



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

ODI RESUME

Investigation: EA 02-036

Prompted By:

Date Opened: 12/11/2002

Date Closed: 01/26/2004

Principal Investigator: TOM BOWMAN

Subject: ABS CORROSION EXTENDS STOPPING DIST

Manufacturer: FREIGHTLINER LLC

Products: 1996 - 2002 FREIGHTLINER

Population: 43220

Problem Description: VEHICLE STOPPING DISTANCES INCREASE DUE TO UNINTENDED ABS (ANTI-LOCK BRAKE SYSTEM) CYCLING CAUSED BY WEAK OR FAULTY SIGNAL GENERATED BY CORRODED ABS TONE RING.

FAILURE REPORT SUMMARY

	ODI	Manufacturer	Total
Complaints:	0	2	2
Crashes/Fires:	0	0	0
Injury Incidents:	0	0	0
# Injuries:	0	0	0
Fatality Incidents:	0	0	0
# Fatalities:	0	0	0
Other*:	0	266	266

*Description of Other: FREIGHTLINER WARRANTY CLAIMS AS OF SEPT, 2002

Action: ODI IS CLOSING THIS INVESTIGATION. SEE ATTACHED TECHNICAL REPORT FOR FULL DETAILS.

Engineer: Thomas Bowman

Date: 01/26/2004

Div. Chief: Richard Boyd

Date: 01/26/2004

Office Dir.: Kathleen C. DeMeter

Date: 01/26/2004

Summary: THE TONE RING TOOTH PROFILE OF AN UNCOATED HYDRAULIC DISC BRAKE DEGRADES AFTER EXPOSURE TO CORROSIVE ENVIRONMENTS. WHEN THE TONE RING TOOTH PROFILE HAS DEGRADED IN FREIGHTLINER VEHICLES, THE ABS WARNING LIGHT ILLUMINATES RELIABLY TO WARN THE OPERATOR TO HAVE THE ABS SYSTEM SERVICED. IN RESPONSE TO ODI'S INQUIRY, FREIGHTLINER HAS ISSUED INFORMATION TO ALL AFFECTED OWNERS THAT ALERTS OWNERS TO THE IMPORTANCE OF RESPONDING TO THE ILLUMINATED ABS WARNING LIGHT.

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☐ FREIGHTLINER ADOPTED COATED ROTORS DURING 2002 (DATE VARIES BY MODEL). SINCE NEITHER ODI NOR FREIGHTLINER HAVE ACCURATE DATA TO FORECAST THE CORROSION RESISTANCE OF COATED ROTORS, ODI PLANS TO CONDUCT A FUTURE SURVEY AT FREIGHTLINER (IN 18-24 MONTHS) TO EVALUATE THE DURABILITY OF THE COATED ROTORS.

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1/26/04

Closing Report – EA02-036

ABS Hydraulic Disc Brake Tone Ring Corrosion in 1996 - 2002 Freightliner Vehicles

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(1) Subject

This report addresses the alleged potential for uncoated hydraulic disc brake rotors installed in certain Model Year (MY) 1996-2002 Freightliner vehicles to corrode prematurely due to exposure to salt and other corrosive elements, potentially compromising the quality of the ABS wheel speed signal, which could increase the vehicle stopping distance.

Reference Numbers: EA02-036 Date Opened: 12-11-2002
PE02-061

Terminology

Integral Tone Ring – A disc brake rotor design in which the ABS tone ring (sometimes called the exciter ring) has been cast integrally into the hydraulic disc brake rotor.

(2) Background

In the spring of 2002, Transport Canada notified the Office of Defects Investigation (ODI) that they had received reports in which hydraulic disc brake integral tone rings had corroded resulting in certain vehicles experiencing extended stopping distances when braking.

In February 2002, Freightliner issued Service Bulletin 42-48 advising vehicle owners that Freightliner was offering a coated rotor that is "more resistant to corrosion." See Attachment A for a copy of this Bulletin.

ODI initiated Preliminary Evaluation PE02-061 on August 7, 2002 after ODI learned of two complaints in which owners had reported increased stopping distances in their vehicles. These reports indicated that the quality of the wheel speed signals generated by the tone ring had been compromised after the tone ring tooth profile had been degraded by corrosion. At that time, ODI also initiated PE02-060 to investigate similar complaints in vehicles manufactured by International Truck.

On August 28, 2002, ODI issued a Request for Information from Freightliner and received a response on October 11, 2002.

On March 11, 2003, ODI met with representatives of Freightliner, MeritorWABCO (the manufacturer of the ABS system), and VRTC engineering to review the status of the investigation and to test drive vehicles equipped with rotors exhibiting varying stages of ABS tone ring corrosion.

In April 2003, Freightliner issued a Field Service Campaign notice, SF258A-D, to owners of approximately 6900 Vehicle Model FS65 (school bus) vehicles manufactured between January 1, 1999, and February 8, 2002. SF258A-D directed owners to inspect the vehicle tone rings for corrosion. If severe corrosion was detected on any tone ring(s), all four rotors were to be replaced with newly designed "coated" disc brake rotors.

See Attachment B for a copy of this Bulletin.

Following the March meeting with ODI, Freightliner also agreed to extend the warranty on uncoated rotors for other vehicles if the corrosion had progressed to the extent that the wheel speed signal had degraded to the point that the ABS warning lamp illuminated.

In September 2003, Freightliner formalized the promised extended warranty commitment by issuing Service Bulletin 42-48 to owners of approximately 34,000 "business class" vehicles. Bulletin 42-48 states, "For vehicles built prior to February 8, 2002, normal warranty applies if severe corrosion is evident and if the tone ring produces ABS fault signals prior to the braking surface wearing out (i.e., the rotor braking surface exceeds the minimum thickness stamped on the rotor)."

See Attachment C for a copy of this Bulletin.

In January 2004, ODI requested Freightliner to issue a Bulletin to the owners of the approximately 547 1996-1998 FS-65 (school bus chassis) since these owners had not been included in earlier notifications. Freightliner has prepared the requested bulletin and has promised to issue this notice in the near future.

(3) Population

Freightliner began installing brake rotors with uncoated integral tone rings in new vehicle production in 1996. During the course of 2002 Freightliner adopted coated rotors at various times according to vehicle model as summarized in the following table.

Model	Implementation Date for Coated Rotors
FLN, FS65, Acterra	February, 2002
Thomas Bus	May, 2002
Freightliner Custom Chassis	November, 2002

Following is a summary of the estimated number of Freightliner vehicles equipped with uncoated rotors manufactured since 1996 until superseded by coated rotors in 2002 (according to the schedule outlined in the above table)

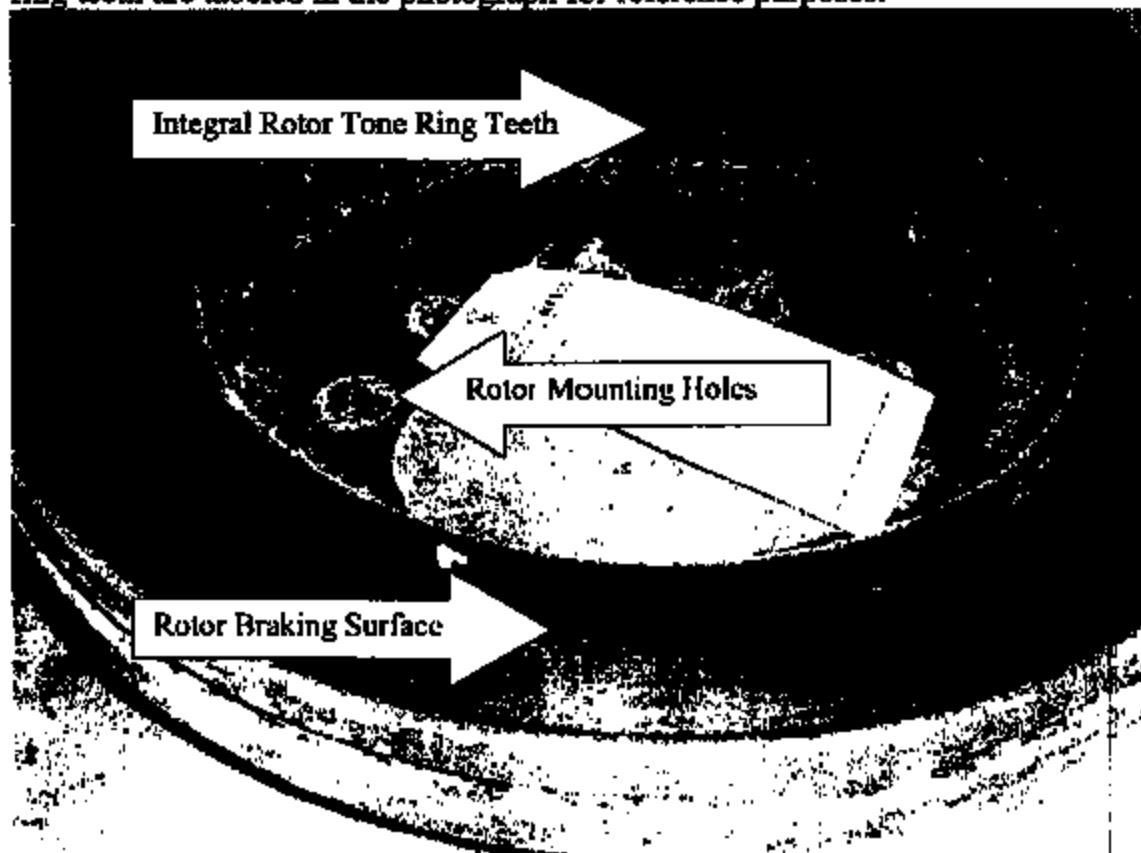
	1996	1997	1998	1999	2000	2001	2002 (est)	Total
Bus Class (N)	161	354	1182	5336	4561	1730	532	13856
Sterling (Q)	0	0	0	0	764	552	173	1489
School Bus (FS65)	8	96	443	1445	2222	2050	1203	7467
Shuttle Bus (MB/FB (J)	0	0	0	207	364	441	414	1426
TBB MPV-EV	0	0	0	242	212	275	288	1017
Motor Home MC-45(C)	0	0	0	24	12	1	0	37
Step Van MT45/55 (V)	0	0	0	4685	5280	4847	3116	17928
Total	169	450	1625	11939	13415	9896	5726	43220

(4) Product Description

During braking, the brake pad is applied against the flat braking surface of the disc brake rotor. Over time and service usage, the braking surface of the rotor is likely to be worn, scored, and possibly warped due to its use as a friction face.

Disc brake rotors are considered to be a vehicle component that requires periodic inspection to determine its condition. Depending on inspection results, rotors may be left in service, have the friction surface machined to remove grooves and to correct distortions, or replaced if the rotor is worn or distorted beyond acceptable limits.

The following photograph depicts a representative uncoated disc brake rotor with the integral tone ring feature that has been removed from service. The ABS tone ring teeth are labeled in the photograph for reference purposes.

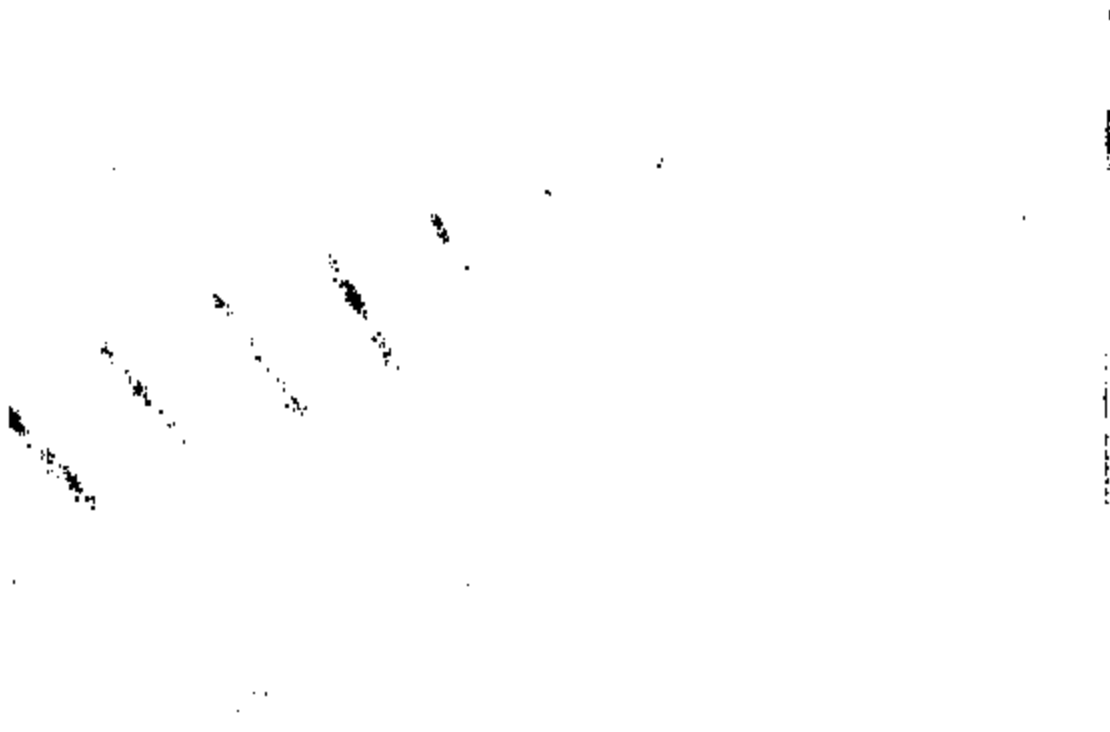


Source: Sample from rotors displayed at March 11, 2003 Review at VRTC.

(5) Problem Description

The following photographs depict minor (early) and severe (progressed) stages of corrosion on the tone ring teeth of representative hydraulic disc brake rotors removed from service. These rotors were inspected at the Freightliner-ODI-VRTC review conducted on March 11, 2003.

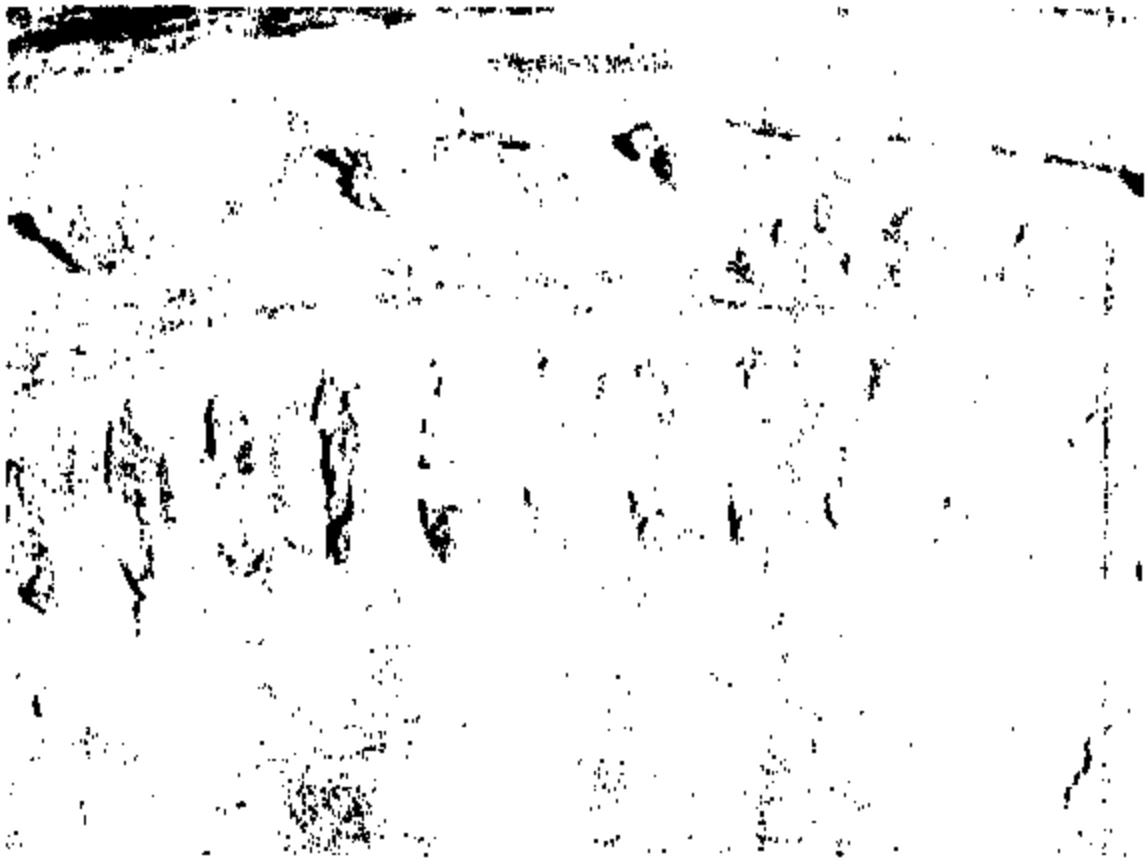
Minor (early) Stage of Tone Ring Corrosion



Source: Sample from rotors displayed at March 11, 2003 Review at VRTC

The vehicle's ABS tone ring signal was not affected by the extent of the corrosion depicted in the above photograph

Severe (progressed) Stage of Tone Ring Corrosion



Source: Sample from rotors displayed at March 11, 2003 Review at VRTC.

During evaluation drives conducted at VRTC on March 11, 2003, the amber in-cab ABS warning lamp consistently illuminated after the vehicle speed had reached 3-5 MPH due to the degraded wheel speed signals generated by severely corroded tone ring teeth such as depicted.

(6) Methodology

To investigate this issue:

- (A) ODI requested information from manufacturers of medium and heavy vehicles. Medium vehicles are typically equipped with hydraulic brake systems; heavy vehicles are typically equipped with air brake systems.

Vehicle Manufacturer	Date of Request
Freightliner, LLC	August 28, 2002
International Truck	October 3, 2002
Mack Trucks	October 3, 2002
PACCAR Inc	October 2, 2002
Volvo Trucks North America (VTNA)	September 27, 2002

Responses from the heavy vehicle manufacturers indicated that ABS tone ring corrosion was negligible in air braked vehicles since tone rings installed in drum brakes are better protected from road spray than integral tone rings and are made of material that is more corrosive resistant than the (uncoated) cast iron used to make integral tone ring rotors.

Responses from Freightliner and International Trucks indicated that vehicles equipped with uncoated cast iron integral tone rings used with hydraulic disc brakes were the most likely vehicle configuration at risk of exhibiting increased stopping distance due to effects of corrosion.

- (B) On March 11, 2003, ODI conducted evaluation drives of several vehicles in conjunction with VRTC, Freightliner, and Meritor WABCO (Freightliner's supplier of ABS systems for hydraulically braked vehicle) to evaluate the ability of the ABS warning system to detect a corroded ABS tone ring and reliably illuminate the ABS warning lamp when the corrosion had progressed to the point where the wheel speed signal had been degraded.

At that review, ODI inspected several rotors in various stages of corrosion. ODI and VRTC engineers also drove several vehicles equipped with a severely corroded (progressed stage) ABS tone ring and determined that the warning lamp illuminated consistently in these vehicles when the vehicle was driven above the threshold speed of 3-5 MPH.

(7) Scope

Freightliner began installing uncoated integral tone ring rotors in hydraulically-braked vehicles in 1996 and superseded the uncoated rotors with coated rotors at various implementation dates during 2002. The implementation dates for the coated rotors vary according to vehicle model as outlined earlier in this summary in Section 3, "Population."

(8) Safety Assessment

ODI initiated this investigation based on two reports of extended stopping distances in Freightliner vehicles that, through subsequent investigation, were determined to have been caused by corroded tone ring teeth. The signal generated by corroded tone ring teeth can degrade to the point that ABS erroneously perceives that one or more wheels have "locked." In response, the ABS will relieve the hydraulic brake fluid pressure at the affected brakes to prevent the wheel lock condition.

If the ABS system relieves the hydraulic brake fluid pressure when the operator is applying the brakes in an attempt to slow or stop the vehicle, the vehicle stopping distance may increase.

Although ODI is aware of five crashes associated with corroded tone rings in International Trucks,¹ ODI is not aware of any crashes that have occurred in Freightliner vehicles due to extended stopping distances caused by corroded tone rings.

Based on discussions with Freightliner, International Truck, MeritorWABCO and the evaluation drives conducted on March 11, 2003, the tone ring corrosion is a gradual process and the warning lamp illuminates reliably and consistently in Freightliner vehicles for an extended period of time during which the wheel speed signal is increasingly compromised by the effects of ongoing exposure to corrosion. The illuminated warning lamp should provide an adequate and ongoing alert to the vehicle operator that the ABS system requires service attention.

¹ ODI's investigation at International Truck (PE02-060) prompted Campaign 92V-252 to remove and replace the ABS ECU installed in 65,487 1999-2003 MY International Truck vehicles.

If the operator does not repair the ABS in response to the warnings, after further deterioration of the ABS tone ring signal, the vehicle stopping distance can increase under certain stopping conditions.

ODI is concerned that increased stopping distance events could occur if operators become conditioned to the illuminated warning lamp and operate the vehicle for an extended period of time but without having the vehicle ABS serviced.

In the assessment of this issue, ODI has concluded that the subject vehicles are medium trucks used for commercial purposes and operated by professional trained drivers who should be sensitive to the significance of an illuminated in-vehicle warning lamp. Further, these types of vehicles are subject to regular inspections by the fleet and local jurisdictional authorities.

The Federal Motor Carrier Safety Administration (§ 392.7, "Equipment Inspection and Use") requires that

No commercial motor vehicle shall be driven unless the driver is satisfied that the following parts and accessories are in good working order, not shall any driver fail to use or make use of such parts and accessories when and as needed:

- Service brakes, including trailer brake connections.
- Parking (hand) brake.
- Steering mechanism.
- Lighting devices and reflectors.
- Tires.
- Horn.

At the completion of each day's work on each vehicle operated, the driver is required to complete a report that covers various parts and accessories, including any indications of an ABS system malfunction. Prior to driving, the driver is also required to review the last driver vehicle inspection report prepared on that vehicle.

ODI is concerned that vehicle owners purchasing replacement rotors may inadvertently purchase uncoated rotors where coated rotors are more appropriate for the vehicle's operating environment. This is more than a speculative concern since it is reasonable to presume that uncoated rotors enjoy a lower cost, and therefore a potential selling price advantage, over coated rotors. In applications involving minor to moderate exposure to corrosion, the uncoated rotor may

provide an acceptable service life before replacement is required. However, if an uncoated rotor is purchased for a vehicle that is subjected to high exposure levels of corrosion, the tone ring teeth may corrode prematurely and shorten the useful life of the rotor.

ODI will forward a copy of this report to school bus maintenance organizations as well as other commercial vehicle maintenance organizations so that purchasers of replacement rotors have access to information that enables them to make an informed decision when purchasing replacement rotors.

(9) Manufacturer's Corrective Actions

In response to this Engineering Analysis,

- (1) Freightliner implemented coated disc rotors in original production vehicles in 2002 (exact dates vary by vehicle model).**
- (2) Freightliner issued SF258A-D in February 2003 advising the approximately 6600 affected owners of school busses to have the hydraulic disc brake tone rings inspected for corrosion and offering free replacement for rotors that exhibited corrosion.**
- (3) Freightliner issued Service Bulletin 42-48 in October 2003 advising owners of approximately 34,000 "business class" vehicles that Freightliner will provide warranty support for severe tone ring corrosion that causes an ABS fault signal prior to the braking surface wearing out.**
- (4) Freightliner will issue a Service Bulletin to the owners of approximately 547 1996-1998 model year FS-65 (school bus) chassis vehicles to advise these owners of the potential for tone ring corrosion and the importance of promptly servicing the ABS systems if the ABS warning lamp is illuminated (other than at vehicle start-up).**

(10) Conclusions

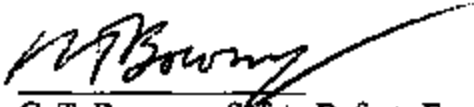
This investigation is closed.

ODI has concluded that certain 1996 -- 2002 Freightliner vehicles equipped with uncoated hydraulic disc brake rotors can corrode when exposed to certain environments. In certain cases the corrosion can degrade the ABS tone ring profile before the useful life of the friction face of the rotors has been exhausted. The wheel speed signal degrades gradually over an extended period of time as the ABS tone ring teeth corrosion progresses. After the corrosion has progressed to the point that the quality of the wheel speed signal is compromised, the ABS warning lamp is illuminated consistently and reliably after each vehicle start-up.

The illuminated warning lamp is intended to provide an obvious warning to the operator that the vehicle ABS requires service. The warning is provided for an extended period of time before the vehicle stopping distance is affected.

Although the application of a corrosion-resistant coating appears to be a directionally correct action for improving the durability of the rotor tone ring teeth, neither ODI nor the vehicle manufacturer have accurate data to reliably forecast the improvement that the rotor coating will have on rotor endurance. Accordingly, after the coated rotors have experienced additional time in service (approximately 18-24 months), ODI will conduct a follow-up inquiry at Freightliner to determine whether any corrosion problems have been reported from the vehicle population equipped with coated rotors.

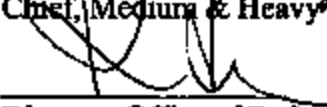
ODI will also forward a copy of this report to selected school bus maintenance organizations and other commercial vehicle maintenance organizations to heighten their awareness of the importance of evaluating whether coated or uncoated rotors is the more appropriate replacement selection for the operating environments of their vehicles.


G. T. Bowman, Safety Defects Engineer

1/22/04
Date

I Concur: 
Chief, Medium & Heavy Duty Truck Division

1/22/04
Date


Director, Office of Defect Investigation

1/24/04
Date

Hydraulic Disc Brake Rotor Corrosion

42-48

FLA COE
FLB COE
FLD Conventional
> Business Class

FLC 112 Conventional
Century Class Conventional
Jockey COE
Cargo

Columbia
Covador
Coronado

**Freightliner
Service Bulletin**

General Information

On February 8, 2002, manufacturing plants began installing hydraulic disc brake rotors with a Magna-Coat finish. The Magna-Coat finish is being added to make the rotor's integral tooth wheel (for ABS sensing) more resistant to corrosion.

Parts

When replacing rotors in service, use the part numbers in Table 1.

Rotor Part Numbers	
Old Rotor	New Magna-Coat Rotor
GUN D6176	GUN D6176M
GUN D6177	GUN D6177M
GUN D6178	GUN D6178M
OM 107912	OM 1003000

Table 1. Rotor Part Numbers

Warranty

This is an informational bulletin only; warranty does not apply.



Field Service Campaign

April 2003
SF258A-D
REVISED NOTICE

Subject: FCCC FS65 Brake Rotors

Models Affected: Specific Freightliner Custom Chassis FS65 school bus chassis with ABS hydraulic disk brakes manufactured between January 1, 1999, and February 6, 2002.

GENERAL INFORMATION

Freightliner LLC, on behalf of its wholly owned subsidiary, Freightliner Custom Chassis Corporation, is initiating Field Service Campaign SF258A-D to modify the vehicles mentioned above.

School buses with ABS hydraulic disk brakes operating in regions that use aggressive de-icing chemicals may experience higher than normal rotor corrosion. Severe corrosion of the ABS tone ring, which is integral to the rotor, may cause the ABS warning lamp in the dash to illuminate due to false wheel speed readings.

Tone rings will be inspected for corrosion. If severe corrosion, not including surface rust, is evident on any tone ring, then all rotors will be replaced with new Magna-coat finish rotors. This Field Service Campaign may be performed once on each vehicle, any additional inspections/rotor replacements are not covered by this campaign.

There are approximately 8,200 vehicles involved.

WORK INSTRUCTIONS

Please refer to the attached work instructions.

REPLACEMENT PARTS

Replacement kits are now available and can be obtained by ordering the kit number listed below from your facing Parts Distribution Center. You will need a total of four kits per vehicle when performing a rotor replacement (two kits for the front rotors and two kits for the rear rotors).

If our records show your dealership has ordered any vehicle(s) involved in campaign SF258A-D, a computer listing of the customers and vehicle identification numbers will be provided to your dealership. This will assist you in determining the number of possible vehicles within your area.

NOTE: There are five vehicles in SF258D. Please order kit 25-SF258-001 only if you have a vehicle calling for SF258D.

Table 1 - Replacement Kits for SF258A-D

25-SF258-000 through 25-SF258-003

Campaign Number	Kit Number	Part Description	Part Number	Qty. per Kit	Suggested Wholesale*
SF258A (Order 4 kits per vehicle.)	25-SF258-000	Gunite Front or Rear Rotor	GUNDB178M	1 ea.	\$95.07 US \$149.56 CAN
SF258B (Order 2 of each kit per vehicle.)	25-SF258-000	Gunite Front Rotor	GUNDB178M	1 ea.	\$95.07 US \$149.56 CAN
	25-SF258-003	ConMet Rear Rotor	CM1000383D	1 ea.	\$216.11 US \$338.98 CAN
SF258C (Order 2 of each kit per vehicle.)	25-SF258-000	Gunite Front Rotor	GUNDB178M	1 ea.	\$95.07 US \$149.56 CAN
	25-SF258-002	Gunite Rear Rotor	GUNDB178M	1 ea.	\$129.97 US \$204.46 CAN
SF258D (Order 2 of each kit per vehicle.)	25-SF258-000	Gunite Front Rotor	GUNDB178M	1 ea.	\$95.07 US \$149.56 CAN
	25-SF258-001	Gunite Rear Rotor	GUNDB177M	1 ea.	\$53.30 US \$89.80 CAN

* Please charge all Direct Warranty Customers the above-listed price for this kit, as they are authorized to perform their own Field Service Campaigns.

Table 1



Field Service Campaign

April 2003
SF258A-D
REVISED NOTICE

Removed Parts

Please follow Warranty Failed Parts Tracking shipping instructions for the disposition of all removed parts.

Labor Allowance

Table 2 - Labor Allowance

Campaign Number	Procedure	Time Allowed (hours)	SRT Code	Damage Code
SF258A-D	Inspect tone rings	0.7	996-0534A	000-Inspected
	Inspect tone rings and replace all rotors	5.1	996-0534B	000-Modifiedx

Table 2

IMPORTANT: When the campaign has been completed, locate the base completion label in the appropriate location on the vehicle, and attach the gray completion sticker provided in the field service kit (Form WAR251). If the vehicle does not have a base completion label, clean a spot on the appropriate location of the vehicle and first attach the base completion sticker (Form WAR259). If a field service kit is not required or there is no completion sticker in the kit, write the campaign number on a blank sticker and attach it to the base completion label.

Claims for Credit

You will be reimbursed for your labor, parts, and handling by submitting your claim through the Warranty system within 30 days of completing the campaign. Please reference the following information in QuickClaim:

- Claim type is **Field Service**.
- In the FTL Authorization field, enter the campaign number and the appropriate condition code (SF258A, SF258B, SF258C, etc.).
- In the Primary Failed Part Number field, enter 25-SF258-000.
- In the Parts field, enter the appropriate kit number(s) as shown in the Replacement Parts Tables. **NOTE:** When performing a rotor replacement, you will need a total of four kits per vehicle (two kits for the front rotors and two kits for the rear rotors). Wheel seals, if needed, may be claimed as miscellaneous parts on your field service claim.
- In the Labor field, first enter the appropriate SRT from the Labor Allowance Table. For administrative time, enter SRT 939-0010A for 0.3 hours.

This Field Service Campaign will terminate on March 1, 2006. Dealers will be notified of any changes to the termination date via dealer e-mail or revised bulletin.

NOTE: ServicePro®/Service Advisor® must be viewed prior to beginning work to ensure the vehicle is involved and the campaign and has not previously been completed. Also, check for a completion sticker before beginning work.

All claims must be submitted within 30 days of the repair and within 30 days of the termination date of the campaign. All excess inventory to be returned to the PDC following the conclusion of the campaign must be returned in resalable condition to the Memphis PDC within 90 days from the termination date. Please submit a PAR to request return to the Memphis PDC. (Canadian dealers should return the kits to their facing PDC.)

Contact the Warranty Campaigns Department at (800) 547-0712, from 7:30 a.m. to 4:30 p.m. Pacific Time, Monday through Friday, e-mail address WarrantyCampaigns@Freightliner.com, or the Customer Assistance Center at (800) 385-4357, after normal business hours, if you have any questions or need additional information.



Field Service Campaign

April 2003
SF258A-D

REVISED NOTICE

Copy of Letter to Owner

Subject: Freightliner Custom Chassis FS65 Brake Rotors

Freightliner LLC, on behalf of its wholly owned subsidiary, Freightliner Custom Chassis Corporation, is initiating Field Service Campaign SF258A-D to modify specific Freightliner Custom Chassis FS65 school bus chassis with ABS hydraulic disk brakes manufactured between January 1, 1999, and February 8, 2002.

School buses with ABS hydraulic disk brakes operating in regions that use aggressive de-icing chemicals may experience higher than normal rotor corrosion. Severe corrosion of the ABS tone ring, which is integral to the rotor, may cause the ABS warning lamp in the dash to illuminate due to false wheel speed readings.

Tone rings will be inspected for corrosion. If severe corrosion, not including surface rust, is evident on any tone ring, then all rotors will be replaced with new Magna-coat finish rotors.

Repair kits are now available for authorized dealers to order. Contact your authorized dealer to arrange to have your vehicle(s) modified and to assure that parts are available at the dealer.

When you contact your dealer, refer to Field Service Campaign SF258A-D and your vehicle identification number. Once kit(s) are received at the dealership, the campaign will take up to approximately four hours and will be performed at no charge to you.

This Field Service Campaign will terminate on March 1, 2006. Please make sure your vehicle(s) is modified prior to this date. Modifications completed after this date will be done at the customer's expense. This Field Service Campaign may be performed once on each vehicle, any additional inspections/rotor replacements are not covered by this campaign.

IMPORTANT: When the campaign has been completed on your vehicle, please ensure that a completion sticker has been affixed to your vehicle referencing **SF258A-D**.

Contact the Warranty Campaigns Department at (800) 547-0712, from 7:30 a.m. to 4:30 p.m. Pacific Time, Monday through Friday, e-mail address WarrantyCampaigns@Freightliner.com, or the Customer Assistance Center at (800) FTL-HELP or (800) STL-HELP, after normal business hours, if you have any questions or need additional information.

WARRANTY CAMPAIGNS DEPARTMENT

Enclosure



Field Service Campaign

April 2003
SF258A-D
REVISED NOTICE

Work Instructions

Subject: FCCC FS65 Brake Rotors

Models Affected: Specific Freightliner Custom Chassis FS65 school bus chassis with ABS hydraulic disk brakes manufactured between January 1, 1999, and February 6, 2002.

Tone Ring Inspection and Rotor Replacement Procedures

1. Park the vehicle on a level surface. Shut down the engine, set the parking brake, and chock the tires.
2. Inspect the base completion label (Form WAR259) on the inside panel over the driver's side sliding window for a completion sticker for SF258 (Form WAR260). If a sticker is present, no further work is needed, remove the chocks from the tires. If a sticker is not present, continue with the next steps.
3. Jack up the vehicle and support it securely on safety stands rated for the vehicle's weight.
4. Under the vehicle, use a light to look through the tone ring inspection ports. Turn the wheels slowly and check all the way around each of the tone rings for corrosion damage.
5. The tone rings are integral parts of the brake rotors. If any of a vehicle's tone rings show severe corrosion, not including surface rust, all rotors on that vehicle should be replaced with new Magna-coat finish rotors from the appropriate field service kits listed in the Replacement Parts Table. NOTE: When performing a rotor replacement, you will need a total of four kits per vehicle (two kits for the front rotors and two kits for the rear rotors).
6. See Group 42 of the vehicle's service or workshop manual for specific removal and replacement procedures.
7. When the work is completed, place a completion sticker for SF258 (Form WAR261) on the base completion label (Form WAR259) located on the panel above the driver's sliding glass window.
8. Remove the safety stands and chocks.

Hydraulic Disc Brake Rotor Corrosion

42-48

FLA COE
FLB COE
FLD Conventional
> Business Class

FLC 112 Conventional
Century Class Conventional
Argosy COE
Cargo

Columbia
Condor
Coronado
> Business Class M2

**Freightliner
Service Bulletin**

Description of Revisions: This bulletin replaces the version dated February 2002. Text and warranty information are expanded and revised. Damage code information and a repair time table are added.

General Information

On February 8, 2002, manufacturing plants began installing hydraulic disc brake rotors with a Magna-Coat finish. The Magna-Coat finish is added to make the rotor's integral toothed wheel (also called the tone ring, for ABS sensing) more resistant to corrosion.

Vehicles with ABS hydraulic disk brakes operating in regions where especially corrosive ice removal chemicals are used may experience higher than normal rotor corrosion. Severe corrosion of the integral ABS tone ring may cause the ABS warning lamp in the dash to illuminate due to false wheel speed readings.

CAUTION

As stated in the driver's manual, illumination of the ABS warning lamp other than at vehicle start-up requires immediate repair of the system. Ignoring the lamp for an extended period may result in reduced brake performance.

Refer to troubleshooting procedures in Group 42 of the appropriate workshop manual.

Parts

Available through the PDCs. Part numbers are superseded to those with Magna-coat finish. See Table 1.

Rotor Part Numbers	
Old Rotor	New Magna-Coat Rotor
GUN D6176	GUN D6176M
GUN D6177	GUN D6177M
GUN D6178	GUN D6178M
GM 107312	GM 10003830

Table 1, Rotor Part Numbers

Warranty

For vehicles built prior to February 8, 2002, normal warranty applies if severe brake corrosion is evident and if the tone ring produces ABS fault signals prior to the braking surface wearing out (i.e., the rotor braking surface exceeds the minimum thickness stamped on the rotor). When submitting claims, refer to this bulletin by number in the story of the claim. See Table 2 for damage code and time guide information. The failed part number on the claim should be the part number of the old, corroded rotor. See Table 1.

Damage Code and Repair Time Information			
Damage Code	SRT	Description	Time (hours)
419-001A12690	402-5010A	Brake, Front, R/R	1.1
419-001A12690	402-5010B	Brake Rotors, Front, Both, R/R	2.1
451-001A12690	423-5010A	Brake Rotor, Rear, R/R	1.2

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Hydraulic Disc Brake Rotor Corrosion

Freightliner Service Bulletin

FLA COE
PLB COE
FLD Conventional
> Business Class

PLC 112 Conventional/
Century Class Conventional
Argosy COE
Cargo

Columbia
Condor
Coronado
> Business Class M2

Damage Code and Repair Time Information			
Damage Code	SRT	Description	Time (hours)
451-001A12890	423-5010B	Brake Rotors, Rear, Both, R/R	2.3

Table 2, Damage Code and Repair Time Information