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2019 Ford E-450 Super Duty Service and Repair Manual

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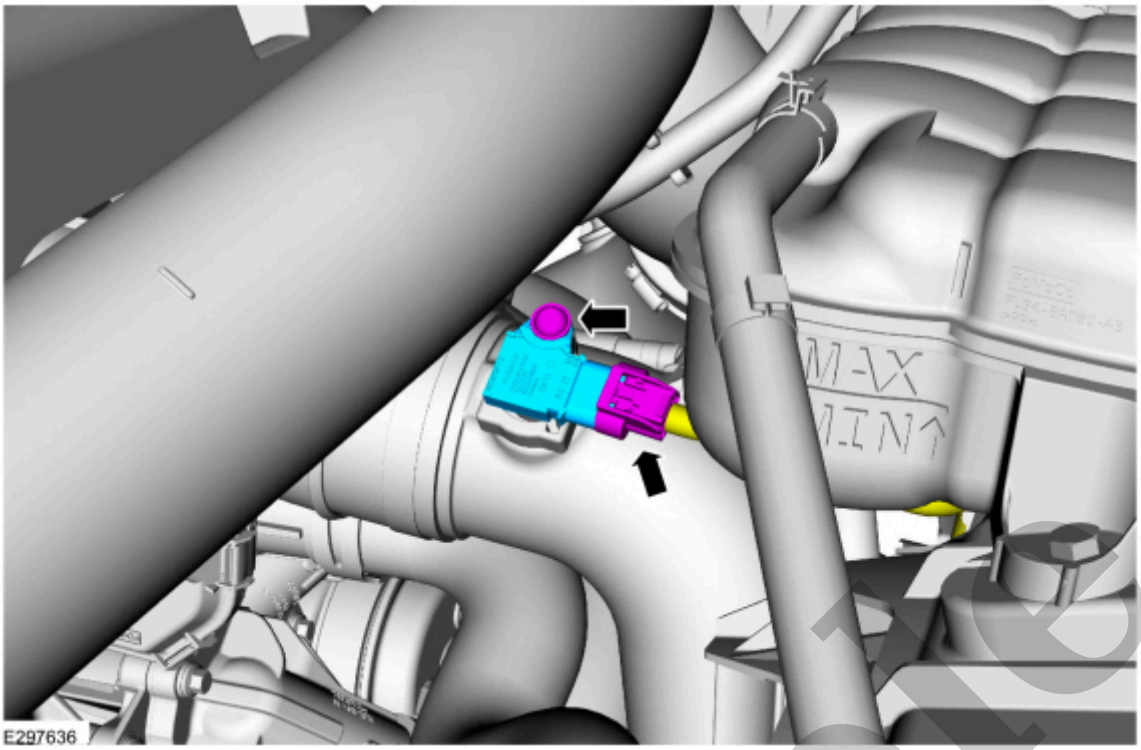
4. **NOTE**

   This step is only necessary when installing a new component.

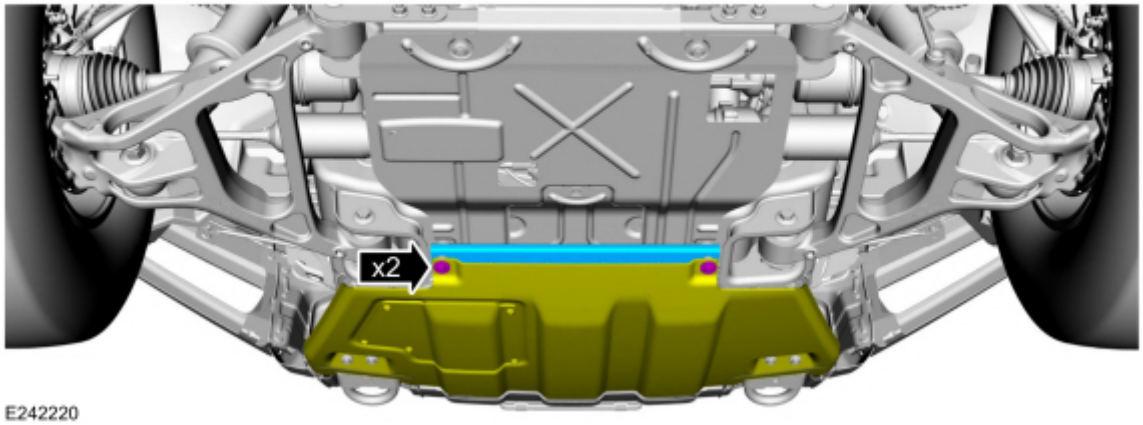
   Using the scan tool, perform the Misfire Monitor Neutral Profile Correction procedure, following the on-screen instructions.



Click here to learn about symbols, color coding, and icons used in this manual.

Installation

1. To install, reverse the removal procedure.



E242220

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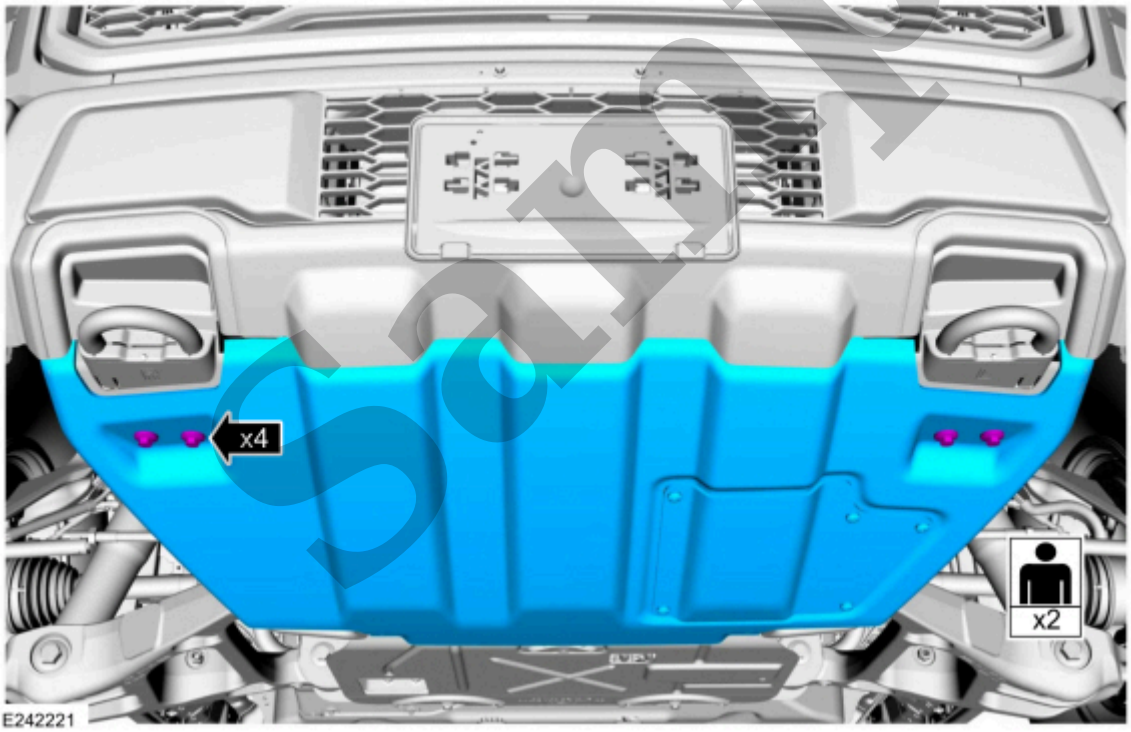
3. If equipped, remove the bolts and the front underbody skid plate.

   Torque : 35 lb.ft (48 Nm)



E242221

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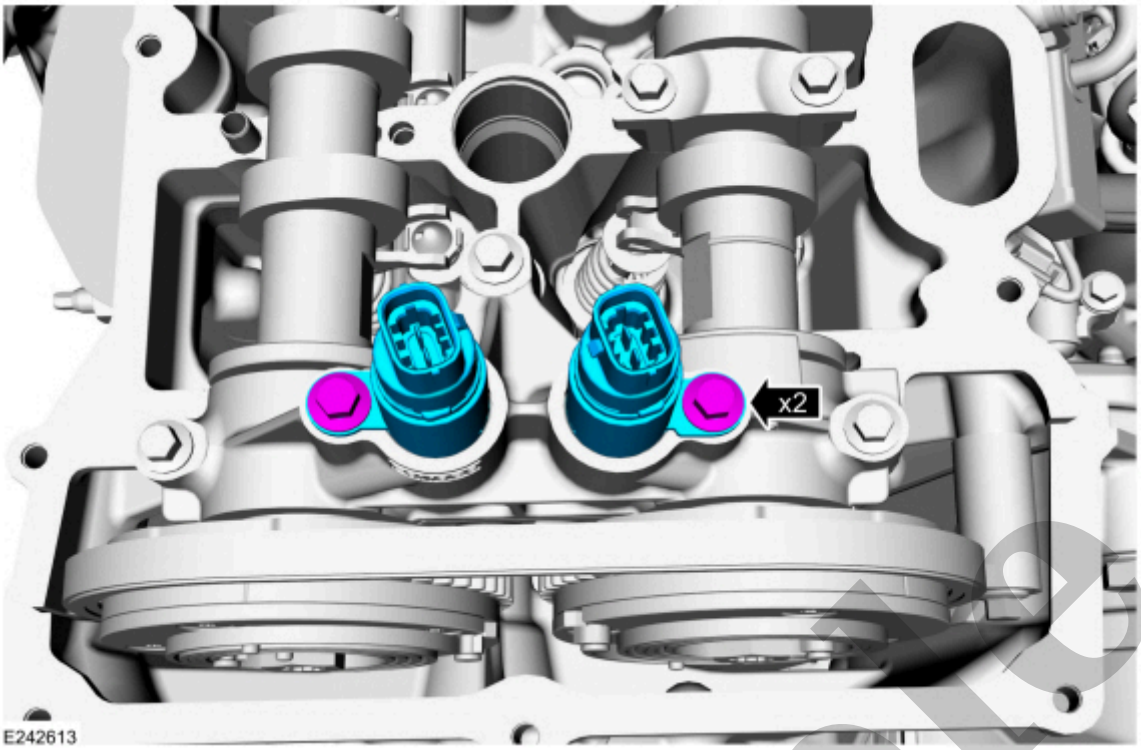
4. Disconnect the CAC (charge air cooler) to throttle body inlet pipe. Disconnect the quick connect coupling at the turbocharger bypass valve.

   Refer to: Quick Release Coupling(310-00A Fuel System - General Information - 2.7L EcoBoost (238kW/324PS), General Procedures).

Installation

1. To install, reverse the removal procedure.



Click here to learn about symbols, color coding, and icons used in this manual.

3. Remove the LH (left-hand) valve cover.

   Refer to: Valve Cover LH(303-01A Engine - 2.7L EcoBoost (238kW/324PS), Removal and Installation).

4. Remove the bolts and the LH (left-hand) VCT (variable camshaft timing) oil control solenoids.

   Torque : 89 lb.in (10 Nm)

Specifications

303-14C Electronic Engine Controls - 3.5L EcoBoost (BM)	***2022 F-150***
Specifications	***Procedure revision date: 12/2/2021***

Specifications

Reference Value Symptom Chart

NOTE

The Reference Value Symptom Chart provides guidance in selecting the appropriate parameter identification (PID) or measured signal related to the fault area. Select a symptom from the symptom chart along with the category number and go to the PID/Measured Signal Chart. For multiple symptoms, select the symptom that is the most evident.

Symptom Occurs During	Symptom	Category Number
Startup:	No start/Normal crank	1
	Hard start/Long crank	2
	Stall after start	3
	Diesels/Runs on	4
Idle:	MIL	5
	Stalls/Quits	6
	Slow	7
	Slow return	8

	Spark knock	18
	Cooling system temperature	19
	Poor fuel economy	20
	Emissions compliance	21
Deceleration:	Stalls/Quits	6
	Backfires	13

Reference Value Parameter Identification (PID)/Measured Signal Chart

NOTE

The following listing reflects PIDS and/or measured values which may reveal a possible concern within each system shown. Match the category number with the related PID/measured signal and go to the Typical Diagnostic Reference Value Charts.

Category Number	Related PIDS/Measured Signals
5, 10, 17	ACP
1, 23	APP1
1, 23	APP2
23	BOO1/BOO2
18, 19	CHT
1, 2, 3, 5, 6, 7, 11, 12, 13, 14, 15, 16, 17, 20, 21	CKP
1, 2, 3, 5, 6, 7, 11, 12, 13, 14, 15, 16, 17, 20, 21	CMP
10	CPP/PNP
3, 5, 6, 7, 9, 11, 15, 16, 20, 21	DPFEGR
4, 18, 19, 21, 22	ECT

1 through 23	MAF
1 through 23	MAP
1 through 22	MISF
1 through 21	O2S11/12/21/22
22	OSS
10	PSP
5	PTO
1 through 23	RPM
5, 14, 16, 17	SCICP
1 through 21	SHRTFT1/2/11/12/21/22
15, 16, 18, 19, 20, 21	SPARKADV [a]
1, 23	TP
2, 4, 5, 9, 10, 11, 16, 17, 18, 19, 20, 21	VCT
2, 4, 5, 9, 10, 11, 16, 17, 18, 19, 20, 21	VCTDC/VCTDC2
1, 2, 3, 5, 6, 11, 12, 13, 14	VPWR
22, 23	VSS

Typical Diagnostic Reference Values

NOTE

Footnotes are referenced throughout the Typical Diagnostic Reference Value Charts. A letter in parentheses next to a value indicates supplemental information is available. An attempt is made to provide as much information as possible. Some vehicles may not display all input and output signals. The Typical Diagnostic Reference Value Charts do not display fault parameter identifications (PIDs). These are PIDs which indicate a hard fault with the circuit. They display a value of FAULT or NO FAULT and are PIDs ending with the letter F. Reference values may vary 20% depending on operating conditions, altitude, and other factors. The RPM values are axle and tire dependent. Values are taken at an altitude of approximately 189 meters (620 ft) above sea level with the engine

(Accelerator Pedal Position D) (%)						
PCM (powertrain control module) APP2 (Accelerator pedal position sensor 2) (V)	VOLTS	APP Sensor	0.41	0.41	0.62	0.64
PCM (powertrain control module) APP2_[APP_E] (Accelerator Pedal Position E) (%)	%	APP Sensor	8	8	12	13
PCM (powertrain control module) APP_MAXDIFF (Maximum angle difference between (APP1) and (APP2)) (Deg)	DEG	PID	0.00	0.00	-0.06	-0.06
PCM (powertrain control module) BARO (Barometric Pressure) (kPa)	kPa (PSI)	PID	99.00 (14.36)	99.00 (14.36)	99.00 (14.36)	99.00 (14.36)
PCM (powertrain control module) BARO_V (Barometric pressure voltage) (V)	VOLTS	PID	3.86	3.86	3.86	3.85
PCM (powertrain control module) BATT_V_INF (Voltage at the Battery Terminals - Inferred) (V)	VOLTS	PID	12.94	14.50	14.50	14.50
PCM (powertrain control module) BRKOVRD_POSS (Number of Drive Cycles in which Brake Override Accelerator Action Possible) (Undefined / Not Used)	NUMERIC VALUE	PID	46	46	46	46
PCM (powertrain control module) BRKOVR_ACTION (Number of Drive Cycles where Brake Override	NUMERIC VALUE	PID	0	0	0	0