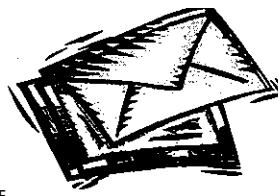


# **NHTSA ccmMercury Routing Slip**



CL-10439549-5411

Printed: 12/8/2011

INFORMATION Redacted PURSUANT TO THE FREEDOM OF  
INFORMATION ACT (FOIA), 5 U.S.C. 552(B)(6)

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**Delivery: S10 E-MAIL**

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**Doc Date: 11/28/2011**

**Due Date: 12/15/2011**

**S10 #: S10-111207-021**

**DOT/I #:**

**RMP #:**

**Subject: S10 DIRECT REPLY - LETTER TO THE SECRETARY FROM [REDACTED]  
REQUESTING NHTSA INVESTIGATE BMW MOTORCYCLE FINAL DRIVRS**

**Ack Date:**

**Sign Office: ENFORCEMENT**

**Cleared Date:**

**File Loc:**

**Added By: BMILLINGS x65470**

**Ack By:**

**Signature: NANCY L. LEWIS**

**Cleared By:**

**XREF File:**

**Modified By:**

**BERNADETTE.MILLINGS**

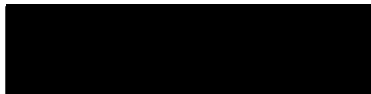
**Signed For:**

**Cleared For:**

**Closed Date:**

**Most Recent Comment:**

**Author:**



**EDMONDS, WA [REDACTED]**

**Tel: [REDACTED] Fax: E-mail:**

| <b>Assigned To</b> | <b>Task</b> | <b>Asgn Date</b> | <b>Deadline</b> | <b>Returned Date</b> |
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| NVS-200            | REPLY       | 12/8/2011        | 12/15/2011      |                      |

**DEC 12 2011**

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**Office of the Secretary of Transportation  
Executive Secretariat**

**Control number:** S10-111207-021      **Action office:** NHTSA  
**Document date:** 11/28/2011      **Due date:** 12/15/2011  
**Author(s):** [REDACTED]  
**Subject:** Requests for NHTSA to Investigate BMW Motorcycle Final Drivers  
**Action:** Direct Reply

**Comments:**

| <b>Date</b> | <b>Action</b>                                                     | <b>Action by</b> |
|-------------|-------------------------------------------------------------------|------------------|
| 12/8/2011   | Assigned to NVS-200 for reply                                     | BMILLINGS        |
| 12/7/2011   | Folder Sent for Draft to Action Office: NHTSA for 'Direct Reply'. | AINGRAM          |
| 12/7/2011   | DIST: P1,C1,S3                                                    | AINGRAM          |
| 12/7/2011   | Updated Folder Information.                                       | AINGRAM          |
| 12/7/2011   | Work Folder Assigned to NHTSA.                                    | MPETTIFORD       |
| 12/7/2011   | Incoming File Uploaded.                                           | MPETTIFORD       |
| 12/7/2011   | Control Number Created.                                           | MPETTIFORD       |

| <b>Date</b> | <b>Note</b> | <b>Note by</b> |
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[REDACTED]  
Edmonds WA [REDACTED]  
November 28, 2011

Ray LaHood  
Secretary of Transportation  
1200 New Jersey Ave SE  
Washington DC 20590

RE: Request for NHSTA to Investigate BMW Motorcycle Final Drives

Dear Mr. LaHood:

Attached is a copy of the package I sent today to David Strickland requesting that the NHSTA open an investigation into the failures of final drive components on certain BMW motorcycles manufactured between 1999-2010. My request to Mr. Strickland was prompted by the NHSTA's repeated failure to open an investigation after receiving 145 complaints from BMW motorcycle consumers between April 2001 and August 2011. During my research into the NHSTA's handling of the consumer complaints received, I discovered an alarming rate of error in the data input by NHSTA staff that may have contributed to the scope of the issue being undetected for so long.

I apologize for clogging your desk with a copy of this material. As a manager, I recognize the need for delegation and independence for staff to perform unencumbered. I also have an acute appreciation for accountability. Hopefully, Mr. Strickland's research into this matter will produce results that can eliminate this particular safety risk and serve the consumer, in addition to identifying how the system failed to elevate an important safety sooner.

Don't worry. I don't have any delusions of you or your staff getting involved in this matter on my behalf and calling me with the result. But I do ask that you or your staff follow up with Mr. Strickland to ensure his team act accordingly and with accountability to your office. Ideally, he will report progress that renews confidence in the effectiveness of his agency. Otherwise, what's the point?

In the interim, I will do my part to be accountable as well. My motorcycle remains parked and unriden since learning about the scope of the component failure until I can be assured that BMW can actually repair the unit so it is safe to ride. Just, please don't make me wait too long.

Attachments

[REDACTED]

[REDACTED]  
Edmonds WA [REDACTED]  
November 28, 2011

David L. Strickland  
National Highway Safety & Traffic Administration  
1200 New Jersey Ave SE – West Building  
Washington DC 20590

RE: Request for Investigation into BMW Motorcycle Final Drive Failures

Dear Mr. Strickland:

On the evening of Friday, October 21, 2011, as I exited US-101 in San Luis Obispo, California, I attempted to bring my 2001 BMW K1200LT to a safe, uneventful stop at the end of the off ramp, something I'd done countless times before. To my surprise, my rear brake did not work, forcing me to use front brake only, which extended my stopping distance and risked my entering the lane of oncoming traffic. Thanks to my training as a certified Motorcycle Safety Foundation Rider Coach, I was able to safely stop without hitting anyone and still remain upright. As a motorcyclist yourself, I'm sure you can appreciate the challenge of coming to a complete stop on a heavy motorcycle using just the front brake as you approach as T intersection, especially when you had no reason to anticipate brake failure.

Upon inspection, I realized the rear brake failed because it was saturated in the gear oil that had leaked from the final drive unit after the final drive bearing seal had failed. Enclosed please find the cause of the seal failure. The attached final drive (crown gear) bearing had failed, causing metal parts to be crushed between the spinning gears, tearing the seal and allowing the oil to leak. I have also attached a photo of the rear wheel at the time. I was lucky as the bearing parts could have just as easily caused the rear wheel to lock at speed, likely resulting in a loss of control. Or, the oil on the tire could have resulted in a loss of traction for the rear wheel, necessary for the stability of a motorcycle. Either event could have resulted in a crash, injury or death.

This was the second failure of the final drive bearing on my K1200LT. The first failure occurred at 59,310 miles in December 2008, but was identified before the seal was ruptured and oil leaked. BMW denied the near \$400 cost of that repair as my warranty had expired. However, this most recent failure, at 75,994 miles (less than 17,000 miles later), was the first time the failure resulted in a dangerous situation that put my safety at risk. After paying another \$400 for repairs, I intended to report the component failure to the NHSTA when I returned to my home in Washington.

Much to my surprise, I have learned that this component failure is not new to the NHSTA as your agency has received 145 complaints between 4/9/2001 and 8/7/2011 (as of 11/19/2011).<sup>1</sup>

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<sup>1</sup> While there have been additional complaints about final drive components for other BMW models, I have limited my research to the BMW models that share the same (1<sup>st</sup> generation) Paralever final drive bearing components as the K1200LT.

Of those 145 complaints filed with the NHSTA, 110 (76%) have involved the K1200LT model sold in the US between 1999 and 2010. I have attached a spreadsheet compiled from data taken from the NHSTA website. As you can see, the number of complaints filed exploded with the 1999 release of the 780lb K1200LT, the heaviest of BMW motorcycles. Further, the overwhelming bulk of the complaints (83% overall; 88% K1200LT) are for model years 1999-2002, after which BMW reportedly changed the size of the crown gear bearing used and, likely focused on more precise assembly as discussed below. As you can also see, there is little consistency within NHSTA on how to classify this component's failure, with NHSTA using 18 different component classifications to describe the same event, ranging from Power Train to Brake and even Engine Cooling failures!

As far as I have been able to determine in my limited research, the cause of the crown gear bearing failure is officially unknown as, according to several BMW dealers, BMW has not formally acknowledged the component defect. However, as reported in the attached article published September 2008 in *Motorcycle Consumer News*, the root causes appear to be excessive preload on the crown gear bearing during assembly and/or an improperly sized ring gear shaft. These theories have been echoed by several independent mechanics within the motorcycling community ([www.bmwlt.com](http://www.bmwlt.com); [www.ibmwr.org](http://www.ibmwr.org); [www.bmwmoa.org](http://www.bmwmoa.org)) and cited as the likely cause of many repeat failures on the same machine as dealers often merely replace the failed bearing and seal, but not the shaft or shims that affect spacing or preload. Not surprisingly, no other large circulation magazine has acknowledged this issue, perhaps to avoid losing the advertising revenue received from BMW? (MCN does not accept advertising.) However, I am not a mechanic or an engineer. So, I don't really know. I am, however, a consumer, voter and taxpayer outraged that after 145 complaints, the government agency chartered to research the very instances of vehicle manufacturer defect that pose safety risk, has not yet even opened an investigation into the issue.

I realize that 145 complaints may not seem significant in the scheme of things. After all, BMW has likely sold thousands of motorcycles in the US equipped with the 1<sup>st</sup> generation Paralever style final drive unit that utilizes the attached bearing in its design. Maybe the low complaint ratio is acceptable to the NHSTA, despite the obvious indication of increased failure on the 1999-2002 K1200LT models. So, I researched how many complaints NHSTA received about the 2007-2010 Toyota Camry accelerator pedal sticking before a recall was initiated on 10/5/2009. After all, the Camry was the top selling car in the US during those years. Camry production must be exponentially greater than BMW's little motorcycle division, right? Again, I was surprised that only 77 Camry complaints needed to be filed with NHSTA before the recall was issued. (That number may actually be lower as 14% of those complaints were dated "Jan 1, 1901.") Yet, even with such a fractional ratio of complaints to units sold, the NHSTA investigation prompted a massive recall. Of course, that case had the dramatic 911 call and tragic death of several occupants trapped in a speeding, out of control Toyota. Does someone really need to die from injuries sustained from a crash caused by this failure before the NHSTA will act?

So, why hasn't the NHSTA opened an investigation into the BMW final drive failures? Unlike your critics during the Toyota fiasco, I am not insinuating that the NHSTA is the lapdog of the manufacturers. After all, and as discussed below, NHSTA has opened investigations in the past into BMW motorcycle related safety issues that resulted in recalls. But I am wondering what

the magic equation of complaints to units sold is necessary to warrant government interaction? Perhaps the 18 different component classifications failed to trigger an algorithmic program to elevate the issue? Again, I do not know.

What I am certain about is that there have been many more incidents of final drive failure than have been reported to NHSTA. Jim Puckett, the BMW motorcyclist referenced in the *MCN* article, had been maintaining a registry of final drive failures online ([www.bmwfinaldrive.com](http://www.bmwfinaldrive.com)) in an effort to quantify the number of riders affected. Before terminating his efforts in 2009, he had logged 172 failures, with only 48% the owners at that time indicating they had reported the failures to NHSTA. His claim is consistent with my own non scientific research conducted by surveying owners on several web sites where fewer than 30% of those responding with a final drive failure report having notified the NHSTA. I must assume this is a common finding when measuring the ratio of complaints to actual occurrences and that your agency has a formula to estimate projected vehicle exposure based on the number of actual complaints received and total number of units manufactured. In any event, my findings would suggest the actual incidence of component failure is much greater than what has been reported to the NHSTA.

In addition, recalls by BMW are not unprecedented. Based on the NHSTA records, you received fewer complaints by BMW motorcycle owners about leaking fuel lines than final drive failures before a manufacturer's recall was prompted to repair the defective parts under NHSTA campaign #04V028000. Similarly, fewer complaints were also received from owners of 2009-2010 BMW K1300GT models for a stalling problem before a recall was initiated under campaign #09V471000. In fact, BMW issued a recall on 10/6/2006 for 700 R1200GS-HP2 and R1200S models as the (2<sup>nd</sup> generation "Evo" Paralever) final drive O-ring may not have been installed correctly during assembly. NHSTA campaign #06V399000 reported that "if a leak were to occur, oil could come into contact with the rear brake disc, increasing the risk of a crash." This is precisely what I experienced and, according to the comments noted with each complaint, what happened to at least 32% of the complainants reporting to the NHSTA. (3% reported the rear wheel locked; in another instance, the rear wheel separated from the motorcycle causing a crash and injuring rider and passenger<sup>2</sup>.) In campaign #06V399000, BMW agreed to replace the O-ring in the affected models. While some owners of the motorcycles with the 1<sup>st</sup> generation Paralever style final drive have reported that BMW voluntarily paid all or some of the cost of repairs even if the motorcycle was out of warranty, these incidents still required the component to first fail, exposing the rider and passenger to harm, in addition to greater expense and inconvenience. This behind the scenes "goodwill" approach is not corporate accountability and should not be acceptable practice while thousands remain at risk and potentially unaware.

I request that the NHSTA open an investigation into the repeated final drive bearing failure and possibly flawed assembly controls of the final drive unit on BMW K1200LT models, if not all BMW motorcycles equipped with the Paralever style final drive unit. I realize that current agency budget constraints may make additional investigations challenging. Hopefully, you can appreciate that the consumers you have sworn to represent and protect have already done much of the heavy

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<sup>2</sup> NHSTA notes for ODI #10410646 do not specify final drive failure; however failure of the crown gear itself would result in the rear wheel separating from the motorcycle described by the consumer.

David Strickland, NHSTA  
November 28, 2011  
Page 4 of 4

lifting on this issue. Based on the information already collected within the NHSTA consumer complaints database (just poorly organized), and the excellent investigative and mechanical research already completed by concerned owners, the pattern of component failure has already been established with information identifying affected models, symptoms, likely causes and possible remedy. Further, campaign # 06V399000 has already established the manufacturer's awareness of the safety risks associated with oil leaking from a final drive unit and demonstrated BMW's willingness to correct, once brought to their attention. Assuming the investigation confirms what me and hundreds, if not thousands of BMW motorcycle owners have already learned, the manufacturer should be required to recall the affected models for inspection of component wear and proper assembly of the unit, with extended warranty of the affected component.

Alternatively, I would like for you to explain why the NHSTA has ignored 145 complaints from consumers about a critical vehicle component that, when it fails, can result in oil coating 50% of the vehicle's wheels, with potential loss of 50% of the vehicle's braking capacity, exposing the operator to the potential loss of control, possible crash, injury and, if left unaddressed, eventual fatality. Can you answer that for me?

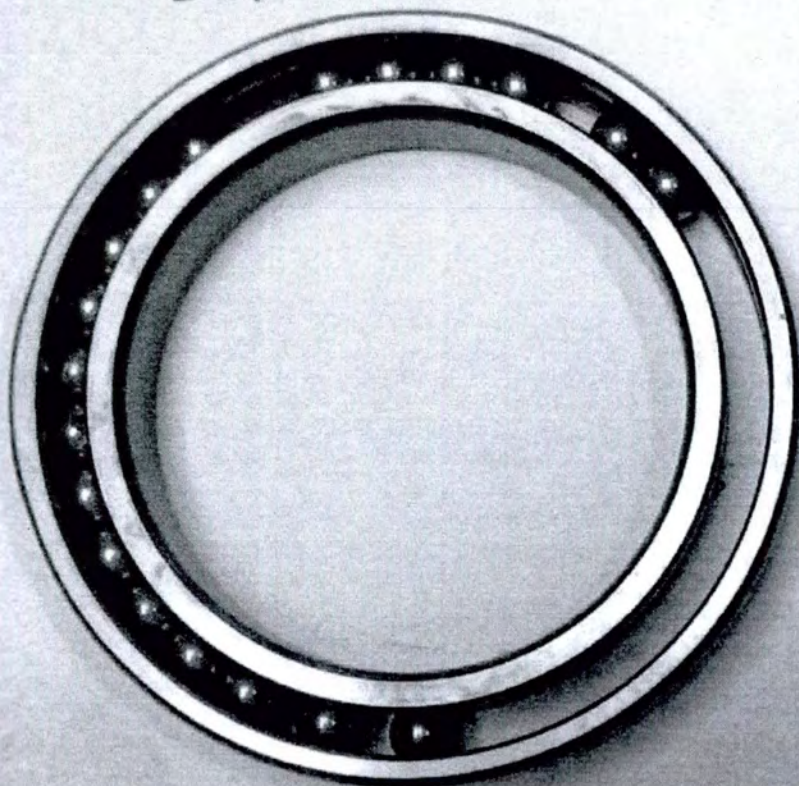


Attachments: Failed crown gear bearing (removed 10/22/11 at 75,994 miles);  
Photo of rear wheel covered in gear oil (taken 10/21/11)  
Data compiled from NHSTA website as of 11/23/2011  
Tarnished Roundel: Final Drive Failures Taint BMW's Image, by Bill Shaw, published September 2008 in Motorcycle Consumer News

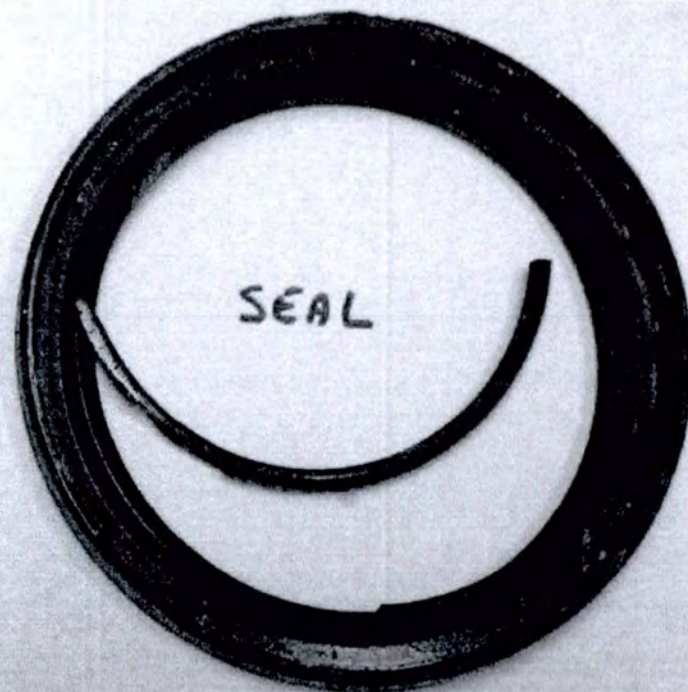
CC: ✓ Ray LaHood, Secretary of Transportation  
Senator Patty Murray, Chairman of the Subcommittee on Transportation, Housing and Urban Development and Related Agencies



BEARING



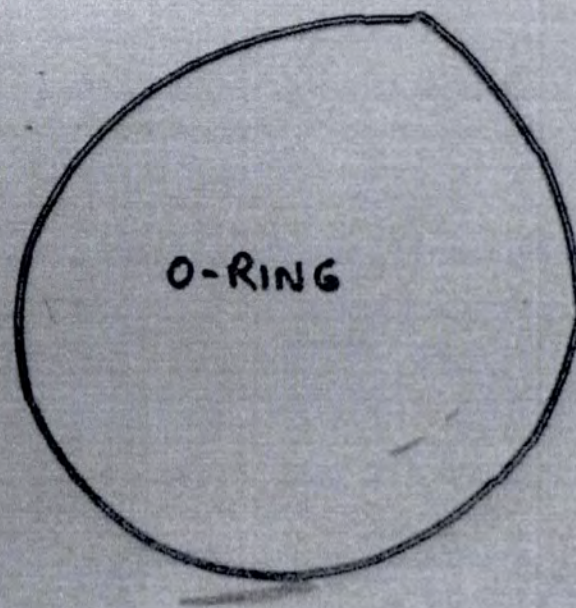
SEAL



TORN METAL SHAVINGS



O-RING



## Feature

# Tarnished Roundel

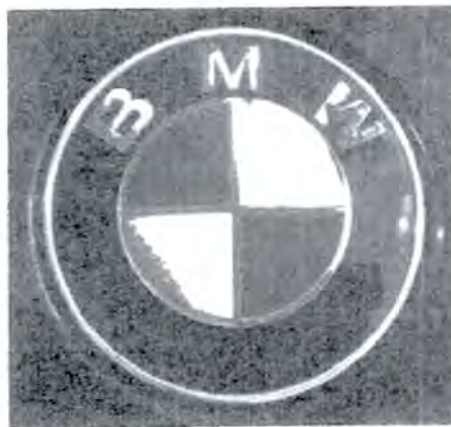
## Final Drive Failures Taint BMW's Image

by Bill Shaw

**I**N THE NOT-so-distant past, if you wanted a well-built, comfortable long-distance touring or sport-touring motorcycle and could afford the price of admission, you needed to look no farther than BMW. For a motorcyclist who yearned to ride around the world, or just explore a small part of his/her universe, Beemers were sought out in large part because of these attributes as well as their proven dependability.

However, this image has been tarnished in recent years due to a number of final drive failures on Paralever-equipped Oilhead and K-series motorcycles that have left riders suddenly stranded. Often, the only telltale sign that outright failure was imminent was a small amount of oil weeping from the junction of the drive shaft and final drive housing.

Unfortunately, the factory remained characteristically silent as it collected the offending parts from dealers, shipped them to Germany for analysis and methodically searched for a cure. But nature abhors a vacuum, so it didn't take long for speculation on the cause of these failures to reach epidemic proportions on Internet message boards devoted to the marque. The would-be culprits included everything from faulty rear end oil seals, to inadequately sized bearings, to too much bearing preload and the viscosity of the final drive fluid. In the absence of any official information or evidence of correction, even diehard customers began to wonder if BMW's legendary engineering had failed them.



As word spread that a problem might exist with the final drives, questions were asked, but never definitively answered. To wit: Which models and years are most susceptible? How many bikes actually failed or might be affected? Or was the final drive failure buzz another Internet phenomenon, caused by just a few very vocal and dissatisfied customers grossly exaggerating a problem?

When this issue first surfaced, we had asked our readers to report any problems to us and we continued to receive sporadic accounts, mainly from owners of the K1200LT models. In light of this, we also wanted to know the extent and cause of the problems.

### Historical Context

It's important to view this issue with some historical perspective. In 1980, BMW introduced the Monolever single-sided swingarm on its R80GS model. This

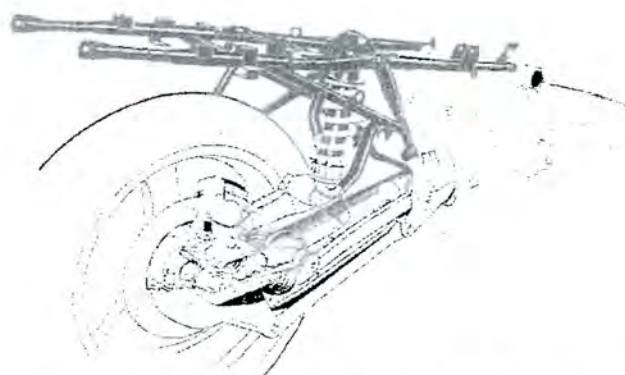
novel design incorporated a crown gear on the final drive, also referred to as a ring gear, which serves as the hub to which the wheel is bolted. Eight years later, BMW made a number of improvements to the Monolever and renamed it the Paralever. These first appeared on the R80GS and R100GS in 1988, on four-valve K-bikes in 1989 and finally on Oilheads in 1993.

In 2004, BMW introduced a second-generation "Evo" Paralever, easily identified by the enormous hollow rear axle with its 50mm hole. The Evo Paralever is used on most of BMW's bikes, but not all of them. The K1200LT, for instance, did not receive this update and continues to use the first generation Paralever final drive technology to this day.

From 1980 until 2000, BMW final drive failures were rare enough to be a non-issue. However, this appears to have changed in 2001 when an increasing number of final drive failures started appearing on K1200LT and R1150GS models. While we have not had access to factory records for exact numbers, experienced BMW mechanics have told us that the majority of final drive failures happen on first generation Paralever bikes, although the number of problems with second-generation Evo Paralever final drives is rising.

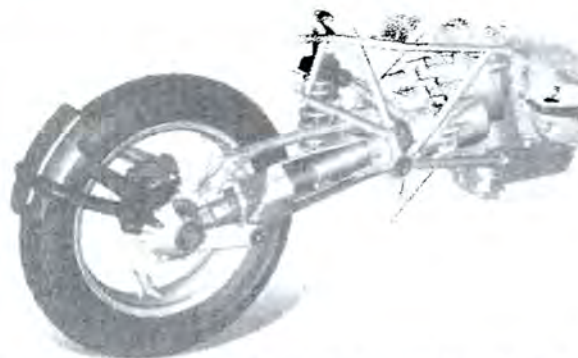
Fact: Of the 38 Paralever-equipped BMWs that entered the 2007 Iron Butt Rally, 14 were R1200 models, that is, Evo Paralever bikes. And of these, four did not finish because they suffered final drive failures—a shocking 29% failure rate (note that this figure doesn't include another competitor's K1200GT that had a final drive failure just days after finishing

First Generation Paralever



BMW introduced the Paralever design in 1988 and continues to use it today, notably on its flagship touring bike the K1200LT.

Evo Paralever



While the majority of reported final drive failures seems to be on first generation Paralever bikes, the number of failures on Evo Paralevers is on the rise too.

the rally). Although the grueling Iron Butt Rally is only one barometer of how reliable a motorcycle is, it is, nonetheless, a very visible indicator.

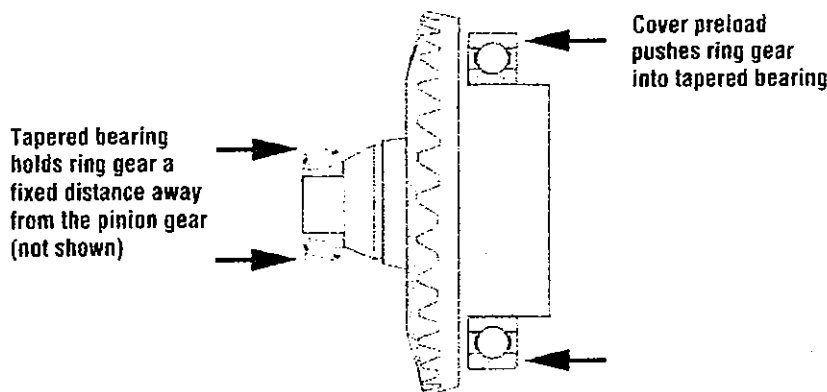
Historically, BMW has chosen to handle service complaints such as this quietly and on a case-by-case basis. While some message boards posts may protest the "secrecy" of this policy, in fact, we have not learned of a single case of final drive failure that the factory has refused to warranty. This is significant from a consumer standpoint, as it shows the company has been standing behind its products admirably. On the other hand, if the company were to proclaim that they would extend warranty coverage to any future instance of final drive failure, this could leave them vulnerable to lifetime replacement regardless of obvious signs of abuse.

Ten years earlier, a number of Oilheads experienced a significant engine surging problem, and MCN provided a forum for a discussion of its causes and the sometimes rude ways dealerships were urged to handle complaints—by blaming the rider's technique. While the cause of the surging problem was eventually solved, albeit after more than a decade, BMW never officially acknowledged that it had a problem. In a similar fashion, BMW Motorrad has not made an official statement either acknowledging or refuting that a problem exists with final drives on some of its models. However, it has made some significant mechanical and servicing changes to Evo Paralever bikes in an apparent effort to reduce problems.

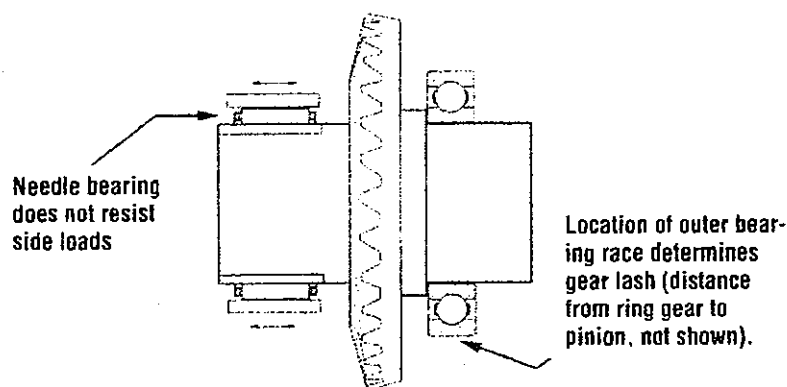
A technical service bulletin was released in February 2005 titled "Bearing Play at the Rear Wheel Drive." During its introduction, BMW boasted that the Evo Paralever final drive was lubricated for life—no oil changes required, ever. However, in September 2006, BMW amended this, saying: "Ongoing monitoring and long-term tests have confirmed that wear in the final drive can be further minimized over the service life of the motorcycle if the oil is changed once during the 600-mile service. Consequently, this oil change has been incorporated into the maintenance schedule as of model year 2007."

This was universally heralded as a prudent move since many owners were skeptical about BMW's initial claim. Interestingly, the bulletin goes on to say that subsequent oil changes, for example as part of the 12,000-mile inspection, show no practical benefit.

Other changes in 2007: BMW increased the size of the pinion gear needle bearing on Evo Paralevers and a magnetic drain plug, or as it's known in the BMW parts manual, a "screw for the oil-drain bore."



On "old style" Paralever final drives, gear lash is controlled by a shim behind the tapered roller bearing. Shims are also placed behind the ball bearing so when the final drive cover is attached to the case, it creates a load on the bearings.



With Evo Paralevers, the final drive is assembled without preload between the cylindrical roller bearings and the large ball bearing; the lateral position of the axle is controlled entirely by the position of the ball bearing.

was added to all Evo final drives beginning with model year 2007. Further, while not publicly disclosed, BMW Motorrad decided in January during a dealer meeting to extend final drive warranties for five years on bikes sold after January 2007.

### Chasing Rumors

In an effort to better understand the issue and determine the scope of the problem, we tried to contact BMW Motorrad first. They have the knowledge of which models have been affected and exactly how many bikes have been repaired. However, our contacts did not want to talk about it, on or even off the record.

We then tried to speak to the National Highway Traffic Safety Administration's vehicle defect investigator. We were interested in knowing what NHTSA knew about the final drive failures, if NHTSA was actually tracking the failures, how many reports they had received and why an investigation hadn't been opened. We were directed to the public affairs officer, who declined our request for an interview.

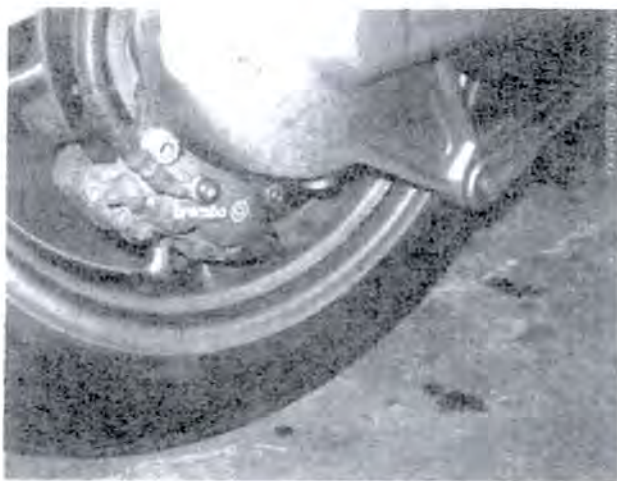
Thankfully, we were able to interview other knowledgeable individuals beyond

the reach of corporate or governmental bureaucracies: Anton Largiadèr, Technical Editor for the BMW Riders Association magazine *On the Level* (OTL), and Paul Glaves, Technical Editor of *BMW Owners News*. Frankly, there are probably few people outside of BMW Motorrad or BMW AG who know more about this subject than Glaves and Largiadèr.

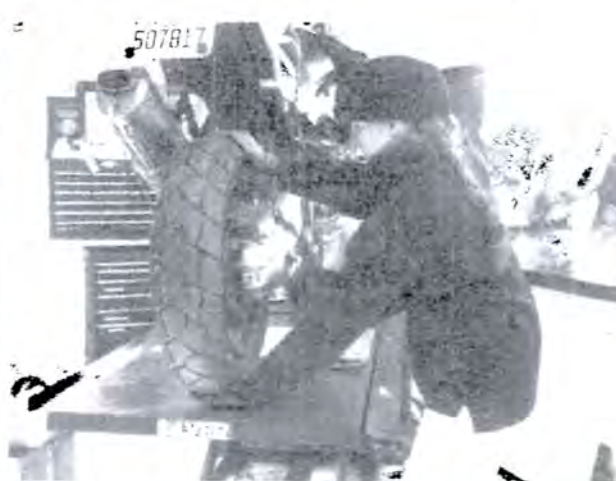
### The Symptoms

On the older Paralever design, a typical final drive failure begins when the hardened surface of the bearing race starts pitting, fracturing and flaking off. This is followed shortly thereafter by damage to the bearing balls and races and then oil seal failure. In a worst-case scenario, this loss of precise alignments spreads damage to other parts of the final drive, damages other bearings and the gears themselves. One of the few early signs of a final drive bearing failure is oil that has seeped past the seals (due to misalignment and abrasive debris) appearing on the outside of the final drive, and eventually collecting on the rear wheel. Another telltale sign is metal flakes that collect on the

## Feature



An oil leak between the drive shaft housing and final drive is a clue to a final drive problem. Performing regular checks will help determine whether a serious problem exists.



The final drive should be inspected frequently. In addition to a thorough visual examination, checking for loose bearings should also be a part of every owner's standard regimen.

magnetic final drive drain plug.

However, the actual causes of final drive failure appear to be different between the older Paralever design and the newer Evo Paralever.

Both Largiader and Graves said that the majority of final drive failures on bikes with the first generation Paralever can be traced back to excessive bearing preload on the output flange end of the ring gear. Graves also believes that the use of out-of-spec lubricants that are too viscous might also be a contributing factor.

On the Evo Paralever, suspicion has focused on the seals and the pinion gear's needle bearing. But these are only theories, since BMW factory technicians are the only people who have inspected damaged Evo Paralever final drives.

### Diagnosing The Problem

The first step in determining how and why some final drives fail is to understand gear lash and preload. In layman's terms, gear lash is the gap or distance between the pinion gear and the ring gear. Stated another way, it is the amount of play between the teeth of these two gears. This gap is critical to the life of the final drive because if there is too much play between the pinion gear and the ring gear, the load-bearing surface on the gear teeth is reduced and skewed. If there is too little play, the gears are pressed into each other and friction is increased. The ideal clearance spreads the contact area evenly over the greatest area for the least pressure per unit of area and therefore provides maximum strength and durability from the gears.

On the "old-style" Paralever final drives, the gear lash is controlled by a shim of precisely the right thickness, which is

located behind the tapered roller bearing. This holds the ring gear an exact distance from the pinion gear. Shims are also placed behind the ball bearing so when the final drive cover is attached to the case, it creates a preload on the bearings. In other words, the shims preload the bearings so there are opposing forces between the ball bearing and tapered roller bearing. This eliminates virtually any bearing play, and since the wheel is bolted directly against the end of the ring gear shaft and is all one piece, any play at the rear wheel signals a problem.

If the correct amount of gear lash and preload are used on old style Paralevers, there usually won't be a problem. However, if there's too much or too little gear lash, and/or there's too much preload, the resulting wear causes metallic bits to be shaved off of the gears or the bearings that support them. This abrasive debris will contaminate the oil, leading to further damage to the gears and seals. And because the ring gear's alignment, and by extension the rear wheel, will no longer be tightly controlled, eventually, the seals will leak and oil will seep to the outside of the final drive and onto the wheel. Largiader said all of the old style Paralever final drive failures he's repaired were the result of excessive preload during assembly at the factory—which is why simply replacing the bearing doesn't permanently solve the problem.

After discussions with a design engineer for a major bearing manufacturer, Graves believes that there might be another contributing factor: not enough clearance in the ball bearing after it is installed on the ring gear, which leaves too little space between the balls and the

races for an adequate cushion of lubricant. This can be caused by excessive shimming preload as described by Largiader. It can also be caused if the shaft portion of the ring gear on which the bearing is pressed is oversized.

Graves has seen failures due to both causes after carefully examining bearings in the earliest stages of failure and has learned how to tell them apart: Where the unit is shimmed too tightly, the initial markings in the races are slightly off-center. When the defects appear centered in the race, there is a loss of bearing clearance because the shaft is too large. A radius just 5 microns too large will cause this loss of clearance, he says. Graves believes this might explain multiple failures on the same final drive, even when the affected unit's rebuild was done properly and carefully.

Even though it shares the same basic configuration, Largiader notes in an OTL article that Evo Paralevers are not shimmed the same way as the older design. On the Evo Paralever drive, the wheel bolts directly to a separate part called the wheel flange. This wheel flange has splines that fit the axle tube. But there isn't any compression between the cylindrical roller bearings and the large ball bearing—the drives are assembled without preload. The Evo Paralever is designed to position the ring gear relative to the pinion gear without the benefit of the inner bearing as a stop, and, therefore, without the precision that comes from preloading the bearings. In the new design, the lateral position of the axle is controlled entirely by the position of the ball bearing. That bearing is held captive in the cover and on the axle, and external shims are

used to hold the cover and the bearing; the axle and ultimately the ring gear at the correct distance from the pinion gear.

There is another important difference between older and newer generation final drives: On the Evo Paralever, the ball bearing is fully sealed with its own grease and is located outside the seal which holds the gear oil in the final drive. So if the bearings aren't preloaded on Evo Paralever bikes and the driveline lash can easily be measured and adjusted with external shims, why are Evo Paralever final drives failing? No one we've spoken to knows for sure since BMW is replacing failed final drives *in toto* and apparently is sending every one back to Germany for analysis instead of repairing them.

But two prevailing theories have developed. One holds that the new design has created an overloaded condition on the pinion bearings. If insufficient driveline lash overloaded the needle bearing and caused it to wear, metallic debris would eventually contaminate the oil and promote gear, bearing and seal wear. This might be the reason BMW decided to increase the size of the pinion gear needle bearing.

A second theory centers on the seals, not the bearings, as the source of Evo Paralever final drive failures. Since some models show signs of lubricant leakage before there is any apparent bearing failure, motorcycle industry consultant Tom Austin has questioned whether some of the failures might be caused by a loss of lubrication from leaking seals. Again, no one knows for sure and BMW Motorrad isn't talking.

### Final Drive Inspections

This all begs the question: Are there any proactive measures owners can take on their own to either prevent problems or determine if a final drive failure is imminent? The answer is yes. By regularly checking the final drive's axle bearings, which can be done anytime the bike is on the centerstand, owners can determine if there is any excess play in the rear wheel. First grab the wheel at 12 o'clock and 6 o'clock and try to rock it. Then do the same thing at the 9 o'clock and 3 o'clock positions. On first-generation Paralever bikes, the wheel should have no play whatsoever, since it is bolted directly against the end of the ring gear shaft. Any movement is a sign that the bearings have started to deteriorate. In this case, the bike should be taken to a qualified BMW technician for a thorough inspection as soon as possible.

On Evo Paralever bikes, if there is any movement of the rear wheel, it will be

coming from one of two places: The wheel carrier or the axle support bearings. If the wheel rocks at all, but there is no perceptible movement of the hollow axle, the wheel carrier might be loose on the splined axle. In this case, the bike should be taken immediately to the dealer. If, on the other hand, the wheel rocks and only the black plastic ring surrounding the axle hole moves within the housing, this means that there is some looseness in the bearings. This is, in and of itself, not cause for alarm since BMW considers up to 1mm of play measured at the wheel rim to be normal.

But the only sure method of determining whether a final drive is actually failing is to drain the final drive oil and inspect the oil plug for metallic particles. If any further concern exists, the final drive must then be removed to inspect the gears, bearings and measure the gear lash and, on older Paralevers, the preload.

### Assessing The Damage

Largiadier points out that a final drive failure is not a problem exclusive to BMWs but could occur on any improperly built or assembled final drive. In this respect, no manufacturer is immune to the possibility of final drive failures. But if a manufacturer is aware of an inherent design flaw, or a problem in the production, manufacturing or assembly process, it is incumbent upon them to accept responsibility and take the appropriate corrective action.

The problem here is that we don't know if BMW's Evo Paralever has an actual design defect or if there has been a problem on the factory assembly line. What we do know is, that some but certainly not all, K1200LT and GS "older" Paralever final drives have come from the factory with excessive preload and/or mismatched bearing and shaft diameters and that a number Evo Paralever final drives on R1200 and K1200 bikes have also failed. Without access to the data, we don't know the source of the problems with the Evo Paralever and when, if ever, they will be resolved.

The only data we do have are based on Internet surveys conducted by two BMW owners. Jeff Eagan started one on the BMW Luxury Touring forum ([www.bmwlt.net](http://www.bmwlt.net)) and as of this writing, lists 174 reported failures. Jim Puckett, a BMW R1150RT owner, started a separate list titled "FD Failure List" ([www.bmwfinaldrive.com](http://www.bmwfinaldrive.com)). At last count, 80 people reported failures to his survey and oil



In extreme cases, as on this R1200GS, the heat generated by a final drive failure can actually ignite the leaking oil. Luckily, the owner of this bike discovered the problem before he had an accident.

these 11 are Evo Paralevers. Of the remaining 69 bikes with "older" Paralever final drives, 36 are K1200LTs. While these lists are anecdotal and admittedly represent only a small part of BMW's sales, the numbers are hard to ignore.

### Conclusion

Based on what we've learned, there always appears to be a telltale indication that the final drive is getting ready to fail: e.g., a loose rear wheel and/or oil on the final drive cover/rear wheel. For the record, we haven't heard of any final drive failure that resulted in a crash. We are also unaware of any instances where a rider had an accident because a final drive leaked oil onto the rear tire, and this might be the reason that NHTSA has not opened an investigation. We simply don't know. But many wonder if a tragedy has to occur first before NHTSA decides to act.

Which brings us to the unrecognized casualty in this saga—the BMW dealer. These men and women are passionate enthusiasts, too, and are oftentimes caught in the middle between trying to help concerned customers and BMW Motorrad, who expects them to toe the party line: i.e., there is no final drive problem. And while we cannot know the full extent of the damage, we know it has had an impact in terms of new bike sales, especially within the long-distance riding community. While losing a few customers probably won't adversely affect the largest BMW dealers, smaller dealers may find it more difficult to make up any losses. As one longtime customer recently wrote on a BMW forum, "I will think long and hard about buying another BMW unless they step up and find a remedy to the problem."

There is little doubt that BMW Motorrad has a serious and growing public relations problem. However, stonewalling dedicated owners would seem to be the wrong approach. ■

| ODI No.  | Date of Failure | Model Year Reported | NHSTA Model Category | model by VIN | NHSTA Component Category                         | Notes from Summary                                             | Mileage at Failure | Injuries | Deaths | Written Complaint |
|----------|-----------------|---------------------|----------------------|--------------|--------------------------------------------------|----------------------------------------------------------------|--------------------|----------|--------|-------------------|
| 10237573 | 5/14/2006       | 1996                | BMW Motorcycle       | K1100RS      | power train; driveline                           | FD failure                                                     | not stated         | 0        | 0      | No                |
| 10209113 | 7/12/2007       | 1996                | R1100RT              |              | power train; driveline; center support bearing   | FD failure                                                     | not stated         | 0        | 0      | No                |
| 2        |                 | 1996                |                      |              |                                                  |                                                                |                    |          |        |                   |
| 10038701 | 9/11/2003       | 1997                | BMW Motorcycle       | K1100LT      | power train                                      | FD failure at 70mph without warning                            | not stated         | 0        | 0      | No                |
| 749492   | not stated      | 1997                | K1200RS              | K1100RS      | engine and engine cooling; gasoline              | seal holding 90wt oil failed, coating rear wheel               | not stated         | 0        | 0      | Yes               |
| 10201908 | 6/16/2006       | 1997                | R1100RT              |              | power train; axle assembly; axle shaft; seal     | 2nd FD failure (1st at 36,000, oil on rear tire; wobbly)       | 60000              | 0        | 0      | Yes               |
| 3        |                 | 1997                |                      |              |                                                  |                                                                |                    |          |        |                   |
| 10208084 | 5/20/2005       | 1998                | BMW Motorcycle       | R1100RT      | power train; driveline; differential unit        | FD failure with oil on rear tire and brakes                    | 27000              | 0        | 0      | No                |
| 10173420 | 7/19/2004       | 1998                | R100RS               |              | suspension; rear                                 | FD bearing failure; wheel "cocked" and bike became unstable    | not stated         | 0        | 0      | No                |
| 2        |                 | 1998                |                      |              |                                                  |                                                                |                    |          |        |                   |
| 10278887 | 7/28/2009       | 1999                | BMW Motorcycle       | K1200LT      | power train                                      | FD failure, crown gear ball bearing                            | not stated         | 0        | 0      | No                |
| 10040932 | 9/26/2003       | 1999                | BMW Motorcycle       | K1200LT      | power train                                      | FD failure                                                     | 31000              | 0        | 0      | No                |
| 10037122 | 8/25/2003       | 1999                | BMW Motorcycle       | K1200LT      | power train; axle assembly; axle shaft           | FD failure with severe vibration and loss of control           | not stated         | 0        | 0      | No                |
| 10208116 | 8/12/2005       | 1999                | BMW Motorcycle       | R1100LT      | power train; driveline                           | FD failure; \$2000 cost to repair                              | 50000              | 0        | 0      | No                |
| 10074714 | 6/1/2004        | 1999                | BMW Motorcycle       | K1200LT      | power train; driveline                           | FD failure with vibration and wobble                           | not stated         | 0        | 0      | No                |
| 10197092 | 10/15/2006      | 1999                | BMW Motorcycle       | K1200LT      | power train; driveline; differential unit        | 2 FD failures; \$800 each to repair                            | not stated         | 0        | 0      | No                |
| 10093543 | 9/27/2004       | 1999                | BMW Motorcycle       | K1200LT      | power train; driveline; differential unit        | FD failure                                                     | not stated         | 0        | 0      | No                |
| 10067913 | 4/25/2004       | 1999                | BMW Motorcycle       | K1200LT      | power train; driveline; differential unit        | 2 FD failures w/in 13,000 miles                                | not stated         | 0        | 0      | No                |
| 10025575 | 5/28/2002       | 1999                | BMW Motorcycle       | K1200LT      | power train; driveline; driveshaft               | FD failure                                                     | not stated         | 0        | 0      | No                |
| 10291986 | 9/7/2009        | 1999                | BMW Motorcycle       | K1200LT      | wheels                                           | rear wheel separated from m/c; vehicle destroyed               | 18600              | 2        | 0      | No                |
| 10210816 | 10/18/2007      | 1999                | BMW Motorcycle       | K1200LT      | service brakes; hydraulic; foundation components | FD failure                                                     | 45000              | 0        | 0      | No                |
| 10009341 | 7/15/2001       | 1999                | K1200LT              |              | engine and engine cooling                        | Rear FD failure causes oil to leak onto rear tires at speed    | not stated         | 0        | 0      | Yes               |
| 10197957 | 7/27/2007       | 1999                | K1200LT              |              | power train                                      | FD failure                                                     | 37000              | 0        | 0      | No                |
| 10032546 | 5/15/2001       | 1999                | K1200LT              |              | power train                                      | FD failure, bearing collapsed                                  | not stated         | 0        | 0      | No                |
| 10088613 | 7/24/2004       | 1999                | K1200LT              |              | power train; axle assembly                       | FD failure; noticed growling sound, rear wheel wobble          | not stated         | 0        | 0      | No                |
| 10038900 | 9/6/2003        | 1999                | K1200LT              |              | power train; axle assembly                       | bearing failure in rear drive assembly                         | not stated         | 0        | 0      | No                |
| 770746   | 7/23/2002       | 1999                | K1200LT              |              | power train; axle assembly                       | FD failure                                                     | not stated         | 0        | 0      | No                |
| 764897   | 6/20/2002       | 1999                | K1200LT              |              | power train; axle assembly                       | no summary                                                     | not stated         | 0        | 0      | No                |
| 764241   | 7/5/2002        | 1999                | K1200LT              |              | power train; axle assembly                       | no summary                                                     | not stated         | 0        | 0      | No                |
| 762017   | 4/21/2002       | 1999                | K1200LT              |              | power train; axle assembly                       | no summary                                                     | not stated         | 0        | 0      | No                |
| 10210877 | 10/26/2007      | 1999                | K1200LT              |              | power train; axle hubs                           | "there should be a recall before someone gets killed"          | 38155              | 0        | 0      | Yes               |
| 10020547 | 7/5/2002        | 1999                | K1200LT              |              | power train; axle hubs                           | FD failure, "it's a pretty common occurrence"                  | not stated         | 0        | 0      | No                |
| 10227768 | 5/8/2008        | 1999                | K1200LT              |              | power train; driveline                           | FD bearing failure                                             | not stated         | 0        | 0      | No                |
| 10045830 | 11/7/2003       | 1999                | K1200LT              |              | power train; driveline                           | FD failure with oil on rear brake; 2nd failure (1st at 14,000) | not stated         | 0        | 0      | No                |
| 10032809 | 8/3/2003        | 1999                | K1200LT              |              | power train; driveline                           | FD failure "without warning"                                   | not stated         | 0        | 0      | No                |
|          |                 |                     |                      |              |                                                  | FD failure                                                     | not stated         | 0        | 0      | No                |

|          |            |      |                        |                                                 |                                                                       |            |   |   |     |
|----------|------------|------|------------------------|-------------------------------------------------|-----------------------------------------------------------------------|------------|---|---|-----|
| 10032796 | 8/13/2003  | 1999 | K1200LT                | power train; driveline                          | FD failure                                                            | not stated | 0 | 0 | No  |
| 10030246 | 7/27/2003  | 1999 | K1200LT                | power train; driveline                          | FD failure with oil dumped on rear brake and tire                     | not stated | 0 | 0 | No  |
| 10025494 | 7/16/2001  | 1999 | K1200LT                | power train; driveline                          | FD failure                                                            | 15,000     | 0 | 0 | No  |
| 10023588 | 6/9/2003   | 1999 | K1200LT                | power train; driveline                          | FD failure allowing oil to leak onto rear tire and brakes             | not stated | 0 | 0 | No  |
| 8010000  | 9/15/2001  | 1999 | K1200LT                | power train; driveline                          | FD failure at speed                                                   | 27500      | 0 | 0 | Yes |
| 768662   | 10/11/2002 | 1999 | K1200RS                | power train; driveline; differential unit       | FD failure with oil dumped on rear brake and tire                     | not stated | 0 | 0 | No  |
| 10201628 | 4/19/2007  | 1999 | R1100R                 | engine and engine cooling                       | FD bearing failure w/oil seeping from seal                            | not stated | 0 | 0 | No  |
| 10278451 | 7/13/2009  | 1999 | R1100RT                | power train; driveline                          | FD failure with oil leaking on tire at speed                          | not stated | 0 | 0 | No  |
| 10074938 | 5/27/2004  | 1999 | R1100RT                | power train; driveline; driveshaft              | FD failure                                                            | 85000      | 0 | 0 | No  |
| 10167232 | 8/17/2006  | 1999 | R1100RT                | power train; manual transmission                | FD failure                                                            | not stated | 0 | 0 | No  |
| 752759   | 9/30/2001  | 1999 | R1100S                 | engine and engine cooling                       | twice replaced FD bearing                                             | not stated | 0 | 0 | Yes |
| 10231964 | 5/14/2008  | 1999 | R1200C                 | power train; driveline                          | FD bearing failure discovered with metallic chips in oil              | not stated | 1 | 0 | No  |
| 10173805 | 3/6/2006   | 1999 | R1200C                 | power train; driveline                          | FD bearing failure at speed with oil on brakes and rear tire          | not stated | 0 | 0 | No  |
| 767900   | 9/2/2002   | 1999 | BMW K1200LT            | power train; axle assembly                      | FD failure                                                            | not stated | 0 | 0 | No  |
| 39       |            | 1999 |                        |                                                 |                                                                       | not stated | 0 | 0 | No  |
| 767811   | 7/4/2002   | 2000 | BMW K1200LT            | power train; axle assembly                      | 2nd FD bearing failure with oil leaked over rear tire and brake       | not stated | 0 | 0 | No  |
| 10275623 | 6/22/2009  | 2000 | BMW Motorcycle K1200LT | power train                                     | FD failure                                                            | not stated | 0 | 0 | No  |
| 10091284 | 9/4/2004   | 2000 | BMW Motorcycle K1200LT | power train; axle assembly                      | Sudden FD failure; spread oil over rear tire                          | not stated | 0 | 0 | No  |
| 10132253 | 6/20/2005  | 2000 | BMW Motorcycle K1200LT | power train; driveline                          | FD failure                                                            | not stated | 0 | 0 | No  |
| 10093619 | 7/13/2002  | 2000 | BMW Motorcycle R1150GS | power train; driveline                          | FD failure with oil on tire and rear brake                            | not stated | 0 | 0 | No  |
| 10088417 | 8/23/2004  | 2000 | BMW Motorcycle K1200LT | power train; driveline; differential unit       | FD failure with oil on tire and rear brake                            | not stated | 0 | 0 | No  |
| 10041049 | 9/7/2003   | 2000 | BMW Motorcycle K1200LT | power train; driveline; differential unit       | FD failure                                                            | not stated | 0 | 0 | No  |
| 10016566 | 10/10/2002 | 2000 | BMW Motorcycle K1200LT | suspension; rear                                | FD bearing failure                                                    | not stated | 0 | 0 | No  |
| 10073605 | 5/7/2004   | 2000 | IK1200LT               | power train                                     | FD bearing failure caused fluid to leak onto rear tire                | 17581      | 0 | 0 | Yes |
| 10240795 | 9/2/2008   | 2000 | K1200LT                | power train; axle assembly                      | FD failure                                                            | not stated | 0 | 0 | No  |
| 10040827 | 9/27/2003  | 2000 | K1200LT                | power train; axle assembly                      | rear wheel bearing failure created unsafe handling                    | not stated | 0 | 0 | No  |
| 10030746 | 6/27/2003  | 2000 | K1200LT                | power train; axle assembly                      | 2nd FD failure w/oil on tire (1st at 29,000) "should be investigated" | 35000      | 0 | 0 | No  |
| 10280436 | 7/23/2009  | 2000 | K1200LT                | power train; driveline                          | 2nd FD failure. Wheel locked up; oil on tire and brakes               | 26000      | 0 | 0 | No  |
| 10280434 | 4/1/2005   | 2000 | K1200LT                | power train; driveline                          | FD bearing failure resulting gear oil leaking onto brakes             | not stated | 0 | 0 | No  |
| 10240734 | 8/20/2008  | 2000 | K1200LT                | power train; driveline                          | FD failure resulting in rear wheel lock                               | not stated | 0 | 0 | No  |
| 10137034 | 8/25/2005  | 2000 | K1200LT                | power train; driveline                          | FD failure at speed with oil dumped over tire and brake               | not stated | 0 | 0 | No  |
| 10037084 | 9/1/2003   | 2000 | K1200LT                | power train; driveline                          | FD failure                                                            | 18200      | 0 | 0 | No  |
| 10030697 | 7/15/2003  | 2000 | IK1200LT               | power train; driveline                          | FD failure                                                            | not stated | 0 | 0 | No  |
| 10060187 | 2/28/2004  | 2000 | K1200LT                | power train; driveline; central support bearing | FD bearing failure resulting in wobble to wheel                       | not stated | 0 | 0 | No  |
| 10033203 | 7/12/2003  | 2000 | K1200LT                | power train; driveline; central support bearing | FD failure "bearings disintegrated"                                   | not stated | 0 | 0 | No  |
| 10000075 | 9/4/2002   | 2000 | K1200LT                | power train; driveline; central support bearing | FD bearing worn out                                                   | 38632      | 0 | 0 | No  |
| 10164170 | 7/26/2006  | 2000 | K1200LT                | power train; driveline; differential unit       | FD failure with vibration then oil on rear brake                      | not stated | 0 | 0 | No  |
| 10091019 | 8/19/2004  | 2000 | K1200LT                | power train; driveline; differential unit       | FD failure with vibration then wobble                                 | 14500      | 0 | 0 | No  |
| 10090737 | 8/7/2004   | 2000 | K1200LT                | power train; driveline; differential unit       | FD failure with vibration then lubricant on brake and tire            | not stated | 0 | 0 | No  |
| 10088433 | 7/20/2004  | 2000 | K1200LT                | power train; driveline; differential unit       | FD failure with gear oil all over rear tire "bearing disintegrated"   | not stated | 0 | 0 | No  |

|          |            |      |         |                                                |                                                                                    |            |   |   |     |
|----------|------------|------|---------|------------------------------------------------|------------------------------------------------------------------------------------|------------|---|---|-----|
| 10078866 | 6/26/2004  | 2000 | K1200LT | power train; driveline; differential unit      | FD failure; grinding noise and wobble                                              | not stated | 0 | 0 | No  |
| 10037168 | 5/18/2002  | 2000 | K1200LT | power train; driveline; differential unit      | FD failure; oil on rear rim "BMW doing nothing about it. We need your help"        | not stated | 0 | 0 | No  |
| 10029251 | 3/27/2003  | 2000 | K1200LT | power train; driveline; differential unit      | FD failure locked rear wheel in rain; bearing "pulverized"                         | 15697      | 0 | 0 | No  |
| 762992   | 11/4/2000  | 2000 | K1200LT | power train; driveline; differential unit      | FD failure at 70mph                                                                | not stated | 0 | 0 | No  |
| 767535   | 8/31/2002  | 2000 | K1200LT | power train; driveline; driveshaft             | FD failed at speed                                                                 | not stated | 0 | 0 | No  |
| 10259615 | 1/5/2009   | 2000 | K1200LT | service brakes; hydraulic                      | FD failure                                                                         | not stated | 0 | 0 | No  |
| 10154980 | 4/5/2006   | 2000 | K1200LT | service brakes; hydraulic                      | FD failed; oil on rear brake and tire; temp loss of control                        | not stated | 0 | 0 | No  |
| 764892   | 6/16/2002  | 2000 | K1200LT | service brakes; hydraulic                      | FD crown bearing and seal failed; oil on rear brake                                | not stated | 0 | 0 | No  |
| 10162095 | 4/3/2006   | 2000 | K1200LT | service brakes; hydraulic; anti-lock           | FD failure with oil on rear brakes                                                 | not stated | 0 | 0 | No  |
| 10016602 | 4/8/2003   | 2000 | K1200LT | suspension                                     | FD failure, loud noise from rear before failure                                    | not stated | 0 | 0 | No  |
| 10161135 | 6/17/2006  | 2000 | K1200LT | suspension; rear                               | 2nd FD bearing failure                                                             | not stated | 0 | 0 | No  |
| 767395   | 9/7/2002   | 2000 | K1200LT | suspension; rear                               | "known rear end failure with this model"                                           | not stated | 0 | 0 | No  |
| 10025799 | 5/12/2003  | 2000 | K1200LT | wheels; center section                         | FD failure; oil all over rear tire made unsafe driving condition                   | not stated | 0 | 0 | No  |
| 765821   | 8/21/2001  | 2000 | K1200RS | power train; axle assembly; axle shaft         | 2nd FD failure; 1st at 47,200; 2nd at 73,800 at speed with lube on tire            | 73800      | 0 | 0 | No  |
| 10043275 | 10/16/2003 | 2000 | R1150GS | power train; driveline                         | FD failure                                                                         | not stated | 0 | 0 | No  |
| 10043215 | 3/1/2003   | 2000 | R1150GS | power train; driveline                         | FD failure                                                                         | 35000      | 0 | 0 | No  |
| 10025676 | 6/16/2003  | 2000 | K1200LT | power train; driveline                         | FD failure (listed as 2002 on NHSTA; but states 2000 model year in summary)        | 2000       | 0 | 0 | No  |
| 10375760 | 11/13/2010 | 2000 | R1200C  | service brakes; hydraulic                      | 3rd FD failure; grinding noise, coated rear tire and brakes with oil, disabled ABS | not stated | 0 | 0 | No  |
| 43       |            | 2000 |         |                                                |                                                                                    |            |   |   |     |
| 10123936 | 5/23/2005  | 2001 | K1200LT | power train; axle assembly; axle shaft; seal   | FD failure                                                                         | 37000      | 0 | 0 | No  |
| 764433   | 7/14/2002  | 2001 | K1200LT | power train; axle assembly; axle shaft; seal   | FD failure with gear oil on rear tire and brakes                                   | not stated | 0 | 0 | No  |
| 10247463 | 9/30/2008  | 2001 | K1200LT | power train; driveline                         | FD failure                                                                         | not stated | 0 | 0 | No  |
| 10195101 | 6/25/2006  | 2001 | K1200LT | power train; driveline; differential unit      | FD failure with gear oil on rear tire and brakes                                   | not stated | 0 | 0 | No  |
| 10136116 | 8/26/2005  | 2001 | K1200LT | power train; driveline; differential unit      | FD failure at speed with gear oil on wheel and brakes, tire slipped on road        | not stated | 0 | 0 | No  |
| 10032995 | 8/7/2003   | 2001 | K1200LT | power train; driveline; differential unit      | FD failure with rear wheel wobble                                                  | not stated | 0 | 0 | No  |
| 8009914  | 5/12/2002  | 2001 | K1200LT | power train; driveline; driveshaft             | FD failure at 65mph with oil on wheel and brakes; rear was "shimmying"             | 29300      | 0 | 0 | Yes |
| 10324890 | 4/9/2001   | 2001 | K1200LT | service brakes; hydraulic                      | FD failure with oil on tire and brakes                                             | not stated | 0 | 0 | No  |
| 10250905 | 11/28/2008 | 2001 | K1200LT | service brakes; hydraulic                      | FD failure; vibration noted                                                        | not stated | 0 | 0 | No  |
| 10201220 | 8/2/2004   | 2001 | K1200LT | service brakes; hydraulic; anti-lock           | FD failure                                                                         | not stated | 0 | 0 | No  |
| 10151127 | 1/25/2006  | 2001 | K1200LT | service brakes; hydraulic; anti-lock           | FD bearing failure with tire and brakes covered in gear lube                       | not stated | 0 | 0 | No  |
| 769292   | 7/2/2002   | 2001 | K1200LT | suspension                                     | FD bearing failure with vibration and rear wheel wobble                            | not stated | 0 | 0 | No  |
| 10193709 | 6/15/2007  | 2001 | K1200LT | suspension; rear                               | FD failure                                                                         | not stated | 0 | 0 | No  |
| 10091356 | 7/27/2001  | 2001 | R1150GS | power train; driveline                         | FD failure                                                                         | not stated | 0 | 0 | No  |
| 10030794 | 5/20/2003  | 2001 | R1150GS | power train; driveline; center support bearing | FD failure                                                                         | not stated | 0 | 0 | No  |
| 15       |            | 2001 |         |                                                |                                                                                    |            |   |   |     |

|          |            |      |         |                                                |                                                                                     |            |   |   |     |
|----------|------------|------|---------|------------------------------------------------|-------------------------------------------------------------------------------------|------------|---|---|-----|
| 10417790 | 6/6/2011   | 2002 | K1200LT | power train; driveline                         | 2nd FD bearing failure; 1st at 17,520 miles                                         | 42502      | 0 | 0 | No  |
| 10283064 | 8/28/2009  | 2002 | K1200LT | power train; driveline                         | 2nd FD bearing failure; 2nd failure occurred 3000 miles after new bearing installed | non stated | 0 | 0 | No  |
| 10282941 | 6/26/2009  | 2002 | K1200LT | power train; driveline                         | FD failure at 70mph with gear oil leaking; wheel later locked up                    | non stated | 0 | 0 | No  |
| 10201745 | 7/27/2007  | 2002 | K1200LT | service brakes; hydraulic; anti-lock           | FD failure with vibration and rear wheel wobble, wobble damaged ABS sensor          | non stated | 0 | 0 | No  |
| 10195550 | 6/26/2007  | 2002 | K1200LT | power train; driveline; center support bearing | FD bearing and seal failure                                                         | non stated | 0 | 0 | No  |
| 10176866 | 11/15/2006 | 2002 | K1200LT | power train; driveline; differential unit      | FD bearing failure                                                                  | non stated | 0 | 0 | No  |
| 10151093 | 10/17/2005 | 2002 | K1200LT | service brakes; hydraulic; anti-lock           | FD bearing failure; "suddenly rear of (m/c) started 'dancing'"                      | 14079      | 0 | 0 | No  |
| 10135893 | 8/26/2005  | 2002 | K1200LT | power train; driveline                         | FD bearing and seal failure; felt grinding; bearing was "shredded"                  | non stated | 0 | 0 | No  |
| 10132728 | 7/16/2005  | 2002 | K1200LT | power train; driveline; differential unit      | FD bearing failed; vibration and rear wheel hopping                                 | non stated | 0 | 0 | No  |
| 10090678 | 9/5/2004   | 2002 | K1200LT | power train; driveline                         | FD bearing and seal failure; oil leaked to tire resulting in tire sliding           | non stated | 0 | 0 | No  |
| 10060124 | 2/29/2004  | 2002 | K1200LT | power train; driveline                         | FD failure; vibration and grinding noises                                           | non stated | 0 | 0 | No  |
| 10060122 | 5/30/2003  | 2002 | K1200LT | power train; driveline                         | FD failure with leaking fluid onto to rear wheel and tire                           | non stated | 0 | 0 | No  |
| 10039008 | 8/26/2003  | 2002 | K1200LT | power train; driveline; differential unit      | FD failure                                                                          | non stated | 0 | 0 | No  |
| 10032679 | 8/11/2003  | 2002 | K1200LT | power train; driveline; differential unit      | FD failure; grinding, vibration and wobble                                          | non stated | 0 | 0 | No  |
| 10016679 | 4/9/2003   | 2002 | K1200LT | power train; driveline; differential unit      | FD failure; "bike went all wobbly"                                                  | non stated | 0 | 0 | No  |
| 10154607 | 3/6/2006   | 2002 | K1200RS | power train; driveline; differential unit      | FD failure at speed with oil on tire and brakes; bike became unstable               | 33000      | 0 | 0 | No  |
| 10032838 | 8/9/2003   | 2002 | K1200RS | power train; driveline; differential unit      | FD failure                                                                          | non stated | 0 | 0 | No  |
| 10029248 | 7/18/2003  | 2002 | K1200RS | suspension; rear                               | FD failure                                                                          | non stated | 0 | 0 | No  |
| 767225   | 9/1/2002   | 2002 | K1200RS | power train; driveline; differential unit      | FD failure; contact directed NHTSA to research other complaints                     | non stated | 0 | 0 | No  |
| 10208674 | 10/15/2007 | 2002 | R1150RS | power train; axle assembly                     | FD bearing failure; oil leaked on tire                                              | non stated | 0 | 0 | No  |
| 10168484 | 4/18/2005  | 2002 | R1150GS | power train; driveline                         | FD bearing and seal replaced                                                        | 36000      | 0 | 0 | No  |
| 10093667 | 10/2/2004  | 2002 | R1150GS | power train; driveline; driveshaft             | FD failure at 70mph; gear oil on tire and rear brakes; wheel hopped                 | non stated | 0 | 0 | No  |
| 10025621 | 6/21/2003  | 2002 | R1150GS | power train; driveline; driveshaft             | FD failure resulting in loss of gear oil and ABS sensor replacement                 | 28200      | 0 | 0 | No  |
| 10238033 | 7/20/2008  | 2002 | R1150RT | power train                                    | FD bearing failure                                                                  | non stated | 0 | 0 | No  |
| 24       |            | 2002 |         |                                                |                                                                                     |            |   |   |     |
| 10217729 | 2/4/2008   | 2003 | K1200LT | power train; driveline                         | FD failure with loss of oil                                                         | non stated | 0 | 0 | No  |
| 10167806 | 8/31/2006  | 2003 | K1200LT | power train; driveline; driveshaft             | FD failure                                                                          | non stated | 0 | 0 | No  |
| 10167135 | 8/30/2006  | 2003 | K1200LT | power train; manual transmission               | FD bearing failure                                                                  | 19000      | 0 | 0 | No  |
| 10150393 | 2/1/2006   | 2003 | K1200LT | power train; manual transmission               | FD bearing failure                                                                  | non stated | 0 | 0 | No  |
| 10355723 | 9/12/2010  | 2003 | K1200LT | power train; driveline                         | FD failure at 75mph; rear wheel locked causing skid, seal failed, oil loss          | 54000      | 0 | 0 | Yes |
| 5        |            | 2003 |         |                                                |                                                                                     |            |   |   |     |

|          |            |      |         |         |                                             |                                                                                       |            |   |   |    |
|----------|------------|------|---------|---------|---------------------------------------------|---------------------------------------------------------------------------------------|------------|---|---|----|
| 10410646 | 6/17/2011  | 2004 | K1200LT |         | wheels                                      | tire separated on hwy, loss of control, totaled bike, injuries (research pending)     | not stated | 2 | 0 | No |
| 10346214 | 7/22/2010  | 2004 | R1150GS |         | power train, driveline                      | FD failure, vibration w/oil on wheel/brakes (contact reports 2 addtl                  | not stated | 0 | 0 | No |
| 10297919 | 12/28/2009 | 2004 | R1150RT |         | power train, driveline                      | FD fails R1100RT)                                                                     | 31000      | 0 | 0 | No |
| 10235119 | 7/15/2007  | 2004 | R1150RT |         | power train                                 | FD failure                                                                            | not stated | 0 | 0 | No |
| 4        |            | 2004 |         |         |                                             | FD bearing failure                                                                    |            |   |   |    |
| 10210376 | 10/15/2007 | 2005 | K1200GT |         | power train; manual transmission; lubricant | FD failure                                                                            | not stated | 0 | 0 | No |
| 10291389 | 11/2/2009  | 2005 | K1200LT |         | power train; driveline                      | FD failure; bearing had been "obliterated"                                            | not stated | 0 | 0 | No |
| 10267148 | 4/20/2009  | 2005 | K1200LT |         | power train; driveline                      | FD bearing failure                                                                    | 36000      | 0 | 0 | No |
| 10235069 | 10/25/2007 | 2005 | K1200LT |         | power train; driveline                      | FD failure; crown bearing cage "destroyed"                                            | 31000      | 0 | 0 | No |
| 10219805 | 11/10/2007 | 2005 | K1200R  | K1200LT | power train, driveline differential unit    | FD bearing "loose"                                                                    | not stated | 0 | 0 | No |
| 5        |            | 2005 |         |         |                                             |                                                                                       |            |   |   |    |
| 10419264 | 8/7/2011   | 2007 | K1200GT | K1200LT | service brakes, hydraulic                   | FD failure                                                                            | not stated | 0 | 0 | No |
| 1        |            | 2007 |         |         |                                             |                                                                                       |            |   |   |    |
| 10276014 | 7/7/2009   | 2008 | K1200GT | K1200LT | power train                                 | FD failure with leaking oil "if it had happened while riding could have caused crash" | 7600       | 0 | 0 | No |
| 10242999 | 8/30/2008  | 2008 | K1200GT | K1200LT | power train; driveline                      | FD failure with oil on rear tire                                                      | 6500       | 0 | 0 | No |
| 2        |            | 2008 |         |         |                                             |                                                                                       |            |   |   |    |
| Total    | Model Year | No.  | K12LT   |         |                                             |                                                                                       |            |   |   |    |
| 2        | 1996       | 0    | N/A     |         |                                             |                                                                                       |            |   |   |    |
| 3        | 1997       | 0    | N/A     |         |                                             |                                                                                       |            |   |   |    |
| 2        | 1998       | 0    | N/A     |         |                                             |                                                                                       |            |   |   |    |
| 39       | 1999       | 31   | 79%     |         |                                             |                                                                                       |            |   |   |    |
| 43       | 2000       | 38   | 88%     |         |                                             |                                                                                       |            |   |   |    |
| 16       | 2001       | 13   | 87%     |         |                                             |                                                                                       |            |   |   |    |
| 24       | 2002       | 16   | 63%     |         |                                             |                                                                                       |            |   |   |    |
| 5        | 2003       | 5    | 100%    |         |                                             |                                                                                       |            |   |   |    |
| 4        | 2004       | 1    | 25%     |         |                                             |                                                                                       |            |   |   |    |
| 5        | 2005       | 4    | 80%     |         |                                             |                                                                                       |            |   |   |    |
| 1        | 2007       | 1    | 100%    |         |                                             |                                                                                       |            |   |   |    |
| 2        | 2008       | 2    | 100%    |         |                                             |                                                                                       |            |   |   |    |
| 145      |            | 110  | 76%     |         |                                             |                                                                                       |            |   |   |    |

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