Specifications

Item		Specification
Transmission Type		6R80
Transmission Control		Floor-shift
Transmission Assembly Weight		101 kg
Stall Speed - 2.2L Engine	Minimum	2700 rpm
	Maximum	3200 rpm
Stall Speed - 3.2L Engine	Minimum	2200 rpm
	Maximum	2800 rpm
Transmission Operating Temperature		80 °C - 110 °C
Gear ratio	1 GR	4.17
	2 GR	2.34
	3 GR	1.52
	4 GR	1.14
	5 GR	0.87
	6 GR	0.69
	Reverse	3.40
ATF	Type	WSS-M2C938-A (Motorcraft® MERCON® LV Automatic Transmission Fluid)
	Fluid Change Interval	240,000 km
	Capacity	9 L (Wet)
		10.50 L (Dry)
	Multi-Purpose Grease	• ESA-M1C172-A • WSB-M1C233-A • WSB-M1C227-A
Hydraulic System (Number of drive/driven gear plates)	Forward Clutch (A)	5/6
	Direct Clutch (B)	5/5
	Intermediate Clutch (C)	5/5
	Low/Reverse Clutch (D)	5/5
	O/D Clutch (E)	6/6
Separator Plate Thickness	Forward Clutch (A)	3.0 mm
	Direct Clutch (B)	2.1 mm
	Intermediate Clutch (C)	3.0 mm
	Low/Reverse Clutch (D)	1.75 mm
	O/D Clutch (E)	3.0 mm

Specifications

Engine Data — 130 PS

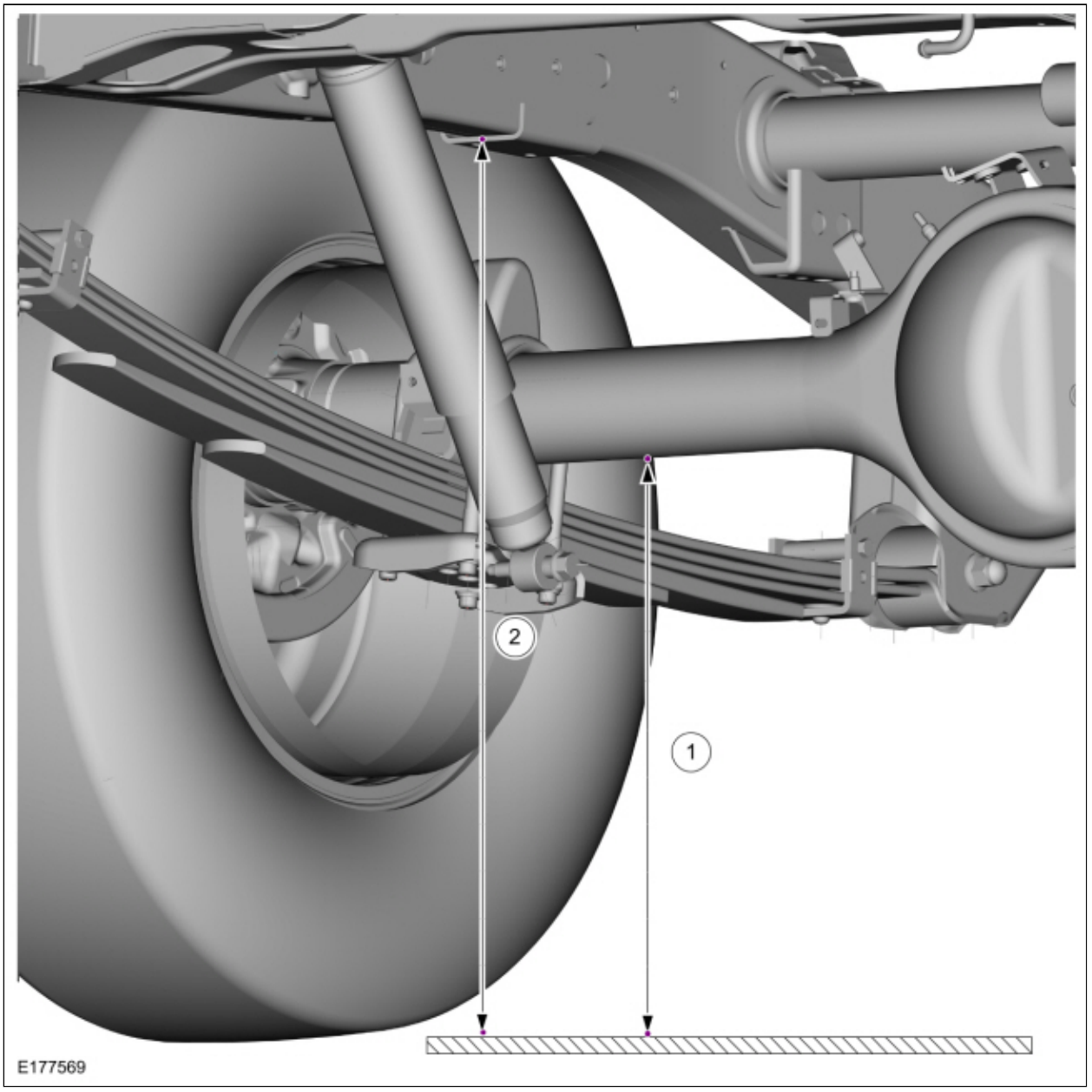
Description	
Code	GBVAJQW
Firing order	1-3-4-2
Bore diameter	86 mm
Stroke	94.6 mm
Displacement	2198 cc
Compression ratio	15.6:1
Power output at _3200 rpm	96 kW (130 PS)
Torque between 1600 to 2500 rpm	320 Nm
Idle speed	800 rpm

Engine Data — 160 PS

Description	
Code	GBVAJQJ
Firing order	1-3-4-2
Bore diameter	86 mm
Stroke	94.6 mm
Displacement	2198 cc
Compression ratio	15.6:1
Power output at _3200 rpm	118 kW (160 PS)
Torque between 1600 to 2500 rpm	385 Nm
Idle speed	800 rpm

Engine Oil Capacity

Description	Liters
Initial fill including oil filter	8.9
Service fill including oil filter	8.6
Service fill without oil filter	8.2



10. **NOTE:** *Lock the tool in the position shown.*

    Position the surface gauge on the same flat, level surface, adjust the gauge arm until the scriber point is located on the rear of the lower edge of the chassis rail bump stop bracket.
    Use the General Equipment: Surface Gauge

	TEST the system for normal operation. ROAD TEST as necessary. REFER to: Road/Roller Testing (100-00 General Information, Description and Operation).

PINPOINT TEST G : BRAKE LOCKUP DURING LIGHT BRAKE PEDAL FORCE

G1 TEST BRAKE LOCKUP

- Road test the vehicle and depress the brake pedal lightly.

Do the rear brakes lockup?

Yes	GO to G2
No	Vehicle is OK. VERIFY the customer concern.

G2 INSPECT THE BRAKE PADS

- Inspect the brake pads for grease or fluid on the linings and wear concerns, correct installation, damage, correct size and type.

Are any concerns found?

Yes	INSTALL new brake pads. REFER to: Brake Pads (206-03 Front Disc Brake, Removal and Installation), TEST the system for normal operation. ROAD TEST as necessary.
No	GO to G3

G3 CHECK THE BRAKE LOAD SENSOR PROPORTIONING VALVE

- Check the brake load sensor proportioning valve for correct installation and adjustment.

Is the brake load sensor proportioning valve correctly adjusted?

Yes	INSTALL a new brake load sensor proportioning valve. TEST the system for normal operation.
No	ADJUST the brake load sensor proportioning valve.

PINPOINT TEST H : BRAKE DRAG

H1 ROAD TEST THE VEHICLE

- Road test the vehicle and apply the brakes.

Are the brakes functioning correctly?

Yes	Vehicle is OK. VERIFY the customer condition.
No	INSPECT individual brake calipers and INSTALL brake calipers as necessary. REFER to: Brake Caliper (206-03 Front Disc Brake, Removal and Installation), GO to H2

H2 CHECK THE BRAKE BOOSTER

- Check the brake booster actuating rod alignment and travel.

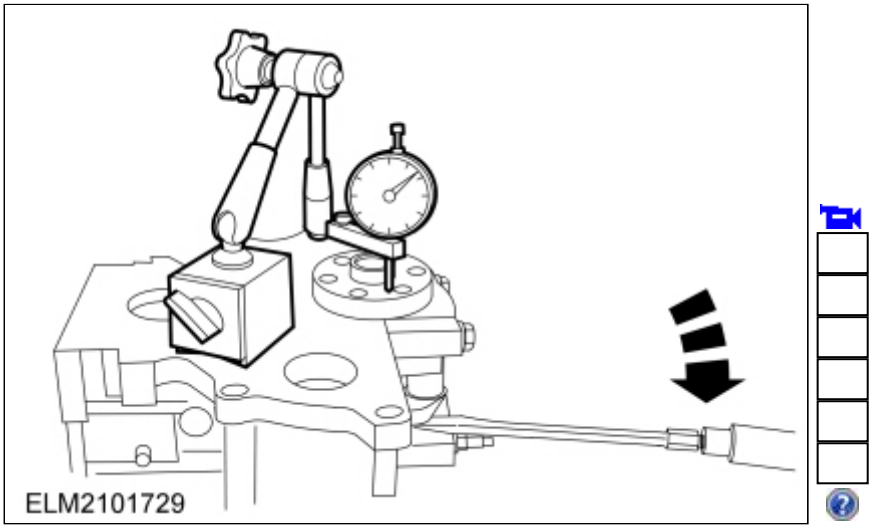
Is the actuating rod OK?

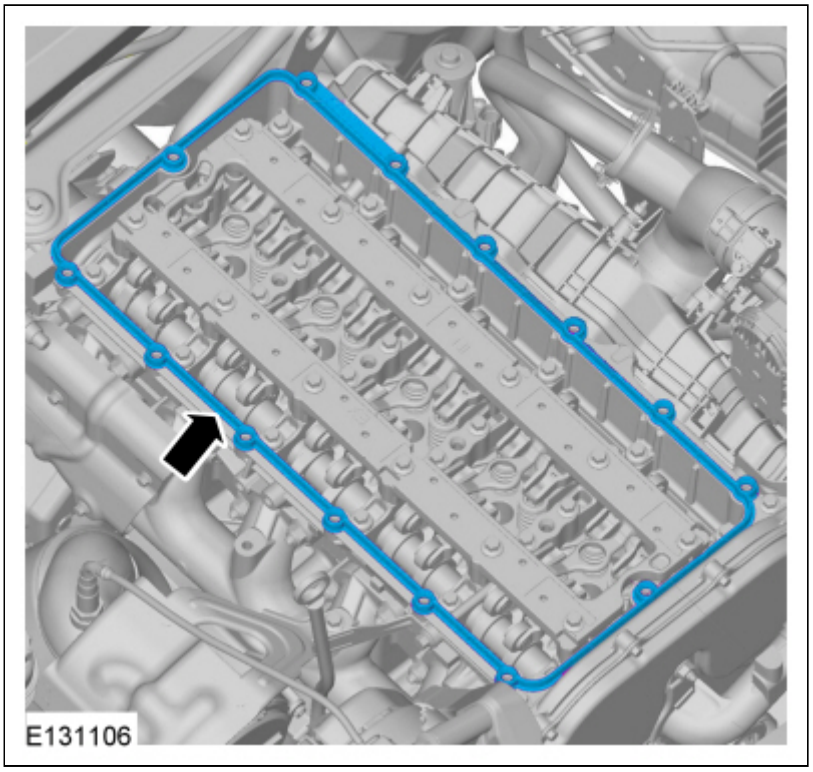
Crankshaft End Play

General Equipment

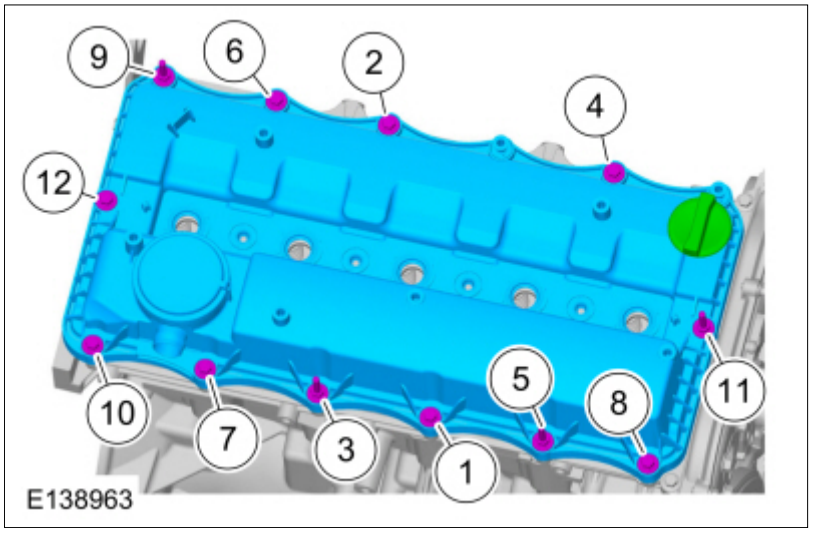
Dial indicator
Dial indicator fixture

1. Determine the end float
   - Place on the dial indicator and bracket .
   - Determine the end float by raising the crankshaft with the aid of a screwdriver.
   - If necessary, correct the end float by using new thrust half washers.



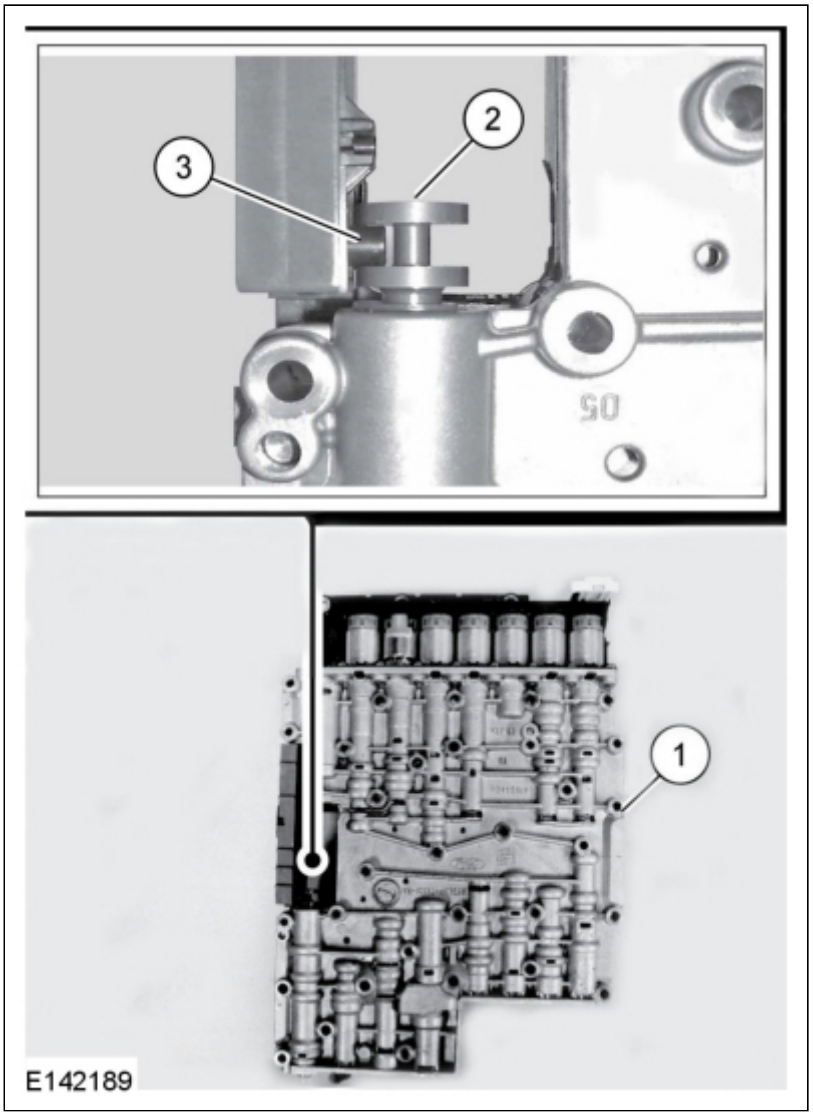


68. *Torque*:
    stage 1: 4 Nm
    stage 2: 10 Nm

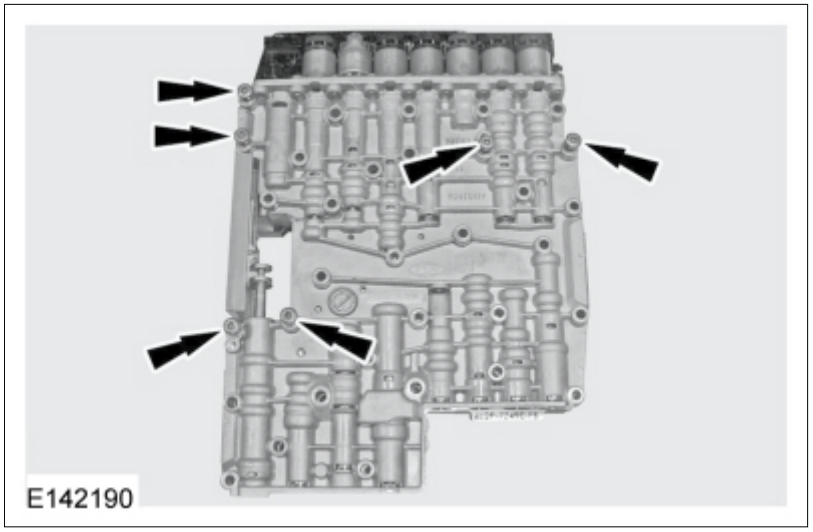


69. **NOTE:** *Make sure that a new component is installed.*

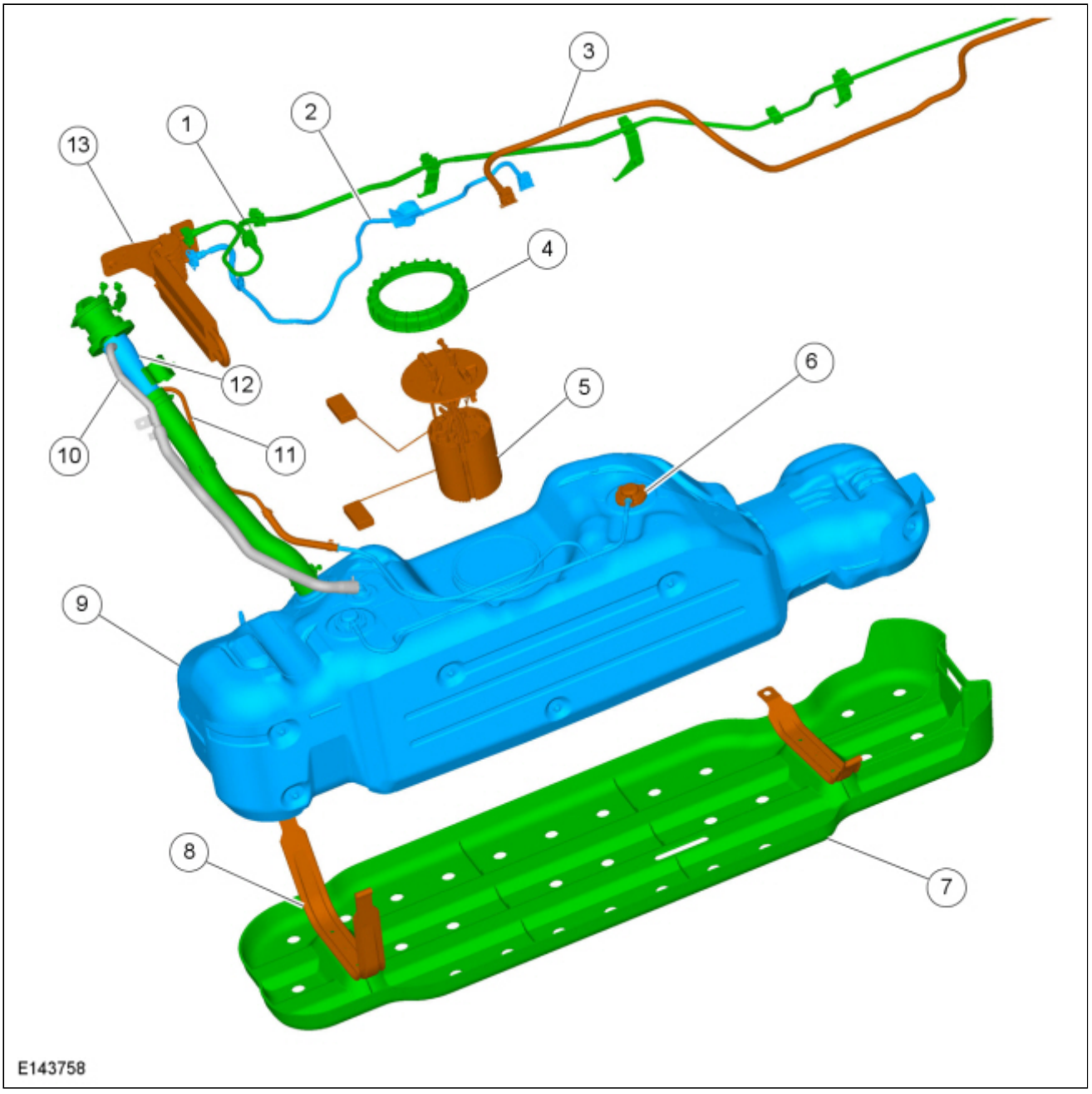
    Install the new engine front cover gasket.



10. Install the 6 long molded leadframe-to-valve body bolts hand-tight.



11. Install the 19 short main control assembly lower-to-upper valve body bolts. Tighten the bolts in the sequence shown.
    Torque:
    :
    Stage 1: 6 Nm
    Stage 2: 7 Nm



Item	Part Number	Description
1	—	Return line from fuel filter to fuel cooler
2	—	Return line fuel cooler to fuel tank
3	—	Supply line fuel tank to fuel filter
4	—	Fuel level sensor locking ring
5	—	Fuel level sensor/ fuel module
6	—	Fuel tank vent valve(s)
7	—	Tank protector
8	—	Fuel tank support straps
9	—	Fuel tank
10	—	Fuel tank breather hose
11	—	Fuel tank vent valve breather
12	—	Filler neck
13	—	Fuel cooler

Vehicles without Fuel cooler

Yes	GO to L3
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

L3 RETRIEVE THE RECORDED DIAGNOSTIC TROUBLE CODES (DTCS) FROM THE PCM (POWERTRAIN CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, perform the PCM self-test.

Are any Diagnostic Trouble Codes (DTCs) recorded?

Yes	Refer to the appropriate section in Group 303 for the procedure.
No	GO to L4

L4 CHECK FOR DTC (DIAGNOSTIC TROUBLE CODE) U0100:00 SET IN OTHER MODULES

- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Wait 10 seconds.
- Ignition ON.
- Using a diagnostic scan tool, retrieve the Continuous Memory Diagnostic Trouble Codes (CMDTCs) from all modules.

Is DTC U0100:00 set in other modules?

Yes	GO to L5
No	GO to L6

L5 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PCM and related in-line connectors.
- Repair:
  - corrosion (install new connector or terminals – clean module pins)
  - damaged or bent pins – install new terminals/pins
  - pushed-out pins – install new pins as necessary
- Reconnect the PCM and related in-line connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no TSB addresses this concern, INSTALL a new PCM. Refer to the appropriate section in Group 303 for the procedure.
No	The system is operating correctly at this time. Concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

L6 CHECK FOR CORRECT BCM (BODY CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all BCM and related in-line connectors.
- Repair:
  - corrosion (install new connector or terminals – clean module pins)
  - damaged or bent pins – install new terminals/pins
  - pushed-out pins – install new pins as necessary
- Reconnect the BCM and related in-line connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Positive Lead	Measurement / Action	Negative Lead
C4821B-12	V	Ground
C4821B-13	V	Ground
C4821B-25	V	Ground
C4821B-26	V	Ground

Is any voltage present?

Yes	REPAIR the circuit in question.
No	GO to M4

M4 CHECK THE APIM (SYNC MODULE) STEREO OUTPUT CIRCUITS TO THE ACM (AUDIO FRONT CONTROL MODULE) FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C4821B-12	Ω	Ground
C4821B-13	Ω	Ground
C4821B-25	Ω	Ground
C4821B-26	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to M5
No	REPAIR the circuit in question.

M5 CHECK THE APIM (SYNC MODULE) STEREO OUTPUT CIRCUITS TO THE ACM (AUDIO FRONT CONTROL MODULE) FOR AN OPEN

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C4821B-12	Ω	C3342-23
C4821B-13	Ω	C3342-25
C4821B-25	Ω	C3342-24
C4821B-26	Ω	C3342-26

Are the resistances less than 3 ohms?

Yes	GO to M6
No	REPAIR the circuit in question.

No	REPAIR the circuit for high resistance.

Q5 CHECK THE CCM (CRUISE CONTROL MODULE) GROUND CIRCUIT

- Ignition OFF.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C9224-4	Ω	Ground

Is the resistance less than 3 ohms?

Yes	GO to Q6
No	REPAIR the circuit for high resistance.

Q6 CHECK FOR CORRECT CCM (CRUISE CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the CCM connector and related in-line connectors.
- Repair:
  - corrosion (install new connector or terminals - clean module pins)
  - damaged or bent pins - install new terminals/pins
  - pushed-out pins - install new pins as necessary
- Reconnect the CCM connector and related in-line connector. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new CCM. REFER to: Cruise Control Module (CCM) (419-03A Cruise Control, Removal and Installation).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

U3003:17

Refer to Wiring Diagrams Cell 31 for schematic and connector information.

Normal Operation and Fault Conditions

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
U3003:17	Battery Voltage: Circuit Voltage Above Threshold	Sets as a continuous memory and on-demand DTC if the CCM detects high battery voltage above 16.5 volts for 500 ms.

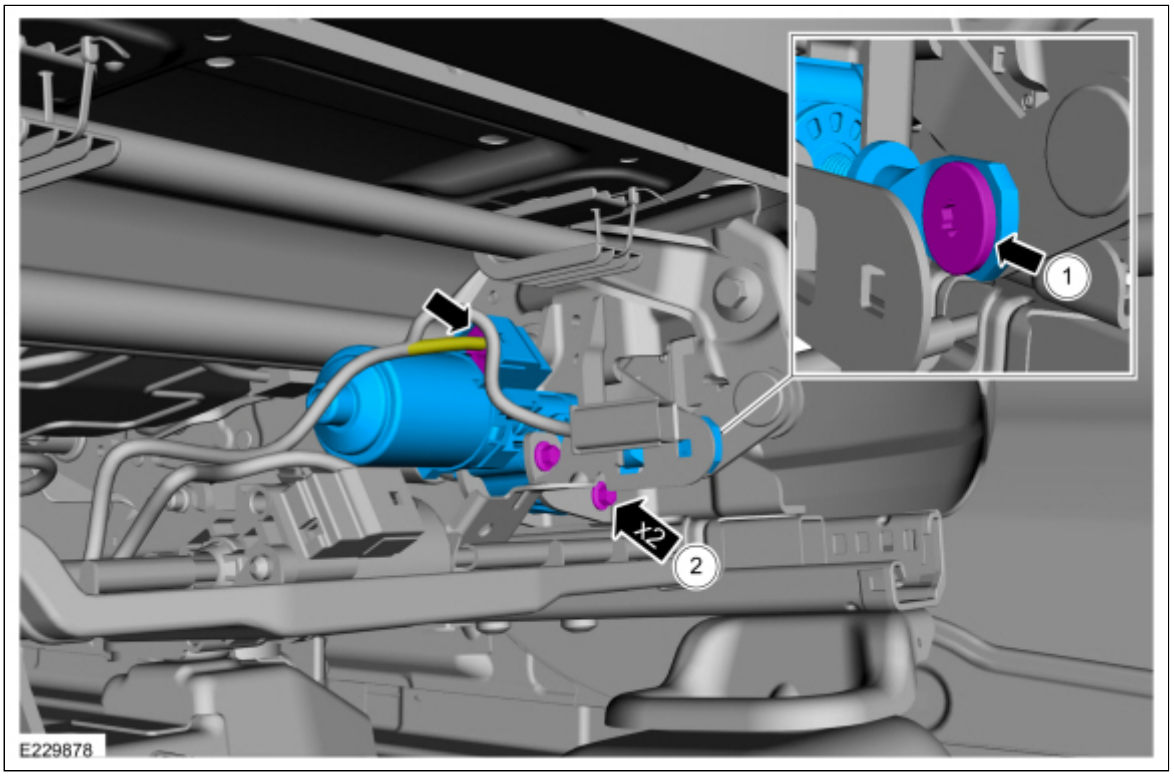
Possible Sources

Front Seat Tilt Motor

Removal

NOTE: *Removal steps in this procedure may contain installation details.*

1. *Torque*:
   1.: 24 Nm
   2.: 2.5 Nm



Installation

1. To install, reverse the removal procedure.
2. **NOTE:** *Check for correct operation after installation.*

	For DTC B1404:12, GO to A15

A12 CONFIRM THE RCM (RESTRAINTS CONTROL MODULE) FAULT

NOTE: *Make sure all SRS components and the RCM electrical connectors are connected before carrying out the self-test. If not, Diagnostic Trouble Codes (DTCs) will be recorded.*

- Ignition OFF.
- Depower the SRS.
  REFER to: Supplemental Restraint System (SRS) Depowering and Repowering (501-20B Supplemental Restraint System, General Procedures).
- Prior to reconnecting any previously disconnected SRS component:
  - Inspect connector(s) (including any inline connectors) for pushed-out, loose or spread terminals and loose or frayed wire connections at terminals.
  - Inspect wire harness for any damaged, pinched, cut or pierced wires.
  - Inspect RCM C310A and C310B Connector Position Assurance (CPA) lever/lock for correct operation.
  - Repair any concerns found.
    Refer to Wiring Diagrams Cell 46 for schematic and connector information.
- Connect Driver Side Airbag (Inline seat connector) C313 (if previously disconnected).
- Connect RCM C310A and C310B (if previously disconnected).
- Repower the SRS. **Do not** prove out the SRS at this time. For vehicles equipped with the police package, REFER to: Supplemental Restraint System (SRS) Depowering and Repowering (501-20B Supplemental Restraint System, General Procedures).
- Ignition ON.
- Using a diagnostic scan tool, perform RCM self-test.

Was the original DTC retrieved on-demand during self-test?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new RCM. REFER to: Restraints Control Module (RCM) (501-20B Supplemental Restraint System, Removal and Installation). GO to A17
No	In the process of diagnosing the fault, the fault condition has become intermittent. Do not install any new SRS components at this time. Install SRS components only when directed to do so in the pinpoint test. For DTC B1404:13 or B1404:1A, GO to A13 For DTC B1404:11, GO to A14 For DTC B1404:12, GO to A15

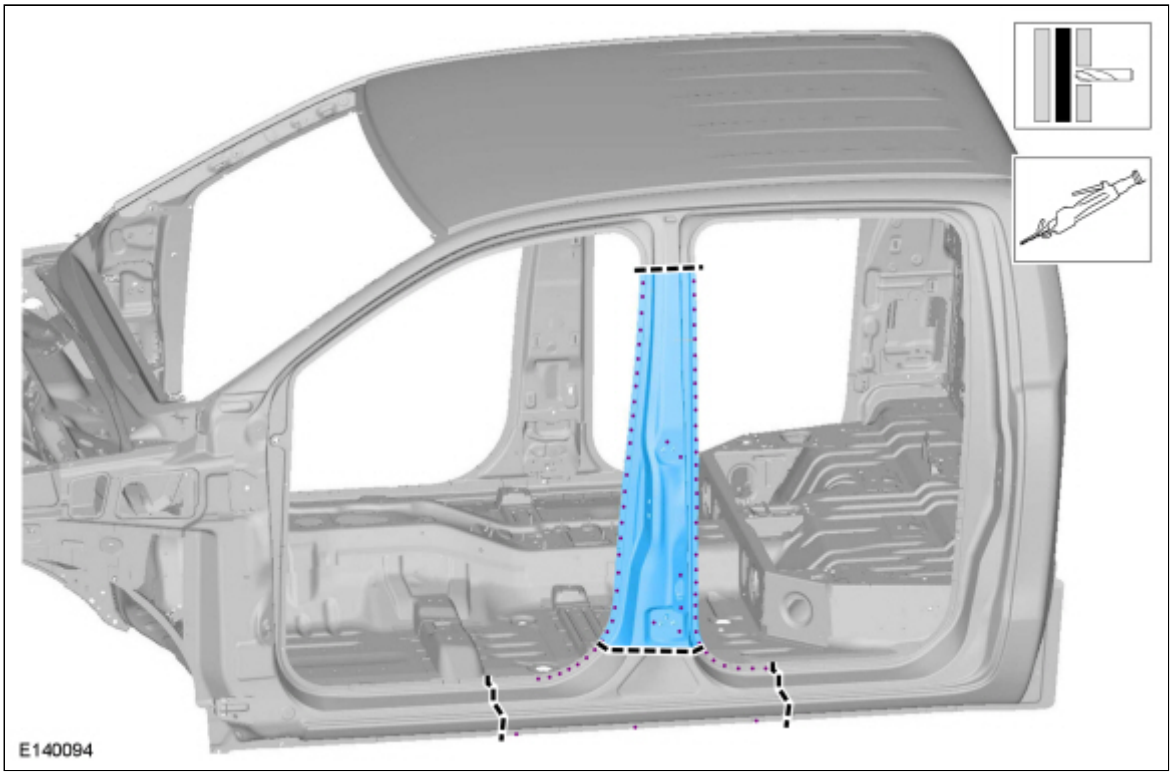
A13 CHECK THE DRIVER SIDE AIRBAG DEPLOYMENT CONTROL RESISTANCE (DEPLOY_10_R) PID (PARAMETER IDENTIFICATION) FOR AN INTERMITTENT LOW RESISTANCE OR OPEN CIRCUIT FAULT

- Using a diagnostic scan tool, view RCM Parameter Identifications (PIDs).
- While monitoring the DEPLOY_10_R PID, attempt to recreate the fault by wiggling connectors (including any inline connectors) and flexing the wire harness frequently. Record the resistance value indicated by the PID.

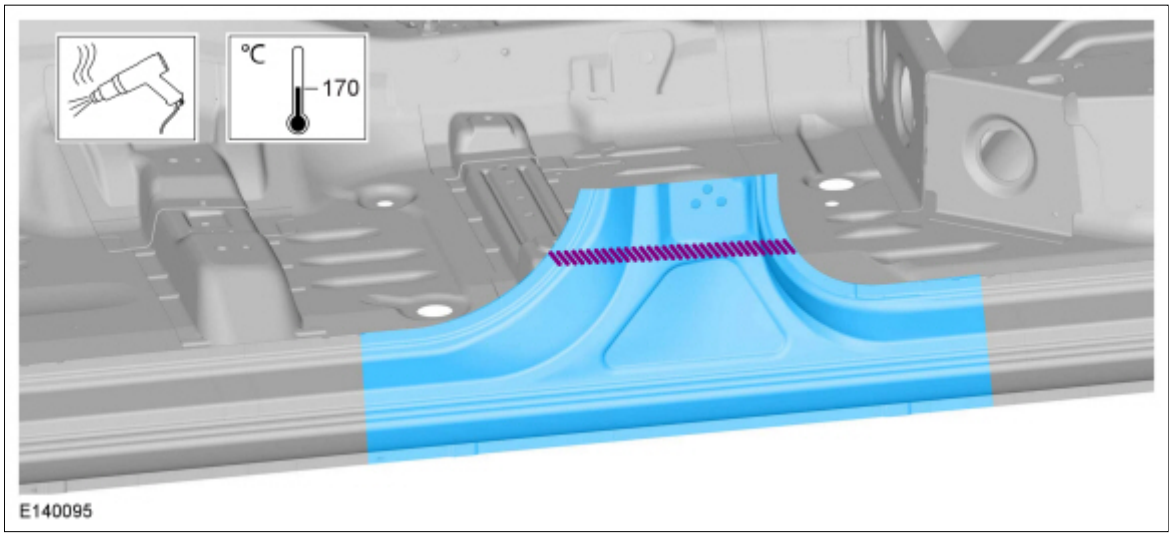
Does the PID value read between 1.44 and 3.52 ohms?

Yes	The fault is not present and cannot be recreated at this time. Do not install any new SRS components at this time. Install SRS components only when directed to do so in the pinpoint test. GO to A16
No	DEPOWER the SRS. REFER to: Supplemental Restraint System (SRS) Depowering and Repowering (501-20B Supplemental Restraint System, General Procedures). REPAIR as necessary. Refer to Wiring Diagrams Cell 46 for schematic and connector information. GO to A17

A14 CHECK THE DRIVER SIDE AIRBAG DEPLOYMENT CONTROL CIRCUITS FOR AN



- Use the General Equipment: Hot Air Gun



- Use the General Equipment: Spot Weld Drill Bit

The surface which has been repaired and then prepared according to the manufacturer's instructions is now ready for basic paint application.

Top coat application

It is important for a good paint result that the recommended process data is adhered to, i.e. mixture proportions, layer thickness, viscosity, drying time etc.

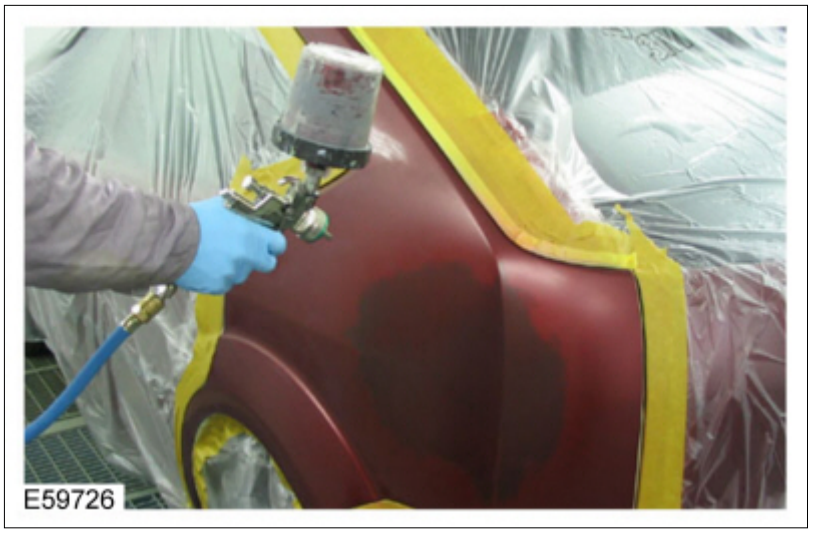
First of all the work area is carefully masked ready for paint application. The correct adhesive materials and techniques must be used so that no hard transitions and edges are created during painting.

NOTE: *The chapter "Tips and Tricks" gives in-depth information on masking work.*

Thoroughly check the surface once more and rub-off with a dust-bonding cloth.

NOTE: *Once more check the paint material and that the spray gun is correctly adjusted before applying the paint.*

Paint application



The base paint is applied in two or three steps. First of all only the repair area is painted with the first paint application.

Flash off