

PUBLISHED: 19-SEP-2019

2020.0 DEFENDER (LE), 501-20A

SEATBELT SYSTEM (G1679074)

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PRINCIPLE OF OPERATION

For a detailed description of the seatbelt system and operation, refer to the relevant description and operation section of the workshop manual.

SAFETY INFORMATION

**WARNINGS:**

- To avoid accidental deployment the back-up power supply must be depleted before beginning any work on the SRS system or its components. Failure to follow this instruction may result in personal injury.
- Do not use a multimeter to probe an SRS module. It is possible for the power from the multimeter battery to trigger the activation of the module. Failure to follow this instruction may result in personal injury.

**NOTE:**

Do not to use a mobile phone or to have a mobile phone in close proximity when working on the SRS system or components.

Power supply depletion

Before beginning any work on the SRS system or related components:

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

There are comprehensive instructions on the correct procedures for SRS system repairs, refer to the relevant section of the workshop manual

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:

- The 'car sense system' of the seatbelt is sensitive to both cornering and braking forces and is designed to lock when it detects this. It is therefore possible to lock when parking the vehicle on high kerbs and inclines. The seatbelt retractor will be locked when removed from the vehicle as it is not in the exact orientation that it was installed on the vehicle. This can be mistaken as a jammed seatbelt retractor.
- If a control module or a component is at fault or 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 by operating the seatbelt
2. Visually inspect for obvious signs of mechanical or electrical damage. Additionally inspect the seatbelt webbing and upper D-loop for signs of dirt/contamination

Visual Inspection

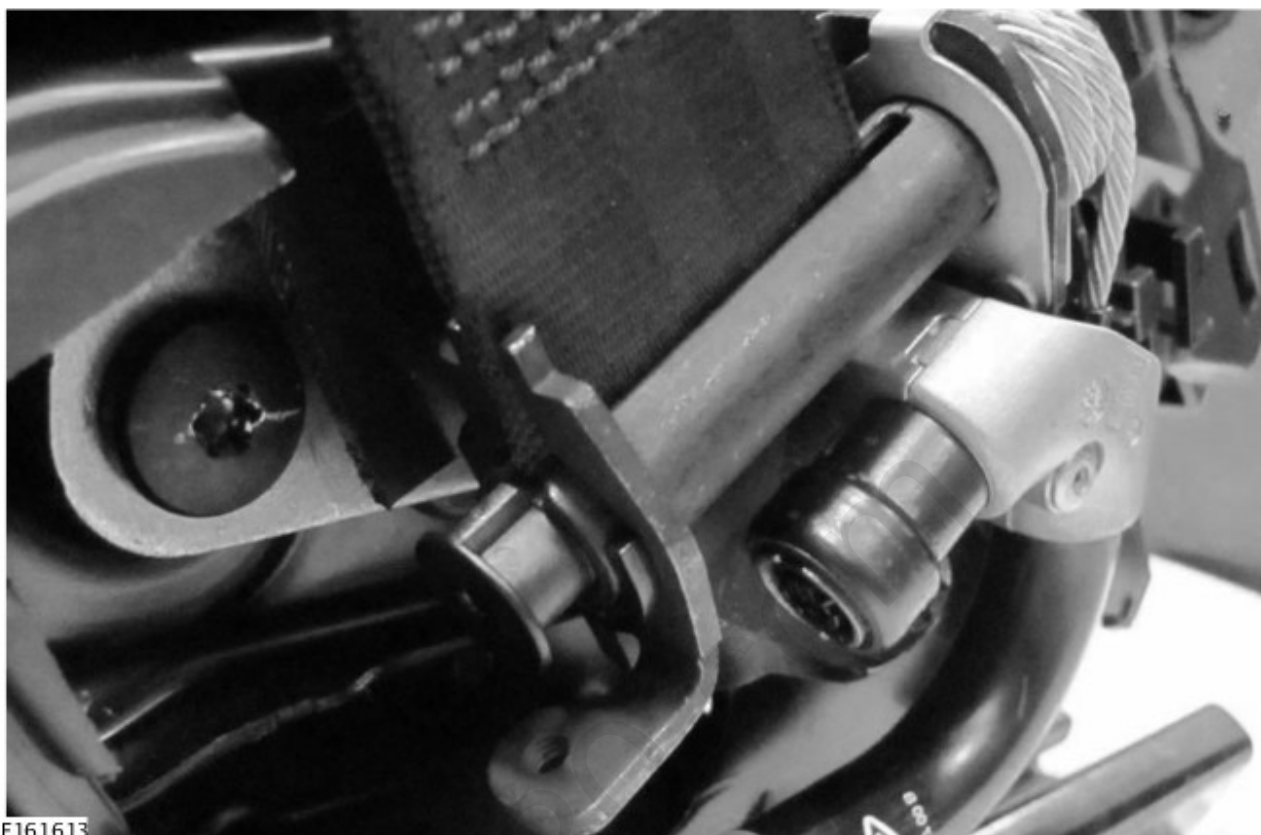
MECHANICAL	ELECTRICAL
■ Check for the installation of non-standard accessories which may affect or obstruct the function of the seatbelt system ■ Frayed or damaged webbing ■ Seatbelt Pretensioners: retractors and lap belt (anchor point, driver only). For lap belt (anchor point) pretensioner webbing check, please refer to Lap belt (anchor point) pretensioner webbing check ■ Webbing contamination	■ Fuses ■ Wiring harness fault ■ Correct engagement of electrical connectors ■ Loose or corroded connections ■ Warning lamp bulb(s) ■ Impact sensor(s) ■ Buckle sensor(s) ■ Seatbelt Pretensioners: retractors and lap belt (anchor point, driver only) ■ Belt tension sensor(s) ■ Restraints control module

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, complete the test methods described below, alternatively check for diagnostic trouble codes and refer to the relevant diagnostic trouble code index

For a complete list of all diagnostic trouble codes that could be set on this vehicle, please refer to section 100-00.

Lap belt (anchor point) pretensioner webbing check

Refer to the 501-20 removal and installation section of the workshop manual, remove any trim panels required to expose the lap belt (anchor point) pretensioner.



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Be careful not to remove the webbing pin from the loop of the webbing. Make sure that the webbing pin is installed correctly inside the loop of the webbing with the webbing pin and the loop slotted into the assembly.

SYMPTOM CHART FOR SEATBELT ROWS 1, 2 AND 3

SYMPTOM	POSSIBLE CAUSES	ACTION
Seatbelt jammed - Webbing tight	■ Backlock effect-in action (webbing retracted quickly and came to sudden stop) ■ Seatbelt retractor not installed correctly ■ Automatic locking retractor activated (clicking - during retraction only)	⚠ CAUTION: Do not insert any objects or tools into the buckle head. ℹ NOTE: The 'car sense system' of the seatbelt is designed to lock when oriented at certain angles. When the seatbelt retractor is removed from the vehicle and not oriented at the exact angle that it is installed in the vehicle, on level ground, it will be locked. This can be mistaken as a jammed seatbelt retractor. ■ GO to Pinpoint Test A. ■ GO to Pinpoint Test F. ■ See the automatic locking retractor description below

Seatbelt jammed - Webbing loose	■ Seatbelt webbing trapped in seat ■ Seatbelt retractor webbing guide loose ■ Twist in webbing ■ Interference in webbing routing ■ D-loop not rotating correctly	■ GO to Pinpoint Test B. ■ GO to Pinpoint Test C. ■ GO to Pinpoint Test D. ■ GO to Pinpoint Test E. ■ GO to Pinpoint Test G.
Seatbelt - Intermittent jamming	■ Seatbelt retractor not installed correctly	 CAUTION: Do not insert any objects or tools into the buckle head.  NOTE: The 'car sense system' of the seatbelt is designed to lock when oriented at certain angles. When the seatbelt retractor is removed from the vehicle and not oriented at the exact angle that it is installed in the vehicle, on level ground, it will be locked. This can be mistaken as a jammed seatbelt retractor. ■ GO to Pinpoint Test F.
Seatbelt - Slow retraction	■ Seatbelt retractor webbing guide loose ■ Twist in seatbelt webbing ■ Interference in webbing routing ■ Seatbelt retractor not installed correctly ■ D-loop not rotating correctly ■ Foreign object /debris ■ Seatbelt webbing dirty/contaminated	■ GO to Pinpoint Test C. ■ GO to Pinpoint Test D. ■ GO to Pinpoint Test E. ■ GO to Pinpoint Test F. ■ GO to Pinpoint Test G. ■ GO to Pinpoint Test E. ■ GO to Pinpoint Test I.
Seatbelt - Not retracting	■ Seatbelt retractor webbing guide loose ■ Twist in seatbelt webbing ■ D-loop not rotating correctly ■ Interference in webbing routing	■ GO to Pinpoint Test C. ■ GO to Pinpoint Test D. ■ GO to Pinpoint Test G. ■ GO to Pinpoint Test E. ■ GO to Pinpoint Test E.

SYMPTOM	POSSIBLE CAUSES	ACTION
	Foreign object /debris	
Seatbelt - Not extracting	- Backlock effect-in action (webbing retracted quickly and came to sudden stop) - Seatbelt retractor not installed correctly - Seatbelt retractor webbing guide loose - Twist in seatbelt webbing - D-loop not rotating correctly - Interference in webbing routing - Foreign object /debris - Automatic locking retractor activated (clicking – during retraction only)	 CAUTION: Do not insert any objects or tools into the buckle head.  NOTE: The 'car sense system' of the seatbelt is designed to lock when oriented at certain angles. When the seatbelt retractor is removed from the vehicle and not oriented at the exact angle that it is installed in the vehicle, on level ground, it will be locked. This can be mistaken as a jammed seatbelt retractor. - GO to Pinpoint Test A. - GO to Pinpoint Test F. - GO to Pinpoint Test C. - GO to Pinpoint Test D. - GO to Pinpoint Test G. - GO to Pinpoint Test E. - GO to Pinpoint Test E. - See the automatic locking retractor description below
Seatbelt - Noisy during operation	- Automatic locking retractor activated (clicking–during retraction only) - Interference in webbing routing (rubbing)	- GO to Pinpoint Test B. - GO to Pinpoint Test E.
Seatbelt buckle - Not latching / jammed	Foreign object /debris	 CAUTION: Do not insert any objects or tools into the buckle head. GO to Pinpoint Test H.

INERTIA REEL SEATBELTS

The vehicle is equipped with (two row one), (three row two), and (two row three (seven seat versions only)) inertia reel seatbelts

These seatbelts are "**dual sensitive**" which means that they have:

- **Car sense system** - A vehicle motion sensor, which locks the seatbelt webbing under braking, cornering, on steep hills and in adverse camber conditions, when parked on a steep incline or driveway or two wheels on a high pavement. When the seatbelt retractor is removed from the vehicle and not oriented at the exact angle that it is installed in the vehicle, on level ground, it will be locked. This can be mistaken as a jammed seatbelt retractor.
- **Web sense system** - A webbing motion sensor, which locks when the seatbelt webbing is extracted suddenly

The seatbelts in the following positions are equipped with an automatic locking retractor function:

CARLINE	MARKET	SEAT POSITION	AUTOMATIC LOCKING RETRACTOR INSTALLED	FROM MODEL YEAR
Range Rover Sport (L494)	All	Driver	No	2014
Range Rover Sport (L494)	ROW	Passenger	No	2014
Range Rover Sport (L494)	US	Passenger	Yes	2014
Range Rover Sport (L494)	ROW	Row 2	No	2014
Range Rover Sport (L494)	US	Row 2	Yes	2014
Range Rover Sport (L494)	ROW	Row 3	No	2014
Range Rover Sport (L494)	US	Row 3	Yes	2014
Range Rover (L405)	All	Driver	No	2013
Range Rover (L405)	ROW	Passenger	No	2013
Range Rover (L405)	US	Passenger	Yes	2013
Range Rover (L405)	ROW	Row 2	No	2013
Range Rover (L405)	US	Row 2	Yes	2013
Range Rover (L405)	All	Row 3	No	2013
Discovery (L462)	All	Driver	No	2017
Discovery (L462)	ROW	Passenger	No	2017
Discovery (L462)	US	Passenger	Yes	2017
Discovery (L462)	ROW	Row 2	No	2017
Discovery (L462)	US	Row 2	Yes	2017
Discovery (L462)	ROW	Row 3	No	2017
Discovery (L462)	US	Row 3	Yes	2017

The **automatic locking retractor function** is a feature to secure a child seat or heavy load to the seat

ACTIVATION	DEACTIVATION
 NOTE: When automatic locking retractor is activated, no further webbing can be drawn from the seatbelt retractor, prior to disengagement of the automatic locking. This can be mistaken as a jammed seatbelt retractor. Activated by total extraction of the webbing When activated the automatic locking retractor is identified by a clicking noise during webbing retraction	Automatic locking retractor is deactivated by allowing the webbing to retract until the clicking stops (close to park position) When deactivated the automatic locking retractor seatbelt changes state, from a static seatbelt to an automatic seatbelt

SEATBELT LOCKING TEST

With the vehicle stationary and on level ground take firm hold of the seatbelt webbing (on the tongue side of the upper seatbelt anchor) and withdraw sharply, **the retractor should lock**. Preventing further webbing release (**repeat this test 3 times**). Any seatbelt retractor which fails to lock **must not be used** and a **new seatbelt must be installed**.

DIAGNOSTIC GUIDE INERTIA REEL SEATBELTS

PINPOINT TEST A : BACKLOCK	
A1: BACKLOCK	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 CAUTION: Do not insert any objects or tools into the buckle head.	
 NOTE: The 'car sense system' of the seatbelt is designed to lock when oriented at certain angles. When the seatbelt retractor is removed from the vehicle and not oriented at the exact angle that it is installed in the vehicle, on level ground, it will be locked. This can be mistaken as a jammed seatbelt retractor.	
	1 Visually inspect the condition of the seatbelt
	2 Draw a maximum of 20mm of the webbing from the seatbelt retractor with moderate force, then release the webbing
	3 Check for correct operation twice
	Does the webbing move freely then retract correctly? Yes No further action required No For first row seatbelt GO to Pinpoint Test C. For second and third row seatbelts GO to Pinpoint Test B.

PINPOINT TEST B : WEBBING - TRAPPED IN SEAT	
B1: WEBBING - TRAPPED IN SEAT	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Visually inspect the condition of the seatbelt
	2 Lift the seat base or release the seat backrest as required
	3 Free the trapped webbing, allow the webbing to retract. Note: If the automatic locking retractor is activated, allow the webbing to retract until the clicking stops
	4 Check for correct operation twice
	Does the webbing move freely then retract correctly? Yes No further action required No GO to Pinpoint Test C.

PINPOINT TEST C : SEATBELT RETRACTOR - WEBBING GUIDE LOOSE	
C1: SEATBELT RETRACTOR - WEBBING GUIDE LOOSE	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Refer to 501-20 removal and installation section of the workshop manual, remove any trim panels required to expose the D loop (anchor point) and seatbelt retractor
	2 Check the webbing is not trapped or twisted and is centrally located on the seatbelt retractor spindle
	3 Attempt to withdraw the webbing from the seatbelt retractor. NOTE: If the seatbelt webbing is jammed, the automatic locking retractor could be engaged
	4 To release the automatic locking retractor, manually wind the webbing onto the spindle until the automatic locking retractor deactivates (clicking stops)
	5 Fully extract webbing
	6 Confirm webbing guide location is correct and the fixing lugs are correctly located in the retractor frame
	7 Allow webbing to retract
	8 Check for correct operation twice
	Does the webbing move freely then retract correctly? Yes Refer to the 501-20 removal and installation section of the workshop manual, reinstall any trim panels, make sure there are no obstructions and the webbing does not catch or rub. No further action required No GO to Pinpoint Test D.

PINPOINT TEST D : TWIST IN WEBBING	
D1: TWIST IN WEBBING	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Refer to section 501-20 removal and installation section of the workshop manual, remove any trim panels required to expose the D loop (anchor point)
	2 Twist the webbing back the correct way in the loop
	3 Pass the twist through the pillar loop or escutcheon as required
	4 Check for correct operation twice
	Does the webbing move freely then retract correctly? Yes Refer to the 501-20 removal and installation section of the workshop manual, reinstall any trim panels, make sure there are no obstructions and the webbing does not catch or rub. No further action required No GO to Pinpoint Test E.

PINPOINT TEST E : INTERFERENCE - WEBBING ROUTING	
E1: INTERFERENCE - WEBBING ROUTING	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Refer to the 501-20 removal and installation section of the workshop manual, remove any trim panels required to expose the D loop (anchor point)
	2 Remove obstructions and foreign objects, make sure the webbing does not catch or rub
	3 Confirm the seatbelt does not contact the wiring harness
	4 Check for correct operation twice
	Does the webbing move freely then retract correctly? Yes Refer to the 501-20 removal and installation section of the workshop manual, reinstall any trim panels, make sure there are no obstructions and the webbing does not catch or rub. No further action required No GO to Pinpoint Test F.

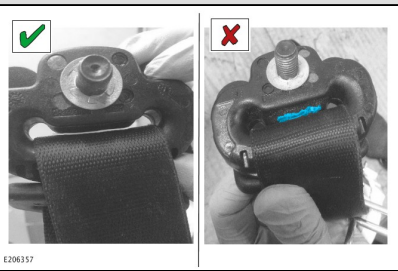
PINPOINT TEST F : SEATBELT RETRACTOR - INCORRECT INSTALLATION	
F1: SEATBELT RETRACTOR - INCORRECT INSTALLATION	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Refer to the 501-20 removal and installation section of the workshop manual, remove any trim panels required to expose the D loop (anchor point) and the seatbelt retractor
	2 Refer to the 501-20 removal and installation section of the workshop manual, correctly reinstall the seatbelt retractor making sure that the locating "T bar" and "anti rotation pins" are correctly located
	3 Check for correct operation twice
	Does the webbing move freely then retract correctly?

PINPOINT TEST F : SEATBELT RETRACTOR - INCORRECT INSTALLATION	
F1: SEATBELT RETRACTOR - INCORRECT INSTALLATION	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	Yes Refer to the 501-20 removal and installation section of the workshop manual, reinstall any trim panels, make sure there are no obstructions and the webbing does not catch or rub. No further action required No Replace as required. 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

PINPOINT TEST G : D-LOOP NOT ROTATING CORRECTLY	
G1: D-LOOP NOT ROTATING CORRECTLY	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Refer to the 501-20 removal and installation section of the workshop manual, remove any trim panels required to expose the D loop (anchor point) and the seatbelt retractor
	2 Make sure there are no obstructions and the webbing does not catch or rub, the D loop (anchor point) rotates correctly and if installed the confirm the height adjuster operates correctly
	3 Check for correct operation twice
	Does the webbing move freely then retract correctly? Yes Refer to the 501-20 removal and installation section of the workshop manual, reinstall any trim panels, make sure there are no obstructions and the webbing does not catch or rub. No further action required No Replace as required. 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

PINPOINT TEST H : SEATBELT BUCKLE - NOT LATCHING/JAMMED	
H1: SEATBELT BUCKLE - NOT LATCHING/JAMMED	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 CAUTION: Do not insert any objects or tools into the buckle head.	
	1 Visually inspect the buckle head for evidence of damage. If damaged replace as required
	2 Press the buckle release (red button) and (using a torch) complete visual inspection for any evidence of debris /material or foreign objects in the buckle head
	3 If required remove the seatbelt buckle from the vehicle. Remove the seat. Remove the seatbelt buckle from the seat frame
	4 Do not insert any objects or tools into the buckle head. With the buckle removed, invert and attempt to shake out any debris
	5 Attempt to latch the tongue in the buckle

PINPOINT TEST H : SEATBELT BUCKLE - NOT LATCHING/JAMMED	
H1: SEATBELT BUCKLE - NOT LATCHING/JAMMED	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	Does the seatbelt buckle operate correctly Yes Reinstall any components, no further action required No Replace the seatbelt buckle, Refer to section 501 20

PINPOINT TEST I : SEATBELT SLOW RETRACTION	
I1: D-LOOP CONTAMINATION CHECK/CLEAN	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
 NOTE: Part shown removed for clarity. Seatbelt D-Loop can be visually inspected without removing the 'B' pillar trim panel.	
 E206137	1 Visually inspect the front seatbelt D-Loop for a build up of dirt or contamination
	Does the front seatbelt D-Loop have a build up of dirt or contamination? Yes Clean the seatbelt webbing and seatbelt D-loop to remove any dirt or foreign material using warm water CAUTION: Do not use any detergents or allow the water to stain the interior trim or enter the seatbelt retractor system No Not the cause of the customers concern, continue diagnostics and follow the symptom chart for the reported failure

DTC INDEX

For a list of diagnostic trouble codes that could be set on this vehicle, please refer to Section 100-00 or for removal and installation/description and operation see Section 501-20AREFER to: [Seatbelt System](#) (501-20A Seatbelt System, Description and Operation).