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(16 pages)

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**RECEIVED**

*By Recall Management Division at 10:39 am, Jan 29, 2013*

Via Email to RMD.ODI@DOT.GOV and Certified Mail

Ms. Nancy Lummen Lewis  
Associate Administrator for Enforcement  
National Highway Traffic Safety Administration  
Attn: Recall Management Division (NVS-215) 1200 New Jersey Avenue, SE  
West Building  
Washington, DC 20590

Re: Notification of Defect Affecting Motor Vehicle Safety

FRAM Group Operations, LLC ("FRAM") has determined that a limited number of replacement oil filters it manufactured and sold to Subaru of Indiana Automotive, Inc. ("SIA") for distribution to the Subaru of America ("SOA") dealer network have a manufacturing defect related to motor vehicle safety. SOA and SIA may be referred to collectively and generally as "Subaru". No motor vehicle accidents or personal injuries have been reported. The following information is submitted pursuant to the motor vehicle equipment defect and non-compliance reporting regulations of the National Highway Traffic Safety Act (49 CFR Part 573). Based upon reported data from the field, the defect resulted in a leaking filter that, shortly after installation, could have resulted in a loss of motor oil. That loss of motor oil could, in certain circumstances, result in a fire and engine shut down. As further set forth below, five incidents impacting motor vehicle safety have been reported to FRAM.

FRAM and Subaru have taken effective steps to quarantine potentially defective filters, and FRAM estimates that few, if any, defective filters remain installed. FRAM will issue public notice and recall the limited number of potentially defective filters that may still be uninstalled and in the possession of certain consumers.

### **Equipment Manufacturer and Chain of Distribution**

FRAM is a manufacturer of oil, fuel, and air filters for passenger and commercial motor vehicles. FRAM sells oil filters to vehicle manufacturers for installation on new vehicles (Original Equipment or "OE") and for distribution to dealers to install as replacements (Original Equipment Service or "OES").

This notice relates to FRAM's model 15208AA12A filter (the "filter") which is sold exclusively to SIA for OES applications. The filters sold to SIA for OES applications fit Subaru Legacy, Outback, Impreza, and Forester models equipped with certain 4 cylinder engines. The potentially affected population consists of an estimated 282,514 filters that were available to Subaru dealers between July and December 2012. However, as described in detail below, as a result of recovery and quarantine efforts, and in consideration of the low conformity rate of 0.0126%, FRAM believes that only an estimated 356 non conforming filters were actually available to Subaru dealers for installation or further distribution.

## Description of the Product

The filter (shown below) is a spin-on filter.



Date Code: [single digit year]  
[three digit date of assembly]  
[single digit shift]

Model Number

The filter media is contained in a housing that prior to assembly is open on one end. During assembly, the open end is capped with a tap plate (shown below):



The tap plate has a female threaded portion that is concentric to the outer diameter of and perpendicular to the plate. The tap plate also has a channel that holds a "P" ring gasket that is inserted during manufacture.



P-Ring Gasket

This threaded portion is intended to mate with a corresponding, hollow and threaded spud that is connected to the engine (shown below).

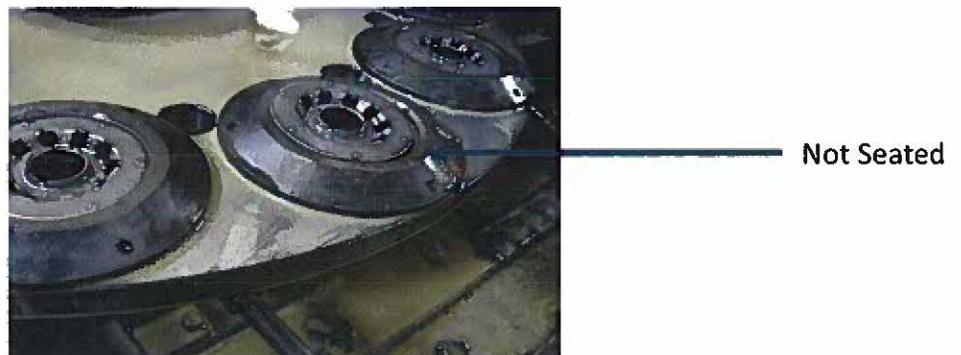


When the filter is screwed onto the engine spud, the gasket compresses against the engine mounting surface and forms an oil tight seal.

**Description of the Defect, Root Cause, and Corrective Measures**

The defect results from a failure in the manufacturing process at FRAM's Greenville, Ohio facility that followed the consolidation of manufacturing operations at that facility during

2012. Between July 5 and October 12, 2012, the threads on a limited number of tap plates were not properly threaded and the assembled filter did not meet the related perpendicularity specification. During this time frame, there were twenty-three multi-shift production runs of this filter, and FRAM's investigation shows that the non-conformity in the tap plates primarily occurred on three multi-shift production runs beginning on July 30, 2012, September 18, 2012 and September 27, 2012. The tap plates are threaded with a high speed, automated tapping machine that makes approximately 3,000 tap plates per hour. The metal blanks that form the tap plates were on a few occasions not aligning properly in the tooling seat that holds the blank in place during the tapping operation (see photograph below):



As of October 25, 2012, FRAM implemented corrective measures to its tapping equipment, which included making changes in the manufacturing process, as well as installing additional sensors on the tapping equipment that now ensure that each blank is properly seated before it is tapped.

A total of 613,151 filters were made in the twenty-three production runs occurring before this manufacturing process issue was identified and corrected. These filters were sold exclusively to SIA for distribution to Subaru automobile dealers. FRAM and Subaru were able to

quarantine a large portion of this population from dealer inventory and recovered or scrapped 330,637 of these filters. Thus, only 282,514 potentially non-conforming filters were available for installation.

Based on its investigation, FRAM believes that of this population, only 0.126% (or 356 filters) may have had this non-conformity, and only a small portion of non-conforming filters could have posed a risk to the safe operation of a vehicle. As a result of its analysis of returned and quarantined filters and field reports, it is FRAM's belief that very few (if any) defective filters remain installed.

#### **Description of the Failure Mode**

The perpendicularity specification for the filter thread is 0.025 inches. This specification is known as "runout" and is equal to the greatest distance between the metal edge of the filter and the engine mounting surface when the filter is installed. FRAM's investigation of the five reported incidents has shown that in failed filters, this measurement has exceeded 0.106 inches.

FRAM's investigation of field incidents and returns shows that non-conforming filters have failed because engine oil pressure extrudes the gasket out of the channel,<sup>1</sup> ultimately breaching the seal and causing a rapid loss of nearly all engine oil.<sup>2</sup>

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<sup>1</sup> The gasket may tear during the process of extruding.

<sup>2</sup> Subaru performance specifications require that oil filters maintain their structural integrity under the following SAE HS-806 testing conditions: a) Impulse Test: 40,000 cycles of 3.33hz

Non-conforming filters with a runout of less than approximately 0.080 inches will seal and pose no safety risks. Non-conforming filters with a runout in excess of 0.080 inches will “wobble” as they are screwed on the engine spud. “Wobblers” should be (and were) identified by Subaru dealer technicians as non-conforming during installation. If the wobble is not observed, field reports demonstrate that filters with runout in excess of 0.120 inches would not be able to hold an adequate seal during engine operation. Such filters will “gush oil” upon start up.

In certain filters with a runout between 0.080 to 0.120 inches, the filters may or may not leak in an amount observable at the time of installation, but operating pressures will soon displace the gasket and these filters will fail with a rapid loss of oil, likely after a day or two of normal operation. Such a failure may affect motor vehicle safety. The incidents reported to FRAM show that these failures have occurred within 300 miles or less of vehicle operation following installation.

Ongoing testing by FRAM has shown that filters with a runout in the range of 0.080 to 0.120 inches may either seal or leak, but will not necessarily result in an extruded gasket leading to a failure that could affect motor vehicle safety. Whether a non-conforming filter will hold a seal depends upon multiple factors, including the degree to which the filter lacks perpendicularity, the normal variances in the threads on the filter and the spud, and the amount of torque applied to seat the filter on the spud. FRAM’s testing has shown that

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pressures from 29-213 psi; b) Burst Test: pressure equal to or greater than 213 psi; and c) Cold Start Test: pressure equal to or greater than 142 psi at a temperature of -22F.

although filters with a runout in excess of 0.080 inches but less than 0.120 inches may not seal completely, and leak when subjected to operating pressures, they may still retain the gasket and not experience a rapid and substantial loss of oil or risk of smoke or fire should oil come in contact with exhaust components.

Of the five in-field incidents reported to FRAM, three failures occurred immediately upon the technician's test drive or within approximately forty-eight hours of installation. Measured by miles driven, the five in-field incidents occurred at 300 miles, 188 miles, 141 miles, 108 miles and 1 mile after installation. The lack of perpendicularity ranged from 0.106 to 0.118 inches. Based on last shipment date of filters produced before corrective measures were put in place (i.e., before October 12, 2012), FRAM believes that vehicles on which any non-conforming filters were installed have far exceeded the mileage that a defective filter with a runout of 0.080 inches (or more) can withstand operating oil pressures prior to a gasket failure leading to a substantial loss of oil.

### **Chronology of Events**

FRAM began manufacturing the filter at its Greenville, Ohio facility on July 5, 2012 and started shipping those filters to Subaru a few days thereafter. There were production runs on a periodic basis through October 12, 2012, and a total of 613,151 filters were delivered to Subaru.<sup>3</sup> The filters were shipped to Subaru within one to two days following each production

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<sup>3</sup> The root cause of the manufacturing defect was identified and corrective measures were in place by October 25, 2012 and none of these filters were manufactured between October 12 and October 25, 2012. On October 25, 2012, FRAM again started manufacturing these filters and shipping them to Subaru, and continues to manufacture and ship these filters to Subaru.

run. FRAM understands that following delivery to Subaru's distribution centers, the filters usually arrive at individual Subaru dealers within a week or two. FRAM believes that most filters are installed within thirty to sixty days of their production date.

In August 2012, FRAM received notice from another customer that certain of its products made at its Greenville facility were leaking after installation. FRAM began an investigation and identified the non-conformity in its tapping process. This investigation concluded with the implementation of the corrective measures described above on October 25, 2012.

On or about October 18, 2012, Subaru first notified FRAM that it had received reports from dealers of "wobbling" or leaking filters. Accordingly, FRAM and Subaru took steps to quarantine the potentially-affected lots that had been shipped. This recovery effort began on October 23, 2012 when Subaru issued a notice to its dealer network to return any uninstalled inventory. To date, Subaru has recovered, scrapped, or returned to FRAM a total of 330,637 filters; thus, of the 613,151 filters shipped by Fram, only approximately 282,514 units were actually available for Subaru dealers for possible installation or sale at a dealership parts department.

After these recovery efforts were underway, on October 24, 2012, FRAM received oral reports from Subaru of additional filter failures and thermal events and re-opened its investigation. To date, FRAM has received a total of forty-five defect reports from Subaru of filters that fall into one of two categories: One category consists of filters that were returned to Subaru by installing dealers because the filters wobbled during installation, leaked upon

installation or was rejected due to cosmetic defect. A total of thirty-five such filters have been returned to Subaru by its dealers and provided to FRAM for inspection. Of these thirty-five filters, FRAM has determined that nine have a runout within specification and twenty-six have runout in excess of specification. FRAM believes that the defect in these twenty-six filters was immediately observed and that these filters were never put in service. Inspection of the nine other filters shows them to have dents and scratches which is the reason for their return to Subaru.

The second category consists of the five reported incidents of filters failing in the field after installation. These incidents occurred between October 23, 2012 and January 10, 2013. Some of these reports have been confirmed by FRAM's own investigation and lead to its determination that this defect is safety related. FRAM has confirmed that these failures have occurred during a technician test drive or during consumer vehicle operation. Five of the failures caused property damage to the vehicle. Four of the failures involved reported fires or thermal events. There have been no reports of any personal injury or any motor vehicle accident as a result of these failures.

FRAM believes that the reported observations of smoke or flame occurred because, as shown below, the exhaust and catalytic converters of the Subaru engine are located in close proximity to the oil filter.



Oil likely came in contact with the exhaust or catalytic converter and caused smoke or flames. In the event of a failure, the oil will rapidly be depleted and may drip onto exhaust components. When the oil fouls those components, smoke and potential flames may occur. FRAM does not believe that there is sufficient oil available to support a thermal event that could endanger vehicle occupants or surrounding structures. The five incidents are more fully described below:

- October 23, 2012. This report was received by Subaru and involves a filter manufactured on September 19, 2012 that was installed on a 2012 Outback by a Subaru dealer located in Turnersville, New Jersey. This filter leaked during a road test conducted by service personnel. The leak was significant and resulted in the loss of a substantial but undetermined amount of engine oil. Personnel at the dealership reported seeing smoke and open flames. The event caused damage and melting of plastic components in the engine compartment. The runout of this filter was 0.118 inches.

- November 7, 2012. This report was received by Subaru and involves a filter manufactured on October 8, 2012 that was installed on a 2010 Outback by a Subaru dealer located in Manchester, New Hampshire on November 6, 2012. The filter failed the next day. The vehicle had been returned and driven a reported 141 miles. The owner reported seeing smoke and experienced a significant loss of engine oil. FRAM was provided photographs of this vehicle but was unable to confirm whether the vehicle experienced any fire damage. FRAM was able to determine that the runout of the filter was 0.106 inches.
- December 7, 2012. This report was received by Subaru and involves a filter manufactured on September 27, 2012 that was installed on a 2009 Impreza by a Subaru dealer located in Louisville, Kentucky. The filter failed the following day after the vehicle had been driven 108 miles. Minor smoking was observed by the driver and service personnel and reported to Subaru. FRAM was able to inspect this vehicle, which showed that the non-conformity resulted in a loss of oil significant enough to cause permanent damage to the engine. The runout of this filter was 0.126 inches.
- December 20, 2012. This report was received by Subaru and involves a filter manufactured on September 27, 2012 that was installed on a 2008 Subaru Legacy by a Subaru dealer located in Boise, Idaho. During the two months following installation, the vehicle had only been driven approximately 300 miles. While the vehicle was underway, the driver reported smelling smoke and stopped the vehicle. After opening the hood, the driver reported seeing smoke and open flames and extinguished the fire. FRAM was

able to inspect this vehicle and observed fire damage to plastic components located on the underbody of the vehicle. Based on that inspection, FRAM believes that oil from the filter contacted heated exhaust components. The runout of this filter was 0.111 inches.

- January 10, 2013. This report was received by Subaru and involves a filter manufactured on September 27, 2012 that was installed on a 2010 Outback by a Subaru dealer located in Kirkland, Washington. The filter was installed on December 17, 2012 and failed after being driven 192 miles. The driver reported seeing smoke while the vehicle was underway and stopped the vehicle. The customer reported an oil leak shortly before failure. FRAM has not yet been able to inspect this filter or determine the runout on this filter.<sup>4</sup>

#### **Analysis of the Potentially-Affected Population**

FRAM has also been inspecting and analyzing the population of 278,436 units that were returned by Subaru following the parts quarantine and not scrapped by Subaru. This inspection includes measuring the runout of these returned filters. The data from these inspections reveals that the non-conforming rate is 0.126%. Accordingly, of the 282,514 filters that were made between July 5, 2012 and October 12, 2012, and shipped to the Subaru dealers, it is estimated that 356 may be non-conforming. This estimate is conservative because the investigation shows that the non-conforming tap plates primarily occurred on three production

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<sup>4</sup> As of the date of this report, the filter is still in Subaru's possession. FRAM's field investigation disclosed that this filter had been designated as subject to the quarantine. However, due to oversight by the dealer, this filter was mistakenly installed. Despite this incident, FRAM is confident that the quarantine has been prompt and effective.

runs beginning on July 30, 2012, September 18, 2012 and September 27, 2012<sup>5</sup>. Of the 109,620 filters manufactured on these three dates, 55,544 were returned following the quarantine. Moreover, of the total estimated non-conforming population of 356, the test data shows that only some have a runout in excess of 0.080 inches and FRAM believes may fail within 300 miles if installed.

FRAM has concluded that any defective filters that could pose a safety risk do not remain in operation, for several reasons. These filters were delivered to Subaru dealers for installation by service technicians who have been notified of the defect by Subaru and are otherwise trained to check for leaks following installation after an oil change. Indeed, twenty-six filters were returned to Subaru because they wobbled or leaked. FRAM's testing and the experience from the field shows that the defect will most likely result in an immediate and obvious failure. Finally, field and laboratory testing establishes that, as confirmed by the five reports of failures post-installation, a defective filter that is installed will fail (if it is indeed prone to failure) within the outer most range of 300 miles of vehicle operation. The potentially affected installed base, the newest of which have already been in service for more than two months, have far exceeded this mileage.

FRAM has concluded, as a result, that any non-conforming filters that were installed and remain in the field have sufficient sealing capability, and that these filters do not pose any

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<sup>5</sup> Three of the five incidents detailed above involve filters manufactured on September 27, 2012.

safety risks prior to their expected service interval replacement. At this time, FRAM is confident that filters installed in the field do not pose any safety risks or risks of future failure.

### **Remedy Program and Schedule**

For the reasons set forth above, FRAM believes that any of the estimated 356 non-conforming (but not leaking) filters that were installed and are in-service are functioning and will not fail over their expected life. Moreover, the Subaru dealers that make up the primary distribution channel of these filters have already been advised to return (and have been returning) any potentially affected filters.

Nonetheless, consumers in one possible channel of distribution should be provided notice and that channel should be the subject of a recall. These consumers consist of individuals or small businesses that might have purchased filters directly from a Subaru dealer for installation elsewhere, such as by another service professional or by consumers themselves.

It is possible that these individuals may have purchased a filter from a parts department of a Subaru dealer prior to implementation of the corrective action by FRAM and prior to the recovery of filters by Subaru from its dealers. FRAM will recall and replace any uninstalled filters free of charge.

Although data relating to the identity or location of these consumers (if any), or the number of these purchases at Subaru dealers (if any) is not maintained by Subaru, FRAM will issue a public notice on its website, in targeted publications, and to Subaru for distribution and display at dealerships. Copies of the notice and display text are attached.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kenneth S. Burns".

Kenneth S. Burns  
Vice President of Engineering and R&D  
Fram Group Operations, LLC.