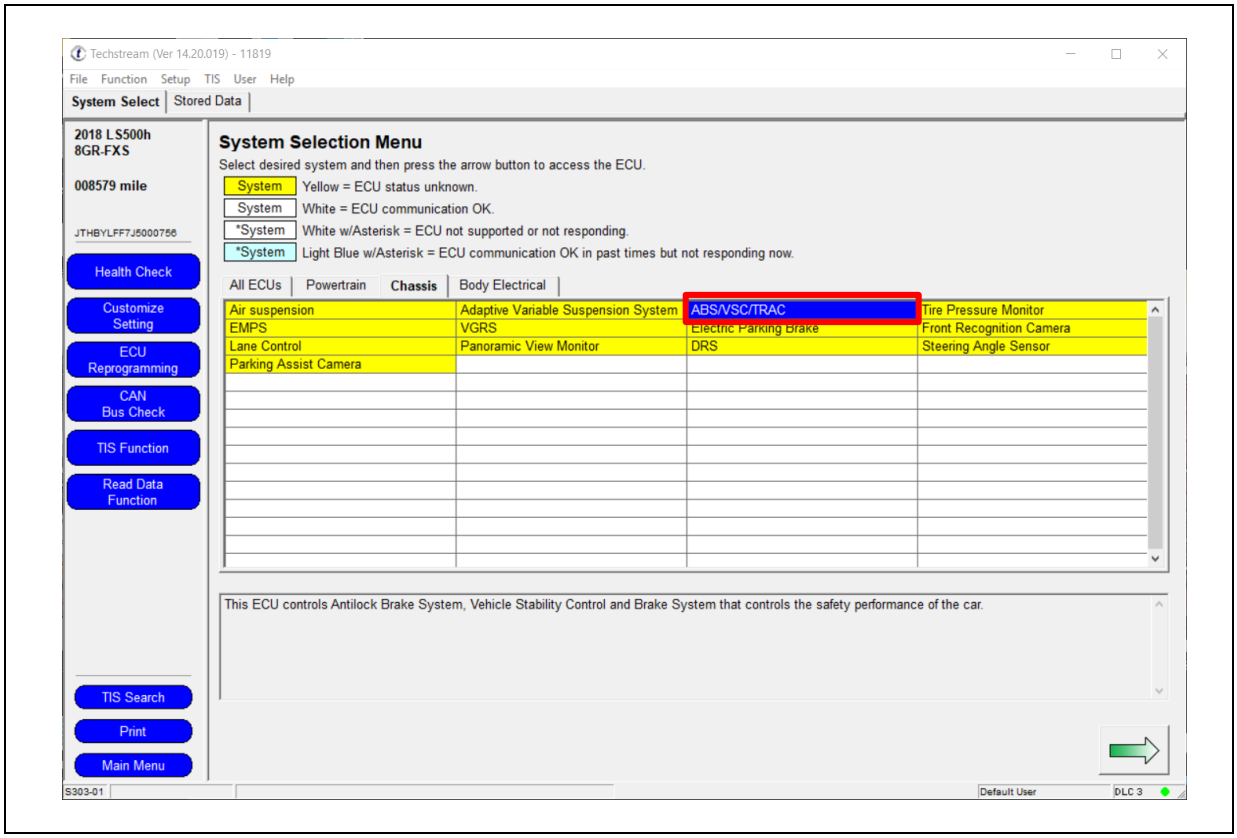
5. Perform the Techstream Active Test to forcefully move the valve in the actuator to complete air bleeding.

   From the Techstream screen, select *Chassis – ABS-VSC-TRC – Active Test – [Perform Actuator Pattern]* and perform.

NOTE

- Perform the above operation five times.
- The Techstream screen images are shown in the following pages.

Figure 8. Techstream Screen Image *(Chassis – ABS-VSC-TRC)*

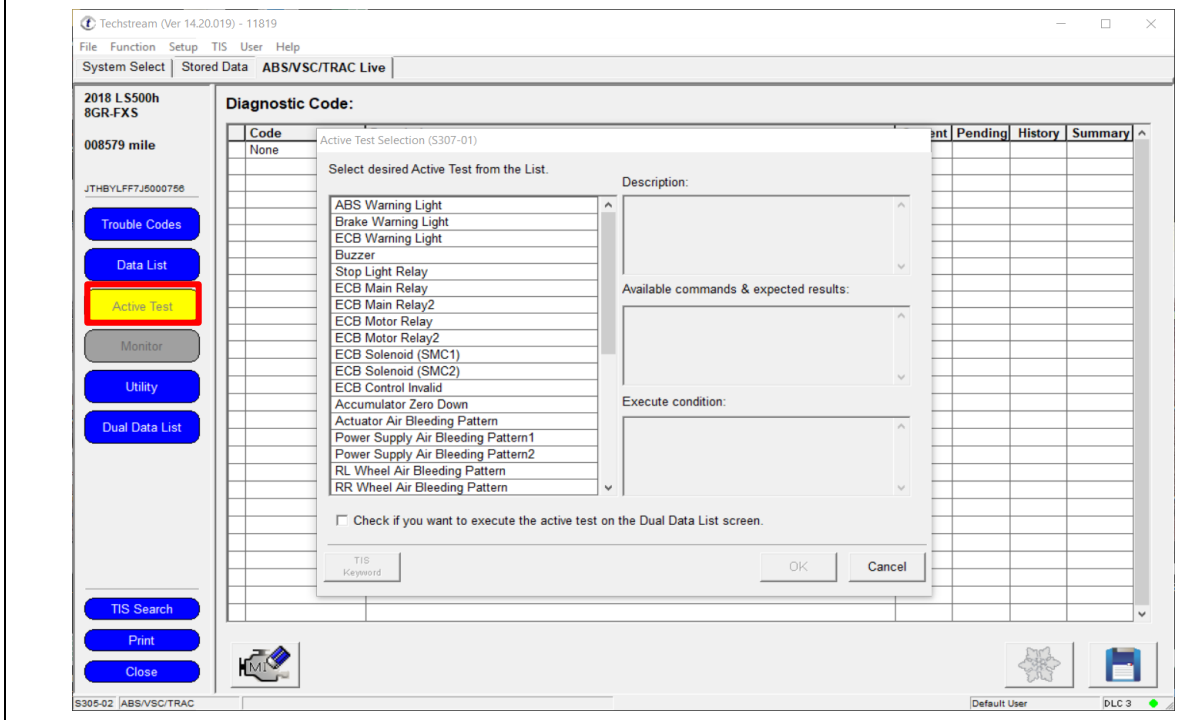


Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

Figure 9. Techstream Screen Image (Active Test)



Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

Figure 10. Techstream Screen Image (Perform Actuator Pattern)

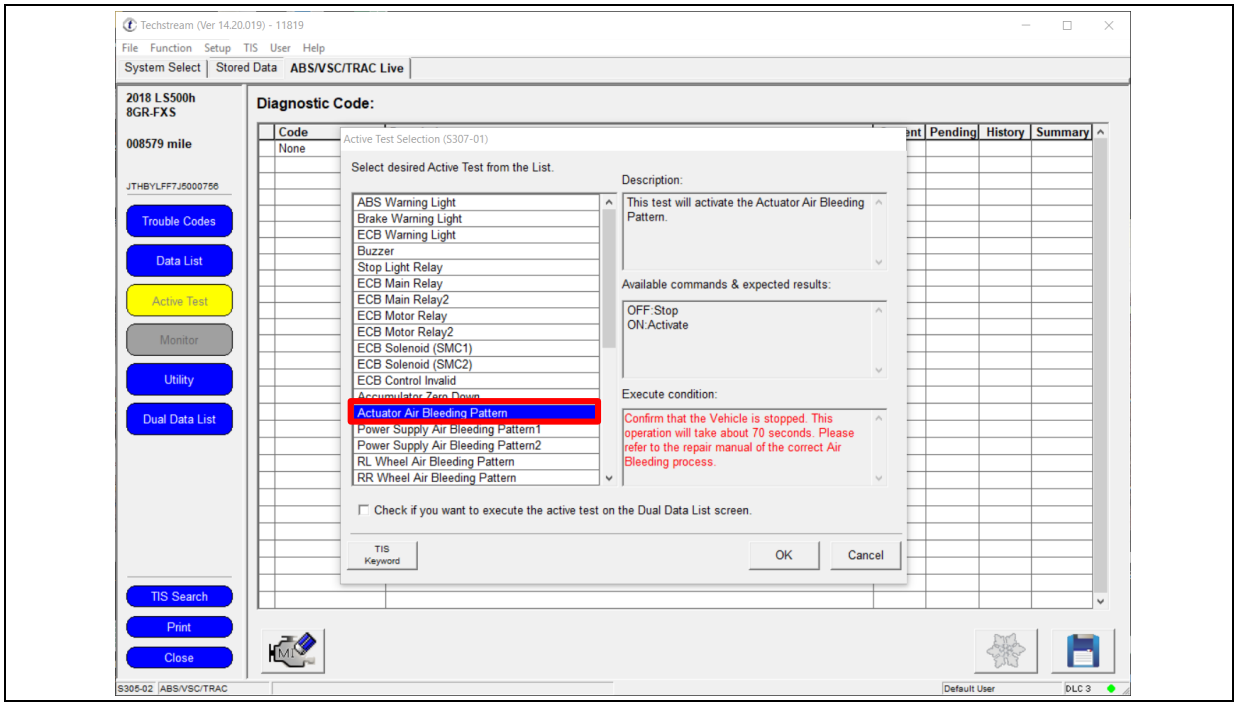
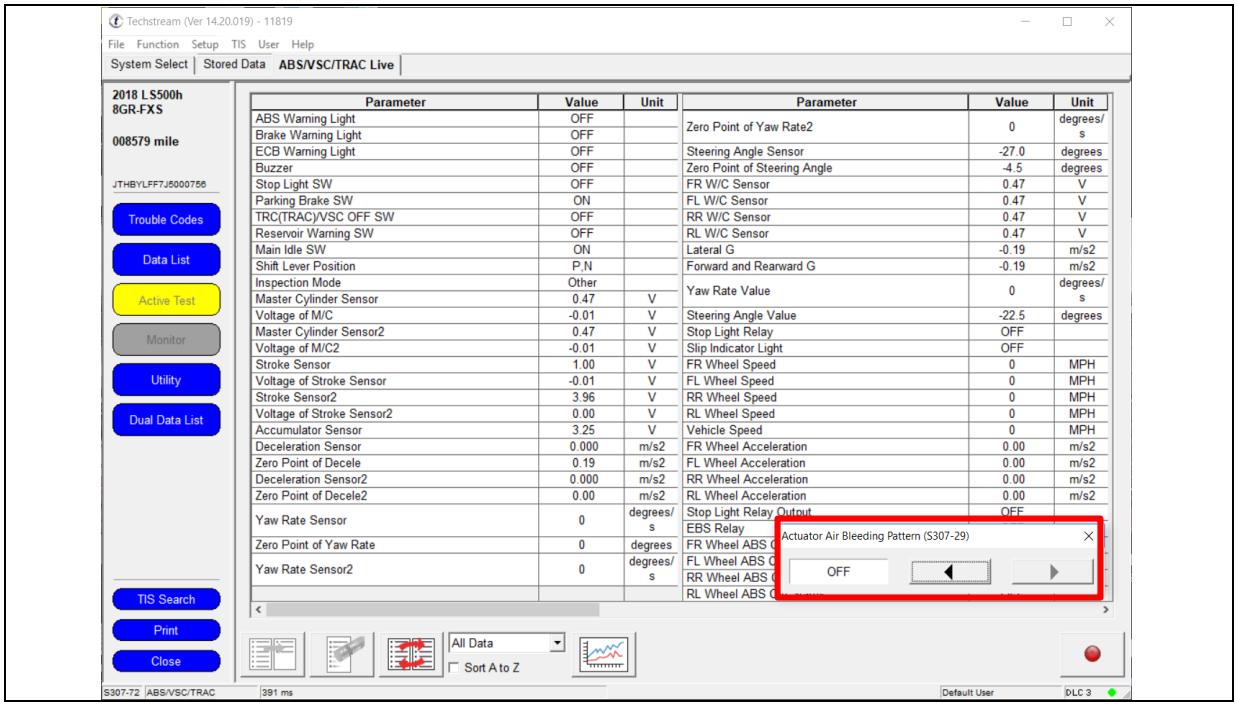


Figure 11. Techstream Screen Image (Execute)



Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

6. Perform the linear valve offset learning and the brake pedal stroke sensor zero-point learning.

   NOTE

   BEFORE air-bleeding, the linear valve offset learning and brake pedal stroke sensor zero-point value memories were deleted. ONLY the linear valve offset learning and brake pedal stroke sensor zero-point learning should be performed.

   Refer to TIS, applicable model and model year Repair Manual:

   - 2016 – 2018 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Electronically Controlled Brake System: Initialization"
   - 2019 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Electronically Controlled Brake System: Initialization"
   - 2020 – 2021 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Electronically Controlled Brake System: Initialization"

   NOTE

   - The battery diagnostic tool MUST be used in Power Supply Mode to maintain battery voltage at 13.5V while flash reprogramming the vehicle.
   - For details on how to use the battery diagnostic tool, refer to the *DCA-8000 Instruction Manual* located at *TIS – Diagnostics – Tools & Equipment – Battery Diagnostics*.

7. Delete DTCs.

   Refer to TIS, applicable model and model year Repair Manual:

   - 2016 – 2018 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Electronically Controlled Brake System: DTC Check / Clear"
   - 2019 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Electronically Controlled Brake System: DTC Check / Clear"
   - 2020 – 2021 RX 450h:
     Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Electronically Controlled Brake System: DTC Check / Clear"

8. Turn the Techstream power OFF.

Brake Squawk/Knock Noise - Brake Actuator Bleed Procedure

Repair Procedure (continued)

Brake System/Pedal/Brake Booster/Brake Fluid/Air Bleeding (continued)

9. Turn the IG OFF.

10. Disconnect the Techstream from the DLC3.

11. Inspect for brake fluid leakage.

12. Inspect and adjust the amount of the brake fluid.
    Refer to TIS, applicable model and model year Repair Manual:
    - 2016 – 2021 RX 450h:
      Brake – Brake Control / Dynamic Control System – “Brake System (Other): Brake Fluid: On-Vehicle Inspection

13. Install the brake master cylinder reservoir filler cap assembly.

14. Test-drive the vehicle to confirm the squawk/knock noise is no longer present.