

Seatbelt Systems - System Operation and Component Description

System Operation

Emergency Locking Retractor (ELR)

All retractors have an Emergency Locking Retractor (ELR) mode, which is a vehicle-sensitive feature designed to activate and lock the safety belt webbing during hard braking, cornering, or an impact of approximately 24 km/h (14.9 mph). The Emergency Locking Retractor (ELR) feature helps reduce the forward movement of the driver and passengers. For testing, see Functional Test - Safety Belt Retractor, Road Test Inspection.

Refer to: [Seatbelt Systems](#) (501-20A Seatbelt Systems, Diagnosis and Testing).

Automatic Locking Retractor (ALR)

The Automatic Locking Retractor (ALR) mode is used when locking a child seat in any passenger seating position. The Automatic Locking Retractor (ALR) mode automatically activates when the safety belt webbing is fully extracted from the retractor and then allowed to retract. As the safety belt webbing retracts back onto the spool, an audible clicking sound is made, indicating the safety belt retractor is in Automatic Locking Retractor (ALR) mode and the safety belt webbing cannot pull back out of the safety belt retractor. The Automatic Locking Retractor (ALR) mode disengages when the webbing is allowed to fully retract back into the retractor. For testing, see Functional Test - Safety Belt Retractor, Automatic Locking Retractor (ALR) Mode,

Refer to: [Seatbelt Systems](#) (501-20A Seatbelt Systems, Diagnosis and Testing).

Safety Belt Warning Chime

The conditions of operation for the driver and/or front passenger safety belt warning indicator and chime operate as follows:

- If the driver safety belt is not buckled with the ignition ON, then the safety belt warning indicator illuminates for 1 to 2 minutes and the warning chime sounds for 4 to 8 seconds.
- If the driver safety belt is buckled while the warning indicator is illuminated and the warning

chime is sounding, then the indicator and chime turn off.

- If the driver safety belt is buckled before the ignition is in the ON position, the safety belt warning indicator and chime remain off.

Belt-Minder®

The Belt-Minder® feature is a supplemental warning to the safety belt warning function. This feature provides an additional reminder that the driver and/or front passenger safety belt is unbuckled by intermittently sounding a chime and illuminating the safety belt warning indicator in the IPC.

Either the driver or front passenger safety belt systems may activate the Belt-Minder®. If the Belt-Minder® warnings have expired (warnings last for approximately 5 minutes) for one occupant (driver or front passenger), the other occupant can still activate the Belt-Minder® feature.

The passenger Belt-Minder® feature is activated only when the OCS detects a passenger in the right front seat and the passenger weight exceeds a programmed limit. For information on the OCS, Refer to: [Airbag and Seatbelt Pretensioner Supplemental Restraint System \(SRS\) - Raptor - System Operation and Component Description](#) (501-20B Supplemental Restraint System, Description and Operation).

When a MyKey® is in the ignition, deactivation of Belt-Minder® and the 5-minute Belt-Minder® timer are overridden. The Belt-Minder® feature cannot be deactivated when a MyKey® is in use. Refer to the Owner's Literature for further information on MyKey® functionality.

To activate or deactivate the Belt-Minder® feature,
Refer to: [Seatbelt Minder Deactivating/Activating](#) (413-01 Instrumentation, Message Center and Warning Chimes, General Procedures).

If...	Then...
the driver and/or passenger safety belt is buckled before the ignition is turned ON or less than 1-2 minutes have elapsed since the ignition has been turned ON...	the Belt-Minder® feature will not activate.
the driver and/or front passenger safety belt is not buckled before the vehicle has reached at least 9.7 km/h (6.0 mph) and 1-2 minutes have elapsed since the ignition has been turned ON...	the Belt-Minder® feature is activated — the safety belt warning indicator illuminates and the warning chime sounds for 6 seconds every 25 seconds, repeating for approximately 5 minutes or until the safety belt(s) is buckled.

the driver or front passenger safety belt becomes unbuckled for approximately one minute while the vehicle is traveling at least 9.7 km/h (6.0 mph) and more than 1-2 minutes have elapsed since the ignition has been ON...

the Belt-Minder® feature is activated — the safety belt warning indicator illuminates and the warning chime sounds for 6 seconds every 25 seconds, repeating for approximately 5 minutes or until the safety belt(s) is buckled.

Inflatable Safety Belt System (if equipped)

The inflatable safety belt system uses a pyrotechnic device to release an inert gas under pressure from an inflator to fill and expand the inflatable shoulder belt. The pyrotechnic device (safety belt inflator) deploys upon receipt of current from the RCM. The RCM monitors the readiness of the safety belt inflator and uses this information, as well as other information provided by the restraints system, to determine if inflatable safety belt deployment is appropriate.

To diagnose any safety belt inflator Diagnostic Trouble Codes (DTCs):

Refer to: [Airbag Supplemental Restraint System \(SRS\) - Raptor](#) (501-20B Supplemental Restraint System, Diagnosis and Testing).

For any concerns regarding safety belt buckle or retractor function:

Refer to: [Seatbelt Systems](#) (501-20A Seatbelt Systems, Diagnosis and Testing).

When replacing safety belt buckles or retractor assemblies use only the replacement parts specified in the Ford parts catalog or equivalent.

Component Description

Child Safety Seat Tether Anchor

Child safety seat tether anchors are mounted to the cab back wall at both regular cab passenger seating positions and at all rear seating positions on SuperCab and SuperCrew. All are serviced separately.

If a child safety seat was in use during a collision, inspect the child safety seat tether anchor and mounting areas and restore the vehicle to the original production configuration.

Refer to: [Seatbelt Procedure After a Collision](#) (501-20A Seatbelt Systems, General Procedures).

Child Safety Seat Tether Anchor - Lower Anchors and Tethers for Children (LATCH)

Lower Anchors and Tethers for Children (LATCH) are located at the rear seating positions of the SuperCab and SuperCrew. They are serviced with the seat cushion frame.

If a child safety seat was in use during a collision, inspect the LATCH and restore the vehicle to the original production configuration.

Refer to: [Seatbelt Procedure After a Collision](#) (501-20A Seatbelt Systems, General Procedures).

Safety Belt Buckle - Inflatable Safety Belt

The safety belt buckle incorporates an inflator that is filled with inert gas under pressure and a pyrotechnic device to release the gas. The inflator is serviced with the safety belt buckle as an assembly.

On vehicles equipped with inflatable safety belts, the safety belt buckle and inflator has 3 functions:

- Receives the tongue and holds it in place until the release button is pressed.
- Senses if the inflatable safety belt is buckled using a Hall-effect sensor which is hard-wired to the RCM.
- Directs the gas from the safety belt inflator into the inflatable safety belt.

For safety belt buckle and inflator location information:

Refer to: [Airbag and Seatbelt Pretensioner Supplemental Restraint System \(SRS\) - Raptor - System Operation and Component Description](#) (501-20B Supplemental Restraint System, Description and Operation).

To diagnose any safety belt buckle or inflator Diagnostic Trouble Codes (DTCs),

Refer to: [Airbag Supplemental Restraint System \(SRS\) - Raptor](#) (501-20B Supplemental Restraint System, Diagnosis and Testing).

For any concerns regarding safety belt buckle or retractor function,

Refer to: [Seatbelt Systems](#) (501-20A Seatbelt Systems, Diagnosis and Testing).

Safety Belt Retractor - Inflatable Safety Belt

Vehicles equipped with inflatable safety belts use 2 retractors, 1 for the lap belt (lower retractor) and 1 for the shoulder belt (upper retractor), however only the shoulder belt inflates. The lap belt retractor can be serviced separately from the shoulder belt retractor.

Lower Safety Belt Retractor (Lap Belt)

The lap belt is secured to the shoulder belt with a bolt and a cover is fitted over the bolt.

The lap belt retractor has both the Automatic Locking Retractor (ALR) and the Emergency Locking Retractor (ELR) features.

Upper Safety Belt Retractor (Inflatable Shoulder Belt)

The shoulder belt includes the safety belt tongue, which is unique to the inflatable safety belt system. Attached to the safety belt tongue is an orifice which is attached to the inflatable shoulder belt and connects to the inflator when the safety belt buckle and tongue are connected.

The safety belt shoulder belt retractor only has the Emergency Locking Retractor (ELR) feature.

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