

Published: 11-May-2011

Steering Column -

General Specification

Item	Specification
Upper column	Manual column with tilt and reach adjustment

Torque Specifications

Description	Nm	lb-ft
Heatshield lower bolts (2) to steel pinion tower	3.2	2.3
Heatshield upper bolt (1) to plastic seal	2.4	1.77
Steering column bolts	25	18
Steering wheel bolt	48	35
Universal joint to steering gear bolt*	25	18

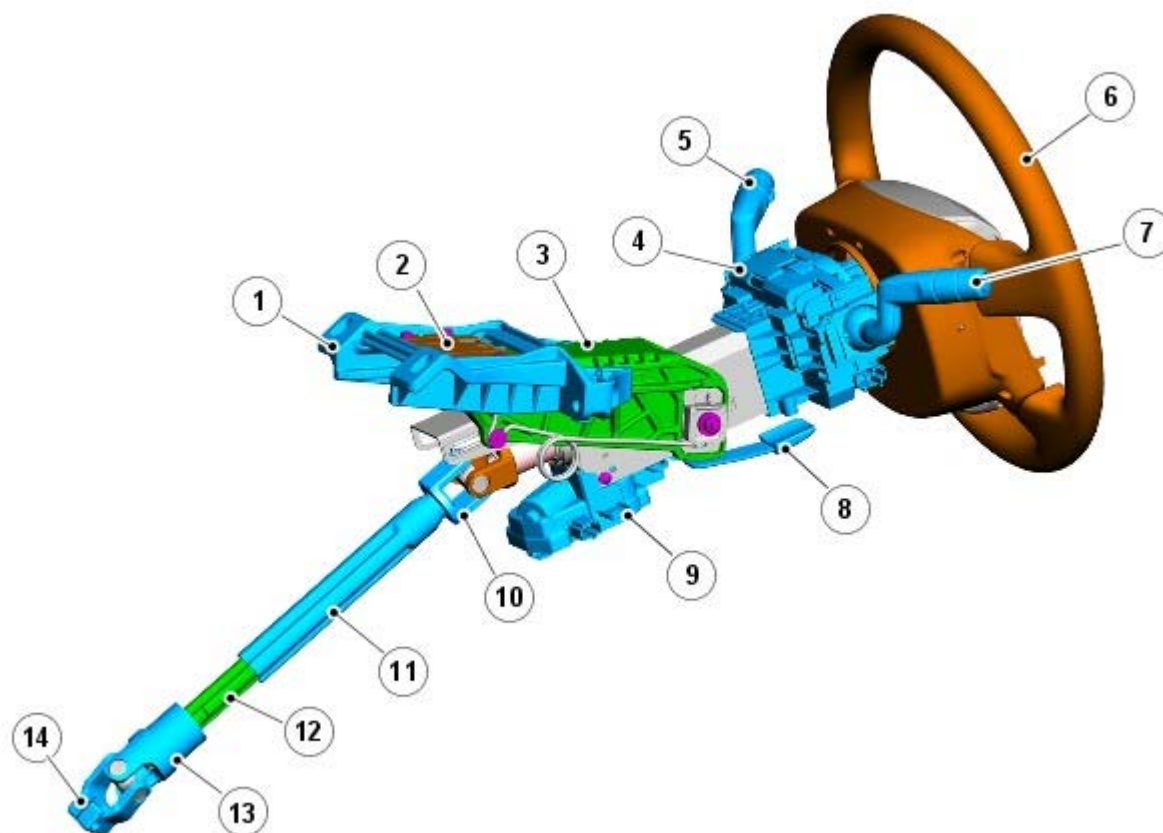
* New nuts/bolts must be fitted

Part Number Steering Column - Steering Column

Description and Operation

Published: 11-May-2011

COMPONENT LOCATION



E81575

Item	Part Number	Description
1	-	Outer bracket
2	-	Energy management plate
3	-	Inner bracket
4	-	Clockspring, steering wheel angle sensor and steering wheel module
5	-	Right Hand (RH) multifunction switch
6	-	Steering wheel
7	-	Left Hand (LH) multifunction switch
8	-	Steering column adjustment lever
9	-	Electric steering column lock
10	-	Upper yoke
11	-	Outer tube
12	-	Inner tube
13	-	Lower yoke
14	-	Clamp bolt

NOTE: On North American Specification (NAS) vehicles, a running change was introduced during 2008 Model Year (MY) to disable the electric steering column lock. Under the change, the internal electronics (printed circuit board (PCB), motor, etc.) of the lock have been removed and the lock has been disabled in the car configuration file. The change is incorporated on VIN (vehicle identification number) 082896, 085531, 085622, 085685, 085832, 085891, 085942, 085987, 086049, 086081, 086123, 086178, 086276, 086287, 086309, 086363, 086383, 086389, 086398, 086403 and 091770 onwards.

NOTE: Items 10, 11, 12 and 13 are components of the intermediate shaft.

OVERVIEW

The steering column is bolted to a magnesium steering column frame which is an integral part of the cross-car beam located behind the instrument panel. The cross car beam is manufactured from a combination of steel tension members and ultra-

lightweight diecast magnesium carriers. The beam not only forms an armature around which the fascia is constructed, but is also an integral part of the vehicle's crash structure.

Steering wheel position can be moved by adjusting the column upper for reach or rake, whilst soft-stops are used to minimize adjustment noise in fore-aft movements. The adjustable upper column is designed to manage crash energy in the horizontal plane.

The intermediate shaft can collapse telescopically to prevent uncontrolled steering wheel displacement during an impact.

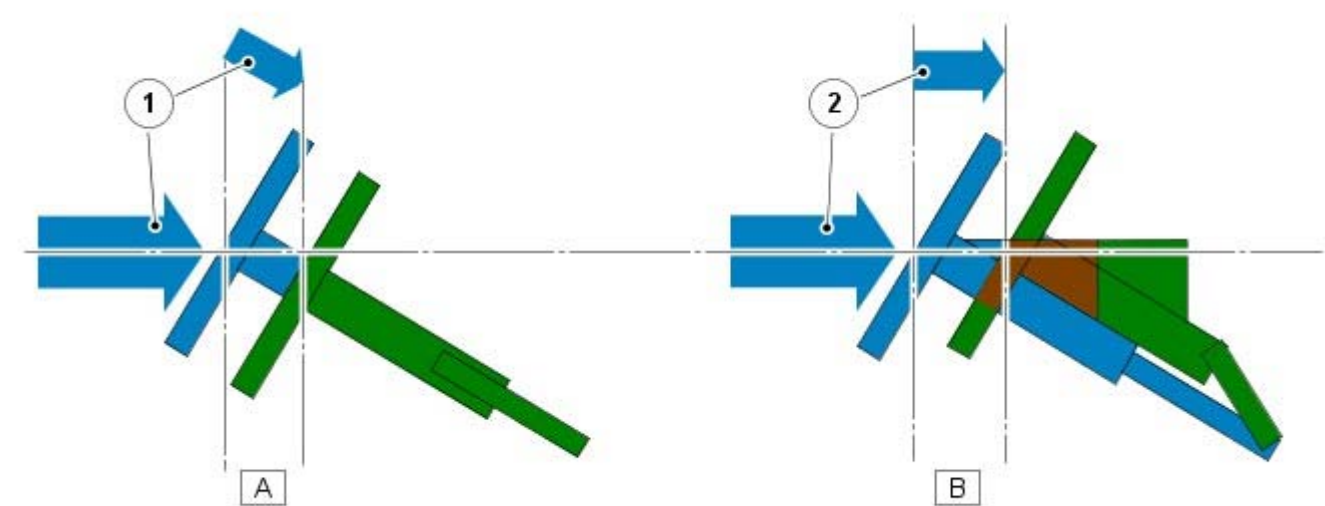
The column lintermediate shaft is produced from steel tube for good rigidity. This is bonded to a stiff thin-walled elastomer to isolate road noise.

IMPACT PROTECTION

In a serious impact, the steering column is designed to manage two simultaneous events; the intermediate shaft must isolate the steering wheel from any movement of the steering rack (if the angle of the steering wheel changes it will affect the way in which the airbag deploys towards the driver).

In addition, to prevent excessive force causing injury as the driver strikes the airbag, the whole upper-column assembly is designed to progressively move forwards as the driver contacts the airbag. This motion helps to safely and progressively decelerate the driver. The steering column has a 'Horizontal Load Limiting' system which differs from conventional designs that rely on movement along the column axis.

Horizontal Load Limiting System



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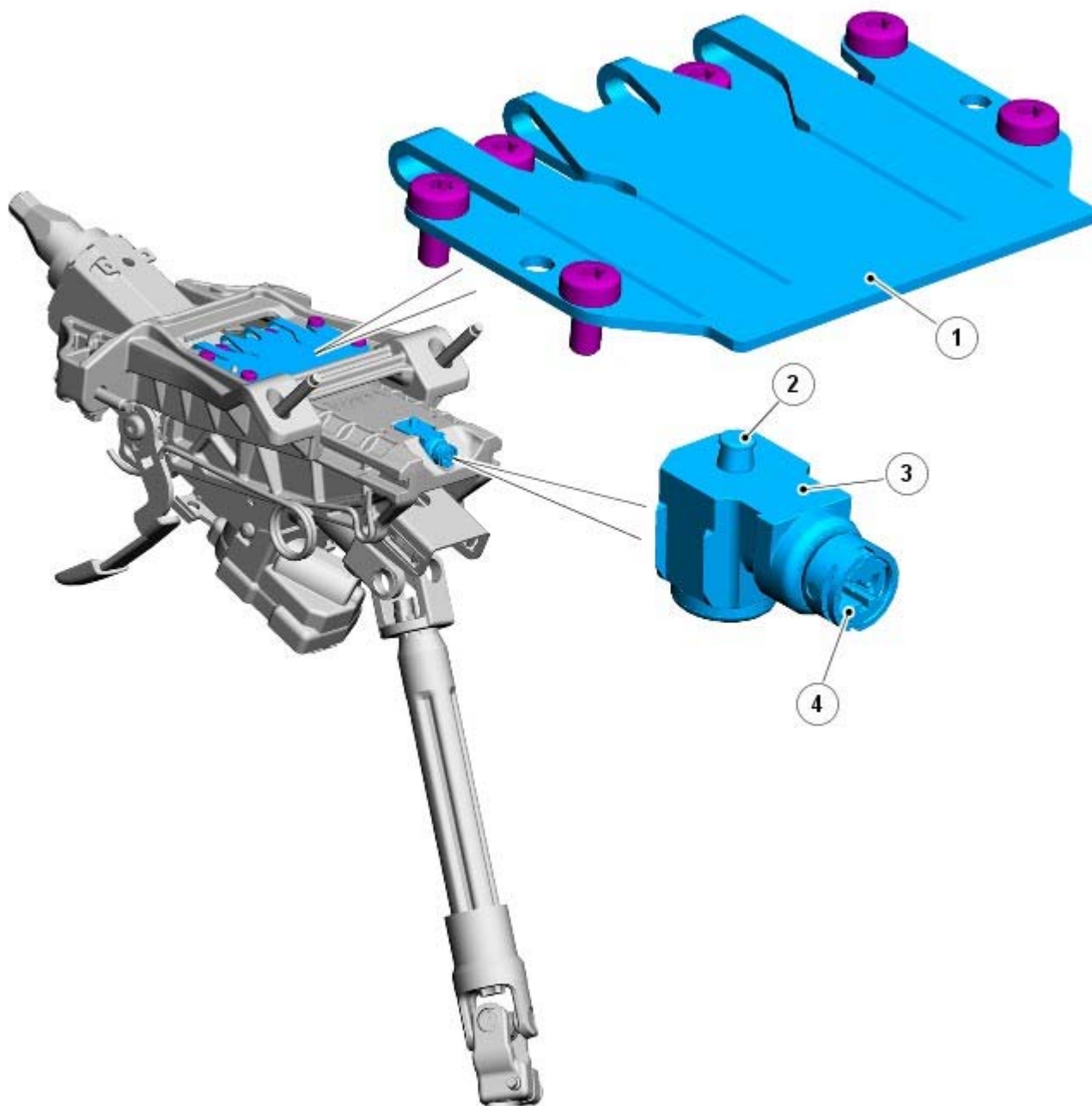
Item		Description
A		Conventional steering column design
B		Horizontal load limiting system
1		Mismatch between direction of force and motion
2		Motion aligned to force

The Horizontal Load Limiting System provides a progressive and stable load limiting characteristic as shown in 'B' in the illustration. Loads applied to the column cause the column to move horizontally with the driver. This movement is controlled by an energy management plate. The plate has leaves which peel back in a controlled manner, absorbing energy and allowing the column to move with the driver.

The plate is bolted to the steering column outer bracket attached to cross-car beam and the inner bracke

Pyrotechnic Additional Load Device - North American Specification (NAS) Only

NOTE: Steering column shown deployed for clarity



E83568

Item		Description
1		Energy management plate
2		Pin
3		Pyrotechnic device
4		Electrical connector

On NAS market vehicles, an additional pyrotechnic device is fitted to provide increased energy absorption to allow for a driver not wearing a seat belt. If the driver is wearing a seatbelt and a crash situation occurs, the device is not activated.

The pyrotechnic device is located below the energy management plate. When the system detects that the driver's seat belt is not buckled, and a crash situation occurs which activates the airbags, the device fires, which retracts the pin engaged in a hole in the central leaf in the energy management plate. This provides the required increase in energy absorption to allow for the additional loading caused by the unrestrained driver.

Published: 11-May-2011

Steering Column - Steering Column

Diagnosis and Testing

For additional information.

REFER to: [Steering System](#) (211-00 Steering System - General Information, Diagnosis and Testing).

Steering Column - Steering Wheel

Removal and Installation

Removal

1. Make the SRS system safe.

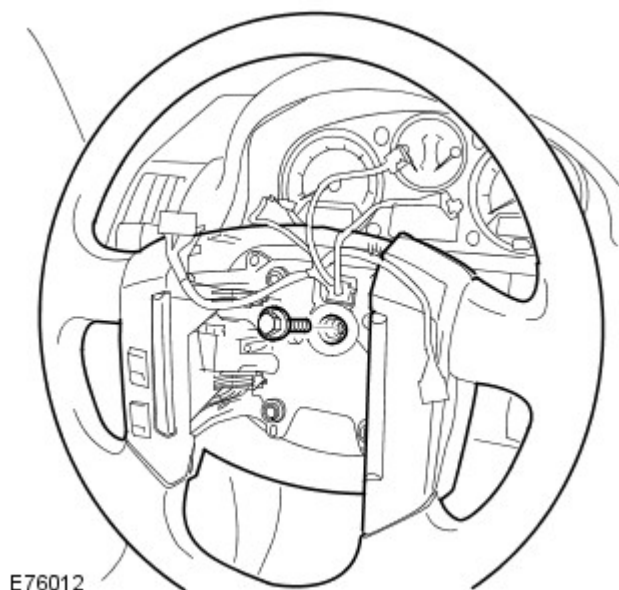
Refer to: Supplemental Restraint System (SRS) Depowering and Repowering (501-20, General Procedures).

2. Remove the driver air bag module.

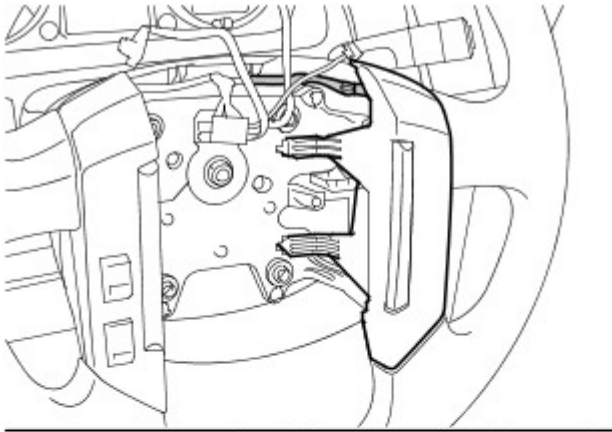
Refer to: [Driver Air Bag Module](#) (501-20B Supplemental Restraint System, Removal and Installation).

- 3.


- Torque: 48 Nm



E76012

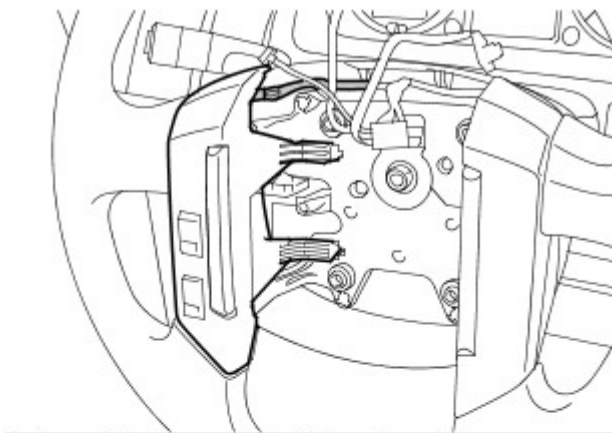
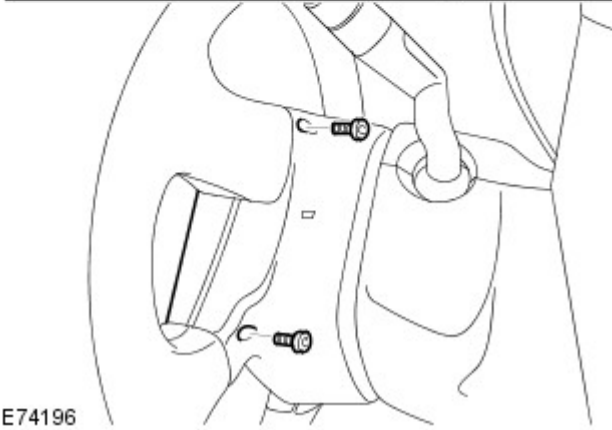


E74196


4.  **CAUTION:** Protect the surrounding trim to avoid damage.

NOTE: Do not disassemble further if the component is removed for access only.

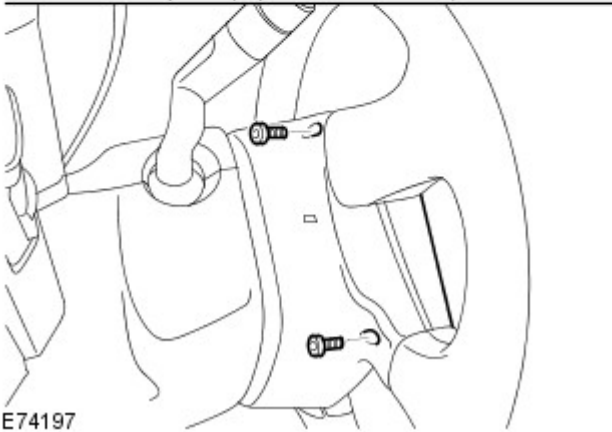
- Remove the 2 Torx screws.
- Disconnect the electrical connector.



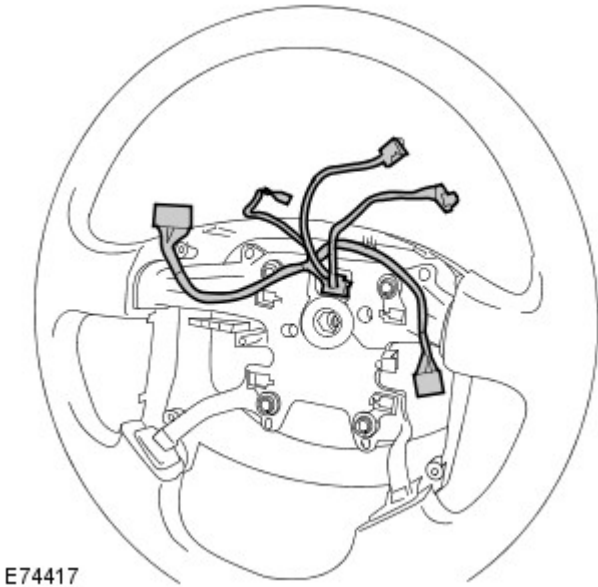
E74197

5.  **CAUTION:** Protect the surrounding trim to avoid damage.

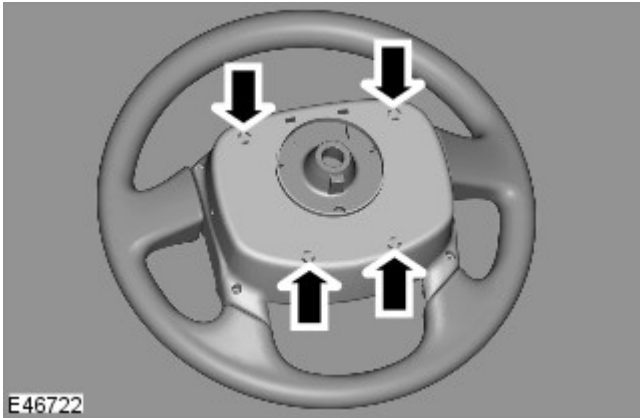
- Remove the 2 Torx screws.
- Disconnect the electrical connector.



6. Remove the steering wheel control switch harness.



- 7.



Installation


1. Install the steering wheel cover.
2. Install the wiring harness
3. Install the cruise speed control switch.
4. Install the horn switch.
5. Install the steering wheel.
6. Install the driver air bag module.

Refer to: [Driver Air Bag Module](#) (501-20B Supplemental Restraint System, Removal and Installation).

Steering Column - Steering Column

Removal and Installation

Special Tool(s)

 E48291	501-106 Remover, Driver Air Bag
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Removal

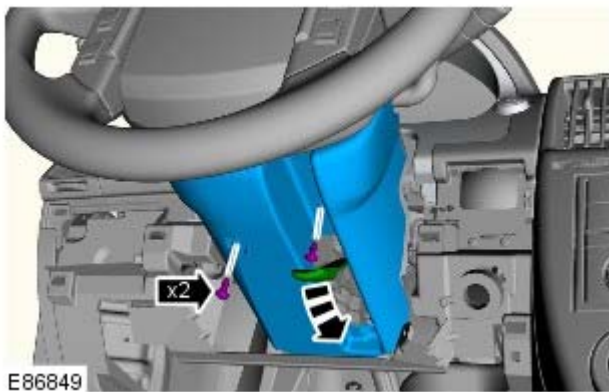
1. Make the SRS system safe.

Refer to: [Standard Workshop Practices](#) (100-00 General Information, Description and Operation).

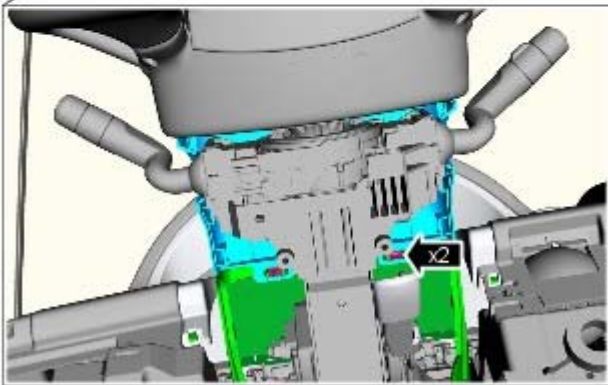
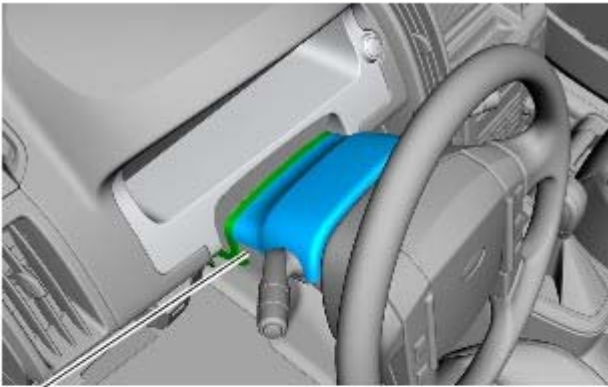
2. Remove the driver lower air bag.

Refer to: [Driver Lower Air Bag Module](#) (501-20B Supplemental Restraint System, Removal and Installation).


3. Remove the steering column lower cowl.

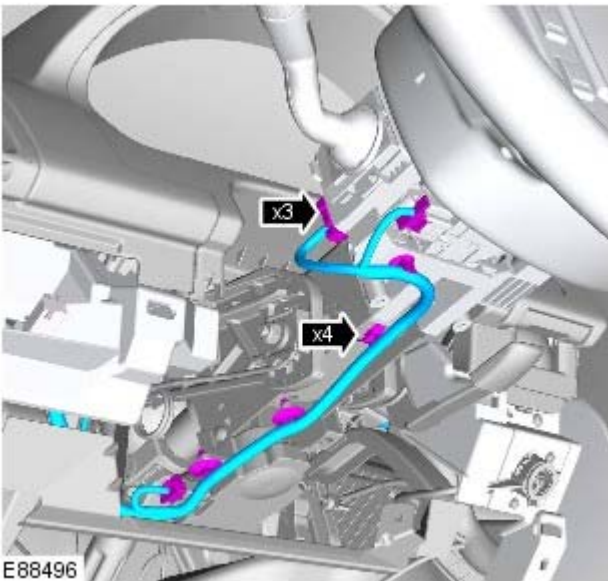


4. Remove the steering column upper cowl.

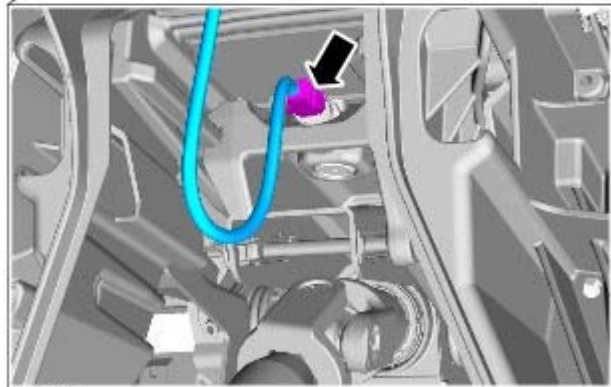
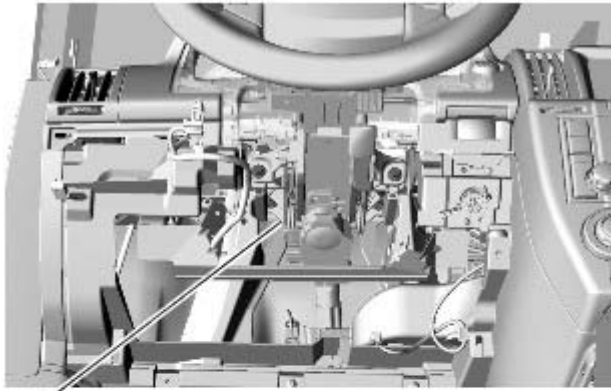


E86851

5.  **CAUTION:** Take extra care not to damage the clips.
Release the steering column wiring harness.

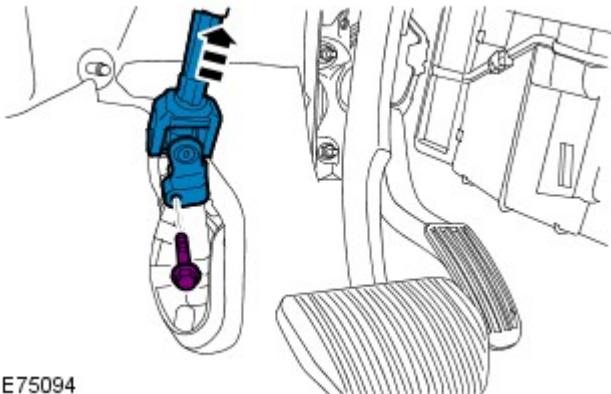


E88496



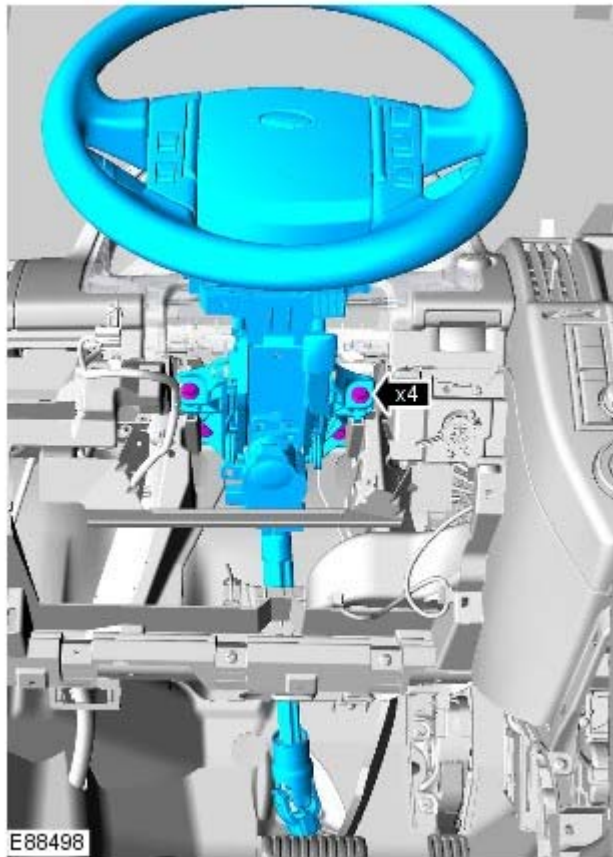
E88497

6. If installed, disconnect the SRS ride-down electrical connector concealed at the rear of the steering column.

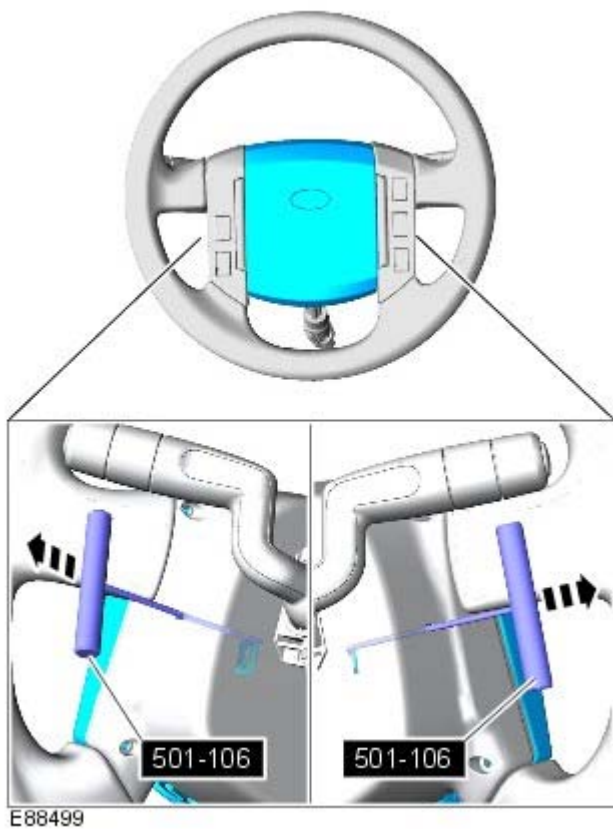


E75094

7. Remove the steering column universal joint clamp bolt and release the shaft.



8. Remove the steering column assembly.

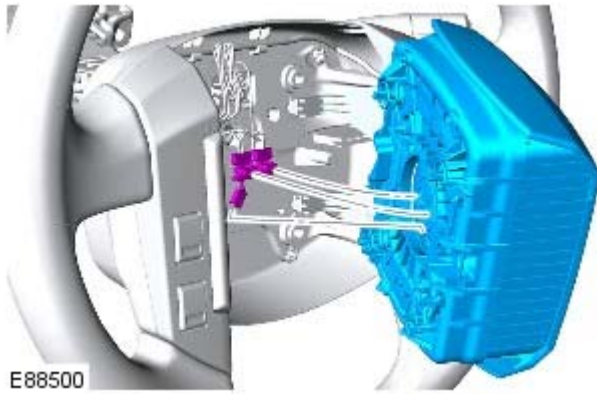



9. **NOTE:** Do not disassemble further if the component is removed for access only.

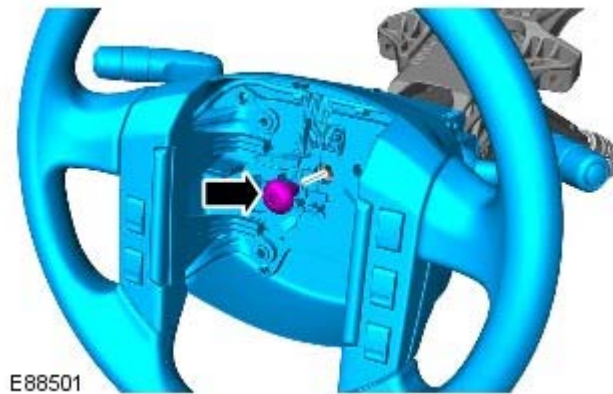
- Using the special tool, remove the driver air bag module.

Special Tool(s): [501-106](#)

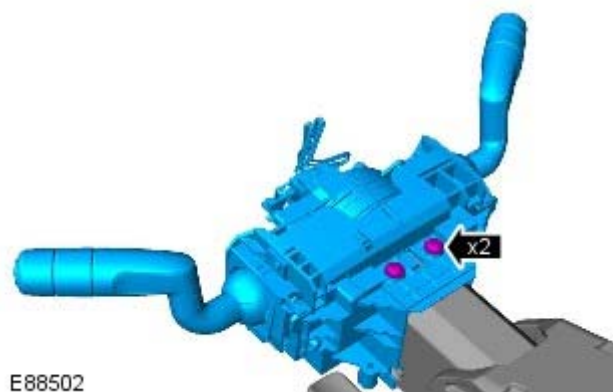
- Carefully release the 2 clips.




10.  **WARNING:** Do not probe supplemental restraint system (SRS) electrical connectors.
 - Disconnect the 3 electrical connectors.



11. Remove the steering wheel.



12.  **CAUTION:** Make sure that the clockspring rotor does not rotate.
Remove the clockspring.

Installation

1. Install the steering column and tighten the bolts.

Torque: 25 Nm

2.  **WARNING:** Make sure that a new bolt is installed.

Connect the steering shaft universal joint and tighten the bolt.

Torque: 25 Nm

3. Install the clockspring.
4. Install the steering wheel.

Torque: 40 Nm

5. **WARNINGS:**



The SRS electrical connectors are unique. DO NOT force, or attempt to connect electrical connectors to the wrong sockets.



Driver air bag module installation can be confirmed by hearing 2 audible clicks, 1 for each spring. The module edges should also be flush with the steering wheel.

Install the driver air bag module.

6. If installed, connect the SRS ride-down electrical connector concealed at the rear of the steering column.

7. Secure the wiring harness to the steering column.

8. Connect the steering column electrical connectors.

9. Install the steering column upper cowl.

10. Install the steering column lower cowl.

11. Install the driver lower air bag module.

Refer to: [Driver Lower Air Bag Module](#) (501-20B Supplemental Restraint System, Removal and Installation).

12. Connect the battery ground cable.

Refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

13. If a new steering column has been installed, configure the steering column lock using Land Rover approved diagnostic equipment.