

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	

SUPERSESSION NOTICE

The information contained in this bulletin supersedes Service Bulletins L-SB-0004-19 and L-SB-0005-21.

Service Bulletins L-SB-0004-19 and L-SB-0005-21 are obsolete, and any printed versions should be discarded.

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	Model Year	DESCRIPTION	TIME	OFP	T1	T2
BR1919	2016 – 2021	Brake Actuator Replacement & Brake Bleed	3.8			
Combo A	2016 – 2017	Reprogram ECU	0.3	44050-48320	91	99
Combo B	2016 – 2018	R & R Master Cylinder Reservoir	1.2			

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.

Parts Information

PARTN	IUMBER	DADTNAME	ΟΤΥ
PREVIOUS	NEW		QIT
47220-48270	47220-48271	Reservoir Assembly, Master Cylinder	1
44050	-48320	Actuator Assy, Brake	1
895B0 895B0	-48030 -48031	Computer Assy, Skid Control ECU	Ι
00475	-1BF03	Brake Fluid	5 – 10
00451-00	0001-LBL	Authorized Modifications Label	1

NOTE

- The ECU should NOT be replaced as part of the Repair Procedure.
- Authorized Modifications Labels may be ordered in packages of 25 from the Materials Distribution Center (MDC) through Dealer Daily - Parts - Dealer Support Materials Orders.

Required Tools & Equipment

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

*Essential SST.

NOTE

- Only ONE of the Techstream units listed above is required.
- Software version 16.20.027 or later is required.
- Additional Techstream units may be ordered by calling Approved Dealer Equipment (ADE) at 1-800-368-6787.
- Use Techstream or an approved J2534 interface to perform flash reprogramming updates. • Visit techinfo.toyota.com for more information regarding J2534 reprogramming.

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

*Essential SST.

NOTE

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

Calibration Information

MODEL	FOU	CALIBR	ATION ID		
MODEL	ECO	PREVIOUS	NEW		
	Main	F152648501	E152649740		
DV 450h	Main	F152648502	<u>F152646740</u>		
RA 4500	Sub	F152648511	F150640750		
	SUD	F152648512	<u>r 152048750</u>		

Repair Procedure

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

Repair Procedure (continued)

- 4. Is the vehicle a 2016 2018 model year RX 450h?
 - **YES** Continue to step 5.
 - **NO** Go to step 10.
- Replace the master cylinder reservoir assembly.
 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: <u>Removal</u> / <u>Installation</u>"
 - 2017 2018 RX 450h: Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Brake Actuator: <u>Removal</u> / <u>Installation</u>"
- 6. Is the vehicle a 2016 2017 model year RX 450h?
 - **YES** Continue to step 7.
 - **NO** Go to step 10.

Repair Procedure (continued)

7. Use Techstream to confirm if the skid control ECU calibration has been updated and check for the Authorized Modifications Label affixed to the vehicle in the location shown below.

Is the calibration ID listed in Techstream and on the label the latest skid control ECU calibration?

- **YES** Go to step 10.
- **NO** Continue to step 8.





1	Replacement Skid Control Part Number (e.g., 895B0-48030 or 895B0-48031)	4	Date Completed
2	New Calibration ID (e.g., F152648740)	5	This SB Number
3	Dealer Code		

Repair Procedure (continued)

8. Flash reprogram the skid control ECU.

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 station, refer to the <u>DCA-8000 Instruction Manual</u> located at TIS – Diagnostics – Tools & Equipment – Battery Diagnostics.

Follow the procedures outlined in <u>L-SB-0001-18</u>, *Techstream ECU Flash Reprogramming Procedure,* and flash the skid control ECU with the NEW calibration file update.

- 9. Prepare and install the Authorized Modifications Label.
 - A. Using a permanent marker, enter the following information on the label:
 - Skid control ECU part number [Refer to the Parts Information section for the NEW PART NUMBER]
 - Calibration ID(s) [Refer to the **Calibration Information** section for the **NEW CALIBRATION ID**]
 - Dealer Code
 - Repair Date
 - Change Authority [This bulletin number]
 - B. Install the Authorized Modifications Label onto the vehicle at the location shown in Figure 1. The Authorized Modifications Label is available through the MDC, P/N 00451-00001-LBL.

Repair Procedure (continued)

10. Using Techstream, perform the following modified air bleeding procedure.

CAUTION

The Techstream MUST be used for air bleeding. If the Techstream is NOT used, the bleeding procedure 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 ignition ON.
- Perform air bleeding with the shift lever in (P) Park 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 two 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.

Repair Procedure (continued)

- A. Turn the ignition ON.
- B. Shift to the (P) Park position.
- C. Turn the parking brake ON.
- D. Turn the ignition OFF.
- E. Connect Techstream to the DLC3 and turn the ignition ON.
- F. From the Techstream screen, select Chassis.
- G. Select ABS-VSC-TRC.
- H. Select Reset Memory.
- I. Select Delete the Back-Up Memory.

CAUTION

- Once "Delete the Back-Up Memory" is complete, the zero-point memory for the yawrate sensor and G sensor will also be deleted. Make sure to perform a zero-point acquisition for the yaw-rate sensor and G sensor.
- After the zero-point memory for the yaw-rate sensor and G sensor have been deleted, and if 15 seconds pass while the shift position is at "P" and the ignition is ON, only the yaw-rate sensor zero-point will be stored. If a vehicle is operated under this condition, Non-Corrected G Sensor zero-point Malfunction will be stored, and its DTC will be output. Ensure the ignition is turned OFF AFTER the zero-point memory for the yaw-rate sensor and G sensor have been deleted to prevent this from occurring.
- J. While the ignition is OFF, disconnect the two brake booster pump connectors.

Figure 2.



1 Brake Booster Pump Connectors

Repair Procedure (continued)

K. Remove the brake master cylinder reservoir filler cap.



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

Figure 4.



1	Туре А
2	Туре В
Α	MIN Line

Repair Procedure (continued)

M. Connect to Techstream and perform the Zero Down by entering the following menus: Chassis – ABS-VSC-TRC – Utility – ECB (Electronically Controlled Brake System) Utility – Zero Down

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.

- N. Confirm the buzzer sound, then turn the ignition OFF.
- O. 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.
- P. Turn the power switch ON (IG ON).
- Q. Enter the following menus in Techstream:

Chassis – ABS-VSC-TRAC – Utility – Air Bleeding

R. Select "Actuator has been removed" and bleed the brake system by following the instructions on Techstream.

CAUTION

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

Repair Procedure (continued)

S. Perform air bleeding per the Techstream instructions below.

Figure 5. Air Bleeding Procedure



- (1) 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.)
- (2) 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.
- (3) 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.

Repair Procedure (continued)



Figure 7. Air Bleeding Procedure (continued)



These Steps Must Be Repeated 20 Times

1

Repair Procedure (continued)

T. AFTER the solenoid is moved for 40 seconds discharging brake fluid, fasten the bleeder plug and release the brake pedal.

Figure 8. Air Bleeding Procedure (continued)



Figure 9. Air Bleeding Procedure (continued)



Repair Procedure (continued)





Figure 11. Air Bleeding Procedure (continued)

Air Bleeding	
[work name]	
Air Bleeding is completed.	
To conduct another Air Bleeding, click "Next." To end, click "End."	
Return Next Air Bleeding	

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

Repair Procedure (continued)

12. Perform the Techstream Active Test to forcefully move the valve in the actuator to complete air bleeding by entering the following menus in Techstream:

Chassis – ABS-VSC-TRC – Active Test – Actuator Air Bleeding Pattern

NOTE

Perform the above operation five times.

		icitu			
	Select desired system and the	en press the arrow button to access the ECU.			
08579 mile	System Yellow = ECU s	status unknown.			
	System White = ECU c	communication OK.			
THBYLFF7J5000756	System Vinite WAstens	sk = ECU not supported or not responding.	but not reconciding now		
Health Check	System Light Dide WAS	stensk – ECO communication OK in past times	but not responding now.		
	All ECUs Powertrain	Chassis Body Electrical			
Customize	Air suspension	Adaptive Variable Suspension Sys	tem ABS/VSC/TRAC	Tire Pressure Monitor	^
Setting	EMPS	VGRS	Electric Parking Brake	Front Recognition Camera	<u> </u>
ECU	Lane Control Parking Assist Camera	Panoramic View Monitor	DRS	Steering Angle Sensor	
Reprogramming	T anning Assist Camera				
CAN					
Dus Check					_
TIS Function					
Read Data					
T direction					
					~
	This ECU controls Antilock B	Brake System, Vehicle Stability Control and Bra	ke System that controls the safety pe	rformance of the car.	~

Figure 12. Techstream Screen Image (Chassis – ABS-VSC-TRC)

Repair Procedure (continued)

2010 233001	Diagnosti	c Code:				
OGR-FAS	Code	[ent	Pending History	Summarv
008579 mile	None	Active Test Selection (5307-01)				
		Select desired Active Test from the List.				
JTHBYLFF7J5000756				Description:		
		ABS Warning Light				
Trouble Codes		Brake Warning Light				
		ECB Warning Light				
		Buzzer				
Data List		Stop Light Relay		×		
		ECB Main Relay		Available commands & expected results:		
Active Test		ECB Main Relay2				
		ECB Motor Relay	_			
Monitor		ECB Motor Relay2	_			
		ECB Solenoid (SMC1)				
		ECB Solenoid (SMC2)	_			
Utility		ECB Control Invalid	_	Evenute condition:		
		Accumulator Zero Down		Execute condition.		
Dual Data List		Actuator Air Bleeding Pattern	-	^		
		Power Supply Air Dieeding Pattern I				
		Power Supply Air Dieeding Pattern2				
		PR Wheel Air Bleeding Pattern	-			
		Trice wheel Air Dieeding Fattern		•		
		Check if you want to execute the active	test o	n the Dual Data List screen		
		Keyword		OK Cancel		
TIS Search						

Figure 13. Techstream Screen Image (Active Test)

Repair Procedure (continued)

2018 L \$500h	Diagnostic	Code:					
OGK-FAS	Code		_		ant Pending	History	Summary
008579 mile	None	Active Test Selection (S307-01)			int Fending	matory	Juniary
		Select desired Active Test from the List.					
JTHBYLFF7J5000756				Description:			
		ABS Warning Light	^	This test will activate the Actuator Air Bleeding			
Trouble Codes		Brake Warning Light		Pattern.			
		ECB Warning Light	1		_		
	<u> </u>	Buzzer					
Data List	<u> </u>	Stop Light Relay		×			
	<u> </u>	ECB Main Relay		Available commands & expected results:	-		
Active Test	<u> </u>	ECB Main Relay2		OEE:Step	-		
	<u> </u>	ECB Motor Relay	-	ON-Activate			
Monitor	<u> </u>	ECB Motor Relay2	-				
	<u> </u>	ECB Solenoid (SMC1)	-				
Utility	H	ECB Solenoid (SMC2)	-				
	<u> </u>	ECB Control Invalid	-				
	<u> </u>	Actuator Air Blooding Pattern					
Dual Data List	H	Power Supply Air Bleeding Pattern1		Confirm that the Vehicle is stopped. This operation will take about 70 seconds. Please refer to the repair manual of the correct Air Bleeding process.			
	H	Power Supply Air Bleeding Pattern2					
	H	RI Wheel Air Bleeding Pattern	-				
	<u> </u>	RR Wheel Air Bleeding Pattern		V	-		
	<u> </u>		-	1	-		
	<u> </u>	Check if you want to execute the active tes	st on	the Dual Data List screen.			
	<u> </u>	-					
		TIS			1		
		Keyword		OK Cancel			
		-					
TIS Search							v
							· · · · ·

Figure 14. Techstream Screen Image (Actuator Air Bleeding Pattern)

Figure 15. Techstream Screen Image

2018 LS500h	Parameter	Value	Unit	Parameter	Value	Unit
8GR-FXS	ABS Warning Light	OFF				degrees/
008579 mile	Brake Warning Light	OFF		Zero Point of Yaw Rate2	0	s
	ECB Warning Light	OFF		Steering Angle Sensor	-27.0	degrees
	Buzzer	OFF		Zero Point of Steering Angle	-4.5	degrees
JTHBYLFF7J5000756	Stop Light SW	OFF		FR W/C Sensor	0.47	V
	Parking Brake SW	ON		FL W/C Sensor	0.47	V
Trouble Codes	TRC/TRAC//VSC OFF SW	OFF		RR W/C Sensor	0.47	V
	Reservoir Warning SW	OFF		RL W/C Sensor	0.47	V
Data List	Main Idle SW	ON		Lateral G	-0.19	m/s2
	Shift Lever Position	P.N		Forward and Rearward G	-0.19	m/s2
Active Test	Inspection Mode	Other			0	degrees/
	Master Cylinder Sensor	0.47	V	Yaw Rate Value		s
	Voltage of M/C	-0.01	V	Steering Angle Value	-22.5	degrees
Monitor	Master Cylinder Sensor2	0.47	V	Stop Light Relay	OFF	
	Voltage of M/C2	-0.01	V	Slip Indicator Light	OFF	-
	Stroke Sensor	1.00	V	FR Wheel Speed	0	MPH
Utility	Voltage of Stroke Sensor	-0.01	V	FL Wheel Speed	0	MPH
	Stroke Sensor2	3.96	V	RR Wheel Speed	0	MPH
Dual Data List	Voltage of Stroke Sensor2	0.00	V	RL Wheel Speed	0	MPH
	Accumulator Sensor	3.25	V	Vehicle Speed	0	MPH
	Deceleration Sensor	0.000	m/s2	FR Wheel Acceleration	0.00	m/s2
	Zero Point of Decele	0.19	m/s2	FL Wheel Acceleration	0.00	m/s2
	Deceleration Sensor2	0.000	m/s2	RR Wheel Acceleration	0.00	m/s2
	Zero Point of Decele2	0.00	m/s2	RL Wheel Acceleration	0.00	m/s2
	Vau Data Sanaar	0	degrees/	Stop Light Relay Output		
	Taw Rate Sensor		S	EBS Relay		~
	Zero Point of Yaw Rate	0	degrees	FR Wheel ABS		^
	Yaw Rate Sensor2	0	degrees/	FL Wheel ABS		I
			-	RI Wheel ABS		
IIS Search	4			ne militar ao		

Repair Procedure (continued)

13. 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:

- <u>2016 2018</u> RX 450h: Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Electronically Controlled Brake System: Initialization"
- <u>2019</u> RX 450h:

Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Electronically Controlled Brake System: Initialization"

 <u>2020 – 2021</u> RX 450h: Brake – Brake Control/Dynamic Control System – "Brake Control / Dynamic Control Systems: Electronically Controlled Brake System: Initialization"

14. Delete ANY DTCs.

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

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

Repair Procedure (continued)

- 15. Turn the ignition OFF.
- 16. Disconnect the Techstream from the DLC3.
- 17. Inspect for brake fluid leakage.
- Inspect and adjust the amount of the brake fluid.
 Refer to TIS, applicable model and model year Repair Manual:
 - <u>2016 2021</u> RX 450h: Brake – Brake Control/Dynamic Control System – "Brake System (Other): Brake Fluid: On-Vehicle Inspection
- 19. Install the brake master cylinder reservoir filler cap assembly.
- 20. Test-drive the vehicle to confirm the squawk/knock noise is no longer present.