

FORD: 1999-2003 F SUPER DUTY
2000-2001 EXCURSION

ISSUE

Some 1999-2003 F250/350 4X4 and 2000-2001 Excursion 4X4 vehicles may exhibit a pull to right or left, while braking.

ACTION

Brake pull is a condition resulting from changing Camber, Caster or Toe during braking and is extremely sensitive to road surface. The following steps will assist in diagnosis of a brake pull condition.

SERVICE PROCEDURE**ROAD TEST- CONCERN VERIFICATION**

1. Test drive the vehicle with the customer to UNDERSTAND THE PULL OR DRIFT CONDITION. Incorrect clear vision may be misinterpreted as a pull or drift because the steering wheel is not straight. Ask the customer about the exact nature of the pull/drift and the conditions under which it is present. Note the following during the road test and include this information on the repair order:
 - Clear Vision Set/Not Set
 - Custom Wheels, Tires, Suspension Etc.
 - Any Special Loading (Rigs, Trailer Tow, Snow Plow Etc.)
 - Any Special Conditions To Duplicate The Concern (Speed, Type Of Braking, Brake Pads Hot/Cold, Road Surface Etc.)
 - Concern Verified/Not Verified
2. Tire pressure should be checked and adjusted, if necessary, after the initial test drive. Test drive again if tire pressure may have been the source of the pull. If pull has been corrected, return vehicle to customer. If not, proceed to step 3.

3. Visually inspect the vehicle according to the visual inspection chart in the Workshop Manual Section 206-00 to find any obvious cause for the observed or reported condition. If found, correct the cause and check if the condition is corrected. If not continue with the Service Procedure diagnostics.

ROAD TEST- DIAGNOSTIC

Perform all three of the following Road Tests (A, B and C). Compare test results to the table in Figure 1 to determine appropriate actions to take.

NOTE

IT IS IMPORTANT TO COMPLETE THE ROAD TEST BEFORE BEGINNING ANY REPAIRS SINCE THERE MAY BE MULTIPLE CAUSES THAT NEED TO BE IDENTIFIED. THE ROAD TEST SHOULD BE PERFORMED ON A FLAT, STRAIGHT ROAD AND SHOULD BE PERFORMED IN BOTH DIRECTIONS TO ACCOUNT FOR WIND. AFTER EACH REPAIR, THE VEHICLE MUST BE RE-EVALUATED TO ASSESS THE IMPACT OF REPAIRS PERFORMED.

Road Test A: Straight Road Driving

1. Maintain a steady speed of about 50-55 MPH (80-88 km/h) DO NOT BRAKE.
2. Is the clear vision OK?
3. Does the vehicle drift? If yes, which way does it drift?

Road Test B: Low Speed Braking

Road test B should be performed on a road with no crown.

1. Make a series of stops (10-15) from speeds of 35-40 MPH (56-64 km/h) with light to moderate braking.
2. Does the vehicle pull? If yes, which way does it pull?

NOTE: The information in Technical Service Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by "do-it-yourselfers". Do not assume that a condition described affects your car or truck. Contact a Ford, Lincoln, or Mercury dealership to determine whether the Bulletin applies to your vehicle.

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Road Test C: High Speed Braking

1. Maintain a speed of about 55-65 MPH (88-104 km/h) in a safe clear area. While firmly holding the steering wheel from rotating, apply the brakes moderately hard, but not to the point of engaging the Antilock Brake System (ABS).
2. Does the vehicle pull? If yes, which way does it pull?

DIAGNOSTIC PROCEDURE 1

NOTE

ACTION ITEMS FROM ROAD TEST "A", IF ANY, SHOULD BE COMPLETED AND VERIFIED BEFORE PROCEEDING WITH DIAGNOSTIC PROCEDURE 1.

1. **CHECK TIRES:** Check the tires for excessive wear and measure the air pressure in all four tires. Are the tires in good condition and the tire pressure within specifications? If yes, go to the next step. If no, adjust the tire pressure. Rotate the tires front to rear. Install new tires, if excessively worn. Test operation.
2. **CHECK THE CALIPER ASSEMBLY:** Do the caliper pistons or pins bind/stick, have unequal pressure left to right, or do the brakes drag? If no, go to the next step. If yes, refer to symptom chart for brake system in the Workshop Manual Section 206-00 for brake drag. Repair or install new components as necessary. Test operation.

NOTE

IF THE VEHICLE BUILD DATE IS BETWEEN JULY 1, 2001 AND NOVEMBER 30, 2001 AND THE VEHICLE HAS A PULL TO THE RIGHT IN ROAD TEST "B" OR ROAD TEST "C", REPLACE BOTH FRONT CALIPERS.

3. **INSPECT BRAKE PADS:** Inspect the front brake pads for contamination and wear concerns. Also check the brake pad edge code on the top edge of all four front brake pads. The edge code will consist of "abex6091ee xxxxx / yyy". Disregard the last three digits after "/". The five digits after "ee" should be the same. If the pads are not ok, or if the edge codes are not the same, go to step 6, otherwise continue to step 4.
4. Swap PADS and ROTORS side to side and Perform Road test "B" or "C" as appropriate. If the pull direction has reversed go to Step 6, otherwise continue to step 5.

5. CHECK REAR BRAKES:

- a. Check for contaminants (i.e. grease, axle lube, leaking brake fluid, etc.).
 - b. Check for broken components, broken or improperly installed parking brake cables.
 - c. Do the caliper pistons or pins bind or stick or do the brakes drag?
 - (1) If no, go to the next step. If yes, refer to symptom chart for brake system in the Workshop Manual section 206-00 for brake drag.
 - d. **INSPECT BRAKE PADS:** Inspect the rear brake pads wear conditions. If the pads are OK, go to the next step. If not, go to Step F.
 - e. Swap pads and rotor side to side. If the pull reverses, go to Step 6.
 - f. Install new pads for the rear brakes. Machine/replace the rotors. Burnish the linings (see step 6). Test operation.
6. Install new pads with the same edge code. Machine the rotors using Rotunda Hub-Mount Brake Lathe / Pro-Cut (201-00002) or replace the rotors. Burnish the linings by a minimum of 50 brake applications from 40 MPH (64 km/h) to stop. Provide sufficient time between brake applications so that linings do not smoke or overheat. Check operation. If the concern is still present, burnish the linings once more and check operation. If the pull is not gone even after burnishing, go to the next step.
 7. **CHECK ALIGNMENT:** Check for correct camber, caster and toe-in settings. Is the alignment within specification? If not, RESET the alignment and ROAD TEST the vehicle. Refer to Section 204-00 of the appropriate Workshop Manual for alignment specifications.

DIAGNOSTIC PROCEDURE 2

1. **CHECK TIRES:** Check the tires for excessive wear and measure the air pressure in all four tires. Are the tires in good condition and the tire pressure within specifications? If yes, go to the next step. If not, adjust the tire pressure. Rotate the tires front to rear. Install new tires, if excessively worn. Test operation.

2. CHECK THE CALIPER ASSEMBLY: Do the caliper pistons or pins bind or stick or do the brakes drag? If not, go to the next step. If yes, refer to symptom chart for brake system in the Workshop Manual Section 206-00 for brake drag. repair or install new components as necessary. Test operation.
3. INSPECT BRAKE PADS: Inspect the front brake pads for contamination and wear concerns. Also check the brake pad edge code on the top edge of all four front brake pads. The edge code will consist of "abex6091ee xxxxx / yyy". Disregard the last three digits after "/". The five digits after "ee" should be the same. If the pads are not ok, or if the edge codes are not the same, go to step 6, otherwise continue to step 4.
4. Swap PADS and ROTORS side to side and check the pull. If the pull direction has reversed, go to Step 6. If the vehicle still pulls to the left, burnish linings and check the pull. If it still pulls left, go to Step 5.
5. Replace both front leaf springs. Refer to the spring selection table in this TSB (Figure 2). If the build date is between March 20, 1999 and November 25, 2001, replace the Steering Gear and the Pitman Arm (Part Numbers 2C3Z-3504-AARM and YC3Z-3590-CA respectively). Adjust the mesh load to 5.0 to 6.0 lb-in. Refer to the Workshop Manual, Section 211-00 for repair procedure. Set cross caster to (-0.5°). Use caster slugs if necessary. Set caster, camber, toe and clear vision within specifications. See Section 204-00 of the appropriate Workshop Manual. Test operation.
6. Install new pads with the same edge code. Machine the rotors using Rotunda Hub-Mount Brake Lathe / Pro-Cut (201-00002) or replace the rotors. Burnish the linings by a minimum of 50 brake applications from 40 MPH (64 km/h) to stop. Provide sufficient time between brake applications so that linings do not smoke or overheat. Check operation. If the condition is still present, burnish the linings once more and check operation.

PART NUMBER	PART NAME
YC3Z-2552-AA	Caliper
1C3Z-2B120-AA	Brake Caliper RT
1C3Z-2B121-AA	Brake Caliper LT
2C3Z-3504-AARM	Steering Gear
YC3Z-3590-CA	Pitman Arm
2U2Z-2V001-AF	Front Brake Pads
2U2Z-2V200-FB	Rear Brake Pads

OTHER APPLICABLE ARTICLES: NONE
WARRANTY STATUS: INFORMATION ONLY

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Road Test	Result	Action
Road Test A	a. Incorrect Clear Vision	Set Clear Visions as per spec
	b. Drifts right or drifts left more than 5 ft/sec	Refer Section 204-00 of the service manual – ‘symptom chart for drift/pull’. If the symptom chart identifies brake drag as a cause, refer to Section 206-00 ‘symptom chart for brake system’ for brake drag.
Road Test B	Pulls right or pulls left	Refer Diagnostic procedure 1.
Road Test C	a. Pulls right or pulls left	Refer Diagnostic procedure 1.
	b. Vehicle does not pull in Road test B but pulls left in Road Test C only	Refer Diagnostic procedure 2.

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Figure 1 - Article 03-19-10

Leaf Spring Selection Table		
	Spring Code	Service Part Number
For F250/350 check the spring code on the cab sticker.	S	2C3Z-5310-EA
	T	2C3Z-5310-FA
	U	2C3Z-5310-GA
	V	2C3Z-5310-HA
	Engine	Spring Service Part Number
For Excursion, select spring based on engine	5.4L	2C3Z-5310-JA
	6.8L	2C3Z-5310-KA
	7.3L Diesel	2C3Z-5310-LA

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Figure 2 - Article 03-19-10