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2017.0 DISCOVERY (LR), 501-11

GLASS, FRAMES AND MECHANISMS

DIAGNOSIS AND TESTING

PRINCIPLE OF OPERATION

For a detailed description of the glass, frames and mechanisms and operation, refer to the relevant Description and Operation section of the workshop manual. REFER to: Glass, Frames and Mechanisms (501-11 Glass, Frames and Mechanisms, Description and Operation).

INSPECTION AND VERIFICATION

⚠ CAUTION:

Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault and may also cause additional faults in the vehicle being checked and/or the donor vehicle

⚠ NOTE:

If the control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the warranty policy and procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module/component

1. Verify the customer concern
1. Visually inspect for obvious signs of mechanical or electrical damage

Visual Inspection

MECHANICAL


ELECTRICAL



<ul style="list-style-type: none"> ▪ Door switchpacks condition and installation ▪ Door window motors/regulators ▪ Door window channels/runners ▪ Door window cables 	<ul style="list-style-type: none"> ▪ Fuses ▪ Harnesses and connectors ▪ Door window lift relay ▪ Door switchpacks ▪ Door window motors ▪ Windshield heater elements and connector
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1. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step

1. If the cause is not visually evident, verify the symptom and refer to the symptom chart, alternatively check for diagnostic trouble codes (DTCs) and refer to the DTC Index.

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
Windshield heater element does not defrost	<ul style="list-style-type: none"> ▪ Fuse ▪ Switch fault ▪ Relay fault ▪ Element fault ▪ Circuit fault 	<div style="background-color: #ADD8E6; padding: 5px; border: 1px solid #ADD8E6; margin-bottom: 10px;"> <p> NOTE:</p> <p>Windshield heater should clear within two minutes</p> </div> <ul style="list-style-type: none"> ▪ In the event of a claim for either or both banks of wires not working, prior to replacing the part: <ul style="list-style-type: none"> ▪ Check the fuses ▪ Check the operation of the heated windshield switch and relay ▪ Check the element for continuity ▪ Check the windshield heater element connector is securely connected to the wiring harness ▪ Refer to the electrical guides and check the heated windshield circuits
Door window(s) inoperative	<ul style="list-style-type: none"> ▪ Fuse(s) ▪ Door switchpack fault ▪ Isolator switch fault ▪ Door window 	<ul style="list-style-type: none"> ▪ Check the fuses. Check the suspect door window operation from the individual door switchpack and from the driver door switchpack (it is unlikely that both door switchpacks would fail at the same time, so if the door window is inoperative from either door switchpack, suspect a fault other than a door switchpack) ▪ If the inoperative door window is a rear unit, check the function of the isolator switch at the driver door switchpack ▪ If the concern persists and a noise cannot be heard when operating the door window, GO to Pinpoint Test B.

	<ul style="list-style-type: none"> motor /regulator fault ▪ Door window channel /runner fault ▪ Door window cable fault ▪ Wiring harness fault 	<ul style="list-style-type: none"> ▪ If the concern persists and a noise can be heard when operating the door window, GO to Pinpoint Test C.
<p>Door window(s) 'one-shot' function inoperative</p>	<ul style="list-style-type: none"> ▪ Door window regulator motor initialization required ▪ Door switchpack fault 	<div style="background-color: #e0f2f1; padding: 5px; border: 1px solid #ccc;">  NOTE: </div> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 5px;"> <p>Do not install a new door window regulator motor for this concern</p> </div> <p>If the battery has been disconnected, carry out the initialization procedure. REFER to: Door Window Motor Initialization (501-11 Glass, Frames and Mechanisms, General Procedures). Check the door switchpack function after initialization</p>
<p>Door window(s) noisy during operation</p>	<ul style="list-style-type: none"> ▪ Door window channel /runner fault ▪ Door window cable fault ▪ Door window motor /regulator fault ▪ Incorrect adjustment of door window 	<p>GO to Pinpoint Test A.</p>
<p>Rear window does not defrost</p>	<ul style="list-style-type: none"> ▪ Fuse ▪ Switch fault ▪ Relay fault ▪ Element fault ▪ Circuit fault 	<div style="background-color: #e0f2f1; padding: 5px; border: 1px solid #ccc;">  NOTE: </div> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 5px;"> <p>On some rear windows the upper elements are antenna lines, they can be identified as the word "Antenna" is written alongside them. They do not have defrost capability</p> </div> <p>Check fuse. Check the operation of the heated rear window switch and relay. Check the element for continuity. Check the heated rear window circuit. Refer to the electrical guides</p>

Slow or partial door window operation	<ul style="list-style-type: none"> ▪ Fuse ▪ Switch fault ▪ Relay fault ▪ Element fault ▪ Circuit fault 	GO to Pinpoint Test D.
Wind noise between the door window and seal	<ul style="list-style-type: none"> ▪ Incorrect adjustment of door window ▪ Door window channel /runner fault ▪ Door window cable fault ▪ Door window motor /regulator fault 	GO to Pinpoint Test E.
Rear door window bounce back	<ul style="list-style-type: none"> ▪ Door window motor initialization required (using IDS /SDD) 	<div style="background-color: #e0f2f1; padding: 5px;"> NOTE:</div> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 5px;">Do not install a new door window regulator motor for this concern</div> <p>Refer to IDS/SDD.</p>
Front door window bounce back	<ul style="list-style-type: none"> ▪ Door window motor initialization required ▪ Door window channel /runner fault 	<div style="background-color: #e0f2f1; padding: 5px;"> NOTE:</div> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 5px;">Do not install a new door window regulator motor for this concern</div> <p>GO to Pinpoint Test F.</p>

PINPOINT TEST

PINPOINT TEST A : WINDOW(S) NOISY DURING OPERATION

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
A1: CHECK THE DOOR WINDOW IS SECURE	

	1 Remove the door window outer waist seal
	2 Check if the door window is installed correctly and secured to the door window regulator
	<p>Is the door window correctly installed and secure?</p> <p>Yes GO to A2 .</p> <p>No</p> <p>Make sure that the door window retaining bracket(s) are secured to the door window (bonded), if damaged, install a new door window as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Glass (Removal and Installation), Rear Door Window Glass (Removal and Installation). If the door window retaining bracket(s) are OK, adjust the door window referring to the door window setting procedure in this procedure</p>
A2: CHECK THE OPERATION OF THE DOOR WINDOW REGULATOR MOTOR	
	1 Remove the door window as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Glass (Removal and Installation), Rear Door Window Glass (Removal and Installation).
	2 Operate the door window regulator four times
	<p>Does the door window regulator operate correctly (without noise)?</p> <p>Yes</p> <p>Remove any foreign material from door window regulator and lubricate the window runners. Test the system for normal operation. If the concern persists, GO to A3 .</p> <p>No</p> <p>Install a new door window regulator as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Regulator (Removal and Installation), Rear Door Window Regulator Motor (Removal and Installation).</p>
A3: CHECK THAT THE DOOR WINDOW SEAL IS FREE FROM FOREIGN MATERIAL	
	1 Check for any foreign material or obstruction in the door window seal
	<p>Is the door window seal free from foreign material?</p> <p>Yes GO to A4 .</p> <p>No</p> <p>Remove any foreign material from door window seal and lubricate the seal. Test the system for normal operation</p>
A4: CHECK THAT THE DOOR WINDOW SEAL IS INSTALLED CORRECTLY	
	1 Check that the door window seal is installed correctly
	<p>Is the door window seal installed correctly?</p> <p>Yes GO to A5 .</p> <p>No</p> <p>Install the door window seal correctly. Test the system for normal operation</p>
A5: CHECK THAT THE DOOR WINDOW SEAL IS NOT WORN IN THE CHANNELS	
	1 Visually check that the door window seal is not worn in the door channels
	<p>Is the door window seal worn in the channels?</p> <p>Yes</p> <p>Install a new door window seal as necessary. Test the system for normal operation</p> <p>No</p> <p>Install the door window. Adjust the door window referring to the door window setting procedure in this procedure</p>

PINPOINT TEST B : WINDOW(S) INOPERATIVE (MOTOR NOISE CANNOT BE HEARD)	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
B1: CHECK FOR DOOR WINDOW REGULATOR MOTOR NOISE	
	1 Operate the door window regulator motor as necessary
	Is there a noise from the door window regulator motor when operated? Yes GO to B3 . No GO to B2 .
B2: CHECK THE VOLTAGE TO THE DOOR WINDOW REGULATOR MOTOR	
	1 Using a multimeter, check the voltage to the door window regulator motor
	Is the voltage greater than 10 volts? Yes Install a new door window regulator motor as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Regulator (Removal and Installation), Rear Door Window Regulator Motor (Removal and Installation). No Repair the wiring harness. Test the system for normal operation
B3: CHECK THAT THE DOOR WINDOW SEAL IS FREE FROM FOREIGN MATERIAL	
	1 Check for any foreign material or obstruction in the door window seal
	Is the door window seal free from foreign material? Yes GO to B4 . No Remove any foreign material from door window seal and lubricate the seal. Test the system for normal operation
B4: CHECK THAT THE DOOR WINDOW SEAL IS INSTALLED CORRECTLY	
	1 Check that the door window seal is installed correctly
	Is the door window seal installed correctly? Yes GO to B5 . No Install the door window seal correctly. Test the system for normal operation
B5: CHECK THAT THE DOOR WINDOW SEAL IS NOT WORN IN THE CHANNELS	
	1 Visually check that the door window seal is not worn in the door channels
	Is the door window seal worn in the channels? Yes Install a new door window seal as necessary. Adjust the door window referring to the door window setting procedure in this procedure. Test the system for normal operation No Adjust the door window referring to the door window setting procedure in this procedure

PINPOINT TEST C : WINDOW(S) INOPERATIVE (MOTOR NOISE CAN BE HEARD)	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS

C1: CHECK THE DOOR WINDOW IS SECURE	
	1 Remove the door window outer waist seal
	2 Check if the door window installed correctly and secured to the door window regulator
	Is the door window correctly installed and secure? Yes GO to C2 . No Install a new door window as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Glass (Removal and Installation), Rear Door Window Glass (Removal and Installation).
C2: CHECK THE DOOR WINDOW REGULATOR INTEGRITY	
	1 Visually inspect the cables, rollers and rail sliders for foreign material
	Are the cables, rollers and rail sliders free from foreign material? Yes GO to C3 . No Remove any foreign material. Test the system for normal operation. If the concern persists, install a new door window regulator as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Regulator (Removal and Installation), Rear Door Window Regulator Motor (Removal and Installation).
C3: CHECK THAT THE DOOR WINDOW SEAL IS FREE FROM FOREIGN MATERIAL	
	1 Check for any foreign material or obstruction in the door window seal
	Is the door window seal free from foreign material? Yes GO to C4 . No Remove any foreign material from door window seal and lubricate the seal. Test the system for normal operation
C4: CHECK THAT THE DOOR WINDOW SEAL IS INSTALLED CORRECTLY	
	1 Check that the door window seal is installed correctly
	Is the door window seal installed correctly? Yes GO to C5 . No Install the door window seal correctly. Test the system for normal operation
C5: CHECK THAT THE DOOR WINDOW SEAL IS NOT WORN IN THE CHANNELS	
	1 Visually check that the door window seal is not worn in the door channels
	Is the door window seal worn in the channels? Yes Install a new door window seal as necessary. Test the system for normal operation No Adjust the door window referring to the door setting procedure in this procedure

PINPOINT TEST D : SLOW OR PARTIAL WINDOW OPERATION	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS

D1: CHECK THE DOOR WINDOW IS SECURE	
	1 Remove the door window outer waist seal
	2 Check if the door window installed correctly and secured to the door window regulator
	Is the door window correctly installed and secure? Yes GO to D2 . No Install a new door window as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Glass (Removal and Installation), Rear Door Window Glass (Removal and Installation).
D2: CHECK THE OPERATION OF THE DOOR WINDOW REGULATOR	
	1 Remove the door window as necessary REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Glass (Removal and Installation), Rear Door Window Glass (Removal and Installation).
	2 Operate the door window regulator as necessary
	Does the door window regulator operate correctly? Yes GO to D3 . No GO to D6 .
D3: CHECK THAT THE DOOR WINDOW SEAL IS FREE FROM FOREIGN MATERIAL	
	1 Check for any foreign material or obstruction in the door window seal
	Is the door window seal free from foreign material? Yes GO to D4 . No Remove any foreign material from door window seal and lubricate the seal. Test the system for normal operation
D4: CHECK THAT THE DOOR WINDOW SEAL IS INSTALLED CORRECTLY	
	1 Check that the door window seal is installed correctly
	Is the door window seal installed correctly? Yes GO to D5 . No Install the door window seal correctly. Test the system for normal operation
D5: CHECK THAT THE DOOR WINDOW SEAL IS NOT WORN IN THE CHANNELS	
	1 Visually check that the door window seal is not worn in the door channels
	Is the door window seal worn in the channels? Yes Install a new door window seal as necessary. Test the system for normal operation No Install the door window. Adjust the door window referring to the door window setting procedure in this procedure. Test the system for normal operation
D6: CHECK THE DOOR WINDOW REGULATOR MOTOR INTEGRITY	
	1 Visually inspect the cables, rollers and rail sliders for foreign material
	Are the cables, rollers and rail sliders free from foreign material?

	<p>Yes GO to D7 .</p> <p>No Remove any foreign material. Test the system for normal operation. If the concern persists, install a new door window regulator as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Regulator (Removal and Installation), Rear Door Window Regulator Motor (Removal and Installation).</p>
D7: CHECK THE VOLTAGE TO THE DOOR WINDOW REGULATOR MOTOR	
	1 Using a multimeter, check the voltage to the door window regulator motor
	<p>Is the voltage greater than 10 volts?</p> <p>Yes Install a new door window regulator as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Regulator (Removal and Installation), Rear Door Window Regulator Motor (Removal and Installation).</p> <p>No Repair the wiring harness. Test the system for normal operation. If the concern continues, install a new door window regulator as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Regulator (Removal and Installation), Rear Door Window Regulator Motor (Removal and Installation).</p>

PINPOINT TEST E : WIND NOISE BETWEEN THE DOOR WINDOW AND SEAL	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
E1: CHECK THAT THE DOOR WINDOW SEAL IS FREE FROM FOREIGN MATERIAL	
	1 Check for any foreign material or obstruction in the door window seal
	<p>Is the door window seal free from foreign material?</p> <p>Yes GO to E2 .</p> <p>No Remove any foreign material from door window seal and lubricate the seal. Test the system for normal operation</p>
E2: CHECK THAT THE DOOR WINDOW SEAL IS INSTALLED CORRECTLY	
	1 Check that the door window seal is installed correctly
	<p>Is the door window seal installed correctly?</p> <p>Yes GO to E3 .</p> <p>No Install the door window seal correctly. Test the system for normal operation</p>
E3: CHECK THAT THE DOOR WINDOW SEAL IS NOT WORN IN THE CHANNELS	
	1 Visually check that the door window seal is not worn in the door channels
	<p>Is the door window seal worn in the channels?</p> <p>Yes Install a new door window seal as necessary. Test the system for normal operation</p> <p>No GO to E4 .</p>
E4: CHECK THE DOOR WINDOW REGULATOR INTEGRITY	
	1 Visually inspect the cables, rollers and rail sliders for foreign material

	<p>Are the cables, rollers and rail sliders free from foreign material?</p> <p>Yes GO to E5 .</p> <p>No Remove any foreign material. Test the system for normal operation. If the concern persists, install a new door window regulator as necessary. REFER to: (501-11 Glass, Frames and Mechanisms) Front Door Window Regulator (Removal and Installation), Rear Door Window Regulator Motor (Removal and Installation).</p>
E5: CHECK THE VOLTAGE TO THE DOOR WINDOW REGULATOR MOTOR	
	<p>1 Using a multimeter, check the voltage to the door window regulator motor</p>
	<p>Is the voltage greater than 10 volts?</p> <p>Yes Adjust the door window referring to the door window setting procedure in this procedure</p> <p>No Repair the wiring harness. Test the system for normal operation</p>

PINPOINT TEST F : FRONT DOOR WINDOW BOUNCE BACK	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
F1: CHECK WINDOW MOTOR INITIALIZATION	
	<p>1 Initialize the door window motor. REFER to: Door Window Motor Initialization (501-11 Glass, Frames and Mechanisms, General Procedures).</p>
	<p>Did the initialization work?</p> <p>Yes Test the system for normal operation</p> <p>No GO to F2 .</p>
F2: CHECK THAT THE DOOR WINDOW SEAL IS FREE FROM FOREIGN MATERIAL	
	<p>1 Check for any foreign material or obstruction in the door window seal</p>
	<p>Is the door window seal free from foreign material?</p> <p>Yes GO to F3 .</p> <p>No Remove any foreign material from door window seal and lubricate the seal. Test the system for normal operation.</p>
F3: CHECK THAT THE DOOR WINDOW SEAL IS INSTALLED CORRECTLY	
	<p>1 Check that the door window seal is installed correctly</p>
	<p>Is the door window seal installed correctly?</p> <p>Yes GO to F4 .</p> <p>No Install the door window seal correctly. Test the system for normal operation</p>
F4: CHECK THAT THE DOOR WINDOW SEAL IS NOT WORN IN THE CHANNELS	
	<p>1 Visually check that the door window seal is not worn in the door channels</p>
	<p>Is the door window seal worn in the channels?</p> <p>Yes Install a new door window seal as necessary. Test the system for normal operation</p>

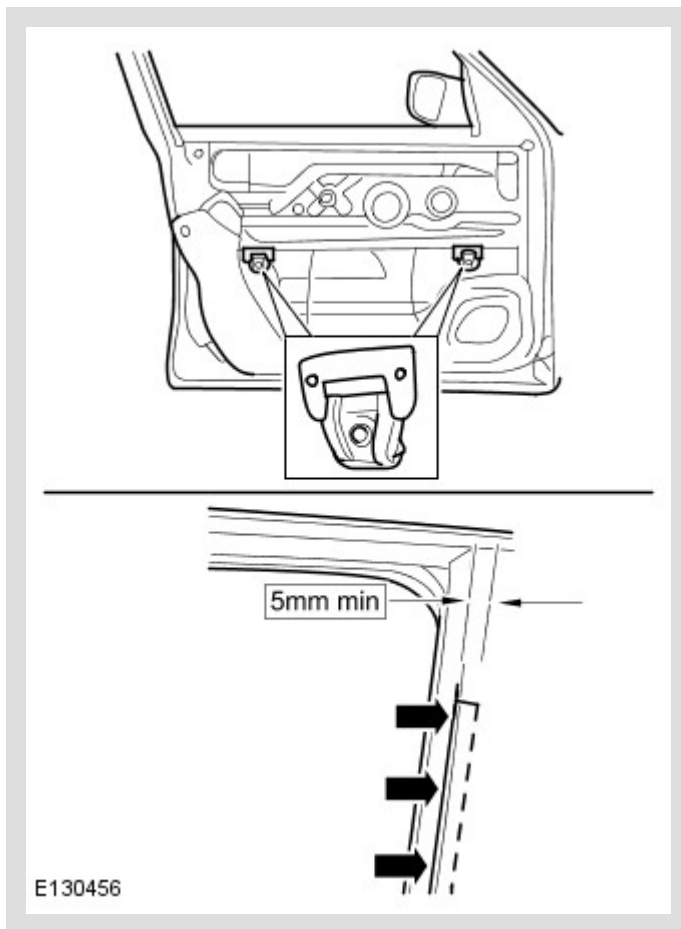
	No GO to F5 .
F5: CHECK THE DOOR WINDOW IS SECURE	
	1 Remove the door window outer waist seal
	2 Check if the door window installed correctly and secured to the door window regulator
	<p>Is the door window correctly installed and secure?</p> <p>Yes Test the system for normal operation</p> <p>No Adjust the door window referring to the door window setting procedure in this procedure. Test the system for normal operation. If the concern persists, install a new door window regulator as necessary. REFER to: Front Door Window Regulator (501-11 Glass, Frames and Mechanisms, Removal and Installation).</p>


DOOR WINDOW SETTING PROCEDURE

NOTE:

Make sure that this procedure is carried out if any concern is with noise or if directed by a pinpoint test


1. Remove the door trim panel as necessary. REFER to: (501-05 Interior Trim and Ornamentation)
Front Door Trim Panel (Removal and Installation),
Rear Door Trim Panel (Removal and Installation).
1. Release but do not remove the door window retaining clip(s) bolt(s)
1. Operate the window switch up and down seven times to make sure that the door window is correctly installed to the door window seal



 **NOTE:**


Make sure that the retaining clips are installed as illustrated

1. Install the door window to the retaining clips, first to the front retaining clip and then to the rear
1. Push the door window to the rear of the door to make sure correct installation in to the door window seal

 NOTE:

Tighten the rear retaining clip bolt first then the front bolt

1. Tighten the door window retaining clip bolts to 10 Nm

 NOTE:

Make sure that there is a minimum of 5mm engagement of the door window to the rear door channel when the door window is fully closed

1. Check the system for normal operation

DTC INDEX

For a list of diagnostic trouble codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: (100-00 General Information)

Diagnostic Trouble Code (DTC) Index - DTC: Driver/Passenger Door Module (DDM /PDM) (Description and Operation),

Diagnostic Trouble Code (DTC) Index - DTC: Body Control Module (BCM) (Description and Operation).