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2020.0 DEFENDER (LE), 501-20B

SUPPLEMENTARY RESTRAINT SYSTEM

AIRBAG SUPPLEMENTARY RESTRAINT SYSTEM

[G2424832]

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PRINCIPLE OF OPERATION

For a detailed description of the supplemental restraints system and operation, refer to the relevant Description and Operation section in the workshop manual. REFER to: [Airbag and Safety Belt Pretensioner Supplemental Restraint System - \[+\] Vehicles with 2nd / 3rd Row Seats](#) (501-20B Supplementary Restraint System, Description and Operation).

SAFETY INFORMATION

**WARNINGS:**

- TO AVOID ACCIDENTAL DEPLOYMENT AND POSSIBLE PERSONAL INJURY, THE BACKUP POWER SUPPLY MUST BE DEPLETED BEFORE REPAIRING OR REPLACING ANY AIRBAG SUPPLEMENTAL RESTRAINT SYSTEM (SRS) COMPONENTS. TO DEplete THE BACKUP POWER SUPPLY ENERGY, DISCONNECT THE BATTERY GROUND CABLE AND WAIT ONE MINUTE. FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN PERSONAL INJURY
- Do not use a multimeter to probe the restraints control module. It is possible for the power from the meter battery to trigger the activation of the airbags. Failure to follow this instruction may result in personal injury

**NOTE:**

It is advisable not to use a mobile phone or to have a mobile phone in close proximity when working on the restraints control module or associated systems

Power Supply Depletion

Before beginning any work on the restraints control module/supplemental restraints system or related components:

1. Remove the ignition key
2. Disconnect the battery leads, ground first
3. Wait 1minute for the power circuit to discharge

There are comprehensive instructions on the correct procedures for supplemental restraints system repairs in the manual. Refer to the relevant section of the workshop manual

⚠ 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 (section B1.2), or determine if any prior approval program is in operation, prior to the installation of a new module/component
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests

1. Verify the customer concern

1. Confirm the function of the warning lamp (if the warning lamp is inoperative, system faults will be signaled by an audible chime)

2. Visually inspect for obvious signs of damage and system integrity**Visual Inspection**

MECHANICAL	ELECTRICAL
■ Check for the installation of non-standard accessories which may affect or obstruct the function of the supplemental restraint system ■ Check the condition of trim, etc at the supplemental restraint system components ■ Sensor(s) ■ Pretensioner(s) ■ Airbag module(s) ■ Occupant classification sensor control module ■ Seat position sensor	■ Fuse(s) ■ Wiring harness ■ Battery condition, state of charge ■ Make sure all electrical connector(s) are engaged correctly on the airbag circuits ■ Make sure the restraints control module is correctly installed ■ Warning indicator ■ Impact sensor(s) ■ Buckle sensor(s) ■ Pretensioner(s) ■ Airbag module(s) ■ Passenger airbag deactivation switch ■ Passenger airbag deactivation warning indicator ■ Occupant classification sensor control module (LIN type communications) ■ Seat position sensor ■ Clockspring

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step. **Faults in supplemental restraint system harnesses would normally mean replacement of the relevant harness. Supplemental restraint system harness repairs are not recommended**

Symptom Chart

SYMPTOM	POSSIBLE CAUSES	ACTION
Deployable device connector and/or wiring harness connector damaged	Wiring harness connector connected /disconnected without first disengaging the connector plunger	 NOTE: Damage caused by an incorrect removal or installation procedure is not warrantable. Install a new wiring harness and/or deployable device as necessary

4. 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
5. Check 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
6. When installing or checking the supplemental Restraints System (SRS) with AK2 connectors the locking plunger must be engaged

RESTRAINTS CONTROL MODULE FLEXRAY COMMUNICATION TABLE

For DTCs U0001-81, U0001-86 and U0001-87: Using the Jaguar Land Rover approved diagnostic equipment, check the snapshot data (0xD020) to determine the missing message source control module. Check the relevant control module for related DTCs and refer to the relevant DTC index. Using the Jaguar Land Rover approved diagnostic equipment, perform a FlexRay network integrity test. Refer to the electrical circuit diagrams and check the Vehicle communication bus F (FlexRay) between the relevant control module (i.e. as indicated by the snapshot data) and the restraints control module

To decode the Hexadecimal response use the following table

DID D020 HEXADECIMAL RESPONSE	MISSING MESSAGE	MISSING MESSAGE SOURCE SYSTEM
00BA	VehicleSpeed	Anti-lock Brake System (ABS)
00BF	VehicleSpeedQF	Anti-lock Brake System (ABS)
00C4	WheelSpeed_FRL	Anti-lock Brake System (ABS)

DID D020 HEXADECIMAL RESPONSE	MISSING MESSAGE	MISSING MESSAGE SOURCE SYSTEM
00C5	WheelSpeed_FRL_QF	Anti-lock Brake System (ABS)
00C6	WheelSpeed_FRR	Anti-lock Brake System (ABS)
00C7	WheelSpeed_FRR_QF	Anti-lock Brake System (ABS)
00C8	WheelSpeed_REL	Anti-lock Brake System (ABS)
00C9	WheelSpeed_REL_QF	Anti-lock Brake System (ABS)
00CA	WheelSpeed_RER	Anti-lock Brake System (ABS)
00CB	WheelSpeed_RER_QF	Anti-lock Brake System (ABS)
0124	AirbagBulbStatus	Gateway Module (GWM) or Instrument Panel Cluster (IPC) through CAN
0147	AmbientTemp	Powertrain Control Module (PCM)
0148	AmbientTempQF	Powertrain Control Module (PCM)
01C4	CarConfigParameters	Gateway Module (GWM)

OCCUPANT CLASSIFICATION SENSOR CONTROL MODULE (OCSCM)



NOTE:

Occupant classification sensor system for the front passenger seat - North American Specification (NAS) vehicles only

The Occupant Classification Sensor Control Module (OCSCM) serves as a slave module to the Restraints Control Module (RCM). OCSCM DTCs are stored in the RCM. Diagnostic routines are run through the RCM. If OCSCM replacement is necessary, install a new occupant classification sensor service kit (Complete service kit consists of foam, occupant classification sensor bladder mat with attached smart digital pressure sensor as a minimum. Do not attempt to install individual components from the service kit as they are calibrated to function as a single assembly)

The OCSCM incorporates 3 load statuses for the seat cushion:

- When the load is less than the lower limit, the seat is classified as unoccupied.
- When the load exceeds the lower limit, but is less than the upper limit, the seat is classified as occupied by a small person or a child restraint is being used.
- When the upper limit is exceeded, the seat is classified as occupied by an adult.

The occupant classification system has four possible states as detailed in the following table:

CLASSIFICATION	SEAT STATUS	PASSENGER AIRBAG STATUS	AIRBAG INDICATOR STATUS
Empty	Empty	Disabled	Off
Occupied inhibit	The seat is occupied by a small person or a child restraint is being used	Passenger airbag and passenger side airbag operation is disabled	Off
Occupied allow	The seat is occupied by an adult	Passenger airbag and passenger side airbag operation is enabled	On
Error	-	Passenger airbag and passenger side airbag operation is disabled	Off

OCCUPANT CLASSIFICATION SENSOR CONTROL MODULE (OCSCM) EXISTING MODULE PROGRAMMING

NOTE:

Do not attempt to install individual components from the Occupant Classification Sensor (OCS) service kit, as they are calibrated to function as a single assembly. The complete service kit consists of foam, occupant classification sensor bladder mat with attached smart digital pressure sensor as a minimum. The CAN type communication and LIN type communication OCS types are NOT interchangeable. Make sure the correct service kit for the vehicle is being used.

1. Check the seat and make sure all electrical connectors are secure. Make sure the seat is correctly mounted and fixings are tightened to the correct torque. Refer to workshop manual section REFER to: [Front Row Seat - Vehicles With: Power Seats](#) (501-10 Seating, Removal and Installation) / [Front Row Seat - Vehicles Without: Power Seats](#) (501-10 Seating, Removal and Installation).

NOTE:

Make sure the vehicle is stationary and on a level surface. The seat must be secure and in an upright position before performing the next step. Failure to do this could induce a DTC.

2. Connect the Jaguar Land Rover approved diagnostic equipment
3. Set the ignition to ON and wait 10 seconds. Make sure the SRS warning light is illuminated during the ignition test cycle. The SRS warning light should then extinguish after the 10 seconds to confirm no SRS faults exist

NOTE:

All OCS DTCs will be set in the RCM.

4. Wait 5 seconds then set the OCS control module in to security access mode, after going in to an extended diagnostic session

5. Using the Jaguar Land Rover approved diagnostic equipment, refer to datalogger signals ECU calibration Data #1 Number (0xF124), ECU Delivery Assembly Number (0xF113), ECU Core Assembly Number (0xF111), ECU Strategy Number (0xF188). Make a note of the OCS control module part number to make sure it is the correct part number for the vehicle
6. Using the Jaguar Land Rover approved diagnostic equipment, check and update the OCS control module to the latest level software. Make sure the ignition is set to OFF and wait at least 5 seconds
7. Set the ignition to ON and wait at least 125 seconds. This will allow sufficient time for DTCs to log in the RCM if any are present
8. Using the Jaguar Land Rover approved diagnostic equipment, check for OCS and Restraints Control Module (RCM) DTCs stored in the RCM. If no DTCs are found and no SRS warning light is illuminated, no further action is necessary. If any DTCs are found and/or the SRS warning light is illuminated, refer to the relevant section of the workshop manual and perform the relevant repair actions as necessary. Re-perform this procedure to confirm the repair

OCCUPANT CLASSIFICATION SENSOR CONTROL MODULE (OCSCM) NEW MODULE REPLACEMENT AND PROGRAMMING



NOTE:

Do not attempt to install individual components from the Occupant Classification Sensor (OCS) service kit, as they are calibrated to function as a single assembly. The complete service kit consists of foam, occupant classification sensor bladder mat with attached smart digital pressure sensor as a minimum. They MUST NOT be installed separately. To make sure the correct function, it is essential to install the complete kit, as it is a safety critical system.

1. Remove the passenger seat from the vehicle. Refer to REFER to: [Front Row Seat - Vehicles With: Power Seats](#) (501-10 Seating, Removal and Installation) / [Front Row Seat - Vehicles Without: Power Seats](#) (501-10 Seating, Removal and Installation).
2. Install a new OCS service kit to the seat. Refer to workshop manual section REFER to: Occupant Classification Sensor (501-20 Supplementary Restraint System, Removal and Installation).
3. Re-install the seat and make sure all electrical connectors are secure. Make sure the seat is correctly mounted and fixings are tightened to the correct torque. Refer to workshop manual section REFER to: [Front Row Seat - Vehicles With: Power Seats](#) (501-10 Seating, Removal and Installation) / [Front Row Seat - Vehicles Without: Power Seats](#) (501-10 Seating, Removal and Installation).



NOTE:

Make sure the vehicle is stationary and on a level surface. The seat must be secure and in an upright position before performing the next step. Failure to do this could induce a DTC.

4. Connect the Jaguar Land Rover approved diagnostic equipment, set the ignition to ON and wait 5 seconds for the module to wake up
5. Using the Jaguar Land Rover approved diagnostic equipment, refer to datalogger signals ECU calibration Data #1 Number (0xF124), ECU Delivery Assembly Number (0xF113), ECU Core Assembly Number (0xF111), ECU Strategy Number (0xF188). Make a note of the OCS control module part number to make sure it is the correct part number for the vehicle
6. Using the Jaguar Land Rover approved diagnostic equipment, check and update the OCS control module to the latest level software. Make sure the ignition is set to OFF and wait at least 7 seconds
7. Set the OCS control module in to security access mode, after going in to an extended diagnostic session. Using the Jaguar Land Rover approved diagnostic equipment, check for any OCS control module or Restraints Control Module (RCM) related DTCs. If any DTCs are found, perform a software update

**NOTE:**

All OCS DTCs will be set in the RCM.

8. Set the ignition to OFF and wait 10 seconds
9. Set ignition to ON and wait 10 seconds
10. Set the OCS control module in to security access mode, after going in to an extended diagnostic session
11. Using the Jaguar Land Rover approved diagnostic equipment, perform routine - Learn Seat Occupant Classification Zero Position (0x5007) This will re-calibrate the new OCS control module
12. Set the ignition to OFF and wait at least 10 seconds
13. Set the ignition to ON and wait 10 seconds. Make sure the SRS warning light is illuminated during the ignition test cycle. The SRS warning light should then extinguish after the 10 seconds to confirm no SRS faults exist
14. If the Learn Seat Occupant Classification Zero Position (0x5007) routine passes (09) and no SRS warning light is illuminated, no further action is necessary. If the Learn Seat Occupant Classification Zero Position (0x5007) routine fails and/or the SRS warning light is illuminated, note which process of the routine failed from the routine parameters described below and proceed to step 15
 1. 02 - Process Failed - Seat Not Calibrated. The Learn Zero position cannot be calibrated if the seat has not been correctly calibrated at the seat manufacturing plant. Install a new service kit as necessary and re perform Learn Seat Occupant Classification Zero Position routine (0x5007)
 2. 03 - Process Failed - Wait 10 Seconds To Re Zero. Wait 10 seconds after ignition ON and re perform Learn Seat Occupant Classification Zero Position routine (0x5007)
 3. 04 - Re Zero Failure - DTCs Set. A fault is preventing the Learn Seat Occupant Classification Zero Position routine (0x5007) from completing correctly. Check for DTCs and repair as necessary, then re perform Learn Seat Occupant Classification Zero Position routine (0x5007)

4. 06 - Process Failed - OCS Pressure Out Of Range. The seat must be empty to perform the Learn Seat Occupant Classification Zero Position routine (0x5007) correctly. Make sure the seat is empty and re perform Learn Seat Occupant Classification Zero Position routine (0x5007)
5. 07 - Process Failed - OCS Pressure Fluctuation. Check to make sure the OCS hose is correctly routed and clipped in position, as this could prevent the Learn Seat Occupant Classification Zero Position routine (0x5007) from completing correctly. Any vibrations or variations within the passenger compartment, for example doors opening / closing will prevent the Learn Seat Occupant Classification Zero Position routine (0x5007) from completing correctly. Make sure the passenger compartment environment is stable and re perform Learn Seat Occupant Classification Zero Position routine (0x5007)
6. 08 - Process Failed - Temperature Out Of Range. Make sure the workshop temperature is within normal acceptable working range and re perform Learn Seat Occupant Classification Zero Position routine (0x5007)
7. 09 - Process Completed - Re Zero Success. Routine has passed, no further actions necessary

15. Using the Jaguar Land Rover approved diagnostic equipment, check for any OCS control module or RCM related DTCs. If any DTCs are found, refer to the relevant section of the workshop manual and perform the relevant repair actions as necessary. Re-perform this procedure to re-calibrate the OCS control module

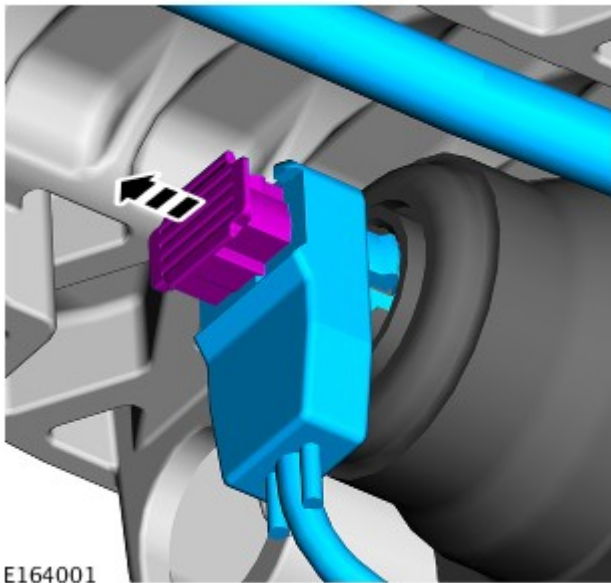
SEAT POSITION SENSOR - NOTES ON REMOVAL/REPLACEMENT



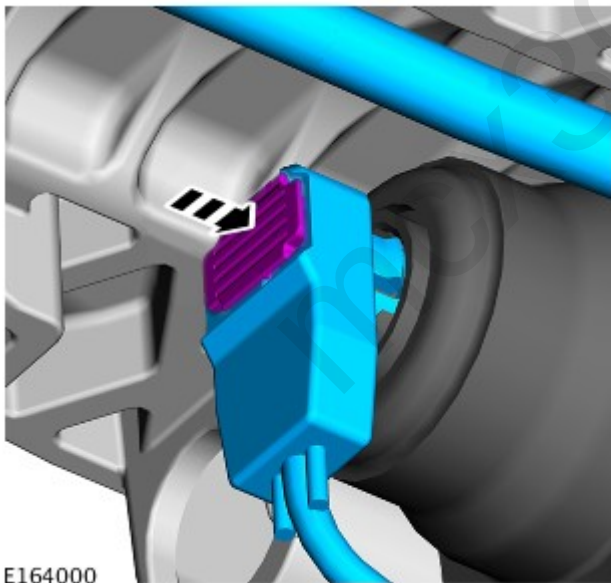
NOTE:

NAS vehicles have a seat position sensor installed to both the driver and passenger-side seats.

The seat position sensor, a hall-effect sensor, is installed to the underside of both the driver and passenger-side seats on NAS vehicles. It should be noted that these sensors cannot be re-installed when removed. If any work is undertaken that requires removal of the seat position sensor, a NEW sensor MUST be installed. Note that different sensors are installed to left and right seats, so care should be taken to make sure the correct replacement parts are installed



- Incorrect Position (Disengaged)



- Correct Position (Engaged)

Seatbelt Buckle Pre Tensioner Diagnostics

This procedure should be used to aid diagnosis of the following supplementary restraints system (SRS) - buckle pre tensioner (PBP) fault codes

SRS LIGHT STATUS	DTC
On	B1211-11, B1211-12, B1211-13, B1211-2B

SRS LIGHT STATUS	DTC
On	B1214-11, B1214-12, B1214-13, B1214-2B

PINPOINT TEST A : BUCKLE/RETRACTOR PRE TENSIONER DIAGNOSTIC	
A1: DIAGNOSTIC PROCEDURE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 WARNINGS: - Prior to any work on the SRS system the vehicle battery must be disconnected - Please wait for 60 seconds to allow the airbag deployment energy reserve to dissipate	
	1 Check location of harness fly-lead making sure there is no risk snagging and sufficient strain relief during full seat travel
	2 Disconnect under-seat buckle pre tensioner connectors
	3 Check connector for water ingress or signs of corrosion (white/green residue)
	4 Check for debris in female connector and remove as required
	5 Check for debris in male harness end connector and remove
	6 Check that male connector pins are secure and in good condition
	7 Check that all connector terminals are clean secure and in good condition
	8 Reconnect the connector An audible click should be heard confirming security
	9 Check actuator harness fly-lead is connected and correctly routed
	10 Reconnect the vehicle battery
	11 Clear the DTC, cycle the ignition state off / on wait 30 seconds and re-test
	12 To confirm repair. When sitting in seat, retest as follows: Seat fully up - move fully backward and forward Seat fully down - move fully backward and forward
	Is the warning lamp illuminated? Yes GO to Pinpoint Test B . No No further action required

PINPOINT TEST B : BUCKLE/RETRACTOR PRE TENSIONER DIAGNOSTIC	
B1: DIAGNOSTIC PROCEDURE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 WARNINGS: - Prior to any work on the SRS system the vehicle battery must be disconnected - Please wait for 60 seconds to allow the airbag deployment energy reserve to dissipate	
	1 Check routing and condition of harness along buckle pre tensioner tube
	2 Make sure harness is in good condition with no damage
	3 Make sure harness is securely routed
	4 Reconnect the vehicle battery
	5 Clear the DTC, cycle the ignition state off / on wait 30 seconds and re-test
	6 To confirm repair. When sitting in seat, retest as follows: Seat fully up - move fully backward and forward Seat fully down - move fully backward and forward
	Is the warning lamp illuminated? Yes GO to Pinpoint Test C . No No further action required

PINPOINT TEST C : BUCKLE/RETRACTOR PRETENSIONER DIAGNOSTIC	
C1: DIAGNOSTIC PROCEDURE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 WARNINGS: - Prior to any work on the SRS system the vehicle battery must be disconnected - Please wait for 60 seconds to allow the airbag deployment energy reserve to dissipate	
	1 Remove seat and check routing and condition of under-seat harness
	2 Make sure harness is in good condition with no damage
	3 Make sure harness is securely routed
	4 Make sure all fir tree clips and cable ties are correctly installed
	5 Reinstall seat
	6 Make sure harness is securely routed
	7 Reconnect the vehicle battery

PINPOINT TEST C : BUCKLE/RETRACTOR PRETENSIONER DIAGNOSTIC	
C1: DIAGNOSTIC PROCEDURE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	8 Clear the DTC, cycle the ignition state off / on wait 30 seconds and re-test
	9 To confirm repair. When sitting in seat, retest as follows: ▪ Seat fully up - move fully backward and forward ▪ Seat fully down - move fully backward and forward
	Is the warning lamp illuminated? Yes Install new component No No further action required

DTC INDEX

For a list of diagnostic trouble codes that could be set on this vehicle, please refer to Section 100-00. REFER to: [Diagnostic Trouble Code Index - DTC: Restraints Control Module \(RCM\)](#) (100-00 General Information, Description and Operation).

cmjjaGFyZG1vcnRvbjsyMDIwLTASLTE4VDE4OjM0JEZlJQ3Mlo7OTAuMTk5LjEyMS4xMTc7