

# Your Ultimate Source for OEM Repair Manuals

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## 2013 FORD Expedition OEM Service and Repair Workshop Manual

[Go to manual page](#)

Start/Run/Move > Noise > Moving/Driving > Always	<a href="#">GO to Pinpoint Test I</a>
Start/Run/Move > Noise > Moving/Driving > Always	<a href="#">GO to Pinpoint Test J</a>
Start/Run/Move > Noise > Moving/Driving > Always	<a href="#">GO to Pinpoint Test K</a>
Start/Run/Move > Noise > Moving/Driving > Always	<a href="#">GO to Pinpoint Test L</a>
Start/Run/Move > Noise > Moving/Driving > Always	<a href="#">GO to Pinpoint Test M</a>
Start/Run/Move > Noise > Moving/Driving > Always	<a href="#">GO to Pinpoint Test N</a>
Start/Run/Move > Noise > Moving/Driving > Always	<a href="#">GO to Pinpoint Test O</a>
Start/Run/Move > Vibration > Moving/Driving > Intermittent	<a href="#">GO to Pinpoint Test P</a>

## Pinpoint Tests

### PINPOINT TEST A : AXLE OVERHEATING

#### Normal Operation and Fault Conditions

REFER to: [Front Drive Axle and Differential](#)(205-03 Front Drive Axle/Differential, Description and Operation).

#### Possible Sources

- Axle lubricant low
- Incorrect or contaminated lubricant type
- Bearing preload adjusted too tight
- Excessive gear wear
- Incorrect ring gear backlash

#### A1 CHECK AXLE LUBRICANT LEVEL

- Inspect all the axle gears for wear or damage.

**Was wear or damage found?**

<b>Yes</b>	<p>Install new components as necessary.</p> <p>REFER to: <a href="#">Differential Ring Gear and Pinion</a> (205-03 Front Drive Axle/Differential, Removal and Installation).</p> <p>REFER to: <a href="#">Differential Carrier</a> (205-03 Front Drive Axle/Differential, Disassembly and Assembly).</p>
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<b>No</b>	GO to <a href="#">A5</a>
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**A5 INSPECT THE RING GEAR FOR SCORING**

- Inspect the ring gear for scoring.

**Was a wear pattern found on the ring and pinion?**

<b>Yes</b>	<p>REFER to: <a href="#">Differential Ring Gear and Pinion</a>(205-03 Front Drive Axle/Differential, Removal and Installation).</p>
<b>No</b>	Inspect the vehicle for any other symptoms related to the axle.

**PINPOINT TEST B : BROKEN GEAR TEETH ON THE RING GEAR OR PINION**

**Normal Operation and Fault Conditions**

REFER to: [Front Drive Axle and Differential](#)(205-03 Front Drive Axle/Differential, Description and Operation).

Broken gear teeth on the ring or pinion gear can be the result of vehicle overloading, insufficient axle lubricant, contaminated axle lubricant, or incorrect axle lubricant.

**Possible Sources**

- Debris in axle
- Overloading the vehicle

**B1 INSPECT THE RING GEAR OR PINION GEARS FOR BROKEN GEAR TEETH**

- Inspect the ring gear or pinion gears for broken gear teeth.

## Was wear or damage found?

<b>Yes</b>	Install new components as necessary. REFER to: <a href="#">Differential Carrier</a> (205-03 Front Drive Axle/Differential, Disassembly and Assembly).
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<b>No</b>	Inspect the vehicle for any other symptoms related to the axle.
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## PINPOINT TEST D : FRONT AXLE DOES NOT ENGAGE

### Normal Operation and Fault Conditions

REFER to: [Front Drive Axle and Differential](#)(205-03 Front Drive Axle/Differential, Description and Operation).

### Possible Sources

- Mode Switch
- 4X4 control module
- Differential
- Integrated Wheel End (IWE)
- TCCM (Transfer Case Control Module)
- Wiring

## D1 CHECK THE ELD (ELECTRONIC LOCKING DIFFERENTIAL) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, carry out the TCCM self-test.

### Are there any Diagnostic Trouble Codes (DTCs) present?

<b>Yes</b>	REFER to: <a href="#">Four-Wheel Drive Systems - Vehicles With: 2-Speed Torque On Demand Transfer Case</a> (307-07A Four-Wheel Drive Systems, Diagnosis and Testing). REFER to: <a href="#">Four-Wheel Drive Systems - Vehicles With: Electronic Shift Transfer Case</a> (307-07A Four-Wheel Drive Systems, Diagnosis and Testing).
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<b>No</b>	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.
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- Inspect axle housing vent for blockage.

**Was blockage found?**

<b>Yes</b>	Clean the axle housing vent.
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<b>No</b>	GO to <a href="#">F2</a>
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**F2 INSPECT THE PINION SEAL AND DUST SLINGER**

- Inspect for damage to seal contact area or dust slinger.

**Was any damage found?**

<b>Yes</b>	Install a new pinion flange and the pinion seal. REFER to: <a href="#">Drive Pinion Flange and Seal</a> (205-03 Front Drive Axle/Differential, Removal and Installation).
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<b>No</b>	The system is operating correctly at this time.
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**PINPOINT TEST G : AXLE HOWLING OR WHINE**

**Normal Operation and Fault Conditions**

REFER to: [Front Drive Axle and Differential](#)(205-03 Front Drive Axle/Differential, Description and Operation).

**Possible Sources**

- Axle lubricant low
- Axle housing damage
- Damaged, worn or incorrect ring and pinion gear contact

**G1 CHECK THE LUBRICANT LEVEL**

- Check the lubricant level.

**Is the lubricant level low?**

<b>Yes</b>	Fill the axle to specification. REFER to: <a href="#">Differential Fluid Level Check</a>
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- Axle lubricant level
- Excessive backlash in the axle

## H1 CHECK THE LUBRICATION LEVEL

- Check the lubricant level.

### Is the lubricant level low?

<b>Yes</b>	Fill the axle to specification. REFER to: <a href="#">Differential Fluid Level Check</a> (205-03 Front Drive Axle/Differential, General Procedures).
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<b>No</b>	GO to <a href="#">H2</a>
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## H2 CHECK FOR EXCESSIVE AXLE BACKLASH

- Check for excessive axle backlash.

### Is there excessive axle backlash?

<b>Yes</b>	Adjust backlash as necessary. REFER to: <a href="#">Differential Ring Gear and Pinion</a> (205-03 Front Drive Axle/Differential, Removal and Installation).
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<b>No</b>	Inspect the vehicle for any other symptoms related to the axle.
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## PINPOINT TEST I : DRIVELINE CLUNK- OCCURS AS THE VEHICLE STARTS TO MOVE FORWARD FOLLOWING A STOP

### Normal Operation and Fault Conditions

REFER to: [Front Drive Axle and Differential](#)(205-03 Front Drive Axle/Differential, Description and Operation).

### Possible Sources

- Pinion gears

## I1 INSPECT PINION GEARS

### Normal Operation and Fault Conditions

REFER to: [Front Drive Axle and Differential](#)(205-03 Front Drive Axle/Differential, Description and Operation).

#### Possible Sources

- Loose rear axle mount bolts
- Loose suspension fasteners

### K1 CHECK FOR LOOSE BOLTS

- Check for loose bolts.

#### Are any bolts loose?

<b>Yes</b>	Tighten to specifications. REFER to: <a href="#">Axle Assembly</a> (205-03 Front Drive Axle/Differential, Removal and Installation).
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<b>No</b>	The system is operating correctly at this time.
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### PINPOINT TEST L : HOWL- CAN OCCUR AT VARIOUS SPEEDS AND DRIVING CONDITIONS (AFFECTED BY ACCELERATION AND DECELERATION)

### Normal Operation and Fault Conditions

REFER to: [Front Drive Axle and Differential](#)(205-03 Front Drive Axle/Differential, Description and Operation).

#### Possible Sources

- Incorrect ring and pinion contact
- Bearing preload
- Gear damage

### L1 INSPECT RING AND PINION, BEARING PRELOAD AND FOR GEAR DAMAGE

- Inspect ring and pinion, bearing preload and for gear damage.

#### Was ring and pinion or bearing preload out of specification?

<b>Yes</b>	Adjust as necessary. REFER to: <a href="#">Differential Carrier</a> (205-03 Front Drive Axle/Differential, Removal and Installation).
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### Possible Sources

- Gear tooth damage to the driver side of the ring and pinion

### N1 INSPECT FOR TOOTH DAMAGE ON RING AND PINION

- Inspect for tooth damage on ring and pinion.

#### Was any damage found?

<b>Yes</b>	Install a new ring and pinion as necessary. REFER to: <a href="#">Differential Ring Gear and Pinion</a> (205-03 Front Drive Axle/Differential, Removal and Installation). REFER to: <a href="#">Differential Carrier</a> (205-03 Front Drive Axle/Differential, Removal and Installation). REFER to: <a href="#">Differential Carrier</a> (205-03 Front Drive Axle/Differential, Disassembly and Assembly).
<b>No</b>	Inspect the vehicle for any other symptoms related to the axle.

### PINPOINT TEST O : SCRAPING NOISE- A CONTINUOUS LOW PITCHED NOISE STARTING AT LOW SPEED

#### Normal Operation and Fault Conditions

REFER to: [Front Drive Axle and Differential](#)(205-03 Front Drive Axle/Differential, Description and Operation).

#### Possible Sources

- Damaged pinion bearings
- Worn pinion bearings

### O1 INSPECT PINION BEARINGS

- Inspect pinion bearings.

#### Was wear or damage found?

<b>Yes</b>	Install new pinion bearings as necessary. REFER to: <a href="#">Differential Ring Gear and Pinion</a> (205-03 Front Drive Axle/Differential, Removal and Installation).
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- Check the rear axle for loose bolts.

**Were any bolts loose?**

<b>Yes</b>	Tighten the bolts as necessary. REFER to: <a href="#">Axle Assembly</a> (205-03 Front Drive Axle/Differential, Removal and Installation).
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<b>No</b>	GO to <a href="#">P3</a>
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**P3 CHECK FOR CORRECT DRIVELINE ANGLES**

- Check for correct driveline angles.  
REFER to: [Driveshaft Angle Measurement](#)(205-01 Driveshaft, General Procedures).

**Are the driveline angles correct?**

<b>Yes</b>	Inspect the vehicle for any other symptoms related to the axle.
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<b>No</b>	Repair as necessary.
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**Axle Fluid Analysis**

The appearance of milky or gray axle fluid in early mileage axles is a result of white marking compound used at the assembly plant to verify gear mesh contact pattern. The marking compound within the fluid will darken some over time. The milky fluid appearance will diminish and cause no harm and does not require a fluid change.

**Analysis of Leakage**

Clean up the leaking area enough to identify the exact source.

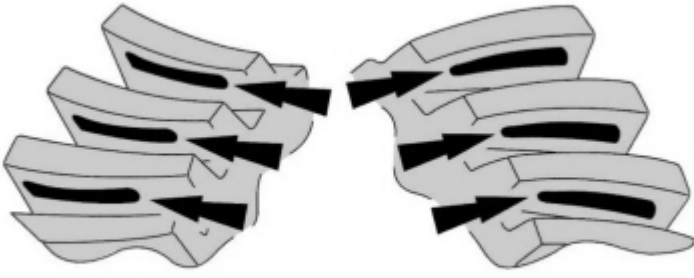
A plugged front axle housing vent can cause excessive pinion seal lip wear due to internal pressure buildup.

Verify the differential lubricant level is at the correct level.

REFER to: [Differential Fluid Level Check](#)

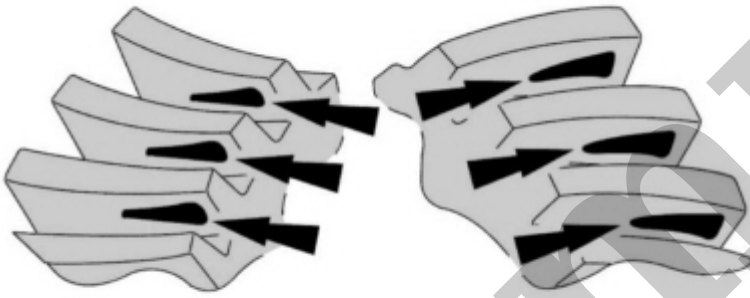
(205-03 Front Drive Axle/Differential, General Procedures).

**Axle Vent**



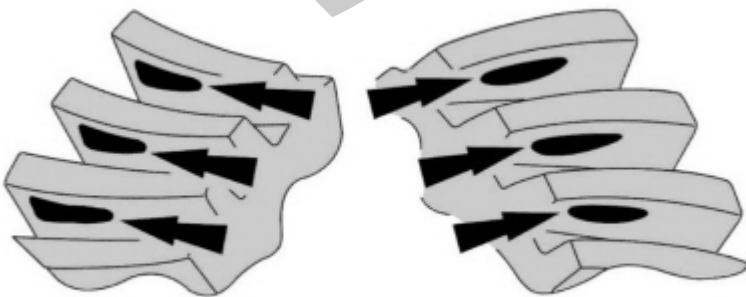
E181792

Correct backlash with a thinner pinion position shim required.



E181793

Correct backlash with a thicker pinion position shim required.



E181794