

FLA COE  
FLB COE  
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Business Class  
FLC 112 Conventional

Century Class Conventional  
Argosy COE  
Cargo  
Columbia

Coronado  
Business Class M2  
> Cascadia  
108SD/114SD

Freightliner  
Service Bulletin

## General Information

Cascadia vehicles equipped with Eaton manual transmissions may experience no-start faults that are associated with the clutch position combination switch (clutch control switch). Recent investigations have exposed several possible causes, and this bulletin should be used to determine the cause of the problem. Use the procedure in this bulletin, and service information published on [www.AccessFreightliner.com](http://www.AccessFreightliner.com) and [www.RoadRanger.com](http://www.RoadRanger.com), to diagnose and repair the problem, if the following symptoms are present:

- engine not starting
- engine has trouble starting/is hard to start
- transmission grinding going into starting gear
- excessive clutch brake wear
- early clutch brake squeeze
- clutch pedal not returning after it has been pressed

The listed symptoms can be caused by any of the following:

- **Clutch Over-Adjust:** It is possible that a small number of Eaton clutch pressure plates, manufactured between mid-2010 and November, 2012, can become over-adjusted in normal service. In the most severe cases, the clutch brake will contact the release bearing before the pedal will close the "clutch open" switch.
- **Clutch Pedal Assembly (mechanical components):** Variations have been identified in the clutch pedal assembly that, when coupled with the tolerances of associated components, can cause the "clutch open" switch to not be activated in normal conditions.
- **Clutch Position Combination Switch:** Deposits can accumulate on the contacts of the clutch position combination switch, causing high resistance. The SAM Cab is sensitive to resistance levels above 30 ohms for the entire circuit. The switch may pass a simple conductivity test with resistances higher than the SAM limit.

NOTE: Active updates are being planned to resolve all these issues. This bulletin should be used only as an interim troubleshooting method.

## Diagnostics

Follow the steps below to identify the failed part.

1. Park the vehicle on a level surface, shut down the engine, and set the parking brake. Chock the tires.
2. Remove the clutch inspection cover.
3. Measure the gap between the clutch brake and the release bearing. The distance should be between 0.48 and 0.59 inch (12 and 15 mm). See [Fig. 1](#).

*If the distance is correct*, install the inspection cover. Tighten the screws 14 to 18 lbf-ft (19 to 24 N-m). Proceed to the next step.

*If the distance is less than 0.48 inch (12 mm)*, reset the clutch (see "Resetting the Clutch"). If the problem is fixed, no further work is needed, otherwise continue with the next step.

*If the distance is more than 0.59 inch (15 mm)*, the issue is not related to any of the causes addressed in this bulletin. Proceed to the next step and resolve this issue separately.

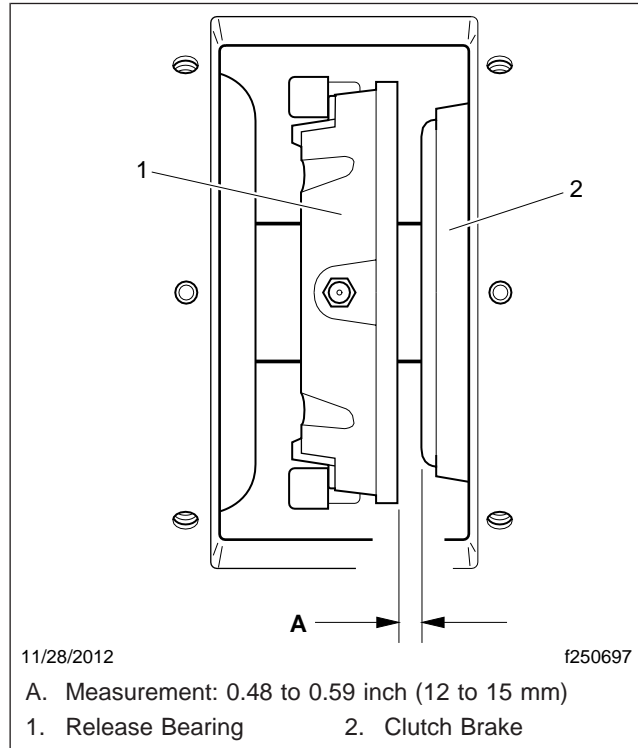
4. Make sure the batteries are charged. Turn the ignition key ON.

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**Fig. 1, Clutch Gap**

5. Connect the vehicle to the ServiceLink diagnostic tool. Select the SAM Cab ECU, then go to the "Templates" tab and select "Starter Relay, Crank Enable." See [Fig. 2](#).
6. While pushing the pedal to the point of clutch brake squeeze ([Fig. 3](#)), check the SAM Cab Template. Does the actuation of the pedal register? The actuation of the pedal is registered when the "Bottom of Clutch Circuit" indicator turns green and reads "At Bottom," as shown in [Fig. 4](#).

*If NO, go to the next step.*

*If YES, and the fault is not intermittent, the system is not experiencing any of the failures covered in this bulletin. Continue with normal diagnostics of the rest of the starting system; see [Cascadia Troubleshooting Manual, P01.01—Starting and Charging](#).*

*If YES, and the customer complaint indicates the fault may be intermittent, test the contact resistance in the clutch position combination switch. If the reading in the circuit is above 15 ohms, replace the switch.*

7. Continue to monitor the SAM Cab ECU while pushing the clutch pedal with enough force (approximately 75 lb [34 kg]) to make the pedal travel all the way to the floor, opening the internal pressure relief valve in the clutch hydraulic system. Does the actuation of the pedal register? The actuation of the pedal is registered when the "Bottom of Clutch Circuit" indicator turns green and reads "At Bottom," as shown in [Fig. 4](#).

*If NO, go to the next step.*

*If YES, replace the hydraulic pedal assembly. See [Cascadia Workshop Manual, Section 25.01](#).*

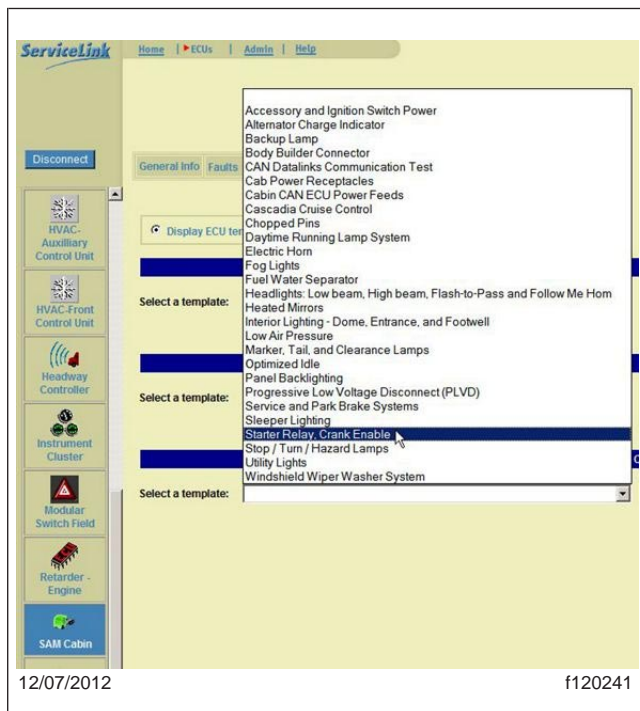
8. Disconnect the chassis harness from the clutch position combination switch. See [Fig. 5](#).

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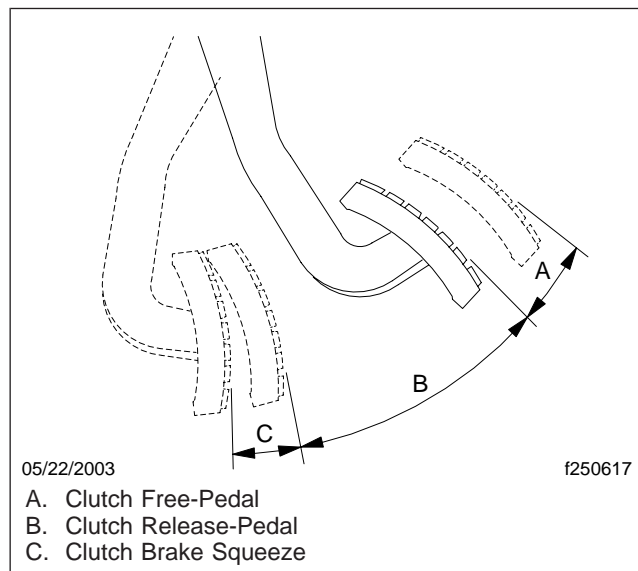
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**Fig. 2, ServiceLink Template Menu**



**Fig. 3, Clutch Pedal Movement**

- Use a jumper wire to close the clutch low position control circuit on the chassis side (between pins A and C in [Table 1](#)), and look for a response on the SAM Cab ECU template. Does the response register on the template?

*If YES*, replace the switch. See *Cascadia Workshop Manual, Section 25.01, Subject 150*.

*If NO*, the system is not registering any of the failures covered in this bulletin. Continue with normal diagnostics.

**Starter Relay, Crank Enable**  
TEMPLATE VER. 5.3, 03/06/2012

APPLIES TO:  
Cascadia 6.0, 6.2

View  
Fault  
Codes

Click on the **i** button in the upper tool bar for additional information.

Wiring diagrams in module 156

**IGN Switch CAN Message**

Ignition

IGNITION SWITCH CIRCUITS

ACC	OFF	IGN	Crank
X13-5	X13-4	X13-6	X13-15

WAIT 30 SECONDS  
between starting attempts to allow the starter protection software to release inhibit. This inhibit is for starter overheating protection.

**Key**

- ! Temporary loss of communication
- Inputs & interlocks have been met
- Outputs are active
- Missing input

**Battery Voltage**

Battery Voltage (SAM\_CAB) 12.10

**Engine RPM**

Engine RPM (SAM\_CAB) 0

**NEUTRAL INPUTS**

At least one neutral input must be green to allow cranking. Confirm with SAM cab and SAM chassis parameter configuration.

<p><b>Bottom of Clutch Circuit</b></p> <div style="background-color: green; text-align: center; padding: 5px;">At Bottom</div> <p>Bottom of Clutch SAM Cab Connector X11 Pins 16 and 20</p>	<p><b>Manual Trans Neutral Sw</b></p> <div style="background-color: gray; text-align: center; padding: 5px;">Signal Not Available</div> <p>Neutral Switch Status Message From SAM Chassis</p>
<p><b>Auto Trans Crank Enable</b></p> <div style="background-color: gray; text-align: center; padding: 5px;">Signal Not Available</div> <p>Auto Trans Neutral Status Rebroadcast From SAM Cab</p>	<p><b>Neutral Switch Circuit</b></p> <div style="background-color: gray; text-align: center; padding: 5px;">Signal Not Available</div> <p>Neutral Switch - SAM Chassis Connector X59 Pins 2 and 18</p>

**DECISIONS**

Green when active.

<p><b>Starter Relay Inhibit</b></p> <div style="background-color: green; text-align: center; padding: 5px;">Not Inhibited</div>	<p><b>Crank Interlock</b></p> <div style="background-color: gray; text-align: center; padding: 5px;">Crank Inhibit</div> <p>Connector X13, Pin 14 When a parameter with CI is set, this must be green to crank.</p>
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**OUTPUTS**

Output is active when yellow.

<p><b>Starter Relay Output Circuit</b></p> <div style="background-color: gray; text-align: center; padding: 5px;">OFF</div> <p>Starter Relay - SAM Cab Connector X19, Pin3</p>	<p><b>Ether Start</b></p> <div style="background-color: gray; text-align: center; padding: 5px;">OFF</div>
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12/07/2012

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NOTE: Cascadia SAM versions 6.0 and 6.2 template shown. Version 5.4 template is similar. Shown with "Bottom of Clutch Circuit" indicator (circled) registering pedal actuation.

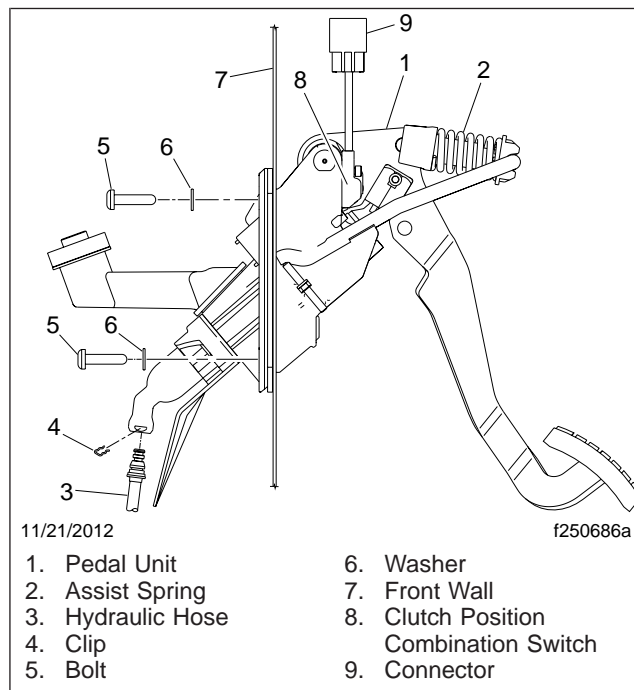
**Fig. 4, "Starter Relay, Crank Enable" Template**

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**Fig. 5, Clutch Pedal Assembly**

Connector	Clutch Position Combination Switch Diagram	A	B	C
<p>03/19/2007 <span style="float: right;">f545004</span></p>	<p>03/19/2007 <span style="float: right;">f545006</span></p>	Blue	—	Black

**Table 1, Clutch Position Combination Switch, Bottom of Clutch Control**

## Resetting the Clutch

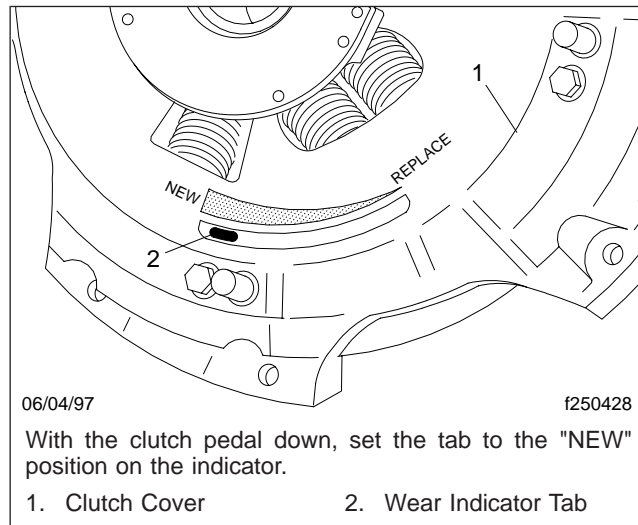
1. With the parking brake applied and the tires chocked, have an assistant hold the clutch pedal down.
2. With the pedal held down, move the wear indicator tab to the left (NEW) position. See [Fig. 6](#).
3. If the cam does not move, support the transmission and remove the clutch housing bolts. Install 1/2-inch spacers between the clutch housing and the flywheel housing, then, with the clutch pedal held down, attempt to reset the wear indicator tab again.

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**Fig. 6, Resetting the Wear Indicator Tab**

4. Remove the spacers, then install the clutch housing bolts. Tighten the bolts 43 to 53 lbf-ft (58 to 72 N·m) for Patch-Lok capscrews, or 38 to 45 lbf-ft (52 to 761 N·m) for non-locking capscrews with lockwashers.

**IMPORTANT:** To prevent the clutch from returning to an over-adjusted position, the gaps between the sleeves and pins have to be eliminated, as detailed below.

5. Install four shipping bolts (7/16-14 x 1-3/4 UNC) next to the sleeves and pins, as shown in [Fig. 7](#). Tighten the bolts so that the gaps between the sleeves and pins are eliminated.
6. Remove the shipping bolts.
7. Push the clutch pedal down and squeeze the clutch brake five times to reposition the bearing, then recheck the gap between the clutch brake and the release bearing.
8. If the gap returns to less than 0.48 inch (12 mm), replace the clutch assembly.

## Warranty

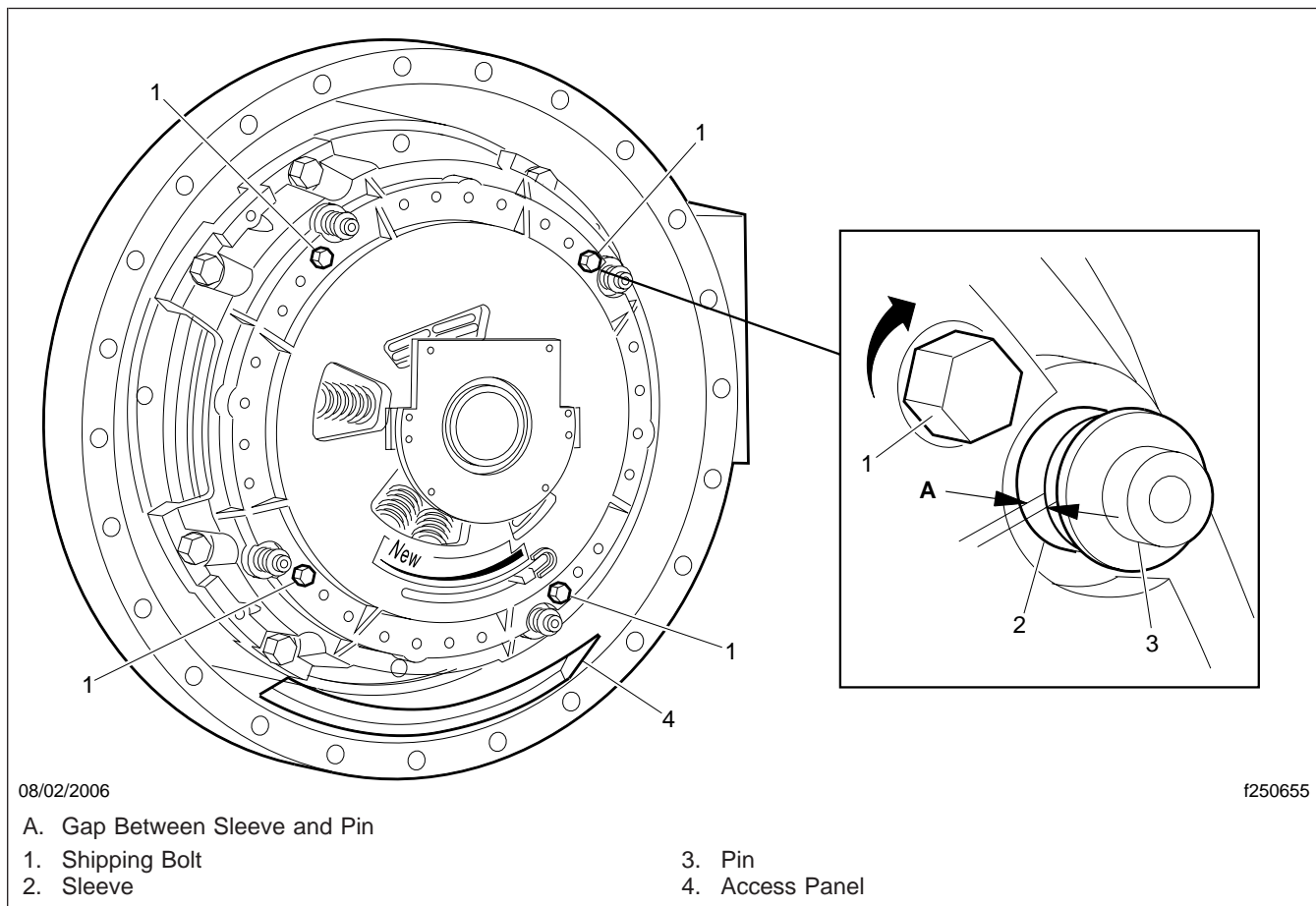
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**Fig. 7, Removing the Gap Between Sleeve and Pin**