METRICS

ENGLISH/METRIC CONVERSION

DESCRIPTION	MULTIPLY	BY	FOR METRIC EQUIVALENT
Acceleration	ft/s^2	0.3048	m/s^2
	in/s^2	0.0254	m/s^2
Torque	lb-in	0.11298	N·m
	lb-ft	1.3558	N·m
Power	horsepower	0.746	kW
Pressure or Stress	inches of water	0.2491	kPa
	psi	6.895	kPa
	psi	0.069	bar
Energy or Work	BTU	1055.0	Joules(J)
	lb-ft	1.3558	Joules(J)
	kiloWatt-hour	3,600,000 or 3.6×10^6	Joules(J)
Light	foot candle	10.764	lumens/square meter (lm/m^2)
Fuel Performance	miles/gal	0.4251	kilometers/liter (km/L)
	gal/mile	2.3527	liters/kilometer (L/km)
Velocity	mph	1.6093	kilometers/hour (km/h)
Length	inch	25.4	mm
	foot	0.3048	m
	yard	0.9144	m
	mile	1.609	km
Area	square inch (in^2)	645.2	mm^2
		6.45	cm^2
	square ft (ft^2)	0.0929	m^2
	square yard	0.8361	m^2
Volume	cubic inch (in^3)	16387.0	mm^3
		16.387	cm^3
		0.0164	liters (L)
	quart	0.9464	liters (L)
	gallon	3.7854	liters(L)
	cubic yard	0.7646	m^3
Mass	pound	0.4536	kg
	ton	907.18	kg
	ton	0.9078	tonne (t)
Force	kilogram	9.807	N
	ounce	0.2780	N
	pound	4.448	N
Temperature	degree Farenheit (˚F)	(˚F-32) 0.556	degree Celsius (˚C)

Revision 1, 8/10/2000

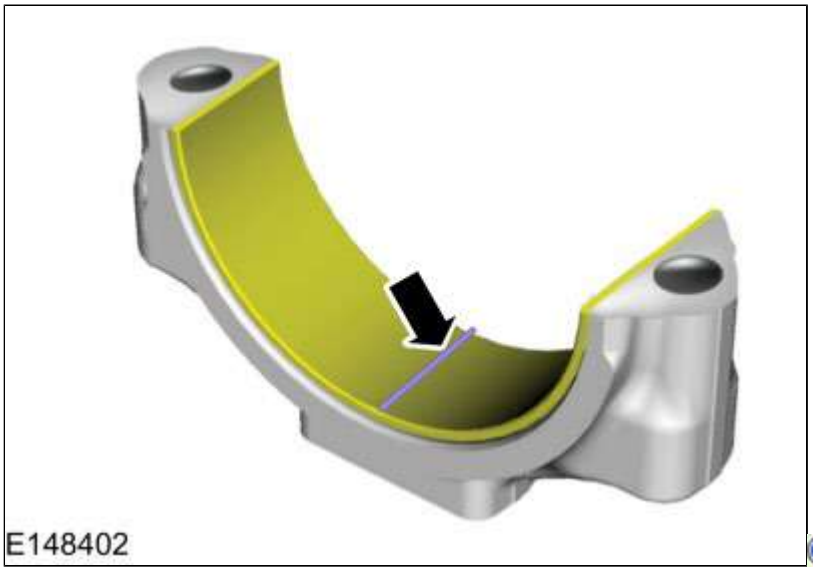
Connecting Rod Bearing Journal Clearance

NOTE: *Refer to the appropriate Section 303-01 for the specification.*

1. **NOTE:** *The crankshaft connecting rod journals must be within specifications to check the connecting rod bearing journal clearance.*

   Remove the connecting rod bearing cap and connecting rod bearing.

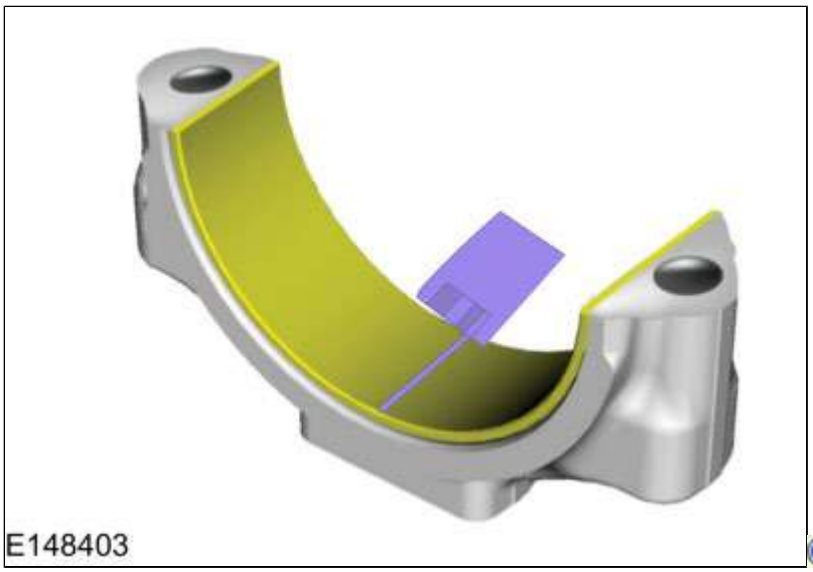
2. Position a piece of Plastigage across the bearing surface.



3. **NOTE:** *Do not turn the crankshaft during this step.*

   Install and tighten to specifications, then remove the connecting rod bearing cap.

4. Measure the Plastigage to get the connecting rod bearing journal clearance. The Plastigage should be smooth and flat. A changing width indicates a tapered or damaged connecting rod or connecting rod bearing.



Engine - Overview

Overview

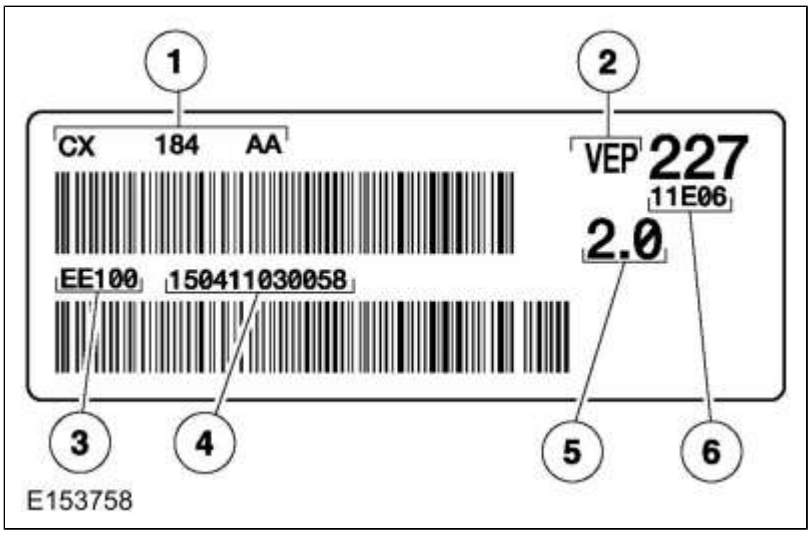
The 2.0L Gasoline Turbocharged Direct Injection (GTDI) 4-cylinder engine has the following features:

- Dual overhead camshafts
- Four valves per cylinder
- Composite intake manifold
- Aluminum cylinder head
- Aluminum cylinder block
- GTDI
- Twin Independent Variable Camshaft Timing (Ti-VCT)

Engine Identification

Always refer to these labels when installation of new parts is necessary or when checking engine calibrations. The engine parts often differ within a CID family. Verification of the identification codes will make sure the correct parts are obtained. These codes contain all the pertinent information relating to the dates, optional equipment and revisions.

Engine Code Information Label



Item	Description
1	Engine part number
2	Valencia Engine Plant
3	Plant code
4	Engine serial number
5	Engine displacement
6	Engine build date YYM(A-L)DD

Engine Cylinder Identification

Specifications

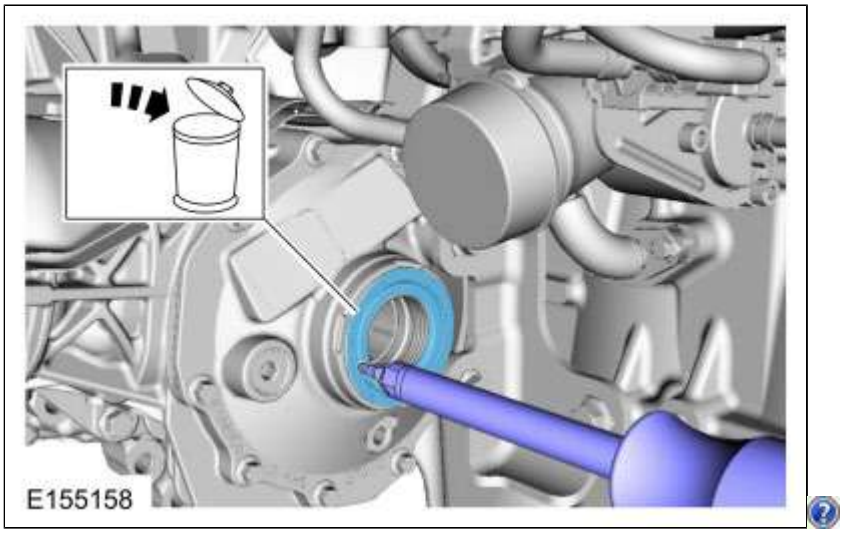
General Specifications

Item	Specification
Spark plug	12405
Spark plug gap	0.031 in (.8 mm)

Transfer Case Input Shaft Seal RH

Removal

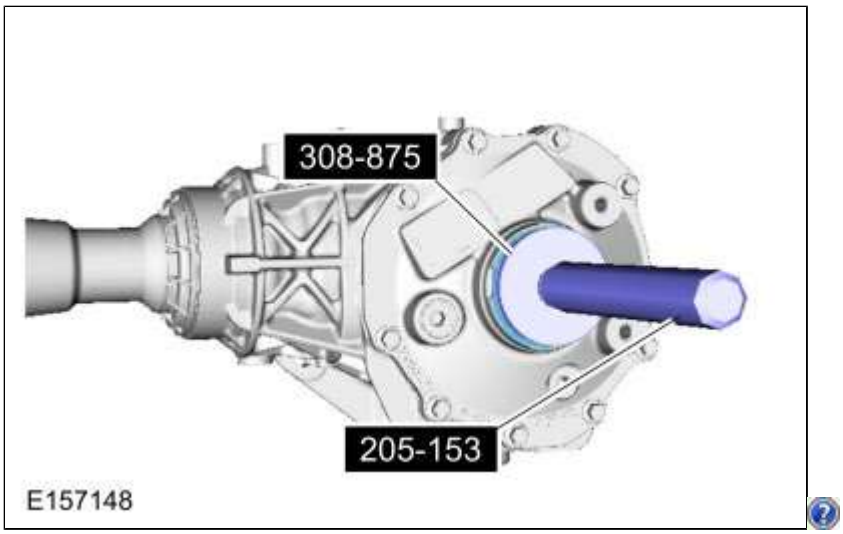
1. Refer to: Front Halfshaft RH (205-04 Front Drive Halfshafts, Removal and Installation).
2. *General Equipment* : Puller



Installation

1. **NOTE:** *The seal is correctly installed if it is flush with the transfer case cover.*

   Special Tool(s) : 308-875 Installer, Inboard Cover Seal , 205-153 (T80T-4000-W) Handle



2. Refer to: Front Halfshaft RH (205-04 Front Drive Halfshafts, Removal and Installation).

DTC	Description	Action
B1048:01	Brake Fluid Level Switch: General Electrical Failure	GO to Pinpoint Test I
B1048:7B	Brake Fluid Level Switch: Low Fluid Level	GO to Pinpoint Test I
B1178:01	Boot/Trunk Ajar Switch: General Electrical Failure	GO to Pinpoint Test AA
All other DTCs	-	REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing).

DTC Chart: Powertrain Control Module (PCM)

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods (100-00 General Information, Description and Operation).

DTC Chart - PCM

DTC	Description	Action
P0460	Fuel Level Sensor "A" Circuit	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, For single sender L-shaped fuel tank, GO to Pinpoint Test C For dual sender saddle-type fuel tank, GO to Pinpoint Test D
P0461	Fuel Level Sensor "A" Circuit Range/Performance	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, For single sender L-shaped fuel tank, GO to Pinpoint Test C For dual sender saddle-type fuel tank, GO to Pinpoint Test D
P0462	Fuel Level Sensor "A" Circuit Low	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, For single sender L-shaped fuel tank, GO to Pinpoint Test C For dual sender saddle-type fuel tank, GO to Pinpoint Test D
P0463	Fuel Level Sensor "A" Circuit High	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, For single sender L-shaped fuel tank, GO to Pinpoint Test C For dual sender saddle-type fuel tank, GO to Pinpoint Test D
P2065	Fuel Level Sensor "B" Circuit	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, GO to Pinpoint Test D
P2066	Fuel Level Sensor "B" Circuit Range/Performance	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, GO to Pinpoint Test D
P2067	Fuel Level Sensor "B" Circuit Low	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, GO to Pinpoint Test D
P2068	Fuel Level Sensor "B" Circuit High	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, GO to Pinpoint Test D
P25B0	Fuel Level Sensor "A" Stuck	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, For single sender L-shaped fuel tank, GO to Pinpoint Test C For dual sender saddle-type fuel tank, GO to Pinpoint Test D
P25B1	Fuel Level Sensor "B" Stuck	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, GO to Pinpoint Test D
P25B2	Fuel Level Sensor "A" or "B" Stuck	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. If sent here from the Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. manual, For single sender L-shaped fuel tank, GO to Pinpoint Test C For dual sender saddle-type fuel tank, GO to Pinpoint Test D
All other DTCs	-	Refer to Powertrain Control/Emissions Diagnosis (PC/ED) manual. Refer to the appropriate section in Group 303 for the procedure.

DTC Chart: RGTM

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods (100-00 General Information, Description and Operation).

DTC Chart - SCCM

DTC	Description	Action
B1306:11	Liftgate Ajar Switch: Circuit Short To Ground	GO to Pinpoint Test AA

Positive Lead	Measurement / Action	Negative Lead
Satellite radio antenna coaxial cable core at the ACM		Ground
Satellite radio antenna coaxial cable shield at the ACM		Ground

Is any voltage present?

Yes	REPAIR or INSTALL a new satellite radio antenna coaxial cable. REFER to: Satellite Radio Antenna Cable (415-00A Information and Entertainment System - General Information - Vehicles With: Touchscreen Display, Removal and Installation).
No	GO to C8

C8 CHECK THE SATELLITE RADIO ANTENNA COAXIAL CABLE CORE FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
Satellite radio antenna coaxial cable core at the ACM	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to C9
No	REPAIR or INSTALL a new satellite radio antenna coaxial cable. REFER to: Satellite Radio Antenna Cable (415-00A Information and Entertainment System - General Information - Vehicles With: Touchscreen Display, Removal and Installation).

C9 CHECK THE SATELLITE RADIO ANTENNA COAXIAL CABLE CORE AND SHIELD FOR AN OPEN

- Measure:

Positive Lead	Measurement / Action	Negative Lead
Satellite radio coaxial cable core at the ACM	Ω	Satellite radio antenna coaxial cable core at the satellite radio antenna unit
Satellite radio antenna coaxial cable shield at the ACM	Ω	Satellite radio antenna coaxial cable shield at the satellite radio antenna unit

Are the resistances less than 1 ohm?

Yes	GO to C10
No	REPAIR or INSTALL a new satellite radio antenna coaxial cable. REFER to: Satellite Radio Antenna Cable (415-00A Information and Entertainment System - General Information - Vehicles With: Touchscreen Display, Removal and Installation).

Park lamp status	GWM	MS-CAN	• DDM • FCIM • PDM • SODL • SODR
Passenger door ajar status	BCM	HS1-CAN	• PAM • PCM • GWM
Passenger door ajar status	GWM	HS2-CAN	• ABS module • CCM • IPMA • GSM
Passenger door ajar status	GWM	HS3-CAN	• IPC • DACMC
Passenger door lock switch status	PDM	MS-CAN	• GWM
Passenger door lock switch status	GWM	HS1-CAN	• BCM
Passenger mirror command	DDM	MS-CAN	• PDM
Passenger rear window lock command	DDM	MS-CAN	• PDM
Passenger restraints indicator request	RCM	HS2-CAN	• GWM
Passenger restraints indicator request	GWM	MS-CAN	• FCIM
Passenger seat active motion position data	SMCH	MS-CAN	• GWM
Passenger seat active motion position data	GWM	HS3-CAN	• APIM
Passenger window command	DDM	MS-CAN	• PDM
PATS control command	BCM	HS1-CAN	• PCM • SOBDMC
PATS start request target data	SOBDMC	HS1-CAN	• BCM • GWM
PATS start request target data	GWM	HS2-CAN	• ABS module
Perimeter alarm chime request	BCM	HS1-CAN	• GWM
Perimeter alarm chime request	GWM	HS3-CAN	• IPC
Power pack status	PCM	HS1-CAN	• ACCM • PAM • DCDC (HEV) • BCM • BECM • GWM
Power pack status	GWM	HS3-CAN	• IPC
Powertrain cooling message request	PCM	HS1-CAN	• GWM

Yes	GO to A10
No	INSTALL a new multifunction switch. REFER to: Steering Column Multifunction Switch LH (211-05 Steering Wheel and Column Electrical Components, Removal and Installation). If the concern is still present after the repair, GO to A11

A10 CHECK FOR CORRECT IPMA (IMAGE PROCESSING MODULE A) OPERATION

- Ignition OFF.
- Disconnect and inspect the IPMA connector.
- 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 IPMA connector. Make sure it seats and latches 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new IPMA. REFER to: Interior Rear View Mirror (501-09 Rear View Mirrors, Removal and Installation).
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.

A11 CHECK FOR CORRECT SCCM (STEERING COLUMN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect the SCCM 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 SCCM 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 Technical Service Bulletin (TSB) exists for this concern, DISCONTINUE this test and FOLLOW Technical Service Bulletin (TSB) instructions. If no Technical Service Bulletins (TSBs) address this concern, INSTALL a new SCCM. REFER to: Steering Column Control Module (SCCM) (211-05 Steering Wheel and Column Electrical Components, Removal and Installation).
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.

The Lane Keeping Aid Or Lane Keeping Alert Does Not Provide Feedback When Activated

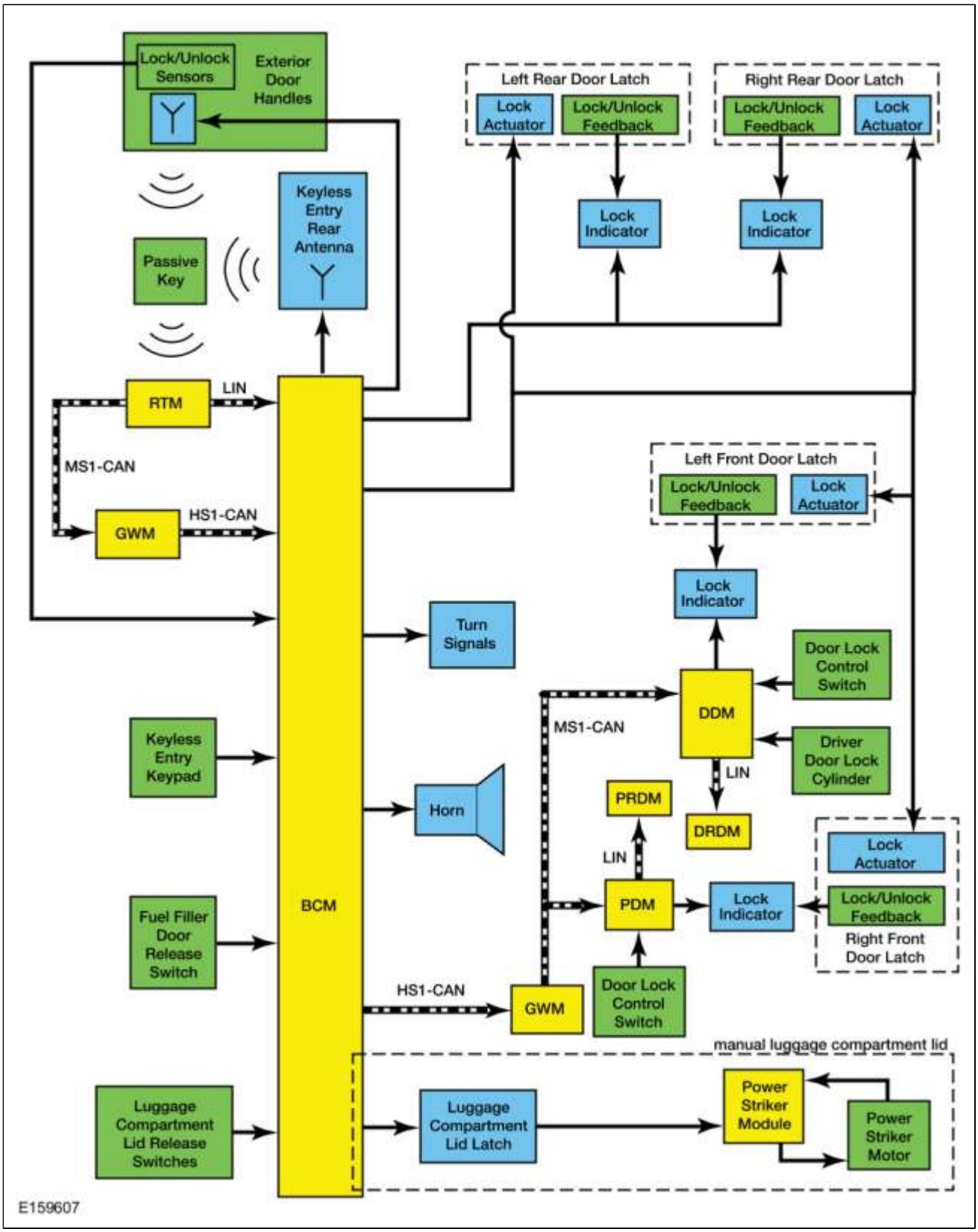
Normal Operation and Fault Conditions

The Lane Keeping System (LKS) only provides feedback when the vehicle speed is above 64 km/h (40 mph) and lane markings are detected on at least one side of the vehicle by the IPMA.
REFER to: Lane Departure Warning - System Operation and Component Description (419-07 Lane Departure Warning,

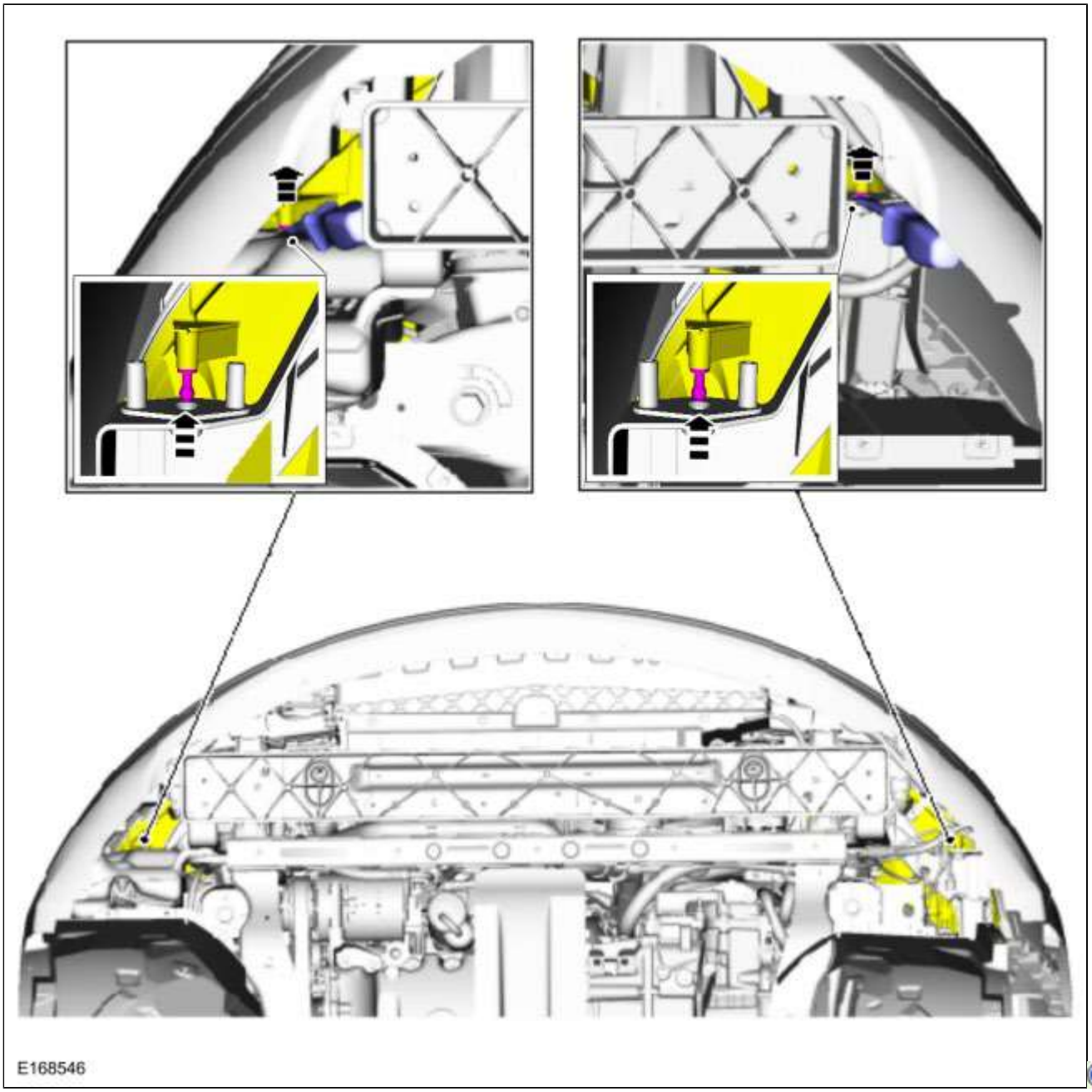
Handles, Locks, Latches and Entry Systems - System Operation and Component Description

System Operation

System Diagram



Network Message Chart



14. Remove the front bumper cover screws.

Is the resistance greater than 10,000 ohms?

Yes	GO to A12
No	REPAIR the circuits. Refer to Wiring Diagrams Cell 5 for schematic and connector information. GO to A17

A6 CHECK THE PASSENGER SAFETY BELT RETRACTOR PRETENSIONER CIRCUITS FOR AN OPEN

- Ignition OFF.
- Depower the SRS .
  REFER to: Supplemental Restraint System (SRS) Depowering and Repowering (501-20B Supplemental Restraint System, General Procedures).
- Disconnect Passenger Safety Belt Retractor Pretensioner C303 .
- Disconnect RCM C310A and C310B .
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C310B-9	Ω	C303-1
C310B-10	Ω	C303-2

Are the resistances less than 0.5 ohm?

Yes	GO to A7
No	REPAIR the circuit(s). Refer to Wiring Diagrams Cell 5 for schematic and connector information. GO to A17

A7 CHECK THE PASSENGER SEATBELT RETRACTOR PRETENSIONER DEPLOYMENT CONTROL DTC (DIAGNOSTIC TROUBLE CODE) FOR A FAULT STATUS CHANGE (OPEN INDICATED)

NOTE: *This pinpoint test step attempts to change the fault reported by the RCM by inducing a different fault condition. If the reported fault changes, this indicates the RCM is functioning correctly and is not the source of the fault.*

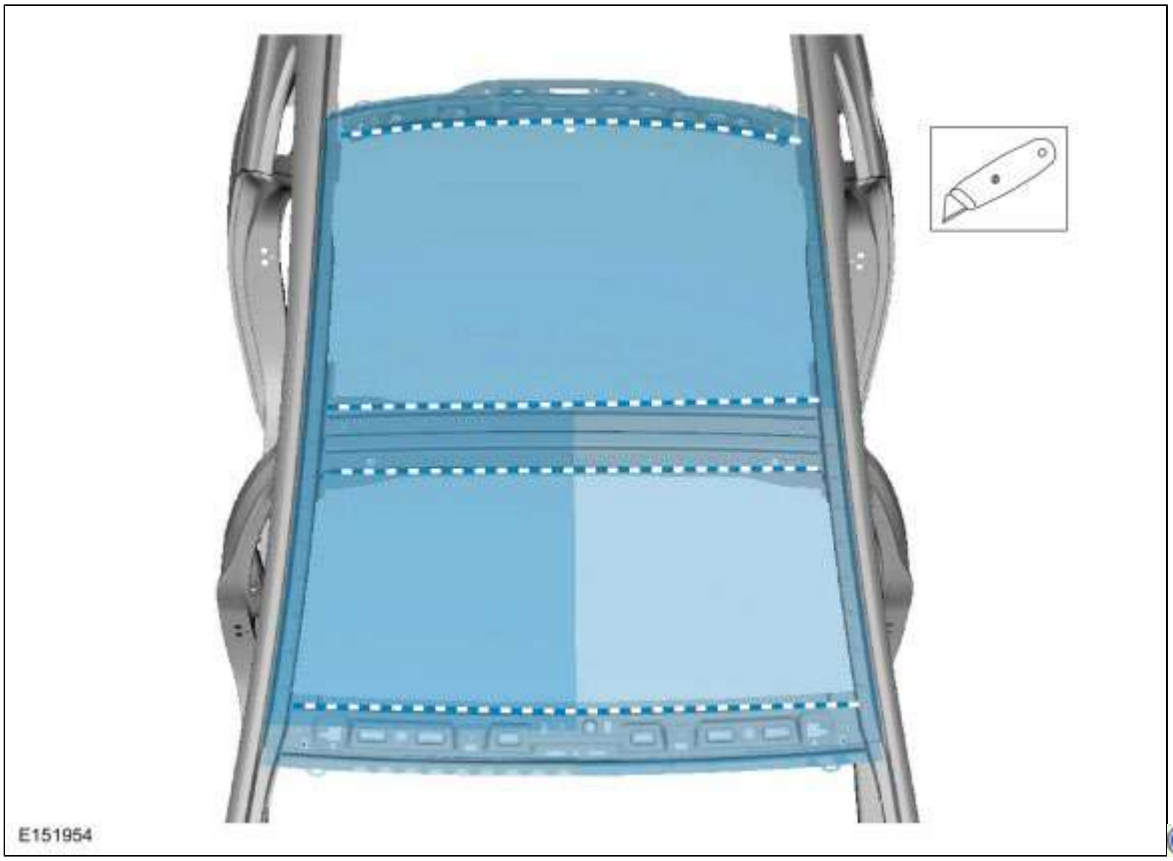
- Connect RCM C310A and C310B .
- Connect a fused jumper wire:

Lead 1	Measurement / Action	Lead 2
C303-1		C303-2

- Repower the SRS . Do not prove out the SRS at this time.
  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.
- DIAGNOSTIC TIP: When viewing Diagnostic Trouble Codes (DTCs) with the passenger safety belt retractor pretensioner circuits shorted together, a low resistance fault is normally retrieved.

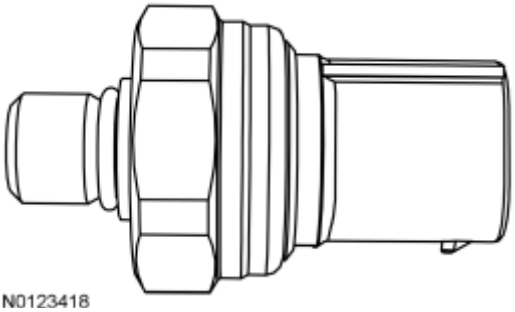
Did the on-demand DTC change from B007F:13 to B007F:1A?

Yes	REMOVE the fused jumper wire and GO to A11



14.

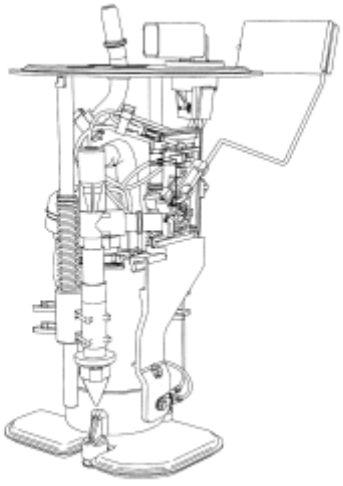
15. *General Equipment* : Grinder



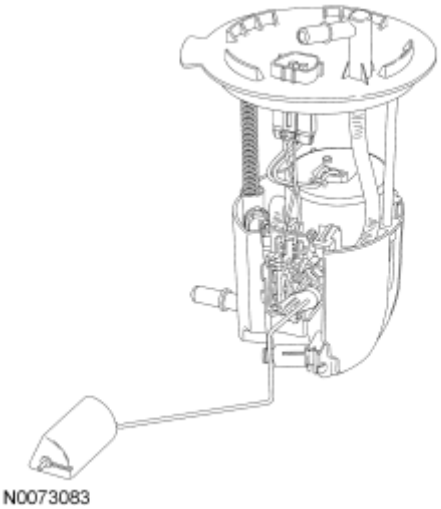
Typical Fuel Pressure Sensor

Fuel Pump (FP) Assembly

The FP assembly contains the fuel pump and sender assembly. The fuel pump is located inside the FP assembly reservoir and supplies fuel through the FP assembly manifold to the engine and FP assembly jet pump. The jet pump continuously refills the reservoir with fuel, and a check valve located in the manifold outlet maintains system pressure when the fuel pump is not energized. A flapper valve located in the bottom of the reservoir allows fuel to enter the reservoir and prime the fuel pump during the initial fill.



Typical Electronic Returnless FP Assembly



DK: Accelerator Pedal Position (APP) Sensor

DK: Introduction

DK1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCS)

Are DTCs P1575, P2104, P2121, P2122, P2123, P2126, P2127, P2128, P2131, P2132, P2133, or P2138 present?

Yes	No
For DTC P1575, GO to DK2 . For all others, GO to DK4 .	For a lack/loss of power, GO to DK3 . For all others, GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .

DK2 REPEAT THE KOEO SELF-TEST

Note: Make sure the accelerator pedal is not applied during the KOEO self-test.

- Ignition ON, engine OFF.
- Carry out the PCM self-test.

Are any DTCs present other than P1575?

Yes	No
DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .	GO to DK3 .

DK3 CHECK THE ACCELERATOR PEDAL FOR OBSTRUCTION

- Ignition ON, engine OFF.
- Press the accelerator pedal fully to the floor and release.

Does the pedal move freely to the floor and back?

Yes	No
GO to DK4 .	ISOLATE and REPAIR the obstruction. Clear the PCM DTCs. REPEAT the self-test.

DK4 CHECK THE APP SENSOR SIGNAL RANGES

- For Fiesta,
- Access the PCM and monitor the APP1__APP_D_ (PER) and APP2__APP_E_ (PER) PIDs.