Steer Axle Brake Chatter

42-077

FLA COE
FLB COE
FLD Conventional
Business Class
FLC 112 Conventional
Century Class Conventional
Argosy COE
Cargo
Columbia
122SD and Coronado
Business Class M2
Cascadia
108SD/114SD
> New Cascadia

Freightliner Service Bulletin

Description of Revision: *This bulletin replaces the version dated 10/30/2018. The cause code has been changed in the warranty table.*

General Information

Some New Cascadia vehicles equipped with a Meritor stamped spider steer axle drum brake package have experienced brake chatter (noise) when the service brakes are applied at lower speeds. Examples of brake chatter can be heard in the following videos:

ABS Brake Noise **https://dtnacontent-dtna.prd.freightliner.com/content/dam/techlit/video/ABS_Brake%20Noise.mp4**

This issue can be resolved by replacing the stamped spider plates with cast plates (part number TDA KIT8341) using the instructions below.

General Safety Precautions

⚠ WARNING

When replacing brake pads, shoes, rotors, or drums, always replace components as an axle set.

- **Always reline both sets of brakes on an axle at the same time.**
- **Always replace both rotors/drums on an axle at the same time.**
- **Always install the same type of linings/pads or drums/rotors on both axle ends of a single axle at the same time. Do not mix component types.**

Failure to do so could cause uneven braking and loss of vehicle control, resulting in property damage, personal injury, or death.

When working on or around a vehicle, observe the following precautions:

- Park the vehicle on a level surface and apply the parking brakes. Shut down the engine and chock the tires.
- If the vehicle is equipped with air brakes, make certain to drain the air pressure from all reservoirs before beginning any work on the vehicle. Depleting air system pressure may cause the vehicle to roll. Keep hands away from brake chamber pushrods and slack adjusters, which may apply as air pressure drops.
- Disconnect the batteries.
- Never connect or disconnect a hose or line containing compressed air. It may whip as air escapes. Never remove a component or pipe plug unless you are certain all system pressure has been released.
- Never exceed recommended air pressure. Always wear safety glasses when working with compressed air. Never look into air jets or direct them at anyone.
- Do not remove, disassemble, assemble, or install a component until you have read and understand the service procedures. Some components contain powerful springs, and injury can result if not properly disassembled. Use the correct tools and observe all precautions pertaining to use of those tools.
- Replacement hardware, tubing, hose, fittings, etc. should be the equivalent size, type, length, and strength of the original equipment.
- Make sure when replacing tubes or hoses that all of the original supports, clamps, or suspending devices are installed or replaced.

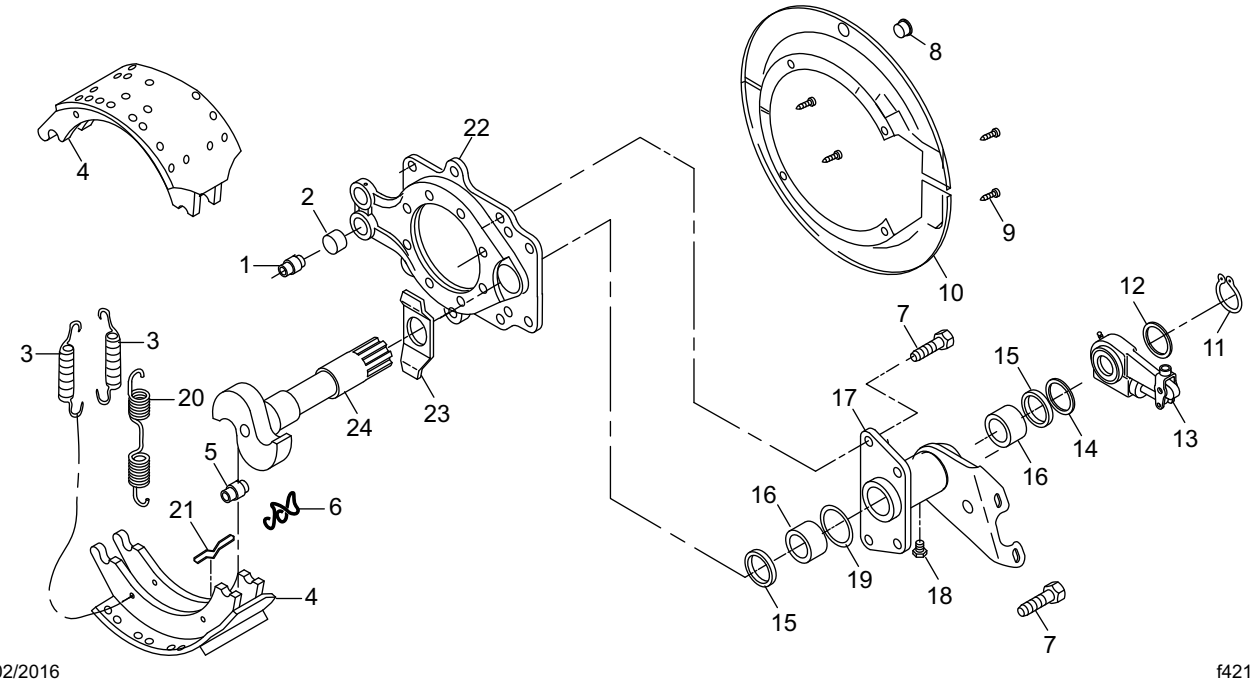
- Replace devices that have stripped threads or damaged parts. Repairs requiring machining should not be attempted.
- Prior to returning the vehicle to service, make certain all components and systems are restored to their proper operating condition.

Disassembly and Inspection

⚠ WARNING

Before working on or around air brake systems and components, review the General Safety Precautions. Failure to do so may result in personal injury.

When performing these instructions, refer to **Fig. 1**.



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1. Anchor Pin
2. Anchor Pin Bushing
3. Retaining Spring
4. Brake Shoe and Lining Assembly
5. Cam Roller
6. Roller Retainer
7. Capscrew, Chamber Bracket
8. Plug
9. Capscrew, Dust Shield
10. Dust Shield
11. Camshaft Snap Ring
12. Washer (spacer)
13. Automatic Slack Adjuster
14. Washer (thick spacer)
15. Camshaft Grease Seal
16. Camshaft Bushing
17. Camshaft-and-Chamber Bracket
18. Grease Fitting
19. Chamber Bracket Seal
20. Return Spring
21. Return Spring Pin
22. Brake Spider
23. Camhead Thrustwasher
24. S-Head Camshaft

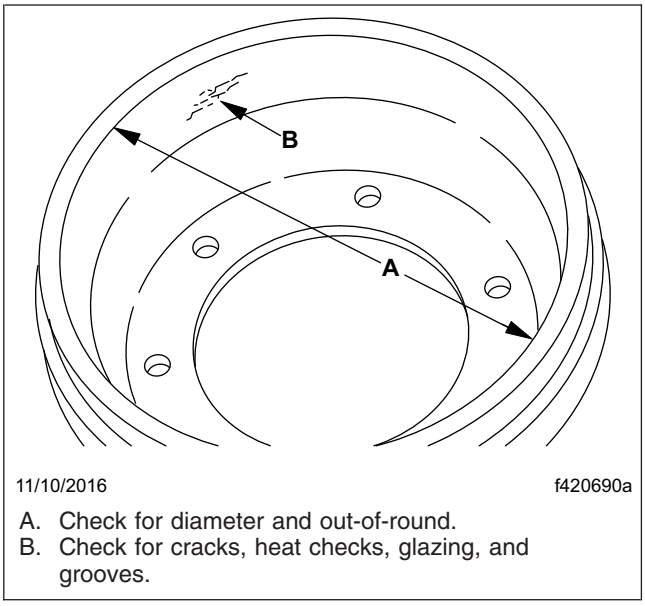
Fig. 1, Q Plus Brake (other than MX500 Series)

1. Park the vehicle on a level surface, shut down the engine, and set the parking brake. Chock the tires on the rear axle.

2. Raise the front axle and place safety stands under the frame or axle. Be sure the stands will support the weight of the vehicle.
3. Remove the front wheels. For instructions, see **Section 40.00, Subject 100** in the *New Cascadia Workshop Manual*.
4. Remove the front hubs. For instructions, see **Section 33.01** in the *New Cascadia Workshop Manual*.
5. Remove the brake drums. For instructions, see **Section 33.01** in the *New Cascadia Workshop Manual*.

IMPORTANT: Meritor recommends that the brake drum not be turned or rebored (resurfaced). Turning or reboring drums can decrease the strength and heat capacity of the drum.

6. Inspect the brake drum, as follows. See **Fig. 2**.



A. Check for diameter and out-of-round.
B. Check for cracks, heat checks, glazing, and grooves.

Fig. 2, Brake Drum Inspection

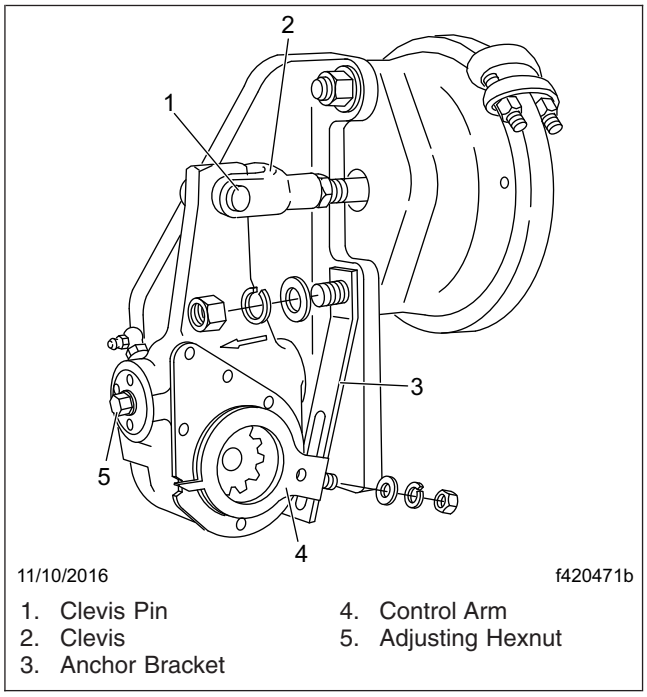
6.1 Check the drum for cracks. Replace any cracked drum.

6.2 Check the drum for severe heat-checking, heat-spotting, scoring, pitting, distortion, and out-of-round. Some drums that are glazed, grooved, or out-of-round can be repaired. For detailed instructions, see **Section 33.01** in the *New Cascadia Workshop Manual*.

6.3 Using a drum caliper or other measuring device, measure the inside diameter of the drum in several locations. Replace the drum if it exceeds the maximum diameter stamped on it.

7. Disconnect the slack adjuster from the pushrod clevis, as follows. For detailed instructions, see **Section 42.11** for Haldex, or **Section 42.12** for Meritor automatic slack adjusters in the *New Cascadia Workshop Manual*.

7.1 Remove the cotter pin from the clevis pin; remove the clevis pin. See **Fig. 3**.



1. Clevis Pin
2. Clevis
3. Anchor Bracket
4. Control Arm
5. Adjusting Hexnut

Fig. 3, Disconnecting Slack Adjuster from Clevis

NOTICE

For a Meritor automatic slack adjuster, disengage the pull-pawl before turning the manual adjusting nut. Failure to do so could damage the pull-pawl teeth. The brake clearance will not automatically adjust if the pull-pawl is damaged.

7.2 For a Meritor automatic slack adjuster, disengage the pull-pawl on the side of the adjuster. Using a screwdriver or an equivalent tool, pry the pawl button out about 1/32 inch (0.8 mm) and wedge the tool in place. See **Fig. 4**. Pull-pawls are spring-loaded. When the tool is removed, the pull-pawl will engage the teeth automatically.

IMPORTANT: Never pull the slack adjuster out of the pushrod clevis. Always turn the adjusting nut for positioning.

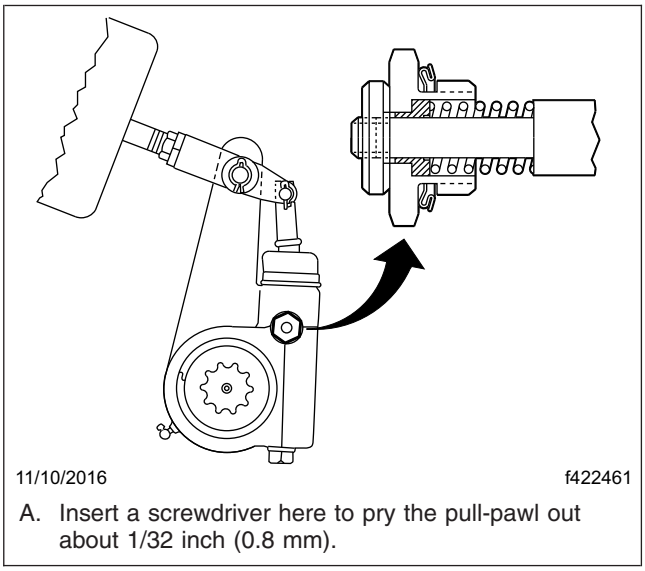
7.3 Using a wrench, turn the manual adjusting nut to back the slack adjuster out of the clevis.

- On Meritor adjustors, turn the square adjusting nut clockwise (as if loosening a right-hand threaded fastener).
- On Haldex adjusters, turn the adjusting hexnut counterclockwise. You will hear a ratcheting sound.

8. Remove the slack adjuster, as follows.

8.1 From the slack adjuster side of the camshaft-and-chamber bracket, remove the snap ring and any washers, spacers, and seals from the camshaft. See **Fig. 1**.

8.2 Remove the slack adjuster from the camshaft.



A. Insert a screwdriver here to pry the pull-pawl out about 1/32 inch (0.8 mm).

Fig. 4, Meritor ASA Pull-Pawl Disengagement

9. Inspect the slack adjuster for damage or binding, as follows.

   9.1 Check the slack adjuster clevis for cracks or bushing wear. Check the splines for chipped teeth and deformation. Replace as needed.

   NOTE: For a Haldex automatic slack adjuster, there is an internal clutch that resists the manual adjusting nut from being turned in the counterclockwise direction. When checking these slack adjusters for binding, only rotate the manual adjusting nut in the clockwise direction.

   9.2 Using a torque wrench that measures lbf·in (or N·cm), turn the manual adjusting nut clockwise so that the worm gear rotates a full 360 degrees (typically 22 turns of the wrench).

   If there is binding, or if more than 25 lbf·in (280 N·cm) is needed to turn the slack adjuster, replace it. For instructions, see the applicable slack adjuster section in this group.

IMPORTANT: If any slack adjuster problem is found, repair or replace the unit, depending on the manufacturer's recommendations.

NOTE: The brake chamber can remain connected to the vehicle if is passes inspection.

10. Remove the brake chamber stud nuts and lockwashers that attach the brake chamber to the camshaft-and-chamber bracket.

    Check the chamber for a cracked housing, bent pushrod, loose clamp ring, loose air fitting, air leaks, or clogged vent holes. Repair or replace brake chamber parts as needed.

11. Remove the whole brake package.

12. Remove the brake spider from the axle flange.

13. If equipped, remove the four capscrews that attach the dust shield to the brake spider; remove the dust shield.

Cleaning

⚠ WARNING

Before starting the procedure below, read the information in the General Safety Precautions. Failure to be aware of the dangers of brake lining dust exposure could result in serious and permanent health damage.

NOTICE

Do not clean ground or polished metal parts in a hot solution tank or with water, steam, or alkaline solutions. These solutions will cause parts to corrode.

NOTE: For corrosion protection, do not apply brake grease or corrosion-preventive materials to the brake linings or the brake drum.

After removing the brake parts being serviced, do the following:

1. Wire brush all parts exposed to mud, road dirt, and salt, including the exterior of the drum and dust shields (if equipped).

NOTICE

A thick layer of oxidation and dirt on the outside of a brake drum acts as an insulator and may hinder normal heat dissipation. Make sure oxidation and dirt are removed by wire brushing, or damage to brake components could occur.

2. Using an industrial vacuum cleaner with a HEPA filter system, remove any dust accumulation from the brake parts that are being reused.
3. Wipe the interior of the drums with a damp rag to remove lining dust.
4. Prepare the brake parts for assembly, as follows.
   - 4.1 Thoroughly clean all the brake parts.

     For ground or polished metal parts, use a cleaning solvent to clean the parts and surfaces that are ground or polished.

     For rough metal parts, use a cleaning solvent or a weak alkaline solution in a hot solution tank to clean the parts. If a hot solution tank is used, leave the rough parts in the hot solution tank until they are completely cleaned and heated. Remove the rough parts from the hot solution tank and wash them with water until the alkaline solution is removed.
   - 4.2 Thoroughly dry all the brake parts with either compressed air or a clean soft cloth or paper towel.

⚠ WARNING

All worn or damaged brake parts must be replaced. If the brakes are assembled with worn or damaged parts, they may not perform to their capacity and a brake failure could occur, which could cause personal injury and property damage.

   - 4.3 Thoroughly inspect all the brake parts for wear or damage. It is very important that all the parts be carefully inspected before they are assembled. Repair or replace any worn or damaged parts.

4.4 For parts that will be assembled, apply a thin layer of brake grease to the parts after they have been cleaned, dried, and inspected to protect them from corrosion.

If the parts will be stored, apply a special material that prevents corrosion and rust on all surfaces. The parts should be stored in special paper (or other material) that prevents corrosion and rust.

Assembly

⚠ WARNING

Before starting the assembly procedure, read the information in the General Safety Precautions. Failure to be aware of the dangers of brake lining dust exposure could result in serious and permanent health damage.

1. Install the dust shield, if equipped. See **Fig. 1**.

   Position the dust shield against the brake spider and install the capscrews. Tighten the capscrews to the specifications in **Table 1**.

Dust Shield, Spider, and Bracket Torque Specifications			
Fastener		**Torque Specification**	
Size	**Grade**	**lbf·ft**	**N·m**
Dust Shield Fasteners			
5/16–18	5	15–20	20–27
3/8–16	5	25–35	34–47
3/8–16	8	35–50	47–68
Brake Spider Fasteners			
7/16–20	—	60–75	81–102
1/2–20	—	85–115	115–156
9/16–18	—	135–165	183–224
5/8–18	—	180–230	244–312
3/4–16	—	237–301	321–408
Camshaft-and-Chamber Bracket Fasteners			
1/2–13 Capscrew (without nut)	5	65–85	88–115
1/2–13 Capscrew (without nut)	8	70–100	95–136
5/8–18 Bolt with Locknut	—	130–165	176–224
5/8–18 Bolt with Plain Hexnut	—	150–190	203–258

Table 1, Dust Shield, Spider, and Bracket Torque Specifications

2. Install the brake package.
3. Apply a thin film of rust-preventive grease on the camshaft splines. For the recommended grease specification, see **Table 2**.

Meritor Grease Specification			
Specification Number	**NLGI Grade**	**Grease Type**	**Outside Temperature: °F (°C)**
O-616-A	1	Clay Base	Down to –40 (–40)

Meritor Grease Specification			
Specification Number	**NLGI Grade**	**Grease Type**	**Outside Temperature: °F (°C)**
O-617-A O-617-B	1 and 2	Lithium 12-Hydroxy Stearate or Lithium Complex	See Manufacturer's Specification
O-645	2	Synthetic Oil, Clay Base	Down to –65 (–54)
O-692	1 and 2	Lithium Base	Down to –40 (–40)
O-637	1 and 2	Calcium Base	See Manufacturer's Specification
O-641	—	Anti-Seize	See Manufacturer's Specification
O-695	2	Synthetic Polyurea	–40 (–40)

Table 2, Meritor Grease Specification

4. Place the brake spider on the axle flange. Install the mounting fasteners with hardened washers under the bolt head and nut. Tighten the nuts to the specifications in **Table 1** in a cross pattern. See **Fig. 5**.

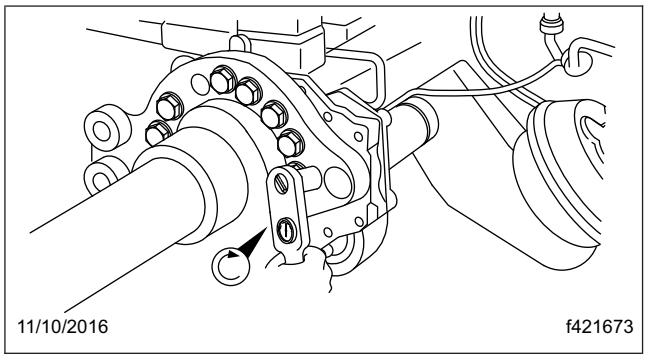


Fig. 5, Tightening the Brake Spider Fasteners

NOTE: If replacing a brake chamber, make sure that the new chamber is the same size and make as the brake chamber on the other side of the axle.

5. Install the brake chamber, as follows.
   - 5.1 Place the brake chamber on the mounting flange (camshaft-and-chamber bracket) with the chamber mounting studs through the flange holes.
   - 5.2 Install the hardened flatwashers, lockwashers, and stud nuts.
   - 5.3 Tighten the brake chamber fasteners to the specifications in **Table 3**.

Brake Chamber Torque Specifications: lbf·ft (N·m)		
Chamber Type (Size)	**MGM**	**Haldex**
16	35–40 (48–54)	100 (136)
20, 24, 30, 36	100–115 (136–156)	100 (136)
Spring Chamber	100–115 (136–156)	100 (136)

Table 3, Brake Chamber Torque Specifications

6. Install the slack adjuster. For instructions, see **Section 42.11** for Haldex, or **Section 42.12** for Meritor automatic slack adjusters in the *New Cascadia Workshop Manual*.

⚠ WARNING

When lubricating the camshaft-and-chamber bracket, if grease leaks out under the cam head, the camshaft grease seal is worn or damaged. If the seal is not replaced, the brake linings could be contaminated by grease and the vehicle's stopping distance could be reduced, which could result in personal injury or property damage.

7. For all Cam-Master Q Plus brakes except MX500, pressure lube the camshaft-and-chamber bracket bushings, as follows.

   NOTE: Use meter-type fittings with a maximum 40 psi (276 kPa) pressure relief at the shutoff.

   7.1 Pump multipurpose chassis grease (NLGI grade 1 or 2) into the camshaft-and-chamber bracket until it appears at the slack adjuster end of the bracket. Use care that no grease enters the drum cavity. For recommended grease specification, see **Table 2**.

   7.2 If grease leaks out under the cam head, the camshaft grease seal is worn, damaged, or installed backwards. For instructions, see **Section 42.01** of the *New Cascadia Workshop Manual*.

8. Install the hubs. For instructions, see **Section 33.01** in the *New Cascadia Workshop Manual*.
9. Install the brake drums. For instructions, see **Section 33.01** in the *New Cascadia Workshop Manual*.
10. Install the wheels. For instructions, see **Section 40.00, Subject 100** in the *New Cascadia Workshop Manual*.
11. Remove the safety stands and lower the vehicle.

Warranty

This procedure is warrantable only if the described condition exists and the repair is performed within the applicable base or extended coverage warranty period. If a failure is not found, this procedure is considered preventive and warranty does not apply.

Normal warranty applies. See **Table 4** for OWL VMRS codes and labor allowance information. Enter this service bulletin number in the *Service Bulletin #* field.

OWL VMRS Codes and Labor Allowance					
Primary Failed Part	**Component Code**	**Cause Code**	**SRT Code**	**Description**	**Time: Hours**
Meritor Stamped Spider Plate	013-001-088	42	402-5012A	Meritor Brake Package, Stamped Spider, R/R (SB 42-077)	4.2

Table 4, OWL VMRS Codes and Labor Allowance