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2020.0 DEFENDER (LE), 501-10

SEATING

SEATS (G2401036)

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PRINCIPLES OF OPERATION

For a detailed description of the Seating system, refer to the relevant Description and Operation section in the workshop manual. REFER to: [Seats - \[+\] 5 Seat Configuration](#) (501-10 Seating, 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 tested and/or the donor vehicle.

 NOTES:

- If the control module or a component may be at fault and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual, or determine if any prior approval program is in operation, prior to the installation of a new module/component.
- When performing voltage or resistance tests, always use a digital multimeter that has the resolution ability to view 3 decimal places. For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. When testing resistance always take the resistance of the digital multimeter leads into account.
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern
2. Visually inspect for obvious signs of damage and system integrity

Visual Inspection

MECHANICAL	ELECTRICAL
■ Seat runners ■ Seat frames	■ Fuses ■ Wiring harnesses and connectors ■ Driver seat module ■ Passenger seat module ■ Body control module ■ Driver/passenger seat module ■ Touchscreen

MECHANICAL	ELECTRICAL
	■ Seat movement switch(es) ■ Seat motor(s)

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Code(s) and refer to the Diagnostic Trouble Code(s) (DTC) Index
5. Check the JLR claims submission system for open campaigns. Refer to the corresponding bulletins and SSMs which may be valid for the specific customer complaint and complete the recommendations as required

SEAT MOVEMENT INHIBITION CHECKS

If the customer is reporting issues with seat movements, first consult the table below to check if the seat movement functions may have been inhibited. If the issue cannot be rectified, proceed to the pinpoint tests below:

SYMPTOM	REASON FOR INHIBIT	HOW TO IDENTIFY FAULT SPECIFICS	RECTIFICATION	AFFECTED SEAT ROW	FURTHER DESCRIPTION
Seat movement not operating from switch press	■ Seat movement motor overheat	■ Only the affected motor will be disabled ■ Under current DTC may be set	■ Wait for at least 5 minutes to allow motor to cool ■ Perform ignition cycle	■ 1st Row - L462, L405 and L494 ■ 2nd Row - L405 Business Class Seating only	■ n/a
Rear seat movement not operating from switch press	■ Seat module software has activated seat movement motor thermal protection	■ Only the affected motor will be disabled	■ Wait for at least 2 minutes to allow motor to cool	■ 2nd Row - L462, L405 60 /40 Seating only ■ 3rd Row - L462, L494 only	■ n/a
Rear seats not folding when using load space switches	■ Tailgate is not open	■ Check if the tailgate is closed	■ Open tailgate	■ 2nd Row - L462, L405 60	■ n/a

SYMPTOM	REASON FOR INHIBIT	HOW TO IDENTIFY FAULT SPECIFICS	RECTIFICATION	AFFECTED SEAT ROW	FURTHER DESCRIPTION
				/40 Seating only ■ 3rd Row - L462, L494 only	
	■ Power management time out	■ Load space lighting is not illuminated	■ Close and open tailgate ■ Press unlock button ■ Turn on ignition	■ 2nd Row - L462, L405 60 /40 Seating only ■ 3rd Row - L462, L494 only	■ n/a
Seat fold not operating from C pillar switch	■ Adjacent door closed	■ Check if adjacent door is open	■ Open adjacent door	■ 3rd Row - L462, L494 only	■ n/a
	■ Power management time out	■ The vehicle has been left without any interaction	■ Press unlock button ■ Turn on ignition	■ 3rd Row - L462, L494 only	■ n/a
Rear seat movement not operating from rear seat switch pack	■ Rear window isolate (child lock) switch on	■ Check if the rear window isolate (child lock) button telltale LED is illuminated	■ Turn off the rear window isolate (child lock) switch	■ 2nd Row - L462, L405 only	■ n/a
Seat movement not operating from switch press	■ Seat controls not working (seat module software has activated circuit protection)	■ Only the affected motor will be disabled	■ Turn ignition OFF, then ON ■ Check for related Diagnostic Trouble Code	■ 1st Row - L462, L405 and L494 ■ 2nd Row - L462, L405 only	■ Fault codes (set in seat module) preventing seat movement. Check for 'Circuit Current Above /Below Threshold' Diagnostic Trouble Code(s) and refer to the relevant DTC index

SYMPTOM	REASON FOR INHIBIT	HOW TO IDENTIFY FAULT SPECIFICS	RECTIFICATION	AFFECTED SEAT ROW	FURTHER DESCRIPTION
			(s) and repair any circuit faults	3rd Row - L462, L494 only	
Seat movement 'inching', not smooth operation (starts and then stops)	Seat movement issue – "inching" movement	Only the affected motor will be inching	Check for related Diagnostic Trouble Code (s) and refer to the relevant DTC index	1st Row - L462, L405 and L494 2nd Row - L462, L405 only	Fault codes (set in seat module) preventing smooth seat movement. Check for 'Speed Position Sensor - No Signal' Diagnostic Trouble Code(s) and refer to the relevant DTC index
Driver seat not returning to memory position (when driving)	-	-	-	1st Row driver seat only - L462, L405 and L494	When a vehicle threshold speed (5 kph) is detected, automatic seat movement to memory position is disabled and on-going return to memory position is stopped
Seat controls not working (minimum voltage protection)	Seat controls not working (seat module software has disabled operation)	-	Check for battery and /or charging faults and rectify as required	1st Row - L462, L405 and L494 2nd Row - L462, L405 only 3rd Row - L462, L494 only	If battery's voltage output decreases below minimum allowable value of 9 volts, the seat module stops operating
Easy Entry/Exit - Drivers seat not returning to original driving position	No automated seat movement is permitted with vehicle moving	-	Do not drive the vehicle when the seat/steering column is moving to required driving position	1st Row driver seat only - L462, L405 and L494	The function of easy entry will only complete and return the seat and column to the required position if the vehicle speed remains lower than a permitted vehicle threshold speed (5 kph)

SYMPTOM CHARTS

SYMPTOM	POSSIBLE CAUSES	ACTION
Front seat fore/aft movement not functioning	Complete the pinpoint test associated to this symptom	GO to Pinpoint Test A.
Front seat feels loose/rocks/clicks	Complete the pinpoint test associated to this symptom	GO to Pinpoint Test B.
Front seat excessive fore/aft free play	Complete the pinpoint test associated to this symptom	GO to Pinpoint Test C.
Front seat fore/aft movement noisy	Complete the pinpoint test associated to this symptom	GO to Pinpoint Test D.
Front seat height, tilt and/or seat extension motor movement not functioning	Complete the pinpoint test associated to this symptom	GO to Pinpoint Test E.
Front seat height, tilt and/or extension movement noisy	Complete the pinpoint test associated to this symptom	GO to Pinpoint Test F.

PINPOINT TESTS

PINPOINT TEST A : FRONT SEAT FORE/AFT MOVEMENT NOT FUNCTIONING	
A1: CHECK FOR FRONT SEAT FORWARD-REARWARD SEAT MOTOR OPERATION	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	 WARNING: Before work is completed, make the airbag supplemental restraint system safe. For additional information, refer to Standard Workshop Practices section of workshop manual
	Set ignition status to 'ON'
	From the switch pack, operate the front seat forward-rearward seat motor switch and listen for evidence of the motor operating
	Does the motor operate? Yes GO to A2. No GO to A3.
A2: CHECK FRONT SEAT FORWARD-REARWARD SEAT MOTOR DRIVE BAR	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	Check front seat drive bar for correct installation and condition

A2: CHECK FRONT SEAT FORWARD-REARWARD SEAT MOTOR DRIVE BAR					
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS				
	Is the front seat drive bar correctly installed and in a serviceable condition? Yes Re-check for correct front seat forward-rearward movement. Remove seat to allow for further investigation if required No Correctly install front seat forward-rearward seat motor drive bar, or replace if required				
A3: CHECK FRONT SEAT FORWARD-REARWARD SEAT MOTOR					
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS				
 WARNING: When carrying out the following steps, stand clear of all moving parts and make sure link harness is routed accordingly					
	1 Set ignition status to 'OFF'				
	2 Disconnect front seat forward-rearward seat motor connector				
	 NOTE: It may be that the seat has been driven to the limit of travel along the relevant axis, and when the link harness is connected, the seat will remain in the same position. If this is the case, a jolt may be felt from the motor. To confirm the motor operation, swap the link harness to alternate motor pin connections and the seat should travel in the opposite direction 3 Using a locally made fused link harness and power supply, connect power and ground to forward-rearward seat motor <table border="1"> <thead> <tr> <th>BATTERY POSITIVE TERMINAL</th><th>BATTERY NEGATIVE TERMINAL</th></tr> </thead> <tbody> <tr> <td>forward-rearward seat motor pin 1</td><td>forward-rearward seat motor pin 2</td></tr> </tbody> </table>	BATTERY POSITIVE TERMINAL	BATTERY NEGATIVE TERMINAL	forward-rearward seat motor pin 1	forward-rearward seat motor pin 2
BATTERY POSITIVE TERMINAL	BATTERY NEGATIVE TERMINAL				
forward-rearward seat motor pin 1	forward-rearward seat motor pin 2				
	Does the motor operate? Yes Using manufacturer approved diagnostic system, check for related Diagnostic Trouble Code(s) and complete the repair operations specified. Alternatively, refer to the electrical circuit diagrams and check front seat forward-rearward seat motor circuits No Replace front seat forward-rearward seat motor. Refer to relevant section of workshop manual				

PINPOINT TEST B : FRONT SEAT FEELS LOOSE/ROCKS/CLICKS	
B1: CHECK FRONT SEAT FOR LOOSENESS/ROCKING/CLICKING	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	 WARNING: Before work is completed, make the airbag supplemental restraint system safe. For additional information, refer to Standard Workshop Practices section of workshop manual

PINPOINT TEST B : FRONT SEAT FEELS LOOSE/ROCKS/CLICKS	
B1: CHECK FRONT SEAT FOR LOOSENESS/ROCKING/CLICKING	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Test the seat in the owners seating position. Sit in the seat and rock upper body forwards/rearwards aggressively so that the shoulders hit the top of the seat back. This should simulate harsh braking or accelerating.
	Is there an audible click from the seat? Use a listening/recording device to pinpoint the area of concern, if available use the Jaguar Land Rover approved diagnostic equipment (Steelman ChassisEAR) Yes GO toB3. No GO toB2.
B2: CHECK FRONT SEAT FOR LOOSENESS/ROCKING/CLICKING	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Move the seat to the highest and forward most position (as possible). Sit in the seat and rock upper body forwards /rearwards aggressively so that the shoulders hit the top of the seat back. This should simulate harsh braking or accelerating.
	Is there an audible click from the seat? Use a listening/recording device to pinpoint the area of concern, if available use the Jaguar Land Rover approved diagnostic equipment (Steelman ChassisEAR) Yes GO toB3. No The front seat frame is operating correctly. Submit Electronic Product Quality Report (EPQR) with any further query
B3: CHECK FRONT SEAT FOR LOOSENESS/ROCKING/CLICKING	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Check the front seat base frame to backrest frame marriage fixings are installed and set to the correct torque.
	Are all accessible front seat frame fixings installed and to the correct torque? Yes GO toB4. No Install and tighten all accessible front seat frame fixings to the correct torque and re-check.
B4: CHECK FRONT SEAT FOR LOOSENESS/ROCKING/CLICKING	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Remove front seat and/or any seat covers/trim to allow access to check remaining front seat frame fixings are all installed and to the correct torque
	Are all remaining front seat frame fixings installed and to the correct torque? Yes GO toB5. No Install and tighten all accessible front seat frame fixings to the correct torque and re-check.
B5: CHECK FRONT SEAT FOR LOOSENESS/ROCKING/CLICKING	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Sit in the seat and rock upper body forwards/rearwards aggressively so that the shoulders hit the top of the seat back. This should simulate harsh braking or

B5: CHECK FRONT SEAT FOR LOOSENESS/ROCKING/CLICKING

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	accelerating. Use a listening/recording device to pinpoint the area of concern, if available use the Jaguar Land Rover approved diagnostic equipment (Steelman ChassisEAR) and determine the area of concern.
	Is there an audible click from the seat base frame area? Yes Install a new front seat base frame only. Refer to the relevant section of the workshop manual. Do not install a seat backrest frame. No Refit the seat cushion trim, referring to relevant section of the workshop manual and re-check. If the click is still present, install a new front seat cushion trim.

PINPOINT TEST C : FRONT SEAT EXCESSIVE FORWARD-REARWARD FREE PLAY

C1: CHECK FRONT SEAT FOR EXCESSIVE FORWARD-REARWARD FREE PLAY

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	 WARNING: Before work is completed, make the airbag supplemental restraint system safe. For additional information, refer to Standard Workshop Practices section of workshop manual 1 Check all accessible front seat frame fixings are installed and to the correct torque
	Are all accessible front seat frame fixings installed and to the correct torque? Yes GO to C2. No Install and tighten all accessible front seat frame fixings to correct torque and re-check for excessive free play
C2: COMPARE THE FRONT SEAT FORWARD-REARWARD FREE PLAY AGAINST A SIMILAR SEAT	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Compare the front seat forward-rearward free play against a similar seat
	Is the front seat forward-rearward free play excessive when compared to a similar seat? Yes GO to C3. No

C2: COMPARE THE FRONT SEAT FORWARD-REARWARD FREE PLAY AGAINST A SIMILAR SEAT	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	The front seat frame is operating correctly. Submit EPQR with any further query
C3: CHECK REMAINING FRONT SEAT FRAME FIXINGS	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Remove front seat and/or any seat covers/trim to allow access to check remaining front seat frame fixings are all installed and to the correct torque
	Are all remaining front seat frame fixings installed and to the correct torque? Yes Replace front seat frame. Refer to the relevant section of the workshop manual No Install and tighten all remaining front seat frame fixings to correct torque and re-check for excessive free play

PINPOINT TEST D : FRONT SEAT FORWARD-REARWARD MOVEMENT NOISY	
D1: COMPARE FRONT SEAT FORWARD-REARWARD MOVEMENT NOISE TO OTHER FRONT SEAT	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	 WARNING: Before work is completed, make the airbag supplemental restraint system safe. For additional information, refer to Standard Workshop Practices section of workshop manual 1 Compare the front seat forward-rearward movement noise to other front seat
	Is the front seat forward-rearward movement noise excessive when compared to other front seat? Yes GO toD2. No GO toD3.
D2: COMPARE FRONT SEAT FORWARD-REARWARD MOVEMENT NOISE TO FRONT SEAT IN OTHER VEHICLE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Compare the front seat forward-rearward movement noise to front seat in other vehicle
	Is the front seat forward-rearward movement noise excessive when compared to front seat in other vehicle? Yes GO toD3. No The front seat frame is operating correctly. Submit EPQR with any further query
D3: CHECK FOR DEBRIS OBSTRUCTING SEAT MOVEMENT	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Check for debris obstructing seat movement
	Is the front seat forward-rearward movement obstructed by debris? Yes Remove obstruction and re-check for noisy forward-rearward seat movement No GO toD4.

D4: RE-ALIGN FRONT SEAT FRAME	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Loosen front seat frame fixings
	2 Set ignition status to 'ON'
	3 Using the front seat switch pack drive the front seat fully forward then fully rearward
	4 Tighten front seat frame fixings to the correct torque
	5 Re-check for noisy seat movement
	Is the front seat forward-rearward movement still noisy? Yes GO to D5. No The front seat frame is now operating correctly
D5: CHECK FRONT SEAT FORWARD-REARWARD SEAT MOTOR DRIVE BAR	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Check front seat drive bar for correct installation and condition
	Is the front seat drive bar correctly installed and in a serviceable condition? Yes Replace front seat forward-rearward seat motor. Refer to relevant section of workshop manual No Correctly install front seat forward-rearward seat motor drive bar, or replace if required

PINPOINT TEST E : FRONT SEAT HEIGHT, TILT AND/OR SEAT EXTENSION MOTOR MOVEMENT NOT FUNCTIONING	
E1: CHECK FRONT SEAT HEIGHT, TILT OR EXTENSION MOTOR	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 WARNINGS: - Before work is completed, make the airbag supplemental restraint system safe. For additional information, refer to Standard Workshop Practices section of workshop manual - When carrying out the following steps, stand clear of all moving parts and make sure link harness is routed accordingly	
	1 Set ignition status to ' OFF'
	2 Disconnect front seat height, tilt or extension motor connector
	 NOTE: It may be that the seat has been driven to the limit of travel along the relevant axis, and when the link harness is connected, the seat will remain in the same position. If this is the case, a jolt may be felt from the motor. To confirm the motor operation, swap the link harness to alternate motor pin connections and the seat should travel in the opposite direction
	3 Using a locally made fused link harness and power supply, connect power and ground to relevant motor

PINPOINT TEST E : FRONT SEAT HEIGHT, TILT AND/OR SEAT EXTENSION MOTOR MOVEMENT NOT FUNCTIONING					
E1: CHECK FRONT SEAT HEIGHT, TILT OR EXTENSION MOTOR					
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS				
	<table border="1"> <thead> <tr> <th>BATTERY POSITIVE TERMINAL</th><th>BATTERY NEGATIVE TERMINAL</th></tr> </thead> <tbody> <tr> <td>motor pin 1</td><td>motor pin 2</td></tr> </tbody> </table>	BATTERY POSITIVE TERMINAL	BATTERY NEGATIVE TERMINAL	motor pin 1	motor pin 2
BATTERY POSITIVE TERMINAL	BATTERY NEGATIVE TERMINAL				
motor pin 1	motor pin 2				
	Does the motor operate? Yes Using manufacturer approved diagnostic system, check for related Diagnostic Trouble Code(s) and complete the repair operations specified. Alternatively, refer to the electrical circuit diagrams and check relevant motor circuits No Replace the relevant motor. Refer to relevant section of workshop manual				

PINPOINT TEST F : FRONT SEAT HEIGHT, TILT AND/OR EXTENSION MOVEMENT NOISY	
F1: COMPARE THE HEIGHT, TILT OR EXTENSION MOVEMENT NOISE WITH THE OTHER FRONT SEAT	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	 WARNING: Before work is completed, make the airbag supplemental restraint system safe. For additional information, refer to Standard Workshop Practices section of workshop manual 1 Compare the front seat movement noise to other front seat
	Is the front seat height, tilt or extension movement noise excessive when compared to other front seat? Yes GO toF2. No GO toF3.

F2: COMPARE FRONT SEAT HEIGHT, TILT OR EXTENSION MOVEMENT NOISE TO FRONT SEAT IN OTHER VEHICLE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Compare the front seat height, tilt or extension movement noise to front seat in other vehicle
	Is the front seat height, tilt or extension movement noise excessive when compared to front seat in other vehicle? Yes GO toF3. No The front seat frame is operating correctly. Submit EPQR with any further query

F3: CHECK FOR DEBRIS OBSTRUCTING SEAT MOVEMENT	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Check for debris obstructing seat movement
	Is the front seat height, tilt or extension movement obstructed by debris? Yes

F3: CHECK FOR DEBRIS OBSTRUCTING SEAT MOVEMENT	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	Remove obstruction and re-check for noisy height, tilt or extension seat movement. If still noisy GO toF4. No GO toF4.
F4: CHECK FOR HEIGHT, TILT OR EXTENSION MOVEMENT MECHANISM LUBRICATION	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Check and apply manufacturer approved lubrication to seat height, tilt or extension movement mechanism and retest for noise
	Is the front seat height, tilt or extension noise still apparent? Yes Replace the relevant motor. Refer to relevant section of workshop manual No The front seat height, tilt or extension motor is operating correctly

DTC INDEX

For a list of Diagnostic Trouble Code(s) that could be set on this vehicle, please refer to Section 100-00. REFER to: [Diagnostic Trouble Code Index - DTC: Driver/Passenger/Rear Seat Module \(DSM/PSM/RSM\)](#) (100-00 General Information, Description and Operation).

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