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2011 FORD Fusion European OEM Service and Repair Workshop Manual

Go to manual page

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

4. **NOTICE**

   Do not lift the cold plate by the coolant pipes or allow the cold plate to bend or component damage may occur.

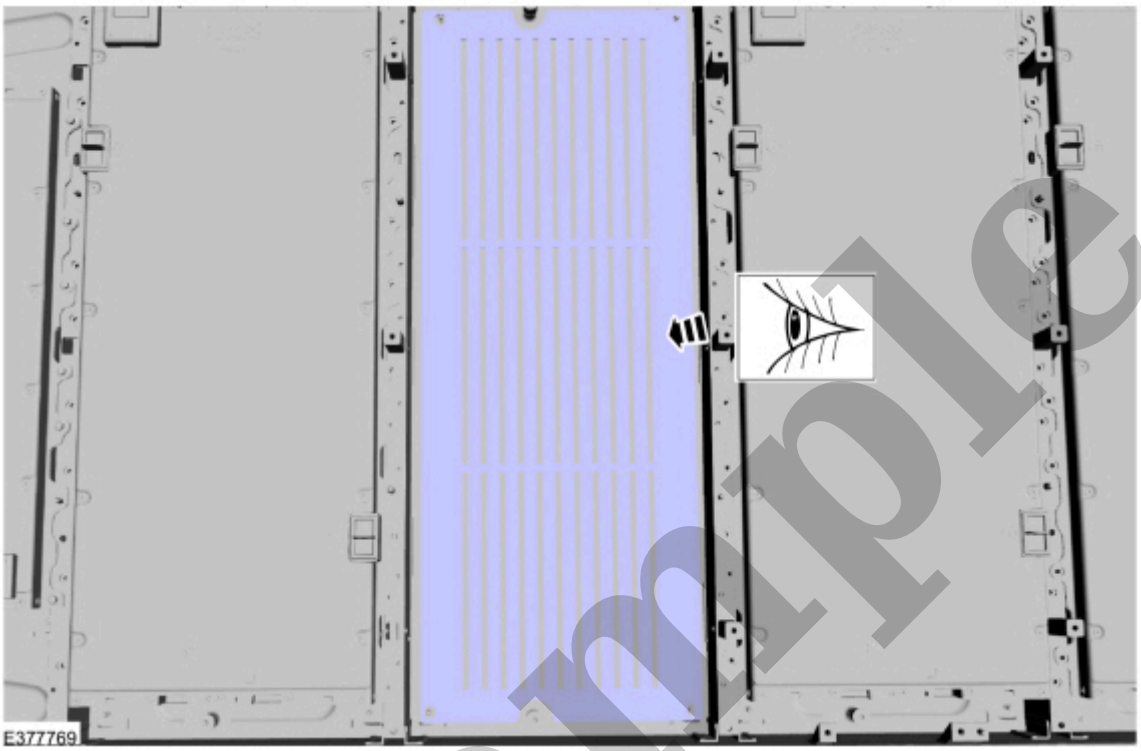
   Install the cooling plate and nuts.

   Torque : 80 lb.in (9 Nm)

6. **NOTE**

   Make sure the correct application template is used and is properly orientated. The template must be fully seated.

   Install the Thermal Interface Material (TIM) application template to the cold plate.



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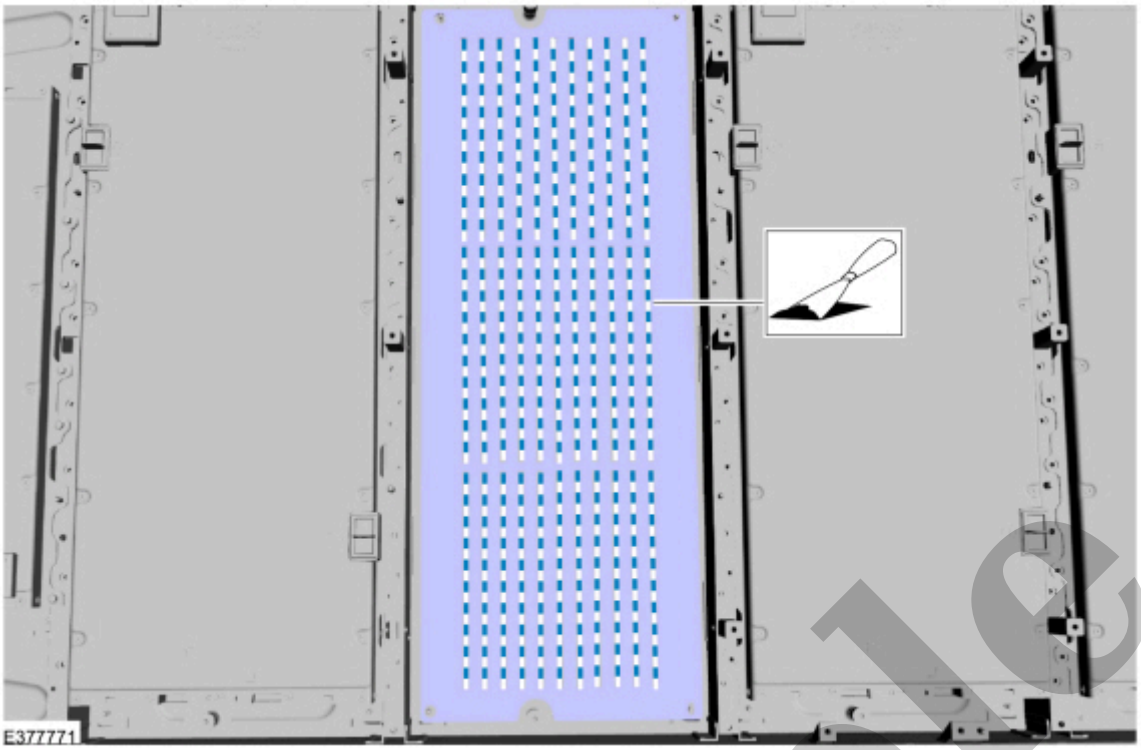
7. **NOTE**

   The high voltage battery modules must be installed within 2 hours of applying the Thermal Interface Material (TIM).

   NOTE

   The use of two 200 mL (6.7 oz) of Thermal Interface Material (TIM) cartridges are necessary when replacing a single high voltage battery module.

   NOTE



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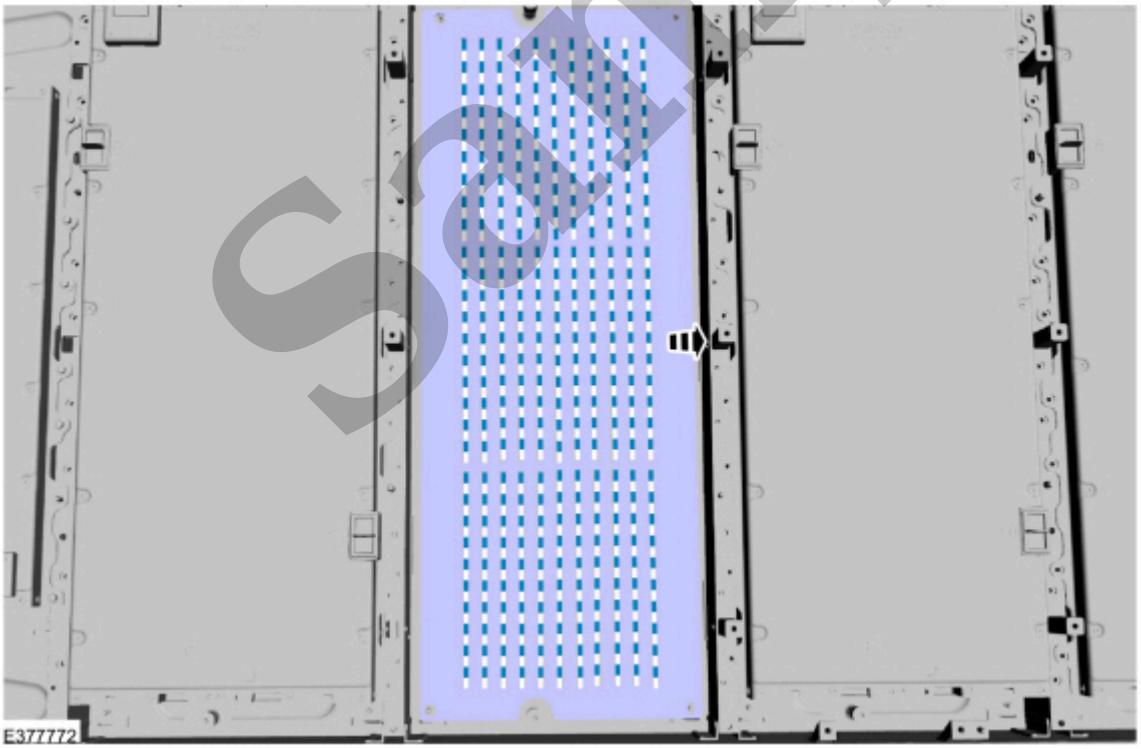
9. Remove the Thermal Interface Material (TIM) application template from the cold plate.



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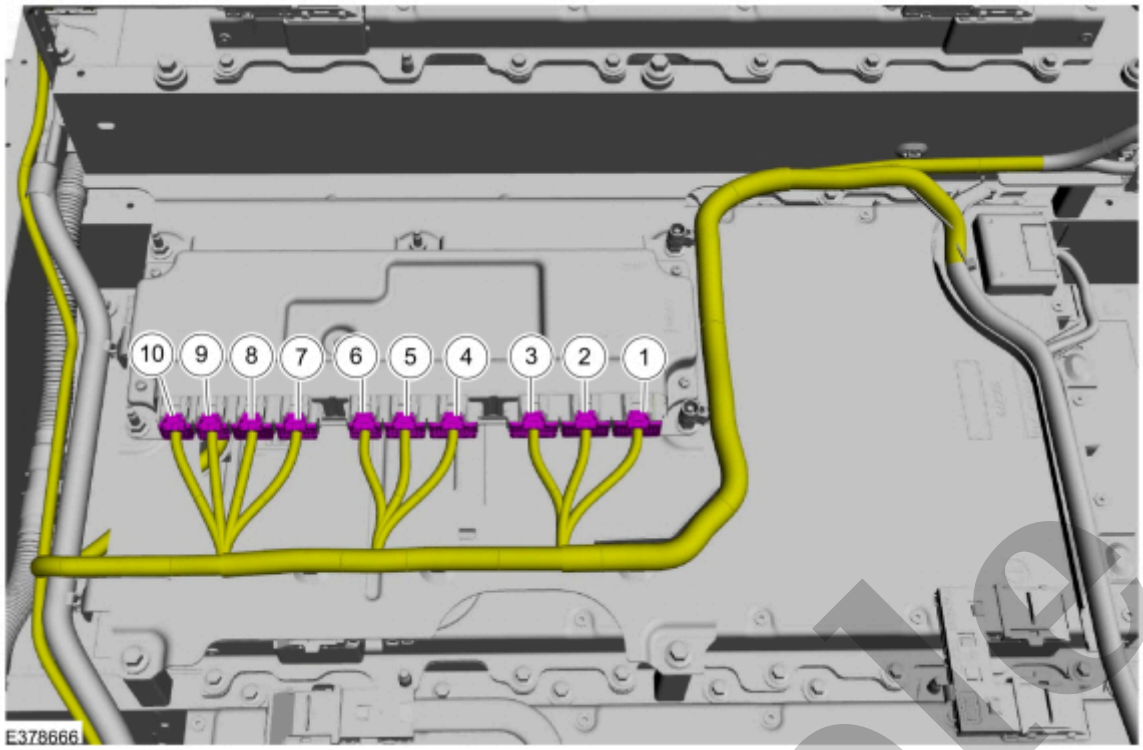

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12. **NOTE**

    The high voltage battery must be checked for coolant leaks before the high voltage battery cover is installed.

    Check the high voltage battery for coolant leaks.

    Refer to: High Voltage Battery Coolant Leak Check (302-03A Electrified Drivetrain Cooling, General Procedures).

Adaptive Steering - System Operation and Component Description

211-02 Power Steering	***2022 F-150***
Description and Operation	***Procedure revision date: 09/18/2020***

Adaptive Steering - System Operation and Component Description

System Operation

System Diagram

6	ADAS
7	PCM
8	PSCM
9	SASM
10	SCCM
11	RCM
12	FCIM
13	FDIM
14	GWM

Network Input Message Chart

SECM (steering effort control module) Network Input Messages

Broadcast Message	Originating Module	Message Purpose
Active front steering request	PSCM (power steering control module)	Requests steering angle changes for stability control events.
EPAS (electronic power assist steering) fail	PSCM (power steering control module)	Informs the SECM (steering effort control module) of an EPAS (electronic power assist steering) or PSCM (power steering control module) failure.
Lane keeping system status	IPMA (image processing module A)	The IPMA (image processing module A) is part of the Advanced Driver Assistance Systems (ADAS) module. Informs the SECM (steering effort control module) of the current lane keeping system status.
Odometer master value	IPC (instrument panel cluster)	This message is sent to the GWM (gateway module A) and then to the SECM (steering effort control module) . Provides the SECM

Vehicle yaw data	ABS (anti-lock brake system) module	Provides the SECM (steering effort control module) with vehicle yaw data for clear vision compensation.

Adaptive Steering System

The SECM (steering effort control module) controls the functions of the adaptive steering system and communicates with other modules through the SASM (steering angle sensor module) over the HS-CAN2 (high-speed controller area network 2) . The SECM (steering effort control module) and the SASM (steering angle sensor module) communicate over a private CAN (controller area network) .

To activate, the SECM (steering effort control module) requires the following:

- Battery voltage
- Ignition voltage
- Communication with other modules over the HS-CAN2 (high-speed controller area network 2)
- Power pack status message from the PCM (powertrain control module)

The SECM (steering effort control module) uses a motor to turn a toothed hub connected to the steering shaft to add or subtract incremental turns to the driver steering shaft input. At low speeds the same steering input from the driver delivers more front wheel angle, providing more low-speed agility. Low speed maneuvers require significantly less steering wheel rotation. At high speeds, straight line driving precision is increased, providing the driver with an improved highway driving experience and feel during moderate-to-high-speed cornering.

As the driver turns the steering wheel, the SASM (steering angle sensor module) detects the speed and direction of the steering wheel rotation and transmits this information to the SECM (steering effort control module) over a private CAN (controller area network) . The SECM (steering effort control module) responds by activating the motor in the appropriate direction and speed to change the turning ratio of the front wheels, thereby reducing the necessary number of steering wheel turns required by the driver.

The SECM (steering effort control module) is self-monitoring and is capable of setting and storing Diagnostic Trouble Codes (DTCs). Depending on the nature of the DTC (diagnostic trouble code) set, the SECM (steering effort control module) may send a request to the IPC (instrument panel cluster) to illuminate the adaptive steering system warning indicator and display a message in the message center, alerting the driver of a potential adaptive steering system concern. The warning message is sent over the HS-CAN2 (high-speed controller area network 2) to the GWM (gateway module A) where it is converted to a HS-CAN3 (high-speed controller area network 3) message and sent to the IPC (instrument panel cluster) over the HS-CAN3 (high-speed controller area network 3) .

Adaptive Steering Lock

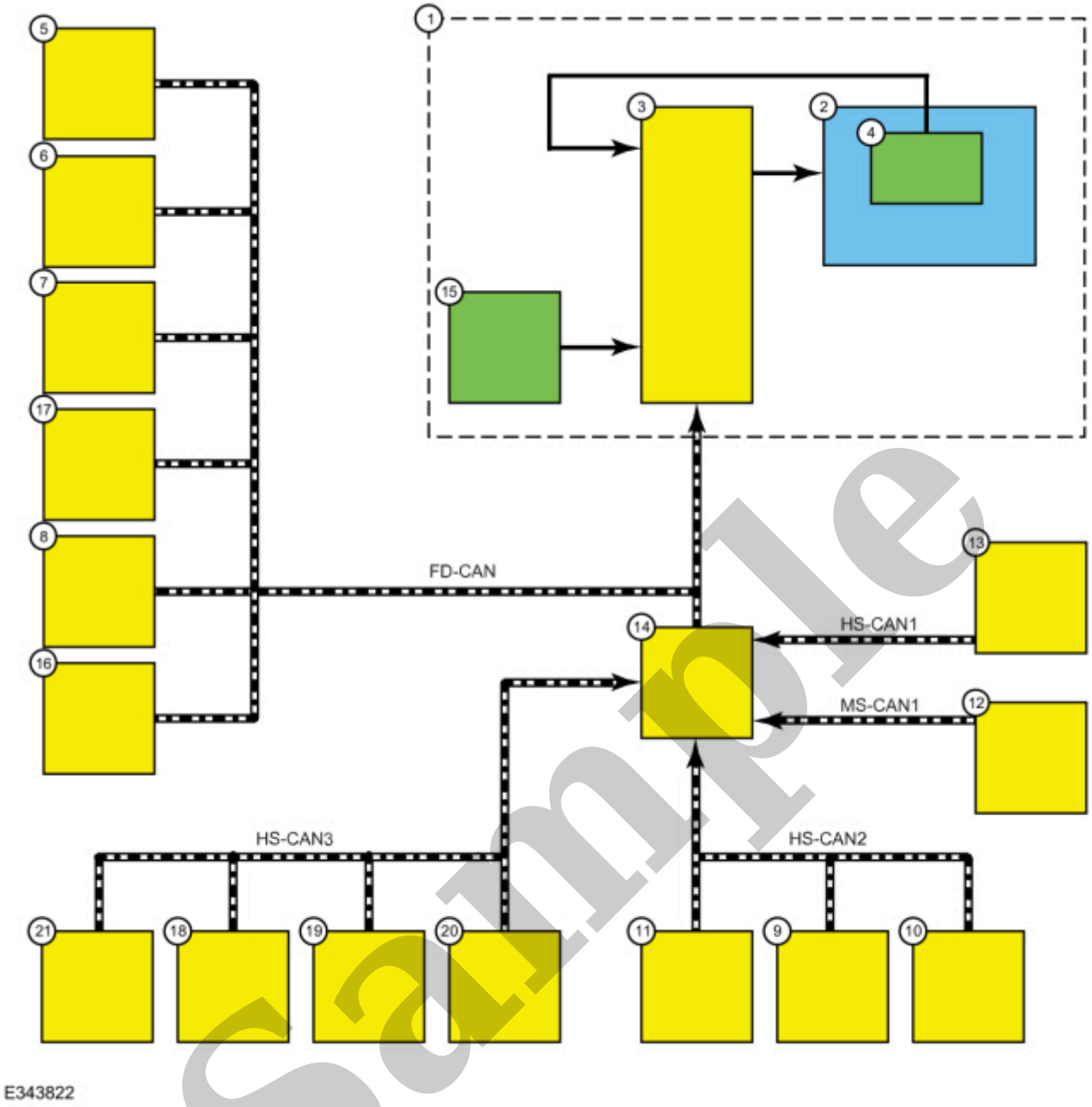
Power Steering - Overview

211-02 Power Steering	***2022 F-150***
Description and Operation	***Procedure revision date: 06/8/2018***

Power Steering - Overview

Overview

The EPAS (electronic power assist steering) system provides steering assist by replacing the conventional hydraulic valve system with a steering gear equipped with an integrated electrical motor and PSCM (power steering control module) . The motor operation and level of steering assist provided is controlled by the PSCM (power steering control module) .



Item	Description
1	EPAS (electronic power assist steering) Gear
2	Motor
3	PSCM (power steering control module)
4	Position Sensor
5	ABS (anti-lock brake system) Module