VRTC Review and Testing of Overheating Bosch Brakes on Workhorse RV Chassis

February 24, 2009 (updated)

VRTC Testing and Review of Data

- Testing to determine the extent of piston diameter increase due to “water swell”
- Review of WCC warranty claim database
- Review of WCC consumer complaints
- Review of ODI VOQs
- Summary of all claims and complaints

VRTC Testing

- Fieldwork revealed internal piston/bore interference fit – not slide pins, not trapped brake line pressure, not erroneous ABS activation
- Found DTR-2001-D0113 (Dyno Test Report) that discussed water swell of phenolic pistons
- Upon our discovery, Bosch agreed that water swell could be the root cause due to the unique duty cycle of RVs, but they needed proof
- Bosch needed to see piston growth in their heated/humid environmental chamber; their pistons were growing and shrinking and did not show any trend

[redacted]

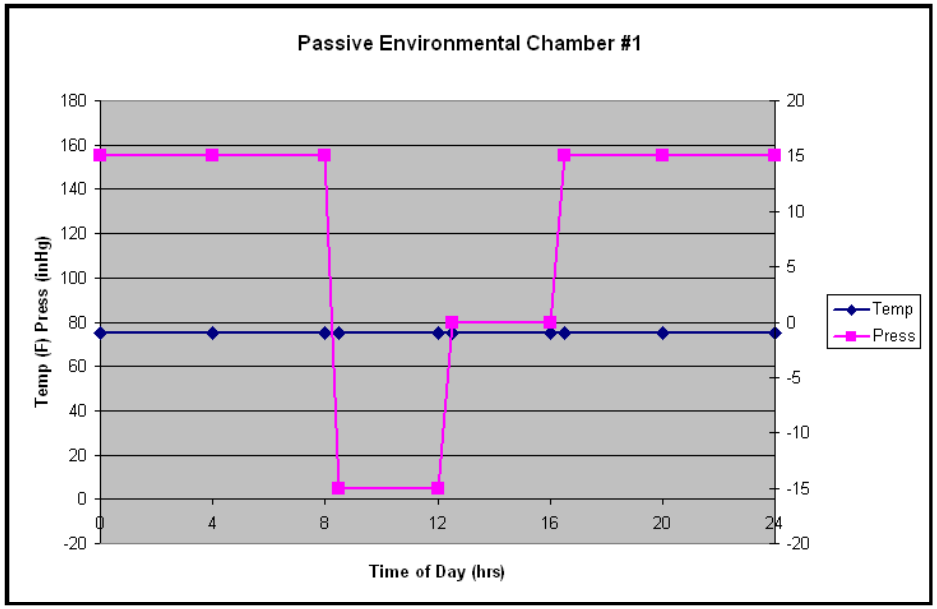
Two passive environmental chambers were used to induce pressure/vacuum and heat/cold, the humidity naturally developed in the sealed chambers

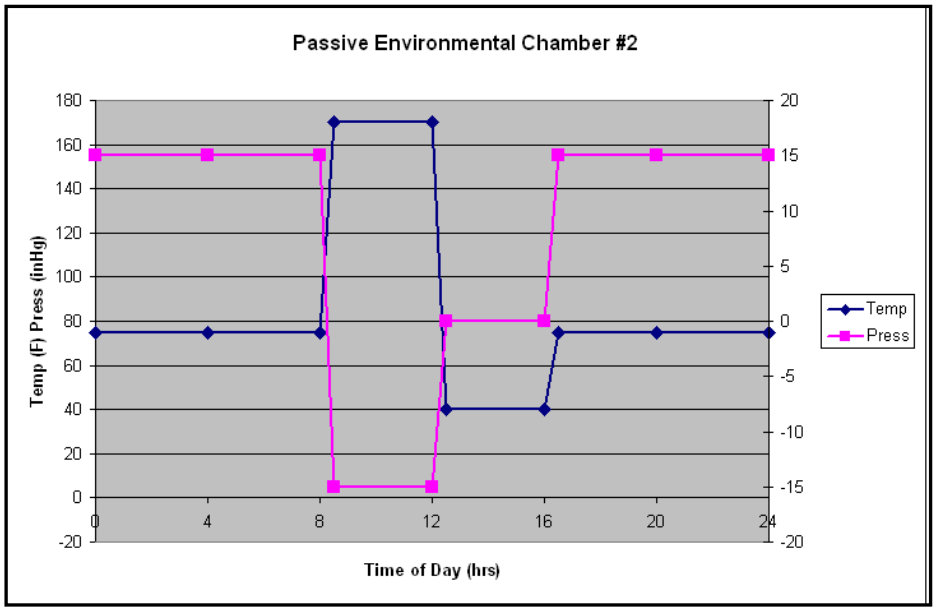
Two Sterilite storage containers with felt lined bottoms and plywood inserts were used anytime the pistons were not in the chambers

The height sensing gage is accurate to one-half of a ten thousands of an inch (0.00005 inch) and the weigh scale to 0.1 grams

Notice measurement position marks and dots on the pistons

Six variations of pistons are being tested including steel and phenolic

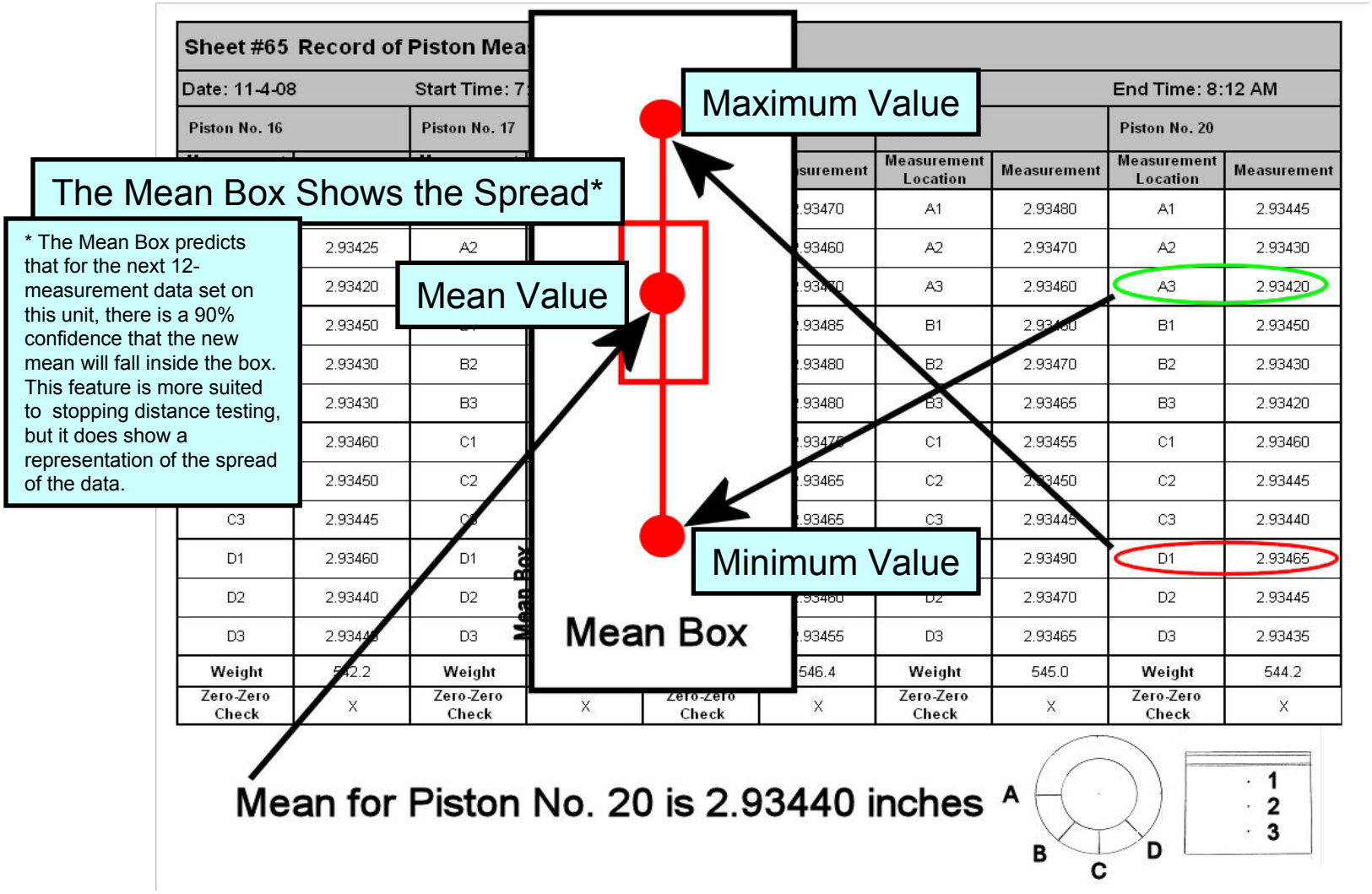


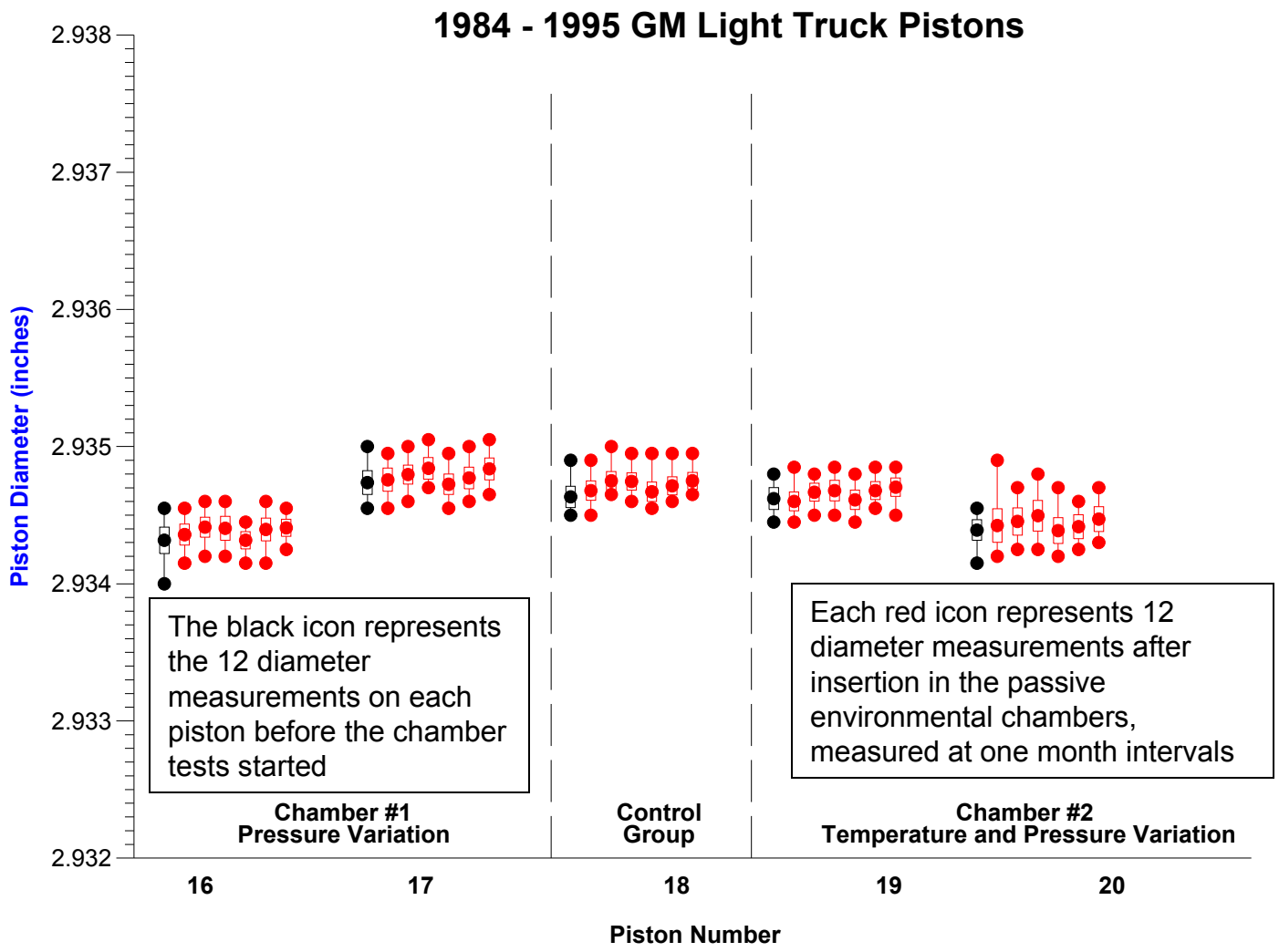


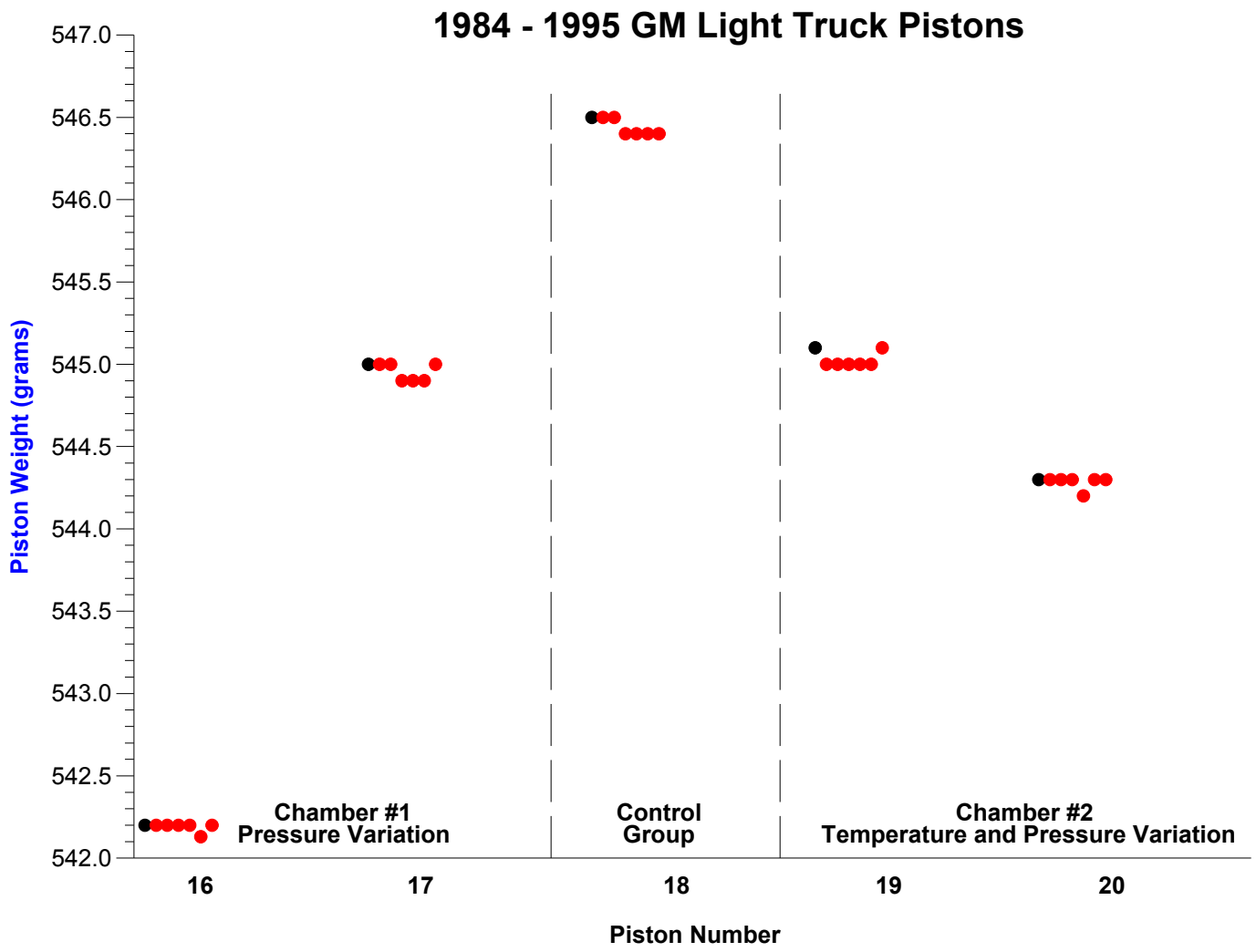
These chambers were always humid and had the same pressure/vacuum changes. Chamber #2 also under went 4 hours in the oven and 4 hours in the refrigerator. The changes in environmental chambers are usually automated, but these chambers required manual attention three times a day, so they were called "passive chambers".

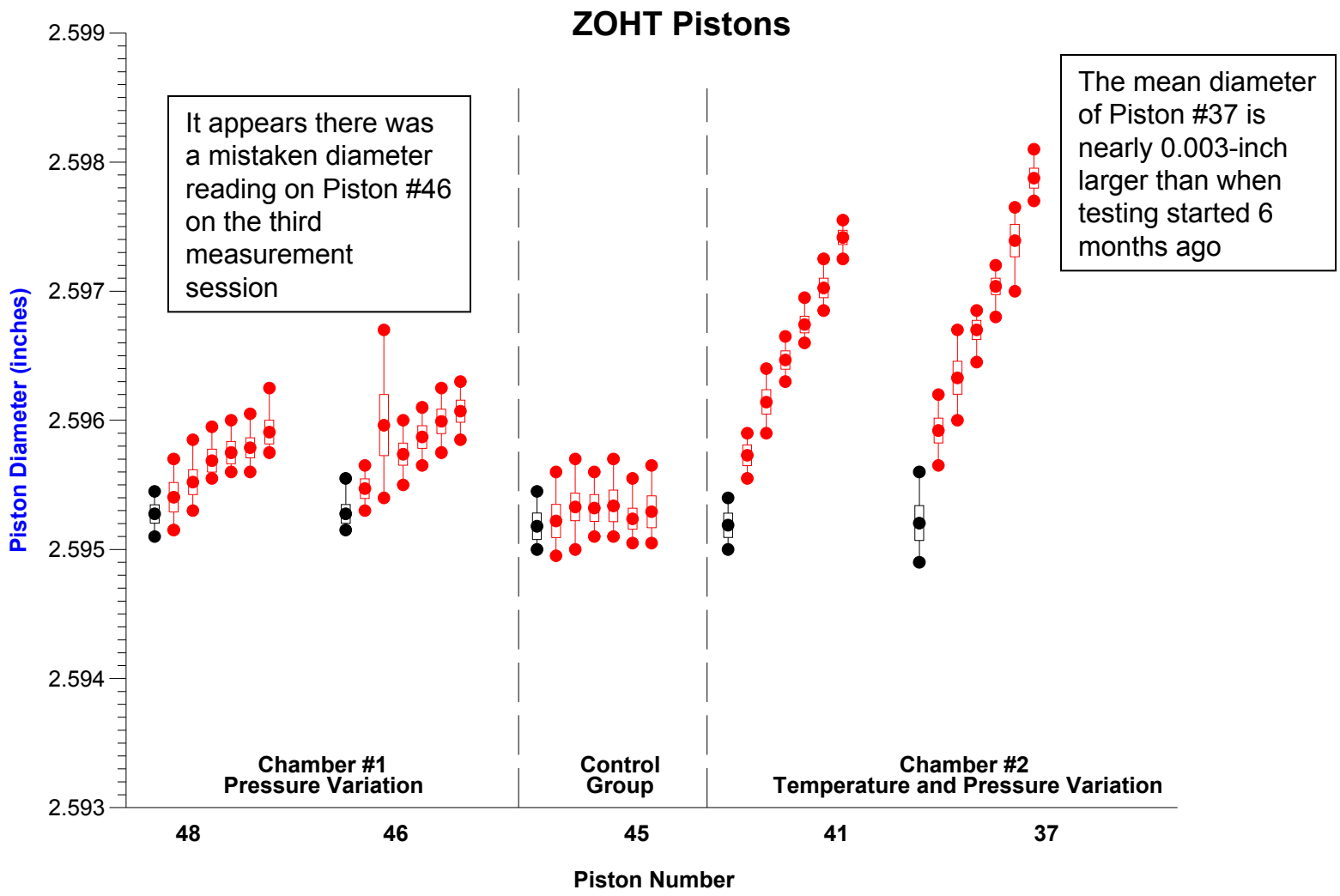
These pressure variations are approximately +/-50% of nominal atmospheric pressure of 14.7 psi. The record atmospheric variations at sea level are 15.7 psi in the winter of 1968 in Siberia and 13.5 psi is in 2005 in the eye of hurricane Wilma. So extreme natural variations range from +7% to -13%. Note: 14.7 psi equals 29.92 inHg

Data Table and How the Mean Box Plot Symbol is Created



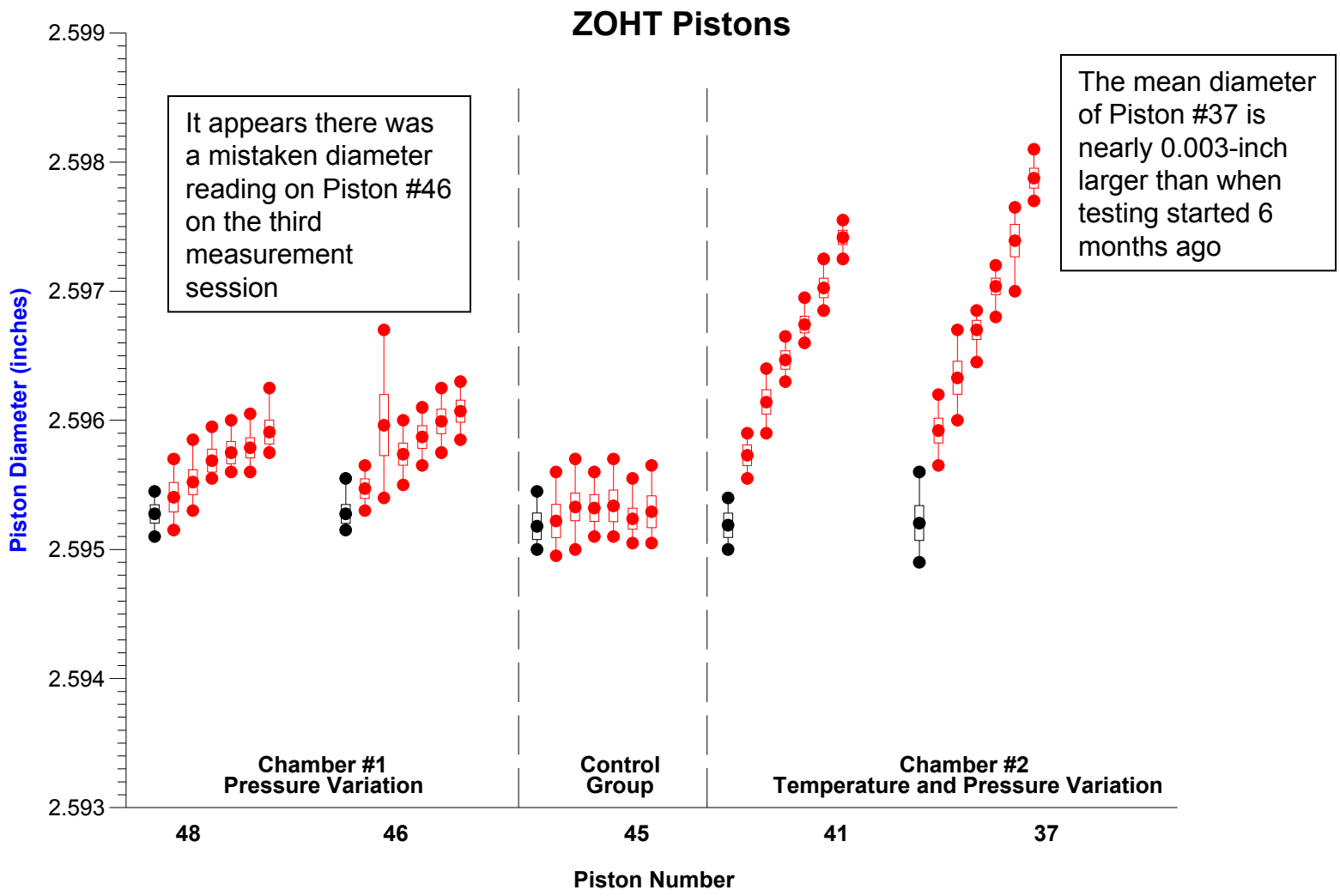

1984 - 1995 GM Light Truck Pistons
Piston Diameter (inches)
2.938
2.937
2.936
2.935
2.934
2.933
2.932
The black icon represents the 12 diameter measurements on each piston before the chamber tests started
Each red icon represents 12 diameter measurements after insertion in the passive environmental chambers, measured at one month intervals
Chamber #1
Pressure Variation
Control
Group
Chamber #2
Temperature and Pressure Variation
16
17
18
19
20
Piston Number

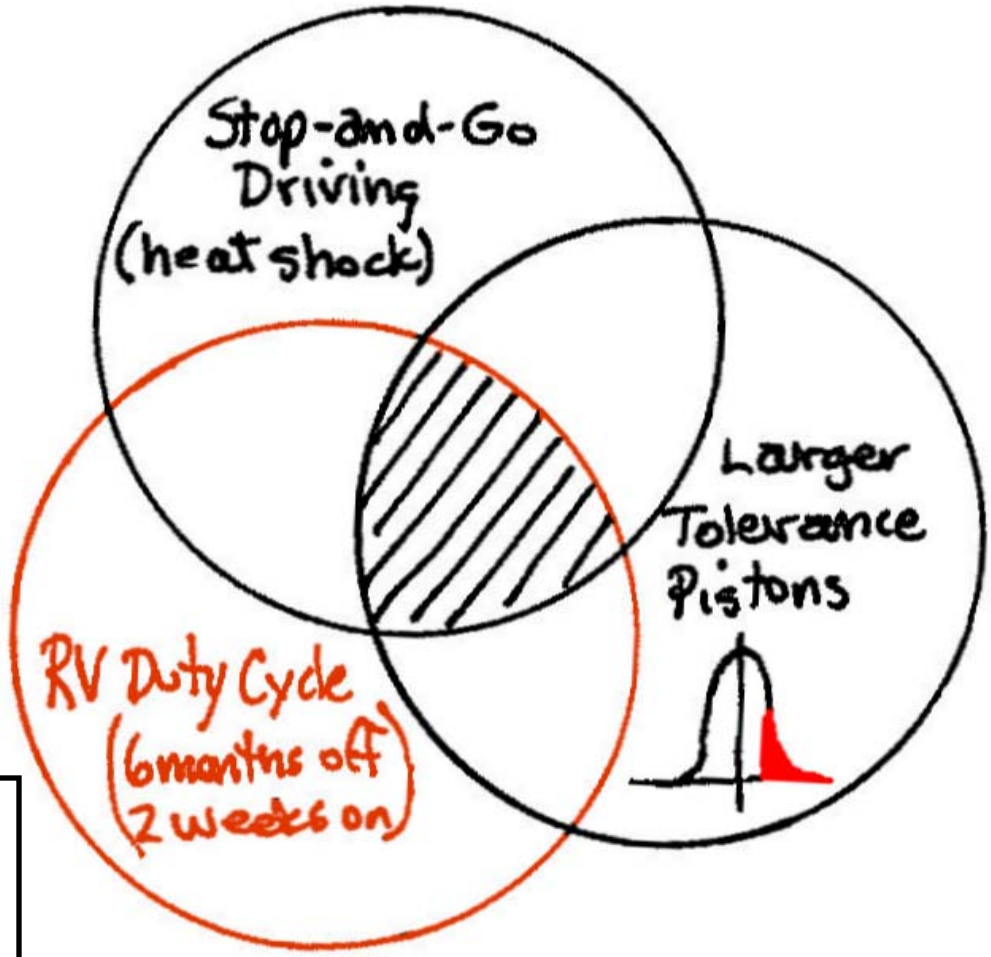

1984 - 1995 GM Light Truck Pistons
Piston Weight (grams)
547.0
546.5
546.0
545.5
545.0
544.5
544.0
543.5
543.0
542.5
542.0
Chamber #1
Pressure Variation
Control
Group
Chamber #2
Temperature and Pressure Variation
16
17
18
19
20
Piston Number


ZOHT Pistons
It appears there was a mistaken diameter reading on Piston #46 on the third measurement session
The mean diameter of Piston #37 is nearly 0.003-inch larger than when testing started 6 months ago
Piston Diameter (inches)
2.599
2.598
2.597
2.596
2.595
2.594
2.593
Chamber #1
Pressure Variation
Control
Group
Chamber #2
Temperature and Pressure Variation
48
46
45
41
37
Piston Number

ZOHT Pistons
Piston Weight (grams)
312.0
311.5
311.0
310.5
310.0
309.5
309.0
308.5
308.0
307.5
307.0
Chamber #1
Pressure Variation
Control
Group
Chamber #2
Temperature and Pressure Variation
48
46
45
41
37
Piston Number

[redacted]


ZOHT Pistons
It appears there was a mistaken diameter reading on Piston #46 on the third measurement session
The mean diameter of Piston #37 is nearly 0.003-inch larger than when testing started 6 months ago
Piston Diameter (inches)
2.599
2.598
2.597
2.596
2.595
2.594
2.593
Chamber #1
Pressure Variation
Control
Group
Chamber #2
Temperature and Pressure Variation
48
46
45
41
37
Piston Number



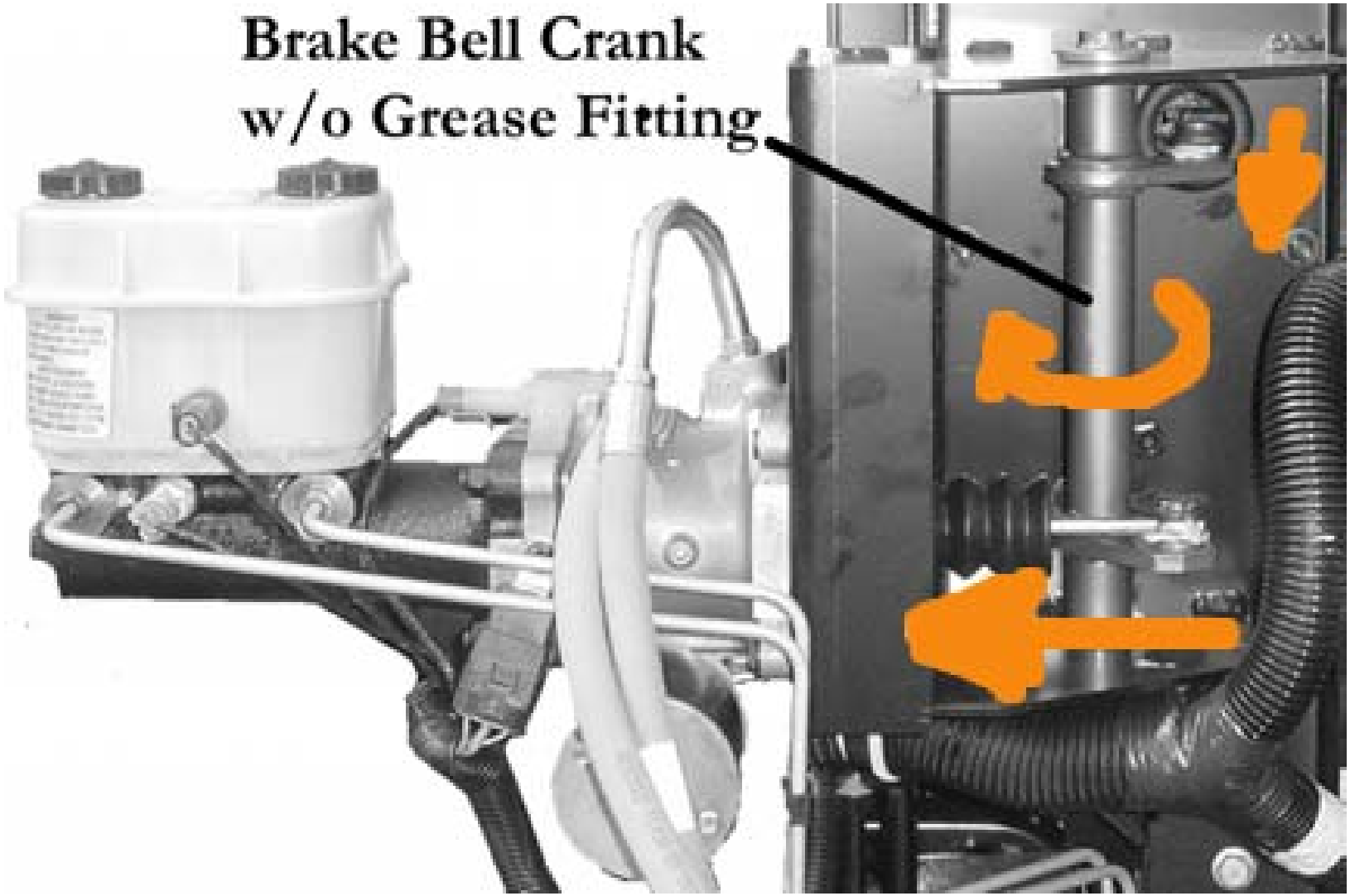
RVs are parked for long periods, do not heat the brake components and drive the water out of the phenolic pistons

VRTC Testing and Review of Data

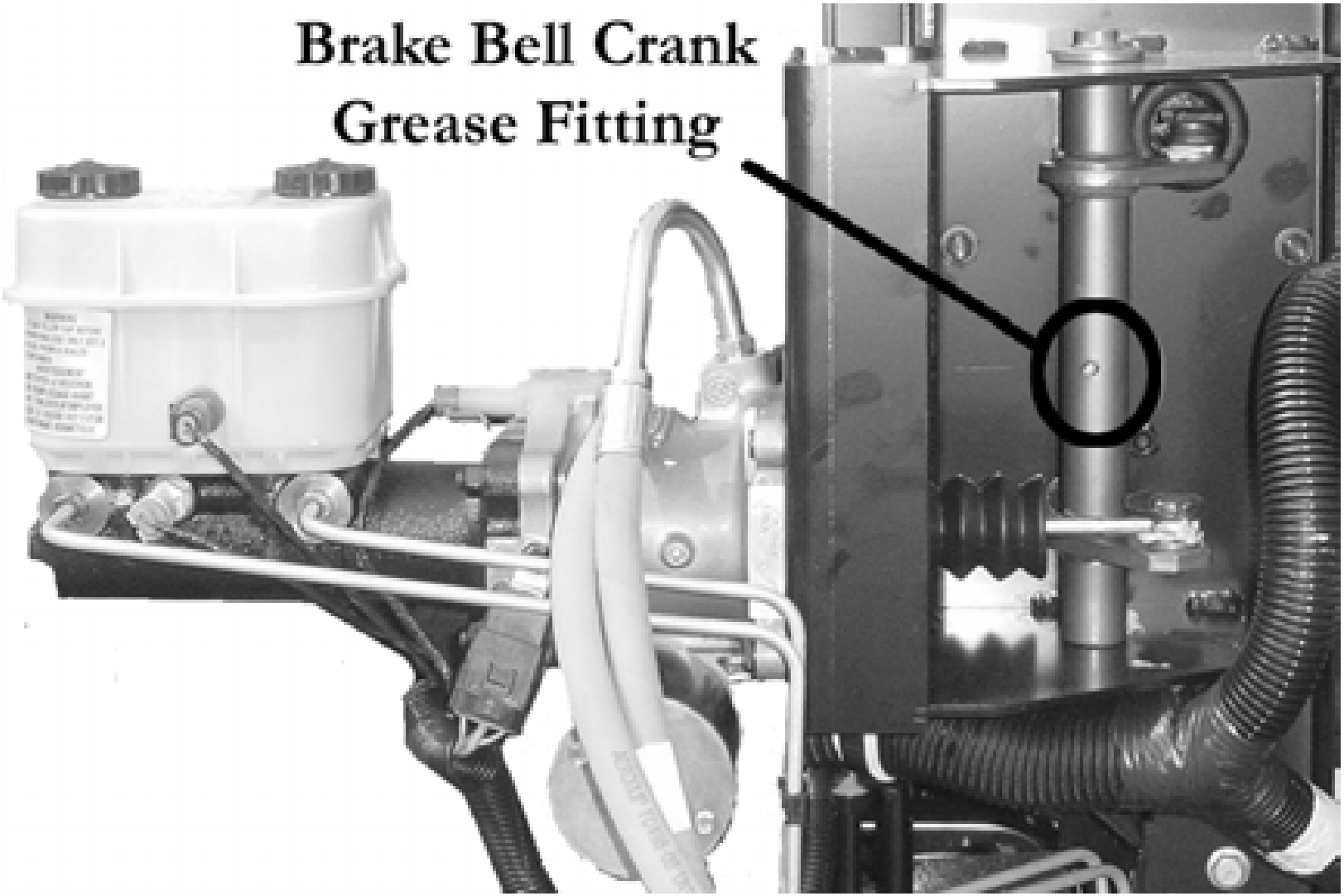
- Testing to determine the extent of piston diameter increase due to “water swell”
- Review of WCC warranty claim database
- Review of WCC consumer complaints
- Review of ODI VOQs
- Summary of all claims and complaints

Review of WCC Warranty Database

- **Data Received**
  - Excel spreadsheet containing 11,173 warranty work items concerning 8,482 warranty claims (submitted to ODI Nov 2008)
- **Data Review**
  - All claims made prior to the actual ZOPS recall date (+10 days for paperwork or data entry delays) were removed and duplicate entries for the same mileage were removed, keeping only the most severe entry
  - **Relevant as Bosch seized ZOPS/ZOHT piston (752)** only if the warranty text indicated the caliper(s) was replaced due to hot brakes [this ignored many other apparently associated brake complaints and assumed a misdiagnosed water-swelled piston would later return with more serious damage indicating the true cause]
  - **Relevant as WCC bellcrank repair (482)** if consumer or technician reported the bellcrank to be stuck, no pedal return, stiff, corrosion, etc
  - **Non-Relevant as WCC preventative measure (1,005)** if grease Zerk was installed without bellcrank problems reported by the consumer or technician [these were tracked separately to alleviate WCC's concern of mixed data]
- **Determined 1,234 WCC Warranty claims were relevant**



bellcrank pivot device makes longitudinal pedal pushrod stroke into lateral master cylinder/booster pushrod stroke



bellcrank tube could be exposed before the body is installed, fill with water and freeze or moisture can cause corrosion => sticking => brakes applied and dragging

WCC Warranty Review by VRTC

The relevancy review was performed separately from the keyword search

			Keyword Search From "ProblemText", "CauseText", and "RemedyText" Columns of 11,173 Claims							
			Claims with "Fire"		Claims With "Burn"		Claims with "Smok"		Claims with "Drag"	
	Production for WCC as of Nov 2007	No. of Claims	No. of Claims *	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles
Relevant Bosch Claims	45,972	752	4	9	121	263	57	124	504	1,096
Relevant WCC Bellcrank Repair Claims	45,972	482	0	0	9	20	3	7	311	676
WCC Nonrelevant Bellcrank Preventive Claims	45,972	1,005	0	0	4	9	4	9	173	376
WCC Non-relevant Claims	45,972	8,931	2	4	175	381	45	98	1,200	2,610
Revelant ZOPS from 2003	128,199	12,125	130	101	279	218	425	332	5,526	4,310

Search Terms			
"fire" "flam"	"burn"	"smok"	"drag" "bind"
"spark"	but not the word "burnish"	"smk"	"hang" "heat"
* Claims were individually			"hot" "lock"
reviewed. The "spark"			"not_releas"
was in a nonrelevant claim.			"stick"

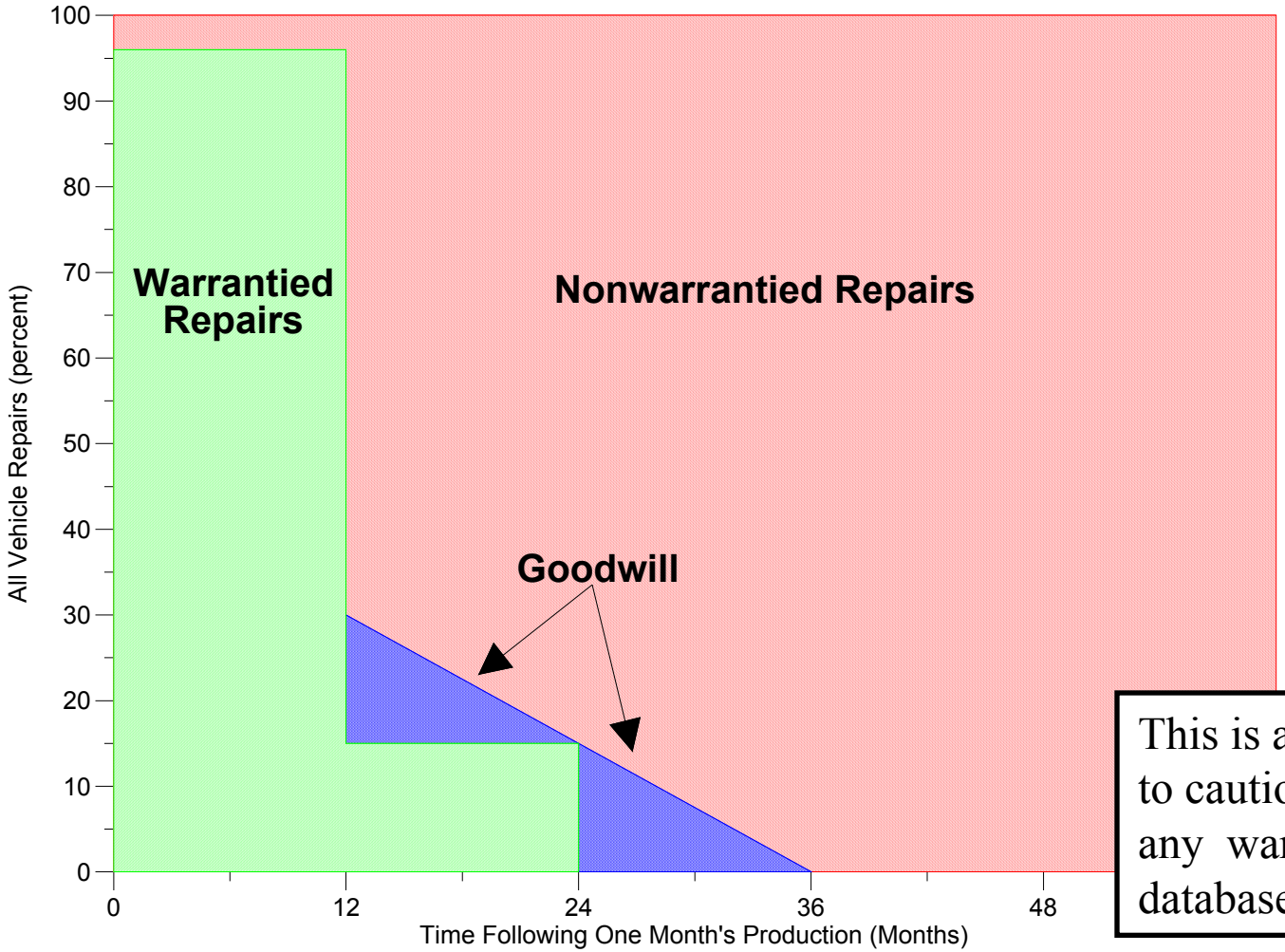
Calculation of WCC VINs w/o Zerk

Factory Installed Zerk Fitting Date	May 2004
Production Prior to May 2004	33,854
Preventive or Repair (unique VIN)	1,469
No. Vehicles Needing Zerk Fitting	32,385

Vehicles That Reported Apparent Boiled Brake Fluid

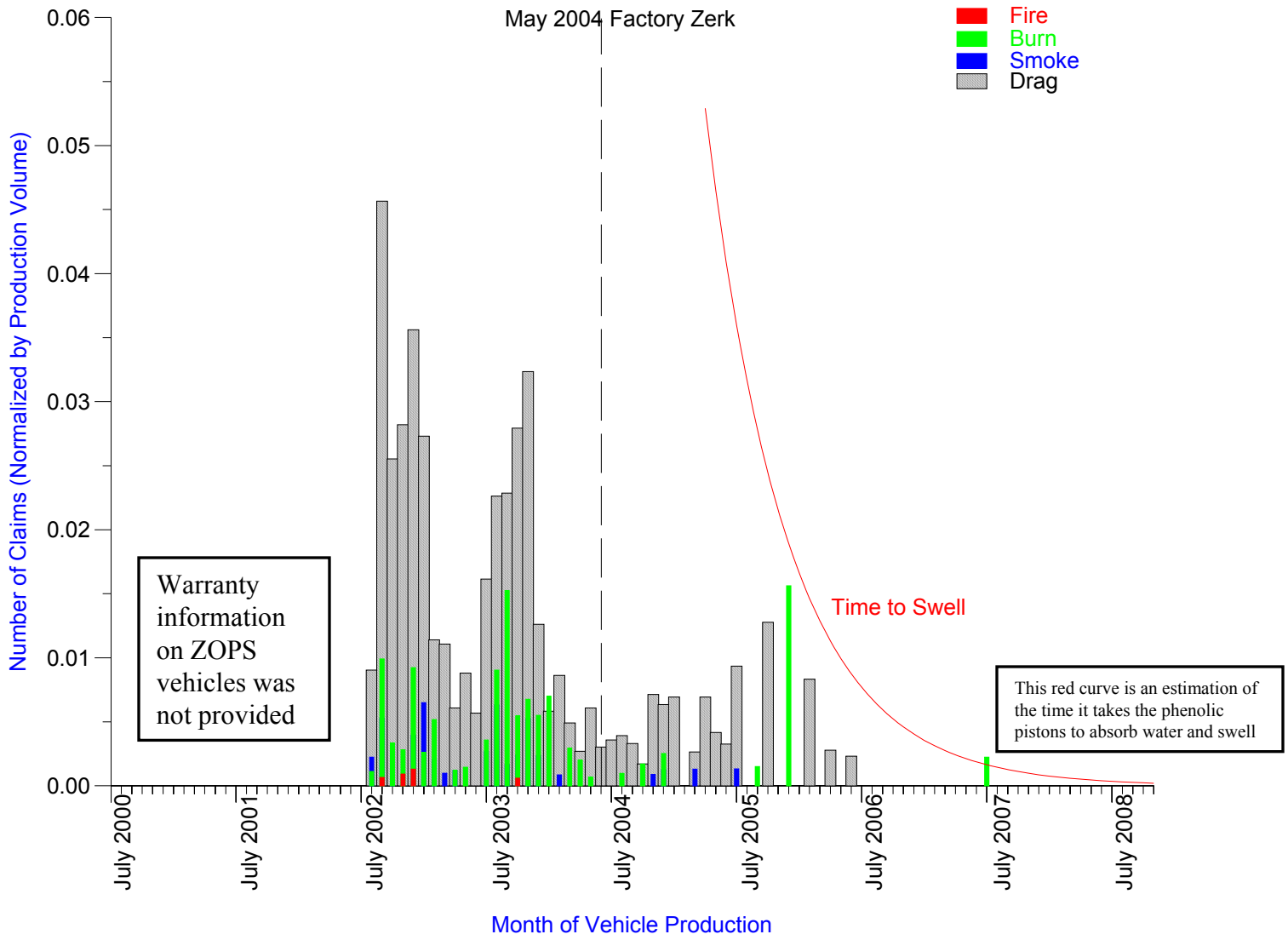
Reason for Floor, Boil, Spongy, Soft, Mushy, "No Brakes", and "Lost Brakes"	Relevant Bosch	Relevant WCC
Brake Line		
Bellcrank		8
Stuck Pistion	46	
Master Cylinder		
ABS		
Other		
Unknown		

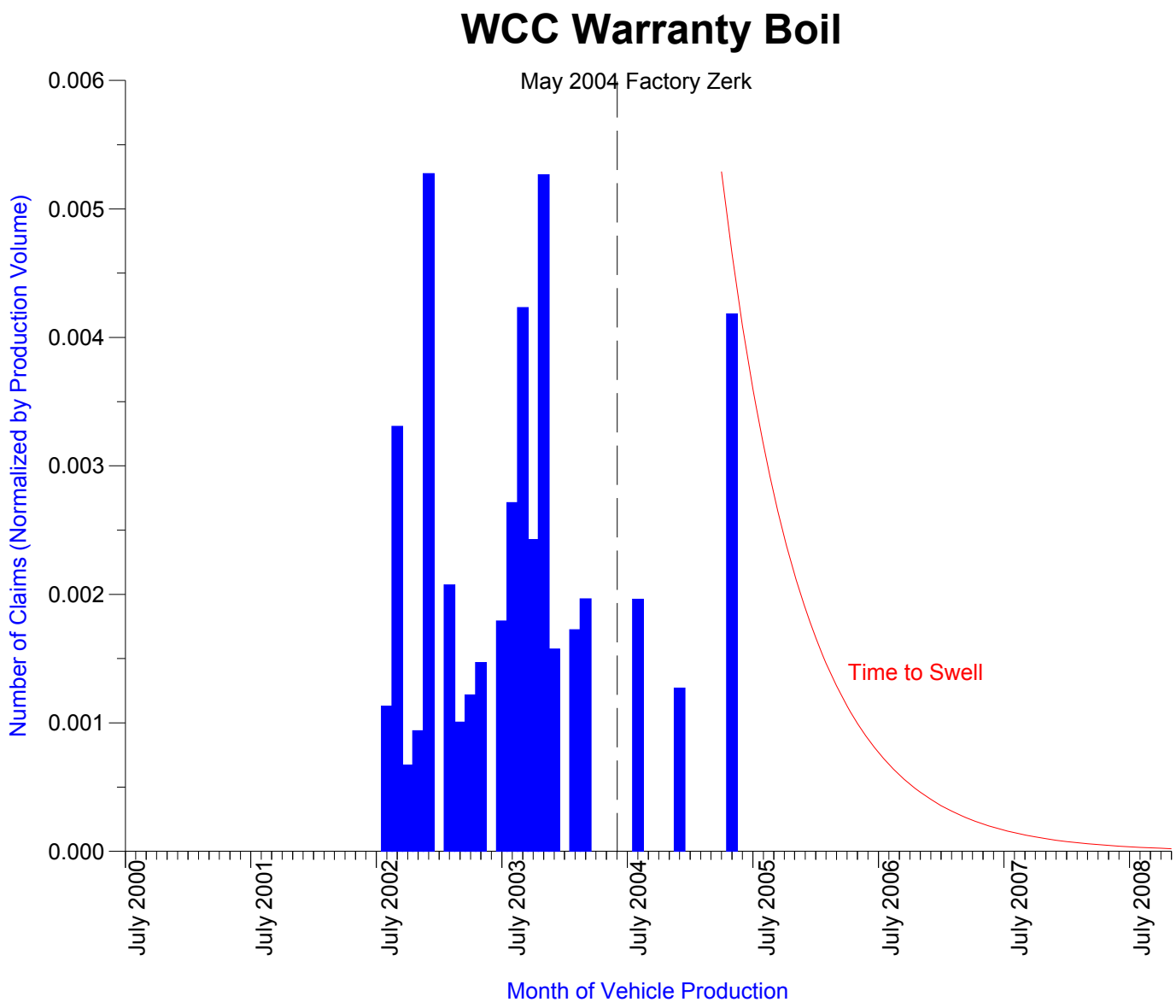
The fire and boil entries were individually reviewed



This is a generic plot to caution viewers that any warranty database is incomplete

WCC Warranty FBSD




WCC Warranty Boil
May 2004 Factory Zerk
Time to Swell
Number of Claims (Normalized by Production Volume)
0.006
0.005
0.004
0.003
0.002
0.001
0.000
July 2000
July 2001
July 2002
July 2003
July 2004
July 2005
July 2006
July 2007
July 2008
Month of Vehicle Production

VRTC Testing and Review of Data

- Testing to determine the extent of piston diameter increase due to “water swell”
- Review of WCC warranty claim database
- Review of WCC consumer complaints
- Review of ODI VOQs
- Summary of all claims and complaints

Review of WCC Consumer Complaints

- **Data Received**
  - PDF copies of paper files contained 493 complaints
  - The complaints were typed into an Excel spreadsheet recording: PDF filename, VIN, event date, event mileage, recall date, recall mileage, relevant to Bosch fire/burn/smoke/drag, relevant to bellcrank repair or preventative update (Zerk), boiled brake fluid, a short description of the complaint
- **Data Review**
  - All data was verified to be relevant to seized pistons, stuck bellcrank, or preventative update (Zerk)
  - All repairs made prior to the actual ZOPS recall date (+10 days for paperwork or data entry delays) were removed and all duplicate entries for the same mileage were removed, keeping only the most severe entry
- **Determined 102 WCC Complaints were relevant**

VRTC Search of WCC Complaint Data

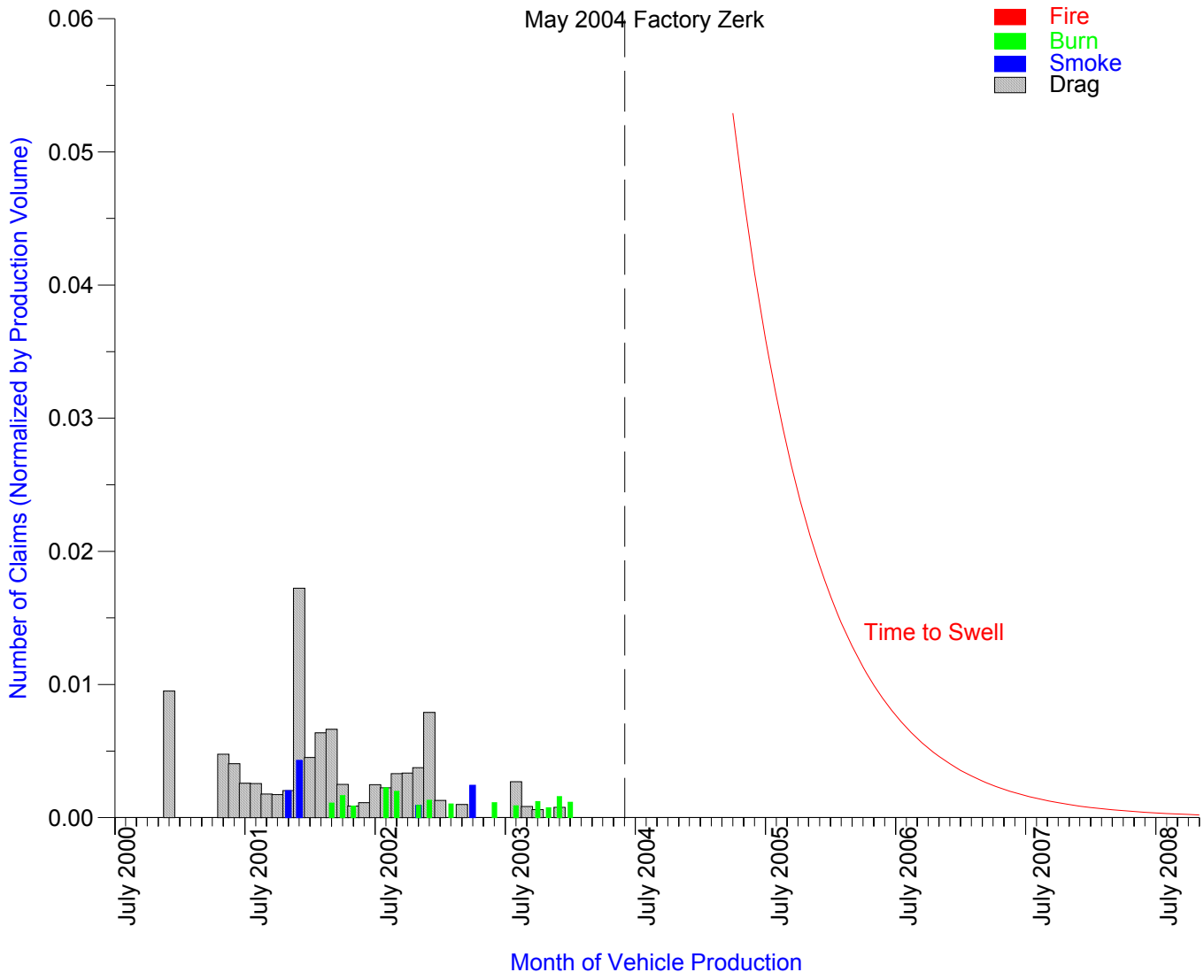
		Keyword Search From 493 Complaints							
		Claims with "Fire"		Claims With "Burn"		Claims with "Smok"		Claims with "Drag"	
	No. of Claims	No. of Claims *	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles
Relevant	102	1	2	20	44	5	11	61	133
		Search Terms							
		"fire" "flam" "spark"		"burn" but not the word "burnish"		"smok" "smk"		"drag" "bind" "heat" "hot" "lock" "not_releas" "stick"	

The relevancy review was performed separately from the keyword search

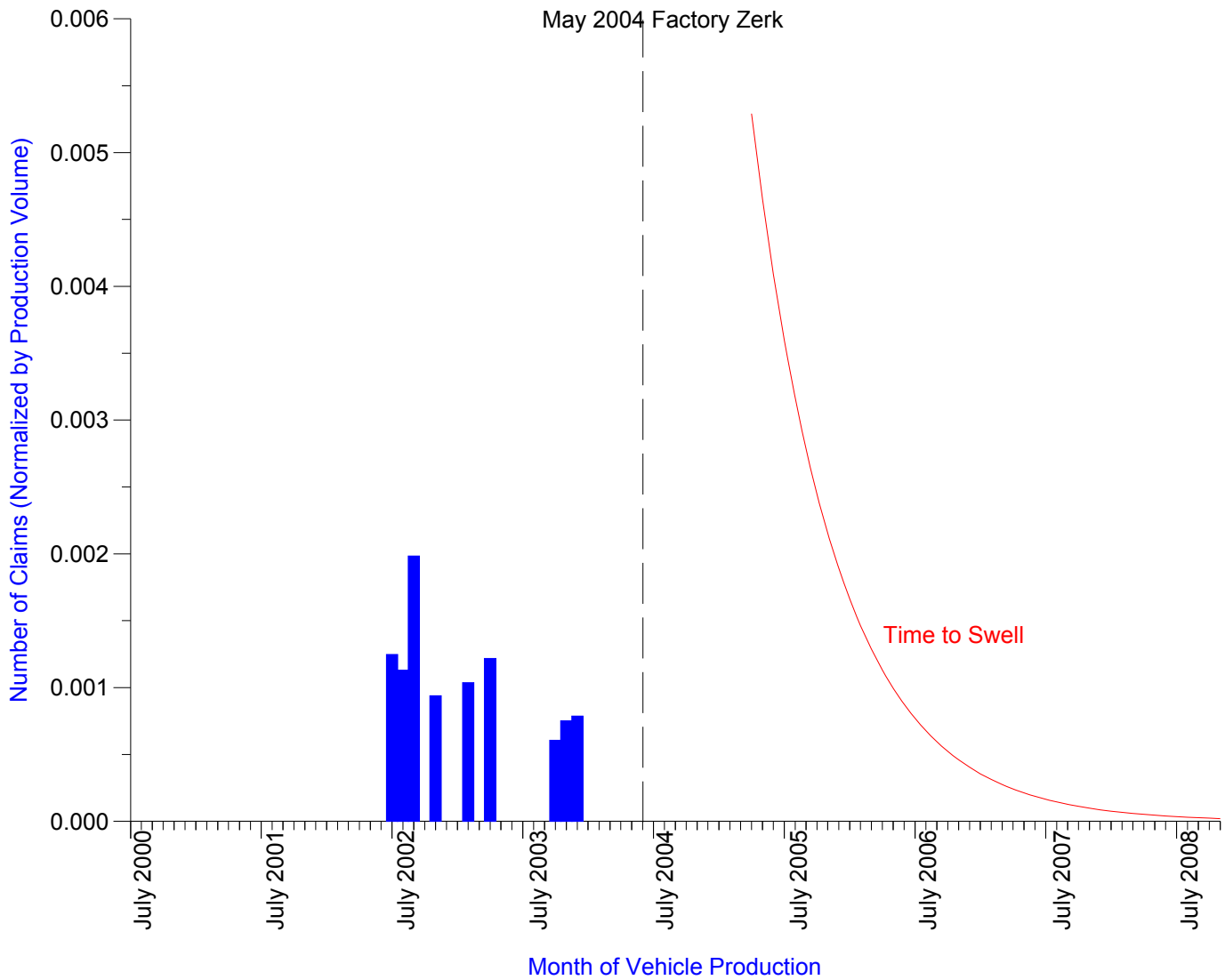
Vehicles That Reported Apparent Boiled Brake Fluid		
Reason for Floor, Boil, Spongy, Soft, Mushy, "No Brakes", "Lost Brakes"	WCC Complaints	Rate per 100,000 Vehicles
Total Count	11	24

The fire and boil entries were individually reviewed

WCC Complaints FBSD



WCC Complaints Boil



VRTC Testing and Review of Data

- Testing to determine the extent of piston diameter increase due to “water swell”
- Review of WCC warranty claim database
- Review of WCC consumer complaints
- Review of ODI VOQs
- Summary of all claims and complaints

Review of ODI VOQ Database

- **Data Received**
  - 45,972 vehicle population (Sept 2007 IRR)
  - VRTC located 901 “5B4”VIN entries in the ARTEMIS public flat file, later entered the VINs from production data file
- **Data Review**
  - All data was verified to be relevant to seized pistons, stuck bellcrank, or preventative update (Zerk)
  - All incident dates prior to the actual ZOPS recall date (+10 days for paperwork or data entry delays) were removed and all duplicate entries for the same mileage were removed, keeping only the most severe entry
- **Determined 191 ODI VOQs were relevant**

VRTC Search of ODI VOQ Complaint Database

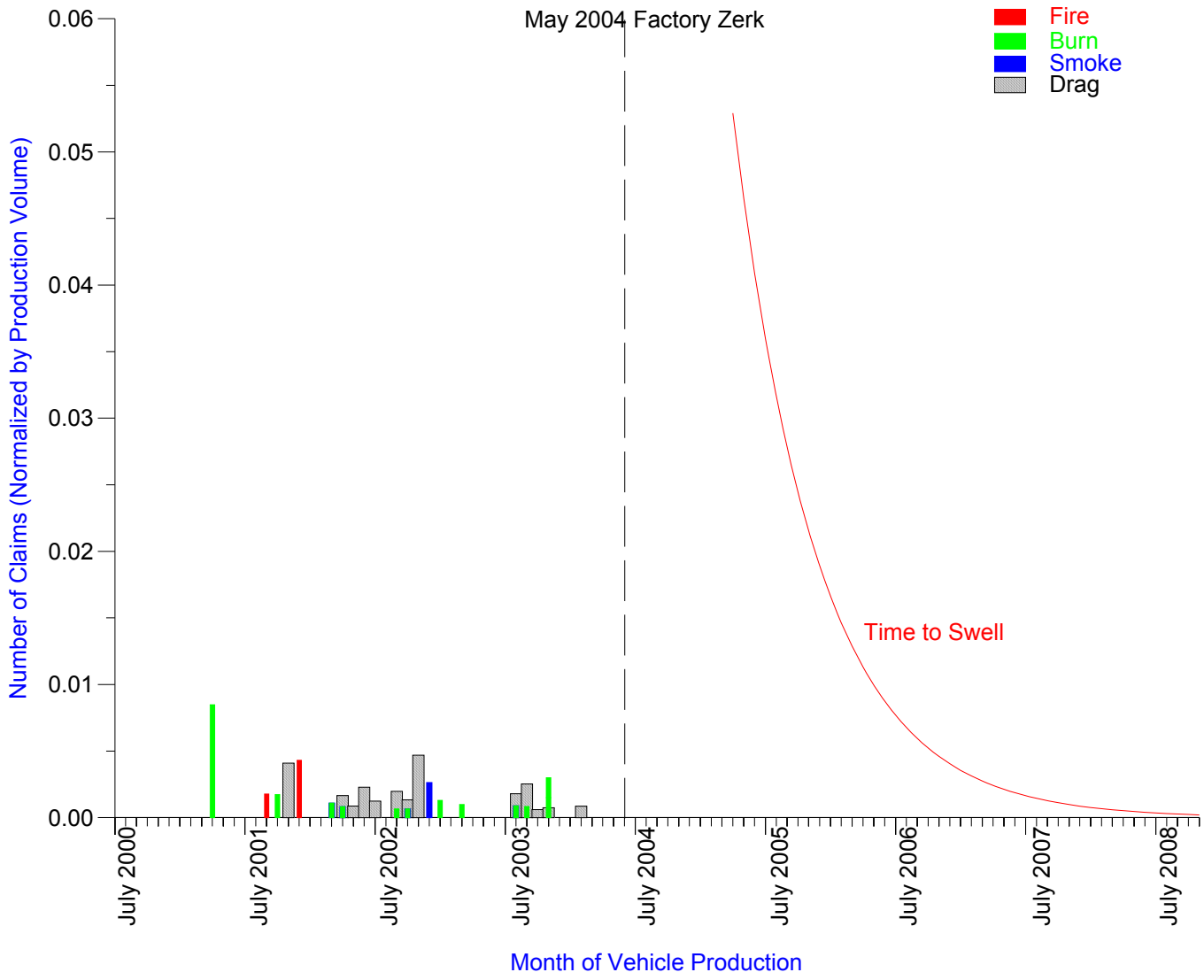
		Keyword Search From "CDESCR" Columns for 443 Complaints							
		Claims with "Fire"		Claims With "Burn"		Claims with "Smok"		Claims with "Drag"	
	No. of Claims	No. of Claims *	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles
Relevant	191	2	4	16	35	6	13	30	65
		Search Terms							
		"fire" "flam" "spark"		"burn" but not the word "burnish"		"smok" "smk"		"drag" "bind" "heat" "hot" "lock" "not_releas" "stick"	

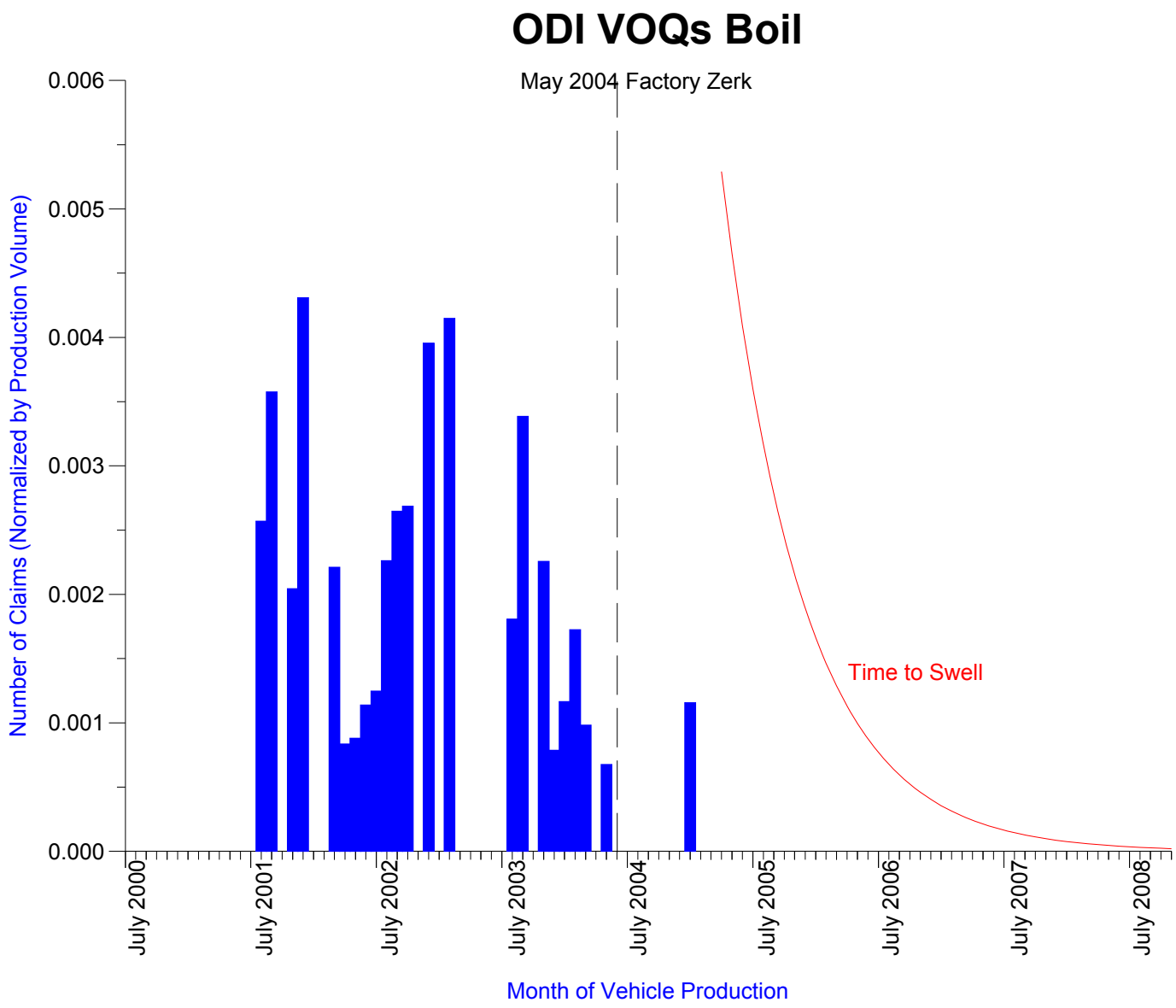
The relevancy review was performed separately from the keyword search

Vehicles That Reported Apparent Boiled Brake Fluid		
Reason for Floor, Boil, Spongy, Soft, Mushy, "No Brakes", "Lost Brakes", Pump, "Brakes Completely Went Out", "Defficult Time Stopping", and "Went To The Floorboard"	VOQs	Rate per 100,000 Vehicles
Total Count	56	130

The fire and boil entries were individually reviewed

ODI VOQs FBSD




ODI VOQs Boil
May 2004 Factory Zerk
Time to Swell
Number of Claims (Normalized by Production Volume)
0.006
0.005
0.004
0.003
0.002
0.001
0.000
July 2000
July 2001
July 2002
July 2003
July 2004
July 2005
July 2006
July 2007
July 2008
Month of Vehicle Production

VRTC Testing and Review of Data

- Testing to determine the extent of piston diameter increase due to “water swell”
- Review of WCC warranty claim database
- Review of WCC consumer complaints
- Review of ODI VOQs
- Summary of all claims and complaints

Workhorse Brake Data Review

Data Sorts	WCC Warranty			WCC Complaints			ODI VOQs		
	Bosch Piston Seized	Workhorse Bellcrank		Bosch Piston Seized	Workhorse Bellcrank		Bosch Piston Seized	Workhorse Bellcrank	
		Repair	Preventative		Repair	Preventative		Repair	Preventative
Original Data	11,173			493			901		
After Removal of Non-Relevant to Seized Piston or Bellcrank Entries [conservative sort based upon caliper replacement or bellcrank description]	788	482	1,005	129	3	1	199		
After Removal of ZOPS Vehicles with a Warranty Date Prior to Actual Recall Date Plus 10 Days for Billing or Entry Delays	752	482	1,005	102	3	1	191		

VRTC Review of WCC Warranty, WCC Complaints, and ODI VOQs

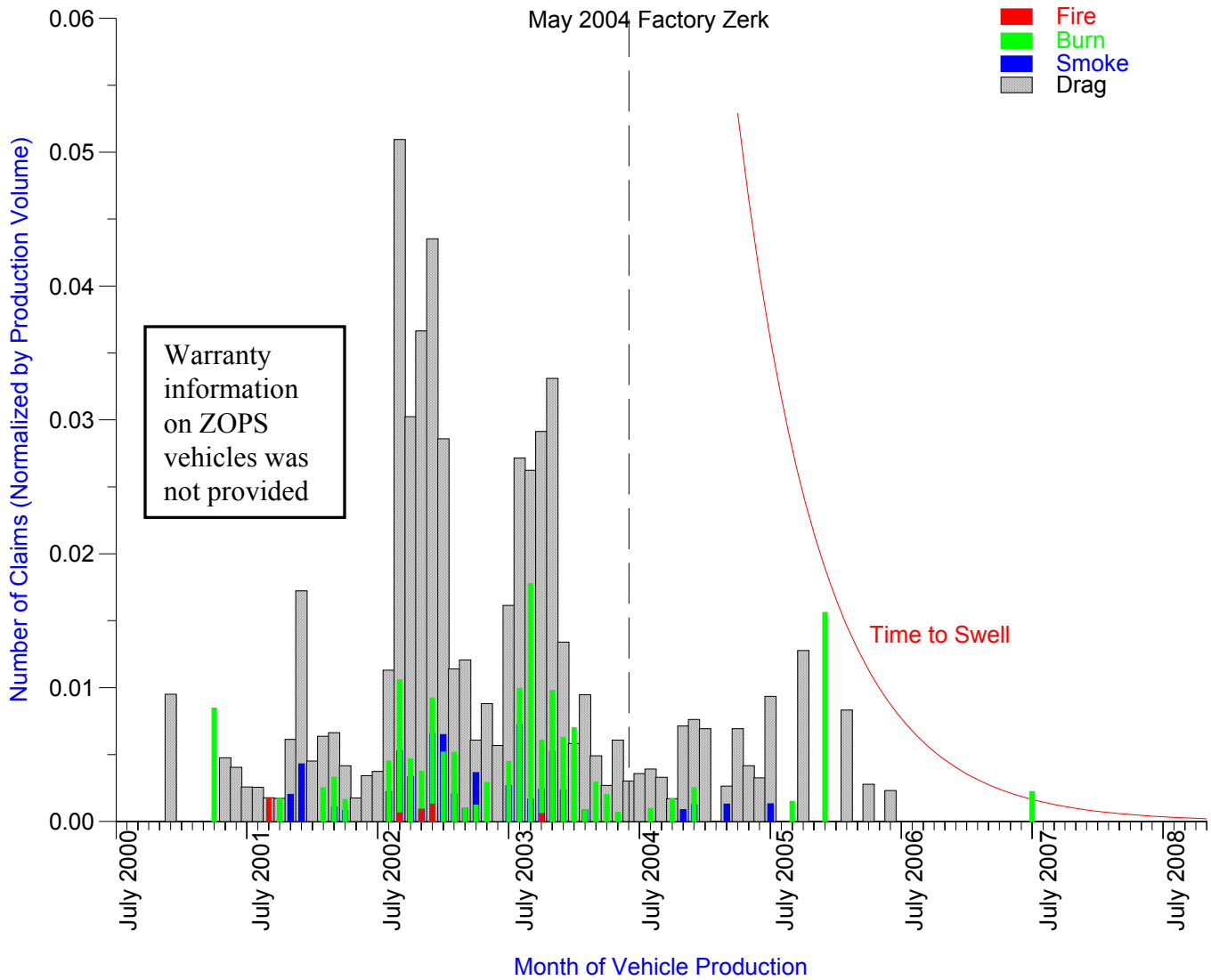
			Keyword Search							
			Claims with "Fire"		Claims With "Burn"		Claims with "Smok"		Claims with "Drag"	
	Production for WCC as of Nov 2007	No. of Claims	No. of Claims *	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles	No. of Claims	Rate per 100,000 Vehicles
Relevant Bosch Claims	45,972	1045	7	15	157	342	68	148	595	1,294
Relevant WCC Bellcrank Repair Claims	45,972	482	0	0	9	20	3	7	311	676
WCC Nonrelevant Bellcrank Preventive Claims	45,972	1005	0	0	4	9	4	9	173	376
WCC Non-relevant Claims	45,972	8,931	2	4	175	381	45	98	1,200	2,610
Revelant ZOPS from 2003	128,199	12,125	130	101	279	218	425	332	5,526	4,310

Search Terms			
"fire" "flam"	"burn"	"smok"	"drag" "bind"
"spark"	but not the word "burnish"	"smk"	"hang" "heat"
* Claims were individually			"hot" "lock"
reviewed. The "spark"			"not_releas"
was in a nonrelevant claim.			"stick"

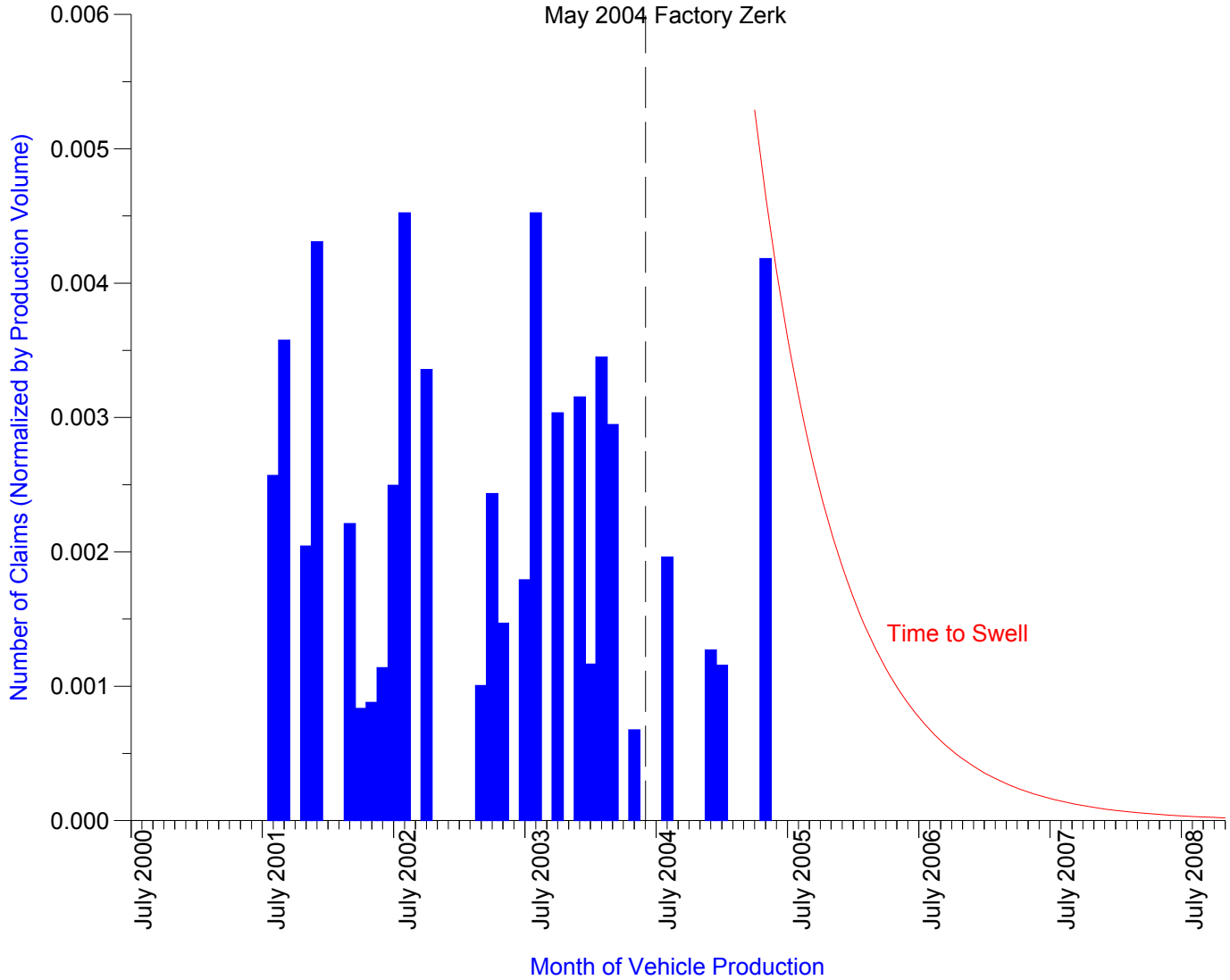
The relevancy review was performed separately from the keyword search

Vehicles That Reported Apparent Boiled Brake Fluid			
Reason for Floor, Boil, Spongy, Soft, Mushy, "No Brakes", and "Lost Brakes"	Relevant Bosch	Relevant WCC	Non-relevant
Brake Line			10
Bellcrank		8	
Stuck Pistion	113		
Master Cylinder			16
ABS			13
Other			21
Unknown			15

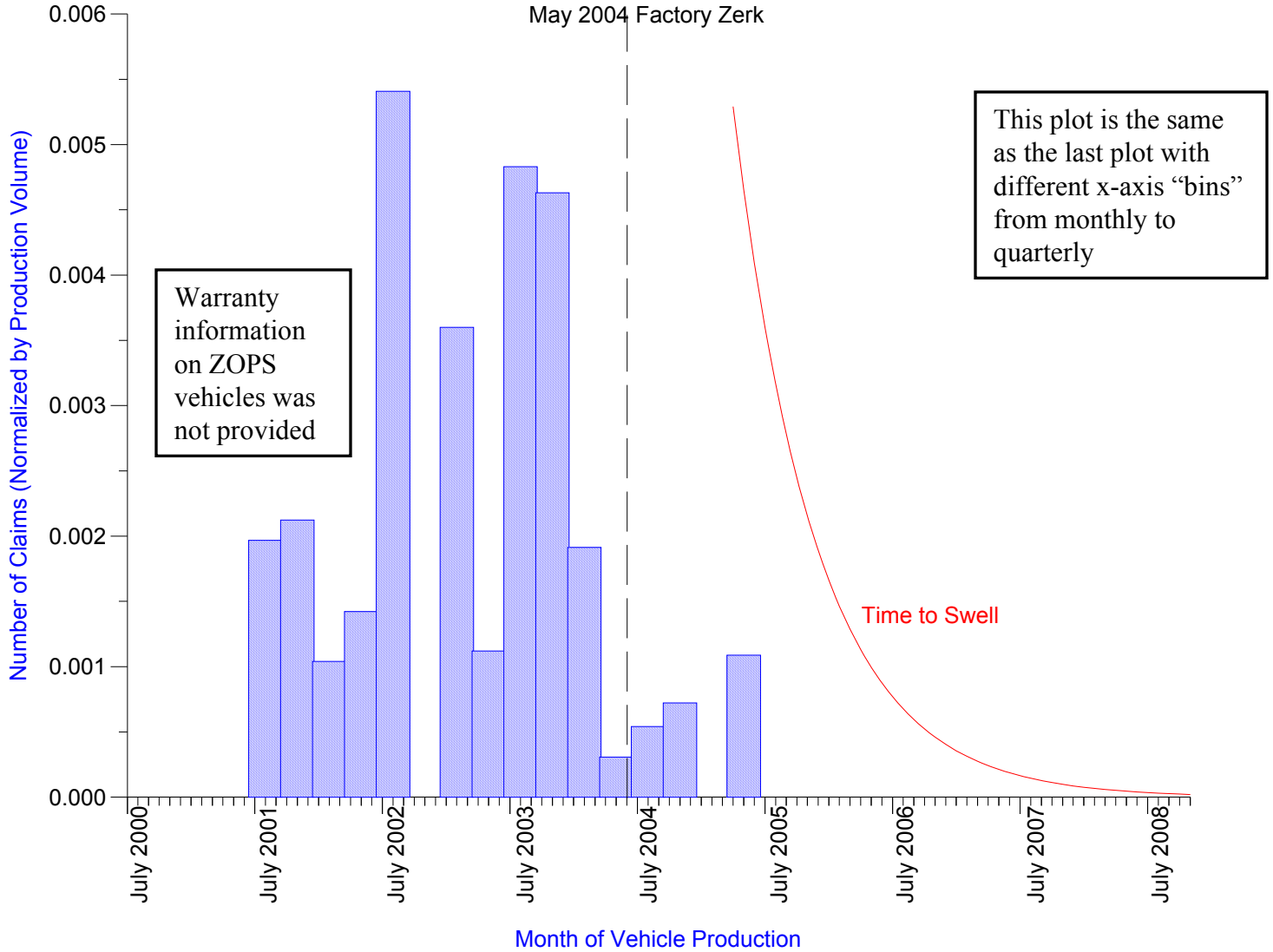
WCC Warranty, WCC Complaints, and ODI VOQs FBSD



WCC Warranty, WCC Complaints, & ODI VOQs Boil



WCC Warranty, WCC Complaints, & ODI VOQs Boil



Nature of Unsafe Event(s)
caused by the defect

- **Loss of Brakes**

- 2005 FLEETWOOD MOTOR HOMES W20
- [redacted]
- Phone call 11-12-07
- Owner stated that after driving for long distances he always smelled the brakes and would hear them squeal shortly after the smell. Owner also stated that "whenever he started smelling the brakes that's when they (the brakes) would go away." In one incident he over shot an intersection as his light was turning red and stopped it in the middle of the intersection. He stated "I could not stop; the brakes had faded to that point where they would not stop the vehicle." He also noted that he was on a downward slope to the intersection. Driver tried to pull vehicle over to the side of the road and couldn't turn the steering wheel fast enough back to straighten up the motor home and hit a sign trying to get the vehicle off the road safely. He was told by the dealer that they put on new [quiet pads].

- The dealership bought the vehicle back after several repeat brake incidents.

Nature of Unsafe Event(s)

Loss of brakes/disabled vehicle

VIN# 5B4MP67GX23[redacted]
GULF STREAM COACH w22
[redacted]
Clermont, FL
Date 9-24-07

- Owner stated the right rear brakes locked up on two different occasions. On each occasion smoke was noticeable from the rear wheel-well. That's when he pulled the motorhome over on the side of the road each time. It is to be noted that the owner said "on the first incident he couldn't smell anything but noticed the brakes we almost gone by the touch." That's when he carefully looked at his mirrors to see if he hade a flat and saw the smoke.
- On the second occasion the owner loss total brakes and ran over something causing damage to the front to the motor home. Owner is not sure exactly what he hit because it was in pieces under the vehicle when he pulled over.
- It was taken to the dealer after the first time and they found no fault then it went back to a different dealer after the second incident and had the complete braking system replaced in the rear.
- The owner also stated that once he pulled the motorhome over to the side and stopped. The rear wheels were locked up and he could not drive away. He said once he was off the side of the road he realized he was not in a safe place and wanted to move but couldn't.

Nature of Unsafe Event(s)

Loss of brakes

VIN# V5B4MP67G353[redacted]

2005 FOUR WINDS INTERNATIONAL W22

[redacted]

Salisbury, NC

Date 10-02-07

- Spoke with owner, who stated that the he could smell the brakes and that "the pedal felt like it didn't want to come back up." "I had no control of the brakes and had to drive it off the road onto the curved embankment to help stop it." In the process hitting a sign causing damage to the front of the vehicle (I'm not sure exactly what type of embankment he was talking about) He went on to say: "I was scare to drive it anymore and I was 500 miles from home".

- Was told by dealer that his brakes failed because he didn't drive it enough

Nature of Unsafe Event(s)

Loss of brakes

NVS-200

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

DOT Auto Safety Hotline
Vehicle Owner's Questionnaire
To Report Vehicle Safety Defects
1-888-DASH-2-DOT
(1-888-327-4236)
INTERNET:www.nhtsa.dot.gov/hotline

2007 SEP 20 AM 10:18

FOR AGENCY USE ONLY 100148
Date Received: 10-SEP-2007
Repository ☐
Reference No. 10202367

OWNER INFORMATION (Type or Print)
Name [redacted]
Address [redacted]
City TAMPA State FL Zip Code [redacted]
Daytime Telephone Number [redacted]
Evening Telephone Number
E-mail Address

Do you authorize NHTSA to provide a copy of this report to the manufacturer of your vehicle? ☒ YES ☐ NO
In the absence of an auth[redacted]e or address to the vehicle manufacturer.
Signature of Owner [redacted] Date 9-12-2007

VEHICLE INFORMATION
17 digit Vehicle Identification Number Located at bottom of windshield or driver's side: 5B4MP67G12[redacted]
Make: WINNEBAGO
Model: ADVENTURER
Model Year: 2002
Date Purchased: 01-MAY-04
Dealer's Name and Telephone Number
Engine: No. Cylinders 8
Fuel Type: Gas
Original Owner ☐
Dealer's City
State
Zip Code
Transmission Type: AUTOMATIC
☒ Antilock Brakes
☒ Cruise Control
Powertrain: REAR WHEEL DRIVE
Vehicle Component Code: 045100 SERVICE BRAKES, AIR:DISC-CALIPER
Multiple Failure: 2

FAILED COMPONENT(S)/PART(S) INFORMATION
Incident Date(s): 01-JUL-2006
Failure Mileage: 46000
Failure Speed: 35

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE
Tire Make
Tire Model (Name or Number)
Tire Size (Example P215/65R15)
DOT No. (Example: DOTHALSABC0361)
☐ Original Equipment ☐ Prior Repair
Failure Location:
Tire Component Code
Tire Failure Type

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE
Make:
Date Manufactured:
Model No./Name:
Seat Type:
Installation System
Child Seat Component Code:
Failure Type

APPLICABLE INCIDENT INFORMATION
(Please describe in detail the incident(s), Failure(s), Crash(es) and injury(ies).)

Crash	Fire	Number of Persons Injured	Number of Deaths	Reported to Police
☐ Yes ☒ No	☐ Yes ☒ No	0	0	N

Narrative Description of Incident(S), Crash(es), and Injury(ies).
Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e, parts repaired or replaced (and if old part is available).

TL*THE CONTACT OWNS A 2002 WINNEBAGO ADVENTURER. WHILE DRIVING 35 MPH, THE BRAKE PEDAL EXTENDED TO THE FLOORBOARD WHEN IT WAS DEPRESSED AND THE STOPPING DISTANCE INCREASED. THE DEALER STATED THAT THE REAR DRIVER SIDE CALIPER FAILED TO RELEASE, WHICH CAUSED THE BRAKES TO OVERHEAT. THEY REPLACED THE WHEEL SENSOR, CALIPER, AND BRAKE PADS. APPROXIMATELY TWO WEEKS LATER, THE REAR PASSENGER SIDE CALIPER FAILED AND WAS REPLACED BY THE DEALER. THE FAILURE MILEAGE WAS 46,000 AND CURRENT MILEAGE WAS 52,000.

The motor home would not stop at all

Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY.

The Privacy Act of 1974-Public Law 93-579 This information is requested pursuant to authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond this questionnaire. Your response may be used to assist the NHTSA in determining whether a Manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.

[redacted]

September 22, 2007

Dear NHTSA,

Here is a brief history of brake failure events:

First failure, front brakes pulling left March 05 repaired under Workhorse brake recall. See attached.

Second failure, total brake failure, motor home would not stop. Repaired in Roanoke VA at Burglund Chevrolet. See attached

Third failure, right real caliper failed approximately two weeks after second failure above. See attached.

I thank God that my brake failures didn't happen in the mountains, it was frightening enough on level ground.

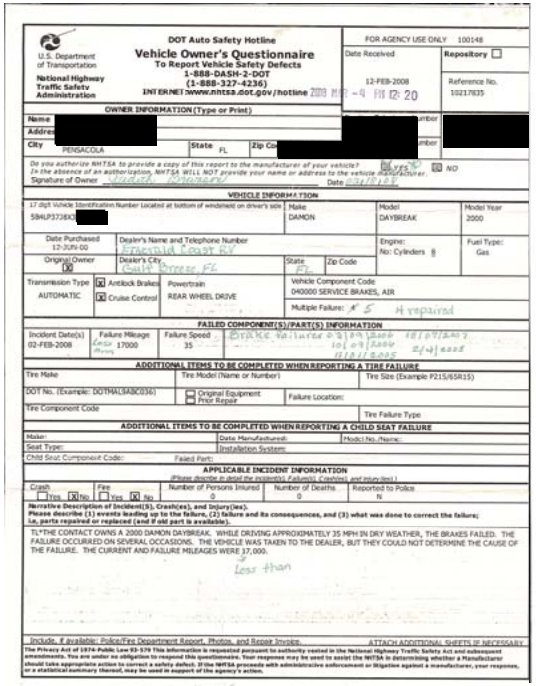
Sincerely,

[redacted]

- **Spoke with owner March 2008;** [redacted]
- **Three unique failures all resulting in a loss of brakes. The third incident resulted in a total loss of brakes causing the vehicle to go through a stop light.**

Nature of Unsafe Event(s)

Extended stopping distance



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

DOT Auto Safety Hotline
Vehicle Owner's Questionnaire
To Report Vehicle Safety Defects
1-888-DASH-2-DOT
(1-888-327-4236)
INTERNET: www.nhtsa.dot.gov/hotline

FOR AGENCY USE ONLY 100148
Date Received 12-FEB-2008
Repository
Reference No. 10217835

OWNER INFORMATION (Type or Print)
Name [redacted]
Address [redacted]
City PENSACOLA State FL Zip Co[redacted]
Do you authorize NHTSA to provide a copy of this report to the manufacturer of your vehicle? ☒ YES ☐ NO
In the absence of an authorization, NHTSA WILL NOT provide your name or address to the vehicle manufacturer.
Signature of Owner [illegible] Date [illegible]

VEHICLE INFORMATION
17 digit Vehicle Identification Number Located at bottom of windshield on driver's side: 5BHLP3738X[redacted]
Make: DAMON
Model: DAYBREAK
Model Year: 2000
Date Purchased: 12-JUN-00
Dealer's Name and Telephone Number: Emerald Coast RV
Engine: No: Cylinders 8
Fuel Type: Gas
Original Owner ☒
Dealer's City: Gulf Breeze, FL
State: FL
Zip Code:
Transmission Type: AUTOMATIC
☒ Antilock Brakes ☒ Cruise Control
Powertrain: REAR WHEEL DRIVE
Vehicle Component Code: 040000 SERVICE BRAKES, AIR
Multiple Failure: 5 4 repaired

FAILED COMPONENT(S)/PART(S) INFORMATION
Incident Date(s): 02-FEB-2008
Failure Mileage: Less than 17000
Failure Speed: 35
Brake failures 03/09/2006 10/09/2006 11/11/2005 18/07/2007 2/4/2008

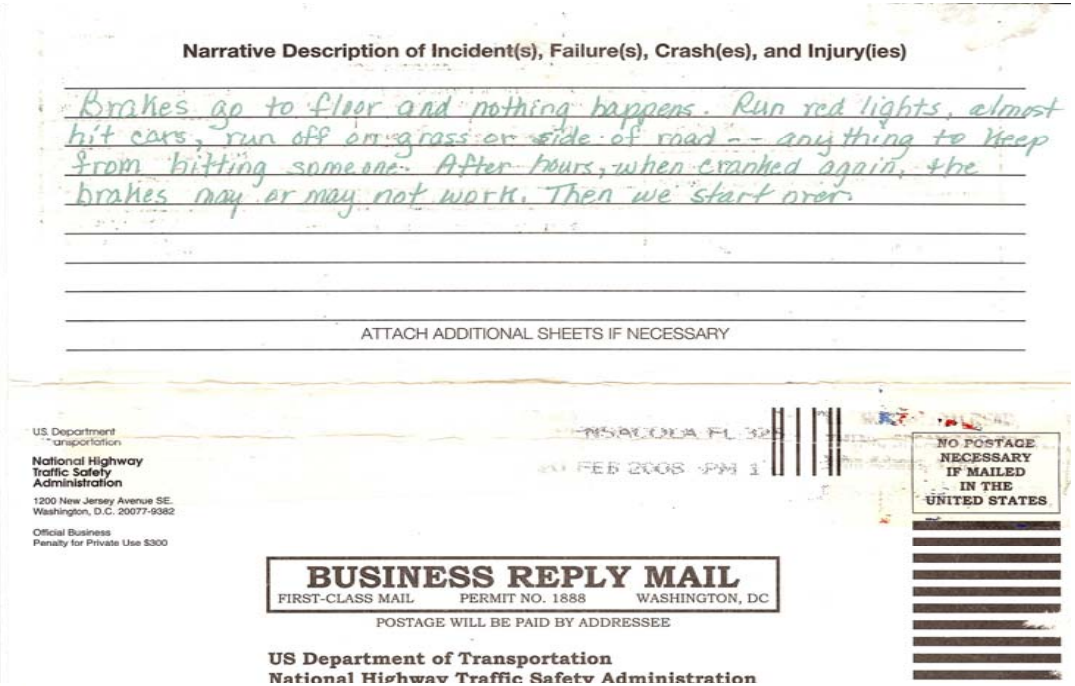
ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE
Tire Make
Tire Model (Name or Number)
Tire Size (Example P215/65R15)
DOT No. (Example: DOTMAL3ABC036)
☐ Original Equipment ☐ Prior Repair
Failure Location:
Tire Component Code
Tire Failure Type

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE
Make:
Date Manufactured:
Model No./Name:
Seat Type:
Installation System:
Child Seat Component Code:
Failed Part:

APPLICABLE INCIDENT INFORMATION
(Please describe in detail the incident(s), Failure(s), Crash(es), and Injury(ies).)
Crash ☐ Yes ☒ No
Fire ☐ Yes ☒ No
Number of Persons Injured: 0
Number of Deaths: 0
Reported to Police: N
Narrative Description of Incident(S), Crash(es), and Injury(ies).
Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e., parts repaired or replaced (and if old part is available).
TL*THE CONTACT OWNS A 2000 DAMON DAYBREAK. WHILE DRIVING APPROXIMATELY 35 MPH IN DRY WEATHER, THE BRAKES FAILED. THE FAILURE OCCURRED ON SEVERAL OCCASIONS. THE VEHICLE WAS TAKEN TO THE DEALER, BUT THEY COULD NOT DETERMINE THE CAUSE OF THE FAILURE. THE CURRENT AND FAILURE MILEAGES WERE 17,000.
Less than

Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY

The Privacy Act of 1974-Public Law 93-579 This information is requested pursuant to authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond this questionnaire. Your response may be used to assist the NHTSA in determining whether a Manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.



Narrative Description of Incident(s), Failure(s), Crash(es), and Injury(ies)

Brakes go to floor and nothing happens. Run red lights, almost hit cars, run off on grass or side of road -- anything to keep from hitting someone. After hours, when cranked again, the brakes may or may not work. Then we start over.

ATTACH ADDITIONAL SHEETS IF NECESSARY

U.S. Department of Transportation
National Highway Traffic Safety Administration
1200 New Jersey Avenue SE.
Washington, D.C. 20077-9382

Official Business
Penalty for Private Use $300

PENSACOLA FL 325
FEB 2008 PM 1

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST-CLASS MAIL PERMIT NO. 1888 WASHINGTON, DC
POSTAGE WILL BE PAID BY ADDRESSEE

US Department of Transportation
National Highway Traffic Safety Administration

- Spoke with owner May 2008 [redacted]
- 5 unique brake failures, the worst being the last one per owner. "the brakes went to the floor and I ran through a red light causing other cars in the other direction to slide to a stop". Not being able to stop she drove the motorhome onto the shoulder into the grass in an effort to keep from hitting anyone.

Nature of Unsafe Event(s)

Brake pedal to the floor

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

DOT Auto Safety Hotline
Vehicle Owner's Questionnaire
To Report Vehicle Safety Defects
1-888-DASH-2-DOT
(1-888-327-4236)
INTERNET:www.nhtsa.dot.gov/hotline

2008 JAN 24 PM 12:46

FOR AGENCY USE ONLY 100148
Date Received 09-OCT-2007
Repository ☐
Reference No. 10205270

OWNER INFORMATION (Type or Print)

Name [redacted]
Address [redacted]
City NESCONSET State NY Zip Code [redacted]
[redacted] Number
Evening Telephone Number [redacted]

Do you authorize NHTSA to provide a copy of this report to the manufacturer of your vehicle? ☒ YES ☐ NO
In the absence of an a[redacted] NOT provide your name or address to the vehicle manufacturer.
Signature of Owner [redacted] Date 11/24/08

VEHICLE INFORMATION

17 digit Vehicle Ide[redacted] Number Located at bottom of windshield on driver's side	Make	Model	Model Year
5B4MP67G13[redacted]	WORKHORSE	W20	2003

Date Purchased	Dealer's Name and Telephone Number	Engine:	Fuel Type:
20-JUN-04		No: Cylinders 8	Gas

Original Owner	Dealer's City	State	Zip Code
☒			

Transmission Type			Vehicle Component Code
AUTOMATIC	☒ Antilock Brakes ☒ Cruise Control	Powertrain REAR WHEEL DRIVE	034510 SERVICE BRAKES, HYDRAULIC:FOUNDATION COMPONENTS Multiple Failure: 1

FAILED COMPONENT(S)/PART(S) INFORMATION

Incident Date(s)	Failure Mileage	Failure Speed
05-OCT-2007	15100	30

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE

Tire Make | Tire Model (Name or Number) | Tire Size (Example P215/65R15)
DOT No. (Example: DOTHAL9ABC036) | ☐ Original Equipment ☐ Prior Repair | Failure Location:
Tire Component Code | Tire Failure Type

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE

Make: | Date Manufactured: | Model No./Name:
Seat Type: | Installation System
Child Seat Component Code: | Failed Part:

APPLICABLE INCIDENT INFORMATION
(Please describe in detail the incident(s), Failure(s), Crash(es), and Injury(ies))

Crash	Fire	Number of Persons Injured	Number of Deaths	Reported to Police
☐ Yes ☒ No	☐ Yes ☒ No	0	0	N

Narrative Description of Incident(S), Crash(es), and Injury(ies).
Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e, parts repaired or replaced (and if old part is available).

TL*THE CONTACT OWNS A 2003 DAMON WORKHORSE (NA). WHILE DRIVING 30 MPH, THE CONTACT WAS FLAGGED DOWN BY ANOTHER MOTORIST AND ADVISED TO PULL OVER. ONCE HE PULLED OFF THE ROAD, HE DISCOVERED THAT THE BRAKES FAILED. HE STOPPED THE VEHICLE WITH THE EMERGENCY BRAKE. THE VEHICLE WAS TOWED TO HIS RESIDENCE. WHEN THE WHEELS WERE REMOVED FROM THE VEHICLE, THE BRAKE SHOES WERE FINE, HOWEVER, THE LEFT REAR WHEEL OVERHEATED AND CAUSED THE CALIPER TO BOIL THE BRAKE FLUID. HE WAS INFORMED THAT THE CALIPERS ANU BRAKE ROTORS NEEDED TO BE REPLACED. THE CURRENT AND FAILURE MILEAGES WERE 15,100.

Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY

The Privacy Act of 1974-Public Law 93-579 This information is requested pursuant to authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond this questionnaire. Your response may be used to assist the NHTSA in determining whether a Manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.

Narrative Description of Incident(s), Failure(s), Crash(es), and Injury(ies)

This incident could have easily caused a brake fire if not caught in time. Only the left rear brake rotor was overheated. The other wheels were slightly warm to the touch. There was no excessive braking prior to this incident. All caliper pins have been lubed and inspected as per workhorse maintenance. The rotor also shows signs of light cracking. The boiling of the brake fluid lead to a complete braking failure. There was no braking ability from the service brakes. The emergency brake works off of the driveshaft which helped stop the vehicle. I will not drive this vehicle again until a satisfactory answer to this problem has been made.

ATTACH ADDITIONAL SHEETS IF NECESSARY

Thank you

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

LONG ISLAND NY 11
15 JAN 2008 PM 5 L

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

- Spoke with [redacted] March 2008
- Driver stated that "the brake pedal when to the floor and I could not stop the vehicle…." " I had to engage the emergency brake to stop the vehicle."
- Owner stated that if he didn't apply the E-brake he would have rammed into the vehicle in front of him at a traffic light. Vehicle was then towed away; driver refusing to drive again.

Nature of Unsafe Event(s)

loss of brakes

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

DOT Auto Safety Hotline
Vehicle Owner's Questionnaire
To Report Vehicle Safety Defects
1-888-DASH-2-DOT
(1-888-327-4236)
INTERNET www.nhtsa.dot.gov/hotline

FOR AGENCY USE ONLY 100148
Date Received: 23-OCT-2008
Repository ☐
Reference No. 10246508

OWNER INFORMATION (Type or Print)

Name: [redacted]
Address: [redacted]
City: PAWLEYS ISLAND State: SC Zip Code: [redacted]
Daytime Telephone Number: [redacted] Number: [redacted]
E-mail Address: [redacted]

Do you authorize NHTSA to provide a copy of this report to the manufacturer of your vehicle? ☒ YES ☐ NO
In the absence of an authorization, NHTSA WILL NOT provide your name or address to the vehicle manufacturer.
Signature of Owner _____ Date __/__/__

VEHICLE INFORMATION

17 digit Vehicle Identification Number Located at bottom of windshield on driver's side	Make	Model	Model Year
5BHMP67G243[redacted]	ITASCA	SUNCRUISER	2004

Date Purchased	Dealer's Name and Telephone Number	Engine: No. Cylinders 8	Fuel Type: Gas
19-JAN-04			

Original Owner ☒	Dealer's City	State	Zip Code

Transmission Type			Powertrain	Multiple Failure:	Incident Date(s)
AUTOMATIC	☒ Antilock Brakes	☒ Cruise Control		2	14-JUL-2008

FAILED COMPONENT(S)/PART(S) INFORMATION

Vehicle Component Code: 030000 SERVICE BRAKES, HYDRAULIC	Failure Mileage	Failure Speed
	27000	30

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE

Tire Make	Tire Model (Name or Number)	Tire Size (Example P215/65R15)
DOT No. (Example: DOTMALMABC038)	☐ Original Equipment ☐ Prior Repair	Failure Location:
Tire Component Code		Tire Failure Type:

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE

Make:	Date Manufactured:	Model No./Name:
Seat Type:	Installation System:	
Child Seat Component Code:	Failed Part:	

APPLICABLE INCIDENT INFORMATION
(Please describe in detail the incident(s), Fatalities, Crashes, and injury(ies).)

Crash	Fire	Number of Persons Injured	Number of Deaths	Reported to Police
☐ Yes ☒ No	☐ Yes ☒ No	0	0	N

Narrative Description of Incident(S), Crash(es), and Injury(ies).
Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure;
i.e, parts repaired or replaced (and if old part is available).

TL*THE CONTACT OWNS A 2004 WINNEBAGO ITASCA SUNCRUISER . WHILE DRIVING 35 MPH, THE BRAKE PEDAL EXTENDED TO THE FLOOR WHEN IT WAS DEPRESSED. THE CONTACT HAD TO DOWNSHIFT IN ORDER TO STOP THE VEHICLE. THE ABS BRAKE INDICATOR ILLUMINATED AND HE DROVE INTO A PARKING LOT IN ORDER TO STOP THE VEHICLE. THE CONTACT CALLED A TOWING COMPANY TO TAKE HIM TO A REPAIR SHOP BECAUSE HE WAS TOO SCARED TO DRIVE THE VEHICLE WITHOUT IT BEING INSPECTED BY A MECHANIC. THE REPAIR SHOP HAD TO REPLACE THE ENTIRE REAR BRAKING SYSTEM. THEY ALSO SERVICED THE FRONT BRAKES. THE CONTACT RETRIEVED THE VEHICLE THE NEXT DAY AND THE FRONT BRAKES FAILED WHILE DRIVING APPROXIMATELY 30 MPH. THE REPAIR SHOP WAS CALLED TO THE SCENE AND THEY COMPLETELY REBUILT THE FRONT BRAKES AGAIN, EXCEPT FOR THE ROTORS. THE TOTAL COST TO REPAIR THE FRONT AND REAR BRAKES WAS $2,500. THE MANUFACTURER ADVISED HIM TO FILE A CLAIM WITH WORKHORSE BECAUSE THEY MADE THE CHASSIS, WHICH WAS THE CAUSE OF THE FAILURE. THE CONTACT HAS NOT YET HEARD BACK FROM WORKHORSE. THE FAILURE MILEAGE WAS 27,000.
UPDATED 11/07/08 *BF
UPDATED 11/07/08. 8JB

Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY

The Privacy Act of 1974-Public Law 93-579 This information is requested pursuant to authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond this questionnaire. Your response may be used to assist the NHTSA in determining whether a Manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.

- Spoke with owner Nov, 2008. [redacted]
- the owner stated that the brake pedal went to the floor and stayed their. Was driving through town and could not stop the motorhome. [redacted] stated that he was lucky that he was in the right lane because he made a hard right turn into a parking lot, down-shifting at the same time to slow down and help stop the vehicle.

Nature of Unsafe Event(s)

loss of brakes

DOT Auto Safety Hotline

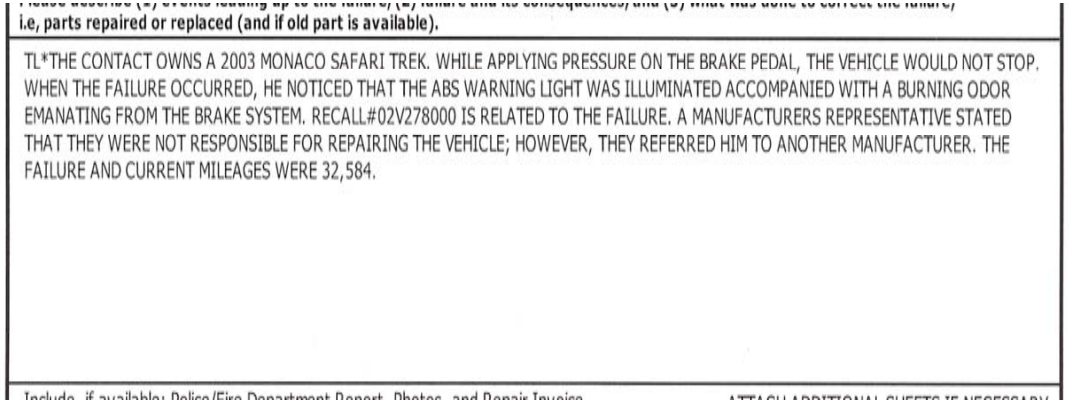
Vehicle Owner's Questionnaire

To Report Vehicle Safety Defects

1-888-DASH-2-DOT

(1-888-327-4236)

INTERNET www.nhtsa.dot.gov/hotline



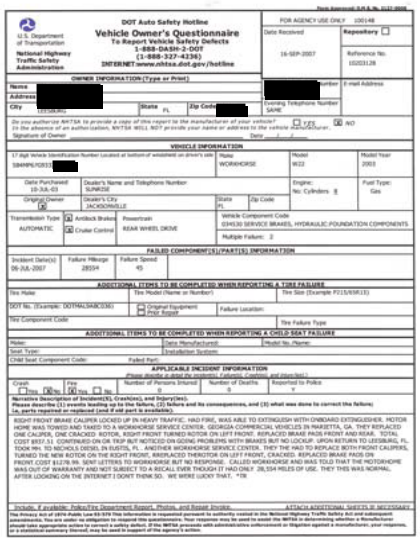
i.e, parts repaired or replaced (and if old part is available).

TL*THE CONTACT OWNS A 2003 MONACO SAFARI TREK. WHILE APPLYING PRESSURE ON THE BRAKE PEDAL, THE VEHICLE WOULD NOT STOP. WHEN THE FAILURE OCCURRED, HE NOTICED THAT THE ABS WARNING LIGHT WAS ILLUMINATED ACCOMPANIED WITH A BURNING ODOR EMANATING FROM THE BRAKE SYSTEM. RECALL#02V278000 IS RELATED TO THE FAILURE. A MANUFACTURERS REPRESENTATIVE STATED THAT THEY WERE NOT RESPONSIBLE FOR REPAIRING THE VEHICLE; HOWEVER, THEY REFERRED HIM TO ANOTHER MANUFACTURER. THE FAILURE AND CURRENT MILEAGES WERE 32,584.

- August 2008 – By phone I spoke with the owner/driver [redacted]
- Came off Sate RT 27 Florida, traveling towards a stop light heading to the Disney parking area. "At which time I had no brakes, the brake pedal went to the floor and I was going straight into a heavily pedestrian traffic area." Owner stated that "I had no choice but to go through the traffic light with the brakes fully depressed with all my might…… wouldn't stop and I had to gear it down."

Nature of Unsafe Event(s)

Fire



DOT Auto Safety Hotline
Vehicle Owner's Questionnaire
To Report Vehicle Safety Defects
1-888-DASH-2-DOT
(1-888-327-4236)
INTERNET:www.nhtsa.dot.gov/hotline

OWNER INFORMATION (Type or Print)

VEHICLE INFORMATION

FAILED COMPONENT(S)/PART(S) INFORMATION

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE

APPLICABLE INCIDENT INFORMATION

(Please describe in detail the incident(s), Failure(s), Crash(es), and injury(ies).)

Crash	Fire	Number of Persons Injured	Number of Deaths	Reported to Police
☐ Yes ☒ No	☒ Yes ☐ No	0	0	Y

Narrative Description of Incident(S), Crash(es), and Injury(ies).
Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e, parts repaired or replaced (and if old part is available).

RIGHT FRONT BRAKE CALIPER LOCKED UP IN HEAVY TRAFFIC. HAD FIRE, WAS ABLE TO EXTINGUISH WITH ONBOARD EXTINGUISHER. MOTOR HOME WAS TOWED AND TAKED TO A WORKHORSE SERVICE CENTER. GEORGIA COMMERCIAL VEHICLES IN MARIETTA, GA. THEY REPLACED ONE CALIPER, ONE CRACKED ROTOR, RIGHT FRONT TURNED ROTOR ON LEFT FRONT. REPLACED BRAKE PADS FRONT AND REAR. TOTAL COST $937.51 CONTINUED ON OR TRIP BUT NOTICED ON GOING PROBLEMS WITH BRAKES BUT NO LOCKUP. UPON RETURN TO LEESBURG, FL. TOOK MH. TO NICHOLS DIESEL IN EUSTIS, FL . ANOTHER WORKHORSE SERVICE CENTER. THEY THE HAD TO REPLACE BOTH FRONT CALIPERS, TURNED THE NEW ROTOR ON THE RIGHT FRONT, RREPLACED THEROTOR ON LEFT FRONT, CRACKED. REPLACED BRAKE PADS ON FRONT.COST $1278.99. SENT LETTERS TO WORKHORSE BUT NO RESPONSE. CALLED WORKHORSE AND WAS TOLD THAT THE MOTORHOME WAS OUT OF WARRANTY AND NOT SUBJECT TO A RECALL EVER THOUGH IT HAD ONLY 28,554 MILES OF USE. THEY THIS WAS NORMAL. AFTER LOOKING ON THE INTERNET I DON'T THINK SO. WE WERE LUCKY THAT. *TR

Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY

- I spoke with [redacted] Nov 2007
- July 6th 2007 @ 28,000 miles. Was driving for 15 minuets until the brakes started to drag and pull to the right. He got the motorhome off the road onto the shoulder where he saw and smelted smoke. He got out of the vehicle and [redacted] noted "I saw the beginning of a small fire in the passenger side wheel-well. I went back into the motorhome got the fire extinguisher and put out the fire".

Nature of Unsafe Event(s)

Brake performance

- I spoke with [redacted] July 2008.
- Owner alleged that when she was driving for approximately 30 minuets the brakes started to feel spongy. [redacted] furthermore noted that "I was very confused…"
- "then the right front brakes locked up and I lost control of the vehicle".
- [redacted] noted that she felt lucky that she was not in a high traffic area because she felt that she could have hurt somebody.

Form Approved: O.M.B. No. 2127-0008

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

DOT Auto Safety Hotline
Vehicle Owner's Questionnaire
To Report Vehicle Safety Defects
1-888-DASH-2-DOT
(1-888-327-4236)
INTERNET:www.nhtsa.dot.gov/hotline

FOR AGENCY USE ONLY 100148
Date Received: 19-FEB-2008
Repository ☐
Reference No. 10218518

OWNER INFORMATION (Type or Print)

Name [redacted]
Address [redacted]
City LOXAHATCHEE | State FL | Zip Co[redacted]
[redacted]ne Number | E-mail Address
Evening Telephone Number

Do you authorize NHTSA to provide a copy of this report to the manufacturer of your vehicle? ☒ YES ☐ NO
In the absence of an authorization, NHTSA WILL NOT provide your name or address to the vehicle manufacturer.
Signature of Owner _____ Date __/__/__

VEHICLE INFORMATION

17 digit Vehicle Identification Number Located at bottom of windshield on driver's side	Make	Model	Model Year
5B4MP67G543[redacted]	SAFARI	SIMBA	2004

Date Purchased	Dealer's Name and Telephone Number	Engine:	Fuel Type:
01-JUN-04		No: Cylinders	Gas

Original Owner	Dealer's City	State	Zip Code
☒			

Transmission Type			Vehicle Component Code
AUTOMATIC	☒ Antilock Brakes ☒ Cruise Control	Powertrain UNKNOWN	034510 SERVICE BRAKES, HYDRAULIC:FOUNDATION COMPONENTS Multiple Failure: 1

FAILED COMPONENT(S)/PART(S) INFORMATION

Incident Date(s)	Failure Mileage	Failure Speed
19-FEB-2008	16250	

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A TIRE FAILURE

Tire Make	Tire Model (Name or Number)	Tire Size (Example P215/65R15)
DOT No. (Example: DOTMAL9ABC036)	☐ Original Equipment ☐ Prior Repair	Failure Location:
Tire Component Code		Tire Failure Type

ADDITIONAL ITEMS TO BE COMPLETED WHEN REPORTING A CHILD SEAT FAILURE

Make:	Date Manufactured:	Model No./Name:
Seat Type:	Installation System:	
Child Seat Component Code:	Failed Part:	

APPLICABLE INCIDENT INFORMATION
(Please describe in detail the incident(s), Failure(s), Crash(es), and injury(ies).)

Crash	Fire	Number of Persons Injured	Number of Deaths	Reported to Police
☐ Yes ☒ No	☐ Yes ☒ No	0	0	N

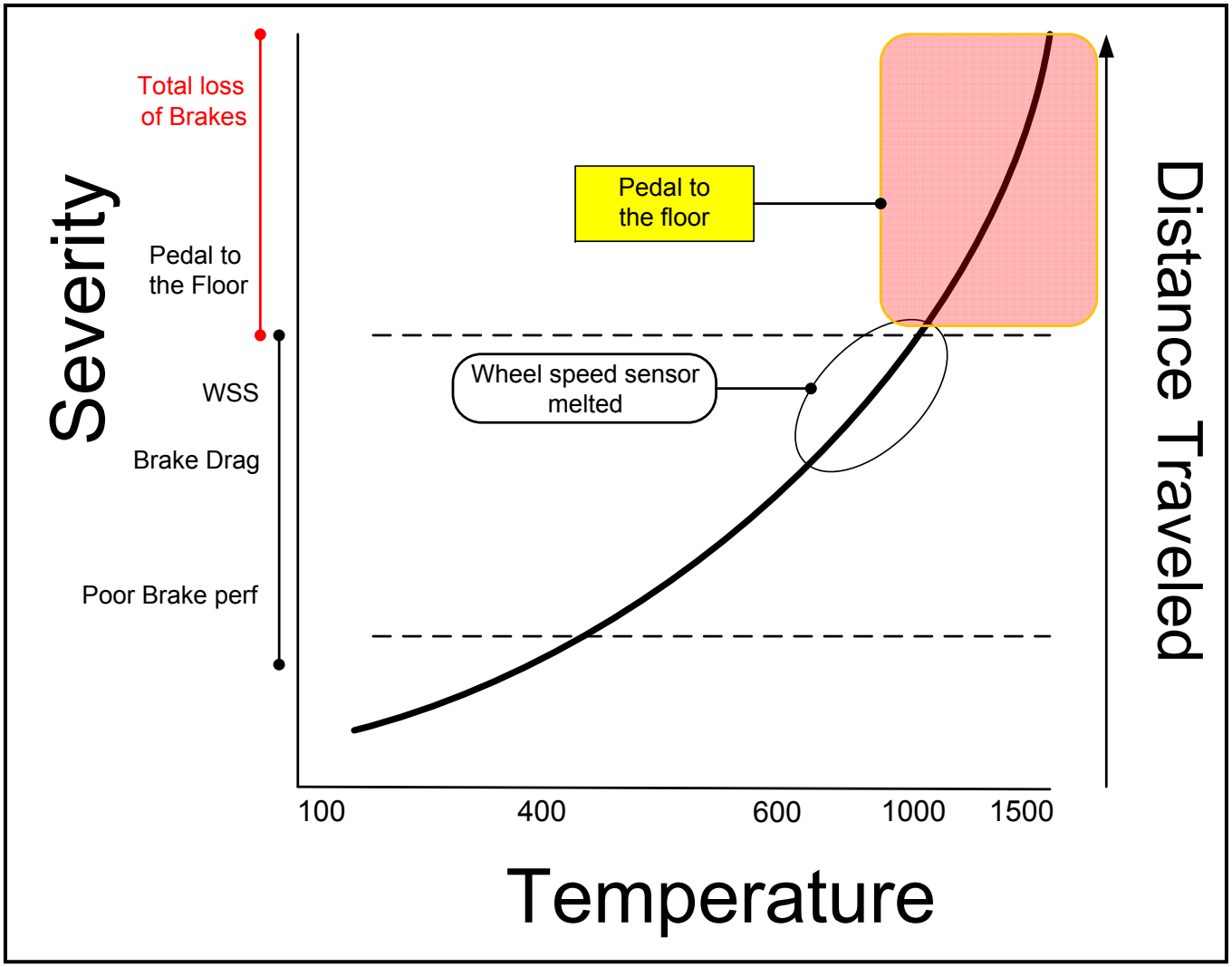
Narrative Description of Incident(S), Crash(es), and Injury(ies).
Please describe (1) events leading up to the failure, (2) failure and its consequences, and (3) what was done to correct the failure; i.e, parts repaired or replaced (and if old part is available).

2004 SAFARI SIMBA W22 CHASSIS, 16250 MILES: FRONT RIGHT CALIPER LOCKED UP, CAUSING BRAKE FAILURE. DAMAGE TO ROTORS, BRAKE PADS AND CALIPERS. WORKHORSE DEALER INFORMED ME THAT ABS SENSOR MELTED. WORKHORSE DEALER IS REPLACING CALIPERS, BRAKE PADS AND ROTORS.

Include, if available: Police/Fire Department Report, Photos, and Repair Invoice. ATTACH ADDITIONAL SHEETS IF NECESSARY

The Privacy Act of 1974-Public Law 93-579 This information is requested pursuant to authority vested in the National Highway Traffic Safety Act and subsequent amendments. You are under no obligation to respond this questionnaire. Your response may be used to assist the NHTSA in determining whether a Manufacturer should take appropriate action to correct a safety defect. If the NHTSA proceeds with administrative enforcement or litigation against a manufacturer, your response, or a statistical summary thereof, may be used in support of the agency's action.

Severity vs. Time



Risk to Public Safety

- Pedal to the floor with extended stopping distances or loss of brakes due to boiling of the brake fluid on 20,000+ lb vehicles -121 claims of boiled brake fluid – **263 per 100,000 vehicles**
- Thermal events at wheel-end - 7 reported fires
- Near crashes - 8 VOQ incidents
  - all report just missing a car or a group of pedestrians
  - three owners used the emergency brakes to stop the vehicle
- Vehicles disabled at the side of the roadway with seized brakes until they cooled and the pistons released
- Drivers expected brake pedal feel/response is violated

End of Presentation