



TECHNICAL SERVICE BULLETIN

4WD - Grinding/Clicking/Ratcheting Noise From Front Wheel Area

22-2219

20 June 2022

This bulletin supersedes 21-2076.

This bulletin supersedes 20-2307.

Model:

Ford 2003-2020 Expedition	4WD
2006-2020 F-150	Non-Raptor 4WD
Lincoln 2003-2020 Navigator	4WD

Summary

This article supersedes TSB 20-2307 and 21-2076 to update the Issue, Action and Service Procedure.

Issue: Some 2003-2020 Expedition/Navigator and 2006-2020 F-150 (non-Raptor) vehicles equipped with 4WD may exhibit grinding/clicking/ratcheting noise from the front wheel area. This may be due to partial engagement of the integrated wheel ends (IWE). To correct this condition, follow the Service Procedure to remove and cap the vacuum supply line or to reprogram the transfer case control module (TCCM) and replace any worn vacuum and/or IWE components.

Action: Follow the Service Procedure steps to correct the condition on vehicles that meet the following criteria:

- One of the following vehicles:
 - 2003-2020 Expedition/Navigator equipped with torque-on-demand (TOD) transfer case (with 4A position on the mode selector switch [MSS])
 - 2006-2020 F-150 (non-Raptor) equipped with TOD transfer case (with 4A position on the MSS) (Figure 2)
 - 2013-2018 F-150 (non-Raptor) equipped with electronic shift on-the-fly (ESOF) 4WD (does not have a 4A position on the MSS) (Figure 1)
- Grinding/clicking/ratcheting noise from the front axle area

Parts

Service Part Number	Quantity	Description	Unit of Issue	Piece Quantity
W720613-S439	1	Caliper Anchor Bolt (2015-2018 F-150)	4	2 Per Affected Side
W714743-S439	1	Caliper Anchor Plate Bolt (2013-2014 F-150)	4	2 Per Affected Side
N802827-S100A	1	Front Half Shaft Nut (2016-2018 F-150 Built On Or After 3-Aug-2016)	4	1 Per Affected Side
N802827-S100	1	Front Half Shaft Nut (2013-2016 F-150 Built On Or Before 2-Aug-2016)	4	1 Per Affected Side
W520215-S441	1	Tie Rod Nut (2013-2014 F-150 Built On Or Before 23-Dec-2014)	4	1 Per Affected Side
W520215-S440	1	Tie Rod Nut (2014-2018 F-150 Built On Or After 24-Dec-2014)		
W520214-S440	1	Upper Ball Joint Nut (2013-2018 F-150)	2	1 Per Affected Side

7L1Z-3C247-A	1 Per Affected Side	IWE Actuator (2013-2015 F-150 Built On Or Before 11-Oct-2015, 2013-2015 Expedition/Navigator)	1	1 Per Affected Side
HL1Z-3C247-A	2	IWE Actuator (2015-2018 F-150 Built On Or After 12-Oct-2015)		
1104	1 Per Affected Side	Front Hub Bearing - Refer To The Parts Catalog For The VIN Specific Application	1	1 Per Affected Side
W706890-S439	1 Per Affected Side	Front Hub Bearing Bolts	4	4 Per Affected Side
HL1Z-3C247-B	1 Per Affected Side	IWE Clutch Ring Kit	1	1 Per Affected Side
3A788	1	3-Port Check Valve - Refer to the Parts Catalog For The VIN Specific Application	1	1
BL3Z-7A785-A	1	Vacuum Lines (2013-2014 F-150)	1	1
FL3Z-7A785-A	1	Vacuum Lines (2015-2018 F-150)	1	1
FL3Z-3C125-A	1	Vacuum Hose To IWE (2015-2018 F-150)	1	1
W716372-S300	1	Cap (2006-2020 F-150 With TOD Transfer Case, 2003-2020 Expedition/Navigator)	4	2
XG-1-E1	As Needed	Motorcraft® Premium Long-Life Grease		

Warranty Status: Eligible under provisions of New Vehicle Limited Warranty (NVLW)/Service Part Warranty (SPW)/Special Service Part (SSP)/Extended Service Plan (ESP) coverage. Limits/policies/prior approvals are not altered by a TSB. NVLW/SPW/SSP/ESP coverage limits are determined by the identified causal part and verified using the OASIS part coverage tool.

Labor Times

Description	Operation No.	Time
Diagnose And Replace Any Worn Vacuum And/Or IWE Components Following The Service Procedure	MT222219	Actual Time

Repair/Claim Coding

Causal Part:	3C247
Condition Code:	D4

Service Procedure

1. Does the vehicle have a MSS that only includes 2H, 4H and 4L positions (does not include 4A)? (Figure 1)

Figure 1 - Example of MSS without 4A selection



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- (1). Yes - proceed to Step 2.
 - (2). No - proceed to Step 4.
2. Is the vehicle a 2017-2018 F-150?
- (1). Yes - reprogram the TCCM using the latest version of the appropriate Ford scan tool.

NOTE: The new TCCM calibration changes IWE operation at start up. When ambient temperature is above 0°C (32°F) the IWEs stay engaged regardless of a 4WD mode selection for approximately 0.8 km (0.5 miles). IWE engagement only occurs once per key cycle and is not reset when shifting between PARK and DRIVE. The TCCM uses this strategy to delay vacuum use until vacuum-intensive engine startup has completed and sufficient vacuum is available to fully disengage IWEs.

(2). No - refer to the 2018 F-150 Workshop Manual (WSM), Section 308-07A Four-Wheel Drive Systems, Diagnosis and Testing, Four-Wheel Drive Systems - Vehicles With: Electronic Shift Transfer Case, Pinpoint Test N for normal diagnostics. Repair is complete.

3. Perform the vacuum system check procedure.

(1). For 2017 vehicles, refer to WSM, Section 308-07A Four-Wheel Drive Systems, Diagnosis and Testing, Four-Wheel Drive Systems - Vehicles With: Electronic Shift Transfer Case Pinpoint Test E. Repair is complete.

(2). For 2018 vehicles, refer to WSM, Section 308-07A Four-Wheel Drive Systems, Diagnosis and Testing, Four-Wheel Drive Systems - Vehicles With: Electronic Shift Transfer Case Pinpoint Test N. Repair is complete.

4. Does the vehicle have a MSS that includes a 4-wheel auto (4A) option? (Figure 2)

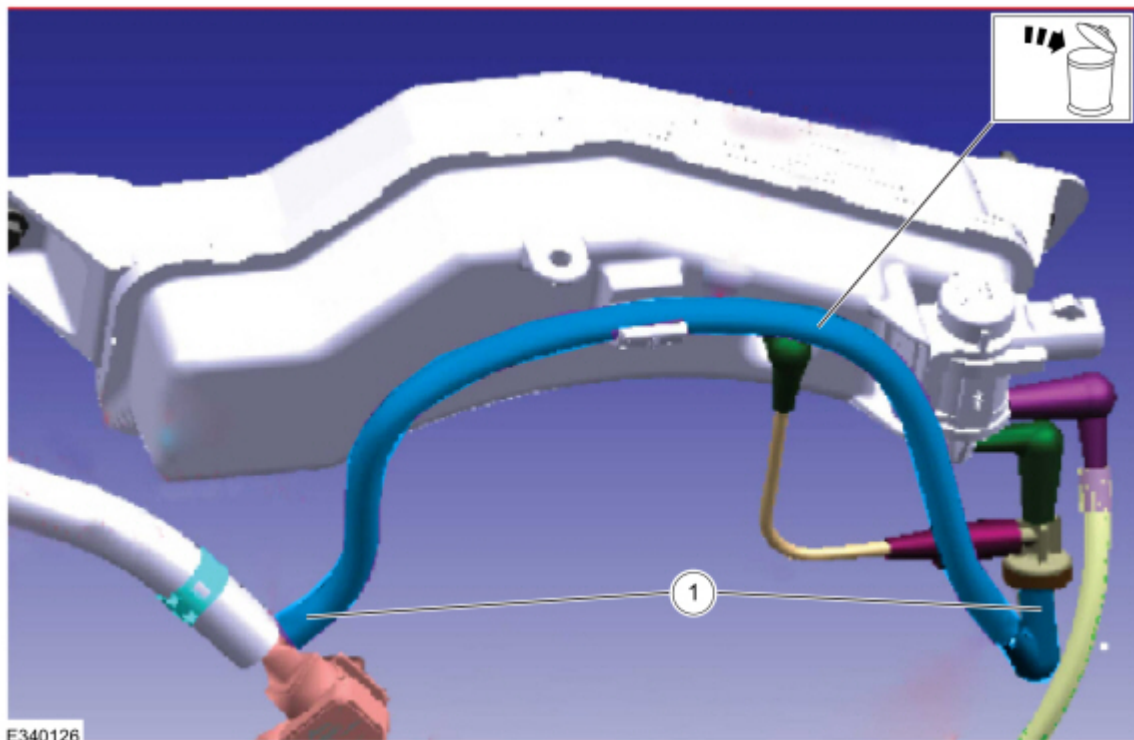
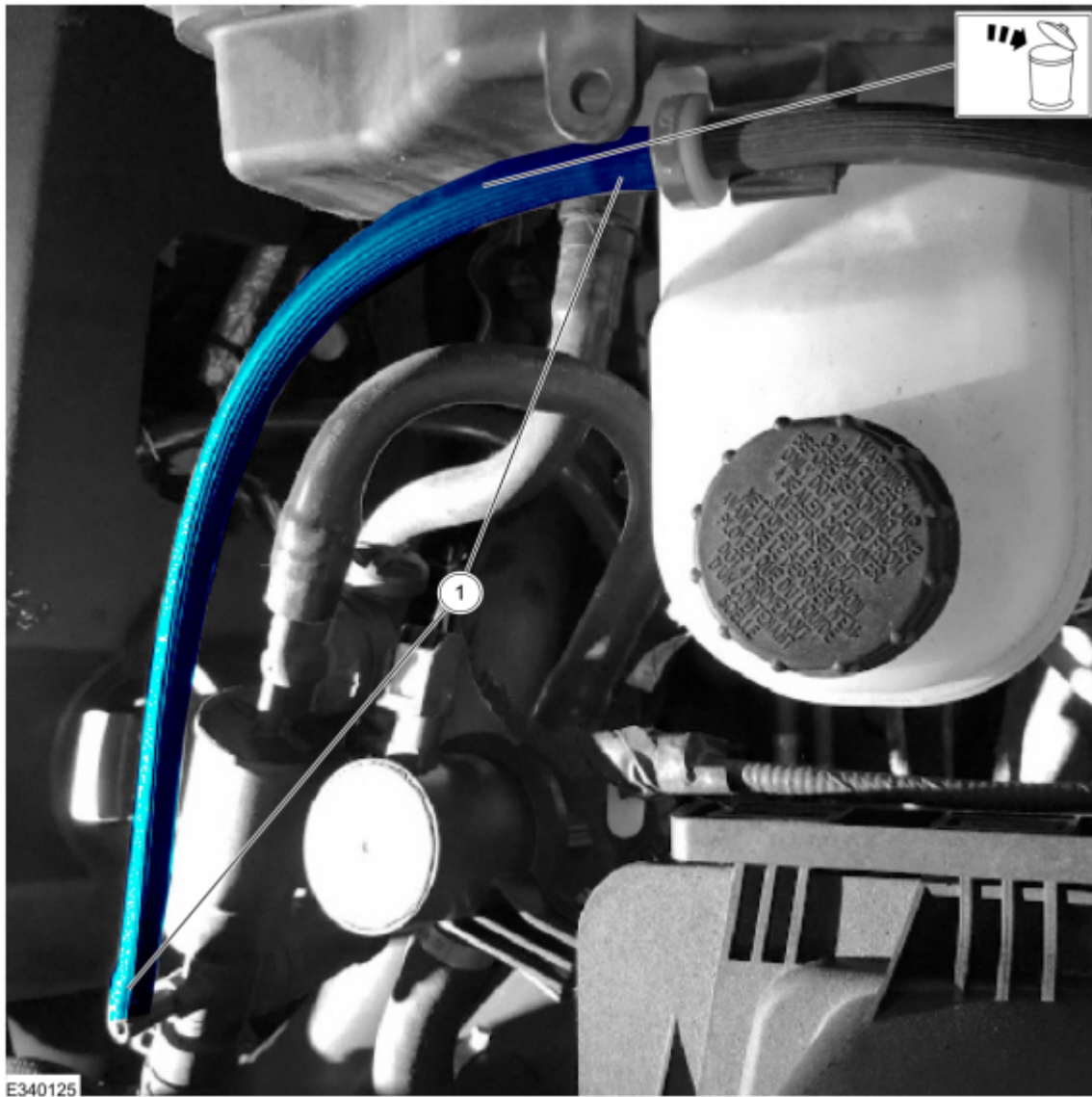
Figure 2 - Example of MSS with 4A selection



(1). Yes - proceed to Step 5

(2). No - this article does not apply. Refer to the Workshop Manual (WSM) for normal diagnostics.

5. Locate the vacuum supply line between the source vacuum and the IWE check valve. Refer to WSM, Section 308-07A. (Figures 3-4)



6. Remove the vacuum supply line.

7. Install the vacuum caps at the IWE check valve and the vacuum source.

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