

HVAC Servo Motor Malfunction

Service Category Vehicle Interior

Section Heating/Air Conditioning

Market USA

Toyota Supports
ASE Certification 

Applicability

YEAR(S)	MODEL(S)	ADDITIONAL INFORMATION
2018 - 2019	LS500, LS500H	

Introduction

Some 2018 – 2019 model year LS 500 and LS 500h vehicles may exhibit one or more of the following HVAC conditions:

- Uneven temperature or air flow between the vents.
- Little or no air flow from the vent(s).
- Improper MODE control function.

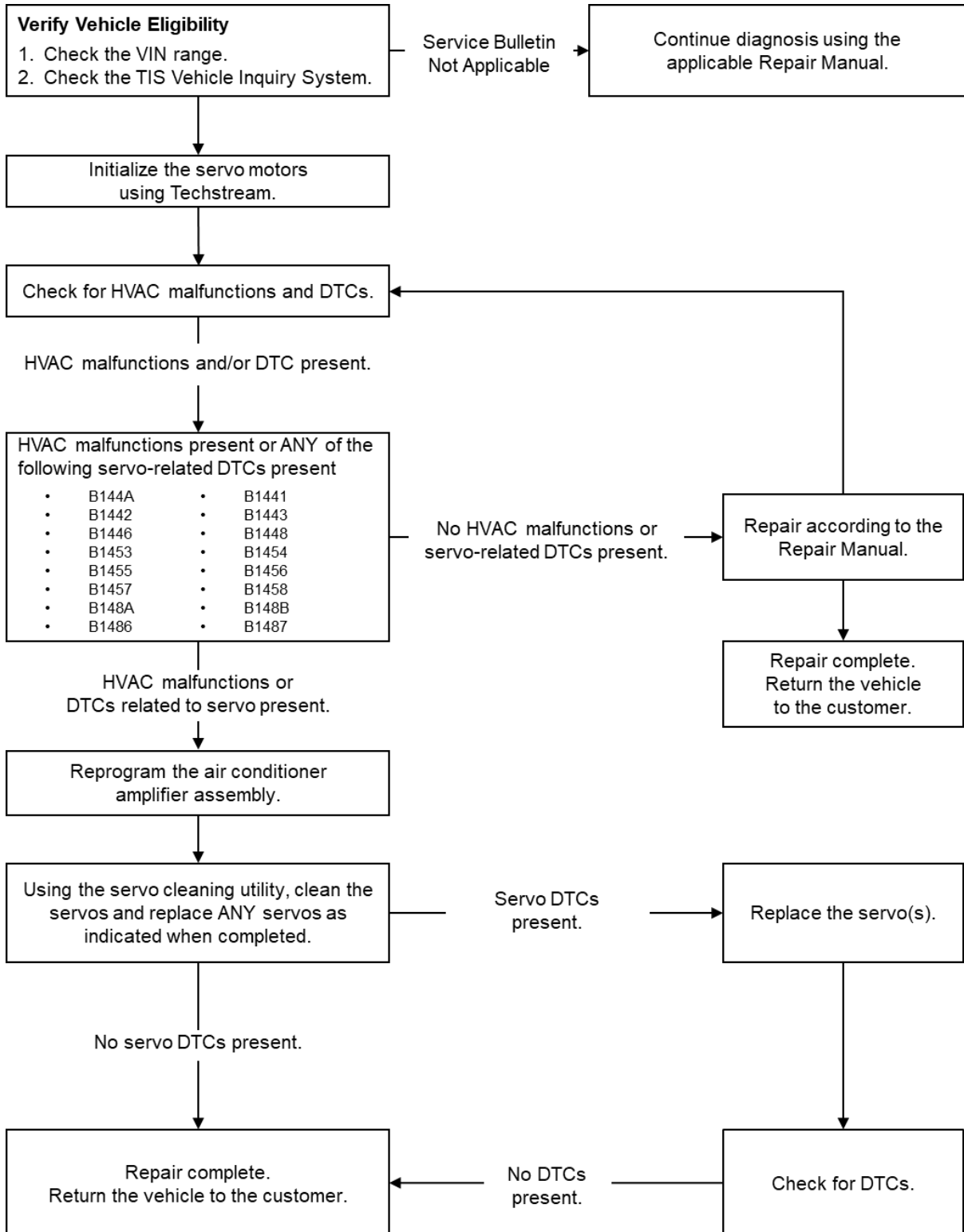
Additionally, some vehicles may store one or more of the following HVAC servo Diagnostic Trouble Codes (DTCs):

- B144A – Air Outlet DEF Damper Control Servo Motor Circuit
- B1441 – Air Mix Damper Control Servo Motor Circuit (Passenger Side)
- B1442 – Air Inlet Damper Control Servo Motor Circuit
- B1443 – Air Outlet Damper Control Servo Motor Circuit
- B1446 – Air Mix Damper Control Servo Motor Circuit (Driver Side)
- B1448 – Passenger Side FACE Servo Motor Circuit
- B1453 – Air Outlet Damper Cool Control Servo Motor Circuit (Driver Side)
- B1454 – Outlet Damper Cool Control Servo Motor Circuit (Passenger Side)
- B1455 – Air Outlet Damper FOOT/DEF Control Servo Motor Circuit (Driver Side)
- B1456 – Air Outlet Damper FOOT/DEF Control Servo Motor Circuit (Passenger Side)
- B1457 – Driver Side Air Outlet Damper Control Servo Motor Circuit
- B1458 – Air Outlet Damper Control Servo Motor Circuit
(Passenger Side Front A/C Rear Air Flow)
- B148A – Air Outlet Rear FOOT Damper Control Servo Motor Circuit (Driver Side)
- B148B – Air Outlet Rear FOOT Damper Control Servo Motor Circuit (Passenger Side)
- B1486 – Driver Side Air Outlet Damper Control Servo Motor Circuit
- B1487 – Air Outlet Damper Control Servo Motor Circuit
(Passenger Side Front A/C Air Flow)

Follow the procedures in this bulletin to address these conditions.

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Operation Flowchart



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Production Change Information

This bulletin applies to vehicles produced **BEFORE** the Production Change Effective VINs shown below.

MODEL	PLANT	DRIVETRAIN	PRODUCTION CHANGE EFFECTIVE VIN
LS500	Tahara	2WD	JTHB51FF#K5010414
			JTHB5LFF#K5010414
		AWD	JTHC51FF#K5007452
			JTHC5LFF#K5007452
LS500H		2WD	JTHBY1FF#L5008212
			JTHBYLFF#L5008212
		AWD	JTHCY1FF#L5001691
			JTHCYLFF#L5001691

Warranty Information

Table 1. Inspection and Reprogramming

OP CODE	MODEL	DESCRIPTION	TIME	OFP	T1	T2
AC2031	LS 500	Reprogram and Redistribute Grease	0.7	88650-#####*	72	41
	LS 500h		0.7			

*Warranty claim MUST be submitted with the correct 10-digit OFP. Choose the correct OFP for the vehicle being repaired by searching Air Conditioning, Amplifier (88650) and Servo Sub-assy, Damper (87106) in the Electronic Parts Catalog using the VIN filter.

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Warranty Information (continued)

Table 2. Reprogram, Redistribution of Grease, and Servo Replacement From the Air Conditioning Unit Removed From the Vehicle

OP CODE	MODEL	DESCRIPTION	TIME	OFFP	T1	T2
AC2032	LS 500	Reprogram and Redistribute Grease, Air Conditioner Box Removal, and R & R One Servo / Module	7.4	87106-#####*	72	41
	LS 500h		8.0			
AC2033	LS 500	Reprogram and Redistribute Grease, Air Conditioner Box Removal, and R & R Two Servos / Modules	7.5			
	LS 500h		8.1			
AC2034	LS 500	Reprogram and Redistribute Grease, Air Conditioner Box Removal, and R & R Three Servos / Modules	7.6			
	LS 500h		8.2			
AC2035	LS 500	Reprogram and Redistribute Grease, Air Conditioner Box Removal, and R & R Four Servos / Modules	7.7			
	LS 500h		8.3			
AC2036	LS 500	Reprogram and Redistribute Grease, Air Conditioner Box Removal, and R & R Five Servos / Modules	7.8			
	LS 500h		8.4			
AC2037	LS 500	Reprogram and Redistribute Grease, Air Conditioner Box Removal, and R & R Six Servos / Modules	7.9			
	LS 500h		8.5			
AC2038	LS 500	Reprogram and Redistribute Grease Air Conditioner Box Removal, and R & R Seven Servos / Modules	8.0			
	LS 500h		8.6			
AC2039	LS 500	Reprogram and Redistribute Grease, Air Conditioner Box Removal, and R & R Eight Servos / Modules	8.1			
	LS 500h		8.7			

*Warranty claim MUST be submitted with the correct 10-digit OFFP. Choose the correct OFFP for the vehicle being repaired by searching Air Conditioning, Amplifier (88650) and Servo Sub-assy, Damper (87106) in the Electronic Parts Catalog using the VIN filter.

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.

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Parts Information

SERVO NAME / DTC	PART NO.	PART NAME	QTY	NOTES
Air Outlet DEF Damper Control Servo Motor Circuit / B144A	87106-11090	Damper Servo Sub-assy, Air Conditioning Radiator, No. 3	0 – 1	Two / Four Zone Type
Air Mix Damper Control Servo Motor Circuit (Passenger Side) / B1441	87106-50700	Damper Servo Sub-assy, Air Conditioning Radiator, No. 4	0 – 1	Two Zone Type (Two Servo Module)
Air Outlet Damper Cool Control Servo Motor Circuit (Passenger Side) / B1454				
Air Mix Damper Control Servo Motor Circuit (Passenger Side) / B1441	87106-50720	Damper Servo Sub-assy, Air Conditioning Radiator, No. 4	0 – 1	Four Zone Type (Three Servo Module)
Air Outlet Damper Cool Control Servo Motor Circuit (Passenger Side) / B1454				
Air Outlet Damper Control Servo Motor Circuit (Passenger Side Front A/C Rear Air Flow) / B1458				
Air Inlet Damper Control Servo Motor Circuit / B1442	87106-50760	Damper Servo Sub-assy, Blower, No. 1	0 – 1	Two / Four Zone Type
Air Outlet Damper Control Servo Motor Circuit / B1443	87106-11060	Damper Servo Sub-assy, Air Conditioning Radiator, No. 1	0 – 1	Two & Four Zone Type (Two Servo Module)
Air Outlet Damper FOOT/DEF Control Servo Motor Circuit (Driver Side) / B1455				
Air Mix Damper Control Servo Motor Circuit (Driver Side) / 1446	87106-11010	Damper Servo Sub-assy, Air Conditioning Radiator, No. 2	0 – 1	Two Zone Type (Two Servo Module)
Air Outlet Damper Cool Control Servo Motor Circuit (Driver Side) / B1453				
Air Mix Damper Control Servo Motor Circuit (Driver Side) / 1446	87106-50710	Damper Servo Sub-assy, Air Conditioning Radiator, No. 2	0 – 1	Four Zone Type (Three Servo Module)
Air Outlet Damper Cool Control Servo Motor Circuit (Driver Side) / B1453				

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Parts Information (continued)

SERVO NAME / DTC	PART NO.	PART NAME	QTY	NOTES
Driver Side Air Outlet Damper Control Servo Motor Circuit / B1457	87106-50710	Damper Servo Sub-assy, Air Conditioning Radiator, No. 2	0 – 1	Four Zone Type (Three Servo Module)
Passenger Side FACE Servo Motor Circuit / B1448	87106-50730	Damper Servo Sub-assy, Air Conditioning Radiator, No. 6	0 – 1	Four Zone Type (Two Servo Module)
Air Outlet Damper FOOT/DEF Control Servo Motor Circuit (Passenger Side) / B1456				
Air Outlet Rear FOOT Damper Control Servo Motor Circuit (Driver Side) / B148A	87106-50610	Damper Servo Sub-assy, Air Conditioning Radiator, No. 5	0 – 1	Two Zone Type (One Servo)
Air Outlet Rear FOOT Damper Control Servo Motor Circuit (Driver Side) / B148A	87106-50670	Damper Servo Sub-assy, Air Conditioning Radiator, No. 5	0 – 1	Four Zone Type (Two Servo Module)
Air Outlet Rear FOOT Damper Control Servo Motor Circuit (Passenger Side) / B148B				
Driver Side Air Outlet Damper Control Servo Motor Circuit / B1486	87020-50040	Damper Assy, Heater Air	0 – 1	Four Zone Type (Two Servo Module)
Air Outlet Damper Control Servo Motor Circuit (Passenger Side Front A/C Rear Air Flow) / B1487				

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Required Tools & Equipment

SPECIAL SERVICE TOOLS (SST)	PART NUMBER	QTY
Plastic Pry Tool Kit*	00002-06020-02	1
DCA-8000 Battery Diagnostic Tool*	DCA-8000P T	1

*Essential SST.

NOTE

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

REQUIRED TOOLS & MATERIAL	Supplier	PART NUMBER	QTY
Techstream ADVi*	ADE	TSADVUNIT	1
Techstream 2.0		TS2UNIT	
Techstream Lite		TSLITEPDLR01	
Techstream Lite (Green Cable)		TSLP2DLR01	
Robinair R1234YF A/C Machine		ROB118150008	1

*Essential SST.

NOTE

- Only ONE of the Techstream units listed above is required.
- Software version 17.00.011 or later is required.
- Additional Techstream units may be ordered by calling Approved Dealer Equipment (ADE) at 1-800-368-6787.

Calibration Information

MODEL	MODEL YEAR	CALIBRATION ID	
		PREVIOUS	NEW
LS 500, LS 500h	2018	8865F5001001	8865F5005001
		8865F5002004	
	2019	8865F5002102	8865F5006001

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Confirmation Procedure

1. Confirm the condition exists.

Does the vehicle exhibit one or more of the following conditions?

- Uneven temperature or air flow between the vents.
- Little or no air flow from the vent(s).
- Improper MODE control function.
- **YES** — Continue to the Flash Reprogramming Procedure section.
- **NO** — Continue to step 2.

2. Using Techstream, check for the following stored DTCs:

- B144A – Air Outlet DEF Damper Control Servo Motor Circuit
- B1441 – Air Mix Damper Control Servo Motor Circuit (Passenger Side)
- B1442 – Air Inlet Damper Control Servo Motor Circuit
- B1443 – Air Outlet Damper Control Servo Motor Circuit
- B1446 – Air Mix Damper Control Servo Motor Circuit (Driver Side)
- B1448 – Passenger Side FACE Servo Motor Circuit
- B1453 – Air Outlet Damper Cool Control Servo Motor Circuit (Driver Side)
- B1454 – Air Outlet Damper Cool Control Servo Motor Circuit (Passenger Side)
- B1455 – Air Outlet Damper FOOT/DEF Control Servo Motor Circuit (Driver Side)
- B1456 – Air Outlet Damper FOOT/DEF Control Servo Motor Circuit (Passenger Side)
- B1457 – Driver Side Air Outlet Damper Control Servo Motor Circuit
- B1458 – Air Outlet Damper Control Servo Motor Circuit
(Passenger Side Front A/C Rear Air Flow)
- B148A – Air Outlet Rear FOOT Damper Control Servo Motor Circuit (Driver Side)
- B148B – Air Outlet Rear FOOT Damper Control Servo Motor Circuit (Passenger Side)
- B1486 – Driver Side Air Outlet Damper Control Servo Motor Circuit
- B1487 – Air Outlet Damper Control Servo Motor Circuit
(Passenger Side Front A/C Rear Air Flow)

Are ANY of the DTCs listed above present?

- **YES** — Continue to the Flash Reprogramming Procedure section.
- **NO** — This bulletin does NOT apply. Continue diagnosis using the applicable Repair Manual.

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Flash Reprogramming Procedure

1. Flash Reprogram the air conditioning amplifier assembly.

NOTE

The air conditioning amplifier flash reprogram is only performed one time if the air conditioning amplifier has NOT been flash reprogrammed previously.

Follow the procedure outlined in [L-SB-0001-18](#), *Techstream ECU Flash Reprogramming Procedure*, and flash the air conditioning amplifier with the NEW calibration file update.

NOTICE

- Damage to the air conditioning amplifier may occur if the correct battery charge mode setting is NOT used.
- Power Supply Mode is used to maintain battery voltage at 13.5V while flash reprogramming.
- For details on how to use the battery diagnostic tool, refer to the [DCA-8000 Battery Diagnostic Tool Instruction Manual](#) located in *TIS – Diagnostics – Tools & Equipment – Battery Diagnostics*.

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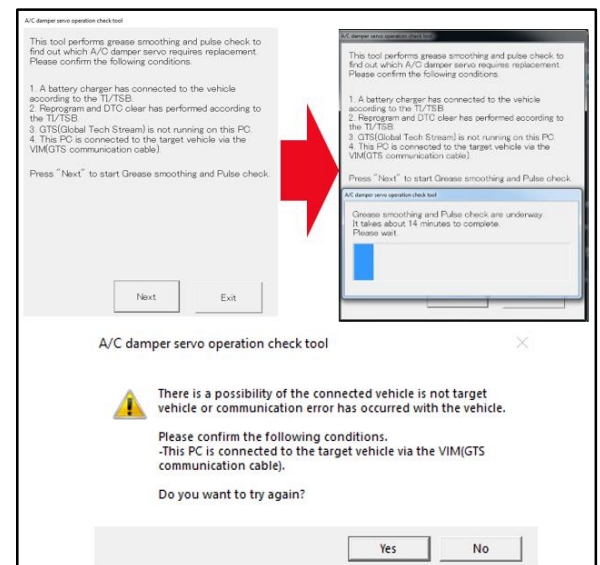
Servo Cleaning Procedure

1. Continue with the battery diagnostic tool connected using the “Power Supply Mode” ONLY.
2. Confirm flash reprogramming of the air conditioning amplifier is complete.
3. BEFORE using the AC damper servo operation check tool, manually set the front and rear air conditioning to the following settings:
 - MODE – Face
 - Temperature – Max Cold
 - Air Inlet – Recirculation
4. Select the following link to download the AC damper servo operation check tool onto the Techstream desktop: [AC damper servo operation check tool download](#).
5. Confirm the ignition is in the IG-ON position and the Techstream unit is connected to the DLC3 connector.
6. Confirm NO other programs on the Techstream unit are currently communicating with the vehicle.
7. Double-click on the AC damper servo operation check tool from the Techstream desktop.
8. Click on NEXT to start the AC damper servo operation check tool and the progress bar will show. It will take between 8 – 14 minutes to complete the cleaning process depending on the condition of the servos. The completion rate of the progress bar will show between 50% – 100%.

NOTE

If the connection between Techstream and the vehicle is interrupted during the cleaning process, the error message in Figure 1 will also display. To reconnect, turn OFF the Techstream unit and disconnect it from the DLC3 connector, reconnect Techstream and confirm connections, and turn ON the Techstream unit and restart the cleaning process.

Figure 1.



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Servo Cleaning Procedure (continued)

9. When the cleaning process is complete, the DTC check result screen shown below will be displayed. If ANY DTC description is output, the servo related to it will require replacement.

Are ANY DTC descriptions output?

- **YES** — Check the DTC description and the Servo Location Guide, and replace the appropriate servo according to the displayed DTC description (Figure 2).
- **NO** — Complete steps 10 – 11 to complete the repair and return the vehicle to the customer (Figure 3).

Figure 2.

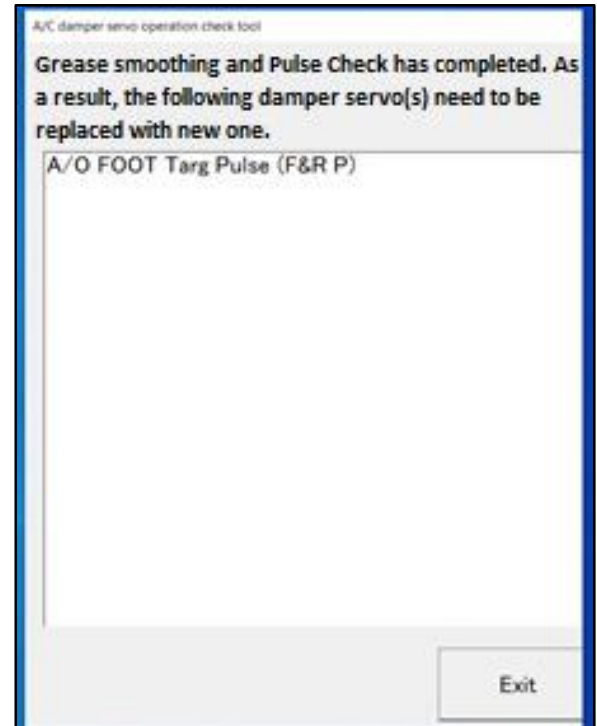


Figure 3.



HVAC Servo Motor Malfunction

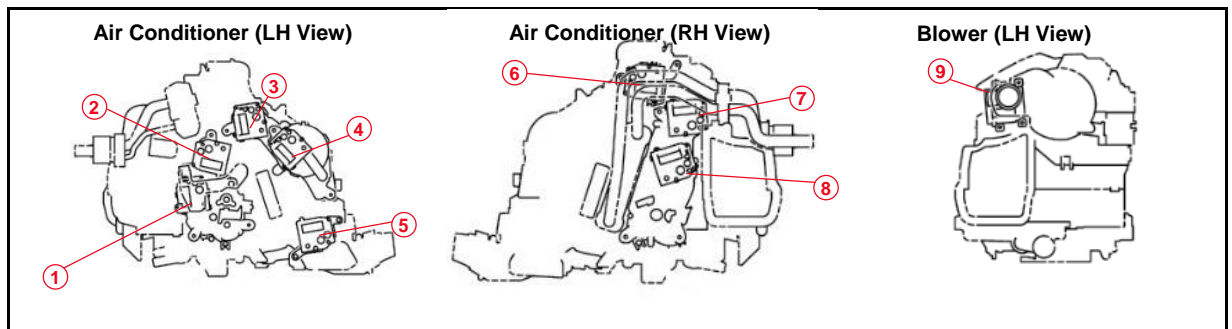
Servo Cleaning Procedure (continued)

10. The Servo Cleaning Operation is complete. Turn OFF the ignition and click "EXIT."
11. Turn OFF and disconnect the DCA-8000 battery diagnostic tool from the battery.

Servo Location Guide (Two and Four Zone HVAC Systems)

If there were any DTC descriptions output after step 9 in the Servo Cleaning Procedure, replace the servos(s) per the replacement steps below for the appropriate servo requiring replacement.

Figure 4. Two Zone System

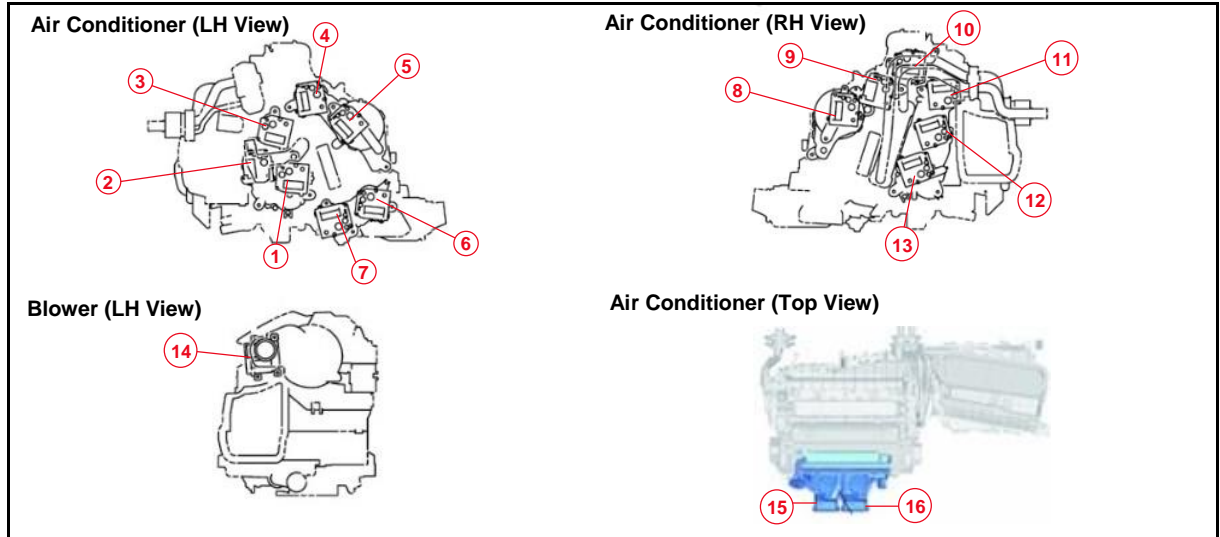


SERVO LOCATION	AC DAMPER OPERATION CHECK TOOL DTC DESCRIPTION OUTPUT	RELATED DTC(S)	SERVO PART NO.	SERVO/MODULE CONFIGURATION
1	Air Mix Servo Targ Pulse (D)	B1446 / B1453	87106-11010	Two Servos / One Module
2	Cool A/M Servo Targ Pls (D)			
3	A/O FACE Targ Pulse (D)	B1443 / B1455	87106-11060	
4	A/O FOOT/DEF Targ Pulse (D)			
5	Air Outlet Servo Pls (F&R D)	B148A	87106-50610	One Servo
6	A/O Damper DEF Pos (D side)	B144A	87106-11090	
7	Cool A/M Servo Targ Pls (P)	B1441 / B1454	87106-50700	Two Servos / One Module
8	Air Mix Servo Targ Pulse (P)			
9	Air Inlet Damper Targ Pulse	B1442	87106-50760	One Servo

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Servo Location Guide (Two and Four Zone HVAC Systems) (continued)

Figure 5. Four Zone System



SERVO LOCATION	AC DAMPER OPERATION CHECK TOOL DTC DESCRIPTION OUTPUT	RELATED DTC(S)	SERVO PART NO.	SERVO/MODULE CONFIGURATION
1	Air Mix Servo Targ Pulse (D)	B1446 / B1453 / B1457	87106-50710	Three Servos / One Module
2	Air Mix Servo Targ Pls (F & R D)			
3	Cool A/M Servo Targ Pls (D)			
4	A/O FACE Targ Pulse (D)	B1443 / B1455	87106-11060	Two Servos / One Module
5	A/O FOOT/DEF Targ Pulse (D)			
6	A/O FOOT Targ Pulse (F & R P)	B148A / B148B	87106-50670	
7	A/O FOOT Targ Pulse (F & R D)			
8	A/O FOOT/DEF Targ Pulse (P)	B1448 / B1456	87106-50730	
9	A/O FACE Targ Pulse (P)			
10	A/O Damper DEF Pos (D side)	B144A	87106-11090	One Servo
11	Cool A/M Servo Targ Pls (P)	B1441 / B1454 / B1458	87106-50720	Three Servos / One Module
12	Air Mix Servo Targ Pulse (P)			
13	Air Mix Servo Targ Pls (F & R P)			
14	Air Inlet Damper Targ Pulse	B1442	87106-50760	One Servo
15	Air Outlet Servo Pls (F & R D)	B1486 / B1487	87106-50040	One Servo / Heater Air Damper Assy.
16	Air Outlet Servo Pulse (F & R P)			

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Damper Servo Sub-assembly Replacement Procedure

1. Does the vehicle exhibit the following DTC?
 - B1442 – Air Inlet Damper Control Servo Motor Circuit
 - **YES** — Continue to step 2.
 - **NO** — Go to step 7.

2. Remove the blower unit from the vehicle.
Refer to TIS, applicable model and model year Repair Manual:
 - [2018](#) / [2019](#) LS 500:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Blower Unit: Removal”
 - [2018](#) / [2019](#) LS 500h:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Blower Unit: Removal”

3. Replace the air inlet damper control servo motor circuit.
Refer to TIS, applicable model and model year Repair Manual:
 - [2018](#) / [2019](#) LS 500:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Blower Unit: Disassembly”
 - [2018](#) / [2019](#) LS 500h:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Blower Unit: Disassembly”

4. Reassemble the blower unit.
Refer to TIS, applicable model and model year Repair Manual:
 - [2018](#) / [2019](#) LS 500:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Blower Unit: Reassembly”
 - [2018](#) / [2019](#) LS 500h:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Blower Unit: Reassembly”

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Damper Servo Sub-assembly Replacement Procedure (continued)

5. Reinstall the blower unit onto the vehicle.
Refer to TIS, applicable model and model year Repair Manual:
 - [2018](#) / [2019](#) LS 500:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Blower Unit: Installation”
 - [2018](#) / [2019](#) LS 500h:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Blower: Installation”

6. If ALL faulty servos have been replaced, go to the Completion Procedure section to initialize and check servo operation.

7. Does the vehicle exhibit one or more of the following DTC(s)?
 - B144A – Air Outlet DEF Damper Control Servo Motor Circuit
 - B1441 – Air Mix Damper Control Servo Motor Circuit (Passenger Side)
 - B1443 – Air Outlet Damper Control Servo Motor Circuit
 - B1446 – Mix Damper Control Servo Motor Circuit (Driver Side)
 - B1448 – Passenger Side FACE Servo Motor Circuit
 - B1453 – Air Outlet Damper Cool Control Servo Motor Circuit (Driver Side)
 - B1454 – Air Outlet Damper Cool Control Servo Motor Circuit (Passenger Side)
 - B1455 – Air Outlet Damper FOOT/DEF Control Servo Motor Circuit (Driver Side)
 - B1456 – Air Outlet Damper FOOT/DEF Control Servo Motor Circuit (Passenger Side)
 - B1457 – Driver Side Air Outlet Damper Control Servo Motor Circuit
 - B1458 – Air Outlet Damper Control Servo Motor Circuit (Passenger Side Front A/C Rear Air Flow)
 - B148A – Air Outlet Rear FOOT Damper Control Servo Motor Circuit (Driver Side)
 - B148B – Air Outlet Rear FOOT Damper Control Servo Motor Circuit (Passenger Side)
 - B1486 – Driver Side Air Outlet Damper Control Servo Motor Circuit
 - B1487 – Air Outlet Damper Control Servo Motor Circuit (Passenger Side Front A/C Rear Air Flow)
 - **YES** — Continue to step 8.
 - **NO** — Go to the Completion Procedure section.

HVAC Servo Motor Malfunction

Damper Servo Sub-assembly Replacement Procedure (continued)

8. Remove the air conditioning radiator assembly.

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

- [2018](#) / [2019](#) LS 500:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Front Air Conditioning Unit: Removal”
- [2018](#) / [2019](#) LS 500h:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Front Air Conditioning Unit: Removal”

9. Replace the faulty servo(s).

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

- [2018](#) / [2019](#) LS 500:
Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Front Air Conditioning Unit: Disassembly”
- [2018](#) / [2019](#) LS 500h:
Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Front Air Conditioning Unit: Disassembly”

10. Reassemble the air conditioning radiator assembly.

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

- [2018](#) / [2019](#) LS 500:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Front Air Conditioning Unit: Reassembly”
- [2018](#) / [2019](#) LS 500h:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Front Air Conditioning Unit: Reassembly”

11. Reinstall the air conditioning radiator assembly.

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

- [2018](#) / [2019](#) LS 500:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Front Air Conditioning Unit: Installation”
- [2018](#) / [2019](#) LS 500h:
Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Front Air Conditioning Unit: Installation”

12. If ALL faulty servos have been replaced, continue to the Completion Procedure section to initialize and check servo operation.

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Completion Procedure

1. Initialize the servo(s).
Refer to TIS, applicable model and model year Repair Manual:
 - [2018](#) / [2019](#) LS 500:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Air Conditioning System: Initialization”
 - [2018](#) / [2019](#) LS 500h:
Vehicle Interior – Heating/Air Conditioning – “Heating / Air Conditioning: Air Conditioning System: Initialization”
2. Check for DTCs.
3. If the servo(s) does(do) NOT function correctly, replace it(them).
4. Restore the vehicle back to its assembled condition.
5. Confirm the condition no longer exists.